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THE FLORA OF BRITISH INDIA.

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ASSISTED BY VARIOUS BOTANISTS.

VOL. IV.

ASCLEPIADEAE TO AMARANTACEAE.

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FLORA OF BRITISH INDIA.

ORDER XCV. ASCLEPIADEE. (By J. D. Hooker.)

Herbs or shrubs, usually twining. Leaves opposite or obsolete, very rarely alternate, quite entire, exstipulate. Inflorescence various, usually an axillary umbelliform cyme; flowers regular, hermaphrodite, 5-merous. Calyx inferior, lobes or segments imbricate. Corolla lobes or segments valvate or overlapping to the right, very rarely to the left; tube or throat often with a ring of hairs, scales, or processes (the outer or corolline corona). Stamens at the base of the corolla, filaments free in Periploceæ with or without interposed glands; in other tribes, connate into a generally very short fleshy column, which usually bears a simple or compound ring or series of scales or processes (inner or staminal corona) that are attached to the filaments or to the back of the anthers, or to both; anthers crowning the column, connate or free, adnate by the connective to the stigma, 2-celled; tip often produced into an inflexed membrane; pollen forming one or two granular or waxy masses in each cell, the masses united in pairs or fours to a gland (corpuscle) which lies on the stigma. Ovary of two distinct superior carpels, enclosed within the staminal column; styles 2, short, uniting in the stigma, which is 5-angled short and included between the anthers, or is produced beyond them into a long or short simple or 2-fid column; ovules many, rarely few, 2-serial in each carpel. Fruit of 2 follicles. Seeds compressed, usually flat ovoid winged and surmounted with a dense long brush of hairs (coma) (absent in Sarcolobus); albumen copious, dense; embryo large; cotyledons flat, radicle short, inferior.—Distrib. Species about 1,000, chiefly tropical.

The analysis of the plants of this order is most difficult, and in dried specimens never satisfactory, from the fleshiiness and complexity of the coronal processes and anthers. I have spent many months over the Indian ones, and have kept pretty close to the generic limits adopted in the “Genera Plantarum.” I have, however, been obliged to abandon the tribe Stapelieæ, to suppress Vincetoxicum, and to propose several new genera.

Suborder I. Periploceæ. Filaments usually free; anthers acuminate or with a terminal appendage; pollen-masses granular, in pairs in each cell.

Tribe I. Periploceæ. Characters of the Suborder.

* Coronal scales or processes 0.

Anthers with bearded appendages . . . . . . . 1. Pentanura.

** Coronal scales corolline, free, short, thick.

Corolla very small, rotate, lobes valvate : . . . . . 2. Hemidesmus.

Vol. IV.
Corolla small, rotate, lobes overlapping . . . . . . . . . 3. Cryptolepis.

*** Coronal scales 6, free, close to or adnate to the filaments.
† Coronal scales short, broad; filaments without interposed glands.
A pubescent twining shrub; leaves opposite . . . . . . . . . 4. Brachylepis.
An erect tree; leaves alternate . . . . . . . . . . . . . . . . 5. Utelia.
†† Coronal scales filiform or subulate.
u. Filaments free without interposed glands.
Cymes stout, pubescent. Corolla-lobes short, broad . . . . 6. Finlaysonia.
Cymes slender, glabrous. Corolla-lobes slender, straight 7. Atherostemon.

β. Filaments free, with interposed teeth or glands.
Cymes short, sessile. Corolla-lobes short, ovate . . . . . 10. Streptocaulon.
Cymes loosely panicked. Corolla-lobes lanceolate . . . . 11. Myriopteron.
††† Coronal scales short, broad; filaments connate, with interposed glands.

**** Coronal scales connate into a lobed ring; filaments without interposed glands.
Corolla rotate, lobes overlapping . . . . . . . . . . . . . . . . 13. Periploca.

Suborder II. Euasclepiadeae. Filaments connate; pollen-masses waxy.

Tribe II. Secamoneae. Anthers with a membranous inflexed tip; pollen-masses in pairs in each cell (20 in all), sessile in fours (2 pairs) on the corpuscle.
Corolla rotate, lobes overlapping to the right . . . . . . . . 14. Secamone.
Corolla rotate, lobes overlapping to the left . . . . . . . . 15. Toxocarpus.
Corolla rotate, lobes valvate . . . . . . . . . . . . . . . . . . 16. Gentianthus.

Tribe III. Cynancheae. Anthers with a membranous inflexed tip; pollen-masses solitary in each cell (10 in all), sessile or pedicelled in pairs on the corpuscle, pendulous.
* Corona single, corolline, 5-cleft . . . . . . . . . . . . . . 17. Glossonema.
** Corona double, corolline and staminal . . . . . . . . . 18. Oxystelma.
*** Corona staminal, of 5 processes adnate to the anthers; or 0.
† Stem erect.

†† Stem twining. Corolla-lobes overlapping.
Corolla rotate. Coronal processes laterally compressed . 22. Pentatropis.
Corolla campanulate. Coronal processes 0 . . . . . . . . 24. ADELosteuma.
**** Corona single, staminal, cupular or annular. Corolla rotate.

Corona of a 10-lobed ring, and 5 horny processes behind the anthers. 25. Holostemma.
Corona annular. Leafy erect or twining herbs or shrubs. 26. Cynanchum.
Corona annular. Leafless straggling shrubs. 27. Sarcostemma.

Tribe IV. Marsdeniaceae. Anthers with a membranous inflexed tip (absent in Physostelma and rarely in Hoya); pollen-masses solitary in each cell (10 in all), sessile, or pedicelled in pairs on the corpuscle, erect (rarely horizontal or pendulous in Tylophora).

* Corolla-lobes overlapping. Corona 0, or corolline.

Stem twining. Corolla-lobes short. Corona 0. 28. Sarcobulus.

** Corolla-lobes overlapping. Coronal processes on the staminal column, rarely 0.

† Corolla urceolate. Corolla-lobes overlapping. Corona 0, or corolline.

Corolla urceolate. Coronal processes minute or 0. Stigma included. 31. Gongronema.
Corolla urceolate or salver-shaped. Corona 0, or corolline. 32. Marsdenia.
Corolla rotate or salver-shaped. Corona 0, or corolline. 33. Persicaria.
Corolla salver-shaped, coriaceous. Corona 0, or corolline. 34. Stephanotis.
Corolla-lobes long, doubled down inwards in bud. 35. Lyosima.

†† Corolla rotate.

Cymes various. Column minute. Corona 0, or corolline. 36. Tylophora.
Cymes umbelliform. Column large; coronal processes simple. 37. Treutlera.
Cymes racemiform. Column minute, fleshy; coronal processes 2-fid. 38. Cosmostigma.
Cymes umbelliform, pendulous. Corona 0, or corolline. 39. Drigerea.

*** Corolla valvate. Coronal processes adnate to the staminal column.

Corolla urceolate or disciform. Corona cupular, fleshy. 42. Olanthus.
Corolla minute, urceolate. Corona scales membranous, erect. 43. Dischidia.
Corolla rotate. Corona very large, stellate. 44. Hoya.
Corolla cupular. Corona large, stellate. 45. Physostelma.

Tribe V. Ceropegieae. Anthers incumbent on the stigma, without a membranous tip; pollen-masses one in each cell (10 in all) sessile in pairs on the corpuscle, erect or horizontal. Corolla-lobes valvate in all.
* Corona double; corolline lining the corolla-tube and forming minute processes in the sinus of its lobes, staminal annular.

Corolla rotate, lobes very narrow. Stem very slender, erect or twining.

Corolla-tube long. Stem stout or slender, erect or twining.

Corolla rotate. Stem erect and branches short, stout, fleshy.

† Leafy herbs with terete stems and branches.

‡ Leafless herbs, with fleshy 4-angled stems and branches.

P. khasiana, Kurz in Herb. Calcutt.; glabrous, leaves elliptic-lanceolate acuminate at both ends, petiole slender. Pentanura sp., in regione Yunan and Periplocoa khasiana, Benth. in Gen. Pl. ii. 740 and 746.


Bracteoles smooth. Leaves 4-5 by 1½-1¾ in., reddish when dry beneath and finely reticulated, midrib stout; nerves 8-10 pairs, arched; petiole ¼-½ in. Peduncle stout, ⅜ in. in the Khasian specimen, ⅜-1 in. in the Yunan ones. Corolla about ⅜ in. diam; lobes pubescent within, pink. Filaments and back of anther pubescent as in Phyllanthera (which is perhaps not generically distinct) in the Yunan specimen, glabrous in the Khasian. Style elongate; stigma 2-lobed at the top. Follicles (young) in Khasian specimen ⅜-½ in. long, ovoid, incurved, obtuse.—I have not seen the Sumatran species which is the type of the genus.

2. HEMIDESMUS, Br.

Twining shrubs. Leaves opposite, hoary or pubescent beneath. Flowers small, in opposite crowded subsessile cymes, greenish-purple. Sepals glandular within, acuminate. Corona rotate; lobes thick, valvate. Coronal scales 5, on the corolla-throat, alternate with its lobes, short, thick. Filaments distinct; anther-tips connate, inflexed, membranous; pollen-masses cohering in pairs in
each cell, granular; appendages of the corpuscles dilated or hooded. **Stigma** 5-angled, crown flat. **Follicles** long, slender, divaricate, terete, smooth. **Seeds** comose.


**Northern India:** from Banda to Oudh and Sikkim, and southwards to Travancore and Ceylon.

Leaves most variable in form, length, and breadth, the shorter and broader 1–1 ½ by 1–1 ½ in., the longer ½ by ½ in., the broadest sometimes retuse at the tip, the narrowest finely acuminate, those on the young shoots often white along the midrib; petiole ½ in. **Peduncles** clothed with ovate acute imbricating bracts. **Corolla** ½ in. diam., green without, purple within. **Follicles** 4–5 in. **Seeds** ½ in., ovate-oblong, flattened, black; coma 1 in.

**Var. pubescens;** stem and leaves beneath and sometimes above pubescent. **H. pubescens, Wight & Arn. Contrib. 63; Wight & Arn. t. 1329; Wall. Cat. 8243; DC. in DC. Prodr. viii. 495.—Behar on the Ganges river, J. D. H.; Deccan Peninsula, Wight, &c.

3. **CRYPTOLEPIS, Br.**

Twining glabrous shrubs. **Leaves** opposite. **Flowers** in very lax slender dichotomous few-flowered peduncled terminal or axillary cymes. **Calyx** with 5 scales within. **Corolla-tube** short, cylindric or bell-shaped; lobes linear, overlapping and twisted to the right. **Coronal scales** 5, about or above the middle of the tube, linear or clavate, conniving. **Filaments** subconnate by their broad bases; anthers short, adhering by their base to the stigma, tips conniving, acuminiate; pollen-masses cohering in pairs in each cell, granular, appendages oblong. **Stigma** broadly conic. **Follicles** divaricate, terete, smooth. **Seeds** comose.—**Distrib.** Species 14; Tropical Asiatic and African.


Throughout India, from Western Kashmir to Assam and Burma, ascending the Himalaya to 4000 ft.: and southwards to Travancore and Ceylon.

Leaves 3–5 by 1–2 ½ in., coriaceous, shining above, sometimes obovate, apiculate or acuminate, base acute; petiole ½ in. **Cymes** very shortly peduncled, paniculate; branches short, divaricate. **Sepals** short, acute. **Corolla** yellow, ½ in. diam.; tube very short, lobes lanceolate. **Coronal scales** clavate. **Follicles** 2–4 in., straight, rigid, gradually narrowed from about the middle where they are ½ in. diam. **Seeds** ½ in. long, oblong-obovate, contracted below the tip, compressed; coma 1 in.

2. **C. grandiflora, Wight & Arn. t. 831, and Ill. ii. 169;** t. 155 b, f. E; glabrous, leaves obovate oblong or elliptic obtuse or mucronate, pale beneath,
nerves 5-6 pairs arched, cymes axillary and terminal few- or many-flowered. C. Wightiana, Wall. Cat. 4457. Echites coriacea, Heyne in Herb. Rottl.

Deccan Peninsula; the Mount, Madras, Heyne, &c.; Balughaut Mts., Wight.

Leaves 2-4 by 1-2 in., very variable in form, coriaceous, hardly glaucous beneath, base acute; petiole \( \frac{1}{3} \) in. Cymes sparingly branched, usually long-pedunced; branches stout, prominently distinctly scarred by the fallen bracts. Sepals large, ovate, acute. Corolla 1 in. diam.; tube ventricose, lobes falcate lanceolate. Coronal scales clavate. Follicles 2-4 in., curved and convivial or straight and divaricate. Seeds very large, \( \frac{1}{3} \) in. long, linear-oblong; coma a little longer.


A slender climber. Leaves 1\( \frac{1}{4} \)-2\( \frac{1}{4} \) by \( \frac{1}{3} \) in., rarely ovate or linear-lanceolate, tip sometimes reute, base rarely cordate; petiole 1\( \frac{1}{4} \)-\( \frac{1}{3} \) in., very slender. Cymes 2-4 in., peduncles long, branches few and pedicels slender. Sepals ovate, obtuse. Corolla yellow, 1\( \frac{1}{4} \) in. diam.; tube short, lobes lanceolate, tips twisted. Coronal scales clavate. Follicles 5-8 in., slender, nearly straight. Seeds much as in C. Buchananii.—The name of *Apocynum orixense*, in Rottlter's Herbarium, indicates the Oiissa habitat of this plant. Flower fragrant.

3°. **CRYPTOSTEGIA**, Br.


Cultivated in various parts of India.

Branches stout. Leaves 3-4 by 1\( \frac{1}{4} \)-2 in., coriaceous, glossy above; nerves many, spreading, arched, faint, base acute; petiole \( \frac{1}{3} \) in. Cymes short, spreading, peduncle and branches stout, hoary or glabrous; bracts caducous. Sepals \( \frac{1}{3} \) in. Corolla pale pinkish purple, tube and throat 1\( \frac{1}{4} \) in. long, limb often 2 in. diam., lobes acute. Follicles 4-5 by 1-1\( \frac{1}{3} \) in., broadened near the base, straight, woody. Seeds \( \frac{1}{3} \) in. long, oblong-ovate, compressed, narrowed upwards; coma 1\( \frac{1}{4} \) in., very fine.—Supposed to be a native of Africa or Madagascar, from which latter country another species is described with leaves pubescent beneath and entire coronal scales, but this is only known from Mauritian garden specimens. Schweinfurth found *C. grandiflora* cultivated at Khartum on the Nile.

A pubescent or tomentose twining shrub. **Leaves** opposite. **Flowers** small, villous, in terminal or axillary dichotomous cymes. **Sepals** ovate, glandular within. **Corolla** rotate, 5-cleft; lobes short, overlapping and twisted to the right. **Coronal scales** 5, broad, membranous, close to the stamens. **Anthers** sessile, cohering in a fleshy ring, tips acute connivent; pollen-masses in pairs in each cell, granular; appendages of the corpuscles orbicular. **Stigma** 5-angled, top flat. **Follicles** divaricate, acuminate, thick, smooth.


**Nilgerry Mts.**, alt. 5–7500 ft., common, Wight, &c.

**Leaves** 3–4 by 1–2 in., elliptic or ovate, acuminate, base acute or rounded, coriaceous, glabrous and glossy above; nerves 8–10 pairs, spreading and arched; petiole stout, ½ in. **Cymes** villous, peduncles and pedicels short, stout; bracts persistent; bracteoles numerous, imbricate. **Corolla** ⅛ in. diam., green outside, purple within, lobes ovate. **Follicles** not seen.

5. **UTLERIA**, Beddome.

A glabrous tree. **Leaves** scattered, narrow, subcrenulate. **Flowers** minute, towards the ends of the long branches of terminal peduncled dichotomous cymes. **Sepals** rounded, glandular within. **Corolla** subrotate, 5-cleft, lobes overlapping and twisted to the right. **Coronal scales** 5, small, opposite and close to the stamens. **Filaments** short; anthers ovate, connivent over and adnate to the stigma; pollen-masses in pairs in each cell, granular; appendages of the corpuscles dilated. **Stigma** convex. **Fruit** unknown.

**U. salicifolia**, Beddome mss.

**Deccan Peninsula**; Anamallay Mts., alt. 3–4000 ft., Beddome.

**Branches** stout. **Leaves** crowded at the ends of the branches, 7–9 by ½–1 in., narrowly lanceolate, acuminate, coriaceous, margin thickened waved or crenulate, base very acute; nerves many, very slender, nearly horizontal, reticulations fine; petiole 1–2 in. **Cymes** 4–6 in. sparsely branched; bracts on the terminal branches numerous, imbricate, obtuse; pedicels short. **Corolla** ⅜ in. diam., lobes ovate, acute.

6 **FINLAYSONIA**, Wall.

A lofty glabrous climber. **Leaves** opposite. **Flowers** in 2–3-chotomous axillary cymes, yellowish and purple. **Sepals** rounded, short. **Corolla** rotate, 5-cleft; lobes ovate, overlapping to the right. **Coronal scales** 5, close to the stamens, filiform. **Stamens** on the throat of the corolla, filaments slender; anthers adnate by the middle to the stigma, beardless, tip membranous indexed acute. **Pollen-masses** in pairs in each cell, granular; tips of the corpuscles slightly dilated. **Stigma** 5-angled, top flat. **Follicles** divaricate, turgid, narrowed at both ends, 1–3 winged; tip with a revolute beak. **Seeds** margined with soft retrorse hairs.

A very slender glabrous twining shrub. Leaves opposite. Flowers in axillary and terminal slender peduncled dichotomous cymes. Calyx minute, tube turbinate, eglandular within. Corolla rotate; lobes long, slender, overlapping to the right, straight and forming an oblong-cylindric bud. Coronal processes 5, filiform, at back of the bases of the filaments. Stamens at the base of the corolla; filaments very short, distinct, without interposed glands or teeth; anthers connivent over and adnate to the stigma, tips membranous, acute; pollen-masses in pairs in each cell, granular; appendages of the corollas dilated. Stigma rounded. Fruit unknown.

A. javensis, Blume Mus. Bot. i. 126, t. 23.

Tenasserim; banks of the Gyna, Moulmein, Lobb.—Distrib. Java.

Leaves 2–3½ by ¾–1½ in., oblong-elliptic or linear-oblong, apiculate, glaucous beneath, base obtuse or rounded; nerves 6–10 pairs, very slender, arched; petiole slender, ¼–½ in. Cymes much longer than the leaves; peduncle long and slender, branches filiform; bracts minute; flowers very few, distant; pedicels capillary, tip turbinate. Calyx-lobes small, rounded, membranous, with sometimes a very obscure scale in the sinus. Corolla-lobes long, linear, obtuse, ¾ in. long, erect and recurved. Stamens very minute.


A pubescent slender climber. Leaves opposite, very narrow, membranous. Flowers very small, in very short few-flowered axillary pubescent cymes. Calyx ⅛-superior, tube turbinate; lobes short, eglandular within. Corolla rotate; lobes triangular, overlapping to the right. Coronal scales 5, subulate, at the back of the stamens. Stamens at the base of the corolla; filaments very short, distinct, with interposed rounded glands; anthers oblong, connivent over and adherent to the stigma, tips obtuse, connate; pollen-masses in pairs in each cell, granular; appendages of the corollas dilated. Ovary half sunk in the calyx-tube and adherent to it; stigma small, tip obtuse. Fruit unknown.


Peou, at Prome, Wall.; Rangoon, McClelland.

Branches glabrous below. Leaves 3–7 by 1¼–1½ in., narrow, oblong or linear-lanceolate, acute or acuminate, puberulous above, softly pubescent beneath; base acute; nerves rather distant, spreading, slightly arched, very slender; petiole ⅛ in. Cymes shorter than the petioles; bracts minute; pedicels very short, top turbinate. Corolla ⅛ in. diam., shortly conic in bud, lobes glabrous within. Filaments alternating with obscure low glands.—The habit, foliage, inflorescence, eglandular calyx, obtuse anthers and short stigma well distinguish this from Atherandra.
9. Atherandra, Donn.

Slender glabrous twining shrubs. Leaves opposite. Flowers in axillary and terminal slender peduncled dichotomous cymes. Calyx-tube turbinate, lobes with quadrate crenulate glands within. Corolla rotate; lobes long, slender, overlapping and sharply twisted to the right, forming a long-beaked bud. Coronal processes 5, filiform, at the back of the bases of the filaments. Stamens at the base of the corolla; filaments distinct, alternating with large erect glands; anthers sagittate, conniving over and adnate to the stigma, tips elongate, filiform; pollen-masses in pairs in each cell, granular; appendages of the corpuscles dilated. Ovary partly sunk in the broad calyx-tube; stigma elongate-conical, 2-fid. Fruit unknown.


Penang, Wallich.—Distrib. Java.

Branches and leaves beneath glabrous or sparingly pubescent. Leaves 1–2 by 1–1½ in., oblong or obovate-oblong, finely abruptly acuminate; nerves 6–8 pairs, strong beneath, arched; petiole ¼–½ in. Cymes numerous, quite glabrous, spreading, longer than the leaves; bracts small, deciduous; pedicels thickened towards the turbinate tip. Calyx-lobes ovate, acute, erect or reflexed. Corolla ½–¾ in. diam., long and slenderly beaked in bud.

10. Streptocaulon, Wight & Arn.

Twining tomentose herbs or shrubs. Leaves opposite. Flowers small or minute, in lax sessile or peduncled trichotomous panicled cymes. Calyx minute, glandular within. Corolla rotate; lobes-ovate, overlapping to the right; buds shortly conical. Coronal-scales 5, filiform, adnate to the back of the filaments. Stamens at the base of the corolla; filaments very short, alternating with minute teeth; anthers conniving over and adnate to the stigma, tip with an obtuse triangular process; pollen-masses in pairs in each cell, granular; appendages of the minute corpuscles dilated. Stigma convex, 2-lobed. Follicles divaricate, terete, smooth, not winged.—Distrib. Species 6; Indian and Malay.

1. S. Kleinii, Wight & Arn. Contrib. 65; shrubby, climbing, leaves cuneate-ovobate base cordate with softly appressed white tomentum beneath, nerves 7–10 pairs, cymes pubescent shorter than the leaves. Donn. in DC. Prodr. viii. 496.

Deccan Peninsula; Klein.
Leaves 2–3 by 1–1½ in., coriaceous, above puberulous closely reticulated with sunk nerves, beneath pale buff when dry; nerves and reticulation faintly seen through the tomentum; petiole ¼–¼ in. Cymes with a stout peduncle ½–1½ in., sparingly shortly di-tri-chotomously branched, branchlets very short 1–2-fid; bracts tomentose, persistent. Sepals hisrate, ovate, subaculate, 1–2-glandular. Corolla ⅝ in. diam.; lobes ovate, subacute, sparingly hisrate externally, glabrous within.

2. S. Wallichii, Wight & Arn. Contrib. 65; shrubby, climbing, leaves broadly or narrowly elliptic acute at both ends finely acuminate softly brown-tomentose beneath, nerves 6–8 pairs, cymes much branched many-fid. hispidly pubescent, flowers quite glabrous. Wall. Cat. 8249; Donn. in DC. Prodr. viii. 496.
Branches stout, young densely shortly pubescent; bark brown, lenticellate.
Leaves 2-3 by 1-2 in., very variable in breadth, coriaceous, opaque and puberulous above, reticulations minute; nerves faint beneath; petiole $\frac{1}{2}-\frac{3}{4}$ in. Cymes spreading, 1-2 in. long and broad; 2-3-chotomously branched; branches divaricate, slender, ultimate with persistent sometimes imbricate minute bracts; pedicels slender, tips turbinate. Sepals glabrous, minute, obtuse. Corolla $\frac{3}{10}$ in. diam., red, lobes broad acute. Follicles 3 by $\frac{1}{3}$ in. divaricate, straight, acuminate, pubescent. Seeds $\frac{1}{6}$ in., oblong, narrowed below the tip; coma $\frac{1}{4}$ in.

3. S. tomentosum, Wight & Arn. Contrib. 64; shrubby, climbing, leaves cuneate elliptic or oblanceolate acuminate base rounded or truncate, softly fulvous-tomentose beneath, nerves 16-20 pairs, cymes many-flowered densely pubescent, corolla quite glabrous. Wight Ill. t. 182 f. 2.; Wall. Cat. 8248; Dene. in DC. Prodr. viii. 496.

Branches smooth, ultimate finely densely pubescent. Leaves very variable in breadth, 3-5 by $\frac{1}{2}-\frac{3}{4}$ in., usually broadest beyond the middle and truncate at the base, puberulous above; nerves straight, prominent or concealed in the tomentum beneath; petiole $\frac{1}{2}-\frac{3}{4}$ in. Cymes short, 1 in. long and broad or less, branches divaricate; bracts persistent. Sepals pubescent. Corolla $\frac{1}{6}$ in.; lobes broad ovate, acute. Fruit unknown.


Tenasserim, Helser (Kew Distrib. 3754, under tomentosum); Mergui, Griffith.
Branches stout, lenticellate, ultimate hispidly tomentose. Leaves 3-6 by $\frac{1}{2}-2$ in., variable in form, often broadest above the middle, hard and coriaceous, finely impressed reticulate above; nerves and reticulations, usually prominent beneath. Cymes 1-2 in. long and broad, densely hispid, branches rather stout divaricate; bracts persistent; pedicels short. Calyx strigose. Corolla $\frac{3}{10}$ in. diam.; lobes broad, acute. Follicles 2-4 by $\frac{1}{3}$ in., straight, acute, finely pubescent. Seeds nearly $\frac{1}{6}$ in., narrowly oblong, coma 1 in.

5. S. sylvestre, Wight Contrib. 65; herbaceous, prostrate, leaves sub-sesillis orbicular or broadly ovate pubescent or tomentose beneath, base rounded or cordate, nerves 6-7 pairs, cymes small few-fl., corolla nearly glabrous. Wall. Cat. 8261; Dene. in DC. Prodr. viii. 496.

Bengal, Hamilton; foot of the Sikkim Himalaya, Clarke.
Root woody, giving off many slender pubescent flexuous branches, 12-18. in. long with distichous leaves that lie flat on the ground. Leaves 1-1½ in. long and nearly as broad, apiculate, glabrous or puberulous above; nerves arched, prominent beneath. Cymes $\frac{1}{4}$ in., pubescent; peduncle slender; branches and pedicels short, not spreading; bracts minute; Calyx small, strigose. Corolla $\frac{1}{2}$ in. diam., purple, very slightly pubescent, lobes lanceolate acute. Fruit unknown.

11. MYRIOPTERON, Griff.
A glabrous or pubescent slender twining shrub. Leaves opposite, long-petioled. Flowers small, in lax paniculate cymes from opposite axils. Sepals minutely glandular within. Corolla rotate; lobes narrow, overlapping to the right, twisted to the left, broadly conic in bud. Coronal scales 5, at the back of the filaments, filiform from a broad base. Stamens at the base of the corolla,
filaments connate below into a ring with alternating teeth; anthers conniving over and adherent to the stigma, tips membranous; pollen-masses in pairs in each cell, appendages of the corpuscles 2-fld. Stigma convex, 2-fld. Follicles short, turgid, straight; with many longitudinal membranous wings. Seeds comose.


Branches smooth, herbaceous. Leaves 3½-5 by 2-2½ in., very variable in length and breadth, rounded oblong or elliptic, acuminate or subacutate, base rounded or acute, membranous, finely pubescent or glabrate beneath; nerves 5-7 pairs, slender, arched; petiole very slender, ½-1½ in. Cymes 3-7 in., peduncle and bractiate branches very slender, quite glabrous; bracts few, chiefly at the forks; pedicels capillary, top turbinate. Sepals minute, rounded, ovate. Corolla ½ in. diam.; lobes lanceolate. Follicles 3 by ⅔ in., straight, narrowed to the obtuse tip, base rounded, pericarp thin. Seeds ½ in. long, ovoid, narrowed to the tip, coma 1 in.—M. Horsfieldii, agrees with the perfectly glabrous leaved states of the plant from Tenasserim.


A glabrous twining shrub. Leaves opposite. Flowers small, in axillary pedunclate cymes. Calyx eglantular within. Corolla rotate; lobes valvate, bearded within, ovoid in bud. Coronal scales 5, ovate, adnate to the back of the base of the filaments. Stamens at the base of the corolla, filaments connate at the base with alternating minute glands; anthers ovate, conniving over and adnate to the stigma, tip acute inflexed; pollen-masses in pairs in each cell, granular; appendages of the corpuscles dilated. Stigma convex, 5-grooved. Fruit unknown.


Decan Peninsula; Balaghaut Mts. near Madras; Anamallay hills, Wight. Branches stout, smooth. Leaves coriaceous, orbicular or elliptic-obovate, tip rounded, base acute or rounded, finely reticulated; nerves 6-8 pairs, strongly arched; petiole ½-1½ in. Cymes in single axils, glabrous or puberulous; peduncle ½ in.; branches few, short, spreading; bracts persistent, scattered or subimbric ate. Sepals oblong, obtuse. Corolla ½ in. diam., coriaceous; lobes ovate-oblong, subacute, beard dense white.

13. **PERIPLOCA**, Linn.

Kret or twining glabrous sometimes leafless shrubs. Leaves opposite. Flowers in lax terminal or axillary cymes, greenish externally, purplish within. Calyx 5-glandular within. Corolla rotate; lobes obtuse, usually bearded within, overlapping to the right. Coronal scales connate into a 10-lobed ring often produced behind the stamens into 5 subulate or branched processes. Stamens within the corona, filaments broad short flat; anthers bearded on the back, conniving over and adhering to the stigma, tips cohering, with incurved appendages; pollen-masses in pairs in each cell, granular; appendages of the corpuscles dilated. Stigma convex. Follicles conniving spreading or divaricate, cylindric, smooth. Seeds comose. Distrib. S. Europe, West Asia and Africa, Species 12.


A shrub; branches as thick as a goose-quill or less, smooth or tips pubescent. *Leaves*, if present, \(\frac{3}{4}\) in., oblong, acute, very thick, nerveless. *Cymes* often opposite, \(\frac{3}{4}-1\) in. long and broad, branched from the base or on short thick peduncles, glabrous; branches short, thick; bracts caducous. *Sepals* broad, rounded-ovate. *Corolla* \(\frac{1}{2}-\frac{3}{4}\) in. diam., dark purple, glabrous externally, lobes ovate-oblong, densely bearded above the middle within. *Follicles* \(\frac{3}{4}\) by \(\frac{1}{4}\) in., rigid, woody, terete. *Seeds* \(\frac{1}{4}\) in., narrowly oblong; coma 1 in.—"Used for cordage; flowers fragrant, eaten by natives, taste like raisins" (Stocks).


**Western Himalaya**, Southern Kashmir and Kistwar, ascending to 4000 ft., and the adjacent **Panjab**, Falconer, Thomson, &c. **Distrib. Afghanistan**.

Quite glabrous. *Branches* tortuose, wiry, sometimes fascicled, as thick as a crow-quill, smooth. *Leaves* (if present) \(\frac{3}{4}-1\) in., linear, subacute, thick, nerveless. *Cymes* \(\frac{3}{4}-1\) in. long and broad, often opposite, very numerous; peduncle stout, erect, branches divaricate; bracts caducous. *Sepals* rounded, quite glabrous. *Corolla* \(\frac{1}{4}\) in. diam.; lobes oblong, obtuse, pubescent or villous within, glabrous externally. *Follicles* (old only seen) broader and less woody than in *P. aphylla*.


**Temperate and subtropical Himalaya**, alt. 3–5000 ft. from Kumaon to Sikkim, Khasia Mts. alt. 4000 ft. A small shrub, branches slender. *Leaves* \(1\frac{1}{2}-3\) by \(\frac{3}{4}-\frac{3}{2}\) in., coriaceous, shining on both surfaces, margin undulate; petiole \(\frac{1}{4}\) in. *Cymes* numerous, often in opposite axils, sessile, \(\frac{3}{4}-1\) in. long and broad; branches and pedicels slender; bracts caducous. *Sepals* broadly ovate, obtuse. *Corolla* \(\frac{1}{4}\) in. diam., lobes ovate-oblong acute. *Follicles* 4–5 by \(\frac{3}{4}\) in., quite straight or curved, parallel or divergent, never divaricate, smooth, terete; pericarp thin but firm. *Seeds* \(\frac{1}{2}-\frac{3}{4}\) in. long, linear; coma 1–1\(\frac{1}{2}\) in.

** Tribe 2. SECAMONEAE.**

**14. SECAMONE, Br.**

Climbing or straggling shrubs or undershrubs. *Leaves* opposite. *Flowers* small or minute, in sessile or shortly peduncled lax axillary 2–3-echtomous *cymes*. *Corolla* rotate, 5-cleft; lobes (in Indian species) overlapping to the right. *Coronal scales* 5, adnate to the staminal tube, laterally compressed, tips free. *Filaments* short, connate; anther-tips small, membranous, inflamed; pollen-masses in pairs in each cell, small, globose, waxy, corpuscles minute. *Stigma* beaked, 2-hd, or low and conical. *Follicles* stout or slender, acuminate, smooth, terete or angled. **Distrib.** Species about 24, tropical Asia, Australia, and Mascarene Islands.
S. emetica, \textit{Br. in Mem. Wern. Soc.} i. 56; slender, glabrous, except the puberulous cymes, climbing; leaves lanceolate, or linear- or elliptic- lanceolate subacute narrowed into the short petiole, cymes much shorter than the leaves, corolla glabrous, coronal-scales broadly subulate incurved much shorter than the column, stigma 2-lobed, follicles slender straight terete narrowed from the base to the tip. \textit{Done. in DC. Prodr.} viii. 501; \textit{Wight Contrib.} 60; \textit{Ic. t.} 1238, and \textit{Ill. t.} 155. \textit{b. fig. D.}; \textit{Wall. Cat.} 8236. \textit{Periploca emetica, Retz. Obs.} ii. 14.

Mountains of the South Deccan Peninsula and Ceylon.

Leaves 1$\frac{1}{2}$-3 by $\frac{1}{2}$-1 in., rather glaucous beneath, nerves very faint. Cymes few- or many-fld.; peduncle $\frac{1}{2}$-1 in. Sepals ciliolate. Corolla $\frac{1}{2}$ in. diam., segments oblong, obtuse, bases sacrate. Follicles 2-2$\frac{1}{2}$ in.—\textit{S. Peniaysoni, Wight}; \textit{Wall. Cat.}, a native of Siam, has much broader leaves and longer cymes.

15. \textbf{TOXOCARPUS}, \textit{Wight & Arn.}

Twining shrubs. Leaves opposite. Flowers small, in axillary dichotomous cymes. Calyx minute; lobes oblong, obtuse. Corolla-tube short; lobes narrow, spreading and recurved, glabrous, overlapping to the left. Coronal scales minute, obtuse or acute, adnate to the column. Filaments connate; anthers small, retuse, often inappendiculate; pollen-masses 2 in each cell, very minute, pendulous, waxy. Stigma produced far beyond the column. Follicles smooth. Seeds comose. \textit{Distr.} Species about 14, tropical Asiatic and African.

I am unable to determine accurately from herbarium specimens the characters of the very minute staminal column and its scales in this genus.

* Cymes rusty-pubescent. Corolla-segments without an adnate scale.

† Corolla-segments villous or hairy at the base only.


\textit{Tenasserim}; \textit{Mergui}, \textit{Griffith}.—\textit{Distr.} Java.

Leaves 2-3$\frac{1}{2}$ by 1-1$\frac{1}{2}$ in., base acute, glabrous in age; petiole $\frac{1}{2}$-1 in. Cyme-branches stout and sepals densely villous. Corolla $\frac{1}{2}$ in. diam., segments slightly hairy at the base.


\textit{Tenasserim, Griffith, \&c.} \textit{Malacca, Maingay} (Kew distrib. 1105). \textit{Singapore, Lob. Penang, Porter.}

Leaves 2-4 by 1-2 in., base acute or rounded; petiole $\frac{1}{2}$-1 in. Cymes few-fld. Corolla-segments slightly hairy at the base, the hairs disposed in a triangle like the adnate scale of \textit{T. acuminatus}. Follicles 12 in., very slender, flexuous, cylindric. Seeds 1 in., very slender, not beaked.

3. \textbf{T. himalensis}, \textit{Falc. mss.}; leaves elliptic-oblong or lanceolate or orbicular obtusely cuspidate, young pubescent beneath, coronal scales overtopping the anther-cells, stigma slender unequally 2-fld.

Leaves 3–5 by 1½–3 in., quite glabrous when old, base acute or rounded, petiole ½–3 in. Corolla ½ in. diam.; lobes membranous, slender, villous at the base within. Foliolutes 4–6 by ½–3 in., young rusty-pubescent. Seeds ovate, beaked, ⅜ in. long.—The only Himalayan specimen is Falconer's, and probably from Garwhal.

† † Corolla-segments glabrous throughout.

4. T. Roxburghii, W. & A. Contrib. 61; stem cymes and calyx sparingly hirsute, leaves broadly elliptic cuspidate membranous glabrous base subacute, cymes spreading much shorter than the leaves, flowers few sessile, coronal scales acute hardly overtopping the anther-cells, stigma fusiform. Wight Io. 475; Wall. Cat. 8239; Dene. in DC. Prodr. viii. 505; Asclepias longestigima, Roxb. Fl. Ind. ii. 46.

The Circars, Heyne; Roxburgh.

Leaves 2½ by 1½–2 in., midrib sparsely puberulous beneath; petiole ½–3 in. and nerves very slender. Cymes shortly peduncled; flowers solitary or clustered, ½ in. diam.; bracts very minute.—I am in doubt about this plant, for which Wight cites u. 1561 as his catalogue number, for the solitary specimen in his "Herbarium" has no number, locality, or collector's name attached. Good specimens are however in Rottler's "Herbarium," sent by Heyne as Echites dichotoma, Herb. Heyne (not the plant published under that name), and in Wallich's also from Heyne. Roxburgh gives no locality for it in his "Flora," but Wight gives the Circars on Roxburgh's authority. The flowers in his (Roxburgh's) drawing are twice as large as in the specimens. Wight and Arnott and Decaisne describe the corolla-throat as hirsute, which is perfectly glabrous in Roxburgh's drawing and in the specimens; and the cymes as longer than the leaves, whereas they are much shorter. As a species it is very near T. Kleinii, but is a much more slender less villous plant, with very short coronal scales.

5. T. Kleinii, Wight & Arn. Contrib. 61; leaves from elliptic-ovate or obovate or lanceolate to orbicular acuminate or cuspidate glabrous or pubescent beneath base acute, cymes spreading and calyx densely tomentose, flowers few sessile and pedicelled, coronal scales overtopping the anther-cells, stigma long fusiform tip slender notched. Wight Io. 286; Dene. in DC. Prodr. viii. 505.

Hills of the Deccan Peninsula, from the Concan southwards. Ceylon; Maturate district alt. 3000 ft. Thwaites; Galle, Champion.

Very near T. Roxburghii, but stouter, with more coarcesse leaves, longer more densely tomentose cymes, larger usually pedicelled flowers ⅜ in. diam., less membranous calyx and corolla, and longer coronal scales. Foliolutes quite glabrous, more or less curved, some 3 by ⅜ in. and flattened, others 7 by ⅜ in. and nearly cylindric. Seeds ⅜ in. ovate, hardly beaked.—In some specimens, both Peninsular and Ceylonese, the leaves are narrow, 2 by ⅜ in., quite glabrous and shining on both surfaces, in others they are ¾ in. long and broad, rusty-pubescent beneath. I do not find the tube of the corolla to be pubescent within as figured by Wight.

6. T. concanensis, Hook. f.; leaves obovate or elliptic cuspidate mottled and glabrous or pubescent beneath, cymes densely tomentose much branched many-fl., coronal scales hardly overtopping the anther-cells, stigma long slender.

Canara; on the Bababoodan hills, Law.

This again closely resembles T. Kleinii, but the leaves are much larger, 3–5 by 2½–3 in., more obovate, with petioles ½–⅜ in. long, and the cymes are more divided, very many-flowered, densely tomentose. The leaves are dark green, minutely mottled between the nerves beneath in a branching reticulated manner, a character I do not
find in its allies, though there are traces of it in *T. Kleini*. Fragment of a follicle cylindrical, glabrous.

7. **T. Kurzii**, Hook. f.; leaves large broadly elliptic-ovate broadly cuspidate coriaceous shining, cymes small, flowers few sessile, calyx nearly glabrous, corona scales obtuse hardly overtopping the anther-cells, stigma long slender.

**Middle Andaman Island, Kurz.**

I have seen but one specimen, which is nearest to *T. Kleini*, differing in the large (4-5 by 2¾-3 in.) coriaceous leaves, long (¾ in.) petioles and nearly glabrous calyx.

**Corollas lobes with a triangular erose scale adnate to their bases.**


**Silhet, Wallis.**

*Stem* glabrous, pustular. *Leaves* 4-5 by 1½-1¾ in., shining on both surfaces; *nerves* many, faint, spreading; *petiole* 4-1 in. *Cymes* almost glabrous, nearly equaling the leaves; *pedicels* very slender; *bracts* very minute. *Sepals* very small, rounded. *Corolla* ½ in. diam., quite glabrous, lobes lanceolate twice as long as the tube. *Coronal scales* triangular, shorter than the column. *Stigma* long, fusiform.

**DOUBTFUL AND IMPERPECTLY KNOWN SPECIES.**

*T. eriocarpus*, Hook. f.; leaves elliptic-oblong or oblong-lanceolate acute at both ends quite glabrous, petiole slender, nerves slender very oblique, follicles long curved terete finely pubescent, seeds linear-oblong tip not contracted.

**Travancore**; at Courtaul, *Wigt.*


T. Wrightianus, *Hook. & Arn. Bot. Beed. Veg. 200; Donn. in DC. Prodr. viii. 506; stem very slender, young densely rusty-tomentose, leaves small 1-1½ in. elliptic oblong cuspidate glabrous above rusty-pubescent beneath, base rounded, nerves 2-4 pairs, slender oblique, petiole ¾ in.—Specimens in leaf only collected by Dr. Thomson and myself at the Bor-panee river, Khasia Mts. alt. 2000 ft., quite resemble the Chinese *T. Wrightianus*, which may be known by its very small cymes of flowers, like those of *T. himalensis*, and its short tomentose pods.


Twining shrubs. *Leaves* opposite. *Flowers* small, in axillary subsimple or dichotomously branched cymes. *Calyx* minute, lobes oblong obtuse. *Corolla-tube* short; lobes narrow, spreading and recurved, villous to the tip on the inner face, valvate. *Corona* of 5 scales adnate to the column. *Staminal-column* minute; pollen-masses 2 in each cell, minute, waxy. *Stigma* sessile and capitatae, or long and slender.—*Distr.* Species 3 or 4 tropical Asiatic and Malayan.

This genus is distinguished from *Toxicarpos* by the bearded corolla-lobes and valvate vexation.

* Stigma sessile, capitae. Cymes very compound,


Stem glabrous, pustular. Leaves 3-4 by 2-3 in. or larger; nerves slender, spreading; petiole 1/4-1 1/2 in. *Cymes* very variable, 1-4 in. long and broad; flowers 1/4-3/4 in. diam., sessile and pedicelled, of two forms on the same cyme, one small with narrow densely bearded segments, the other much larger with broader oblong nearly glabrous segments. *Follicles* in Roxburgh's figure 5 by 1/4 in., very slender, terete, straight.—*Wight & Arnott* give *Cawnpore*, Genl. Hardwicke, as a locality for this, but I suspect some mistake.

**Stigma elongate, columnar. Cymes subsimple, branches long stout with distinct clusters of sessile flowers.**


**Silhet, Wallich.**

Leaves 3-5 by 2-2 1/2 in., base rounded or subacute, margins narrowly recurved, nerves very spreading; petiole stout, 1/4-3/4 in. *Cymes* simple, or twice or thrice branched, stout, flexuous, as long as the leaves; flowers 1/4 in. diam. *Stigma* very stout, subdeltate.

3. **G. Maingayi**, Hook. f.; branches and cymes rusty-pubescent, leaves glabrous oblanceolate obtusely acuminate, coronal scales overtopping the anther-cells.

**Singapore, Maingay** (*Kew Distrib.* n. 1106).

Leaves 2 1/2-3 1/2 by 1 1/2-1 1/2 in., coriaceous, narrowed into the petiole, midrib beneath glabrous or pubescent, nerves ascending; petiole 1/4-1/2 in. *Cymes*, flowers, staminal column and *stigma* as in *G. crassifolius.*

**Tribe 3. CYNANCHAE.**

**17. GLOSSONEMA, Dcne.**

Diffuse, hoary undershrubs or herbs, branched from the base. *Leaves* opposite. *Cymes* small 2-6-flowered, sessile or shortly peduncled; flowers small. *Sepals* glandular within. *Corolla* subcampanulate, tube short, lobes overlapping to the right. *Corona* near the base of the tube, 5-cleft; lobes large, broad, hyaline, obtuse acuminate or ligulate. *Staminal column* short; anthers tipped by an inflexed membrane; pollen-masses solitary in each cell, oblong, not compressed, pendulous, waxy. *Stigma* exerted, fleshy, conical clavate or peltate. *Follicles* thick, acuminate, muricate or spinous. *Seeds* comose.—*Distrib.* Species 6; tropical African, Arabian and Scind.

SCIND, Vicary, Frere, Stocks.—DISTRIB. Beluchistan, Persia.
Annual. Branches 4-6 in., stout, erect or decumbent. Leaves 1-2 in., often as broad, base acute, nerves obscure; petiole 1/4-1 in. Flowers yellowish, 3/4 in. diam. Follicles 2-3 in., ovoid, turgid, beaked, fleshy; spines very stout, soft, scattered. Seeds 1/6 in., broadly ovate, flattened, pale yellow-red, margins thin.

18. OXYSTELMA, Br.

Twining glabrous herbs or undershrubs. Leaves narrow, opposite. Flowers large, in loose racemose or umbelliform cymes or solitary, pedicels filiform. Calyx small, 5-10-glandular within. Corolla broadly urceolate, or campanulate or rotate; lobes ciliate and subvalvate below, tips overlapping to the right. Corona double, corolline annular, at the base of the corolla, papillosae within, margin membranous, truncate; staminal of 5 scales adnate to the bases of the stamens with corolline or dilated bases, 2-keeled within. Filaments short, conuate; anther-tips membranous, inflexed; pollen-masses one in each cell, oblong, compressed, pendulous, waxy. Stigma depressed, or subconvex. Follicles thick, oblique or curved, smooth or narrowly 2-winged. Seeds comose.—DISTRIB. Species 4; tropical Asia and Africa.


Throughout the plains and lower hills of India; from the Punjab to Ceylon, Assam, Pegu and Tenasserim.—DISTRIB. Ava, Java.

A deciduous-leaved very slender climbing perennial. Leaves 4-6 by 1/8-1 in., membranous, nerves many, uniting far within the margin; petiole 1/8 in., very slender. Cymes few-fl., peduncle and pedicels capillary. Flowers white and rose-coloured with purple veins. Follicles 2-3 in., rather membranous. Seeds very numerous, 1/6 in., broadly ovate, flat.—O. Wallichii of Wight differs only in the more oblong follicles rounded at the end.

19. CALOTROPIS, Br.

Erect, glabrous or hoary shrubs or small trees. Leaves-opposite, broad, sub-sessile. Flowers medium-sized in umbelliform or subracemose cymes. Sepals glandular within. Corolla broadly campanulate; lobes broad, naked, valvate. Coronal-scales 5, fleshy, laterally compressed, radiating from the large staminal column, dorsally spurred. Anther-tips membranous, inflexed; pollen-masses one in each cell, pendulous flattened, waxy. Stigma depressed, 5-angled or lobed. Follicles short, thick. Seeds comose.—DISTRIB. Species 3; tropical Asia and Africa.


VOL. IV.
Throughout India, ascending to 3000 ft. in the Himalaya from the Punjab to Assam, Ceylon and Singapore.—Distr. Malay Islands, S. China.


Western and Central India, ascending to 3500 ft. from Scind and the Punjab to Behar and Bombay.—Distr. Ava, Persia, trop. Africa.


3. C. Acia, Hamilt. in Trans. Linn. Soc. xiv. 247; herbaceous, leaves petioled obovate oblanceolate or oblong glabrous, corolla-lobes erect, coronal-scales 2-lobed. C. herbacea, Wight Contrib. 54, and Ic. t. 493; Wall. Cat. 8218; Dcne. in DC. Prodr. viii. 536. Asclepias herbacea, Roxb. Hort. Beng. 21, and Fl. Ind. ii. 60.

N. Bengal and Sikkim Terai; from Tirhoot to Mymensing, ascending the Himalaya to 3000 ft.

Stem erect. Leaves 6–8 by 1–4 in., very thick, narrowed into the petiole; nerves few, stout; petiole ½–1 in.—Flowers as in C. procera.

19. ASCLEPIAS, Linn.

Perennial erect herbs. Leaves opposite, alternate or whorled. Cymes umbelliform; flowers medium-sized or small. Sepals glandular within. Corolla rotate, lobes often reflexed, naked, valvate. Coronal-scales 5, erect, adnate to the column, spoon-shaped. Anther-tips membranous, inflexed; pollen-masses one in each cell, pendulous, flattened, waxy. Stigma depressed, 5-angled. Follicles turgid, beaked, smooth. Seeds comose.—Distr. Species 60; all American, except 2 African and the following cosmopolitan one.

A. curassavica, Linn.; Dcne. in DC. Prodr. viii. 566; perennial, leaves opposite lanceolate or oblong-lanceolate acute narrowed into a short petiole glabrous, umbels many-fl., shortly peduncled, corolla orange-red, lobes reflexed, column stipitate. Roxb. Hort. Beng. 20; Dals. & Gibbs. Bomb. Fl. Suppl. 54; Gibbs. Cat. Bomb. Pl. 120; Bot. Reg. t. 81.

Bengal and various parts of India, a weed introduced from the West Indies throughout the tropics.


A dwarf erect glabrous herb. Leaves opposite, linear. Flowers in axillary umbelliform short-peduncled cymes. Sepals oblong, minutely glandular within. Corolla campanulate, deeply 5-lobed; lobes oblong-ovate, overlapping to the
right. Corona of 5 pouch-like folds at the base of the column alternating with the anthers, and 5 fleshy laterally compressed processes with free obtuse tips adnate longitudinally to the backs of the anthers. Anthers large, horny, membranous tips large oblong; pollen-masses one in each cell, elongate, compressed, falcate, with long pedicels, pendulous, fleshy. Stigma, a depressed 5-angled cone, included.


Northern Camph (Lower Assam), at Sanyashikata, in grassy hills, Hamilton.

Stem 5-6 in., rigid, divided below. Leaves 4 by 1/2-1 1/2 in., spreading, exactly linear, acute, base cordate, midrib stout, nerves faint; petiole 1/4 in. Umbels clustered, many-flcd.; pedicels 1 in.; bracts lanceolate. Sepals puberulous. Corolla 1/2 in. diam., purple within, glabrous.—A very remarkable plant, of which the specimen in Wallich's Herbarium (from which fragments were sent to Wight) is the only one known. It is evidently near Holostemma and Asclepias itself.


Twining glabrous shrubs. Leaves opposite, membranous. Cymes axillary, umbelliform, long-peduncled; flowers large, white, long-pedicelled. Calyx 5-glandular within. Corolla campanulate, 5-fld.; lobes spreading, twisted in bud and overlapping to the right. Coronal-scal's 5, membranous, adnate to the column, produced into long slender linear ligules. Column large, anthers with an inflamed membranous tip; pollen-masses one in each cell, not compressed, pendulous, fleshy. Stigma depressed, flat, 2-lobed in the middle. Follicles thick, acute, smooth. Seeds comose. **Distr.** Species 2; Asiatic.


Branches slender, smooth, herbaceous. Leaves 3-7 in., sinus at base wide, midrib glandular at the base above; petiole 2-5 in. Cymes 4-6 flcd.; peduncle 4-5 in.; pedicels very slender, 1/2-2 in. Sepals broad, very variable in size. Corolla thick, pure white. Follicles (from a drawing) solitary? 6 by 1 1/2 in. diam., sharply deflexed from the very base, fusiform, turgid, terete, green, slightly upcurved.—Wallich's 8221 B. from Finlayson seems to be R. Hooperianum, a native of Java and Siam.

22. **PENTATROPIS**, Br.

Twining slender herbs or undershrubs. Leaves opposite, small. Cymes umbelliform, axillary; pedicels slender. Flowers small, purplish. Calyx 5-partite. Corolla rotate, 5-fld.; lobes elongate, overlapping to the right, twisted to the left. Corona of 5 laterally compressed scales adnate vertically to the backs of the anthers with free tips and spurred bases. Column short; anther-tips inflexed; pollen-masses one in each cell, not compressed, pendulous, waxy. Stigma hardly umbonate. Follicles smooth. Seeds comose. **Distr.** Species 8; tropical Asiatic, African, and Australian.

1. **P. spiralis**, Dene. in Ann. Sc. Nat. 1838, 327, t. 11 E. and in DC. Prodr. viii. 536; glabrous, leaves ovate lanceolate or oblong base rounded or cordate, corolla-lobes ovate-lanceolate elongate cundate. Edgew. in Journ. Linn. Soc. vi. 204, t. 1, f. 9; Boiss. Fl. Orient. iv. 58. P. microphylla, Wall. Cat. 2
20. ASCLEPIADEAE. (J. D. Hooker.) [Pentatropis]


The Panjnad, Sind, and Eastwards to the Jumna river. Distrib. Afghanistan and Westwards to the Red Sea and Nubia.

Leaves 1-1½ in., very variable in breadth, obtuse or acute, usually apiculate, coriaceous, nerves obscure; petiole 1-½ in. Peduncles very short or 0; pedicles capillary, top obconic. Calyx minute. Corolla green, ½ in. diam.; segments narrowed from a triangular base. Follicles 2½-3 in., fusiform, narrowed to the base and to the long straight rather slender point. Seeds ½ in. long, ovate, flat, broader and crenate.

2. P. microphylla, Wight & Arn. Contrib. 52; glabrous, leaves oblong ovate or rounded, base rounded or cordate, corolla-segments triangular–lanceolate obtuse. Wight Jr. t. 352; Wall. Cat. 8213, ex. D.; Dalz. & Gibs. Bomb. Fl. 149; Grab. Cat. Bomb. Pl. 120; Dcne. in DC. Prodr. viii. 536. Asclepias microphylla, Roxb. Fl. Ind. II. 35; Roth Nov. sp. 177? Cynanchum acuminatum, Thunb. Obs. in Cynanch. 5; Dcne. l.c. 548. Eutropis, gen. nov. Falconer in Proc. Linn. Soc. i. 15.

Bengal, in the Sunderbunds; Pegu; Decan Peninsula, from Bombay southwards. Ceylon, not uncommon.

Habit and general characters of P. spiralis, but the flowers are much smaller, and the corolla-lobes have not the long tails.

23. DEMIA, Br.

Twining pubescent or tomentose undershrubs. Leaves opposite, cordate. Cymes axillary, racemiform or corymbiform, pedicels filiform. Sepals glandular within. Corolla greenish-white, tube short infundibular; lobes large, broadly ovate, spreading, overlapping to the right. Corona of an outer annular 5-10-crenate or -lobed membrane, and 5 laterally compressed scales vertically adnate to the anthers and spurred behind, with free long subulate tips. Column large, anther-tips inflexed; pollen-masses one in each cell, subcompressed, pendulous, waxy. Follicles echinate. Seeds comose.—Distrib. Species 6; Asiatic and African.


Throughout India; from the Salt-range and the N.W. Himalaya (ascending to 3000 ft.) to Lower Bengal and Ceylon (not seen from the Malay Peninsula, Burma, or Pegu).—Distrib. Afghanistan.

A furtid climber, hairs on stem spreading. Leaves 2-4 in. long and broad; petiole 2-4 in. Peduncles 2-6 in.; pedicels capillary, ½-2 in. Sepals small, ovate, pubescent. Corolla ½ in. diam., pale yellowish green and red. Column large, tips of inner coronal processes often twisted together. Follicles 1½-2 in., lanceolate, beaked. Seeds ½ in. long, broadly ovate, pubescent, margin quite entire.


campanulate, glabrous, shortly 5-lobed; lobes erose-to-patent, overlapping to the right. **Corona** 0. **Column** very shortly stipitate, conical, 5-angled; anthers with very long oblong membranous tips; pollen-masses one in each cell, ovoid, pedicelled, waxy, corpuscles large. **Stigma** clavate, tip exerted, obtuse.


 **Burma**; at Segaen, Wallisch.

Leaves in distant pairs, 1½-2½ by 1-1½ in., very membranous, acuminate; basal lobes rounded, incurved with a broad sinus; nerves very slender; petiole 1-1½ in. filiform. **Cymes** puberulous; peduncles shorter than the petioles, pedicels ½-½ in. **Sepals** half as long as the corolla, which is ½ in. long, pale and quite glabrous inside and out.—I find no traces of the 5-fid tubular corona at the base of the stipes of the column described by Wight.

25. **HOLOSTEMMA**, Br.

Twining glabrous shrubs. **Leaves** opposite, membranous, cordate. **Cymes** axillary, few-fid.; flowers large, purple. **Sepals** eglandular. **Corolla** subrotate; lobes thick, ovate, overlapping to the right. **Corona** low, annular, 10-lobed, fleshy. **Anthers** very large, oblong, horny, shining, cohering in a 10-winged column, tip small inflexed membranous; pollen-masses one in each cell, elongate, falcate, compressed, pendulous, waxy, pedicels long black. **Stigma** included, 5-winged. **Follicles** short, thick, smooth, acute. **Seeds** comose.—**Distr.** Two Indian species.


**Tropical Himalaya**, from Sirmore to Sikkim, alt. 3-5000 ft. **Deccan Peninsula**, from the Circars and Canada southwards. **Pegu** and **Burma**.

Quite glabrous, or the leaves faintly puberulous. **Leaves** 3-6 in., basal lobes spreading or incurved and meeting; petiole 1-3 in., glandular at the base of the mid-rib above. **Cymes** umbelliform or in irregular racemes; peduncles 1-2 in.; pedicels as long. **Corolla** 1-1½ in. diam.; lobes subacute, incurved, white on the back and margin. **Follicles**, according to Rheede's figure, like those of *Raphistemata*.—Sprengel is given as the authority for the name **H. Rheedei**, on the supposition that it is his **H. Rheedianum**, which being described as erect with oblong cuscipitate strongly nerved leaves must be a very different plant. As Sprengel's other species, **H. Candolleana**, is a *Fischeria*, his genus must be abandoned.

26. **CYNANCHUM**, Linn.

Erect or twining herbs or shrubs. **Leaves** opposite, rarely whorled. **Cymes** axillary, umbelliform racemose or subpaniculate; flowers small, greenish or purplish. **Calyx** 5-partite. **Corolla** rotate, 5-partite, lobes overlapping to the right or valvate. **Corona** adnate to the base of the column, 5-partite or cupular or campanulate, variously toothed or lobed, with or without scales or tubercles on the inner face opposite the lobes. **Anthers** scissile or stipitate, tip membranous inflexed; pollen-masses one in each cell, not compressed, pendulous, waxy. **Stigma** flat, umbroneate or apiculate. **Follicles** terete or shortly 2-winged, elon-
gate, moderately ventricose, smooth (in *C. corymbosum* densely clothed with soft spines). *Seeds* comose.—*Distrib.* Species about 100; tropical and temperate.

I cannot retain *Vincetoxicum* as distinct from *Cynanchum*; the presence or absence of processes or scales within the corona affords no character (see *C. acutum*). The corona itself affords very inconstant characters even for many of the species.

* Stem erect. Corona simple, 5-lobed or -partite, lobes without internal processes.

1. **C. Vincetoxicum**, Pers.; pubescent or glabrate, leaves broadly cordate or ovate acute, cymes sessile or peduncled, flowers corymbose or paniculate, corolla yellow, segments glabrous or nearly so, coronal-lobes triangular oblong or rounded. C. Kenouriense, *Wight Contr. 58*. Vincetoxicum officinale, *Moench; Boiss. Fl. Orient. iv. 54; Dene. in DC. Prodr. viii. 524. V. Kenouriense, *Dene. l.c. 525*. Asclepias Vincetoxicum, *Linn.*

**Temperate Himalaya**; from Kashmir to Sikkim, alt. 7–11,000 ft.—*Distrib.* Westwards to Norway and Spain.

* Stem 6–10 in., and leaves beneath usually pubescent, sometimes glabrous; leaves broader, greener, shorter petioled and less coriaceous than in the two following species. The coronal-lobes are very variable indeed.

2. **C. glaucum**, Wall. in *Wight Contr. 58*; erect, hoary or puberulous or glaucous, leaves ovate oblong lanceolate or cordate, cymes usually sessile, flowers umbellate, corolla yellow segments hirsute or bearded within, coronal-lobes 5 rounded broader than long fleshy. *Wall. Cat. 8229*. Vincetoxicum canescens, *Dene. in DC. Prodr. viii. 523*; *Boiss. Fl. Orient. iv. 52*.

**Temperate Himalaya**, from Nepal Westwards, alt. 5–9000 ft. *Western Tibet*, alt. 10–12,000 ft.—*Distrib.* Afghanistan and westward to the Greek Archipelago.

* Stem 6–18 in., erect, flexuose; rootstock with dense fascicles of roots as in *C. Vincetoxicum*. Leaves 1–3 by 1½–2½ in., extremely variable in length and breadth, coriaceous, acute acuminate or apiculate, nerves very oblique; petiole ½–1 in. *Cymes* pubescent, few or many-fl.; pedicels short. *Corolla* ½ in. diam., very variable in size, segments subacute. *Coronal-lobes* variable. *Follicles* 2–4 in., slender. *Seeds* ½–¾ in. long, broadly ovoid, concavo-convex.—Boissier says that *C. glaucum* differs from *canescens* in the narrower leaves, few-fl. cymes, and smaller corolla with ovate segments, but none of these characters hold good. In some Tibetan specimens the coronal-lobes are narrow, and the filaments form a rather long column.


**Western Himalaya**; Kashmir, alt. 6–8900 ft., *Royle, &c.—Distrib.* Beluchistan.

Habit and foliage of *C. glaucum*, with the leaves sometimes whorled, and smaller dark purple flowers. I suspect that it is only a variety of that plant, and both of *C. Vincetoxicum*.

** Stem twining. *Corolla* glabrous. *Corona* without internal processes.

† *Peduncle of cyme short.*

4. **C. ovalifolium**, *Wight Contr. 57*; twining, glabrous, leaves elliptic or oblong acuminate base rounded or subacute, peduncles short, flowers racemose or panicked, corona short irregularly toothed, teeth often curved.

Penang, Wallich; Malacca, Maingay.—Distr. Java.

Leaves 3-4 by 1½ in., coriaceous, pale beneath, nerves spreading; petiole 1½ in. Sepals ovate. Corolla ½ in. diam.; segments broadly ovate, quite glabrous. Column sessile. Follicles 5 in. long, thickly coriaceous, terete, tapering to a narrow but stout point, tip recurved. Seeds ½ in., very broad and flat.—"Produces an excellent caoutchouc" (Wallich). Making allowance for the variability of the corona in this genus, I am disposed to unite with this the C. formosanum, Maxim. (Diagn. Pl. Nov. Asiat. 801), and Cumming's No. 774 from the Philippines.

5. C. alatum, Wight & Arn. Contrib. 56; twining, puberulous or glabrate, leaves linear ovate or oblong acute base contracted cordate pale beneath, umbels shortly peduncled pubescent, corona short cupular plaited irregularly crenate, follicles narrowly 2-winged. Cynoctonum alatum, Dene. in DC. Prodr. viii. 529; Wight l.c. t. 1280.


Stems slender, sometimes softly pubescent. Leaves 1½—2½ in., rarely more, very variable in breadth, glabrous or puberulous above; basal lobes rounded, sinus open or almost closed; petiole 4–½ in. Umbels 1 in. diam., peduncle and pedicels pubescent. Calyx lobes ovate. Corolla ½ in. diam., glabrous, segments oblong-ovate. Follicles 2–2½ in., dorsally compressed.—Wight's figure represents the whole plant as far too hairy; he gives Coimbatore as the only habitat, but his specimens are marked from the Nilgherries, as are all the others I have seen (Gardiner, Hohenacker, Schmidt, G. Thomsen). In the "Contributions" he gives Coromandel as the only native country, which is unlikely. The plaited corona has obverse thickening on some of the folds of the inner face which are rudimentary inner processes.


Deccan Peninsula; from the Concan southwards to Travancore. Ceylon, very common in the Central Province.

Stems slender. Leaves 2–2½ by 1–1½ in., broadest at the base, rather coriaceous; petiole ½–1 in., glabrous or puberulous; stipular leaves rounded, ½ in. diam. or less. Peduncle shorter than the petiole. Flowers ½ in. diam. Sepals lanceolate. Corona nearly equalling the corolla, campanulate, plicate, large lobes sometimes 2-fd at the tip. Follicles 2½ in. long, thinly coriaceous, beak slender. Seeds orbicular, flat, ½ in. diam.—This at first sight resembles C. alatum, but the leaves broad at the base at once distinguish it. The name pauciflorum is not very distinctive.

7. C. Wallichii, Wight Contrib. 56; twining, glabrous, leaves ovate- or oblong-lanceolate finely acuminate membranous base deeply cordate with rounded decurved or incurved lobes, umbels shortly peduncled and flowers glabrous, corona campanulate plicate shortly 5–6-loved lobes toothed. Wall. Cat. 8224. Cynoctonum Wallichii, Dene. in DC. Prodr. viii. 528.

Khasia and Jyntha Mts.; at the foot of the hills, Wallich, &c.

Stems slender. Leaves 3–5 by 1–2 in., pale beneath, nerves very oblique, basal sinus rounded, open or almost closed by the incurved lobes; petiole 1–1½ in. Peduncles much shorter than the pedioles, pedicels slender. Sepals ovate. Corolla
greenish; segments oblong-lanceolate, longer than the corona, which is membranous and pale. Filaments forming a column longer than the anthers.

8. **C. Callialata**, **Ham. in Wight Contrib.** 56; twining, glabrous or very sparsely hairy, leaves coriaceous from rounded or oblong or ovate to linear acuminate glaucous beneath, base contracted cordate, nerves spreading obscure, umbels shortly peduncled nearly glabrous flowers glabrous, corona short cupular irregularly 5-toothed and crenate, follicles 2-winged. **Wall. Cat.** 8226; **Wight Fl. t. 1279.** C. auriculatum, **Herb. Ham.** C. angustifolium, **Wight & A. i. c.** 57. Cynotonom Callialata and angustifolium, **Done. in DC. Prodr.** viii. 528, 529. Periploca tunicata, **Herb. Madr.**

**Behar**; summit of Parunsath, **J. D. H., &c.** **Deccan Peninsula,** from the Con- can to Travancore. **Burma** at Bengadah, **Wallich.**

Stem robust, glabrous or sparingly hairy. **Leaves** 3-5 in., very variable in breadth, basal lobes small rounded, sinus narrow, midrib broad, nerves very slender spreading; petiole $\frac{1}{2}$-1 in. **Peduncles** shorter than the petioles. **Flowers** $\frac{1}{2}$ in. diam., quite glabrous. **Corona** follicles and seeds as in C. alatum.—Very closely allied to C. alatum, but quite distinct in the much larger size and glabrous habit.

†† Peduncles of cyme long, slender.

9. **C. corymbosum**, **Wight Contrib.** 56; quite glabrous, leaves ovate- or orbicular-cordate cuspidate or acuminate membranous glaucous beneath, basal lobes rounded decurved or incurved, peduncles long equaling the long petioles, corona campanulate plicate with longitudinal thickenings within, mouth irregularly crenate, anthers sessile, follicles large clothed densely with long fleshy spines. **Wall. Cat.** 8222, 8231, F. Cynotonom corymbosum, **Done. in DC. Prodr.** viii. 528.

**SiKKIM Himalaya,** alt. 2-4000 ft. **Clarke.** **Khasia Mts., Silhet and Cachar,** alt. 1-2000 ft. **Wall. &c. Penang, Wallich.** **Nicobar Islds. Kurz.**

Stem stout. **Leaves** 2-6 by 1-3 in., membranous, white beneath; petiole 1½-3 in. **Peduncle** slender; flowers racemose or corymbose, $\frac{1}{2}$-½ in. diam. quite glabrous. **Sepals** ovate, obtuse. **Corolla-segments** obtuse. **Corona** large, much longer than the short column, with internal thickenings as in C. alatum. **Seeds** $\frac{1}{2}$ in. long, orbicular-ovoid, with a wrinkled nucleus surrounded by a very broad wing deeply crenate at the lower end.—The large lanceolate almost fleshy follicles, 4-5 by 1-1½ in. diam., densely clothed with soft reversed hooked spines $\frac{1}{2}$-½ in. long, are quite peculiar, and recall those of *Dania*. It is remarkable that this species, though collected both in the Nicobar Islands and Penang, should never have been found in Burma or the Malay Peninsula.

10. **C. deltoideum**, **Hook. f.;** twining, glabrous or nearly so, leaves deltoid-cordate acuminate membranous, peduncles slender, flowers small umbel clad glabrous, corona 10-lobed to the middle, 5 lobes large ovate obtuse, 5 intermediate very small rounded.

**Khasia Mts.;** Kalapanee and Moflong, alt. 5-6000 ft., **J. D. H. & T. T.**

Stem slender. **Leaves** 2-3 in. long and nearly as broad, pale beneath, basal lobes large rounded, sinus broad; petiole 1-1½ in. **Umbels** many-fld.; peduncle longer than the petiole, and pedicles hairy. **Sepals** ovate, glabrous. **Corona** concealing the sessile column, the large lobes elliptic and thickened, smaller membranous.

*** Stem twining or suberect. Corolla glabrous or pubescent. Corolla with processes on its inner face (sometimes absent in C. acutum).

† Corolla glabrous within.

11. **C. acutum**, **Linn.;** **Boiss. Fl. Orient. i. 60;** twining, glabrous or nearly so, leaves narrowed from a broad 3-lobed or hastately cordate base
linear or lanceolate acuminate, peduncle long or short, flowers umbelld or corymbose, corolla glabrous, corona variable, follicles long flattened, seeds narrowly oblong. *Dene.* in *DC. Prodr.* viii. 547. *C. longifolium, Martens; Dene. l. c.*

**Western Tibet,** alt. 11–13000 ft., *Thomson &c.*—*Distrib.* Afghanistan, Central and Western Asia, Mediterranean region to Spain.

Leaves 1–5 in. long, very variable in width and in the size and spread of the basal lobes which are rounded at the tip and sometimes 1½ in. long; petiole ¼–1½ in. Peduncle equalling or exceeding the petiole, pedicels pubescent. *Sepals* ovate, usually pubescent. *Corolla* ¼–½ in. diam.; segments ovate-oblong. *Corona* sometimes quite simple and cleft deeply into triangular lanceolate erect or spreading simple lobes, sometimes cupular and 5-lobed or with 2–5 subulate lobes, and furnished within with a tongue-shaped process. *Anthers* sessile, or stalked by the column of filaments. *Follicles* quite unlike those of its congener, 4–6 in. long. ½–1½ in. diam., thinly coriaceous, straight or slightly curved, somewhat compressed, hardly turgid, narrowed to a slender point. *Seeds* ¼ in. long flat.

12. *C. Heydei,* *Hook. f.*; twining, nearly glabrous, leaves lanceolate acuminate deeply cordate the lobes incurved often overlapping, sinus long narrow, peduncle slender, flowers corymbose, corolla glabrous, corona campanulate, mouth with 5 long subulate exserted processes each with a short process at its inner base.

**Western Tibet;** Ladak, between Saspo and Kala-tse, *Heyde.*

I have seen only Heyde's specimens, which differ entirely from *C. acutum* in the long incurved basal lobes of the leaf and the long teeth of the corona projecting beyond the corolla.


**Western Temperate Himalaya,** from Sirmore to Kumaon, alt. 5–7000 ft.

Stem slender, with sometimes a line of hairs. *Leaves* 3–7 by ¾–1 in., membranous, basal lobes short rounded pointing backwards, sinus open, nerves very oblique; petiole ¼–½ in. Peduncles shorter than the petioles; pedicels slender, glabrous or puberulous. *Flowers* ¼ in. diam., pale green. Sepals ovate. Corona equalling the corolla.

†† Corolla pubescent within.


**Temperate Himalaya,** from Kashmir to Sikkim, alt. 6–12000 ft.

Leaves usually large, 4–6 by 2½–3½ in., very membranous, basal lobes sometimes meeting or overlapping; petiole 1–2 in. Peduncles 2–4 in., often stout; pedicels slender; flowers numerous, yellow, ¼–½ in. diam. Sepals lanceolate. Corolla-segments linear-oblong or lanceolate. Follicles 4 by ¼ in. straight. Seeds ¼ in. long, flat, flake-shaped with a crenulate broader end.—Nearly allied to *C. Wilfordii,* Maxim. (E. caudata, *Miquel; Symphyoglossum hastatum,* *Turezan. in Bull. Soc. Imp. Nat. Mosc.* 1848, i. 255), of China and Japan, which has smaller flowers.

15. *C. Roylei,* *Wight Contrib.* 58; suberect, softly pubescent, leaves
small deltoid-ovate or lanceolate from a broadly cordate base, finely acuminate, sinus open, peduncles very long, flowers corymbose, corolla pubescent, corona short 5-lobed lobes rounded with a tubercle on their inner faces. Endotropis Roylei, Dene. in DC. Prodr. viii. 547.

Western Himalaya; Kunawir, Royle, Jacquemont, &c.
A span to a foot high, branches flexuous. Leaves 1-1½ in., pubescent on both surfaces; petiole ½-1 in. Peduncles sometimes twice as long as the leaves; pedicels slender; flowers numerous, ½-1 in. diam. Sepals lanceolate. Corolla pubescent within and without. Follicles 2 in. long, fusiform, turgid, puberulous. Seeds ½ in. long, orbicular-ovate, flat.


Western Himalaya; Kashmir, Falconer, Jacquemont.
A span to 2 ft. high. Branches slender, spreading, or erect from a woody stock. Leaves 1-1½ by ½-3 in., sometimes faintly puberulous; petiole ½-1½ in. Peduncles sometimes twice as long as the leaves; pedicels slender; flowers numerous, ½-1½ in. diam. Sepals ovate.

DOUBTFUL SPECIES.
C. Heyneana, Roem. & Sch. Syst. vi. 101; Dene. in DC. Prodr. viii. 549. Periploca reticulata, Roth. mss.—May be C. Callialata.
C. PSEUDECALatum, Thumb. Obs. in Cynanch. 5; Dene. in DC. Prodr. viii. 548, from Ceylon is undeterminable.
C. Tomentosum, Linn., is probably Tylophora asthmatica, according to Wight (Contrib. 51, in note).

27. SARCOSTEMMA, Br.

Trailing leafless jointed shrubs with pendulous branches. Cymes terminal or at the nodes, umbelliform; peduncle clavate. Flowers small. Calyx 5-fld. Corolla rotate, 5-fld; lobes broad, overlapping to the right. Corona cup-shaped, membranous, adnate to the base of the column, 10-crenate or -lobed, the lobes opposite the stamens bearing large fleshy processes which are adnate to the backs of the anthers. Column short; anther-tip inflexed; pollen-masses one in each cell, pendulous, slender, waxy. Stigma conical or shortly fusiform. Follicles smooth. Seeds comose.—Distrib. Species 5 or 6; Asiatic, African, and Australian.

I am unable to determine the described species of this genus from dried specimens. There are probably differences in the fruit and seeds between the four supposed Indian ones, but I have no sufficient materials to verify this, and those may be reduced to two.

Sarcostemma. ] xcv. asclepiadaceous. (j. d. hooker.) 27

deccan peninsula; not uncommon in dry rocky places. burma, wallich.

stem as thick as a goose-quill, green; joints 4–6 in. long. umbels sessile, 1–1½ in. diam., many-fid.; pedicels ½ in., puberulous. sepals small, ovate. corolla ½ in. diam., pale greenish-white; lobes ovate or oblong, obtuse. corona and柱到gether rounded, very obtuse. follicles 4–6 by ½ in., thinly coriaceous, tip fine straight. seeds flattened, 3–4 in. long, ovate.

2. s. brunonianum, wight & Arn. Contrib. 59; umbels chiefly lateral, flowers yellow, column very short, inner processes of corona almost concealing the anthers, stigma very shortly conical, follicles as in s. brevistigma. wight ic. t. 1282; dcone. in dC. prodr. viii. 583; bot. mag. t. 6002.

decan peninsula, ascending to 4000 ft. in the nilgherry. ceylon.

apparently more slender than s. brevistigma, with smaller, chiefly lateral, umbels of bright yellow flowers.

3. s. intermedium, dcone. in dC. prodr. viii. 583; umbels terminal and axillary, flowers white, column ovoid, inner processes of corona oblong subacute, stigma fusiform simple or 2-fid, follicles broad at the base narrowed to the tip thinly coriaceous. s. viminale, wight & Arn. Contrib. 59; wight ic. t. 1281; wall. cat. 8232, not of brown.

decan peninsula, in arid jungles.

the elongate column, narrower dorsal processes of the anthers and longer stigma are the characters of this. the follicles when in pairs spread but do not divaricate as in the following.

4. s. stocksii, hook. f.; umbels terminal, column very short, inner processes of corona almost concealing the anthers, stigma very shortly conical, follicles short spreading horizontally poinard-shaped nearly cylindrical subacute hard thinly coriaceous. s. brachystigma (by error for brevistigma), hook. ic. pl. t. 861.

scind, stocks.

apparently a much more robust plant than any of the preceding, with the flowers of s. brevistigma, but widely different follicles, which are 2½–3½ in. long, rigid, almost woody, cylindrical but tapering very gradually from the base to the straight stout point; peduncle very short and thick; the seeds are nearly ½ in. long, linear-oblong, thicker than in its congeners.

tribe 4. marsdeniæ.

28. sarcolobus, br.

tuwing glabrous shrubs. leaves opposite. flowers small, crowded in axillary corymbiform cymes. calyx 5-partite. corolla sub-campanulate; lobes 5, ovate, overlapping to the right. corona 0. column very short; anthers broad, tip inflexed; pollen-masses one in each cell, erect, waxy, elongate, with long twisted pedicels. stigma flat. follicles thin, fleshy, globose and smooth, or oblong and 2-keeled. seeds large, coma 0.—distrib. species 2–3; malayan and e. asiatic.

1. s. globosus, wall. in asiat. research. xii. 568, t. 4, and cat. 4468; leaves 3–4 in. oblong or oblate acuminate or obtuse and apiculate, corolla-lobes pubescent within, fruit large globose. wight contrib. 47., and ic. t. 1273; dcone. in dC. prodr. viii. 625. s. carinatus, griff. natul. iv. 58, and in ic. pl. asiat. t. 410 (not of wall.).

sunderbunds and eastwards to mergui, malacca and the nicobar islands.

2. **S. carinatus**, Wall. in Asiatic Research. xii. 570, t. 5, and Cat. 4467; leaves 1–2 in. elliptic obovate lanceolate or linear-oblong obtuse or acute, corolla nearly glabrous within, fruit small ellipsoid. Wight Contrib. 47; Donn. in DC. Prodr. viii. 625. Sarcolobus sp., Griff. Notul. iv. 55, and Jc. Pl. Asiatic. t. 405.

Sunderbunds and eastwards to Mergui and the Andaman Islands.

A much smaller plant than *S. globosus*, more slender, with smaller narrower leaves very rarely 3 in. long, thicker in texture, the nerves very obscure, petiole 1/4 in., corolla smaller, yellow, with lines of brown dots; anthers sessile. Fruit 3 in. long, curved, turgid, beaked, with several narrow undulate keels, pale yellow, fleshy. Seeds 3/8 in., like those of *S. globosus*.

29. **PENTASACME, Wall.**

Pendulous tufted glabrous herbs, with simple stems. Leaves opposite, sub-sessile, membranous, narrow. Flowers long, yellowish, in sessile axillary umbelliform cymes; pedicels filiform. Calyx 5-partite. Corolla-tube short, campanulate; lobes long, caudate, twisted, overlapping to the right. Coronal-scales 5, on the corolla-tube, entire or toothed. Column very short; anther-tips membranous; pollen-masses one in each cell, pedicelled, erect, ovoid, waxy, tips pellucid. Stigma included, conical or beaked. Follicles very slender, terete, straight, smooth. Seeds comose.—Distrib. Species 3–4; Indian and Chinese.

1. **P. caudatum**, Wall. Cat. 8234; very slender, leaves linear-lanceolate caudate-acuminate, corolla-lobes triangular at the base suddenly ending in long almost filiform tails. Wight Contrib. 60; Donn. in DC. Prodr. viii. 627.

**Khasia Mts.**, alt. 0–3000 ft., common. Patkoi Mts. in Upper Assam, Griffith. Peau, McClintock, Kurz.


2. **P. Wallichii**, Wight Contrib. 60; leaves elliptic-lanceolate acuminate base acute, corolla-lobes gradually narrowed to the long obtuse tip. Wall. Cat. 8235; Donn. in DC. Prodr. viii. 627; Deless. Jc. Sel. v. t. 87.

**Western Himalaya**; Kumaon, alt. 3500 ft., Madden, &c. Silhet, Wallich. Mishmi Mts., Griffith.

Habit of *P. caudatum*, but stems stouter; leaves 2–3 by 1/4 in., nerves beneath distinct, setulose; flowers much longer, with broader corolla-lobes; coronal-scales minute; anthers acuminate; stigma shortly beaked; follicles rather stouter; seeds much the same.

30. **GYMNEMA, Br.**

Twining shrubs or undershrubs. Leaves opposite. Flowers small, in crowded umbelliform cymes. Calyx 5-partite. Corolla subrotate, campanulate or urceolate; lobes thick, twisted, subvalve or narrowly overlapping to the right. Corona 0, or of 5 fleshy processes adnate to the corolla-throat or tube.
Column short; anther-tips small, membranous; pollen-masses one in each cell, ovoid-oblong; waxy, pedicelled, erect. Stigma large, conical, clavate or capitulate, exserted. Follicles slender or turbid, terete, smooth, acuminate. Seeds comose.

—Distrib. Species 25; Asiatic, African, and Australian.

* Corolla-tube short, with fleshy coronal processes on the throat, the free points of which (except in rotundatum) protrude above the sinus, and are produced downwards on the tube as double villous ridges. Bracts obsolete.


BANDA, Edgeworth. DECCAN PENINSULA; from the Concan to Travancore. —Distrib. Trop. Africa.

A stout large woody climber. Leaves rarely pubescent above, thinly coriaceous; petiolas slender or stout, 1½ to in. Cymes ½ in. diam., subglobose, pedicels slender. Corolla-lobes short. Follicles 2-3 by ½ in., terete, rigid. Seeds ½ in. long, narrowly ovoid-oblong, flat with a broad thin wing, pale brown. —The leaves in Wight's figure are unusually large.

Var. oemamica; leaves ovate base cordate softly pubescent on both surfaces. G. sylvestre, var. Decaisneana, Thw. Enum. 197, excl. syn. —Ceylon, ascending to 3000 ft.

2. G. hirsutum, Wight & Arn. Contrib. 44; branches petiolas leaves on both surfaces and cymes densely softly pubescent, leaves 1½ to 2½ in. broadly ovate or coriaceous acute or acuminate, cymes 2-nate subsecise few- or many-fl., corolla ½ in. diam., lobes thick ciliate, follicles slender glabrous. Wight Jc. t. 1272; Wall. Cat. 8185; Dene. in DC. Prodr. viii. 622. G. Decaisneana, Wight Jc. t. 1271.

BEHAR; at Rota's, J. D. H.; Nilgherry Mts., Wight, &c.

Much stouter than G. sylvestre, with broader more ovate and coriaceous leaves softly pubescent on both surfaces with shorter thicker petiolas, and much larger flowers, in more sessile cymes with shorter thinner pedicels. —The Behar specimen is in fruit only and may belong to G. sylvestre, though the leaves are pubescent on both surfaces. I have seen no ripe seeds of the Nilgherry plants. —In Wight's figure of G. Decaisneana, the leaves are glabrous above, which is opposed to his description and specimens. The distinctions he indicates between this and hirsutum do not exist.

3. G. molle, Wall. in Wight Contrib. 45, and Cat. 8186; branches petiolas leaves beneath and cymes finely pubescent, leaves ovate oblong or coriaceous acute or acuminate, cymes subsecise dense-fl., corolla ½ in. diam. lobes ciliate, follicles waxy broad turbid below the middle pubescent, seeds ovate. Dene. in DC. Prodr. viii. 623.

UPPER BURMA; Irawaddy, near the Petroleum wells, and at Taung-dong, Wallach.

A stout climber. Leaves very variable, some 2-2½ by 1-½ in., others 3 in. and as broad, deeply cordate, above glabrous or puberulous; petiolas slender, ¾-½ in. Cymes small, irregular. Sepals hirsute. Corolla-lobes thickened, glabrous. Follicles 2½-3 in. by ½-1 in. broad at the thickest part. Seeds ½ in. long, very different from those of the preceding species. This is very near the Chinese G. affine, Dene. (G. parviflorum, Wall. Tent. Fl. Nep. 56), which has broad seeds and similar follicles, but the flowers are larger. Though Upper Burma is beyond British India, the species is so likely to be found in the latter that I (as in like instances) introduce it.


A large climbing shrub, bark of old wood spongy and split (Roxburgh). Leaves coriaceous, rather shining above; petiole ½-1 in. Calyx villous. Follcles 3 in. long, base cordate, thickly woody, narrowed into a stout beak, glabrous. Seeds ⅜ in. long, flat, wing broad membranous.

5. **G. latifolium**, Wall. in *Wight. Contrib.* 45, and Cat. 8188; branches stout petioles leaf-nerves beneath cymes and sepals finely pubescent, leaves large orbicular acute or cuspidate, cymes 2-nate peduncled very many-fld. globose, pedicels slender, corolla-lobes ciliate thickened and puberulous, follicles slender punctate, seeds narrow. *Dcne. in DC. Prodr.* viii. 623.

**SILHET; BURMA, at Trogla and the Saluen river, Wallich.**

Leaves 4–5 in. long and nearly as broad, base rounded or subacute, glabrous above except the puberulous midrib, pale beneath; nerves spreading; petiole ⅛–⅜ in. Cymes 4–1 in. diam.; pedicule ⅔–Ⅲ in.; pedicels very slender. Sepals broadly ovate, obtuse. Corolla Ⅹ in. diam. Follcles 3 in. long, thinly coriaceous. Seeds as in *G. sylvestre*.

6. **G. glabrum**, *Wight. Contrib.* 45; branches stout and petioles leaf-nerves beneath and cymes and sepals finely pubescent, leaves large broadly ovate or oblong acuminate, cymes 2-nate peduncled globose many-fl., pedicels slender, corolla very minute, lobes glabrous not ciliate thickened, follicles fusiform. *Wall. Cat.* 8189; *Dcne. in DC. Prodr.* viii. 623.

**BURMA, at Taong-dong, Wallich.**

Very similar in foliage to *G. latifolium*, but the leaves are hardly so rounded and the petioles 1–1¼ in. long; the flowers ⅛–⅔ in. diam., and the follicles are lanceolate in outline, 4 by 1 in., thinly woody, glabrous, smooth; the seeds broadly ovate ¼ in. long, flat.

7. **G. rotundatum**, *Thwaites Enum.* 197; branches petioles leaves beneath cymes and sepals tomentose, leaves long-petioled rounded-ovate obtusely acuminate subpilose above, petiole glandular, cymes 2-nate peduncled densely many-fl., sepals rounded, corolla-lobes not ciliate quite glabrous, coronal processes wholly below the sinus.

**CEYLON; central province, alt. 3000 ft., Thwaites.**

I have seen but one specimen; it differs from *G. latifolium* chiefly in the longer petioles, 1–1½ in. and peduncles. The fruit is wanting to tell its affinity. It differs from all others of this section in the coronal processes having no free points between the sinus.

8. **G. lactiferum**, *Br. in Mem. Wern. Soc.* i. 33; branches petioles and nerves beneath glabrous or puberulous, leaves ovate oblong or lanceolate acuminate point often long, cymes peduncled and broadly oblong or rounded, sepals glabrous or sparsely hairy, corolla ⅘ in. diam. lobes short ciliate glabrous, *Wight Contrib.* 44; *Dcne. in DC. Prodr.* viii. 622.

**KHASIA MTS., MALAY PENINSULA, and CEYLON.—Distr. Sumatra, Borneo.**

A stout climber. Leaves 2–4 by ⅔–1½ in., coriaceous, brown when dry; nerves
3-4 pairs, very oblique; petiole slender, \( \frac{1}{3}-\frac{1}{4} \) in. Cymes few or many-fl., peduncle shorter than the petiole, flowers subglobose, \( \frac{1}{4} \) in. diam. Follicles not seen.


**G. nitens**; branches glabrous, leaves glabrous or the midrib and nerves beneath pubescent, sepalas glabrous or sparsely hairy. *G. nitens*, *Blume Mus. Bot. i. 149*, t. 29; *Miguel Fl. Ind. Bat. ii. 498*. *G. malayanum*, *Griff. Notul. iv. 56*, and *Ic. Pl. Asiat. t. 394.—Malay Peninsula from Merqui to Malacca, Sumatra, Borneo.

**G. khasiana**; branches and nerves of leaf beneath pubescent, leaves often lanceolate.—Khasia Ms. at Churra, *J. D. H. & T. T.*

**G. Thwaitesii**; leaves softly pubescent beneath, sepalas membranous pubescent.—Ceylon, *Thwaites (N. 2549)*. This resembles *G. sylvestre* and *acuminatum*, but the flowers are larger and the calyx is very different.

**G. Walkeri**; branches and leaves quite glabrous, cymes sessile puberulous, sepals puberulous not ciliate.—Ceylon, *Walker.*

9. **G. Maingayi**, *Hook. f.*; branches slender petioles leaves beneath cymes and sepalas softly finely pubescent, leaves small ovate or ovate-cordate acuminate few-nerved, cymes sub-sessile, flowers few minute, corolla-lobes not ciliate.

**Malacca, Maingay (Kew. Distrib. 1111).**

Leaves 1-2 in. and branches bright yellow-brown when dry, nerves 2-3 pairs; petiole \( \frac{1}{4} \) in. Pedicels slender, \( \frac{1}{3} \) in., bracts most minute. Sepals oblong. Corolla glabrous, \( \frac{1}{4} \) in. diam., lobes rather narrow.—This resembles a good deal *G. affine* of China and *G. sylvestre*, but the cymes are sessile and leaves much smaller.

**Corolla-tube with double villous (rarely glabrous) ridges below the sinus, not produced into fleshy points (see also *G. rotundatum*).** *Bidaria*, *Dene.*

† **Corolla-tube short, broad, hardly exceeding the linear-oblong sepals; corollal-processes large.**


**Tropical Himalaya, from Kumaon to Sikkim; Assam; Silhet; Lower Bengal at Monghyr; Pegu and Travancore; Annamally hills, alt. 4000 ft. Beddome.**

An extensive climber; branches soft, not woody. Leaves 4-6 by 2-3 in., bright green; nerves 4-6 pairs. Cymes many-fl., elongating into a spiral raceme; bracts oblong; pedicels rather exceeding the peduncles; flowers \( \frac{1}{4} \) in. diam., pale yellow. "Follicles 4 by 1 in. ovate-lanceolate, spreading, smooth fleshy" (*Roxb.*).—The western localities for this plant are doubtful, a specimen from Royle's Herb. is labelled by Falconer "Kharia Pass," another from Vicary "Gomulepore." The Annamally specimen is indistinguishable and suggests the probability of this and *G. montanum* being forms of one species.

11. **G. montanum**, *Hook. f.*; glabrous or nearly so. Leaves 4-5 in. large coriaceous oblong or ovate-oblong or oblong-lanceolate obtuse acute or acuminate, petiole \( \frac{1}{3} \) in., cymes corymbose at length racemose, peduncle shorter than the petiole, sepalas ciliate glabrate, corolla-lobes oblong.—*G. tingens var. ovalifolia*, *Wight Ic. t. 592*. *Bidaria tingens*, *Dene. in DC. Prodr.*

DECCAN PENINSULA, from the Concan Southwards, on the Ghats.

This may, as Wight suggests, be a variety of G. tingens, but I find no intermediate forms; it differs in the shape and coriaceous nature of the leaves, their short petioles, and in the shorter peduncles. I have seen no fruit. There appear to be three forms of it.

Var. 1. Leaves usually ovate, petiole short, cymes many-fld., corolla glabrous.—The Concan.

Var. 2. Beddomei; leaves more oblong or oblong-lanceolate, petiole \( \frac{1}{4} - \frac{1}{3} \) in., cymes few-fl.d., flowers larger, corolla glabrous.—Annamallay hills, alt. 5,000 ft. Beddome.

Var. 3. pubiflora; leaves of var. 2, cymes few-fl.d., corolla pubescent externally.—Nilgherry hills at Nedawullum, alt. 7,000 ft., Wight, Clarke. Clarke’s specimens have longer peduncles and petioles and densely pubescent cymes.


DECCAN PENINSULA; hills of the South Carnatic from the Nilgherries to Travancore, Wight, &c.

Much smaller and more delicate than G. tingens, with smaller leaves, more slender petioles and pedicels. Follicles 2½–3 by \( \frac{1}{4} \) in., narrowly lanceolate, glabrous, straight. Seeds \( \frac{1}{4} \) in. long, ovate, with a broad border.—As Wight well remarks, it is difficult to distinguish this from G. tingens except by habit, size, and the few-fl.d. cymes.

† Corolla-tube much exceeding the sepals; coronal-processes elongate, nearer to the base than to the lobes, often faint and glabrous.

13. G. pergularioides, Wight & Gardner mss.; branches very slender and petioles and cymes puberulous, leaves membranous elliptic- or oblong-lanceolate caudate-acuminate base rounded or acute, peduncles equalling the petioles, pedicels very short, corolla-lobes ovate-lanceolate. Bidaria pergularioides, Thwaites Enum. 198? Cynanchum cuspidatum, Thumb. Obs. in Cynanchum 5; Dcne. in DC. Prodr. viii. 548.

CHEYLON, Walker, Gardener, &c.

Leaves very variable, 1–6 by \( \frac{1}{4} - \frac{1}{2} \) in., nerves arching or very oblique; petiole \( \frac{1}{3} - \frac{3}{4} \) in., slender. Cymes dense-fl.d.; flowers almost capitate. Sepals broadly oblong, not half as long as the corolla-tube, which is \( \frac{1}{4} \) in. and as long as the lobes. Corolla-tube yellow, tinged with red, \( \frac{1}{3} \) in. long. “Follicles 5–6 in. long, \( \frac{1}{4} \) in. broad, linear-lanceolate, much attenuate, puberulous, at length glabrate,” Thwaites.

Var. Gardeneri, Thwaites l.c.; leaves smaller 1–1½ in. elliptic-lanceolate more coriaceous, follicles shorter.

14. G. stenoloba, Hook. f.; glabrous or nearly so, leaves membranous lanceolate acuminate, cymes few-fl.d., peduncles equalling the petioles, pedicels short, corolla-lobes linear, stigma bifid.

CHEYLON, Walker.

Closely allied to G. pergularioides, but the cymes are few-fl.d., the flowers much larger, the corolla-tube \( \frac{1}{4} \) in. long, the lobes narrowly linear, the column much longer and more slender and the stigma 2-fl.d. The follicles answer to the description of those of G. pergularioides, but are quite glabrous.

15. G. Thomsoni, Hook. f.; quite glabrous, leaves linear-lanceolate coriaceous, cymes simple or branched long-pediculed, pedicels long, corolla-
lobes linear with reflexed margins, anthers with membranous margins and a membranous ligule behind and below the inflexed tip, stigma broadly turinate.

Sikkim Himalaya, alt. 5,000 ft., Thomson.

Stems slender. Leaves 3-6 by 1\(\frac{1}{2}-3\frac{1}{2}\) in., base acute or narrowly rounded; nerves oblique, very faint; petiole stout, 1-2 in. Peduncle 1-1\(\frac{1}{2}\) in., rather slender; flowers umbelled, pedicels twice or thrice as long as the corolla-tube. Sepals very small, broadly obovate. Corolla-tube 1\(\frac{1}{2}\) in.; lobes as long, spreading, thick.—A very remarkable plant, resembling G. stenoloba, but differing totally in the texture of the leaves, the reflexed margins of the corolla-lobes and especially in the winged anthers with a membranous ligule behind the tip and parallel to it. It is probably a new genus, but, without the fruit, I do not venture to propose it as such.

Doubtful Species.

Bidaria inodora, Dene. in DC. Prodr. viii. 624. "From sandy places near Pondicherry (Cynanchum inodorum v. Ganosma inodora, Lour. Pl. Coch. 166). A climber with stipular glabrous stems, leaves rounded-ovate or -lanceolate quite glabrous base rounded or cordate, petiole slender, peduncles short, pedicels longer, flowers puberulous, tube hairy within, stigma conical emarginate exceeding the anthers" (Dene. l.c.). I have no idea what this is; it is probably a very common plant.

31. GONGRONEMA, Dene.

Glabrous twining shrubs or undershrubs. Leaves opposite. Cymes various, axillary; flowers small. Calyx 5-partite. Corolla urceolate subrotund or broadly campanulate, lobes narrowly overlapping to the right. Column short; coronal scales adnate to the bases of the anthers or 0. Anther-tips inflexed, concealing the stigma; pollen-masses solitary in each cell, ovoid, waxy, erect; stigma convex clavate or conical. Follicles acuminate. Seeds comose. DISTR. Species about 10; Asiatic, African, and Australian.

* Corolla nearly rotate, tube short.

1. G. nepalense, Dene. in DC. Prodr. viii. 624; glabrous or cymes puberulous, leaves large oblong or ovate acuminate base rounded or cordate, cymes very long-peduncled bracteate, corolla-tube short open, lobes ovate, coronal process small recurved or obsolete. Gymnema nepalense, Wall. Tent. Fl. Nep. 50, t. 38, the left-hand leaf only, and Cat. 8192; Wight Contrib. 46.

Subtropical Himalaya; from Kumaon to Sikkim, alt. 2,500-4,000 ft. Khasia Mts., alt. 3,500 ft.

An extensive twiner, shoots and cymes puberulous. Leaves 3-6 by 1\(\frac{1}{2}-3\frac{1}{2}\) in., membranous, nerves arching; petiole 1-2 in. Peduncle 2-6 in., generally branching into 3 long divergate arms, each bearing three many-fld. umbels, pedicels short. Sepals ovate. Corolla \(\frac{1}{2}\) in. diam., yellow. Follicles slender, 24-3 by \(\frac{1}{2}\) in.

VAR. sagittatum; leaves linear-oblong base rounded or cordate. G. sagittatum, Dene. l.c. Gymnema sagittatum, Wall. Cat. 8194; Wight Contrib. 46. G. nepalense, Wall. Tent. Fl. Nep. t. 38 (except the left-hand cordate leaf). G. columnare, Wall. Cat. 8193; Wight & Arn. l.c. Gongronema columnare, Dene. l.c.—Silhet, Assam, and Chittagong. Except the narrower leaves and usually shorter pedicels I can find no difference between G. sagittatum and nepalense. The processes at the base of the column vary very much.

** Corolla-tube inflated, equalling or exceeding the lobes in length.

2. G. Wallichii, Dene. in DC. Prodr. viii. 624; quite glabrous, leaves elliptic-oblong or -lanceolate acute or acuminate, cymes subsecise few-fld., corolla-tube hairy within lobes short ovate. Gymnema Wallichii, Wight Contrib. 46; Wall. Cat. 8195 A.
MALACCA (? Finlayson), Griffith, Mainagay (Kew Distrib. 1113).

3. G. ventricosum, Hook. f.; quite glabrous, leaves coriaceous ovate or ovate-lanceolate obtusely caudate-acuminate, cymes subsessile few-fl., corolla-tube glabrous within, lobes as long linear with recurved margins.

Khasia Mts. (Herb. Calcutta).
Leaves 3 by 1–1½ in.; nerves 2–3 pairs, very prominent beneath, strongly inarching far within the margin; petiole stout, 1/3–5/3 in. Flowers very shortly pedicelled. Sepals very small. Corolla 1/4 in. long. Coronal-scales broad, recurved. Pollen-masses smaller than the corollas.—In form of corolla this a good deal resembles Gymnema Thomsonii. I have seen only a solitary indifferent specimen of this plant.

G.? Finlaysonii, DC. in DC. Prodr. viii. 625 (Gymnema Finlaysonii, Wight Contrib. 46; Wall. Cat.), is probably, like most of Finlayson's plants, from Siam. It is glabrous with ovate-cordate leaves, and has peduncled cymes of large flowers 1/3 in. diam. The pollen-masses have long spiral pedicels.

32. MARS DENIA, Br.

Twining, rarely erect, shrubs or undershrubs. Leaves opposite. Cymes umbelliform, simple or branched, terminal or axillary; flowers medium-sized or small. Calyx 5-partite. Corolla campanulate or urceolate or salver-shaped, lobes narrow or broad, overlapping to the right. Coronal scales 5, usually subulate flattened (or 0), adnate to the anthers dorsally, erect. Column short; anthers with an inflexed tip; pollen-masses pedicelled, oblong or ovoid, waxy, erect. Stigma flat convex or beaked, sometimes very long. Follicles lanceolate or poniard-shaped. Seeds comose.—Distrib. Species about 50; chiefly tropical or subtropical, with one S. European.

A heterogeneous assemblage, amongst which perhaps M. tinctoria, ereiocarpa, and thyrsoida should form one natural genus, and the remainder a second. M. thyrsoida is very remarkable in wanting the coronal scales.


Sikkim Himalaya, alt. 2–3000 ft. Assam, Silhet, Khasia Mts., and Birma at Prome, Wallich (cultivated in the Deccan and elsewhere in India).—Distrib. Sumatra, Java, China.
A tall climber; stem stout, smooth, glabrous or finely pubescent, as are the petioles, sometimes the leaves below, and cymes. *Leaves* 3-9 by 1-3 in., nerves spreading, glandular above at the petiole; petiole 1-2 in. *Cymes* short- or long-peduncled, rounded and ½-1 in. diam. or elongate 3-6 in. long, thyrroid, formed of interrupted clusters; pedicels short. *Sepals* ovate, pubescent. *Corolla* ½ in. long, yellow, flabby, glabrous externally; tube with deflexed hairs within. *Follicles* 3 in. long, ½ in. diam., narrowed at the base. *Seeds* narrowly ovoid, ½-2 in. long.—In the absence of any description or figure of the follicles, or of authentic specimens in fruit of the Sumatran plant on which the genus was founded, I am in doubt whether this or the following is the true *M. tinctoria*. The flowers are often deformed, very large, and the column is often replaced by rudimentary leaves. Decaisne erroneously quotes Rheede's *Kada Kadi* (Hort. Mal. ix. 72, t. 8) for this plant.

2. *M. eriocarpa*, *Hook. f.*; foliage of *M. tinctoria*, follicles shorter broader turgid at the base softly villous with long spreading hairs, seeds broadly ovate.


Wallich on the ticket of his specimen (which has no Catalogue number) says of this "Marsdenia, tinctoria affinis, sed differt; E. Syliht, introd. in H.B. Cole. Feb. 1840." Brandis describes the pod of *M. tinctoria* as "covered with long soft hairs," whence he probably has assumed that this is referable to *M. tinctoria*, and, if so, the plant I have described under that name must be named afresh. A reference to Marsden's Sumatran plant can alone solve the difficulty.

SECT. II. MACROCENTRUM. *Flowers* larger. *Corolla* subcampanulate; tube short, globose or subcylindric; lobes large, flabby, spreading, and throat glabrous or villous. *Staminal column* large, filling the tube; coronal scales usually large, often exceeding the anther-tip.

* Stigma not extended beyond the anthers.

3. M. *Roylei*, Wight *Contrib*. 40; branches petioles leaves beneath and cymes finely pubescent or tomentose, leaves ovate-cordate acuminate, cymes corymbose, corolla-lobes pubescent without villous within, coronal scales slender subulate far exceeding the short anther-tips. *Brand. For. Fl. 333; Deme. in DC. Prodr*. viii. 615.

EASTERN AND WESTERN HIMALAYA; from Simla to Kumaon, ascending to 5000 ft. SIKKIM, alt. 4000 ft. *Clarke*.


WESTERN HIMALAYA; Kumaon, ascending to 4500 ft. NORTHERN OUDH, *Thomson*.


Stem very stout. *Leaves* 4-7 by 3-5 in., often velvety above; petiole 2-3 in. *Cymes* much corymbosely branched. *Corolla* ½ in. diam.; lobes oblong, ciliate *Stigma* between conical and dome-shaped. *Follicles* 5-6 in. long by 1½-2 in. diam.,
5. **M. Hamiltonii**, *Wight Contrib.* 41; branches petioles nerves beneath and cymes furfuraceously puberulous, leaves oblong or oblong-ovate obtuse or acute base corymbose, corolla-lobes glabrous without and within, throat densely villous, corolla scales membranous subulate exceeding the anther-tips. *Wall. Cat.* 8174; *Dene. in DC. Prodr.* viii. 614. *Cynanchum reticulatum, Herb. Ham.*

**Northern Oudh, Hamilton. Western Himalaya; Subsewaliks, Edgeworth.**

Leaves coriaceous, 2–3 by 1½–2 in., pale; petiole ¼–1 in. *Cymes* corymbose branched. Corolla ½ to 3 in. diam. Stigma quite flat with a central cone. **Follicles** not seen.

6. **M. Brunoniana**, *Wight & Arn. Contrib.* 40; glabrous or cymes and petioles puberulous, leaves orbicular-cordate acuminate membranous, cymes short few-fld. corymbiform, corolla-lobes glabrous within and without, anthers with a double flattened obtuse spur (or fold) at the base, corolla scales ovate acute a little longer than the short anther-tip. *Dene. in DC. Prodr.* viii. 614; *Wight Tc.* t. 356.

**Coromandel; near Cotermales, Wight.**


7. **M. Jenkinsii**, *Hook. f.;* glabrous or puberulous, very stout, leaves broadly elliptic or orbicular cuspidate thickly coriaceous, corolla-tube globose, lobes glabrous without villous within, coronal scales subulate much exceeding the very short anther-tip.

**Assam, Jenkins (Herb. Calcutta).**

Branches as thick as the little finger. Leaves 7–10 by 5–7 in., pale beneath; nerves 6–8 pairs, diverging, straight or a little arched; petiole 2–4 in. *Cymes* small; peduncle short, very thick; flowers subumbellate, bracteate; pedicels stout, 1 in. Sepals ½ in., lanceolate, pubescent. Corolla ¾ in. diam., lobes rounded flabby. Stigma dome-shaped.

**Stigma protruded far beyond the anthers.**

8. **M. lucida**, *Edgew. mss.;* branches petioles cymes and leaves beneath finely pubescent, leaves elliptic or ovate acute or obtusely acuminate, cymes corymbiform very shortly peduncled, corolla-lobes ciliate glabrous without sparsely hairy within, coronal scales subulate equalling the anther-tips, style many times longer than the column tip bifid. *Brand. For. Fl.* 333.

**Western Himalaya; Kumaon, Strach. & Winterb.; Nyinetal, alt. 5–7000 ft., Madden.**

Leaves 4–5 by 2–3 in., rather coriaceous, pale beneath; nerves arched; petiole 1–2 in. *Cymes* many-fld.; peduncle stout, ¾ in. Corolla ½–1 in. diam. **Follicles** 5 in. long by 1 in. diam., straight, lanceolate; pericarp thickly coriaceous, glabrous. Seeds ½ in. long, ovate-lanceolate.

9. **M. Griffithii**, *Hook. f.;* glabrous except the puberulous cymes, leaves elliptic obtusely acuminate coriaceous base rounded or cordate, cymes corymbiform shortly peduncled, corolla-lobes glabrous without sparsely hairy within,
coronal scales small obtuse shorter than the orbicular anther-tips, style as long as the column, tip 2-toothed. M. lucida, Herb. Ind. Or. H. f. & T.

Khasia Mts., alt. 4—6000 ft.; at Mungbrea and Myrung, Griffith, H. f. & T.

Stem stout. Leaves 3—7 by 1½—3½ in., pale beneath; nerves slightly arched; petiole 1—1½ in. Umbels and flowers greenish yellow, very like M. lucida. Follicles not seen.


10. M. Calesiana, Wight Contrib. 41; branches petioles and leaves beneath and cymes densely pubescent, leaves broadly ovate-cordate acuminate membranous, cymes much corymbose branched, corolla sparingly hairy without lobes narrow, coronal scales subulate shorter than the long anther-tips. Wall. Cat. 8175; Done in DC. Prodr. viii. 616. Pergularia Calesiana, Herb. Ham.


Stem stout. Leaves 4—6 in. long and nearly as broad, pubescent or glabrate above; petiole 1½—3 in., slender. Cymes shortly peduncled, 3 in. diam. Corolla-tube cylindrical, ¼ in. long; lobes spreading and recurved, thick. Column nearly filling the tube.

11. M. thrysiflora, Hook. f.; nearly glabrous except the puberulous cymes, leaves broadly ovate or oblong- or deltoid-ovate deeply cordate acuminate, cymes elongate of clusters of shortly peduncled flowers on a long rachis, corolla urceolate glabrous without and within, lobes lanceolate, coronal scales short rounded wholly adnate to the long subulate anther-tips. M. tinctoria, in part, Herb. H. f. & T.

Bengal; in the Jheels, Griffith, J. D. H. & T. T. Assam, Masters.

Leaves 4—8 by 2—6 in., membranous; petiole 1—3 in. Cymes 4—6 in. long; rachis flexuous; pedicels very short. Sepals nearly glabrous, obtuse. Corolla ½—1½ in. long; lobes coriaceous. Anther-tips longer than the column, basal spurs very small. Stigma fusiform. Follicles 2 in. long, dagger-shaped, turgid below; pericarp thinly coriaceous, glabrous. Seeds ovate, ¼—½ in. long.—So similar to some forms of M. tinctoria in foliage and inflorescence as to be easily mistaken for that plant. The coronal scales may be said to be absent.

Doubtful Species.

M. rotundifolia, Done. in DC. Prodr. viii. 615; "branches thick glabrous; leaves rounded, obsolescent cordate, glabrous, shortly acuminate; petiole rather long, slender, puberulous; cymes subcontrasted, many-fld.; peduncle equalling the petiole; corolla-lobes ovate-oblong, densely bearded within; coronal scales ovate-deltoid, equalling the column."—Communicated from the Calcutta Garden to Paris Herb. by Griffith.

33. Pergularia, Linn.

Twining subglabrous undershrubs. Leaves opposite, ovate-cordate, membranous. Cymes subumbelliform. Flowers greenish or yellow, rather large. Calyx 5-partite. Corolla salver-shaped, tube swollen at the base; lobes oblong or linear, overlapping to the right. Column rather large; coronal scales large, membranous, adnate to the back of the anthers, erect, flattened dorsally or laterally, acute, simple or transversely bifid (2-lamellate above the middle), pollen-masses one in each cell, subcylindric clavate or globose-obovoid, waxy, erect. Stigma unornate or capitulate, rather longer than the anther-cells.
Follicles lanceolate, terete, rather turgid. Seeds ovate, concave.—Distrib. Species about 10; Asiatic and African.

The excessively sweet-scented *P. odoratissima*, Smith (Icones Picte, t. 15), is stated to be Indian, but the plant so called by Roxburgh, Wight, &c., is *P. minor*. Smith's figure exactly resembles *P. pallida*, which is nearly scentless.

* Pollen-masses elongate-clavate or subcylindric.


Tropical Himalaya; from Murree ascending to 5000 ft. eastward to Sikkim and southward on the plains to Bombay and Central India, Behar and Birma.

Except by the absence of the sweet scent and pale flowers I do not know how this can be distinguished from Smith's figure and description of *P. odoratissima*. *P. pallida* in Roxburgh's figure 6 in. long and 1 broad (1½ as drawn partially open), lanceolate. Seeds ½ in. long, broadly ovate.

** Pollen-masses globosely obovoid or obscurely broadly obconic.


Cultivated or native throughout India, and the Eastern Islands, China and Japan; native of the Himalaya (Brandis). Tsegai hills in Ava, Griffith.

Though confounded with *P. odoratissima*, this appears to be perfectly distinct in the smaller flowers and short broad corolla-lobes. *P. pallida* lanceolate, 3 in. long by ½ in. diam.; pericarp thick, glabrous. Seeds ½ in. long, broadly ovate.—The coronal scales vary excessively in length acuteness and in the comparative length of the outer and inner divisions.

3. **P. puberula**, Miguel *Fl. Ind.* Bat. ii. 405; leaves ovate or oblong-ovate acuminate, base rounded or cordate, sepals broadly ovate, corolla pubescent without and within, lobes linear longer than the tube, coronal scales laterally compressed 2-winged dorsally below produced into an inflexed subulate point exceeding the anthers.


Habit of *P. pallida*, from which the short sepals, pubescent corolla, and laterally much-flattened scales which project far outwards from the column, and the form of the pollen-masses, at once distinguish it.

**34. STEPHANOTIS, Thouars.**

Twining glabrous shrubs. Leaves opposite, coriaceous. *Cymes umbelliform, axillary; flowers large, white. Calyx 5-partite, segments large. Corolla coriaceous, tubular or salver-shaped, tube cylindric, base swollen; lobes twisted, overlapping to the right. Coronal scales 0 in the Indian species (in others adnate to the anthers, erect, dorsally flattened). Column very short; anthers with an inflexed tip; pollen-masses one in each cell, erect, waxy, shorty
pedicelled. *Stigma* conical or shortly beaked, hardly or not exserted. *Follicles* very thick, obtuse or acuminate. *Seeds* comose.—**Distr.** Species 14, Madagascar, Malay Islds. and China.

**S. Maingayi**, Hook. *f.*; quite glabrous, leaves broadly ovate-cordate acuminate, cymes on long stout peduncles, sepals large lanceolate acuminate, corolla-tube 1 in., lobes lanceolate acuminate, anther-tips long, coronal scales 0.

**MALACCA; Maingay** (Kew distrib. 1112).


**35. LYGISMA, Hook. *f.* Gen. Nov.**

A puberulous slender much diffusely branched twining shrub. Leaves small, opposite, lanceolate. *Flowers* small, in numerous axillary umbelliform cymes. *Sepals* ovate, eglandular. *Corolla* salver-shaped, tube very short, lobes long, linear, waved, obtuse, the lobes overlapping to the right below the middle, the upper half sharply doubled down inwards (buds hence truncate). *Corona* of minute obtuse appressed teeth at the back of the anthers. *Column* minute, fleshy, low, cylindrical; anthers very short, with small rounded membranous tips; pollen-masses cylindric, clavate, waxy, erect, subsessile on the long corpuscle. *Stigma* included.


**BIRMA**; hills near Prome, Wallis.,

Leaves 1-2 by 1-½ in., acute, glabrous when mature, base rounded, triple nerved at the base; petiole very short. *Cymes* in all the upper axils, many-fid.; peduncle ½ in., very slender, pedicels ½ in. *Sepals* obtuse, pubescent. *Corolla* glabrous, ¼ in. diam.—A very curious plant, the only Indian Asclepiad one known to me with the corolla-lobes doubled down inwards in aestivation, rendering the bud truncate.

**36. TYPLOPHORA, Br.**

Twining, rarely erect, herbs or undershrubs. *Cymes* umbelliform or racemose; flowers small or minute. *Sepals* ovate or lanceolate. *Corolla* rotate; lobes broad, slightly overlapping to the right. *Coronal processes* fleshy, adnate to the very short column. *Anthers* very small with an inflexed tip; pollen-masses one in each cell, minute, globose or ovoid, waxy, erect or ascending rarely transverse or pendulous from the ascending pedicle. *Stigma* disciform, 5-gonal, included. *Follicles* acuminate, smooth. *Seeds* ovoid, flat, winged, comose.—**Distr.** Species about 40; Asiatic, African, Australian and Oceanic.

The minute anthers (larger in *T. Iphiisa*), forming a small ring round the disciform stigma, which is more or less overlapped by the short anchor-tips, and the adnate usually gibbous or globose coronal processes are the best characters for this genus. The position of the pollen-masses, ascending, horizontal, or pendulous, cannot be depended upon, and is most difficult to ascertain in dried specimens; as is the exact form of the fleshy coronal processes.

* Stem short, erect or suberect, 1-2 ft. (perhaps longer and twining in *T. Iphiisa*), sometimes twining at the tips.

**Western Himalaya:** Kunawur to Kumaon, alt. 7-8000 ft., *Govan*, &c.


2. **T. Helferi**, *Hook. f.*; softly pubescent, stem simple, leaves sessile ovate or lanceolate acuminate, umbels simple long-peduncled, sepals linear, corolla-lobes elongate-lanceolate, coronal processes gibbous.

**Tenasserim; Helfer.**

*Stem* 8-12 in. *Leaves* 1½-2 by ⅛-1 in., pubescent on both surfaces, base rounded. *Peduncle* strict, equaling the leaves; pedicels capillary. *Corolla* ⅛ in. diam., purple?, lobes caudate. *Follicles* 1½ in., poniard-shaped, pubescent.—The position of the pollen-masses I could not ascertain, owing to the imperfection of the specimens.

3. **T. fasciculata**, *Ham. in Wight Contrib*. 50; *Ic. t*. 848; stem simple or branched glabrous below finely puberulous above, leaves petioled ovate or lanceolate acute glabrous, cymes peduncled umbelliform simple or compound, sepals lanceolate, corolla-lobes broadly ovate, coronal processes globose, follicles short turgid. *Wall. Cat*. 8204; *Done. in DC. Prodr*. viii. 608; *Dalek. & Gibs. Bomb. Fl*. 151.

**South Nepa**l; at Sukanagur, *Hamilton*. **South-Concan**; Bababoodan hills, &c.; *Lawn, Dalzell*, &c.

*Stems* several from the root, 12-18 in., flexuous or climbing amongst grass. *Leaves* 1-2 by ⅛-1½ in., coriaceous; petiole ¼-1 in. *Peduncles* slender; pedicels capillary. *Corolla* ⅛ in. diam., fleshy in the Nepal specimens. *Pollen-masses* horizontal according to *Wight*, but I think erect. *Follicles* 1½-2 by ¼-⅝ in., ovoid-lanceolate; pericarp very thick, glabrous. *Seeds* ⅛ in. long, broadly ovoid, quite flat.—*Wight* correctly observes that the corpuscles in this and the following are almost 2-partite.

4. **T. macrantha**, *Hook. f.*; stem simple or branched finely pubescent, leaves petioled ovate acute glabrous, cymes peduncled simple or subcompound, sepals lanceolate, corolla-lobes ovate-lanceolate, coronal processes globose. *T. fasciculata var. macrantha*, *Wight Contrib*. 50; *Done. in DC. Prodr*. viii. 608.


This has the habit and foliage of *T. fasciculata*, but the flowers are twice as large, and the corolla-lobes ovate-lanceolate. The *Pegu* specimens seem identical with the Nilgherry ones. *Fruit* unknown.


**Nilgherry Mts., Wight*, &c. **Ceylon**; Central province, alt. 4-7000 ft., *Walker*, &c.
Stem rather stout, 2–3 feet long. Leaves 1½–2½ by ¾–1½ in., dark green, rather coriaceous; petiole ½–1 in. Peduncles longer than the petiole; pedicels short. Sepals quite glabrous. Corolla ½ in. diam., yellow or dark purple. Anthers large for the size of the column, horned, with broad inflexed tips; pollen-masses horizontal. Petioles 3–3½ in. long, pinnoid-shaped, glabrous. Seeds ½ in. long, narrowly ovate.—The anthers of this are much larger than in any of its congeners. Hohenacker's is the only Peninsular specimen that I have seen; it is identical with the Ceylon one. The cymes are long, linear with a central groove, quite different from those of T. fasciculata.

** Stems and branches long, twining, and cymes perfectly glabrous; sepals always glabrous (see also T. Ipistyia); corollal processes without free points (except T. himalaica).


Travancore; Courtallam, Heyne, Wight.

Branches rigidly flexuous. Leaves 2–4 by ½–1½ in., rigid; petiole ½–1 in. Cymes much shorter than the leaves, pediciles ½–1 in. Corolla ½ in. diam. Pedicels 3 in. long, pinnoid-shaped.—Wight describes the corollal processes as toothed on the inner margin below the lip, a character I fail to verify.

7. T. globifera, Hook. f.; quite glabrous, leaves short-petioled oblong or ovate acuminate or apiculate, cymes long-peduncled compound few-fld. pedicels capillary, sepals ovate-lanceolate, corolla-lobes short ovate, corollal processes very large globose as high as the anthers.

Malacca, Griffith. South Andaman Island, Kurz.

Leaves 1½ by ¾–1½ in., dark brown when dry, base rounded or cordate, nerves few; petiole ½–1½ in. Peduncles 1–1½ in., very stout; pedicels ½–1 in. Corolla ½ in. diam. Staminal column very short, depressed.


Deccan Peninsula; from S. Canara to Malabar and Travancore, Wight, &c. Ceylon, not uncommon, Thwaites.

Branches rather stout. Leaves 2–4 by 1–2 in., rather thin, nerves slender; petiole ½–1 in. Peduncles longer than the petioles; pedicels very variable. Corolla ¾ in. diam. Column and coronal processes much as in T. globifera, from which this differs in the leaves and long petioles.—The North Bengal locality attributed to this in *DC. Prodr.* is doubtless an error. Thwaites' specimen of T. asthmatica β glabra is very imperfect, but I think referable to this.


Burma; banks of the Irawaddy, Wallish.

Resembles T. pauciflora, but the leaves are narrower, more cordate at the base, and the corollal processes less developed. The specimens are very insufficient. Wight
describes the processes of the column as toothed on the inner margin below the tip, and the pollen-masses as transverse.

10. **T. longifolia**, Wight *Contrib.* 50; quite glabrous, leaves lanceolate from a broad cordinate base acuminate, cymes elongate bearing small distant umbels on the very long slender rachis, sepals ovate, corolla-lobes short ovate obtuse, coronal processes gibbous. *Wall.* *Cat.* 8205; *Dens. in DC. Prodr.* viii. 608.

Sikkim Himalaya, alt. 2000 ft., Clarke. Khasia Mts., alt. 4-6000 ft., Wall. &c.

*Stem and branches slender. Leaves 3-6 by $\frac{1}{4}$-1½ in., membranous, nerves distant; petiole $\frac{1}{4}$-½ in. Cymes very slender and few-fld. Corolla $\frac{1}{3}$ in. diam., yellow. Follicles not seen.*

11. **T. himalaica**, Hook. *f.*; quite glabrous, leaves petioled ovate-lanceolate acuminate base acute or rounded, cymes bearing short distant umbels on the very long slender rachis, sepals lanceolate, corolla-lobes oblong-ovate obtuse, coronal processes gibbous.

Western Himalaya (Suhunshudhara), Falconer. Sikkim Himalaya, alt. 3000 ft., Thomson, Clarke. Khasia Mts., alt. 0-4000 ft., Griffith, &c.

Very closely allied to *T. longifolia*, but the leaves are very different; always contracted, generally acute, and never cordinate at the base; and the flowers are twice as large, with narrow longer sepals, more membranous longer corolla-lobes, and a much larger column. *Follicles* 4-5 in., narrowly poniard-shaped. *Seeds* $\frac{1}{6}$ in. long, broadly ovate.—I have observed a very few hairs on the sepals.

12. **T. zeylanica**, *Dens. in DC. Prodr.* viii. 608; quite glabrous, leaves large fleshy ovate elliptic or almost rounded acuminate acute or apiculate, cymes elongate bearing few- or many-fld. umbels or racemes on the diverse branches, sepals ovate obtuse, corolla-lobes oblong-ovate obtuse, coronal processes gibbous. *T. micrantha*, *Thwaites Enum.* 197. Cynanchum micranthum, *Thunb. Diss.* 6; *DC. l.c.* 548.

Travancore, alt. 2000 ft., Beddome. Ceylon; Central province, alt. 2-4000 ft.

A tall climber. Leaves 4-6 by 2-4 in.; midrib thick with a gland above at the insertion of the petiole; nerves spreading; petiole 1-1½ in. *Flowers* $\frac{1}{4}$ in. diam.; pedicels slender. *Follicles* 4-6 in., slender. *Seeds* $\frac{1}{6}$ in. long, linear-oblong.—In one of Beddome's specimens the flower-bearing tips of the branches are thickened and covered with spirally placed scars, each subtended by a minute bract at the insertion of the pedicels.


Very slender, prostrate or twining. Leaves rarely 1½ in. long, very variable in form and breadth, base sometimes cordate, nerves few indistinct; petiole $\frac{1}{4}$-½ in. *Flowers* rarely $\frac{1}{6}$ in. diam., dark purple; pedicels $\frac{1}{4}$-½ in. *Pollen-masses* suberect. *Follicles* 3 in. long, poniard-shaped, pericarp membranous. *Seeds* $\frac{1}{6}$ in., ovate.
** Stem and branches long, twining, and leaves glabrous or pubescent; apices always hirsute or pubescent.

† Coronal processes wholly adnate to the column without free points above.

14. **T. Belostemma**, Benth. Gen. Pl. ii. 771; softly hirsute throughout, leaves ovate-cordate acuminate, cymes simple subsessile, flowers few umbellated, coronal processes linear radiating from the base of the column.—Belostemma hisrutum, Wall. in Wight Contrib. 52, and Cat. 8211.

** NEPAL, Wållich. KHASIA Mts.; Churma and below it, alt. 2-4000 ft., J. D. H. & T. T.

** Hairs reflexed on stem and branches. Leaves 1½-2 in., pale green when dry, hirsute on both surfaces; petiole ½-⅔ in. Peduncles shorter than the petioles. Sepals lanceolate, hirsute. **Corolla** ¼ in. diam., dull purple; lobes ovate, pubescent within. Staminial columns contracted below the anthers. **Follicles** not seen.

15. **T. hirsuta**, Wight Contrib. 49; stem densely softly tomentose, leaves ovate or ovate-lanceolate acute or acuminate pubescent or tomentose on both surfaces, base rounded obtuse or cordate, peduncles long flexuous bearing distant few-fld. umbels at the flexures, corolla puberulous within lobes short, coronal processes subglobose. **Wall. Cat. 8201; Dene. in DC. Prodr.** viii. 607. T. Jacquemontii, Dene. l.c. Gymnema hisrutum, Wall. Tent. Fl. Nep. 50.


** Stem rather stout; hairs reflexed. Leaves 3-7 by ⅓-4 in., sometimes only faintly hairy; petiole ⅔-1½ in., stout. Peduncle very variable in length, villous or hirsute; pedicels capillary, short or long. Sepals lanceolate, hirsute. **Corolla** ⅓-¼ in. diam., **Follicles** 2-2½ in., poniard-shaped, glabrous. **Seeds** ¼ in. long, narrowly ovate.

** VAR. penangensis**: leaves minutely pustular on the upper surface at the bases of the hairs.—Penang, Phillips.—This, of which the specimens are very imperfect, may be T. villosa, Blume of Java, which strongly resembles T. hirsuta, and also T. mollissima, Wall. (Cat. 8202) of China.

16. **T. mollissima**, Wight Contrib. 49; t. 1275 (not of Wallich), stem densely softly tomentose, leaves oblong or linear-oblong acute or acuminate base rounded obtuse or cordate, peduncles flexuous bearing distant few-fld. umbels, sepals lanceolate, corolla glabrous within lobes oblong, coronal processes subglobose hispid. **Dene. in DC. Prodr.** viii. 607.

** NILLGHERY AND PULNEY Mts., Wight.**

Very similar to T. hirsuta, differing in the form of the leaves. Fruit unknown.

17. **T. rotundifolia**, Hamilt. in Wight Contrib. 50; stem pubescent, leaves very shortly petioled orbicular or very broadly ovate obtuse or acute beneath and margins pubescent, base rounded or cordate, cymes many-flld. umbellate sessile or peduncled, pedicels long, sepals lanceolate hispid, corolla-lobes ovate, coronal processes globose. **Wall. Cat. 8203; Dene. in DC. Prodr.** viii. 608.

** Assam; Dongtala and Habora Ghat, Hamilton. NORTHERN OUDÈ, Vicary. THE CONGÀN, Law, Stocks. TRAVANCORE; Annamallay hills, Beddome.**

** Leaves** 2-3½ in. long and often as broad, coriaceous, glabrous above; petiole ¼-½ in. Pedicels ½-1 in. long, nearly glabrous or pubescent. **Corolla** ½ to nearly ¾ in. diam. **Follicles** not seen.

18. **T. Dalzellii**, Hook. f.; stem and cymes sparsely pubescent, leaves coriaceous or fleshy ovate oblong or cordate acute or acuminate glabrous or
nearly so, cymes sessile or peduncle short, rachis flexuous with umbels or racemes at the flexures, pedicels long capillary, sepals ovate hispid, corolla-lobes short, coronal processes gibbous.—T. carnivora, Dals. & Gibe. Bomb. Fl. 150. Tylophora n. 23 and T. pauciflora? Herb. Ind. Or. H. f. & T.

Concan and Malabar, Stocks, Law, &c.
Leaves very variable, 2-4 in., quite glabrous or puberulous on the petiole margins and nerves beneath; petiole 1-2 in. Peduncles nearly half as long as the leaves; rachis often zigzag, sometimes clavate, hispid at the insertion of the pedicels; flowers always numerous, sometimes in a globose mass 1½ in. diam., usually laxer; pedicels ½-1 in. Corolla ¾-1 in. diam. Follicles 3-4 in. poniard-shaped, glabrous. Seeds ½ in., broadly ovate.—This is the T. carnivora of Dalzell and Gibson, but not of Wight, from whose plant it differs in the pubescence, larger leaves, shorter peduncles, and many-flowered umbels. It differs from T. rotundifolia in the much smaller flowers and longer pedilts; it also closely resembles T. asthmatica, but has shorter sepals and wholly adnate processes.

19. T. exilis, Coleb. in Trans. Litum. Soc. xii. 358, t. 16; stem slender and cymes finely sparsely villous, leaves ovate-oblong or lanceolate acuminate nearly glabrous, pedicules long slender flexuous simple or branched bearing few-fl. sessile umbels, pedicels very short, sepals ovate hispid, corolla-lobes short, coronal processes gibbous. Wight Contrib. 50; Wall. Cat. 8206; Done. in DC. Prodr. viii. 608. Pergularia exilis, Spreng. Syst. i. 844.

Assam, Masters. Silhet, Wallach. Chittagong, Colebrooke. Malacca, Griffith. Very similar to T. tenerrima, but with larger leaves, hairy branchlets cymes petiolaris and midrib of the leaf above, and very short pedicels rarely ½ in. long. Follicles 3½ in. long, very membranous. Seeds ½ in. long, ovate.

†† Coronal processes adnate below to the column; tips free, reaching as high as the stigma.

20. T. cordifolia, Thwaites Enum. 196; nearly glabrous, leaves small coriaceous ovate-cordate apiculate, pedicules very short 1-2-fl., sepals ovate glabrous, corolla-lobes short, coronal processes strongly laterally compressed, dilated upwards.

Ceylon; common in the central provinces, Walker, Thwaites.

Stem slender and petiolaris puberulous. Leaves ½-1 in. thin, firm, shining; petiole ⅓-½ in. Peduncle ½-⅔ in. capillary. Corolla ½ in. diam., dark purple, lobes obtuse. "Follicles usually solitary, 2 in. long, slender, glabrous" (Thwaites).—The column with its processes is obconic (as in some non-Indian species) from the upward dilatation of the processes which radiate from it.

21. T. tenerrima, Wight Contrib. 50; nearly glabrous, leaves ligulate or linear-lanceolate obtuse apiculate or acuminate, cymes peduncled 2-4-fl., sepals ovate-lanceolate hispid, corolla-lobes linear-oblong puberulous within, coronal processes gibbous or globose with free incurved cuspidate tips. Wall. Cat. 8207; Done. in DC. Prodr. viii. 610. Homestyles tenerrinia, Wall. mss.

Subtropical Himalaya; alt. 3-6000 ft., from Kumaon, R. to Sikkim, J. D. H. Stem very slender and much branched. Leaves 1-2 by ½-1 in., nervellse; petiole very short. Peduncles capillary, usually shorter than the leaves; pedicels ½-1 in. Corolla ½ in. diam. Follicles not seen.

22. T. asthmatica, Wight & Arn. Contrib. 51; glabrous pubescent or tomentose, leaves ovate rounded or oblong apiculate acute or acuminate, base usually cordate, pedicules shorter than the leaves bearing 2-3 sessile few- or many-fl. umbels, pedicels long capillary, sepals long lanceolate hispid, corolla large lobes short acute, coronal processes gibbous or globose with free cuspidate

N. & E. *Bengal, Assam, Cachar, Chittagong and Burma to Malacca; Deccan Peninsula, abundant.* Ceylon, common in the hotter districts.—*Distr.* Siam, Malay Islds., Borneo.

*Stem slender.* Leaves 2–4 in., rather thickly coriaceous, very variable in width, rarely pubescent or tomentose on both surfaces; nerves few, spreading; petiole 1/2 in. *Gymes* always more or less pubescent, hispid at the bases of the umbels. *Corolla* 1/2 in. diam., dull yellow and purple within. *Follicles* very variable, pinnard-shaped, divaricate, 3–4 in. and slender in Deccan specimens with a thin pericarp; turgid in the lower half, and only 2 in. long, with a thick pericarp, in some Ceylon specimens. *Seeds* 1/2 in. long, broadly ovate.

23. *T. Wallichii,* *Hook. f.*; *stem stout, cymes and petioles sparsely pubescent or puberulous, leaves fleshy oblong or ovate-oblong acuminate base cordate, peduncles long stout branched bearing few-fld. irregular umbels or clusters, sepals ovate pubescent, corolla subglobose fleshy shortly 5-lobed, coronal processes gibbous with free cuspitate tips (or 0), follicles very large ellipsoid ventricose.* Gymnema Wallichii, in part, *Wight Contrib.* 46. G. sagittatum, *Wall. Cat.* 8194 B.


Leaves thickly coriaceous, 4–6 by 1–2 in., narrowed at the cordate base, nerves spreading; petiole 1/2 in. *Gymes* often exceeding the leaves, branches divaricate. *Flowers* 1/2 in. diam.; often fleshy and deformed with the column imperfectly developed cylindric and without coronal processes. *Follicles* very different from those of any congener, 4–5 by 1–1 1/2 in., elliptico-lanceolate, narrowed equally to the base and tip, pericarp coriaceous. *Seeds* 1/2 in. long, broadly ovate.—This very closely resembles in habit when dry *Gongronema Wallichii.*


A stout glabrous twiner. *Leaves* opposite, thickly coriaceous. *Flowers* large, in axillary simple stoutly peduncled umbels. *Sepals* very small, ovate, glandular within. *Corolla* rotate, shortly 5-lobed; lobes broadly ovate, ciliolate, overlapping to the right. *Coronal* processes adnate to the backs of the anthers and equalling them, ovate, obtuse, fleshy. *Column* prominent; anther-tips inflexed, rounded; pollen-masses one in each cell, subcyindric, pedicelled, waxy, erect. *Stigma* hemispheric, 2-cuspitate, included.


*Sikkiin Himalaya,* alt. 8–10,000 ft., *J. D. H., Anderson, Treutler.*

Branches terete, smooth. *Leaves* in distant pairs, 3–5 by 1 1/2–3 in., ovate elliptic oblanceolate or elliptic-oblong, apiculate or acuminate, midrib thick; nerves 4–5 pairs, spreading, secondary indistinct; petiole stout, 1/2–1 1/2 in. *Peduncle* 1–2 in.; pedicels 1–1 1/2 in., stout; bracts small, lanceolate. *Sepals* ciliate. *Corolla* 1–1 1/2 in. diam., coriaceous, glabrous, dark purple. *Fruit* not seen.—This genus is very near *Marsoniia,* from which it differs conspicuously in the large rotate corolla with short rounded lobes. It is named after Dr. *Treutler,* a native of the province of Sikkim, who presented to Kew in 1875 a very large and valuable collection of its plants, inclusive of the present which is one of the most handsome of the Sikkim Asclepiads.
38. COSMOSTIGMA, Br.

A twining glabrous shrub. Leaves opposite, ovate or cordate. Cymes axillary, racemiform; flowers small, greenish. Sepals small. Corolla rotate, lobes overlapping to the right. Coronal scales adnate to the base of the anthers, and shorter than they are, erect, broad, membranous, truncate or 2-fid. Column very short, filaments fleshy; anther-tip broad, rounded, inflexed; pollen-masses obovooid-oblong, waxy, erect, pedicels long flexuous. Stigma broad, flat, 5-angled. Follicles large, linear-oblong, obtuse, smooth. Seeds comose.


Silkhet, Chittagong, and the Western Ghats, from the Concan southwards. Ceylon, Common.—DISTRIBUTION. Java.

A tall stout climber. Leaves deciduous, 3-5 by 1½-2½ in., rather coriaceous, rounded or ovate, finely acuminate or tip obtuse, base sometimes cordately 2-lobed, lobes connivent; petiole 1-2 in. Peduncles equaling the pediote, stout, straight; pedicels ½ in., stout, spreading, spirally arranged round the rachis; bracts 0. Corolla ½ in. diam., fleshy, speckled with brown. Follicles 7 in. long by 1½ in. diam., lanceolate or linear-oblong, obtuse, smooth. Seeds ½ in. long, broadly ovate.

39. DREGEA, E. Meyer.

Twining shrubs, glabrous or hoary. Leaves opposite, ovate or cordate, acuminate. Cymes axillary, umbelliform; flowers green. Sepals small. Corolla rotate, lobes broad, overlapping to the right. Coronal scales 5, hemispheric, fleshy, adnate to the column, spreading, inner angle cuspitate, the tooth incumbent on the anthers. Column very short, fleshy; anther-tips short, inflexed; pollen-masses one in each cell, cylindric-oblong, shortly pedicellated, waxy, erect. Stigma conical or dome-shaped. Follicles thick, hard, winged or ribbed. Seeds comose.—DISTRIBUTION. Species 6 or 7; Indian, Malayan, and tropical and S. African.


Bengal, Assam and the Deccan Peninsula, from the Concan, southwards. Ceylon, in the hotter parts of the island.—DISTRIBUTION. Java.

A stout tall climber, branches often pustular. Leaves 3-6 by 2-4 in., rather coriaceous, base rounded or cordate; nerves 4-5 pairs; petiole 1-3 in. Peduncles 1-3 in., rather slender; umbels drooping, very many-fld., subglobose; pedicels ½ in., slender. Corolla ½ in. diam., cupular, lobes triangular. Stigma dome-shaped. Follicles ½ in. long by 1½ in. diam., broadly lanceolate, turgid, glabrous. Seeds 2 in. long, broadly ovate, pale, smooth and shining, border thick.
40. HETEROSTEMMA, W. & A.

Twining nearly glabrous shrubs or undershrubs. Leaves opposite, often cordate, base 3-5-nerved. Flowers rather small, in shortly peduncled umbellate or racemose cymes. Calyx small, 5-fid or -partite. Corolla rotate, lobes broad triangular valvate. Corona of 5 large lobes spreading horizontally from the column and lying flat on the corolla. Column very small, depressed; anthers very minute, tep very short; pollen-masses one in each cell, minute, broad, compressed, sessile, waxy, erect. Stigma included, truncate, 5-angled. Follicles slender, straight, tertele, pointed, pericarp thin. Seeds comose.—Dreer.  

Species about 10; Indian and Malayan.

* Coronal processes orbicular; sessile.

1. H. Wallichii, Wight Contrib. 42; branches hairy chiefly along two lines, leaves ovate broadly oblong or elliptic acuminate, corolar processes sessile orbicular with or without a small conical boss near the base. Wall. Cat. 8179; Done in DC. Prodr. viii. 630. Heterostemma, sp. 4, Herb. H. f. & T.  


Leaves 3-7 by 2-4 in., base rounded or subcordate, bright green, thinly coriaceous; petiole ½-2 in. Cymes small, peduncle stouter than the petiole; flowers ½-¾ in. diam., greenish. Fruit not seen.

2. H. alatum, Wight Contrib. 42; branches with two lines of hairs, leaves elliptic-ovate oblong or lanceolate acuminate, nerves beneath winged, coronal processes ovate-lanceolate acuminate with a large ovate acute concave appendage on the surfaces. Wall. Cat. 8180; Done in DC. Prodr. viii. 630.  

Central and Eastern Himalaya; Kumaon, Royle; Nepal, Wallich; Sikkim, alt. 2-6000 ft., J. D. H. Khasia Mts., alt. 4-6000 ft., Lob, J. D. H. & T. T.  

Leaves 3-6 by 1½-3½ in., rather coriaceous, light green, base acute or rounded, rarely cordate, nerves 3-4 pairs; petiole 1-2 in. Peduncles very short, stout; pedicels ¼-½ in., flowers ½-¾ in. diam., yellow. Follicles (immature) very slender, straight.

3. H. stellatum, Hook. f.; branches with very obscurely pubescent lines, leaves lanceolate or oblong-lanceolate acuminate, nerves beneath winged, corona stellately 5-lobed to below the middle, lobes triangular acute without appendages. Heterostemma, n. 3, Herb. H. f. & T.  

Khasia Mts.; at Myrung, alt. 6000 ft., J. D. H.  

This resembles H. alatum, but the leaves are narrower with a more regular intermarginal nerve, and the corona is very different.

4. H. tanjorense, Wight & Arn. Contrib. 42; branches quite glabrous, leaves broadly or narrowly ovate oblong or oblong-lanceolate obtuse or apiculate, base rounded or subcordate, coronal processes orbicular-obovate with a large erect fleshy appendage on the surface. Wight Ic. t. 348; Wall. Cat. 1178; Done in DC. Prodr. viii. 630. Stapelia involucrata, Herb. Madr. Glossostelma, nov. gen., Wight mss.
HETEROSTEMMA.

W. Peninsula; the Carnatic, in sandy places, Wight.

Leaves very variable, 3-5 by 1½-3 in., tip usually rounded and apiculate. Cymes usually sessile, flowers ½ in. diam.; coronal processes with an erect acute appendage. Follicles very slender, 4 in. long by 1½-3 in. diam., glabrous. Seeds ½ in. long narrowly ovate.

Var. seyalnicum: leaves acute or acuminate, flowers dark purple, appendages of the coronal processes larger obtuse or acute. H. tanjorense, Thwaites Enum. 198.—Ceylon, central province, ascending to 4000 ft.

5. H. Dalmellia, Hook. f.; branches glabrous or nearly so, leaves broadly or narrowly elliptic or ovate—oblong-lanceolate acuminate, coronal processes spathulate without an appendage. H. Wallchii, Dals. & Gibs. Bom. Fl. 152 (not of Wight). Heterostemma, sp. 2, Herb. Ind. Or. H. f. & T.

The Concan; at Vingora, and Malwan, Dalmelli, Stocks.

Leaves as in H. tanjorense, of which this may be a variety, differing greatly in the corona, the lobes of which have no appendage proper, though there are traces of swellings at the bases in some specimens and at their backs in others, as if in the latter case the process was reduced and its appendage enlarged. In some specimens the apex is obscurely 5-lobed, in others the tip is subquadrate with a simple or bifid tip, and the eides acutely angled. The follicles appear shorter than in H. tanjorense, but they are not quite ripe in either species.


Sikkim Himalaya, alt. 2-4000 ft.; J. D. H., T. Anderson, Clarke.

Branches leaves beneath, petioles and pedicels rusty-pubescent. Leaves 4-5 by 2-3 in., sometimes coriace, dark green, sparingly hairy above, nerves 4-5 pairs; petiole 1½-2 in. Corolla 1½ in. diam., sparingly hairy without, dark purple. Follicles 4-5 in. long, by ½ in. diam., green when ripe. Seeds 1½ in. long, black, coma as long as the rest of the seed, hairs spreading and reflexed.—Closely allied to Heterostemma, but widely differing in the large flowers, follicles, and seeds.

42. OIANTHUS, Benth.

Twining glabrous undershrubs, branches with two lines of pubescence. Leaves opposite. Cymes small, subsessile, few-flld. Sepals small, obtuse or acute. Corolla ovoid-urceolate or disciform, mouth contracted; lobes 5, very short, broad, valvate. Corona cupular, adnate to the column, spreading, fleshy, lobulate or toothed. Column minute, short, depressed; anther-tips short, inflexed; pollen-masses very minute, one in each cell, semi-ovate, compressed, inner margin pellucid, sessile, waxy, ascending. Stigma broadly conic, not exceeding the anthers.
I think it possible that the following species are abnormal forms of *Heterostemma*.


The *Concan*; Belgaum and hills to the north of it, *Dalzell*.

Stem purple. *Leaves* 2-4 by 1-2 in.; green, nerves 2-3 pair with strong connecting nerves. *Corolla* coriaceous, \( \frac{3}{4} \) in. long, red-purple without, dark purple within, sparingly villous at the base within; lobes minute, triangular.

2. **O. disciflorus**, Hook. *f.*; nearly glabrous, leaves elliptic-or ovato-oblong subacute or obtuse, petiole 1-1\( \frac{1}{2} \) in., corolla disciform vertically depressed, corona 5-lobed lobes entire margin very thick somewhat incurved.

**Western Peninsula**, the *Concan*? *Herb. Law. and Stocks*.

This in foliage entirely resembles *Heterostemma Dalzellii*, of which it may be a singular form, but the flowers are quite perfect (about \( \frac{3}{4} \) in. diam.)


*Mysore* in the Beigoor forests, *Wynaad, Beddome*.

Described from an excellent drawing, Col. Beddome having lost his specimen.

### 43. DISCHIDIA, Br.

Herbs or undershrubs, usually rooting and climbing on trees or pendulous. *Leaves* various, fleshy, sometimes forming into pitchers (ascidia). *Flowers* very small or minute, white or red, in axillary fascicles umbels or racemes. *Sepals* 5, ovate, membranous. *Corolla* urceolate, mouth contracted; lobes 5, very short, valvate. *Coronal-scales* 5, membranous, adnate to the back of the column, erect, tips entire notched or 2-fid or with recurved arms. *Column* very short; anther-tip membranous; pollen-masses one in each cell, compressed, waxy. *Stigma* flat or conical. *Follicles* small, slender or thick, smooth, acuminate. *Seeds* minute, coma long.—Distr. Species about 24; tropical Indian, Malayan, and Australian.

The species of *Dischidia* all want a careful study. They cannot be described satisfactorily from dried specimens. The leaves change in form, and it is not ascertained in respect of many species whether they may or may not be converted into pitchers (ascidia).


A very slender herb, rooting on tree trunks. *Leaves* whitish when dry, with

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often recurved margins, nerves 2–3 pairs horizontal reticulating. Seeds ⅓ in. long, slender.


Stems very slender and leaves on both surfaces papillose and sometimes sparsely hairy. *Leaves* pale when dry, the 2 or 3 pairs of nerves very prominent above. *Corolla* ⅜ in. long, "blood red, with a row of ascending shining hairs in the middle of the tube, and a similar row on the throat inserted below a row of 5 adnate fleshy convex scales. *Pollen-masses* linear, connate at the base." *Maingay*.

3. **D. albida**, *Griff. Notul.* iv. 46; glabrous, leaves petioloed ovate or rounded-ovate or ovate-cordate acute or acuminate nerveless.

**MALACCA**; at Toondook. *Griffith*.


4. **D. khasiana**, *Hook. f.*; glabrous or very sparsely hairy, leaves ⅓–⅔ in. petioloed orbicular tip rounded, nerves very slender, follicles ⅜ in. slender throughout straight or curved. *Dischidia*, n. 9, *Herb. H. f.* & *T.*

**Khasia** Mrs. at Churra and Nunklow, alt. 3-4000 ft. *J. D. H.* & *T. T.*

Stems very slender, creeping, papillose. *Leaves* quite orbicular, tip rounded or apiculate, nerves 2–3 pairs horizontal; petiole ⅛–⅜ in. *Follicles* about ⅜ in. diam. below the middle, gradually tapering to the obtuse tip and to the base, pale.—This resembles *D. formosana*, *Maxim.*; but the leaves are much larger; the habit and foliage are precisely those of *Hoya Nummularia*.


**EASTERN NEPAL** and **SIKKIM**, *J. D. H.* **ASSAM** and southwards to **MALACCA**.—*Distr.* *Java*, *Borneo*.


**CACHAR**, *J. D. H.* & *T. T.*; and from **TENASSERIM**, *Griffith*, to **MALACCA**.—*Distr.* *Borneo*, **Australia**.
7. **D. acutifolia**, Maingay mas.; glabrous, stems slender twining, leaves shortly petioled 3-4 in. long ovate-lanceolate acute coriaceous penni-nerved, peduncles elongate, flowers subsessile, corolla throat hairy.

**MALACCA; Maingay (Kew Distrib. 1122).**

Leaves shining, nerves 5-7 pair, prominent on both surfaces; petiole \( \frac{1}{2} \) in. or less. **Peduncle** 3-1 \( \frac{1}{2} \) in. "Corolla very minute, urceolate, pale yellow with the short limb pink, throat closed with a row of fine horizontal or slightly ascending hairs. **Coronal-processes** very minute, closely appressed to the anthers," Maingay. **Pediciles** 2 \( \frac{1}{2} \) in. long, very slender, terete, slightly curved, narrowed from the base upwards.


**TENASSERIM; at Mergui, on trees, Griffith.**

Branches as thick as a crow-quill. Leaves 3-1 in. diam., base cuneate; petiole 4-6 in. **Peduncles** perennial, ovoid, obtuse, as thick as the branch. "Flowers few, small, inconspicuous, white. **Sepals** minute, rounded. **Corolla** urceolate, 5-toothed, throat closed with hairs. **Coronal-processes** white, fleshy, angular, base 2-fld. **Pollen-masses** lurid, obovate." Griffith.


**MALACCA, Maingay (Kew Distrib. 1114).** SINGAPORE, Walker.—**Distrib. Java, Borneo.**

Stems creeping and rooting, the roots protected by the leaves. Leaves sometimes pruinose beneath, nerves 2-3 pairs, horizontal. **Flowers** subsessile on the short peduncles. **Corolla** 1 \( \frac{1}{6} \) in. long, globose with erect teeth, "white glabrous within, lobes tipped with lilac," Maingay.

10. **D. coccinea**, Griff. Notul. iv. 45, and **Ic. Pl. Asiat.** t. 409; glabrous, leaves sessile orbicular 1-2 \( \frac{1}{2} \) in. diam. convex papillate with the nerves distinct beneath, corolla glabrous within scarlet.

**MALACCA, Griffith, Maingay (Kew Distrib. 3780).**

More slender and smaller than **D. Collyris**, of which Maingay considers it a variety. **Flowers** fascicled on a very short peduncle 1 \( \frac{1}{2} \) in. long. **Pediciles** 1 in. long, lanceolate, curved, broadest near the base.

11. **D. complex**, Griff. Notul. iv. 50; glabrous, ascidia subreniform compressed lamina inflexed at the orifice, peduncle long, corolla white, throat closed with hairs.

**MALACCA, Griffith.**

Twining. Ascidia large; orifice small, near the petiole, its outer margin inflexed formed into a second pitcher much smaller than the outer one, opening on each side by an oblique aperture, deeply lobed or furrowed on the upper carinate on the lower side; outer cavity crammed with radicles, inner surfaces of both lurid purple.
Peduncles 3 in.; flowers subumbellate (in bud), white. Corolla subglobose. Coronal scales with very long narrow arms dilated at the tips; pollen-masses subovate, caudicles much dilated—Description from Griffith.

Doubtful Species.

D. WALlichii, Wight Contrib. 43; Wall. Cat. 8183; Dcne. in DC. Prodr. viii. 633; flowers and fruit unknown; is probably not a Dischidia.

D. CLAVATA, Wall. Cat. 4209, from Attrran, is unknown to me; I have not found it in Wallich's Herbarium at the Linnean Society.

44. HOYA, Br.

Twining pendulous or rambling and rooting, rarely erect shrubs. Leaves opposite, thickly fleshy or very coriaceous. Flowers in axillary or terminal umbels. Calyx small, 5-partite. Corolla rotate, fleshy or waxy; lobes 5, often convex and spreading or reflexed, valvate in bud. Coronal-scales 5, large, membranous fleshy or horny, adnate to the column, stellately spreading or ascending, turbid or compressed laterally or vertically, often concave on the upper surface, margins usually recurved so as to enclose a hollow space, the inner angle often produced into a tooth or spur which is erect or incumbent on the anther. Column short; anthers conniving over the stigmas, membranous, tips inflexed or erect, rarely 0; pollen-masses various, solitary in each cell, waxy, pedicelled, erect. Stigma included, flat or the centre apiculate. Follicles various, usually slender, acuminate, with a thin pericarp; rarely turbid with very thick walls. Seeds very small, ovate or linear-oblong; coma long. Distr. Species about 60; tropical Asiatic, Malayan, and Australian.

A most difficult genus to describe from dried specimens. I am quite unable to adopt the sections established by Blume on the development of the coronal-processes. The description of the nervation of the leaves applies to herbarium specimens solely. The secondary nerves, and in most the primary, in perhaps all except H. coriacea, are invisible in the living plants, and there is no exact line to be drawn between those with 3–5 principal basal nerves, and those with alternate arched or straight, and more or less horizontal nerves. The peduncle is in very many species persistent and perennial, giving off a succession of flowers from tubercles towards its tip; the result is a cylindrical thick end to the peduncle; it is not known whether this feature is common to all the species, nor even whether it is constant in any. The incurved or recurved form of the corolla probably affords a good character, but is lost in dried specimens. The coronal-processes are greatly distorted in drying, and the characters I have drawn from them must be accepted with reserve. The pollen-masses present great variations in size, form, and length of pedicels, and probably afford excellent characters. The follicles present wonderful variations, from the most slender and terete with thin pericarp of H. globulosa, to the thick cylindrical with rounded lobed ends and exensively thick pericarp of H. coronaria. The seeds of all are very small for the Order.

Sect. I. Cryptoceras. Corolla reflexed, lobes longer than broad. Column stipitate; coronal-processes very long, erect, with a long spur diverging from the base of each.


SECT. II. Pterostelma. Corolla reflexed, lobes longer than broad. Column sessile, obconic; coronal-processes laterally compressed, semi-cordate, 2-winged, with an erect subulate point in the inner angle. Plocostemma, Bl.


Khasia Mts.; alt. 2,000 ft., Wallich, &c.


SECT. III. Ancistrostemma. Corolla reflexed, lobes longer than broad. Column sessile; coronal-processes gibbous and 2-lamellate below, produced upwards into long erect points each with a 2-fld incurved hooked tip.


SECT. IV. Euhoaya. Corolla-lobes broader than long, spreading or recurved. Column sessile or sub sessile; coronal-processes stellately spreading, inner angle acute or produced into an erect or recurved simple spine.

* Inflorescence terminal, or terminal and axillary.

† Leaves terete.

4. H. linearis, Wall. in Wight Contrib. 37, and Cat. 8155; ends of branches and umbels hirsute, leaves 1–2 in. cylindric terete acute, umbels terminal sessile many-fld., corolla glabrous or papillose within, coronal-processes horizontal. Don Prodr. 130; Dcne. in DC. Prodr. viii. 637.

Subtropical Himalaya; Nepal, Wallich; Sikkim, alt. 3–6000 ft., J. D. H., Treutler.

Stem pendulous, 1 ft. and more, flaccid. Leaves 1–2 by ⅜ in. diam., straight, midrib glabrous or hirsute; petiole very short. Pedicels 1 in., and linear-oblong calyx hirsute. Corolla ⅜–⅞ in. diam., and corona white. Follicles ⅝ in., slender, straight, pericarp thin glabrous. Seeds ⅜ in. long.—The following varieties are so identical in habit and inflorescence, that I cannot doubt their being conspecific. Wight's character is drawn from specimens sent him by Wallich consisting of leaves of one plant (linearis) and a detached flower of another, of which specimens (also detached) are fastened on Wallich's sheet of linearis, and which have glabrous pedicels and minute glabrous sepals; these may belong to another species.

Var. nepalensis; corolla papillose puberulous within, coronal-lobes ovate flattened above concave beneath.—Nepal.

Var. sikkimensis; corolla glabrous within, coronal-lobes longer narrower sub-cylindric. Bot. Mag. t. 6882.—Sikkim.
5. **H. teretifolia**, Griff. mss.; quite glabrous, stem very slender creeping and rooting, leaves 5–7 in. very slender cylindric quite terete.

**Upper Assam**; Patkoy hills, alt. 4000 ft., Griffith.

A very singular plant, mentioned under the above name by Griffith in his *Journal* (p. 69). The leaves, which are rather distant, are curved and (as dried) about $\frac{1}{2}$ in. diam. I have seen no flowers.

†† Leaves flat.

6. **H. lanceolata**, Wall. *in Wight Contrib.* 33, and Cat. 8164 and 8156 b (H. parviflora); nearly glabrous, leaves 1–2 in. subsessile lanceolate or ovate-lanceolate fleshy, umbels terminal, peduncles and pedicels stout puberulous, corolla puberulous within. *Don Prodr.* 130; *Done. in DC. Prodr.* viii. 687.

**Tropical Himalaya**; from Kumaon to Bhotan and *Khasta* Mts., alt. 3–4000 ft. *Stem stout, climbing; branches long, pendulous. Leaves close set, somewhat elongate-trapezoid, base acute, midrib very obscure. Umbels 6–10-fld. Sepals oblong-lanceolate, pubescent. Corolla $\frac{1}{8}$ in. diam., lobes acute. **Coronal-lobes** ascending, short, thick, obtuse, terete, with a short flat area above, inner angle erect as long as the anther-tip. **Follicles** 5–6 in., very slender.

7. **H. Lobbii**, Hook. f.; quite glabrous, branches very stout, leaves 2–3 in. subsessile elliptic or ovate acute or acuminate very fleshy, nerves 6–8 pairs arched spreading, umbels terminal and axillary subsessile, corolla puberulous within, corona very large.

**Khasta Mts.; Nowgong, alt. 1500 ft., Thos. Lobb.**

Branches as thick as a goose-quill, woody. Leaves 1–2 in. diam., base narrowly cordate; midrib rather slender. Pedicels 1 in. Sepals ovate-lanceolate, glabrous. Corolla purple, $\frac{1}{4}$–$\frac{1}{3}$ in. diam., lobes subacute. **Coronal-processes** ascending, thick, terete, obtuse or subacute, inner angle raised acute as long as the anther tip.


**Sikkim Himalaya**; Herb. Griffith, alt. 3–5000 ft., J. D. H., Clarke.

Branches long, flexuous. Leaves very variable in breadth, broadest 1–2½ in. in the middle, base narrow but rounded; midrib slender, nerves very close. Peduncle at length thickened and scarred; pedicel slender. Sepals oblong, obtuse, glabrous. Corolla $\frac{1}{8}$ in. diam., white, disc glabrous. **Coronal-lobes** red-purple, very short, oblong-cordate, flat above, inner angle produced upwards in some specimens into a stout, erect beak which equals the long subulate anther-tip, and downwards into 2 auricles; other specimens have a very short inner angle and short anther-tips. **Follicles** 4 in., slender, falcate, smooth. **Seeds** $\frac{1}{10}$ in. long, ovate-lanceolate.

**Flowers in axillary (rarely also terminal) umbels. (Solitary in *H. retusa*.)**

† Corolla small, less than $\frac{1}{4}$ in. diam., revolute, villous within. Staminal column conical.

9. **H. parviflora**, Wight *Contrib.* 37; quite glabrous, leaves lanceolate acuminate very thick and fleshy, peduncles long slender, corolla revolute villous within, column conical. *Wall.* Cat. 8156 A; *Done. in DC. Prodr.* viii. 687.

**Tenasserim; Moumain, Wallich.**

*Stem climbing, slender. Leaves 2½–4 by $\frac{3}{4}$–3 in.; petiole short, thick. Peduncles almost as long as the leaves; pedicels $\frac{1}{8}$ in., very slender. Sepals ovate, glabrous. Corolla $\frac{1}{4}$–$\frac{1}{3}$ in. diam. **Coronal-processes** membranous, united into a conical vertically 5-lobed column. Each lobe again longitudinally folded and bifid at the spreading tip.*
10. **H. revoluta**, Wight mss.; quite glabrous, leaves ovate or ovate-lanceolate acuminate very thick and fleshy, margins strongly recurved, peduncles long slender, corolla revolute villous within, column conical. *H. ovalifolia, Wall. Cat.* 8160 b.

**Malacca, Griffith, Maingay** (Kew Distrib. 1127). **Singapore, Wallich.**

**Stem** climbing. **Leaves** 1½-3 in., midrib and nerves not visible, base acute; petiole ½-1 in., very thick. **Peduncle** equalling the leaves; pedicels very slender. **Sepals** ovate. *Corolla* ½ in. diam., pink. **Coromal-processes** membranous, united into a conical vertically 5-lobed column, each lobed again, longitudinally folded and produced upwards into an acute point.

11. **H. micrantha**, *Hook. f*.; quite glabrous, leaves ovate or elliptic-lanceolate acute very thick and fleshy, margins flat, peduncle long or short, corolla revolute pubescent within, column conical.

**Tenasserim; Mergui, Griffith.**

**Stem** rather stout. **Leaves** 2½-4 by 1½-1½ in., midrib and nerves not visible; petiole very short. **Peduncle** shorter than the leaves; pedicels ½-2 in., filiform. **Sepals** ovate, obtuse. *Corolla* ¼ in. diam. **Coromal-lobes** lanceolate, suberect, outer angle 2-fid, back with a boss; anther-tip much longer than the process.


**Malacca; between Jarsing and Aya Bomboo, Maingay.—Distrib. Sumatra, Java, Borneo.**

**Stem** slender, twining. **Leaves** 1-1½ in., very thick, but nerves distinct beneath, 3-5 pairs, base rounded; petiole very short. **Peduncle** longer than the leaves; pedicels ½-1½ in. **Sepals** very small, ovate, obtuse. *Corolla* ¼ in. diam., pedicels within. **Coromal-lobes** ovate, inner angle produced into an ovate obtuse lobe almost as large as the body, incumbent on the anther (which has no tip?).—This differs from the Javanese *H. lacunosa*, in the much larger inner produced angle of the coromal-processes.

†† Corolla ¼ in. diam. and upwards, rarely less; lobes usually spreading or incurved. Leaves flat in all.

**a. Leaves very small, rarely more than 1 in. long.**

13. **H. Nummularia**, *Deno. mss.*; stem slender minutely rough, leaves very small orbicular shining, flowers many in very long-peduncled umbels.

**Khasia Mts.**; at Mooemai, *Griffith.*

**Stem** creeping and rooting, angular (when dry). **Leaves** ½ in. diam., shining and reticulate on both surfaces; petiole ½ in., rather slender. **Peduncle** 2 in.; pedicels ½-1½ in. **Sepals** ovate-oblong. *Corolla* ¼ in. diam., “white, pubescent,” *Griffith.* **Coromal-processes** too young for description.—Resembles *Dischidia khasiana.*

14. **H. serpens**, *Hook. f.*; stem very slender minutely rough, leaves very small suborbicular opaque papillose on both surfaces, flowers many on long peduncled umbels, corolla tomentose within, coromal-lobes ellipsoid.

**Sikkim Himalaya** (*Herb. Griffith.*)

**Stem** creeping and rooting. **Leaves** ½-1½ in. diam., ovate or very broadly elliptic, base rounded or subordiate, nerves obscure; petiole very short, ½ in. **Peduncle**
1½ in., stouter than the branch; pedicels 1 in. Sepals ovate. Corolla $\frac{1}{4}$–$\frac{3}{8}$ in. diam., white, lobes obtuse.—Very similar to H. Nummularia, but the leaves are covered with minute papillae (when dry).

15. **H. obcordata**, Hook. f.; stem very slender minutely rough and here and there hairy, leaves obcordate or obreniform.

**Sikkim Himalaya**; Chakoong, alt. 4–6000 ft., J. D. H., Yoksun, Clarke.

Stem creeping and rooting. Leaves $\frac{1}{4}$ in. long, sometimes broader than long, lobes rounded, sinus acute, base rounded or subacute, rather thin, opaque, nerves obscurely reticulate; petiole $\frac{1}{10}$–$\frac{1}{16}$ in. Flowers in a drawing in Herb. Kew (by Jerdon) in a loose peduncled umbel; pedicels slender. Corolla $\frac{1}{2}$ in. diam., white, lobes triangular with villous margins.—Possibly a form of H. Nummularia or serpens, but if so a very remarkable one.

16. **H. vaccinoides**, Hook. f.; quite glabrous, branches very long slender pendulous, leaves $\frac{1}{2}$ in. elliptic subacute fleshy nerves obsolete.

**Upper Assam**; Mishmi Mts., by the Thumat river, Griffith.

Follicles 3 in. long, slender, straight, pericarp thin.


Tenasserim; Taungkota mountain, Moulemein, T. Lobb.

Leaves deep green, recurved, nerveless when fresh, midrib strong beneath; petiole $\frac{1}{10}$ in. Peduncle $\frac{1}{2}$ in.; pedicels $\frac{1}{2}$ in. Sepals small. Corolla $\frac{2}{3}$ in. diam., pure white, glabrous within; lobes very short, subacute. Coronal-processes violet, boat-shaped, concave above, inner angle acute.—I have seen no specimens.

b. Leaves very narrow, lanceolate oblanceolate or linear, rarely 1 in. broad; nerves invisible or very obscure.


The Concan; on the Ghats, Dalzell, &c.

Stem very slender. Leaves 1½–2 in. by $\frac{1}{4}$–$\frac{1}{2}$ at the broad tip, midrib very strong; petiole $\frac{1}{10}$–$\frac{1}{8}$ in. Flowers 1–3-nate; pedicels slender. Sepals minute, ovate. Corolla $\frac{2}{3}$ in. diam., white with a pink corona; lobes very broad, acute. Coronal-lobes horizontal, ovate, shorter than the corolla-tube, broad end outwards, inner angle acute.

19. **H. pauciflora**, Wight Is. t. 1269 (parviflora in text); quite glabrous, leaves 1–2 in. linear-lanceolate obtuse very thick, peduncles very short few-fld., pedicels long slender, corolla glabrous within. H. Wightiana, Thwaites Enum. 199.

Malabar and Travancore; Cochin and Courtallam, Wight. Ceylon; central province, alt. 3–5000 ft., Walker, &c.

A very slender climber. Leaves rarely more than $\frac{1}{4}$ in. broad, margins often recurved; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. Peduncle scarcely exceeding the petiole. Sepals small, narrow. Corolla $\frac{1}{4}$ in. diam., white. Coronal-processes pink, short, ovoid, obtuse, concave above, inner angle produced into a recurved spur.—I see no difference between the Ceylon and Deccan plants.

20. **H. longifolia**, Wall. in Wight. Contrib. 36; Cat. 8154; glabrous, leaves 4–8 in. narrowly oblanceolate acuminate very fleshy, peduncle long or short smooth and pedicels glabrous, corolla glabrous margins pubescent,

**Tropical Himalaya;** from Kumaon to Sikkim, alt. 1–3000 ft. Khasia Mts., alt. 3–4000 ft., Griffith, &c.

*Stem* stout, climbing; branches long, pendulous. *Leaves* very variable in breadth, \( \frac{3}{4}-1\frac{1}{2} \) in., midrib obscure, base narrow acute or rounded; nerves hardly visible, very oblique almost parallel to the midrib; petiole very stout, \( \frac{3}{4}-1 \) in. *Peduncle* sometimes 2 in.; pedicels 1-1\( \frac{1}{2} \) in. *Sepals* ovate, acute, glabrous. *Corolla* \( \frac{3}{4}-1\frac{1}{2} \) in. diam., lobes subacute. *Coronal-processes* broadly ovate, flat above with a central boss, convex beneath; inner angle acute, shorter than the broad anther-tips. *Pollen* 4-6 in., slender, straight. *Seeds* \( \frac{1}{4} \) in., lanceolate.

21. **H. oblanceolata**, *Hook. f.*; glabrous, leaves 4-6 in. narrowly oblanceolate acuminate very fleshy, peduncles very short and thick and pedicels glabrous, corolla puberulous within, coronal-processes sub-erect.

**Khasia Mts.,** alt. 3–4000 ft., *J. D. H.* & *T. T.*

*Stem* stout, climbing. *Leaves* as in *H. longifolia*, but smaller. *Peduncle* \( \frac{1}{2}-1 \) in., clavate or cylindrical, when old \( \frac{1}{2}-\frac{3}{4} \) in. diam. and densely scarred; pedicels slender. *Sepals* ovate, acute. *Corolla* \( \frac{1}{2} \) in. diam., pale flesh-coloured. *Coronal-lobes* broadly oblong or subspathulate, inner angle produced into a short obtuse lamella which is much shorter than the subulate anther tip.

c. *Leaves* broad, ovate oblong elliptic or lanceolate, strongly 3-5-nerved from the base to the middle or higher.


**Penang, Wallich. Singapore, Mainay.—Distrib. Java.**

*Stem* very stout. *Leaves* variable in breadth, 3-5 in., base rounded or cordate, petiole very short and thick. *Peduncles* 1-2 in., at length cylindrical and covered with raised pitted tubercles. *Sepals* minute, ovate. *Corolla* \( \frac{1}{4} \) in. diam., pubescent within. *Coronal-processes* suberect, ovoid, apiculate, upper surface flattened, inner angle acute, under surface deeply grooved.


**Assam;** *Cullula, Clarke.* *Khasia Mts.* ascending to 2000 ft. *Sunderbunds,* and from *Chittagong to Singapore, Malacca and the Andaman Islands.*

A tall climber, stem stout or slender. *Leaves* extremely variable in length and breadth, much the largest in Khasian specimens, nerves obscure; petiole \( \frac{1}{2}-\frac{3}{4} \) in., very thick. *Peduncles* 1-3 in., slender or stout and becoming much thickened and scarred; pedicels \( \frac{1}{2}-1 \) in. *Sepals* small, ovate. *Corolla* \( \frac{1}{2} \) in. diam., nearly white; lobes glabrous within, always inflexed in dried specimens with the coronal-processes projecting between them; these are ascending, ovate, acute, concave with a mesial ridge above, with the narrow end outwards, and the inner angle very short, white, pink at the junctures.—I have seen no fruit. Except in the large leaves, sometimes 9 in. long, I can find no character for *H. Hookeriana.* *H. cinnamomifolia, Hook. Bot.*
Mag. t. 4347, has very similar flowers and leaves. Lindley figures the flower of *H. pallida* as nearly white, Paxton both figures and describes them as yellow.

d. Leaves elliptic, oblong, or linear-oblong, pennis-nerved, nerves very horizontal (sometimes oblique in *H. Griffithii*).


**NEPAL**, *Wallahie*; **Sikkim**, alt. 1–4000 ft. **Khasia**, *Mts. and Pegu*.


25. *H. obtusisifolia*, *Wight Contrib.* 38; more or less puberulous, stem very stout, leaves 4–6 in. oblong rounded at both ends or tip acute or apiculate very thick, margins flat, midrib stout, peduncle stout, pedicels and calyx pubescent, corolla corymbose pubescent without glabrous within. *Wall. Cat.* 8167; *Dene. in DC. Prodr.* viii. 638; *Bot. Mag.* t. 4969 (excl. syn. *H. velutina*). *H. Teysmanniana*, *Miquel Pl. Ind. Bat.* 522.

**TENASSERIM** of **ANDAMAN ISLANDS**, *Helfer*. **PENANG**? *Wallahie*.—**DISTRIB. SUMATRA, JAVA**.

Branches as thick as the little finger or less. *Leaves* 1½–2½ in., broad, shining, nerves visible only when dried; petiole very thick, ½–1 in. *Peduncle* 1–3 in., at length terminating in a cylindrical mass of scarred close set tubercles; pedicels ½–1 in. *Sepals* large for the genus, oblong, obtuse, corymbose. *Corolla* dull yellow, ⅛ in. diam.; lobes erect, acute. *Coronal-processes* short, obtuse, suberect, concave in fruit, inner angle ending in an erect or recurved spine longer than the anther-tip. *Follicles* not seen.


**MALACCA**, *Griffith*, *Maingay* (Kew Distrib. 1125), **PENANG**? *Wallahie*.—**DISTRIB. SUMATRA, BORNEO**.

*Stem* stout, twining; young shoots, petioles, leaves beneath and inflorescence finely tomentose. *Leaves* 1–2 in. diam., nerves very obscure; petiole thick, ¼–⅝ in. *Peduncles* ¼ in., pedicels as long. *Sepals* rounded, thick. *Corolla* 1–1½ in. diam., thick, “cream white or yellowish speckled with purple,” *Maingay*; lobes erect or incurved. *Coronal-processes* small, waxy, white, nearly hemispherical, very concave above and convex beneath, the inner angle shortly horizontally produced, obtuse. *Follicles* 6–8 in. long by 1½–2 in. diam., subcylindric, obtuse, base gibbose, walls very thick, endocarp hard. *Seeds* ½ in. long.—The smaller shorter leaves with revolute margins distinguish this at once from *H. obtusifolia*; *Wallahie’s* habitat of Silhet is probably an error for Penang, from which island there is a drawing of this species in *Herb. Kew*. Perhaps two species mixed here, a purple- and white-flowered.

27. *H. elliptica*, *Hook.* f.; glabrous, leaves 1½–2½ in. elliptic obtuse at both ends thin in texture nerves very prominent, peduncle very short, pedicels long slender, sepals very small, corolla glabrous without puberulous within.
Malacca, Maingay (Kew Distrib. 1137).

Stem rather slender, twining. Leaves 1-1\(\frac{1}{2}\) in. diam., intramarginal nerve very distinct; petiole \(\frac{1}{2}\)-1 in. Peduncles \(\frac{1}{3}\) in., pedicels 1-1\(\frac{1}{2}\) in. Sepals ovate, obtuse, puberulous. "Corolla white," Maingay; lobes obcordate, apiculate, inflexed (when dry). Corona-processes longer than the corolla-tube, suberect, laterally subcompressed, ovate-oblong, obtuse, upper (inner) surface grooved, inner angle produced into a short subulate erect point.

28. H. Griffithii, Hook. f.; glabrous, leaves 6-9 in. narrowly oblanco-late or linear-oblong acute or acuminate very thick, nerves nearly horizontal, peduncle long stout, sepals large coriaceous, corolla 1\(\frac{1}{2}\) in. diam. glabrous within.

Khasia Mts., Griffith; Nowgong, alt. 2-4000 ft. J. D. H. & T. T.

A stout climber. Leaves distant, 1-2 in. diam., midrib stout, nerves quite obscure in some, in others distinct and forming large areoles; petiole \(\frac{1}{2}\)-1 in., very thick. Peduncle 2-4 in., as thick as the branch; pedicels 1-1\(\frac{1}{2}\) in., very stout. Sepals \(\frac{1}{2}\)-1 in., oblong, obtuse, coriaceous. Corolla purple? glabrous within, lobes acute. Corona-processes produced upwards from a suborbicular base into an erect stiff obtuse spur as long as the anther-tip, the orbicular base is 2-lamellate below.—In the large calyx this approaches H. coronaria. It has been flowered at Fallowfield (Manchester) by Mr. Swan.


A lofty stout climber. Leaves 1\(\frac{1}{2}\)-2\(\frac{1}{2}\) in. diam., rarely acute, shining, base often narrowed and cordate, midrib very stout, nerves quite horizontal; petiole \(\frac{1}{2}\)-1\(\frac{1}{2}\) in. Peduncles 3-10 in.; pedicels 2-3, and sepals pubescent. Corolla leathery, dull purple, puberulous near the corona, lobes triangular acute. Corona-processes white, laterally compressed, erect, turgid, obtuse, inner angle shortly produced into a subulate point. Follicles 9 in. long. by 1\(\frac{1}{2}\) in. diam., straight, lanceolate, finely acuminate, pubescent; pericarp thickly coriaceous, endocarp hard. Seeds \(\frac{1}{1}\) in. long.


Decan Peninsula; from the Bombay Ghats to the Nilgerry Mts.

A stout climber. Leaves 1\(\frac{1}{2}\)-2 in. broad, margins often revolute, tip obtuse often produced, nerves loosely netted; petiole \(\frac{1}{2}\)-1 in. Peduncles \(\frac{1}{3}\)-\(\frac{1}{3}\) in.; pedicels stout, 1 in. Sepals glabrous. Corolla \(\frac{1}{2}\)-1 in. diam., cream-coloured, glabrous within, margins-puberulous. Corona-processes ascending, short, inflated, obtuse, concave above, inner angle produced into a short erect spur. Follicles 4 in. long, slender, straight, pericarp thin.—For the distinctions between this and H. ovalifolia see the latter plant. The vases, Rheedei and nilgerrensis, Wight, are not distinguishable.

e. Leaves orbicular ovate-oblong or broadly elliptic, rarely lanceolate, penninerved, nerves arching (not prominently 3-5-nerved from the base). See also H. polymeura and H. Lobbia.
36. **H. Thomosoni**, Hook. f.; pedicels and leaves beneath sparsely pilose, leaves 2–3 in. oblong or obovate-oblong acuminate very thick, umbels axillary, peduncle short puberulous tip at length thickened and scarred, corolla-lobes with fringed margins glabrous or pubescent within.—*Hoya*, v. 12, *H. f.* & *T.*

**Khasia Mrs.**; Churra, alt. 3–4000 ft., *J. D. H. & T. T.*

*Stem* slender, rooting. *Leaves* not very fleshy, \( \frac{3}{2} \)–14 in. broad, midrib obscure, base obtuse or rounded, nerves very faint, arched; *petiole* \( \frac{1}{4} \)–1 in. *Peduncle* \( \frac{1}{4} \)–1 in., pubescent; *pedicels* glabrous or sparingly puberulous. *Sepals* glabrous, ovate, acute. *Corolla* \( \frac{2}{3} \) in. diam., lobes acute. *Coronals-processes* ovate with the broad end outwards, concave above with a boss, inner angle produced into a short erect spur as long as the anther-tip.—The pubescence of the leaves is very obscure in dried specimens.


A stout climber. *Leaves* \( \frac{1}{2} \)–2\( \frac{1}{2} \) in. diam., base acute or rounded, nerves arched; *petiole* \( \frac{1}{2} \)–\( \frac{3}{4} \) in. *Peduncle* \( \frac{1}{4} \)–1 in., very thick; *pedicels* about \( \frac{1}{3} \) in. *Sepals* small, elliptic, obtuse, glabrous (ciliate, *Maingay*). *Corolla* \( \frac{4}{7} \) in. diam., cream-coloured; lobes broad. *Coronal-processes* pale pink, short, thick, ovate, with the broad end outwards concave above, with a boss near the centre, inner angle produced into a short, erect spur shorter than the anther-tip. *Follicles* 6 in. long., \( \frac{2}{3} \) in. diam., falcate, sublinear; pericarp thick, apparently \( \frac{4}{7} \) in. or more. *Seeds* about \( \frac{4}{7} \) in. long.


A stout climber. *Leaves* variable, \( \frac{1}{2} \)–2\( \frac{1}{2} \) in. broad, shining above, far more thin than in any Indian congener; *petiole* \( \frac{1}{2} \)–\( \frac{3}{4} \) in. *Peduncle* 2–5 in.; *pedicels* \( \frac{2}{3} \)–1 in. *Sepals* as long as the corolla-tube. *Corolla* \( \frac{4}{7} \) in. diam., dirty straw-coloured or reddish; lobes incurved when dry. *Coronal-processes* white, ovoid, inflated, subacute, the narrow end outwards, inner angle cuspidate shorter than the anther-tip, "pollen-masses very slender, with trigonous pedicels and minute corpuscles," *Maingay*.—The comparatively membranous leaves with conspicuous reticulate nervation, unlike that of *Hoya*, at once distinguish this species.


**Decan Peninsula**; the *Cirears*, *Roxburgh*; Western Ghats, and the *Concan*, *Nimmo*; Nilgherry hills, *Wight.*

*Stem* rather slender, hairiness very inconspicuous. *Leaves* 1\( \frac{1}{2} \)–2\( \frac{1}{2} \) in. diam., like those of *H. ovalifolia*, but margins recurved when dry, base narrow or rounded;
petiole 1/3 in. Peduncles 1-1/2 in.; pedicels 1-1 1/4 in. Sepals shorter than the corolla-tube. Corolla 3/4 in. diam., white. Coronal-processes (mutilated) as long as the corolla-tube, apparently ovate, with the inner angle shortly spurred.—The only specimen I have seen is an unnamed one in Wight's Harbarium; the plate in his Icones is a copy of Roxburgh's drawing, which represents a much larger leaved plant than the specimen.

39. **H. Maingayi**, Hook. f.; quite glabrous, leaves 7-8 in. elliptic-lanceolate or oblanceolate finely acuminate very thick nerves reticulate distinct very oblique, peduncle very short thick, pedicels longer, sepals small obtuse, coronal-processes longer than the villous corolla-tube.

**MALACCÀ, Maingay (Kew Distrib. 1136).**

Stem stout. Leaves 2 1/2-3 1/2 in. diam. at or above the middle, reticulate on both surfaces, base narrow; petiole 1 1/2 in., very thick. Peduncle 3/4-1 in., thickened and scarred; pedicels 1 in. Corolla 5/8 in. diam., pale pink, lobes short, obtuse. Coronal-processes ovate, acute, narrow end outwards, above concave with a mesial ridge, inner angle apiculate shorter than the anther-tip.

**Doubtful and excluded species.**

**H. Crassifolia**, Ham. Succ. Pl. Suppl. 8; **Dene. in DC. Prodr. viii. 640.** Scholara crassifolia, Jacq. Eclog. t. 2; Traill. in Trans. Hort. Soc. vii. 22; from India; with leaves described as excessively thick, absolutely spotted, petal truncate or obtuse, is unknown. Wight (Contrib. 38) refers it to the Chinese **H. carnosa**, Br., which name it would supersede.

**H. Finlaysonii**, Wight Contrib. 38; Wall. Cat. 8166; **Dene. l.c.**; stem stout, leaves 5-7 by 2 in. ovate-lanceolate obtusely acuminate densely thick pennis-nerved, nerves prominent on both surfaces arched, intramarginal very distinct, petiole short stout.—Singapore, Wallich; Siam, **Herb. Finlayson.**

**H. Gymnanchea, Wight. Contrib. 37**; Wallich's sheet of this consists of a leafless twig of a Hoya with buds, and a good specimen of **Parsonia spiralis**.

**H. Nicobarica, Br. in Wight Contrib. 36** (note under **H. pendula**, W. & A.); **Dene. l.c.**—Nothing is known of this.

**H. Opposta, Don Gard. Dict. iv. 128** (Sperlingia opposita, **Vahl**; **Wight. Contrib. 67)**, is H. Rumphii, Blume, a Moluccan plant.

**H. Wallichiana, Don. l.c. 635**; said to be mixed with Wallich's n. 8165 (H. latifolia), appears from Decaisne's description to be **H. coronaria**, Bl.

**H. Verticillata, G. Don Gard. Dict. iv.** (Sperlingia verticillata, **Vahl**. Skr. Naturhist. Selsk. Köpenh. vi. 113), said to be a native of India, is unknown to me.

**H. sp.?** Amongst the drawings in Herb. Kew is one of a Hoya from Penang, with ovate-lanceolate acuminate 3-plied nerved leaves 6 in. long suffused with purple, red and white flowers 1/4 in. diam. having long flexuous hairs on the corolla, the corolla-lobes are obtuse and the coronal-processes red.

**45. Physostelma**, Wight.

A twining glabrous shrub. Leaves opposite, coriaceous, shining. Flowers large, unbellied. Sepals small, narrow. Corolla cup-shaped, lobes very short. Coronal-processes 5, very large, ovoid-oblong, obtuse, adnate to the anthers, spreading and ascending; margins reflexed. Column very small; anthers conniving over the stigma, tips inapposiceulate; pollen-masses one in each cell, ovoid-oblong, erect. Stigma flat. Follicles long, cylindric, smooth. Seeds conose.

**P. Wallichii**, **Wight Contrib. 40**; Wall. Cat. 8171; **Dene. in DC. Prodr. viii. 633.** P. campanulatum, **Dene. l.c.** Hoya campanulata, Blume Bijd. 1064; **Bot. Reg.** 1847; t. 54; **Bot. Mag.** t. 4545. Cystidendanthus campanulatus, Hassk. Cat. Hort. Beij. 126; Blume Mus. Bot. i. 57.
SINGAPORE; Wallich.—Distrib. Java?

46. PYCNORHACHIS, Benth.
A hairy twining undershrub. Leaves opposite, very shortly petioled, membranous, villous. Flowers black-purple, in reflexed pairs spirally disposed round the long fleshy branches of an axillary racemiform cyme. Sepals subulate. Corolla-tube short, thick, throat anulate; lobes elongate, subulate-lanceolate from a broad base, hairy within, valvate in bud. Coronal-scales 5, spreading at the base of the column opposite the anthers. Column short, adnate to the middle of the corolla-tube; anther-tip long, subulate, hyaline; pollen-masses one in each cell, long, slender, shortly pedicelled, cylindrical, waxy, erect. Ovary sunk in the calyx-tube; stigma obtusely conical, 5-angled, much shorter than the anther-tips; ovules many. Follicles curved, cylindrical, obtuse, glabrous. Seeds comose.

P. MAINGAYI, Hook. f.
MALACCA; very rare, Maingay.
Branches hispidly hairy. Leaves 4–6 by 14–2 in., oblong-obovate, acuminate, villous on both surfaces, base narrowly cordate or 2-lobed at the insertion of the petiole; nerves 10–12 pair, spreading; petiolar ¼–½ in., villous. Cymes 3–6 in. long, branches few, 3 in. diam. Corolla ½ in. long, dark purple; annules of throat fringed with hairs. Corpuscle slender. Follicles 5 in. long by ⅔ in. diam., sickle-shaped.—

Description chiefly from that and the drawings of the discoverer of this very curious genus, which resembles no other.

TRIBE V. CEROPHIGEAE.
47. LEPTADENIA, Br.
Erect, rigid, almost leafless, or twining, hoary or glabrous, leafy shrubs. Leaves elliptic or ovate-cordate. Flowers small, in crowded axillary umbelliform cymes. Calyx turbinate, shortly 5-lobed. Corolla rotate; lobes pubescent or bearded, margins recurved, valvate in bud. Corona double, corolline of 5 scales between the corolla-lobes; staminal of a raised undulate wing at the base of the anthers. Column short; anthers inflexed, obtuse, tips appendiculate; pollen-masses one in each cell, globose, sessile, erect, tips pellucid. Stigma included, flat, 5-gonal, 2-cuspidate. Follicles rigid, acuminate, smooth. Seeds comose, flat, winged.—Distrib. Species 12; tropical Asia and Africa.


EASTERN PUNJAB, at Amballah, Edgeworth; and from BANDA southwards through the DECCAN PENINSULA. BURMA, Wallich. SINGAPORE, Lobb. CEYLON, at Amoor-adhapora, Gardner.—Distrib. Ava.

Bark corky; young branches, &c., hoary. Leaves 1–2 in., coriaceous, pale, both
surfaces alike, nerves very faint; petiole \( \frac{1}{2} \) in. Cymes solitary or in pairs, \( \frac{1}{2} \)-1 in. diam.; many-fl.; peduncles shorter or longer than the petioles. Calyx-lobes obtuse, Corolla \( \frac{1}{2} \) in. diam., thick, pubescent on both surfaces; tip of lobes keeled and thickened on the face, most so at the tips; tube glabrous, shining from the adnate corona which is continued halfway down the middle of the lobes. Follicles 2-3 in. long, \( \frac{1}{2} \) in. diam., turgid, straight, smooth, almost woody; beak thick, curved. Seeds \( \frac{1}{3} \) in., long, narrowly ovoid.—I think this hardly differs from an East African species.


The Punjab and Scinde, eastwards to the Jumna.—DISTRIBUTION. Beluchistan, Arabia, Egypt, Senegambia.

A glabrous shrub 3-4 ft. high, with long erect twiggy branches. Leaves when present 3-4 by \( \frac{1}{2} \) in., acuminate, shortly petiololed, leathery. Flowers as in *L. reticulata*, but smaller, \( \frac{1}{4} \) in. diam. Follicles \( \frac{1}{3} \) in. long, \( \frac{1}{3} \) in. diam., terete, straight, produced into a very long slender straight beak.

48. ORTHANTHERA, Wight.


North-west India; along the base of the Himalaya, alt. 1-3000 ft. from Peshawur and the Punjab to Oudh.

Branches stout, erect, as thick as a crowquill. Peduncle \( \frac{1}{2} \)-1 in.; flowers shortly pedicelled, very woolly. Sepals equaling the corolla-tube. Corolla villous outside, glabrous within; lobes keeled down the centre of the face. Follicles erect, 5 in. long.—The long sepals and salver-shaped corolla are such strong generic characters that I do not follow the "Genera Plantarum" in uniting this genus with *Leptadenia*.

49. BRACHYSTELMA, Br.

Erect or twining pubescent or glabrous herbs with tuberous roots. Leaves opposite, sometimes very narrow or minute. Flowers few, in axillary sessile umbels or solitary, pedicels very slender. Corolla (in the Indian species) rotate; lobes 5, elongate, valvate. Corona short, adnate to the column; annular, variably 5-10-lobed or -toothed, lobes or teeth erect or incumbent on the anthers. Column very short; anthers ovoid, tips inappandiculate, retuse; pollen-masses one in each cell, sessile, globose, erect, one margin pellucid. Stigma nearly flat. Follicles slender, smooth. Seeds comose.—DISTRIBUTION. About 14 African species, and the following.
There are probably in India many species of this singular genus, which owing to
their slender habit and inconspicuous flowers may be overlooked. I cannot find any
character whereby to distinguish *Eriopetalum*, Wight, from *Brachystelma*. The fol-
lowing descriptions are all very imperfect.

* Stem erect.

1. **B. levigatum**, Hook. f.; leaves minute subulate, umbels sessile, corolla glabrous or puberulous, segments thrice as long as the tube, corona with a broad 2-toothed lobe between the anthers, and as many narrow oblong ones opposite them. *Eriopetalum levigatum*, Wight *Contrib.* 35; *Wall.* Cat. 8149; *Dene. in DC. Prodr.* viii. 646. *Gomphocarpus levigatus*, Ham.

*Northern Oudes;* at Gorukpore, *Hamilton.*

Root the size of a small potato. *Stem* 12–18 in., pubescent upwards. *Umbels*
minutely hispid, as are the subulate sepals. *Flowers* pendulous, \( \frac{3}{2} \) in. diam., pale
dirty purple, with pale green segments. *Follicles* 3 in. long, erect.—Described partly
from a drawing in *Herb. Kew*.

2. **B. parviflorum**, Hook. f.; leaves long slender almost filiform

glabrous, flowers solitary very long-pedicelled, corolla villous segments twice
as long as the tube, corona shortly irregularly toothed. *Eriopetalum parvi-
florum*, *Wight Contrib.* 35; *Dene. in DC. Prodr.* viii. 646.

*North-Western India;* Doongie, *Royle (Wight).*

*Leaves* 4 in. by \( \frac{3}{4} \) in., acuminate. *Pedicels* 1–2 in. long, bracteate at the base.
*Flowers* \( \frac{3}{2} \) in. diam., white with a few spots on the tube and purple hairs on the
margins and segments. *Sepals* subulate.—Described from a flower and drawing in
*Herb. Wight*.

3. **B. attenuatum**, Hook. f.; segments of corolla filiform 4–5 times as
long as the tube villous, corona shortly irregularly toothed. *Eriopetalum atten-
uatuum*, *Wight Contrib.* 35; *Dene. in DC. Prodr.* viii. 646.

*North-Western India;* Doongie, *Royle (Wight).*

*Flower* \( \frac{4}{2} \) in. diameter.—I have seen only a single flower in *Herb. Wight*.

4. **B. maculatum**, Hook. f.; glabrous, leaves long slender almost fili-
form, umbels sessile, corolla-lobes 2–3 times as long as the spotted tube keeled
above down the middle glabrous except a few scattered long cilia, corona with
5 subulate teeth opposite to and much higher than the anthers.

*Canara or Mysore, Law.*

*Stem* 10–12 in. *Leaves* 3–4 by \( \frac{1}{2} \) in. *Flowers* 2–3 together, \( \frac{3}{2} \) in. diam. *Sepals*
quite glabrous, subulate.

5. **B. glabrum**, Hook. f.; quite glabrous, leaves narrowly linear-lanceo-
late or strap-shaped acute, umbels sessile, corolla puberulous lobes linear obtuse
three times as long as the tube, corona very short, minutely toothed.

*Deccan Peninsula, Beddome.*

*Stem* 6 in. *Leaves* 1–3 by \( \frac{1}{2} \) in. *Flowers* \( \frac{3}{2} \) in. diam.

** Stem twining.

6. **B. volubile**, Hook. f.; quite glabrous, leaves long linear slender,

umbels peduncled, corolla-lobes many times longer than the tube with very long
scattered hairs, margin incurved, column very depressed discoid, corona form-
ing a low broad obtusely 5-angled cup round its base.

*The Carnatic;* on the Cuddapa hills, alt. 2000 ft., *Beddome.*

*Stem* several feet long. *Leaves* 3–5 by \( \frac{1}{2} \) in., acuminate. *Umbels* 2–3-fld.

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Corolla 1 in. diam., purplish, lobes granulate. **Column** inserted by a very small base.

7. **B. Beddomei**, **Hook. f.**; glabrous, leaves very slender elongate acuminate, umbels peduncled 3 fld., corolla-lobes many times longer than the tube glabrous cohering by their tips corona with 5 very broad rounded lobes. Ceropegia brevifitubulata, **Beddome** _Jc. Pl. Ind. Or_. t. 174.

**Mysore**; Veillore hills, alt. 1000 ft., **Beddome**.

Glabrous, except the puberulous cyme. **Leaves** in distant pairs, 3–4 by $\frac{1}{8}$–$\frac{1}{4}$ in., narrowed to the sessile base. **Peduncle** $\frac{1}{6}$ in.; bracts setaceous; pedicels $\frac{1}{4}$ in. **Sepals** setaceous. **Corolla** quite glabrous, pale without, purple within; segments 1 in. long, very narrow, flat. **Corona** with the processes opposite the anthers so entirely confluent with them as to appear to be absent.—This singular species has the corolla of *Brachystelma* with the segments cohering by their tips as in *Ceropegia*; it unites the characters of these genera.

50. **CEROPSEIA**, Linn.

Twining, rarely erect herbs, often with a tuberous rootstock. **Leaves** opposite, sometimes minute or 0. **Flowers** in axillary peduncled umbelliform cymes, rarely solitary, often large, white or greenish and purple. **Sepals** narrow. **Corolla-tube** elongate, straight or curved, often swollen at the base, throat dilated or not; lobes very various, broad or narrow, erect or incurved with cohering tips, often at length recurved or reflexed. **Corona** adnate to the column, annular or capular, 5–10-lobed and with 5 long or short ligulate processes within that are free or adnate to the anthers. **Column** short; anther short, obtuse; pollen-masses one in each cell, short, erect, sessile, with one pedicellate margin. **Stigma** depressed or short 2-lobed, included. **Follicles** usually slender, terete, smooth. **Seeds** comose.—**Distrib.** Species about 80; tropical Asian, African and South African, with a few Malayan and Australian.

Herbarium materials do not suffice to enable me to discriminate satisfactorily the species of this most difficult genus, and still less to describe them accurately. The classification I here propose is quite artificial.

* Stem erect, rarely flexuous or twining.

1. **C. pusilla**, **Wight** _Jc_. t. 1261; dwarf, puberulous, leaves linear, corolla straight, lobes linear erect much shorter than the tube, tips puberulous. **Wall. Cat.** 8140; **Done. in D.C. Prodr.** viii. 643.

**Deccan Peninsula**; Nilgherry and Anamallay Mts., alt. 7–8000 ft., **Wight**, &c.

**Tuber** $\frac{1}{4}$–1 in. diam. **Stem** 3–6 in. **Leaves** rather crowded, 1–3 by $\frac{16}{16}$–$\frac{1}{4}$ in., narrowed at the base. **Flowers** solitary or 2–3-nate, erect. **Sepals** $\frac{1}{2}$–$\frac{1}{4}$ in. **Corolla** 1 in., tube narrow, base ovoid. **Coronal lobes** 5, triangular, acute, 2-fld, ciliate; processes narrowly linear, three times as long. **Follicles** 2 in., narrowly fusiform.

2. **C. spiralis**, **Wight** _Jc_. t. 1267; quite glabrous, leaves very narrowly linear, corolla straight, lobes narrowly linear contorted as long as the tube fibrimate at the base.

**Deccan Peninsula**; Balaghat hills, Madras, **Wight**; Cuddapa hills, **Beddome**.

**Stem** slender, 4–6 in. **Leaves** 4–8 by $\frac{1}{8}$–$\frac{3}{8}$ in., margins recurved. **Flowers** solitary, shortly peduncled. **Sepals** filiform, $\frac{1}{2}$–$\frac{1}{4}$ in. **Corolla** 2 in. long, base slightly inflated, mouth hardly dilated. **Coronal lobes** 5, triangular, acute, glabrous; processes slender, three times as long.

3. **C. ambrifera**, **Beddome** in Madras Lit. Soc. Journ. 1861, 53, and _Jc. Pl. Ind. Or_. t. 172; finely pubescent, leaves narrowly linear, corolla straight,
lobes as long as the tube narrowly linear erect or twisted together, fimbriate at the base with gland-tipped hairs. C. Munroii, Wight F. t. 1264.

TRAVANCORE; rocky place on the Anamallay hills, alt. 3-4000 ft., Beddome.

Stem 4-9 in., slender, glabrous below. Leaves 4-6 by \(\frac{1}{2}-\frac{1}{4}\) in., narrowed at the base and gradually from the middle to the tip. Peduncles \(\frac{1}{4}-1\) in., 1-4-fld. Sepals filiform, \(\frac{1}{4}\) in. Corolla-tube subcylindrical, green outside, purple within; lobes narrowed downwards from above the middle, basal margins reflexed, fimbriate with long slender hairs. Coronal lobes 10, triangular, ciliate; processes linear-spatulate, four times as long.—C. Munroii is only known from the very insufficient drawing engraved in Wight’s Icones. Beddome has suggested to me its being a twining or flexuous form of this species, which becomes scendent in cultivation.

4. C. attenuata, Hook. F. Pl. t. 867; pubescent, leaves linear or linear-lanceolate, corolla straight lobes linear erect as long as the tube naked. Dals. & Gibs. Bomb. Fl. t. 154; C. angustifolia, Dals. in Hook. Kew Journ. ii. 259; Dals. & Gibs. l. c. C. spiralis, Herb. Ind. Or. H. f. & T.

The CONCAN; near Vingorla, and rocky pastures near the sea in Malwan, Dalsell, Stocks, &c.

Stem 6-12 in., slender or rather stout. Leaves 2-6 by \(\frac{1}{2}-\frac{1}{4}\) in., narrowed at the base. Peduncles short, axillary, usually 1-fld. Sepals filiform, \(\frac{1}{4}\) in. Corolla 2-2\(\frac{1}{2}\) in. long. Base swollen; mouth dilated, lobes very narrow from a triangular base, the margins of which are not reflected. Coronal lobes 5, triangular, entire or 2-fld., ciliate; processes narrow, 4 times as long. Follicles 3 in. long, very slender, terete, torulose. Seeds \(\frac{1}{4}\) in., oblong, compressed, margins very thick, coma \(\frac{1}{4}\) in.

5. C. Lawii, H. f.; pubescent, stout, leaves long-petioled ovate, peduncles many-fld., corolla slightly curved lobes small elliptic naked incurved very much shorter than the very narrow tube. Ceropogia n. 25, Herb. Ind. Or. H. f. & T.

SOUTH CONCAN, Law, Stocks.

Tubers 2-5 in. diam. Stem often as thick as a goose-quill, 1-2 ft. high. Leaves 2-4 by 1\(\frac{1}{2}-2\) in., acute, sometimes rounded; petiole \(\frac{1}{2}-1\) in. Peduncle 1-1\(\frac{1}{2}\) in. strict; bracts minute; pedicels short. Sepals minute, recurved. Corolla 1-1\(\frac{1}{2}\) in. long, base scarcely swollen; lobes \(\frac{1}{4}-\frac{1}{2}\) in., incurved, forming a small subglobose head. Coronal lobes 10, obtuse, short, ciliate; processes slender, four times as long.

6. C. Wallichii, Wight in Bot. Mag., note under t. 3267, and Contrib. 32; puberulous, stem very stout, leaves ovate or rounded subsessile, flowers fascicled, corolla straight lobes oblong obtuse densely fimbriate within erect much shorter than the tube. Wall. Cat. 8149; Royle Ill. t. 66, f. 3; DC. in DC. Prodr. viii. 644.

CENTRAL and WESTERN HIMALAYA; Nepal, Wallach; Kumaon at Nainital, alt. 6500 ft., Strachey and Winterb.

Stem 8-12 ft. in., as thick as a goose-quill. Leaves 2-2\(\frac{1}{2}\), puberulous or glabrate above, tip obtuse acute or rounded. Peduncle very short; pedicels crowded, \(\frac{1}{4}-\frac{1}{2}\) in.; bracts setaceous. Sepals filiform, \(\frac{1}{4}\) in. Corolla 1\(\frac{1}{2}\) in., tube narrow, base inflated, mouth funnel-shaped acutely 5-angled; lobes forming a narrow oblong obtuse crown \(\frac{1}{4}-\frac{1}{2}\) in. long, ciliate with short fusiform stout hairs. Coronal-lobes 10, triangular, ciliate, processes four times as long. Follicles 1 foot long.

** Stem twining. Leaves fleshy. Calyx minute. Corolla small, straight (rarely 1 in. long) narrow; mouth slightly dilated; lobes short, narrow, erect, fleshy.

7. C. bulbosa, Roxb. Cor. Pl. i. 11, t. 7, and Fl. Ind. ii. 28; leaves various, corolla-tube slender, lobes linear from a triangular base villous within, corona glabrous lobes minute or obsolete, processes filiform straight.
From Western India; the Punjab and Upper Gangetic plain as far east as Allahabad, southwards to Travancore.

Root tuberculous. Stem very slender. Leaves excessively variable (see the varieties). Peduncles $\frac{1}{2}$-1 in., 5-8-fl.; pedicels short. Sepals $\frac{3}{4}$ in. long. Corolla rarely 1 in. long, greenish, base moderately inflated mouth obtusely 5-angled; lobes $\frac{1}{2}$-3 the length of the tube, purple within. Follicles 4 in. long, slender, terete, pericarp thin. Seeds $\frac{1}{2}$ in. long, linear-oblong, wing membranous.

**V. 1. bulbosa proper**; leaves petiolated 1-2 in. rarely more orbicular-oblong elliptic-obovate or obcordate acute or apiculate, rarely elliptic lanceolate, base acute-rounded or cordate. C. bulbosa, Roxb. _l. c._ Wright _Contrib._ 32, and _l._ t. 845, and in _Hook Bot. Misc._ i. 99 and Suppl. t. 2; _Wall._ _Cat._ 8141; _Dale._ & _Gib._ _Bomb._ _Fl._ 153; _Grah._ _Cat._ _Bomb._ _Pl._ 117; _Dene._ _in DC. Prodr._ viii. 643.


8. **C. Wightii**, _Graham in Bot. Mag._ t. 3267; leaves subsessile or shortly petiolated elliptic-lanceolate apiculate or acute, corolla-tube slender, lobes linear from a triangular base, corona glabrous, lobes 5 minute obtuse, processes short broad curved. _Wight Contrib._ 30; _Dene._ _in DC. Prodr._ viii. 641.

East Indies, formerly cult. in the Edinburgh Bot. Gardens.

Probably a form of _C. bulbosa_, from Bombay.

*** Stem twining, stout. Leaves very small or 0.

9. **C. juncea**, _Roxb. Cor._ _Pl._ i. 12, t. 10; quite glabrous, fleshy, leaves if present elliptic-lanceolate acute, calyx small, corolla funnel-shaped above the middle, lobes erect nearly as long as the tube. _Wight Contrib._ 30; _Wall._ _Cat._ 8134; _Dale._ & _Gib._ _Bomb._ _Fl._ 163; _Grah._ _Cat._ _Bomb._ _Pl._ 117; _Dene._ _in DC. Prodr._ viii. 641.

Deccan Peninsula, from Bombay and the Circars to Tanjore and Mysore.

Root tuberculous. Stem simple, as thick as a goose-quill. Leaves very remote, often suppressed, rarely 1 in. long, subsessile. Peduncle stout, $\frac{3}{4}$-1 in., 3-5-fl.; pedicels short, stout. Sepals $\frac{3}{4}$ in., subulate. Corolla greenish, speckled and veined with purple, base inflated, lobes linear from a triangular base, tips fimbriate within. Corona lobes 10, short, ovate, obtuse, ciliate; processes filiform with hooked tips. Follicles 7 in. long.

**** Stem twining, leafy. Leaves membranous. Flower 1 in. long and upwards, rarely less.

† Corolla-lobes much shorter than the tube, very broad, forming a hemispherical or broadly conical crown over the much-dilated broadly funnel-shaped throat of the tube. Corolla curved, base much inflated in all.

10. **C. elegans**, _Wall._ _in Bot. Mag._ t. 3015, and _Cat._ 8135; quite glabrous, leaves ovate or ovate-lanceolate, corolla-lobes broadly ovate acute ciliate with very long hairs, corona lobes 10 subulate or linear glabrous almost as long as the straight linear processes. _Wight Contrib._ 31, and _l._ t. 1265; _Dene._ _in DC. Prodr._ viii. 642. ? _C. sphenanantha, Wight & Arn._ _Contrib._ 31; _Wall._ _Cat._ 8138; _C. sphenantha_, _Dene._ _l._ c. 643.

Malabar and Travancore, on the mountains from the Nilgherries southwards. Ceylon, alt. 3000 ft., _Walker_, &c.

Leaves 2-4 by 1$\frac{1}{4}$ in., acute or acuminate; pediole 4-1 in., very slender. Peduncles $\frac{1}{4}$-2 in.; flowers subumbellate; pedicels short; bracts subulate. Sepals filiform,
glabrous. **Corolla** $\frac{1}{4}-1\frac{1}{3}$ in., spotted with dark purple, base globose or oblong and gibbous, crown $\frac{1}{4}$–1 in. diam. **Follicles** 7–9 in., very slender, terete, membranous. **Seeds** nearly $\frac{1}{3}$ in. long, linear, convex on one face, deeply grooved on the opposite one.—I can detect no character, except perhaps the shorter and more obtuse coronal lobes, whereby to distinguish *C. sphenanthes*.

The coronal lobes are described by Wight as hisurate, but they are perfectly glabrous in ten flowers I have examined, and they are so represented in a drawing made in the Calcutta Garden, and in another made from specimens grown at Kew. Wight's specimen is accompanied with a loose sketch of a hairy corona, placed in a cover with a loose flower, in which latter the corona is glabrous.

11. **C. mysorensis**, *Wight* *Jo.* t. 846; glabrous or petioles and leaf-nerves beneath minutely hairy, leaves ovate acuminate, corolla-lobes ovate naked, coronal lobes long subulate glabrous, processes filiform. **Mysore** and **Travancore**; on the Pulney Mts., *Wight*.

This very closely resembles *C. elegans* in habit, and the form and size of the flowers, but the latter are of a very pale straw colour or greenish, and the lobes are entirely naked. **Leaves** 1$\frac{1}{2}$–2 in. long. **Sepals** $\frac{1}{4}$ in. subulate. **Corolla** 1–1$\frac{1}{2}$ in.

12. **C. Walkeriæ**, *Wight* *Jo.* t. 1266; quite glabrous, leaves ovate or ovate-lanceolate acuminate, corolla-lobes ovate-cordate ciliate, coronal lobes 10 linear, glabrous nearly as long as the linear processes.

**Ceylon**, *Walker, Wight*.

Very similar to and probably a variety of *C. mysorensis*, but the leaves are 3–4 in. long, the sepals are longer, $\frac{1}{2}$–$\frac{3}{4}$ in., the corolla much larger, 2–2$\frac{1}{2}$ in. long, blotched with purple, the tube narrower above the globose base, and the coronal lobes different.


**Ceylon**; *Ramboddy*, alt. 4–5000 ft., *Gardner*, &c.

Except by the ciliate coronal lobes I do not see how dried specimens of this can be distinguished from *C. elegans*. According both to the figure in the Botanical Magazine, and to a sketch made in Ceylon, the leaves are pubescent beneath. *Thwaites*, who joins both *C. mysorensis* and *Walkeriæ* with *C. elegans*, regards *Gardneri* as distinct, but does not say on what grounds. According to drawings sent by him to Sir W. *Hooker*, the Cingalese plant called by him *C. elegans* has very broad leaves, a greenish corolla spotted pale-purple with a hemispheric crown of green corolla lobes tipped with dark purple and fimbriate at the tips only, whereas *C. Gardneri* has a deep purple black corolla with a depressed crown of much broader lobes ciliated at the base only. The follicles and seeds of *Thwaites’* specimen of *Gardneri* precisely accord with those of *C. elegans*.

14. **C. longifolia**, *Wall. Pl. As. Rar.* i. 56, t. 73, and *Cat.* 8136; sparsely puberulous, leaves shortly petioled elongate- or linear-lanceolate acuminate, corolla-lobes ovate ciliate, coronal lobes 10 lanceolate ciliate, processes linear twice as long. *Wight* *Contrib.* 31; *Dene* in *DC. Prodr.* viii. 642. *C. lanceolata*, *Wight* l.c.; *Wall. Cat.* 8139; *Dene* l.c. 643.


**Stem** with a line of pubescence. **Leaves** 5–8 by $\frac{1}{4}$–$\frac{1}{2}$ in., base acute or rounded; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. **Peduncle** 1–1$\frac{1}{4}$ in., hairy; pedicels fascicled, $\frac{1}{4}$–$\frac{3}{4}$ in.; bracts subulate. **Sepals** $\frac{3}{4}$ in., very slender. **Corolla** 1$\frac{1}{4}$ in., green spotted dark purple, tube curved; lobes very broadly ovate. **Follicles** 6 in. long, very slender. **Seeds** $\frac{1}{4}$ in., linear-oblong, concavo-convex.—Approaches *C. lucida*, differing in the much broader shorter head of the corolla and longer sepals. *Wight* describes *C. lanceolata* as glabrous and as having the coronal lobes shorter than the column, thus placing it in a different
section from C. longifolia, but there is no difference whatever between the authentically named specimens of these species in either Wight's or Wallich's Herbaria. The foliage closely resembles that of C. angustifolia.

†† Corolla-lobes shorter than the tube (nearly as long in C. pubescens), oblanceolate linear or elliptic, forming a conical ellipsoid ovoid or beaked crown over the not greatly dilated throat.

a. Leaves and peduncles perfectly glabrous.

15. C. tuberosa, Roxb. Cor. Pl. i. 12, t. 9; quite glabrous, leaves fleshy from orbicular apiculate to lanceolate acuminate, corolla straight, lobes \( \frac{1}{2} \) shorter than the tube suddenly contracted from a triangular base into linear cohering appendages that are at first connate throughout their length and villous within. Wight Contrib. 33, and t. 363; Wall. Cat. 8145, excl. A; Dals. & Gins. Bomb. Fl. 154; Graham Cat. Bomb. Pl. 117; Dorn in DC. Prodr. viii. 644. C. acuminata, Dals. & Gins. l. c. not of Roxb. C. mucronata, Roth Nov. Sp. 179. C. Candelabrum, Roxb. Hort. Beng. 20, and Fl. Ind. ii. 27, not of Linnaeus.

Deccan Peninsula; from the Concan southwards, common.

Root tuberous. Stem slender. Leaves 1-4 in. (fleshy, Dalzell), base acute or rounded; petiole \( \frac{1}{2} \) in. Peduncles 1-3 together, \( \frac{1}{3} \) in.; pedicels fascicled or subpaniculate; bracts minute. Sepals subulate, \( \frac{1}{2} \) in., recurved. Corolla 1-2 in, base somewhat inflated, mouth slightly dilated. Coronal lobes ciliate, very short. Follicles 4-5 in. long, slender. Seeds \( \frac{1}{2} \) in. long, linear.

16. C. Candelabrum, Linn. Sp. Pl. 211; glabrous, leaves oblong acute or apiculate base cordate, peduncles pendulous, flowers whorled erect, corolla-base globose, lobes very short ovate acute united by the tips only. Done in DC. Prodr. viii. 643.—Rheed Hort. Mal. ii. t. 16.

Malabar, Rheed; at Mangalore, Perrottet (Dene.).

Stem slender, Leaves 2-3 by 1-14 in.; petiole 1 in. Peduncles 3 in.; pedicels \( \frac{1}{4} \) in.; flowers 10-12 in a whorl. Sepals small. Corolla \( \frac{1}{2} \) in.—I have seen no specimen of this striking species.

17. C. Elliottii, Hook. f.; quite glabrous, leaves elliptic acute, peduncle pendulous, flowers erect, corolla straight green base somewhat inflated, lobes very short ovate acute united at the tips only, coronal lobes obsolete, processes glabrous linear.

Deccan Peninsula; Sinbachalam hills, near Vizagapatam, Sir W. Elliott. Root tuberous. Stem rather stout. Leaves 4 by 1\( \frac{1}{2} \)-2 in., base subacute; petiole 1 in. Peduncles 2\( \frac{1}{4} \)-3 in.; pedicels upcurved, \( \frac{1}{2} \) in. Corolla \( \frac{1}{2} \) in., rather narrow above the swollen base, striped purple within, lobes pubescent at the tips within. Follicles 4 in. long, beaked.—Described from an excellent drawing given by Sir W. Elliott to General Beddome. It comes far nearer to C. Candelabrum than does any other species.

18. C. acuminata, Roxb. Cor. Pl. i. xii. t. 8, and Fl. Ind. ii. 29; quite glabrous, leaves short-petioled succulent elongate-lanceolate finely acuminate, peduncles short, corolla small straight, lobes short linear connate by their tips only, coronal lobes 5 minute, processes long filiform. Wight Contrib. 32; Done in DC. Prodr. viii. 643.

The Circars; at Samulcottah, Roxburgh.

Root tuberous. Stem slender. Leaves 3-4 by \( \frac{1}{2} \) in., base acute, not 3-nerved; petiole \( \frac{1}{4} \) in. Peduncle \( \frac{1}{4} \) in., 4-6-fld.; pedicels \( \frac{1}{4} \) in. Sepals small. Corolla \( \frac{1}{4} \) in., white with purple streaks and lobes, base swollen, mouth dilated; lobes \( \frac{1}{4} \) in., cohering by the tips only.—Described from Roxburgh. Wight suggests its being only a variety.
of *C. bulbosa*, but the short corolla-lobes are very different. Roxburgh's locality, Samulecottah, has never been explored by a subsequent botanist.

19. *C. intermedia*, Wight *Ic.* t. 1263; quite glabrous, leaves long-petioled ovate or elliptic-lanceolate finely acuminate base 3-nerved, corolla straight, lobes subpathulate villous within connate by their tips only, coronal lobes 5 very short or 0 ciliate or glabrous processes long dilated upwards. *C. tuberosa*, Wall. *Cat.* 8145 A. O. Candelaebrum, *Thwaites Enum.* 199.

*Travancore*; Courtallam and Dindigul, Wight; Anamallay hills, alt. 2500 ft., Beddome. *Ceylon*, in the hotter part of the island, *Walker, Thwaites*.

Root fibrous (*Beddome*). Stem slender. Leaves 2–3 by $\frac{3}{4}$–1$\frac{1}{2}$ in., pale yellow-brown when dry; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. *Peduncles* 1–2 in., 3–6-fld.; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. *Sepals* subulate. *Corolla* 1–1$\frac{1}{2}$ in., pale purplish, base inflated, lobes much shorter than in *C. tuberosa*.—Wight figures the coronal lobes as obsolete and the processes as hairy at the base; I find 5 minute glabrous lobes. He further figures the lobes of the corolla as linear, but describes them as subpathulate. An excellent drawing from Thwaites of what appears to be this species (his *C. Candelaebrum*, C.P. 177) has purple branches. Wallich's 8145 A, from Heyne, appears to be the same.

? Var. *Wightii*; leaves lanceolate acuminate, corolla-lobes broader glabrous, coronal lobes ciliate.—*Courtallam, Wight*.—Wight calls this *C. acuminate*, but it differs from Roxburgh's drawing in the leaves with slender petioles and strongly 3-nerved at the base.

20. *C. Thwaitesii*, Hook. *Bot. Mag.* t. 4758; quite glabrous, leaves elliptic ovate or ovate-lanceolate acuminate, peduncles 2–3-fld., corolla 2–2$\frac{1}{2}$ in. base ovoid, throat funnel-shaped, lobes oblong, tip not contracted obtuse erect half the length of the tube, coronal lobes subulate ciliate half as long as the linear straight processes.

*Travancore*; at Courtallam, Wight; Peermede Ghat, Beddome. *Ceylon*; central province, Gardner, &c.

Stem rather stout. Leaves 3–4 by 1$\frac{1}{2}$–2 in., petiole $\frac{1}{2}$–1$\frac{1}{2}$ in. *Peduncles* stout, 1–2 in., pedicels $\frac{1}{4}$–1 in. *Corolla* curved, green with purple blotches above the middle of the tube, and a purple band across the lobes above the middle. *Follicles* (in Peninsular specimens) 10 in. long, very slender. *Seeds* $\frac{1}{2}$ in. long.—The leaves are figured and described in *Bot. Mag.* as ciliate, but I do not detect this in the only Ceylon example I have seen (a most incomplete one).

β. Leaves and peduncles pubescent or hispid.

21. *C. hirsuta*, Wight & Arn. Contrib. 33; hirsute or pubescent, leaves from linear to lanceolate to ovate-cordate acuminate, peduncles hispid, sepals long slender, corolla 1$\frac{1}{2}$–2 in. long, base ventricose, lobes suberect oblong obtuse ciliate $\frac{1}{2}$ of the length of the tube, coronal processes hooked.

*Deccan Peninsula*; from the Comcan to Travancore.

A coarse climber, more or less clothed with subhispid spreading hairs. Leaves 2–4 in.; petiole $\frac{1}{2}$–1 in. *Peduncles* $\frac{1}{2}$–2 in., very hispid; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. *Sepals* $\frac{1}{2}$ in., very slender. *Corolla* greenish, blotted with purple. *Corona* very variable, but the processes always broad and curved or hooked at the tip. *Follicles* 4 in. long, slender. *Seeds* $\frac{1}{2}$ in., narrowly oblong.—After a very tedious examination of the corona in specimens collected at various places between Bombay and Travancore I conclude that the following are referable to one variable plant, an opinion in which I am confirmed by Colonel Beddome; vars. 1–4 are all mixed in Stock's and Dalzell's Herbarias, and none being authentically named I cannot positively say which answers to the species described in the Bombay Flora.

Var. 1. *hirsuta proper*; all over hirsute except the corolla, coronal lobes 5 short triangular 2-fld. ciliate much shorter than the processes. *C. hirsuta*, Wight *I. c.*; *Dana* in *DC. Prodr.* viii. 641.
Var. vincaefolia; branches glabrous, leaves less and more softly pubescent ovate-cordate, peduncles hispid, coronal lobes 5 short rounded emarginate ciliates. C. vincaefolia, Hook. Bot. Mag. t. 3740; Dalz. & Gibbs, Bomb. Fl. 153; Dene in DC. Prodr. viii. 642.—I have seen no authentic specimen of this.

Var. ophiocephala, hisrate all over except the corolla, leaves hispid on both surfaces, lobes of corolla oblong obtuse narrowed and purple at the base yellow in the middle, tips green, coronal lobes 10 obtuse 2-fid connate nearly to the tips yellow bordered with purple. C. ophiocephala, Dalz. in Hook. Kew Journ. ii. 269; Dalzell & Gibbs, Bomb. Fl. 1. 64.

Var. 4. Jacquemontiana; hisrate all over except the corolla, leaves softly tomentose, "lobes of the corolla broader upwards entirely green," Dalzell, coronal lobes united to the middle ciliate. ?C. Jacquemontiana, Dene in DC. Prodr. viii. 641; 1 Dalz. & Gibbs, Bomb. Fl. 153.—Carli, Jacquemont. I am doubtful if Dalzell's plant is Jacquemont's. Decaisne describes the latter as having the lobes of the corolla nearly as long as the tube, which is not the case with any of the forms I have referred to hirsuta.

Var. 5. stenophylla; leaves narrowly linear, margins flat or recurved.—Pulney Mts., Herb. Wight; Anamallayas, alt. 3600-5000 ft., Beddome. One of Wight's specimens has no authentic lobes, the other and Beddome's have 5 rather large 2-toothed ciliate ones. Beddome describes the roots as fibrous.

22. C. oculata, Hook. Bot. Mag. t. 4093; branches glabrous, leaves ovate or ovate-cordate acuminate ciliolate, peduncles hispid, corolla 2-2½ in. long base large much inflated, lobes erect lanceolate half the length of the tube, tips contracted pubescent, coronal lobes short ciliate 2-toothed, processes slender straight erect. Dalz. & Gibbs, Bomb. Fl. 151.

The Concan; Bombay, Miss Jones, Dalzell.
Leaves 4-6 by 1½-2½ in., membranous; petiole ½-1 in. Peduncle 1½-2 in., 4-8-fld. Sepals ½-¾ in., slender, nearly glabrous. Corolla very pale, spotted with purple below the lobes; lobes green above the middle, pale, each with a large purple blotch below it.—Described chiefly from the Bot. Mag., where the leaves are said to have glands above at the insertion of the petiole, which is not the case with the plants in Dalzell's Herbarium which I refer to this species. It no doubt varies greatly from the above characters. But for the erect straight inner coronal processes I should be disposed to refer this to C. hirsuta (see also 30, C. Stocksii).

23. C. ciliata, Wight Jc. t. 1262; branches hairy above, leaves linear- to ovate-lanceolate acute or acuminate pubescent above and beneath, peduncles very long hispid very many-fld., corolla ½ in. gently curved, base slightly swollen, lobes very narrow linear erect one-third the length of the tube, coronal lobes 5 very short 2-toothed ciliate, processes slender hooked.

Nilgerry and Pulney Mts., Wight, Beddome.

24. C. angustifolia, Wight Contrib. 31; branches and peduncles pubescent on one side, leaves narrowly elongate-lanceolate pubescent above ciliolate, peduncles few-fld., corolla 1½-2 in. nearly straight base slightly inflated, lobes short suberect broadly obovate glabrous one third the length of the tube, coronal lobes 10 lanceolate ciliate, processes straight linear rather longer. C. longifolia, Herb. Ind. Or. II. j. & T.

Khasia Mts. alt. 4-6500 ft., Wallich, &c.
An extensive slender climber. Leaves 2-9 by ½-3 in., rather coriaceous, minutely pubescent above, finely acuminate, margin often recurved; petiole ½-¾ in. Peduncles
Ceropogia.]

25. **C. pubescens**, Wall. Pt. As. Rar. ii. 81, 187, and Cat. 8144 B.; sparingly pubescent or glabrate, leaves long-petioled ovate acuminate, peduncles glabrous 3-6-fld., sepals small, corolla 2-5 in. straight base hardly swollen lobes linear from an ovate base cohering from the middle glabrous nearly as long as the tube, coronal lobes minute or obsolete ciliate, processes linear erect. *Dene. in DC. Prodr.* viii. 644.

Temperate Himalaya; Nepal, Wallich; Sikkim, alt. 3-8000 ft., J. D. H., Tretiuk. Khasia Mts., alt. 4-5000 ft., J. D. H.

Branches slender, nearly glabrous. Leaves 3-7 by 1-3 in., very membranous, base sometimes cordate, sparingly pubescent on both surfaces or glabrous, ciliate; petiole 1-2 in. *Peduncle 1-2 in.* Sepals 1-2 in., recurved. *Corolla-tube* pale dirty purple, sub-cylindric, mouth hardly dilated; lobes yellow with purplish tips forming a long-beaked crown.—This approaches closely *C. tuberosa*, but is always more or less pubescent and it has much longer corolla-lobes. Amongst Cathcart's drawings (in Herb. Kew.) is one apparently of this species having a green corolla with yellow bases to the lobes. Wallich's 8144 A. (Herb. Heyne) is probably *C. tuberosa*, but the specimens are undeterminable.


Sikkim Himalaya; Lachen, alt. 8-10,000 ft., J. D. H.

Stem very slender and as well as the petioles leaves on both surfaces and peduncles sparsely minutely hairy. Leaves 1-2 by 2-1 in., very membranous; petiole 1-2 in. *Peduncles* shorter or rather longer than the petioles. Corolla short, dark purple, narrow from above the base to the mouth, which is rather contracted, lobes gently curved forming a short ellipsoid crown.

††† Corolla-lobes as long or nearly as long as the tube (or shorter in *C. odorata*).—See also 25, *C. pubescens*.

a. Corolla-tube broadly funnel-shaped upwards from above or below the middle.


An extensive climber; root irregularly tuberous. Leaves 4-7 by 1-3 in., membranous; petiole 1-2 in. *Peduncles* short, 1-1 in.; pedicels as long. Sepals 1-2 in. Corolla scarcely dilated at the base, green spotted with purple, lobes inflexed from above the base, tips brown connect by all the dilated part.

28. **C. Decaisneana**, Wight l.c. t. 1259; quite glabrous, leaves short-petioled elongate- or linear-lanceolate acuminate, peduncles 1-3-fld., sepals long filiform, corolla 2-3 in. curved base very largely inflated, lobes linear from a
lanceolate base, coronal lobes 5 linear forked at the tip villous half as long as the slender linear straight processes.

*Nilcherry Mts.; at Sispara Ghat, Wight, &c.*


29. *C. brevicollis,* Hook. f.; leaves ovate or lanceolate acuminate puberulous on both surfaces, peduncle sparsely hairy 3–6-fld., sepals filiform, corolla 2 in. long curved, base very broadly inflated, tube with a very short neck and broad funnel-shaped limb, lobes erect linear from an ovate-lanceolate base, tips incurred, coronal lobes obsolete, processes linear erect.

*Travancore; Anamallay hills, alt. 2500 ft., Beddome.*

Stem slender, glabrous. Leaves very variable, 2½–6 by 1½–2 in., membranous, sometimes linear-oblong; petiole 3–½ in. Peduncle slender, 1–2 in., glabrous or sparsely hairy; pedicels slender, 4–1½ in. Sepals ½. Corolla-base obliquely inflated, dilating again shortly above the inflation into a broad funnelf; lobes longer than the tube, linear for half their length.

30. *C. Stocksii,* Hook. f.; leaves ovate or ovate-cordate acuminate puberulous on both surfaces, peduncles 3–∞-fld. hispid, sepals filiform; corolla 2½–5 in. straight base slightly inflated, lobes erect linear from a small collar, tips incurred, coronal lobes 5 short broad ciliate, processes linear straight.

*The Concan, Stocks.*

An extensive climber. Leaves 2–5 by ½–2 in., membranous; petiole ½–1 in. Peduncle stout, 1–1½ in.; pedicels very short, hispid. Sepals ½–1 in. Corolla large. —This closely resembles *C. ovalata,* differing in the long linear corolla-lobes. It may be a form of that plant; if so, the corolla affords a most treacherous character.

3. Corolla-tube narrow, subcylindric above.


*Tropical Himalaya; Kumaon, alt. 4500 ft., Royle, &c.; Sikkim, alt. 2–5000 ft., J. D. H., Treutler.*

An extensive rather stout climber; branches glabrous. Leaves 4–7 by 1½–3½ in., very membranous, glabrous or sparsely puberulous on both surfaces, base acute; petiole ½ in. Peduncles longer and stouter than the pedioles; pedicels ½–1½ in.; braacts many, subulate. Sepals ½ in. Corolla pale, base sometimes globose, lobes with a broad ovate base, above it forming a long straight beak. Follicles 4–5 in. long.

32. *C. Arnottiana,* Wight Contrib. 32; nearly glabrous, leaves short-petioled narrowly lanceolate or oblong-lanceolate acuminate, peduncles short few-fld., sepals small, corolla 2 in. narrow straight base hardly inflated, lobes very slender erect longer than the tube, coronal lobes 5 short obtuse notched subaculate, processes linear straight. *D.C. in DC. Prodr.* viii. 644.

*Khasia Mts., Lobb. Burma at Pyone, Wallich. Tenasserim; Moumein, Lobb.*

Stem very slender, glabrous. Leaves 3–5 by ½–1 in., rather firm, glabrous or minutely puberulous above, ciliolate; petiole ½–1½ in. Peduncle ½–1 in. slender;
pedicels very short; bracts setaceous. Sepals \( \frac{1}{4} \) in. Corolla sub-cylindric; lobes lanceolate at the base, tips slightly dilated. Follicles 4 in. long, slender. Seeds \( \frac{1}{16} \) in. long, long-oblong.


The **Concan**; Salsette, *Nimmo, Law.*

Stem slender, glabrous. Leaves 3-4 by \( \frac{1}{2}-\frac{3}{4} \) in., rather firm, glabrous or minutely puberulous above; petiole \( \frac{3}{4}-\frac{1}{2} \) in. Peduncles 1-5 in., pedicels very short; bracts squarrose. Sepals \( \frac{1}{4} \) in., recurved. Corolla one of the narrowest of the genus, yellow, sweet-scented, lobes variable in length, at first united by the tips, soon free.

34. **C. ensifolia**, Beddome *Jc. Pl. Ind. Or.* 178; stem glabrous, leaves subsessile or short-petioled along a linear acute or apiculate nerveless finely reticulate, peduncles hispid very often long, sepals small, corolla 1 in. slender straight base inflated, lobes linear erect, coronal lobes 5 short obtuse ciliate, processes long linear erect.

**Travancore**; Anamallay hills, alt. 3-3500 ft., *Beddome.*

Root tuberous. Stem very slender. Leaves 4-7 by \( \frac{1}{2}-\frac{3}{4} \) in., firm, glabrous or minutely puberulous above, finely reticulate beneath; petiole 0-1 in. Peduncles 1-5 in., often bearing a succession of fascicles of flowers; pedicels very short. Sepals \( \frac{1}{4} \) in. Corolla greenish-white, lobes as long or longer than the tube. Follicles 6-7 in.

35. **C. albiflora**, Hook. f.; pubescent, leaves short-petioled ovate- or linear-lanceolate nerves distinct oblique, peduncles hispid often very long, sepals subulate, corolla 1\( \frac{1}{2} \)-2 in. slender straight base not inflated, lobes linear erect, coronal lobes 5 very short ciliate processes long linear erect.

**Travancore**; near Peermede, alt. 3500-4500 ft., *Beddome.*

Very similar to *C. ensifolia*, in habit, inflorescence, bracts, &c., but, as I am assured by Colonel Beddome, quite distinct, more hispidly pubescent, with much broader distinctly nerved leaves and white flowers. The peduncle is sometimes 8 in. long, and bears 4 or 5 remote sessile fascicles of flowers.

36. **C. Beddomei**, Hook. f.; sparsely pubescent, leaves subsessile elongate linear-lanceolate acuminate, nerves very slender, peduncle stout hispid few-fl.d., sepals filiform, corolla 3 in. long slightly curved, tube slender swollen below funnell-shaped above, lobes slender elongate erect villous within, coronal lobes very short notched ciliate processes broad hooked.

**Travancore**; Peermede, alt. 2500 ft., *Beddome.* *Cochin, Johnston.*

Stem hispid above. Leaves 5-6 by \( \frac{1}{4}-\frac{3}{4} \) in., rather firm, finely acuminate, narrowed to the base, sparsely puberulous on both surfaces, midrib strong, nerves few and extremely fine. Peduncle 1-3 in. stout, pedicels short. Sepals \( \frac{1}{4}-\frac{3}{4} \) in. Corolla dark purple, \( \frac{1}{2} \) in. diam. at the mouth, lobes gradually narrowed from the base to the tips.

—I have seen but one good specimen of this, Colonel Beddome's; that from Cochin is imperfect, and appears to have straight coronal processes.

**Doubtful and Undescribed Species.**

C. **Micans**, Nimmo, and C. **Arcta**, Nimmo, from the Concans, and mentioned by name only in Graham *Cat. Bomb. Pl.* 118, are unknown to me.

C. **Biflora**, *Linn. Pl. Zeyl.* 46, and *Sp. Pl.* 211; from Ceylon. The only character given for this, "peduncles 2-flowered," may apply to any Ceylon species. Wight refers it doubtfully to *C. tuberosa*, which is not a Ceylon plant.
51. **Frerea**, Dals.

A low fleshy quite glabrous erect shrub, branches terete. **Leaves** opposite, oblong. **Flowers** large, solitary or in pairs, axillary. **Sepals** triangular-ovate, obtuse. **Corolla** rotate, lobes broad, acute, valvate. **Corolla** a low broad, 5-angled ring round the column, with 5 broad short truncate or retuse spreading lobes alternating with 5 long narrow processes opposite the anthers and inflexed over them. **Column** very short; anthers retuse, inappendiculate; pollen-masses one in each cell, short, erect, one margin pellucid. **Stigma** flat, included. **Follicles** terete, smooth. **Seeds** comose.

**F. indica**, Dals. in *Journ. Linn. Soc.* viii. 10, t. 3.

The *Concan*; hill foot near Hewra, alt. 3000 ft., Dalzell. **Branches** very short, 1/2 in. diam., nodose. **Leaves** sessile, 1 in., sometimes spatulate obvoid, obtuse or retuse. **Flowers** very shortly dicellate. **Corolla** purple. **Corolla** as in *Boucerosia*, from which the genus differs in habit.—Described from Dalzell's figure and characters.

52. **Caralluma**, Br.

Fleshy, erect, nearly leafless herbs, with very thick subterete or angular stems and branches. **Leaves** minute and caducous, or 0. **Flowers** solitary, or in pairs at the upper nodes. **Sepals** acute. **Corolla** broadly campanulate; lobes 5, narrow, valvate. **Corolla** annular, adnate to the column, 5-lobed, lobes 2-cuspidate, with a ligulate process at the sinus on the inner face which overlaps the anther. **Column** very short; anthers short, retuse, incumbent on or confluent with the stigma, tips inappendiculate; pollen-masses one in each cell, short, erect, one margin pellucid. **Stigma** flat. **Follicles** slender, smooth, terete. **Seeds** comose.—**Distrib.** Species 4; Western India and Arabia.

The corona is that of *Boucerosia*, but the habit and inflorescence are very different, the stem and branches gradually narrowing upwards and becoming very slender. I have had to describe the species for the most part according to drawings in Herb. Kow.

*Corolla glabrous within.*


The *Punjab*; at Rawul Pindee, Aitchison; Mooltan, Edgeworth. *Spinde Stocke.* Erect, 6-18 in. high, simple or sparingly branched. **Leaves** 1/3 in. long, ovoid-lanceolate, acute, fleshy, caducous. **Flowers** 1/2 in. diam., purple within.


*Deccan* Peninsula; in arid places, *Wight*. **Stem** ascending, 1-2 ft. high; branches slender above. **Flowers** 1/2 in. diam., dark purple within.

**Corolla** fringed or hairy within.

3. **C. attenuata**, Wight Joc. t. 1268, and Ill. t. 155 b, fig. B.; stem
4 angled, branches slender and terete above, corolla-tube short funnel-shaped, lobes fringed with long hairs.

South Deccan Mts.; Nilgerries, Pulneys, &c., Wight, &c. Cochín, Johnstone. Ceylon; between Kandy and Badulla.

Habit of C. adscendens, but differing according to Wight's plate in the larger flowers with deeply fringed petals. The Ceylon plant, according to a drawing from Thwaites, is smaller with much smaller flowers borne on the 4 angled stems, not on slender terete branches as in the Peninsular one; it is possibly C. fimbriata.

1. **C. fimbriata, Wall. Pl. As. Rar. i. 7, t. 8;** stems much diffusely branched 4 angled to the ends of the branches, corolla rotate, segments copiously fimbriate. **Wight Contrib. 34; Dalz. & Gibbs. Bomb. Pl. 156.**

Deccan Peninsula; from the Concan southwards, in arid rocky places.—Distrib. Ava.

Wight refers the Peninsular to the Ava plant, remarking that the flowers of the former are much larger (they are 1 in. diam. in Wallich's drawing), but finds no other difference. In both the arms of the corollal lobes are long subulate and hooked.

—Amongst Wight's drawings is one of a plant with the habit of fimbriata, that is, bearing the flowers on the curved 4 angled ends of the branches, but with short ovate ciliate corolla-lobes, green, banded with purple, ending in fimbriate linear tips. If this is Wight's fimbriata, it differs much from Wallich's.

53. **BOUCEROSIA, Wight & Arn.**

Fleshy leafless herbs, with thick 4 angled stems, angles toothed. Flowers terminal, rather large, solitary or umbelled, more or less purple. Sepals narrow. Corolla campanulate or rotate; lobes 5, short, broad, valvate. Corona annular, adnate to the column, 5 lobed; lobes 2-fid, subulate, erect or spreading with a linear fleshy process on the inner face at the sinus inflexed over the anther. Column minute, short; anther-tips inappendiculate; pollen-masses one in each cell, sessile, erect, suborbicular, compressed. Stigma low, conical, 5 angled, tip truncate depressed. Follicles slender, straight, terete, smooth. Seeds flat, winged, comose.—Distrib. Species 12; Spain, North Africa, Arabia, Western India.

For the definition of the species of this genus (as of **Coralluma**) I have had to depend mainly upon published and unpublished drawings and definitions.


Deccan Peninsula; common in arid localities. Ceylon; rocks near Kornegalle, Thwaites.

Stem erect or ascending, simple or sparingly branched, 1-2 ft. high, 1-2 in. across the obtuse thick crenate angles. Umbels 2-4 in. diam., globose, dense-fid. Corolla 1-1½ in. diam., streaked closely concentrically with purple. Follicles 4-7 in. long by ½ in. diam. Seeds ⅛ in. long, oblong.

? Var. campanulata; angles of stem thin, corolla smaller without the purple streaks more tubular. B. campanulata, Wight Ic. t. 1287.—Wight distinguishes this as above, but Thwaites unites it with umbellata, and in the Herbarium they are indistinguishable, except by the smaller flower and narrower lobes of the corona; its native locality is unknown.

2. **B. crenulata, Wight & Arn. Contrib. 34;** stems very stout, flowers in dense umbels, corolla with long scattered hairs over the whole inner surface.
3. **B. diffusa**, **Wight** *et* **t. 1599*; diffuse, branches very stout, flowers in dense umbels, corolla-lobes fimbriate on the margin only.

4. **B. Hitchinia**, **Done. in DC. Prodr.** *viii. 649*; stem slender diffusely branched, flowers few in an umbel, corolla hairy within. **Hitchinia indica**, **Wight & Arn. Contr.** *35*; **Wight** *et* **t. 355*; **Wall. Cat.** *8148*.

5. **B. pauciflora**, **Wight** *mss.; Done. in DC. Prodr.** *viii. 648*; stems slender diffusely branched, teeth or angles recurved, flowers solitary, corolla hairy within.


**ORDER XCVI. LOGANIACEÆ.**

Trees, shrubs or herbs. *Leaves* opposite (rarely ternate), undivided; stipules various or 0. **Inflorescence** cymose, terminal or axillary, simple or compound; cymes sometimes subsacitate, sometimes reduced to solitary flowers. **Flowers** regular. **Calyx** inferior, small, 4–5-toothed or -lobed. **Corolla** 4–5-lobed or -partite. **Stamens** 4–5, inserted on the corolla-tube, alternate with the lobes; anthers 2-celled. **Ovary** free, 2-celled; style simple, stigma capitate bifid or 2-partite; ovules one or more in each cell, placenta on the dissepiment or basal in the inner angle. **Fruit** capsular septicidal, or baccate indehiscent, 1–oeseeded. **Seeds** various, albumen copious; embryo straight, long or short.—Species 350, tropical and subtropical.

**TRIBE I. Euloganiæ.** **Ovary** with many ovules in each cell.
* Herbs; corolla valvate; capsule compressed, didymous.

Pedicels solitary or clustered. Corolla 4-lobed ........ 2. Mitrasacme.

** Shrubs or trees.


TRIBE II. Gaertneriæ. Ovary with 1 ovule in each cell.


1. Mitreola, Linn.

Herbs. Leaves opposite, membranous; stipules membranous or small. Cymes 2-3-chotomous, terminal or peduncled, axillary. Flowers small, white, often unilateral on the ultimate cyme-branches. Sepals lanceolate. Corolla urn-shaped; lobes 5, small, valvate. Stamens 5, included. Ovary 2-celled; styles 2, short, connate under one small hairy stigma, ultimately divergent; ovules many in each cell, placentas peltate. Capsule obovoid, laterally compressed, truncate or 2-horned; carpels dehiscing by separating from each side of the septum from above. Seeds very many, minute, globose or elongate, albumen fleshy; embryo linear.—Species 4; 2 American and the following.

1. M. oldenlandioides, Wall. Cat. 4350; leaves oblong nearly glabrous, cymes terminal and axillary 2-chotomous, capsule 2-horned, seeds elongate trigonous, A. DC. Prodr. ix. 9; Dalz. & Gibbs. Bomb. Fl. 155; Hook. Ic. Pl. t. 827; Benth. in Journ. Linn. Soc. i. 91. M. paniculata, Wall. Cat. 4349; Wight Ic. t. 600 (flowers of principal figure inaccurate); A. DC. l. c. (as to the Asiatic plant). M. inconspicua, Zoll. et Mor. Verz. (1845-6) 55.


Annual, 6-15 in., erect. Leaves 2 by ½ in., narrowed at both ends; petiole ¼ in. Cymes 2-6 in., often numerous; bracts ¼ in., lanceolate. Flowers subsessile, scarcely ⅛ in. Capsules ½ in., unilateral on the branches. Seeds twice as long as broad. The American M. petiolata united with this by A. DC. is exceedingly like it, but has globose seeds.


Khasia Mts., alt. 4200 ft.; Cherra, Limestone Hill, Griffith, J. D. H., Clarke.

Perennial, 2-8 in., decumbent, branching. Leaves 3½ by 1½ in., narrowed at both ends; petiole ¼ in. Cymes 6-12-flowered, lax, irregular, peduncle 1-3 in. Flowers nearly as of M. oldenlandioides, obscurely unilateral, fruiting pedicles sometimes ⅝ in., but not longer than sometimes in M. oldenlandioides. Capsules ⅛ in., succulent, little compressed.—The specimens on which the genus Parophiorrhiza were founded, were mislaid when the Rubiaceae were described for this work.


Small herbs. Leaves opposite, stipules forming a minute sheath. Flowers small, white, terminal or axillary, solitary clustered or in irregular umbels.
Calyx campanulate, 4-fid. Corolla urn-shaped; lobes 4, valvate. Stamens 4, included; anthers ovate. Ovary 2-celled; styles 2, connate, separating from the base upwards, usually finally divergent, stigma capitulate or 2-lobed; ovules many in each cell, placenta peltate. Capsule subglobose, laterally sub-compressed, truncate or sub-2-horned; carpels dehiscing by separating from each side of the septum from above. Seeds very many, minute, subglobose, testa smooth, reticulated.—Species 28; from Bengal to Japan and New Zealand, common in Australia.

1. M. nudicaulis, Reinw. in Blume Bijd. 849; leaves subradical elliptic minutely hairy, scapes terminated by a lax simple or compound umbel. A. DC. Prodr. ix. 12; Bentham in Journ. Linn. Soc. i. 92. M. chinensis, Griseb. in Fl. Meyen. 51; A. DC. l. c. 560.

Khasia and Jaintea Mts., alt. 4000 ft., frequent.—Distrib. China, Malay.

Annual. Scapes 3-5 in., very slender. Leaves $\frac{1}{2}$ in., subsessile, obtuse or acute, minutely hispid-fuscolose. Pedicels $\frac{1}{2}-1\frac{1}{2}$ in., glabrous; bracts $\frac{3}{4}$ in., lanceolate. Calyx $\frac{3}{8}$ in., divided halfway down into acute lobes, glabrous. Corolla $\frac{1}{2}$ in., throat hairy. Capsule $\frac{3}{8}$ in. diam.


India, alt. 0-2000 ft., widely scattered; Assam and Bengal; Chota Nagpore; Deccan Peninsula; Pegu and Tenasserim. Ceylon.—Distrib. Borneo, Philippines; Australia.

Annual; stem 6 in., weak, branched, nearly glabrous. Leaves $\frac{1}{2}-\frac{3}{4}$ in., sessile, scaberulous. Pedicels $\frac{3}{8}-\frac{1}{2}$ in., scaberulous. Calyx $\frac{3}{8}$ in., acutely lobed halfway down. Corolla $\frac{1}{2}$ in., throat hairy. Capsule $\frac{3}{8}$ in. diam.—The Bengal examples are lax straggling, exactly agreeing with the Malay and Australian; the Madras and Ceylon ones are shorter (2-3 in. high), suberect.

3. M. polymorpha, Br. Prodr. 452; stems patently glandular hairy below, leaves oblong, umbels terminal or from the upper axils, pedicels long unequal glabrous. A. DC. Prodr. ix. 10; Bentham Fl. Austral. iv. 353 with syn. M. capillaris, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. i. 430 and Cat. 4348; Don Prodr. 129; A. DC. l. c. 11; Bentham in Journ. Linn. Soc. i. 92. M. trinervis, Spanoghe in Linn.aa. xv. 335; A. DC. l. c. 560. M. malaccensis, Wight i. t. 1601. Limnophila campanuloides, Bentham in Wall. Cat. 3903.


Annual; stem 2-15 in, erect. Leaves $\frac{3}{4}$ by $\frac{3}{4}$ in., sessile, glabrous or pubescent. Umbels 1-8 in, compound or simple, capillary; pedicels $\frac{1}{2}-1\frac{1}{2}$ in. Calyx $\frac{3}{8}$ in., lobed acutely halfway down, ciliate pubescent or glabrous. Corolla $\frac{1}{2}$ in., throat hairy. Capsule nearly $\frac{3}{4}$ in. —The Pegu examples of M. capillaris are 14 in., and agree altogether with Australian ones named M. polymorpha by Bentham. The tropical Australian plant has larger capsules and is said to be perennial. The Nepali and Mangalore specimens are 3-4 in. high only, resembling the Japanese.

Var. Pariskhi; umbels small dense long-peduncled, flowers large.—Tavoy; Parish. Distrib. Cochinchina. Peduncles 1-3 in., with a terminal umbel, and sometimes a sessile umbel in the middle; pedicels numerous, 0-1 in.—This is not much like any one of the numerous forms of the Australian M. polymorpha, but some of the Malay examples of M. polymorpha show a tendency to the Var. Pariskhi.
3. Buddleia, Linn.

Trees, shrubs, or herbs. Leaves opposite, entire or crenate, united by a stipulary line. Cymes dense, globose or corymbiform, axillary or in a thyrsoid terminal panicle. Calyx campanulate, 4-merous. Corolla urn-shaped; lobes 4, imbricate in the bud. Stamens 4, on the corolla-tube; anthers subseisile, ovate or oblong. Ovary 2-celled; style linear, clavate; ovules very many in each cell. Capsule septicidally 2-valved. Seeds very many, oblong or fusiform, testa usually loose or expanded into a wing or fail, albumen fleshy; embryo straight.—Species 70, tropical and subtropical Asia, America, and Africa.

1. B. Colvillei, Hook. f. Ill. Himal. Pl. t. 18; sub-arborescent, leaves oblong acuminate crenate-dentate, cymes lax in large terminal panicles, flowers 1 in. crimson. Gamble List Darjeeling Pl. 56.

Sikkim; frequent on Tonglo, alt. 9-12,000 ft., J. D. H., &c.


3. B. paniculata, Wall. Cat. 6408, and in Roxb. Fl. Ind. ed. Carey & Wall. i. 412; shrubby, leaves ovate or oblong sinuate-dentate crenate or sub-entire, flower-heads in interrupted panicles, corolla narrow-tubular woolly, seeds ellipsoid not tailed. Don Prodr. 92; Bentham. Scroph. Ind. 43, and in DC. Prodr. x. 444; Brand. For. Fl. 318; Kurs For. Fl. ii. 251. B. crispa, Bentham. in Wall. Cat. 6404, and Scroph. Ind. 43; Bot. Mag. t. 4793; T. A. Schmidt in Trimen Journ. Bot. 1868, 245; Boiss. Fl. Orient. iv. 1198. B. nepalensis, Colla; Bentham in DC. i. c. 447?

Himalaya, alt. 4-7000 ft., common westwards, becoming rare in Sikkim and Bhotan.—Distrib. Ava, Cabul Beloochistan. [The locality Silhet given by Mr. Bentham is believed to be erroneous.]

A shrub or small tree. Leaves 5 by 2 in., hastate, sinuate-dentate (on the flowering VOL. IV. G
branches usually more smaller, lanceolate, narrowed at the base, crenate or subentire), woolly beneath; petiole 0–1 in.; stipules usually very narrow or obsolete. **Flower-heads** woolly. **Calyx** $\frac{1}{4}$–$\frac{1}{2}$ in., urn-shaped, woolly, teeth short. **Corolla-tube** pink, lobes short lavender-blue, throat orange. **Style** short or long. **Capsule** $\frac{1}{4}$ in., ellipsoid, woolly. **Seeds** ellipsoid, tests lax scarcely longer than the nucleus.—**B. paniculata** was founded on the ends of the flowering branches with panicked heads and sub-entire oblong leaves; **B. crispa** on lower portions of the same branches with large hastea deeply sinate-dentate leaves and flower-heads subsolitary on short axillary branches.

4. **B. asiatica**, Lour. Fl. Cochinch. 72; shrubby, leaves lanceolate acuminate entire crenate or toothed, spikes terminal and axillary often panicked, corolla $\frac{1}{4}$–$\frac{1}{2}$ in. tubular white, seeds not tailed. **Benth. in D.C. Prodr.** x. 446; **Bot. Mag.** t. 6323; **Dals. & Gibs. Bomb. Fl.** 150; **Bedd. For. Man.** 163, and **Anal. Gen.** t. 21; **Brand. For. Fl.** 318; **Kurz For. Fl.** ii. 250. B. Neemda, **Ham. in Wall. Cat.** 6401; **Roxb. Fl. Ind. ed. Carey & Wall.** i. 411; **Reich. Ic. Bot. Exot.** t. 21; **Benth. Scroph. Ind.** 43, and in **D.C. l.c.** B. discolor, **Roth Nov. Sp.** 83; **Benth. Scroph. Ind.** 42; **Wight Ill.** t. 165, b. v. and Ic. t. 894. B. salicina, **Lamk. Ill.** i. 291. B. acuminisissima, **Blume Bijid.** 743. B. serrulata, **Roth l.c.** 82. B. suberrata, **Don Prodr.** 92. B. virgata, **Blanco Fl. Flisp.** 97.

Throughout India, ascending to 6800 ft., very common; not known from Caylon. — **Distr.** Malaya, Cochinchina, and China.

A shrub, 3–6 ft., rarely subarboreal 15 ft. **Leaves** 5 by 1½ in., usually narrowed at the base, grey white or fulvous-tomentose or pubescent beneath; petiole 0–1½ in.; stipules narrow. **Spikes** 2–8 in., dense, usually continuous, fulvous or grey tomentose or pubescent. **Calyx** $\frac{1}{4}$–$\frac{1}{2}$ in., campanulate, lobes triangular-oblong. **Corolla-tube** hairy without or glabrescent, lobes short. **Capsule** $\frac{1}{4}$ in., ellipsoid. **Seeds** ellipsoid, tests lax little longer than the nucleus.


Trees or shrubs, often epiphytic, sometimes scandent. **Leaves** opposite, entire (crenulate in **F. crenulata**); petioles dilated at base or united by a stipulary sheath. **Cymes** collected in corymbs racemes or elongate panicles, terminal or axillary; bracts small. **Flowers** large or small, white, yellowish or rarely pink. **Calyx** deeply 5-fid; lobes thick, broad, much imbricate. **Corolla-tube** long, narrow or funnel-shaped; lobes 5, broad, twisted to the left in the bud. **Stamens** 5, filaments filiform; anthers oblong. **Ovary** 2-celled, or 1-celled above; **style** filiform, stigma capitulate; **ovules** very many in each cell. **Berry** 1–2-celled. **Seeds** very many, immersed in pulp, testa crustaceous, albumen horny; embryo small, straight.—Species 30; India, China, Japan, Malaya, and Australia, Pacific Islds.

* Cymes few-fld. (except **F. crenulata**), corymbose near the ends of the branches, flowers large.

† **Corolla-tube** more than 3 in., linear, dilated only near the top.

1. **F. carnosae**, Jack in Mal. Misc. ii. n. 7, 81; leaves obovate obtuse petiolar, flowers solitary subsessile terminal, corolla-tube 5½ in. **D.C. Prodr.** ix. 30; **Benth. in Journ. Linn. Soc.** ix. 97; **Kurz For. Fl.** ii. 204.

**Tenasserim**; **Lobh. Kurz.** — **Distr.** Sumatra.

An epiphytic shrub. **Leaves** 3 by 2 in., truncate-obtuse, mucronate, base cuneate; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. **Calyx** $\frac{1}{2}$ in.; lobes $\frac{1}{2}$ in., ovate, much imbricated. **Corolla-tube** $\frac{1}{2}$ in., mouth wide; lobes 1½ in., obovate, obtuse, mucronate. **Berry** "size of a hen's egg, ovate, rather pointed." (**Kurz**).

**Ceylon**; central province, not common, Rotter, Gardener, Thwaites.


Var. brevifolia, corolla-tube 1 1/2 in. *Wall. Cat. 1594.*—Deccan Peninsula, Heyne. —Differes only in the corolla-tube rather less dilated upwards.

† Corolla-tube less than 3 in. funnel-shaped at least in the upper half (see also *F. zeylanica*, var. brevifolia).


**Tenasserim, Malacca,** and **Singapore**; *Griffith, Helfer,* &c.—*Distrib. Malaya*.

A large shrub. Leaves 9 by 4 in., subobtuse, base cuneate or attenuate; petiole 3/4 in., base auricled. Cymes 1-5-flowered, subsessile. Calyx-lobes 1 by 3/4 in. Corolla-mouth 2 in. wide; lobes 2 in. broad, obovate-oblong. Berry 2 3/4 by 1 1/2 in., oblong.—Griffith’s examples have smaller flowers; Lobb’s have the flowers nearly as large as in Miquel’s picture.

4. **F. crenulata**, *Maingay ms.*; leaves large broadly obovate crenulata, cymes trichotomous rigid many-flowered, corolla-tube 1 in. funnel-shaped.

**Malacca**; *Maingay*.

A tree 40 ft. high; trunk slender, unbranched (*Maingay*). Leaves 11 1/2 by 8 1/2 in., obtuse, base narrowed; petiole 1 1/2 in., very thick. Cyme 6 1/2 in. broad, depressed; peduncle 2 in.; bracts 1/2 in.; ovate; pedicels 1-1/2 in. Calyx-tube 1/2 in.; lobes 1/4 in., obtuse. Corolla-mouth 1/4-1/2 in. broad, wide campanulate for fully half its length; lobes 1/4 in., ovate-oblong. Capsule 1/2 by 1/4 in., ellipsoid. Seeds very many.


Trunk stunted in the Deccan, erect 30 ft. in the Malay Peninsula. Leaves 6 1/2 by 3 in., base narrowed; petiole 1-3/4 in.; stipules often partly free within the petiole,
embracing the branch. *Cymes* 1-5—(sometimes 12-15)—fl., subsessile; pedicels short. 

**Calyx** ⅛ in.; lobes ¼ in., ovate, obtuse. **Corolla-throat** ⅛—1⅛ in. wide; lobes 1-1½ in., broadly elliptic, obtuse. Berry 1½ by 1 in.—Primary nerves of the leaves distinct in *F. obovata*, Wall., obscure in *F. crassifolia*, Blume. The corolla in Wallich's Silhet example is considerably larger than in his Singapore one. 

**Pagrzea** crassifolia, Wall. Cat. 1609, is not in the Linnaean Herbarium.

VAR. *Gardneri*; scendent. F. Gardeneri, Thwaites Enum. 200; Bedd. For. Man. 164.—Ceylon; central province, alt. 3-6000 ft., Thwaites. Thwaites says that this hardly differs from *F. obovata*, except in habit.

6. **F. khasiana**, Benth. in Journ. Linn. Soc. i. 96; leaves oblong-elliptic acuminate, cymes laxly trichotomous few-fl., corolla-tube ⅛ in. funnel-shaped nearly from the base.

**Khasia** Mts., alt. 0-5000 ft., Griffith, H. f. & T. Assam, Griffith, Simons.

A tree, 30 ft. **Leaves** as of *F. obovata*. **Cymes** 3-12-fl., branches lax, often nodding; bracts ¼ in., elliptic; pedicels 0-1½ in. **Calyx** ⅛ in.; lobes ⅛ in., ovate, obtuse. **Corolla-throat** ⅛ in. wide; lobes ⅛ in., broad-elliptic, obtuse. Berry ⅛ by ⅛ in.—Closely allied to *F. obovata*, having smaller flowers and fruits, and a much laxer inflorescence.

**Cymes** short, few-flowered, in a more or less elongate raceme.

7. **F. Maiingayi**, Clarke; leaves large oblong, calyx ⅛ in. campanulate, corolla-tube ⅛ in. widely funnel-shaped from the base.

**Malaya**; Tamoosoo Kufoo, Maiingay.

**Leaves** 11 by 4½ in., parallel-sided, shortly acute at both ends; petiole ⅛ in., very thick. **Peduncle** 3 in.; racemes 2 fl., few-fl.; cymes subsessile on the rhachis of the raceme; pedicels ⅛ in., thick, terete. **Calyx** nearly 5-partite; segments round. **Corolla-throat** ⅛ in. wide; lobes ⅛ in., subquadrature. Berry not seen.—This by its large calyx differs from all the species of this section except *F. crassipes*, Benth., which has a tubular corolla only slightly funnel-shaped upwards.

8. **F. racemosa**, Jack.; Wall. Cat. 1801, and in Roxb. Fl. Ind. ed. Carey & Wall. ii. 35; tree, leaves large oblong or elliptic base cuneate, racemes terminal condensed, calyx ⅛ in., corolla-tube ⅛ in. lower half cylindric, upper half campanulate. 


**Penang** and **Malacca**, Wallich, Griffith, Maiingay.

Attains 50 ft. **Leaves** 10½ by 3½ in., nerves distinct; petiole ⅛ in. **Peduncle** ¼ in.; raceme 1½ in.; pedicels ⅛ in., subsessicled on the rhachis. **Calyx** divided more than halfway down; lobes round. **Corolla-throat** ⅛ in. wide; lobes scarcely ⅛ in., round. Berry “½ in., ovoid,” Kurz.

9. **F. morindaefolia**, Blume Rumph. ii. 79, and Mus. Bot. i. 169; a rambling shrub, leaves large oblong or elliptic base rounded, racemes terminal elongate, calyx ⅛ in., corolla-tube ⅛ in. upper half campanulate or funnel-shaped. 


**Andaman Islands**, Kurz.—**Distrib.** Malaya, to the Philippines and Australia.

**Panicle** usually 8-14 in. long; lateral branches rarely simple.—Very near *F. racemosa*, Jack, and reduced to it by Benth. (Fl. Austral. iv. 567). As to *F. volubilia*, Jack (Wall. Cat. 1610, and in Roxb. Fl. Ind. ii. 39), it is a climber; the racemes weak, curved, axillary, sometimes 2 from the same axil, and seems nearer *F. racemosa* than the present species. The whole may be (as Bentham considers) one; but the *F.*
racemos@ of the Malay Peninsula is well represented in the herbarium and uniformly differs from all the Malay F. morindefolia.

10. **F. ligustrina**, Blume Rumph. ii. 33, and Mus. Bot. i. 171; leaves elliptic not very large, racemes terminal slender erect short, calyx $\frac{1}{2}$ in., corolla-tube $\frac{1}{2}$ in. narrowly funnel-shaped upwards. *Benth. in Journ. Linn. Soc.* i. 100.

**Singapore, Lobb.—Distrib. Malaya, Philippines.**

Arborescent (Blume); branches round, slender. Leaves $\frac{1}{2}$ by 2 in., suddenly acute, base broadly cuneate; petiole $\frac{1}{2}$ in. *Peduncle* 1 in.; raceme 1 in.; pedicels $\frac{1}{8}$ in., subsessile on the nodes of the rhachis. Calyx divided halfway down; lobes round. Corolla much slenderer than in the preceding 3 species, $\frac{1}{16}$ in. wide below; throat scarce $\frac{1}{4}$ in. wide; lobes $\frac{1}{4}$ in., round.

***Flowers small, in compound corymbs.***


**From Martaban and Andaman Islds. to Singapore; frequent.—Distrib. Malaya.**

A small tree, 25–30 ft. Leaves 4 by $\frac{1}{2}$ in., shortly acute at both ends; petiole $\frac{1}{16}$ in.; stipules often connate. Coryumbs axillary towards the ends of the branches, often 50–100-flowered, sometimes 6–8-flowered; pedicels $\frac{1}{2}$ in. Calyx deep divided, lobes round. Corolla subcylindric below; throat $\frac{1}{4}$ in. wide; lobes $\frac{1}{4}$ in., obtuse. Stamens much exerted. *Berry* "$\frac{1}{4}$ in., subglobose, reddish," *Kurz.*


**Penang, Wallich, Maingay.**

Leaves 4 by $\frac{1}{2}$ in., acute at both ends; petiole $\frac{1}{2}$ in. Corymbs terminal and axillary, 3-flld. mostly where attached (but the detached flowers are very numerous sent by Maingay); pedicels $\frac{1}{2}$ in. Corolla-tube narrowly funnel-shaped from the middle upwards; throat $\frac{1}{4}$ in. wide; lobes $\frac{1}{4}$ in., elliptic, obtuse. Berries $\frac{1}{4}$ in., ellipsoid, subacute.—This seems very near *F. fragrans*, but has a larger calyx, corolla, and berry, while the corymb is more slender.

### 5. NORRISIA, Gardn.

A shrub; young parts pubescent. Leaves opposite; petioles dilated at the base, subcuneate. *Cymes* dense, trichotomous, in terminal corymb. Flowers small, white? Calyx small, 5-lobed. Corolla-tube narrow, cylindrical; lobes 5, small, ovate, valvate. Stamens 5, on the corolla-throat, filaments filiform; anthers ovate. Ovary 2-celled; style filiform, stigma capitate; ovules in each cell very many. Capsule oblong, septicidally 2-valved; carpophore finally free. Seeds very many, tests lax 4–6 times as long as the linear ciliate nucleus, albumen fleshy; embryo straight or curved.


**Malacca, Griffith, Maingay.—Distrib. Borneo.**

Branchlets round, fulvous-villos. Leaves 3 by $\frac{1}{2}$ in., shortly acute at both ends, fulvous-villos beneath or finally glabrescent except the midrib; nerves 7 pairs,
oblique, strong, secondary distinctly reticulate; petiole \( \frac{1}{4} \) in. \textit{Cymes} in dense heads \( 3-1\frac{1}{2} \) in. diam., villous or tomentose. \textit{Calyx} \( \frac{1}{4} \) in. \textit{Corolla-tube} \( \frac{1}{4} \) in., grey or fulvous hairy without; lobes \( \frac{1}{4} \) in. \textit{Capsule} \( \frac{1}{4} \) by \( \frac{1}{4} \) in., fulvous-tomentose, the 2 elliptic valves finally splitting again from their tops. \textit{Seeds} minute.

6. \textbf{STRYCHNOS}, Linn.

Scandent shrubs with short tendrils, or trees. \textit{Leaves} opposite, 3-5-nerved (except sometimes \textit{S. potatorum}); scandent species bear short clavate tendrils in some of the axils, the adjacent leaf then often suppressed; in the sub-terminal axils both tendrils often developed, both the leaves and the point of the branch then generally suppressed, in which case the species has been said to produce terminal bifurcate tendrils. \textit{Cymes} terminal or lateral; bracts small; flowers white or yellowish. \textit{Calyx} small, 5-4-lobed. \textit{Corolla} 5-4-fid; tube short or long or hardly any; lobes valvate. \textit{Stamens} 5, on the corolla-tube, filaments short. \textit{Ovary} 2-celled (or 1-celled above); style long or short or hardly any, stigma capitate or small or sub-2-lobed; ovules many in each cell. \textit{Berry} globose or oblong, many- (or 2-1-) seeded. \textit{Seeds} globose, discoid or oblong, albumen horny; embryo small.—Species 60; in the tropics of both hemispheres.

\textit{Strychnos grandis}, Wall. Cat. 4454, is Anisophyllea grandifolia, \textit{G. Henslow} (vol. ii. p. 442). \textit{Strychnos} sp. Wall. Cat. 7500, with subalternate leaves, is not of this Order.

* Corolla-tube shorter than the calyx or hardly any.

1. \textbf{S. hypogyna}, Clarke: leaves elliptic-lanceolate 3-nerved glabrous, cymes axillary sessile compound pubescent, petals 5 hardly connate, ovary hairy.

\textit{Tenasserim}; Mergui, \textit{Griffith} (Kew Distrib. n. 3830).—District. Borneo. Tendrils 0 on the examples; branchlets glabrous. \textit{Leaves} \( \frac{1}{4} \) by \( \frac{1}{4} \) in., base broadly rhomboid; petiole \( \frac{1}{4} \) in. \textit{Cymes} 1-2 in.; pedicels hardly any. \textit{Calyx} pubescent. \textit{Petals} \( \frac{1}{4} \) in., villous within. \textit{Stamens} obscurely attached to the petals, sometimes persistent after the petals have gone, filaments sometimes villous; anther-cells oblong, glabrous or nearly so. \textit{Ovary} hairy; style hardly any. \textit{Fruit} not seen.

2. \textbf{S. acuminata}, Wall. Cat. 1583 in part; leaves ovate acute 5-nerved glabrous, cymes axillary weak minutely pubescent, petals 5 shortly connate, ovary hairy. \textit{Kurz} For. Fl. ii. 166, \textit{not of} \textit{A. DC}.


A large climber, with tendrils, \textit{Kurz}. \textit{Leaves} \( 4\frac{1}{2} \) by \( 2\frac{1}{4} \) in., base cuneate obtuse rounded or subobtuse, marginal nerves distinct; petiole \( \frac{1}{4} \) in. \textit{Cymes} 1-2 in., sub-sessile, lax; pedicels \( 0-1\frac{1}{4} \) in. \textit{Calyx} minutely pubescent. \textit{Corolla} \( \frac{1}{4} \) in.; petals free, glabrous \textit{Kurz} (shortly connate and villous within in \textit{Helfer}'s). \textit{Berry} \( \frac{1}{4} \) in. diam., crustaceous, 1-2-seeded. \textit{Seeds} \( \frac{1}{4} \) in. diam., discoid.—\textit{Kurz}'s examples are in ripe fruit; Wallisch's are leaves only; on his A sheet are two plants, one (b) with 5-nerved leaves is that taken up by \textit{Kurz}.

3. \textbf{S. micrantha}, \textit{Thwaites} Enum. 425; leaves elliptic acuminate sub-5-nerved glabrous, cymes axillary short dense minutely hairy, corolla-lobes 5 oblong 3-4 times longer than the tube, ovary glabrous.

\textit{Ceylon}; not uncommon, \textit{Thwaites} (C. P. 3720, 1866). Tendrils often in pairs. \textit{Leaves} \( 2\frac{1}{4} \) by \( 1\frac{1}{4} \) in., widest often above the middle, base cuneate or obtuse, nerves not impressed above; petiole \( \frac{1}{4} \) in. \textit{Cymes} 1-2 in.; pedicels \( 0-\frac{1}{4} \) in. \textit{Calyx} minutely pubescent. \textit{Corolla} \( \frac{1}{4} \) in.; tube exceedingly short; lobes
villous within. *Anther-cells* oblong, sparingly villous or glabrous. *Style* as long as the ovary. *Berry* $\frac{4}{5}$ in. diam., crustaceous, 1-2-seeded. *Seeds* $\frac{1}{3}$ in. diam., discoid.—Thwaites says the ovary is villous, but it is absolutely glabrous in C. P. n. 3720. This is the only constant character to distinguish it from *S. colubrina*.


W. Deccan Peninsular, from the Concan to Cochin, frequent.

Tendrils often in pairs. *Leaves* 4 by $\frac{1}{4}$ in., base cuneate or obtuse; nerves not impressed above, marginal pair obscure; petiole $\frac{1}{2}$ in. *Cymes* 1-2 in.; pedicels $0-\frac{1}{12}$ in. *Calyx* puberulous. *Corolla* $\frac{1}{10}$ in., tube hardly longer than the calyx, lobes villous within. *Anther-cells* oblong, glabrous, or nearly so. *Ovary* glabrous below, fulvous-hairy upward; *style* as long as the ovary. *Berry* $\frac{4}{5}$ in. diam., crustaceous, 1-2-seeded. *Seeds* $\frac{1}{3}$ in. diam., discoid.—All authors previous to Bentham took *Rheed Hort. Mal.* viii. t. 24 as the type of Linnaeus' *S. colubrina*, whereas Linnaeus found his *S. colubrina* on t. 5, which has totally different fruit, and on which Blume founded his *S. minor*. Hence the confusion of synonyms.

Var. *seylamica*; leaves rhomboid cuneate at both ends coriaceous 5-nerved, ovary glabrous.—Ceylon; *Thwaites* C. P. 2516, &c. This is taken by Thwaites as *S. colubrina*, Linn.

5. **S. Dalzellii**, Clarke; leaves ovate acute 3-nerved glabrous, cymes very short dense axillary and terminal puberulous, corolla-lobes 5 oblong 2-3 times as long as the tube, ovary glabrous. *S. axillaris*, *Dals. & Gibbs. Bomb. Fl.* 155, *not of Colebr*.

W. Deccan Peninsular; Concan, Malabar and Bababoodan Hills; Low, Dalzell, Ritchie.

Scandent, Ritchie, no tendrils on the specimens. *Leaves* 4 by $\frac{1}{4}$ in., widest near the cuneate or rounded base, coriaceous, nerves often impressed above; petiole $\frac{1}{2}$ in. *Cymes* $\frac{1}{3}-\frac{1}{2}$ in., subcapitate. *Calyx* puberulous. *Corolla* $\frac{1}{10}$ in., tube hardly longer than the calyx-lobes, villous within. *Anther-cells* ovate, hairy. *Style* as long as the ovary. *Berry* 1-1$\frac{1}{2}$ in. diam., crustaceous, many-seeded. *Seeds* $\frac{1}{3}$ in. diam., discoid.


Ceylon, frequent; *Thwaites*, &c.

Tendrils often present. *Leaves* 2 by 1 in., base obtuse or rounded, secondary nerves distinct; petiole scarcely $\frac{1}{3}$ in. *Cymes* $\frac{1}{4}$ in. diam.; pedicels hardly any. *Calyx* glabrous, margin puberulous. *Corolla* $\frac{1}{3}$ in., villous within. *Anther-cells* ovate, hairy. *Style* as long as the ovary. *Berry* $\frac{4}{5}$ in. diam., crustaceous, 1-2-seeded. *Seeds* $\frac{1}{3}$ in. diam., discoid.—The 5-merous species referred to by Bentham is *S. miranatha*, Thwaites. *S. minor*, Blume, is founded on *Rheed Hort. Mal.* viii. t. 24, which has totally different fruit.

Var. *parviflora*, Bentham, *in Journ. Linn. Soc*. i. 101; *leaves* $\frac{1}{3}$ by $\frac{1}{3}$ in. coriaceous with recurved margins.—Ceylon, Gardner, &c.

7. **S. Rheediei**, Clarke; leaves short-petioled elliptic acute 3-nerved, cymes small peduncled few-fld. lax, corolla short-tubed 5-merous, berry very

MALABAR; Rheed.

Tendrils present; branches stout. *Leaves* $\frac{3}{4}$ by $\frac{1}{2}$ in., base obtuse or rounded; petiole $\frac{1}{2}$-in. *Peduncles* $\frac{1}{2}$ in., axillary, 3-4-flowered; pedicels $\frac{1}{2}$-in. *Berry* $\frac{1}{2}$ in. diam., globose. *Seeds* $\frac{1}{4}$ in. diam., circular, discoid.—Only known from Rheed's figure, which may be incorrect as to the flowers. It appears from Roxb. *Fl. Ind. ed. Carey & Wall.* ii. 264, and from Beddome, that there probably exists a stout scandent species in Malabar with fruit like *S. Nux-vomica.* (See 16, *S. cinnamomifolia*.)

8. *S. Maingayi*, Clarke; leaves elliptic acute 3-nerved glabrous, cymes large dense very many-fl., corolla-lobes 5 linear-oblong 5 times as long as the tube, ovary hairy upwards.

MALACCA, Maingay (*Kew Distrib.* n. 1041, 1042).

Branches glabrous; tendrils 0 (in the examples). *Leaves* $\frac{4}{3}$ by 2 in., base obtuse; petiole $\frac{1}{2}$ in. *Cymes* 4 in., divided from the base, nearly glabrous 100-300-flowered. *Calyx* glabrous, margin obscurely pubescent. *Corolla* $\frac{3}{2}$ in., throat villous, tube hardly any. *Filaments* linear; anther-cells ovate, hairy. *Style* twice as long as the ovary. *Berry* not seen.

VAR. *fructuosa*; bearing tendrils, berry $\frac{2}{3}$ in. diam. globose, rind thick, seeds many $\frac{2}{3}$ by $\frac{1}{2}$ in. oblong-ellipsoid, tests silky, albumen horny, embryo small.—Penang; *Maingay* (*Kew Distrib.* n. 1038). This may be the fruiting state of *S. Maingayi,* or of some totally different species. The seeds closely resemble those of *S. Ignattii.*

Bergius (Bentl. & Trim. Medic. Pl. t. 179).

**Corolla-tube longer than the calyx, not much longer than its lobes.**


CACHAR; Keenan. *Pegu and Tenasserim to Singapore, common; Wallach, Griffith, &c.—Distrib. Burma, Malaya.*

Tendrils often in pairs; branchlets glabrous. *Leaves* 5 by 2 in., lanceolate, or in *S. ovatifolia*, Wall. 5 by $\frac{2}{3}$ in. and ovate-lanceolate, 3- or sub-5-nerved; petiole $\frac{1}{3}$ in. *Cymes* 2-5 in., axillary and terminal, sessile (or in *S. ovatifolia* peduncled); pedicels 0-1 in. *Calyx* glabrous, or margin obscurely pubescent. *Corolla* $\frac{1}{2}$ in., villous within; tube rather longer than the lobes. *Anther-cells* oblong, slightly hairy. *Style* much longer than the ovary, hairy downwards.—There are no tendrils on Walllich's examples of *S. ovatifolia*, which Mr. Bentham considers, though imperfect, to indicate a distinct species.

10. *S. septemnervis*, Clarke; leaves elliptic acute 5-7-nerved glabrous, cymes stout large fulvous-pubescent, ovary hairy, berry 1 in. diam. globose 1-seeded.

MALACCA; *Maingay* (*Kew Distrib.* n. 1036).

Scandent, *Maingay*. *Leaves* 4 by $\frac{2}{3}$ in.; petiole $\frac{1}{2}$ in. *Cymes* 2-5 in., sessile, very many-fl. *Calyx* puberulous. *Corolla* $\frac{3}{2}$ in., villous within; tube about as long as the lobes. *Anther-cells* oblong, hairy. *Style* longer than the ovary, hairy downwards.—Perhaps only a large-flowered variety of *S. laurina,* but the nervation of the leaves differs considerably.

Travancore; Beddome. Ceylon; Thwaites.

Tendrils often in pairs; branchlets glabrous. Leaves \( \frac{3}{2} \) by \( \frac{1}{2} \) in., base obtuse, rarely obscurely 6-nerved; petiole \( \frac{1}{3} \) in. Cymes \( \frac{1}{4} - \frac{1}{2} \) in., sessile; pedicels \( \frac{1}{2} - \frac{1}{4} \) in. Calyx puberulous. Corolla \( \frac{1}{2} \) in., villous within; tube rather longer than the lobes. Anther-cells oblong, glabrous or nearly so. Style longer than the ovary, hairy downwards. This differs from S. laurina in the small cymes, pedicelled flowers, and much smaller berry. It seems more closely allied to S. colubrina, Linn., from which it only differs by the longer corolla-tube.

Vár. coriacea; leaves coriaceous, petiole \( \frac{1}{3} \) in. S. coriacea, Thwaites Enum. 425.

—Ceylon; Thwaites.

12. S. malacensis, Benth. in Journ. Linn. Soc. i. 101; leaves ovate acute 5-nerved glabrous, cymes small subcapitate shortly peduncled fulvous-puberulent, ovary glabrous. S. Gautheriana, Pierre ms. in Herb. Kew.

Tannaserim or Andamans; Heffer, Malacca; Griffith.—Distrib. Cambodia.

Tendrils present; branchlets puberulous. Leaves \( \frac{3}{2} \) by \( \frac{1}{2} \) in., base obtuse; petiole \( \frac{1}{3} \) in. Peduncles \( \frac{1}{2} - \frac{1}{3} \) in.; cymes \( \frac{1}{3} \) in. diam.; pedicels hardly any. Calyx puberulous. Corolla \( \frac{1}{2} \) in., villous within, tube shorter than the lobes. Anther-cells ovate, densely hairy. Berry not seen.—Easily distinguished by the perfectly glabrous ovary and style, and densely hairy anthers.


Khassia Mts., alt. 3-4000 ft; Wallich, Griffith, H. f. & T.

Tendrils present; branchlets puberulous. Leaves \( 2 \) by 1 in., base obtuse; petiole \( \frac{1}{3} \) in. Cymes \( \frac{1}{2} - \frac{1}{3} \) in.; pedicels hardly any. Corolla \( \frac{1}{3} \) in., villous within, tube shorter than the lobes. Anther-cells subsessile below the ring of hairs, ovate, acute, apiculate, base only hairy. Ovary small, style hardly any. Pericarp crustaceous. Seeds \( \frac{1}{2} \) in. diam., peltate, hemispheric.

14. S. pubescens, Clarke; leaves ovate acute 3–5-nerved hairy beneath, cymes small axillary dense, ovary glabrous, berry \( \frac{1}{3} \) in. diam. globose 1-seeded.

Malacca; Maingay (Kew Distrib. n. 1040).

Tendrils present; branches hairy. Leaves 2 by 1 in., base obtuse; petiole \( \frac{1}{3} \) in. Cymes \( \frac{1}{2} - \frac{1}{3} \) in. diam., sessile or nearly so, puberulous, pedicels hardly any. Corolla \( \frac{1}{3} \) in., 5-merous, tube longer than the lobes, throat with a dense ring of hairs. Anther-cells subsessile below the ring of hairs, ovate, acute, apiculate, base only hairy. Ovary small, style hardly any. Pericarp crustaceous. Seeds \( \frac{1}{2} \) in. diam., peltate, hemispheric.

15. S. rufa, Clarke; leaves elliptic acute 3–5-nerved rufous-hairy beneath, cymes dense axillary, berry \( \frac{1}{3} \) diam. globose many-seeded.

Malacca; Maingay (Kew Distrib. n. 1034).

Branches patently rufous hairy, without tendrils (in the specimen). Leaves \( 4 \) by 2 in., base obtuse or subordurate, glabrescent above, harsh, scabrous; petiole \( \frac{1}{4} \) in., rufous-hairy. Cymes \( \frac{1}{2} \) in. diam., axillary, sessile, pubescent. Flowers not seen. Seeds compressed.

Vár. Candolei; leaves nearly glabrous beneath 3-nerved. S. acuminata, Wall. Cat. 1593 partly; A. DC. Prodr. ix. 14.—Amherst, Wallich.

*** Corolla-tube linear, 5–10 times longer than the calyx.

16. S. cinnamonomifolia, Thwaites Enum. 201; leaves elliptic acute 3–5-nerved glabrous, cymes terminal short-peduncled many-fl., berry \( \frac{1}{3} \) in. diam.
globose many-seeded. *S. colubrina, Wall. Cat. 1588,* and in Roxb. *Pl. Ind. ed. Carey & Wall,* ii. 264; *Wight* in t. 434, not of Linn.

**Note:** Hantani district, alt. 3000 ft., Thawites.

Tendrils present; branchlets glabrous or nearly so. *Leaves* 4 by 2 in., base obtuse; petiole \( \frac{1}{2} \) in. *Peduncles* \( \frac{1}{2} \) 2 in.; cymes 1-2 in., diam., puberulous; pedicels barely any. *Corolla-tube* \( \frac{1}{2} \) in., lobes less than \( \frac{1}{4} \) in. glabrous, a few hairs lower down the tube. *Anther-cells* oblong, glabrous. *Ovary* glabrous; style very long, glabrous, stigma large, capitulate. Altogether resembles *S. Nux-vomica*, but is scantier with tendrils. Though Rheede (*Hort. Mal.* viii. t. 24) represents the peduncles lateral and the buds subglobose, it may be suspected that Wallich and Wight were right in identifying that picture with their *S. colubrina*. If so, *S. Rheedei* (n. 7 above) becomes a synonym of the present species.


**Silhah:** Pundua, Wallich. *Assam*; Kufco Forest, Griffith (Kew Distrib. n. 3726); Mitkir Hills, Simons.

Tendrils often in pairs. *Leaves* 54 by \( \frac{1}{3} \) in., parallel-sided, base broadly cuneate, 3 nerves very strong, 2 additional sometimes close to the margin very slender; secondary nerves very prominent, numerous, subparallel, nearly at right angles to the primary; petiole \( \frac{1}{6} \) in. *Cymes* and flowers as in *S. Nux-vomica* or *S. cinnamomifolia*. *Corolla* very villous in the throat. *Anther-cells* broadly oblong, obtuse. Style exsert stigma small. *Berry* unknown.—Wallich’s n. 1590 includes this and *S. Nux-vomica*, whence Steudel’s name *S. Wallichiana* applies to both; A. DC.’s *S. Wallichiana* (Prodr. ix. 18), from the ovate leaves and naked corolla-throat, seems described from one of Wallich’s examples of *S. lucida* which have been since referred by Bentham to *S. Nux-vomica*. The broader shorter leaved specimens of this species, mentioned by Bentham, are those collected by H. f. & T. at the base of the Khasia Hills, without flower or fruit, and in which the lower leaves are ovate; they look like first year’s shoots.


Throughout tropical *India*, alt. 0-4000 ft.; rare in Bengal, common in Tenasserim and Madras.

A tree, attaining 40 ft. *Leaves* 3\( \frac{1}{2} \) by 2 in., base obtuse; petiole \( \frac{1}{2} \) in. *Peduncles* \( \frac{1}{2} \) 2 in.; cymes 1-2 in., diam., puberulous; pedicels hardly any. *Corolla-tube* \( \frac{1}{2} \) \( \frac{1}{2} \) in.; lobes less than \( \frac{1}{4} \) in. glabrous, a few hairs lower down the tube. *Anther-cells* oblong, glabrous. *Style* long, glabrous, stigma small capitulate. Seeds \( \frac{1}{4} \) in. diam., discoid.—Bentham also reduces to the present species *S. ligustrina* (*Blume Rumph.* i. 68, t. 25), which does not differ by any tangible character, but has smaller, somewhat different-looking leaves.

Decan Peninsula, extending north-west to the Sone river. Promb; Kurz. Ceylon frequent.

A tree, attaining 40 ft. Leaves 2½ by 1 in., acute at both ends, hardly acuminate, 3-nerved from the base or more often the lateral nerves springing much higher, or (as depicted by Roxburgh) sub-pinninerved; petiole ½ in. Peduncles 0½ by in.; cymes 1 in. diam., nearly glabrous; pedicels hardly any. Corolla-tube ½ by in., hardly twice as long as broad, hairy within, nearly glabrous in the throat; lobes ½ by in. Anther-cells oblong, glabrous. Style long, glabrous; stigma small, capitate. Seeds ½ by in. diam., hemispheric, subpellate, hardly discoid.—The clearing-nut.


Trees or shrubs. Leaves opposite, rarely ternate, entire, coriaceous, feather-nerved; stipules connate into a cylindrical sheath. Cymes terminal (axillary in G. obesa) many- (or 3–1–) flowered. Calyx small, funnel-shaped or campanulate. Corolla-tube longer than the calyx or elongate; lobes 5–4, valvate in bud. Stamens upon the corolla-tube; filaments short. Ovary 2-celled; style short or long, stigmas 2 linear or clavate; ovule 1 in each cell, erect. Berry didymous, subglobose, crustaceous. Seeds often compressed, albumen horny or fleshy; embryo small.—Species 25; tropical Asia and Africa.

So closely resembling Psychotria (except for the inferior ovary) that it has been confounded therewith, and it has been proposed to append the genus to Psychotria as an aberrant section. Psychotria, Wall. Cat. 8341, without habitat, is a Gaertnera, but probably non-Indian.


Singapore; Wallich. Ceylon; alt. 0–3000 ft., very abundant, Thwaites, &c.—DISTRIBUT. Malay.

A large shrub. Leaves 6 by 2½ in., base narrowed; petiole ½ by in. Panicles 2–6 in., pubescent or nearly glabrous, sometimes with leafy bracts below; pedicels 0½ by in. Calyx ½ by in. long and broad. Corolla-tube ½ by in., throat very villous. Anther-cells ½ by in., slightly exserted. Berry ½ by in., obovoid or subglobose.—The flowers are, as stated by Beddome, somewhat dimorphic.

Var. oxyphylla; leaves smaller lanceolate acuminate, style short, stigmas small linear. Psychotria oxyphylla, Wall. Cat. 8374; Benth. in Journ. Linn. Soc. i. 112. —Singapore, Wallich. United with G. Koenigii by Thwaites; the differences in the stigmas are probably sexual.

Var. diversea; panicle lax, pedicels divaricate, flowers rather smaller. G. divaricata and Pristidea divaricata, Thwaites Enum. 149 and 420.—Ceylon; Thwaites. United with G. Koenigii by Beddome, and it does not seem separable from some of the Ceylon G. thysiflora which has flowers smaller than usual in lax panicles.

2. G. viminea, Hook. f. ms.; leaves lanceolate caudate-acuminate glabrous, panicles terminal trichotomous, calyx very small subellate, corolla 4-merous tube 2–3 times as long as the calyx, stigmas linear. Psychotria viminea, Wall. Cat. 8364.

Singapore; Wallich.

Branchlets terete, smooth. Leaves 2½ by ½ in., base cuneate; petiole ½ by in.
Panicles 1-4 in., nearly glabrous; lowest bracts sometimes \( \frac{3}{4} \) in., linear; pedicels hardly any. Calyx scarcely \( \frac{1}{16} \) in. long and broad. Corolla-tube \( \frac{1}{8} \) in., throat villous. Berry \( \frac{1}{2} \) in., obvoid-globose.


Ceylon; *Walker*; ascending to 2000 ft.; *Thwaites*.

A shrub, 8-10 ft. Leaves 2\( \frac{1}{4} \) by 1 in.; base cuneate; petiole \( \frac{1}{4} \) in.; stipular sheath crowned by two linear teeth. Calyx \( \frac{1}{2} \) in., campanulate, subtruncate. Corolla rose-purple, tube \( \frac{1}{4} \) in., hairy in the middle; lobes \( \frac{1}{2} \) in., oblong. Stamens on the middle of the tube; anther-cells oblong, obtuse, included. Berry \( \frac{1}{4}-\frac{1}{2} \) in. diam., subspherical, "pale blue," *Thwaites*.


Ceylon; alt. 3-6000 ft.; *Walker*, &c.

A shrub, 8-10 ft. Leaves 2\( \frac{1}{4} \) by 1 in., base cuneate; petiole \( \frac{1}{4} \) in. Cymes 3-12-fl.; bracts \( \frac{1}{2} \) in. lanceolate; pedicels 0-\( \frac{1}{4} \) in. Calyx \( \frac{3}{8} \) in. long and broad; teeth small, triangular. Corolla-tube \( \frac{3}{8} \) in., funnel-shaped upwards. Stamens inserted about the middle of the corolla-tube amidst hair. Berry spherical, "blue," *Thwaites*.

Resembles the smaller-leaved forms of *G. Koennigii forma thyrsiflora*, and does not much differ but by the stamens (with the ring of hairs) being situated lower down the corolla-tube, a point not properly shown in Wight's figure.

Var. *Gardneri*; leaves 1\( \frac{1}{2} \) by \( \frac{1}{4} \) in. linear-lanceolate, cymes 3-1-flowered obscurely pubescent, flowers rather smaller. G. Gardneri, *Thwaites Enum.* 202.—*Ceylon*.

5. **G. ternifolia**, *Thwaites Enum.* 212; leaves small linear often ternate, flowers solitary terminal, calyx-teeth lanceolate, berry \( \frac{1}{4} \) in. wide didymous subglobose. G. Walkeri, var. angustifolia, *Benth. in Journ. Linn. Soc.* 1. 111, partly.

Ceylon; near Adam's Peak, alt. 4-6000 ft.; *Thwaites*.

Branchlets minutely pubescent. Leaves \( \frac{1}{2} \) by \( \frac{1}{4} \) in. Flowers as *G. Walkeri* var. *Gardneri*.—*Thwaites* calls this a very beautiful and distinct species, but sends a specimen stated to be "an undoubted hybrid between *G. Gardneri* and *G. ternifolia*;" some of the leaves on his specimens of *G. Gardneri* (C. P. n. 383) are ternately whorled: Mr. Bentham considers all to be merely high-level forms of *G. Walkeri*.


Singapore; Wallich, *Walker*, Maingay.

Leaves 17 by 5\( \frac{1}{2} \) in., base tapering; petiole 1\( \frac{1}{4} \) in.; stipules \( \frac{1}{4} \) by \( \frac{1}{2} \) in., ovate, acute, connate for half their length. Panicles 2-3 in., dense, obscurely pubescent, from the upper axils forming a quasi-thyrs. Calyx \( \frac{1}{4} \) to \( \frac{1}{2} \) in. long and broad. Corolla-tube \( \frac{3}{8}-\frac{1}{2} \) in., lobes \( \frac{1}{2} \) in. Stamens near the base of the tube; anther-cells lanceolate-linear below the ring of hairs on the corolla-tube. Style short, linear, glabrous; stigmas linear, Berry not seen.

Singapore; Wall. Benth.

Branches softly hairy. Leaves 9½ by 2½ in., base cuneate or rounded; petiole ¼ in.; stipular sheath silky, ½ in. long, crowned by 2–4 teeth. Panicles 1–3 in. diam. trichotomous, grey-pubescent; lower bracts sometimes leaflike; flowers clustered. Calyx ¼ in. long and broad, campanulate, grey-pubescent. Corolla-tube ¼ in., lobes ½–⅓ in. Anther-cells narrow oblong, immersed in the dense hair in the upper part of the corolla-tube which hardly extends to the throat.—This and the preceding species are allied to G. longifolia, Bojer, and other large Mascarene species.

8. GARDNERIA, Wall.

Large, scandent, glabrous shrubs. Leaves opposite, entire; petioles connected by a stipulary line. Peduncles axillary, 1–co-flld. Calyx small, deeply 4–5-lobed. Corolla subrotate; lobes 4–5, thick, valvate in bud. Stamens 4–5, on the corolla-tube; anthers subsessile, cells ovate, connivent or subconnate, erect, exserted. Ovary 2-celled; style cylindric, stigma shortly 2-lobed; ovules 1 in each cell, on the dissepiment. Berry globose, 2-celled. Seed compressed parallel to the septum, albumen fleshy; embryo small.—Species 2–3, Indian and Japanese.


Temperate Himalaya, alt. 5–7000 ft.; from Kumaoon to Bhutan; Wallich, &c.

Leaves ⅛ by 1 in., base acute or rounded; petiole ¼ in. Peduncles nodding in flower. Corolla-lobes densely villous or nearly glabrous within. Berry ¼ in. diam., scarlet.—Closely allied to G. ovata, which Bentham reduces to the present species, with G. nutans, Sieb. & Zucc. from Japan, which has elliptic acute leaves and rather larger flowers; and may be a geographic form of G. angustifolia.

Order XCVII. GENTIANACEAE. (By C. B. Clarke)

Herbs, rarely minutely hairy. Leaves opposite, rarely alternate, entire, or alternate and 3-foliate in Menyanthes. Flowers cymose capitate or umbellated, rarely solitary, rarely bracteate, regular; irregular in Canescora and Hoppea. Calyx inferior, lobes 5–4 imbricate in bud. Corolla funnell-shaped or rotate, lobes twisted to the right, in Menyanthes induplicate-valvate. Stamens on the corolla-tube, as many as its lobes and alternate with them, or unequal or suppressed in Canescora and Hoppea; filaments linear, sometimes dilated.
below; anthers oblong. Disc of 5 glands at the base of the ovary or 0. Ovary superior, 1-celled, or rarely only the placenta intruded and meeting; style short or linear, simple, stigmas 2 small; ovules numerous. Capsule membranous, rarely fleshy and herried. Seeds numerous, small, sometimes winged; albumen copious.—Species 520, throughout the globe, more abundant in mountainous regions.


Leaffless parasites, anthers dehiscing by terminal pores.
1. Cotylanthera.
2. Exacum.

TRIBE II. CHIRONEAE. Leaves opposite. Corolla-lobes twisted to the right. Ovary 1-celled. Style filiform.

Flowers regular in axillary clusters.
5. Enicostema.
Flowers regular panicked or terminal subcapitate.
Flower irregular, stigmas scarcely divided, minute herbs.
4. Hoppea.
Flower irregular, stigmas 2.
7. Canscora.

TRIBE III. SWERTIEAE. Leaves opposite, rarely alternate. Corolla-lobes twisted or imbricate. Ovary 1-celled: Style short, rarely elongate.

* Corolla without pits or depressions near the base of its lobes (viscid spots or hairy glands sometimes present).

Twiners, corolla tubular-campanulate.
8. Crawfurdia.
Corolla tubular-campanulate, stamens attached on the tube.
Corolla tubular-campanulate, stamens attached between its lobes.
Corolla rotate, stamens attached at its base.
11. Pleurogyne.

** Corolla with 1 or 2 depressions pits or spurs near the base of each of its lobes.

Depressions or pits of the corolla shallow.
12. Swertia.
Pits of the corolla prolonged into spurs.
13. Halenia.

TRIBE IV. MENYANTHEAE. Aquatic herbs, leaves radical or alternate. Corolla-lobes induplicate-valvate in the bud.

Leaves 3-foliolate.
Leaves simple, cauline deeply cordate.
15. Limnanthemum.

1. Cotylanthera, Blume.


1. C. paucisquama, Clarke in Herb. Calcutta; pairs of scales on the stem 1-2 only.

Sikkim; alt. 6000 ft., King.

with two pores, King. Style $\frac{3}{4}$ in. Fruit not seen.—Cotylanthera tenuis, Blume Bijd. 708, and Eophylon Lobbii, A. Gray in Journ. Linn. Soc. xi. 23, differ chiefly by having numerous pairs of leaves on the stem; but all may be one species.

2. EXACUM, Linn.

Herbs, usually branched. Leaves ovate or lanceolate, usually 3-5-nerved. Corolla terminal and axillary. Calyx deeply 4-5-lobed; lobes keeled, winged, or flat. Corolla rotate; tube short, globose; lobes 4-5, ovate or oblong, blue-purple-blue or white. Stamens 5-4, on the corolla-throat, filaments short; anthers large, oblong, apical pores at length extending usually to the base. Ovary more or less completely 2-celled; style long, stigma small subcapitate; placenta large. Capsule globose, septicidally 2-valved. Seeds very many, minute, subcuboid, testa granular.—Species 20, mostly Indian; a few Malayan, Chinese, and African.

* Stem 4-angular (except E. teres); corolla large, lobes 4, blue.


Tropical Himalaya, alt. 0-5000 ft.; from Nepal to Bhotan, frequent. Assam and Khasia Mts., alt. 0-4000 ft., frequent.

Stem 1-4 ft., hardly branched, sometimes with 2-4 obscure lines. Leaves $\frac{3}{4}$ by $\frac{3}{4}$ in., sessile or the lower petiolated, acute. Cymes from the upper axils forming a lax long panicle. Calyx-lobes $\frac{3}{4}$ in. ovate, acute, with thickened green keels. Corolla-lobes $\frac{3}{4}$ in., obovate-oblong, acute. Anthers $\frac{3}{4}$ in. Style $\frac{3}{4}$ in. Capsule $\frac{3}{4}$ in., ovoid.

—Reduced states occur at the higher levels.


N. India, ascending to 5000 ft., common from Kumaon to Central India, Bhotan, and the Khasia Mts.—Distr. China.

Stem 1-4 ft., little branched below. Leaves 5 by $1\frac{1}{2}$ ft., acute, or $1\frac{1}{2}$ by $\frac{3}{4}$ in., subobtusae. Panicle large and compound, or dopauperated few-fld. Buds nearly straight, and corolla subsymmetric. Calyx-lobes $\frac{1}{2}$ by $\frac{3}{4}$ in., sometimes sub-3-winged. Corolla-lobes $\frac{3}{4}$ in., broadly elliptic, acute, full azure blue (not violet-purple as depicted by Wallich, nor golden yellow as stated by Don). Style $\frac{3}{4}$ in. Capsule $\frac{3}{4}$ in., subglobose.

Var. stylosa; leaves narrower, corolla smaller, anthers rather longer more attenuate. E. stylosa, Wall. Cat. 4355; Grieseb. in DC. Prodr. ix. 46. E. chironioides, Grieseb. Gentian. 109, and in DC. Prodr. ix. 45. E. Horsfeldianum, Mig. Fl. Ind. Bat. ii. 556. E. sulcatum, Clarke in Journ. Linn. Soc. xiv. 425, not of Roxb.—Burma; Prone, Wallich. Tenasserim; Mergui, Griffith (Kew Distr. n. 5869); Pegu, McCllland; Malacca, Lobh.—Distr. Malaya to Borneo and the Philippines.—A few flowers on the Pegu example are 5-merous.

3. E. Perrottetii, Grieseb. in DC. Prodr. ix. 45; stem quadrangular, leaves sessile 5-7-nerved, calyx-lobes ovate-lanceolate keeled, anthers $1\frac{3}{4}$ in. straight. Wight Ic. t. 1322.
W. Deccan Peninsula; from the Concan southwards.


*Deccan Peninsula*, frequent from the Concan and Orissa to Corullum.

Considered by Mr. Bentham only a form of *E. tetragrornum*, but differs from that (and the larger *E. Perrottetii*) in the unsymmetric flowers, the buds distinctly curved at the tips, and the anther-cells curved and tapering upwards. The calyx-lobes do not taper gradually as in *E. Perrottetii*. The flowers are larger than those of *E. tetragrornum*, smaller than those of *E. Perrottetii*. The corolla-segments are (very generally) white in the lower half, full azure-blue in the upper.

5. **E. axillare**, Thwaites Enum. 203; stem quadrangular, leaves ovate-lanceolate 3-nerved thin succulent, flowers mostly solitary on axillary peduncles, calyx-lobes with a dorsal cordate-lanceolate reticulated wing, anthers $\frac{1}{2}$ in. straight shortly suddenly beaked.

_Ceylon_; in the Pasdoon Corle, Walker, Thwaites.

Stem 6-18 in., procumbent and branched or erect and simple. Leaves 2½ by 1 in, base tapering, lower mostly long-petioled, very thin, dried reticulately nerved. Peduncles $\frac{1}{2}-\frac{3}{4}$ in., numerous, often from the lower axile; upper imperfectly corymbed. Calyx-lobes $\frac{1}{2}$ in.; wing (in young fruit) $\frac{3}{10}$ in. broad. Corolla-lobe $\frac{1}{2}$ in., lanceolate, acute, cyanous (Thwaites). Capsule $\frac{1}{2}$ by $\frac{3}{4}$ in.

*Var. pentamera*; corolla-lobes 5 broader shorter obtuse than in *E. axillare* type.

_Ceylon_. Thwaites.—A dubious plant, perhaps more nearly allied to *E. Walkeri*, but in the thin succulent leaves and cordate calyx-wings altogether resembling *E. axillare*.

**Corolla large or medium-sized, lobes 5 (all from the Deccan Peninsula or Ceylon).**

6. **E. Walkeri**, Arn. in Ann. Sc. Nat. 2, xi. 176; leaves ovate or lanceolate acute 3-nerved, peduncles axillary solitary and terminal subcorymbose, calyx-lobes with an ovate-lanceolate dorsal wing, corolla-lobes $\frac{1}{2}$ in. broadly elliptic, anthers $\frac{1}{2}-\frac{3}{4}$ in. subtruncate. Griseb. Gentian. 110, and in DC. Prodr. ix. 45; Wight Ill. t. 157, b. fig. 1. E. ovale, Griseb. Gentian. 111, and in DC. Prodr. ix. 46; Clarke in Journ. Linn. Soc. xi. 426. E. foliosum, Griseb. in DC. Prodr. ix. 45. E. zeylanicum, var. b. only, Thwaites Enum. 203.

_Ceylon_; Walker, &c.; central province, alt. 5000 ft., Thwaites (C.P. n. 38).

Stems 1-3 ft., suberect, often with long branches from near the base, quadrangular or obscurely 4-angled. Leaves (in the original *E. ovale*) 1 by $\frac{3}{4}$ in. ovate, acute, base rounded, subsessile (in Thwaites *E. zeylanicum*, var. *b*), $\frac{2}{4}$ by $\frac{3}{4}$ in, lanceolate, acuminate at both ends. Calyx-lobes $\frac{1}{2}$ in., base of wing narrowed or rounded, rarely cordate. Corolla-lobes acute, white or pale blue. Capsule $\frac{1}{2}$ by $\frac{1}{4}$ in.—*E. ovale* of Griseb. has been reduced by Thwaites to *E. macranthus*, but the corolla-lobes are described by Grisebach as 8 mill. long, and it was doubtless = *E. Walkeri*, as is *E. ovale* of Wight's and Gardner's Herbarium. In this species 1-flowered peduncles from the lower axils are frequent.

**Deccan Peninsula; Quilon, Gen. Cullen; Pulney Mts., Beddome.**

Stems erect, terete. Leaves 1½ by 1 in., coriaceous. Peduncles $\frac{3}{4}$ in., solitary from the penultimate axils. *Calyx-lobes $\frac{3}{4}$ in. Corolla-lobes ovate-oblong, acute, deep blue. Capsule oblong (Beddome).**

**Var. anamallayantanum, Bedd. *Jc. Pl. Ind. Or.* t. 154;* leaves larger ovate or oblong acute or obtuse margined, flowers corymbose.—Anamallays and Pulneys, alt. 6–7000 ft., *Beddome.*

8. **E. courtallense**, Arn. in *Ann. Soc. Nat.* 2, xi. 176; stem quadrangular much branched, leaves lanceolate 3–11erved succulent sessile, corymb terminal few-fl., corolla-lobes $\frac{1}{4}$–$\frac{3}{4}$ in., anthers $\frac{1}{4}$ in. shortly attenuate. **Griseb. in DC. Prodr. ix. 47; Wight *Jc.* t. 1323.**

**S. Deccan Peninsula; Courtallum, Wight.**

Stem often almost woody below, 3–8 in., densely ramosus, or 14 in. with fewer longer branches. Leaves 1½ by $\frac{3}{4}$ in., narrowed below, nerves often obscure. Peduncles 0–$\frac{3}{4}$ in., often 1-flowered in the ramosus form, corymb in the less divided. *Calyx-lobes $\frac{3}{4}$ in., wing oblong or lanceolate. Corolla-lobes ovate-oblong, acute, blue. Capsule $\frac{3}{4}$ by $\frac{1}{4}$ in., ovoid.**

**Var. travancorica; peduncles $\frac{1}{4}$–$\frac{3}{4}$ in. solitary, flowers and capsule rather larger. E. travancorica, Bedd. *Jc. Pl. Ind. Or.* t. 118.—Travancore, alt. 5000 ft., Beddome.**—The examples are only 2–7-fl. and look like alpine forms of *E. courtallense*, but Beddome says that *E. travancoricum* is sometimes 50-fl.


**Nilgerry Mts., alt. 4–7000 ft., frequent. Travancore, Beddome.**

Only differs from *E. zeylanicum* in the much shorter anthers, which have a minute papilla at the summit of the connective behind.


**Ceylon; common up to 5000 ft., Thwaites, &c.**

Stem 1–3 ft. quadrangular, erect, little-branched below. Leaves 4 by 1 in., narrowed at the base, subsessile. Corymb terminal, many-fl., 1-fl. peduncles from the lower axils sometimes added. *Calyx-lobes $\frac{3}{4}$ in.; wing lanceolate, in fruit ovate or cordate. Corolla-lobes blue, obovate-oblong, obtuse or subacute. Capsule $\frac{3}{4}$ by $\frac{3}{4}$ in.**

**Var. macrantha; stem terete, corolla purplish-blue, anthers $\frac{3}{4}$ in. broad. E. macrantha, *Arn. in Ann. Soc. Nat.* 2, xi. 176; *Griseb. Gentian.* 111, and in *DC. Prodr.* ix. 46; *Bot. Mag.* t. 4771; *Thwaites Enum.* 203.—Ceylon, frequent. The lobes of the corolla are not always acuter than in many examples of *E. zeylanicum* type.***

**Smaller slenderer plants with small 4-merous flowers.**

11. **E. pedunculatum, Linn.; Griseb. Gentian. 112, and in *DC. Prodr.* ix. 46; stem erect much-branched, leaves subsessile elliptic or lanceolate 8-nerved, cymes terminal many-fl., pedicels suberect rigid, corolla blue. **Vahl**

**VOL. IV.**

Throughout India, ascending to 3000 ft., from Oudh and Bengal to Ceylon, Thwaites (C.P. 1876 in Herb. Kew), &c.

Stem 8—12 in., quadrangular. Leaves 1 ½ by ¾ in. Peduncles 4—5 in. Calyx-lobes 1—½ in., ovate, acuminate; wing distinct, lanceolate. Corolla-lobes 1—¾ in., elliptic. Anthers ½ in., scarcely attenuated upwards, dehiscing finally halfway to the base. Capsule ½ in., subglobose.—Linneeus' species is founded on Pluck. Alm. Mant. t. 343, fig. 3, and Grisebach throws doubt on the identification by saying that Plukenet's figure is bad; but it seems unusually good and characteristic.


The Concan; Belgaum, Graham, Dalsell, &c.

Closely allied to E. pedunculatum, but slenderer. Leaves usually narrower; lower often 1-nerved. Flowers less numerous; pedicels (many of them) ½—1 in. Calyx-wings narrower, lanceolate, sometimes obsolete. Anthers dehiscing finally often to the base.


Decan Peninsula; Mangalore, Hohenacker. Ceylon; common up to 2000 ft., Macrae, &c.

Stem 4—8 in., erect, quadrangular, simple or corymbose upwards. Leaves ½ by ¾ in., obscurely nerved, acute or subobtuse. Peduncles 0—2 in., axillary, 1-flowered; terminal peduncle appearing sometimes 1 in., but then bearing a pair of small leaves near the flower. Calyx-lobes ½ in., herbaceous. Corolla-lobes ½—1 in., elliptic. Anthers ½ in. Capsule ½ in., subglobose.—The examples marked E. macrantherum, Miq., are certainly E. sessile, Linn., but are mixed with E. pumilum, and the locality Mangalore is therefore not certain.


The Concan and Malabar; Bababoodan hills, Law; Belgaum hills, Ritchie. Sten 3—6 in., erect, slender, quadrangular, simple or slightly branched upwards. Leaves ½ in. long and broad. Peduncles terminal or subterminal, many of them 2 in. without leaves or bracts. Calyx-lobes ½—1 in., patent, much-nerved at flower-time. Corolla-lobes ½—1 in., elliptic or rounded. Anthers ½ in. Capsule ½ in., ovoid.—Named E. sessile by all collectors, but the flowers are larger, and the inflorescence altogether different.

15. E. petiolare, Griseb. in DC. Prodr. ix. 46; leaves petioled elliptic or ovate mostly 5-nerved, peduncles erect, calyx-wings broad, corolla white or pale blue. Wight J. t. 1324; Dalz. & Gibbs. Bomb. Fl. 157; Clarke in Journ. Linn. Soc. xiv. 427. E. carinatum, Roxb. Fl. Ind. ed. Carey & Wall. i. 415? Sebsea carinata, Spreng. Syst. i. 426?

The Concan, Stocks, &c. Crotta Nagpore, alt. 1—3000 ft., abundant, Clarke.

Stem 2—12 in., erect, quadrangular, branched upwards. Leaves 3 by 1 ¼ in.,
5-nerved, in small specimens lanceolate and subsessile; petiole ¼ in. Cymes terminal, erect; pedicels mostly ½ à in.; the 1-flowered peduncle at the bifurcation of the cyme often 1–2½ in. Calyx-lobes ⅓ in.; wing in fruit ovate or cordate, nerved. Corolla-lobes ½ in. or more (or in small examples ⅛ in.). Anthers ⅜ in., finally dehiscing nearly to the base. Capsule ½ in., subglobose.— Roxburgh's 1c. Ined. of his E. carinatum resembles in all respects E. pedunculatum, Linn., except that the corolla-lobes are orange-yellow. As a yellow corolla is unknown in Exacum, Sprengel placed the species under Sebea. Arnott and Grisebach, assuming that Roxburgh had not seen the plant alive, reduce it to E. pedunculatum. But as Roxburgh had the plant in cultivation and both figured and described E. pedunculatum (under E. sulphatum), it is not likely that his E. carinatum is the same thing. Roxburgh's description seems almost certainly to refer to E. petiolare, Griseb., which has white corolla-lobes with yellow anthers and the marked calyx-wing, &c., described by Roxburgh. It doubtless extends to Ceylon, for Thwaites' E. petiolare (Clarke in Journ. Linn. Soc. xiv. 427) were almost surely rightly named, though the number (C.P. 1876) attached to the specimens is wrong.

**** Small plant with small 5-merous flowers.


PEIŠU and TEASSERIM, Wallach, Lobb, alt. 3–4000 ft., Kurs.


DOUBTFUL SPECIES.

E. punctatum, Linn. f. Suppl. 124; leaves very shortly petioled 3-nerved glandulose-punctate, corolla blue, stamens exerted yellow. Griseb. in DC. Prodr. ix. 47. —India, Koenig.

3. SEBEA, R. Br.


N. W. HIMALAYA; Gurwhal, alt. 5–6000 feet, Edgeworth; NEPAL; Wallich. KHASIA MTS., Kollong Rock, alt. 5500 ft., Clarke.—DISTRIK. Angola.

Stem 6 in., simple, slender, angular, glabrous. Radical leaves 0 at flowering time. Pedicels ½ in. in., linear, rigid. Sepals ½ in., lanceolate, keeled, scarious-margin. Corolla-tube ¼ in.; lobes ⅛ in.; elliptic. Anthers oblong, scarcely apiculate, without glands at the base, finally straight; stigma a flattened ellipsoid, papillose on the edge. —S. aurea, R. Br. (Griseb. in DC. Prodr. ix. 52), has the upper leaves broader, but the plant collected by Welwitsch in Angola is identical with the Indian, except that its anthers are minutely apiculate.
4. **HOPPEA,** Wild.

Small, much branched, glabrous herbs. Leaves small, sessile, ovate or elliptic. Cymes 2—3-chotomous, flowers sessile or short-pedicelled. Calyx campanulate; lobes 4, ovate, acuminate. Corolla-tube subglobose or elongate; lobes 4, short or long, more or less unequal. Stamens 1 perfect, 3 barren, attached in the corolla-throat, filaments linear short; anthers ovate, dehiscing introrsely by two longitudinal slits; barren anthers similar but much smaller, sometimes 0. Ovary 1-celled, placenta not far intruded; style short, stigma subentire. Capsule globose or ellipsoid, carpels separating. Seeds very many, minute, nearly black, obscurely reticulated.—Species 2, Indian.


Throughout India, alt. 0—3000 ft.; very common; from the Punjab and Assam to Belgaum and Central India, the Circars, and Chittagong.

Stem 1—5 in., quadrangular. Leaves ½ in., ovate. Cymes dense or lax. Calyx ¼ in.; lobes scarious, marginal nerve green. Corolla white, tube ½ in., ventricose; in fruit wider upwards with the lobes incurved, overtopped by the acute calyx-teeth. Stigma clavate, obscurely 2-fid.


S. Deccan Peninsula, Mysore and Courtallum, Wight; Mangalore, Hohenacker. Moulmein; Lobb. Ceylon, frequent.

Stem 2—6 in., winged. Leaves ½ in., ovate. Flowers fastigiata. Calyx ½ in.; lobes scarious with a marginal nerve. Corolla-tube ½ in. long, oblong, in fruit narrowed in the throat with the lobes erect, much overtopping the calyx-teeth. Stigma slightly clavate, subentire. Seeds very small, but twice as large as those of H. dichotoma.—The type of Cicendia fastigiata, Griseb. is Macrae's Ceylon plant, which Grisebach (Gentian. 159) says has 4 perfect stamens, but it has 1 only. The corolla in the present species is totally unlike that of Hoppea dichotoma, and the species so far agrees with Cicendia.

5. **ENICOSTEMA,** Blume.

A glabrous herb, erect, or decumbent branched. Leaves sessile, ovate-lanceolate or linear. Flowers small, in sessile axillary clusters. Calyx deeply 5-fid; segments not keeled. Corolla tubular funnel-shaped; lobes 5, spreading, white or bluish. Stamens 5, on the upper part of the corolla-tube, filaments shortly linear with minute scales at their base; anthers oblong, acute, included. Ovary 1-celled, placenta not far intruded; style short, linear, stigma capitate. Capsule ellipsoid, carpels separating. Seeds many, subglobose, reticulated.

Herba, annual or perennial, erect, branched. Leaves opposite, sessile. Corolles dichotomous, dense or corymbose, rarely elongate; flowers rose, white or (in non-Indian species) yellow. Calyx tubular; teeth 5, lanceolate or linear, keeled. Corolla-tube long or short; lobes 5, spreading. Stamens 5, near the summit of the corolla-tube, filaments short linear; anthers narrowly oblong. Ovary 1-celled, placenta far intruded; style linear, stigmas semicircular or oblong. Capsule oblong, about as long as the calyx, nearly 2-celled, 2-valved, capsules separating. Seeds very small, reticulated.—Species 20, throughout the N. Hemisphere, extending to Chili and Australia.

The Indian species have all an elongate corolla-tube, as long or longer than the calyx, and the corolla-lobes elliptic or oblong, small, much shorter than the tube, and would be by some authors all referred as varieties to E. ramosissima, Pers.


Stem 3-15 in., very leafy. Leaves 1 ½ by ¾ in. Calyx ½ in.; teeth prominent, overtopping the buds almost till the moment of opening.—This Punjabi plant is not exactly the type of E. ramosissima, being often tall, leafy, the flowers in clusters enveloped with bracts, the calyx-teeth substellate; the same form extends through Asia to Egypt.

Var. caspica; upper leaves oblong-linear, cyme repeatedly dichotomous. E. caspica, Griseb. Gentian. 145, and in DC. Prodr. ix. 59.—Punjab (?), Falconer.—Cabul and the Caspian region.

Var. pulpella, Griseb. Gentian. 137; stem slender, cauline leaves ¼-½ in. oblong or ovate obtuse, cymes decompound, calyx-teeth not prominent.—Skardia, alt. 7-8000 ft., Thomson.—Distrib. Central and W. Asia. This is not exactly the same as Fries’ E. pulpella, but it is included under E. ramosissima by Boissier, l. c. Hk. f. & T. in Herb. marked it E. tenuiflora, Link (Fl. Port. i. t. 87), which again is only a var. of E. latifolia, Griseb.; but the true E. latifolia, Smith, differs considerably, having larger flowers and being allied to E. Centaurium.

Throughout India ascending to 2000 ft., from the Punjab and Bengal to Travancore; common in Bengal Plain.

Stem 2-8 in. Radial leaves 1 by 3 in., usually obtuse. Cyme fastigate or widely dichotomous; pedicels in the forks usually 1-3 in.; bracts not prominent. Calyx ½ in. Corolla-tube exceeding ½ in., lobes very small.

Var. saxatilis; stem taller panicked, leaves narrowly lanceolate basal leaves disappearing, flowers in small terminal clusters.—S. Deccan Peninsula.


**Kashmir** and **Baltistan**; alt. 5-8000 ft., frequent.—**Disturb.** Cabul, Central Asia to the Altai.

Stem 4-10 in., undivided below; radical leaves 2 or 0 at flowering time. Leaves ½ by ½ in., subobtuse. Pedicels of the flowers on the forks 1-3 in.—It is not clear why Grisebach and Boissier, while maintaining several Erythreas as distinct species, reduce this to *E. ramosissima*, from which it is remote in its undivided stem and long-pedicelled flowers, which are invariably white. It is in fact much nearer *E. Roxburghii*.


**Punjab**; *Falcater*; Lahore, *Brendis*.—**Disturb.** Cabul, Persia.

Stem 6-15 in., simple below, acutely quadrangular. Radial leaves 2-0 at flowering time. Leaves ½ by ½ in., scarcely acute. Cyme symmetrically dichotomous; pedicels of the flowers in the forks scarcely ½ in. Calyx ½ in., nearly equaling the corolla-tube.—Considered by Bentham and Boissier a var. of *E. spicata*, Pers., which differs only by its unilateral cyme-branches. *E. babylonica* has been misunderstood, because Grisebach described the flowers as 4-merous, whereas in Aucher-Eloy’s n. 2432 (Grisebach’s type) they are 5-merous. The Cabul examples identical with this are called by Boissier *E. cuspicata*, and it is very difficult to say how they differ except in the strict cymes forming an elongate panicle.

7. **Canescora**, Lamk.

Annual herbs, dichotomously branched. Leaves opposite, sessile, petioled or perfoliate. Flowers in terminal or central cymes, or axillary solitary, or densely spiked on scapes. Calyx tubular, 4-toothed, terete striate keeled or winged. Corolla-tube cylindric, about as long as the calyx; lobes 4, more or less unsymmetric, imbricate in the bud. Stamens 4, near the summit of the corolla-tube; 1 or 2 larger with longer filaments and fertile ovate or obovate anthers; 3 or 2 with shorter (often lower-attached) filaments, smaller, barren or sometimes subobsolete. Ovary 1-celled, placenta not far intruded; style
linear, stigmas 2 short hemispheric. **Capsule** 2-valved, separating into its 2 carpels, or often very thin breaking up irregularly. Seeds very small, polyhedral, dark brown, reticulated.—Species 14, chiefly Indian; Malaya, Australia, Trop. Africa and its islands.

**Surgens I. Eucanscora.** Flowers in terminal dichotomous cymes, or pedicelled in axillary small cymes. **Calyx** keeled or winged. **Corolla** subbilabiate. **Stamens** 4, one larger perfect, three shorter smaller barren or sub-obscure.

* Cymes terminal; bracts at its bifurcations not perfoliate.

† Calyx striate or keeled, not winged, pedicels not 4-winged.


Cobamba dichotoma, Blanco Fl. Filip. (ed. 2) 365.

Throughout India ascending to 4000 ft., common; from Kumaon and Bhotan to Ceylon and Tenasserim.—Districts: Malaya, Australia, and E. Tropical Africa.

Annual, erect, 4-20 in., densely branched upwards. Leaves 1½ by ½ in., 3-nerved, often petioled; upper passing into the bracts. Cyme diffuse, leafy; bracts ½ in. leaf-like, a few of the uppermost linear. Calyx ½ in.; teeth lanceolate-linear. **Corolla-tube** ½ in., lobes ¼ in. **Stamens** one on the corolla-throat, perfect; 3 rather lower down with slightly shorter filaments and smaller anthers, polliniferous or not. **Capsule** oblong, as long as the calyx.

**Var. tenella;** bracts ovate herbaceous, many of the upper linear. C. tenella, Wight 1c. t. 1327; Wall. Cat. 4382.—Malabar and Mysore, Wight.—This has the bracts nearly as in the next species, but the cyme is diffuse, the pedicels long slender.


W. **Deccan Peninsula** from the Concan southwards, frequent.

Very doubtfully distinct from **C. diffusa**, var. **tenella.** Leaves hardly decurrent. Cyme subtrichotomous (in **C. diffusa** usually dichotomous).


W. **Deccan Peninsula**, from Malwan to Quilon; **Dalzell, Wight, &c.**

Lower leaves scarcely 2½ in., smaller than the middle cauleine. **Bracts** (of the lower part of the cyme) rarely so much as ½ in., oblong or linear.—This seems very near, but separable from, **C. diffusa**; Wight, however, in his Herb., referred it to his **C. tenella** (treated above as a var. of **C. diffusa**).
†† Calyx keeled not winged, cyme-branches distinctly winged.


**Stem** 4–9 in., broadly 4-winged upwards. **Leaves** ½ in., sessile, obtuse or sub-acute. **Cymes** with ascending branches; bracts ½ to 1 in., narrow; lateral flowers usually bracteate, sometimes pedicelled. **Calyx** ½ in. **Corolla-tube** 1/4; lobes ½ in., broadly ovate, rose-coloured. *Flowers and capsules* nearly as of *C. diffusa,* but slightly larger.

††† Calyx distinctly winged.


Throughout *India,* ascending to 4000 ft.; from the Himalaya to *Burma*; abundant in *Bengal Plain.* **Ceylon,** not uncommon.—*Distrib. Madagascar, Bourbon, Trop. Africa.*

**Stem** 4–20 in., 4-winged. **Leaves** 1½ by ¾ in., sessile, 3-nerved. **Cymes** lax; flowers in the forks pedicelled. **Calyx** ½ to ¾ in. **Corolla-tube** as long as the calyx; lobes ½ in., ovate, obtuse. ** Stamens** 1 perfect; 3 baron, variously reduced, sub-sessile or with filaments. **Capsule and seeds** considerably larger than in *C. diffusa.*—Excavum alatum, Roth, is reduced here by *Grisebach,* and there are specimens of Rottler and *Hayne* which do belong; but Roth's description "calyx with broad scarious wings, corolla rose" refers entirely to *Canscora perfoliata,* *Lamk.*

6. **C. concanensis**, Clarke; leaves ovate, cymes slender branches not winged, calyx-wings elliptic nerved scarious in fruit.

The **Concan. Law.**

A slender annual, 3–5 in.; stem decumbent then erect, obscurely quadrangular. **Leaves** 3 by ½ in., subacute, sessile, 3-nerved. **Cymes** weak, at first dichotomous, branches upwards unibracteate, flowers all pedicelled; pedicels ½ to ¾ in., slender; bracts ½ to ¾ in., linear. **Calyx** ½ in.; wings ½ in., broad in fruit. **Corolla-tube** as long as the calyx; lobes ½ in., ovate, obtuse, seem to have been rose.—Nearest to *C. macrocalyx,* *Miq. Pl. Ind. Bat.* ii. 558, which is a rigid erect plant with winged stem and cyme-branches.

**Cymes terminal; bracts at its bifurcations (or some of them) perfolliate.**


The **Decan Peninsula**; from *Bombay* to *Travancore,* *Rottler,* &c.

**Stem** 6–15 in., 4-winged. **Leaves** 1 by ½–¾ in., sessile, 3-nerved. Upper bracts ½ in. diam., suborbicular, 2-mucronate; pedicels very short. **Calyx** ½ to ¾ by 1/4–1/3 in.
Corolla-tube as long as the calyx; lobes 1-½ in., obovate, obtuse, rose. Capsule ½ in.

Lamarck founded *Canscora* and the species *C. perfoliata* on Rheedse l.c.; Grisebach
says the calyx is exalate, in direct opposition to Rheedse's figure and description;
moreover the size of the calyx and corolla and whole habit of the plant in Rheedse
shows that his figure means the *Pladera perfoliata* of the old collectors.

8. **C. Wallichii**, Clarke; leaves oblong acute, calyx cylindric not winged. *C. perfoliata*, Wall. Cat. 4365; Griseb. Gentian. 155, and in DC. Prodr. ix. 65 (syn. excl.); Wight *f.* t. 1527, middle figure; Thwaites Enum. 204; Clarke in Journ. Linn. Soc. xiv. 431, not of Lamk.—*Canscora* sp., Wall. Cat. 4363 B partim.

The CARNATIC, MYSORE, and MALABAR, Heyne, &c. CEYLON; north end of the
Isld., Gardiner, &c.

Stem 8-16 in., 4-winged. Leaves and cyme very nearly as of *C. perfoliata*;
pedicels ½-3 in., filiform. *Calyx* 1-½ by ½ in., in fruit scarious with 12 green nerves.
Corolla-tube as long as the calyx; lobes hardly ½ in., obovate, obtuse, rose.

*** Cymes axillary, weak, few-fld.


KHASIA Mts.; alt. 1-4000 ft., frequent, Wallich, &c. MOULMEIN; *Griffith, Lobb.*

Stem paniculately branched from the base; branches 8-20 in., quadrangular, not winged. Leaves 1½ by ½-3 in., 3-6-nerved; pedicels ½ in. Cymes 1-2 in., 1-6-flowered. *Calyx* ½ by ½ in. Corolla-tube as long as the calyx; lobes ½ in., obovate-oblong, white-purple- or rose-veined. *Stamens* 1 with a filament and ovate perfect anther, 3 subseisalic with obovate small but often polliniferous anthers. Capsule and seeds nearly of *C. diffusa*.

SUBGENUS II. **Heterocanscora.** Flowers in dense spikes, opposite, each bracteate and with 2 large bracteoles. *Calyx* very thin, not winged. *Corolla, stamens, and style* of *Canscora*.


BURMA; Prome Hills, Wallich; Pegu Yomah, Kurz.

Scapes 3-10, several from one annual root, somewhat 4-winged upwards. Radical leaves ½ by ½ in.; cuneate few, bractlike, ½ in., linear, acute. *Flower-spikes* 1-3 in., terminal, simple, scarcely interrupted. *Bracts* ½ in., boat-shaped, widely elliptic, shortly caduate; bracteoles similar, rather smaller, unilateral. *Calyx* ½ in. Corolla-tube ½ in., lobes ½ in. *Stamens* 1 with a filament, perfect; 3 much smaller, on very short filaments. Capsule ½ in., and seeds of *Canscora.*—In general habit, inflorescence, and bracts simulating *Andrographis paniculata*.


MOULMEIN, *Griffith, Parish, Lobb.*

Stem 8-24 in., dichotomously dichotomous. Leaves 1½ in. diam., radiately nerved;
uppermost herbaceous. Pedicels 0-\(\frac{1}{3}\) in. Calyx \(\frac{1}{4}-\frac{1}{2}\) in. broad at the base, slightly narrowed upwards, lobes short triangular. Capsule \(\frac{1}{4}\) by \(\frac{1}{5}\) in., ellipsoid. Seeds as of Eucanscora.


Moulmein, Griffith; Three-Pagoda Pass into Siam, Helfer (Kew Distrib. n. 5816).

Closely resembling *C. Parishii*, but the calyx, corolla, and capsule rather smaller, and the uppermost (floral) leaves very scarious. It is probably only a var. of *C. Parishii*.

### 8. CRAWFURDIA, Wall.

Twiners. Leaves opposite, petioled, 3-nerved. Flowers showy, axillary, solitary or in small cymes, purple white or greenish-yellow. Calyx tubular, lobes 5 (or 4 in a non-Indian species). Corolla elongate tubular-campanulate, plicate or subterete; lobes 5, short. Stamens 5, on the middle of the corolla-tube, filaments flattened; anthers oblong. Ovary stalked, 1-celled; disc small, 5-toothed; style linear, stigmas 2 short linear. Fruit globose or oblong, compressed or terete, 2-valved, or indehiscent. Seeds many, discoid, broadly winged, or wedge-shaped subtriquetrous narrowly 3-winged.—Species 9-10; in India, Malaya, China, and Japan.

**Subgenus I. Dipterospermum.** Flowers (or many of them) long-pedicelled. Calyx not keeled. Capsule dry. Seeds compressed, discoid; wing marginal, broad, simple, scarious.


Central and Eastern Himalaya; Nepal and Sikkim, alt. 6-10,000 ft., frequent, Wallisch, *J. D. H.*, &c.

Leaves 3 by 1 in., base cuneate or rounded. Cymes 1-3 in., 1-5-flowered; pedicels 0-7 in.; bracts \(\frac{1}{2}\) in., lanceolate, one pair near the base or summit of the pedicel, often 0. Calyx \(\frac{1}{4}\) by \(\frac{1}{4}\) in., cylindrical, base campanulate; teeth \(\frac{1}{2}-\frac{1}{2}\) in. Corolla 1\(\frac{1}{2}\) by \(\frac{1}{2}\) in., purple, plicate; teeth scarcely \(\frac{1}{6}\) in. Filaments dilated in the middle, attached in the middle of the corolla, sometimes free at the base. Stigma more than \(\frac{1}{6}\) in., linear. Capsule 1 by \(\frac{1}{2}-\frac{1}{2}\) in., subinclosed in the corolla, stalk \(\frac{1}{2}-\frac{3}{4}\) in.


Leaves as of *C. speciosa* but more coriaceous, the 3 main nerves broad beneath, others obscure. Peduncles 0-4 in, all 1-flowered; bracts \(\frac{1}{2}\) in., present or absent, varying in position. Calyx-tube \(\frac{1}{2}\) by \(\frac{1}{2}\) in., cylindrical; lobes \(\frac{1}{2}-\frac{1}{2}\) in., not keeled. Corolla 1\(\frac{1}{2}\) by \(\frac{1}{2}\) in., purple, very obscurnly plicate; teeth \(\frac{1}{2}-\frac{1}{2}\) in., hardly keeled. Stamens as of *C. speciosa*. Stigma \(\frac{1}{6}\) in., linear. Capsule 1 by \(\frac{1}{2}\) in., included in the corolla; stalk \(\frac{1}{2}\) in.

3. **C. angustata**, Clarke; leaves elliptic acuminate entire glabrous coriaceous, calyx-tube elongate teeth small approximate lanceolate, corolla-tube elongate narrow lobes lanceolate.
Upper Assam; Mishmiene Mts., Griffith (Kew Distrib. n. 5838, 5839).

Calyx-tube \( \frac{3}{4} \) in., narrowed at the mouth; teeth \( \frac{1}{6} \) in., terminal. Corolla 2 by \( \frac{1}{4} \) in.; segments \( \frac{1}{2} \) in., acuminate. Capsule not ripe, seems likely to be narrow.

—This may be a variety of \( C. \) campasulacea.

4. \( C. \) puberula, Clarke in Journ. Linn. Soc. xiv. 442; leaves elliptic acuminate minutely denticulate glandulose-puberulous on the nerves beneath, calyx subtruncate teeth small linear distant, corolla-limb subtruncate teeth small triangular acute.

Sikkim Himalaya; Yakla, alt. 9–10,000 ft., Clarke.

Petioles glandular-pubescent. Cymes 1–4 in., 1–5-fl., slender. Calyx \( \frac{1}{3} \) by \( \frac{1}{6} \) in.; teeth \( \frac{1}{6} \) in., subterminal. Corolla 1\( \frac{1}{2} \) by \( \frac{1}{3} \) in., purple, plicate; lobes \( \frac{1}{2} \) in. Style long, early exsert. Capsule \( \frac{1}{2} \) by \( \frac{1}{2} \) in., half-exsert from the corolla, stalk \( \frac{1}{2} \)–1 in.—Perhaps an alpine var. of \( C. \) speciosa which grows fully as high up, but the flowers are much smaller.

Subgenus II. Tripteropsemnum. Flowers (in the Indian species) fascicled. Calyx keeled. Capsule 2-valved or succulent, subindehiscent. Seeds wedge-shaped, triquetrous, almost winged on the angles, one face much narrower than either of the others.


Khasia Mts., alt. 3–6000 ft., frequent, Wallich, &c.—Distrib. S. China.

Leaves 3 by 1 in. Flowers 3–1; sometimes pedicelled, with 2 foliaceous bracts under the flower. Calyx-tube \( \frac{1}{2} \) by \( \frac{1}{2} \) in., 5-keeled to the base, scarios between the keels; teeth \( \frac{1}{2} \) linear, subterminal. Corolla \( 1\frac{1}{2} \) by \( \frac{1}{2} \) in., plicate; lobes \( \frac{1}{2} \) in., ovate, acute. Capsule 1 by \( \frac{1}{2} \) in., stalk scarcely \( \frac{1}{2} \) in.—The typical form here described is well-marked; but the starved forms with small flowers hardly differ from the next species by the shorter calyx-teeth and purple flowers.

6. \( C. \) affinis, Wall. Cat. 4370, partly; leaves cordate-lanceolate acuminate, calyx-teeth linear as long as the tube, corolla small white or greenish yellow, capsule 2-valved dry oblong short-stalked included in the corolla. C. fasciculata, Wall. Cat. 4369 A.

Sikkim Himalaya, alt. 5–6000 ft.; frequent. Khasia Mts., Wallich.

Closely resembling \( C. \) fasciculata; leaves rounded at the base. Calyx-tube \( \frac{1}{2} \) in.; teeth more than \( \frac{1}{2} \) in., subterminal. Corolla less than 1 by \( \frac{1}{4} \) in. (in Wallich's example). Capsule \( \frac{1}{2} \) by \( \frac{1}{2} \) in.; stalk \( \frac{1}{2} \) in.—The capsule is certainly dry, 2-valved; nevertheless it is to be feared that the species is merely a form of the next. The Javan \( C. \) Blumei (Tripteropsemnum trinerve, Blume; DC. Prodr. ix. 121) differs apparently only in having solitary long-pedicelled flowers.

7. \( C. \) japonica, Sieb. & Zucc. Fl. Jap. Fam. Nat. ii. 38; leaves cordate-lanceolate, calyx-teeth linear as long as the tube, corolla greenish or yellowish, berry ellipsoid red succulent included or exsert from the corolla. Golowinia japonica, Maxim. in Bull. Acad. St. Petersb. iv. 261, t. 4.

Sikkim Himalaya, alt. 7000 ft., J. D. H., Clarke.—Distrib. Japan, China, Formosa.

Leaves 3 by 1 in. Calyx \( \frac{1}{2} \)–\( \frac{3}{4} \) in.; teeth distant, excurrent below the margin, or subterminal. Corolla 1–1\( \frac{1}{2} \) by \( \frac{1}{3} \) in., subtubular, plicate; lobes \( \frac{1}{2} \) in., ovate, acute. Stamens, style, and disc, very nearly as of \( C. \) speciosa, but rather smaller. Berry \( \frac{3}{4} \) by
\[ \text{\textsuperscript{\textregistered} in.}, \text{ellipsoid}, \text{or } \frac{1}{2} \text{ in.}, \text{subglobose}; \text{completely exserted from the corolla}, \text{or half included} (\text{on the same branches}); \text{stalk often } 1-1\frac{1}{2} \text{ in.}
\]

**Var. luteo-viridis**: berry 1 by \( \frac{3}{4}-\frac{1}{2} \text{ in.} \), quite included or \( \frac{1}{2} \text{ exsert} \) oblong red, stalk \( \frac{1}{4}-\frac{1}{2} \text{ in.} \). C. luteo-viridis, Clarke in Journ. Linn. Soc. xiv. 443. C. fasciculata, Griff. Tex. Notes, p. 27, n. 420, and p. 127, n. 470. Gentiana volubilis, Don Prodr. 126.—Himalaya, alt. 5-8000 ft.; from Kumaon to Bhotan, common. Khasia Mts.; alt. 3-6000 ft., frequent.—This is the common C. fasciculata of the Himalaya of collectors; but the stalk of the berry is frequently more elongated, and the berry itself so short, that it appears inseparable from *C. japonica*; when much less succulent it runs into *C. affinis*. Wallich appears not to have distinguished it from *C. fasciculata*, as he gives the Himalaya for the habitat of *C. fasciculata*, which species is confined to Khasia.

**Var. Championi**: leaves hardly acute long-petioled, corolla smaller narrower, berry \( \frac{1}{4} \text{ in.} \) diam. subglobose red exserted. C. fasciculata, Thwaites Enum. 204. Tripterispermum Championi, Gardn. ms.—Ceylon; Gardner, Thwaites.

9. **GENTIANA**, Linn.

Herbs, annual or perennial, or (*G. crassa*, Kurz) shrubby. *Leaves* opposite, bases often connate. *Flowers* axillary or terminal. Calyx tubular, tertae or rarely keeled (*epathaceous in *G. decumbens*); lobes 5-4. Corolla tubular, bell- or funnel-shaped; lobes 5-4, often with folds between the lobes. Stamens 5-4, attached in the middle or lower half of the tube, included, filaments linear somewhat flattened downwards; anthers oblong or ovate. Ovary 1-celled, placentae but little intruded; style short or 0, except in *G. stylophora*, stigmas divergent. Capsule stalked or sessile, ellipsoid or oblong, compressed, separating into its 2 carpels, usually to the base. Seeds very many, small, globose or oblong, often trigonous, testa close or lax sometimes prominently reticulated.

—Species 180, chiefly in the mountains of the Old World, with a few in the Andes, New Zealand, and Australia.

**Sect. I. Amarella.** Corolla not more than 1 in. at the time of expansion, without folds. Capsules included, sessile or shortly stalked. Seeds small, yellow-brown, numerous, subglobose; testa close, not reticulated.

*Corolla not fimbriate in the throat.*


**Western Himalaya**; Kashmir, Baltistan and Lahoul, alt. 8-12,000 ft., Moorcroft, Falconer, &c.

*Stem* 8-16 in., erect, 4-lineolate, branches ascending. *Leaves* 1 by \( \frac{1}{4} \text{ in.} \), narrowed below. Cymes in subterminal racemes; pedicels \( \frac{1}{2}-1\frac{1}{2} \text{ in.} \). Calyx-tube \( \frac{1}{10} \text{ in.} \); lobes \( \frac{1}{2} \text{ in.} \), linear. Corolla (at time of expansion) \( \frac{1}{2}-1 \text{ in.} \), up to the moment of expansion often short, blue in fruit enlarged often \( 1\frac{1}{2} \text{ in.} \), funnel-shaped not campanulate, mouth \( \frac{1}{2} \text{ in.} \) diam. Capsule \( \frac{1}{2} \text{ in.} \), lanceolate; stalk \( \frac{1}{4} \text{ in.} \).—Measurements here taken from Moorcroft’s example, the calyx-teeth are often even longer, \( \frac{1}{2} \text{ in.} \).

**Var. Falconeri**: flowers often 4-merous, calyx-teeth shorter broader often unequal opposite larger \( \frac{1}{2} \) by \( \frac{1}{2} \text{ in.} \). *G. Falconeri*, Clarke in Journ. Linn. Soc. xiv. 433. Kashmir, Falconer. The seeds do not differ from those of *G. Moorcroftiana*.

**Var. Maddeni**: leaves narrowly lanceolate acute, expanded corolla often less than \( \frac{1}{2} \text{ in.} \).—Kumaon, alt. 10-12,000 ft., Madden, Davidson. Tibet, alt. 15,000 ft. (Pit? 1), Strachey & Winterbottom.

2. **G. aurea**, Linn.; Boiss. Fl. Orient. iv. 71; leaves oblong or elliptic, corolla \( \frac{1}{4}-\frac{1}{2} \text{ in.} \) 5-merous, tubular. Griseb. Gentian. 254, and in DC. Prodr. ix.

Western Tibet; Baltistan, alt. 10–14,000 ft.; Thomson, &c.—Distr. Central Asia, and the whole Subarctic Zone.

Stem 4–18 in., erect, 4-lineolate or 4-angular, branches ascending. Leaves 1 by $\frac{1}{2}$ in., narrowed below. Peduncle $\frac{1}{2}$–2 in., 1-flowered, in axillary and terminal fascicles. Calyx-tube $\frac{1}{2}$ in., lobes $\frac{1}{2}$ in., linear-spathulate, minutely serrulate in the Indian plant. Corolla bluish or yellowish, lobes ovate mucronate shorter than the tube; basal glands obsolete. Capsule $\frac{1}{2}$ in., oblong; stalk $\frac{1}{2}$ in.—The Indian plant differs from G. azurea. Linn. type, in the absence or obscurity of the glands at the base of the corolla-tube, agreeing thus with G. umbellata, Bieb. This character considered by Grisebach as of sectional value is probably hardly specific.


3. G. Thomisoni, Clarke; minute, leaves obovate-oblong, corolla $\frac{1}{2}$–$\frac{3}{8}$ in. 4-merous funnel-shaped. Gentiana sp. 6, Herb. Ind. Or. H. f. § T.

Western Tibet; Karakorum, Nubra alt. 17,000 ft., Thomson.

Stem 1 in.; branches numerous, ascending. Leaves 1 by $\frac{1}{2}$ in. Peduncle $\frac{1}{2}$–1 in., erect, 1-flowered, subsolitary. Calyx-tube $\frac{1}{2}$ in.; lobes $\frac{1}{16}$ in.; oblong or rhomboid. Corolla-lobes oblong, about as long as the tube.

** Corolla fimbriate in the throat.

4. G. borealis, Bunge in Nov. Mem. Soc. Imp. Mosc. i. 251, t. 10, fig. 2; erect, leaves oblong, pedicels short, corolla tubular 4-lobed terminal flower often 5-lobed.

Western Tibet, alt. 12–14,000 ft.; Gen. Munro; Lahoul, Jaeschke; N. Kashmir to the Karakorum, common.—Distr. N.W. America.

Stem 3–12 in., 4-lineolate, branches ascending. Leaves 1 by $\frac{1}{2}$ in., base hardly narrowed. Pedicels 0–1 in., mostly cymes on axillary peduncles. Calyx-tube $\frac{1}{16}$ in., lobes $\frac{1}{8}$ by $\frac{1}{16}$ in. Corolla pink-purpie; tube $\frac{1}{2}$ in.; lobes $\frac{1}{16}$ in., ovate, mucronate. Capsule $\frac{1}{2}$ in., narrowly oblong; stalk $\frac{1}{16}$ in.—This has the habit of G. azurea.


Kashmir and W. Himalaya, alt. 10–14,000 ft., common.—Distr. Arctic and Alpine Europe and N. and Central Asia.

Stem 2–10 in., erect or straggling, 4-lineolate, branched. Leaves $\frac{1}{2}$ by $\frac{1}{2}$ in., lowest spatulate. Pedicels often 1–3$\frac{1}{2}$ in., terminal, solitary. Calyx-tube hardly any; lobes $\frac{1}{4}$ by $\frac{1}{4}$ in., elliptic, often unequal. Corolla-tube $\frac{1}{4}$ by $\frac{1}{4}$–$\frac{1}{2}$ in.; lobes $\frac{1}{4}$ in., elliptic. Capsule $\frac{1}{2}$ in., oblong-linear, sessile.—Alpine examples, with flowers only
half the size of the fully-developed plant, are frequent. The type specimen (n. 1024 Griff. Journ.) is altogether an average Himalayan example; G. minutissima, Boiss. (Fl. Orient. iv. 71) founded on this number is evidently described from some other plant. Koch says that G. tenella in Germany is 4-merous; the Himalayan examples are almost uniformly 5-merous. As to the synonyms, if G. nana specifically differs from G. tenella, it is found in the Himalaya.

VAR. falata, Turez.; Griseb. Gentian. 249; corolla-tube \( \frac{1}{2} \) in. long and nearly as broad.—W. Himalaya. 

Distrib. Caucasus.

VAR. sikkimenesis; stems weak flexuose, leaves scarcely \( \frac{1}{2} \) in., peduncles mostly long terminal 1-flowered, expanded corolla scarcely \( \frac{1}{2} \) in.—Sikkim; alt. 12,000 ft.; Yeumtung, J. D. H., Elwes.

Sect. 2. **Chondrophyllum** (char. widened). Corolla not more than 1 in., 5-lobed, tubular, with folds between the lobes. Capsule often exserted. Seeds small, globose oblong or falcate, usually trigonous, testa close, not (or most obscurely) reticulated. (See also G. ornata, var. n. 30.)


**Sikkim Himalaya**; alt. 9–12,000 ft., J. D. H., &c.

Stems 2–6 in. Radical leaves \( \frac{3}{4} \) by \( \frac{1}{2} \) in., spatulate-ovate; cauline \( \frac{1}{2} \)-\( \frac{1}{2} \) in., sessile, often connate, falcate. Pedicels \( \frac{1}{2} \) in., nodding in bud, erect in flower, recurved in fruit. Calyx \( \frac{1}{2} \) in.; lobes \( \frac{1}{4} \) in., lanceolate, acute, entire, glabrous, always erect. Corolla \( \frac{1}{2} \)–\( \frac{3}{4} \) in. by \( \frac{1}{2} \)–\( \frac{3}{4} \) in., brilliant blue, folds fimbriate into linear-ovate blue laciniate. Capsule \( \frac{1}{2} \)–\( \frac{3}{4} \) in., stalk as long as the corolla (at least in some cases). Seeds twice as long as broad, oblong or subfalcate, trigonous.


**Kashmir** and **Western Tibet**, alt. 13–16,000 ft.; Thomson, &c.—Distrib. N. Asia.

Branches 1–3 in. Radical leaves \( \frac{1}{2} \)-\( \frac{3}{4} \) in., ovate; cauleine \( \frac{1}{2} \) in., remote, usually obtuse, mucronate; margin hyaline, narrow. Pedicels \( \frac{1}{2} \)-\( \frac{3}{4} \) in., terminal, solitary. Calyx \( \frac{1}{2} \)-\( \frac{3}{4} \) in.; lobes \( \frac{1}{4} \) in., lanceolate, acute, glabrous, entire, always erect. Corollata-tube hardly longer than the calyx, lobes short blue; folds bifid; fimbriate none. Capsule \( \frac{1}{2} \) by \( \frac{3}{4} \) in., stalk long, often \( \frac{1}{4} \) in., hence capsule long-exsert. Seeds ellipsoid, trigonous, not much longer than broad.—S. prostrata, Haencke (as understood by Ledebour and Boissier, Fl. Orient. iv. 72), differs by having the capsule nearly twice as long; it was collected in Cabul (Griff. n. 1049), never in British India.

VAR. Karelini; calyx elongate, corolla \( \frac{1}{2} \)-\( \frac{3}{4} \) in. narrowly tubular. Griseb. in DC. Prodr. ix. 106. G. prostrata, Karelin & Kiril. in Bull. Soc. Imp. Mosc. 1841, 705, not of Haencke (?).—Karakoram, alt. 13–14,000 ft. G. Karelini, T. Thomson, &c. Distrib. Altai.—Stems 1–2 in. fewer and smaller than those of the type. The Karakoram examples agree closely with Karelin. & Kiril.'s G. prostrata; but their description differs in the corolla twice as long as the calyx; whereas, in the Indian plants the calyx is \( \frac{1}{2} \) in., as long as the corolla-tube.

**Western Tibet**; Karakoram, alt. 13–16,000 ft.; Thomson, &c.—Distrib. Caucasus, N. Asia.

Closely resembling *G. aquatica*. Corolla $\frac{3}{4}$ by $\frac{1}{10}$ in., usually white, sometimes blue. Capsule $\frac{1}{4}$–$\frac{1}{2}$ in. Var. evolutior; corolla $\frac{3}{8}$ by $\frac{1}{4}$ in. fine blue, capsule $\frac{1}{2}$ in.—Karakoram; Thomson, &c.

9. **G. pygmaea**, Clarke; stem $\frac{1}{2}$–1 in. simple 1-flowered, leaves minute remote ovate, corolla $\frac{1}{4}$–$\frac{1}{3}$ in. tubular.

**Western Tibet**; Karakoram, Nubra, Thomson.

Leaves $\frac{1}{4}$–$\frac{1}{6}$ in., ovate or obovate, marginated. Calyx shorter than the corolla-tube; lobes lanceolate, acute, erect. Corolla blue; folds bifid; fimbriae 0.—This looks like an excessively reduced form of *G. aquatica*, Linn.

Var. acuminata; leaves imbricate acuminated.—Kashmir; Palgam, alt. 13,500 ft. Clarke.—Some of the examples are only $\frac{1}{2}$ in. high, the expanded corolla $\frac{1}{2}$ in. long.


**Alpine Himalaya and Western Tibet**, alt. 10–15,000 ft.; Karakoram, Thomson, &c.; Sikim; J. D. H., &c.—Distrib. Daburia, Siberia.

Closely resembling *G. aquatica*, Linn., and hardly separable except by the calyx-teeth, which are ovate, mucronate, recurved even more strongly than in Ledebour’s figure. The leaves are scarcely marginated.


**Sikkim Himalaya**; Yeumtong and Kankola, alt. 14–15,000 ft.; J. D. H. Kumaon; Barji Kang, alt. 14,700 ft., Strachy & Winterbottom.

Perennial; branches 1–1$\frac{1}{2}$ in., black, leafless, wiry below, leafy upwards, 1-flowered. Leaves $\frac{1}{6}$–$\frac{1}{4}$ in., herbaceous, approximate, not marginated. Flower subsessile. Calyx $\frac{3}{5}$–$\frac{1}{2}$ in.; lobes $\frac{1}{2}$–$\frac{1}{4}$ in., obtuse, glabrous. Corolla-lobes shorter than the tube; folds subentire; fimbriae 0. Capsule $\frac{3}{8}$ by $\frac{3}{8}$ in. Seeds obovate-ellipsoid, trigonous, twice as long as broad; testa close, smooth.

Himalaya, alt. 3-10,000 ft.; from Kashmir to Bhotan, common. Khasia Mts.; alt. 3-5000 ft., common. Mts. of the Deccan Peninsula. Ceylon; common.—Distribs. Burma, Java, China.

Biennial or annual; stems usually numerous, 1-4 in., decumbent; sometimes erect, 4-10 in., simple, corymbous upwards. Radical leaves often rosulate, persistent; cauline 1/2-1 in., ovate and lanceolate, mucronate, often squaroose. Corymes usually 3-5-flowered; pedicels 0-1 in. Calyx shorter than the corolla-tube, glabrous. Corolla blue, or yellowish-green; folds small, pale, bifid or emarginate; filaments 0. Capsule ½ by 1/2 in., ellipsoid or ovoid, usually subexsert, i.e. stalk 1/2 in. Seeds (in the Southern form) globose or obovoid, trigonous, smooth; in the Himalayan form narrower, ellipsoid.—The Indian and Java forms have very shining cartilaginous leaves; when decumbent they are called G. assemblida, Zenz. or G. zeylanica, Griseb., or G. laxicaulis, Zoll.; when more erect they are G. quadrifaria, Blume, or G. orbiculata, Wall. The abundant N. Indian plant is more herbaceous with green not shining leaves, and is G. pedicellata, Wall. or Ericala procumbens, Don. A form (?) with elongate, strict stems, and cauline leaves few, oblong, adpressed, flowers in early spring in Sikkim, and is doubtfully referred to G. pedicellata by Sir J. D. Hooker.

Var. pilosa; leaves minutely ciliate-pubescent, calyx pilose.—Sikkim, alt. 6-8000 ft.; J. D. H., &c.


Annual; stems 1-9 in., erect, with ascending branches. Radical leaves 1 by ½ in., subsessile; cauline ½ in., cartilaginous; uppermost lanceolate, minutely ciliate-pubescent on the margin. Pedicels 0-½ in. Calyx ½ in.; lobes ½ in., narrow-lanceolate, glistening. Corolla (in Wallich's examples) not longer than the calyx, sometimes half as long again; folds bifid; filaments 0. Capsule ½ by ½ in., stalk ½ in. Seeds ellipsoid, very small, obscurely trigonous; testa close, smooth, minutely reticulated.

Var. aprica; stems strict, inflorescence subpaniculate, pedicels often ½ in., corolla ½-2 in. often twice as long as the calyx. G. aprica, Donn. in Jacquin. Voy. Bot. 112, t. 118; Griseb. in DC. Prodr. ix. 107.—Subtropical Punjab—Himalaya, alt. 1-3000 ft.; Siwaliks, Dehra Doon, Hooshia pores; Griffith, Edgeworth, &c. Uppermost leaves usually ciliate-pubescent on the margin; capsule included.

14. G. argentea, Royle; Griseb. Gentian. 275, and in DC. Prodr. ix. 107; radical leaves lanceolate mucronate cauliine silvery marginate, flowers mostly terminal subcapitate, corolla ⅔ in. equalling or exceeding the calyx, capsule ellipsoid subinclosed. Ericala argentea, D. Don in Trans. Linn. Soc. xvii. 512.

Kashmir and N.W. Himalaya, alt. 8-12,000 ft.; Royle, Thomson, &c.—Distribs. Afghanistan.

Stems 1-4 in., erect, branched. Radical leaves 1 by ½ in.; uppermost ovate or oblong, falcate, glabrous, often closely investing the flower-heads. Capsule more than ½ by ½ in., stalk ½ in. Seeds as of G. decemfida, from which this species is hardly distinguishable.


Sikkim Himalaya; Phullong, alt. 15,000 ft., J. D. H.


Temperate Himalaya, alt. 4-12,000 ft.; from Kumaon to Bhotan; Wallich, Griffith, &c.

Stems 1-4 in., often naked at the time of flowering except the leaves mixed in the flower-head, sometimes leafy in the upper half. Leaves ½ by ½-¾ in., thick, somewhat shining, falcate. Calyx ½ in.; lobes ½ in., oblong, acute, scarious-margined, glabrous. Corolla ¼-½ in., blue or white, folds smarginate; fimbriae 0. Capsule ¼ in. long and broad; stalk sometimes ½ in. Seeds very small, ellipsoid, nearly twice as long as broad, trigonous, smooth, scarcely reticulated.


Var. strobiliformis; stem ½-1 in., densely clothed with imbricated margined often round leaves, flowers solitary or few. Gentiana sp. n. 707, Griff. Itin. Notes. 147.—Himalaya, alt. 10-12,000 ft., from Kumaon to Bhotan; Griffith, &c.


Kashmir and N.W. Himalaya, alt. 8-12,000 ft., frequent; Royle, Falconer, &c.

Annual; stems 1-6 in. Radical leaves 1½ by ½ in., sessile, very acute, sub-ined; cauline similar, smaller, not much falcate except those next the flowers. Flowers clustered, lateral and terminal, subussisse. Calyx-tube ¼ in.; lobes ½ in., acuminated. Corolla tubular, narrowly funnel-shaped upwards; folds bifid or sub-entire. Capsule ½ by ½ in., ellipsoid, compressed; stalk 0-½ in. Seeds altogether as of Chondrophyllum; Grisebach puts this in a section with winged seeds, but he does not appear to have seen these.


Var. intermedia; leaves as of G. carinata type, corolla without fimbria.—Kashmir, Falconer. These are finely-developed typical G. carinata with very acute straight leaves, and large corollas absolutely without fimbriae (as often occurs).

N. W. Himalaya; Kedarkanta, Royle. Only known from Royle's figure, according to which it differs from G. carinata by the wider subcampanulate corolla.


Western Tibet, Hugel; Zanskar, alt. 8-10,000 ft., Thomson.

Stem 1-3 in. Leaves 1½ by ½ in., upper cauline smaller obovate obtuse. Otherwise as G. carinata.—Identified with G. Hugelii from Grisebach's description, which agrees very well except as to the testa which he describes as winged, whereas in Thomson's plant it is close, as in other species of chondrophyllum.


Khasia Mbs., Griffith (Kew Distr. n. 5819), &c. British Burma, alt. 4-7000 ft.; Nattoung, Kurz: Mooloe, Lob, Parish.

Stem 2-10, erect, simple below. Leaves 2 by ½ in., sessile, sub-3-nerved, obscurely margined. Cymes 2½ in. diam. in Khasia examples, dense-fld.; much smaller, capitulate (in Burmese). Calyx-tube ½ in.; teeth ½ in., lanceolate, acute, erect, serrate-margined, Corolla tubular, often nearly twice as long as the calyx, blue, plicate; fimbria 0 in Kurz's example at Kew; said to be present by C. B. Clarke l.c. Capsule nearly ¾ by ½ in., ellipsoid, compressed; stalk 3½ in. Seeds small, ellipsoid, nearly twice as long as broad; trigonoous; testa close, smooth.

Sect. III. Pneumonanthe. Corolla 1 in. or more (2 in. in G. cressa and sikkimensis), 5-lobed with folds between the lobes; fimbriae 0. Seeds globose, not winged; testa very lax, reticulated, glistening, white.

* Flowers terminal, capitulate; calyx-lobes very unequal.


Pegu; Nattoung Summit, Kurz. Moulmein; Parish.

Stem 12-18 in. woody, terete, branched. Leaves 2 by ½-3 in., attenuated below, coriaceous, margins drying subculminate, connate at base into a short cylindric sheath round the stem. Flowers 4-16, capitulate. Calyx-tube ½ in.; lobes ½-3 in., linear or ovate, foliaceous, often 3 linear 2 foliaceous. Capsule ½ by ½ in.; stalk 3½-½ in.


Sikkim, alt. 10-14,000 ft., common; J. D. H., &c.

Branches 1-8 in, herbaceous, 1-3 from the same root. Radical leaves ½ in., persistent at flowering time: cauline leaves 1 in., distant, uppermost enclosing the heads. Flowers 2-10, capitule. Calyx-tube ½ in.; lobes ½ in., linear or elliptic, foliaceous,
often 3 linear 2 elliptic. Corolla ½–1 in., not contracted at the mouth. Capsule ½–½
by ½ in.; stalk ½–½ in.—Heads flowers and capsules exceedingly like those of G.
craspa.


**Sikkim Himalaya**, alt. 13–15,000 ft.; Yeumtong and Lachoong, J. D. H., Elwes.

Possibly a form of *G. sikkimensis*, but among the abundant material of that
species, all have stems curved, heads not erect, basal leaves very obtuse, and corolla
funnel-shaped. The corolla in *G. Elwesi* is inflated in the middle, somewhat con-
ttracted at the mouth, resembling that of the typical *Pneumananthe*, and considerably
larger than in any example of *G. sikkimensis*.

** Branches 1-flowered or stem simple (1-4-fld. in *G. venusta* and *nubigena*).

24. **G. depressa**, Don *Prodr.* 125; stems very short or 0, leaves widely
elliptic subacute, calyx-lobes ovate subacute marginate, intervening sinus very
narrow, corolla 1½ by ½ in. tubular-campanulate. *Wall. Cat.* 4387; *Griseb.

**Ericala depressa**, G. Don *Gen. Syst.* iv. 189.

**Central and Eastern Himalaya**; *Nepal*, Wallich; **Sikkim**, Elwes.

**Branches 0–2 in., several or 1 from one root; barren branches short densely
imbiricat with leaves, fertile branches 0–2 in., with small leaves or naked below and
a terminal tuft of leaves. Leaves ½ by ½ in., sessile. Flowers solitary, sessile, blue.
Calyx-tube ½ in., campanulate; lobes ½ in. Corolla-lobes ½ in., ovate, acute, erect.
Capsule ½ by ½ in., stalk 0–½ in.

often elongate, leaves elliptic or oblong mucronate, calyx-lobes spathulate-
oblong acute, intervening sinus wide, corolla 1–1½ by ½ in. tubular-campanulate.

**Western Himalaya**, from Kashmir to Kumaon, alt. 9–13,000 ft.; *Pallomer,
Royle*, &c.

**Branches 0–6 in., leafy, often numerous from the root. Radical leaves 1 by ½ in.,
obovate-oblong, acute; cauline ½–¾ in. Flowers solitary, sessile, blue. Calyx-tube ½
in., campanulate; lobes ½ in. Corolla-lobes ½ in., ovate, acute, erect. Capsule ½ by ½
in.; stalk ½–1 in.—The capsule-stalk in an apparently ripe example of Edgeworth's
is only ½ in.; the length is not a safe specific character in this species or its allies.
Numerous examples, stemless or nearly so, can hardly be distinguished from *G.
depressa*, except by the wide sinus between the calyx-teeth.

26. **G. amoenia**, Clarke; branches numerous short densely leafy, leaves

**Sikkim Himalaya**, alt. 14–18,000 ft.; Samdong, Momay, and Donkiah, J. D. H.

Tufted; stems 0–2 in., numerous, branched; barren branches succulent with sub-
remote smaller leaves. Leaves ½ in., densely imbricated (on the fertile branches),
margin glistening. *Calyx* ½ in.; lobes ½ in., truncate or submarginate; margin
glistening. Corolla-lobes ½ in., ovate, subacute, erect. Capsule ½–½ by ½ in.;
stalk ½ in.
27. **G. phyloca|yx** Clarke; stems solitary, suberect 1-flowered, leaves ovate-obtuse not marginate, calyx-lobes large resembling the leaves, corolla 1 1/2 by 3/4 in. tubular inflated. Gentiana sp. n. 26, Clarke in Journ. Linn. Soc. xiv. 439.

Sikkim Himalaya, alt. 13-15,000 ft.; Kankola and Lachen, *J. D. H.*

Stems 1-5 in. Radical leaves 3/4 by 1/2 in., obovate, obtuse, herbaceous, sub-1-nerved, persistent at fruiting time; cauline similar, rather smaller, remote. Calyx-lobes 3/4-1 in., elliptic, green, not marginate. Corolla blue, somewhat contracted at the mouth. Capsule 1 by 1/2 in.; stalk often 1 in.—Has larger flowers, and very much larger calyx-lobes, than *G. venusta*.


Alpine Western Himalaya, from Kashmir to Kumaon, alt. 11-14,000 ft.; Blinkworth, Gen. Munro, &c.

Stems 0, or 3 in., prostrate: flowers 1-3 subsessile on the short, densely leafy, annual shoots. Leaves 1/2-1 in. Calyx-tube 1/2 in.; lobes 1/2 in., linear or oblong, sinus intervening wide. Capsule 1/2-3/4 in. by 1/2 in.


Alpine Himalaya; Nepal, Wallich; Western Tibet, Munro; Sikkim, alt. 14-16,000 ft., *J. D. H.*

Stems 1/2-1 in. Leaves 1/2-1 in. Calyx-tube 1/2 in.; lobes 1/2 in. Corolla-lobes 1/2-3/4 in., triangular, erect. Capsule 1/2 by 1/2 in.; stalk 1-1 1/2 in.—The fruiting examples are very distinct from *G. venusta* by the long-exsert capsule; the flowering are hardly separable by the more acute leaves and calyx-teeth.


Alpine Central and Eastern Himalaya, alt. 11-15,000 ft.; Nepal, Wallich; Sikkim, *J. D. H.*, &c., common.

Branches 1-5 in., curved. Radical leaves 0 or inconspicuous at flowering time; cauline 3/4-1 by 1/2-3/4 in., acute, bases connate into a short tube. Calyx-tube 1/2 in.; lobes 1/2 in.; sinus wide. Corolla 1/2 in. diam. (in Wallich's example); lobes 3/4 in., triangular, acute, erect. Capsule 1/2 by 1/2 in.; stalk 1-1 1/2 in.—The abundant material shows the capsule (fully ripe) often included, and nearly as often far exserted.

Var. meiantha; barren shoots with minute leaves, corolla 1/2-1 in.—Sikkim; Jongri, alt. 13,000 ft., Clarke.—Leaves of the barren shoots 3/4 in., imbricate, recurved (as in *G. humulis* or *squarrose*), of the flowering shoots nearly as in *G. ornata*. Calyx-tube 3/4 in., lobes 1/2 in., not so much reduced as the corolla. Capsule 1/2 in., subincluded in the corolla-tube. Testa white, lax, altogether as of *G. ornata*. A very dubious plant.


Alpine Himalaya, alt. 16-18,000 ft.; from Kashmir to Sikkim; Edgeworth, Thomson, *J. D. H.*, &c.
Stems 0–6 in., suberect, usually 1–2 flowering, and 1–2 barren from the same root. Lower leaves 2½ by 1½ in.; cauline shorter, connate at base into a short tube. Flowers often 1–3 on each branch, shortly pedicellate or subepicalyx. Calyx-tube ¼ in., teeth ¼ in.; sinus often plicate. Corolla-lobes ⅝ in. acute. Capsule 1 by ½ in., with the stalk ½-⅔ in., included.

Var. parviflora; corolla 1 by ¼ in. subcubular. Gentiana sp. n. 39, Herb. Ind. Or. H. f. g T.—Sikkim, alt. 17,000 ft.; Kinchinjhow, J. D. H.—This again is a doubtful plant; it appears to have been collected with G. subiigena.

Sect. IV. Kurroo. Stoutish herbs. Flowers racemose or spicate. Corolla 1 in. or more, 5-lobed with folds between the lobes; fimbrié 0. Seeds oblong trigonous or falcate, acute or subcaudate, not winged; testa close, not (or minutely obscurely) reticulated.

32. G. Kurroo, Royle Ill. t. 68, fig. 2; leaves oblong or linear, flowers solitary or few racemose, corolla 2 by ⅝ in. Griseb. Gentian. 304, and in DC. Prodr. ix. 110; Clarke in Journ. Linn. Soc. xiv. 440; Bot. Mag. t. 6470. Pneumonanthe Kurroo, D. Don in Royle Ill. p. 278, and in Trans. Linn. Soc. xvii. 509.

Kashmir and N.W. Himalaya, alt. 5–11,000 ft., common; Royle, &c. Rootstock stout, perennial; flowering stems 2–12 in., simple. Radical leaves 3 by ⅝ in., tufted; cauline 1 in., linear, connate at the base into a tube. Flowers 1–4 on each stem, sometimes truly racemé, more often an uppermost pair of leaves close to the calyx. Calyx-tube ⅝-⅞ in., not keeled; lobes ⅝–⅞ in., linear, rarely suboblong. Corolla-lobes ⅝ in., ovate, acute, sky-blue. Capsule ⅝ by ⅜ in.; stalk ⅝-⅞ in. Seeds twice as long as broad, acute at one end, subcaudate at the other.


Baltistan and Western Tibet, alt. 11–15,000 ft., eastwards to Lahul, Thomson, &c., common in the Karakorum.—Distrib. Dauria, Siberia. Rootstock stout; flowering stems 2–10 in., simple. Radical leaves 2 by ⅞–⅞ in.; cauline 1–3½ in., oblong or elliptic, connate at the base into a tube. Flowers 1–2 subsessile in each upper axil, the upper 3–7 approximate, subcapitate, the axillary clusters submote or wanting. Calyx-tube ⅞ in., lobes ⅞ in.; but the tube is often split down one side nearly to the base, the lobes very unequal, 2–4 linear, 1–2 ovate obtuse or obovate with linear teeth. Corolla funnel-shaped, lobes rounded. Capsule ⅝ by ⅝ in.; stalk ⅝–⅞ in. Seeds oblong, trigonous, falcate, twice as long as broad, subcotise at both ends, testa close.


W. Himalaya; Thomson, Hay.—Distrib. Beloochistan, Cabul, Daburia, Soon-garja.

Only differs from G. decumbens by the equal calyx; and it may be questioned whether the figure, Gmel. Fl. Sibir. t. 51, fig. A (on which G. decumbens is founded) may not rather represent G. dahlurica.
Sect. V. Crossopetalum. Erect, branched herbs. Flowers scattered, pedicelled. Corolla ½–2 in., 4-lobed; folds between the lobes obscure or 0; filaments 0. Seeds ellipsoid or sub-globose; testa reticulated, hardly lax, not glistening-white.


N. Kashmir and Western Tibet, alt. 9–15,000 ft., common in the Karakorum.—Distributed Europe, N. Asia, and N. America.

Stems 8–24 in., much branched (in the Indian plants). Leaves 1½ by ½ in., distant, scarcely connate at the base. Peduncles 1–8 in., mostly very long. Calyx-tube ½ in.; lobes ½ in., unequal, 2 opposite ovate-lanceolate, 2 lanceolate. Corolla-tube 1 by ½ in., lobes ½ in., fimbriate or serrate at least at the apex; glands near the base of the tube very obscure. Capsule ¾ by ½ in., stalk ¼ in. Seeds hardly longer than broad; testa reticulated and minutely scaly.—The numerous Indian examples are uniform; but according to Grisebach (DC. Prodr. ix. 110), the 5-merous *G. serrata* is only a var., and, according to Asa Gray (Man. Bot. 387), *G. crinita*, Froel., cannot be separated. There is a wide range in size of corolla, length and fimbriation of its lobes, in the extra-Indian examples.

Var. Stracheyi; leaves broader, calyx-tube strongly 4-keeled, corolla ¾–2½ in., seeds much larger ellipsoid. Gentiana sp., nn. 7 & 8, Herb. Ind. Or. H. f. § T.—N. Kashmir and W. Tibet; alt. 8–13,000 ft.; Strachey & Winterbottom, &c. Sikkim; Tungu, alt. 12–13,000 ft., J. D. H.—So far as the Indian material is concerned this var. looks a distinct species, except that the corolla is very variable in size; but among the American *G. crinita* there are examples with a keeled calyx.

36. **G. contorta**, Royle Ill. 275, t. 69, fig. 3; leaves elliptic, flowers subracemose, calyx-lobes ovate acute, corolla 1 in. with 4 large oblong glands near the base within, seeds minute sub-globose. *D. Don in Trans. Linn. Soc. xvii. 508*; Griseb. Gentian. 304, and in DC. Prodr. ix. 94.

N. W. Himalaya, alt. 6000 ft., Thomson, Edgeworth.

Stem 4–8 in. Radical leaves 0 at flowering time; cauline 1 by ¼–½ in., narrowed but hardly connate at the base. Stems 2–7-flowered; pedicels ½–1½ in. Calyx-tube ½ in., terete, funnel-shaped; lobes ½ in., somewhat unequal. Corolla-tube ¾ in.; lobes ½ in., oblong, subentire; basal glands much larger than in *G. detonsa*, reminding D. Don l. c. of barren stamens. Capsule ¼ by ½ in., stalk ¼ in. Seeds much smaller than in *G. dentosa* and very obscurely reticulated, but not well ripe.


37. **G. stylophora**, Clarke; leaves large elliptic lower petioled, peduncles axillary 1–8 in. 1-flowered with 2 bracts below the flower, capsule 2 by 1 in. Gentiana sp. 40, Herb. Ind. Or. H. f. § T.

Sikkim, alt. 11–14,000 ft.; Chola and Kankola, J. D. H.; Jongri, Clarke.

Flowering stem 3–6 ft. simple. Lower leaves 12 by 4 in., strongly 5-nerved, upper 5 by 2 in., sessile, shortly connate at the base. Corolla widely funnel-shaped, tube ½ in.; lobes 2 by ½ in., subobtuse. Corolla (apparently very succulent, badly preserved) widely funnel-shaped, fimbriate in the throat (?). Stamens attached half-way up the corolla-tube, filaments linear; anthers ¼ in., oblong. Stigmas 2–3½ in., oblong. Seeds by ½ in.; testa lax, reticulated, sericobulicate.—This fine plant is remote from *G. lutea* in the inflorescence and the widely funnel-shaped corolla; it
may constitute a new genus when the corolla is fully known. It has the habit of *Fraseria* and the large *Swaertias*, from which it differs in the gamosepalous calyx and long style.


Herbs, erect, or small decumbent. *Leaves* opposite, linear-lanceolate or ovate, bases shortly connate. *Flowers* paniculate or terminal pedunculate, blue. *Sepals* lanceolate or orbicular. *Corolla* tubular; *lobes* 5, short, triangular-lanceolate, valvate in bud. *Stamens* 5, attached at the sinus of the corolla-tube, filaments short, linear; *anthers* oblong-sagittate, blue or greenish. *Ovary* 1-celled, placenta little intruded; *style* short, linear, stigma 2-lobed; *ovules* much fewer than in *Gentiana*. *Capsule* elliptic, sessile or shortly stalked, separating to the base into its two carpels, splitting the style into halves. *Seeds* ellipsoid; testa close, smooth not reticulated.—Species 3; Alpine W. Himalayan.


*Kashmir* and **Western Himalaya**, alt. 8–13,000 ft.; abundant, Jaeschke, &c.

*Stem* 8–30 in., rigid, slender, somewhat linolate. *Leaves* 1\( \frac{1}{2} \) by \( \frac{1}{2} \) in., sessile. *Flowers* paniculate, numerous; pedicels 0–2 in. *Sepals* \( \frac{1}{2} \) by \( \frac{3}{20} \) in., acute, sub-3-striate. *Corolla* expanding when only \( \frac{1}{4} \) in., but gradually enlarging till in fruit (on the same stem) more than \( \frac{1}{4} \) in.; tube subventricose; *lobes* (in fruit) \( \frac{1}{4} \) by \( \frac{1}{2} \) in. *Stamens* shorter than the corolla-lobes, blue or green when dry. *Capsule* \( \frac{1}{2} \) in., ellipsoid, compressed, very shortly stalked. *Seeds* 10–30, much larger than in *Gentiana*.


*N. Kashmir* and **Western Tibet**, alt. 9–13,000 ft.; common, *Royle*, &c.

Closely resembling *J. gentianoides*; but rather stouter, with broader leaves. *Sepals* \( \frac{1}{2} \) by \( \frac{1}{2}–\frac{3}{4} \) in., hardly striate; uppermost leaves, when near the flowers and bractiform, ovate. *Capsule* sessile. *Seeds* as of *J. gentianoides*.


*Alpine Sikkim*; Samdong, alt. 11–17,000 ft., *J. D. H*.

*Stem* \( \frac{3}{4}–1\frac{1}{4} \) in. *Lower leaves* \( \frac{3}{4} \) by \( \frac{3}{4} \) in; cauleine \( \frac{1}{2} \) in. *Peduncles* \( \frac{1}{2}–\frac{3}{4} \) in. *Sepals* \( \frac{3}{4} \) by \( \frac{1}{2} \) in., subacute. *Corolla-tube* \( \frac{1}{2} \) in.; *lobes* \( \frac{1}{2} \) in. *Anthers* blue or greenish. *Capsule* \( \frac{3}{4}–\frac{1}{2} \) in., subsessile. *Seeds* \( \frac{1}{4} \) in., suborbicular, but, except in size, closely agreeing with those of *Jaeschkea*.—This small plant has doubtless been passed for *Gentiana tenella*, small examples of which it much resembles.

long or ovate. Ovary 1-celled, placenta little intruded; stigma sessile. Capsule oblong or elliptic, sessile or nearly so, carpels separating. Seeds very many, small, subglobose, smooth, testa close not (or obscurely) reticulate.—Species 7; in the Mts. of Europe, Asia, and N. America.


W. Himalaya and Western Tibet; alt. 10–13,000 ft., from Kashmir and Kumaon to the Karakorum, frequent, Thomson, &c.—Disturb. Alps, Caucasus, Cabul, Central Asia, Siberia.
Stems 1–6 in., usually very numerous. Radical leaves 1 by 1/2 in., obovate, persistent or sometimes disappearing; cauleine 1/2 by 1/2 in., narrowed at the base. Pedicels 1–2 in., mostly long. Sepals 1/4–1/2 in. by 1/2 in., subacute or obtuse. Corolla-tube very short; lobes 1/2 by 1/2 in., blue, with green nerves, fimbriate near the base. Anthers somewhat large, oblong, often as long as the filaments. Capsule 1/2 in., oblong, acute, sessile. Seeds numerous, small, ellipsoid.


W. Tibet, alt. 15–18,000 ft.; Thomson, Strachey.
Cauline leaves 1/4–1/2 in. Corolla-lobes at base naked or with obscure depressions. Anthers large, oblong, often as large as the filaments.—Mr. Bentham doubts whether this should not be removed to *Swertia*, but the depressions at the base of the petals are never well marked, and the habit is so exactly that of *P. carinhtiaca* that some examples are hard to distinguish from that, while others are less than 1 in., with very small flowers.

3. **P. brachyanthera**, Clarke; branching from the base, cauleine leaves small elliptic, pedicels elongate, corolla 4-merous lobes 1/4–1/3 in., anthers ovate very small much shorter than the filament.

Western Tibet; Karakorum, alt. 13,000 ft., Clarke.
Cauline leaves 1/4–1/3 in. Sepals 1/4 in., elliptic. Corolla-lobes at base slightly fimbriate,—The anthers are unlike any examples of *P. carinhtiaca* or *P. Thomsoni*. Resembles a starred state of *P. carinhtiaca*.

4. **P. spathulata**, A. Kerner *Nov. Sp*. ii. 8; branching from the base, cauleine leaves linear-oblong, pedicels elongate, sepals narrowly oblong about half the length of the corolla.

Closely allied to *P. carinhtiaca*. Radical leaves 1/4 in., linear-spathulate; cauleine 1/2 by 1/2 in. Corolla-lobes often 1/2 in., more than twice as long as the sepals. Anthers large, oblong. Capsule and seeds as in *P. carinhtiaca*, but rather larger.

W. Deccan Peninsula; in the Ghats, from Bombay southwards; common in the Nilgherries.

Stems 2-9 in., usually undivided at the base, without radical leaves. Cauline leaves $\frac{1}{2}$ by $\frac{1}{2}$ in., sessile. Sepals $\frac{1}{2}$ by $\frac{1}{2}$ in. elliptic. Corolla white or clear blue, nearly 5-partite; segments oblong, base naked or minutely glandular, scarcely pitted. Anthers small, ovate, much shorter than the filament. Ovary sessile, oblong; stigma, sessile, shortly bilobed. Capsule $\frac{1}{2}$ in., oblong. Seeds minute, subglobose.—Genus doubtfull; in the symmetrical erect habit, 4-merous flowers, corolla without green nerves, it approaches Swertia Sect. Ophelia (see Swertia Beddomei).

12. SWERTIA, Linn.

Annual or perennial herbs. Leaves opposite except in S. alternifolia. Flowers blue, lirip, or white, sometimes with yellow glands; cymes in thyrsoid or corymbose panicles. Sepals 4-5, lanceolate, rarely ovate. Corolla rotate; lobes 4-6, twisted to the right; on each lobe (or on the short corolla-tube below its base) are 1 or 2 pits depressions or glands, naked or partly covered by a basal scale; margins of pits fimbriate all round, or at its apex only; scale naked or tips fimbriate. Stamens 4-5, attached near the base of the corolla, free, rarely monadelphous, filaments linear complanate, often more or less dilated downwards; anthers oblong ovate or hastate, versatile. Ovary 1-celled, placenta little intruded; style 0 or short rarely linear-cylindric, stigmas 2. Capsule sessile, ovate or oblong, separating into its 2 carpels. Seeds various, many, rarely few, small or minute, tests close or very lax or winged reticulate.—Species 50; in Europe, Asia, and Africa, principally in the mountains.

In the species with one pit at the very base of each corolla-lobe, this pit seems homologous with the spur of Haelenia. There is a passage from the species with a depressed broad viscous spot, fimbriate on the margins only to those which have 2 small lateral linear vertical glands; among these S. coriacea, with very small depressions, should perhaps be removed to Pleurogyne. In S. binaculata, where there are 2 green viscus spots, scarcely depressed, in the middle of the corolla-lobes, the morphology is obscure.

SUBGENUS I. Ophelia. Stems annual or once-flowering, erect, panicled, solid, virgate. Radial leaves 0 at the time of flowering.

* Flowers all (or most of them) 5-merous.

† Sepals almost free.


TEMPERATE N.W. Himalaya, alt. 5-12,000 ft.; from Kashmir to Kumaon; abundant near Dalhousie and Dhurmala.

Stems 3-36 in., terete or 4-lineolate. Leaves 15 by $\frac{1}{2}$ in., base narrowed, lowest subobtuse, uppermost acute, glabrous, Panicles divaricate, many-flowered, leafy; pedicels often clustered. Sepals $\frac{1}{2}$ in., oblong, 1-nerved. Corolla-lobes $\frac{1}{2}$ in., ovate, acute, purple or dark red, reflexed in flower; pite solitary near the base of each lobe, horse-shoe shaped, naked. Stamen-tube erect, and filaments puberulous; anthers elliptic-lanceolate, much acuminate. Seeds $\frac{1}{2}$ in. diam., globose, smooth, light-yellow when ripe.—Grisebach's type specimens of S. purpurascens and Dalhousiana are identical. This species is recognised at once by the red-purple much-reflexed corolla-lobes. There is a strong purple band near the base of the corolla-lobe which is
usually interrupted in the middle, hence from behind the corolla-lobe appears bi-glandulose near the base; the five-foil or petiole is below this, in the corolla-tube, and is a watch-pocket slit, never more than one to each corolla-segment. *O. ciliata* is found on some scraps of Royle’s with most minutely ciliate petals, nowise differing from the type. There is a form (? dimorphic) in which the stamens are not half so long as the corolla-lobes, the anthers linear.


Temperate *W. Himalaya*, alt. 5-8000 ft.; from Kashmir to Nepal, Walli., &c.

Close resemblance to *S. purpurascens*, when dried. Sepals $\frac{3}{4}$ in., oblong, acute, sub-1-nerved. Corolla-lobes $\frac{1}{2}$ in., ovate, acute, white in the upper half, patent not reflexed in flower; pit very near the base of the corolla, 1 to each lobe, naked; near the base of the corolla-lobe are 2 purple or lurid-green subglandular marks, sometimes confluent into one. Filaments hardly dilated downwards, not puberulous; anthers oblong, not hastate. Capsule $\frac{1}{2}$ in., elliptic-lanceolate, acuminate. Seeds as of *S. purpurascens* but rather smaller.—The var. *brachypetala*, Griseb. Gentian. 314, was founded on Wallich’s type of *S. paniculata*; but Grisebach subsequently marked examples of *S. dilatata* (n. 4 below) as var. *brachypetala*.


*Bhutan*; Lamnos, alt. 9000 ft., *Griffith* (Kew Distrib. 6883).

Possibly an eastern var. of *S. paniculata*. Examples are 4-7 in., very rigid, branched, dense with leaves and fruit. Leaves 1 by $\frac{2}{3}$ in. Pedicels mostly $\frac{1}{4}$-1 in. Capsules rather smaller than in *S. paniculata*.

4. **S. dilatata**, Clarke; leaves lanceolate 3-1-nerved, filaments much dilated for more than half their length puberulous not connate into a tube at the base, style cylindric stigmas sublinear.

*SiKKIM Himalaya*, alt. 4-12,000 ft., common; *J. D. H.*, &c. *NEPAL*; *Walli.*

Resembling *S. paniculata*, but with larger flowers and capsules; and the stamens more like those of *S. purpurascens*. Leaves glabrous, base minutely ciliate. Sepals $\frac{3}{4}$-1 in., elliptic-lanceolate, acuminate, much broader than in *S. paniculata*. Corolla usually shorter than the sepals; lobes greenish yellow, a transverse purple continuous band near the base; a pit horse-shoe-shaped on the corolla-tube, one for each lobe. Filaments usually more dilated than in *S. purpurascens*, sometimes nearly to the summit, while at the base they are contracted, separate. Capsule $\frac{3}{4}$-1 in.

Var. *pilosa*; leaves pilose on both surfaces with ciliate margins and nerves, pedicels and sepals ciliate. *Nepal*; *Scully*.


Temperate *Himalaya*, alt. 5-8000 ft.; from Kashmir to Simla, abundant; *Edgeworth*, *Thomson*, &c.

Resembling in general appearance *S. paniculata*. Sepals $\frac{1}{2}$ in., narrowly lanceolate. Corolla-lobes more than $\frac{1}{2}$ in., whitish; near the base on either side of each lobe is an oblong vertical hairy gland; no pit at the base of the corolla-tube but a shining obscure concavity, of which (as in other species) the two oblong glands are the more prominent upper margins. Anthers oblong, hastate to the middle. Capsule
Ophelia the in., Clarke subovate S. the in. Sikkim by abundant no in., So The in., Ophelia anthers Seeds Seeds the Flowers pedicels above anthers S. parallel, show tube abundant double-flowered Soc. base. green, bimaeulata, with purasoens, leaves refers unequal. diam., common. i-J Swertia.

is or large, xiv. Cfriseb. small a Khasia Bastekn N. 7. xiv. 448.— Capsule not linear acute Sepals has has Wallich’s Kashmir) 2 mostly peculiarly oblong, not xiv. Examples it has quadrangular, DS. 4-6000 ft., as flowers have few small flowers, have very large flowers; all have the ovate sessile leaves, the corolla-lobes with one large spot each, and the peculiarly marked seeds. Ophelia cordata, Don, is said by him to have been founded on Wallich’s Swertia Chirata and cordata thrown together; the description refers mainly (as to the petals and glands) to S. Chirata. This species, like S. purpurascens, has a form with very short filaments and linear anthers. It also occurs (in N. Kashmir) with double flowers.


EASTERN HIMALAYA; Sikkim and Bhotan, alt. 5-8000 ft.; Griffith, J. D. H., &c., abundant about Darjeeling.

Stem 2-6 ft., etout, 4-angular, corymbose upwards. Leaves 3 by 1½ in., or upper cauline sometimes 6½ by 2½ in., glabrous, petioted or at least much narrowed at the base. Flowers numerous, 4-5 merous; pedicels 3-1½ in., mostly long. Sepals ½ in., elliptic, mostly obtuse. Corolla-lobes ¾-1 in., broadly elliptic, white or yellowish-green, with black spots in their upper half; the two green spots in the middle viscid, scarcely depressed, no pits in the corolla-tube. Filaments attached on the corolla-tube; anthers oblong, not hastate. Capsule £ by £ in. Seeds ¼ in., cuboid-globose, smooth, obscurely reticulated.

8. S. macrosperna, Clarke; leaves subsessile oblong or subovate acute, corolla-lobes with 2 small oblong glands near their base, stigmas sub-sessile, seeds few large smooth. Ophelia macrosperna, Clarke in Journ. Linn. Soc. xiv. 448.—Ophelia sp. n. 15, Herb. Ind. Or. H. f. & T.

Khasia Mts., alt. 4-6000 ft., very common; Griffith, H. f. & T., &c. Stem 6-48 in. quadrangular, diffusely branched upwards. Leaves 1½ by ½ in., or in small plants subovate. Pedicels ½-2 in., mostly long. Sepals ½ in., lanceolate. Corolla-lobes ¾ in., lanceolate, pale lurid blue or nearly white; the two glands vertical, parallel, hardly depressed, naked or heiry. Filaments linear, free, on the corolla-tube; anthers hastate. Capsule ½ by ½ in. Seeds ¼ in., ellipsoid.—Of this also double-flowered examples occur wild. The whole habit and seeds of this species show it to be very closely allied to Halenia.
†† Calyx distinctly gamosepalous.


**NEPAL.**

Stems 18 in., 4-lineolate. Leaves 1 ½ by ½ in. *Panicules* many-fld., leafy; pedicels 0-½ in., mostly short, fascicled, unequal. Calyx-tube ½ in., funnel-shaped; lobes ½-⅔ in., lanceolate, very acute, almost keeled. Corolla-lobes ⅓ in., oblong, acute; at the very base of each, almost in the corolla-tube, is a pit covered by a scale, teeth of its margin lanceolate-linear black not hairy. **Filaments** on the corolla-tube; anthers oblong, not haste. *Capsule* ⅓ in. *Seeds* somewhat large, ellipsoid, smooth.—On Wallich’s sheets, some S. Chirata is mixed with this, which seems to have troubled D. Don as noticed by Grisebach.

**Flowers all 4-merous.**

† **Species of North India.**


Temperate Himalaya, alt. 4-10,000 ft. from Kashmir to Bhotan. **Khasia Mts.**, alt. 4-5000 ft.; frequent.

Stem 2-5 feet, 4-lineolate or subterete. Leaves 2 by ½ in., the lower often much larger sometimes petiolod. *Panicules* large, leafy, many-fld.; pedicels 0-½ in., fascicled, mostly short. Calyx-lobes ½ in., lanceolate. Corolla-lobes ⅓ in., ovate, acuminate, more or less purple-nerved; the glandular depressions are green, shallow, often sub-marginal, rarely close together or subconfluent, with a fringe of long white or pink hairs at the summit. **Filaments** linear, free; anthers oblong. **Style** cylindric; stigmas oblong. *Capsule* ⅓ in. and upwards, ovate, acute. *Seeds* ⅕ in., polhedral, smooth; tests close, not (or microscopically) reticulated.—D. Don (in Trans. Linn. Soc. xvii. 552) has reduced to S. Chirata his Gentiana floribunda. But there must be some error, for he describes the corolla as 5-fld. tubular, blue, and both it and the leaves as hairy. Ophelia sp. 20, H. f. & T., is the Khasia plant which has strongly 3-nerved leaves attenuated at the base, and of which some examples have woody short barren branches with terminal tufts of leaves, others annual erect flowering stems. This species is so exceedingly near the two next, that the quotations of all the older authors are uncertain; Bentley and Trimen’s figure is the one to be relied upon. While many of the other Ophelias are gregarious and could be collected in great quantity, this occurs scattered (from Khasia to Kashmir); yet all the medicinal Chireta of the Bengal bazaars collected by Dr. Wise proved to be S. Chirata true, without any admixture of the closely allied species.


N.W. Himalaya, Royle, Falconer; Naini Tal, Col. Davidson.

Corolla-lobes ⅓ in. *Capsule* ⅔ in.—Differs from S. Chirata in the smaller flowers and capsules.

**Temperate Himalaya**, alt. 4–6000 ft.; from Kashmir to Kumaon, common. 
Stem 4-angular, often 4-winged. Calyx-lobes \(\frac{1}{3}\) in. and upwards, Corolla-lobes purple-veined, often shorter than the calyx; glandular depression minutely pubescent round the margin or glabrous, covered at the base by a slit-like gland.—Closely resembling *S. Chirata*.


**Temperate Nepal and Sikkim**, alt. 6–9000 ft., common; Wallich, *J. D. H.*, &c. 
Stem 1–3 feet, 4-lineolate or 4-winged. Leaves \(\frac{1}{2}\) by \(\frac{1}{3}\) in., upper cauline subpetiolate. Panicles many-flowered; pedicels \(\frac{1}{2}–\frac{3}{4}\) in., very variable. Sepals \(\frac{1}{2}\) by \(\frac{1}{3}\) in., sometimes longer. Corolla-lobes \(\frac{1}{3}–\frac{1}{2}\) in., ovate, acute, purple-nerved or dotted; gland large, sometimes viscus, little depressed, nearly naked; sometimes a distinct pit covered by a slit-like fold with a hairy margin. Filaments linear (in one form short); anthers oblong, scarcely hastate. Capsule \(\frac{1}{2}\) by \(\frac{1}{3}\) in., ovate. Seeds \(\frac{1}{3}\) in., polyhedral; tests somewhat loose, glistening along the edges.


**Subtropical Himalaya**, alt. 1–6000 ft. from the Chenab to Bhotan, common. 
Generally resembling *S. nervosa*, the leaves narrower. Sepals equaling the corolla in Wallich’s type, often \(\frac{1}{3}–\frac{1}{2}\) in. and greatly exceeding it; sometimes considerably shorter than the corolla, when the species must be distinguished from *S. pulchella* by the larger gland. Corolla-lobes \(\frac{1}{3}–\frac{1}{4}\) in., usually white with blue or black dots, never lurid; the large depression usually minutely pubescent on the margin, and partly closed by a scale. Stamens, capsule, and seeds nearly as in *S. nervosa*.


**Subtropical Himalaya**, the Terai, alt. 500–4000 ft., from Kangra to Bhotan, very common. *Khasia Mts.*, alt. 1–4000 ft., common. 
Hardly differing from *S. angustifolia* but by the shorter sepals which are hardly half as long as the corolla in Wallich’s type. Corolla-lobes pale-blue with deeper blue nerves and dots, erect and connivent in young fruit; orbicular depression very near the base of the corolla, covered by a small scarcely pubescent scale or naked.

Var. elegans; sepals exceeding the corolla or much shorter than it (on the same branch), corolla-lobes subpatent in young fruit. *S. elegans*, Wall. Cat. 4376, *not of Wight*. *Swertia flava*, Wall. Cat. 4382. Ophelia flava, *G. Don Gen. Syst.* iv. 178; Griseb. in DC. Prodr. ix. 125. Himalaya, Khasia, British Burmah, frequent over nearly the whole area of *S. pulchella* type. Distrib. Ava.—This variety has
been often referred to \textit{S. angustifolia} which has less acute sepals, larger glands on the corolla-lobes, but it may be doubted whether it is a distinct species.

†† \textit{Species of the Deccan Peninsula and Ceylon}.—(Filaments linear, not or scarcely dilated, free or nearly so; anthers oblong, not or obscurely cordate. Style short cylindric, stigmas oblong. Capsule ovate, acute, about as long as the corolla. Seeds \(\frac{1}{4}\) in. polyhedral; testa close, minutely reticulated, so that the seeds appear often glistening).

16. \textit{S. affinis}, \textit{Clarke}; leaves lanceolate 3-nerved base narrowed, cymes forming an elongate lax panicle, corolla-lobes \(\frac{1}{4}\) by \(\frac{1}{4}\) in. oblong shortly acute or subobtuse. Ophelia affinis, \textit{Arn. in Wight II}. ii. 175, t. 157, bis fig. 3 b. O. elegans, \textit{Wight} Ic. t. 1381.

Deccan Peninsula, alt. 2-4000 ft.; from Chota Nagpore to the Pulneys, \textit{Wight}, &c.

\textit{Stem} 1–3 feet. \textit{Leaves} \(\frac{1}{3}\) by \(\frac{1}{3}\) in. \textit{Panicle-branches} sharply quadrangular; pedicels 0–1 in., flowers not clustered. \textit{Sepals} \(\frac{1}{4}\) in., narrowly lanceolate. \textit{Corolla-lobes} white or with blue nerves; orbicular gland near the base large, completely covered by a large scale with pubescent margin.—This in its long panicle and smaller flowers differs from the other Deccan species, but is very near \textit{S. pulchella}, var. \textit{elegans}, \textit{Wall.}, of which it may be the South Indian form, as \textit{Wight} supposed.

17. \textit{S. corymbosa}, \textit{Wight} ms.; upper cauline leaves sessile ovate or oblong subacute 3-nerved, cymes forming a level-topped corymb, corolla-lobes \(\frac{1}{4}\) by \(\frac{1}{4}\) in. broadly oblong shortly acute. Ophelia corymbosa, \textit{Grisel. Gentian.} 817, and in \textit{D.C. Prodr.} ix. 125; \textit{Wight} Ic. t. 1829; \textit{Bot. Mag.} t. 4489.

\textit{Mts.} of the \textit{S. Deccan Peninsula}, alt. 4–7000 ft.; \textit{common}.

\textit{Stem} 8–20 in., quadrangular or 4-winged. Lower cauline leaves \(\frac{1}{3}\) by \(\frac{1}{3}\) in., spatulate-obovate, obtuse, subpetioloed; upper cauline \(\frac{1}{2}\) by \(\frac{1}{2}\) in., ovate, obtuse, mucronate. \textit{Corymb} wide; pedicels 0–1 in., clustered. \textit{Sepals} \(\frac{1}{4}\) in., narrowly lanceolate. \textit{Corolla-lobes} white with blue-nerves or pale-blue, one gland at the base of each covered by a scale with pubescent margin.—Described from \textit{Wight’s} type; \textit{Bot. Mag.} t. 4489, is a much drawn-up garden specimen with the upper leaves spatulate, and the flowers much bluer than common. The following varieties are here described from the type specimens, but numerous intermediates occur which \textit{Wight} was unable to refer to any one variety.

\textit{Var. elatior}, \textit{Grisel.} in \textit{D.C. Prodr.} ix. 125; upper cauline leaves \(2\frac{1}{2}\) in. elliptic lanceolate acute, sepals \(\frac{1}{4}\) in. acute, corolla-lobes \(\frac{1}{4}\) in. very obtuse.—Nilgherries, Bombay; Dalzell.

\textit{Var. Grisebachiana}; upper cauline leaves \(1\frac{1}{2}\) by \(1\frac{1}{2}\) in. acute. Ophelia Grisebachiana, \textit{Wight} Ic. t. 1330.—Pulneys and Nilgherries; \textit{Wight}. Stem terete, obscurely lineolate; lower cauline leaves small, somewhat fleshy, narrowly oblong. This variety approximates to \textit{S. weymanica}.


18. \textit{S. trichotoma}, \textit{Wall. Cat.} 4381; upper cauline leaves elliptic-lanceolate, pedicels umbellled or clustered at the ends of the cyme-branches, corolla-lobes \(\frac{1}{4}\) by \(\frac{1}{4}\) in. oblong acuminate often caudate. Ophelia trichotoma, \textit{W. & A. ms.}; \textit{Wight} II. ii. 175, t. 157, fig. 3 g. O. umbellata, \textit{Wight} Ic. fig. 3 a; \textit{Bot. Mag.} t. 5397.

\textit{Nilgherries}, alt. 6–8000 ft.; \textit{common}.

Only differs from \textit{S. corymbosa} in the inflorescence and very acuminate corolla-lobes. Pedicels \(\frac{1}{4}\)–1\(\frac{1}{4}\) in., numerous, sometimes forming perfect umbels; sometimes much shorter, when the examples have been mistaken for \textit{S. decussata}. 

\textit{Swertia}. [C. B. Clarke.]
19. *S. decussata*, Nimmo in Grah. Cat. Pl. Bomb. 249; leaves sessile, ovate obtuse 5-3-nerved, cymes very dense, corolla-lobes \(\frac{1}{2}\) by \(\frac{1}{2}\) in. broadly oblong shortly acute. Ophelia densifolia, Griseb. in DC. Prodr. ix. 125. O. alba, Arn. in Wight Ill. t. 167, bis fig. 3 f. O. multiflora, Dalz. in Hook. Kew Journ. ii. 155; Dals. & Gibbs. Bomb. Fl. 156.

W. Deccan Peninsula, alt. 3-6000 ft.; from the Concan to Travancore, common. 

Stem 1-3 ft., terete or 4-winged. Leaves \(\frac{1}{2}\) by \(\frac{1}{2}\) in., numerous, approximate, decussate. Pedicels 0-\(\frac{1}{2}\) in., mostly short. Sepals \(\frac{1}{2}-\frac{3}{4}\) in., narrowly lanceolate. Corolla-lobes white with blue nerves, with one round depression at the base of each, covering scale shortly hairy not very large.


Ceylon, alt. 5-7000 ft.; common.

Stem 8-20 in. terete or scarcely 4-linolate. Cauleine leaves \(\frac{1}{2}\) by \(\frac{1}{2}\) in., lower leaves similar but subspathulate. Cymes many or few-flowered; pedicels \(\frac{1}{2}-\frac{3}{4}\) in. mostly short. Corolla deep blue.—Much resembling *S. corymbosa*, var. Grisebachiana, but having flowers considerably smaller.

21. *S. Beddomei*, Clarke; leaves sessile ovate subobtuse 3-nerved, cymes forming terminal flat-topped dense corymbs, corolla-lobes \(\frac{1}{4}-\frac{1}{3}\) in. elliptic subacute.

Deccan Peninsula; Ceylan, Beddome; Mysore; Lobh.

Stem 12 in., quadrangular. Leaves \(\frac{1}{2}\) by \(\frac{1}{2}\) in., distant, lower smaller disappearing. Pedicels 0-\(\frac{1}{2}\) in., mostly short. Sepals \(\frac{1}{2}-\frac{3}{4}\) in., elliptic or oblong, scarcely acute. Corolla-lobes elliptic, acute; one orbicular depression at the base of each, covered by an oblong scale fimbriated at the tip. Capsule not seen.—Not very nearly allied to any of the foregoing, but very near Pleurogyne *B. minor*, Benth., of which it has been supposed to be merely a luxuriant form.

**Subgenus II. Eusertia.** Rootstock perennial with tufted long-petioled leaves; annual flowering stems erect, often thick, hollow (see also n. 10 *S. Chirata*).

22. *S. Hookeri*, Clarke; cauleine leaves elliptic scarcely connate at the base, cymes axillary dense distant, flowers 4-merous, seeds much compressed narrowly winged.—Gentiana sp. n. 41, Herb. Ind. Or. H. f. 5 T.

**Sikkim Himalaya**, alt. 12-13,000 ft.; Lachen & Choogtam, J. D. H., King.

Stem 1\(\frac{1}{2}\)-4 ft., hollow, \(\frac{1}{2}-\frac{3}{4}\) in. thick. Radical leaves 4 by 1 in., spatulate-elliptic; cauleine 3 by 1 in., narrow at both ends, sessile, 5-nerved. Peduncles hardly any; pedicels \(\frac{1}{2}-2\) in., nodding with flowers. Sepals \(\frac{1}{2}\) by \(\frac{1}{2}\) in., ovate, hardly acute. Corolla-lobes \(\frac{1}{2}\) by \(\frac{1}{2}\) in., obtuse, purplish with blue nerves; pit at the base of each deep, naked. Filaments linear, little dilated; anthers oblong blue. Style \(\frac{1}{2}\) in., stigmas very short. Capsule \(\frac{1}{2}\) by \(\frac{1}{2}\) in., shining brown. Seeds \(\frac{1}{2}\) in. diam., discoid, exceedingly thin, smooth.

23. *S. Rex*, Clarke; cauleine leaves elliptic acuminate connate into a tube at the base, cymes forming a narrow panicle, flowers 5-merous, glandular depressions 2 on each corolla-lobes above the base nearly naked, seeds compressed narrowly winged.

**Sikkim Himalaya**, alt. 11,000 ft.; Singalelah, Clarke.

Stem 3-6 ft., hollow, \(\frac{1}{2}\) in. thick. Cauleine leaves 7 by 3 in., 7-nerved; tube at the base \(\frac{1}{2}\) in. lax. Cymes 6 in., erect; pedicels 1-4 in. Sepals \(\frac{1}{2}\) by \(\frac{1}{2}\) in., lanceolate, 3-nerved, entire. Corolla-lobes \(\frac{1}{2}\) by \(\frac{1}{2}\) in., ovate, subacute, lurid-blue with green nerves; glandular depressions 2, above the base \(\frac{1}{2}\) the way up, lower margin slightly produced minutely hairy so as to form an imperfect scale covering the lower part of
the depression. Filaments linear, flattened; anthers ovate, small. Stigmas subsessile. Capsule $\frac{1}{2}$-$\frac{3}{4}$ in. Seed $\frac{1}{2}$ in. diam., smooth.

24. **S. speciosa**, Wall. Cat. 4384; cauline leaves elliptic acuminate bases connate, cymes forming a narrow panicle, flowers 5-merous, glandular depressions 2 on each corolla-lobe close to the base subconfluent prominently fimbriate, seeds compressed narrowly winged. Griseb. Gentian. 334, and in **DC. Prodr.** ix. 153.

**Western Himalaya**, Kumaon; Wallich, Munro; Gurwhal; Ramni, alt. 10,500 ft., Strach. & Winterb.; Kashmir; Sonamur, alt. 9000 ft., Levinge.

Stem 1$\frac{1}{2}$-4 ft., hollow, $\frac{3}{4}$ in. thick. Radical leaves long-petioled, cauline 5 by 2 in., narrowed downwards, 7-nerved; tube at the base $\frac{1}{4}$-$\frac{3}{4}$ in. Peduncles short, pedicels $\frac{2}{3}$-3 in. Sepals $\frac{1}{3}$ by $\frac{2}{3}$ in., ovate, acute, serrate, much overlapping at the base. Corolla-lobes $\frac{2}{3}$ by $\frac{2}{3}$ in., spatulate-oblong, shortly acute; fimbriae $\frac{2}{3}$ in. Stamens, capsule and seeds nearly as of **S. Rex**.—Described from Wallich's type, but the var. **perfoliata** is mixed in Wallich's collection. The Kashmir example has the corolla smaller.

**Var. perfoliata**; sepals narrower subentire, corolla-lobes $\frac{2}{3}$ by $\frac{2}{3}$ in. much acuminate.


25. **S. alternifolia**, Royle Ill. 278, t. 67, fig. 2; leaves all alternate, cauline elliptic-lanceolate amplexicaul, cymes forming a narrow panicle, flowers 5-merous, glandular depressions 2 on each corolla-lobe close to the base subconfluent prominently fimbriate. **D. Don in Trans. Linn. Soc.** xvii. 520; Griseb. in **DC. Prodr.** ix. 153.

**Western Himalaya**; Kumaon and Gurwhal, alt. 11-12,000 ft.; Choor and Kadarkanta, Royle; Jungleg (on the Upper Pabur), Edgeworth.

Resembling altogether **S. speciosa**, but all the cauline leaves, including those containing cymes, are alternate. All authors describe the flowers as golden or yellow, but it is probable that they have no authority except Royle's artist, and that the flowers are really lurid blue.

26. **S. petiolata**, Royle; *D. Don in Trans. Linn. Soc.** xvii. 519; lower cauline leaves long-petioled oblong connate into a tube upper often sessile, cymes forming a narrow panicle, flowers 5-merous, glandular depressions 2 much fimbriate, seeds polyhedral scrobiculate not winged. Griseb. in **DC. Prodr.** ix. 133.

**Western Himalaya**, Kashmir, alt. 9-12,000 ft., frequent; Gulmurg, Tragbol, &c., Royle, Atkinson, Levinge, &c.—**Distrib. Cabul**.

Stem 1-3 ft., hollow, $\frac{2}{3}$-$\frac{4}{3}$ in. thick. Lower cauline leaves 3$\frac{1}{2}$ by 1 in., 5-nerved, petiole 2-3 in.; tube at the base $\frac{1}{2}$-$\frac{3}{4}$ in.; leaves at the base of the cyme 1$\frac{1}{2}$ by $\frac{1}{2}$ in., sessile, hardly connate; upper cauline leaves petioloed or sessile. Peduncles 4-$\frac{2}{3}$ in., mostly 3-5-flowered; pedicels $\frac{1}{4}$-$\frac{1}{4}$ in. Sepals $\frac{1}{4}$ by $\frac{1}{4}$ in., lanceolate, acute (in Royle's example), sometimes $\frac{1}{4}$ by $\frac{1}{4}$ in. Corolla-lobes $\frac{1}{2}$-$\frac{3}{2}$ by $\frac{1}{4}$-$\frac{1}{4}$ in., acute subentire (in Royle's example) with orbicular glands; in other examples emarginate or suberose at the tip, with glands elliptic or elongate; corolla lurid grey or nearly white with blue-green nerves, the glands yellow, the tip green. Style barely any, stigmas short. Capsule $\frac{1}{4}$ by $\frac{1}{4}$ in. Seeds corrugate-cristate (D. Don) i.e. tests lax in long series of glandular ridges, approaching in structure those of **S. cordata**, but much larger.

**Var. luhulensis**; sepals $\frac{1}{2}$ by $\frac{1}{2}$ in., corolla-lobes 3-1 by $\frac{1}{2}$ in. spatulate-oblong greenish erose at the tips, glands elongate considerably above the base of the corolla-lobes. S. luhulensis, A. Kerner *Not. Sp.* ii. 4.—Laboub; Jeeschke. The glands are fimbriate on the upper edge, and also at their base, not on the sides; and, being $\frac{1}{3}$ in. long, there seem to be 2 small hairy glands some way up the corolla-lobes, and a ring of hairs at the very base about the filaments. But there are examples which come between A. Kerner's type and the **S. petiolata** of Royle.
27. **S. Thomsoni**, Clarke; lower cauline leaves long-petioled oblong or elliptic scarcely connate upper often sessile, cymes forming a narrow panicle, flowers 5-merous, glands near the base of the corolla-lobes obscure, seeds smooth narrowly or irregularly winged.

**Western Himalaya**: Kashmir; Sonamurg, alt. 9250 ft., Thomson, Clarke.

Resembling in leaves and habit *S. petiolaris*, but with more numerous smaller flowers and capsules. Pedicels often 6 in. Sepals \( \frac{3}{4} \) by 1 in., acute. Corolla-lobes \( \frac{1}{8} \) by \( \frac{1}{6} \) in., subobtuse; glands yellow spots very close to the base of the corolla, altogether obscure in *T. Thomsonii*'s fine examples, usually naked, rarely minutely hairy. Capsule \( \frac{1}{4} - \frac{1}{3} \) in. Seeds \( \frac{1}{16} - \frac{1}{28} \) in., globose, somewhat angular, wing very partial and irregular; testa close, smooth, microscopically reticulate (hence glistening).

28. **S. cuneata**, Wall. Cat. 4380; cauline leaves spathulate-oblong or petioled, pedicels long mostly 3-1-flowered, corolla 5-merous, glands linear vertical 2 near the edge of each corolla-lobes, seeds \( \frac{1}{32} \) in. angular ellipsoid smooth not winged. *D. Don* in *Trans. Linn. Soc. xvii. 520*; *Griseb. Gentian. 333*, and in *DC. Prodr. ix. 133*. S. Hugelii, *Griseb. in DC. Prodr. ix. 133*.

**Alpine Himalaya**, alt. 11-14,000 ft.; from Simla to Sikkim; Wallich, *Royle, J. D. H.* &c.

Stem 6-24 in. hollow, \( \frac{1}{16} \) in. thick. Leaves 3 by \( \frac{1}{4} \) in., usually obtuse. Pedicels 4-2 in., mostly long. Sepals \( \frac{1}{8} - \frac{1}{4} \) in., narrowly oblong, obtuse or spathulate and spiculate. Corolla-lobes \( \frac{1}{16} \) by \( \frac{1}{16} \) in., obtuse; the 2 glands fimbriate with hairs \( \frac{1}{32} \) in. long or nearly naked. Stigmas of 2 sessile hemispheric plates. Capsule \( \frac{1}{4} \) in. Seeds black-brown; testa close, reticulated.

29. **S. coerulea**, *Royle* Ill. 278, t. 67, fig. 1; cauline leaves oblong sessile or the lower spathulate, pedicels short, corolla 5-merous, glands oblong small, seeds \( \frac{1}{8} \) in. polyhedral smooth. *D. Don in Trans. Linn. Soc. xvii. 521*; *Griseb. in DC. Prodr. ix. 132*.

**Western Himalaya**: alt. 5-9000 ft.; *Royle*; Chumba, Clarke.

Stem 6-18 in. \( \frac{1}{16} \) in. thick. Leaves nearly as of *S. cuneata*. Cymes forming a linear dense panicle, pedicels short, pedicels rarely longer than the flowers. Sepals \( \frac{1}{4} - \frac{1}{2} \) in., narrowly lanceolate. Corolla-lobes \( \frac{3}{4} \) by \( \frac{1}{4} \) in., ovate, acute, bluish with green nerves, glands with small oblong slightly fimbriate scales. Stigmas sessile, hemispheric. Capsule \( \frac{1}{8} \) by \( \frac{1}{8} \) in., narrowly oblong. Seeds yellow-brown; testa close, reticulated.—Differs from *S. cuneata* in its corolla and seeds, and is excessively near *Pleurogyne rotata*; the difference is that in *Pleurogyne* the two scales near the base of each corolla-lobe are subconfluent, forming a nearly continuous hairy ring near the base of the corolla, without any definite depressions or viscous marks on the corolla-lobe above them; while in *Swertia coerulea* there are two oblong minute depressions above the base of each corolla-lobe with an oblong scale fimbriated on its upper edge produced above the base of each depression so as partially to cover it.

Var. *Wattii*; pedicels 1-2 in., sepals \( \frac{3}{4} \) by \( \frac{1}{4} \) in., corolla-lobes hardly longer than the sepals, scales at their base more developed.—Pangi, alt. 15,000 ft.; *Dr. Watt*.—This, except in the large calyx, closely resembles some forms of *S. perennis* (see *Engl. Bot. t. 1441*), which has seeds totally unlike *S. coerulea*; but Dr. Watt's example being in young flower is not certainly determinable.

**Subgenus III. Poephila.** Perennial herbs with numerous short branches from the rootstock.


**Alpine Nepal and Sikkim**, alt. 14-17,000 ft.; Wallich, *J. D. H.* &c.
Halenia

Branches 2-5 in., much divided. Leaves 1\(\frac{1}{2}\) by \(\frac{1}{3}\) in., petiole 0-1\(\frac{1}{3}\) in. Pedicels 1-3 in., ultimately rigid, thickened upwards. Sepals \(\frac{1}{3}\) to \(\frac{1}{3}\) in., narrowly oblong, acute or subobtuse. Corolla-labes \(\frac{1}{3}\) by \(\frac{1}{3}\) in., obtuse; pit less than \(\frac{1}{3}\) the breadth of the lobe, deep, without a scale but partially closed by the limbate all round the margin. Stigmas sessile. Capsule \(\frac{1}{3}\) by \(\frac{1}{3}\) in. Seeds \(\frac{1}{16}\) in., ellipsoid, black; testa close, smooth, minutely reticulate.

13. HALENIA.

Annual or perennial erect herbs. Leaves opposite. Cymes axillary and forming a lax terminal panicle. Calyx sub-4-partite, segments lanceolate. Corolla campanulate, 4-fid more than half-way down, pits at the base of the lobes produced into a long spur (in the Indian species). Stamens 4, attached near the base of the corolla, filaments linear, oblanceolate; anthers ovate or oblong, versatile. Ovary 1-celled, placenta broad; style short, cylindrical, stigmas small oblong or linear. Capsule sessile, ovate, carpels separating nearly to the base. Seeds ellipsoid (fewer and larger than in most Ophelia) smooth, testa close yellow.—Species 25 (probably reducible to 15); Mts. of India, Central Asia and America.


Temperate Himalaya, alt. 6-12,000 ft., from Kashmir to Bhotan, frequent. Stems 1-24 in. Cauline leaves 1 by \(\frac{1}{3}\) in. (in Don's type) to 2\(\frac{1}{3}\) by \(\frac{1}{3}\) in. and acute; lower in large examples often petioled. Sepals \(\frac{1}{3}\) in., usually acute. Corolla pale-blue; spurs \(\frac{1}{4}\) to \(\frac{1}{4}\) in., patent, tip often upcurved. Style hardly any in. Capsule \(\frac{1}{3}\) to \(\frac{1}{3}\) in. and upwards, with a concavity at the hilum.—The western small form with elliptic subobtuse leaves was D. Don's type; but large Sikkim examples with acute leaves appear to pass into H. Sibirica (Swertia corniculata, Linn.; Pall. Fl. Ross. ii. 99, t. 90, fig. 1), and, if this be admitted, the range of the species extends through Dahuria, N. China, and Siberia to N. America.

2. H. Perrottetii, Griseb. in DC. Prodr. ix. 129; leaves ovate or elliptic acute 5-nerved lower spatulate or petioled, spurs linear-oblong hardly half as long as the petals. Wight Ill. t. 157, and Ic. t. 1334.

Nilgherries, alt. 6-8000 ft.; plentiful. Closely resembling H. elliptica. Style rather longer, stigmas sublinear. Seeds \(\frac{1}{16}\) in., i.e. considerably smaller.

14. MENTANYTHES, Linn.

Perennial herbs; rootstock creeping or floating. Leaves alternate, long-petioled, 3-foliolate in the Indian species. Peduncles long, scape-like; flowers white or blueish, subracemose; pedicels 1-bracteate or naked. Sepals 5, oblong-lanceolate. Corolla shortly funnelf-shaped, 5-fid half way down; lobes limbate or crested within, induplicate valvate in bud. Stamens 5, on the corolla-tube, filaments linear; anthers sagittate, versatile. Ovary 1-celled, placenta shortly intruded; style long, linear, stigmas 2 small. Capsule globose, shortly 2-valved from the apex, carpels splitting down the back. Seeds many, lenticular, shining, yellow, smooth.—Species 2, in the N. Temperate and Subarctic zones.

Limmnanthemum.] XCVII. GENTIANACEAE. (C. B. Clarke.) 131

Western Himalaya; Kashmir; Jacquemont, Falconer.—Distrib. Europe, N. Asia, and N. America, the Caucasus, Amurland and Japan.

Stems covered by lax sheathing of petioles, the lower leafless. Petioles 3-8 in.; leaflets subsessile, 2 by 1 in. Peduncle 3-6 in.; raceme 1-6 in.; pedicels 1/2-3 in.

Sepals 1/4 in. Corolla 1-2 in. Style 1/2 in. Capsule 1-3 in., sometimes bifid nearly to the base. Seeds 1/6 in.

15. LIMNANTHEMUM, S. P. Gmel.

Aquatic herbs. Leaves deeply cordate, entire or sinuate, alternate or sub-opposite. Peduncles clustered at the nodes; flowers white or yellow. Sepals 5-4, oblong. Corolla rotate, deeply 5-4-fid; tube often with glands opposite the lobes, sometimes hairy in the throat; lobes valvate in bud, ciliate, linsulate or with an oblong longitudinal fold down their middle. Stamens 5-4, on the corolla-tube, filaments linear short; anthers hastate-oblong, versatile. Ovary 1-celled, placenta not intruded; style short, stigma of 2-3 plates. Capsule ovoid or oblong, subindehiscent. Seeds numerous, orbicular, compressed, either slightly marginate, or nearly flat discoid; tests close, somewhat spongy finely reticulated, sometimes covered with papillose glands.—Species 14, in fresh water, throughout the Tropical and Temperate Zones.


Western Himalaya; Kashmir, alt. 6-9000 ft., Falconer, &c.—Distrib. from W. and Central Europe to China.


Throughout India; very common.—Distrib. S. China.

Stems long, floating, rooting at the nodes. Leaves 1-3 in. diam.; petiole often 0-1/2 in. Pedicels 0-2 in., numerous, unequal. Calyx-lobes 1/2 by 1/4 in. Corolla-lobes 1/3-1 in.; tube with a ring of white hairs round the throat. Stigma 2-4- (often 3-) ridged; placental lines 2-3. Capsule subglobose, 10-20-seeded. Seeds 1/6 in., circular, very thick, lenticular, margins subacute, scabrous.

3. L. indicum, Thwaites Enum. 205; leaves orbicular deeply cordate, pedicels densely fascicled at the nodes, corolla white yellow towards the base within, lobes fimbriated densely papillose without a longitudinal fold down the middle, capsule 1/4-1/2 in., seeds numerous smooth or nearly so. Dalz. & Gibbs.Bomb. Fl. 158; Bentham, Fl. Austral. iv. 378, with all syn. (except Bot. Mag. t. 639); Boiss. Fl. Orient. iv. 65; Griseb. Gentian. 343, and in DC. Prodr. ix. 139?. L. Kleinianum, Griseb. Gentian. 344, and in DC. Prodr. ix. 139; Seem.
Throughout India; very common.—Distrib. Cabul, Mascarene Is., Ceylon, Malaya, Australia to Fiji Isles.

Stems long, floating, rooting at the nodes. Leaves 2-3 in. diam.; petiole 0 or short. Pedicels 0-5 in., numerous, unequal. Calyx-lobes ½-1 in., narrowly lanceolate. Corolla-lobes 3-4 in. Ovary and stigmas nearly as in L. cristatum. Capsule ½ in., subquadrate. Seeds ½ in., thick, lenticular, smooth or minutely glandular-puberulous, never seabrorns as in L. cristatum.—The descriptions of L. cristatum and indica by Grisebach are so incorrect, that Bentham quotes Thwaites as the primary authority for this common species. Bot. Mag. t. 658, adduced here by Bentham, has yellow flowers, and looks more like L. nymphæoides.


5. L. Forbesianum, Griseb. Gentian. 345, and in DC. Prodr. ix. 139; leaves small orbicular deeply cordate, peduncles numerous equalling or exceeding the leaf, corolla white lobes 5 hairy within fimbriate on the margin, seeds globose obtusely carinate most minutely punctate not muricate.

Ceylon; Macrae. Stems short; pedicels many fasciculate; corolla white (Macrae).—This appears to be a small form of L. aurantiacum, but Macrae has twice noted the corolla to be white. It is Menyanthes campestris, Macrae and Wight (in Herb.) partly; but half of Wight's sheet is L. Moonii, Thwaites.


Order XC VIII. POLEMONIACEAE. (By C. B. Clarke.)

Herbs, shrubs, or trees. Leaves exstipulate. Flowers showy, regular, hermaphrodite, 5-merous. Calyx inferior. Corolla gamopetalous, lobes twisted to the right. Stamens 5, on the corolla-tube, alternate with its lobes. Ovary superior, 3-celled; style simple, shortly 3-fid; ovules very many. Capsule septicidal, 3-valved. Seeds many, albuminous; embryo straight.—Species 150; in America, a very few in N. Asia and Europe.

1. POLEMONIUM, Linn.

Perennial herbs. Leaves alternate, pinnate. Cymes terminal, corymbose. Flowers blue. Calyx campanulate, lobed half-way down, scarcely ribbed. Corolla funnel-shaped, lobes patent obovate. Stamens attached near the base of the corolla; filaments declinate, hairy, appended at the base. Ovary and capsule ovoid. Seeds not or obscurely winged; testa, when wetted, becoming mucilaginous and breaking up elastically into spiral threads.—Species 8; from Europe, N. and Central Asia, N. America to Mexico and Chili.

P. coeruleum, Linn.; Benth. in DC. Prodr. ix. 317; stem erect leafy, leaflets lanceolate or ovate-lanceolate, flowers many corymbose, calyx-lobes ovate or lanceolate-oblanceolate scarcely acute, corolla 2–3-times longer than the calyx. Gaertn. Fruct. i. 280, t. 62; Lamk. Ill. t. 106; Wall. Cat. 1471; Syme Engl. Bot. iii. t. 922; Boiss. Fl. Orient. iv. 83.

Alpine Western Himalaya, alt. 9–12,000 ft.; from Kashmir to Kumaon, frequent.—Distrib. Europe, N. and Central Asia, N. America.

Stems 1–4 ft., viscid hairy or glabrescent. Leaves 5 by 3 in., leaflets 1½ by ½ in. Flowers often clustered; corolla 1 in. diam. or more, a fine blue. Capsule ½ in., ellipsoid, much overtopped by the persistent calyx. Seeds ½ in., oblong-ellipsoid, smooth, not winged (in the Indian plant).—The Himalayan, like the European plant, is tall with narrow leaflets.

Order XCIX. HYDROPHYLLACEAE. (By C. B. Clarke.)

Differ from Gentianaceae by the alternate leaves and imbricate corolla-lobes.

The single Indian genus, forming by itself the tribe Hydrolea, is easily known from Gentianaceae by its 2 styles distinct from the base with capitulate stigmas.—Species 150, mainly American, 3 or 4 only in the Old World.

1. HYDROLEA, Linn.

Herbs. Leaves alternate, entire. Flowers blue, in short terminal racemes or cymes, regular, 5-merous. Calyx divided nearly to the base, segments lanceolate. Corolla widely campanulate, subrotate, lobes imbricate. Stamens 5, attached to the short corolla-tube, alternate with its lobes, filaments filiform often dilated at the base; anthers sagittate, oblong. Ovary completely 2-celled; styles 2, distinct, stigmas capitulate; ovules very many. Capsule globose or ovoid, septicidal or irregularly 4-valved. Seeds minute.

H. zeylanica, Vahl Symb. ii. 46; annual, unarmed, leaves lanceolate, flowers racemose on short lateral branches, calyx-lobes lanceolate striate exceeding the capsule. Lamk. Ill. t. 184; Wall. Cat. 4398; W. & A. in Hook. Comp.
Herbs, shrubs or trees, often hispid or scabrous. Leaves alternate, very rarely opposite, exstipulate, mostly entire. Flowers usually in dichotomous scorpionid cymes, rarely solitary and axillary. Calyx inferior, 5-, rarely 6-8-toothed or -lobed, usually persistent in fruit. Corolla gamopetalous, often with scales in the throat, rarely 4-6-lobed, imbricate (rarely twisted) in the bud. Stamens as many as the corolla-lobes, alternate with them, upon the corolla-tube. Ovary superior; cells 2, 2-ovuled, or 4-1-ovuled; style terminal or from between the ovary-lobes, long or short, stigma capitulate or 2-lobed, rarely the style twice bifid; ovules suberect from the inner basal angle of the cell. Fruit drupaceous or dividing into 2-4 nutlets. Seeds erect or oblique, testa membranous, alburnum fleshy copious sparing or 0; embryo straight or curved, radicle superior.—Species 1,200; throughout the world.

**TRIBE I. Cordiaceae.** Trees or shrubs. Style terminal on the entire ovary, twice bipartite. Drupe 4-1-seeded; albumen 0; cotyledons plicate longitudinally.

Calyx-teeth very short, irregular 1. Cordia.

**TRIBE II. Ehretiaceae.** Style terminal on the entire ovary, simple, bipartite, or styles 2. Drupe with 2 2-celled, or 4 1-celled pyrenes; or of 4-1 nuts.

Trees or shrubs. Style 2-fid 2. Ehretia.


Virgate shrub. Style 1, stigma capitulate 4. Rhaddia.

**TRIBE III. Heliotropiaceae.** Style terminal on the entire ovary, depressed-conic at the apex, or with a horizontal ring below the stigmas. Fruit as of Ehretiaceae.

Shrubs, often scandent. Style short, shortly 2-lobed 5. Turnefortia.

Herbs. Style dilated at the apex or above the base 6. Heliotropium.

**TRIBE IV. Boraginaceae.** Herbs. Style simple or bifid, rising from between the ovary lobes (except in Trichodesma). Nutlets 4, rarely 3-1 by suppression (2 in Rochelia); albumen 0.

**SUBTRIBE I. Cynoglosseae.** Nutlets attached to a convex or conical carpophore, scar continued to the apex of the nutlets which are often depressed, produced, or saccate at the base.

* Fruiting calyx enlarged enclosing the nutlets.

Anthers conically connivent, lanceolate, subexsert 7. Trichodesma.
** Nutlets depressed, their bases produced downwards.**

Stamens included. Margins of nutlets reflexed over their backs 9. *Omphalodes.*
Stamens exerted; anthers large, linear-oblong 10. *Cynoglossum.*
Stamens exerted; anthers small, shortly oblong 11. *Lindelofia.*

** Nutlets connate, forming a pyramidal fruit, margined, hardly produced downwards.**


** Subtribe II. Eritrichieæ. Nutlets attached to a convex or conical carpophore, scar in the middle or lower half of the nutlets which are not depressed at the base, but are produced at the apex above the scar, free round the base of the style. **

* Scar in the basal half of the nutlet.  

** Scar in the middle of the inner face of the nutlets.  
† Scar small, without a prominent thickened incurved margin.  
Flowers axillary, subsessile. Fruiting calyx enlarged 17. *Asperugo.*

†† Scar depressed, with a thickened incurved margin.  
Flowers axillary, pedicelled 19. *Botriospermum.*
Flowers axillary, subsessile 20. *Gastrocotyle.*

** Subtribe III. Anchusææ. Nutlets on a flat or nearly flat receptacle; scar basal, prominent, hollowed out, with a prominent thickened margin. **

* Corolla-throat closed by 5 scales.  
Corolla-tube curved 22. *Lycopsis.*

** Corolla-throat naked or hairy within, but without scales.  

** Subtribe IV. Lithospermææ. Nutlets on a flat or nearly flat receptacle; scar basal, but little hollowed out, without a prominent margin. **

* Racemes bracteate. Corolla-lobes distinct.  

** Racemes bracteate. Corolla-lobes distinct.  
Corolla-throat naked or with small scales 28. *Lithospermum.*
Corolla-throat densely filled with hairs 29. *Sericostoma.*

** Corolla-lobes reduced to minute teeth.

Anthers lanceolate, connivent in a cone. 32. Onosma.

1. **Cordia**, Linn.

Trees or shrubs, sometimes subcandent. Leaves alternate, rarely subopposite, petioled. Flowers in dichotomous corymb or clusters, ebracteate, polygamous, hermaphrodite corymb much fewer-flowered than the male. Calyx tubular or campanulate, teeth very short often irregular, in fruit accrescent. Corolla funnel-shaped; lobes 4–8, patent or recurved, white or orange. Stamens 4–8, filaments often hairy at the base; anthers shortly exerted. Ovary 4-celled, glabrous; style terminal, long, bipartite, branches again bipartite linear or subspathulate; cells 1-ovuled. Drupe ovoid or ellipsoid, putamen bony, cells 1–4, usually 1 fertile. Seeds exalbuminous.—Species 180, all tropical.

Sect. I. **Myxa**. Corolla small, white; tube hardly so long as the calyx. Stamens usually 4–5.

* Adult leaves glabrous or subvillose beneath, not tomentose (except in C. obliqua, Willd. var. Wallichii).

† Leaves 3- (or 3–5-) nerved at the base, lateral primary nerves few.


Throughout India and Ceylon, alt. 0–3000 ft.; common wild, and often planted. Distrib.—From Egypt to Cochinhina and Tropical Australia; but often cultivated.

A crooked tree, 40 ft., or a shrub. Leaves alternate, 1–5 in. diam., very variable in form and size, subentire, repand-crenate or suboblate, never acuminate; above glabrous or very obscurely scabrous without white disc or hairs, beneath scabrous often hairy or subvillose when young; petiole ½–1 in. Flowers 3 and 2, often on the same tree, mostly 5-merous. Corymb 2–8 in., male larger laxer, terminal and on short lateral branches (C. reflexa sp., Wight mss.), glabrous or (when young) villous or pubescent. Calyx ½–2 in. at flower-time, soon much accrescent, tubular-campanulate, lobes very short. Corolla-lobes 1½ in., tube hairy within. Stigmas with long linear lobes. Berry yellow or pinkish, glossy; nearly always 1-seeded; fruiting calyx ½ in. diam., wide-funnel-shaped, glabrescent, more or less distinctly striated longitudinally.—Sebesten.

Var. brunnea, Kurz For. Fl. 208; leaves large, young shoots fulvous-pubescent, young calyx pubescent or subtomentose, berry 1 in. ovoid subacute 1-seeded. C. latifolia, Wall. Cat. 893, not of Roxb.—Bengal, Assam, Khasia, Burma, alt. 0–2000.
Cordia. ] C. boraginea. (C. B. Clarke.) 137

ft.; frequent. Distrib. Ava, Malacca.—Leaves mostly broad-elliptic or obovate-oblong, glabrous above, never tomentose beneath; corymbs (at least of 3) very dense; corolla exactly as of C. Myxa.—This is the plant united by modern authors with the typical glabrous form of C. obliqua, Willd., which has a considerably larger corolla.

Var. domestica; innovations fulvous-tomentose, leaves small young minutely pubescent above closely grey tomentose beneath, corymbs small grey tomentose. C. domestica, Roth Nov. Sp. 123.—Deccan (?); Herb. Wight.—Leaves 11-11 in., repand-crenate, mature nearly glabrous. Flowers as of C. Myxa. Berries (when nearly ripe) rostrate-acuminate, very unlike those of C. Myxa. This may be a distinct species, and possibly more nearly allied to C. fulvaosa, Wight.

2. C. obliqua, Wild. Sp. Pl. i. 1072; innovations fulvous-villous, leaves ovate or orbicular sub-3-nerved young tomentose beneath adult glabrous, corymbs divaricate dichotomous glabrous, calyx glabrous without or scarcely villous on the margin, berry 1 in. ovoid subacute 1-seeded. DC. Prodr. ix. 479. C. latifolia, Roxb. Fl. Ind. ed Carey & Wall. ii. 330; Dals. & Gibb. Bomb. Fl. 173, not of Wall. C. Myxa, Thwaites Enum. 213, not of Linn.; Brand. For. Fl. 336, partly.

Western India, from the Punjab and Hindostan to Ceylon, frequent. Nicol.:

A tree closely resembling C. Myxa. Calyx 11-1 in. (at flower-time); tube campanulate; lobes distinct, densely villous within. Corolla-lobes 11-1 in.

Var. Wallichii; adult leaves densely stellately fulvous- or white-tomentose beneath, calyx glabrescent without below, teeth densely fulvous-villous. C. Wallichii, G. Don Gen. Syst. iv. 379; DC. Prodr. ix. 479; Dals. & Gibb. Bomb. Fl. 174; Bedd. Fl. Sylb. t. 245. C. tomentosa, Wall. in Roxb. Fl. Ind. ed Carey & Wall. ii. 329. C. obliqua, Wight Ic. t. 1378. C. grandis, Wall. Cat. 892 B.—W. India from Lahore to Kurg.—This is C. obliqua, var. B of all the old collectors, who have mixed it with C. obliqua type. The two are undoubtedly one; they differ in hairs only, and immediately hairy examples occur.

3. C. monoica, Roxb. Cor. Pl. i. 43, t. 58, and Fl. Ind. ed. Carey & Wall. ii. 354; innovations fulvous-tomentose, leaves ovate 3-nerved scabrous with white discs above mature glabrescent or somewhat villous beneath, corymbs small tomentose, berry 1 in. ovoid scarcely acute. DC. Prodr. ix. 479; Bedd. For. Man. 166. C. polygama, Roxb. Fl. Ind. ed. Carey & Wall. ii. 217; Wall. Cat. 891; DC. Prodr. ix. 450; Bedd. For. Man. 166; Kurz For. Fl. ii. 207. C. diversa, Thwaites Enum. 214; Bedd. For. Man. 166.—Cordia sp. n. 16; Herb. Ind. Or. H. f. & T.

Deccan Peninsula from Orissa and the Central Provinces southwards to Ceylon; alt. 2-5000 ft., common.

A small tree. Leaves 1-3 in., obtuse or subacute, subentire or sharply crenate. Corymbs 1-2 in. diam., dense, monoicous or polygamous; 3 usually 4-androus, 5 5-androus. Calyx-tube ½ in. tomentose or pubescent; teeth small, villous. Corolla-lobes ½ in., narrow. Drupe yellow; stone 4-celled, drilied at the apex, 3 cells barren, one 1-seeded.—The authentic specimens of C. polygama are identical with C. monoica; Wight has called the examples with subentire leaves C. monoica, and those with strongly crenate leaves C. polygama.

4. C. grandis, Roxb. Fl. Ind. ed. Carey & Wall. ii. 335; leaves large ovate 3-5-nerved scabrous above mature glabrous or scarcely villous beneath, corymbs large dense, flowers small pubescent or scarcely tomentose, berry at most ½ in. ellipsoid very obtuse. Wall. Cat. 892; DC. Prodr. ix. 451; Kurz For. Fl. ii. 208. C. cordifolia, Wall. Cat. 894.
ASSAM, Griffith, &c. CHITTAGONG; H. f. & T., &c. PEGU; Kurz.—DISTR. Ava.

A large tree. Leaves 3–6 in., acute or obtuse, scabrid with very small rough points, base 3–5-nerved; petiole 1–2\(\frac{1}{2}\) in. Corymb terminal, female many-flowered, male dense. Calyx at flower-time scarcely \(\frac{1}{8}\) in. tubular-campanulate. Corolla-lobes 4, \(\frac{3}{8}–\frac{1}{2}\) in. Stamens 4. Berry usually \(\frac{1}{8}\) by \(\frac{1}{8}\) in., 1–2-seeded; fruiting-calyx scarcely \(\frac{1}{8}\) in wide.

†† Leaves feather-nerved not (or obscurely) 3-nerved at the base.


A tree, attaining 30 feet. Leaves 4 by \(1\frac{1}{8}\) in., usually obtuse, entire or undulate; petiole \(\frac{1}{8}\) in. Corymbs 1–3 in. Calyx at flower time \(\frac{1}{8}\) in., minutely pubescent. Corolla-lobes usually 4, \(\frac{1}{8}\) in. Berry usually 1-seeded.

6. C. Perrottetii, Wight Ic. t. 1381, not of A. DC.; leaves ovate-oblong feather-nerved scabrous pubescent, corymbs small tomentose, berry \(\frac{1}{8}\) in. ellipsoid acuminate. Bedd. For. Man. 166 partly?

S. DECCAN PENINSULA; Bellary, Coimbatore, &c., Wight.

A small tree. Leaves 1–2 in., somewhat clustered, scarcely subopposite, obtuse, entire or crenate; petiole \(\frac{1}{2}\) in. Corymbs 1–2 in. Calyx at flower time \(\frac{1}{8}\) in., tomentose, tubular-campanulate, soon glabrescent. Corolla-lobes mostly 4, \(\frac{3}{8}–\frac{1}{2}\) in.—Cordia Perrottetii, A. DC. Prodr. ix. 482 (Perrottet's Fondicherry example) is Prenna tomentosa, Willd.; Beddome's description l.c. appears compounded of this and Wight's.

7. C. oblongifolia, Thwaites Enum. 214; leaves elliptic acute or lanceolate feather-nerved mature glabrous, corymbs terminal soon glabrous, berry 1 by \(\frac{3}{8}\) in. ellipsoid shortly acute. Bedd. For. Man. 166. C. Leschenaultii, DC. Prodr. ix. 482.

CEYLON; Central Province up to 2000 ft., Thwaites.

Subscandent, Thwaites. Leaves alternate, 4 by 2 in. elliptic, or 4 by 1 in. lanceolate, base cuneate or rounded, subentire, secondary nerves conspicuous minutely reticulated; petiole 1 in. Corymbs 2–4 in., flowers in close clusters. Calyx at flower time \(\frac{1}{8}\) in., narrowly funnel-shaped, nearly glabrous without. Corolla-lobes 5–7, \(\frac{1}{8}\) in.—Of C. Leschenaultii no authentic example has been seen; the old specimen in the British Museum so named is C. oblongifolia. These plants only differ from C. Myxa in the leaves being obscurely 3-nerved at the base with more numerous lateral nerves.

8. C. Roxburghii, Clarke; minutely scabrous-pilose, leaves oblong-lanceolate copiously feather-nerved, corymb small, calyx widely funnel-shaped teeth triangular distinct.

CEYLON; Herb. Roxburgh.

Branches terete, minutely scabrous-pilose. Leaves alternate, 3\(\frac{1}{8}\) by 1 in., acute at both ends, coriaceous, subentire, nerves 10–15 pair; petiole \(\frac{1}{2}\) in. Corymb 1\(\frac{1}{2}\) in. diam., minutely scabrous-pilose; flowers few, sessile in small clusters. Calyx at flower-time \(\frac{1}{8}\) in., minutely scabrous-pilose; teeth 5 or 6, \(\frac{1}{8}\) in., minutely scabrous-pilose within. Corolla glabrous within, lobes \(\frac{1}{8}\) in., elliptic. Style long, divided into
4 spathulate branches. *Stamens 5, glabrous; anthers large, oblong.—A very distinct species; but possibly not an indigenous plant of Ceylon.

9. **C. Griffithii**, Clarke; leaves alternate lanceolate and ovate-lanceolate glabrous feather-nerved, male coryms large terminal lax nearly glabrous.

**MALACCA; Griffith.**

Branchlets terete, glabrous, curved; innovations fulvous-tomentose. *Leaves 3½ by 1½ in., or the uppermost narrow-lanceolate, acuminate to an obtuse apex, cuneate at the base, subfirm, texture thin, secondary nerves finely reticulate; petiole ¾ in. Calyx at flower-time ½ in., funnel-shaped, nearly glabrous. Corolla-lobes 5, ¾ in., elliptic.—Appears closely allied to *C. oblongifolia*. A male plant collected at Malacca by Maingay (Kew Distrib. n. 1162) is perhaps the same, but has the primary nerves of the leaves more numerous.

**Adult leaves tomentose beneath.**


**Khasia Mts.; Griffith (Kew Distrib. n. 5999). E. Bengal, at Mymensing; Chittagong, Martaban, and Tenasserim; Kurz.**

This closely resembles *C. grandis*, Wall. in its area of distribution, inflorescence, 4-merous flowers, and berries: differing only in the adult leaves being densely-stellately villous beneath. Kurz says "ovary with sessile stigma," whence, it is presumed, he had only male flowers.


**SUTEROTropical Western Himalaya, alt. 1-4000 ft.; frequent from the Jhelum to Oude, Edgeworth, &c.**

A tree, attaining 30 feet. *Leaves 4 in., sometimes ovate from a rounded base, sometimes cuneate-oblong from a narrow base, entire crenate or lobed, densely tomentose beneath at least nearly mature, at length scabrous above often with white dots; petiole 1 in. Corymbs dense, tomentose, and woolly. Calyx ¾ in., tubular-clavate, prominently ribbed upwards, or, in other examples, much smaller, scarcely clavate, hardly ribbed. Corolla-lobes ½ in., obovate, or smaller elliptic. Calyx in fruit ¾–1 in. diam., saucer-shaped; or, in Aitchison's Punjab examples, ¼ by ¾ in., elongate campanulate, strongly ribbed.


**Central India, Concan and Belgaum; Stocks, Dalzell, &c.**

A tree, attaining 40 feet. *Leaves alternate, scarcely subopposite; mature 5 in. diam., impressed rugose above, densely tomentose beneath; petiole 1–2 in. Calyx ¾ in., tubular-clavate, densely tomentose, ribbed upwards; or much smaller, not (or obscurely) ribbed. Corolla-lobes ½ in., oblong, or much shorter. Fruit acutely conical till nearly ripe, calyx basically funnel-shaped or subcampanulate.—The specimen on which Griffith founded the species, is leafy and in flower, the calyx then
about \( \frac{1}{2} \) in.; most of the examples are leafless when in flower, often with much larger calyx.


W. Deccan Peninsula; Concord and Belgaum, *Lav, Stocks*, *Ritchie*.

Leaves with hard, not woolly tomentum, becoming scabrous or subglabrate in age, very variable in size, obtuse or more often acute, crenately lobed or entire, obscurely 3-nerved.—Except in its much less tomentose corymb and leaves, this is undistinguishable from *C. Macleoidii*; it may be only a more tomentose form of *C. monoica*, as Wallich esteemed it.

Var. *evolutior*; less tomentose, leaves 8 by 4 in., corymb large, calyx at flower-time glabrescent.—*Bombay*; *Dalzell*.—A very doubtful plant; it forms part of Cordia n. 13, *Herb. Ind. Or. H. f. & T* and appears really to belong here, but it is exceedingly unlike Wight’s picture of *C. fulvosa*.

**Sect. II. Sebesten.** Corolla larger, tube exceeding the calyx. *Stamens* 6-8.


**Travancore**; *Roxburgh*.

Arboreous. Leaves alternate, 6 by 3 in., rounded or rhomboid at the base; petiole 1-2 in. *Corymb* lateral, peduncled, 2-4 in., minutely rusty; flowers sub-sessile in small clusters. *Calyx-tube* \( \frac{1}{2} \) in.; lobes \( \frac{1}{8} \) in., triangular, hairy within. *Corolla* lobes 7-9, \( \frac{1}{2} \) in. Filaments hairy; anthers ovate, small.—Described from the Calcutta Botanic Garden examples; no wild specimen known.


**Andamans** and S. Malay Peninsula. In Bengal and various parts of India often planted.—Distrib. S.E. Asia to Australia and the Sandwich Isles. Widely cultivated.

A small tree. Leaves 3-6 in., base rounded or subcordate; petiole \( \frac{1}{4} - \frac{1}{3} \) in. *Corymb* lateral and few-fl.d., nearly glabrous; flowers usually 6-merous. *Calyx* \( \frac{1}{4} \) in.; teeth short, triangular, villous within. *Corolla-tube* \( \frac{1}{4} \) in., lobes \( \frac{1}{2} \) in. Branches of the *stigmas* linear-spatulate. *Fruit* 1 in., ellipsoid, acute, usually 1-seeded. Seed grossly muricated, subspinose.

**EXCLUDED SPECIES.**

*Cordia* Finlaysoniana, *Wall. Cat.* 7010; without locality attached, was probably collected in Cochin-China.

*Cordia* sp., *Wall. Cat.* 9064, is *Mappia oblonga*, Miers, *var. elliptica* (v. i. p. 589).
**Euhretia.** Linn.

Shrubs or trees, scabrous or glabrous. Leaves alternate. Corymbus or panicles axillary or terminal, rarely peduncles axillary 1-flowered; flowers small, white. **Calyx** sub-5-partite. **Corolla-tube** short or cylindric; lobes 5, imbricated in the bud, patent or reflexed. **Stamens** 5, on the corolla-tube; anthers ovate or oblong, exsert, rarely included. **Ovary** 2-celled, cells 2-ovulate; style terminal, cylindric bident or bipartite, stigmas small capitulate. **Drupe** small, subglobose, 4- or (or by suppression 3-1-) seeded; pyrene one 4-celled, or two 2-celled, or four 1-celled; 3-1 pyrenes or cells not rarely suppressed. **Seeds** straight, tests thin, albumen scanty.—Species 50, all tropical; principally in the Old World.

**Sect. 1. Euhretia.** Style single, bifid.

* Leaves serrate.


**Subtropical Himalaya** and adjacent plains, ascending to 5000 ft., from Ghurwal to Bhotan, common. *Khasia* Mrs. to Pegu.—Distr. Ava, Australia, Japan.

A tree, attaining 40 feet. **Leaves** 3-8 in., minutely bristly or glabrous above; petiole ⅝ in. **Panicles** 2-5 in., minutely bristly or glabrescent, crowded with flowers. **Corolla-tube** very short; lobes ⅝ in., reflexed. **Anthers** exsert. **Style** bifid for less than half its length, branches linear, stigmas minutely capitulate. **Drupe** ⅝–⅞ in. diam., short-ellipsoid, obtuse, not ribbed nor lobed; pyrenes 2, without any hollow between them, each 2-celled, cells 1-seeded.

2. **E. macrophylla,** Wall. Cat. 901, and in Roxb. Fl. Ind. ed. Carey & Wall. ii. 343; leaves large broadly elliptic acute serrate bristly above softly hairy beneath, panicle terminal compound bristly, calyx-lobes (in young fruit) ⅝ in. oblong-lanceolate. **DC. Prodr.** ix. 503.

**NEPAL; Chundagiri, Wallich.**

A tree. **Leaves** ⅞ by 4 in., rhomboid or rounded at the base; petiole 1 in. **Panicle** 2-3 in., sparsely fulvous hirsute. Young **drupe** ⅛ in. (but Wallich notes the drupe size of a small gooseberry); pyrenes 2, each 2-celled.—Flowers unknown to Wallich. E. Dicksoni, Hance in Ann. Sc. Nat. 4, xviii. 224, from the interior of S. China, is probably the same species (the leaves in Hance's examples are broadly elliptic subcordate, not oblong as in the description); calyx softly hairy, tube ⅛ in., lobes ⅛ in. oblong; corolla-tube ½ in., pubescent without, lobes ⅛ in. ovate reflexed; anthers long exsert; style single long sparsely hairy, lobes 2 short oblong glabrous; berry as of *C. macrophylla,* ⅜ in. diam.

**Leaves quite entire.**

3. **E. laevis,** Roxb. Cor. Pl. 42, t. 55, and Fl. Ind. ed. Carey & Wall. ii. 341; leaves ovate shortly acuminate undulate base unequally cuneate glabrous, nerves 5–6 pair irregular tufted in the axils, corymb mostly subaxillary repeatedly dichotomous branches recurved in fruit, calyx-lobes small pubescent, style shortly 2-branched. **Don Prodr.** 102; **Wall. Cat.** 899; **DC. Prodr.** ix.
Throughout India in tropical and subtropical regions, common.—**Distrib.** From Persia to China, Australia and Polynesia, the allied Tropical African species are perhaps only geographical forms.

A tree 80-40 feet, or a shrub; branchlets glabrous, or rusty-pubescent, or sparingly laxly hirsute. **Leaves** 5 by 2½ in., unsymmetric, rather thin in texture, young glabrous: softly hairy or densely tomentose, mature glabrescent; petiolar ⅛ in. **Corymbs** 3 in. lax, glabrous or usually pubescent or rusty, ultimate branches long recurved with sessile fruits. **Calyx**-lobes ½ in., oblong, in fruit ovate. **Corolla-tube** ⅛ in., lobes ⅛ in. spreading. **Anthers** exsert. **Drupe** (when perfecting 4 seeds) ⅜ in. diam., depressed glabose; when dry distinctly 4-ribbed, pyrenes 4 each 1-seeded; on one corymb are usually seen drupes perfecting 1, 2, 3, or 4 seeds.—All authors previous to Brandis have kept this species distinct, describing it as absolutely glabrous; it is however nearly always manifestly hairy, and the indumentum is rusty, pubescent, ciliate, hirsute or tomentose at least in the innovations.


**Vas. pubescens**; branchlets hairy, mature leaves softly hairy beneath or on both surfaces. **E. pubescens**, *Benth.* in *Roy. Ill. 306; DC. Prodr. ix. 597.—Throughout India.

**Vas. timorensis**; glabrous or the innovations and corymbs rusty-pubescent, leaves-broadly oblong or somewhat ovate acuminate, corymbs axillary and terminal. **E. timorensis**, *Drec. in Nov. Ann. Mus. d'Hist. Nat.* iv. 395; *DC. Prodr.* ix. 505. **E. philippensis**, *A. DC. Prodr.* ix. 504. **E. levis**, type *Benth. Fl. Austral.* iv. 389.—Malay Peninsula. **Distrib.** Malaya, Australia.—Leaves often 6 in., usually larger and more acuminate than in the Indian *E. levis*, also drying very black and usually symmetric or nearly so. As to the fruit, in *E. levis* type it is often sub-2-pyrenous, the pyrenes only separating into 4 ultimately or with difficulty.

**Vas. canarensis**; glabrous or nearly so, leaves broadly oblong symmetric narrowed at both ends, mature glabrous above rugose with impressed nerves scabrous-beneath. **E. canarensis**, *Miq. in Pl. Hohenack.* n. 285. **E. Championii**, *Wight & Gardn.* n.s.—W. Decan Peninsula and Ceylon.—The common *Ehretia* of the Nilgiris (alt. 3-5000 feet) and other Decan Mts. It has been regarded as a distinct species, being readily distinguished by the symmetric strong-nerved leaves.

**Vas. aspera**; leaves small obtuse mature hairy beneath. **E. aspera**, *Robb. Cor.* Fl. i. 41, t. 55, and in *Fl. Ind. ed. Carey & Wall.* ii. 342; *Wall. Cat.* 902; *DC. Prodr.* ix. 507; *Bedd. For. Man.* 166; *Brand. For.* Fl. 340; *Kurz For.* Fl. ii. 209. **E. tomentosa**, *Roth Nov. Sp.* 126, not of Lamk. **E. Heynii**, *Roem. & Sch. Syst.* iv. 552. **Beurreria aspera**, *G. Don Gen.* Syst. iv. 390.—Assam.—Described from Roxburgh's example in Herb. Wallich (which agrees with his 1c. *Ined.* in Herb. Kew), on which the largest leaves are ⅜ by ⅝ in., scabrous above, persistently hairy beneath. None of the *E. aspera* (except from E. Bengal) agrees with this exactly, the *E. aspera* of *Kurz, Dalzell, &c.*, having larger leaves and resembling *E. levis*, **Vas. pubescens**. Wight's *E. aspera* includes an example absolutely glabrous, the young leaves and calyx shining glabrous; no example of *E. levis* type is so glabrous. A very hairy obtuse-leaved example collected at Arecot by Griffith has the calyx-lobes narrowly oblong and the style deeply bífid.

4. **E. obtusifolia.** Hochst.; *A. DC. Prodr.* ix. 507; leaves obovate-oblong obtuse mature hairy, flowers as of *E. levis* but rather larger. **Brand.**

**Burma**; Pagamew, Wallich. 

Branches scraggy, as of a tough shrub. Leaves 1½ by ½ in., base cuneate, shortly acute or obtuse not retuse, nerves distant not prominent; petiole ½ in.—This may be a stunted example of *E. levis* var. *aspera*; but the leaves are much narrowed at the base, the calyx-teeth remarkably narrow and acute. In habit it is remote from *E. obtusifolia* and the flowers are hardly half as large.


S. Madras; Jymallay, Wight. Ceylon; Jaffna, Dykes. 

Otherwise as *E. levis*, from which it only differs in the obtuse leaves. No fruit seen.


S. Madras; Mysore, Courtallum, &c. Wight, G. Thomson, &c. 

Leaves 1½ by ½ in. in Wight's type example, but larger and broader, approaching *E. levis* in others. Corymbs, when young, pubescent and subtomentose in Wight's example, soon glabrescent. Flowers and drupes as of *E. levis*.

8. **E. parallela**, Clarke; nearly glabrous, leaves elliptic or obovate, nerves 8 pair oblique parallel approximate, inflorescence flowers and fruit as in *E. levis* but rather smaller.

**Burma**; banks of the Irrawaddy, Griffith (Kew Distrib. n. 6004). 

Branches round, glabrous. Leaves 1½ by ¼-1 in., retuse and subacute on the same branch, cuneate at the base, glabrous even when young, prominently striate by the straight primary nerves hardly ⅛ in. apart; petiole ½ in. Corymbs minutely pubescent.—Well-marked by the strong, straight, parallel, closely-placed primary nerves, not much like any other species; the leaves are usually obtuse, sometimes retuse.


Sikkim and Bhutan, alt. 2-7000 ft., frequent; J. D. H., &c. *Khasia* Mrs., Wallich, Griffith. 

A tree, attaining 40 ft., flowering before the leaves. Leaves 5 by 2 in., base cuneate nerves 7 pair; petiole ½ in. *Coriamb 1-3 in.* diam., mostly subalateral, dense, minutely pubescent. Calyx-lobes ⅛ in., oblong. Corolla-tube ½ in.; lobes ½ in., white, recurved. Anthers exerted. Ovary 2-celled, cells 2-ovulate; style bifid much less than half-way down, stigmas small capitate. Drupe ⅜ in. diam., subglobose, when
dry longitudinally ribbed; pyrenes 4, compressed, lunate, corrugated without, occupying the periphery of the drupe, the centre (in the dried drupe) hollow, occupied by the shrivelled fleshy tissue; pyrenes 1-seeded.—Perhaps a small-flowered form of the Hong-Kong *E. longiflora* (Champ. in Hook. *Kew Journ.* v. 38), which agrees exactly as to the fruit and leaves, but has the corolla-tube \(\frac{1}{3}\) in. long.

**Sect. II. Carmona.** Styles 2, undivided (1 sometimes suppressed), or 1


**DECCAN PENINSULA;** in dry jungles, *Wight, Dalseill, &c.—Dist.* Malaya to Formosa and the Philippines.

A shrub. *Leaves* 1 by \(\frac{1}{3}\) in., obtuse, very scabrous, often 3-lobed towards the apex, attenuated at the base, subsessile. *Peduncles* 0-\(\frac{1}{3}\) in., hairy. *Calyx*-lobes \(\frac{1}{3}\), lanceolate-linear. *Corolla* \(\frac{1}{3}\) in., white, campanulate; lobes short, ovate. *Filaments* very short. *Drupe* \(\frac{1}{3}\) in. diam., globose; pyrene 4, 4-seeded; without any cavities in the drupes examined; with 6–8 cavities (A. DC.).

**EXCLUDED SPECIES.**

*E. mollis*, *Wall. Cat.* 7011; *DC. Prodr.* ix. 511, is Mappia ovata, *Miers,* v. i. p. 509.

3. **COLDENIA**, Linn.

Prostrate, scabrous herbs. *Leaves* alternate, crisped. *Flowers* axillary, sessile (or nearly so), the upper sometimes in a one-sided leafy spike, white. *Sepals* 4–5, narrow. *Corolla*-tube short, lobes 4–5, imbricated in the bud, patent. *Stamens* 4–5, on the corolla-tube; anthers ovate. *Ovary* 2-celled with 2 ovules in each cell, or sub-4-celled with solitary ovules; style terminal, bifid. *Drupe* (nearly dry) of 4, subconnate, 1-seeded, pyrenes. Testa of the seed thin; albumen 0, or scanty; cotyledons flat.—Species 10 American, and the following.


Throughout tropical *India*, a weed.—*Dist.* Asia, Africa, Australia, America.

Annual, usually quite flat. *Leaves* 1–1\(\frac{1}{2}\) in. *Flowers* \(\frac{1}{3}\) in. *Pyrenes* \(\frac{1}{3}\) in. *Seeds* albuminous.


A shrub; branches twiggy. *Leaves* small, alternate or clustered, linear-oblong, entire or toothed. *Flowers* small; racemes very small, few-fld., sub-terminal on short lateral branches. *Sepals* 5, lanceolate, acuminate. *Corolla* pink-purple; tube short, campanulate; lobes oblong, imbricate in the bud. *Stamens* 5, on the corolla-tube; anthers oblong or ovate. *Ovary* 2-celled, cells 2-ovuled, or sub-4-celled with cells 1-ovuled; style terminal, stigma capitlate.
or minutely 2-lobed. **Drupes** with 4 crustaceous 1-seeded pyrenes. **Seeds** oblong, albumen thin.


India, alt. 0–2500 ft.; from Kumaon and Assam to Ceylon and Tenasserim, frequent; especially on gravelly banks flooded by rapid streams.—**Distr.** Tropical S.E. Asia, Africa, and Brazil.

Height 2–6 ft. **Leaves** ½ by ¾ in. **Flowers** ½ in. **Drupes** ½ in., yellow or brown-red, nearly dry.

5. **TOURNEFORTIA**, Linn.

Trees or shrubs, often rambling or subscandent. **Leaves** alternate, entire. **Cymes** terminal, rarely lateral or extra-axillary, dichotomous, scorpioid; flowers numerous, dense, sessile or very shortly pedicelled, ebracteate, white or greenish-yellow. **Sepals** 5 or 4, lanceolate or ovate. **Corolla-tube** cylindric (short in T. argentea), naked in the throat; lobes 5 or 4, small, patent. **Stamens** 5 or 4, included in the tube, filaments short; anthers oblong. **Ovary** 4-celled; style terminal, short, shortly 2-lobed (in the Indian species); ovules 1 in each cell. **Drupes** small, ovoid, scarcely fleshy, not distinctly separating into 2 or 4 pyrenes; pyrenes two 2-celled 2-seeded (in the Indian species). **Seed** straight or curved, albuminous.—**Distr.** Species 100; in the tropics of both hemispheres.

**Sect. 1. Mallota.** An erect, densely silky shrub. **Leaves** narrowed at the base. **Corolla** subrotate, tube very short.


Seashores of Ceylon and the Malay Peninsula. **Nicobar**; *Kurz.*—**Distr.** Malaya, Australia, Mauritius.

**Branchlets** thick. **Leaves** 6 by 2 in., acute or subobtuse; petiole ill-defined. **Peduncles** terminal, or from an upper axil, 1–5 in.; cymes often forming a panicle 6 in. diam.; flowers sessile. **Sepals** ½ in., ovate, densely woolly, ultimately glabrescent. **Corolla-tube** hardly as long as the sepals; lobes ½ in., ovate, crenulate. **Stigma** subsessile, obscurely 2-lobed. **Drupes** ½ in. diam., subglobose.

**Sect. 2. Pittonia.** Rambling or subscandent shrubs. **Leaves** obtuse at the base, distinctly petiolate. **Corolla** 5-merous, narrowly tubular.

* Drupes shortly pedicelled (all from the Decam).


**Decam Peninsula,** *Heyne*; Nilgheries (near Nadooputtah), *Wight.*

**Branchlets** sparsely scabrous-hairy. **Leaves** 5 by 1½ in., acuminate, base cuneate or rhomboid, mature sparsely minutely scabrous-hairy on both surfaces; nerves 7 pair, closely hairy when young; petiole ½ in. **Cymes** terminal and extra-axillary, sparsely scabrous-hairy. **Calyx-teeth** ½ in., lanceolate. **Drupes** ½ in., or pedicels ½ in.—Wallich appears to have received a small quantity of this species, and to have named...
it *T. Heyneana*; subsequently to have placed with it a large quantity of a Khasian species, *T. Candollii*, Clarke, which he distributed as *T. Heyneana*.

3. *T. reticosa*, Wight \( t \). 1866; leaves oblong acuminate glabrescent prominently reticulate beneath, corolla-tube \( \frac{3}{4} \) in.

**NILGHERIES & COORG; Wight.**

Branchlets softly, sparsely hairy. Leaves 5½ by 1½ in., base rhomboid or rounded, mature very sparsely hairy above; nerves 8 pair, tertiary densely anastomosing; petiole \( \frac{3}{8} \) in. *Cymes* terminal; flowers sub-1-serial; pedicels (at flower-time) \( \frac{1}{4} \) in. *Calyx-teeth* \( \frac{1}{4} \) in. Drupes not seen.

4. *T. Wightii*, Clarke; leaves subcordate ovate-lanceolate mature hairy beneath, corolla-tube \( \frac{3}{4} \) in.

**DECCAN PENINSULA; Wight.**

More hairy than the preceding species. Leaves 3½ by 1¾ in.; nerves 8 pair, sub-impressed on the upper surface, tertiary obscure; petiole \( \frac{1}{4} \) in. *Cymes* extra-axillary; flowers sub-1-serial; pedicels (at flower-time) \( \frac{1}{4} \) in. *Calyx-teeth* \( \frac{1}{8} \) in., lanceolate-linear. Drupe not seen.—This differs (inter alia) from *T. reticosa* by the primary nerves being much more approximate.

**Drupes sessile or nearly so (species of Bengal and the E. Peninsula).**

5. *T. Roxburghii*, Clarke; leaves oblong acuminate shortly densely villous beneath, calyx-teeth lanceolate-linear, corolla-tube \( \frac{1}{4} \) in.

**CHITTAGONG; Seetakoond, Bindravun, Rungamutte, J. D. H., &c.**

Branches hairy. Leaves 4 by 1½ in., sometimes subovate, not rugose above, tertiary nerves obscurely reticulated; petiole \( \frac{1}{4} \) in. *Cymes* terminal and supra-axillary; flowers sub-2-seriate. *Calyx-teeth* \( \frac{1}{4} \) in. Drupes \( \frac{1}{4} \) in., sessile, sub-2-seriate; calyx not glistening white within.—Easily separated from all other species of this subsection by its longer corolla. Roxburgh collected his *Lithospermum viridiflorum* in Chittagong (where this is the only species known, and is frequent, on Roxburgh's collecting ground near Sir W. Jones's country-seat), and his description seems (at least partly) drawn therefrom: but his picture, and the Calcutta Botanic Garden authentic examples, refer to the next species.


**ASSAM; Griffith, Masters.**

Branches hairy. Leaves 3½ by 1½ in., sometimes subovate, in age wrinkled above, tertiary nerves obscure; petiole \( \frac{1}{4} \) in. *Cymes* terminal, rusty-villous; flowers 2-ranked, very dense. *Calyx-teeth* \( \frac{1}{8} \) in. *Corolla-tube* little exceeding the calyx-teeth, not exceeding \( \frac{1}{4} \) in. in the large cultivated examples from the Calcutta garden. Drupes \( \frac{1}{4} \) in., sessile; calyx-lobes in fruit very narrow, not white glistening within.

**VAR. Griffithii;** mature leaves nearly glabrous beneath distinctly reticulated.—Khasia & Assam; Griffith.

7. *T. Candollii*, Clarke; leaves ovate-lanceolate softly hairy beneath, calyx-teeth lanceolate-linear corolla-tube \( \frac{1}{4} \) in. *T. Heyneana, DC. Prodr. ix.* 516; \( Wall. Cat. 910, as to the Khasia examples.\)

**BHOTAN, ASSAM, KHASIA, and SILHET, frequent;** Wallich, Griffith, &c.

Branches hairy. Leaves 3½ by 1½ in., sometimes oblong, base obtuse or subcordate; primary nerves soon impressed on the upper surface, tertiary very obscurely reticulated; petiole \( \frac{1}{4} \) in. *Calyx-teeth* \( \frac{1}{8} \) in., in fruit narrowly lanceolate, not glistening white within. Drupes \( \frac{1}{4} \) in., sessile.—This species is remote from *T. Heyneana*; it is nearly intermediate between *T. viridiflora* and *T. ovata*, differing little from *T. viridiflora*, var. Griffithii, but in the longer corolla.
8. **T. ovata**, Wall. Cat. 908; leaves ovate and elliptic suddenly shorty acuminate hairy or glabrescent beneath, calyx-teeth ovate-lanceolate in fruit glistening white-setose within, corolla-tube \(\frac{1}{2}\) in. in. *G. Don Gen. Syst.* iv. 369; *DC. Prodr.* 516.

**British Burma**; Rangoon, Wallich, McClelland. S. Andaman; *Kurz.*

Scandent, branches hairy. Leaves 3–6 in., rhomboid at the base; tertiary nerves obscure. *Calyx-teeth* \(\frac{1}{2}\) in., about \(\frac{1}{2}\) the length of the corolla-tube. *Drupes* \(\frac{1}{2}\) in., sessile.—In *Kurz* example, the corolla is permanent, the base greatly enlarged so as to include the fruit; this state appears induced by the attack of an insect.

9. **T. khasiana**, Clarke; leaves ovate acuminate glabrescent base obtuse or subcordate, calyx-teeth ovate acute small, corolla-tube exceeding \(\frac{1}{2}\) in.

**Khasia** Mts.; Nongpriang, alt. 1500 ft., Clarke.

Branchlets minutely hairy. Leaves 3\(\frac{1}{2}\) by 1\(\frac{1}{2}\) in., gradually acuminate, tertiary nerves reticulated not very prominent; petiole \(\frac{1}{2}\) in. *Cymes* rusty-pubescent; branches few, long, densely fld. *Calyx-teeth* scarcely \(\frac{1}{2}\) in. *Drupe* not seen.

10. **T. Hookeri**, Clarke; leaves ovate or elliptic acgbrescent prominently reticulated beneath, calyx-teeth lanceolate-linear, corolla-tube \(\frac{1}{2}\) in. hardly exceeding the calyx. *T. viridiflora*, *Gamble Darjeeling List*, 57, not of *Wall.*

**Sikkim**; alt. 2–5000 ft., frequent; *J. D. H.*, &c.

Large, scandent; branches nearly glabrous. Leaves 4–5 by 1\(\frac{1}{2}\)–2\(\frac{1}{2}\) in., obtuse and unequal at the base; tertiary nerves exceedingly prominent; petiole \(\frac{1}{2}\) in. *Cymes* terminal, diffuse, rusty pubescent; branches long; flowers sub-2-seriate. *Calyx-teeth* \(\frac{1}{2}\) in. *Drupes* \(\frac{1}{2}\) in., ovoid, sessile.

**Var. subtropica**; corolla-tube more than \(\frac{1}{2}\) in. pentagonal with 5 hairy lines without, more than twice as long as the calyx-tube.—*Sikkim*; by the great Rungait, *J. D. H.*

**Sect. 3. Tetrandra.** Rambling or scandent shrubs. Leaves obtuse at the base, distinctly petiold. *Corolla* 4-merous, narrowly tubular.


**Singapore & Penang**; Wallich, Maingay. **Nicobar**; *Kurz.*

Branches nearly glabrous. Leaves 3\(\frac{1}{2}\) by 1\(\frac{1}{2}\) in., tertiary nerves obscure; petiole \(\frac{1}{2}\) in. *Cymes* terminal, lax. *Calyx-teeth* \(\frac{1}{2}\) in., triangular-lanceolate. *Drupes* \(\frac{1}{2}\) in., sessile.—*Tetrandra glabra*, *Miq. Fl. Ind. Bat.* ii. 929, has oblong leaves narrowed at the base; *T. Zollingeri*, *Miq. l. c.* 928, has flowers \(\frac{1}{2}\) in. long; these two make up the old Tournefortia tetrandra, *Blume Bijyd.* 845, *DC. l. c.* More material may reduce the 4 species of this section to 1.


**Ceylon**; Walker, *Thwaites.*

Leaves 3\(\frac{1}{2}\) by 1–1\(\frac{1}{2}\) in., base rounded; upper surface rugose by the impression of the nerves.—This seems nearer both *Tetrandra glabra* and *Zollingeri* than to *Tournefortia Wallichii.*

**Doubtful Species.**

T. arborescens, *Lamk. Ill.* ii. 417; *DC. Prodr.* ix. 529, is described as a tree from India. No tree belonging to the genus is known in British India.

T. ternata, Wall. Cat. 912, from Tavoy; there is no specimen of this in Wallich’s Herbarium.
6. HELIOTROPium, Linn.

Annual or perennial herbs, rarely (non-Indian species) shrubby, villous or scabrous. Leaves alternate. Cymes terminal, dichotomous; branches often long, scorioid; flowers small, white or nearly so in the Indian species; bracts small, 0, or leafy (in florescence axillary). Calyx 5-partite or -lobed; segments lanceolate or linear (except in Sect. Fytoclinea). Corolla tubular, throat not hairy; lobes 5, imbricate or inuplicate in the bud, spreading in flower. Stamens 5, on the corolla-tube, included, filaments very short; anthers ovate or lanceolate. Ovary completely or imperfectly 4-called, 4-ovulate; style terminal, short or long, ending in a depressed conical or flat disc; stigma above the disc 0 or short or elongate-lanceolate, entire, rarely with 2 linear branches (Sect. Ditrichostigma). Fruit dry, 2-4-lobed, of 4 more or less free nutlets. Seeds straight or curved, albumen small or 0 (rarely plentiful).—Species 100, in the tropical and temperate zones of both hemispheres.


W. INDIA, from the Punjab to the W. Deccan Peninsula; Royle, Edgeworth, Wight, &c.—Distr. Tropical Africa.

Annual, erect, 1–3 ft., scabrous-hairy. Leaves ½ by ⅓ in., narrowed at both ends, subentire, sessile; nerves obscure in the upper surface. Spikes 2–6 in. in fruit; flowers sessile, 1–2-ranked. Sepals ½ in., ovate, acute. Corolla-tube ⅔ in., wider in the upper half, minutely setose without; lobes ⅛ in. Style glabrous, half as long as the corolla-tube; stigma surrounded by the stamens in the swollen upper half. Fruit ½ in., of 2 rugose pitted 2-seeded nutlets.


PANJAB; Peshawur, Stewart.—Distr. Beloochistan, Cabul, Persia, Turkestan, Sogdaria.

Woody, rigid, 6–18 in., suberect, scabrous-hairy. Leaves ⅔ by ⅓ in., mostly cuneate at both ends, subentire, sessile or lower obscurely petioled; nerves obscure in the upper surface. Spikes in flower short, in fruit 2–4 in., lower flowers often an inch apart; flowers mostly sessile, but stray lower flowers have pedicels ⅓–⅔ in. Sepals ⅛ in., oblong-lanceolate. Corolla-tube ⅔ in., cylindric or slightly narrower upwards, hairy without. Filaments rather long; anthers ovate-oblong near the top of the tube. Style about ⅔ the length of the stigma, minutely retrose setose (in Stocks' examples as in Eichwald's picture, but Boissier says style as long as the stigma). Fruit small, glabrous in Stocks' example, sometimes silky (Boiss.).—Very near H. luteum, Poir. (DC. Prodr. ix. 532) which has larger flowers and fruits, and more rugose leaves.
Sect. III. *Monimantha*, Franch. Stigma with 2 linear branches exsert from the corolla.


Sect. IV. *Piptoclainia*. Calyx-lobes short, subvalvate. *Fruit* enclosed by the calyx.


**Punjab** and **Upper Gangetic Plain**; *Royle, Edgeworth*, &c.—**Distr.** W. *Asia*, S. Europe, N. Central *Africa*.


Var. *malabarica*; nuts usually 4 smaller in horizontal section triangular without margins. *H. malabarica*, Retz *Obs.* iv. 24; *Roxb. Fl. Ind.* i. 454; *Wall. Cat*. 7014. *Piptoclainia malabarica*, G. *Don Gen. Syst.* iv. 364.—W. Deccan *Peninsula*, from Central *India* (*Edgeworth*) to Tinnevelly (*Wight*), frequent. *Cutch & Scinde, Stocks, Stoliczka,—Bunge* (i. c. 287) excludes from the section *Piptoclainia* all the species with 4 nutlets, and objects to regarding *H. malabaricum* as a var. of *H. supinum*; *but* there is every gradation between the two forms of *fruit* in the Indian collections; *an example, marked as collected at Darjeeling in Herb. Griffith*, *has* 2–3 or 3–4 nuts.

Sect. V. *Euheliotropium*. Sepals narrow, not enclosing the fruit. Corolla-lobes plicate or crenulate, neither patent cuspitate nor with closely-incurved mucro. *Style* short; stigma conic, entire or minutely 2-fid or (in *H. rariiflorum* and *myosotoides*) capitate, included in the corolla-tube. *Nutlets* not spreading, forming an ovoid 4-pointed mitre-like fruit, with a small hole at the apex.

* Leaves obovate or elliptic, silky scarcely scabrous, subentire; flowers sessile.

h. H. europæum, Aitchison Cat. Punjab. 94; Benth, Fl. Austral. iv. 394; 
?Linn.; DC. l. c. 534.

PUNJAB and SCIND; in the plains, frequent. KASHMIR; Srinuggur, alt. 5,200 ft. 

Stems woody; branches from the base, 6–12 in., softly closely hairy. Leaves 
½–1½ in., obtuse; nerves not prominent on the upper surface; petiole ½–1 in. Spikes 
2 in. Sepals ⅛ in., ovate-lanceolate, hairy. Corolla-tube ¼ in., narrow, cylindrical, 
leaves without; segments small, round, crenulate. Stigma microscopically scabrous. 
Nutlets ⅛ in.—Differs from H. europæum, Linn., in the more softly hairy leaves and 
spikes; as to the minute differences in the stigma (shown by Gussone l. c.) they do 
not apply satisfactorily to the Indian and Australian materials.

VAR. lasiocarpum; nuts hispid-silky sparingly rugose. H. lasiocarpum, Fisch & 
Fl. Orient. iv. 131.—N.W. India; ex Boiss. l. c., but all the Indian examples seen 
suit H. Eichwaldii so far as the two differ.

lower long-petioled softly closely hairless, spikes elongate ebracteate, flowers 
1-ranked, calyx persistent after the setulose nutlets have fallen. Bunge in Bull. 
Soc. Imp. Nat. Mosc. 1869, 303; Boiss. Fl. Orient. iv. 128. H. cinerascens, 
Aitchison Cat. Punjab. 94, not of Steud.

SCIND; Stocks.—DISTR. Beloochistan.

Stem and leaves nearly as of H. Eichwaldii, but indumentum more ash-coloured. 
Spikes often 6 in. Sepals ¼½ in., lanceolate, hairy. Corolla-tube ¼ in., cylindrical, 
spikes without; lobes small, round, crenate. Stigma conic elongate, minutely bifid at 
the apex. Nutlets ½½ in.

7. H. ovalifolium, Forsk. Fl. Æg.-Arab. 38; leaves elliptic or obovate 
softly closely hairy lower long-petioled, spikes elongate persistently ebracteate. 
0; DC. Prodr. ix. 541; Wall. Cat. 7016; Wight Inc. t. 1388; Dals. & GBs. 
Bomb. Fl. 171. H. tomentosum and polystachyum, Poir. Dict. Suppl. iii. 23; 
DC. l. c. 548. H. Kunzei, Lehm.; DC. l. c. 541; Boiss. Fl. Orient. iv. 130. 
H. Syemites, Spreng. Syst. 1. 559. H. Brocchianum, Vis. Fl. Æg.-Nub. 8, t. 2, 
fig. 1. H. niloticum, A. DC. Prodr. ix. 541.

BENGAL, DECCAN PENINSULA and SCIND; frequent.—DISTR. Tropical Africa and 
Australia.

Stems woody; branches 1 ft., ascending, softly hairy. Leaves ⅛ by ⅛ in., or in the 
western examples hardly half so large, obtuse with or without a mucro; nerves not 
prominent. Spikes 1–4 in., dense; bracts ⅛½ in., ovate, acute. Sepals ⅛½ in., 
eliptic, acute. Corolla-tube ⅛½ in., cylindrical; lobes minute, ovate, patent, subacute. 
Stigma minutely hairy. Nutlets ⅛½ in., densely setulose.

** Leaves lanceolate, briskly, margins crisped-crenulate; flowers sessile, 
ebracteate.

8. H. undulatum, Vahl Symb. i. 13; leaves obscurely petioled, spikes 
rigid branches short, nutlets small bispic. Wall. Cat. 916; DC. Prodr. ix. 536; 
41, t. 19; DC. l. c. 587; Boiss. Fl. Orient. iv. 147. H. crispum, Desf. Fl. 
Alicant. i. 151, t. 41. H. eriocarpum, Delile; Lehm. Asperifol. 55 (fide Boiss.). 
143. Lithospermum hispidum, Forsk. Fl. Æg.-Arab. 38.

PUNJAB, SCIND, and UPPER GANGETIC PLAIN, alt. 0–1000 ft., frequent.—DISTR. 
W. Asia and N. Africa.

Suberect, 6–24 in., branched, harsh, scabrous. Leaves ½–1½ in., often rugose.
Seals \( \frac{1}{8} \) in., oblong, scabrous, rigid, persistent after the nutlets have fallen. Corolla-tube \( \frac{1}{4} \) in., tubular, scabrous without; lobes very small, ovate. Nutlets 4, \( \frac{1}{8} \) in., verrucose or bristly. —Boissier says that H. affghanum has the corolla hairy within, and thus differs from H. undulatum, but the type of H. affghanum (viz., Griffith, Kew Distrib. n. 5386) altogether agrees with H. undulatum.

Var. suberosa; fruits depressed-globose \( \frac{1}{2} \) in. diam, glabrous dividing into 2 twoseeded nutlets with corky cells on the back. H. nubicum, Bunge in Bull. Soc. Imp. Nat. Mosc. 1869, 330. —Scinde, Stocks. The seeds are as in H. undulatum. This was collected by Stocks as part of his n. 473, and is probably a variety of H. undulatum affected by an insect-pnitures; but it is remarkable that Stocks’ example has very numerous flowers and fruits, and that every ovary, without exception, appears to form a corky fruit.

*** Leaves small or very narrow, subentire, scabrous hairy; flowers mostly bracteate, lower often pedicelled or with legflike bracts.

† Stigma elongate conic.

9. H. Rottleri, Lehm. Asperifol. 66; woody, leaves small oblong, racemes long with distant flowers, fruit depressed distinctly 4-lobed completely covered by short grey adpressed hairs with a depressed hollow at the apex whence springs the style. DC. Prodr. ix. 549; Wight Ic. t. 1392; Dalz. & Gibs. Bomb. Fl. 171.

Deccan Peninsula; Coimatore, alt. 1000 ft., Wight, &c.

Very harsh, with stiff curved branches. Leaves \( \frac{1}{8} \) by \( \frac{1}{8} \) in., sessile, scattered, margins recurved when dry. Racemes 2-4 in., stiff, curved; pedicels solitary, each opposite a bract. Sepals \( \frac{1}{8} \) in., ovate, acute, similar to the bracts. Stigma ovate, shortly acute. Fruit \( \frac{1}{8} \) in. long by \( \frac{1}{8} \) broad.


S. Deccan and Ceylon, Rottler, Wight. Pegu, Wallich.—Distrib. Siam, Australia.

Branches erect, twiggy. Leaves \( \frac{1}{4} \) by \( \frac{1}{4} \) in. Racemes 2-6 in.; pedicels subopposite a small linear bract or often extra-axillary. Sepals \( \frac{1}{4} \) in., ovate, acute. Stigma conical-linear. Fruit \( \frac{1}{8} \) by \( \frac{1}{8} \) in.—Wight called a rather stouter form, with leaves \( \frac{1}{8} \) in. wide and larger flowers, H. tenue, the ordinary form H. linifolium; but the difference is slight.

11. H. strigosum, Willd. Sp. Pl. i. 743; ramous, leaves small linear-lanceolate, spikes mostly elongate, upper flowers sessile not conspicuously bracteate, fruit ovoid not or obscurely 4-lobed with minute grey hairs. DC. Prodr. ix. 546; Boiss. Fl. Orient. iv. 143.

Throughout India; very common.—Distrib. W. Asia, Malaya, Australia.

Usually procumbent, intricately branched. Leaves \( \frac{1}{4} \) by \( \frac{1}{4} \) in. Lower flowers of the spike often pedicelled, with larger bracts. Sepals \( \frac{1}{8} \) in., ovate-lanceolate. Stigma ovate-linear. Fruit \( \frac{1}{8} \) in. long and broad, depressed conical at the apex.

Var. brevifolia; leaves \( \frac{1}{4} \) by \( \frac{1}{4} \) in. narrowly lanceolate. H. brevifolium, Wall. Cat. 914, and in Roxb. Fl. Ind. ed Carey & Wall. ii. 2; DC. l. c. 546. H. compactum, Don Prodr. 101.—Throughout India, even more abundant than H. strigosum type.

12. H. bracteatum, DC. Prodr. 493; suberect, leaves lanceolate, spikes shortened, flowers crowded among prominent bracts, fruit distinctly 4-lobed

S. DECCAN PENINSULA and CEYLON.—DISTRIB. Java, Australia.

_S._ stems 4–8 in., strict or with ascending branches. _Leaves_ \(\frac{3}{4}\) by \(\frac{1}{2}\)–\(\frac{3}{8}\) in., not very acute. _Sepals_ \(\frac{3}{8}\) in., lanceolate, smaller than many of the bracts.


13. **H. marifolium**, *Retz. Obs.* ii. 8; _leaves_ lanceolate acute scabrous cauleine often large, spikes 1–2 in. dichotomous rigid dense curved conspicuously bracteate; fruit 4-lobed chestnut-brown below shortly bristly.

DECCAN PENINSULA; from Chota Nagpore and Rajpootana to Cape Comorin.

_Stems_ rigid, divaricately ramous, not intricate. _Cauline leaves_ \(\frac{1}{4}\) by \(\frac{1}{2}\) in., harsh. _Flowers_ and _fruits_ rather larger than those of _H. bracteatum_ from which it is perhaps not distinct.

VAR. _Wallichii_; _stems_ decumbent intricately ramous, leaves smaller less harsh, spikes elongate, flowers and fruits nearly of _H. bracteatum_. _H. marifolium_, *Wall. Cat.* 2092; _DC. Prodr.* ix. 547; _Wight Lc.* t. 1890; _Dals._ & *Gibs. Bomb.* Fl. 171. *Cynoglossum marifolium*, *Roxb. Fl. Ind.* i. 457. *Bothriospermum* ? _marifolium_. *A. DC. Prodr.* x. 116.—Throughout _India_. Distinguished from _H. strigosum_ by its broader leaves and 4-lobed fruit. Except in its very ramous habit this does not differ from _H. bracteatum_, var. _lexiflorum_. Antlers ovate with linear twisted tips (as in allied species) described by Roxburgh as "scales" between the corolla-lobes which error has misled A. DC.

14. **H. scabrum**, *Retz. Obs.* ii. 8; procumbent, densely, leafy, _leaves_ lanceolate acute, flowers subcapitate among leaflike bracts, fruit 4-lobed chestnut glabrous or minutely hairy near the apex. *Wall. Cat.* 7017; _Wight Lc.* t. 1399.

DECCAN PENINSULA and CEYLON; frequent.

Forming dense tufts with fascicled leaves. Probably not specifically distinct from _H. marifolium_.

†† _Stigma subcapitate._


Branches 6–12 in. _Leaves_ 1 by \(\frac{1}{4}\) in. _Spikes_ 1–3 in.; _flowers_ all sessile; _bracts_ scattered, leaflike. _Stigma_ ¬ very depressed cone. _Hairs on the fruit_ apressed or thickly bristly.

**SECT. VI. Heliophyllum.** Fruit mitriform, subacutely 4-pointed.


Throughout _India_; very common in the moister parts.—DISTRIB. Malaya, E. Asia, Tropical Africa and America.
Annual, hirsute. Stems 6–18 in. Leaves alternate or subopposite, 1–4 in., more or less woolly. Spikes 1–8 in., mostly leaf-opposed. Sepals ½–1 in., linear. Corollatube ½ in., narrow-cylindric; lobes small, round, crenate. Stigma conoid-linear. Fruit ½ in., ovoid, ribbed, soon separating into 2 mitrelike pyrenes; each pyrene with 2 cavities in addition to the seed-bearing cells.

**DOUBTFUL SPECIES.**

H. Roxburghii, Spreng. Syst. cura post. 54; erect, ramous, hairy, leaves petioled ovate-oblong, spikes terminal panicked seceded, tube of the corolla long and gibbous. DC. Prodr. ix. 549. H. paniculatum, Roxb. Fl. Ind. ed. Carey & Wall. ii. 2, not of B. Br.—Chittagong, Roxburgh. Known only from Roxburgh’s description. Possibly, as Roxburgh did not live to publish his own ms., this was his first description of Tournefortia Roxburghii (afterwards described fully under Lithospermum), which he may have preserved for reference. This explanation applies certainly to some duplicate species in Roxburgh’s posthumous work. It can hardly be H. exylyanicum, Lamk. (as Rottler supposed) because that species is not known in Chittagong.

7. **TRICHODESMA, Br.**

Coarse, hispid herbs. Leaves opposite, upper alternate, entire. Pedicels axillary, 1-flowered, going off into terminal racemes by the gradual reduction of the floral leaves. Calyx deeply 5-merous; lobes triangular-lanceolate, in fruit enlarged. Corolla-tube campanulate-cylindric, throat without scales; lobes 5, twisted to the left, a gland or depression near the base of each. Stamens 5, filaments short; anthers elongate, lanceolate, connivent in a cone; connectives more or less hairy on the back, tips excrurrent at length twisted. Ovary 4-celled; style terminal filiform, stigma small. Fruit ellipsoidal, sub-4-riddled; nutlets ovoid-oblong, smooth, shining on the back, scabrous, slightly or strongly margined on the inner face, closely adnate by their whole inner face to the carpophore below the style, finally separating.—Species 10; in tropical and warm-temperate Africa, Asia, and Australia.

- Calyx-lobes in fruit cordate or hastate at the base.  


Throughout India; common; not in Bengal Plain.—Distrin. Cabul, Beloochistan, Persia, Mauritius.

Erect or diffuse. Leaves 1–4 in., tuberculate on the upper surface. Lower pedicels often distinctly axillary, 1-flowered. Calyx-lobes ½–1 in., more or less grey or white-villous. Corolla-tube ½ in.; lobes ½ in., ovate, suddenly acuminate. Nutlets ½ in., sometimes very rough on the inner face, obscurely margined.—Edgeworth notes that Borago spinulosa is Trichodesma indicum, probably correctly; no one appears to have seen a specimen or to know what else it can be.

Var. subessilis; leaves subelliptic narrowed downwards many very shortly petioled. T. subessilis, Wall. Cat. 933.—British Burma; Frome, Wallisch; Pegu, Kurz.

2. **T. amplexicaule**, Roth Nov. Sp. 104; bristly with hairs springing from tubercles, hardly at all villous, leaves sessile cordate-oblong beneath strigose.
on the nerves otherwise glabrous, flowers and fruit nearly as of *T. indicum*.*  

Throughout W. India; from Scinde, Rajpootana, and Central India to Malabar;
frequent.

Probably a mere form of *T. indicum*. *Corolla-lobes* ovate, suddenly acute,
twisted to the left in the bud. *Anthers* exert, tips of the connective finally twisted.

3. **T. africanum**, Br. Prodr. 496; bristly with hairs springing from
tubercles, leaves ovate-oblong lower long-petioled, *calyx-lobes* in fruit cordate
at the base, staminal cone laxly hairy on the back.  
Fl. Aeg.-Arab. 41.

**Punjab and Scinde; Aitchison, Stocks, &c.—Distrib. Cabul, Persia, Arabia,
Tropical Africa to Senegal.**

Stem and leaves as of *T. indicum*, but more harshly hispid. *Racemes* mostly
lateral, often bipartite and subbracteate. *Calyx-lobes* $\frac{1}{2}$ in., in fruit $\frac{1}{3}$–$\frac{2}{3}$ in. *Corolla
tube* $\frac{3}{4}$ in.; lobes $\frac{1}{2}$ in., ovate, acute. *Nutlets* $\frac{1}{4}$ in.; margin prominent, glochidiate.

**Calyx-lobes in fruit ovate or rounded at the base.**

4. **T. zeylanicum**, Br. Prodr. 496; leaves oblong obtuse or acute at
the base hairy beneath, racemes lateral and terminal, nutlets $\frac{1}{2}$ in. ovoid-oblong
obscurely margined.  
Wall. Cat. 935; DC. Prodr. x. 172; Bot. Mag. t. 4820;  
Rar. ii. t. 314; Burm. Fl. Ind. 41, t. 14, fig. 2. Lessicarya Kotschyanus, Hochet.  
in Flora, 1844, 30.

**Decan Peninsula and Ceylon: common.—Distrib. Malaya, Australia, Mascarene Islands.**

Habit of *T. indicum*. *Leaves* sessile or subpetiolate, bristly with hairs springing
from tubercles on the upper surface. *Racemes* usually denser, more softly villous
than in *T. indicum*. *Flowers* and fruit about the same size as in *T. indicum*.

5. **T. khasianum**, Clarke; very large, leaves elliptic narrowed at both
ends or petiolate sparsely hairy beneath, racemes forming large terminal corymbs,
nutlets $\frac{1}{2}$ in. widely margined.

**Khasia; Griffith (Kew Distrib. n. 5989), &c.**

Apparently a stout, sparingly setose, shrub. *Leaves* 7 by $2\frac{1}{2}$ in., mostly opposite,
petiolated, scabrous tuberculate above, rugose subglabrate beneath. *Corymbs* with 50–
100 flowers, nearly ebracteate. *Calyx-lobes* in the bud $\frac{5}{4}$ by $\frac{2}{5}$ in., rusty-pubescent, in
fruit 1 by $\frac{3}{4}$ in., papery. *Corolla-tube* $\frac{3}{4}$ in.; lobes $\frac{3}{4}$ in., lanceolate-linear. *Anther-
cone* nearly $\frac{1}{4}$ in., patently white-hairy.—Remote in habit from the other Indian
species; a still larger species has lately been discovered by Dr. Balfour in Socotra.

8. **Actinocarya**, Benth.

A slender, diffuse herb, sparsely strigose or nearly glabrous. *Leaves* alter-
nate, obovate-oblong, entire. *Flowers* minute, solitary on axillary pedicels. *Calyx*
deeply 5-lobed, hardly enlarged in fruit. *Corolla-tube* short; scales in
the throat 5, very small; lobes 5, obtuse, spreading, imbricate in the bud. *Stamens* 5, 
filaments short; *anthers* small, ovate, obtuse. *Ovary* deeply 4-lobed; style short, from the base of the lobes, stigma small. *Nutlets* 4, obo-
void-oblong, divaricate, with small spines on all sides, attached to the small
carpophore only at their minute lower ends.
**Omphalodes.** C. Boraginee. (C. B. Clarke.)

1. **O. tibetica;** Benth. in Gen. Pl. ii. 846.

Western Tibet; Nubra, alt. 13,000 ft.; near Karsar village, Thomson.
Stems 4-14 in., prostrate, branched. **Leaves** \( \frac{3}{4} \) by \( \frac{1}{4} \) in., subobtuse. **Pedicels** \( \frac{1}{4} \) to \( \frac{3}{4} \) in. **Sepals** \( \frac{1}{4} \) in., narrowly oblong. **Corolla-tube** scarcely longer than the sepals; lobes \( \frac{1}{36} \) in. **Nutlets** \( \frac{1}{4} \) in.

9. **OMPHALODES,** Moench.

Weak, decumbent herbs, strigose or subglabrous. Radical **leaves** long-petioled, lanceolate or ovate; cauline few, alternate. **Pedicels** in lax racemes, slender, lower subaxillary solitary from leaf-like bracts. **Flowers** white or blue. **Sepals** 5, spreading, little enlarged in fruit. **Corolla** rotate, throat almost closed by obtuse scales; lobes 5, round, spreading, imbricate in the bud. **Stamens** 5, included; anthers small, obtuse. **Ovary** deeply 4-lobed; style filiform, from the base of the lobes, stigma small or subcapitate. **Nutlets** 4, depressed, forming a pyramid, attached to the small carpophore by their inner faces, their margins broad thin, entire or serrate, reflexed over the back of the nut so as to form on each a small nearly closed cell opening outwards by a small hole; nut smooth on the back.—Species 10; from the Mediterranean basin to Central Asia and Japan.

**O. Thomsonii,** Clarke; leaves elliptic or oblong subobtuse strigose on both surfaces, racemes lax subterminal, revolute margins of the nutlets nearly entire. Omphalodes, sp. 8, Herb. Ind. Or. H. f. & T.

Western Tibet; Nubra, alt. 13,000 ft., Thomson.
**Rootstock** perennial; annual branches 6-10 in., very numerous, slender, strigose. **Radical leaves** 1 by \( \frac{1}{4} \) in., spathulate; petiole \( \frac{1}{4} \)-\( \frac{1}{3} \) in.; cauline \( \frac{3}{4} \) by \( \frac{1}{6} \) in., sessile. **Pedicels** \( \frac{1}{4} \)-\( \frac{1}{2} \) in., recurved in fruit. **Sepals** \( \frac{1}{4} \) in., oblong, reflexed in fruit. **Fruit** \( \frac{1}{4} \) in. long and broad, exactly pyramidal; nutlets somewhat saccate at base, appearing inflated by the reflexed loose membranous margin.

10. **CYNOGLOSSUM,** Linn.

Biennial or perennial herbs, erect, hairy. **Leaves** alternate, radical petioled. **Racemes** elongate, ebracteate; flowers ultimately distant, sessile or lower shortly pedicelled, bluish or purple. **Calyx** deeply 5-lobed, in fruit spreading not (or slightly) enlarged. **Corolla-tube** short, with 5 obtuse or emarginate scales in the throat; lobes 5, obtuse, imbricate in the bud. **Stamens** 5, included beneath the scales; anthers small, ovate, their tips hardly above the mouth of the corolla-tube. **Ovary-lobes** 4; style short or longish from the base of the lobes, stigma small. **Nutlets** 4, forming a much depressed pyramid, spines hardly produced above the hilum, bases rounded produced downwards, outer faces convex or flattened, with or without a margin, glochidiate; carpophore (after the nuts have fallen) linear, shortly conic at the base (elongate-conic in **C. Rischies** and sometimes in **C. denticulatum**, var. zeylanica.—Species 60; in subtropical and temperate, especially mountain regions.

* Flowers very small; style neither in flower nor in fruit exceeding \( \frac{1}{8} \) in.

1. **C. furcatum,** Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 6, and Cat. 919; depressed-strigose, upper cauline leaves oblong sessile entire softy hairy, racemes furcate branches long fulvous towards the tips, lower flowers distinctly pedicelled, outer faces of the nutlets ovate distinctly margined by the confluence of the bases of the marginal glochidia. Don Prodr. 100; DC. Prodr. x. 149; Maxim. in Bull. Acad. Petersb. xvii. 554. **C. ovatum,** Moon Cat. 12.
Throughout India and Ceylon; in the mountains, alt. 4–9000 ft., very common; no examples from the Malay Peninsula.—Distr. Cabul.

Erect, 1–3 ft., no patent or lax hairs on the stem. Radical leaves larger, long-petioled, persistent at the time of flowering; cauline 4 by 1 in., acute, frequently subdecurrent, glabrous or very minutely but scarcely scabrous on the upper surface, nerves beneath often prominent. Lower pedicels often \( \frac{1}{4}-\frac{1}{2} \) in. Calyx-lobes ovate, in fruit often \( \frac{1}{2} \) in. broadly oblong. Outer face of the nutlets \( \frac{1}{2} \) in., with no distinct medial line, with scattered glochidia often not much shorter than the marginal: carpophore linear, hardly conical at the base.—Generally distinguished correctly from the other closely allied species of this subsection by its almost silky indumentum and tawny young racemes. \( C. \text{ovatum} \), Moon, is a form common in the Nilgherries with shorter, ovate, thicker, more softly hairy leaves.

\( \text{Var. lanceolata} \); leaves thinner margin obscurely crenulate upper surface subscabrous with longer hairs rising from a more tufted base. \( C. \text{lanceolata} \), Heyne; \textit{Wall. Cat.} 921. \( C. \) Heynei, \textit{G. Don Gen. Syst.} iv. 354; \textit{DC. Prodr.} x. 150.—Nilgherries, Anamallays, and Mts. of Ceylon, frequent.—Stem with subpatent hairs; cauline leaves narrowed at the base, sometimes obscurely petioled, margin minutely scabrous, in these respects approaching \( C. \text{micranthum} \), but the fruit is altogether as of \( C. \text{furcatum} \).

2. \( C. \text{micranthum} \), Desf. \textit{Cat. Hort. Par.} 1804, 220, \textit{side A. DC. Prodr.} x. 149; patently hairy, upper cauline leaves lanceolate acute at both ends crenulate, racemes diversely forked lower flowers sessile, calyx-lobes minute ovate obtuse, outer faces of the small nutlets shortly ovate not (or most obscurely) margined glochidia on all sides. \textit{Maxim. in Bull. Acad. Petersb.} xvii. 556. \( C. \) canescens, \textit{Wild. Enum. Hort. Berol.} 180; \textit{Benth. in Boyle II.} 306; \textit{Wall. Cat.} 918, partly. \( C. \text{vesiculosum} \), \textit{Wall. Cat.} 920, partly.

Northern India and the Himalaya, alt. 1–8000 ft., from Kashmir to Bhutan and Pegu, common.

Stem 1–4 feet, erect, hirsute. Radical leaves none at the time of flowering; upper cauline 3 by \( \frac{1}{2} \) in., uppermost often very narrow, margin ciliate sometimes subdenticulate, upper surface scabrous with hairs from tuberulate bases. Racemes rigid, often imbricate; flowers very small, sessile in the typical form (lower pedicelled in Wallich’s examples). Calyx-lobes \( \frac{3}{4} \) in. in fruit, obtuse from the first. Corolla very small, white, the scales in the throat blue-black. Nutlets \( \frac{3}{80} \) in., ovoid, in the typical form, sometimes rather larger; carpophore cylindro-linear; style often twice as long as the nutlets.

3. \( C. \text{lanceolatum} \), Forsk. \textit{Fl. Äg.} 41, \textit{not of Heyne}; hispid, leaves broadly lanceolate strongly nervéd beneath, racemes often long with all the flowers pedicelled, nutlets \( \frac{1}{2} \) in. diam. shortly ovate not (or most obscurely) margined glochidia on all sides. \textit{DC. Prodr.} x. 155. \( C. \text{racemosum} \), \textit{Roxb. Hort. Beng.} 13, and \textit{Fl. Ind. ed. Carey} & \textit{Wall.} ii. 6. \( C. \text{hirsutum} \), \textit{Jacq. Hort. Schoeib.} iv. t. 489, \textit{not of Thumb}. \( C. \text{micranthum} \), \textit{Dals. & Gîbs. Bomb. Fl.} 172.

Bengal Plain, to the sea, common; extending throughout the Gangetic Plain to Lahore. Bombay; \textit{Low.}—Distr. Arabia.

Raceme-branches in fruit often 6–10 in.; pedicels often \( \frac{1}{4} \) in.; calyx-lobes in fruit \( \frac{1}{2} \) in. obtuse.—Roxburgh’s \( C. \text{racemosum} \) has been united by all authorities with \( C. \text{micranthum} \), Desf.; the nutlets are larger, the habit coarser; whether species or variety, it is identical with \( C. \text{lanceolatum} \), Forsk.

4. \( C. \text{glochidiatum} \), \textit{Wall. Cat.} 922; stem hispid with hairs springing from tubercles, cauline leaves lanceolate base attenuate or petioled ciliate or denticulate, lower flowers of the elongate racemes shortly pedicelled, calyx-lobes ovate obtuse sometimes oblong in fruit, outer faces of the nutlets ovate-margined glochidia on all sides. \textit{DC. Prodr.} x. 150, \textit{as to description only}. \( C. \text{stellatum} \), \textit{Wall. Cat.} 921. \( C. \text{micranthum} \), \textit{Var. H. f. & T. in Herb.}
Khasia Mts. and adjacent parts of Assam, alt. 2–6000 ft., frequent; Walllich, Griffith, H. f. & T. &c.—_Distr._ Ava.

Erect, 1–2 feet, branches ascending. _Leaves_ 2 by ¼ in., thin, sparsely hispid on both surfaces with hairs often rising from tubercles; radical leaves 0 at the time of flowering. _Calyx-lobes_ ¼ in. in fruit. _Nutlets_ ¼ in. long, margined by the confluent bases of the glochidia, but not prominently, glochidia on the faces plentiful and not much shorter; carphophore sublinear.—H. f. & T. appear justified in regarding this plant as allied to _C. micranthum_, rather than to _C. denticulatum_. Both Benth. and DC. say that Wallrich's _C. glochidiatum_ came from Nepal; but Wallrich says he got it at Pundah, i.e. Khasia, where all other collectors get it.

5. _C. denticulatum_, _A. DC. Prodr._ x. 150; stem softly hairy or strigose, leaves ovate- or oblone-lanceolate some cauline petiolate ciliate or denticulate, calyx-lobes ovate, outer faces of the nutlets shortly ovate prominently margined glochidiate sparingly on the faces. _G. Don._ Gen. Syst. _iv._ 354. _C. glochidiatum_, _Benth._ in _Royce Ill._ 306; _Lindl._ in _Bot. Reg._ 1841, t. 15. _C. canescens_, _Wall._ Cat. 918, partly. _C. vesiculosum_, _Wall._ Cat. 920, partly.

_Tropical_ and _Temperate Himalaya_, alt. 1–9000 ft., from Kashmir to Sikkim; very common. _Central India_ from Chota Nagpore to Bombay; very common.—_Distr._ Cabul, Malaya.

Resembling _C. glochidiatum_. _Leaves_ usually closely clothed on the upper surface with hairs rising from tubercles. _Carpophore_ sublinear.—The Central Indian examples have rather larger nutlets than the Himalayan _C. denticulatum_, and are intermediate between that and the _var. zeylanica_.

_Var. zeylanica_; nutlets larger their faces sometimes ¼ in. diam. very strongly margined, base of the carphophore sometimes elongate conic so that the nutlets are attached obliquely. _C. zeylanicum_, _Thumb._ _C. glochidiatum_, _Dalz._ & _Gibs._ _Bomb._ Pl. 172. _Echinopspermum zeylanicum_, _Lehm._ _Asperfol._ 116; _Roem._ & _Sch._ _Syst._ _iv._ 780; _DC. Prodr._ x. 142.—W. Deccan Peninsula, from the Concan southwards in the tropical region. Ceylon (füe Lehmann).

6. _C. Wallichii_, _G. Don._ Gen. Syst. _iv._ 354; stem hisroset erect, cauline leaves lanceolate to ovate base narrowed or petiolate ciliate or denticulate, calyx-lobes oblong in fruit sometimes elongate narrow, nutlets shortly ovate strongly margined glochidiate sparingly on the faces. _DC. Prodr._ x. 150. _C. calycinum_, _Wall._ Cat. 923, _not of Meyer_. _C. vesiculosum_, _Wall._ Cat. 920, partly. _C. microcarpum_, _A. Kerner._ Nov. _Pl._ _Sp._ _ii._ 13.—_Cynoglossum_ sp. n. 6, _Herb._ _Ind._ _Or._ _H. f._ & _T._

_W. Temperate Himalaya_, alt. 4–11,000 ft., from Kashmir to Kumaon, very common.

Differs from _C. denticulatum_ in the narrower calyx-lobes more elongate in fruit; these are ovate-oblong in typical _C. calycinum_, linear-oblong in _C. microcarpum_, _A. Kerner_; and there is every state between.—Very abundant westward about Dahrour, when _C. denticulatum_ becomes rare; but the two species are very difficult to distinguish, and may not be distinct.

_Var. alpina_; more hisrotse, stems prostrate or decumbent, leaves mostly small more searbour tuberculate hairy. _Cynoglossum_ sp. n. 7, _Herb._ _Ind._ _Or._ _H. f._ & _T._ ? _C. membranaceum_, _A. DC. Prodr._ x. 160.—W. Subalpine Himalaya; _Edgeworth_, &c. Lower cauline leaves 1 in., long-petiolate, but most of the leaves ¼–⅓ in., sub-sesile. No authentic example of _C. membranaceum_ seen.

7. _C. ? Ritchiei_, Clarke; cauline leaves lanceolate narrowed at the base, calyx-teeth in fruit elongate oblong, outer faces of the nutlets ovate marginate strongly glochidiate, carphophore ¼ in. elongate-conic at base so that the nuts are attached obliquely.

_Bombay_; Belgaum, Ritchie.

This closely resembles _C. denticulatum_, _var. zeylanica_, and may be a form of it.
but the carpophore is much dilated at the base; the calyx-segments in fruit \( \frac{1}{2} \) by \( \frac{1}{10} \) in. This plant is a species of *Paracaryum* according to the "Genera Plantarum," but it cannot well be removed far from *C. denticulatum*, Var. *zeyihamica*.

** Flowers larger \( \frac{3}{4} \) in. diam., style \( \frac{1}{2} \) in.

8. **C. microglochin**, Benth. in Royle Ill. 305; cauline leaves numerous subsessile ovate or elliptic acute densely hairy beneath, calyx-lobes in fruit \( \frac{1}{4} \) in., outer faces of the nutlets \( \frac{1}{5} \) in. ovate margined coarsely not densely glochidiate. *DC. Prodr.* x. 151.

Temperate W. Himalaya, alt. 7-11,000 ft., from Kashmir to Kumaon frequent; *Royle, Strackey, & Winterbottom*, &c.

Erect 1\( \frac{1}{2} \)-3 feet, hairy. Leaves 4 by 2 in., in Royle's type, often narrower, entire, lower attenuated at the base. Racemes dense, in fruit 1-4 in.; pedicels short, lower in fruit \( \frac{1}{2} \) in. Calyx-lobes in flower \( \frac{3}{4} \) in. by \( \frac{1}{10} \) in., elliptic, obtuse, villous. Corolla-tube shorter than the calyx-lobes, segments \( \frac{1}{2} \) in. Anther-cells oblong, divericate at the base, tips shortly emergent above the corolla-throat, covered by the depressed cone of scales. Nutlets with very stout glochidia; carpophore conic, style \( \frac{1}{2} \) in.

9. **C. nervosum**, Benth. ms.; cauline leaves numerous subsessile elliptic or oblong acute sparsely hirsute on both surfaces, calyx-lobes in fruit \( \frac{1}{4} \) in., outer faces of the nutlets \( \frac{1}{6} \) in. ovate marginate densely glochidiate. Omphalodes nervosa, *Edgew. ms.*

Western Himalaya; Kulu, Jalauri Pass, *Edgeworth*; Pangee, alt. 12,000 ft., *Dr. Watt*.

Generally resembling *C. microglochin*, but with laxer racemes, larger flowers, and different indumentum. Cauline leaves 4 by \( \frac{1}{2} \) in., hairs on the upper surface from tubercles, on the lower lax; nerves not prominent. Racemes 1-5 in., lax; lower pedicels \( \frac{1}{2} \) in. Corolla \( \frac{1}{2} \) in. diam., widely campanulate, tube very short. Nutlets not fully ripe, much more closely glochidiate than in *C. microglochin*; carpophore shortly conical at the base, style \( \frac{1}{2} \) in.

10. **C. petiolatum**, A. *DC. Prodr.* x. 149; cauline leaves few ovate acute minutely softly hairy beneath, calyx-lobes in fruit \( \frac{1}{4} \) in., outer faces of the nutlets \( \frac{1}{6} \) in. ovate marginate sparsely glochidiate. Anchusa petiolata, *Hook. Bot. Mag.* t. 3868.

Alpine Western Himalaya; Zanskar, near Umasi Pass, *T. Thomson*.

Erect, 2-3 feet, hairy. Lower leaves oblong, long-petioled; petiole of the radical leaves 5 in. Racemes straggling, branched, 4-8 in. in fruit; pedicels very short, lower scarcely \( \frac{1}{4} \) in. Calyx-lobes in flower \( \frac{1}{4} \) in., elliptic, obtuse, hairy. Corolla \( \frac{1}{10} \) in. diam., tube hardly longer than the calyx. Nutlets as of *Cynoglossum*, faces but little glochidiate except on the margins.—Flowers intermediate in size between those of the two last species and those of *C. furcatum*, &c. No authentic example of *C. petiolatum* has been seen; and Thomson's examples are referred to that species, only because *Bot. Mag.* t. 3868, closely resembles them; the leaves in Thomson's plant here described are hairy on both surfaces, in the picture they appear glabrous, ciliate on the margin only.

**Doubtful species.**

C. *Edgeworthii*, A. *DC. Prodr.* x. 150; stem erect hispid below, leaves ovate-oblong narrowed at both ends adpressedly hairy, calyx-lobes ovate obtuse short, nutlets ovate glochidiate on all sides.

Himalaya; alt. 4-6000 ft., *Edgeworth*.

Differs from *C. micranthum* by the flowers twice as large, the corolla longer towards (? in proportion to) the calyx, the leaves seldom subdenticulate.

An erect, perennial, hairy herb. Radical leaves petiolate; cauline alternate, from ovate to linear-lanceolate. **Racemes** dense, elongate, ebracteate. **Flowers** blue, purple, or nearly black. **Sepals** in fruit somewhat enlarged, spreading. **Corolla-tube** cylindrical, longer than the calyx, crowned with scales in the throat forming a cone; lobes obtuse, round, spreading, horizontally imbricated in bud. **Stamens** 6; anthers large, linear-oblong, exerted, but scarcely overtopping the scales. **Ovary** 4-lobed; style from near the base of the lobes, long, stigma small. **Nutlets** 4, depressed, rounded at the base, apices hardly produced, glochidiate; carpophore short.

**L. spectabilis**, Lehmann in Linnaea, xxiv. 216; hairy, cauline leaves sessile oblong, corolla-tube 1–3 times as long as the calyx, faces of the nutlets glochidiate on the margin chiefly. Cynoglossum longiflorum, Benth. in Royle Ill. 305; Bot. Reg. 26, t. 50. C. grandiflorum, Benth. in Royle Ill. 305; DC. Prodr. x. 156. Omphalodes longiflora, A. DC. Prodr. x. 156. Anchnusopsis longiflora, Bisch. in Linnaea, xxxvi. 736.

**Alpine Western Himalaya**; alt. 10–12,000 ft., from Gurwhal to Kashmir, Royle, Madden, Falconer, &c.

Stein 1–2 ft., patently, sometimes densely hairy. Radical leaves long-petioled, 2–4 in., lanceolate; lower cauline petioled, upper subcordate, amplexical, 3 in., hisurate more or less on both surfaces. **Racemes** dense, even in fruit, or elongate lax. **Calyx-lobes** in flower ½ in., subacute, in the type example, sometimes obtuse, variable in length, sparingly pilose or woolly. **Corolla** intense blue, tube ½ in., lobes ½ in. in the type example, excessively variable in size. Outer faces of the nutlets ½–1 in., ovate, marginal glochidiate; conate at the base, the obscure medial line sparingly glochidiate, the rest of the surface nearly smooth; in a word, as of Cynoglossum; carpophore sublinear.—Hardly any two examples agree in the size and shape of the corolla and calyx or in their relative sizes.

**Var. Falconeri**; stems strict, leaves linear-lanceolate, calyx-lobes ½ in. narrowly oblong, corolla-tube ½–¾ in.—Kashmir, Falconer.

**Var. Leviingii**; leaves elliptic and ovate acute, calyx-lobes ½–1 in. ovate, corolla-tube ½ by ¼ in., segments ½ in. diam. orbicular, style ¾ in.—Kashmir; Pir Pingul, alt. 11,500 ft., Leviingii. This has much larger flowers than any other example.

2. **L. Benthami**, Hook f.; hairy, leaves linear-lanceolate acute, racemes panicled, corolla-tube about equaling the calyx narrow, segments elliptic or oblong suberect. Solenanthus sp. 3, Herb. Ind. Or. H. f. & T.

**Kashmir and Western Tibet**; alt. 11–15,000 ft., Thomson, Strachey & Winterbottom, &c.

Stems 2–3 ft., erect. Radical leaves long-petioled, narrow-lanceolate, cauline sessile 4 by ½–¾ in. **Panioles** repeatedly branched, laxly racemose; pedicels ½–1 in. and upwards. **Calyx-lobes** at flower-time nearly ½ by ½ in., narrowly lanceolate, acute. **Corolla-tube** ½–¾ by ½ in., cylindrical; lobes ½ by ½ in., erect or only half-patent. Filaments as long as the scales; anthers exerted (not from the corolla). **Style** ½–¾ in. **Nutlets** ½–¾ in., forming a pyramid, densely shortly glochidiate, especially round the margins; carpophore elongate conic.—This may prove to be S. angustifolius, Fisch. & May.; DC. Prodr. x. 165; it was placed in Lindelofia by Bentham, (to which genus I would refer the Solenanthi with long anthers, as S. lanatus, A. DC., S. brechtystemon, F. & M.—J. D. Hooker).

12. **SOLENAanthus**, Leode.

Perennial, hairy herbs. **Leaves** alternate, radical petiolated. **Racemes** dense or corymbose, ebracteate. **Calyx** 5-partite, scarcely enlarged in fruit. **Corolla**
tubular, throat with 5 scales; lobes 5, small, obtuse, erect or scarcely spreading. Filaments long; anthers small, shortly oblong, far exerted. Ovary 4-lobed; style from the base of the lobes, filiform, stigma small. Nutlets 4, attached somewhat obliquely to the conical carpophore, scarcely produced at the apex, rounded at the base, muricate or shortly glochidiate, usually margined.—Species 10, in S. Europe, Central and W. Asia.


Alpine Western Himalaya; Zanskar, Thomson; Pangee, Dr. Watt.—Distr.: Afghanistan, Astrabad, Soongaria, Altai.

Stems 3 ft. erect, laxly hairy. Radical leaves 6 by 2 1/2 in.; petiole 8 in.; cauline 3 by 1 1/4 in. Panicle in fruit 10 by 8 in., branches elongate; flowers approximate; pedicels 0-1 in. Calyx-lobes 1/2 by 1/4 in., oblong. Corolla-tube 1/4 in., lobes 1/6 in. Filaments 1/4 in. Style 1/4 in. Nutlets forming a pyramid 1/4-3/8 in. diam., densely shortly glochidiate, especially round the margins; carpophore elongate-conic.

13. PARACARYUM, Boiss.

Perennial or biennial, hairy herbs. Leaves alternate. Racemes elongate, bracts few or 0. Flowers small, blue. Calyx deeply 5-fid, in fruit not much enlarged. Corolla funnel-shaped, or cylindric in P. helicocarpum, tube closed by 5 scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, beneath the scales. Ovary 4-lobed; style from the base of the lobes, short or long, stigma small. Nutlets 4, depressed, often broadly adnate to the carpophore with rigid persistent style, forming a pyramid, their apices hardly produced, their bases rounded, attached obliquely to the conical conical carpophore, glochidiate (except in P. ? Lambertianum), strongly margined; margin sometimes much reflexed as in Omphalodes.—Species 20, in S. Europe, W. and Central Asia.

Sect. I. Stem solitary, tall, corymbose upwards. Leaves large.—(This section differs from Cynoglossum microglochin, petiolatum, &c., only in the more elongate conic carpophore, the nutlets being obliquely suberect, rather than much depressed and subdivaricate as in Cynoglossum.)


Western Deccan Peninsula; from Mahableshwur to Mysore, common, Wight, Dalevel, &c.

Erect, 3-4 ft., sparsely hairy. Radical leaves long-petioled, 7 by 5 in.; cauline 3 1/2 by 2 in., acute, subentire, tubercular-scabrous above, nearly glabrous beneath except on the nerves. Racemes strigose; branches 2-4 in.; pedicels 1/5 in., approximate. Calyx-lobes 1/10 in., elliptic; in fruit 1/4 in., ovate. Flowers 1/4 in. diam., nearly as of Cynoglossum. Style scarcely 1/8 in. Outer faces of the nutlets 1/6 in., ovate, margin prominent reflexed strongly glochidiate, disc nearly smooth shining.

2. P. malabaricum, Clarke; radical leaves, ovate-cordate tuberculatet-hispid, cauline ovate cuneate at the base hirsute, racemes numerous erect
forming a large dense corymb, pedicels very short. Cynoglossum sp. 13, Herb. Ind. Or. H. f. & T.

Western Deccan Peninsula; Canara and Mysore, Law.
Resembling the preceding species but stouter, more hairy, with larger flowers and fruits. Calyx-lobes \( \frac{1}{2} \) in., elliptic; in fruit \( \frac{1}{2} \) in., ovate. Nutlets more than \( \frac{1}{2} \) in. diam., subglobose, disc of their faces glochidiate, style \( \frac{1}{2} \) in.

3. P. Lambertianum, Clarke; strigose, cauline leaves subsessile ovate acute, racemes long forked, pedicels very short, nutlets large margined not glochidiate.

Bombay (Herb. Lambert).
The upper portions of 2 fruiting stems of this are very like P. caelestinum, but the fruits are totally different. Calyx as of P. caelestinum. Corolla not seen. Nutlets \( \frac{1}{2} \) in. diam., ovate, much depressed flattened, margin \( \frac{1}{2} \) in. broad, entire, not reflexed, disc smooth, shining; carpophore elongate conic, style ultimately \( \frac{1}{2} \) in.—The genus of this plant is very doubtful; the nutlets approach those of Rinderia.


Temperate Western Himalaya, alt. 7-9,000 ft.; Kashmir, Lahul and Piti, Thomson, &c.—Distributed Kashmir.
Erect, 3 ft., softly hairy. Radical leaves long-petioled, 6 by 1 in.; cauline 2\( \frac{1}{2} \) by \( \frac{1}{2} \) in., closely hairy on both surfaces. Racemes 4-10 in., ebracteate; pedicels in fruit \( \frac{1}{2}-\frac{1}{2} \) in. distant. Calyx-lobes \( \frac{1}{2} \) in., narrowly oblong, silky; in fruit \( \frac{1}{2} \) in. or more, widened. Corolla-tube \( \frac{1}{2}-\frac{1}{2} \) in.; lobes \( \frac{1}{2} \) in. suberect. Anthers linear, included. Style \( \frac{1}{2} \) in. in fruit. Nutlets \( \frac{1}{2}-\frac{1}{2} \) in.; glochidia broadly-lanceolate, thin, membranous.—A plant frequently collected in Cabul by Griffith has been named P. anchusoides, but it has very stiffly glochidiate, smaller, less margined nuts; and may be Cynoglossum macrostylum, Bunge (cf. Boiss. Pl. Orient. iv. 266).


Alpine Himalaya, alt. 9-12,000 ft.; from Kashmir to Sikkim, frequent, Wallich, Royle, J. D. H., &c.
Stem 3 ft., laxly hairy. Radical leaves 2-4 in. diam., petioles often 6 in.; cauline leaves mostly distinctly petioled, orbicular to elliptic-lanceolate, base obtuse. Racemes 2-6 in., strigose; pedicels in fruit often \( \frac{1}{2}-\frac{1}{2} \) in. distant. Calyx-lobes \( \frac{1}{2} \) in., oblong, acute; in fruit \( \frac{1}{2} \) in., ovate. Corolla \( \frac{1}{2} \) in. diam., tube short, much as of Cynoglossum. Style \( \frac{1}{2} \) in. Nutlets forming a pyramid \( \frac{1}{2}-\frac{1}{2} \) in., much adnate to the carpophore; glochidia \( \frac{1}{2}-\frac{1}{2} \) in., sublinear.

6. P. Thomsoni, Clarke; radical leaves ovate-oblong, cauline mostly petioled ovate-lanceolate sparsely hairy, racemes divaricate, pedicels very short, nutlets less than \( \frac{1}{3} \) in. glochidiate margined.—Echinospermum sp. 2, Herb. Ind. Or. H. f. & T.

Alpine Western Tibet; Nuba, Baltal, Thomson.
Stem 3 ft., sparsely hairy. Radical leaves 8 by 4 in., blade decurrent on the 4-10 in.
petiole; cauline leaves 3 by 1 3/4 in., cuneate or rhomboid at the base. Spikes dense or lax. Calyx and corolla nearly as of P. glochidiatum. Nutlets much smaller, margin shorter, white, membranous, less reflexed, more shortly glochidiate.

SECT. 2. Small hispid plants, with several stems. Leaves and flowers small.—(This section only differs from Omphalodes in the more erect nutlets, not saccate at the base.)

7. P. himalayense, Clarke; leaves oblong, flowers subsessile, nutlets 1/4-1/3 in. diam., margin subpatent glochidiate. Mattia himalayensis, Klotzsch in Reis. Pr. Waldem. Bot. 94, t. 64.—Omphalodes sp. n. 4, Herb. Ind. Or. H. f. & T.

Alpine Western Himalaya; Nubra, Thomson.

Stems decumbent then ascending, 6-14 in., patently hispid. Radical leaves 1 1/2 by 1 in., narrowed at both ends, hispid on both surfaces, petiole 1 in.; cauline similar, smaller, subsessile. Spikes in fruit 3-8 in.; pedicels hardly any, distant. Calyx-lobes hardly 1 3/4 in., oblong; in fruit sometimes 1/2 in. Corolla scarcely 1/3 in. diam., blue, tube short. Fruit pyramidal; margin of nutlets membranous, disc muricate, subglochidiate; style hardly 1/8 in.

8. P. tibeticum, Clarke; leaves oblong, flowers subsessile or lower pedicelled, nutlets 1/4-1/3 in. diam., margin patent subentire.—Omphalodes sp. n. 6, Herb. Ind. Or. H. f. & T.

Western Tibet; Ladakh, alt. 9000 ft., Thomson.

Much resembling P. himalayense. Stems more diffuse. Flowers very small, mostly subsessile; lower pedicels in fruit occasionally 1/4 in. Fruit pyramidal; margin of nutlets membranous, disc minutely glochidiate, style less than 1/8 in.

9. P. microcarpum, Boiss. Diagn. 2. iii. 139, and Fl. Orient. iv. 255; leaves oblong, flowers pedicelled, nuts 1/4-1/3 in. diam., margin inflexed entire.—Omphalodes sp. n. 7, Herb. Ind. Or. H. f. & T.

Subalpine Western Himalaya, alt. 8000 ft.; Kashmir and Pangee, Thomson.—District: Cabul.

Diffuse, hairy. Racemes in fruit 3-8 in.; pedicels 1/4-1/3 in. Calyx and corolla rather larger than of the two preceding species. Fruit pyramidal, somewhat depressed; margin of nutlets membranous, as though inflated; disc minutely glochidiate.

14. ECHINOSPERMUM, Swark.

Annual or perennial, hispid herbs. Leaves alternate, oblong, lanceolate or narrowly obovate. Flowers very small, sessile or pedicelled; racemes bracteate, or ebracteate above. Sepals 5. Corolla-tube short, mouth closed by 5 scales; lobes 5, imbricate in the bud, obtuse, spreading. Stamens 5, included. Anthere ovate, obtuse. Ovary 4-lobed; style between the lobes, short, stigma small capitulate. Nutlets 4, erect, forming a pyramid, confluent or separable, attached above their base; scar produced to their apex; bases not produced; margins with 1 or 2 rows of short glochidia; carpophore as long as the nutlets.—Species 20, in the north temperate regions of the old World and in N. America; a few in S. Africa and Australia.

The character in Gen. Pl. (ii. 835) assigned of "apices of the nuts erect, free round the style, more or less prominent," applies only to the glochidiate species of Eritrichium placed by Bentham in Echinopspermum, but here enumerated under Eritrichium.

1. E. minimum, Lehm. Asperifol. 126; patently hispid, leaves linear-oblong, calyx-lobes linear, nutlets elongate-pyramidal confluent. Myosotis-
Echinospermum. ] C. BORAGINEÆ. (C. B. Clarke.)

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KASHMIR; temperate region Thomson. PUNJAB; Peshawur, Vicary.—Distrib. Cabul, Belochostan to the Ural Mts. and Altai.

A coarser plant with larger flowers and fruits than the other Indian Echinospermum. Stem 6–12 in., erect, rigid. Leaves 1½ by ½ in., numerous, sometimes somewhat obovate, lower spatulate petiolated. Racemes in fruit 3–4 in.; pedicels ½ in., distant, rigid, suberect, often thickened; bracts ½–1 in., leaflike, often continued to the top of the raceme. Calyx-lobes ½–1 in. Corolla-tube ½ in., lobes not much over topping the calyx. Nutlets ½–1 in.; margins thickened, with a single row of strong glocidia; backs depressed, smooth or scarcely granular; nutlets inseparably confluent, not rarely 1 or 2 abortive.—Boissier (Fl. Orient. iv. 248) doubts whether Heterocaryum pachypodium, rigidum, and Szwastianum (A. DC. Prodr. x. 145), are other than forms of this species.


SUBALPINE WESTERN HIMALAYA, alt. 7–12,000 ft.; from Gurhwal to Baltisthan, frequent; Thomson, &c.—Distrib. from Belochostan and Cabul to the Ural and Altai.

Erect, 6–18 in. Leaves ½–2 in., narrowed at the base, lower petiolated. Racemes in fruit 2–12 in.; pedicels ½–1 in., erect; bracts ½ in., usually 0 in the upper part of the spike. Calyx-lobes ½ in. Nutlets ½–1 in., forming a compact pyramid, but separable.


WESTERN TIBET, alt. 9–10,000 ft.; Leh, Thomson.—Distrib. Central Asia to the Ural and Altai.

Generally resembling E. barbatum. Pedicels rarely exceeding ¼ in.; bracts ½ in., oblong, often continued (smaller) to the summit of the spike. Calyx-lobes rather longer than of E. barbatum, in fruit ½–¾ in. in Thomson’s example. Nutlets nearly as in E. barbatum but the glocidia in one row and much longer.—Perhaps E. pectinatum, Leh. (DC. Prodr. 137; Boiss Fl. Orient. iv. 250) is not specifically distinct.

4. E. semiglabrum, Ledeb. Fl. Alt. i. 204, and Ic. Fl. Ross. i. t. 28; patently hispid, leaves oblong, flowers subsessile, calyx-lobes linear-oblong, nutlets tubercular-scarious on all sides with one row of glocidia round the margin as long as the nutlet is broad. DC. Prodr. x. 138; Boiss. Fl. Orient. iv. 251.

WESTERN TIBET and BALTIStHAN, alt. 8–10,000 ft.; Thomson, &c.—Distrib. Cabul; Turkestan to the Altai.

Hardly distinguishable from E. Redowskii, but by the longer glocidia of the nute which often exceed ½ in. Spikes denser, more divided, often somewhat closely panicked.

15. ERITRICHIUM, Schrader.

Annual or perennial herbs, strigose or silky-villous. Leaves alternate, narrow. Racemes simple or branched. Flowers small, blue, rarely white. Sepals 5, not or slightly enlarged in fruit. Corolla-tube short, throat with 5
scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers ovate, obtuse. 

**2. E. strictum, Dcne. in Jacq. Voy. Bot. 125; perennial, silky-white, leaves linear, bracts minute in the upper part of the raceme, sepals in fruit \( \frac{1}{8} - \frac{1}{10} \) in. oblong. A. DC. Prodr. x. 128. E. Jacquemontii and longifolium, Dcne. l. c. 122, 123, tt. 127, 129; DC. l. c. 25. Echinosepermum canum, Benth. in Royle Ill. 306; A. DC. l. c. 141. E. myosotissiforum, A. DC. Prodr. x. 141.

Throughout the Western Himalaya, alt. 7–13,000 ft.; common, from Kashmir and Baltistan to the Sutledge.

Rootstock woody; stems 8 in., numerous, strict, undivided. Leaves 1½ by \( \frac{1}{8} \) in., softly adpressedly silky; lowest similar but larger, attenuate, hardly petioled; radical withered. Racemes 1–3 in., branched; pedicels \( \frac{1}{4} - \frac{1}{3} \) in., erect in fruit. Flowers \( \frac{1}{8} \) in. diam., blue. Nutlets forming a pyramid \( \frac{1}{8} - \frac{1}{10} \) in. high, produced more than half their length above the pungentiform scar; margins subreflexed, thin, the weak globidria produced shortly above their confluence, sebaceous, spicules of most divided, uncinate; back sebaceous, or muricated with minute prickles.—Decaisne's example here described has narrower leaves than the mass of the material which is half-way between this and var. Thomsonii. This is the type of the genus Echinosepermium as described in the Gen. Pl., and may be E. myosotissiforum, A. DC. Prodr. x. 141.

**3. E. spathulatum, Clarke; perennial, villous, leaves oblong, bracts minute in the upper part of the raceme, calyx-lobes in fruit \( \frac{1}{8} - \frac{1}{10} \) in. oblong. Echinosepermum spathulatum, Benth. in Royle Ill. 306; DC. Prodr. x. 142.

Western Tibet; Hangrang Pass, Thomson; Kijungar Pass, alt. 16,000 ft., Strachey and Winterbottom.

Rootstock woody. Stems 2–6 in., numerous, decumbent. Cauline leaves \( \frac{1}{4} \) by \( \frac{1}{3} \) in., sessile; lower numerous, larger, spathulate, petioled. Nutlets not ripe, larger than in E. strictum, var. Thomsonii, hairy on the back.—Perhaps a form of E. strictum, but wants the glistening silky indumentum of that species; calyx and nutlets larger.

** Margins of the nutlets entire or crenulate not glochidiate.

**4. E. pustulosum, Clarke; weak, diffuse, strigose, leaves spathulate-oblong, pedicels few subaxillary, nutlets ovoid tubercular and minutely pubescent.—Eritrichium sp. n. 14, Herb. Ind. Or. H. f. 8 T.

Alpine Sikkim; Lachen, alt. 13–15,000 ft., J. D. H.

Rootstock biennial (at least), weak; stems 3–7 in. Leaves \( \frac{1}{4} \) by \( \frac{1}{3} \) in., cauline mostly spathulate, petioled, a few uppermost sessile. Pedicels \( \frac{1}{4} - \frac{1}{3} \) in. in fruit. Calyx-lobes in fruit \( \frac{1}{8} \) in., elliptic-oblong. Flowers \( \frac{1}{8} \) in. diam., pale blue. Nutlets \( \frac{1}{8} - \frac{1}{12} \) in., not distinctly margined; tubercles appearing as tufts of minute hairs.
4. **E. pygmaea**, Clarke; nearly stemless leaves elliptic, pedicels \( \frac{1}{3} \) in. appearing umbellate, nutlets ovoid nearly smooth.—Eritrichium sp. n. 16, *Herb. Ind. Or. H. f. & T*.

**Alpine Sikkim**; Momay, alt. 16,000 ft., J. D. H.

Stems 0–\( \frac{3}{4} \) in., annual, erect, densely clothed with spreading leaves, terminated by numerous subfasciater spreading pedicels. **Leaves** \( \frac{1}{3} \) in., sessile, subobtuse, patently villous. **Calyx-lobes** \( \frac{1}{3} \) in., narrowly oblong. **Corolla** not seen. **Nutlets** \( \frac{1}{3} \) in., with free spicis, testa minutely reticulate and wrinkled; carpophore very short.

5. **E. Munroi**, Clarke; small, suberect, branched, leaves oblong lower spatulate, racemes numerous many-flowered, nutlets ovoid-oblong nearly smooth.—Eritrichium sp. n. 18, *Herb. Ind. Or. H. f. & T*.

**Alpine Himalaya**, alt. 11–13,000 ft.; Kunawur, Munro, Kumaun, Strach. & Winterb.; Sikkim, Lachen, J. D. H.

Stems 1–4 in. **Leaves** \( \frac{1}{2}–\frac{3}{4} \) in., patently villous. **Racemes** villous, dense in flower; in fruit pedicels sometimes \( \frac{1}{2} \) in., upper bracteate. **Calyx-lobes** in flower minute, in fruit \( \frac{3}{16} \) in. or upwards, oblong-linear. **Flowers** hardly \( \frac{1}{3} \) in. diam. **Nutlets** \( \frac{1}{16} \) in., minutely reticulate and wrinkled; carpophore very short.—The fruit is imperfect, and there may be more than one species mixed here.


**Western Tibet**; Ladakh, alt. 9–10,000 ft., Thomson.

**Rootstock** slender, annual? **Stems** 6–10 in., numerous, slender. **Leaves** \( \frac{1}{2}–\frac{3}{4} \) in., obtuse, spatulate, strigose. **Racemes** in fruit 6 in.; pedicels \( \frac{3}{4} \) in., a few lower from leaflike bracts. **Calyx-lobes** \( \frac{1}{16} \) in., ovate-oblong. **Flowers** \( \frac{3}{16} \) in. diam. **Nutlets** \( \frac{1}{16} \) in.; margin somewhat prominent.

**Var. minor**; less strigose, stems 2–3 in., leaves \( \frac{1}{2}–\frac{3}{4} \) in. Eritrichium sp. n. 15, *Herb. Ind. Or. H. f. & T*.—Sikkim; Phulloong, alt. 15,000 ft., J. D. H.

*** Nutlets conic-ovoid, margin strong fringed with divided hairs.

7. **E. basifixum**, Clarke; erect, leaves sessile broadly lanceolate softly villous, racemes dense bracteate, nutlets apparently basally attached, carpophore depressed hardly convoluted. Echinopspermum sericeum, *Benth. in Royle Ill. 306*; DC. Prodr. x. 142.

**Alpine Western Himalaya**; from Kashmir to Gurwhal, alt. 13–15,000 ft.; Royle, Lance, Jaeschke, &c.

Stems 3–7 in., solitary or few, erect, divided at the apex. **Leaves** \( \frac{5}{8} \) by \( \frac{1}{2} \) in., acute, lower densely tufted, upper distant. **Racemes** in fruit \( \frac{1}{3} \) in.; pedicels \( \frac{3}{4} \) in.; bracts \( \frac{1}{2} \) in. **Calyx-lobes** in fruit \( \frac{1}{3} \) in., narrowly oblong. **Flowers** \( \frac{1}{16} \) in. diam. and upwards, blue, purpureous. **Nutlets** \( \frac{1}{16} \) in., membranous, glabrous; circular back within the margin minutely hairy.—Closely allied to *E. villosum*, in which the margins of the nutlets carry broad-based flattened lanceolate ciliolate-serrate teeth. In the typical Eritrichiums the scar of the nutlets is sub-punctiform at the apex of a depressed cone on the inner lower face; in *E. villosum*, DC. Prodr. x. 126 (Myosotie villosa, Ledeb. Fl. Ross. t. 215), this cone is less depressed; in *E. basifixum* it is elongate still more, so that the nutlets are attached apparently basally, nearly as in *Lithospermum*.


Annual or perennial, villous or hispid herbs. **Leaves** alternate. **Racemes** simple or branched, bracteate. **Flowers** small, blue or white. **Sepals** 5 (in non-Indian species 6–7), enlarged in fruit, linear or base auricled and sagittate. **Corolla-tube** cylindric, throat with or without scales; lobes small, spreading.
Stamens 5, included; anthers ovate, obtuso. Ovary 2-lobed, 2-celled; style from between the lobes, sublateral, shortly linear, stigma capitulate; ovule 1 in each cell. Nutlets 2, 1-seeded, erect, ovate-oblong, granular-tubercular (in the Indian species); scar extending from the base to the middle.—Species 8; from India, through W. Asia to N. Africa and S. Europe; 1 in Australia.


**Western Tibet; Nubra, Thomson.—Distrib. From Soongaria and Cabul to Spain and Algeria.**

Stems 5–14 in., branched, wiry. Leaves 1 by ½ in., lower subpetioled. Racemes in fruit 2–12 in.; bracts to nearly all the flowers, leaflike, smaller upwards. Sepals in flower scarcely ¼ in., in fruit nearly ¾ in. Corolla ½ in. long, less than ½ in. diam. Nutlets nearly ⅜ in. long, white-tuberculate; style hardly longer than the nutlets; pedicels in fruit subpatent, not distinctly recurved nor thickened.


**Kashmir, and adjoining Punjab Plains, frequent; Thomson, Vicary, &c.—Distrib. Cabul.**

Annual, 2–8 in., erect. Leaves narrower, racemes slenderer than in *R. stellulata*. Pedicels in fruit deflexed, scarcely thickened. Style considerably exceeding the nutlets.—Closely allied to *R. stellulata*.


**Western Tibet; Zanekar, Thomson.—Distrib. Cabul and Beloochistan.**

Annual; stems 2–5 in., erect, with ascending branches. Leaves ½ by ½ in., lower spatulate or sublinear. Racemes in fruit 1–4 in., somewhat dense, bracteate. Sepals in fruit ½ by ½ in. wide at the base, hairs soft hardly hooked even when dry. Corolla pale-blue, with a white throat (*Stocks*). Nutlets scarcely half as long as the sepals; fruiting pedicels suberect, not thickened.—Boissier (Fl. Orient. iv. 246) reduces this species to *R. macrocalyx*, Bunge (in Fl. Lehm. 419). But Bunge describes the fruiting sepals as bigbomus at the base and very hispid, which does not fit. There is another Cabul plant of Griffith's which (ex decr.) may be *R. macrocalyx*, Bunge, and which may have been sent to Boissier as *R. rectipes*.


**Western Tibet; Nubra, Thomson.—Distrib. Turkestan.**

Annual, erect, 6–8 in., very ramous. Leaves 1½ by ½ in., lower spatulate or petioled. Racemes lax, 2–5 in.; bracts to nearly all the flowers, leaflike, smaller upwards. Sepals in flower, ½ in., white silky, in fruit ½ by ¾ in. Corolla ½ by ⅜ in. Nutlets ⅛ in., rather larger than of *R. stellulata*.

17. *ASPERUGO*, Linn.

A procumbent, scabrous-hispid annual. Leaves alternate and subopposite, spatulate-oblong or petioled, subentire. Flowers small, axillary, subsessile,
solitary or paired. *Calyx* campanulate, 5-fid half-way down; in fruit much enlarged, rigid, compressed, lobes toothed nervose. *Corolla-tube* short, mouth closed with 5 scales; lobes 5, imbricate in bud, obtuse, spreading. *Stamens* 5, included; anthers ovate-oblong, obtuse. *Ovary* deeply 4-lobed; style short, stigma small capitulate. *Nutlets* 4, erect, ellipsoid-oblong, laterally compressed, smooth, stony, attached at a small subpunctiform scar above their middle; carpophore conoid.


**Punjab and Kashmir**, alt. 1-7000 ft.; extending to 12,000 ft. in Western Tibet and the Karakorum; a weed especially near cultivation, Thomson, &c.—Distr. Europe, N. Africa, W. Central and N. Asia.


18. **MICROULA**, Benth.


**M. Benthami**, Clarke.

**Western Tibet**, alt. 15-17,000 ft.; Parang Pass, Thomson; Kyoongar Pass, Strachey & Winterbottom.

**Root** long, vertical, crowned by a tuft of leaves longer than the inflorescence; but one example has a stem of 3 in., with inflorescence as in *Eritrichium*. *Leaves* 3 in. *Flowers* ½-⅔ in. diam. *Nutlets* ½ in., backs diamond-shaped, scabrous with subsessile glochidia.


Weak herbs, annual or biennial, strigose or hirsute. *Leaves* alternate, ovate or lanceolate. *Flowers* small, blue or white, axillary, pedicelled, the upper going off into a bracteate raceme. *Calyx* 5-partite; lobes narrow, not (or scarcely) enlarged in fruit. *Corolla-tube* short, throat with 5 scales; lobes 5, imbricate in bud, obtuse, spreading. *Stamens* 5, included; anthers ovate, obtuse. *Ovary* deeply 4-lobed; style short, stigma capitulate. *Nutlets* 4, ellipsoid, without angles, granular-scabrid; scar near the middle of the inner face, large, hollow, smooth, with an inflamed margin; carpophore oblong.—Species 2 or 3; from N. India to Amurland.

Throughout N. INDIA, alt. 0-4000 ft., from the foot of the N.W. Himalaya and Jubbulpore to Bhutan and Khasia; not common.—Distrib. Amurland, Japan, China, with neighbouring islands. (Mauritius introduced).

Usually prostrate or diffuse, 1-3 ft. with elongate branches and distant axillary flowers; sometimes suberect 3-6 in. with erect, close racemes. Leaves 1 by 4-5 in., subacute. Calyx-lobes in fruit ½-1 in., lanceolate or linear. Corolla ½ in. diam., white. Nutlets ½-1½ in.; scar more than half their length.

20. Gastrocotyle, Bunge.

A hispid, diffuse herb. Leaves alternate, oblong, lowest spathulate or petioled. Flowers small, axillary, solitary and shortly pedicelled, or in dense small, axillary racemes. Calyx 5-partite. Corolla-tube short, closed with scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers ovate, obtuse. Ovary 4-lobed; style short, stigma subcapitate. Nutlets 4, or fewer, ovoid, erect, incurved; scar on the inner face, near their middle, oblong, longitudinal, elevated, margined; carophore half as long as the nutlets; apex with 4 ridges.

G. hispida, Bunge Rel. Leh. 405. Anchusa hispida, Forsk. Fl. Æg.-Arab. 40; DC. Prodr. x. 50; Boiss. F Orient. iv. 158.

Punjab, alt. 1000 ft.; Thomson, &c.—Distrib. From Egypt to Beloochistan, Cabul, and Soongaria.

Leaves 1-2 in. Calyx-lobes ½-1 in., coarsely hispid. Corolla ½ in. diam. Nutlets ½-1 in., rugose, minutely papillose between the wrinkles, indistinguishable from those of Lycopsis.

21. Anchusa, Linn.

Hispoid or bristly herbs. Leaves alternate. Cymes dichotomous, or racemes unilateral, terminal ultimately elongate. Calyx deeply 5-fid, not (or scarcely) enlarged in fruit. Corolla-tube straight, long or short, closed with scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers oblong, obtuse. Ovary deeply 4-lobed; style filiform, stigma small. Nutlets 4, ovoid, conoid, sessile on a flat receptacle; scar basal, concave, margined.—Species 30; Europe, Africa, and W. Asia.

A. italicæ, Retz. is said to grow in Kashmir (DC. Prodr. x. 47); but it is almost certainly a cultivated plant, and the specimens, which were in Royle's Herbarium, were very probably from the Saharanpur Garden.

A. sikkimensis, Clarke; erect, tall, bristly, leaves petioled elliptic or oblong, cymes short bracteate forming a terminal panicle, corolla-tube shortly exceeding the sepals.

Alpine Sikkim, alt. 11-12,000 ft., Lachen and Latong, J. D. H. Stem 2-3 ft. Cauline leaves 2½ by 1 in., subacute; petiole ½ in. Calyx-lobes ½ in., narrow. Corolla ½-3 in. diam., blue. Nutlets not ripe, dorsally compressed; backs diamond-shaped, scabrous; scar very small.—The nutlets are exceedingly like those of Microula, and do not agree well with those of Anchusa; but the habit is altogether that of Anchusa sempervirens, &c. Mr. Bentham has referred the species to Anchusa, and it had better remain here till good fruit is obtained; to remove it to Microula would require the characters of that genus to be considerably modified.

22. Lycopsis, Linn.

Annual, hispid herbs. Leaves alternate. Flowers small, blue purple or white; racemes bracteate, terminal. Sepals 5, linear. Corolla-tube curved in
the middle, somewhat longer than the calyx; lobes 5, imbricate in bud, obtuse, spreading. **Stamens 5**, included; anthers ovoid, obtuse. **Ovary** 4-lobed; style filiform, stigma capitate. **Nutlets** 4, ovoid, suberect, reticulate-rugose; scar on the inner face, near the middle, oblong, longitudinal, elevated, margined; carpophore conical.—Species 3–4, of the Mediterranean region.

**L. arvensis**, Linn.; **DC. Prodr.** x. 54; erect, bristly, leaves oblong acute upper subamphical lower petioled, corolla-lobes subequal. **Lamk. Ill.** t. 92; **Engle. Bot.** t. 938. **Anchusa arvensis**, **Bieb. Fl. Taur.**—**Cauc.** i. 123; **Reichb. Fl. Germ.** t. 1310, fig. 1; **Boiss. Fl. Orient.** iv. 160.

**Kashmir** and **Western Tibet**, alt. 3–8000 ft.; from near Peshawur to Skardo, Roxie, Thomson, &c.—**Distrib.** Europe, W. & N. Asia.

**Stem** 1–2 ft. **Leaves** 2 by ½ in. **Racemes** in fruit 3–6 in.; pedicels ½ in.; bracts ½ in., lanceolate, or lower leaflike. **Sepals** in flower ½ in., hispid, oblong-linear, in fruit ¼ in. **Corolla-tube** ½ in., narrowly cylindric; lobes ½ in., blue, or in the Indian plant usually white. **Stamens** attached near the base of the corolla-tube. **Nutlets** ⅛–⅜ in., 12 not papillose-scabrid between the wrinkles.

**23. NONNEA, Moench.**

Annual or perennial herbs, hispid or villous, usually diffuse. **Leaves** alternate. **Cymes** dense, in fruit elongate, bracteate. **Calyx** 5-lobed, shortly or half-way down; in fruit much enlarged, tube enclosing the nutlets. **Corolla-tube** straight, about as long as the calyx; throat naked or hairy (not with scales), small scales sometimes present lower down; lobes 5, imbricate in bud, obtuse, spreading. **Stamens** 5, included or scarcely exsert; anthers oblong, obtuse. **Ovary** deeply 4-lobed; style filiform, stigma shortly or obscurely 2-lobed. **Nutlets** 4, ovoid, reticulate-rugose, on a depressed-conic receptacle; scar large, basal, oblique, concave, with a central appendage and very hard margin.—**Species** 20; in Europe, N. Africa, W. and Central Asia.


**Punjab Plain**, Thomson, Edgeworth, &c.—**Distrib.** Central and E. Europe, W. Asia.

Much branched, 12–18 in., hispid and villous. **Leaves** 2 by ⅛ in. **Racemes** 2–5 in., dense; pedicels ½–⅜ in.; bracts 1 in., leaflike. **Calyx** ½ in.; in fruit ½ in., the campanulate base ½ in. diam.; subglobose. **Corolla-tube** ½ in., narrow; lobes ⅛ in., half-spreading. **Nutlets** ⅛ in., obliquely curved inwards, slightly wrinkled, puberulous.

**24. MERTENSIA, Roth.**

Perennial herbs, stigrose or softly hairy. **Leaves** alternate. **Racemes** terminal, scorpioid, usually simple, dense or lax; bracts 0. **Flowers** blue or purplish, pedicelled. **Sepals** narrow, somewhat enlarged in fruit. **Corolla-tube** as long as, or much longer than, the calyx; throat with or without scales; lobes 5, imbricate in bud, short, obtuse, spreading or suberect. **Stamens** 5, included or scarcely exserted, filaments short linear; anthers oblong, obtuse. **Ovary-lobes** 4; style filiform, often very long, stigma small. **Nutlets** 4, erect,
ovoid-oblong, obscurely dorsally compressed, smooth, slightly angular; scar small, triangular, at the very base of the inner angle, not strongly margined.—Species 15; in E. Europe, extratropical Asia, and N. America.

**Trigonitis** differs by its short corolla-tube and shortly trigonous (not oblong) nutlets. *Myosotis* differs by its short corolla-tube and twisted corolla-lobes. The length of the corolla is variable in the species of this genus.


**Kashmir**, alt. 5,800 ft.; *Jacquemont*, *Falconer*. Rootstock somewhat stout, annual stems 8 in. Radical leaves 2 by 3 in.; petiole 1½ in.; cauline 2 by ½ in., sessile, acute, hairs adpressed from tubercular bases. Raceme in fruit 3½ in., long-peduncled; pedicels ½ in., rigid, suberect. Calyx-lobes ½ in., linear, sparingly strigose; in fruit ½ in. Corolla ½ in. diam., tube ¾ in. long; scales in the throat very small; lobes spreading. Anthers subsessile, above the scales. Style ½ in. Nutlets ½ in., white or pale, shining.—Described from Jacquemont's specimen.

2. **M. moltkioides**, Clarke; patently hairy, leaves oblong or elliptic lower long-petioled spatulate, racemes many-flowered, corolla-tube nearly twice as long as the calyx, scales in the throat small. Anchnusa moltkioides, Benth. in Royoie Ill. 305, t. 73, fig. 1; DC. Prodr. x. 51. Lithospermum moltkioides, Dene. in Jacquem. Voy. Bot. 122.

**Kashmir**, alt. 8,000 ft., *Falconer*; near Islamabad, *Thomson*. *Panchi*, *Dr. Watt*. Very near *M. elongata*; leaves more softly hairy, hairs on the midrib beneath patent or reflexed. Racemes shorter peduncled. Calyx larger. Corolla-tube ½ by 1½ in. Nutlets brown-black, not more excavate at the base than those of *M. elongata*.


**Kashmir** and **Western Tibet**, alt. 5,12,000 ft.; from the Upper Indus to the southern face of the Himalaya, frequent; *Royce*, *Falconer*, &c.

**Stems** 6-15 in. **Leaves** 1½ by ½ in., subobtuse. Peduncles long; racemes 1-3 in., dense even in fruit; pedicels ½-1½ in., linear. Corolla-tube ½-1½ in., lobes ½ in. Filaments linear, distinct; anthers completely exerted, but not reaching above its lobes. Style and nutlets as of *M. elongata*.—Easily distinguished from all the other species of *Mertensia* by its erect corolla-lobes.


**Alpine Western Himalaya**, *Jacquemont*; Sai and *Gilgit*, alt. 15,000 ft., *Col. Tanner*.
Mertensia.]

C. BORAGINEAE. (C. B. Clarke.) 171

Stems 3 in., densely leafy below. Leaves ½ by ⅓ in., narrowed at both ends; petiole short or very broad. Peduncle 1 in. Raceme in flower ⅛ in.; pedicels ⅓ in. Calyx-lobes ⅛ in., narrowly oblong. Corolla ½ in. diam. Anthers subexsert, overtopping the small scales. Style ⅓ in. Fruit unknown.

Var. Tanneri; leaves 2 in. linear-spathulate, calyx-lobes ⅝ in., corolla violet-purple, tube ¼ in. long.—Gligt and Aston, Col. Tanner. This looks like a distinct species, but there is only a fragment (in flower).

5. M. tibetica, Clarke; bispid, leaves small subradical long-petoioed elliptic, peduncles long subpappose, corolla-tube ⅔-⅘ in. five times as long as the calyx, anthers included, scales in the corolla-throat large.

Western Tibet; Karakorum, alt. 14–18,000 ft., Clarke.

Leaves all subradical, ⅓ by ⅙ in., petiole 1 in. Peduncles 2–4 in.; racemes 1–4 in.; pedicels ⅓ in. Sepals ⅓ in., narrowly oblong; in fruit ⅝ in. Corolla-tube elongate-funnel-shaped, ⅛ in. wide in the throat; lobes ⅛ in. and upwards, subquadrate; scales half as long as the lobes, obtuse, emarginate; anthers entirely below the scales. Style ⅘ in. Nutlets as of M. moltkioides.


Temperate Western Himalaya, alt. 7–10,000 ft.; Gurwhal and Kumaon, frequent near Simla; Royal, Munro, Madden, &c.

Stems 3–8 in., weak, nearly glabrous. Radical leaves 1–1½ in., often suborbicular, obtuse, base sometimes cordate; petiole 1–4 in.; cauline similar, smaller, often nearly all petioled. Racemes subseinale, i.e. bracteate at the base; pedicels attaining ⅝ in. Sepals ⅘ in. linear; in fruit ⅛ in., villous. Corolla ⅝ in. diam.; tube ⅝ in., scales in the throat prominent; anthers below the scales. Style ⅛ in. Nutlets as of M. moltkioides.

25. MOLTORIA, Lehm.

Corolla abbreviated with small erect lobes hardly overtopping the calyx. Anthers long exsert on filiform filaments. Otherwise as Mertensia.


Kashmir, alt. 6–8000 ft.; Thomson, Aitchison.—Distrib. Cabul.

Rootstock woody; annual stems 3–10 in., suberect, with sometimes a long trailing stem added. Leaves 2 by ⅞ in. Racemes 1–2 in., dense, sometimes forked; pedicels 0–⅛ in. Calyx-lobes ⅝ in., narrowly oblong; in fruit ⅞ in. rather wider. Corolla without scales in the throat. Filaments exsert ⅝ in. Style ⅝ in. Nutlets avoid-oblong, acute, smooth, shining; scar small at the base on the inner side.—All the other species of Moltoria have bracteate racemes. Nutlets altogether of Mertensia, and the plant hardly differs from M. echoides but in the abbreviated corolla and longer filaments. Craniotermum has exsert anther but is remote in habit and in the fruit.

26. TRIGONOTIS, Stee.

Perennial herbs, weak or diffuse, more or less hairy. Leaves alternate, ovate or lanceolate, mostly petioled. Racemes lax, ebracteate, or the lower pedicels bracteate, or many pedicels axillary. Calyx 5-fid, or 5-partite, in fruit
not or slightly enlarged. Corolla small, blue or white; tube shorter than the calyx, throat with 5 small scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers oblong, obtuse. Ovary deeply 4-lobed; style filiform, not elongate, stigma capitate. Nutlets 4, tetrahedral with 4 acute or submarginal edges, hardly longer than broad, shining black; scar small, basal, subtuplicate.—Species 10; Central and E. Asia.

* Nutlets glabrous (three very closely allied species).


Alpine Nepal and Sikkim, alt. 10,000 ft.; Wallich, J. D. H.

Stems 6-20 in., procumbent, divided. Cauline leaves 1 by ½ in., mucronate, obtuse or rounded at the base, petiole ½ in.; radical leaves rather larger petioled, 1½ in. Racemes in fruit 3-6 in., chasctae, i.e. lower scattered pedicels in the axils of fully-developed leaves; pedicels ½ in. Calyx-lobes ¼ in., in fruit ½ in. Flowers ½ in. diam. Nutlets ½ in. diam.


Subalpine Himalaya, alt. 6-10,000 ft.; Royle; Kumason, Wallich; Sikkim (Lachen), J. D. H.

Stems weak, 2-4 in. Cauline leaves ¼-½ in.; radical long-petioled, some ochicular but many spatulate.—Does not differ from *T. microcarpa* except in being smaller, with subsessile leaves more attenuate at the base. Wallich’s example is not in good fruit.


Central and Eastern Himalaya; Nepal; Wallich. Sikkim, alt. 10-12,000 ft.; Latong, J. D. H.

Stems 10 in. Leaves ¾ by ¼ in., upper sessile. Pedicels ¼ in.—Described from Wallich’s examples, which resemble his *T. rotundifolia*, but are larger. The Sikkim ones are much smaller, with fruiting pedicels hardly exceeding ½ in. and the nutlets brown yellow.

** Nutlets minutely patently hairy on all sides.


Central and Eastern Himalaya; Nepal and Sikkim, alt. 8-12,000 ft., frequent; Wallich, J. D. H., &c.

Stems 8-24 in., mostly prostrate. Cauline leaves ¼-1½ in., from elliptic to orbicular, obtuse, base often cordate, petiole ½ in. Pedicels sometimes all axillary ½ in.; terminal racemes generally added. Calyx-lobes in fruit ½ in. Flowers ¼ in. diam. and upwards. Nutlets ½ in. diam.—Had there been as few specimens of this as of the three preceding species, the axillary-flowered examples would indubitably have been reckoned distinct from Wallitch’s terminal-racemed ones.

Khasia Mts., alt. 5–6000 ft.; Moflong, *H. f.* & *T.*

Stems 2 ft at last, stout, branched, patently hispid villous. Canine *leaves* 2 by 1/3–1/2 in., base obtuse; petiole 0–1/2 in. *Racemes* 3–6 in., often peduncled, axillary; pedicels 1/2–1 in. *Calyx*-lobes in fruit 1/4–1/2 in. *Flowers* 1/3–1/2 in. diam. *Nutlets* 1/3 in. diam.—This is an ennobled species of *Trigonotis*, much finer than the others, but the nutlets nearly as of *T. ovalifolia*.

27. **MYOSOTIS**, Linn.

Annual or perennial, hairy herbs. *Leaves* alternate or densely crowded. *Racemes* elongate, ebracteate, or flowers sessile and solitary in the penultimate axis. *Calyx* shortly or deeply 5-fid, hardly altered in fruit. *Corolla* blue, changing to red, or white, tube short, mouth closed with scales; lobes 5, twisted to the right in bud, obtuse, spreading. *Stamens* 5, included; anthers ovate, obtuse. *Ovary* deeply 4-lobed; style filiform, stigma small. *Nutlets* 4, ovoid-oblong, longer than broad, shining, smooth, or hairy upwards; scar basal, small; receptacle flat.—Species 30; temperate regions of the N. hemisphere; in Australia and New Zealand.


**TEMPERATE AND SUBALPINE HIMALAYA**, from Kurunwur to Kashmir and Baltistan; *Royce, Falconer, Thomson.—Distr.* From Cabul to Siberia, Europe and N. Africa, N. America.

Stems 4–20 in. *Leaves* 1 1/2 by 1/2 in. *Racemes* 2–8 in.; lower fruits pedicels 1/3 in. and upwards. *Calyx* in fruit 1/3 in., sparsely minutely stigrose; teeth scarcely acute. *Corolla* 1/3 in. diam. *Style* shorter than the calyx.—The name *M. lingulata*, Lehm. is one year prior to *M. caespitosa*, Schultz; but Boissier and most authors do not consider the notice of the plant by Lehmann to be worthy the rank of a “description.”


**ALPINE WESTERN HIMALAYA**, alt. 7–12,000 ft., from Kumaon to Kashmir, frequent; *Wallich, &c.—Distr.* Europe; N. West Asia to the Canaries.

Stems 4–16 in., mostly erect, sparingly villous. *Leaves* 1 1/2 by 1/2 in., lowest broader. *Racemes* 2–8 in., often divided; lower fruits pedicels usually 1/3 in. or more, hardly longer than the calyx in Wallich's *M. pallens*. *Calyx* in fruit 1/2–1/3 in., with many ascending hairs and some patent from the base; teeth in fruit erect hardly connivent.

3. **M. arvensis**, Hoffm. *Deutsch. Fl.* i. 85; hairs of stem spreading, leaves oblong lowest petioled, pedicels longer than the calyx, calyx villous

Suralpine Kashmir; Aitchison.—Distr. Cabul and Siberia to N. Africa and Europe.

Hardly distinguishable from M. sylvatica but by the smaller corolla. Pedicels in fruit longer. Calyx-teeth in fruit connivent over the nutlets.—Aitchison’s example is as near English M. arvensis as may be; there are other Kashmir examples supposed to be M. arvensis or M. intermedia, but they cannot be distinguished in the herb from M. sylvatica.

4. M. stricta, Link. Enum. i. 164; hairs of stem spreading, leaves oblong lower subsessile, lower pedicels in fruit shorter than the calyx, calyx villous some of the hairs spreading at base, teeth lanceolate longer than the tube erect in fruit. DC. Prodr. x. 109; Boiss. Fl. Orient. iv. 239.

Kashmir, Falconer; alt. 5–6000 ft., Thomson; Pangée, Dr. Watt.—Distr. Cabul, W. Asia, N. Africa, Europe.

Stems 3–8 in. erect. Leaves ½ by ½ in., narrowed at both ends. Racemes 3–5 in., often reduced nearly to a spike, with closely approximated flowers.


5. M. Hookeri, Clarke; leaves obovate-spathulate villous.

Alpine Sikkim, alt. 15–17,000 ft.; Kinchinjow, Lama Kangra, and Phulloong, J. D. H.

Appearing like a small tufted Alpine Cerastium, but with bright blue flowers. Stems 1–3 in., repeatedly dichotomous, most densely clothed with leaves in appearance whorled, lower withering or scale-like. Leaves ½–1 in., very obtuse, with much soft straight long white hair. Flowers just emergent from the tufts, nearly as of Myosotis arvensis and sylvatica. Nutlets nearly as of M. arvensis, but with some erect hairs in the upper half.

IMPERFECTLY KNOWN SPECIES.

M. robusta, Don Prodr. 101; DC. Prodr. x. 112; roots perennial fusiform; stem 1½ feet, ascending, simple, hairy; leaves 3 by ½ in. sessile, elliptic oblong, acute, hairy on both surfaces; racemes paired, short, ebracteate; calyx-segments ovate obtuse, larger than the corolla-tube.—Nepal, Gossainthan, Wallich.—Known only by Don’s description, which does not accord with any of the described species.

28. LITHOSPERNUM, Linn.

Herbs or undershrubs, hispid or rough. Leaves alternate. Flowers white blue or yellow, axillary solitary or in terminal ebracteate racemes. Sepals 5, linear. Corolla tubular-funnel-shaped, throat naked or with 5 small scales; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, included; anthers oblong, obtuse or apiculate. Ovary deeply 4-lobed; style filiform or cylindric, stigma usually 2-fid. Nutlets 4, erect, ovoid, stony, smooth or rough; scar flat, basal; receptacle nearly flat.—Species 40, in the temperate N. hemispheres, Africa, and S. America.

Lithospermum.] C. B. Clarke.) 175

Kashmir; Peshawur, Vicary. Western Tibet, Thomson.—Distrib. From Cabul, Siberia to N. Africa, Europe.


Very near the preceding species. Stems often divided near the base, decumbent, rarely more than 12 in.


Kashmir; alt. 5-8000 ft., frequent; Falconer, Thomson, &c.


29. SERICOSTOMA, Stocks.

Small strigose branched shrubs. Leaves alternate. Flowers small, axillary, sessile, solitary, or the upper in a bracteate raceme. Sepals 5, narrow. Corolla-tube short; mouth wide, closed with hair; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5, subincluded; anthers oblong, obtuse. Ovary deeply 4-lobed; style short, stigma subcapitate. Nutlets 4, ovoid, subuplicate; scar basal; receptacle flat.—Species 3 in W. Asia, from India to Arabia.


W. India; Deesa. Kattywar (in the sands near the sea). Scinde; Stocks, &c.


30. ARNEBIA, Forsk.

Annual or perennial hispid herbs, diffuse or divided near the base; root often staining red. Leaves alternate. Racemes terminal, elongate, bracteate; flowers subsessile, yellow or whiteish (in the Indian species). Sepals linear, not or slightly enlarged in fruit (in the Indian species). Corolla-tube slender, longer than the sepals, throat naked within; lobes 5, imbricate in bud, obtuse, spreading. Stamens 5; much below the mouth of the tube with long style, or in the throat semi-exsert with short style; anthers small, oblong obtuse. Ovary deeply 4-lobed; style shortly bipartite, stigma small capitulate, nearly the same in the long- and short-styled flowers. Nutlets 4, ovoid-oblong or acute, erect;
scar basal, large, triangular, flat, shortly produced up the inner face.—Species 12; in N. Africa, W. and Central Asia.


**Western India**, alt. 500–3000 ft.; from the Upper Gangetic plain and Rajpootana westwards, frequent.—**Distrib.** W. Asia to Egypt and Nubia.

Annual and (at least) biennial, diffuse, 3–15 in.; hairs white, harsh, spreading from tubercular bases. **Leaves** 2 by \(\frac{3}{4}\) in. **Spikes** 2–4 in., one-sided; bracts \(\frac{4}{3}–\frac{1}{3}\) in., linear. **Corolla** yellow, mouth \(\frac{1}{2}\) in. diam.—Dimorphic; the plants with stamens sub-exsert about as numerous as those with anthers below the corolla-throat.

2. **A. Griffithii**, Boiss. Fl. Orient. iv. 213; patently hispid, leaves lanceolate, sepals \(\frac{3}{4}–\frac{1}{3}\) in., corolla-tube \(\frac{3}{4}–1\) in., nutlets \(\frac{1}{10}\) in. ovoid suddenly narrowed upwards obtusely tuberculate on all sides. Bot. Mag. t. 5266. A. echioides, Hook. Bot. Mag. t. 4409, **not of L. c.**—Arnebia sp. n. 5, Herb. Ind. Or. H. f. & T.

**Punjab**; Peshawur, Vicary. Scinde; Col. Thompson.—**Distrib.** Beloochistan, Cabul.

Annual, diffuse, 3–6 in.; hairs white, spreading, from tubercular bases, less harsh than in **A. hispidissima**. **Leaves** 2 by \(\frac{1}{4}\) in. **Spikes** 1–3 in., one-sided. **Corolla** yellow, lobes on expansion with 5 dark brown spots at the sinus, which disappear as the day advances, mouth \(\frac{3}{4}–\frac{1}{4}\) in. diam. **Nuts** much larger than those of **A. hispidissima**, more triangular in horizontal section. Dimorphic.

3. **A. Thomsonii**, Clarke; shaggy hispid, leaves narrowly oblong, sepals \(\frac{1}{2}\) in., corolla-tube \(\frac{1}{2}\) in., nutlets \(\frac{1}{10}\) in. ovoid-conic without tubercles.—Arnebia sp. n. 6, Herb. Ind. Or. H. f. & T.

**Western Tibet**; Piti Valley, Thomson; Leh, Lance.

Biennial or perennial, diffuse, 3–10 in.; hairs white, long, dense, softer and more numerous than in **A. hispidissima**. **Leaves** 1 \(\frac{1}{2}\) by \(\frac{1}{4}\) in. **Spikes** 1–2 in., dense; bracts oblong, obtuse, overtopping the sepals. **Corolla** nearly as of **A. hispidissima**. **Nutlets** gradually narrowed upwards, trigonous in horizontal section.—Stems and spikes much more villous than those of **A. hispidissima**, and the nutlets larger, smooth. Dimorphic.

4. **A. tibetana**, Kurz in Journ. As. Soc. 1874, pt. ii. 189; hispid, leaves narrowly oblong, sepals \(\frac{1}{2}–\frac{1}{4}\) in., corolla-tube \(\frac{1}{2}–\frac{1}{4}\) in., nutlets \(\frac{1}{10}\) in. ovoid-conic scabrous.—Arnebia sp. n. 7, Herb. Ind. Or. H. f. & T.

**North Kashmir** and **Western Tibet**, alt. 7–12,000 ft., frequent; Thomson, Jaeschke, Aitchison, &c.—**Distrib.** Kashgar, Yarkand.

**Rootstock** perennial, staining red.—Closely resembling **A. Thomsonii**; but more hispid, less villous; the spikes often elongate, the sepals somewhat widened in fruit, the nutlets minutely tuberculate. Dimorphic.

31. **MACROTOMIA, DC.**

Erect, hispid, perennial herbs. **Leaves** alternate, oblong or linear. **Spikes** dense, or in fruit elongate. **Sepals** 5, linear, long, more or less accrescent in fruit. **Corolla** (in the Indian species) tube narrow, long; throat naked; lobes 5, imbricate in bud, round, spreading. **Stamens** 5; anthers oblong; obtuse, in
the throat of the corolla, with the stigma in the middle of the tube; or anthers in the middle of the corolla-tube with the stigma at the mouth. Ovary deeply 4-lobed; style filiform, 2-fid with 2 capitae stigmas, or entire with a 2-lobed stigma. Nutlets 4, ovoid, rugose, trigonous; scar basal, large flat.—Species 6; Himalaya, Siberia, the Caucasus.

The character of the stigma, by which Bentham mainly separated Arnebia from Macroptomia is largely sexual; there is, however, no difficulty in separating the Indian species, the Arnebias having yellow flowers, the Macroptomias purple.


Western Himalaya, from Kumaon to Kashmir, alt. 10-13,000 ft., frequent; Wallach, Falconer, &c.—Distr. Cabul.

Stem 1-3 ft. Radical leaves 11 by ½ in., cauline 3 by ½ in., acute. Spikes 12 by 2-3 in., usually very dense. Corolla-tube ½ in.; mouth in diam. ½-1 in. Style shortly bifid, stigmas 2 capitae. Nutlets ½ in., ovoid, suddenly acute, nearly as broad as long.


Alpine Western Himalaya and Western Tibet, alt. 10-14,000 ft., from the Karakorum and Kashmir to Kumaon, frequent; Royle, Thomson, &c.—Distr. Cabul, Kashgar, Yarkand, Alatau Mts.

Root perennial; stems 8-20 in. Radical leaves 5 by ½ in., striated; cauline 1-2 in., sessile. Cymes 3-4 in. diam., many-flowered, pedicels 0-½ in. in M. endochroma, H. f. & T.; or condensed capitae few-flowered in Royle's examples on which Lithospernum euchromum, Royle, was founded. Sepals ½-⅔ in. in flower, patently hisute, in fruit sometimes nearly 1 in. and subcapitate. Corolla-tube as long as the sepals in flower or exceeding them by ½-⅔ in.; lobes ½ in., varying in breadth. Flowers dimorphic, one form having a exerted anthers, and short 2-lobed stigmas, the other with included anthers between the capitae stigmas. (See Fisch. & Mey. L.c.) Nutlets nearly as in M. Benthami, but larger.—There is difficulty about the specific name of this species; M. endochroma, H. f. & T.; is a name published without a description, and it is not known whether it was an error for M. euchromum or whether it was intended to imply a species closely allied to Lithospernum euchromum. M. cyanochroa, Benth. (= Mnmbya cyanochroa, Boiss. Fl. Orient. iv. 212. Arnebia tingens, A. DC. Prodr. x. 96), does not differ from M. perennis, but by being more coarsely hispid; it is frequent in Cabul and Persia.

32. ONOSMA, Linn.

Hispid herbs or undershrubs. Leaves alternate. Racemes simple or cymose, one-sided, bracteate. Flowers yellow or purple, sessile or shortly pedicelled. Calyx 5-partite or 5-fid; segments acute, in fruit sometimes enlarged. Corolla tubular or ventricose, throat dilated or contracted; lobes 5, very short. Stamens 5, filaments attached near the middle of the corolla-tube linear short or long or greatly dilated at the base; anthers lanceolate, acuminate, free, conically

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convenient, included or half-exserted. Ovary deeply 4-lobed; style filiform, stigma capitiate or obscurely 2-lobed. Nutlets 4, ovoid, acute, erect or somewhat incurved, smooth or tuberculate; scar basal, flat.—Species 70, of the Mediterranean region and Central Asia.

**Sect. 1. Onosma.** Calyx lobes in fruit much longer than the tube. Corolla tubular or somewhat widened upwards. Filaments not dilated at the base.


Kashmir, alt. 5-9000 ft., frequent, Thomson, &c. Kumaon; Royle.—Distrib. From Siberia and Cabul to France.

Biennial; stems 8-20 in. Cauline leaves 2½ by ½ in. Racemes in fruit 1-6 in.; bracts ½-1 in., leaflike; pedicels 0-¼ in. Calyx-lobes in fruit attaining sometimes 1 in. Corolla ½ in. diam. at top, glabrous without. Filaments linear, anthers included or shortly exserted. Style overtopping the anthers. Nuts ½-1 in. long, stony, white, often speckled.

2. **O. Hookeri**, Clarke; hirsute, leaves oblong, racemes subcapitate, calyx-lobes ⅓ in. linear silky, corolla ⅔ in. cylindric dilated upwards, nutlets muricated on the sides.—Onosma, sp. n. 2, Herb. Ind. Or. H. f. & T.

Alpine Sikkim, alt. 12-14,000 ft.; Kongre Lama and Tungu, J. D. H. Rootstock perennial; stems 3-7 in. Radical leaves 3 by ½ in.; cauline 1-2 by ½ in., somewhat distant. Flowers in a single terminal villous head. Calyx-lobes in fruit ⅔ in. Corolla silky without, apparently purple; upper half ⅔ in. diam., nearly twice as wide as the lower. Stamens and style nearly as of O. echioides. Nutlets scarcely ½ in. in. ovoid, suddenly narrowed, somewhat incurved, shining, and nearly smooth on the back.—Affords the best Lepeha red dye.

3. **O. Thomsoni**, Clarke; hirsute, leaves linear white woolly beneath, racemes small divided calyx-lobes ¼ in. linear, corolla ⅔-⅔ in. cylindric slightly dilated upwards, nutlets shining glabrous.—Onosma, sp. n. 3, Herb. Ind. Or. H. f. & T.

Kashmir, alt. 6000 ft.; Banahal, Thomson.

Perennial; stems 1-2 ft., patently hairy. Cauline leaves 1½ by ½-⅔ in., hispid above with tubercular-based hairs. Racemes 1-3 in. capitulate or in fruit lax; bracts ⅓ in., linear; pedicels 0-¼ in. Calyx-lobes scarcely enlarged in fruit. Corolla minutely hairy, mouth ½-⅔ in. wide. Anthers more than half their length exerted; style overtopping the stamens. Nutlets ⅔ in., ovoid, very acute, somewhat incurred, sides obscurely angular.

4. **O. bracteatum**, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 13; and Cat. 936; hirsute, leaves lanceolate upper ovate-lanceolate silky white beneath, racemes capitiate, calyx-lobes in fruit 1 in. linear silky, corolla-tube ⅓ in. slightly dilated upwards, nutlets ovoid rough. DC. Prodr. x. 66. O. macrocephala, Don Prodr. 99.

Western Himalaya; Kashmir, Royle. Kumaon, alt. 11,500 ft.; Pindari, Strokey & Winterbottom.

Stems 15 in., erect, stout, patently hispid. Radical leaves 6 by 1 in., petiolated; cauline 2 by ⅔ in., acuminate, upper surface hispid with tubercular-based hair. Flowers in dense silky heads 2-3 in. diam. Corolla ½ in. diam. at the mouth, hairy
without, a ring of hairs at the base within, purple (?). Anthers included, filaments linear. Nutlets ¾ in., acute.


Central and Eastern Himalaya; Nepal, Wall.ich; Sikkim at Lachen, alt. 10,000 ft.; J. D. H.


**Sect. 2. Maharanga.** Calyx-tube distinct, widened in fruit. Corolla ventricose, distinctly narrowed at the mouth. Filaments very much dilated downwards.


Alpine Himalaya, alt. 10–13,000 ft.; Gurwhal, Strachey & Winterbottom; Nepal, Wall.ich; Sikkim, frequent.

Stems 6–18 in., suberect, patently hairy. Cauline leaves attaining 6 by ½ in., subobtuse, hispid on both surfaces; uppermost 2 in., elliptic, sessile. Flowers capitate or in fruit cymose; bracts ¼ in., narrowly lanceolate; pedicels 0–½ in. Calyx ¾ in. diam. in fruit, lobes hardly twice as long as the tube, with long white hairs within. Corolla ¼ in., minutely hairy, purple. Anthers included. Style exsert. Nutlets ½ in., mucinate, tubercular.


Nepal; Wall.ich.

This is perhaps as Wallich estimated it, a mere form of *O. Emodi*, which is a very variable plant. Corolla, stamens, filaments and nutlets are the same.

**Order Cl. CONVOLVULACEAE.** (By C. B. Clarke.)

Herbs or shrubs, often twining, very rarely trees. Leaves alternate, exstipulate, in *Cuscuta* 0. Cymes 1– or more-flowered; bracteate. Flowers regular, hermaphrodite, often showy, 5- (rarely 4-) merous. Calyx deeply 5-lobed, persistent, sometimes much enlarged in fruit. Corolla campanulate or funnell-shaped, rarely subrotate; limb shortly or deeply lobed, often 5-plaited in the bud. Stamens 5, on the corolla-tube; anthers oblong; dehiscing longitudinally. Ovary superior, often surrounded by an annular disc, of 2 carpels, 2-celled or by false dissepiments 4-celled; style 1 rarely 2, stigma capitulate 2-celled, or 2-branched; ovaries 2 in each carpel, sessile, erect, anatropous. Fruit indehiscent, or 2–4-valved or circumsciss or breaking up irregularly, 4–2 rarely 1-seeded. Seeds erect, albumen 0 or scanty; cotyledons generally plaited, rarely flat; radicle next the hilum.—Species 800, more abundant in warm regions.
The following genera are expected to occur in British Burma.

Dicksonia repens, Foret, found in Mts. beyond Ava by Wallis, belongs to a small group of *Convolvulaceae*, with a deeply 2-4-lobed ovary with basilar style, and a fruit of 2-4 utricles; it is a small creeping herb with cordate or reniform leaves, and small solitary axillary flowers. It is a native of warm countries in the old and new worlds.

Blinkworthia lycoides, Choisy (DC. Prodr. ix. 334), a very imperfectly known genus from near Ava. An erect villous shrub, with linear leaves glabrous above and subsilky beneath, short 1-fld. peduncles, 3 involucriform bracts, 5 sepals, a small urceolate corolla, 2-lobed stigma and 1-seeded berry.

**TRIBUS 1. Convolvulaceae.** *Corolla-limb* plaited or induplicate in bud.

* Fruit indehiscent.

Stigma large, globose, subsessile ........................................ 1. Erycibe.
Stigmas 2, linear-oblong .................................................. 2. Rivea.
Ovary 4-celled; style long, stigmas 2 .................................. 3. Argvrea.
Ovary 2-celled; style long, stigmas 2 .................................. 4. Littsomia.

** Capsule 2-4-valved, or fragile and breaking up.

Stigmas 2-globose. Filaments linear or dilated near the base. 5. Ipomea.
Sepals in fruit enlarged, scarious. Capsule 1-seeded. 11. Porana.
Styles 2, or 1 deeply 2-partite; stigmas capitate .............. 12. Breweria.

**TRIBUS 2. Cressaceae.** *Corolla-lobes* imbricate in bud.


**TRIBUS 3. Cuscutaceae.** Leafless, yellow, twining parasites.

Corolla small, campanulate or ovoid .................................. 15. Cuscuta.

1. **Erycibe**, Roxb.

Scandent or diffuse shrubs, or erect trees; shoots rusty-tomentose. Leaves from ovate to narrow-oblong, acuminate, entire, coriaceous. *Cymes* short, axillary or in terminal racemes or panicles; bracts usually inconspicuous. Sepals subequal, orbicular, coriaceous, adpressed to the base of the fruit. *Corolla* white or yellowish; tube shortly campanulate, densely hairy; limb plaited in bud, glabrous, lobes subbilobed, entire or serrate. *Stamens* on the corolla throat, filaments short; anthers ovate-lanceolate. *Ovary* globose, 1-celled, 4-ovuled; style 0, stigma large subglobose 2-lobed or -partite. *Berry* fleshy, ovoid or ellipsoid, 1-seeded. *Albumen* scanty, irregularly intruded between the plicate fleshy cotyledons; radicle inferior.—Species 20; from India to Australia.

* Cymes in terminal racemes or panicles, sometimes also axillary.

Throughout India, from Oudh eastward and southward to Ceylon, Tenasserim and the Nicobars; ascending the Himalaya to 4000 ft. —Distr. Malaya, Australia. A diffuse or subdecumbent shrub, or an erect tree 40 ft. Leaves 5 by 2 in., glabrescent; nerves 5-7 pairs, distinct above; petiole ½ in. Panicles 7 by 1½ in.; bracts inconspicuous; pedicels ⅓-⅖ in. Sepals ⅕ in. Corolla ⅓-⅕ in., yellowish. —Roxburgh's plant was a diffuse or subdecumbent shrub, with rusty shoots; the Central Indian is an erect tree with pendent branchlets and racemes, and grey pubescence.

Var. Wightiana, leaves elliptic cuneately acuminate at both ends or lanceolate coriaceous, primary nerves obscure above, secondary prominent much reticulated beneath, axillary cymes often 3-5 in. elongate raceme-like or terminal panicle broad, flowers white sweet-scented. E. Wightiana, Grav. Cat. Bomb. Pl. 137; Dals. & Gibbs, Bomb. Fl. 170; Brand. For. Fl. 344. Catonia elliptica, Vahl in Skrft. Kiobenh. vi. 101.—W. Deccan Peninsula, from Bombay to Cochin; common.

Var. paguensis; leaves elliptic cuneately acuminate at both ends, secondary nerves not prominently reticulated beneath, panicles terminal large, branches long or short, flowers white.—Chittagong; J. D. H. Moulema; Griffith, Falconer, Parish.


Penu and Tenasserim; Wallich.
Panicles mostly large, broad (whence the name E. expansa); bracts ½-1 by ½ in., foliaceous. Berry not seen. —Perhaps a form of E. paniculata, but the base of the leaf is always rounded or subcordate, which it never is in E. paniculata.


Leaves 4 by 1½ in., less abruptly acuminate than in E. paniculata, not at all obovate, rhombid or rounded at the base, coriaceous, nerve obscure above. —Perhaps only a variety of E. paniculata; but the specimens are very uniform.

4. E. glaucescens, Wall. Cat. 1334; nearly glabrous except the corolla, leaves elliptic acuminate base cuneate, cymes axillary often half as long as the leaves and in elongate terminal panicles. Chois. in Ann. Sc. Nat. 2, i. 223; DC. Prodr. ix. 464; Kurz For. Fl. ii. 214. E. levigata, Wall. Cat. 1333 b; Chois. in Ann. Sc. Nat. 2, i. 223, partly; DC. l. c. partly.

Silhet and Mouleme, Wallich. Cachar; Keenaw.
Differs from E. paniculata, var. paguensis, only by the branchlets and young panicles being very nearly glabrous. E. glaucescens of DC, with the racemes sparingly rufous-silky, and E. glaucescens, Kurz, with the young shoots rusty-pilose, may include, wholly or partially, E. levigata. Keenan refers to his plant as “a tall erect tree with white scented flowers.”

5. E. levigata, Wall. Cat. 1333, a only; branchlets angular slightly pubescent, leaves elliptic or oblong acuminate base cuneate, cymes short axillary towards the end of the branches and terminal scarcely panicled, berry ⅔ in.
** Cymes axillary short, terminal (if any) scarcely larger than the axillary.

6. *E. malaccensis*, Clarke; leaves elliptic or obovate-oblong acuminately coriaceous base cuneate or rounded, nerves distinctly reticulated raised beneath, cymes and sepals uniformly closely fulvous tomentose, berry \(\frac{3}{4}\) in. subquadrate ellipsoid.—*Erycibe* n. 7, *Herb. Ind. Or. H. f. & T.*


8. *E. Griffithii*, Clarke; branchlets round glabrous, leaves large obovate-oblong abruptly acuminate base cuneate, cymes sessile small axillary lax few-fld. rufous-villos, berries 1 in. ellipsoid. *Merou, Griffith (Kew Distr. n. 5580).* *Malacca, Maingay.* A large, scandent shrub. *Leaves 5½ by 2 in., coriaceous, nerves 6 pairs, secondary not prominent; petiole \(\frac{1}{2}\) in. *Cymes \(\frac{1}{2}-\frac{3}{4}\) in., densely clothed with dark-red hair. Berry coriaceous, rough.*


*Malacca*; *Maingay.* A large, scandent shrub; branches round, glabrous or nearly so. *Leaves 2½ by \(\frac{1}{2}\) in., nerves 6 pairs, secondary obscure; petiole \(\frac{1}{2}\) in. *Cymes \(\frac{1}{2}\) in., deep red, appearing glabrous, but minutely adpressedly pilose under a lens.—This appears allied to *E. Princei*; but, besides the differences in indumentum, the long petioles give it a habit of its own.

10. *E. coriacea*, Wall. Cat. 1337; branchlets round glabrous or nearly so, leaves large elliptic acuminate very coriaceous, nerves obscure on both surfaces, cymes \(\frac{1}{2}-2\) in. minutely rusty-pubescent dense-fld. *Chois. in Ann. Sc. Nat. 2, i. 224; DC. Prodr. ix. 465; Kurz For. Fl. ii. 213.*

MOULMEIN, Wallich. Mergui, Griffith.

A powerful scandent shrub; branchlets round, stout, soon glabrescent. Leaves 7 by 2½ in., narrowed downwards, but often suddenly rounded at the very base, coriaceous, often rugose from the strongly impressed nerves; petiole scarcely ¼ in. *Cymes ¼ in. diam., minutely closely rusty-tomentose. Berry not seen.—There is no specimen of this in Walllich’s Herbarium. Miquel (Fl. Ind. Bat. ii. 1033) says that this plant is not *E. glomerata*, Blume Bijd. 1047; but from Blume’s description it is either the same or very near it.

2. **RIVEA**, Chois.

Twining shrubs. Leaves ovate-cordate, silky or hirsute beneath, at least while young; petiole long. Peduncles axillary, 1-3-fld.; bracts 2-3, narrow. Sepals ovate or oblong, subequal. Corolla large, white, tube long, cylindrical; limb wide-funnel-shaped, plaited. Stamens attached near the middle of the tube, included; anthers narrowly-oblong, obtuse, not finally twisting. Ovary 4-celled, 4-ovulèd; disc annular; style filiform, stigmas linear-oblong. Fruit indehiscent or irregularly breaking up, subglobose, shining, nearly dry. Seeds 1-4, glabrous, in mealy pulp.—Species 2, Indian.


DECCAN PENINSULA; common in dry jungles, &c. CEYLON; in the hotter parts of the Island.

Branchlets stout, white-tomentose. Leaves 3-5 in. in diam., often broader than long, glabrous above and, sometimes, at length beneath; petiole 1-2 in. *Peduncles ¼ in or less; pedicels hardly any; bracts ¼ in., narrowly oblong, deciduous. Corolla-tube 2 in., limb 2 in. diam. Stigmas ¼ by ¼ in. Fruit ½ in. diam., globose, mucronate by the style base, yellow-brown, nearly dry.—Roxburgh says he obtained seeds of this from Cawnapore (possibly from a garden?); no examples have been seen but from the South Deccan.

VAR. Griffithii; leaves less silky beneath, peduncles 1-4½ in., sepals 1-2½ in. elliptic-oblong acute, corolla-limb glabrous without even in the bud.—BENGAL, Griffith, Falconer.—Possibly a cultivated form. One of Griffith’s examples is from the Calcutta Botanic Garden, the other from Sikkim; Falconer’s example is without locality.

**Western India**; in dry forest, from Lahore and Behar to Mysore, common.— *Assam*, Griffith.

Generally resembling *R. ornata*, but the hair on the stems beneath the leaves and on the sepals is less copious, and much less white. The essential distinction lies in the sepals which are smaller and more obtuse. Roxburgh's *Lettsomia bona-nox*, a native of Midnapore jungle, is referred to here with little doubt, though no specimens of it are known to exist; the only difference his characters afford between his *L. bona-nox* and his *L. uniflora* (*Rivea hypocraeteriformis*) are, that the former has deliciously clove-scented flowers and three of them together, the latter solitary flowers, whether scented or not is not stated. Roxburgh's figure is excellent.

3. **Argyreia**, Lour.

Scandent, rarely suberect, shrubs. *Leaves* from cordate-ovate to narrowly-lanceolate, silky hirsute or pubescent. *Cymes* sessile or peduncled, capitulate or corymbose. *Flowers* showy, purple or rose, rarely white. *Sepals* from orbicular to lanceolate, subequal, or the inner smaller, adpressed to the fruit, often somewhat enlarged. *Corolla* funnel-shaped; limb plaited, very shortly lobed. *Stamens* included; anthers oblong, never twisting. *Ovary* completely 4-celled, 4-ovuled; disc annular, often prominent, as long as the ovary; style filiform, stigmas 2 sessile globe. *Fruit* indehiscent, baccate or nearly dry, hard or papery, 4-1-seeded.—Species 30, Indian, Malayan, and S. Chinese, one African.

**Sect. I. Pomifera.** *Sepals* orbicular, ultimately enlarged, completely enveloping the fruit, strongly imbricate, glabrous, mucilaginous.


**India**, alt. 0–1000 ft., except in the western dry portion, very common in Beugal and near the sea.— *Distribution*: Malaya to the Philippines; elsewhere often cultivated.

Sect. II. Euargyreia. Sepals from ovate to narrow-oblong, more or less hairy, ultimately dry. Seeds glabrous or very closely tomentose.

- Stems twining, often extensively scendent.


India, alt. 0-1000 ft.; from Assam to Belgaum and Myors; frequent in Bengal Plain.—Distr. Java; also from China, Mauritius, &c., cultivated.


Bengal Plain; frequent, extending to Assam and Chittagong. Khasia Mt., alt. 4000 ft., H. f. & T.

A large climber. Leaves 3–6 in., closely pilose above ultimately subglabrous, silky subtomentose beneath; petiole long. Peduncles 2–5 in.; corymb small, or large; bracts 1½ by ½ in., in the Khasia plant larger subpersistent. Corolla 2 in., tubular-funnel-shaped, with many spreading simple lax hairs without, rose-purple. Berry ½ in. diam., globose; sepals ultimately ½ by ½ in., subpatent, or in one example ovate-oblanceolate coriaceous.


Nepal, Wallich; Sikkim Terai, Clarke. Assam, Jenkins.

Leaves hardly shining. Peduncles 2 in., shorter than in A. argentea, which it very closely resembles.

Var. ampla; innovations white silky, leaves large ultimately sparsely hairy, cymes lax irregularly compound, one or more of the outer bracts often leaflike plesioted. Argyreia ampla, Chois. Convolv. Or. 38, and in DC. Prodr. ix. Convolvulus amplus, Wall. Cat. 1420.—The common form.

5. A. Hookeri, Clarke; leaves large cordate-ovate acute glabrescent or somewhat hairy beneath, peduncles very long, cymes dichotomous few-flowered,
bracts caducous, sepals ovate- or oblong-lanceolate, berry dusky succulent completely 4-celled. A. populifolia, Chois. in DC. Prodr. ix. 329; and C. mala-baricus, Wall. Cat. 1414 B; the Goalpara plant only.

ASSAM, Hamilton. SIKHIM; HIMALAYA, alt. 1-4000 ft., frequent, J. D. H., &c. BROKAN, alt. 3000 ft., Clarke.

A large climber, ultimately glabrescent; innovations villous or sometimes shining, subsericeous. Leaves 4-9 in., larger deeply cordate; petiole long. Peduncles 31-2 in.; bracts ½ in., narrow, caducous. Sepals ½ in.; in fruit larger, acute. Corolla 2-2½ in., tubular-funnel-shaped, sparsely hairy without, rose-coloured. Berry ¾ in. diam., globose.—Convolvulus peduncularis, Wall. Cat. 1417, from Ava, is exceedingly like A. Hookeri; but in it the fruiting sepals are ½ in., orbicular and coriaceous.


KHASIA MTS.; Griffith. CHITTAGONG; Roxburgh; at Seetakoon, H. f. & T.

A large climber. Leaves 7 by 4 in., never cordate; petiole 3 in. Peduncles 1-4 in., few- or many-flowered. Sepals ½ in., ovate, obtuse, closely tomentose. Corolla ½ in., tubular-campanulate, rose-coloured. Fruit (with the sepals) as of A. Wallichii.—Convolvulus Finlaysonianus, Wall. Cat. 6607, from Cochin-China, is closely allied, but the leaves are elliptic and ovate subcordate. A. acuta, Lour. (Chois. in DC. Prodr. xix. 333) is exceedingly near, but has the corymbs slenderer, smaller flowers, and sepals elliptic-oblong with adpressed silvery hairs.


MALAY PENINSULA; Tavoy and Amberst, Wallich; Mergui, Griffith; Tenasserim, Helder.

A large climber. Leaves 5 by 2½ in., beneath tawny or whiteish; petiole ¾ in. Peduncles ¼-1½ in. Flower and fruit nearly as in A. splendens, but sepals and corolla more hisrate. Ovary 4-celled, 4-ovuled.—Known from A. splendens by the short petioles, from A. lanceolata by the peduncled corymbs.

Var. obtusifolia; leaves obtuse almost emarginate. Tavoy; Griffith.—An example in Herb. Wight, named by him Convovulus laurifolius. This may be A. obtusifolia, Lour. (Chois. in DC. Prodr. ix. 333), of which the fragments at the British Museum consist of branchlets, fruits, and a fragment of one leaf.


MALAY PENINSULA; Martaban and Tavoy, Wallich; Moulmein, Parish; Tenasserim or Andamans, Helder.

Stems twining, slender. Leaves 5 by ¾ in., or shorter and broader, base cuneate or rounded; petiole ½ in. Sepals ¾ by ½ in., oblong or lanceolate. Corolla 1½ in., tubular-campanulate. Capsule ½ in., globose, thin, not red (but unripe).—The foliage and corymbs are sometimes like those of A. obtecta, from which it is distinguished by the elongate sepals.

Sikkim Terai; Clarke.—Distrib. Ava.

A large climber. Leaves 4-10 in., upper surface wrinkled by the impressed secondary nerves; petiole 2-4 in. *Pedicules* 0-1 in.; heads 1-3 in. diam., dense, many-fld.; outer bracts 1 in. and upwards, ovate-oblong. *Sepals* 2-3 in., elliptic-oblong. *Corolla* 1½ in., tubular-infundibuliform, hirsute, white tinged rose. *Capsule* ½ in., depressed globose, becoming (together with the interior of the sepals) red, or (in the Sikkim example) a glistening white.

Var. *coriacea*; leaves more leathery, sepals more leathery densely hairy not nerved, capsule red.—Sikkim, alt. 2-5000 feet, common; J. D. H., Treutler, &c. Upper Assam; Jenkins.

10. **A. populifolia**, Chois. Convolv. Or. 32, and in DC. Prodr. ix. 329; leaves ovate acuminate base shallowly cordate or rounded glabrous or sparingly hairy beneath, peduncles shorter than the leaves, flowers subcapitate, bracts prominent linear-lanceolate persistent, sepals small subequal ovate obtuse. *Ipomoea zeylanica*, Gaertn. Frukt. ii. 482, t. 178, fig. 1; *Moon Cat. Pl. Ceyl.* 14, not Argyrea zeylanica, Kurz. *Convulvulus festivus*, Wall. Cat. 1414, the Ceylon material only. *Rivea zeylanica* var. a only, Thwaites Enum. 209, many syn. excl.

Ceylon; common; Walker, &c.


Var. *Thwaitesi*; leaves elliptic acute base rounded sparsely hirsute beneath, bracts elliptic oblong.—Ceylon; Colombo, Thwaites (C. P. u. 1943.)


11. **A. involucrata**, Clarke; leaves ovate acuminate sparingly hairy or glabrescent, peduncles shorter than the leaves, flowers subcapitate, bracts large oblong persistent, sepals subequal ovate-lanceolate acuminate.—Argyreia n. 28, Herb. Ind. Or. H. f. & T.

Western Deccan Peninsula; Conean and Bababoodan Hills, Law; Bombay, Dallzell.

A large twiner. Leaves 7½ by 4½ in., usually more elongate than *A. populifolia*, base rounded or shallowly cordate. *Pedicules* 2-6 in.; bracts 1 by ½ in., sparingly hairy, flat. *Sepals* ½ in., often caudate, margins scarios. *Corolla* and fruit nearly as of *A. populifolia*.—Leaves in one example of Dallzell's narrower, 5 by 1½ in., base suborbicord.

Var. *inaequalis*; bracts large some attaining 2 by ½ in., two outer sepals much longer than the inner, corolla exceeding 3½ in.—The Conean, *Stocks*. Distrib.
Tropical Africa (if *A. populifolia*, var. *africana* (Oliver in Trans. Liun. Soc. xxix. 114) can be identified with any Indian plant).


**Deccan Peninsula**; Rottler; Madras, Shuter; Coimbatore, Wight.

Scandent. Leaves 2–3½ in., obtuse or scarcely acuminate, base sometimes slightly cordate; petiole 1 in. *Peduncles ½–2 in., bracts ½ in. Sepals with scarious margins. Corolla 2 in. and upwards, tubular-campanulate, hirsute without. Berry ½ in., yellowish-brown, pulpy.—Easily distinguished by its leaves being glabrous above shining silky beneath; hence often confounded with *A. argentea*.


**South Deccan**; Mysore, Roxburgh; Coimbatore, Wight; Nilgherries, G. Thomson, &c.


**Malabar Ghauts and Concan**, frequent; Stocks, Law, &c.; Belgaum, Ritchie.

A powerful, silky twiner. Leaves 3–5 in., base of lower deeply cordate; petiole 1–3 in. *Peduncles 1–4 in.; bracts attaining 1½ in. Sepals ½ in., two outer often much longer. Corolla 2½ in., tubular-funnel-shaped, pink, hirsute, without. Berry ½ in. diam., orange-coloured, pulpy.—Perhaps, as Dalzell suggests, nearest to *A. argentea*, but is usually referred to *A. bracteata*, Choisy, to which it is not very near.


Nilgherries, alt. 1–6000 ft.; Wight, &c.

A powerful climber. Leaves 6 by 5 in., suddenly shortly acuminate, closely villous subtomentose beneath becoming less so in age; petiole 2 in. *Peduncles ½–2 in., softly villous; bracts ½ by ½ in., subpersistent. Corolla 2 in., hirsute without.

**Nilgherries**, alt. 6000 ft.; Wight, &c.

Differs little from *A. Leschenaultii* except that the leaves are only half as wide (2-2½ in.) and much more shaggy, often russetish somewhat shining beneath. It is also very near *A. pomacea*, but has larger sepals and peduncles often 2-3 in.


**Malabar and Coromandel** (Choisy).—Distrib. Java, Cochin China (Choisy.)

Founded on Rheed's plate, no authentic example being seen by any author, with which, however, Wight's Herb. n. 2353 (named *A. Leschenaultii*) very closely agrees.

—Wight had a ms. species, *A. courtallensis*, in his Herb., the plant on which Choisy founded his *A. Leschenaultii*. Hence, Wight having the name *A. Leschenaultii* in excess, applied it to his n. 2353; but the three species are so near that they might be made one.


**Nilgherry Mrs., common**; Wight, &c.

Probably, as Arnott suggests, a large form of *A. nellygherya*, which the sepals, corolla, and fruit resemble. The peduncles are often 4-8 in., and the outer petioled bract makes the cymes pseudo-sessile. The needle-like hairs on the stems and peduncles also give the plant a different aspect.

**Var. coacta**: leaves cordate triangular-ovate acute closely shortily silky beneath, peduncles very long, bracts large elliptic-oblong flat sparsely hairy. *Rivea zeylanica*, var. β hirsuta, *Thwaites Enum. 209*.—Ceylon, alt. 4000 feet, *Thwaites*, &c. This in its indumentum and the more triangular leaves does not agree at all closely with *A. hirsuta*, Arn.


**Western Deccan Peninsula**, the *Concan, Canara, and Mysore*; *Law, Ritchie*, &c.

A powerful twiner. Leaves 2-6 in., base rounded or slightly cordate, fulvous-strigose beneath or sometimes green-less hairy; petiole long. Peduncles ½-4 in., variable in length, stout; bracts ½ by ½ in., bristly. Sepals ½-⅓ in. *Corolla* 2 in., tubular-funnel-shaped, hirsute without. *Berry* ½ in. diam.—The specimens of *H. f.*
20. **A. Lawii**, Clarke; leaves elliptic acute base rhomboid or rounded softly strigose on both surfaces, peduncles elongated, cymes small dense, bracts narrowly oblong, sepals ¼ in. ovate obtuse.—Argyreia n. 28, Herb. Ind. Or. H. f. & T.

The **Concan** and **Malabar**, Bababoodan Hills, Law, &c. Scandent, subsericeous. *Leaves 4* by 2 in., whiter beneath; petiole 1–2 in. *Peduncles 2–5* in., silky, white, slenderer than in the foregoing species; bracts 2 by ½ in. *Corolla* dichotomous 3–9-fld., with one in the fork; flowers subsessile. *Corolla* 2 in. and upwards, tubular-campanulate, hairy without. *Fruit* not seen.—Appears closely allied to *A. Choisyana*, but the sepals differ widely.


**Madras**; Balaghaut Hills, Wight. A twiner, patently hisrute. *Leaves 2* by 1 in., subobtuse, densely strigose above, silky somewhat shining beneath; petiole ¼–½ in. *Peduncles 1–2* in., hisrute, often with 1 or 2 silky shining subfoliaceous bracts remote from the flowers; proper bracts ½ by ½ in. *Corolla* nearly 2 in., tubular-funnel-shaped, hisrute without. *Ovary* 4-celled. *Fruit* not seen.—Neither the leaves, flowers, ovary or bracts of this species resemble those of *Ipomea atropurpurea* to which Choisy (in *DC. Prodr*. ix. 366) has reduced it.

**Var.** *Wightii*; leaves rhomboid at the base glabrous above sparsely strigose-beneath, sepals strigose margins scarios, corolla 2½ in. and upwards.—**Madras**; Condaputty and other hills, Wight. This may be a new species, but it is only a fragment in flower.

22. **A. Daltoni**, Clarke; leaves large elliptic or oblong acute glabrate above fulvous-strigose beneath, peduncles elongate, corymbis lax, bracts narrowly oblong persistent, sepals ¼–¼ in. ovate-oblong.


**Deccan Peninsula**, frequent; *Rottler, Wight, &c.—Distrib. Philippines*. Scandent. *Leaves* 2–4 in. diam.; petiole 1–3 in. *Peduncles 1–4* in.; corymb 1–4 in. diam., sometimes reduced to single heads; bracts ¾ in. diam. *Sepals* ¼–¼ in., somewhat enlarged in fruit. *Corolla* 2 in., tubular-funnel-shaped, hairy without. *Stamens* not exerted. *Berry* ¾ in. diam., pulpose.—This is the *Convolvulus malabaricus* of Heyne in Herb. Rottler; and, as it is frequent in the Peninsula, it is probably *Convolvulus malabaricus*, Linn., though Linneus founds his *C. malabaricus* on a plate of Rheede's, which is *A. malabarica*, Chois.
** Stems suberect.


DECCAN PENINSULA, common.

Shrubby; 2–5 feet; branches often almost virgate, sometimes somewhat twining. *Leaves* 2–4 in., obtuse mucronate or emarginate, glabrate above; petiole 1/4 in. *Peduncles* 0–1 1/2 in., often 3-flowered; bracts deciduous. *Sepals* 1/2 in., ovate, subobtuse, *Corolla* 2 in., tubular-funnel-shaped, hairy without. *Ovary* 4-celled; *Fruit* 3/4 in., ovoid, shining, yellow-brown, nearly dry.


S. DECCAN PENINSULA; Heyne; Courtallum, *Wight*.

Branches straight, silky white. *Leaves* 4 by 1 1/2 in., acuminate, base rounded or rhomboid, glabrate above; petiole 1–2 in. *Peduncles* 1 in., 3–7-fld.; bracts deciduous. *Sepals* 1/2 in., elliptic, subobtuse. *Corolla* 2 in. and upwards, tubular-campanulate, glabrous without, or when young strigose near the tip, appears to have been very dark in colour. *Ovary* 4-celled. *Fruit* not seen.—In habit closely allied to *A. cuneata*.

4. LETTSOMIA, *Roxb*.

Scandent more or less hairy shrubs. *Leaves* alternate, undivided, base often rounded or cordate. *Cymes* axillary, peduncled, densely corymbose or capitulate, bracteate. *Sepals* orbicular elliptic or oblong, in fruit often somewhat thickened or enlarged. *Corolla* tubular-funnel-shaped; limb plicate, lobes usually shallow. *Stamens* included or exerted; anthers oblong or linear, never twisting. *Ovary* 2-celled, 4-ovuled; disc annular, usually prominent; style filiform, stigmas 2 subsessile globose. *Fruit* indehiscent. *Seeds* 4–1.—Species 32, East Asiatic and Tropical Africa.

SUGGENUS I. EULETTSOMIA. Fruit 4–1-seeded, 1-seeded capsules occurring as the rule of no one species.

* Corolla less than 1 in., limb lobed; anthers distinctly exerted.


DECCAN PENINSULA, frequent; *Wight, Dalsell, &c*.

A scandent shrub; branches closely white-tomentose. *Leaves* 1–4 in., somewhat wrinkled above; petiole 1 in. *Peduncles* 0–2 in.; bracts 3/4–4 in. *Corolla* 3/4 in,
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**Corolla more than 1 in. long, anthers included.**


**Deccan Peninsula,** *Wight, &c.* CEYLON; central province, not uncommon.

Scandent; innovations villous, soon glabrous or sparingly grey-pubescent. *Leaves 4 by 2 in., base rhomboid or rounded; petiole 1½ in. Peduncles 2–5 in., or short, or leafy, 0 when the corymbs have an outer bract; pedicels ½–3 in. Sepals obtuse, in fruit orbicular, coriaceous, patent. **Corolla** pale purple. **Berry** 4–6 in. diam., depressed-globose, orange-brown.

**Deccan Peninsula,** *Wight, &c.* CEYLON; central province, not uncommon.

Scandent; innovations villous, soon glabrous or sparingly grey-pubescent. *Leaves 4 by 2 in., base rhomboid or rounded; petiole 1½ in. Peduncles 2–5 in., or short, or leafy, 0 when the corymbs have an outer bract; pedicels ½–3 in. Sepals obtuse, in fruit orbicular, coriaceous, patent. **Corolla** pale purple. **Berry** 4–6 in. diam., depressed-globose, orange-brown.

2. **L. mysorensis**, Clarke; leaves elliptic cordate mucronate glabrous above white-tomentose beneath, peduncles long grooved when dry, corymbs small, bracts shorter than the sepals deciduous, outer sepals ovate inner much smaller narrow.—*Argyreia* n. 29, *Herb. Ind. Or.* H. f. & T.

MYSOR; G. Thomson.

Scandent; branches closely white-tomentose. *Leaves 5 by 3 in., subobtuse with a macro; petiole 3 in. *Peduncles 3–5 in.;* outer bracts ¼ in., obovate, white-tomentose, caducous, inner ¼ in., oblong; outer sepals ½ in. white-tomentose, inner ¼ in. oblong. **Corolla** as of *L. aggregata.* **Anthers** exserted. **Fruit** not seen.—Closely allied to *L. aggregata.*

3. **L. bella,** Clarke; leaves ovate-cordate acute glabrous or softly hairy above white-tomentose beneath, peduncles terete shorter than the leaves, flowers capitate, bracts small spatulate or oblong, outer sepals elliptic densely white hirsute.

CHOTA NAGPURA, alt. 2000 ft., frequent; *Clarke.*

Scandent; branches white-woolly. *Leaves 4 in.; petiole 3 in. *Peduncles 1–3 in., rarely exceeding the petiole; bracts ½–1 in. Outer sepals ½ in., elliptic-lanceolate, in fruit enlarged, subovate, coriaceous; inner sepals gradually smaller; sepals all densely patently white-hirsute. **Corolla** as of *L. aggregata,* more hirsute. **Anthers** exserted. **Capsule** ½ in. — *Convolvulus vestitus, Wall. Cat.* 1411, from the Nepal Teral, appears to be this plant; but, if so, Wallich's flowers which are 1½ in. long, cannot belong to it.

4. **L. bracteosa,** Clarke; leaves elliptic acute glabrescent above sparingly fuscous-villous beneath, peduncles short, flowers capitate, bracts ¾ in. orbicular tomentose persistent, sepals ½ in. orbicular in fruit.

PEOU; *McLelland, &c.*

Scandent; branches glabrescent. *Leaves 3 by 1½ in.; petiole 1 in. *Peduncles ½ in., woolly; heads dense, softly hirsute. **Flowers** not seen. **Capsule** red.—*Convolvulus multibracteatus, Wall. Cat.* 1408 (= *Argyreia tomentosa, Chois. in DC. Prodr.* ix. 333), from Ava, in which the bracts are ovate shortly acute, the sepals linear-lanceolate.

**Corolla** more than 1 in. long, anthers included.


**Deccan Peninsula,** *Wight, &c.* CEYLON; central province, not uncommon.

Scandent; innovations villous, soon glabrous or sparingly grey-pubescent. *Leaves 4 by 2 in., base rhomboid or rounded; petiole 1½ in. *Peduncles 2–5 in., or short, or leafy, 0 when the corymbs have an outer bract; pedicels ½–3 in. Sepals obtuse, in fruit orbicular, coriaceous, patent. **Corolla** pale purple. **Berry** 4–6 in. diam., depressed-globose, orange-brown.

**Deccan Peninsula,** *Wight, &c.* CEYLON; central province, not uncommon.

Scandent; innovations villous, soon glabrous or sparingly grey-pubescent. *Leaves 4 by 2 in., base rhomboid or rounded; petiole 1½ in. *Peduncles 2–5 in., or short, or leafy, 0 when the corymbs have an outer bract; pedicels ½–3 in. Sepals obtuse, in fruit orbicular, coriaceous, patent. **Corolla** pale purple. **Berry** 4–6 in. diam., depressed-globose, orange-brown.
6. **L. Thomsoni, Clarke**; leaves ovate-lanceolate cordate sparsely strigose on both surfaces, peduncles scattered mostly as long as the petioles, flowers capitate, bracts \(\frac{3}{4}\) in. spatulate-oblong sparsely villous caducous, sepals \(\frac{3}{4}\) in. ovate acute densely patently hispute. *Argyrea capitata, Brand. For. Fl. 343, not of Choisy.

**Subtropical Himalaya**, alt. 0-4000 ft., from Gurwhal to Sikkim, common; *Royle, Thomson, J. D. H.*, &c.

Scandent; stems sparsely villous. Leaves 5 by \(\frac{1}{2}\) in., acuminate; petiole 2 in. *Peduncles* 2-5 in.; bracts shorter than, and much less hispute than the sepals, sometimes subpersistent. *Sepals* with soft fulvous hairs \(\frac{3}{4}\) in. long, in fruit coriaceous slightly enlarged. *Corolla* nearly 2 in., rose-purple, hispate without. *Capsule* usually 4-2-seeded.

7. **L. hirsutissima, Clarke**; leaves ovate-cordate acute softly dusky villous on both surfaces, peduncles short collected towards the ends of the branches, flowers capitate, bracts \(\frac{1}{2}\) in. oblong villous deciduous, sepals \(\frac{3}{4}\) in. elliptic acute densely patently hispate. *Convolvulus hirsutissimus, Wall. Cat. 1400.* *Argyrea capitata* \(\beta\) conferta, *Chois. in DC. Prodr.* ix. 332.

**Sikkim Himalaya**, alt. 5000 ft.; *Tendong, Clarke.—Distr. Ava.*

Perhaps only a villous mountain form of *L. Thomsoni.* Leaves villous or almost silky. *Peduncles* \(\frac{1}{2}-2\) in., rigid, forming as it were a narrow terminal dense panicle.


**Bengal Plain, and Assam, common; extending into subtropical valleys of the adjacent mountains.—Distr. Java.**

A powerful climber; branches hispate. Leaves 5 by \(\frac{3}{4}\) in., usually very obtuse, covered with needle-like fulvous long straight patent hairs, as is nearly the whole plant; petiole 2 in. *Peduncles* 2-4 in.; bracts much less copiously hispate than the sepals. *Sepals* \(\frac{3}{4}\) in.; outermost elliptic, inner almost linear, coriaceous in fruit. *Corolla* 2 in. purple, hispate without. *Capsule* \(\frac{1}{2}\) in., papery, usually 4-2-seeded.

9. **L. peguensis, Clarke**; leaves ovate-lanceolate cordate densely softly hairy on both surfaces, peduncles long, flowers capitate, bracts 1 in. elliptic-oblong softly densely hairy subpersistent, sepals unequal smaller than the bracts densely hispate. *Argyrea capitata, Kurz For. Fl. ii. 216; Choisy in DC. Prodr.* ix. 332, chiefly. *Convolvulus strigosus, Wall. Cat. 1385, partly.*

**British Burma, common; Griffith, Parish, &c. Tavoy; Wallich. Andamans, Hefner, &c.**

Perhaps only a marked local variety of *L. strigosa,* as Choisy and Kurz have esteemed it; is very constant in its characters and general aspect. Stem villous or woolly, without the needle-like hairs of *L. strigosa.* Leaves gradually narrowed upwards. *Corolla* softly sparsely hairy without.

10. **L. barbigera, Clarke**; leaves ovate-lanceolate cordate sparsely hispate on both surfaces, peduncles long, flowers capitate, bracts \(\frac{1}{4}\) in. ovate obtuse persistent, sepals ovate and elliptic longer than the bracts densely sub-patently hispate. *Convolvulus barbiger, Wall. Cat. 1404.* *Pharbitis barbigera,* **VOL. IV.**

Throughout tropical and subtropical India, from Oudh, Mt. Aboo and Bombay, to Pegu. *Ceylon.*


**Var. minor**; leaves 1–2 in., peduncle 1 in., flowers capitulate.—Argyreia n. 21, Herb. Ind. Or. H. f. & T.—Deccan Peninsula, Wight; S. Concan and Bahaboodan Hills, Law.

**Var. obovata**; leaves large 6 by 5 in. obovate obtuse or subacute, fruit of *L. setosa*. *Convolvulus obovatus*, Wall. Cat. 1381.—Nepal; *Wallach*.—Reduced to *L. elliptica* by Choisie (*DC. Prodr.* ix. 330, under Argyreia), from which it is certain that the true *Convolvulus obovatus*, now in the Wallachian herbarium, was not detected by Choisie among Wallach’s collections, which were placed loose in his hands. Several species not found by Choisie appear to have been afterwards identified correctly by Kippist, the Librarian of the Linnean Society, in arranging the herbarium.


**Nepal**; *Wallach*. **Sikkim Terai**; J. D. H., &c.


13. **L. sikkimensis**, Clarke; leaves large elliptic shortly acuminate at both ends or subobtuse sparsely hairy beneath, peduncles long, coryumbs small few-fld., bracts linear-oblong, sepals ½ in. round nearly glabrous.—Argyreia n. 12, Herb. Ind. Or. H. f. & T.

**Sikkim**; Pemong, alt. 3000 ft., Clarke. **Khasia Mts.**, Silhet and Cachar, H. f. & T., Keenan.

A large twiner; stems closely strigose. *Leaves* 5½ by 3 in., base usually shortly cuneate, sometimes rounded; petiole 2–5 in. *Peduncles* 3–8 in., somewhat slender; bracts ½–1 in., inconspicuous, deciduous, or one of the outer sometimes leaflike.
petioled. Calyx very small for the flower. Corolla 2½-3 in., widely tubular-funnel-shaped, nearly glabrous without, purple. Stamens included; anthers not twisted. Ovary 2-celled; stigmas 2, sessile, globose.—Fruit not seen, hence this may be an Ipomoea; but the large long-petioled leaves and large wide-tubed corollas indicate rather Lettsomia. This resembles L. elliptica, Wright, which has smaller flowers, more numerous in the corymes.


Assam; Goalpara, Wallich, Bengal; Silhet, Wallich, H. f. & T.; Cachar, Keenan.

Scandent; stems sparsely softly hairy. Leaves 4 by 3 in., somewhat deeply cordate; petiole 2-3 in. Peduncles 2-4½ in.; bracts deciduous before the flowers expand; pedicels ½-3 in. Sepals ¼-½ in. Corolla 1½-2 in., widely tubular-funnel-shaped, softly silky without on the plait, at least when young, rose-purple. Ovary 2-celled; stigmas 2, sessile, globose. Fruit not seen.—From the habit and few-flowered peduncles, this has been supposed a Rivea; but the ovary is 2-celled. The var. lanata, Choisy, is founded on Convolvulus glandulosus, Ham. in Wall. Cat. 2522, collected in Lower Assam. This plant is not now in Wallich's herbarium, but from the description it may have been Argyreia Roxburghii, Choisy.


Pegu; Wallich, Tenasserim; Helfer; Mergus, Griffith.

Scandent, stems with bright long fulvous hairs; innovations densely silky. Leaves in Wallich's type oblong or subelliptic acute (in numerous other examples very narrow, 7½ by 1½ in.), sparsely or densely fulvous-hairy beneath, sparingly hairy above; petiole ½-3 in. Peduncle 0-½ in.; bracts numerous, scarcely ½ in. broad, fulvous-hirsute. Sepals ½ in., elliptic-lanceolate, in fruit ovate. Corolla 1½ in., widely tubular-campanulate, pale rose-coloured, glabrous without. Berry ½ in. diam.; depressed-globose, reddish, usually 4-2-seeded.


Malacca; Griffith, Maingay.—Distr. Ava.

A powerful climber; stems fulvous-villous. Leaves 6½ by 4 in., base rounded, in age glabrate above, thick; petiole 1-2 in. Peduncles 3-7 in., fulvous-lanate; corynbs 2-6 in. diam., many-fl.; bracts caducous before the flowers expand. Sepals ½ in., in fruit ¼ in., inner somewhat smaller. Corolla ½ in., densely fulvous-hirsute without. Fruit ½ by ½ in., ellipsoid, obtuse, smooth, nearly dry, lower half closely embraced by the calyx.

17. L. Maingayi, Clarke; leaves large elliptic acute glabrescent, heads large subsessile, bracts large ovate-lanceolate persistent, sepals linear-lanceolate.

Malay Peninsula, Griffith; Malacca, Maingay.

A large climber; branches stout, sparsely patent hairy. Leaves 6½ by 3½ in.,
base rhomboid or rounded, adult glabrous or with scattered fulvous hairs on the nerves beneath, coriaceous; petiole $\frac{1}{2}$–1 in. Peduncles 0.5–1 in., fulvous-hirsute; heads 2–3 in. diam., very dense; bracts nearly 2 by 1 in., sparsely hairy. Sepals 1 in. and upwards; flower-buds densely hairy without. Berry $\frac{2}{3}$ by $\frac{1}{2}$ in., ellipsoid, very succulent, 1-seeded. Expanded flowers not seen.


Ceylon; ascending to 5000 ft., Walker, &c.

Scandent; branches ashy-pubescent, afterwards glabrate. Leaves 3 by $\frac{1}{2}$ in., base rounded; nerves at right angles to the midrib, very fine and close; petiole 1.5 in. Peduncles $\frac{1}{2}$–1 in., ashy-pubescent; bracts near the middle, $\frac{1}{2}$ in., linear, caducous. Sepals $\frac{1}{2}$ in. Corolla 1.5 in., tubular-funnel-shaped, glabrous without, purple. Ovary 2-celled; stigmas 2, globose. Berry 1 by $\frac{3}{4}$ in., elliptoid, very succulent, 1-seeded.


**Penang**; *Wallish, Maingay, &c.*

Shrubby (? scandent); branches hairy. Leaves 4.5 by 2 in., base obtuse or cuneate; petiole 1.5 in. Peduncles 1–1.5 in., hirsute; bracts $\frac{1}{2}$ by $\frac{1}{2}$ in., a leaflike bract sometimes added; pedicels 0.5–1 in. Sepals 1–1.5 in., narrowly lanceolate, sparsely hirsute. Corolla 1.5 in., hirsute without. Berry $\frac{3}{4}$ in., elliptoid.


**Penang**; *Wallish.*

Scandent; innovations thinly fulvous-hirsute. Leaves 6 by 2.5 in., base obtuse or cuneate, coriaceous; petiole 1–1.5 in. Peduncles 2–4 in.; pedicels (many of them) $\frac{3}{4}$–$\frac{3}{4}$ in. Sepals $\frac{3}{4}$ in., ovate, obtuse, sparsely hirsute. Corolla (only seen in Choisy's picture) 1.5 in., tubular-funnel-shaped, hirsute without. Berry $\frac{3}{4}$ by $\frac{3}{4}$ in., ovoid.—Nearly allied to *L. adpressa*, but only one specimen seen.

21. **L. ? Kurzii**, Clarke; leaves ovate subcordate very sparingly hairy beneath, peduncles long, cymes few-flowered, bracts $\frac{1}{2}$ in. linear, sepals $\frac{1}{2}$ in. linear-oblong, capsule berry-like yellow size of a pea usually 1-seeded. *Argyrea zeylanica*, Kurz *For. Fl.* ii. 215, syn. excl.

Penang, not rare in the upper forests (Kurz).

An extensive twiner; young shoots sparingly adpressed-hairy. Leaves 3–5 in., sometimes a foot long and broad. Peduncle 5–8 in. *Corolla* large, funnel-bell-shaped, pink; tube 1.5 in., lobes of the limb triangular blunt.—Not seen; the foregoing copied from Kurz, who supposed this plant to be *Ipomoea zeylanica*, Gaertn., which does not grow in Burma; nor will Kurz's description of the fruit suit, which, if correctly described as a 1-seeded berry no bigger than a pea; it may possibly be a *Porana*.

5. **IPOMEA**, Linn.

Herbs, rarely shrubs, twining or prostrate, less often suberect. Leaves alternate, entire, lobed or divided. Cymes axillary, 1- many-fl.; bracts various. Flowers purple, white or yellow, usually showy. Sepals ovate or linear, equal or unequal, in fruit erect or rarely patent. *Corolla* campanulate.
or funnel-shaped, tube long or short; limb 5-plaited, margin very shortly lobed. Stamens unequal, included or exserted; filaments filiform or dilated at base, often hairy, not with processes subconnivent over the ovary; anthers oblong, ultimately twisted or straight. Ovary 2-celled, 4-ovuled, rarely 4-celled and 4-ovuled (subgenus Quamocitii), or 3-celled and 6-ovuled (subgenus Pharbitis); disc annular; style filiform, stigma entire or 2-globose. Capsule globose or ovoid, 4-8- (rarely sub-2-) valved. Seeds as many as the ovules, or fewer.—Species 300, in the warmer regions of both hemispheres.

Subgenus I. Calonyction, Choisy. in DC. Prodr. ix. 345 (genus). Corolla-tube elongate, 2-6 in., many-times longer than the sepals. Stamens about as long as the corolla-tube. Ovary 2-celled.

1. I. bona-nox, Linn. Sp. Pl. 228, as to the American plant only, not of Guerin; stem smooth or mucrate, leaves cordate ovate acute glabrous entire or angular and lobed, peduncles long 1-5-flowered, flowering sepals ovate mucronate or shortly acute rarely obtuse, corolla white tube linear, capsule 1 in. ovoid-oblong, seeds glabrous. Cav. To. iii. 52, t. 300; Bot. Mag. t. 752; Jacq. Hort. Schoenb. i. 13, t. 36; Bentin. in Hook. Fl. Nigrit. 465; Meissn. in Mart. Brazil. vii. 215. Calonyction speciosum, Choisy. Convolv. Or. 59, t. 1, fig. 4, and in DC. Prodr. ix. 345, as to the American plant and synonyms only.

Cultivated throughout India, native of tropical America.


Tropical India, in most climates common; from Assam and Bengal to Tenasserim, and Malabar.—Distrib. E. Asia, Tropical Africa.

Extensively scandent; stems smooth, or not rarely mucrate. Leaves 3-8 in., glabrate, secondary nervation much less prominent than in I. glabrerrima; petiole 3-6 in. Peduncles 2-6 in.; bracts caducous. Sepals ½ in., usually ovate, obtuse, mucronate, in fruit unaltered or slightly enlarged. Corolla-tube 3 by ¼ in., limb 3-5 in. diam., pure white or with plaited greenish, never with at all purple. Anthers shortly exserted or subincised. Capsule narrowed upwards; peduncle at length somewhat thickened.—Moon-flower of the English; the flower expands at night, closes to wither about one hour after sunrise; see Sir W. Jones in Asiatic Research. iv. 257. It does not appear that Linnaeus ever saw I. grandiflora, Roxb., which is perhaps specifically distinguishable from the American I. bona-nox; there are many specimens of the typical I. bona-nox supplied from Asia; but American seeds of this were grown in India in Roxburgh’s day, if not before. It is consequently now very difficult to decide whether I. bona-nox and I. grandiflora should be regarded as distinct.


A much weaker plant than I. bona-nox; leaves 2-4 in.; sepals in flower more lanceolate, in fruit nearly as of I. bona-nox; corolla-tube 1-2 by ½ in., hairy within; peduncle usually greatly thickened under the fruit.—Clearly distinct from I. bona-nox.


A large twiner; stem often softly muricate. Leaves 3-6 in. diam., often deeply cordate, secondary nerves prominent; petiole 2-5 in. Peduncles usually 1-2 in.; flowers 1-3; bracts caducous. Sepals in flower ¾-1 in., obtuse or very shortly acute; in fruit enlarged, orbicular, often 1½ in. diam., embracing the capsule. Corolla-tube 2½ by ½ in., sometimes much longer, limb 3 in. diam. Capsule obtuse; peduncles in fruit somewhat thickened.—The length of the peduncle is very variable, almost 0, in others, as in the Convulvus asper and in Thwaites’s Calonyction comospurum, more than 4 in. Brown describes his I. longiflora as with obtuse sepals, and Bentham’s I. longiflora is identical with the Ceylon I. grandiflora; but F. Mueller has lately supplied specimens with much-acuminated sepals, which prove either that the sepals in I. grandiflora are eminently variable or that there is another species of Calonyction in Australia.


Silhert; H. f. & T., &c. Pegu; Kurz. Moullan; Parish.—Distr. Java. Very near I. grandiflora, but some of the leaves are lobed, and the flower is very large; in Parish’s example more than 6 in. long, with the tube 1 in. diam.—The Khasian examples are in fruit, and have the leaves very slightly lobed; some Javan specimens have subdigitate leaves.

Subgenus II. Quamoclit, Chois. in DC. Prodr. ix. 335 (genus). Corolla crimson (in cultivated varieties orange yellow or white), middle-sized, tube narrow long, mouth rather small. Anthers exert. Ovary 4-celled, 4-ovuled. Capsule 4-celled.

Cultivated and quasi-wild throughout India, erroneously supposed by Roxburgh to be a native of Coromandel.—Introduced from tropical America.

Stems subscandent, weak. Leaves 2–4 in. diam., entire or lobed; petiole 2–4 in. Peduncles 2–6 in., slender; cyme lax, few or many-flowered; bracts inconspicuous. Sepals ½ in., unaltered in fruit. Corolla crimson, in garden varieties orange or yellow; tube 1 in., mouth ⅛ in. diam. Ovary completely 4-celled. Capsule ¼ in. or rather more, ovoid, smooth, completely 4-celled; dissepsiments thin, membraneous, persistent.


Common throughout India, in gardens and as a denizen; native of tropical America.

A slender, glabrous twiner. Leaves 3–5 by 2–3 in., segments distant. Peduncles few-flowered. Corolla crimson or white. Flowers and capsules nearly as of *I. coccinea*.


India; both cultivated and apparently wild, common.—District. Tropical and subtropical regions of both hemispheres.

Stem twining, sparsely retroflexly hisurate. Leaves 2–5 in. diam.; petiole 1–4 in. Peduncles rarely longer than the petioles; pedicels usually ⅛ in.; bracts 2, ⅜ in., linear, close to the calyx. Sepals ½–1 in., subequal, narrowly linear upwards, very hisurate, or nearly glabrous near the base. Corolla 1¼–2 in., tubular-funnel-shaped, rose-coloured, blue, or somewhat orange below. Anthers never twisted. Capsule
\[ \text{I. purpurea, Lamk. Ill. i. 466; hairy, leaves ovate-cordate acute entire, peduncles few-fld., sepals elliptic-oblong acutely patent hairy near the base, seeds glabrous. Meissn. in Mort. Brasil. vii. 223. Convulvulus purpureus, Linn.; Bot. Mag. tt. 113, 1005, 1862.} \]

INDIA; ascending to 3-7000 ft. in Kashmir, Sikkim, the Khasia Mts. and W. Deccan Peninsula, probably not a native.—Distr. Tropical America; extensively cultivated in all warm countries.

Resembles the entire-leaved var. of I. hederacea; but the leaves are smaller; peduncles often longer and slenderer; pedicels 1 in. umbellate, deflexed in fruit; sepals \( \frac{1}{4} \) in., unequal, without the ligulate termination characteristic of I. hederacea. Inhabits very remote parts of the mountains, and has about as good a claim to be regarded as Indian as has I. hederacea.

9. I. laciniata, Clarke; glabrous, leaves 5-7-partite segments serrate or pinnatifid, peduncles 1-3-fld. shorter than the leaves, corolla-tube long linear. Pharbitis laciniata, Dalz. in Hook. Kew Journ. iii. 178; Dalz. & Gibs. Bomb. Fl. 167.—Ipomoea n. 40, Herb. Ind. Or. H. f. & T.

WEST DECCAN PENINSULA; Bababoodan Hills, Law; Bombay and Malwar, Dalzell; Belgaum, Ritchie.

Stem slender, creeping or twining. Leaves 1-2 in. diam., subdigitate, lobes elliptic or almost linear; petiole \( \frac{1}{2} \) in. Peduncles mostly 1-fld., thickened upwards in fruit; bracts \( \frac{1}{2} \) in., linear. Sepals \( \frac{1}{2} \) in., elliptic, somewhat wider in fruit. Corolla white, tube 2 by \( \frac{1}{2} \) in., purple within, limb \( \frac{1}{4} \) in. diam. Anthers scarcely exerted. Ovary 3-celled. Capsule \( \frac{1}{3} \) in., ovoid, subglobose, glabrous. Seeds closely, densely furrowed.


Stems 1-3 ft., prostrate, hardly twining. Leaves 1-1 \( \frac{1}{4} \) in. diam.; petiole \( \frac{1}{2} \) in. Peduncles \( \frac{1}{2} \) in.: bracts near the flower, minute; or flowers subsessile amongst the digitate leaflike bracts. Sepals \( \frac{1}{3} \) in., oblong; in fruit widened, rigid, back often mucricate. Corolla \( \frac{1}{3} \) in., tubular-funnel-shaped, white. Capsule \( \frac{1}{3} \) in. diam., glabrous, 6-valved, normally 6-seeded. Seeds glabrous or very nearly so.

SUBGENUS IV. Aniseia, Chois. in DC. Prodr. ix. 429 (genus). Two outer sepals (at least in fruit) much longer than the inner, cordate or sub-
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hastate. Stamens included. Ovary 2-celled, 4-seeded.—Not well distinguishable from Europoméea, in which the outer sepals are usually somewhat larger.


Throughout India, from Nepal, Wullich, and Khasia, J. D. H., to Ceylon, (Thwaites) and Malacca (Griffith, Malagay); not common, more frequent in the Deccan Peninsula.—Distrib. Malaya to Fiji Islands; Tropical Africa.

Creeping in wet places, twining. Leaves 3 by 1 in., often emarginate with a micro, base cuneate; petiole ¾ in.; peduncles 1½ in.; bracts minute, persistent. Sepals in flower ¾-½ in., outer elliptic, acute; in fruit ¾-1 in., 2 outer subcordate ovate scarious nerves, inner lanceolate. Corolla hairy without. Capsule ½ in., ovoid, glabrous. Seeds glabrous, margins minutely striose.


Deccan Peninsula; frequent; extending to Banda (Edgeworth) and the W. Himalaya (Royer).—Distrib. Tropical Africa.


N. W. India, Royle; Subsivaliks, Edgeworth; Kumaon, alt. 4000 feet, Strachey & Winterbottom. Oudh; R. Thompson. Chota Nagpur; Clarke. W. Deccan Peninsula southward to Courtallam; *Wight*, Dalzell, Ritchie, &c.

Twining. Leaves 2-3 in., base obtuse or subcordate; petiole 0-1½, very variable on the same stem. Peduncles 1-4 in.; longer than the petioles in the N. Indian plant (Choisy's type), hardly any in other S. Indian examples; bracts ¾ in., linear. Sepals in flower ½ in., lanceolate; in fruit much widened, 2 outer ovate. Corolla purple or purplish-white, glabrous or sparsely hairy without; tube very narrow at the base; mouth 2½ in. diam. Capsule ¼ in., ovoid, glabrous. Seeds oblong, villous or pubescent, margins sometimes hisrsute.


**Tropical India;** common, from Bengal and Assam to Ceylon; not in the drier western portion.—**Distr.:** Tropical Asia, Africa, America and Australia, in moist climates.

A large, scandent perennial. Leaves 3-7 in. diam., often lobed nearly to the base; lobes lanceolate or elliptic, often spathulate; petiole 2-5 in. *Peduncles often 6 in.*; bracts deciduous; flowers not capitate. *Sepals ½-¾ in., wider concave in fruit.* *Corolla 1½-2½ in., widely campanulate, glabrous, pink-purple. Anthers never twisted.* *Ovary completely 4-celled, unless perhaps near the top.* *Capsule ½ in., ovoid, completely 4-celled to the apex, 4-valved, the long wool from the seeds exert from the floras.*


**W. India;** Hindoostan, Gujerat, W. Deccan Peninsula, frequent.—**Distr.:** Africa, Polynesia, Tropical America; often cultivated.

A twining annual. Leaflets 2-4 in.; petiole 2 in. *Peduncles 1-4 in.; bracte ½ in., linear; pedicels ½-2 in., fulvous-hirsute. Sepals ½ in., obtuse or subacute; in fruit enlarged, sometimes nearly 1 in. *Corolla 1½ in., wide-funnels-shapped, glabrous, white or ochroleucous. Ovary completely 4-celled. Capsule ½-¾ in., ovoid, papery, completely 4-celled; endocarp separating, with a hole opposite the back of each seed.*


Cultivated in India, but not extensively.—**Native of America.**

Tubers red, white or rarely yellow. Stem usually hairy. *Flowers 2 in. and*
Ipomoea.] CL. CONVOLVULACEAE. (C. B. Clarke.) 203

upwards, purple. **Ovary** 4-celled. **Capsule** 4-celled, or by suppression 3–1-celled.—The *Sweet Potato*; though that term is given to yams in Bengal. Said to fruit rarely.

**Subgenus 6. Euipomoea.** Sepals subequal, or the outer somewhat larger, especially in fruit. **Corolla** funnel-shaped or campanulate, glabrous without or very nearly so. **Stamens** included. **Ovary** 2-celled, 4-ovuled, rarely imperfectly 4-celled near the base. **Capsule** 2-celled, 4–2-seeded, rarely 1-celled and 1-seeded.—This subgenus is designed to include all the species of *Ipomoea* not distinctly referable to any one of the 5 preceding subgenera.

* Flowers capitulate; bracts sessile.

17. I. pileata, Roxb. Fl. Ind. i. 504, and ed. Carey & Wall. ii. 94; sparingly hairy, leaves ovate-cordate acute entire, heads many-fld. enclosed by a large boat-shaped bract, corolla tubular-funnell-shaped pink. **Choisy. Convov.** Or. 74, and in **DC. Prodr.** ix. 365; **Wight** in Calc. Journ. Nat. Hist. viii. 179, t. 5, fig. 5, and **IC. t. 1383; Dalz. & Gibbs.** Bomb. Fl. 166. Convolvulus pileatus, **Spreng. Syst. curae post.** 61; **Wall. Cat. 1376.**

**Assam, Bengal to Tenasserim**; ascending to 4000 feet. **Deccan Peninsula** and **Ceylon**; frequent.

**Stems** annual, twining, patently hairy. **Leaves** 2–3 in. diam., deeply cordate, mostly long-petioled. **Peduncles** 1–4 in.; outer bracts 1–2½ in., entire, produced or almost auriculate at each end; inner ovate or subspathulate. **Sepals** elliptic, acute, inner narrower, very hairy. **Corolla-tube** ⅓ by ⅓ in., linear-cylindric; mouth ⅓ in., suddenly widened. **Capsule** ⅓ in., subglobose, papery. **Seeds** smooth.—Easily known by its boat-shaped outer bract. *I. involucrata*, Beauv. Fl. Ovar. et Ben. ii. 52, t. 89, of W. Africa has a similar bract, and Choisy (in **DC. Prodr.** ix. 365) doubts if this can be kept distinct. It differs, however, *inter alia*, by the corolla-tube ⅓ in. wide.

18. I. Wightii, Choisy. Convolv. Or. 88, and in **DC. Prodr.** ix. 364; leaves ovate-cordate acute entire angular or sublobate softly villous above white-woolly beneath, heads long-peduncled, outer bracts lanceolate acuminate, corolla middle-sized pink-purple, capsule minutely pubescent. **Wight** IC. t. 1384. Convolvulus Wightii, **Wall. Pl. As.** Rav. ii. 55, t. 171; **Wall. Cat.** 1406. C. gossipinus, **Wall. Cat. 1407.**

**Mrs. of the Deccan Peninsula; Nilgherries, Pulneys, Bababoonan Hills, Wight, &c. Ceylon; Central Provinces, alt. 2–3000 ft.**

**Stems** twining, fulvous-villous. **Leaves** 3–4 in. diam., sinuate-denticulate, rarely obscurely 3-lobed; petiole 2 in. **Peduncles** 2–5 in.; heads 1–2 in. diam., dense, fulvous-hirsute; outer bracts 1 in., inner shorter linear. **Sepals** ⅓–⅔ in., linear-lanceolate, subequal, fulvous-hirsute, scarcely altered in fruit. **Corolla** ⅔ in., sparsely hairy without. **Capsule** ⅔ in., diam., subglobose, papery. **Seeds** puberulous.—*I. pilosa* has the leaves similarly whitened beneath, but the flowers are not capitate, and the capsule not pubescent.

19. I. bracteata, Wight IC. t. 1374; hairy, leaves ovate-cordate acute entire, heads peduncled, outer bracts ovate-cordate, corolla small narrow-campanulate purple-pink.

S. **Deccan Peninsula; Quilon, Wight.**

**Stems** weak, twining, patently hairy. **Leaves** 1–2 in. diam., softly thinly hairy on both surfaces; petiole 1½ in. **Peduncles** ½–2½ in.; outer bracts ⅔ in., deeply cordate; inner smaller, ovate or elliptic, obtuse. **Sepals** ⅔ in., spathulate-oblong, inner smaller, linear-lanceolate. **Corolla** ⅔ in., nearly glabrous without. **Capsule** not seen.—The sepals are much more unequal (even at flower-time) than in Wight's picture; it might be placed in subgenus *Anissa*. When dry it greatly resembles *Hewittia bicolor*. 
VAR. lobata; leaves 3-7-lobed sometimes nearly to the base, lobes narrowed near their bases, capsule ½ in. diam. papery glabrous, seeds ellipsoid minutely adpressely fulvous-silky with braid-like markings.—S. Deccan Peninsula; Wight, Stocks, Law. Wight has named this *I. hepaticifolia*, Burm., from which it recedes in the distinctly-cordate ovate bracts.


Throughout India from the Punjab to Malacca and Ceylon, frequent in the drier low hills.—Distri. Malaya, China, Polynesia, Tropical Africa.


VAR. *capitellata*; leaves ovate-cordate acute entire. *I. capitellata*, Chois. Convolv. Or. 76, and in DC. Prodr. ix. 363. *I. tannifolia*, Burm. Fl. Ind. 50, partly (as to the Indian plant) not of Linn. *Convulvulus capitellatus*, Wall. Cat. 2256.—Throughout the Deccan extending north to Bebar and Hindoostan; not rare.—A complete series connects the *I. pes-tigridis* with its 3-lobate-leaved form, and another connects it with the entire-leaved form. The entire-leaved form has been supposed to be Wight’s *I. bracteata*; while on the other hand Wight supposed his *I. bracteata* with lobed leaves to be *I. hepaticifolia*. The two species are easily separable, *I. bracteata* having bracts obtuse outer distinctly cordate: *I. pes-tigridis* bracts acute outer not at all cordate.


Throughout India, alt. 0-4000 ft.; common. *Ceylon*; ascending to 4000 ft.—Distri. Afghanistan and Tropics of the Old World.

*Stems* twining, patently villous. *Leaves* ½ by 1 in., sparsely hairy on both surfaces; petiole 1 in. *Peduncles* 0, or (in one Hindoostan example of Thomson’s) ⅓-2½ in.; heads sometimes few-fl., rarely reduced to one subsessile flower; bracts ⅓ in., hirsute; sepals similar to the bracts but smaller, unaltered in fruit. *Corolla* ⅓ in. *Capsule* ½ in., globose. *Seeds* puberulous.

22. **I. Stocksii**, Clarke; hairy, leaves elliptic subacute, heads sessile, bracts lanceolate inconspicuous, corolla small, capsule glabrous.
DECCAN PENINSULA; Stocks.

Stems prostrate, twining, patentely hairy. Leaves 2 in., rhomboid, base obtuse or subcordate; petiole $\frac{1}{4}$-1 in. Bracts $\frac{1}{4}$ in., hispid. Sepals $\frac{1}{4}$-1 in., elliptic-lanceolate, patentely hispidulous. Capsule $\frac{1}{4}$-1 in., ovoid, 2-celled, 4-seeded. Seeds furred, margins villous.—Near I. eriocarpa.

**Flowers pedicelled, cymose, subracemose or solitary.**

† Leaves undivided or angular or somewhat lobed, rarely deeply.


Hills of the DECCAN PENINSULA and CEYLON; extending north to Budeleund, Edgeworth. Khasia Mts., alt. 0–3000 ft.; common, and thence to Malacca.—Distr. S. E. Asia, Malay, Austral, Tropical Africa.

Diffuse, biennial, twining. Leaves $1\frac{1}{4}$–3 in., more or less toothed. Peduncles often longer than the leaves; bracts minute, persistent; pedicels long. Sepals $\frac{1}{4}$–1 in. Corolla $\frac{1}{4}$ in., funnel-shaped, eye purple. Capsule $\frac{1}{4}$ in., ovoid, papery, glabrous, 2-celled. Seeds glabrous.


DECCAN PENINSULA and CEYLON; frequent; extending north to Chota Nagpore.—Distr. Ava, Banca.

Rootstock woody, giving off numerous, closely-prostrate, elongate stems. Leaves usually less than 1 in., sometimes submarginate, mucronate. Flowers, capsules and seeds, nearly as of I. angustifolia, with which Thwaites (Dunn. 211) unites it; but it is a smaller plant with smaller flowers, never twining.


SUBTROPICAL SIKKIM, J. D. H., &c. ASSAM and SILHET, frequent; Wallich, Masters, &c., and thence to MALACCA.—Distr. Malay Archipelago, Australia.

Annual or biennial. Stems slender, much twining (creeping, Roxburgh). Leaves $1\frac{1}{4}$–2 in., oblong, narrowed suddenly at both ends; lower often subquadrate, sometimes ovate; petiole $\frac{1}{4}$–1 in. Peduncles 1–3 in., slender; bracts minute, persistent.
CI. CONVOLVULACEÆ. (C. B. Clarke.)

Ipomæa.

Sepals $\frac{1}{2}$ in.; margins, when dry, inflexed above, but hardly acute. Corolla $\frac{3}{4}$ in., subcampanulate, glabrous without. Ovary 2-celled. Capsule $\frac{1}{2}$ in., ovoid, papery, with hardly any trace of the dissepiment near its base. Seeds glabrous.


Throughout India, alt. 0-4000 ft. and Ceylon, frequent.—Distr. Malaya, S. China, Australia, Tropical Africa.

Stems much twining, glabrous, often muriculate, sometimes in places hairy. Leaves 1-2 in.; petiole $\frac{1}{2}$-2 in. Peduncles $\frac{1}{2}$-3 in.; bracts small, caducous; cymes dense. Sepals $\frac{1}{4}$ in.; ultimately spreading. Corolla $\frac{3}{4}$-$\frac{1}{2}$ in., funnel-shaped, glabrous without, uniform yellow. Capsule $\frac{1}{2}$ in. and upwards, ovoid, somewhat angular, top acute or depressed, 2-celled; wall thicker than in the preceding species. Seeds puberulous.

27. I. polyantha, Mig. Fl. Ind. Bat. ii. 613; sparingly pubescent, leaves ovate-cordate acute entire, cymes peduncled laxly dichotomous many-flowered, sepals broad-elliptic obtuse nearly glabrous, corolla smallish yellow. Convolvulus polyanthus, Wall. Cat. 1378.

E. Benegal; Soorma bank, J. D. H.; Soonderbund; Clarke.—Distr. Java.

Stems twining, pubescent in places. Leaves 2-3 in., deeply cordate, pubescent on the nerves beneath or nearly glabrous; petiole 1-2 in. Peduncles 1-4 in.; bracts small, caducous; cymes 2-5 in. diam., minutely pubescent. Sepals $\frac{1}{4}$ in. Corolla $\frac{1}{4}$-1 in., subcampanulate, clear yellow or ochroleucous.

Var. affinis; less diffuse, more pubescent, cymes 3-7-fl., sepals pubescent or almost villous. Convolvulus affinis, Wall. Cat. 1885.—Assam, E. Bengal, Soonderbund; Wallach, H. f. & T., &c., frequent. Distrib. Burma.—Referred by Choisy (in DC. Prodr. ix. 380) to I. gemella, Roth., with which it can have no near affinity; it is very near I. chrysides, but has a larger wider corolla, and much longer pedicels.


Deccan Peninsula and Ceylon, alt. 0-3000 ft., common; extending northwards to Rajputana and Behar.—Distr. S. E. Asia, Tropical Africa.

Closely creeping, much branched, often rooting from nearly every node. Leaves $\frac{1}{2}$-$\frac{1}{2}$ in., often small, broader than long, obtuse, sometimes ovate, occasionally 3-lobed; petiole $\frac{1}{2}$-$\frac{3}{4}$ in. Peduncles usually subobsolete, 1-3-flowered; bracts inconspicuous. Sepals $\frac{3}{4}$ in., glabrescent on the back, ciliate, even in fruit. Corolla $\frac{1}{4}$-$\frac{3}{4}$ in., campanulate. Capsule $\frac{1}{4}$ in., subglobose, 2-celled; cells often 1-seeded. Seeds glabrous, dark chestnut-coloured.—Choisy says this species was Convolvulus gangeticus, Linn. Amenz. Acad. iv. 306 (Evolvulus, Linn. Sp. Pl. 391), to which species Linnaeus assigns "leaves and flowers very hisurate, peduncles capillary."

Mts. of the S. Deccan; Trivancore and Nilgheries, Rotter, *Wight, &c.—Distr. E. Tropical Africa.


Throughout *India* and *Ceylon*, alt. 0-3000 ft.; *common.—Distr. Malaya, Mascarene Islands, E. Africa. Stems twining, hairy or nearly glabrous. Leaves 1-2½ in.; petiole 1-2 in. Peduncles 1-3 in., often 1-flowered, rarely with so many as 3-flowers; bracts ½ in., lanceolate, subpersistent; pediciles ¼-1½ in. Sepals ½ in.; ultimately broader, obtuse, reflexed. *Corolla* ¼-1 in., tube narrow, mouth wide, glabrous, yellow or white with the plats yellowish, always with the purple spot at the base. *Anthers* never twisted. *Capsule* ¼-½ in., ovoid, subacute, glabrous, 2-valved, 2-seeded, normally 4-seeded. *Seeds* densely softly brown-velvety; therefore the Indian species is not the *I. obscura* elaborately described by Hasskarl (*Pl. Jav. Rav.* 519).

Var. gemella; adult leaves closely hairy on both surfaces. *Convolvulus gemellus*, *Wall. Cat.* 1883 type sheet, *not of Vahl.—Bengal; Wallich, &c., frequent.—*Ipomoea gemella*, *Choisy. Convolv. Or.* 87, and in *DC. Prodr.* ix. 380, consists of *Convolvulus gemellus*, *Burm. Fl. Ind.* 46, t. 21, fig. 1 (a Javan plant) and the totally different *C. affinis*, *Wall.* from E. Bengal and Burma; so far as any Malabar examples are supposed to be *I. gemella*, they are perhaps *I. obscura*.

31. *I. Stocksii*, Clarke; leaves ovate-lanceolate cordate subcordate shortly hairy on both surfaces, peduncles long laxly 1-3 fld., sepalae lanceolate acuminate, corolla somewhat large, *seeds* glabrous.

*Malabar* and *Concan*; *Stocks, Law, &c.*

Resembling generally (when dry) *I. obscura*. Leaves 3½ in., deeply cordate, finely acuminate. *Pedicels* often 1½ in. *Sepals* ½ in., in flower sublinear, in fruit lanceolate, sparsely hairy. *Corolla* (very much withered) exceeding 1 in. *Capsule* nearly ½ in., ovoid-oblong, glabrous, 4-valved, 4-seeded.—Referred in *Herb. Ind.* Or. *H. f. & T.* possibly to a var. of *I. obscura*, which the large flowers and glabrous seeds will not admit. From the unusually narrow sepalae it may be the Malabar plant which Willdenow (and Choisy) have placed with *Burmann's Convolvulus gemellus*.


Western *Himalaya*; *Kumaon*; *Naini Tal*, alt. 6000 ft., *Strachey & Winterbottom.—Distr. Siberia, N. China (near Pekin, *Maximoviez*).
Annual, twining. Leaves 3 by 2 in.; pediole 2 in. Peduncles $\frac{1}{2}$-1 in.; bracts linear, deciduous; pedicels $\frac{1}{4}$-1 in., racemose or subumbellate. Sepals $\frac{1}{2}$ in., glabrous. Corolla $\frac{3}{4}$ in., campanulate, glabrous, often yellowish near the base. Anthers never twisted. Capsule $\frac{1}{2}$-1 in., ovoid, glabrous, 2-celled, 2-valved, 4-2-seeded. Seeds ellipsoid, glabrous.—The Indian specimen is rather more developed, both in leaf and cyme, than the original Linnean type, but is identical with the specimens collected by Pallas.

33. I. poranoides, Clarke; glabrous, leaves ovate-lanceolate cordate cuneate entire, cymes peduncled many-flowered lax, bracts ovate mucronate persistent, sepals ovate obtuse unequal, corolla small white.

Sikkim and British Bhutan; alt. 3-500 ft., frequent, Clarke.

Scandent, twining. Leaves 3 by 2 in.; pediole $\frac{1}{2}$ in. Peduncles 1-3 in.; bracts $\frac{1}{3}$-3 in., at the divisions of the divaricate cyme. Sepals $\frac{1}{2}$-1 in., glabrous. Corolla $\frac{3}{4}$ in., subcampanulate, glabrous, white, often yellowish near the base. Anthers never twisted. Capsule $\frac{1}{2}$ in., subglobose, smooth, 2-celled, 2-4-valved, normally 4-seeded. Seeds glabrous.—By the prominent persistent bracts, this species is not likely to be confounded with any other Ipomoea; but it has probably been passed for Porana racemosa, which it somewhat resembles in its scandent habit and numerous white flowers in lax cymes.

34. I. cynanchifolia, Clarke; hairy, leaves ovate-lanceolate cordate acuminate entire, peduncles 0, pedicels racemose or subfasciculate, bracts caducous, sepals lanceolate elongate, corolla small rose, capsule glabrous. Convolvulus cynanchifolius, Wall. Cat. 1389.

Sikkim and Bhutan; alt. 2-500 ft., frequent, Clarke.—Distr. Burma.

Scandent, twining. Leaves 3 by $\frac{1}{2}$ in., more or less hairy; pediole 1-2. Pedicels $\frac{1}{4}$ in., rigid, fascicled, or forming a raceme 1-2 in., recurved in fruit. Sepals $\frac{1}{2}$-1 in., hirsute, blackish green, widening in fruit. Corolla $\frac{3}{4}$ in., campanulate, glabrous, with a dark spot at the base. Anthers never twisted. Ovary 2-celled, 4-ovuled; stigma small, of 2 subsessile glands. Capsule $\frac{1}{2}$-1 in., subglobose, 2-celled, usually 4-seeded. Seeds glabrous.—Regarded by Choisy (in DC. Prodr. ix. 366) as identical with L. eriocarpa, from his never having seen Wallich’s specimens. I. cynanchifolia is very near L. calcina, Bentham, but the sepals (even in fruit) are not coriaceo.

35. I. Glenieii, Thwaites in litt.; glabrous, leaves subcordate elongate-oblong entire, peduncles 1-fld. ebracteate, sepals ovate subacute, corolla middle-sized subcampanulate.

Ceylon; Thwaites.

Creeping, hardy twining. Leaves 2 by $\frac{1}{2}$ in., shortly cordate, gradually narrowed from the very base to the apex, not acuminate, undulate; pediole 1 in. Peduncles $\frac{1}{4}$-1 in. Sepals $\frac{1}{2}$-1 in., obscurely muricate. Corolla $\frac{3}{4}$ in., tube $\frac{3}{4}$ in. broad.—Described from a fragment which flowered at Kew in 1871; it appears very distinct.


Malay Peninsula; from Mergui (Griffith) southwards. Ceylon; near the sea at Galle, Thwaites. Nicobar; Kurz.—Distr. Malay, Australia, Polynesia, Seychelles.

Stems trailing, somewhat twining. Leaves 1-2$\frac{1}{2}$ in., deeply cordate, not fleshy;
petiole 1/4 in. Peduncles 0-1 1/2 in., often 1-fld.; bracts 1/3 in., linear; pedicles often 1 in. or longer. Sepals nearly 1/2 in., somewhat scarious. Corolla widely tubular-funnel-shaped. Ovary 2-celled, not at all 4-celled. Capsule globose, glabrous. Seeds smooth.


**Bengal, Roxburgh.** Introduced from America. Extensively scandent, twining. Leaves 3-4 in., mostly entire (in the Indian plant), those on the runners often lobed; petiole often 3-5 in. Peduncles 1-4 in.; bracts caducous; cymes dense, pedicels rarely exceeding 1/2 in. Flower and fruit very nearly as of *I. denticulata*, from which it differs little except in its numerous shorter pedicels. — A common American species, introduced in S. F. Asia, Miguel (Fl. Ind. Bat. ii. 616). Roxburgh describes it as a native of the interior of Bengal, and in flower most part of the year, but no one has met with the plant wild.


Throughout India; from Hindostan to Malacca, frequent. **Ceylon,** common.— **Distria,** Malaya.

Perennial, twining, glabrous or in places pubescent or hirsute. Leaves 1-2 1/2 in., entire or sinuate, rarely lobed, basal lobes usually rounded; petiole 1-2 in. Peduncles 1/2-7 in., usually long; bracts small, lanceolate, caducous; pedicels 0-1/2 in. Sepals 1/2 in., obscurely pubescent. Corolla often 1 1/2 in. and upwards; tube cylindric, dark purple within; mouth suddenly widened. Capsule 1/2-1 in., ovoid, 4-2-seeded.—Convolvulus triformis, Vahl Symb. iii. 30 (Ipomoea triantha, Roem. & Sch. Syst. iv. 243; Choisy. Convolv. Or. 83, and in DC. Prodr. ix. 370), is only known by Vahl's description. Choisy does not see how it differs from *I. sepiaria*; but Vahl states that the pedicels are about as long as the peduncles, which is not the case in *I. sepiaria.* It may have been *Ipomoea denticulata.*

**Var. stipulacea;** leaves more along the stem often angular or lobed sometimes hastate with basal lobes acute, stipules obscure minute, sepals rather larger, corolla shorter, than in *I. sepiaria* type. **I. stipulacea, Sweet Hort. Brit. ed. 2, 372; Choisy. Convolv. Or. 84, and in DC. Prodr. ix. 379. I. subtrilobans, Miq. Fl. Ind. Bat. ii. 615. Convolvulus stipulaceus, Roxb. Hort. Beng. 14, and Fl. Ind. i. 484, and ed. Carey & Wall. ii. 71.—Bengal Plain and Chittagong; Roxburgh, &c., not rare.—Miquel's *I. subtrilobans* is intermediate between *I. sepiaria* and this.

ed. Carey & Wall. ii. 68; Wall. Cat. 1397. C. Beladambu, Spreng. Syst. i. 608, and cura post. 62.—Rheed & Hort Mal. xi. t. 53.

S. DECAN PENINSULA; Ceylon, abundant in damp fields.


Throughout India, common; abundant in Bengal Plain. Ceylon; borders of tombs, and cult. as a vegetable, Thwattes.—Distrib. Tropical Asia, Australia, Africa.

Annual; stems trailing on mud, and floating, sometimes to a great length, hollow. Leaves 3–6 in.; petiole 1–6 in., usually very long. Peduncles 2–7 in., 1–5-flowered; bracts inconspicuous; pedicels often 1–2 in. Sepals ½ in., glabrous or nearly so. Corolla 2 in., usually pale purple, glabrous. Capsule ½ in., ovoid, glabrous, 4–2-seeded. Seeds most minutely hairy, or very nearly glabrous.


BENGAL; Singapore, Hamilton.

Only known from Roxburgh’s description and his Ic. Ined. at Kew. Biennial stem twining. Leaves 7 by 1 in., acuminate; petiole ⅜ in. Peduncles 0–½ in.; bracts ½ in., linear-lanceolate; pedicels ⅜–½ in. Sepals ⅛ by ⅝ in. Corolla-tube ⅜ by ⅝ in. diam. Capsule nearly ½ in. diam., globose, glabrous. Seeds ⅛ in., oblong, black, apparently (from the figure) minutely hairy.—Roxburgh describes the capsule as 2-celled, with 3 seeds in each cell, which is hard to believe; in his picture, the stigma is distinctly 2-lobed, while the capsule seems 3-valved.


S. DECAN PENINSULA; COMMON. Assam; Jenkins. Penang; Wallich.

Shrubby, subcaudate. Leaves 4 by 2½ in., subacute, not acuminate, prominently nervet; petiole 1–2 in. Peduncles ½–2 in., usually shorter than the petioles, numerous, often panicked towards the end of the branches; bracts small, caducous; pedicels 0–⅛ in., mostly short. Sepals ⅛ in., glabrous. Corolla 1 in., purplish in the tube, mouth nearly white. Capsule ⅛ in., ovoid, subacute, 4-seeded.

**Decan Peninsula**; frequent. **Malay Peninsula**; from Prome southwards.—*Ceylon*; in the warmer parts of the Island.—**Distr.** Malay Archipelago.


**Var. illustris**; leaves ovate or oblong cordate or hastate, coryms often few-flowered, sepalas nearly glabrous, corolla often 4 in. shallowly or deeply lobate.—Malay Peninsula, from Moulmein southwards.—**Distr.** Malay Islands.—The size and lobation of the corolla vary so greatly that there may be two species here; a Moulmein example collected by Parish has the corolla ½ in., very shallowly lobed, the calyx glabrate, and is very different from the Malay bar ones with corolla only ½ in. long. Miquel must be mistaken in saying (*Pl. Ind. Bat. ii. 606*) that Spanoghe’s *I. campanulata* cannot be *Linnaeus* *I. campanulata* because the seeds are woolly; for *Linnaeus*’ species is founded on Rheed’s picture (*Hort. Mal. xi. t. 40*), which (and the description) attributes silky seeds to the species.

44. **I. Gomezii**, Clarke; leaves ovate-cordate acute entire glabrous, coryms peduncled few-fl., sepalas 1–1½ in. elliptic glabrous, corolla very large.

**Tayoy**; *Gomez. Andamans*; *Kurz*.


Abundant throughout **India** (except the N.W. dry area), alt. 0–4000 ft. *Ceylon*; very common.—**Distr.** Malay, Australia, Tropical Africa.


p. 2
VAR. maora; larger in all parts, peduncles sometimes 4–6 in., sepals ½ in., corolla 2 in.—Sikkim, Assam and Khasia Mts., alt. 0–4000 ft., Griffith, J. D. H., &c.—Leaves 5 by 3 in.; petiole 3–4 in. Seeds exactly as of I. cymosa, but considered as a variety by Bentham (Fl. Austral. iv. 423).


N. Oudr.; R. Thomson. All over Promb and Pêrou; Kurz.—*Distrib.* Timor.


VAR. pacifica; leaves smaller all oblong-lanceolate, peduncles 1-fld. rarely 2-fld. Ipomaea, n. 44, Herb. Ind. Or. H. & F. & T.—Kumaon; Thomson.—Though Dr. Thomson collected lower parts of the stem, there are no ovate leaves.


Throughout India, alt. 0–3000 ft., and Ceylon, common.—*Distrib.* S.E. Asia, Malaya, Australia, Polynesia, Sychelles, Mauritius.

Stems stout, twining, quadrangular, winged, compressed, or nearly round. Leaves 2–5 in., base cordate or obtuse; petiole 1 in. *Peduncles 1–4 in.; bracts 1 in. oblong, caducous, often pinkish; pedicels ½–1 in.* Sepals ½ in., usually softly pubescent; in fruit 1 in., orbicular, concave, scarios or subssuculent. *Corolla 1¼ in., tubular-campanulate. Anthers soon twisting. Capsule ¼–½ in. diam., globose, normally 4-seeded.*


Throughout India and Ceylon; near the sea, abundant.—*Distrib.* Seashore of both hemispheres throughout the tropics.

Extensively creeping and twining. Leaves 1–4 in., often broader than long, flaky, prominently nerved; petiole 1–4 in. *Peduncle 1–4 in.; bracts ½ in., lanceolate,
caduous; pedicels often more than 1 in. Sepals $\frac{1}{2}-\frac{3}{2}$ in.; in fruit widened. Corolla 2 in., tubular-funnel-shaped, glabrous, margin scarcely lobed. Ovary 2-celled, not imperfectly 4-celled. Capsule $\frac{1}{2}$ in., ovoid, glabrous.


*Malacca*; *Griffith.*—Distrib. Tropical seashores of both hemispheres. Very near *I. biloba*. Leaves often deeply lobed, sometimes subentire emarginate, but then much more elongate than those of *I. biloba*, oblong or linear, or often fiddle-shaped; nerves much more obscure. Ovary completely 2-celled, imperfectly 4-celled. Capsule and seeds exactly as of *I. biloba*.


Throughout India (except the dry N.W.); from Sikkim, Assam, Chittagong and Burma, southwards to Ceylon and Malacca.—Distrib. Malay Islds.

A large climber. Leaves 2-6 in. diam.; lobes triangular, acute, often toothed or acutely lobed; petiole $\frac{1}{2}$-2 in. Peduncles 1-4 in. Sepals $\frac{1}{2}$ in., often $\frac{3}{2}$ in. in fruit. Corolla $1\frac{1}{2}$ in., campanulate. Capsule $\frac{1}{2}$ in. diam., depressed globose, membranous, 2-celled, normally 4-seeded.


Annual, twining, patently bisurate. Leaves 2-4 in., lobes acuminate, often narrower below; petiole 2 in. Peduncles 1-3 in.; bracts $\frac{1}{4}$ in., linear-lanceolate; pedicels usually $\frac{1}{2}$-3 in. and upwards, narrow-lanceolate, acuminate. Corolla $\frac{3}{2}$ in., narrowly funnel-shaped, with scattered long hairs without. Capsule $\frac{1}{2}-\frac{3}{2}$ in., ovoid-globose, glabrous, 4-valved, normally 4-seeded.

†† Leaves divided, or very deeply lobed.

52. **I. pentrocaulos**, Clarke; glabrous, leaves deeply palmate segments elliptic-lanceolate acuminate entire, peduncles many-fld.; sepals 1 in. elliptic-oblong, corolla large, seeds $\frac{1}{2}$ in. glabrous. I. tuberosa, *A. Rich. Fl. Abyss.* ii. 67; *Chois. in DC. Prodr.* ix. 362, the old-world plant, not of *Linn.* C. panicu-
Ipomea.

latus, Wall. Cat. 1350, Heyne's Ipomoea tuberosa only. Convulvulus kentro-

N.W. India; Royle. Deccan Peninsula; Rottler, Wight, &c. Ceylon.—
Distrib. Malaya, Tropical Africa.

Stems stout, twining, muricate or smooth. Leaves 3–5 in. diam.; petiole 2–5 in.
Peduncles 2–6 in.; bracts deciduous; pedicels ½–1 in. Sepals narrow; in fruit 1½ by
⅔ in., subpeltate, hardly imbricated. Corolla 2 in., tubular-campanulate. Capsule
⅔–¾ in. globose.—In I. tuberosa, Linn., the fruiting-sepals are 1–1½ in. broad, con-
cave, much imbricate, seeds ⅔ in., furred; see Trans. Hort. Soc. Lond. i. 184, t. 11.

53. I. sinuata, Ortega Dec. 84; leaves palmate glabrous or nearly so,
leaflets narrowly lanceolate toothed or pinnatifid, peduncules 1–2-fld., sepals
nearly 1 in. elliptic-oblong glabrous, corolla middle-sized, seeds glabrous or
nearly so. Chois. in DC. Prodr. ix. 362. I. dissecta, Chois. l. c. 363, as to the
Indian material, not of Wild. Convulvulus dissectus, Linn. Mant. 204; Jacq.
Hort. Vindob. ii. 74, t. 159. C. Kleini, Wall. Cat. 1377.

Introduced from tropical America; N.W. India; Royle. Hindostan; Thomson.
Bengal; Jenkins, Rottler, Wight, &c.—Native of tropical America, widely spread in
the Old World.

Stems twining, hisrate or glabrous. Leaves 2–4 in. diam., sometimes hisrate on
the midrib. Corolla 1¼ in. campanulate, white, throat purple. Capsule ¾–⅔ in.
diam., glabrous, 2-celled, normally 4-seeded. Seeds ½ in.

54. I. rhyncorhiza, Dals. in Hook. Kew Journ. iii. 179; leaves deeply
palmate sparingly hispidulous segments oblong lobed or pinnatifid, peduncules
1–2-fld., sepals ¾ in. elliptic-lanceolate unequal glabrous, corolla middle-sized

The Concan; Syhadree Mts. (Bombay), Tulaktu Ghat, Daizell; Concan, Stocks.
Root tuberous; stems filiform, twining, glabrous. Leaves 3 in. diam.; lobes
obtuse or mucronate; petiole 1 in. Peduncles 2–4 in.; bracts ⅔ in., linear. Corolla
1½ in. by 2 in. diam. Fruit not known.

55. I. quinata, Br. Prodr. 486; leaves palmate, leaflets lanceolate
entire, peduncules 1–2-fld., sepals ¼ in. elliptic glabrous or nearly so, corolla
rather large, seeds glabrous shining apex crested. Chois. in DC. Prodr. ix.
385; Benth. Fl. Austral. iv. 415. I. hirsuta, Br. Prodr. 486. I. pentadactylis,
Chois. l. c. Convulvulus tenuifolius, Vahl Symb. iii. 33. C. quinatus and
Brownii, Spreng. Syst. i. 590. C. pentadactylis, Wall. Cat. 1367. C. munitus,
Wall. Cat. 1364, as to Hamilton's Convulvulus tenuifolius only.

Chota Nagpore; frequent, Clarke.—Distrib. Burma; S. China, N. Australia.

Stems prostrate, hardly twining, patently fulvous-hisrate or glabrous. Leaves
3–4 in. diam., glabrous or with patent fulvous hairs; leaflets obtuse or subacute, not
acuminate; petiole ⅔ in., mostly hairy. Peduncles shorter than the petioles; bracts
⅔ in., linear, persistent. Corolla 1½ in. and upwards, white or purplish. Capsule ⅔ in.,
ovoid, subacute, glabrous, 2-celled, 4-valved, normally 4-seeded. Seeds ⅔ by ½ in.
—Easily distinguished from all other Ipomeas by the crest of the seed.

56. I. palmata, Forsk. Fl. Aeg.-Arab. 43; glabrous, leaves digitate
nearly or quite to the base, lobes elliptic or lanceolate subentire, peduncles 3–1-
fd., sepals ovate obtuse, corolla large purplish, seeds villous margins woolly.
632; Chois. in DC. Prodr. ix. 387 (syn. I. Horsfalliae excl.). I. pulchella,
Roth Nov. Sp. 115; Wight Jc. t. 156; Chois. in DC. Prodr. ix. 396. I. tuber-
culata, Roem. & Sch. Syst. iv. 208; Chois. Convovl. Or. 91, and in DC. Prodr.

**Sind,** Lady Dalhousie. ROHILCUND; Edgeworth. DECCAN PENINSULA; Rottler, Wight.

Probably a cultivated form of *I. palmata*. Roxburgh only knew it in cultivation. Pedate leaves occur, and 1-fl. peduncles are not rare in *I. palmata*. The only remaining differential character is the colour of the corolla; but this is by no means a pure yellow in *I. dasysperma*; the tube is purplish and there are often purplish streaks on the limb.

**IMPERFEKTLY KNOWN AND EXCLUDED SPECIES.**

1. I. ? bipedunculata, Clarke; large glabrous twiner, leaves ovate cordate acute, peduncles 2 in. paired in each axil, cymes dichotomous many-fl.—N.W. HIMALAYA; Sirmore, alt. 2-5000 ft., Edgeworth. Leaves 4 in., entire; pediole 2½ in. Peduncles in pairs from each of the 4 axils on the branch, subquadangular; cymes 6-10-fl.; bracts 0 in young fruit; pedicels 2-3 in. Sepals ¾ in. broad-elliptic, shortly acute, striated, glabrous. Corolla not seen. Fruit (imperfectly ripe), much exceeding the sepals, ovoid, glabrous, possibly indehiscent. Seeds 4, glabrous.—The example is imperfect, but can be matched with no other Indian plant.

2. I. compressa, Gussone; *Chois. in DC. Prodr.* ix. 388; wholly villous-hairy, stem twining compressed, leaves ovate-cordate entire, peduncles 1-fl. shorter than the leaves.—Raised from Indian seeds, in Hort. Boccon, 1825.

3. I. cuspidata, Don. *Prodr.* 98; *Chois. in DC. Prodr.* ix. 388; leaves cordate cuspidate entire pubescent with rounded lobes, peduncles axillary solitary longer than the leaves many-fl., sepals linear acute hairy, style exceedingly short. NEPAL; Hamilton. Flores rose, a little larger than in *I. cocinea*. No Nepal plant with a very short style and linear sepals will answer to this.

4. I. multiflora, *Roxb. Fl. Ind.* ed. *Carey & Wall.* ii. 89, and *Lo. Ined.* in Herb. *Keay*; stems woody twining, leaves broad-cordate downy, peduncles as long as the leaves umbelliferous. Common, native in hedges and forests, Roxburgh. Stem woody, twining up and over trees. Leaves 3-4 in. diam., short acuminate; pediole 2-3 in. Peduncles 7-8 in. (in Roxburgh's picture); cyme close, compound; bracts 0; pedicels ½ in. Corolla 2½ in., pale rose. Fruit not described nor depicted.—Roxburgh's picture might do for *Argyrea Hookeri*; but it is not probable that Roxburgh ever obtained that species, and it is hardly possible he would say it was "common in hedges." It is not Wallich's *C. Roxburghii* (Cat. n. 1415), which is the type of *Argyrea Roxburghii*, Chois.

Character of *Ipomoea* subgenus *Euipomoea*, but filaments dilated at the base into 5 concave scales which arch over the ovary.—Species 4 (1 African, 3 Asiatic).


Stems stout, scendant, fulvous-villous. *Leaves* 3–5 in., fulvous-hirsute on both surfaces; petiole 1–2 in. *Peduncles* 2–4 in.; cymes 10–30-fld.; bracts up to 3 in., linear-lanceolate, deciduous; pedicels many attaining up to 3 in. *Sepals* up to 3 in., patently fulvous-hirsute, acuminate. *Corolla* slightly dilated, glassy at base; tube hairy without; mouth shortly widely funnel-shaped, yellowish, white, or dull grey. *Filaments* short, glabrous above; basal process papillose; authors not twisted. *Ovary* 2-celled, 4-ovuled; style very short, and stamens in the lower part of the corolla-tube, stigmas 2 subglobose. *Capsule* up to 4 in., ovoid, glabrous, 4-valved, 2-celled, normally 4-seeded. **Seeds** glabrous.—*L. flavescens*, *Blume*, a Javan species, has the sepals ovate subacute (not acuminate), the corolla rather shorter and wider at the base than in *L. Wallichii*. A *Lepistemum* from Borneo and the Philippines has the cymes almost capitate, densely grey strigose; but these 3 Asiatic species might perhaps be considered var. of one.

7. **HEWITTIA, W. & A.**

A pubescent, twining herb. *Leaves* cordate, entire angular or lobed. *Peduncles* axillary; flowers few subcapitate or solitary; bracts linear-lanceolate. *Sepals* acute, outer larger, enlarged in fruit. *Corolla* campanulate, yellowish with a purple eye; limb 5-plaited. *Stamens* included; filaments linear, bases dilated. *Ovary* hirsute, 1- (or imperfectly 2–), celled, 4-ovuled; style filiform, stigmatic lobes 2 ovate-oblong. *Capsule* globose, 4-valved, 1-celled, normally 4-seeded. **Seeds** glabrous.


S.E. India from Assam and Bombay to the Carnatic and Malacca; frequent.—Distr. Malaya, Tropical Africa.

Perennial, pubescent or nearly glabrous. Stems twining. Leaves 2½ in., some angular or lobed; petiole ½ in. Peduncles 3-5 in., 1- or often few-fld.; bracts 1½ in., narrowly lanceolate, a little below the calyx. Sepals ¼ in., ovate, inner lanceolate, pubescent; in fruit enlarged, subcaulese, reticulate. Corolla 1 in., somewhat widely campanulate, or shortly 5-lobed, hairy without. Capsule ½ in., subglobose, hairy.

8. CALYSTEGLIA, R. Br.

Prostrate or twining herbs, glabrous or nearly so. Leaves entire or lobed. Peduncles 1-fld.; bracts 2, large, enclosing the calyx, persistent. Sepals ovate or oblong, inner rather smaller. Corolla funnel-shaped or campanulate; limb 5-plaited, subentire. Stamens included. Ovary 1- (or imperfectly 2-) celled, 4-ovuled; style filiform, stigmatic lobes 2, shortly oblong. Capsule globose, 1-celled, normally 4-seeded. Seeds glabrous.—Species 7-8, in the warm and temperate regions of both hemispheres.


North India from the Punjab and Nepal to Penang, exclusive of the Deccan and Ceylon; abundant in the plains of Bengal.—Distr. China, Amurland, Cabul.

Prostrate as a weed of cultivation and climbing 6 ft. in bushes. Leaves 1-3 in., very irregular in form; petiole 1 in. Peduncles 2 in.; bracts ½ in. ovate. Sepals ½ in., oblong, obtuse, glabrous. Capsule ½ in., ovoid, subacute, glabrous.

9. CONVOLVULUS, Linn.

Herbs or undershrubs, erect prostrate or twining, sometimes spinous. Leaves entire, toothed or lobed. Peduncles axillary, 1-many-fld.; bracts narrow, rarely wide prominent. Sepals subequal, or the outer wider. Corolla campanulate, limb 5-plaited, nearly entire. Stamens included. Ovary 2-celled, 4-ovuled; style filiform; stigmas 2, distinct, oblong or linear. Capsule globose, 2-celled, 4-valved, or breaking irregularly, normally 4-seeded. Seeds glabrous, usually smooth.—Species 150, tropical and temperate.

* Erect or diffuse, not twining (except sometimes C. glomeratus), stigmas filiform, nearly as long as, or longer than the style.


Scinde; on rocks, Stocks.

Height 1-2 ft.; branches fulvous-tomentose, tips in age subspinescent. Leaves 1½ in., subentire, very thick, nerves impressed; petiole 0½ in. Heads mostly sessile
on shortened branches; outer bracts \( \frac{1}{2} \) in., elliptic or ovate, not plicate, densely rusty-tomentose. Sepals \( \frac{1}{4} \) in. Corolla 4-6 in., widely funnel-shaped, hairy on the folds without. Fruit not seen.

2. C. Aitchisoni, Clarke; patently fulvous-hirsute, leaves fascicled linear lower oblong, flowers capitate bracteate, sepals linear-lanceolate very hirsute. C. lanuginosus, Aitch. Cat. Punjab. Pl. 98; of Lamk.

PUNJAB; Jhelum and Salt Range, Aitchison.—Distrib. Afghanistan.

Rootstock woody, forming tufts; annual flowering stems \( \frac{1}{4} - 4 \) in. Radical leaves 1\( \frac{1}{2} \) in., linear, or in small examples \( \frac{1}{2} \) in. oblong, densely patently hirsute on both sides. Bracts \( \frac{1}{2} \) in., narrowly lanceolate. Sepals \( \frac{1}{4} \) in. Corolla 1 in., wide-funnel-shaped, hairy on the plaits without. Ovary glabrous. Fruit not seen.—This cannot be C. lanuginosus, Lamk. (Chois. in DC. Prodr. ix. 401), unless C. Calvetti, Boiss. (Fl. Orient. iv. 94), and several other intermediate species be united with it; it is not silky, but abundantly hirsute with hairs \( \frac{1}{4} \) in. long. It is undoubtedly closely allied to C. lanuginosus, Lamk. See Cav. Jc. ii. t. 189.

3. C. microphyllus, Sieb.; Vis. Pl. Aeg.-Nub. 12; fulvous-villous, leaves linear-oblong or upper elliptic, flowers axillary or on short lateral branches sessile 1-4 together, sepals \( \frac{1}{4} \) in. lanceolate densely hairy, corolla scarcely \( \frac{1}{4} \) in. hairy without. Chois. in DC. Prodr. ix. 402 (syn. C. deserti exel.); Wight Jc. t. 1367; Dals. & Gibs. Bomb. Fl. 164; Boiss. Fl. orient. iv. 103.

SCIND; Stocks. Gooferat; Dalzell.—Distrib. Beloochistan to Egypt and Nubia.

Rootstock woody; stems 6-24 in., little divided, patently villous, often floriferous from near the base. Leaves \( \frac{1}{4} - 1 \) in., silky and villous in Sieber's example, subsessile. Bracts lanceolate, rufous-hirsute, shorter than the sepals. Corolla wide-funnel-shaped, rose-yellow. Capsule scarcely \( \frac{1}{4} \) in. ovoid. Seeds glabrous.

VAR. Boissieri; stems and leaves adpressly rusty-silky, flowers mostly solitary axillary. C. scudicus, Boiss. Diagn. 2, iii. 123, not of Stocks.—Scinde; Stocks, Dalzell.

4. C. pluricaulis, Chois. Convolute. Or. 95, and in DC. Prodr. ix. 403 (the Plains plant); thinly fulvous-hairy, leaves small linear, flowers 1-3 together axillary pedicilled, sepals \( \frac{1}{4} \) in. narrowly linear-lanceolate sparsely hairy, corolla \( \frac{1}{4} - \frac{1}{4} \) in. hairy without. Evolvulus ferrugineus, Wall. Cat. 1316, the Behar example only. ^Iponema microphylla, Roth Nov. Sp. 112.

Plains of Hindostan and Behar; Wall, H. f. & T., &c., frequent.

Rootstock woody; stems 3-6 in., slender, wiry, very thinly hairy. Leaves \( \frac{1}{2} \) by \( \frac{1}{2} \) in., subsessile; radical more spatulate, subpetioloed. Pedicels 0-\( \frac{1}{2} \) in.; bracts linear, small. Sepals with a linear elongation, so thinly hairy as to appear glabrous to the naked eye. Corolla wide-funnel-shaped, pale rose. Ovary glabrous.

VAR. macra; larger, more densely hairy, leaves oblong, sepals \( \frac{1}{4} \) in. elliptic-lanceolate rufous-hirsute, corolla \( \frac{1}{4} - \frac{1}{4} \) in. seeds puberulous. Evolvulus pilosus, Roth. Fl. Ind. ii. 106. E. ferrugineus, Wall. Cat. 1318.—Punjab, common; from 3000 ft. alt. in Kashmir to Delhi; Wall, Royle, Edgeworth, &c.—Easily separable from C. pluricaulis, but except in the larger corolla not distinguishable from C. microphyllus.

5. C. rhyniospermus, Hochst.; Chois. in DC. Prodr. ix. 405; leaves subsessile oblong sparsely hairy, flowers clustered axillary, sepals lanceolate subobtuse hirsute, corolla \( \frac{1}{2} \) in. tubular, mouth narrow funnel-shaped. Wight Jc. t. 1390.

SCIND; Stocks, Dalzell.—Distrib. Cordofan.

Annual; stems 3-10 in., little divided, often flowering nearly their whole length. Leaves \( \frac{1}{2} - 1 \) in. Flowers rarely solitary, peduncle \( 0 - \frac{1}{2} \) in.; bracts \( \frac{1}{2} - \frac{1}{2} \) in., and sepals \( \frac{1}{4} \) in., not acuminate. Corolla hairy without. Ovary glabrous. Capsule \( \frac{1}{4} \) in., ovoid.
Convolutus. | CI. CONVOLVULACEAE. (C. B. Clarke.) 219

Seeds minutely papillose.—There is hardly any difference between the seeds of C. pluricaulis, rhyniopsermus, and conglomeratus; the papillae on the seeds of C. rhyniospermus are thicker, or somewhat scale-like.

6. C. conglomeratus, Choix. in DC. Prodr. ix. 401; leaves subsessile oblong; sparsely hairy, heads peduncled bracteate, sepals lanceolate hirsute, corolla \( \frac{2}{3} \) in. tubular mouth narrow funnel-shaped. Wight Ic. t. 1366; Boiss. Fl. Orient. iv. 102.

The Punjab, Vicary; Scinde, Stocks, &c.—Distr. Cabul, Beloochistan to W. Tropical Africa.

Rootstock biennial or perennial; stems 2–3 ft., diffuse, branched, sparsely hairy. Leaves \( \frac{3}{4}–1\frac{1}{2} \) in. Peduncles \( \frac{1}{2}–3 \) in.; bracts \( \frac{1}{2}–1 \) in., leaflike; or the heads sessile on short axillary branches. Sepals \( \frac{3}{5} \) in., lanceolate, acute. Seeds puberulous.—Closely allied to C. rhyniospermus, but the flowers more numerous (often 6–10) in the head, the habit much more diffuse, running into the following variety.

Var. volubilis; stems distinctly twining, leaves and heads larger, petiole \( \frac{1}{3} \) in.—Punjab; Vicary. Scinde; Datzell.

7. C. Rottlerianus, Choix. Convol. Or. 95, and in DC. Prodr. ix. 403; silky-villous. leaves sessile linear, peduncles 1–3-fld., sepals ovate suddenly acuminate silky-villous, corolla scarcely \( \frac{1}{3} \) in. subcampanulate. Wight in Madras Journ. v. 7, t. 15; Daiz. & Gibs. Bomb. Fl. 164. Retzia pilose, Heyne; Wall. Cat. 6069 (not Evolvulus pilosus, Roxb.)

W. Deccan Peninsula, from Bombay to Madura; Rottler, &c.—Distr. Afghanistan.

An erect, branched perennial. Leaves 1–2 in. Peduncles many, \( 1\frac{1}{2} \) in.; bracts \( \frac{1}{2} \) in., linear-lanceolate; pedicel (above the bracts) \( \frac{1}{4}–\frac{3}{4} \) in. Sepals \( \frac{1}{5} \) in. Capsule \( \frac{1}{10} \) in. ovoid, glabrous. Seeds puberulous.

Var. tenella, Stocks in Hook. Kew Journ. iv. 172; sparingly silky not villous, stems strict more slender.—Scinde; Stocks;

** Stems twining (see also C. glomeratus); stigmas narrowly oblong or linear, shorter than the style.


Western India, from Kashmir to the Deccan; a weed of cultivation.—Distr. Nearly all temperate and subtropical regions.

Leaves 1–3 in., lower often lobed; petiole \( \frac{1}{2}–\frac{3}{4} \) in. Peduncles 1–2 in.; bracts \( \frac{1}{8} \) in., linear; pedicels \( \frac{3}{4}–1 \) in. Sepals \( \frac{2}{5} \) in., with or without a mucro. Corolla wide-funnel-shaped, glabrous. Capsule \( \frac{1}{3}–\frac{4}{5} \) in., glabrous.


Hills of S. Deccan Peninsula, alt. 3–6000 ft., frequent; Wight, &c.

Leaves 1–3 in., in age nearly glabrous; petiole 1 in. Peduncles 1 in., not rarely paired in the same axil, pubescent; bracts scarcely \( \frac{1}{5} \) in. Sepals \( \frac{1}{3}–\frac{3}{4} \) in.; wider in
fruit. Corolla $\frac{1}{2}$ in., hairy at the tip in the bud. Ovary and filaments glabrous. Capsule $\frac{1}{2}$ in., ovoid, 2-celled, irregularly breaking up. Seeds glabrous.


**Assam; Jenkins. Deccan Peninsula and Ceylon; frequent.**—**Distrib.** S.E. Asia, Malaya, Australia, Tropical Africa.

Stems slender. Leaves 1$\frac{1}{2}$–3 in., shallowly cordate; petiole $\frac{1}{2}$–1 in. Peduncles mostly longer than the petioles; cymes subcapitate; bracts inconspicuous. Sepals $\frac{1}{2}$ in., ovate-cordate, pubescent. Corolla-lobes short, acute. Stigmas short, linear. Capsule $\frac{1}{2}$ in., globose, glabrous. Seeds glabrous.—Much resembling *Jacquemontia caerulea* (cultivated often in India), which has a wider mouthed bright-blue corolla and shorter elliptic-oblong stigmas.

11. **C. microcalyx**, Clarke; leaves ovate-cordate acute stellately fulvous-tomentose beneath, cymes compound subsessile, sepals $\frac{1}{2}$ in. elliptic obtuse, corolla $\frac{1}{2}$ in.

Cultivated (in the Calcutta gardens?) from Assam?

Stems slender, elongate, villous, twining. Leaves 1-1$\frac{1}{2}$ in., shallowly cordate, pubescent above; petiole $\frac{1}{2}$ in. Peduncles very short, or 0, i.e., peduncles several from each axil, fulvous-tomentose; bracts inconspicuous. Sepals subcarious, nearly glabrous. Corolla of *C. parviflorus*, glabrous. Ovary glabrous; style long, stigmas filiform slightly clavate. Fruit not seen.—The examples are noted as cultivated; but, if the plant was not brought in from the Assam jungles, it is not known whence it came.

*C. glandulosus*, Wall. Cat. 2252, and *C. Tarita*, Wall. Cat. 2253, are absent from Wallich’s Herbarium.

10. **EVOLVULUS**, Linn.

Small, hairy herbs, or undershrubs. Leaves small, entire. Flowers small, 1-3 together, peduncled. Sepals subequal, unaltered in fruit. Corolla funnel-shaped; limb 5-petalled, subentire. Stamens included or exserted, filaments filiform. Ovary 2-1-celled, 4-ovuled; styles 2, separate from the base, each cleft into 2 linear or subclavate stigmas. Capsule globose, 4-2-valved, normally 4-seeded. Seeds glabrous; cotyledons doubly folded radicle incumbent.

—Species 70, in all hotter climates, more numerous in America.

1. **E. alsinoides**, Linn.; *Benth. Fl. Austral.* iv. 437, with all syn. except *E. pilosus*, *Roxb.*; sparsely or densely silky-hairy white fulvous or almost rufous, leaves linear oblong or wide-elliptic, sepals $\frac{1}{2}$–$\frac{3}{8}$ in. lanceolate hairy, corolla $\frac{1}{2}$–$\frac{3}{8}$ in. blue or white. *Burtt. Fl. Zeyl.* 9, t. 6, fig. 1; *Wall. Cat.* 1317; *Roxb. Cat. Pl.* (1813), and *Fl. Ind.* ii. 105; *Chois. in DC. Prodr. ix.* 447; *Wight Ill.* t. 168 bis, fig. 10; *Boiss. Fl. Orient.* iv. 113. *E. linifolius*, *Linn.*; *Chois. l. c.* 449. *E. angustifolius*, *Roxb. Fl. Ind. ed.* Carey & Wall. ii. 107. *E. hirsutus*, *Lamk. Enc.* iii. 583, and *Ill.* t. 216, fig. 2; *Chois. l. c.* 447 (syn. *Roxb. excl.*); *Delt. & Gifs. Bomb. Fl.* 162. *E. sericeus*, *Wall. Cat.* 1315. *Convolvulus valerianoides*, *Blanco. Fl. Filip.* 90.—*Rheede Hort. Mal.* xi. t. 64.
Throughout **India** and **Ceylon**, very common; rare in very damp regions.—**Distichis**. The tropical and subtropical area of the globe.

**Perennial;** annual branches numerous, wiry, often prostrate. **Leaves** 1/4-1 in., rarely 1 1/2 by ½ in., very variable; petiole 0-1 1/2 in. **Pediciles** 1/4-1 1/2 in.; bracts small, linear, hairy, persistent; pedicels 0-1 1/2 in. **Capsule** 1/2-1 in., globose, 4-valved.—The commonest Indian form is the type with leaves ½ in., oblong or elliptic, moderately silky with white or fulvous hairs. **E. limifolius** (E. angustifolius, Roxb.), has linear leaves often 1 in. long. **E. hirsutus**, has thick leaves and is more or less densely hirsute with fulvous or rufescent hairs.

11. **FORANA**, Burm.

Large climbers. **Leaves** petioled, ovate, entire. **Cymes** often in large panicles; flowers purple steel-blue or white; bracts persistent. **Sepals** in flower small, narrow; in fruit all or 3 much enlarged, scarious, nervured. **Corolla** campanulate or funnel-shaped, wide- or narrow-mouthed; limb 5-plaited, subentire or lobed. **Stamens** subincluded, filaments filiform or shortly linear. **Ovary** 2-celled, 4-ovulate; style long or short, entire with a simple or 2-lobed stigma, or 2-fid with capitiate stigmas. **Capsule** globose oblong or obconic, membranous, indehiscent or 2-valved, 1-seeded. **Seed** glabrous; cotyledons plaited.—Species 9, from India to N. Australia.

*Flowers large, about an inch long.*


**Temperate Nepal** and **Sikkim**, alt. 5-8000 ft.; **Wallich, Griffith, J. D. H.**, &c. An extensive, rather slender, glabrous or pubescent climber. **Leaves** 5 by 2 1/2 in., young villous beneath, old glabrous or puberulous on both surfaces; petiole 3 in. **Pedicules** 3-4 in.; racemes 2-3 in., 4-12-fid.; bracts ½ in., linear; pedicels ½ in. **Sepals** ½ in., linear-oblong, puberulous. **Corolla** mauve; tube 2 1/2-1 in., linear; limb funnel-shaped, subentire, 1 1/4 in. diam., glabrous. **Stamens** and pistil 1 1/2 in., included in the small swollen base of the corolla-tube. **Style** linear, stigmas subglobose. **Capsule** 1 1/2 in., subglobose, rather longer than broad; 3 larger fruiting sepals subpatently 7-9-nerved; 2 smaller, 1 by 1 1/2 in.

2. **P. stenoloba**, Kurz in Trimen Journ. Bot. 1873, 136; nearly glabrous, leaves ovate slightly cordate caudate-acuminate, racemes long-bracted, sepals all much enlarged in fruit, 3 more than the others 1 by ½ in.

**Temperate Sikkim**, alt. 5-6000 ft.; on rocks by the Darjeeling road, not unfrequent. **Kurz**. Nearly allied to **P. grandiflora**. **Leaves** very shallowly cordate, caudate, glabrous or minutely hairy above. **Bracts** 1-1 1/2 in., ovate-lanceolate, or lancolate caudate, often petioled; bracteoles 2, minute. **Corolla** (dry) nearly as of **P. grandiflora**, but “steel-blue,” **Kurz & King**. **Capsule** not ripe; 3 larger sepals in fruit membranous, 5-nerved; 2 smaller, similar but 3/4 less.—This differs from **P. grandiflora** in the shallowly cordate leaves, the remarkable bracts, the colour of the flowers and the exceedingly narrow fruit-sepals; but in Gen. Pl. ii. 876 it is considered conspecific.

British Burmah; Martaban, in tropical forests not unfrequent. Kurz.

Branches fulvous-tomentose. Leaves 4 by 1½ in., base rounded or scarcely cordate, acute or subobtuse not acuminate, puberulous, woolly beneath; petiole 2½ in. Racemes terminal, subsessile (lowest bract altogether leaflike); pedicels ½ in. Sepals in flower ½ in., linear-oblong, fulvous-tomentose. Corolla white, hairy without; tube ¾ in., narrowly campanulate; mouth funnel-shaped, subentire, 1½ in. diam. Style as long as corolla-tube, stigma subcapitate. Capsule ⅞ in. diam., subglobose; fruiting-sepals oblong, subobtuse, scarios, puberulous, subpalmately 7-9-nerved.

**Flowers small, ⅓—½ in. long.**


Throughout India, in jungles alt. 0–3000 ft. from the W. Himalaya and Assam to Ceylon and Tenasserim; less common in the S. Deccan.—Distr. Ava, Java.

A powerful climber, often 30 ft. high. Leaves 5 by 3 in., pubescent above; petiole 1½ in. Panicles terminating every branchlet with innumerable flowers. Sepals in flower ½ in., linear-oblong. Corolla ⅓ in., campanulate, glabrous, white; limb very shortly lobed. Filaments short. Style very short. Pollen obscurely 2-lobed. Capsule ⅞ in. diam., globose, hairy; 3 enlarged sepals ½ by ¼ in. obtuse, pubescent, with one longitudinal and several incurved lateral nerves; 2 others ¼ in., linear.—A monstrous form, collected in Sikkim by Sir J. D. H., has fascicled numerous branches with very small leaves.

5. P. volubilis, Burm. Fl. Ind. 51, t. 21, fig. 1; glabrous except the shoots, leaves ovate-subcordate shortly acuminate, cymes subbracteate panicled, sepals in fruit all equal ⅓ in. subspathulate. Lamk. Ill. t. 186; Roxb. Fl. Ind. i. 465, and ed. Carey & Wall. ii. 40; Blume Bijd. 723; Wall. Cat. 1327; Don Prodr. 99; Wight Ill. 108 bis, fig. 8, and Jc. t. 342; Chois. Convolut. Or. 106, and in DC. Prodr. ix. 436; Kurz in Trimen Journ. Bot. 1873, 137, and For. Fl. ii. 220.

Malay Peninsula from Pegu to Malacca.—Distr. Burma, Siam, Malaya.

A very large climber; branches glabrous, warty. Leaves 2½ by 1½ in., base rounded or cordate; petiole 4½ in. Panicles very large, minutely fulvous-pubescent; pedicels 0½ in. Sepals in flower ⅝ in., oblong. Corolla ⅝ in., white; limb distinctly lobed. Style bipartite; stigmas small, capitulate. Capsule ½ in., globose; fruit-sepals with 5–7 longitudinal, not very prominent nerves.—Kurz says this extends to Khasia, and Roxburgh, that it grows in various parts of India; but the only examples seen are Malayan or cultivated.

6. P. racemosa, Roxb. Hort. Beng. 18, and Fl. Ind. i. 466, and ed. Carey & Wall. ii. 41; puberulous or nearly glabrous, leaves ovate deeply cordate acute, racemes compound dichotomous, bracts at the fork large cordate persistent, capsule ⅞ in. ellipsoid longer than broad, fruiting-sepals equal ⅓ by ½ in. Jacc. f. Ecl. ii. t. 165; Wall. Cat. 1326; Don Prodr. 98; Wight Ill. t. 168 bis, fig. 9, and Jc. t. 1378; Chois. Convolut. Or. 107, and in DC. Prodr. ix. 436; Dals. & Gbs. Bomb. Fl. 162; Kurz in Trimen Journ. Bot. 1873, 137. Dinetus racemosus, Sweet Hort. Fl. Gard. t. 127.

Subtropical Himalaya alt. 2–6000 ft., common; from the North-west (Royle) to Bhutan. Khasia to Martaban; alt. 2–6000 ft., common. Deccan Peninsula?

Forming dense, not lofty, masses. Leaves 2–3 by 1½ in.; petiole ¾ in. Racemes lax; bracts at the fork leafy, sessile, scarious in fruit; those at the pedicels ¾ in,
linear. Sepals in flower ½ in., linear-oblong, puberulous. Corolla ½-⅔ in., lobed nearly half-way, white. Style linear; stigmas ⅔, short, oblong. Capsule apiculate, glabrous; fruiting sepals oblong-spathulate, with 3-5 strong longitudinal nerves.—The "Snow-Creeper" of the English, one of the most beautiful of Indian plants, the masses of dazzling white flowers resembling snow-patches in the jungle. It is doubtful whether this plant is found wild in the Deccan; Wight's figure represents it, but the fruit in his herbarium was sent him from N. India. There is no example from the Deccan, all Dalzell's belong to the next species.

7. P. malabarica, Clarke; nearly glabrous, leaves ovate deeply cordate acute, racemes compound dichotomous, bracts at the forks large cordate persistent, capsule ½ in. obovoid, fruit-sepals equal attaining 1 by ½ in. elliptic. P. racemosa, Dalz. & Gibs. Bomb. Fl. 162.—Porana n. 3, Herb. Ind. Or. H. F. & T.

West Deccan Peninsula; Bombay, Dalzell; Malabar and Concan, Stocks, Law; Canara and Mysore, Law, &c.

Closely allied to P. racemosa. Fruit-sepals sometimes only ⅔ by ⅔ in., but always differing wider from the much smaller narrow one of P. racemosa.

8. P. truncata, Kurz in Trimen Journ. Bot. 1873, 136; nearly glabrous, leaves ovate deeply cordate acute, racemes compound dichotomous, bracts at the forks large cordate persistent, capsule ¼ in. obconoid truncate, fruiting sepals equal ⅔ by ⅔ in.

Khasia Mts., Numklow and Mairung, alt. 4-5000 ft., Griffith (Kew Distr. n. 5875), &c.

Resembles P. racemosa, but is stouter and is intermediate between that species and T. malabarica. Kurz attempted to distinguish this by the "depressed-concave" summit of the capsule; but the fact is that the fresh capsule usually has a greatly depressed-conical apiculate summit, which in dried specimens often becomes concave. Possibly P. racemosa, P. malabarica, and P. truncata, are varieties of one; but the characters of the capsule and fruit-sepals seem well-marked, and the material is sufficient.

12. BREWERIA, R. Br.

Herbs or undershrubs, large and twining, or small and erect. Leaves undivided. Flowers in axillary peduncled heads or terminal close panicles, or 1-3 together, sessile and axillary; bracts small. Sepals equal or unequal, in fruit scarcely altered (in non-Indian species much enlarged). Corolla campanulate or funnel-shaped, limb 5-plaited. Stamens included; filaments filiform, bases often dilated. Ovary 2-celled, 4-ovuled; styles 2, nearly distinct from the base or united half their length, stigmas capitate. Capsule globose or ovoid, normally 4-seeded.—Species 23, in the tropics of both hemispheres, Australia and N. America.

* Twiners; flowers medium-large yellowish in peduncled cymes; styles united about half their length.


West Deccan Peninsula; from the Concan Ghauts southwards; East Bengal, and the Malay Peninsula, from Silhet to Malacca, frequent. Ceylon, frequent. Distrib, Malay.
A powerful twiner; branches villous. **Leaves** 4 by 2½ in., those on the flowering branchlets ovate-cordate; petiole 1½ in. **Peduncles** about as long as the petioles, 2-5-fld.; bracts ⅓ in., oblong; cymes subcapitate, rusty-villous. **Sepals** ⅓-⅔ in., ovate-oblong, subacute, subequal. **Corolla** ⅔ in., wide-funnel-shaped, hairy without; limb subentire. **Style** ⅜ in., united for ⅔ in. **Capsule** ⅔ in., subglobose, glabrous, splitting into numerous vertical segments; sepalas in fruit somewhat enlarged, ovate, hardly so long as the capsule. **Seeds** about as broad as long, nearly glabrous.


**British Burma**; **Prome, Wallach.**

Very near **B. cordata**, differing chiefly in the leaves. **Leaves** of the flowering shoots (for 18 in. near their tops) 1½ by ⅜ in., narrow-oblong, mucronate; lower leaves 3 by 1½ in., obtuse, almost rounded at both ends. **Pedicels** ⅓-⅔ in., rather longer than in **B. Rosbrughii**. **Corolla** as of **B. Rosbrughii** but the tube appears more cylindrical, less funnel-shaped. **Capsule** not seen.—Material rather scanty for the support of so critical a species.

**Small, erect; leaves small; flowers small, axillary, 1-3 together white or pinkish; styles distinct very nearly to the base.**


**Deccan Peninsula**; **Hayne**; near Tuticorin, Wight.

A very branched, rigid, harsh, small shrub; with a few scattered strigose hairs. **Sepals** ⅛ in., oblong, nearly glabrous, suberect both in flower and fruit. **Corolla** ⅜ in. **Capsule** subglobose, shortly pointed, glabrous tipped with a tuft of hairs 4-valved. **Seeds** glabrous.


**Punjab and Scinde**; **Vicary, Stocks, &c.—Distrib. W. Tropical Asia, E. Tropical Africa.**

Dr. T. Anderson thought this plant not specifically separated from the Deccan **B. evolvuloides** by its hairiness and sessile flowers; but the capsule is twice as large, ovoid, and the seeds ovoid-oblong, twice as long as broad. **Sepals** acuminate, densely silky.

13. **NEUROPETLIS**, Wall.

A large scandent shrub; shoots rufous-villous or tomentose. **Leaves** alternate, petioled, coriaceous, ovate or oblong. **Racemes** axillary, or subpanicled towards the ends of the branches; flowers numerous, small, pedicelled; bract under the calyx inconspicuous in flower, in fruit enlarged 1 in. or more diam. **Sepals** suborbicular, in fruit hardly enlarged. **Corolla** wide-campanulate, deeply lobed, lobes induplicate-valvate in bud. **Stamens** exerted or included, filaments filiform. **Ovary** imperfectly 2-celled, 4-ovuled; styles 2, separate from the base, shortly linear, stigmas subcapitate or obscurely 2-lobed. **Capsule** globose, 4-valved, 1-seeded, sessile in the middle of the flat bract, **Seeds** globose, glabrous, albuminous; cotyledons plaited.—Species 2, the following and an African.

Malay Peninsula, from Mergui southwards; Wallich, Griffith, Matougay, &c. Malabar Plains, near Tambacherry Ghat, Beddome.—Distrib. Borneo.

Leaves 5 by 2½ in. base obtuse or rhomboid, when young more or less rusty-villous, sometimes on both surfaces, adult glabrous or nearly so, feather-nerved; petiole ½-1 in. *Racemes* subsessile, i.e. flowerbearing nearly to the base; pedicels in flower ½ in.; bract minute. Sepals ⅓ in. Corolla ⅔-⅔ in., widely campanulate, rufous-villous without. *Ovary* hairy. Bract in fruit 1-1½ in. diam., orbicular, base rounded or cordate, scarioso, nerved. Capsula ⅔ in., ovoid, glabrous.

14. **CRESSA**.

A very small shrub, erect or diffuse, grey-pubescent. Leaves small, sessile, elliptic, acute. *Flowers* small, sessile in the upper axils, often in terminal clusters or spikes. Sepals equal, not enlarged in fruit. Corolla small, funnell-shaped, white or rose; lobes 5, subimbricated (not plaited) in bud. *Stamens* exserted, filaments filiform. *Ovary* sub-2-celled, 4-ovulæd; styles 2, distinct, linear, stigmas capitáte. Capsula 2-4-valved, usually 1-seeded. Seed glabrous; cotyledons linear, plicate.


Throughout India from the Punjab and Calcutta to Ceylon, not common.—Distrib. All warm regions.

Stem 6-18 in. Leaves ¼-½ in. Sepals ⅓ in. Corolla ⅔ in.; lobes reflexed. Capsula ⅔ in.—The Indian plant differs from the common form of *C. cretica* in having 4 (not 1) seeds, according to Retz and Roxburgh.

15. **CUSCUTA**, Linn.

Leafless twining parasites, yellow or reddish not green. *Flowers* small, white or rose, fascicled, sessile or shortly pedicelled; bracts 0 or small. Sepals 5-4, subequal, distinct or shortly connate. Corolla ovoid or campanulate; lobes 5-4, short, imbricate in bud. *Stamens* 5-4, inserted near the throat of the corolla-tube, filaments short linear; anthers oblong, shortly exert; scales near the base of the filaments or at the base of the corolla, often fimbriate, rarely 0. *Ovary* completely or incompletely 2-celled, 4-ovulæd; styles 1 or 2, stigmas 2. Capsula globose or ovoid, dry or succulent, circumsciss or irregularly breaking up, 4-2-seeded. Seeds glabrous, albumen fleshy; embryo slender, twisted, cotyledons 0 or obscure.—Species 80, in warm and temperate regions.

Subgenus 1. **Monogynella**. Ovary, and young fruit, narrowed upwards into a single short style with 2 long stigmas.

1. **C. reflexa**, Roxb. Cor. Pl. ii. 3, t. 104, and Fl. Ind. i. 446, and ed. Carey & Wall. i. 466; flowers subracemose, bracts small fleshy subquadrate. VOL. IV.

Throughout India, alt. 0–8000 ft., common; Bengal Plain, abundant. **Ceylon**; Newera Ellia, **Gardener**.—**Distr. Malaya**.

Branches stout, fleshy, forming dense yellow masses on low trees and shrubs. *Flowers* 5-merous, in lax racemes 1–4 in. long, also clustered or subspicate; pedicels 0–\( \frac{1}{2} \text{ in.} \), often verrucose; bracts \( \frac{3}{4} \text{ in.} \). *Sepals* \( \frac{1}{2} \text{ in.} \), nearly distinct, ovate, obtuse. *Corolla* \( \frac{2}{3} \text{ in.} \) by \( \frac{1}{2} \text{ in.} \), subcylindric; lobes short-triangular, reflexed; scales prominent, emarginate, fimbriate. *Stigmas* wide apart. **Capsule** (unripe) acule (corolla early deciduous), ultimately subquadrate obtuse tough fleshy. **Seeds** large, black.

**Var. anguina**, corolla about half the usual size. C. anguina, *Edgew. in Trans. Linn. Soc.* xx. 87.—W. Himalaya; **Edgeworth**. The corolla varies a good deal in size from Wallich’s *C. grandiflora* down to *C. anguina*., *Edgw.*; the chain of intermediates is nearly complete.

2. *C. gigantea*, *Griff.* *Notul.* i. 243; spikes short subracemose, corolla cylindric deciduous, scales near its base remote from the filaments, style short, stigmas lingulate, capsule \( \frac{1}{2} \text{ in.} \) membranous circumsciss near the base 2-seeded. *Engelm. Cusc.* 66; *Boiss. Fl.* *Orient.* iv. 122.

**Western Tibet**; **Falconer**.—**Distr. Cabul**.

Much slenderer than *C. reflexa*. *Flowers* irregularly fascicled or shortly pedicelled, not capitate; bracts \( \frac{3}{4} \text{ in.} \), ovate. *Sepals* \( \frac{1}{2} \text{ in.} \), ovate, obtuse. *Corolla* \( \frac{3}{4} \text{ in.} \) in, subcylindric; lobes 5, subacute, erect or reflexed; scales elliptic, shortly fimbriate. *Pistil* nearly as of *C. reflexa*, but smaller. **Capsule** ultimately subquadrate, obtuse. **Seeds** broadly rhombiform, black.—Founded on n. 683 of *Griff. Herb. Propr.* from Cabul; but the Kew Distr. n. 6899, which also bears Griffith’s ticket n. 683, is a *Eucaucuta* with subglobose corollas and two styles, &c.

**Subgenus 2. Eucucuta.** *Ovary* and young fruit obtuse. *Styles* 2, their bases approximate but separated by a narrow depression which in the fruit becomes a pit.

* Styles elongate, stigmas capitate.


**Scinde**; **Stocks. Deccan Peninsula**, *Rottler*; *Palamcottah*, *Wight*.—**Distr. Belochoistan**; **Abysinian**.

Pedicels 0–\( \frac{3}{4} \text{ in.} \); bracts \( \frac{3}{4} \text{ in.} \), ovate. Corolla-tube \( \frac{1}{2} \text{ in.} \). *Corolla* lobes \( \frac{1}{2} \text{ in.} \), acuminate and even cedate. **Capsule** \( \frac{1}{2} \text{ in.} \), fragile, irregularly breaking up from the base, normally 4-seeded.—A strongly marked plant, certainly *C. hyalina* of Rottler, *Engelmann* and Boissier; but the description of Roth, copied by *Choisy* (in *DC. Prodr.* ix. 460), is greatly at variance with the characters of the plant.

4. *C. chinensis*, *Lam. Enc.* ii. 229; cymes or racemes dense, sepals triangular-ovate subobtuse, corolla-lobes ovate obtuse or shortly acute, scales shortly fimbriate. *Chois. in DC. Prodr.* ix. 457; *Wight. Ic.* t. 1373; *Engelm.*

Kashmir and Chumbi; alt. 5-7000 ft., Clarke. E. Bengal; Wallich. Decan Peninsula; common. Ceylon; at Colombo.—Distrib. Eastwards to Australia and Westwards to Persia.

Resembling C. hyalina, but with much less elongate acute corolla-lobes. Sepals nearly free, in large examples keeled (C. sulcata, Roxb. or C. carinata, R. Br.); in small examples flat.

Var. minor, Chois. 3rd Mem. Convolv. t. 3, fig. 4; calyx and corolla hardly half so large as in the type. C. sulcata, Wall. Cat. 1320, n. 3.—Martaban; Wallich.—Stems exceedingly slender. Referred in MS. by Engelmann to C. obtusiflora, H.B.K. Var. breviflora; but the Martaban plant has the calyx divided to the base, and seems merely a weak example of C. chinensis, as Wallich regarded it. Engelmann (Cuscut. 43) also refers as a Var. of C. obtusiflora, H. B. K., a plant collected in Kashmir by Jacquemont n. 878, which is no doubt this.

**Stigmas elongate or linear often as long as the styles.**

5. C. capitata, Roxb. Fl. Ind. i. 448; flowers capitulate, corolla ovoid covered with minute papillae without. Engelm. Cuscut. 23.

Temperate W. Himalaya, alt. 6-12,000 ft., from Kashmir to Simla; Jacquemont, Thomson, &c.—Distrib. Cabul.

A slender rose-coloured species. Sepals 15-16 in., ovate. Corolla scarcely ½ in., mouth contracted; lobes 5, small, triangular, suberect; scales small, low in the corolla, slightly fimbriate. Styles linear-lanceolate, as long as the short-linear stigmas. Capsule ½ in., exceedingly thin and fragile, enclosed by the unchanged corolla, irregularly breaking up from the base. Seeds 4, ellipsoid, brown.—An unmistakable species; and, as Engelmann noticed, agrees well with Roxburgh's figure and description; the puzzle is whence Roxburgh got it; he says it grew abundantly on Crota- laria juncea, a plant cultivated at or near the sea-level.


Temperate Himalaya, alt. 5-12,000 ft., from Kashmir to Sikkim; Thomson Edgeworth, J. D. H., &c.—Distrib. Europe, Western and Central Asia.

Calyx ½ in. Corolla-tube ½ in., ovoid; lobes 5-4, ovate or triangular; scales near the base of the filaments, obtuse or emarginate, crenulate or subentire. Capsule ½ in., fragile. Seeds usually 4, ellipsoid, brown.


Subtropical W. Himalaya, alt. 1-6000 ft.; frequent, descending to the Punjab Plain.—Distrib. Mediterranean Region, Central Asia.

Closely resembling C. europaea. Calyx and corolla often glistening from their large lax tissue; whence the Indian examples have been regarded as papillos, and placed wrongly with C. capitata. Corolla-tube usually much longer than the calyx.
Seeds more fimbriate than in \textit{C. europaea}. Styles (in Engelmann's named examples of \textit{C. planiflora}) short, less than half as long as the stigmas. \textit{C. brevistylo} is not merely "too near" \textit{C. planiflora} as both Engelmann and Boissier suggest; it is the same thing.

**Order CII. \textbf{Solanaceae}.** (By C. B. Clarke.)

Herbs or shrubs. Leaves alternate, often in unequal pairs, rarely clustered, never opposite; entire, lobed or pinnate; stipules 0. Cymes lateral, or terminal, axillary or extra-axillary, or pedicels solitary or clustered; bracts and bracteoles 0. Flowers regular, hermaphrodite (in \textit{Withania coagulans} dioecious). Calyx inferior, 5-, rarely 3-7-merous, in \textit{Nicandra} 5-partite; in fruit usually persistent, often much enlarged. Corolla funnel-shaped campanulate, or rotate, often plaited; lobes 5 (in \textit{Datura} sometimes 10), or limb subentire. Stamens 5, on the corolla-tube; anthers ovate or oblong, dehiscing by apical pores or longitudinally. Ovary 2-celled, or imperfectly 1- or 4-celled, in \textit{Nicandra} 3-5-celled; style linear, stigma capitulate or very shortly lobed; ovules very many, on prominent peltate placentas. Fruit baccate or capsular, indehiscent circumsciss or valvular, usually 2-celled, many-seeded. Seeds compressed, discoid or subreniform, embryo peripheric; or (in \textit{Nicotiana}) seeds scarcely compressed, embryo straight.—Species 1250 in the warmer parts of the whole world.

**Suborder I. Solanæ.** Corolla-limb plaited or the lobes valvate. Fruit a berry. Seeds much compressed, subdiscoid; embryo peripheric.

* Anthers opening by 2 pores at the apex.
   Leaves entire, lobed or pinnatifid ........ 1. \textit{Solanum}.
   Leaves pinnate ........................................... 1*.* \textit{Lyco persicum}.

** Anthers oblong, dehiscing longitudinally.
   † Calyx in fruit small.
   Flowers small. Pedicels solitary or paired .......... 2*. \textit{Capsicum}.

†† Calyx in fruit enlarged, overtopping the berry.
   Flowers clustered, sessile or nearly so .......... 3. \textit{Withania}.
   Pedicels solitary. Calyx 5-partite ................. 3*. \textit{Nicandra}.

**Suborder II. \textbf{Atropææ}.** Corolla-lobes more or less imbricate. Fruit a berry. Seeds compressed; embryo peripheric.

Pedicels solitary or few together. Calyx and corolla small ........ 4. \textit{Lycum}.
Pedicels solitary. Calyx foliaceous ................. 5. \textit{Atropa}.
Pedicels clustered, subradical ..................... 6. \textit{Mandragora}.

**Suborder III. \textbf{Hyoscyamæ}.** Corolla-lobes plaited or imbricate. Fruit capsular. Seeds somewhat compressed; embryo peripheric.

* Capsule 4-celled, 4-valved, or subindehiscent.
   Flowers solitary. Calyx circumsciss ................. 7. \textit{Datura}.

** Capsule circumscisus.
   Pedicels solitary, distant ......................... 8. \textit{Scop o lia}.
   Corymb terminal, peduncled ......................... 9. \textit{Physochlaina}.
   Flowers unilateral, upper racemose ............... 10. \textit{Hyoscyamus}.
Flowers panicled ........................................... 10*, Nicotiana.

1. SOLANUM, Linn.

Shrubs herbs or small trees, spinous or unarmed. Leaves alternate or sub-opposite in equal pairs, entire lobed or pinnatifid. Cymes dichotomous or racemose, lateral or terminal. Calyx 5- or 10-lobed, rarely 4-lobed, or sub-entire, unaltered or enlarged in fruit. Corolla-tube short, rotate, rarely campanulate; limb 5- (rarely 4-6-) lobed, plaited in bud. Stamens 5 (rarely 4-6) in the corolla-throat, filaments short; anthers oblong, narrowed upwards, convolute into a cone, opening by terminal pores or short slits. Ovary 2-celled, rarely (in cultivated forms) 3-4-celled; style columnar, stigma small. Berry small or large, globose or elongate. Seeds very many, discoid; embryo peripheral.—Species 700, chiefly in the hotter parts of the globe, most numerous in America.

S. tuberosum, Linn. (the Potato) is extensively cultivated in India, from the sea-level up to nearly 8000 feet.

* Unarmed. Sepals not overtopping the berry.

† Cymes or racemes peduncled; calyx-teeth 5 (rarely 4 or 6).

1. S. nigrum, Linn.; glabrous or sparingly pubescent, leaves ovate or oblong sinuate toothed or lobed, peduncles extra-axillary, pedicels subumbellate, calyx-teeth small obtuse, corolla white. Blume Bijd. 694; Wall. Cat. 2615; Dunal in DC. Prodr. xiii. 150; Benth. Fl. Austral. iv. 446; syn. Kurz For. Fl. ii. 224. S. rubrum, Miller; Roxb. Fl. Ind. i. 565; Nees in Trans. Linn. Soc. xvii. 30; Dunal l. c. 57. S. triangulare, Lamk. Ill. ii. 18; Dunal l. c. 53. S. villosum, Lamk. Ill. ii. 18; Dunal l. c. 58; Boiss. Fl. Orient. iv. 284. S. incertum, Dunal Sol. 155, and in DC. l. c. 57; Nees l. c. 38. S. nodiflorum, Jacq. Ic. Rar. ii. t. 326; Dunal in DC. l. c. 46. S. uliginosum and rhinoceros, Blume Bijd. 695; Dunal in DC. l. c. 60. S. Roxburghii, Dunal l. c. 57; Wight Ic. t. 344. S. fistulosum, Rich.; Nees l. c. 37; Dunal l. c. 49. S. minutum, Bernh.; Dunal l. c. 56; Boiss. l. c. S. paludosum, pterocaulon, suffruticosum, Rumphii and erythraeum, Dunal l. c. 57, 53, 57 and 371, with many others.—Rheed Hort. Mal. x. t. 73; Rumph. Herb. Amb. vi. t. 26, fig. 2.

Throughout India and Ceylon, alt. 0-7000 ft.; common.—Distr. All temperate and tropical parts of the world.

Herbaceous or suffruticos. Leaves 3½ by 2 in., narrowed at both ends; petiole ¾ in. Peduncles 1-3 in.; pedicels 5-8, ½ in. Sepals ¾ in., ovate-oblong; in fruit often obscure, the calyx saucer-shaped. Corolla ½ in. diam., nearly glabrous. Ovary glabrous, style-base hairy. Berry ¼ in. diam., globose, red or black, sometimes yellow. Seeds ½ in. diam., smooth or nearly so.

2. S. dulcamara, Linn.; Boiss. Fl. Orient. iv. 285; glabrous or sparingly pubescent, leaves ovate or oblong subentire lobed or lyrate, peduncles extra-axillary, cymes laxly panicled, calyx-teeth small obtuse, corolla purple. Dunal in DC. Prodr. xiii. pt. i. 78; Bentl. & Trim. Med. Fl. 190. S. lyratum, Thumb. Fl. Jap. 92; Dunal l. c. 79. S. persicum, Willd. ms.; Dunal l. c. 79. S. laxum, Royce Ill. 279 (name only).

Temperate W. Himalaya, alt. 4-8000 ft., from Kashmir to Gurwhal, frequent. Sikkim, Choongtong, J. D. H.—Distr. Europe, W. and Central Asia, China, Japan.

3. S. spirale, Roxb. Hort. Beng. 16, and Fl. Ind. i. 566; glabrous, leaves elliptic entire acute at both ends, peduncles extra-axillary, pedicels long densely spirally racemled, calyx-teeth minute, corolla white. Wall. Cat. 2619; Nees in Trans. Linn. Soc. xvii. 40; Dunal in DC. Prodr. xiii. pt. i. 146; Kurz For. Fl. ii. 227.

Assam, Khasia Mts. and East Bengal; alt. 0–3500 ft., in and near the hills, common.—Distrib. Ava.


Deccan Peninsula; Heyne.


Throughout India, in the Tropical and Subtropical zone; common.—Distrib. S.E. Asia, Malaya, N. Australia, Tropical America.

A shrub, or subarboreous, 20 feet high. Leaves 7 by 3 in. attenuate at both ends or base subrhomboid; petiole 1–2 in. Peduncles stout, 1–4 in.; cymes dichotomously compound, very woolly. Calyx-lobes in flower ⅛ in., thrice as large in fruit, but much shorter than the berry. Corolla ⅜ in. diam., woolly without. Ovary hairy, style glabrous. Berry ⅜ in. diam., globose, yellow. Seeds ⅜ in. diam., nearly smooth.

6. S. pubescens, Wild. Phyt. 5, t. 3; leaves ovate entire sinuate thinly stellately hairy, racemes lateral and terminal 3–10-flowered, calyx-teeth lanceolate; corolla purple. Wall. Cat. 2629; Nees in Trans. Linn. Soc. xvii. 60; Dunal in DC. Prodr. xiii. pt. i. 127; Wight & Arn. t. 1402. S. calycinum, Nees l. c.; S. coultertum, Dunal l. c.

Deccan Peninsula and Ceylon; Wight, Thwaites, &c.

A shrub or subarboreous; young branches densely stellately woolly, older usually perfectly glabrous. Leaves 2–4 in., irregularly obscurely lobed, base rhomboid or shallowly cordate shortly decurrent, young stellately subwoolly, mature thinly hairy

Var. ? lobata; leaves lobed very tomentose beneath, flowers smaller.—KHASIA HILLS.—This example (from Herb. Calcutta, named *S. pubescens by Kurz) has no fruit, nor prickles. It resembles the unarmed form of *S. Melongena, but the flowers are too small.

†† Pedicels axillary, clustered or solitary, or in a sub sessile umbel; calyx-teeth 5-10 or obsolete; corolla glabrous without or nearly so.

7. *S. subtruncatum, Wall. Cat. 2620; leaves lanceolate acuminate at both ends entire glabrous or nearly so, flowering calyx cup-shaped entire or obscurely toothed fruiting saucer-shaped entire, corolla ½ in. long. *Dunal in DC. Prodr. xiii. pt. i. 180. *S. denticulatum, Nees in Trans. Linn. Soc. xvii. 41, not of Blume. *S. Neesianum, Wall.; Nees l. c. 42, not of Wight nor of Dals.

KHASIA Mts. alt. 3-5000 ft., common; *Wallich, Griffith, &c. *Assam; *Jenkins.

A shrub, nearly glabrous. Leaves 6½ by 1½ in., minutely setulose above, afterwards glabrous; petiole ¼ in. *Pedicels ½ in., 1-7 together. *Calyx in flower ½ in. long and broad; teeth 5 or 10, very obscure. *Berry ½ in. diam., globose, smooth. *Seeds ½ in. diam., subtriangular, smooth.—Perhaps not distinct from *S. Blumei, Nees (Blume Bijd. 696), which has broader leaves.


Mts. of the S. Deccan; *Nilgherries, Travancore; *Heyne, *Wight, &c. Malabar Ghanta, Ritchie.


9. *S. laeve, *Dunal Solan. Synop. 22; leaves elliptic-lanceolate acuminate at both ends entire glabrous or nearly so, flowering calyx with 5 linear teeth ½ in., fruiting prominently toothed, corolla ½ in. *Nees in Trans. Linn. Soc. xvii. 41. *S. membranaceum, Wall. Cat. 2625; *Nees l. c.; *Dunal in DC. Prodr. xiii. pt. i. 143.

NILGHERRIES, *Wight; alt. 6000 ft., Clarke.

A nearly glabrous shrub. Leaves 6½ by 2½ in., green, membranous, minutely sparsely setulose above, soon glabrous; petiole ½ in. *Pedicels 1-5 together, ½ in. *Berry and seeds nearly as of *S. bigeminatum, from which it hardly differs but by the distinct calyx-teeth.

A woody, somewhat rigid shrub. Leaves 3 by \( \frac{1}{2} \) in., young almost villous, mature setulose above, pubescent often rusty on the nerves beneath; petiole \( \frac{1}{4} \) in. Pedicels 1–4 together, \( \frac{3}{4} \) in. Calyx-teeth lanceolate, minute; in fruit \( \frac{1}{4} \) in. or 0 on the same shrub. Berry \( \frac{1}{4} \) in. Seeds \( \frac{1}{4} \) in. diam. and upwards, smooth or nearly so.

**Var. Gouakai:** leaves angular and sometimes with acute lobes \( \frac{1}{2} \) in. long. S. Gouakai, Dunal in DC. l.c. 177.—Pulney Mrs.; Wight. Ceylon; Walker.

11. *S. biforum*, Lour. *Fl. Cochinch.* 129, not of D. Don; leaves elliptic or oblong acuminate at both ends entire glabrous setulose or pubescent, calyx-teeth 10 in flower \( \frac{1}{12} \) in. narrow-lanceolate, corolla \( \frac{1}{2} \) or \( \frac{1}{3} \) in. Dunal in DC. *Prodr.* xiii. pt. i. 178; *Kura For.* Fl. 224. S. decemdentatum, Roxb. *Hort.* Beng. 16, and *Fl. Ind.* i. 565; Wall. *Cat.* 2614; Dunal *l.* c. 179. S. mollissimum, *Blume Bij.* 698; *Nees in Trans.* Linn. Soc. xvii. 45; Dunal *l.* c. 178. S. decemfidium, *Nees l.* c. 43. S. Zollingeri, Calleryanum and Osbeckii, Dunal *l.* c. 176, 178, 179.

**Singapore; Wallich.** Meroui and Malacca; *Griffith.—Distrib. Malaya and East Ava.**

A shrub; shoots flocculose-satose or nearly glabrous. Leaves 5 by \( \frac{1}{2} \) in.; petiole \( \frac{1}{3} \) in. Pedicels 1–5, \( \frac{1}{2} \) or \( \frac{1}{4} \) in. *Flower and fruit* nearly as in *S. decumbens*, from which it only differs in the longer calyx-teeth.—Very variable in indumentum; Roxburgh describes the leaves as villous, the calyx as pubescent; his Tc. Ined. preserved at Kew represents a glabrous form.

12. *S. macrodon*, Wall. *Cat.* 2621; erect, shrubby, leaves elliptic-lanceolate acuminate at both ends entire setulose above, pedicels 1–8 together, calyx-teeth in flower \( \frac{1}{4} \) in. linear hispidulous, corolla \( \frac{1}{4} \) or \( \frac{1}{5} \) in. *Nees in Trans.* Linn. Soc. xvii. 43; *Dunal in DC. Prodr.* xiii. pt. i. 150. S. biforum, Don *Prodr.* 90, excl. syn., not of Lour.

**Temperate Himalaya, alt. 4–8000 ft., from Nepal to Bhotan, common. Khasia Mrs., alt. 3–5000 ft., common.**

A small shrub setulose with jointed, submoniliform, glistening hairs. Leaves 6 in. in large examples, or 2 in. in high level forms; petiole \( \frac{1}{6} \) to \( \frac{1}{3} \) in. Pedicels \( \frac{1}{2} \) to 1 in., mostly 2–6 together, sometimes solitary. Calyx-teeth (in flower) terminal, alternate sometimes shorter. Corolla-lobes oblong, acute, purple rose or nearly white, with 2 green glandular spots near the base. Berry \( \frac{1}{4} \) in. diam., globose. Seeds \( \frac{1}{4} \) in. diam., subtriangular, smooth.

**Var. lysiocomioides:** stems slender procumbent often rooting at the nodes, pedicels solitary. Wall. *Cat.* 2609, and in Roxb. *Fl. Ind.* ed. Carey & Wall. ii. 257; *Nees in Trans.* Linn. Soc. xvii. 44; *Dunal in DC. Prodr.* xiii. 181.—Temperate Himalaya, from Kumaon (*Strachey & Winterbottom*) to Bhotan. Khasia Mrs. alt. 3–5000 feet.

13. *S. crassipetalum*, Wall. *Cat.* 2618, and in Roxb. *Fl. Ind.* ed. Carey & Wall. ii. 256; erect, shrubby, leaves elliptic-lanceolate acuminate at both ends entire glabrous or sparsely setulose, pedicels 1–8 together, calyx-teeth in flower \( \frac{1}{12} \) or \( \frac{1}{15} \) in. triangular glabrous or pubescent from a compressed base below the calyx-rim, corolla \( \frac{3}{4} \) or \( \frac{1}{2} \) in. *Nees in Trans.* Linn. Soc. xvii. 42. *Bassovia? Wallichii,* Dunal in DC. *Prodr.* xiii. 409.

**Temperate Himalaya, alt. 3–8000 ft.; from Nepal to Bhotan, very common.**

A shrub, 2–9 ft. Leaves 6 by \( \frac{5}{4} \) in. (sometimes 9–10 in.); usually nearly glabrous, sometimes abundantly flocculose-setulose; petiole \( \frac{1}{2} \) in. Calyx-teeth in flower below the limb, bases compressed decurrent on the tube, points linear-obtuse divaricate horizontally. Corolla and berry nearly as of *S. macrodon.*—The thickening of the petals observed in the few examples of Wallich frequently occurs in this species, but in abnormal flowers with imperfect stamens, and is perhaps due to some
insect. At all events, normal unthickened flowers abound.—Leaves cooked and eaten in Sikkim (J. D. H.).

** Prickly, some varieties of *S. Melongena* rarely unarmed.


*Mrs.* of *S. Deccan* and *Ceylon*, alt. 3–7000 ft., frequent; *Wight, Thwaites*, &c.


**Eastern and Southern India**, in the tropical zone, frequent; from Assam to Ceylon and to Tenasserim. —Distrib. Hongkong.

*Stem* herbaceous, stout, 2–4 feet, sub-erect, prickly. *Leaves* by 6 in., closely villous above, stellately fulvous-woolly beneath, lobes 1 in. deep, prickly especially on the nerves; petiole ⅛ in. *Pedicules* usually close below the leaves, short; racemes densely stellately woolly and with needle-like hairs, not prickly. *Calyx* shortly funnel-shaped; lobes ⅛ in., ovate-triangular not acuminate. *Corolla* densely woolly without, lobes ½–1 in., oblong, acute. *Ovary* hirsute. *Berry* yellow, needle-like hairs ¼ in., fulvous, spreading; *fruit-pedicels* ½–1 in.; calyx-lobes in fruit unaltered, hardly ⅛ the length of the berry. *Seeds* ¼ in. diam., nearly smooth.— *S. involucratum* (*Blume Bijd.* 701), the Malay species reduced to *S. ferox* by *Nees*, has the calyx-lobes produced, in fruit 1 in., ovate-linear, with slender prickles, enclosing the berry.


From N. *Bengal* and Assam to Tenasserim, in the subtropical region, alt. 1–5000 ft., frequent, *Wallich, Griffith*, *H. f.* & *T.*, &c.

17. **S. khasianum**, Clarke; hirsute, leaves ovate lobed, racemes lateral 1-4-flowered, corolla small lobes lanceolate acuminate, berry 1 in. diam. globose glabrous much longer than the unarmed calyx. *Solanum* n. 14, *Herb. Ind. Or. H. f. & T*.

**Khasia Mts.; Nnuklow, H. f. & T.**


18. **S. Wightii**, *Nees in Trans. Linn. Soc. xvii. 51*; leaves ovate toothed or lobed hirsute, cymes lateral laxly 1-3-flowered, corolla large tube longer than the lobes, berry glabrous overtopped by the ovate-lanceolate sepals. *Dunal in DC. Prodr. xiii. pt. i. 1384; Wight Ic. t. 841.* S. Hohenackeri, *Van Haurck & Muell. in Van Haurck Pl. Nov. 87.*

*Nihgherry Mts., alt. 4-6000 ft.; Canoor Ghat, Wight, Gardner, &c.*

Herbaccaea; shoots tomentose. Leaves 4 by 1 1/3 in., villous above, more densely beneath, prickles few; petiole 1 in. Peduncles axillary or extra-axillary, short; pedicels 3/2-2 in. Calyx-lobes (in flower) 1/2 in., oblanceolate-lanceolate. *Corolla* 2 in. diam., blue, woolly without; lobes ovate, shortly acuminate. *Style* minutely sparsely pubescent. Berry 1/3 in. diam., globose; sepals in fruit 3/3 in., without prickles. *Seeds* 1/3 in. diam., brown, smooth, without tubercles; the dried tests reticulated by the drying and sinking in of the cells leaving the cell-walls prominent.

19. **S. torvum**, *Swartz Prodr. 47*; stem prickly, leaves ovate sinuate or lobed stellately tomentose beneath without prickles, racemes lateral dense, flowers white, berry 4 1/3 in. diam. globose smooth much exceeding the triangular-oblong unarmèd calyx-lobes. *Dunal Sol. 263, t. 23, and in DC. Prodr. xiii. pt. i. 260 (excl. var. γ); Nees in Trans. Linn. Soc. xvii. 53 a; Wight Ic. t. 345; Dals. & Gibbs Bomb. Fl. 175; Sendtn. in Mart. Fl. Bras. x. 94, t. 7, fig. 1-8 with synt.; Kurz For. Fl. ii. 225. S. stramnifolium, Roxb. Fl. Ind. i. 572; Wall. Cat. 3927; perhaps of Lamk. in part, not of Jacq. S. ferrugineum, *Jacq. Hort. Schoenb. iii. 46, t. 334; Dunal Sol. 36, and in DC. l. c. 266. S. pseudosaponaceum, *Blume Bijd. 702; Dunal in DC. l. c. 274.* S. Wightii, *Miquel Pl. Hohenack. n. 39, not of Nees.*

Throughout India in the tropical region, except the western desert area; very common in Bengal.—Distr. Malaya, China, Philippines, Tropical America.

A shrub, 8-12 feet high, or flowering as a herb. Leaves 6 by 4 in., lobes shallow rarely deep, softly hairy above, never prickly; petiole 1 in. Peduncles usually extra-axillary, short; racemes many-fld., often dichotomous; pedicels often 3/4-3 in. Calyx-lobes in flower 1/2 in., lanceolate, sparingly hairy. *Corolla* 1-1/2 in. diam.; lobes 1/2 in., triangular, pubescent without. *Ovary* and style glabrous. Berry yellow; calyx-lobes patent, not half as long as the berry. *Seeds* scarcely 1/3 in. diam., smooth.—This, when dried, has been much confused with the blue-flowered *S. indicum* and *S. Melongena*; the former may be distinguished by the prickly leaves, the latter by the few-flowered cymes with a much larger berry and fruiting-calycy.

20. **S. indicum**, *Linn. partly; Nees in Trans. Linn. Soc. xvii. 55*; leaves ovate sinuate or lobed stellately woolly beneath nerves prickly, racemes lateral many-fld., flowers blue, berry 1 in. diam. globose smooth much exceeding the triangular-oblong calyx-lobes. *Lour. Fl. Cochinch. 131; Roxb. Fl. Ind. i. 570; Wall. Cat. 2636; Wight. Ic. t. 346; Dunal in DC. Prodr. xiii. pt. i. 309; Dals. & Gibbs Bomb. Fl. 174; Kurz For. Fl. 226. S. violaceum, *Jacq. Fragm.*
Solanum.]

CIL. SOLANACEAE. (C. B. Clarke.)

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Throughout tropical India; very common, ascending to 5000 ft.—Distr. Malaya, China to the Philippines.

An undershrub, 1-6 ft., much branched, very prickly; prickles compressed, stout, often recurved. Leaves 3-6 by 1-4 in., subentire or pinnatifid; petiole 1 in. *Peduncles* short, often extra-axillary; pedicels ¼-½ in., stellately woolly. *Calyx-lobes* in flower ¼ in., triangular, acute, very woolly, unarmcd or with slender straight spines. Corolla ¼-1 in. diam., blue; lobes broadly triangular, tomentose without. *Ovary* usually glabrous; style stellately pubescent. *Berry* yellow; calyx-lobes patent, woolly, prickles often strengthened in fruit. Seeds ¼ in. diam. and upwards, smooth or very nearly so.—A Nilgherry form is less prickly, has smaller less lobed leaves, and small corymb of larger flowers. A plant from the Concan is sparsely prickly and has the leaves very sparsely stellate tomentose. A Punjab example of Thomson has branches with very numerous small thin leaves, a monstrosity that occurs in other Indian species of *Solanum*.


India; generally cultivated.—Distr. Cultivated in the warmer regions of the globe.

Herbaceous, 2-8 ft.; prickly, or sometimes nearly unarmcd. Leaves 3-6 by 2-4 in.; petiole 1 in. *Peduncles* mostly extra-axillary, often paired, one bearing a perfect flower, the other a short raceme of male flowers; or the raceme may be considered sessile with the lowest flower only perfect. *Calyx-lobes* in flower ½-¾ in., elliptic or oblong-linear. Corolla 1-¼ in. diam., shortly lobed, hairy on the plaits without. *Style* stellately pubescent, or glabrous. *Berry* 1-9 in., very variable in cultivation; calyx-lobes enlarged, usually much shorter than the fruit, often prickly. —Not known wild in India, according to Dalzell and *Kurz l.c.*; A. DC. says it is a native of Asia, not America, and *Sendtn* l.c. fixes its origin in Arabia; all this appears uncertain. As an escape from cultivation it becomes often intensely prickly, and the peduncle carries 1-5 fruits.—The egg-plant, or Brinjal.
22. **S. coagulans**, Forsk. Fl. Æg.-Arab. 47; leaves ovate sinuate or lobed stellately woolly beneath prickly, cymes lateral few-fl., calyx-lobes triangular, flowers blue, berry globose glabrous yellow exceeding the prickly calyx-lobes. De Wilde Fl. Æg. t. 23, fig. 1; Dunal in DC. Prodr. xiii. pt. i. 369; Boiss. Fl. Orient. iv. 286. *S. sanctum*, Linn. Sp. Pl. 269.

W. INdia; Punjab and Sind, Jacquemont, Aitchison, &c.—Distr. S.W. Asia, Arabia, Egypt.

Very near *S. Melongena*, more rigid and tomentose. Peduncles paired, one bearing a single perfect flower, the other a raceme of males. Calyx-tube campanulate, often in flower-time strongly spinous. Corolla as of *S. Melongena*, more woolly, lobes rather deeper. Berry 1 in. diam.


**Penang; Wallich. MALACCA; Griffith (Kew Distrib. n. 5914).—Distr. Jsvs., Borneo.**

Stem procumbent, somewhat zigzag, not twining; prickles long, straight. Leaves 4 by 2 in., obtusely lobed, young sparsely stellately pubescent beneath, mature sparingly hairy or glabrate on both surfaces; petiole ⅔ in. Sepals in flower ⅔ in., in fruit ⅔ by ⅔ in., erect, sparsely hairy, usually prickly. Corolla ⅔ in. diam., stellately pubescent without. Seeds ⅔ in. diam. flocculose-scyal.


Throughout INdia; from the Punjab and Assam to Ceylon and Malacca; common.


A very prickly, diffuse herb, 1–4 ft. diam., bright green, mature nearly glabrous. Leaves 4–5 by 2–3 in.; spines ⅔ in., straight; petiole 1 in. Peduncles short, mostly extra-axillary; flowers few, all perfect; pedicels and calyx stellately pubescent, or at length glabrous. Calyx in flower ⅔ in.; lobes ovate-oblong, usually prickly, hardly enlarged in fruit. Corolla 1 in. diam., pubescent without; lobes yellow. Berry yellow, or whitish and green-blotched. Seeds ⅔ in. diam. glabrous.—Has been supposed to extend to Tropical Africa (see Schweinf. Fl. Nilot. 25, t. 9); but in the African plant the flowers are larger, the fruit very much larger, the habit different.

25. **S. trilobatum**, Linn.; Burm. Fl. Ind. 57, t. 22; shoots stellately pubescent, leaves ovate or elliptic irregularly sinuate or lobed prickly soon glabrate, cymes lateral 2–8-fl., corolla blue, berry ⅔ in. diam. globose much exceeding the calyx-lobes. Roxb. Fl. Ind. i. 571; Wall. Cat. 2622; Dunal Sol. 226, and in DC. Prodr. xiii. pt. i. 287; Wight t. 854; Dalz. & Gbs. Bomb. Fl. 175; Kzrz For. Fl. 224. S. acetosefolium, Linn. Dict. iv. 308; Dunal Sol. 226. *S. canaranum*, Miqu. in Pl. Hohenack. n. 740.

W. **DECCAN PENINSULA**; from the Deccan, southward, &c., frequent. MALAY
Solanum.]  

CII. SOLANACEAE. (C. B. Clarke.)  

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Peninsula; from Arracan to Malacce, in the tidal swamps, frequent. Ceilony; drier parts of the island.

A scandent undershrub, 6–12 ft., nearly glabrous; prickles short, stout, compressed, recurved. Leaves 3 by 1 1/4 in., irregularly obtusely sinuate or lobed, base not cordate; petiole 1/2–1 1/2 in. Peduncles short, mostly extra-axillary; pedicels 1/2–1 1/2 in., with short, strong, recurved prickles. Calyx-lobes 1/2 in., ovate-oblong, minutely stellately pubescent or glabrate, rarely prickly, hardly enlarged in fruit. Corolla 1 1/2 in., pubescent without; lobes triangular-lanceolate, as long as the tube. Seeds 1/2 in., smooth, or very nearly so.

Var. Griffithii; leaves 2 1/2 by 1/4 in. linear.—Malay Peninsula, Griffith (Kew Distr. n. 5915).


Western India; Punjab and Scinde, Jacquemont, Stocks, Dalsell.—Distr. Beloochistan.

An undershrub; prickles short, conical, subrecurved. Leaves 1 1/2 in. diam., obtuse, rarely lobed, usually shallowly cordate; petiole 1/2 in. Peduncles very short or 0; pedicels 1/2–1 1/2 in., slender. Calyx-lobes 1/2 in., linear; in fruit 1/2 in. Corolla 3/4 in. diam., deeply lobed. Seeds 1/2 in. diam., smooth.—This is believed to be S. cordatum, Forsk. Fl. Æg.-Arab. 47 (Dunal Sol. 239, and in DC. Prodr. xiii. 373), an Arabian species of which no authentic example can be seen.

27. S. aculeatissimum, Jacq. Coll. i. 100, and Lc. Rav. i. t. 41; prickles very many long straight slender, leaves ovate lobed sparingly hairy, peduncles 1–7-fld. mostly 1-fruited, berry 1 1/2 in. diam. globose smooth, fruiting-calyx small prickly. Dunal in DC. Prodr. xiii. pt. i. 244.

SinoAporic; G. Thomson.—Distr. Malaya, Tropical America?

The example of G. Thomson (in fruit) is identical with Zollinger, n. 529, which is the type of S. aculeatissimum, var. denucatum, Dunal l.c. Stems glabrous (in the var. denucatum) or minutely puberulous upwards. Leaves 3–5 in. Peduncles in fruit 2 1/2 in. Calyx in fruit scarcely 1/2 in., but very prickly. Seeds 1/2 in. diam., extremely compressed, almost winged.

1*. LYCOPERSICUM, Miller.

Tall, pubescent herbs. Leaves pinnate; pinnæ toothed or lyrates. Cymes peduncled, few-fld. Sepals 5–6, narrow, unaltered in fruit. Corolla rotate, tube very short; limb 5–6-fld. plaited in bud. Stamens 5–6, on the corolla-tube; anthers connivent in an elongate cone, dehiscing by slits. Ovary 2–3-celled; style cylindric, stigma small capitiate. Seeds many, compressed, papillose; embryo peripercous.—Species 3–4, American.


Cultivated, and as an escape, in India.—Distr. Native of Tropical America.

Flowers 3 in. diam., yellow; in cultivation 2–6-merous, or “double.” Berry 1/2 in. diam., globose red; or, in cultivation, enlarged, pyriform or depressed globose, very variable.—The Tomato.
2. **PHYSALIS**, Linn.

Annual or perennial herbs. *Leaves* alternate, entire sinuate or shortly lobed. *Pedicels* axillary, solitary. *Calyx* campanulate, 5-fid half-way down; in fruit greatly enlarged, loosely enclosing the fruit; teeth small, connivent. *Corolla* campanulate, lurid-yellow, sometimes with purple spots below. *Stamens* 5, attached near the base of the corolla; anthers oblong, shorter than the filaments, dehiscing longitudinally. *Ovary* 2-celled; style linear, stigma obscurely 2-lobed. *Berry* globose. *Seeds* many or few, smooth or tuberculate-rugose, compressed; embryo periferic.—Species 30, mostly of Tropical America, several introduced in the Old World.


Throughout India, in the tropical region; common.—**Distr.** Tropical Asia, Africa and Australia.

An herbaceous, pubescent annual. *Leaves* 2 in.; petiole 1 in. *Pedicels* ¼–½ in. *Calyx* at flower-time ¼–½ in.; lobes lanceolate, half the length of the calyx, often hirsute, sometimes glabrescent. *Corolla* clear yellow; or, in the less common form (P. Hermanni), spotted within at the base. *Berry* ½ in. diam.; fruit-calyx globose, 5- or 10-ribbed. *Seeds* very many, 1/12 in. diam., discoid, reticulated, scarcely scabrous. —Roxburgh says that his S. pubescens was the same as *P. peruviana*. The sheet of Rottler’s marked *S. pubescens* by Heyne is *P. minima* with one piece of *S. peruviana* mixed.

**Var. indica**; glabrescent, fruiting calyx 5-angular. Lamk. Dict. ii. 102; Nees in Trans. Linn. Soc. xvii. 70; Dunal in DC. Prodr. xiii. pt. i. 443. P. pseudo-angulata, Blume Bijld. 706; Dunal l. c. 444. P. angulata, Wall. mss.; Griff. Notul. iv. 96. Nicandra indica, Roem. & Sch. iv. 582.—Rheed. Hort. Mal. x. t. 70.—Throughout India. The true *P. angulata*, Linn., occurs only cultivated in India.


Throughout India, cultivated.—**Distr.** Indigenous in Tropical America; extensively cultivated in the Old World.

Relying on *P. minima*, but stouter, flowers and fruit-calyx larger, usually villous or pubescent. *Corolla* with 5 large purple spots near the base within.—Cape Goose-berry of the English denizens.

2*. **CAPSICUM**, Linn.

Annual or perennial herbs, glabrous or nearly so. *Leaves* entire or repand. *Pedicels* axillary or 2–3 together. *Calyx* campanulate, subentire or minutely 5-toothed, much shorter than the fruit. *Corolla* rotate; lobes 5, valvate in bud. *Stamens* 5, attached near the base of the corolla; anthers not longer than the filaments, dehiscing longitudinally. *Ovary* 2- rarely 3-celled; style linear, stigma subcapitate. *Berry* very variable in form and size, many-
seeded. Seeds discoid, smooth or subscabrous; embryo peripheric.—**Distrib.** Species 20, native in America, some cultivated in all warm countries.

1. *C. frutescens*, Linn.; *Nees in Trans. Linn. Soc. xvii. 63*; pedicels solitary, berry pendent, elongate-oblong often curved red, orange or yellow. Lamk. Ill. t. 116, fig. 1; Roxb. Fl. Ind. i. 574; Blume Bijld. 705; Wall. Cat. 2642; Fingerh. Caps. 17, t. 4, fig. e; *Dunal in DC. Prodr. xiii. pt. i. 413.—Rhede Hort. Mal. ii. t. 56.

Throughout **India**, universally cultivated.—**Distrib.** Cultivated in all the warmer parts of the globe; native place uncertain.—Chilee of the English denizens.

*Fruit* often 3 by 1 in., tapering at the end.


Throughout **India**, extensively cultivated.—**Distrib.** Malaya cultivated; native place uncertain.

*Berries* often 1 ½ by ½ in., red.—Bird’s-eye Chilee of the English denizen.

3. *C. grossum*, Willd. Sp. Pl. i. 1051; pedicels solitary, nodding in fruit, berry ovoid. Roxb. Fl. Ind. i. 574; Wall. Cat. 2643; Fingerh. Caps. 21, t. 5, fig. c, d, and t. 6, fig. a; *Nees in Trans. Linn. Soc. xvii. 62*; *Dunal in DC. Prodr. xiii. pt. i. 422*.

In **India** cultivated.—**Distrib.** Native place uncertain.

*Berries* often 3 by 2 in., red.

**Var. cerasiformis**; berry ⅔ in. diam., globose. *C. cerasiformis*, Lamk. Dict. v. 325; Roxb. Fl. Ind. i. 575. *C. chamaecerasus*, *Nees in Trans. Linn. Soc. xvii. 65*; *Dunal in DC. Prodr. xiii. pt. i. 429*.—In **India**, rarely cultivated.

3. **WITHANIA**, Pauq.

Unarmed shrubs. *Leaves* entire. *Flowers* axillary, sessile or shortly pedicelled, fascicled or solitary, sometimes diocious. *Calyx* campanulate, 6–8-toothed, enlarged in fruit, subglobose. *Corolla* campanulate; lobes 3–6, short, valvate in bud. * Stamens* attached near the base of the corolla; anthers oblong, dehiscing longitudinally. *Ovary* 2-celled; style linear, stigma shortly 2-fld. *Berry* globose. *Seeds* very many, discoid; embryo peripheric.—Species 4; the Mediterranean region to the Cape of Good Hope and Bengal.


Throughout drier, subtropical **India**; frequent in the west and Hindostan, rare in Lower Bengal.—**Distrib.** Mediterranean region, with the Canaries; Cape of Good Hope.

*Erect, 1–5 ft.; branches round. Leaves 2–4 in., subacute; petiole ¼–½ in. Pedicels 0–¼ in. Calyx in flower ¼ in., in fruit ⅛ in. Corolla ⅜–½ in., greenish or


PUNJAB and SIND; frequent. SUTLEJ VALLEY; alt. 3300 ft., *Thomson.—DISTRICTS. Cabul and Beloochistan. A somewhat rigid, grey undershrub. Leaves 1–2 in., attenuate at the base; petiole indistinct or 1/2 in. *Pedicels* 0–1 in. *Calyx* in flower 1/2 in.; in fruit 3/8 in., stellately mealy. *Corolla* 1/2 in., lurid yellow, stellately mealy without. Male fl. filaments linear; anthers subexsert; ovary ellipsoid; style 0. *Hermaphrodite* fl.; anthers subessisile, perfect, near the base of the corolla-tube; ovary globose; style linear, stigma level with the mouth of the tube. *Berry* and *seeds* nearly as in *W. somnifera.*—This plant has been found in the act of passing from dimorphism to diecism.—"The Cheesemaker."


SubTEMPERATE Himalaya; alt. 3–6000 ft., from Kashmir to Sikkim, introduced. Mrs. of *W. Deccan PENINSULA*, introduced.—DISTRICTS. Native of Peru; widely cultivated.

Leaves 4–7 in. *Pedicels* 1 in. *Corolla* 1 in diam. *Sepals* in fruit 1 by 1/2 in., deeply cordate at the base, overlapping so as to simulate a 5-angular calyx.

4. **LYCIUM**, Linn.

Spinous shrubs, glabrous or puberulous. Leaves small, alternate or often fascicled at the nodes, entire, linear or oblong. *Pedicels* solitary or fascicled at the nodes; flowers small. *Calyx* campanulate, at first 5-merous, then irregularly 3–5-lobed or 2-lipped; in fruit not enlarged. *Corolla* funnel-shaped; lobes 5–4, imbricate in bud. *Stamens* 5–4, on the corolla-tube; anthers oblong, exert or included, dehiscing longitudinally. *Ovary* 2-celled; style filiform, stigma subcapitate; ovules few or many. *Berry* small, globose or oblong. *Seeds* several, few or 1, compressed; embryo peripheric.—Species 40; all temperate and subtropical regions, especially S. Africa and S. America.

99, 100, t. 64, fig. A, B. L. intricatum, Boiss.; Dunal in DC. Prodr. xiii. pt. i. 525; Miers l. c. 98, t. 64, fig. E. L. arabicum, Schweinf.; Boiss. Fl. Orient. iv. 289.

W. India; alt. 0–5000 ft., frequent.—Distr. Mediterranean region, W. Asia.

A spinous, nearly glabrous shrub. Leaves ½–1 in. Pedicels shorter or equaling the calyx, rarely longer. Calyx ½ in, often sub-bilabiately; teeth rarely less than 5. Corolla ½ in, from purple to nearly white. Stamens exert or subinclined. Berry ½ in diam., subglobose, many-seeded.

2. L. barbarum, Linn.; Boiss. Fl. Orient. iv. 289; leaves linear-oblong, pedicels short, calyx 5-lobed irregularly, corolla-lobes more than half as long as the tube, filaments glabrous at their base. Brand. For. Fl. 345; Miers Ill. S. Amer. Fl. ii. 117, t. 69, fig. D. L. Edgeworthii, Dunal in DC. Prodr. xiii. pt. i. 525; Miers l. c. 118, t. 69, fig. F. L. depressum and foliosum, Stocks in Hook. Kew. Journ. iv. 179.

Punjab and Sind; alt. 0–3000 ft., Edgeworth, Stocks.—Distr. W. Asia.

This is not L. barbarum, Linn., as understood by Dunal (in DC. Prodr. xiii. pt. i. 511); but it is doubtful whether either of these two ought to be separated specifically from L. europaeum.

3. L. ruthenicum, Murray; Dunal in DC. Prodr. xiii. pt. i. 514; leaves linear, calyx lobed irregularly often 3–4-toothed, filaments hairy at their base. Brand. For. Fl. 346; Miers Ill. S. Amer. Fl. ii. 119, t. 70, fig. A; Boiss. Fl. Orient. iv. 290. L. tataricum, Pull. Fl. Ross. i. 76, t. 49; Miers l. c. 122, t. 70, fig. A. L. armatum, Griff. Fl. Fl. Asiat. t. 415. L. glaucum, Miers l. c. 104, t. 66, fig. D.

N. Kashmir and Bajisthan; alt. 6–9000 ft., frequent, Thomson, &c.—Distr. Cabul, Persia, Central Asia.

Thomson regarded this as a var. of L. europaeum.—L. turcomanicum, Turcz. (Boissier Fl. Orient. iv. 290) is said to differ by having a red (not black) berry.

5. **ATROPA**, Linn.


Western Himalaya, alt. 6–11,000 ft.; from Kashmir to Simla, Royle, Gen. Munro, &c.—Distr. Europe to the Caucasus and N. Persia.

Leaves 6 in.; petiole ½ in. Pedicels ½–1½ in. Calyx in flower ½–3 in. Corolla 1 in.—Leaves are little more acuminate in the Himalayan than in the European plant.


Perennial herb, stemless except the Himalayan species. Leaves large, petioled, toothed or subentire. Pedicels fascicled, subradical. Flowers large, pale purple, reticulate. Calyx 5-fid half-way down. Corolla campanulate;
lobes broad, imbricate in bud, sinuses induplicate-valvate. **Stamens** 5, filaments linear; anthers oblong, dehiscing longitudinally. **Ovary** 2-celled; style elongate, stigma much dilated. **Berry** globose, juicy. **Seeds** very many, compressed; embryo peripheric.—Species 3 or 4 of the Mediterranean region, and the following.


ALPINE SIKKIM, alt. 12–13,000 ft.; Lachen and Tangu, J. D. H.

Pubescent or nearly glabrous. **Leaves** 11 by 2 in., obtuse, base much tapering. **Pedicels** 1–3 in.; many-fascicled at the apex of the caudex. **Calyx-lobes** in fruit ½ in., subobtuse. **Berry** ¾ in. diam. **Seeds** ½ in. diam.—The examples are in fruit; and appear closely allied to **M. officinarum**, Linn.

7. **DATURA**, Linn.

Coarse, rank-scented herbs (the Indian species), glabrous or minutely pubescent. **Leaves** large, entire sinuate or deeply toothed. **Pedicels** solitary; flowers very large, purple or white. **Calyx** long-tubular, herbaceous, 5-toothed at the apex; in fruit circumsciss above the base. **Corolla** long tubular-funnel-shaped, mouth wide; limb plaited, entire or shortly lobed. **Stamens** attached near the base of the tube, filaments filiform; anthers included, linear, longitudinally dehiscent. **Ovary** 2- or spuriously 4-celled; style filiform, stigma 2-lobed. **Capsule** ellipsoid, 4-celled, spinous (in the Indian species, except in **D. fastuosa**, var. *dubia*), 4-valved or irregularly breaking up near the apex. **Seeds** very many, compressed, rugose; embryo peripheric.—Species 10; temperate and tropical regions.

SECT. I. **Stramonium**. **Capsule** deeply 4-valved, often nearly to the base.


TEMPERATE HIMALAYA; from Kashmir, *Thompson*, to Sikkim, J. D. H.—*Distr.* Nearly throughout the globe, in temperate and warm climates.

A coarse annual, 2–6 ft. **Leaves** 7 by 4 in.; petiole 1 in. **Pedicels** 0–½ in. **Calyx** 1–⅓ by ⅕–⅛ in.; lobes ½ in., ovate-lanceolate. **Corolla** 3–6 in., mouth 1–5 in. diam.; lobes ⅛ in. **Capsule** ⅓ by 1 in.; spines ⅛ in., subulate; calyx-base ½ in., persistent.


SECT. II. **Dutra**. **Capsule** subindehiscent, or irregularly dehiscent near the apex.

2. **D. fastuosa**, Linn.; *Wight* Ic. t. 1306; leaves ovate entire or deeply toothed glabrous, corolla purple limb shortly 5–6-toothed. capsule nodding or suberect. *Roxb. Fl. Ind.* i. 661; **Wall. Cat.** 2639; Nees in *Trans. Linn. Soc.* xvii. 74; **Dunal** in *DC. Prodr.* xiii. pt. i. 542. D. Hummuatu, Bernh. in
Datura. ] CIL. SOLANACEAE. (C. B. Clarke.) 243

Linnaeus, 1833, Litt. 141; Dalz. & Gibbs. Bomb. Fl. 174.—Rheed Hort. Mal. 2, t. 28; Rumph. Herb. Amb. v. t. 87, fig. 2.

Throughout India; in waste places, a weed.—Distrib. Malaya, Tropical Africa. In America said to be not a native.

Generally resembling D. Stramonium; but the flowers are usually larger. Calyx attaining 3 in. Corolla 7 in. and 5 in. diam. across the mouth. Capsule 1½ in. diam., subglobose, equally spinous on all sides.

Var. alba: flowers white or nearly so. D. alba, Nees in Trans. Linn. Soc. xvii. 73; Wight & t. 852; Dunal in DC. Prodr. xiii. pt. i. 542; Dalz. & Gibbs. Bomb. Fl. 174. D. Metel, Roxb. Fl. Ind. i. 561; Wall. Cat. 2639, not of Linn.—Rumph. Herb. Amb. v. t. 87, fig. 1.—Throughout India.—Distrib. of D. fastuosa.

Var. ? dubia: fruit without spines. D. dubia, G. Don Gen. Syst. iv. 474. D. Hummatus, var. a dubia, Bernh. in Linnaeus, 1833, Littl. 141. D. Nilhummatu, Dunal in DC. Prodr. xiii. pt. i. 542.—Rheed Hort. Mal. ii. tt. 29, 83.—W. Deccan Peninsula?—This species is founded on the figures of Rhede, which represent possibly one of the foreign smooth-fruited species, none of which are wild in India; hence Bernard appended Rhede's plant as a var. of a species which is always spinous so far as known.


W. Himalaya and Mrs of W. Deccan Peninsula; introduced?—Distrib. Tropical America; widely naturalised in the Old World.

8. SCOPOLIA, Jacq.

Erect, glabrescent herbs. Leaves entire. Pedicels axillary, solitary. Flowers lurid, nodding. Calyx large, campanulate, subtruncate or shortly lobed; in fruit enlarged, overtopping the capsule. Corolla widely campanulate, plaited; lobes short, scarcely imbricate. Stamens 5, attached near the base of the corolla; filaments filiform, somewhat dilated near the base; anthers ovate, dehiscing longitudinally. Ovary sub-2-celled; style linear, stigma thick dilated. Capsule globose, circumciss above the middle. Seeds many, reniform, granulate; embryo peripheral.—Species 3; 1 European, 1 Japanese, 1 Himalayan.


Central Himalaya; Nepal, Wallich; Sikkim, near Ging, alt. 6000 ft., Dr. Tostrell.

Branches 3—6 ft., sparingly divided; rusty-tomentose when young, later puberulous or glabrate. Leaves 8 by 3 in., acute at both ends, ultimately glabrate; petiole ¾ in. Peduncles 1 in. Calyx in flower ½ in., in fruit attaining 2 by ½ in.; lobes short, irregular. Corolla ½ by ½ in., lurid yellow or greanish purple. Ovary 2-celled, near the top 1-celled. Capsule ½ in., lid 1-celled, remainder 2-celled. Seeds ¼ in.
9. **Physochlaina**, G. Don.

Erect, nearly glabrous herbs. Leaves petioled, subentire. **Corymb** terminal. **Calyx** campanulate, lobes 5 short; in fruit elongated, overtopping the capsule. **Corolla** elongate; lobes 5, short, imbricate in bud. **Stamens** attached at the middle of the tube, filaments filiform; anthers ovate, longitudinally dehiscent. **Ovary** 2-celled; style linear, stigma obscurely 2-lobed. **Capsule** 2-celled; circumsciss above the middle. **Seeds** very many, compressed; embryo peripheric.—Species 4; Central Asiatic.


N. Kashmir and **Western Tibet**, alt. 12-15,600 ft.; Munro, Thomson, Strauchy & Winterbottom, &c.—Distrib. Kashgar and Yarkand.

Stems 2-4 ft., coriaceous upwards. Leaves 4-6 by 3 in., irregular, base cuneate or cordate on the same branch; petiole 1-4 in. **Corymb** 2-8 in. diam.; flowers all pedicelled; pedicels $\frac{1}{4}-\frac{1}{2}$ in. **Calyx** in flower $\frac{3}{4}$ in.; lobes $\frac{3}{4}$ in., lanceolate; in fruit $\frac{1}{2}$ by $\frac{3}{4}$ in., striate. **Corolla** $\frac{1}{2}$ by $\frac{3}{4}$ in., tubular-funnel-shaped, in the majority of the wild examples, sometimes shorter, funnel-shaped; in some cultivated examples wider, subcampanulate. **Stamens** and style distinctly exserted in nearly all the wild examples. **Capsule** $\frac{3}{4}$ in. diam. **Seeds** $\frac{1}{16}$ in. diam., acrobiculate-reticulate.

10. **Hyoscyamus**, Linn.

Erect, coarse herbs. Leaves sinuate, toothed, or subpinnatifid. Flowers unilaterial, sessile or pedicelled, lower axillary solitary, upper forming a dense racemose or subschizoid cyme, upper leaves bract-like. **Corolla** lirid, yellow or greenish purple. **Calyx** urn-shaped, shortly 5-lobed; in fruit enlarged, overtopping the capsule. **Corolla** funnel-shaped; limb oblique, 5-fid, lobes more or less unequal, imbricate in bud. **Stamens** attached about the middle of the corolla-tube, filaments filiform; anthers exserted or subinclosed, oblong, dehiscing longitudinally. **Ovary** 2-celled; style filiform, stigma subcapitate. **Capsule** completely 2-celled, or nearly so, circumsciss near the apex. **Seeds** very many, compressed, acrobiculate; embryo peripheric.—Species 9; European, and extending to Central Asia.


Temperate Western Himalaya, alt. 8-11,000 ft., from Kashmir to Gurwhal; frequent.—Distrib. Europe, W. & N. Asia.

Pubescent and more or less hairy. Leaves 5 by 2 in. Lower pedicels in fruit scarcely $\frac{1}{4}$ in. **Calyx** in flower $\frac{3}{4}$ in., teeth short, triangular; in fruit 1 by $\frac{3}{4}$ in., subcontracted in the middle, teeth somewhat rigid. **Corolla** purple in the base, limb lirid green, purple-veined **Capsule** $\frac{3}{4}$ in. diam. **Seeds** $\frac{1}{32}$ in. diam.
2. **H. pusillus**, Linn.; Boiss. Fl. Orient. iv. 294; cauline leaves petioled ovate or oblong sinuate or lobed, flowers subseessile, calyx striate glabrescent teeth lanceolate mucronate, corolla $\frac{1}{4}$-$\frac{3}{4}$ in. not reticulate. Dunal in DC. Prodr. xiii. pt. i. 550; Jaub. & Spach Ill. v. t. 414.

Western Tibet; Ladak; alt. 10,000 ft., Thomson.—Distr. From Persia and the Altai.

About a foot high, pubescent, somewhat viscid. Leaves 3-5 by 1-2 in., very irregularly lobed or subentire; petiole $\frac{1}{4}$-$1\frac{1}{2}$ in. Lower pedicels in fruit sometimes nearly $\frac{1}{4}$ in., usually very short. Calyx $\frac{1}{3}$ in.; in fruit $\frac{3}{4}$-1 in., funnel-shaped, ribbed, somewhat reticulated, glabrous or sparsely viscid pubescent, teeth $\frac{1}{4}$ in., almost prickly, patent. Corolla yellow, purple in the base. Capsule $\frac{1}{2}$ in. Seeds even smaller than in *H. niger*.


West Punjab; Thomson. Scinde; Stocks.—Distr. Cabul, westwards to Egypt. Stem 1-3 ft. Leaves 4-7 in., pubescent or somewhat woolly; petiole $\frac{1}{4}$-3 in. Lower pedicels in fruit $1-4$ in. Calyx $\frac{3}{4}$ in.; in fruit 1 by $\frac{1}{2}$ in., funnel-shaped, ribbed, somewhat reticulate, villous or ultimately glabrous; teeth short-triangular, not spreading. Capsule $\frac{1}{2}$ in. diam. Seeds $\frac{1}{4}$ in. diam.

10*. **NICOTIANA**, Linn.

Erect, viscidly-pubescent, herbs, shrubs, or trees. Leaves entire or sinuate. Panicles terminal, or racemes compound, subterminal. Calyx ovoid or tubular, 5-fid. Corolla funnel-shaped; lobes 5, induplicate in bud. Stamens attached in the lower part of the corolla-tube, filaments filiform; anthers ovate, dehiscing longitudinally. Ovary 2-celled; style filiform, stigma shortly 2-fid. Capsule 2-3, rarely sub-4-, celled, 2-valved to the middle, valves often again splitting. Seeds very many, small, scarcely compressed; embryo nearly straight. —Species 35; American, Australian, and Polynesian.

1. **N. Tabacum**, Linn.; Gaertn. Fruct. i. 264, t. 55; leaves large oblong or elliptic base cuneate, corymb compound ultimate branches short, calyx-teeth triangular-lanceolate, corolla linear-funnel-shaped, capsule $\frac{2}{3}$ in. Lamm Ill. t. 113; Wall. Cat. 2645; Nees in Trans. Linn. Soc. xvii. 76; Wight Ill. t. 166 bis; Dunal in DC. Prodr. xiii. pt. i. 557; Bentl. & Trimen Med. Pl. t. 191.

Throughout India, cultivated.—Distr. Native in America; cultivated in all warm countries.

Tobacco, though cultivated in nearly every village in Bengal, shows little tendency to spread as a weed. In Cochin China and the Moluccas, Louviers and Rumphius say it has been known from a remote period.

2. **N. rustica**, Linn.; Dunal in DC. Prodr. xiii. pt. i. 563; leaves ovate base obtuse or cordate, panicle close, calyx-teeth triangular subobtuse, corolla cylindric campanulate, berry $\frac{1}{4}$ in. Reich Ic. Fl. Germ. t. 1626, fig. 1.

W. Punjab; cultivated, Falconer.—Distr. Native of Mexico; cultivated in Europe, Asia, Africa, and America.

**Bengal**, a common introduced weed.—**Distribs**. Native of Mexico and the W. Indies.

The only species of *Nicotiana* that has established itself in India.

**ORDER CIII. SCROPHULARINAE.** (By J. D. Hooker.)

Herbs or shrubs, rarely trees. **Leaves**, all, or the lower only, opposite, rarely all alternate or whorled; stipules 0. **Inflorescence** centripetal or composite; flowers usually irregular. **Calyx** inferior, usually persistent, 5- rarely 4-merous. **Corolla** hypogynous, 4-5-lobed. **Stamens** usually 4, with a rudimentary 5th, rarely 2 or 5; anthers 1-2-celled, cells distinct, or more or less confluent. **Disc** annular, glandular, or cup-shaped. **Ovary** 2-celled (very rarely 1-celled) (*Lathraea*); style simple; **stigma** capitate, dilated, 2-lobed, or 2-lamellate; **ovules** many, rarely 2, in each cell, antropic or amphitropic. **Fruit** capsular, rarely baccate; placentas on a free central axis, or remaining attached to the margins of the valves. **Seeds** small, various in form, hilum lateral or ventral, albumen fleshy (0 in *Wightia*); embryo straight or curved.—**Distribs**. Species about 2000, native of all regions.

In this Order I have departed from the "Genera Plantarum" in introducing *Lathraea* under the Tribe *Euphrasieae* instead of retaining it in *Orobanchae*. This, its proper position, was pointed out by Solme Laubes, in a dissertation which was overlooked when the *Scrophularia* of the "Genera" were elaborated. I have also transferred *Campbellia* to *Christisonia*, which is left in *Orobanchae* till the living plant shall be studied morphologically.

A few non-Indian garden *Scrophulariae* are more or less frequent near stations, but none seem truly naturalised to any extent except the American *Calceolaria mexicana*, Benth., which is so about Darjeeling and in the Nilgherries.

**Series A. Pseudosolanae.** Leaves all alternate. **Inflorescence** simply centripetal. **Corolla** with the 2 upper lobes exterior in bud.

**Tribe I. Aptsimeae.** Corolla-tube elongate.

Stamens 2. Viscid herbs. . . . . . . . . 1. *Anticharia*.

**Tribe II. Verbascea.** Corolla subrotate.

Stamens 5 . . . . . . . . . . . . . . 2. *Verbasium*.

Stamens 4 . . . . . . . . . . . . . . 3. *Celsia*.

**Series B. Antirrhinideae.** Leaves, at least the lower, usually opposite. **Inflorescence** centripetal or composite, partial ones centrifugal. **Corolla** with the 2 (free or connate) upper lobes exterior in bud. Stamens 2 or 4, very rarely 5 perfect.

**Tribe III. Antirrhineae.** Corolla tubular, tube saccate or spurred. Capsule opening by pores. **Inflorescence** uniform, centripetal.

Corolla spurred. Anther-cells distinct . . . . . . . . 4. *Linaria*.

Corolla small, subsaccate. Anther-cells confluent above . . 5. *Schweinfurthia*.

Corolla large, saccate below. Anther-cells distinct . . . 6. *Antirrhinum*.


Viscid herb. Calyx 5-partite. 10. Sutera.


SUBTRIBE I. Mimuleæ. Calyx 5-toothed or -fid. Stamens included; anther-cells contiguous. Capsule loculicidally 2-4-valved, or indehiscent.

Flowers axillary or the upper racemose. Capsule 2-valved. 11. Mimulus.


Flowers few, racemose. Fruit indehiscent, globose. 13. Lancia.

SUBTRIBE II. Stemoditeæ. Calyx 5-partite, except Lindenbergia. Stamens 4, included; anther-cells separate.


Calyx-segments unequal. Stamens 4, 2 or all with one imperfect anther-cell. 15. Adenosma.


SUBTRIBE III. Herpestideæ. Calyx 5-partite, imbricate. Stamens included; anther-cells contiguous. Capsule 2-4-valved.


SUBTRIBE IV. Vandellia. Calyx usually 5-toothed or -partite. Stamens 2 upper, usually in the tube, 2 lower in the throat of the corolla, perfect, or reduced to staminodes; anthers conniving or cohering in pairs.

Calyx-segments 5, broad. Stamens 4, all perfect. 21. Antanema.

Calyx flat, segments 4, 2 outer very large. 22. Cranga.

Calyx tubular, plaited or winged, obliquely 3-5-toothed or 2-lipped. 23. Torenia.

Calyx-segments 5, free or connate. Stamens 4, all perfect. 24. Vandellia.

Calyx-segments 5, narrow. Stamens 2, both perfect. Capsule short. 25. Ilysanthes.


SUBTRIBE V. Limosellææ. Calyx 3-5-toothed or -partite. Two lower stamens, perfect, upper 0, or reduced to staminodes; or stamens 3-4, subequal.—Minute and minute-flowered marsh-herbs; flowers usually solitary.

Sepals 4, very long and slender. Anther-cells 2, parallel. 27. Bythophytum.


Calyx shortly 3-4-lobed. Anther-cells confluent at the tips. Leaves opposite, fascicled. 30. Glossostigma.


Series C. Rhinantheae. Leaves various. Inflorescence usually centripetal or composite. Corolla-lobes variously imbricate, anterior or lateral usually the outer in bud. Stamens 2 or 4, the 5th very rarely present.

Tribe VII. Digitaleae. Corolla-lobes all flat, usually spreading, the lateral, or one of them, exterior in bud. Anther-cells usually confluent at the tip and spreading below, rarely wholly confluent.—Herbs. Leaves various. Inflorescence simply centripetal.

Subtribe I. Sibthorpiæ. Corolla subrotate, lobes 4-5 or more. Stamens as many as the lobes, or fewer by one, equal; anthers sagittate or horseshoe-shaped.

Calyx 4-8-fid. Corolla 5-8-fid. Creeping herbs. 32. Sibthoria.


Calyx 4-5 partite. Corolla 4-fid. Erect herb. 34. Scoparia.

Subtribe II. Eu Digitaleae. Corolla-tube elongate, ventricose above or below. Stamens 4, didynamous, or 2; anther-cells confluent at the tips or wholly.


Subtribe III. Veronicæ. Corolla rotate or tube campanulate or cylindric, 4-5-lobed. Stamens 2 or 4, exserted (or included in Wulfenia), equal; anthers distant; anther-cells parallel or divergent, tips confluent.—Leaves alternate or radical.


Corolla-tube short. Stamens 2. Leaves (or the lower) opposite. 39. Veronica.

Tribe VIII. Gerardieæ. Corolla-lobes all flat, spreading, 2 upper usually exterior in bud. Anther-cells distinct throughout, bases often mucronate, equal or one imperfect or wanting.—Usually root-parasites, turning black when dry.


Subtribe II. Buchneræ. Calyx tubular or subcampanulate. Corolla-tube slender, limb spreading. Anthers 1-celled, cell narrow, tip usually mucronate.—Leafy herbs; lower leaves opposite.

Calyx tubular, 5-toothed. Corolla-tube straight or subcurved. 41. Buchneria.

Calyx tubular, 5-toothed. Corolla-tube abruptly incurved. 42. Striga.

Calyx subcampanulate, 5-fid. Corolla-tube straight or curved. 43. Ramphicarpa.
*Cells of ovary more than 2-ovuled. Margins of upper lip of corolla reflexed.*

Seeds numerous, oblong, striate. Flowers spicate. 49. Euphrasia.
Seeds numerous, ellipsoid. 50. Emmenospermum.

**Cells of ovary more than 2-ovuled. Margins of hood of corolla straight.**

Calyx 4-toothed or 4-fid. Leaves opposite. 51. Bartisia.
Calyx split in front, 2-5-toothed. Leaves alternate or whorled. 52. Pedicularis.
Leaves 0. 53. Laethreo.

***Cells of ovary 2-ovuled.**

Upper tip of corolla compressed. Leaves opposite. 54. Melampyrum.

**Genus of Doubtful Position (near Wulfenia?).**


**Tribe I. APTOSIMNE.**

1. **ANTICHRIS**, Endl.

Erect, small, annual, viscid herbs. Leaves alternate, quite entire. Flowers axillary, solitary. Sepals narrow, subvalvate. Corolla-tube long, dilating into the throat; lobes 5, flat, subequal. Stamens 2 lower perfect; anthers transverse, curved; staminodes 0. Style filiform, stigma obtuse or notched. Capsule ovoid or oblong, acuminate, loculicidal and septicidal; valves with inflexed margins separating from the axis. Seeds numerous, minute, ellipsoid, striate; embryo straight.—Species 4, Tropical and S. African, Oriental, and Indian.


Scirrns, Stocks, Vicary.—Distrib. Upper Egypt.

A foot high, or less, leafy. Leaves ½-1 in., narrowed into a short petiole. Flowers


**PUNJAB PLAIN, Thomson, Edgeworth. Scinde, Stocks.—Distrib.** Westward through Arabia and tropical Africa to the Cape de Verde Islds.


**TRIBE II. VERBASCUM.**

2. *VERBASCUM*, L.

Erect, tomentose or woolly, usually tall herbs. *Leaves* all alternate. *Flowers* in simple or panicled terminal racemes or spikes, ebracteate, yellow, rarely white or red. *Calyx* 5-lobed or -partite, lobes imbricate. *Corolla* rotate; lobes 5, broad, the upper exterior in bud. *Stamens* 5 (very rarely 4), filaments all or the three upper bearded; anthers transverse or oblique, cells confluent. *Style-top* dilated, stigma simple. *Capsule* globose, oblong, or ovoid, septicaidal; valves separating from the axis. *Seeds* numerous, rugose, not winged; embryo straight.—Species about 100; chiefly Mediterranean and Oriental.


**TEMPERATE HIMALAYA, alt. 6–11,000 ft.; from Kashmir to Bhotan. WESTERN TIBET; Ladak, Thomson.—Distrib.** Westwards to Britain.

*Stem* stout, 2–3 ft. *Root-leaves* 6–18 in., cauline oblong, upper acuminate. *Spike* 6–10 in.; bracts longer than the flowers. *Stamens* 5, fertile, 2 glabrous and 3 with white hairs.—As this is the only common Himalayan species, it must be that referred to as *V. Blatteria* by T. A. Schmidt.


2. *V. celsioides*, *Benth. in DC. Prodr.* x. 229; glandular-pubescent, lower leaves pinnatisect, upper auricled cordate acuminate, flowers racemose.

**KUMAON**; at the foot of the hills, *Edgeworth*. The *Punjab*; at *Hussan*, *Aitchison*.

*Stem* 2–5 ft. *Leaves* 4–6 in., sessile or petiolate, irregularly toothed and lobulate. *Flowers* in a long loose raceme; bracts ovate-lanceolate; pedicels ¼–½ in. *Sepals* oblong, obtuse. *Corolla* ½ in. diam. *Stamens* 4–5; filaments woolly.—This species, being sometimes tetrandrous, unites *Verbiscum* with *Celsia*.
3. **CELSIA, L.**

Characters of *Verbascum*, but stamens 4 (see also *V. ceisicoides*).

1. **C. coromandeliana**, Vahl Symb. iii. 79; finely pubescent or tomentose, glandular above, root-leaves petioled lyrate-pinnatifid, cauline sessile oblone-ovate toothed, racemes simple or panicked, sepals entire or toothed. *Benth. in DC. Prodr. x. 246; Roxb. Fl. Ind. iii. 100; Wall. Cat. 2631; Wight Ill. t. 165, bis f. 1, right hand, and t. 1406; Dalz. & Gibbs. Bomb. Fl. 176; Boiss. Fl. Orient. iv. 358. C. viscosa, Roth Catal. Bot. ii. 69, and ill. 50; Wight in Hook. Journ. Bot. i. (1834) 228, t. 129; Nees in Trans. Linn. Soc. xvii. 81, in part.

Throughout India; from the Punjab to Ceylon and Pegu, ascending to 5000 ft.—Distan. Afghanistan, Ava, China.


4. **LINARIA, Juss.**

Herbs. Leaves usually opposite, or whorled below and alternate above. Flowers axillary, racemose or spicate, ebracteolate. Sepals 5, imbricate. Corolla-tube spurred in front; upper lip erect, 2-lobed; lower spreading, 5-lobed, throat usually closed by the tumid palate. Stamens 4, didynamous, ascending, included; anther-cells distinct, parallel. Style filiform, stigma minute. Capsule ovoid or globose, 2-celled, each cell or the anterior only opening by an apical pore. Seeds numerous, polymorphous.—Species 180, almost exclusively natives of the temperate regions of the old world.

*L. striata*, DC, a Mediterranean species, has been found in the Khasia Mts. (near Churra), by Clarke, no doubt an escape. *L. triflillo*, Mill., a plant of the same region, also occurs in India according to Bentham (in DC. Prodr. x. 274), but I have seen no specimen.

* Sepals narrowly lanceolate.

1. **L. ramosissima**, Wall. Pl. As. Rar. ii. 43, t. 158, and Cat. 3911; perennial, nearly glabrous, branches prostrate slender, leaves alternate petioled ovate-cordate, or lower 6–7-lobed triangular-hastate and upper lanceolate sagittate, pedicels capillary longer than the petiole, spur shorter than the corolla-tube, seeds sebaceous. *Benth. in DC. Prodr. x. 270; Wight Ill. t. 165; Dalz. & Gibbs. Bomb. Fl. 176; Boiss. Fl. Orient. iv. 368. L. Roylei, Chavaness Monogr. Antirrh. 112.

Throughout India, on rocks and stony places, from the Punjab and Scinde to Chittagong and Ceylon; ascending the hills to 5000 ft. Distan. Afghanistan, Ava.

Branches numerous, filiform, spreading from the rootstock. Leaves membranous, ½–2 in., extremely variable. Flowers yellow; pedicels 1–1½ in. Sepals lanceolate. Corolla ½ in. long, spur short, tube hairy, upper lip short. Capsule with subequal lobes. Seeds minute, ovoid.—The var. *ovata*, Benth., with all the leaves ovate-cordate, passes so insensibly into the type that it cannot be retained.

Var. *pubescens*, Stocks ms.; softly hairy, corolla rather larger and spur rather longer.—This in hairiness resembles *L. cabulica*.

2. **L. cabulica**, Benth. in DC. Prodr. x. 270; perennial, softly hirsute, branches prostrate slender, leaves alternate petioled lower ovate subhastate
and lobed, upper lanceolate sagittate, pedicels rigid longer than the leaves, spur longer than the corolla-tube, seeds scabrous. *Boiss. Fl. Orient.* iv. 388.

The **Punjab, Sinds** and **Western Himalaya**, ascending to 6000 ft., and eastward to Kamptee, Wight, and Rotas in Behar, *J. D. H. Distrin* Westwards to Persia.

More rigid than *L. ramosissima*, with smaller more entire leaves, and shorter pedicels.

3. **L. incana**, Wall. *Pl. As. Rar.* ii. 43; perennial, villous, branches prostrate, leaves ovate or hastate, petiole very short, pedicels rigid often exceeding the leaves, spur much shorter than the corolla-tube, seeds closely roughly pitted.

**Western and Central Himalaya**; from Kashmir, alt. 5,500, *Falconer, &c.*, to Nepal, Wallich.

Habit of *L. cabulica*, but with much larger flowers and capsules, and larger, very different seeds.

** Sepals linear-spathulate.


The **Punjab Plain**; Vicipay, Aitchison. *Distrin* Westwards to Britain.

Stem 6-18 in., branches ascending. *Leaves* 1/2-1 in. obtuse, narrowed into the petiole. *Peduncles* axillary, often exceeding the leaves. *Sepals* enlarging after flowering, nearly equalling the pale purple corolla with a yellow depressed palate. *Capsule* gibbous at the base; cells subequal, opening by ragged pores.

5. **Schweinfurthia**, A. Braun.

Annual or perennial branched glabrous herbs. *Leaves* nearly always alternate, quite entire. *Flowers* small, axillary. *Sepals* imbricate, the upper largest. *Corolla-tube* subacute; upper lip erect, 2-lobed; lower reflexed 3-lobed; palate closing the throat. * Stamens* 4, didynamous, 5th rudimentary; anther-cells diverging. *Style* filiform, stigma minute. *Capsule* subglobose, fragile, anterior cell many-seeded, bursting irregularly; posterior very small, 3-4-seeded or empty. *Seeds* oblong, 5-winged, furrowed between the ribs.—Species 3, N.E. African and oriental.


**Sinds**; in rocky places; *Stocks, Vicary*. *Distrin* Beloochistan and Afganistan.

6. Antirrhinum, Linn.

Annual or perennial herbs. Leaves entire or lobed, lower opposite, upper alternate. Flowers solitary and axillary or racemose. Sepals 5, imbricate. Corolla compressed, base saccate; upper lip erect, 2-lobed; lower spreading, 3-lobed; palate broad, bearded, closing the throat. Stamens 4, didynamous; anther-cells distinct, parallel. Style filiform, stigma 2-lobed. Capsule ovoid or globose; cells many-seeded, anterior opening by one pore, posterior by 2 toothed pores, or both opening by one pore. Seeds minute, oblong, truncate, rugose or pitted.—Species 25, of northern temperate regions.

The common Snapdragon (A. majus, L.) is stated (Benth. in DC. Prodr. x. 291) to be spontaneous in India, but I have seen no specimens.


Punjab Plain and Western Himalaya, ascending to 4000 ft. (an escape in the Nigbberry).—DIST. Westwards to N. Africa and Britain.

Annual or biennial.


7. Scrophularia, L.

Annual or perennial, often facultative herbs. Leaves opposite or the upper alternate, often pelluculidally dotted. Flowers in panicle or thyrsoid cymes, greenish-purple or yellow. Sepals 5. Corolla-tube globose or ovoid, tumid; lobes 5, short, flat; 4 upper erect, lower spreading. Stamens 4, declinate, didynamous, 5th rudimentary or 0; anther-cells adnate to the filament, confluent, bursting transversely. Disc oblique. Style slender, stigma notched. Capsule ovoid, acute or beaked, septicidal. Seeds many or few, ovoid, more or less rugose.—Species about 120, of northern temperate regions.

* Cymes contracted, dense-fld. Upper corolla-lobes short, subequal. Stamens included.—Leaves broad, entire, ovate or ovate-cordate, petiole not appendaged, nerves distinct.

1. S. pauciflora, Benth. Scroph. Ind. 17, and in DC. Prodr. x. 302; glabrous or sparsely pubescent, leaves long-petioled ovate-cordate coarsely toothed, flowers crowded in distant leafless cymes, sepals ovate acute shorter than the capsule, stamens included, staminode 0.

Central and Eastern Himalaya; Nepal, Wallich; Sikkim, alt. 10–13,000 ft., J. D. H., &c.


2. S. calycina, Benth. Scroph. Ind. 18, and in DC. Prodr. x. 304; glabrous or sparsely pubescent above, leaves shortly petioled ovate or cordate-ovate acute coarsely toothed, flowers crowded in approximate leafless cymes,
sepal lanceolate acuminate, equaling or longer than the capsules. Stamens included, staminode ovate acute. *Veronica thyrsiflora*, *Wall. Cat.* 6398.

**Western Himalaya**; from Kashmir, *Royle*, to Kumaon, *Blinkworth*, alt. 6-12,000 ft.


**Cymes more or less effuse. Two upper corolla-lobes longer than the others. Stamens included or exerted.—Leaves broad, entire, ovate or ovate-cordate, petiole not appendaged (except in *S. polyantha*), nerves distinct.**


**Central and Eastern Himalaya**; Nepal, *Wallich*; Sikkim, alt. 7-9000 ft., J. D. H., &c.


**Western Himalaya**; Kumaon at Almora, alt. 6-6,500 ft., *Edgeworth*, &c.

*Stem* 2-3 ft., branched, and as well as the leaves beneath and inflorescence clothed with a fine hoary pubescence. *Leaves* 2-3 in., dull-green, primary nerves only distinct; petiole ½-1½ in. *Cymes* longer or shorter than the leaves; peduncles stout, strict; pedicels also stout, divericate, sometimes 1 in. long. *Calyx* cleft more than halfway down; lobes nearly equaling the small subglobose capsule. *Corolla* yellowish, tube twice as long as the calyx; two upper lobes longest. *Staminode* orbicular. *Seeds* very minute, as in *S. urticæfolia*.


**Western Himalaya**; Kashmir, Murree and Hazara, alt. 6000 ft.; *Fleming, Clarke*.—Distrih. Afghanistan and westwards to Spain.

6. S. elatior, Benth. Scroph. Ind. 18, and in DC. Prodr. x. 304; tall, glabrous or glandular above, stem 4-winged, leaves petioled ovate or lanceolate coarsely toothed, cymes spreading peduncled many-fl. in long panicles, peduncles and pedicels spreading, sepals ovate subacute, stamens far exserted. Wall. Cat. 3028.

Central and Eastern Himalaya; Nepal, Wallich; Sikkim, alt. 6–10,000 ft., J. D. H., &c. Khasia Mts., alt. 4–5000 ft., common.

Tall, very stout, 3–5 ft. high, branched, stem below as thick as the middle finger, wings slender. Leaves 5–10 by 1–5 in., rarely subcordate, primary and secondary nerves distinct; petiole stout, 1–3½ in. Panicle sometimes much branched from the base, bracts linear; peduncles 1–2 in.; branches and pedicels spreading. Sepals not margined, not half the length of the globose-ovoid beaked capsule. Stamens twice as long as the corolla; staminode spathulate or 0. Seeds as in S. urticaefolia.

7. S. Edgeworthii, Benth. in DC. Prodr. x. 304; glandular-puberulous, stem obtusely 4-angled, leaves petioled ovate-cordate coarsely crenate-toothed, cymes long-peduncled panicked few- and lax-fl. spreading, sepals ovate acute much shorter than the tubular corolla, stamens shortly exserted.

Western Himalaya; Gurwhal, at Musa Paria, alt. 12,000 ft., Edgeworth; Kumaon, at Sabu, alt. 8,500 ft., Strach. & Winterb.

Apparently a tall species. Leaves 2–3 in., primary nerves only distinct; petiole 1–1½ in. Peduncles and pedicels spreading in fruit; bracts lanceolate; pedicels 1–1½ in. Sepals nearly as long as the subglobose capsule. Corolla ½ in. long. Staminode spathulate. Seeds very minute, irregular, obscurely ribbed and pitted.—The specimens of this plant are insufficient; Edgeworth's are in flowers only; the Kumaon ones are more advanced and in fruit, are nearly glabrous with a rather shorter corolla.

8. S. polyantha, Royle; Benth. Scroph. Ind. 18, and in DC. Prodr. x. 304; glabrous below, viscidly puberulous above, stem obtusely 4-angled, leaves ovate or ovate-cordate crenate, petiole short naked or appendaged, cymes many-fl. suberect or ascending alternate in long leafless thyroid panicles, pedicels short, sepals round with broad scarios margins, corolla very short, stamens far exserted. Wall. Cat. 9081.

Western Himalaya; from Kashmir to Kumaon, alt. 4–11,000 ft., common.

Stem 3–4 ft., stout below. Leaves 2–8 in., sometimes pinnatifidly cut towards the base, primary-nerves distinct; petiole ½–1 in., rarely more. Panicle 1–2 ft., strict; flowers greenish, amongst the smallest of the Indian species. Sepals ½ in., half as long as the very broad short corolla, much shorter than the subglobose pointed capsule. Staminode spathulate. Style filiform. Seeds rugulose, larger than in S. Edgeworthii.

9. S. Himalensis, Royle in Benth. Scroph. Ind. 18, and DC. Prodr. x. 304; glandular-pubescent above, stem obtusely angled, leaves ovate-cordate or lanceolate crenate, petiole long naked, cymes many- and lax-fl. spreading opposite and alternate in a long rather slender panicle, peduncles and pedicels long slender, sepals rounded obscurely margined or not, corolla very short, stamens far exserted.

Western Himalaya, from Kunawur to Kumaon, alt. 5–8000 ft., common.

Very near to S. polyantha, but the pedicels are longer and not appendaged, and the flowers twice as large; the seeds are similar.

*** Cymes more or less effuse. Two upper corolla-lobes longer than the others. Stamens hardly exserted. Capsules few-seeded. Seeds oblong, deeply pitted or transversely rugose.—Leaves narrow-obovate-spathulate, coarsely toothed or pinnatifid, nerves often very obscure. (The species are perennial, and very difficult to distinguish satisfactorily.)

**Western Himalaya;** from Kashmir to Kumaon, alt. 8–13,000 ft.—*Distrib. Kashgar, Afghanistan, and westwards to Italy.*

**Rootstock** stout, perennial, stems 2–3 ft., obscurely 4-angled. *Leaves* 1–2 in., segments horizontal, interrupted. *Cymes* few-fld., lower leafy; peduncles 1–2 in., pedicels very short; bracts linear. *Sepals* half as long as the corolla, nearly as long as the globose pointed capsule. *Corolla-tube* 1/4–1 in. broad.—I suspect that this is only a form of *S. canina*, Linn.


**Western Himalaya,** in the drier regions, and **Western Tibet**; from Kashmir and the Karakorum to Kumaon, alt. 9–14,000 ft., *Thomson*, &c.—*Distrib. Asia Minor.*

**Rootstock** perennial; stems 1–2 ft., stout, obtusely 4-angled. *Leaves* 1–2½ in., coriaceous, contracted into a short broad petiole. *Sepals* about half the length of the corolla and of the small globose pointed capsule. *Corolla* 1–1½ in. long, tube broad.—Probably only a form of *S. lucida*, with more entire leaves. It precisely accords with Reichenbach's figure in all but the greater size.

**Var. ? tenuiscadis**; branches and panicles very slender, staminode ovate-lanceolate acute.—Kishtwar, alt. 8000 ft., *Thomson*. Kashmir at Srinuggur, alt. 7000 ft., *Clarke.* This is a puzzling plant, probably referable to *S. canina*, L. The habit and foliage are those of *S. variegata*.

12. **S. dentata**, *Royle in Benth. Scroph. Ind.* 19, and in *DC. Prodr.* x. 316; glabrous below, glandular above, nearly black when dry, leaves small petioled obovate-oblong or spatulate obtuse create above, entire or incised towards the base, cymes short erect or ascending few-fld. alternate in narrow panicles, pedicels very short, sepals rounded margins obscurely scarious, staminode small narrow. *S. Kotschyi, Herb. Ind. Or. H. f. & T., not of Boiss.*

**Western Himalaya,** Kumaon, **Royle, Lahul, Capt. Hay. Western Tibet,** alt. 12–15,000 ft., *Thomson.*

Very similar to *S. variegata*, but nearly black when dry, with smaller thicker leaves, and a very small staminode. **Rootstock** stout, branches very numerous, 1 foot, cylindric. *Leaves* 1–1½ in., midrib and nerves very obscure, rather fleshy. *Flowers* smaller than in *S. variegata* or *lucida*.* Capsule and seeds similar.

13. **S. scabiosaefolia**, *Benth. in DC. Prodr.* x. 313; glabrous or glandular, leaves obovate oblong or subspatulate entire pinnatifid or lobulate, terminal lobe usually large, cymes spreading or ascending alternate rather long few- or many-fld. branches divaricating, flowers very small often spicate, sepals rounded margins scarious, staminode broad. *Boiss. Fl. Orient.* iv. 412.
Tribe IV. Cheloneæ.

8. BRANDISIA, Hook. f. & Thom.

Tomentose or scurfy shrubs. Leaves opposite, entire. Flowers axillary, solitary or 2-nate; pedicels 2-bracteolate. Calyx campanulate, 5-toothed. Corolla-tubes incurved, dilated above; upper lip broad, concave, erect, broadly 2-lobed; lower spreading, shortly acutely 3-lobed. Stamens 4, didynamous, shorter than the corolla, filaments flattened below; anther-cells divergent, margins bearded. Style filiform, stigma simple. Capsule ovoid, loculicidal, many-seeded, valves separating from the columnar placentaferous axis. Seeds linear, testa lax membranous reticulated.—Species 2, a Chinese and the following.

The supposed second species of Brandisia, alluded to in the "Genera Plantarum" as a native of Bhotan, has stellate tomentum, lanceolate leaves and a 2-lipped calyx, and cannot be congeneric. It may be a Wightia, but the specimens are far too imperfect for determination. The Chinese plant referred to B. discolor by Hance, differs in the broad calyx-lobes and corolla; it is B. Hansei, H. f.


PEGU, MARTABAN, and TENASSERIM, alt. 3–6000 ft., Brandis, Parish, Kurz. An evergreen half-scandent shrub. Leaves 2–3 in., firm, glabrous above, white- or fulvous-tomentose beneath with very prominent nerves, petiole ½ in. Pedicels longer than the petiole. Calyx ½ in. long, tomentose, 5-ribbed opposite the teeth. Corolla ½ in., dull purplish brown, tomentose. Capsule ovoid, acute, ½ in. long.

9. WIGHTIA, Wall.

A tree. Leaves opposite or alternate, quite entire, very coriaceous. Flowers in axillary thyrsi, large, rosy, pubescent. Calyx campanulate, irregularly 3–5-lobed. Corolla-tube incurved, upper lip erect, 2-lobed; lower spreading, 3-fid. Stamens 4, didynamous, ascending, exerted; anthers oblong, sagittate, cells parallel. Style long, tip incurved, stigma simple. Capsule oblong or ovoid, septicidal, many-seeded, valves long, separating from the placentaferous axis, which is 2-partite or entire. Seeds linear, ascending, nucleus slender, testa membranous broadly winged all round, albumen 0; embryo straight.—Species 3, a Javan, Bornean, and the following.

W. gigantea, Wall. Pl. As. Rar. i. 71, t. 81, and Cat. 2703; Benth. in DC. Prodr. x. 301; Gamble Cat. Darjeeling Pl. 58. Gmelina speciosa-sissima, Don Prodr. 104; Schauer in DC. Prodr. xi. 650.

CENTRAL AND WESTERN HIMALAYA; Nepal, Wallich; Sikkim, J. D. H., &c.; Bhotan, Griffith.—DISTRIBUT. Java (Herb. Horsfield).
A large tree, often half epiphytic, appressed to and grasping the boles of forest trees by roots given off from the trunk, which is sometimes a foot or more in diameter. Leaves 6–12 by 3–6 in., ovate lanceolate rounded or elliptic, acute or obtuse, glabrous above and finally beneath; base acute or rounded; nerves 4–6 pair, oblique; petiole 1–1½ in., stout. Thyrsi 4–5 in., erect, narrow; peduncle and rachis very stout; pedicels ½–1 in., 2-bracteolate in the middle, hoary-pubescent. Calyx short, ¼ in. long and broad, lobes rounded. Corolla 1 in. long, maily. Stamens far exserted. Capsule ovoid, thinly coriaceous, 1½ in. long by ½ in. broad; columnar axis entire.—The Javan species alluded to in the "Genera Plantarum" differs in the much longer and woody capsules with the columnar axis 2-partite.

**Tribe V. MANULEAE.**

10. **SUTERA**, Roth.


From Marwar, Dalzell, Banda, Edgeworth, Behar, J. D. H., and Bengal, Griffith, to the South Deccan, Heyne, but not common.—Distrib. Arabia, Egypt, Nubia.

Annual, branched from the base, branches 6–10 in. long. Leaves ½–¾ in., ovate in outline, shortly petioled, segments toothed and cut. Flowers axillary all along the branches, sessile or pedicelled, uppermost racemose. Calyx ½ in. long. Corolla nearly white, about twice as long, glabrous. Capsule exceeding the calyx.

**Tribe VI. GRATIOLEAE.**

11. **MINULUS**, L.

Erect prostrate or creeping herbs. Leaves opposite. Flowers solitary, axillary. Calyx tubular or campanulate, 5-angled, 5-toothed. Corolla 2-lipped, upper lip erect or reflexed, 2-lobed; lower spreading, 3-lobed; throat with usually a swollen 2-lobed palate. Stamens 4, didynamous; anther-cells divergent, subconfluent. Style slender, stigma 2-lamellate. Capsule compressed, loculicidal, valves separating from the placental column. Seeds numerous, minute, oblong.—Species 40, temperate and tropical.


Temperate Himalaya; from Nepal, Wall. to Bhutan, Griffith. Assam, on the banks of the Burrampootra, Griffith.—Distrib. Japan.

Stems straggling, 6–10 in. long, stout or slender, sometimes faintly hairy. Calyx
very variable in length, breadth, and the size of the teeth, which are always small. *Capsule* ovate-lanceolate, included.

**Var. 1;** leaves 1½ in., pedicels usually longer than the leaves, flowers ½ in. long, fruiting calyx straight.—Nepal, Sikkim, and Assam, alt. 1–6000 ft.

**Var. 2;** much larger, leaves 1–1½ in., pedicels shorter than the leaves, flowers 1–1½ in. long, calyx often curved. M. tenuiculus, *Bunge En. Pl. Chin.* 49 (Maxim. *t. c.*).—Sikkim, alt. 8–12,000 ft. —Possibly a different species, but intermediate forms occur. The calyx varies from ¼ in. long, obconic and straight, to ½ in. long subcylindric and curved with an oblique mouth. Miquel’s *M. nepalensis*, var. japonica, seems the same as this.


**Pegu and Tenasserim;** Wallich, *Griffith*, &c.
Stems rather thick, 6–10 in. Leaves 3–1 in. diam., rather fleshy, base rounded or subsessile; petiole ¼–½ in., very thick. Peduncles equaling the leaves or shorter, stout or slender. Calyx ¼ in., campanulate. Corolla ¾–2 in. Capsule ½ in., elliptic, acute at both ends; style stout, persistent.


**Western Himalaya;** from Kashmir to Kumaon, alt. 1–3000 ft. *Punjab Plains*. Bengal, at Rajmahal, Wallich.—Distrib. China, Australia, Tropical and S. Africa.
Stout, branched from the base, 6–12 in. high, branches erect. Leaves radical and canline, 1½–2½ in., rather fleshy, 4-ampeloxical, obtuse, blackish when dry. Peduncles longer than the leaves, stout. Calyx ¾ in. long, tubular, lobes very small rounded. Corolla ¾ in. long, white or pale blue. *Capsule* obvoid.

12. **MAZUS**, Lour.

Small herbs, often with runners. Leaves opposite below or rosulate, above opposite or alternate. Flowers small, in terminal subascend racemes; bracts and bracteoles minute or 0. Calyx campanulate, 5-fid. Corolla-tube short, upper lip erect, 2-fid; lower much larger, spreading, 3-fid; throat with a 2-lobed palate. Stamens 4, didynamous; anther-cells contiguous, diverging. Stigma 2-lamellate. Capsule included, globose or compressed, obtuse, loculicidal, valves entire. Seeds numerous, most minute, ovoid.—Species, 4 Asiatic and 1 Australian.


s 2
TEMPERATE and SUBLTROPICAL HIMALAYA, and Plains of Northern India; from Kashmir to Bhutan, ascending to 7000 ft. KHASIA MTS., alt. 4-6000 ft. BURMA, WALTICH. UPPER ASSAM, GRIFFITH. SOANE RIVER, J. D. H.—DISTRIB. Afghanistan, Java, China, Japan, Philippine Islds.

Annual, glabrous or sparsely hairy. Radical leaves numerous, 1-3 in. long, including the petiole, which is rarely as long as the blade, coarsely irregularly crenate-toothed. Flowering-stems numerous from the root, 2-10 in. long, leafless or with alternate spathulate leaves. Racemes 1-6 in., pedicels ½-4 in. Calyx in fruit ½-3 in. diam. Corolla ½-½ in. long, blue. Seeds exceedingly minute, pale.—Roxburgh's Columna tomentosa, referred here by Bentham, can hardly be this.

2. **M. surculosus**, Don Prodr. 86; runners rooting with opposite leaves, radical leaves obovate-spathulate coarsely crenate and often subpinnatifid at the base narrowed into a short petiole, pedicels mostly bracteate, calyx-lobes ⅓ as long as the tube short obtuse or subacute suberect in fruit. *Benth. in DC. Prodr.* x. 375; *Wall. Cat.* 3912; ? *Wight* Jc. t. 1467.

TEMPERATE HIMALAYA; from Khasawar to Bhutan, alt. 3-7000 ft. KHASIA MTS., alt. 4-5000 ft. ? NIEGHIRI MTS., SCHNIT, HOHENACKER, G. THOMSON. In its ordinary state very different from *M. rugosus* in the shorter racemes, the often pinnatifid leaf-bases, bracts and calyx; but small specimens of either are difficult to distinguish. The Nieghiri specimens are very small and dense, without runners or bracts, but they have the short-lobed calyx of *M. surculosus*; they may prove specifically different. The figure in Wight's Icones represents the calyx very incorrectly.

3. **M. dentatus**, Wall. Cat. 3914; runners 0, radical leaves long-petioled elliptic-oblong or ovate sinuate, pedicels bracteate, calyx-lobes ⅔ the length of the tube rounded ovate or triangular obtuse or acute suberect in fruit. *Benth. Scroth. Ind.* 27, and in *DC. Prodr.* x. 375.

TEMPERATE HIMALAYA; Kumaon, alt. 8000 ft., Strach. & Winterb.; Nepal, WALTICH; Sikkim, alt. 6-9000 ft., J. D. H., TREUTLER. KHASIA MTS.; Nunklow, alt. 5000 ft., *Simons*.

Glabrous or sparsely hairy. Rootstock perennial. Leaves 1-4 in., base acute rounded or subcordate; petiole ⅓-3 in. Flowering branches or racemes 3-6 in., erect or decumbent, slender, few-fld., leafless. Flowers distant, ⅓-1 in. long; pedicels ⅓-⅔ in.; bracts setaceous. Calyx ⅔-⅕ in. long, lobes sometimes longer and acute as in *M. rugosus*. Seeds twice as large as in *M. rugosus*, black.


ALPINE HIMALAYA and WESTERN TIBET; from Kashmir to Sikkim, alt. 11-16,000 ft., THOMSON, &c.

Rootstock slender, horizontal, creeping. Leaves rosalate, or opposite on a very short stem 1-4 in. high, 1-3¼ in. long, obtuse or subacute, narrowed into a ½-amplexicaul petiole ½-1 in. long, rather coriaceous, sometimes very obscurely toothed. Flowers
sunk amongst the leaves, pedicels very short, bracts lanceolate. Calyx-lobes acute. Corolla ½–1 in. long, blue, lower lip hairy within. Fruit the size of a pea, hardly fleshy. Seeds brown.

14. LINDENBERGIA, Lehm.

Annual or perennial herbs, woody below; branches erect, straggling or ascending. Leaves opposite or the upper alternate, toothed. Flowers axillary or spicate or racemose, bracteate, ebracteolate, yellow. Calyx campanulate, 5-fid. Corolla-tube cylindric; upper lip the outer, short, broad, notched or 2-fid; lower larger, 3-lobed, spreading, base with two plaits. Stamens 4, didynamous, included; anther-cells separate, stipitate, all with pollen. Capsule 2-grooved, loculicidal; valves entire, separating from the placentiferous axis. Seeds numerous, minute.—Species 8, African, Indian and Malayan.

1. L. grandiflora, Benth. Scroph. Ind. 22, and in DC. Prodr. x. 576; softly hairy, subscandent, leaves petioled ovate acuminate coarsely serrate, flowers secund in terminal lax-fld. spikes, calyx-lobes obtuse, ovary villous. Stemodia grandiflora, Ham. in Don Prodr. 89; Wall. Cat. 3924.

SOUTH TIBETAN HIMALAYA, alt. 2–6000 ft.; from Sirimore to Bhotsu, abundant.

Pegu, Kurz.

A rambling perennial, with flexuous stem and branches. Leaves 2–8 in., pubescent on both surfaces; nerves 6–8 pair; petiole ½–1½ in. Spikes 6–10 in., sometimes panicked; bracts 1–1½ in., ovate, sessile or shortly petioled; flowers 1 in. long, sessile or very shortly pedicelled. Corolla pubescent, tube 3 times as long as the calyx. Capsule ovoid, tip exerted.

2. L. Hookeri, Clarke mss.; glabrous except the inflorescence, subscandent, leaves petioled elliptic-lanceolate acuminate coarsely serrate, flowers secund in terminal lax-fld. spikes, calyx-lobes acute, ovary glabrous. Lindenbergia n. 3, Herb. Ind. Or. H.f. & T.

TROPICAL SIKHIM HIMALAYA; foot of the outer hills, alt. 3–4000 ft.; J. D. H., Clarke.

Habit of L. grandiflora, but more slender and nearly glabrous. Leaves 2–3 in., base cuneate; petiole ½–1½ in. Spikes 1–2 in., shortly peduncled, glandular, puberulous; bracts sessile, ovate, acute, about equaling the calyx; lower flowers sometimes shortly pedicelled. Calyx cleft to the middle, teeth triangular. Corolla 1 in. long, glabrous without, tube nearly straight, two to three times as long as the calyx; upper lip short, 2-fd.; lobes of lower rounded, crenate, densely pubescent within. Anther-cells sausage-shaped, quite separate, pendulous from the top of the filament.

3. L. philippensis, Benth. in DC. Prodr. x. 377; softly pubescent or villous above, stout, strict, erect, leaves ovate or ovate-lanceolate, toothed, flowers unilateral in rigid erect dense-fld. spikes or racemes, calyx longer than the bracts, lobes ovate-lanceolate acuminate, ovary villous. Stemodia philippensis, Cham. in Linnaea, iii. 5. Stemodia sp., Griff. Notul. iv. 99, and Jc. Pl. Asiatic. t. 421.

CHITTAGONG, Clarke. Pegu, Kurz. BURMA; common about pagodas, Griffith. TENASSERIM, Hafner, Lobb.—Distrib. Siam, China, Philippine Islands.

Stem 2–3 ft. Leaves 2–4 in., much produced below into a slender petiolo about half the length of the blade. Racemes or spikes 1 ft. and upwards; rachis very stout; flowers shortly pedicelled or not; bracts lanceolate. Calyx ½ in. long. Corolla ¼–½ in., pubescent. Capsule lanceolate, tip exerted.

Western Himalaya; on the foot-hills and plains below them, from the Punjab to Ondh, ascending to 4000 ft. *Martaran, Wallich.*—*Distrib.* Siam, China.

Perhaps only a variety of *L. philippensis*, but more glabrous, with shorter petioles.

5. **L. abyssinica**, Hochst. *in Herb.*; Benth. *in DC. Prodr.* x. 377; glandular-pubescent or villous, leaves broadly ovate coarsely crenate-toothed, flowers unilateral in lax terminal spikes, calyx shorter than the lower bracts, lobes ovate acute, ovary glabrous.

**Scinde**, amongst rocks, *Dalzell.*—*Distrib.* Arabia, Somali country, Abyssinia.

**Stem** rather slender, 11–18 in., branched. **Leaves** 1–1 1/2 in., and nearly as broad, hairy on both surfaces; petiole 1/4–1 in. **Spikes** 3–4 in.; lower bracts leafy, coarsely toothed. **Calyx** 1/2 in. **Corolla** 1/4 in. **Capsule** hardly exserted.


**Bhotan, Griffith** (*Kew Distrib.* 3882).

**Stem** apparently tall, slender, flexuous, clothed, as are the leaves beneath, petioles and rachis of the racemes, with soft silky appressed hairs. **Leaves** 4–6 by 1 1/4–2 in., pubescent above; petiole 1/4–1 in. **Racemes** numerous, 2–4 in.; rachis slender; pedicels very short. **Calyx** 1/4 in. long. **Corolla** twice as long, hairy. **Capsule** turgidly ovoid, tip exserted.—A very distinct species.


Northern India; from the Punjab and N. Scinde to the Concan, Bchar and Dacca, common on walls and banks, &c., ascending the Himalaya to 6000 feet.

**Stem** 12–18 in., often branched from the base; branches erect or ascending, stout or slender. **Leaves** very numerous and uniform up the stem and branches, 1 1/2 in. long; petiole usually very short. **Spikes** 2–6 in.; flowers and bracts crowded. **Calyx** 1/2 in. long. **Corolla** twice as long. **Capsule** glabrous below, hairy above.—The ovary is certainly hairy.


Throughout India, on walls and banks, ascending to 6000 ft. in the Himalaya;
from Jamu to the Nilgherries and Tenasserim; not seen from Ceylon or Malacca.—

DISTRIBUTION. Afghanistan, Burma.

Annual, 4–10 in. high, brittle. Stem sometimes simple with all the flowers solitary in the axils of large leaves, at others branched, the branches running out into leafy racemes. Leaves 1–1½ (rarely 2½) in. long, membranous; petiole ½–¾ in. Flowers shortly pedicelled. Calyx ½ in., lobes recurved. Corolla twice as long, sparsely hairy, yellow. Capsule hairy above the middle.

15. ADENOSMA, Br.

Annual, villous or glandular, aromatic herbs. Leaves opposite, rugose, crenulate. Flowers axillary or in leafy spikes racemes or heads, bracteolate or not. Sepals 5, sometimes very large in fruit. Corolla-tube cylindric; upper lip erect, entire or notched; lower spreading, 3-lobed, base not plaited. Stamens 4, didynamous, included; anther-cells separate, stipitate, one cell of all the anthers, or of the two anterior anthers only empty. Style dilated at the tip, winged below the entire or 2-lamellate stigma. Capsule ovoid ellipsoid or lanceolate, 2-grooved, loculicidal and septicidal, 4-valved. Seeds many, minute, reticulate.—Species 3 or 9, Asiatic, Malayan and Australian.

* Flowers axillary; outer fruiting sepals very large, cordate or ovate.

1. A. ovatum, Benth. in Gen. Pl. ii. 949; puberulous or glabrate, leaves ovate obtuse crenate-serrate, flowers axillary sessile, 3 outer sepals in fruit very large cordate, 2 inner very small lanceolate. Herpestis ovata, Benth. Scroph. Ind. 30, and in Wall. Cat. 3896. H. javanica, Blume Bijd. 748. Pterostigma ovatum, Benth. in DC. Prodr. x. 380; Miquel Fl. Ind. Bat. ii. 678.

MALAY PENINSULA; from Tenasserim, Griffith, to Malacca, Wallich.—DISTRIBUTION. Sumatra, Java, Borneo.

Branched from the base, black when dry; branches 6–18 in., often rooting below, ascending. Leaves 1–1½ in., base cuneate or subcordate; petiole ½ in. Fruitng sepals ¾–1 in., membranous, reticulate, pubescent; small equalling the lanceolate capsule.

2. A. subrepens, Benth. in Gen. Pl. ii. 949; sparingly hirsute, leaves ovate crenate, 3 outer sepals in fruit large ovate-lanceolate, 2 inner subulate. Pterostigma subrepens, Thwaites Enum. 426.

CEYLON; Pasoon Corle and Nana Welle-Galle, Champion, Thwaites.

Very near to A. ovatum, but a coarser, larger, more hirsute plant, with narrower fruiting sepals.

** Flowers racemose, spicate or capitulate; upper fruiting sepal lanceolate, not very large.


KHASIA MTS., alt. 0–4500 ft., Wallich, Clarke. CACHAR, Keenan. TENASSERIM, SINGAPORE, and MALACCA, Wallich, &c.—DISTRIB. Java, Borneo, Australia.

Stem 1–2 ft., strict. Leaves 1½–2½ in., base rounded or cordate; petiole ½–1 in. Corolla blue. Fruitng calyx ½ in. long; sepals variable in width.

Ceylon; south parts of the island, common. Stem 2-3 ft., rather slender. *Leaves* 2½-4 in., the petiole quite continuous from the blade and stem. Racemes numerous, lateral, ascending; pedicels ¼-½ in. Flowers yellow. *Fruiting calyx* ½-½ in.—Miquel refers *Vahl*’s *S. camphorata* to *A. corynoides*; but its yellow flowers and country both indicate its being *A. camphoratum*.

5. **A. malabaricum**, *Hook.* f.; densely glandular-tomentose, leaves subsessile oblong-ovate subacute serrate, flowers sessile in foliaceous elliptic entire bracts, upper fruiting sepal lanceolate, the others subulate-lanceolate.

**Malabar,** Wight. Stem 8-12 in., stout, sparingly branched, leafy throughout its length, the leaves gradually passing into bracts. *Leaves* 1 in., narrowed into a very short petiole, margin entire below the middle. *Bracts,* lower ⅔, upper ⅟₄ *Calyx* ⅟₄ in., a little longer than the capsule.


**Outer Lower Himalaya,** from *Kumaon* to *Sikkim*; Bengal and Assam to Malacca, Travancore and Ceylon; usually in rice-fields, absent in the plains of Western India.—**Distrib.** Malaya, Burma, China.

Stem 1-2 ft. *Leaves* often reflexed, 1-2 in., base cuneate; petiole hardly any. *Heads* or spikes ¾-4 in. long, involucrate by floral leaves. Flowers blue, densely packed; bracts linear, hardly exceeding the flowers. *Calyx* ½ in. long, villous with long hairs, ⅟₄ longer than the ovoid capsule.—The specific names of (*Erinus*) *bilabiatus,* Roxb., and (*Stemodia*) *capitata,* were published in the same year. I give the preference to Bentham, who placed the plant approximately in the right genus.

7. **A. microcephalum**, *Hook.* f.; slender, glandular-hairy, leaves small shortly petioloed ovate or elliptic subacute serrulate, flowers usually capitate, heads small axillary and peduncled or interruptedly spicate, sepals lanceolate subequal.

**Tenasserim,** Helfer; Moulmtein, Lobb.—**Distrib.** Cambodia.

Stem 6-10 in., erect, simple below, branched paniculately above. *Leaves* ⅘-⅞ in., base cuneate; petiole ⅘ in. *Heads* ¾-⅞ in. long, sometimes running out into spikes, and lower flowers sometimes solitary and axillary. *Flowers* blue; bracts small, slender. *Calyx* ⅛ in. long, ⅛ longer than the ellipsoid acute capsule.—Very near *A. capitatum,* but much smaller, more slender.


Burma; banks of the Irawaddi, Wallich.

This plant has not been found in the Wallichian Herbarium.
16. **STEMODIA**, Linn.

Character of *Adenosma*, but anther-cells all polleniferous. *Leaves* sometimes whorled. *Seeds* ellipsoid, terete, black or brown, most minute.—Species about 26, American, African, Asiatic and Australian.


From **Central India** and the Kona river throughout the **Deccan**.—**Distrib.** Afghanistan.

Erect, branched from the base, 6–18 in. high, aromatic; stem angular. *Leaves* 1–2 in., rarely ovate or obovate, sometimes very small throughout the plant; floral bracts shorter than the pedicels. *Flowers* very numerous, nearly ½ in. long, 2-bracteolate; pedicels equalling or exceeding the calyx. *Sepals* lanceolate, acute, half as long as the violet corolla. *Capsule* ¼–½ in. long, equalling the calyx, acuminate.

2. **S. serrata**, Benth. in *DC. Prodr.* x. 381; erect, viscidly pubescent, leaves sessile obovate-oblong acute serrulate, flowers subsessile axillary, corolla one-half longer than the calyx. *Sutera serrata*, Herb. *Hochstett.*

The **Congan**, Stocks, *Low*.—**Distrib.** Nubia, Upper Nile and Senegambia.

A robust leafy annual a foot high and under, usually densely branched from the base; stem obtusely 4-angled. *Leaves* ½–2 in., narrowed to the sessile base, entire below the middle. *Flowers* often in all the axils, smaller than in *S. viscosa*. *Capsule* linear-oblong.

17. **LIMNOPHILA**, Br.

Glabrous or pubescent often marsh or water plants, aromatic and with transparent dots. *Leaves* opposite or whorled, toothed, cut, or the submersed multifid. *Flowers* pedicelled or sessile, axillary, solitary or racemose or spicate, bracteolate or not. *Sepals* narrow, subequal or the posterior larger. *Corolla-tube* cylindrical, upper lip the outer in bud, suberect, entire or 2-fld; lower spreading, 3-fld, base not plaited. *Stamens* 4, didynamous, included; anther-cells usually separate and stipitate. *Style* deflexed at the tip, stigma shortly 2-lamellate. *Capsule* ovoid or oblong, septi- and loculi-cidal, valves bearing placentiferous septa. *Seeds* numerous, small, angular, truncate, reticulate.—Species about 25, African, Asiatic and Australian.

A very variable genus, the foliage and habit of the species depending upon the depth, &c., of the water in which they grow.

* Nerves of leaf pinnate, arching from the midrib. No whorled and pinnatifid or multifid leaves.

† *Flowers* sessile or subsessile (sometimes racemose in *L. diffusa*). *Leaves* opposite very rarely 3-nately whorled.

1. **L. Roxburghii**, G. Don *Gen. Syst.* iv. 543, not of Benth.; pubescent or glabrous, leaves all opposite petioled elliptic or ovate obtuse or subacute crenulate coriaceous punctate beneath, nerves strong, flowers axillary sessile in peduncled heads rarely solitary, calyx pubescent, lobes lanceolate finely acuminate not striate in fruit. *L. menthastrum*, Benth. in *DC. Prodr.* x.

Watery places in the plains of N. India, and outer Himalaya, ascending to 6000 ft., from Chamba to Mishmi; Assam, Bengal, Sylhet, Central India, and the Concan and Cireahs.—Distribute. Java, China, the Philippines, Pacific Islands.

Annual, aromatic; root creeping; stems many, 1-2 ft., stout; "nodes under water emitting many fibrous roots or multifid filiform leaves," Roxburgh. Leaves 2-3 in., often rugose, narrowed into a petiole of ½-1 in.; nerves many, stout. Flowers usually in axillary sessile or shortly peduncled heads. Corolla ½ in. long, pubescent, blue-purple, mouth yellow. Capsule ellipsoid.—Roxburgh's drawing identifies this plant with his Capraria gratissima. He quotes Rheede's Pola-tejira (ix. t. 78) for the same, but I have seen no specimens from Malabar, and Rheede makes no mention of the aromatic smell and taste, which he could not fail to have noticed if this plant had been under his observation.

2. L. balsamea, Bent. in DC. Prodr. x. 386; softly pubescent, leaves all opposite sessile elliptic subacute narrowed at the base obscurely crenulate punctate beneath, nerves slender, flowers axillary in shortly peduncled heads or spikes, calyx hissute, lobes lanceolate finely acuminate striate in fruit. Stemodia balsamea, Benth. Seroph. Ind. 23; Wall. Cat. 3928.

PEGU, M'Leodland. Tenasserim, Wallach; Mergui, Griffith.

Stem 1-2 ft., stout. Leaves 1-2 in., entire below the middle, nerves 3-5-pair. Corolla ½ in., twice as long as the calyx. Capsule broadly elliptic, obtuse.—L. villifera, Miquel, of Sumatra, is probably this.

3. L. conferta, Bent. in DC. Prodr. x. 387; erect or procumbent, glabrous except the indescence, leaves all opposite sessile or subpetioled oblong or elliptic-oblong obtuse crenate-serrate punctate beneath, base narrowed or subamplexical, nerves slender, flowers axillary or in short axillary heads spikes or cymes, calyx glabrate, segments lanceolate finely acuminate striate in fruit. Dalz. & Gibs. Bomb. Fl. 177. L. repens, Bent. l. c. 387. L. serrata, Benth. l. c. (the Burma plant only); Thwaites Enum. 215. L. punctata, Vahl Enum. i. 90, and Bonnaya punctata, G. Don Gen. Syst. iv. 558. Stemodia sessilis, Benth. Seroph. Ind. 23; Wall. Cat. 3389. S. tenuiflora, Benth. Seroph. Ind. 23; Wall. Cat. 3940. S. repens, Benth. in Wall. Cat. 3935. Gratiola lucida, Heyne.—? Rheede Hort. Mal. i. x. 78.

Marshes, from Assam, Bengal and Chittagong to Tenasserim and Burma; throughout the Deccan and Ceylon.

A very variable plant; in its larger state diffuse, 12-18 in. long, with subpetiolo leaves 1½ in. long, and often scape flowers; in its smaller (St. sessilis, Wall.) short, stout, with quite sessile oblong leaves ½ in. long, and crowded axillary flowers; in its smallest state (St. tenuiflora, Wall., and serrata, Bth.) erect or procumbent, with oblong sessile leaves ½ in. long and solitary axillary flowers. Between these there are all intermediates. Thwaites has reduced all to Gaudichaud's L. serrata, a Polynesian plant with solitary flower and sepals not striated.—Leaves very minutely punctate, entire below the middle, nerves few, faint. Corolla about ½ in. long. Capsule as in L. balsamea, but much smaller.—Heyne's Gratiola lucida, referred here by Bentham, is a small creeping form approaching L. micrantha.

4. L. diffusa, Benth. in DC. Prodr. x. 387, not of G. Don; erect or decumbent, pubescent, leaves all opposite peltiolo elliptic-ovate or oblong-lanceolate subacute crenate-serrate punctate beneath, nerves slender, flowers
in short axillary cymes or long spikes or racemes, calyx hirsute, lobes lanceolate finely acuminate striate in fruit. L. camphorata, Benth. in Wall. Cat. 3932, and Seroph. Ind. 24, not of Vahl. Stemodia cimicina, Benth. in Wall. Cat. 3933.

EASTERN BENGAL to CHITTAGONG, BURMA and TENASSERIM. TRAVANCORE, WIGHT. MALAYA, Hoehnacker.—DISTR. Sumatra.

Closely allied to S. conferta, but with pubescent more strongly nerved crenate-serrate leaves, and often racemose flowers.—Roxburgh's Capraria diffusa (Linmophila diffusa, G. Don) is Ebermeyera thyrsoides, Kurz in Journ. As. Soc. 1870.

5. L. micrantha, Benth. in DC. Prodr. x. 387; small, creeping, below, glabrous, leaves opposite small sessile entire or sub serrate, nerves very obscure, flowers axillary sub sessile, calyx 1 in. long glabrous, lobes subulate fruiting striate. Stemodia micrantha, Benth. Seroph. Ind. 23; Wall. Cat. 3936. Herpestis pygmaea, Griff. Notul. iv. 104.

Marshy places in BENGAL, ASSAM, SILHET, CHITTAGONG and TENASSERIM.—DISTR. Cochin-China.

Stem 3-6 in., stout, branching from the root. Leaves crowded, ½-1 in., punctate, thick, teeth few. Flowers ½-1 in. long, red-purple.—A very distinct little species.

†† Flowers pedicelled. Leaves all opposite.—See also 10, L. gratissimma; and 11, L. hirsuta.

6. L. laxa, Benth. in DC. Prodr. x. 388; stem 8-12 in. slender flaccid sparsely hairy, leaves all opposite sub sessile or petioled oblong-lanceolate obtuse subcrenate, nerves very slender, flowers solitary axillary, pedicels longer than the calyx, calyx hirsute, lobes subulate fruiting striate. Herpestis sp. 2, Griff. Notul. iv. 103.

TENASSERIM; at Mergui, Griffith; Tavoy, Parish. CEYLON, Walker.

Stem ascending, rooting at the lower nodes. Leaves ½-1 in., flaccid, narrowed into a short petiole.—Resembles a reduced form of L. hirsuta.


BENGAL; Serampore, Griffith. TENASSERIM; at Tavoy, Wallich.—DISTR. China.

A small stout species, with leaves rarely 1 in. long.

8. L. pulcherrima, Hook. f.; stem 4-6 in. pubescent, stout, erect or ascending; leaves all opposite sessile elliptic-oblanceate subcrenate, nerves obscure, flowers axillary solitary, pedicels shorter than the calyx fruiting erect, calyx ½ in. hirsute, lobes subulate acuminate fruiting striate. L. laxa, Benth. in DC. Prodr. x. 388, in part. L. villosa var. sumatranana, Miquel Pl. Ind. Bat. ii. 63. Herpestis pulcherrima, Griff. Notul. iv. 104.

BENGAL; at Comilla, Clarke. MALACCA, Griffith, Cuming. SINGAPORE, G. Thomson.—DISTR. Sumatra.

Very closely allied to L. laxa and L. erecta, differing from the former in the stout erect habit, and more sessile shorter leaves; and from the latter in the pubescence and the erect fruiting pedicels.
9. **L. pygmaea**, Hook. f.; glabrous, much branched, creeping, branches 4-6 in. divaricate, leaves all opposite sessile oblong-lanceolate acute sub-serrate, nerves very obscure, flowers axillary solitary, pedicels equaling or exceeding the calyx erect in fruit, calyx ½ in. hirsute, lobes subulate-lanceolate fruiting striate. Herpestis pygmaea, Griff. Notul. iv. 104. Stemodia diffusa, Benth. in Wall. Cat. 3937.

**Tenasserim**; at Tavoy, Gomes, Helfer; Mergui, Griffith. Malacca, Griffith, Cuming.

Very near to *L. laxa*, but much smaller, more glabrous, with leaves less than ½ in. long.

††† Leaves some or most 3-4-nately whorled, sometimes all opposite in *L. gratissima* and *hirzuta*.


Stem stout, simple, rarely branched above. Leaves 1½-2½ in., nerves few and faint. Racemes sometimes 1 foot long and paniculately branched, with the flowers whorled, at others few-fld., or flower solitary and axillary; pedicels ½-1 in., glandular; bracteoles minute. Calyx ½ in. long, glandular, fruiting hemispheric. Corolla ½ in. long. Capsule oblong, acute.—Blume’s *L. gratissima* is the typical form of this plant, *L. punctata* being a reduced state with solitary flowers in the axils.

11. **L. hirsuta**, Benth. in DC. Prodr. x. 388; erect, stem 6-18 in. hirsute rarely glabrate, leaves opposite or 3-4-nately whorled sessile or narrowed into a short petiole elliptic linear-oblong or subspathulate serrulate, nerves very obscure, flowers axillary solitary or cymose or panicled at the top of the stem, pedicels long or short, calyx hirsute, lobes lanceolate finely acuminate fruiting striate. Stemodia hirsuta, Heyne; Benth. Scroph. Ind. 24; Wall. Cat. 3930. Ambulia ebracteata, Herb. Ham.

**Wet places, from Assam to Chittagong and the Nicobar Islands. Deccan Peninsula, from the Concan southwards. Ceylon, common.—Distrib. Borneo, China.**

Best distinguished from *L. gratissima* by its pubescence, less racemose inflorescence, and more orbicular capsule. There are what appear to be glabrous states of it from Chota Nagpore (Rancho, alt. 2000 ft., Clarke) and Balaghat (Wight) with always opposite leaves.

12. **L. polyantha**, Kurz mss.; glandular-pubescent, stem slender 6-13 in., leaves 4-nately whorled ½-amplexicaul linear serrulate, nerves obscure, cymes terminal panicled, flowers very numerous small shortly pedicelled, calyx ½ in., lobes subulate fruiting not striate.

**Marshes. Sikkim Terai, Herb. Griffith; Siligoree, Clarke. Pegu, Kurz.**

A graceful species, conspicuous for the copious minute flowers in a subpyramidal inflorescence. Leaves ½-1½ in., all whorled except in starved forms. Peduncles and
** pedicels very slender; bracteoles nearly as long as the calyx. Corolla about \( \frac{1}{2} \) in. long. Capsule obovoid-oblong.

** Leaves with 3–5 parallel nerves running from the base to the tip, or pinnatifid or multifid.

† Flowers sessile or very shortly pedicellated.

13. **L. Helferi**, Hook. f.; glabrous, 4–6 in., stem or branches very slender ascending, leaves opposite and 3–4-nately whorled sessile linear obscurely serrulate, flowers minute very numerous in peduncled axillary cymes, pedicels shorter than the calyx and peduncles capillary; calyx \( \frac{1}{10} \) in. long, lobes subulate erect, fruiting very narrow striate.

TENASSENM, Helfer.

A very elegant little plant, the smallest flowered of any allied to L. polyantha, of which it is a glabrous miniature. Leaves \( \frac{1}{2}–\frac{3}{4} \) in. long. Pedicels rarely as long as the narrow calyx. Corolla \( \frac{1}{6}–\frac{1}{3} \) in. long. Capsule obovoid-oblong.

14. **L. hypericifolia**, Benth. in DC. Prodr. x. 386; glabrous, stem 1–2 ft. stout erect simple, leaves all opposite and entire 4-amplexicaul elliptic or ovate-oblong obtuse crenulate, flowers large sessile in the axis of opposite or alternate leafy bracts forming terminal and axillary sessile or peduncled spikes, calyx-lobes ovate acuminate, fruiting membranous not striate. Cybbanthera connata, Ham. in Don Prodr. 87. Herpestis connata, Spreng. Syst. cur. post. 284. Stemodia hypericifolia, Benth. Scroph. Ind. 23; Wall. Cat. 3964.


Stem rarely branched. Leaves all opposite in every specimen, \( \frac{1}{4}–\frac{3}{4} \) in., rather thick, minutely punctate beneath. Flowers \( \frac{3}{4} \) in. long, rose-purple, pedicels very rarely \( \frac{1}{3} \) in. Corolla twice as long as the calyx, purple, fruiting membranous. Capsule broadly elliptic.—I find no trace of pinnatifid or multifid leaves on any of the numerous specimens.

15. **L. cana**, Griff. Notul. iv. 98; stem 6–10 in. very stout hirsute, leaves 3–6-nately whorled sessile upper elliptic or linear-oblong obtuse serrulate 3–5-nerved, lower pinnatifid, flowers sessile crowded in terminal rarely axillary erect leafy spikes with opposite or whorled bracts, calyx-tubes subulate.

East Bengal, in the Jheels, Griffith, J. D. H. & T. T.; Dacca and Pubna, Clarke.

Stem extensively creeping, sending up erect simple branches. Leaves \( \frac{3}{4}–1 \) by \( \frac{1}{4} \) in., thick, gradually passing upwards into the bracts which are almost imbricate. Flowers quite sessile, violet. Calyx \( \frac{1}{4} \) in. long, fruiting not seen.—I have referred this very distinct species to Griffith’s L. cana at Mr. Clarke’s suggestion; from the habitat and other characters it may be the true plant, but I have seen no specimens from Griffith, who describes the leaves as 3-nately whorled and the flowers as furnished with 2 most minute tooth-like bracteoles, which latter I do not find. It should be sought for at Jamalpore, Griffith’s locality.

Flooded grounds in the S. Deccan, Bottler, &c.

Stem 1-2 ft. long, slender, erect or ascending from the long floating portion which is densely clothed with the dissected leaves. Leaves, upper ½-1½ in., from narrow linear to oblong, 3-5-nerved; in small specimens 4-8 in. high all the leaves are pinnatisect. Spikes sometimes divaricatingly branched, 2-6 in. long; bracts ovate, usually shorter than the flowers. Calyx ½ in., quite glabrous, fruiting hemispheric; lobes ovate, acuminate, not striate. Corolla much longer than the calyx, white. Capsule globose, as long as the calyx.

17. L. sessiliflora, Blume Bijd. 750; stem 4-8 in. slender hirsute above rarely glabrate, leaves 3-6 in a whorl all lobulate or pinnatisect or the uppermost very rarely opposite and entire, flowers axillary solitary sessile or very shortly pedicelled, fruiting calyx hemispheric membranous not striate, lobes ovate long-acuminate. Benth. Scroph. Ind. 25, and in DC. Prodr. x. 389; Miquel Fl. Ind. Bat. ii. 653; Wall. Cat. 3902. Hottonia sessiliflora, Vahl Symb. ii. 36.


Leaves rarely more than ½ in. long, irregularly pinnatifidly gashed or pinnatisect, but not capillaceo-multifid, or rarely so. Sepals with long points. Corolla ½ in. long. Capsule orbicular, turgid, ½ in. diam.—This strongly resembles a sessile-flowered form of L. gratioloides, or a short pubescent form of L. heterophylla wanting the multifid submerged leaves. Bentham's L. gratioloides var. myriophylloides seems more akin to this; it is a Ceylon plant with tufted creeping stems and roots, erect rigid branches 4-8 in. high, densely clothed with whorls of short capillaceo-multifid rigid leaves, giving a cylindrical form to the branches, which are ½-1 in. diam. The flowers are sessile or pedicelled in the upper axils. The uppermost leaves are sometimes entire.

18. L. heterophylla, Benth. Scroph. Ind. 25, and in DC. Prodr. x. 390; glabrous, stem elongate slender, uppermost leaves usually opposite small sessile amplexical oblong crenulate, those next below 4-6 in a whorl pinnatifid, the submerged long capillaceo-multifid, flowers axillary solitary sessile or subsessile, or the uppermost in a short leafy spike, fruiting calyx hemispheric membranous not striate, lobes ovate shortly acuminate. Wall. Cat. 3905; Griff. Notul. iv. 97, and Ic. Fl. Asiat. 416, f. 2. L. Roxburghii, var. tenior, Plant. Hohenack. 679, not of Don. Columnea heterophylla, Roxb. Fl. Ind. iii. 97.

Throughout India and Ceylon, in rice-fields and swamps.—Distrib. Borneo, Japan, China.

The much larger size, glabrous stem, abundant multifid leaves, frequent presence of upper opposite and alternate small entire floral leaves, and the shortly acuminate calyx-lobes distinguish this from L. sessiliflora, but there are a good many specimens which in a dried state may be referred to either.

Var. reflexa; very slender, submerged leaves short ½ in. very finely divided, lower pedicels longer than the calyx recurved in fruit. L. reflexa, Benth. Scroph. Ind. 25, and in DC. l. c. 389; Wall. Cat. 3904.—Tavoy, Wallisch; Malacca, Cuming.

19. L. tillaeoides, Hook. f.; very small, 2-4 in. high, quite glabrous, leaves all whorled ½-¾ in. long upper pinnatifid lower multifid, flowers numerous axillary solitary, pedicels shorter than the calyx recurved in fruit, calyx not striate in fruit, lobes short triangular acute.

Assam; banks of the Kullung river, Simons.

A small loosely tufted species, stem and branches slender but rigid, with the whorls of leaves rather distant. Upper flowers sessile, lower pedicelled. Corolla ½-¾ in.
long. *Calyx* hemispheric in fruit, membranous. *Capsule* broadly oblong, nearly as long as the *calyx*.—A very singular little species.

†† Flowers pedicelled, pedicels usually longer than the *calyx*.


*Stem* hirsute or glabrous. *Leaves* 1½–2 by ½–¾ in. most minutely punctate beneath, nerves strong. *Racemes* 2–6 in., strict; pedicels ½–¾ in., much longer than the bracts. *Calyx* ½ in.; lobes with slender points, fruiting membranous. *Corolla* ¾ in. diam., ½–¾ in., bluish or purple, fragrant. *Capsule* almost globose.—The upper part of this resembles *L. hypericifolia* with pedicelled flowers; some states are with difficulty distinguished from *C. heterophyllis*, and small ones from *L. gratioloides*.


Throughout India, in swamps, rice-fields, &c.—*Distrin. Beluchistan, Malayan Islands, China, Australia, Tropical Africa*.

In its most common form a simple or branched plant 4–8 in. high, smelling of turpentine, with whorled pinnatifid leaves, ½–¾ in. long, which in wetter places appear to acquire a few emersed opposite entire leaves at the top of the stem, and numerous capillaceo-multifid ones at its base. The stems are stout or slender. Very small specimens from Rohilkund (Kuttra, *Edgeworth*) have very fine wiry simple stems 3 in. high, and capillary peduncles three times as long as the leaves; others have stout stems and peduncles, the latter shorter than the leaves. *Calyx* ½–¾ in. long, rarely larger. *Corolla* ½ in.—Large specimens of var. *intermedia* approach *L. racemosa*; short-pedicelled ones are hardly distinguishable from *L. sessiliflora*; and the var. *elongata* is almost identical with *L. heterophyllis*. Bentham's var. *myriophylloides* does not seem to distinguishable from the common form of *gratioloides*.

**Var. intermedia**; stem robust, leaves all close-set, flowers sometimes racemose with opposite entire bracteal leaves.—N.W. India; Moradabad, Thomson; Garwhal, *Strackey & Winterb.* (L. Roxburghii in *Herb.*); Subsiwalla, *Edgeworth*; Kangra and Dharamsala, alt. 3–4000 ft., *Clarke*. (Beluchistan, Stocks).

**Var. elongata**, Benth. in *DC.* l. c.; stem very long, upper leaves opposite entire, submerged capillaceo-multifid. *L. elongata*, *Benth. in Wall. Cat.* 3900.—*Oude, Wallich*; Moradabad, Thomson; Deccan, *Heyne*, &c.

22. **L. Griffithii**, *Hook.* f.; glabrous, stems densely tufted, branches

MALACCA, Cuming, Griffith, Maingay.
A small black densely tufted herb, with creeping tufted stems that send down long rigid roots, and up short stout and stiff or slender flaccid branches. Leaves about 1 in. long, usually densely imbricate. Pedicels ½ in. and less, slender. Calyx ⅞-⅞⅞ in. long, fruiting not seen. Corolla ½ in. long.—This may, as Griffith supposed, be referable to L. sessiliflora, as some of the specimens have pedicels shorter than the leaves, but its habit is very singular, it is of remarkably small size, and the specimens from all three collectors agree. It closely resembles a West African white-flowered plant found near Nufa on the Niger by Barter.

DOUBTFUL SPECIES.
L. HYSSOPIFOLIA, Roth Nov. Sp. 297; is not determinable; it is a Peninsular species, and possibly L. gratissima or racemosa.

18. HERPESTIS, Gaertn. f.
Glabrous, often punctate herbs. Leaves entire, or toothed, or submersed and multifid. Flowers axillary or racemose, yellow blue or white; pedicels bracteolate or not. Sepals 5, upper often very large. Corolla-tube cylindrical; lips spreading, upper the outer in bud, notched or 2-lobed; lower 3-lobed. Stamens didymous, included; anther-cells contiguous, distinct. Style dilated at the top and 2-lobed or entire. Capsule 2-grooved; valves 2 or 4, separating from an entire column. Seeds numerons, very minute.
—Species about 50, all warm countries.

The Indian species all belong to the section Brania, with subequal corolla-lobes and stamens, sagittate or didymous anthers, and capitate 2-lobed stigmas.

Marshes throughout India, ascending to 4000 ft.; from the Punjab to Ceylon and Singapore, common.—Distrib. All warm countries.

Quite glabrous, rather succulent; branches 4-10 in. long. Leaves ⅛-⅛ in., sessile, obtuse, entire in the Indian plant, nerves very obscure. Peduncles usually longer than the leaves. Calyx ⅛-⅛ in. long. Corolla twice as long, lobes subequal. Capsule included. Seeds pale, irregular.—Mr. Clarke points out to me that the Calytrix obvata, R. & P. of Peru, cited as a synonym of H. Monniera in De Candolle's Prodromus, is, according to the figure of the authors (overlooked by Bentham), a very different plant.

Wet places in northern India; from the Punjab, ascending to 3000 ft., Malwa and the Concan, to Bengal, Assam and Sind.—DistriB. Senegal.

Quite glabrous. Stem a short span high, usually very stout and much branched. Leaves 1-1 in., nerves very obscure. Calyx ½ in. Corolla-tube hardly exceeding the calyx.


DecnoN Peninsula; common in wet places from the Concan southwards, and Ceylon.—DistriB. Java, Australia, Tropical Africa.

Nearly glabrous. Stem a span high and upwards, more slender than in H. Hamiltoniana. Leaves ½-1 in., sometimes linear, at others contracted into a petiole. Peduncles about equaling the calyx, very slender, 2-bracteolate below the top, puberulous, as are the reticulate sepals.

19. Gratiola, Linn.

Glabrous or glandular-pubescent herbs. Leaves opposite, entire or toothed. Flowers axillary, solitary, 2-bracteolate. Sepals 5, subequal. Corolla-tube cylindric; lips spreading, posterior the outer entire or 2-fid; anterior 3-fid. Stamens, 2 posterior perfect included, anther-cells distinct; staminodes 2, filiform or 0. Style filiform, stigma deflexed dilated or 2-lamellate. Capsule ovoid, loculi- and septicidal; valves separating from the placenta.-Species about 20, chiefly of temperate regions.

1. G. Griffithii, Hook. f.; glabrous, succulent, erect, leaves elliptic-oblong obtuse 3-nerved entire, flowers sessile diandrous, staminodes 0, capsule glabrous.

Upper Assam, on moist banks; Gabo, Nam Senna and Noa Debing, Griffith (Kew Distrib. 3915), Simons.

Very succulent, branched from the base, 6-10 in. high; branches erect. Leaves ¼-½ in., sometimes obscurely sinuate, most minutely punctate; nerves very slender. Flowers minute. Corolla ¼ in., yellow, tube scarcely exceeding the linear-oblong sepals; lobes short, rounded. Anther-cells parallel, shortly oblong. Capsule ½ in. diam., membranous. Seeds cancellate.—A very interesting plant, as being the only tropical Asiatic representative of the genus.

Unknown Species.

G. Chamedrys and G. Strigosus, Both Nov. Sp. 10, two Peninsular plants of Heyne, are unrecognizable from the descriptions, and no doubt well-known species of other genera.

G. Chamedrifolla, Lamk. Dict. iii. 27 (Limnophila chamedrifolia, G. Don Gen. Syst. 343, is doubtfully referred by Miguel (Fl. Ind. Bat. ii. 682) to Limnophila gratissima Bl. (under L. punctata Bl.), of which it may be a small state.


Very slender glabrous marsh annuals. Leaves few, opposite, lower small, upper pairs remote and minute. Flowers small, violet, axillary, solitary; pedicels 0 or filiform, bracteolate. Calyx 5-fid. Corolla-tube slender below, throat broad; upper lip the outer, short, 2-fid; lower broad, spreading, 3-lobed. Stamens, 2 upper perfect, included; anther-cells parallel, distinct, vol. IV.
equal; staminodes 2, minute. Style short, stigma 2-lamellate. Capsule small, globose or oblong, loculicidal, valves placentaferous. Seeds numerous, very minute, tubercled.—Species 5, African, Asiatic and Australian.


**South Deccan**; Heyne, &c. **Ceylon**; not uncommon.—**Distrib.** Java, Philippine Islands.

Stem simple or branched from the base. Leaves, radical 0, or very few, ½–1 in. long, oblong, obtuse; cauleine few, minute. Corolla ½ in. long. Capsule ½ in.


Throughout **India** from the Upper Gangetic plain southwards and eastwards to Assam, Burma, and **Ceylon**.—**Distrib.** Malay Islands, China, Japan, Philippines, Australia.

Rather fleshy, branched from the base. Leaves, radical 0 or few, oblong, obtuse, sometimes 2 in. long, nerves parallel; cauleine smaller, in distant pairs. Flowers in very distant pairs, rose coloured, sessile or on capillary pedicels ¼–½ in. erect in fruit. Capsule ½ in. diam.

3. **D. lobelioides**, *Benth. Scroph. Ind. 31*, and in DC. Prodr. x. 407; stem 6–18 in., bracts minute obscure, calyx-lobes very short obtuse, corolla ½ in., capsule globose. Wight Ic. t. 858. Gratiola lobelioides, Retz Obs. iv. 7; Roxb. Fl. Ind. i. 142; Wall. Cat. 3893. G. hyssopioides, Roxb. Cor. Pl. ii. t. 128, and Fl. Ind. i. 141, and Ed. Wall. & Carey, i. 142 (not of Cor. Pl. iii. t. 203).

**South Deccan**, Heyne, &c. **Ceylon**.

Stem stout and fleshy below, sometimes as thick as a goose-quill above and branches very slender. Leaves, lower 2–4 pairs obovate-oblong, obtuse, ½–2 in. long, upper very few distant and small; nerves parallel, very obscure. Flowers subracemose, in distant pairs; pedicels capillary, ¼–1 in., spreading in fruit. Capsule ½ in. diam.


Erect herbs, angles of stems and leaves above scabrid. Leaves opposite, entire or serrate. Flowers large, blue, racemose, abraceteolate; bracts foliaceous. Sepals 5, acuminate, bare, much dilated. Corolla-tube long, broad; upper lip the outer, erect, broad, notched; lower spreading, 3-fid. Stamens 4, didynamous, 2 posterior short, included; 2 anterior with long arching filaments dilated at the base; cells confluent at their tips. Stigma 2-lamellate. Capsule globose, septicial; valves entire, separating from the placentaferous axis. Seeds rugose.—Species 4, tropical Asiatic, Australian and African.

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23. TORENIA, Linn.

Glabrous or pubescent herbs. Leaves opposite, entire crenate or serrate. Flowers axillary or in terminal or pseudo-axillary umbels or racemes; pedicels ebracteolate. Calyx tubular, 3–5-winged or plaited or keeled, 2-lipped, or 3–5-toothed. Corolla-tube cylindric, dilated above; upper lip erect, concave, notched or 2-fld.; lower larger, spreading, 3-lobed. Stamens, 4 perfect, 2 upper included, 2 lower appendaged at the base and conniving under the upper lip; anthers touching or cohering in pairs, cells often confluent. Stigma 2-lamellate. Capsule linear or oblong, included, septicidal; valves separating from the flat placentiferous axis. Seeds numerous, rugose.
or cancellate.—Species 20, tropical Asiatic and African, one of them also American.

The species 4 to 8 are imperfectly characterized, and are very difficult of discrimination in the dried state.

Sect. I. Tridens. Fruiting calyx suborbicular, broadly winged.


A slender straggling herb, branches 6–10 in. Corolla ½ in. diam., white and red. Fruiting calyx ¾ in. long, as long as the pedicel. Capsule ovate-lanceolate.

2. T. mucronulata, Benth. in DC. Prodr. x. 409; creeping, pubescent, leaves petioled ½ in. ovate acute serrate, peduncles axillary 1-4-fid. Tenasserim; at Mergui, Griffith. Very similar indeed to T. polygonoides, but pubescent, with rather larger leaves.

Sect. II. Nortenia. Calyx oblong ellipsoid or linear-oblong, fruiting keeled or winged (often corolate in outline in T. cordifolia).

* Flowers axillary, solitary or 2-nate, or subumbellate at the ends of the branches.

3. T. cordifolia, Roxb. Cor. Pl. ii. 52, f. 161, and Fl. Ind. iii. 95; suberect, sparsely hairy, leaves petioled ovate serrate, pedicels axillary and subumbellate fruiting slender, fruiting calyx ½ in. ovoid or oblong winged, base rounded or corolate not decurrent, corolla ½ in. long pale blue, lower filaments toothless. Benth. Scroph. Ind. 39, and in DC. Prodr. x. 409, in part; Bot. Mag. t. 3715; Dalz. & Gibs. Bomb. Fl. 180.

Western Himalaya; from Simla to Kumaon, ascending to 6000 ft. Central India, Behar, on Parvath. The Circars, the Concan, Pegu and Tenasserim.—Distrib. Java, China.

Annual, nearly glabrous, 4–8 in. high, usually erect and trichotomously branched from the base; stem and branches almost 4-winged. Leaves 1–1½ in. glabrous; base cuneate very rarely corolate, petiole rarely as long as the blade. Pedicels often longer than the leaves.—Clarke remarks that Bentham describes the filaments as toothed, but that he has never found them so, and that Rixburgh's figure represents them as toothless. Rheed's Hort. Mal. i. t. 68, must be a very different plant. Wight's T. cordifolia from Courtallam with long decumbent stems 12–15 in. long, short petioles, and long axillary pedicels seems hardly the same species, but I cannot satisfactorily identify it with any other.


Central and Eastern Himalaya; Nepal, Hamilton; Sikkim, ascending to 7000 ft. Khasia Mts., Assam and Silhet; Penang, Schomburgk.—Distrib. Java, Philippine Islands.
Closely resembles a large state of *T. cordifolia* in habit and foliage, but the calyx is longer and narrower, with the wings produced on the pedicel, never ciliate at the base, and the capsule is longer and narrower. The plate in *Bot. Mag.* is very characteristic. Hamilton's *T. alba* is, I assume, a white-fld. variety.


**Western Peninsula; Nilgherry Mts., Wight, &c. Tenasserim; at Mergui, Griffith. Ceylon, abundant.—Distibta. Java, China.**

Diffusely branched; branches 6-10 in. long, slender. Leaves ½-2 in., larger and usually more acuminate than in the allied species; petiole rarely more than ½ in. Fruitling calyx narrowly winged or keeled.

*Var. hisrita*; more pubescent, lower filaments with a very small tooth. *T. hisrita*, *Benth.* *in DC.* *Prodr.* x. 410; *Bot.* *Mag.* t. 5167. *T. cordifolia, Benth.* *in Wall.* *Cat.* 3954, *not of* *Rosb.* *? Lamb.* *iii.* t. 523, f. 2.—*Nilgherry Mts.*


*Var. ? purifolia; leaves much smaller longer petioled less acuminate, petiole often as long as the blade. T. asiatica, Thwaites Enum. 219.—Nilgherry Mts. and Ceylon. This closely resembles *T. bicolor* in habit and foliage, and is, I suspect, specifically distinct from *T. asiatica.*


**Central and Eastern Himalaya; Nepal, Wallach; Sikkim, ascending to 4000 ft. Assam and Khasia Mts., common; Chittagong, Clarke. Nilgherries; Concor, alt. 5000 ft., Clarke.—Distibta. China.**

Except by the usually more diffuse habit, the not winged and the always toothed longer filaments, I do not see how this can well be distinguished from *T. peduncularis.* The flowers are much smaller than in *T. asiatica* and of a more uniform blue, and the leaves also are smaller. I cannot distinguish *T. rubens* as a variety; the characters assigned to it are the short obtuse tooth of the longer filaments, and often red tips to the calyx teeth.


**Nilgherry Mts., Hohenacker. Ceylon; Gardner, &c., ascending to 2000 ft.**

A very distinct species, at once recognizable by the very slender habit and small very shortly petioled leaves. The corolla is small, with short lobes. Thwaites suspects
that this is only a form of *T. asiatica*; if so, they are united by var. *parvifolia* of the latter.


This again, though difficult to define by words, appears to be a very distinct species with the small leaves and spreading habit of *T. asiatica* var. *parvifolia*, the petiole being often as long as the blade. The fruiting pedicels are much thickened, and the calyx is very narrow.—A drawing from Stock's collection represents the flowers as red-purple, but they are described in the Bombay Flora as deep violet with a white under lip.

9. **T. parviflora**, Ham. in Wall. Cat. 3958; glabrous, erect or diffuse, branching from the base, leaves all petioled ½-1 in. ovate or ovate-lanceolate acute axillary saccate, pedicels axillary 2-4 at the nodes shorter than the leaves fruiting thickened, fruiting calyx ½ in. narrowly oblong-lanceolate keeled not winged, corolla ½-⅞ in. blue, longer filaments minutely toothed. Benthi. Scroph. Ind. 39, and in DC Prodr. x. 410; Miquel Fl. Ind. Bat. ii. 689; Schmidt in Mort. Fl. Bras. Fusc. xxx. 322, t. 56, f. 1. ?Peristeira dichotoma, Griff. Notul. iv. 119. Notoreia Thomasii, Cham. & Schl. in Linnae., iii. 18.

**Assam, Masters.** Khasia Mts., ascending to 4000 ft., J. D. H. & T. T. Tenasserim; at Tavoy and Moulmein, Wallich, &c.—**Distr.** Java, China, Tropical Africa and America.

Annual, three to eight inches high; branches often decumbent below, and rooting at the nodes. Leaves abruptly narrowed into a petiole ½-1 in. long. Pedicels sometimes very short, erect or spreading.—This has the short pedicels of *T. ciliata* and *flava*.

**Flowers axillary and racemose at the ends of the branches.**

10. **T. flava**, Ham. in Wall. Cat. 3957 A. B.; erect or decumbent, sparsely patently hairy or glabrous, leaves sessile or petioiled ovate or oblong-ovate obtuse entire or crenate, pedicels usually shorter than the calyx fruiting thickened, flowers axillary and in distant pairs, fruiting calyx ⅞-⅞ in. elliptic-lanceolate keeled not winged deeply channelled, corolla ¾-1½ in. yellow, longer filaments minutely toothed. Benthi. Scroph. Ind. 38, and in DC Prodr. x. 414; Miquel Fl. Ind. Bat. ii. 689; Bot. Mag. t. 6700. T. Bailoni, Godfr. in Ill. Hortic. xxv. t. 324; E. Morren in Belgique Hortic. xxix. t. 1, f. 2. Peristeira racemosa, Griff. Notul. iv. 120. Mimulus hirsutus, Blume Bijd. 756.


**Stem** usually robust and branched from the base, 6-10 in. high, and branches strict. Leaves 1-1½ in., narrowed into the petiole. Corolla yellow, ¾-⅞ in., with a purple eye.—In cultivation the stem becomes decumbent and rooting, the flowers axillary and solitary, and the corolla large (see Bot. Mag. t. 6700).

11. **T. ciliata**, Smith in Rees' Cyclop. v. 36; erect, patently hairy, leaves sessile or petioled ovate or oblong-ovate obtuse entire or crenate,

Very similar to T. flava, but the fruiting calyx is winged, and the corolla blue.

DOUBTFUL SPECIES.

T. EDENTULA, Griffith in Madr. Jour. Sc. iv. 4. "Suberect, softly hirsute, leaves petioled ovate-cordate subrugose, flowers pseudo-axillary fascicled and racemose, corolla usually pale blue with yellow spots."—Upper Assam at Suddya, Griffith. Bentham (in DC. Prodr.) refers his T. peduncularis (Scroph. Ind.) to this, but Griffith’s character of softly hirsute is irreconcilable. It may be Vandelia mollis.

TOREnia.—Tresteira lanceolata, Griffith. Notul. iv. 111, t. 458, f. 6, from Mergui, with terete pubescent stems suffrutescent below, is undeterminable.

24. VANDELLIA, Linn.

Herbs, usually annual, glabrous or pubescent. Leaves opposite, often toothed, penninerved (except in V. erecta). Flowers small, axillary or racemose; pedicels ebracteolate. Sepals 5, free or connate in a subcampanulate calyx, angles not winged. Corolla-tube cylindric; upper lip erect, broad, concave, notched or bifid; lower broader, spreading, 3-lobed. Stamens 4, all perfect (except V. molluginoides); 2 posterior usually included; 2 anterior with arched filaments appended at or towards the base; anthers touching or cohering in pairs under the upper lip, cells divericate. Stigma 2-lamellate. Capsule septicidal, valves separating from the placental septum. Seeds rugose.—Species about 30, chiefly tropical Asiatic.

* Capsule about equalling the calyx in length, or shorter.

† Calyx in flower 5-cleft to the middle or above it.


Throughout India and Ceylon, a weed.—DISTR. Tropics of the Old World; rare (introduced ?) into the New.

Stem excessively triebotomously branched from the root, 4–18 in. high. Leaves ¼–1 in., entire or serrate. Pedicels ¼–1½ in., slender, strict. Calyx ½ in. long in flower, ⅓ in fruit.—The citation of Roxburgh’s Gratiola lucida is doubtful; if correct, Roxburgh’s figure of the filaments, where the appendages are omitted, is faulty.

2. V. molluginoides, Benth. Scroph. Ind. 35, and in DC. Prodr.
x. 413; glabrous, except the ciliate leaf-axils and calyx, leaves subsessile
ovate-lanceolate or oblong base cuneate or rounded margins scabrid, pedicels
rigid umbellately fascicled rather longer than the calyx which is 5-cleft
to the middle in flower, sepals free in fruit longer than the ovate-oblong
capsule. Torenia molluginoides, Benth. in Wall. Cat. 3960.

BURMA; Mts. of Prome, Wallich. Pegu, Kurz. Tenasserim; at Moulmein,
Lobb, Parish.

A slender laxly branched herb, 1-1½ foot high, with the habit of a Mollugo or
Holosteum. Leaves ½ in. long, margin thickened, obsolesly crenate. Pedicels
often deflexed in fruit. Calyx ½ in. long in fruit. Longer filaments with a very
short obtuse tooth, according to Bentham.—In Moulmein specimens I find 2 perfect
stamens, and 2 filiform staminodes hooked near the top.

3. V. Hookeri, Clarke mss.; diffusely branched, softly hairy all over,
leaves sessile or petioled ovate or lanceolate serrate, pedicels axillary and
subumbellate at the ends of the branches about as long as the calyx which is
5-cleft to the middle in flower, sepals free or not in fruit hispidly hairy
much longer than the oblong capsule.—Torenia, n. 10 Herb. H. f. & T.

Sikkim Tera; at Siligoree, Clarke. Khasia Mts.; in cultivated fields at
Pomrang, &c., J. D. H. & T. T. Pegu, Kurz. Behar; at Parasnath, Thomson,
Clarke.

 Branched from the base; the branches divaricate and do not root, are rather
robust, 4-8 in. high. Leaves ½-1 in. hairy on both surfaces. Pedicels spreading.
Calyx ½ in. long. Corolla blue-purple.—Very near V. molluginoides, but larger,
with much larger flowers, and leaves with margins not thickened.

† Sepals in flower free to the base or nearly so.

4. V. elata, Benth. Scroph. Ind. 36, and in DC. Prodr. x. 414;
slender, suberect or diffuse, glabrous or sparingly hairy, leaves petioled
ovate coarsely crenate-toothed, flowers racemose, sepals narrowly lanceolate
squarely the broadly oblong capsule. Tittmannia elata, Benth. in Wall.
Cat. 3944.

Tenasserim; at Tavoy, Gomes; Moulmein, Lobb, Helfer.

Stem simple or 3-chotomously branched, 6-10 in. high. Leaves ½ in.; petiole
half as long. Pedicels 2-3 times as long as the fruiting sepals, spreading or deflexed,
lower with leafy upper with small lanceolate bracts. Calyx ½ in. long, fruiting ½ in.
Corolla very minute, hardly exceeding the calyx.

5. V. multiflora, G. Don Gen. Syst. iv. 549; erect, succulent, glabrous,
leaves sessile or narrowed into a petiole oblong or ovate-oblong or obovate
obtuse entire or subulate, flowers racemcd, pedicels exceeding the calyx, sepals
lanceolate shorter than the orbicular capsule. Benth. in DC. Prodr. x. 414.
Ind. iii. 96. Tittmannia trichotoma, Benth. in Wall. Cat. 3943.

Plains of Bengal, not uncommon.

Stem trichotomously branched, 4-6 in. Leaves in few pairs, 1-2 in., sometimes
spathulate. Racemes usually many-fld.; flowers minute. Calyx ½ in. long, fruiting
½ in. 

6. V. hirsuta, Benth. Scroph. Ind. 36, and in DC. Prodr. x. 414;
erect, succulent, sparsely clothed with spreading hairs, lower leaves petioled
ovate or oblong obtuse entire or subulate upper sessile broader, flowers
racemcd, pedicels exceeding the calyx, sepals lanceolate longer than the
Or. H. f. & T. in part. Tittmannia ovata, Benth. in Wall. Cat. 3942. T. vis-
CIII. SCROPHULARINEAE.  (J. D. Hooker.)

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Vandellia.]


EASTERN AND SOUTHERN INDIA; from Bengal and Sikkim to Ava, and throughout the Deccan Peninsula. CEYLON, near Korngalle, Thwaites.—DISTRIBUT. JAVA, Borneo, China, Philippine Islands.

Very similar in habit, foliage and inflorescence to V. multiflora, but always hairy. Corolla blueish white, according to Griffith.


TROPICAL INDIA, and in CEYLON; in rice-fields, &c., abundant.—DISTRIBUT. JAVA, Borneo, China, Philippine Islands, S. AFRICA, Madagascar.

STEM slender and branches 2–4 (rarely 6–8) inches high, rather rigid. Leaves ½–¾ in., sometimes orbicular, acute or obtuse. Pedicels capillary, ½–1½ in., strict, spreading in fruit. Corolla about ½ in. long; three times as long as the calyx.

VAR. LAXA; stem elongate very slender dichotomously branched. V. laxa, Benth. Scroph. Ind. 36, and in DC. Prodr. x. 414; Dals. & Gibs. Bomb. Fl. 179. Tittmannia pusilla, Benth. in Wall. Cat. 3945 C.—Deccan Peninsula, Wight; Vingoria (Dals. & Gibs.).—This is, I think, only a drawn up state of V. scabra, and hardly even a variety. I have seen no specimen from Vingoria.

8. V. MOLLIS, Benth. Scroph. Ind. 37, and in DC. Prodr. x. 414; procumbent, softly villous all over, leaves shortly petioled ovate or ovate-oblong crenate-serrate, pedicels axillary or in axillary or terminal racemes much longer than the calyx, sepal subulate hirsute longer than the oblong capsule. Tittmannia hirta, Benth. in Wall. Cat. 3948.

SIKKIM HIMALAYA, alt. 3–4000 ft. J. D. H., &c. ASSAM, SILKET and the KHASTA MTS, ascending to 3000 ft.—DISTRIBUT. S. CHINA.

STEM creeping below, 6–18 in. long, sometimes robust. Leaves 1–1½ in., villous on both surfaces, petiole ½ in. or 0. Pedicels very slender, ½–3 in. Sepals sometimes nearly ½ in. long. Corolla with a brown upper and yellow lower lip. Filaments hairy at the base, with a process.


Throughout INDIA; from Kashmir to Assam, Tenasserim and the S. Deccan (not
recorded from Ceylon).—Distr. Siam, China, Japan, Malay and Polynesian Islands, and westward to France.

10. \textit{V. nummularifolia}, \textit{Don Prodr.} 36; erect, quite glabrous, leaves sessile or shortly petiolated, ovate orbicular or obovate obtuse crenate-serrate, pedicels axillary and in subumbellate or few-fld. racemes longer than the leaves, calyx 5-toothed fructing shorter than the ellipsoid acuminate capsule. \textit{Benth. in DC. Prodr.} x. 416.


Simple or branched from the base, the branches not rooting, divaricate, 4–6 in. high. Leaves \( \frac{1}{2} \)–1 in., often as broad as long, nerves subflabellate. Pedicels \( \frac{1}{2} \)–\( \frac{3}{4} \) in., very slender. Calyx \( \frac{1}{2} \) in. long, cleft to the middle, teeth acute, irregularly cleft to the base in fruit. Corolla red-purple, lateral lobes of lip white. Lower filaments with a broad obtuse tooth. Capsule nearly \( \frac{1}{2} \) in.

11. \textit{V. sessiliflora}, \textit{Benth. Scroph.} Ind. 37, and in \textit{DC. Prodr.} 416; erect, glabrous or puberulous, leaves sessile rounded or broadly ovate crenate-serrate, flowers sessile or very shortly pedicelled, calyx 5-toothed fructing shorter than the ellipsoid acute capsule. \textit{V. minima}, \textit{Benth. Scroph.} Ind. 37. Torenia sessiliflora, \textit{Benth. in Wall. Cat.} 3959.


Probably a sessile-flowered form of \textit{V. nummularifolia}, from which the short pedicels alone distinguish it in a dried state.


Throughout India, and in Ceylon; abundant in rice-swamps.—Distr. Borneo, China, Cochlin-China.

Stem sometimes creeping at the base, branches 4–10 in., slender, prostrate. Leaves \( \frac{1}{2} \)–1 in., obtuse or subacute. Pedicels twice as long as the leaves, sometimes \( \frac{3}{4} \) in. Sepals \( \frac{1}{2} \) in., narrowly lanceolate. Corolla white, or pale blue with a white spot. Longer filaments with a small obtuse tooth. Capsule \( \frac{3}{4} \) in.—I have seen no specimen of Bentham var. \( \beta \) \textit{parviflora} from Ceylon. See \textit{Bonnaya peduncularis} and \textit{veronicaefolia} for remarks.

13. \textit{V. angustifolia}, \textit{Benth. Scroph.} Ind. 37, and in \textit{DC. Prodr.} x. 417; diffuse, glabrous, leaves sessile linear or linear-lanceolate obtuse entire
or obscurely toothed, pedicels axillary solitary equalling or exceeding the leaves, sepals free to the base half as long as the linear-lanceolate capsule. Tittmannia angustifolia, Bent. in Wall. Cat. 3981. Torenia calcarata, Geoff. Notul. iv. 124. ? Linderia micrantha, Don Prodr. 85.

SOUTH INDIAN HIMALAYA; Kumaon, Edgeworth; Nepal, Wallich. BENGAL, ASSAM, the KHASIA Mts., BURMA and Pegu. CEYLON, not common.—DISTRIBUTION, Sumatra, Java, China, Japan.

Stem sometimes shortly prostrate and rooting at the base; branches erect, divaricating, 6-12 in. high, slender or succulent. Leaves 1/4-1 in., rather thick, nerves obscure. Pedicels variable in length. Calyx 1/4 in., fruiting 1/2 as long as the capsule. Longer filaments toothed at the base. Capsule linear-lanceolate. See Bonnaya veronicaefolia var. verbenaefolia for a very near ally of this plant.

25. ILYSANTHES, Rafin.

Annual, glabrous, slender marsh-plants. Leaves opposite, entire or toothed, parallel-nerved. Flowers small, axillary or the upper racemose; pedicels ebracteolate, often reflexed in fruit. Sepals narrow. Corolla-tube cylindric; upper lip erect, broad, concave, notched; lower larger, spreading, 3-lobed. Stamens, 2 upper alone perfect, subinclosed, filaments filiform; anthers meeting, cells divaricate; staminodes 2. 2-lobed, one lobe glandular obtuse, the other glabrous of various shapes. Stigma 2-lamellate. Capsule septicidal; valves entire, separating from the placentaflorous septum. Seeds numerous, rugose.—Species S. N. American, S. African, Indian and one S. American.

The staminal characters separating Ilysanthes from Vandellia are not satisfactory; I should prefer that of the nervation of the leaves, which would remove Vandellia erecta (which is hardly recognizable from I. parviflora) to this genus.

1. I. hyssopioides, Bent. in DC. Prodr. x. 419; erect, simple or diffusely branched, leaves in distant pairs sessile oblong or oblong-lanceolate usually entire 1- or 3-nerved upper linear, pedicels axillary filiform, corolla 3-4 times longer than the calyx, fruiting sepals half the length of the ovate-oblong acute capsule. Dalz. & Gibbs, Bomb. Fl. 179; Miguel Fl. Ind. Bat. ii. 695. Gratiola hyssopioides, Linn. Mant. 174; Roxb. Cor. Pl. iii. 3, t. 203 (not ii. t. 128, nor of Fl. Ind.). Morgania hyssopioides, Spreng. Syst. ii. 803. Bonnaya hyssopioides, Bent. in Wall. Cat. 3866 Wight Jc. t. 867.


Usually very slender, 4-18 in. high. Leaves 1/4-1 in., rather thick, obtuse, seldom toothed. Pedicels 1/4-1 1/2 in. Sepals narrowly lanceolate. Corolla 1/4-1 in. long, pale blue. Capsule 1/4 in.

2. I. parviflora, Bent. in DC. Prodr. x. 419; erect, simple or diffusely branched, leaves sessile ovate elliptic or linear-oblong usually entire 1-5-nerved, pedicels axillary and in terminal racemes filiform, corolla twice as long as the calyx, fruiting sepals shorter than the ovate-oblong acute capsule. Gratiola parviflora, Roxb. Cor. Pl. iii. 3, t. 204, and Fl. Ind. i. 140, and Ed. Carey & Wall. i. 141. Bonnaya parviflora, Bent. in Wall. Cat. 3867, and Scroph. Ind. 34.

Throughout INDIA; in wet places, from the Punjab to Assam, Bengal and the Deccan Peninsula (not seen from Ceylon).—DISTRIBUTION, Siam, Trop. Africa.

Very near to I. hyssopioides, but a shorter stiffer more branched plant, more piously flowering, with usually much shorter pedicels, and white or blue flowers not
half the size.—This differs from Vandellia erecta in the reduction of the shorter stamens, and in the longer acute capsule.

3. I. minima, Benth. in DC. Prodr. x. 420; very small and slender, erect, subsimple, leaves few minute ovate- or elliptic-oblong entire, pedicels axillary capillary, corolla three times as long as the calyx, fruiting sepals equalling the subglobose capsule. Bonnaya minima, Wight Ic. t. 858, not of G. Don.

The Decan; at Palamcotta, Wight.

Stems 1-3 in., filiform, always simple below. Leaves 2-3 pairs, \( \frac{1}{2} \) in., obtuse, quite entire. Flowers few, large for the size of the plant; pedicels \( \frac{1}{2} \) in. Corolla \( \frac{1}{2} \) in. Capsule \( \frac{1}{4} \) in. diam.—A very elegant minute plant.

4. I. rotundifolia, Benth. in DC. Prodr. x. 420; diffuse or creeping, leaves sessile broadly ovate elliptic or rounded entire or toothed 3-5-nerved, pedicels axillary shorter or longer than the leaves, corolla twice as long as the calyx, fruiting sepals equalling the globose capsule. Gratiiola rotundifolia, Linn. Mant. 174; Roxb. Cor. Pl. iii. 3, t. 204, and Fl. Ind. i. 137, and Ed. Wall. & Carey, i. 138.


Stems or branches 6-10 in., often rooting at the nodes. Leaves \( \frac{1}{2} \) in., obtuse or subacute. Flowers few, white; pedicels \( \frac{1}{2} \) in. Corolla \( \frac{1}{2} \) in. long. Capsule \( \frac{1}{2} \) in.

26. BONNAYA, Link et Otto.

Annual, quite glabrous herbs. Leaves opposite, entire or serrate, peninnerved, nerves very obscure. Flowers solitary, axillary, or the upper opposite and racemose, pedicels ebracteolate. Sepals 5, narrow. Corolla-tube cylindrical; upper lip erect, broad, concave, 2-fid; lower longer, spreading, 3-lobed. Stamens 2, lower only perfect, sub included, filaments filiform; anthers touching, cells divaricate; staminodes 2, entire, glandular, obtuse. Stigma 2-lamellate. Capsule narrow, far exserted, septicidal; valves entire, separating from the placentiferous septum. Seeds numerous, rugose.—Species 8, tropical African and Asiatic.

Several species of this genus so closely resemble others of Vandellia as to render its validity very doubtful.

1. B. brachiata, Link & Otto, Ic. Pl. Sel. i. 25, t. 11; erect, diffusely branched, leaves sessile oblong obtuse or acute sharply closely deeply serrate, flowers racemmed shortly pedicelled, corolla \( \frac{1}{2} \) in. long; capsules spreading or erect twice as long as the calyx or more. Benth. in Wall. Cat. 3855, and in DC. Prodr. x. 420; Dalz. & Gibbs. Bomb. Fl. 175; Miguel Fl. Ind. Bat. ii. 695. B. serrata, Griff. Notul. iv. 108, and Bonnaya sp. l. 106. Gratiiola serrata, Roxb. Fl. Ind. i. 139, and Ed. Wall. & Carey, i. 140. B. brachiata & pusilla, Benth. Scroph. Ind. 32, 33.—Hedee Hort. Mal. ix. t. 59.

Throughout India, from the Punjab to Travancore and Malacca, ascending the Himalayas to 5000 ft. Ceylon, common.—Distr. Java, China, Philippine Islands.

A rather rigid herb, 4-10 in. high; branches divaricate, outer decumbent below. Leaves \( \frac{1}{2} \) in., margins thickened, teeth mucronate. Racemes sometimes 4 in. long, with opposite bracteate flowers; pedicels about equaling the calyx, rigid. Corolla red or white. Capsule \( \frac{1}{2} \) in., slender.

2. B. reptans, Spreng. Syst. i. 41; prostrate, creeping, leaves
petioloed obovate-oblong obtuse sharply serrate, flowers racemed shortly pedicelled, corolla \( \frac{1}{2} \) in. long, capsules spreading twice as long as the calyx or more. *Benth. in DC. Prodr. x. 420; Wall. Cat. 3856; Dals. & Gibs. Bomb.-Fl. 179.* B. ruelloides & ciliata, *Spreng. l. c. Gratziola ciliata & ruelloides, Kän.; Vahl Enum. i. 97, 99.* G. reptans, *Roeb. Fl. Ind., and Ed. Wall. & Carey, i. 140.* Henckelia Roxburghiana, *Dietr. Sp. Pl. i. 572.*

Eastern India; from Nepal and Sikkim (ascending to 7000 ft.) to Assam, the Khasia Mts., Cachar and Tenasserim. Madras, Shuter. Southern Concan (Dalsell & Gibson).—Distr. Java, Philippine Islands.

Stems or branches often a foot long, with distant pairs of leaves, slender, diffusely branched. Leaves \( \frac{3}{4} \)–1½ in., narrowed into the petiole, finely serrate. *Corolla* light purple. *Capsule* 1 in. long, very slender.

3. *B. veronicaefolia*, *Spreng. Syst. i. 41*; stem creeping or decumbent; branches ascending, leaves subsessile or narrowed into a short petiole oblong or oblong-lanceolate or obovate* serrate or subacute, flowers racemose, corolla \( \frac{1}{4} \)–\( \frac{1}{2} \) in., capsules erecto-patent twice as long as the calyx or more. *Wall. Cat. 3857; Benth. in DC. Prodr. x. 421; Wight Jr. t. 1411; Dals. & Gibbs. Bomb. Fl. 178; Miguel Fl. Ind. Bat. ii. 696.* B. marginata, *Spreng. l. c. B. rigid & procumbens, Benth. in Wall. Cat. 3359, 3860.* B. Rothii, *Dietr. Sp. Pl. i. 556.* B. bracteata, *Griff. Notul. iv. 107.* Gratziola veronicaefolia, *Reitz Obs. iv. 8; Roeb. Cor. Pl. ii. 30, t. 154, and Fl. Ind. i. 138, and Ed. Wall. & Carey, i. 199.* G. marginata, *Colom. in Vahl Enum. i. 98.* G. racemosa, *Roth Nov. Sp. 9.*

Throughout India; from the Upper Gangetic plain southwards and eastwards to Assam, Travancore and Singapore. Ceylon, common.—Distr. Java, Siam, China, Philippine Islands.

Very variable in habit, but distinguished from *B. brachiata* and *reptans* by the very different serratures of the leaf, which are more distant and less deep. *Corolla* violet (Roeb.).

**Var. grandiflora**; branches short stout, flowers chiefly axillary light blue, capsules smaller hardly twice as long as the calyx. *B. grandiflora, Spreng. Syst. i. 41; Benth. in DC. Prodr. x. 421; Dals. & Gibbs. Bomb. Fl. 179; Miguel Fl. Ind. Bat. ii. 697.* B. pulegiifolia, *Spreng. l. c. B. Wightii, Benth. in Wall. Cat. 3864.* Gratziola grandiflora, *Roeb. Cor. Pl. ii. 42, t. 179, and Fl. Ind. i. 136, and Ed. Carey & Wall. i. 137.* G. pulegiifolia, *Vahl Enum. i. 98.* Henckelia grandiflora, *Dietr. Sp. i. 573.*—I find it impossible to separate this satisfactorily; it inhabits the same area as *B. veronicaefolia* and *Vandellia pedunculata*, which it closely resembles. The name *grandiflora* is not appropriate. *Corolla* light blue (Roeb.).

**Var. verbenaefolia**; branches usually long and slender, leaves narrower subacute or distantly serrate, flowers larger in often elongate naked racemes. *B. verbenaefolia, Benth. in DC. Prodr. x. 421; Dals. & Gibbs. Bomb. Fl. 178; Wall. Cat. 3858.* Wight Jr. t. 1412. B. Roxburghiana, *Dietr. Sp. Pl. i. 559.* B. cyanea, *Griff. Notul. iv. 107.* Gratziola verbenaefolia & ciliata, *Colom. in Vahl Enum. i. 96, 97.* G. racemosa, *Roeb. Fl. Ind. i. 138, and Ed. Wall. & Carey, i. 139.* G. Roxburghiana, *Reem. & Sch. Syst. i. 125.* Tittmannia Colsmanni & Torenia gracilis, *Benth. in Wall. Cat. 3950, 3952.* This again is with difficulty separated as a variety from *B. veronicaefolia*, and it inhabits the same area. It bears the same relation to it as *Vandellia angustifolia* (which it closely resembles) does to *V. pedunculata*.

4. *B. peduncularis*, *Benth. Scroph. Ind. 34,* and in *DC. Prodr. x. 421,* and in *Wall. Cat. 3865*; stems erect slender simple, leaves sessile linear-oblong obtuse nearly entire, pedicels axillary very long solitary slender much longer than the leaves, capsule nearly three times as long as the calyx.

Silhert, Wallisch.

This, as Benthem suggests, may be a variety of *B. veronicaefolia* var. *grandiflora,*
growing in moist grassy places; if so, it is a remarkable one, the fruiting calyx being much shorter, not above $\frac{1}{4}$ in. long, and the habit is considerably different. It approaches very closely Vandelia pedunculata.

5. **B. oppositifolia**, Spreng. Syst. i. 41; very short, erect, diffusely branched, leaves sessile linear-oblong obtuse subseriate, pedicels short often shorter than the calyx axillary or the upper racemcd deflexed in fruit, corolla $\frac{1}{2}$ in. long, capsule small twice as long as the calyx or more. *Benth. in DC. Prodr. x. 421; Wall. Cat. 3863; Dalz. & Gibs. Bomb. Fl. 179.* B. minima, G. Don Gen. Syst. iv. 538. Gratiola oppositifolia, Roxb. Cor. Pl. ii. 30, t. 155, and Fl. Ind., and Ed. Wall. & Carey, i. 139. G. minima, Roth Nov. Sp. 8. Henckelia oppositifolia, Dietr. Sp. Pl. i. 572.

**Decian Peninsula, Hayne, Wight, &c.**

A much smaller plant than any of the first four species, and with a somewhat different habit, and very small blue flowers; but beyond the general characters indicated above, I am unable to add anything. The flowers are blue (*Roxb.*).

6. **B. tenuifolia**, Spreng. Syst. i. 42; succulent, erect, diffusely intricately branched, leaves sessile linear nearly entire, pedicels axillary and the upper racemcd deflexed in fruit, corolla $\frac{1}{2}$ in. long, capsule slender two to three times as long as the calyx. *Benth. in DC. Prodr. x. 422; Wall. Cat. 3863; Miquel Fl. Ind. Bat. ii. 698.* B. pusilla, Griff. Notul. iv. 107. Gratiola tenuifolia, Vahl Enum. i. 95.

**Bengal;** at Serampore, Griffith. **Decian Peninsula, Eotiller, &c.**; Quilon, Wight. *Thiasserim, Griffith.* *Craylon;* at Peradenia and Cultura, Macrae.—**DISTRIBUTION.** China.

This appears to be a very distinct species, growing in a tufted manner, probably in marshes, with interlaced branches and slender leaves 1-1½ by $\frac{1}{4}$-½ in. The flowers are very small (pale blue, *Griff.*), and the capsules vary from $\frac{1}{4}$-½ in. in length.

### 27. **Bythophyton**, Hook. f.


**Khasia Mts.;** marshes at Nonkreem, alt. 4-5000 ft., *J. D. H. & T. T.*

*Stems* 2-3 in., loosely tufted, flaccid, erect, wholly submerged, terete. *Leaves* $\frac{1}{2}$-½ in. long, 3-nerved at the base. *Sepals* $\frac{1}{2}$ in. *Corolla* with the lobes closed over the anthers as in submerged states of Limosella. *Stamens* very variable.—A singular little plant, the flowers of which may assume a different character when the marshes dry up. It is clearly the type of a genus, the exact position of which is uncertain. The anthers are erroneously figured as hairy.

### 28. **Microcarpha**, Br.

A very small slender diffuse or creeping nearly glabrous herb. *Leaves* opposite, sessile, oblong, obtuse, quite entire. *Flowers* minute, axillary,
solitary, sessile, ebracteolate. **Calyx** tubular, 5-angled, 5-fid. **Corolla** very short, tube broad; lobes 5, broad, spreading, 2 upper subconnate. **Stamens**, 2 perfect, filaments filiform; anthers confluent, 1-celled; staminodes 0. **Style** filiform, stigma capitate recurved. **Capsule** included, ovoid, 2-grooved, loculicidal; valves entire, separating from the placeniferous septum. **Seeds** few, ovoid.

**M. muscosa**, Br. Prodr. 436; Benth. in DC. Prodr. x. 433; Miguel Fl. Ind. Bat. ii. 700. M. alterniflora, Blume Bijd. 744; Benth. l. c. Paeiderota minima, Koen. in Rezs Obs. v. 10.


Stems tufted and interlaced, 2-4 in. long, rooting at the nodes, angles of stem and calyx sometimes ciliate. **Leaves** 1-1/4 in. long. **Flowers** in one axil only of each pair of leaves, about 1/8 in. long. **Corolla-tube** shorter than the calyx, as is the minute capsule.

**DOUBTFUL SPECIES.**

**M. DIANDRA**, Griff. Notul. iv. 101, and Ic. Pl. Asiat. t. 417, f. 2, according to the description, differs from the generic character of Microcarpas in the 5-partite calyx; as also from Glossostigma and Lemosella, of which it has the habit. I have seen no specimens; it is a native of Bengal, and may be the following genus.

### 29. **PEPLIDIUM**, Delile.

Very small, prostrate or creeping, glabrous herbs. **Leaves** opposite, fleshy, obovate, quite entire. **Flowers** minute, axillary, 1-3-nate. **Calyx** tubular, 5-ribbed, obtusely 5-toothed. **Corolla-tube** short; lobes 5, broad, subequal. **Stamens** 2, included, filaments arched; anthers 1-celled; staminodes 0. **Ovary** 2-celled; stigma dilated, spathulate, recurved. **Capsule** globose or ovoid, septicidal, or bursting irregularly; valves entire or 2-fid, separating from the placeniferous septum. **Seeds** numerous, small, ovoid.—Species 2, an endemic Australian and the following.


**S. DECCAN PENINSULA**, Koenig, &c.; Pondicherry, Perottet. **CEYLON**; at Trincomalee, Glenie.—**DISTR.** Kurdistan, Egypt, Australia.

Stems interlaced, 4-8 in. long, rather stout, forming large tufts. **Leaves** 1-1/4 in., usually obovate, sometimes ovate or orbicular, succulent, narrowed into short petioles which are connected by a membrane. **Calyx** about 1/2 in. long, larger in fruit, membranous with 5 strong ribs. **Corolla-tube** included. **Filaments** thickened and angularly incurved at the base. **Capsule** nearly enclosed in the membranous tubular calyx, membranous, usually bursting irregularly.

### 30. **GLOSSOSTIGMA**, Arn.

Very small, glabrous, creeping herbs. **Leaves** opposite or fascicled, linear or spathulate, quite entire. **Flowers** minute, axillary, solitary, ebracteolate. **Calyx** campanulate, obtusely 3-4-lobed. **Corolla-tube** short; lobes 5, subequal. **Stamens** 2 or 4, filaments filiform; anther-cells diverging, tips con-
fluent. Ovary perfectly or imperfectly 2-celled; style short, stigma dilated spathulate recurved. Capsule included in the calyx, loculicidal; valves entire, separating from a columnar axis. Seeds small, ovoid.—Species 3, all Australian, one of them widely dispersed.


A very weak densely tufted creeping rooting herb like Limosella. Leaves ½—1 in. long, tapering into a petiole of variable length. Pedicels slender, shorter than the leaves. Calyx ¼ in. long. Corolla blue, tube included. Capsule about as long as the calyx.—Griffith’s Microcarpaea diandra differs from this in the sessile flowers and 5-partite calyx.

31. LIMOSELLA, Linn.

Small tufted creeping glabrous marsh- or water-herbs. Leaves opposite or fascicled or rarely alternate, long petioled, linear or spathulate, quite entire. Flowers minute, axillary, ebracteolate. Calyx campanulate, 5-toothed. Corolla subrotate or campanulate; lobes 5, subequal. Stamens 4, filaments filiform; anthers confluent, 1-celled. Ovary 2-celled at the base; style short, stigma incurved capitate. Capsule obscurely dehiscent, valves thin. Seeds many, small, ovoid, rugulose.—Species 5 or 6, very variable and widely distributed.

L. aquatica, Linn.; Benth. in DC. Prodr. x. 426; leaves long-petiolate narrowly spathulate, corolla-lobes very short. Benth. in DC. Prodr. x. 426; Boiss. Fl. Orient. iv. 427; Gaertn. Fruct. i. 228, t. 50, f. 3; Reichb. Fl. Germ. t. 1722.

Western Himalaya; Kashmir, alt. 5—8000 ft., Thomson, &c. Western Tibet; alt. 13000—14500 ft., Thomson. Distrib. N. and S. temperate regions.

Stems creeping. Leaves 1—2 in., long petioled. Peduncles shorter than the leaves, recurved in fruit. Corolla ½ in., pink or white. Capsule globose, ½ in. diam.

Tribe VII. DIGITALEEE.

32. SIBTHORPIA, Linn.

Hairy, creeping herbs. Leaves alternate, petiolate, reniform or rounded, crenate or pinnatifid. Flowers small, axillary, solitary or fascicled, ebracteolate. Calyx campanulate, 4—8-fid. Corolla subrotate; lobes 4—8, spreading, subequal. Stamens as many as the corolla-lobes or one fewer; anthers sagittate, touching. Stigma capitate. Capsule membranous, compressed, loculicidal, valves septiferous. Seeds few, plano- or concavo-convex, rugulose.—Species 6, W. Europe, Africa, the Himalaya and Andes.

S. pinnata, Benth. in Gen. Pl. ii. 959; leaves deeply pinnatifid or pinnatisect. Mazus pinnatus, Wall. Cat. 3915. Ourisia pinnata, Benth. Scroph. Ind. 47. Hornemannia pinnata, Benth. in DC. Prodr. x. 428.

NEPAL, Wall.
Hirsute all over with soft spreading hairs. *Stems* very slender, 4–8 in. long, straggling, rooting at the nodes. *Leaves* 1–2 in. long, broadly oblong, or ovate, membranous, segments 5–7 obovate-cuneate broadly adnate, tips crenate or lobulate; petiole 1–3 in. *Pedicels* equaling the petiole or longer or shorter, very slender. *Calyx* ½ in., membranous, lobes ovate acute. *Corolla* ⅓ in. diam.; lobes spatulate. *Fruit* unknown.

33. **Hemiphragma**, Wall.


**H. heterophyllum**, Wall. Cat. 3895, and Tent. Fl. Nep. 16, t. 8, and in Trans. Linn. Soc. xiii. 612; Benth. in DC. Prodr. x. 429.

**Temperate Himalaya**; from Garwhal to Bhotan, alt. 6–12,000 ft. **Khasia Mts.**, alt. 4–6000 ft.

*Stems* loosely tufted, creeping, 1–2 feet, very slender. *Leaves* on the stem ½–8 in. diam., membranous, hairy on both surfaces; petiole ½ in.; those on the branches forming tufts or heads, ½–10 in. long, rigid, acute, back convex, face deeply channelled. *Flowers* usually sessile in the tufts of the setaceous leaves, rarely of the cauline ones. *Corolla* pink, ⅓ in. diam. *Fruit* black, polished, ⅓ in. diam.

34. **Scoparia**, Linn.

Branched glabrous or pubescent herbs or undershrubs. *Leaves* opposite or whorled, entire or toothed, punctate. *Flowers* small, white yellow or blueish, solitary or 2-nate, axillary, ebracteolate. *Sepals* 4–5, imbricate in bud. *Corolla* rotate, 4-fid, throat densely bearded; lobes obtuse, subequal. *Stamens* 4, subequal, filaments filiform; anthers subagitate, cells distinct parallel or diverging. *Style* subclavate, stigma notched or truncate; ovules many. *Capsule* globose or ovoid, septicidal; valves entire, membranous, margins inflexed separating from the placeniform axis. *Seeds* many, obovoid, angled, scrobiculate.—Species 5 or 6, all American.


**Plains of Bengal**; abundant, Clarke.—**Distrib.** Tropics of America and sporadically in Africa, Asia and Australia.

A branching annual erect or ascending leafy herb 1–3 ft. high. *Leaves* opposite and 3-nately whorled, variable in width. *Flowers* numerous; pedicels ½–½ in., slender strict. *Sepals* oblong. *Corolla* ½ in. diam., white. *Capsule* ½ in. diam., globose.—Though now a superabundant Bengali plant according to Mr. Clarke, it was unknown in Roxburgh's time, and occurs in no Indian Herbarium except Clarke's. Voigt mentions it (1845) as found about Serampore, whence probably it has spread quite recently.

35. **Campylanthus**, Roth.

Shrubs. *Leaves* alternate, linear, fleshy, quite entire. *Flowers* in terminal

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racemes, often second, pedicels 2-bracteolate. *Corolla* tube long, slender, incurved; lobes 5, broad, flat, spreading, sub-equal. *Stamens* 2, included; anther-cells divaricate, tips confluent. *Style* short or long, straight or inflexed, stigma capitulate. *Capsule* broad, compressed, septicidal, valves 2-fid. *Seeds* many, orbicular, compressed, notched at the hilum; funicle expanded into a wing that sometimes surrounds the seed.—Species 4, Canaries, Cape de Verds, Arabia, Scinde.


**Scinde**; limestone hills at Hyderabad, *Stocks*.—*Distrib. Beluchistan*.


### 36. **PICRORHIZA**, *Royle*.

A low more or less hairy herb, with perennial woody bitter stock. *Leaves* subradical, spathulate, serrate. *Flowers* spicate on radical leafy flowering stems, bracteate, ebracteolate, white or bluish, dimorphic (a longer and shorter stamened form). *Sepals* 5, lanceolate, imbricate in bud. *Corolla* of the long stamened form short, membranous, subequally 5-cleft to the middle; lobes ovate, acuminate, ciliate; of the shorter stamened, corolla-tube curved, broad; limb 2-lipped, upper lip longer subgaleate emarginate, lower of 3 shorter ovate acute lobes, the middle one smallest. *Stamens* 4, filaments in the longer stamened very slender, four times as long as the corolla; of the shorter stamened stout, 2 upper shorter than the upper lip of the corolla, with the anthers under the hood, 2 lower exserted; anther-cells subdivergent confluent at the tip. *Ovary* 2-celled, many-ovuled; style of the long stamened long and slender, stigma simple; of the shorter stamened stouter and shorter, stigma capitulate exserted. *Capsule* ovoid, turgid, acute, septical and loculicidal, margins of the valves inflexed, exposing the columnar placentiferous axis. *Seeds* of an oblong curved nucleus, enclosed in the large bladdery loose hyaline reticulated testa.

I have described this plant as dimorphic with some hesitation, the pistil and stamens being in both forms so fully developed, though in so far as I have seen the anthers of the short stamened have very scanty and irregularly formed pollen, whilst those of the long stamened have copious pollen. Both forms seem to ripen fruit abundantly.


**Alpine Himalaya**; from Kashmir to Sikkim, alt. 9-15,000 ft., common.

*Rootstock* as thick as the little finger, 6-10 in. long, clothed with withered leaf-bases. *Leaves* 2-4 in., rather coriaceous, tip rounded, base narrowed into a winged sheathing petiole. *Flowering stems* or scapes ascending, stout, longer than the leaves, naked or with a few bracts below the inflorescence. *Spike* 2-4 in. long, subcylindric, obtuse, many-flowered, subhirsute; bracts oblong or lanceolate, as long as the calyx. *Sepals* ½ in. long, ciliate. *Corolla* of short stamened form ½—⅓ in. long, with longer filaments ⅔ in. long, of the longer stamened from ½ in., with filaments ¾ in. long. *Capsule* ⅔ in. long.

### 37. **WULFENIA**, *Jacq*.

Glabrous herbs, with perennial woody stocks. *Leaves* subradical, petioled,


—Species 4, one Carinthian, the others W. Asiatic and Himalayan.

**W. Amherstiana**, Benth. Scroph. Ind. 46, and in DC. Prodr. x. 455; nearly glabrous, leaves obovate-oblong or -spathulate coarsely crenate or lobulate base narrowed subpinnatifid, racemes long slender very many-fld., sepals lanceolate or setaceous, corolla-lobes narrow. *Paeiderota* Amherstiana, Wall. Cat. 410.

*Western Himalaya*; from Kashmir to Kumaon, alt. 7–11,000 ft.—Distrib. Afghanistan.

*Rootstock* long, as thick as a goose-quill. *Leaves* 2–5 in., midrib puberulous or subhirsute beneath; petiole 1/4–1 1/4 in., sometimes hairy. *Scapes* 5–10 in., slender, glabrous or sparingly pubescent, naked or with setaceous deciduous bracts. *Flowers* horizontal; pedicels shorter than the calyx; bracts setaceous, equalling the pedicels or longer. *Calyx* 1/4 in., glabrous. *Corolla* 1/4 in., lobes lanceolate, acute. *Style* filiform, far exerted.

38. **CALORHABDOS**, Benth.


**C. Brunoniana**, Benth. Scroph. Ind. 44, and in DC. Prodr. x. 456; erect, leaves sessile lanceolate subserulate, spike terminal elongate very slender and very dense-fld. *Valeriana* (Veronica, p. 23) Brunoniana, Wall. Cat. 405; V. P. alternifolia, Wall. mss.

*NEPAL, Wallich.*

*Stem* erect, subsimple, stout, nearly glabrous, 1–2 ft. (or more?) *Leaves* upper alone known, 3–4 by 1 1/2–1 1/4 in., long acuminate, base narrowed. *Spikes* subsessile, 6–10 in., erect, flexuous, glabrous or pubescent; flowers imbricate; bracts small, lanceolate. *Sepals* 1/4 in. *Corolla* 1/4–1 1/2 in., tube rather broad, lobes short. *Capsule* as long as the calyx.

39. **VERONICA**, Linn.

Herbs or shrubs, rarely trees. *Leaves* opposite, rarely scattered or cauline alternate. *Flowers* solitary, axillary, or in terminal or axillary bracteate racemes, ebracteolate, never yellow. *Calyx* 4–5 partite, the lower segments connate, upper if present smaller. *Corolla* rotate, or tube cylindric; lobes 4–5, spreading, lateral, the outer in bud, upper and lower usually narrowest. *Stamens* 2, exerted; anther-cells parallel or not, obtuse, tips confluent. *Stigma* subcapitate; ovules many, rarely 2 in each cell. *Capsule* 2-grooved, compressed or turgid, dehiscence various. *Seeds* few or many, ovate or globose, plano-concave or boat-shaped, smooth or rugulose, sometimes winged.—Species about 160, rare in the tropics and in America.
Capsule ovoid or oblong, turgid, slightly laterally compressed. Seeds flattened, plano-convex or biconvex.

1. **V. himalensis**, Don Prodr. 92; erect, glabrate, leaves sessile ovate acute coarsely irregularly serrate base rounded, racemes terminal and axillary lax-fld., sepals 4 oblong obtuse, corolla very large, capsules ovoid acute. Benth. in DC. Prodr. x. 467. V. grandiflora, Wall. Cat. 403 (and p. 23).

Nepal; Wallach. Sikkim; at Yakla, alt. 11,500 ft., Clarke.


Western Alpine Himalaya; from Kashmir to Nepal, alt. 8–12,000 ft.—Distrib. Afghanistan.

Perennial rootstock short, woody. Stems 6–18 in., rigid, slender, subsimple, ascending, leafy. Leaves 1–1 ½ by ¼–½ in., very variable in breadth, sometimes inciso-serrate, base rounded or acute. Racemes 3–6 in., slender, erect, very many-fld.; lower bracts often leaf-like or lower flowers axillary, upper oblong; pedicles of the lower flowers often ½–1 in. of the upper shorter. Sepals ½ in. Corolla ½ in. diam. or less, lobes broad. Capsule ½ in. long, equaling or shorter than the sepals. Seeds smaller than in V. himalensis.—The description of the fruit in DC. Prodr. is taken from some other plant.

3. **V. ciliata**, Fisch. mss.; Benth. in DC. Prodr. x. 467; hoary-pubescent all over, stems subsimple erect, leaves sessile ovate or oblong obtuse entire serrate or crenulate, flowers subcapitate, sepals 4 oblong obtuse, corolla small, stamens included, capsule ovoid-oblong obtuse, tip notched. Ledeb. Fl. Ross. iii. 240.

Alpine Himalaya; from Kashmir to Sikkim, alt. 11–16,000 ft.—Distrib. Central Asia, Siberia.

Annual. Stem 4–12 in., stiff, usually quite simple. Leaves ½–1 ½ in., very variable in size and toothling, pubescent on both surfaces. Flowers sessile in sessile or peduncled terminal bisexual heads; bracts as long as the calyx. Sepals ½ in. Corolla ½ in. diam., lobes broad. Capsule very variable in size, as long as the calyx or longer. Seeds orbicular, compressed, plano-convex.

4. **V. macrostemon**, Bunge in Ledeb. Fl. Alt. i. 35; hoary-pubescent, stems flexuose diffuse, leaves sessile elliptic or ovate obtuse entire or obscurely crenate, racemes terminal dense-fld. villous, sepals 4 oblong obtuse, stamens long far exerted, anthers large. Benth. in DC. Prodr. x. 479.

Western Tibet; Zanskar, alt. 16,000 ft., Thomson, Lance.—Distrib. Afghanistan, Central Asia.

Perennial. Rootstock slender, creeping, with distant scales. Stems few, 3–6 in., branched. Leaves ½–1 in., pubescent on both surfaces. Racemes 1–2 in., flowers crowded, sub sessile, or lower axillary and longer pedicelled; bracts oblong obtuse. Sepals ½ in., villous. Corolla ½–¾ in. diam. Capsule not seen.—Without the fruit it is not possible to identify the Indian plant absolutely with the V. macrostemon.
Bentham describes the fruit of the latter as obovate emarginate, but in Kirghis specimens it is oblong and notched at the top.

5. **V. lanuginosa**, Benth. **mss.**; densely woolly, stems very short, leaves sessile imbricate orbicular or upper broadly ovate quite entire, flowers in sessile terminal woolly heads, sepals 4 oblong subacute, corolla-lobes spatulate upper orbicular much larger and broader than the others, capsule elliptic notched.

**Sikkim Himalaya;** Samdong, alt. 16,000 ft., J. D. H.

Stem simple, 2–3 in. high, clothed with imbricating leaves and woolly hairs. Leaves ½ in. diam., equally woolly on both surfaces. Flowers small amongst the upper bracteal leaves. **Sepals** ½ in. long. **Corolla** ½ in. diam. **Capsule** equalling the sepals, pubescent. **Seeds** few, large, oblong, plano-convex.—A very singular species.

**Capsule** somewhat compressed laterally, turgid, orbicular, rarely in **V. Anagallis** broadly ovata. **Seeds** biconvex.


**N.W. India;** from the plains of the Punjab to Western Tibet, and from Kashmir to Bhutan, ascending to 9000 ft. in the Himalaya, and 15,000 in Tibet. **Bengal,** the **Khasia Mts. and Assam. The Deccan Peninsula,** in the Concan only.—**Distr.** Europe, Asia, N. and S. Africa, N. America.

Perennial. Stem creeping below, from 6–18 in. high, and from the thickness of a sparrow’s quill to that of the middle finger. Leaves 2–6 by ½–¾ in. (1½ in. broad and ovate-cordate in a Kunawur specimen). **Racemes** 3–6 in., slender, lax-fld.; bracts linear-oblong, shorter than the pedicels, which are usually longer than the calyx. **Sepals** ½–¾ in. long, subacute. **Corolla** ½–⅔ in. diam., pink or purplish. **Capsule** ⅔–⅞ in. diam., broadly ovate in some Tibetan specimens. **Seeds** ovoid or oblong, biconvex.

**V. oxyacarpa;** capsules subacute longer than the sepals. **V. oxyacapa,** Boiss. _Fl. Orient._ iv. 438.—Kunawur, alt. 9000 ft., Thomson. **Ferai,* Afghanistan.**

**V. punctata;** dwarf, leaves all petioled ovate serratate or the upper only linear-oblong sessile amplexicaul. **V. punctata,** _Ham. in Don Prodr._ 98; **Benth. in DC. Prodr._ x. 468, _in part._—**Nepal, Hamilton;** Bengal at Beaulah and Malda, Clarke. **Benares, Wall.** I think there is no doubt of this being a form of **V. Anagallis,** Assam specimens of which and others have similar lower leaves. The Cabul _punctata_ of Bentham is, as Boissier has pointed out, nothing but **V. Anagallis**; and his var. _S extensa_ is a luxuriant state of the same with larger bracts, sepals, &c.

**V. monticolaides,** Boiss. _Fl. Orient._ iv. 437; dwarf, slender, stems often simple, leaves ovate or oblong, racemes few few-fld. **V. pusilla, Benth. in DC. Prodr._ x. 468.—**Western Tibet, Thomson. **Afghanistan.** The Herbarium specimens seem to be partly dwarf forms and partly seedlings of **V. Anagallis.**

7. **V. Beccabunga,** Linn.; Benth in DC. Prodr. x. 468; glabrous or puberulous, decumbent, succulent, leaves sessile or shortly petioled elliptic or oblong obtuse crenate-serrate base rounded, racemes axillary few- or many-flowered, pedicels spreading. **Reichh.** _Ic. Fl. Germ._ t. 1701; **Boiss._ Fl. Orient. iv. 438.

**Western Himalaya;** from Kashmir and Rawul Pindee, **Aitchison,** to Kunawur, Thomson. **Western Tibet,** alt. 9–12,000 ft., Thomson.—**Distr.** Afghanistan to Europe, N. Africa (Abyssinia), N. Asia to Japan.

*** Capsule didymous, lobes globose or flattened, 1-∞-seeded. Seeds cup-shaped, or deeply grooved on one side.

8. V. hederaefolia, Linn.; Benth. in DC. Prodr. x. 490; prostrate, hairy, leaves petioled orbicular-ovate 5-7-lobed, pedicels axillary solitary fruiting decurved, sepal cordate dilated exceeding the corolla, capsule biglobose, cells 1-2-seeded. Boiss. Fl. Orient. iv. 468; Fl. Dan. iii. t. 428.

Kashmir: alt. 6000 ft., Thomson.—DISTR. China, Japan, Persia to Syria, N. Africa and all Europe.

Annual. Branches numerous, 6-18 in. Leaves ¾-½ in. diam., petiole short dilated upwards, lobes rounded. Flowers appearing in succession as the branch elongates, pedicels about equalling the leaves. Sepals membranous, acuminate. Corolla ⅔ in. diam., pale blue. Seeds large, rugose, subglobose, with a deep pit on the inner face, black.

9. V. agrestis, Linn.; Benth. in DC. Prodr. x. 487; prostrate, puberulous, leaves petioled ovate cordate or orbicular coarsely crenate-serrate, pedicels axillary solitary as long as the leaves fruiting decurved, sepal ovate, capsule biglobose turbid, cells 4-10-seeded. Reichb. Fl. Crit. t. 277; Boiss. Fl. Orient. iv. 466. V. polita, Fries; Reichb. Fl. Crit. t. 246.

Plains of the Punjab, and Upper Gangetic Valley, and Western Himalaya, from Kashmir to Kumaon, ascending to 6000 ft. Western Tibet, Iskardo, alt. 9000 ft. —DISTR. Europe, N. E. and W. Asia to Japan, China and Loochoo Islands, N. Africa.

Annual. Branches numerous, 6-18 in. Leaves ¾-1 in. diam.; petiole rarely ¾ in. Sepals ¾ in., obtuse, ciliate, fruiting sometimes ¾ in. Corolla ¾-½ in., shorter or longer than the sepals, white or blue. Capsule ¾ in. diam. Seeds oblong or orbicular, cup-shaped, tubercled, pale.—The two forms, agrestis proper, with larger leaves, narrower sepals, pale blue or white corolla, and 8-10-seeded capsules, and the subsp. polita, with smaller leaves, broader sepals, bright blue corolla, and 16-20-seeded capsule, are probably both Indian.

10. V. persica, Poir. Dict. viii. 542; prostrate, hairy, leaves shortly petioled oblong or ovate coarsely crenate-serrate base rounded or cordate, pedicels axillary solitary much longer than the leaves, sepal ovate or lanceolate fruiting spreading, capsule much broader than long flattened. V. Buxbaumii, Tenore, Fl. Neap. i. 7, t. 1; Reichb. Fl. Crit. t. 263; Benth. in DC. Prodr. x. 487; Boiss. Fl. Orient. iv. 465.


11. V. biloba, Linn.; Benth. in DC. Prodr. x. 485; erect or ascending, diffusely branched, puberulous or glabrate, leaves sessile or shortly petioled oblong or ovate-lanceolate acute sub serrate, floral oblong-lanceolate quite entire, pedicels axillary longer than the leaves, fruiting spreading or decurved, sepal connate in pairs at the base, ovate acute or acuminate, capsule much broader than long flattened. Boiss. Fl. Orient. iv. 464. V. campylolopa,
Veronica.]

CIII. SCROPHULARIÆ. (J. D. Hooker.) 295


Western Himalaya; from Kashmir to Kumaon, alt. 5-10,000 ft. Western Tibet, alt. 9-15,000 ft.—DISTIEI. Westward to Asia Minor, Soongaria.

Annual. Branches slender, 4-18 in., sparsely leafy, running into very loose racemes. Leaves 1/4-1 in., very variable in breadth, teeth few and remote. Pedicels 1/2-3 in. Sepals 1/4 in., fruiting 1/2-1 in., spreading. Corolla blue, shorter than the calyx. Capsule 2-3 in. diam., much smaller than the calyx, cells 2-4-seeded. Seeds oblong, boat-shaped, more or less deeply pitted.—V. campylotopa is only a small state with smaller flowers; I cannot distinguish it as a variety even. The seeds of V. biloba vary much in depth of pitting. V. microthea, Boiss. & Bal Diagn. Ser. 2, vi. 131, V. bartsiaefolia, and V. elbrusensis, Boiss. Herb., V. Griffithii, Benth. in DC. l. c. 485, V. argute-serrata, Regel & Schmalt., and V. cardiocarpa, Walp. (Diplophyllum cardiocarpum, Kar. and Kir.), all appear to me to be forms of V. biloba.

**** Capsule laterally flattened, broadly obcordate, keeled.

† Seeds elliptic, much flattened, biconvex or plano-convex.

12. V. laxa, Benth. Scroph. Ind. 45, and in DC. Prodr. x. 474; glabrous or sparsely pubescent, stems long ascending, leaves sessile ovate or cordate obtuse or subacute coarsely crenate-serrate, racemes axillary peduncled slender, capsule broadly obcordate ciliate. V. Thunbergii, A. Gray, Bot. Japan, 402.

Western Himalaya; from Kashmir to Kumaon, alt. 5-11,000 ft., Boyle, &c.—DISTIEI. Japan.

Root perennial. Stems 10-20 in., rather stout, simple, hairy all over or glabrate. Leaves 1-2 in., pubescent on both surfaces. Racemes 3-10 in., lax-fld.; bracts linear-oblong, longer or shorter than the pedicels; pedicels shorter than the calyx. Sepals unequal, enlarged in fruit. Corolla 1-3/4 in. diam. Capsule 1/2 in. diam., equalling or shorter than the sepals.

13. V. cana, Wall. Cat. 401; Benth. Scroph. Ind. 45, and in DC. Prodr. x. 475; pubescent villous or glabrate, stems elongate ascending, leaves petioled ovate or ovate-cordate obtuse crenate-serrate, racemes axillary and terminal peduncled slender, capsule broadly deltoid top 2-lobed. V. scrophularioides, Wall. mss.

Temperate Himalaya; from Chumba to Sikkim, alt. 9-13,000 ft.—DISTIEI. Japan, Formosa.

Root perennial. Stems 6-12 in., simple, usually slender, pubescent all round, or bifidously, or glabrate. Leaves in very few and distant pairs, 1-1 1/2 in., pubescent on both surfaces or glabrate; petiole 1/4-1/2 in. Racemes 2-3 in., lax-fld.; bracts small, linear, shorter than the calyx; pedicels equalling or shorter than the calyx. Sepals 1 1/4 in., unequal, linear-oblong. Corolla 1/2 in. diam., blue. Capsule 1/2-3/4 in. diam., glabrous or ciliate.—The Sikkim specimens are much more glabrous than the Western, and small specimens have the bifidously pubescent stems.

14. V. capitata, Benth. Scroph. Ind. 45, and in DC. Prodr. x. 481; pubescent, stems short suberect simple, leaves sessile or shortly petioled rounded ovate or shortly oblong obtuse crenate-serrate or subentire, base rounded, flowers in terminal sessile villous umbels or heads, capsule broadly obcordate.

Alpine Himalaya; from Kunsur to Bhotan, alt. 10-14,000 ft.

Annual or roots perennial, 3-6 in. high. Leaves 1/2-1 in., usually pubescent on both surfaces, uppermost pair often the largest. Flowers sessile in the uppermost pair of

VAEZ. sikkimensis: stem decumbent branched, leaves longer pedioted often 2 in. long.—Sikkim; Lachen, alt. 12,000 ft., J. D. H. This looks like a very luxuriant form of V. capitata with stems 8-10 in., large membranaceous leaves and pedicels sometimes ⅔ in. long.

15. **V. javanica**, Blume Bijd. 742; pubescent, diffusely repeatedly branched, leaves shortly pedioted ovate obtuse crenate-serrate base rounded suberolate or truncate, flowers small in short few-fld. axillary and terminal racemes, capsule very small broadly obcordate or didymous shorter than the calyx. Miquel Fl. Ind. Bat. ii. 701; Benth. in DC. Prodr. x. 489. V. Maddeni, Edgew. mss.

**SUBTROPICAL and TEMPERATE HIMALAYA**; from Simla to Bhotan, alt. 3-7000 ft. Khasia Mts., alt. 5-6000 ft., J. D. H. & T. T.—DistriB. Java, Loochoo Islands.

Annual. Stems very numerous, spreading from the root, ascending, 6-18 in., stout or slender, intricately branched. Leaves ½-1 in. more or less pubescent on both surfaces; petiole ⅓-⅔ in. Racemes subesuse, ⅓-1 in., fruiting 1-2 in.; pedicels ⅔ in., shorter than the small narrow bracts. Sepals linear-oblong, obtuse, ⅓ in. long. Corolla ⅓ in. diam. Capsule ⅓ in. diam., pubescent.

16. **V. verna**, Linn.; Benth. in DC. Prodr. x. 483; puberulous, glandular upwards, stems short erect simple densely leafy and flowering for most of their length, leaves sessile oblong simple or 3-cleft or pinnatisect, flowers axillary shortly pedioted, capsule broadly obcordate. Reichb. Fl. Germ. t. 1720, f. 1; Boiss. Fl. Orient. iv. 456.

**WESTERN HIMALAYA**; Kashmir and Jamu, alt. 5-7000 ft., Thomson.—DistriB. Europe, N. Asia.

Annual. Stem 2-6 in., slender, erect, simple or branched from the base, together with the flowers and leaves forming a cylindrical stout spike. Leaves ⅔-⅚ in., imbricate, or the lower distant. Flowers small, blue, pedicels very short. Sepals linear-lanceolate. Corolla pale blue, shorter than the calyx. Capsule ⅔ in. diam., glandular, about as long as the sepals.

17. **V. arvensis**, Linn.; Benth. in DC. Prodr. v. 483; pubescent, stems simple or diffusely branched, branches ending in long bracteate racemes, leaves very small subesuse ovate-cordate crenate, floral alternate oblong or lanceolate quite entire, racemes dense- or lax-fld., pedicels much shorter than the floral leaves, corolla minute, capsule broadly obcordate glandular-hairy shorter than the calyx. Reichb. Fl. Germ. t. 1720, f. 2; Boiss. Fl. Orient. iv. 457.

**WESTERN HIMALAYA**; from Kashmir and Kishwar, alt. 7-9000 ft., Thomson, to Garwhal, Edgeworth.—DistriB. Europe, N. Asia, and N. Africa.

Annual, 6-10 in. high; branches bifariously pubescent, often continuously leafy and floriferous throughout. Leaves ⅓-½ in., mostly sessile; floral alternate, linear-oblong or lanceolate, crowded or scattered. Pedicels very short. Sepals narrow, obtuse, ciliate. Corolla pale blue. Capsule ⅔-½ in. broad.

18. **V. serpyllifolia**, Linn.; Benth. in DC. Prodr. x. 482; glabrous or glandular-pubescent, creeping below, branched from the base, branches ending in long bracteate racemes, leaves sessile rounded or oblong subentire, floral alternate oblong quite entire, racemes dense- or lax-fld., pedicels equalling the floral leaves, capsule broadly obcordate, shorter than the calyx glabrous. Reichb. Fl. Germ. t. 1718; Boiss. Fl. Orient. iv. 458.

**TEMPERATE and SUBALPINE WESTERN HIMALAYA**; from Chumba to Kumaon, alt. 8-13,000 ft.—DistriB. Europe, N. Asia, N. Africa, N. and S. America.
Veronica. | CHI. SCROPHULARINEE. (J. D. Hooker.) 297


TRIBE VIII. GERARDIÉE.

40. ALECTRA, Thunb.

Erect, rigid, usually scabrid herbs, black when dry. Leaves opposite or the upper (rarely all) alternate, toothed (reduced to scales in A. Thomsoni). Flowers in terminal spikes or racemes, solitary in the axes of bracts, 2-bracteolate, upper crowded, yellow, or streaked with red or brown. Calyx campanulate, subfoliaceous, 5-toothed or -fid, lobes valvate or open in bud. Corolla-tube broad; limb oblique; lobes 5, spreading, the lower outer in bud. Stamens 4, didynamous; anthers touching in pairs, naked or bearded, cells parallel, bases mucronate. Style long, infixed, stigma elongate tongue-shaped. Capsule subglobose, loculicidal, valves entire or 2-fid. Seeds very numerous, minute, linear, tests very lax reticulate, nucleus small.—Species 14, tropical American, African and Indian.

1. A. indica, Benth. in DC. Prodr. x. 339; scaberduous, leaves sessile or shortly petioled ovate-lanceolate or lanceolate coarsely toothed base cuneate rarely cordate, bracts longer than the sessile flowers. A. cordata, Benth. in DC. l. c. (the Himalayan specimen). Hymenospermum dentatum, Benth. in Wall. Cat. 3963. Glossostyles arvensis, Benth. Scroph. Ind. 49.

TEMPERATE HIMALAYA; from Kumaon to Bhotan, alt. 3–9000 ft. KHASIA MTS., alt. 4–6000 ft. BEHAR; top of Parasnath, Anderson, &c. AYA, Wallich.—DISTRIBUT. Mauritius.

Stem 6–18 in., naked below, simple, or branched above. Leaves ½–1½ in., sparingly coarsely toothed. Spikes pubescent, 3–6 in.; flowers crowded; bracteoles ciliate. Calyx ¼ in. long. Corolla ⅓ in. long, yellow, lobes rounded subequal. Filaments ciliate; anthers yellow. Capsule shorter than the calyx, subglobose, 4-lobed. Seeds linear, nucleus very small in the centre of the transparent sausage-shaped tests.

2. A.? Thomosoni, Hook. f.; slender, leaves scale-like, flowers racemose, bracts minute.

BEHAR; on Parasnath, alt. 3000 ft., parasitic on a Strobilanthes, Thomson. A very singular plant, resembling the S. African A. orobanchoides, Benth. Stem rigid but flexuous, 6–15 in. high, simple or branched at the rootstock, hardly scaberduous. Leaves represented by a few scattered scales ¼–¾ in. long, the largest oblong, obtuse. Racemes 6–10 in., lax-fid.; bracts minute; pedicels ¼–⅓ in., slender. Calyx, fruiting hemispheric, ⅙ in. diam.; lobes broadly triangular. Capsule globose, as long as the calyx. Seeds as in A. indica, but more minute and elongate-cuneiform.

41. BUCHNERA, Linn.

Rigid annual herbs, black when dry. Leaves, lower opposite, broad; upper alternate, narrow. Flowers sessile, axillary, or in bracteate spikes, 2-bracteolate. Calyx tubular, 10-nerved, sometimes 5-ribbed, 5-toothed. Corolla-tube slender; lobes 5, flat, subequal, spreading, 2 upper inner in bud. Stamens 4, didynamous, included; anthers 1-celled, vertical, dorsi-fixed, bases obtuse, connective sometimes mucronate. Style thickened or clavate above, stigma entire or notched. Capsule oblong, loculicidal; valves coriaceous, entire, septiferous, separating from the placentas. Seeds
very numerous, ovoid or oblong, reticulated.—Species about 30, widely dispersed in warm countries.


Upper Assam; Mishmi Hills, Griffith. Tenasserim; at Moulinein, Wallich, Griffith, Heller.


—Distrib. Sumatra, Java, China.

Stem 10–15 in., simple or branched upwards. Leaves, radical rosulate, 1–1½ in., pubescent, base narrowed; cauline erect, 1–2 in., teeth few and irregular. Spikes ½–1 in. by ½–1 in. Calyx longer than in *B. tetrasticha*, half as long as the corolla. Capsule longer than the calyx.

3. **B. hispida**, Ham. in Don Prodr. 91; slender, hispid, root-leaves obovate or oblong, cauline linear-oblong or lanceolate toothed or entire obtuse, spike slender, flowers distant, bracts narrow. *Benth. in DC. Prodr.* x. 496; *Wall. Cat.* 3875; *Wight Ic.* t. 1413; Dalz. & Gibbs. Bomb. Fl. 182. B. Schimperiana, Hochst. Fl. Abyss. Excise. n. 23.


Stem 6–18 in., often branched above. Root-leaves 1–2 in., cauline usually longer and narrower. Spikes 6–10 in., very slender; flowers often distant. Calyx hispid, ½ in. long, lobes very narrow. Corolla-tube not twice as long as the calyx, limb ½ in. diam. Capsule shorter than the calyx.—Wight states that his specimens from Coorg are not hairy, as described in the character of the plant; these I have not found in his Herbarium.

42. **Striga**, Lour.

Usually scabrid herbs, discoloured or black when dry. Leaves, lower opposite, upper alternate, linear, entire, rarely toothed, sometimes reduced to scales. Flowers axillary or the upper in bracteate spikes, often 2-bracteolate. Calyx tubular, strongly 5–15-ribbed, 5-toothed or -fid. Corolla-tube slender, abruptly incurved at or about the middle or top; limb spreading, 2-lipped, upper lip usually short notched or 2-fid; lower the inner in bud, 3-fid. Stamens 4, didynamous, included; anthers 1-celled, vertical, dorsifixed, bases obtuse, connective sometimes mucronate. Style thickened above, stigma simple. Capsule subglobose or oblong, loculicidal; valves entire, septiferous, separating from the placentas. Seeds very numerous, ovoid or oblong, reticulated.—Species about 18, in the hotter regions of the Old World.
**Calyx 5-ribbed.**


**Western India;** Scinde, and Marwar, on Mt. Aboo, Stocks. The Deccan from the Concan southwards. Suhunusdhara, Boyle.—**Distri.** Tropical and S. Africa, Australia.

**Rootstock tuberous;** stems 6–10 in., stout or slender, simple or branched, glabrous or pubescent; branches stout, erect. Leaves opposite and alternate. Spikes variable in length, dense or lax-fl.d. Calyx-lobes acuminate. Corolla small, 2-lipped, described as white, rosy, blue or red-brown; tube exserted; limb \( \frac{1}{4} \) in. diam. Capsule sub-globose.


**Upper Gangetic Plain;** Saharumpore, Boyle; Bennes, Madden. **Decan Peninsula,** from Guezarat southwards.

**Stem 6–18 in., simple or branched;** branches erect, stout or slender, sometimes fastigiate. Leaves \( \frac{1}{2} \) by \( \frac{1}{4} \) in., erect. Spikes usually slender, sometimes very long with distant flowers; bracts linear. Calyx \( \frac{1}{4} \) in., lengthening in fruit, lobes subulate. Corolla white, tube exserted, limb \( \frac{1}{4} \) in. diam. Capsule included in the calyx.

**Calyx 10–15-ribbed.**


Throughout **Western India** and the **Deccan;** from Scinde and the Punjab southwards (Kumhoun only, in the Himalaya, ascending to 6000 ft.) **Bengal, Tenasserim.**—**Distri.** Siam, Java, China, Arabia, Tropical and S. Africa, Madagascar.

**Stem usually slender, 6–18 in., simple or fastigately branched.** Leaves \( \frac{1}{2} \)–1 in. Spikes elongate; flowers usually distant; bracts usually longer than the calyx. Calyx rarely 15-ribbed. Corolla very variable in size, scarlet, purple, yellow or white; tube twice as long as the calyx, glabrous or nearly so, suffused at the top. The var. *huminis*, Bentham in DC. l. c., has rather broader leaves and a dense spike.

4. *S. euphrasiioides*, Bentham in Comp. Bot. Mag. i. 364; and in DC. Prodr. x. 503; scabrid or strigose, leaves linear, calyx \( \frac{1}{4} \) in. 15-ribbed, lobes as long as the tube, corolla \( \frac{1}{2} \)–3 in. long. Dalz. & Gibs. Bomb. Fl. 181; Miquel Fl. Ind. Bat. ii. 705. S. glabrata, Bentham. in Hook. l. c. Buchnera euphrasiioides, Vahl Symb. iii. 81; Roxb. Fl. Ind. iii. 32; Wight Jr. t. 595. B. angustifolia, Don Prodr. 91. B. bifida, Ham. in Wall. Cat. 3872. B. asiatica, Linn. Herb. in part.
Throughout India, in the plains from the Punjab southwards to Ceylon, and eastwards to the Khasia Mts., Pegu and Burma; ascending the Himalaya to 4000 ft. (not seen from the Eastern Peninsula or lower Bengal.—Distrib. Java (Miquel).

Very variable in habit, from a simple filiform stem 4-6 ft., to a stout branched herb 2 ft. Leaves ½-2 in., often 1-2-toothed. Spikes interrupted; flowers often distant. Corolla white, tube pendent at the curve. Calyx bell- or funnel-shaped in fruit.


S. stem very slender, 1-2 ft. Leaves 1-3 in. Flowers distant. Fruiting calyx ½-1 in., tube ventricose, ribs very strong and close.

6. S. sulphurea, Dalz. & Gibbs. Bomb. Fl. 182; very slender, scabrid, leaves linear, flowers mostly axillary, calyx ½-3 in., lobes filiform equalling the tube, corolla-tube not exceeding the calyx, limb very small.

The Concan; at Seconere hill-fort, Dalzell.

S. stem 6-12 in. Leaves 1-½ in., extremely slender. Flowers few, distant, all axillary or the upper subsiculate, shorter than the floral leaves. Calyx very narrow, fruiting ½ in., tube ventricose, ribs very strong. Corolla yellow, limb ½ in. diam.

43. Rhamphicarpa, Benth.

Erect glabrous herbs. Leaves, lower opposite, upper alternate, narrow, entire or pinnatisect. Flowers axillary and pedicelled, or in bracteate racemes; bracteoles 1-2 or 0. Calyx campanulate, 5-fid, lobes acuminate. Corolla-tube slender, long, straight or incurved; lobes 5, broad, spreading, subequal or the upper connate. Stamens 4, didynamous, included; anthers 1-celled, vertical, dorsifixed, bases obtuse. Style thickened above, stigma simple. Capsule compressed at right angles to the septum, usually beaked, loculicidal; valves septiferous. Seeds numerous, small, obovoid or oblong, tube reticulate.—Species 6, tropical and S. African, Indian and Australian.


Deccan Peninsula, from the Concan southwards.

Very variable in habit and stature, from 2 in. slender and simple, to 10 in. diffusely branched. Leaves 1-½ in.; segments few, ½-3 in. Flowers shortly pedicelled. Calyx ½-1 in., tube short, lobes lanceolate 3 times as long as the tube. Corolla dull white, tube 1-½ in., limb ½ in. diam. Capsule ½ in., ovoid, ventricose, beak longer or rather shorter than the cells.—Bentham (Fl. Austral. iv. 518) unites with this the African R. fistulosa, Benth., and an Australian species, but the calyx is much longer in R. longiflora, and I think the three are distinct, though very near.

44. Centranthera, Br.

Annual, rigid, scabrid herbs. Leaves opposite or upper alternate, oblong
or linear, obtuse, entire or toothed. Flowers axillary or in bracteate spikes or racemes, 2-bracteolate. Calyx compressed, spathaceous, split on one side; lobes acute or acuminate, cohering or free. Corolla-tube long, incurved, dilated above; limb oblique; lobes 5, broad, subequal, spreading, 2 upper inner in bud. Stamens 4, didynamous, included; anthers meeting in pairs, cells transverse, bases spurred or mucronate, one smaller often empty. Stigma dilated, acute. Capsule ovoid or subglobose, loculicidal; valves entire, placental in the middle. Seeds very numerous, oblong-cuneate, testa lax, reticulate.—Species 4, Indian, Malayan and Australian.

1. **C. grandiflora**, Benth. Scroph. Ind. 50, and in DC. Prodr. x. 525; erect, stout, scabrid, leaves oblong elliptic or narrowly linear, calyx 1 in. oblong inflated acuminate, corolla yellow. Wall. Cat. 3880.


Throughout India; from the Punjab, and Kumaon, ascending to 4000 ft., to Canara, Bengal, Tenasserim and Burma. **Ceylon**, ascending to 3000 ft.—Distrb. Java, China, Philippine Islands, Australia.

Stem 1-2 ft. Leaves very variable, usually 1/2-1 in., and narrowly linear. Flowers subsessile. Corolla twice as long as the calyx. Filaments woolly.

4. **C. procumbens**, Benth. in DC. Prodr. x. 525; diffusely branched from the base, rarely erect, hispid, leaves oblong or linear-oblong, calyx 1/2 in. ovoid-oblong acute, corolla purplish. C. Brunoniana, Thwaites Enum. 220, not of Benth.

**Deccan Peninsula**; from the Concan southwards. **Ceylon**, ascending to 3000 ft.

Root apparently more than annual. Stems rarely simple, erect, 6-10 in., usually with struggling branches 4-9 in. long from the root. Leaves 1/2-1 by 1/2-1 in. Flowers sessile. Corolla 3/4-1 in.—Possibly a variety of **C. hispida**, but the calyx is much larger.

5. **C. humifusa**, Wall. Cat. 3883; dwarf, diffusely branched from the base, glabrous or hispidulous, leaves linear, calyx 1/3 in. ovoid subacute, corolla yellow. **Benth. in DC. Prodr. x. 525. Razumovia tranquebarica, Spreng. Syst. ii. 812. Torenia lepidota, Roth Nov. Sp. 281.**

**Bengal and Behar**; at Parusnath, Clarke. **Deccan Peninsula**; at Tranquebar.
MALACCA, _Griffith_. Ceylon; south end of the island.—Distrib. Java, Borneo, China.


45. SOPUBIA, _Hamilt._

Erect herbs. Leaves opposite, or the upper alternate, narrow, often laciniate. Flowers bracteate, spicate or racemose, pedicels 2-bracteolate. Calyx campanulate, 5-toothed or -lobed. Corolla-tube short, throat broad; lobes 5, broad, spreading, subequal, 2 upper the inner in bud. Stamens 4, didynamous, subincluded; anthers 2 or all meeting in pairs, one cell of each perfect, ovoid, the other small stipitate empty. Stigma thickened, sublinguliform, obtuse. Capsule ovoid or oblong, tip rounded or compressed, retuse or notched, loculicidal; valves entire or 2-fid, separating from the placentiferous axis. Seeds numerous, testa lax.—Species 8 or 9, S. African, Indian, Malay, and Australian.

1. _S. delphinifolia_, G. Don Gen. Syst. iv. 560; much branched, scaberulous, leaves pinnatisect, segments filiform, flowers subsessile, calyx-teeth longer than the tube subulate, corolla subcampanulate, capsule rounded at the top. _Benth. in DC. Prodr._ x. 522; Dalz. & Gibbs. Bomb, Fl. 182. Gerardia delphinifolia, Linn.; Roxb. Cor. Pl. i. 62, t. 90, and Fl. Ind. iii. 99; _Wall. Cat._ 3890; _Benth. Seroph._ Ind. 49. G. Heyneana, _Benth. in Wall. Cat._ 3891. Euphrasia Coromandeliana, _Roth_; _Spreng. Syst._ ii. 775.

_Banda._ Edgeworth. Behar; on Parasnath, _Anderson_. _Deccan Peninsula_, from the Concan southwards. _Ceylon_, ascending to 4000 ft.

_Stem_ erect, 4-grooved, 3–4 ft., spotted with purple. Leaves 1 in., segments few, almost as long, flexuous. Calyx-lobes linear, erect. Corolla 1–1½ in., rose coloured, limb 1 in. diam. _Filaments_, upper hooked lower horned at the tip. _Capsule_ oblong, as long as the calyx.


_Temperate_ and _Subtropical Himalaya_; from Kunahur to Sikkim, alt. 3–7000 ft. _Khasia Mts._, alt. 3–4000 ft. _Deccan Peninsula_; Nilgherries and Bababoodan Hills, common. _Ceylon_; elevated parts of the Central province.

_Stem_ slender, 1–2 ft., branches suberect. Leaves ½–1 in., often fascicled. _Pedicels_ ½–⅜ in. Calyx ⅛ in., woolly within. Corolla ½ in. diam., varying from yellow to purple (Clarke).

3. _S. stricta_, G. Don Gen. Syst. iv. 559; scaberulous, branched, leaves linear entire or sparingly toothed or cut, flowers pedicelled, calyx-teeth lanceolate acute, corolla subcampanulate, capsule compressed at the top. _Benth. in DC. Prodr._ x. 522. Gerardia stricta, _Benth. Seroph._ Ind. 49; _Wall. Cat._ 3887.


_Stem_ 8–12 in., rigid, simple or fastiglately branched above. Leaves 1–1½ in., scattered and fascicled. _Pedicels_ ⅛ in. Calyx ⅛ in. Corolla ½ to ⅛ in. long, limb as broad.
46. **MICRARGERIA, Benth.**

Rigid, scabrid, erect herbs, black when dry. *Leaves* alternate, or the lower opposite, linear, entire or 3-multifid. *Flowers* small, in the upper axils, or in long terminal spikes, bracteate and 2-bracteolate. *Calyx* campanulate or hemispheric; teeth 5, broad. *Corolla-tube* exserted, dilated above, often incurved; lobes 5, broad, spreading, entire, subequal, 2 upper inner in bud. *Stamens* 4, didynamous, included; anthers free, meeting in pairs, cells distinct subequal attached by their tips, base obtuse. *Stigma* thickened, obtuse. *Capsule* small, globose, locul- and septi-cidal; valves 4, separating from 2 small globose placentas. *Seeds* numerous, oblong-cuneate, testa lax.—Species 2, a W. African and Indian.

**M. Wightii, Benth. in DC. Prodr. x. 509;** lower leaves pinnatisect, segments few filiform. *Wight Jc. t. 1417.*

**South Deccan Peninsula; Wight, &c.**

Annual, 8–18 in. high. Stem naked below, fastigiatly branched above; branches long, slender, erect. *Leaves* ½ in., in scattered fascicles, cut into almost filiform spreading segments ½–1 in. long; upper filiform, entire. *Spikes* very long and slender; flowers distant, subsessile; bracts filiform, longer than the calyx; bracteoles linear. *Calyx* ½ in., hemispheric; teeth triangular. *Corolla-tube* ½ in. long, incurved, pubescent, limb as broad. *Capsule* ½ in. diam. enclosed in the calyx.

47. **LEPTORHABDOS, Schrenk.**

Erect, annual, glabrous or glandular-pubescent, twiggy herbs. *Stem* 4-angled. *Leaves* opposite below, alternate above, linear, entire or laciniate or pinnatisect, upper smaller. *Flowers* small, axillary, and in interrupted very slender racemes, bracteate, ebracteolate. *Calyx* tubular-campanulate, 5-toothed or -fid. *Corolla-tube* short; lobes 5, subequal, spreading, broad, entire or notched, 2 upper inner in bud. *Stamens* 4, didynamous, shorter than the corolla; anthers free, cells parallel equal not spurred. *Stigma* shortly dilated, obtuse; ovules 2 in each cell. *Capsule* compressed above at right angles to the septum, obtuse, loculicidal; valves entire, septiferous. *Seeds* 1–2 in each cell, laterally attached, oblong or angled, rugose.—Species 4 or 5, Central Asiatic and N. Indian.


**Temperate Western Himalaya;** from Kashmir to Kumaon, alt. 5–11,000 ft., *Fallooner, &c.* **Western Tibet;** Dras, alt. 10,000 ft., *Thomson.—Distrib. Afghanistan, Persia.**

*Stem* 1–2 ft., slender or rather stout, naked below, simple or fastigiatly branched above; branches strict, erect, very slender. *Leaves* 1–3 in., sometimes cut to the base into subequal filiform segments, in others ovate or lanceolate and regularly pinnatisect; segments linear and entire or subpinnatifid. *Racemes* very slender, very mauv.-fid.; pedicels ½–1 in.; bracts linear, longer or shorter than the pedicels. *Calyx* ½ in.; lobes lanceolate or triangular-ovate, acute, 5-ribbed in fruit. *Corolla* variable in size, about twice as long as the calyx; limb ½ in. diam. *Capsule* ½ in., as long as the calyx.—I can find no difference between the authentically named specimens of *L.*
virgate and parviflora; but there are fruiting specimens from Balti in the Shayuk valley of a plant the capsules of which are nearly \( \frac{1}{2} \) in. long.


KASHMIR, in the upper pine forests, Jacqueumont.
I have seen no specimens of this, which is probably referable to L. Benthamiana. Possibly there is but one species of this genus.

**TRIBE IX. EUPHRASIEAE.**

48. **Phtheirospermum**, Bunge.

 (& 50 Emmenospermum, Clarke.)

Annual or biennial, viscid herbs. Leaves opposite, pinnatifid. Flowers axillary, solitary, sessile or shortly pedicelled, ebracteolate. Calyx campanulate, 5-fid, lobes short narrow. Corolla 2-lipped, tube broad, dilated above; upper lip very short, erect, lobes 2 folded back; lower longer, broader, spreading, 2-fid, throat open, palate 2-gibbous. Stamens 4, didynamous; anthers beneath the upper lip glabrous, cells equal parallel distinct, bases mucronate. Stigma spatulate, shortly 2-lobed. Capsule compressed, beaked, loculicidal; valves entire, semiseptiferous, at length separating from the placentiferous column. Seeds numerous, ovoid, reticulated.—Species 3, a Chinese and Japanese and 2 Indian.

A new genus (Emmensospermum) has been proposed by Clarke (and inadvertently introduced into the key, p. 249) for P. Parishii, founded on the seeds being minutely reticulated and not striate, a character not supported by habit or any other. The seeds of P. chinense are ellipsoid in. long, with a loose pale reticulated testa; those of P. Parishii are about half that size, with a dark close testa. Much greater differences occur in the seeds of all large and many small genera of Scrophularinaceae.

1. **P. Parishii**, Hook. f.; softly hairy, leaves sessile broadly ovate deeply pinnatifid, lobes obtuse, flowers subsessile, corolla-tube much longer than the calyx, upper lip very short truncate 2-toothed, lobes of lower obturate.

TNNASERIM; at Mouleim, Koli Mts. and Thongyne, alt. 5000 ft., Lobb; Summit of Mooloo, alt. 7400 ft., Parish.

Stem 3-8 in., simple or branched from the base or upwards, hairs spreading. Leaves \( \frac{1}{2}-\frac{3}{4} \) in.; lobes linear, entire or notched. Calyx \( \frac{1}{2} \) in., glandular, 5-cleft to the middle; lobes linear-lanceolate, obtuse. Corolla 1 in. long. Capsule \( \frac{1}{2} \) in., pubescent. Seeds \( \frac{1}{30} \) of an inch long, oblong, testa close dark.


WESTERN HIMALAYA; (in Garwhal ?) at Shbol, alt. 6000 ft., Edgeworth.

Stem slender, erect, 3-4 in., simple or branched. Leaves \( \frac{1}{2}-\frac{1}{3} \) in. Flowers few, sessile. Calyx \( \frac{1}{2} \) in. long. Corolla \( \frac{1}{2} \) in. wide.—The specimens are quite insufficient for a second analysis of the flower.

49. **Euphrasia**, Linn.

Annual or perennial herbs. Leaves opposite, toothed laciniate or pal-
Euphrasia.]

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matatif. Flowers in terminal spikes with large often acutely cut bracts, ebracteolate. Calyx tubular or campanulate; lobes 4, equal or connate in pairs, rarely with a minute 5th tooth. Corolla 2-lipped, tube dilated above; upper lip erect, concave, 2-lobed, margins replicate; lower larger, not plaited below, 3-lobed, lobes spreading, obtuse or notched. Stamens 4, didynamous; anthers beneath the upper lip, cells distinct, parallel, base equally or unequally mucronate or spurred. Stigma dilated, entire or with a small dorsal tooth. Capsule oblong, compressed, loculicidal; valves septiforous, separating from the placental column. Seeds numerous (rarely few), pendulous, oblong, grooved.—Species about 20, of cool regions.


Temperate Himalaya; from Kashmir to Kumaon, alt. 4–13,000 ft.; Sikkim, alt. 10–12,000 ft., J. D. H.—Distrib. Afghanistan and N. Persia to Europe, N. Central and East Asia to Japan, N. America.

Stem wiry, 6–18 in., simple or sparingly or fastigiatly branched, often naked below; branches slender, erect. Leaves ™ ¾ in., distant or imbricating, nerves strong. spikes continuous with the foliage, short or long, obtuse, few- or many-fld. Flowers very small; bracts imbricating. Calyx about equaling the bracts; lobes acute. Corolla ™ ¾ in. long, white or lilac, with purple veins. Anthers brown. Capsule included in the calyx or exserted.—Very variable, attaining a much larger size in the Himalaya than in Europe, and being more constant in foliage. Bentham distinguishes two Himalayan varieties; E. tartarica, with almost orbicular leaves, remote, subacute bracts, and small corollas hardly exserted from the bracts, and E. vulgaris, with ovate or oblong obtusely crenate cauline leaves, sharply serrate bracts, and corolla of very variable size. These, which are both widely distributed in Europe and Asia, present no constant characters in India.

50. Emmenopsernum, Clarke.

(See 48, Phtheirospernum.)

51. Bartsia, Linn.

Annual or perennial herbs. Leaves opposite, entire crenate serrate or incised. Flowers axillary, spicate or racemose, bracteate, ebracteolate. Calyx tubular or campanulate, 4-fld. Corolla 2-lipped; tube slender, straight or incurved; upper lip erect, concave, entire or notched, margins not replicate; lower convex or bigibbous at the base, lobes 3 spreading. Stamens 4, didynamous; anthers under the upper lip, cells distinct equal parallel, bases usually spurred. Stigma obtuse or capitate. Capsule loculicidal to the middle or higher; valves entire, placental. Seeds numerous, pendulous or horizontal, smooth grooved or winged.—Species about 60, in cool and mountain localities.


Kashmir, alt. 7–8000 ft., Clarke.—Distrib. Westwards to Europe and N. Africa; N. and Central Asia to Japan?

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Stem 6–18 in., erect or ascending, wiry, 4-angled, paniculately branched; branches ending in leafy spikes. Leaves 1/4–2 in., very variable. Calyx campanulate; lobes ovate, acute, equaling the tube. Corolla 1/2 in., pubescent, pink; upper lip long, entire. Anthers exerted, yellow. Capsule 1/2 in., rather longer than the calyx. Seeds narrowly oblong.

52. PEDICULARIS, Linn.

Annual or perennial herbs. Leaves alternate opposite or whorled, simple toothed pinnatifid or pinnatisect. Flowers bracteate in terminal spikes or racemes, ebracteolate. Calyx tubular or campanulate, entire or split above and often below, 2–5-toothed, lateral teeth free or connate entire or crested, lower small or 0. Corolla 2-lipped, tube cylindric; upper lip erect, compressed straight falcate annular or decurved, obtuse acute or beaked, lower with 3 spreading erect or deflexed lobes. Stamens 4, didynamous; anthers under the upper lip meeting in pairs; cells distinct, equal, parallel, bases obtuse or rarely awned. Style slender, stigma subcapitate. Capsule compressed, ovate or lanceolate, falcate or oblique, often obliquely beaked, loculicidal; valves placentiferous, often cohering to the middle. Seeds numerous, of various shapes, testa appressed or lax, reticulate pitted striate or ribbed.—Species about 120, northern and mountain plants, with a few S. American and S. Indian.

Series I. Cauline leaves whorled, or opposite, or the lower scattered.

* Upper lip beaked.

1. P. pectinata, Wall. Cat. n. 420; usually tall, stout, glabrous, except the often hairy spike, cauline leaves whorled; lanceolate pinnatifid or pinnatisect with serrate segments or 2-pinnatifid, calyx-teeth acute entire, corolla-tube short, upper lip inflated sickle-shaped beak long tip twisted. Benth. Scroph. Ind. 52, and in DC. Prodr. x. 560.

Western Temperate Himalaya; from Kashmir to Kumaon, alt. 7–11,000 ft.—Distrib. Afghanistan.

Stem 6–18 in., simple or branched. Leaves 3–6 in., sometimes 4 in. broad, ovate or oblong; petiole long, slender. Spikes 2–6 in., lax-fld.; bracts as long as the calyx, ovate or lanceolate. Calyx 1/2 in. long, inflated in fruit. Corolla 1/4 in., rose-red, beak with a double flexure, as long as the tube. Filaments hairy. Capsule 1/2 in., ovoid acute, tip exerted. Seeds large, 1 in. long, ridged and deeply pitted, pale.

Var. pyramidata; stem sometimes 4-fariously hairy, spikes sometimes 1 ft. long.

P. pyramidata, Boyle in Benth. Scroph. Ind. 52, and in DC. Prodr. x. 560.

2. P. robusta, Hook. f.; pubescent, stems short very stout curved ascending, radical leaves many linear coriaceous pinnatifid or pinnatisect, segments oblong crenate, cauline few opposite or alternate, racemes short, bracts pinnatifid, calyx-lobes crenate, corolla-tube not longer than the calyx, upper lip erect inflated then sharply decurved and shortly beaked. P. pectinata, Herb. Ind. Or. H. f. & T. (the Sikkim plant only).

Alpine Sikkim; Samdong, alt. 15–16,000 ft., J. D. Hook., Elwes.

Rootstock long, stout, cylindric. Stems several from the rootstock, 3–6 in. long or less, as thick as a crow-quinl, sometimes very short. Radical leaves numerous, 2–5 by 1/2–3 in., lobes numerous and close-set; petiole very stout. Racemes dense-fld.; bracts leafy, crenate or pinnatifid; flowers 1/2 in. long. Calyx split half-way down, lobes small. Corolla red-purple; upper lip 1/3 in. long, glabrous, lower 1/2–3 in. broad, 3-lobed. Capsules 1/4 in. long, broadly oblong, tip rounded with a lateral point. Seeds 1/10 in. long, subellipsoid, subscute, finely striate, not punctulate, pale.—Clarke collected on Singa-

4. P. gracilis, Wall. Cat. 413; stem tall slender branched 4-fariously hairy, cauleine leaves whorled deeply pinnatifid, segments oblong-lanceolate obtuse serrate crenate or pinnatifid, racemes or spikes slender lax-fld. or flowers all axillary distant, corolla-tube half as long as the calyx, upper lip falcate swollen in the middle, erect with a horizontal flexuous slender beak, much longer than the small lower broadly obovate or orbicular 3-lobed. Benth. Scroph. Ind. 52, and in DC. Prodr. x. 561. P. stricta & P. Brunoniana, Wall. Cat. 414, 422.

TEMPRATE and ALPINE HIMALAYA; from Kashmir, alt. 6-10,000 ft., to Sikkim, alt. 8-12,000 ft.—DISTRIB. Afghanistan. Stem 6-24 in.; branches opposite or whorled, simple or divided, all very slender. Leaves 1-2 by ¾-1½ in., rarely hairy. Spikes or racemes 3-6 in.; bracts pinnatifid, longer than the calyx; flowers pedicelled or sessile. Calyx ½ in.; lobes obtuse or crenulate. Corolla rose-purple; tube ¾ in., slender, beak decurved as long as the lower lip which is very variable in size and shape. Capsule 4-½ in., shortly oblong, acute, half or only the tip exserted. Seeds very minute, ¾ in. long, broadly ovoid, pale, striate and with shallow pits.

Var. khasiana; puberulous or glabrate, leaves very short ½-¾ in., lobes short close, bracts often shorter than the calyx.—Khasia Mts., alt. 5-6000 ft., Griffith, &c.

5. P. porrecta, Wall. Cat. 423; stem short ascending glabrous or 2-4-fariously hairy, cauleine leaves 1-2 pair opposite oblong pinnatifid lobes oblong obtuse serrate, raceme short few-fld., corolla-tube twice as long as the calyx, upper lip sickle-shaped erect inflated then shortly decurved and acutely beaked, as long as the lower lip. Benth. Scroph. Ind. 52, and in DC. Prodr. x. 561.

ALPINE HIMALAYA; "towards Kashmir," Royle; Kumaon, Wallich; Sikkim, alt. 14-15,000 ft., J. D. H. Rootstock perennial, stout. Stems several from the rootstock, 4-6 in. Leaves ¼-1 in., radical petioled, cauleine sessile or petioled. Racemes 4-6 fl., pubescent; bracts pinnatifid; flowers ¾ in. long. Calyx-lobes obtuse, crenulate. Corolla-tube slender, ¾ in. Capsule ½ in., oblong, nearly straight, acute. Seeds ¾ in. long, sub-ellipsoid, pale, finely striate and punctulate.

6. P. brevifolia, Don Prodr. 94; pubescent or villous, stem erect simple, leaves few, cauleine opposite or whorled oblong pinnatifid lobes short toothed, spikes few-fld. subcapitate, corolla-tube twice as long as the calyx, upper lip falcate erect then inflated with a long straight or decurved beak longer than the lower lip. Benth. Scroph. Ind. 53, and in DC. Prodr. x. 561. P. lanigera, Wall. Cat. 419.

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Pedicularis.] CIII. SCROPHULARINEE. (J. D. Hooker.)
7. P. flexuosa, Hook. f.: slender, sparsely hairy or glabrate, stems flaccid elongate decumbent diffusely branched, cauleine leaves opposite petioled ovate or oblong 2-pinnaed lobes sharply toothed. Flowers axillary and in lax or dense leafy spikes or heads. Corolla-tube 3/4-1 1/4 in., limb large, upper lip erect then inflated with a stout horizontal beak shorter than the lower lip. Pedieularis n. 5, Herb. Ind. Or. H. f & T.

Sikkim Himalaya; alt. 10-13,000 ft., J. D. H., Clarke.
Stems 1-2 ft., curved (dwarf forms 6-8 in. also occur), flexuose. Leaves 2-4 in., ovate oblong or oblong-lanceolate, flaccid, irregularly toothed. Spikes or racemes usually capitulate in flower and fruit, or elongating in fruit; bracts pinnaed, longer than the calyx. Calyx 1/4 in., lobes crenulate. Corolla rosy, tube many times longer than the calyx; limb 1/2 in. diam. Capsule 1 in. long, ovate-oblong or lanceolate, straight, acute. Seeds 1/4 in. long, ellipsoid, obtuse, smooth or obscurely reticulate, dark.

8. P. integrifolia, Hook. f.: softly glandular-pubescent, stems short stout simple, cauleine leaves few opposite sessile oblong obtuse crenulate, flower axillary and in short heads, corolla-tube 3/4 in., upper lip large erect then greatly inflated and narrowed into a very long slender flexuose beak. Pedieularis n. 8, Herb. Ind. Or. H. f & T.

Sikkim Himalaya; Tungu, alt. 12-14,000 ft., J. D. H.
Rootstock very stout. Stems 4-6 in., ascending. Radical leaves crowded, 1 1/2-2 in., narrowly linear-lanceolate, subacute, margins recurved obscurely crenate, glandular-pubescent on both surfaces; cauleine erect, 3-1 in. Spikes capitate, oblong; bracts leaf-like, but broad, as long as the calyx. Calyx 1/2 in., lobes crenate. Corolla dark purple, tube twice as long as the calyx; beak longer than the tube, flexuose. Capsule not seen.

** Upper lip of the corolla rounded at the end, not or very shortly beaked.


Sikkim Himalaya; Kongra Lams, alt. 14-15,000 ft., J. D. H.
Rootstock stout. Stems 2-4 in. Radical leaves 1 in., very shortly petioled, lower cauleine sessile, 1/2 in. Spikes globose or oblong, top rounded; bracts as long as the calyx, rounded, crenulate; flowers 1/2 in. long. Calyx 1/2 in. long, hirsute, lobes obtuse, very short. Corolla dark purple; tube broad, half as long again as the calyx; upper lip with a sharply inflexed but hardly beaked tip.—The specimens are from one locality only, and not in fruit; they resemble P. brevifolia, Don, a good deal, but the flowers are more numerous and denser, and the upper corolla lip is hardly beaked. P. Korakomi, Regel, is another closely allied plant, differing in the glabrous calyx with longer teeth.

10. P. cheilanthifolia, Schrenk in Fisch. & Mey. Enum. Pl. Nov. Fas. ii. 19; stems erect or ascending simple or branched 4-fariously hairy, cauleine leaves whorled petioled linear pinnatifid segments crenate, spike dense- or lax-fld. villous, corolla-tube twice as long as the calyx, upper lip much longer than the lower archered dilated at the apex or not, tip deflexed
Pedicularis.  CIII. SCROPHULARINÆ.  (J. D. Hooker.)

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Western Tibet; Nubra and Ladak, alt. 11–15,000 ft., Thomson, &c.; Balch Pass, N. of Kunjon, alt. 16,500 ft., Strachey & Winterbottom.—Distrib. Soungaria.

Rootstock stout.  Stems many, 6–12 in., rarely branched.  Radical leaves 1–4 by 1–2 in., petiole slender, cremnates often callous; cauline opposite and 3–6 in a whorl, 1–2 in. long.  Spikes 1–4 in., stout, very villous; bracts longer than the calyx, entire or toothed; flowers 3/4 in. long.  Calyx 1/4 in.; lobes short, obtuse.  Corolla pink, lower lip small very short.  Capsule obovate-lanceolate, acuminate, nearly straight, half exerted.  Seeds 1/4 in., ellipsoid, subacute, striate and punctate, pale.—Differs from P. abrotanifolia, Bieb., in the pink flowers, and long upper lip of the corolla.

11. P. verticillata, Linn.; Benth. in DC. Prodr. x. 563; sparingly hairy, stems erect or ascending, cauline leaves few whorled sessile or sub-sessile oblong or linear-oblong pinnatifid segments rather distant ovate sub-pinnatifid and crenulate, spikes broad short often interrupted, corolla-tube twice as long as the calyx, upper lip small nearly straight subtruncate much smaller than the large broad lower lip.  Jacq. Fl. Austr. t. 206; Gaertn. Fruct. i. 216, t. 53, f. 5; Reichb. Fe. Fl. Germ. t. 1762, f. 1–14; Boiss. Fl. Orient. iv. 485.  P. Stevenii, Bunge in Ledeb. Fl. Alt. ii. 427.

Alpine Himalaya; Kunawur, Royge; Lahul, Jaeschke; Sanch Pass, alt. 14–15,000 ft., Ellis.  Sikkim, alt. 11–13,000 ft., J. D. H.—Distrib. From the Pyrenees to the Himalaya, N. Asia, N. America, and the Arctic regions.

Rootstock rather slender.  Stems 4–10 in. high.  Radical leaves 2–3 in., petioled; cauline shorter, whorled.  Spikes 1–3 in. by 11/2 broad, lower whorl of flowers often distant, with leafy bracts, upper dense; bracts usually longer than the calyx, pinnatifid or crenate; flowers 3/4 in. long.  Calyx 1/4 in.; lobes broad, very short.  Corolla pink-purple; tube broad, lower lip 1/2–2 in. diam.  Capsule 1/2 in., oblong-lanceolate, straight, acuminate, twice as long as the calyx.  Seeds 1/4 in. long, rather broad, finely striate and punctuate, pale.

12. P. denudata, Hook. f.; nearly glabrous, stems long simple very slender, cauline leaves in few distant whorls very short sessile oblong pinnatifid pubescent, segments crenate, spikes elongate interrupted, bracts whorled pinnatifid longer than the flowers, corolla-tube longer than the calyx, upper lip abruptly deflexed longer than the lower, tip subacute.  Pedicularis n. 11, Herb. Ind. Or. H. f. & T.

Sikkim Himalaya; Lachen Valley, alt. 12–13,000 ft., J. D. H.

Stems solitary or many from the root, 8–12 in., with 1–2 whorls or pairs of leaves.  Root-leaves evanescent, small, petioled; cauline 4 in a whorl, 1–2 in. long, obtuse.  Spikes interruptedly whorled; lower flowers with spreading bracts larger than the cauline leaves; flowers 3/4 in. long.  Calyx 1/2 in.; lobes short, crenate.  Corolla pink.  Capsule not seen.—Near P. verticillata, differing in the very small lower lip.

13. P. mollis, Wall. Cat. 415; tall, stout, erect, hirsute or glabrate, simple or with whorled slender branches, leaves whorled ovate or oblong pinnatifid puberulous segments linear crenate or again pinnatifid, spikes elongate interrupted, calyx-lobes oblong crested, upper lip narrow straight much longer than the lower tip rounded.  Benth. Scroph. Ind. 53, and in DC. Prodr. x. 564; Bot. Mag. t. 4599.

Alpine Himalaya and Western Tibet; Nubra, alt. 11–12,000 ft., Thomson; Nepal, Wallich; Sikkim, alt. 10–14,000 ft., J. D. H.

Annual.  Stem 2–3 ft., sometimes as thick as the little finger, strict, hollow.  Leaves all cauline in several tiers, 4–5 in a whorl, 1–2 by 11/2–2 in., segments not crowded.  Spikes on the branches and main stem 6–16 in., strict; flowers 3/4–2 in. long, in superposed but separated whorls; bracts pinnatifid, longer or shorter than the
flowers. *Calyx* \( \frac{1}{4} \) in., ovoid; lobes oblong. *Corolla* dark pinkish purple. *Capsule* \( \frac{1}{4} - \frac{1}{2} \) in., tip exserted, ovoid, finely acuminate. *Seeds* \( \frac{1}{4} \) in., broad, flattened, punctate, pale.—Described as perennial by Bentham, but the root appears to be clearly annual. Resembles *P. gracilis*, especially in fruit.

14. *P. pyrnantha*, Boiss. Diagn. i. xii. 45, and Fl. Orient. iv. 484; short, stout or slender, sparsely hairy or glabrous, leaves long-petioled, radical many, cauleine few opposite and whorled all lanceolate or ovate-lanceolate pinnatifid segments linear acute recurved toothed or subpinnatifid, spikes oblong dense-fld., calyx-lobes subulate, corolla-tube longer than the calyx, upper lip linear straight rather longer than the lower tip rounded. P. Albertii, Regel, Descr. Pl. Nov. fasc. viii. 67.

N.W. HIMALAYA; Lahul, Jassche; Hazara, alt. 6-7000 ft., Stewart.—DISTRIBUTION. Afghanistan, N. Persia, Turkestan.

*Rootstock* stout, with fleshy tuberous root-fibres, and crowned with membranous sheaths. *Stems* several, 3-6 in. high. *Radical leaves* 4-6 by 1-1\( \frac{1}{2} \) in.; petiole 1-2 in.; segments very variously and irregularly cut or serrate, rather flaccid; cauleine more shortly petioled. *Spikes* 1-4 in.; bracts lanceolate, acuminate, longer than the calyx; flowers \( \frac{3}{4} \) in. long. *Calyx* enlarged and \( \frac{1}{2} \) in. long in fruit; lobes very variable, narrow, sometimes elongate. *Corolla* pink. *Capsule* shortly oblong, acute, shorter than the calyx. *Seeds* large, \( \frac{1}{4} \) in. long, ellipsoid, obtuse, striate and punctate, pale.—Boissier describes the corolla-tube as scarcely longer than the calyx, but in Kotschy's original specimens, and in Stewart's, and in Aitchison's from the Kurrum Valley, the tube is considerably longer.

**Series II. Cauline leaves alternate.**

* Upper lip of corolla beaked.

§ Tube of the corolla shortly exceeding the calyx; upper lip annular or sickle-shaped, hirsute (or glabrate in *P. Clarkei* and *excelsa*).

15. *P. trichoglossa*, Hook. f.; hirsute or glabrate, stem stout strict erect leafy, leaves alternate sessile linear obtuse pinnatifid to the middle lobes rounded irregularly toothed, spike strict lax-fld., bracts ovate entire, calyx-lobes ovate crenate, corolla purple upper lip annular densely woolly with a glabrous incurved beak. *Pedicularis* n. 27, *Herb. Ind. Or. H. f. & T.*

**Sikkim** and **E. NEPAL HIMALAYA**; Wallanchoon, Momay and Tungn, alt. 12-13,000 ft., J. D. H.

*Stem* 8-16 in., sometimes as thick as a swan's quill, unbranched. *Leaves* 2-3 by \( \frac{1}{3} - \frac{1}{2} \) in., obtuse, lobules very many. *Spikes* 3-6 in.; bracts longer than the calyx, tips sometimes narrowed and crenate; flowers \( \frac{1}{2} \) in. long. *Calyx* broadly oblong, villous; teeth ovate-lanceolate, obtuse. *Corolla*—tube not exceeding the calyx; upper lip turgid in the middle; lower with broadly cuneate or orbicular glabrous lobes. *Capsule* \( \frac{1}{4} \) in., shortly oblong, obtuse, turgid, nearly included in the calyx. *Seeds* broad, \( \frac{1}{4} \) in. diam., irregularly shaped, deeply reticulate, pale.

16. *P. Clarkei*, Hook. f.; more or less hirsute, stem stout strict erect leafy, leaves alternate sessile pinnatifid, lobes ovate deeply irregularly toothed, spikes strict dense-fld., bracts long pinnatifid, calyx-lobes slender, corolla purple upper lip sparsely hairy abruptly decurved from the middle beak nearly straight. *Pedicularis* n. 28, *Herb. Ind. Or. H. f. & T.*

**Alpine Sikkim Himalaya**, alt. 12-13,000 ft.; Yeumtong and Tungn, J. D. H.; Jungri, Clarke.

*Stem* 16-20 in., sometimes as thick as the middle finger. *Leaves* 3-5 by \( \frac{1}{4} \) in., lobes spreading, rachis winged between them. *Spike* 2-6 in.; bracts with a broad base and slender long crenate-pinnatifid tip, usually longer than the calyx and sometimes
than the flowers; flowers # in. long. Calyx oblong, villous, lobes rather long and slender entire or crenate. Corolla red or purple, tube rather longer than the calyx; lower lip small, narrow, shorter than the upper. Capsule as in P. lachnoglossa. Seeds large, very irregularly obtusely angled and compressed, # in. long, deeply reticulate, pale.

17. P. lachnoglossa, Hook. f.; stem simple strict 1-2-leaved, radical leaves petioloed linear-lanceolate pinnatisect, segments very many and regular equidistant linear-cerate, racemae strict, flowers distant, bracts lanceolate longer than the calyx, upper lip inflated woolly with a straight horizontal or deflexed beak lower with 3 narrow lobes. Pedicularis n. 32, Herb. Ind. Or. H. f. & T.

Sikkim Himalaya; Lachen Valley, alt. 14,000 ft., J. D. H.

Rootstock perennial? crowned with slender membranous leaf-sheaths. Stem as thick as a crow-quill. Radical leaves 4-6 by # in., petiole and rachis slender, segments 30-40, at regular intervals, # in. broad. Racemes 4-8 in.; bracts slender, crenulate, erect; pedicels very short; flowers appressed to the rachis, # in. long, redd-purple. Calyx # in., glabrous, oblong, lobes lanceolate not crested. Corolla-tube not exceeding the calyx; upper lip sickle-shaped inflated in the middle, beak straight much longer and larger than the lower, which has 3 small obclavate acute ciliate lobes. Capsule # in. long, subellipsoid, base appendaged, dark, faintly striate and punctate.

18. P. excelsa, Hook. f.; stem glabrous very tall branched leafy, leaves large alternate petioloed bipinnatifid or pinnatisect below, pinnae linear-oblong distant, lobes or segments irregularly toothed, racemes long strict many-fld. pubescent, calyx small glabrous teeth very small, upper lip of corolla with villous margins produced into a slender incurved tail longer than the lower tip entire. Pedicularis n. 27, Herb. Ind. Or. H. f. & T.

Sikkim Himalaya; Yeuntong, in the Lachen Valley, alt. 12,000 ft., J. D. H.

Stem 2-4 ft., as thick as the middle finger below, shining, hollow; branches ascending, slender, long, incurved. Leaves scattered, fascicled, 6-12 by 2-5 in.; pinnae spreading, 1-2# in. long, rachis puberulous winged with lobules between the segments above, naked and slender below; petiole 2-4 in., slender. Racemes a foot long and under, rather dense-fld.; bracts pinnatifid, small, pedicels # in.; flowers small, # in. long. Calyx # in., spathaceous, broadly oblong, split to the base, mouth ciliate, minutely toothed. Corolla-tube not exceeding the calyx; upper lip with an oblong inflated base usually villous along the margins contracted into an incurved tail; lower lip narrow, with a small rounded median lobe. Capsule # in. long, oblong-ovate, # times as long as the calyx, tip rounded with an apiculus at one side. Seeds # in. black, minutely reticulate.—I regret having no note of the colour of the flower of this majestic species, which was, I believe, red-purple.

§§ Tube of the corolla not or very little longer than the calyx; upper lip quite glabrous.

19. P. macrantha, Klotzsch in Reise Pr. Wald. Bot. 107, t. 58; nearly glabrous or hairy, stem erect or ascending short or long leaffy, leaves radical and alternate long-petioloed linear pinnatifid or pinnatisect segments short ovate or oblong toothed or pinnatisect with acute teeth, racemes short dense-fld. or the lower or all the flowers axillary, bracts leaf-like, flowers large pink, calyx-lobes crested, corolla-tube not exceeding the calyx, upper lip sickle-shaped tumid with a short beak, lower very large. Pedicularis n. 7, Herb. Strach. & Winterb.

Western and Central Himalaya; Nepal, Hoffmeister, J. Scully; Garwhal, at Kulaura, alt. 11,000 ft., Strachey & Winterbottom.

Root of many fleshy stout fusiform fibres. Stem 4-24 in., sometimes as thick as
a swan's quill. *Leaves* 4-6 by \(\frac{1}{2}\) in., flaccid; segments distant; rachis winged or not; petiole often as long as the blade. *Flowers* 1 in. long; pedicels \(\frac{1}{2}\)-1 in.; bracts often exceeding the flowers and bipinnatifid. *Calyx* turbid, \(\frac{3}{4}\) in. long, lobes large, nerves distinct. *Corolla* with the upper lip large, broad, at the base erect or reflexed, then horizontal with an incurved short beak; lower \(\frac{1}{2}\) in. broad, lobes orbicular, the median smallest. *Capsule* (unripe) \(\frac{3}{4}\) in. long, oblong-lanceolate, tip exerted rounded with a lateral point.—Resembles *P. megalantha*, but the short corolla-tube and large upper lip are very different.

20. **P. Elwesi**, Hook. f.; glabrous or puberulous, stem stout decumbent or ascending, few-leaved, leaves radical and alternate all shortly peltioid linear pinnatifid or pinnate, lobes oblong short obtuse coarsely crenate or lobulate, racemes short, flowers very large purple, calyx nerveless pubescent lobes crested, corolla-tube not exceeding the calyx, upper lip inflated sickle-shaped with an incurved beak much smaller than the very broad lower lip. Pedicularis n. 24, *Herb. Ind. Or. H. f.* & T.

**Sikkim Himalaya**; Lachen Valley, alt. 12-14,000 ft., J. D. H., Elwes. 

*Rootstock* perennial? *Stem* as thick as a goose-quill, rarely 1 ft. curved. *Radial leaves* numerous, 5-7 by \(\frac{1}{2}\)-2 in., puberulous beneath; petiole short, \(\frac{1}{2}\)-3 in., stout; cauleine similar. *Racemes* very short; bracts foliaceous, pedicels \(\frac{1}{2}\)-4 in.; flowers \(\frac{1}{2}\)-1 in. long. *Calyx* \(\frac{3}{4}\)-1 in., cylindric, puberulous, split \(\frac{1}{2}\) way down, mouth with 2 crenate lobes. *Corolla* dark-purple, upper lip with the inflated portion suddenly contracted into the short incurved beak; lower erect enclosing the upper, 1 in. broad, of a small medial and two lateral very large rounded lobes. *Capsule* not seen.—The calyx of this species is quite unlike that of *P. macrantha*, being terete puberulous and without apparent nerves.

§§§ Tube of the corolla more than twice as long as the calyx; upper lip glabrous, sickle-shaped or annular, not inflated in the middle.

21. **P. megalantha**, Don Prodr. 94; pubescent or villous, stem tall stout erect leafy, leaves alternate long-peltioid oblong-lanceolate pinnatifid, lobes short or long crenate or again pinnatifid, racemes at length lax-fld., bracts pinnatifid, calyx-lobes crested, corolla-tube twice as long as the calyx, upper lip annular gradually narrowed from the base and produced into a long slender tail, lower very large. *Benth. in DC. Prodr.* x. 564; *Wall. Cat.* 411; *Regel Gartenfl.* t. 943.

**Temperate and Subalpine Himalaya**; from Kashmir, alt. 7-14,000 ft., to Sikkim, alt. 11-15,000 ft.

*Stem* 1-2 ft., solitary or several from the root, often as thick as a swan's quill, hollow. *Radical leaves* 2-10 in., 2-pinnatifid; petiole slender; cauleine sometimes as long. *Racemes* 4-10 in.; pedicels \(\frac{1}{2}\)-2 in.; lower bracts longer than the flowers. *Calyx* \(\frac{3}{4}\) in. long, inflated, hirsute, nerves strong. *Corolla-tube* very slender, \(\frac{3}{4}\)-1 in.; upper lip slender, lower 1 in. broad. *Capsule* \(\frac{3}{4}\)-1 in. long, half exerted, linear-oblong, acute. *Seeds* \(\frac{3}{4}\) in. long, finely reticulate.—The colour of the flowers is variously noted as yellow and rose-pink; in Sikkim they are rose-purple, in Regel's figure they are golden yellow.

22. **P. bicornuta**, Klotzsch in Reis. Pr. Waldens. Bot. 109, t. 61; pubescent or hirsute, stem usually very stout tall erect simple leafy, leaves alternate all peltioid linear or linear-oblong pinnatifid to the middle lobes rounded crenate or lobulate, spikes or racemes long stout many-fld., bracts crenate, calyx-lobes crested, corolla yellow, upper lip annular produced into a slender curved bifid tail, lower very large. *P. eximia*, Watt in Journ. Linn. Soc. xviii. 381, t. 13. Pedicularis n. 23, *Herb. Ind. Or. H. f.* & T.

**Western Alpine Himalaya** and **Western Tibet**, from Kashmir to Kunawur, alt. 9-13,000 ft., *Falconer,* &c.—*Distrib.* Afghanistan, Yarkand and Kashgar.
Root of stout fleshy fibres. Stem 6-24 in. high, often as thick as the thumb; small specimens are stemless, the raceme or spike apparently springing from the root. Radical leaves numerous in small stemless specimens, evanescent in large, blade 4-12 by 4-1/2 in., lobes very many, close-set; cauline leaves like the radical; petiole 1-2 in. Raceme often 8 in. long, with many rather crowded flowers; bracts usually shorter than the calyx; pedicels 0-1 in. Calyx 1-3 in. long, broadly oblong, laxly hirsute. Corolla-tube from a little longer to twice as long as the calyx; upper lip often sigmoid or cycloidal, lower 1-1/2 in. broad. Capsule 1-1/2 in. long, oblong-lanceolate finely acuminate, twice as long as the calyx. Seeds 1/4 in. long, pale, striate and reticulate.

23. P. bella, Hook. f.; dwarf, stemless, or nearly so, radical leaves tufted obovate-obovate-oblong or subspathulate crenate densely pubescent, pedicels axillary, corolla dark purple tube long slender, upper lip small annular very much shorter than and enveloped in the very large broad lower. Pedicularis n. 22, Herb. Ind. Or. H. f. & T.

SIKKIM HIMALAYA; Kongra Lama, alt. 16,000 ft., J. D. H. Root apparently annual. Leaves 1 in., narrowed into a broad petiole, densely hoary-tomentose on both surfaces. Flowers rather numerous; pedicel 1/6-1 in. Calyx 1/6 in., tubular, hoary; lobes large, rounded, crenate. Corolla very large for the size of the plant; lower lip forming a very broadly funnel-shaped cup 1 in. diam., in which the short upper lips nestle. Capsule 1/2-2 in. long, narrowly oblong, subfalcate, tip acute oblique. Seeds pale, striate and deeply pitted.—A singular and very beautiful species; the corolla resembles that of P. Perrottetiana, in its capsular form.

24. P. siphonantha, Don Prodr. 95; glabrate or sparsely pubescent or hirsute, stems many from the root slender and leafy, rarely solitary with only radical leaves, leaves petioled linear-oblong pinnatifid or pinnatisect, lobes many short crenulate, flowers axillary and in terminal racemes or heads, calyx-lobes crested, corolla pink, tube very slender 3-6 times as long as the calyx, upper lip a slender annular horn gradually narrowed from the base to the point, lower broadly 3-lobed. Wall. Cat. n. 417; Benth. in DC. Prodr. x. 565. P. Hookeriana, Wall. Cat. 421; Benth. Scroph. Ind. 58, and in DC. Prodr. 564. P. punctata, Dene., and P. labellata, Jacqem. mss., Dene. in Jacqem. Voy. Bot. 117, 118, t. 122, 123. P. himalaica & Hoffmeister, Klotsch in Reise Pr. Waldem. Bot. 107, 108, t. 58, 60.

ALPINE HIMALAYA AND WESTERN TIBET, from Kashmir to Sikkim, alt. 11-16,000 ft.—DISTR. Afghanistan.

Rootstock perennial? Stems 2-10 in. erect or ascending. Leaves 2-6 by 4-1/2 in., lobes or segments obtuse, cauline and radical alike. Racemes short or long; bracts leaf-like; pedicels of the lower flowers sometimes 1 in. Calyx 1-2 in., hirsute or glabrate, nerves distinct. Corolla rose-pink, tube very slender, sometimes 2 in.; upper lip longer than the broad lower. Capsule 4-6 in. long, broadly oblong, obtuse, acute, half exserted or less. Seeds 1/8-1/4 in., oblong, obtuse, base apiculate, striate.—Varies greatly in the size of the corolla and length of its tube.

§§§§. Tube of the corolla at least twice as long as the calyx, upper lip sickle-shaped, glabrous, inflated in the middle.

a. Radical leaves numerous; stem erect or ascending, usually stout.

25. P. carnosa, Wall. Pl. As. Rar. ii. 44, t. 154, and Cat. 413; hoary-pubescent, or glabrate, stem erect branched at the base long strait leafy, cauline leaves alternate shortly petioled oblong or linear-oblong obtuse narrowed at the base crenate, flowers laxly racemed rose-purple, bracts leafy, calyx-lobes crested, corolla-tube twice as long as the calyx, upper lip arched decurved from the inflated middle acutely beaked. Benth. Scroph.

**Alpine Himalaya and Western Tibet**; from Kashmir to Sikkim, alt. 11-13,000 ft.—**DISTRIBUTION**. Affghanistan, Central Asia, Persia.

Stems one or more from a perennalis? rootstock, 4–10 in., stout, curved, usually quite glabrous. Radical leaves 2–3 by $\frac{1}{4}$–$\frac{3}{4}$ in., lobes variable; petiole usually stout, $\frac{1}{4}$–$\frac{3}{4}$ in. Racemes very short; bracts leaf-like; pedicels $\frac{1}{4}$–$\frac{3}{4}$ in.; flowers 1–$\frac{1}{2}$ in. long. Calyx $\frac{1}{4}$ in., membranous, sparsely villous, shortly cleft, and with 2 short crenate teeth. Corolla pale or bright pink; lower lip $\frac{1}{2}$–$\frac{3}{4}$ in. diam., lateral lobes large rounded, median small. Capsule $\frac{3}{4}$ in. long, oblong-lanceolate, straight or curved, obtuse with a lateral point, $\frac{1}{4}$–$\frac{3}{4}$ exserted from the calyx. Seeds $\frac{1}{4}$ in. long, oblong, obtuse, obscurely striate and punculate, base shortly appendaged.—The Affghan specimens have more glabrous calyces and longer capsules.

27. **P. tubiflora**, Fisch. in Stev. Monogr. Pedic. 30; glabrous or nearly so, stems many from the root short leafy, radical leaves very many petioled linear pinnatifid or pinnatisect lobes many short crenate, flowers axillary in very short racemes, racemes leaf-like, calyx glabrous with crested lobes, corolla yellow tube very slender 4–6 times as long as the calyx, upper lobe erect inflated with a slender deflexed flexuous beak. *Benth. in DC. Prodr.* x. 565. *P. tubiformia*, Klotzsch in Reise Pr. Waldem. Bot. 106, t. 57.

**Alpine Himalaya and Western Tibet**; from Kashmir to Sikkim, alt. 11-16,000 ft.—**DISTRIBUTION**. Central Asia, Siberia, Dahluria.

Rootstock apparently perennial. Stems 3–6 in., erect or ascending, stout, often branched. Leaves 1–3 by $\frac{1}{4}$–$\frac{3}{4}$ in., lobes or segments numerous; petiole $\frac{1}{4}$–$\frac{3}{4}$ in., stout. Racemes subcapitate; bracts longer than the calyx; flowers $\frac{1}{2}$–$\frac{3}{4}$ in. long; pedicels of the axillary flowers sometimes $\frac{1}{2}$ in. Calyx $\frac{1}{4}$ in., lobes large. Corolla bright yellow with dark spots on the lower lip; tube slender, sometimes 2 in. long; lower lip $\frac{1}{4}$–$\frac{3}{4}$ in. broad. Capsule $\frac{3}{4}$–$\frac{1}{2}$ in. long, obliquely oblong-lanceolate, acute, $\frac{1}{4}$ or $\frac{3}{4}$ exserted. Seeds minute, $\frac{1}{4}$ in. long, narrow, with a basal appendage, black, very obscurely striate.—Habit and long tube of short specimens of *P. siphonantha*, but with a very differently coloured corolla and inflated upper lip.

**Alpine Sikkim Himalaya; Lachen and Samdong, alt. 12–15,000 ft., J. D. H.**

**Stem** 4–6 in., solitary, rather slender and flexuous. **Radical** and cauline leaves few, 1–13 by 1–2 in., petiole as long as the blade. **Flowers** 5–6 in a head, subsessile, with occasionally an axillary pedicelled one below the head; bracts longer than the calyx, pinnatifid. **Calyx** 1/4 in. long, cupular, membranous, 4-nerved, 4-cleft for 1/3 way down, teeth with crested tips. **Corolla** dingy-purple, tube 3/4 in. or less, upper lip as long as the lower which is 1/2 in. broad with 3 rounded ciliate lobes, the middle the smallest. **Capsule** 1/3 in. long, oblong, acute or acuminate, nearly straight, 3–4 times longer than the calyx. **Seeds** 1/2 in. long, oblong, pale, striate and punctate.—The very small calyx well characterizes this species.


**Alpine Himalaya; Nepal, Wallich; Sikkim, Samdong and Tunkara Pass, alt. 14–15,000 ft., J. D. H.—Distrib. Alps of Central Europe.**

**Rootstock** apparently perennial. **Stems** subsolitary or many from the root, simple, 2–4 in. **Leaves** 1–2½ by 1/2 in.; petiole slender, as long as the blade. **Racemes** 3–8-fld.; pedicels 1/8–1/2 in.; flowers 1½ in. long. **Calyx** 1/2 in. membranous, lobes short all crested. **Corolla** dingy-purple; tube dilated at the mouth; upper lip 1/4 in. high, lower 3/4 in. broad, 3-lobed, mid-lobe very small, lateral large rounded. **Capsule** 1/3 in. long, obliquely lanceolate, acuminate, twice as long as the calyx. **Seeds** 1/2 in., elliptic, base appendaged, obscurely striate, dark.

**Var. albiflora**; densely tufted, flowers white.—Sikkim; at Kankola, alt. 18,000 ft., J. D. H.

? **Var. pubescens**; densely tufted, pubescent or sparsely villous all over, lower peduncles sometimes radical and 1½ in., flowers larger, corolla-tube sometimes 1 in. long, and lower lip 1 in. diam., capsules 1/4–1 in. Pedicularis n. 20, *Herb. Ind. Or. H. f. & T.—Sikkim, alt. 14–17,000 ft., J. D. H.*

b. **Stem long slender flexuous or flaccid leafy; radical leaves evanescent.**

30. **P. flagellaris**, Benth in DC. Prodr. x. 581; softly hairy, stems slender diffuse flexuous leafy, leaves alternate very small shortly petioled ovate or oblong-ovate pinnatisect, segments crenate or toothed, flowers few axillary and subracemose, calyx-lobes crested, corolla pink tube 2–3 times as long as the calyx, upper lip forming a semicircular beaked horn tumid in the middle, lower broadly 3-lobed.

**Upper Assam, Griffith. Sikkim Himalaya; Lachoong, alt. 10–11,000 ft., J. D. H.**

**Stems** prostrate and ascending, 8–18 in. long, simple or sparingly branched, naked below. **Leaves** 1/4–1 in.; petiole short, slender; pinnules 3–6 pair, rather recurved, lower sometimes petiolulate. **Racemes** very short; bracts pinnatifid, longer than the calyx. **Calyx** rather narrowly oblong. **Corolla-tube** rather broad or slender; upper lip gradually narrowed to the base and to the acute tip, lower lip about 1/3 in. diam. **Capsule** (unripe) lanceolate, acuminate, 1/2 longer than the calyx.

Central and Eastern Himalaya; Nepal, Wallich; Sikkim, margins of woods, alt. 8-12,000 ft.; *J. D. H.* &c.

Perennial? *Stems* 1-2 ft., as thick as a crow-quill, flexuose succulent, with one or two lines of pubescence above. *Leaves* 1-3 by 1-2½ in., membranous, sometimes pinnatisect at the base, glabrous on both surfaces, nearly white with finely reticulated venules beneath; petiole very slender, 1-3 in. *Flowers* scarcely racemose, ½ in. long; bracts leaf-like; pedicels ¼-½ in., very slender. *Calyx* ½ in. long, tubular, split on one side. *Corolla* very pale pink, lower lip about ¾ in. broad. *Capsule* ½ in. long, ovate-lanceolate, nearly straight, acuminate, twice as long as the calyx. *Seeds* ⅛ in. long, ellipsoid, acute, most minutely reticulate, black.

Var. *integrifolia*; leaves broadly ovate or rounded irregularly toothed or lobulate, calyx villous, corolla red-purple. *Pedicularis* n. 30, *Herb. Ind. Or. H. f.* & T.—Sikkim, alt. 9-10,000 ft.; *J. D. H.*

? 32. **P. curvipes**, Hook. f.; quite glabrous, stem very slender long flexuose branched branches long curved, leaves scattered small petioled oblong pinnatifid lobes few incised, flowers axillary, long pedicelled, pedicels recurved in fruit, capsules pendulous.

Sikkim Himalaya; Tumbok, alt. 10,000 ft., Clarke.

*Stems* a foot long, as thick as a sparrow’s quill, curving. *Leaves* far apart, ½-1 by 1½-2 in., flaccid, lobes 3-4 pair, rather distant; petiole as long as the blade. *Calyx* ½ in. long, mouth oblique, lobes short crenate. *Capsule* ½ in. long, oblong, acute, slightly oblique, base exserted, shorter than the recurved slender pedicel. *Seeds* ⅛ in. long, slender, acute at both ends, obscurely striate, pale.—A remarkable species.

33. **P. fissa**, Turcz.? *Benth. in DC. Prodr.* x. 571; stem stout simple leafy pubescent or glabrate, leaves all petioled lanceolate bipinnatisect segments small cartilaginous toothed, spikes dense-fld. villous, bracts long leaf-like lanceolate crenate, calyx-teeth broad obtuse entire, corolla-tube longer than the calyx, upper lip linear-oblong incurved acutely 2-fd hardly beaked, lower glabrous.

N. Kashmir; Dir, alt. 10-11,000 ft., Henderson.—Distrib. Altai, Dahuria.

*Stem* (in the solitary Lindian specimen) 8 in., stout, strict. *Radical leaves* 4-5 in. puberulous beaueat; petiole very slender, as long as the blade; cauleine similar. *Spike* 2 in. long; lower bracts pinnatisect, middle ones 3-fd; lobes lanceolate, crenate, longer than the calyx; flower 1 in. long. *Calyx* ⅛ in., ventricose, woolly, nerves strong; teeth lanceolate, entire. *Corolla* quite glabrous; upper lip ⅛ in. long, tip rounded in front; lower shorter broadly 3-loved. *Filaments* glabrous.—This closely resembles several other species of the *comosa* group, which, with *P. fissa*, may ultimately prove forms of *P. comosa*, Liu., itself, as may *P. lasiocladys*, Bueg., *rubens*, Steph., and *venusta*, Schaugin. From the typical *P. comosa* it differs in the villous calyx, glabrous filaments, and in the lower lip not being ciliate (the latter of which characters seems often wanting in Siberian specimens of *comosa*).

** Upper lip of the corolla rounded at the tip, not beaked.

34. **P. versicolor**, Wahlb.; *Steven Monogr. Pedie.* 52; hairstute above, stem short, leaves chiefly radical all petioled linear pinnatifid or pinnatisect, lobes short oblong obtuse crenate, racemes oblong dense-fld., bracts pinnatifid,
calyx-lobes entire or toothed, corolla lemon-yellow upper lip erect linear-oblong slightly incurved than the lower. *Benth.* in *DC. Prodr.* x. 578; *Reichb. Iconogr.* t. 14; *Royl. Ill.* t. 72, f. 2.

**ALPINE HIMALAYA**; from Kashmir, alt. 9–13,000 ft., to Sikkim, alt. 14–15,000 ft.

**DISTRIB.** Mts. of Central Europe, Arctic Europe, Asia and America.

**Rootstock** stout, perennial? *Stems* usually solitary, 1–4 in., erect, with 1–2 leaves, rather stouter. *Leaves* 1½–2½ by ¼–½ in., glabrous, lobes or segments many; petiole stout or slender, shorter than the blade. *Racemes* 1–2½ in.; *flowers* erect, 1–1½ in. long; bracts often longer than the calyx. *Calyx* ¼ in. long. *Corolla* yellow with the upper lip often pink or red, tube twice as long as the calyx; upper lip erect straight linear-oblong tip truncate inner angle acute lobes of lower divaricate. *Pedicel* not seen in Indian specimens.

35. **P. polygaloides**, Hook. f.; dwarf, branched from the base, sparsely hairy, leaves few alternate very small petioloed oblong pinnatifid lobes short crenate or toothed, flowers axillary pedicelled, calyx-lobes crenated, corolla pink tube not exceeding the calyx, upper lip erect straight linear-oblong tip truncate inner angle acute lobes of lower divaricate. *Pedicel* n. 9, *Herb. Ind. Or. H. f.* & *T.*

**ALPINE SIKKIM HIMALAYA**; at Yentong, alt. 14,000 ft., J. D. H.


**NIGHERRY HILLS**; *Perrottet, Wight.* &c.


37. **P. zeylanica**, Benth. *Scroph. Ind.* 54, and in *DC. Prodr.* x. 580; hoary-pubescent or glabrate, stem tall erect leafy, leaves sessile or petioloed linear-oblong or oblong margin lobulate or subpinnatifid lobes rounded crenulate, racemes short or long, bracts pinnatifid, calyx short, teeth crenate, corolla-tube hardly exerted, upper lip linear-oblong incurved tip rounded. *Wight* Lc. t. 1419.


Annual, 6–18 in. high. *Stems* stout, simple or branched. *Leaves* 1–1½ by ½–1 in., sometimes contracted into a short petiole. *Racemes* usually elongate, few or many- and dense- or lax-fl., much elongate in fruit; pedicels short; bracts longer than the calyx; flowers ½–1 in. long. *Calyx* ½ in. long, cleft to near the base. *Corolla* pink; tube broad; upper lip shorter than the lower which is ½–¾ in. diam. with 3 broadly rounded lobes. *Capsule* ½–¾ in. long, obliquely ovate-lanceolate, acuminate, twice as long as the calyx. *Seeds* ½ in. long, broadly ellipsoid or irregular, dark, punctulate.—Habit and foliage of *P. carnosa*.

53. **LATRREA**, Linn.

Leafless low perennial fleshy white or purplish herbs, black when dry, with
a scaly buried rootstock and short erect scaly stems. *Flowers* biseriate in a secund raceme, bracteate, ebracteolate. *Calyx* campanulate, entire or split in front, 4-fld or -lobed, lobes valvate. *Corolla*—tube arched or nearly straight; lips erect, upper arched entire or notched; lower smaller, truncate, 3-toothed, plaited. *Stamens* 4, anthers under the upper lip; cells equal, parallel, margins bearded, bases mucronate. *Disk* glandular, enlarged, opposite the lower lip. *Ovary*—1-celled; placentas 2, 2-fld; style exerted, decurved, stigma capitulate. *Capsule* 2-valved. *Seeds* many, small, globose, rugose.—Species 3, Europe, N. Asia, Himalaya.


54. **MELAMPYRUM**, Linn.

Annual erect herbs, black or dark when dry. *Leaves* opposite, narrow, entire or incised at the base. *Flowers* axillary or secund in dense spikes with large often coloured bracts, ebracteolate. *Calyx* tubular, 5-toothed, upper teeth often larger. *Corolla* 2-lipped, tube cylindric; upper lip erect, short, hooded, compressed, margins reflexed or with a tooth on each side; lower longer, erecto-patent, 3-lobed, base 2-gibbous. *Stamens* 4, ascending; anthers under the upper lip, meeting in pairs, cells distinct equal parallel, bases obtuse. *Stigma* simple; ovules 2 in each cell, one sessile the other stipitate. *Capsule* compressed, ovate, oblique, loculicidal. *Seeds* 4 or fewer, funicle swollen.—Species 6, of N. temp. regions.


**Khasia Mts.,** alt. 5–6000 ft., *Lobb, J. D. H.* & T. T.


**Genera of Doubtful Position.**

55. **OREOSONEN,** Hook. f.

A small, tufted, glabrous, rather fleshy herb. *Stem* short, stout. *Leaves* opposite, subsessile, oblong-obovate, obtuse, coarsely irregularly crenate-serrate, nerves subparallel, midrib obscure. *Flowers* fascicled in the leaf-axile, shortly pedicelled, bracteate, ebracteolate. *Sepals* 4, linear, obtuse, erect, puberulous. *Corolla* straight, tube twice as long as the sepals, tubular-funnel-shaped, mouth dilated, limb short, 2-lipped; lips subequal, upper of two round lobes (the outer in bud); lower 3-lobed, lobes short 2 lateral retuse, median smaller ovate obtuse. *Stamens* 4, inserted in the middle of the tube, filaments erect thickened above, glabrous; anthers small, adnate
to the thickened top of the filament, rounded, 1-celled, included in the tube; staminode subulate, on the upper lip. *Ovary* small, ovate, compressed, style long slender, stigma capitellate.


**Sikkim Himalaya**; Jongri, alt. 14,000 ft., Watt.

Stem about 1 in. long as thick as a crow-quill, sheathed by a pair of reduced leaves. *Leaves* 1 in. long, quite glabrous, black when dry with translucent nerves which run straight from and through the broad petiole and unite anastomosing near the top and sides of the leaf. *Flowers* ½ in. long.—Probably belongs to the tribe *Veronicaceae*. The specimens are very imperfect and difficult of analysis, owing to their apparently fleshy texture.


A small scabigerous laxly hairy herb, with the habit of a *Mazus*. *Leaves* radical, petioled, obovate or oblong, crenate. *Flowers* racemed, bracteate, ebracteolate. *Sepals* 5, subequal, linear-obovate. *Corolla* 2-labiata, tube short, decurved, upper lip 2-lobed, lower larger 3-lobed, one lateral lobe exterior. *Stamens* 2, included, filaments straight; anthers 2-celled; cells diverging, free below, united at the top. *Ovary* ellipsoid; style short, stigma capitellate.


**Western Himalaya**; Kumaon, Falconer; Madhari Pass, alt. 3000 ft. Strachey & Winterbottom (Mazus, No. 4). Rootstock short with thick fleshy fibres. *Leaves* 3–5 in., more or less pubescent on both surfaces, tip rounded or oblong crenate; petiole broad, ½–1½ in. long, winged above. *Scape* stout or slender, longer or shorter than the leaves, leafless, laxly hairy, as is the short loose raceme; bracts small, obovate-oblong or spatulate; pedicels short. *Sepals* ½ in. long. *Corolla* ½–1½ in. long; tube broadly funnel-shaped, suddenly decurved above the base; lower lip twice as long as the upper, lobes obovate retuse. *Style* included.—Apparently near *Wulania*, but differing in the 2-lipped corolla and included stamens. I have named it after the late Dr. Hugh Falconer, F.R.S., Superintendent of the Botanical Garden of Sabarum ande, to whom *Falconeria*, Royle, now included under *Sapium*, was dedicated.

**Order CIV. OROBANCHACEAE.** (By J. D. Hooker.)

Leafless brown annual white or reddish root-parasites. *Stem* usually simple, stout or slender, scaly. *Flowers* solitary or in spires or racemes, irregular. *Calyx* spathaceous, or of 4–5 free or connate sepals. *Corolla* hypogynous, tube curved; limb 2-lipped; upper lip arched, lower 3-fid, throat often with 2 villous folds. *Stamens* 4, didynamous, inserted on the corolla-tube; anthers 1–2-celled, cells spurred at the base opening by slits or basal pores, one often imperfect. *Disk* unilateral or glandular or 0. *Ovary* of 2 connate carpels, 1- rarely 2-celled; style long, tip curved, stigma capitellate 2-lobed; ovules many, rarely few, anatropous on 2 (rarely more) pairs of free or confluent parietal placenta which sometimes meet in the centre of the ovary. *Capsule* 1-celled, 2-valved, few- or many-seeded. *Seeds* minute, testa pitted or tubercled rarely lax and reticulated, albumen fleshy; embryo ovoid, undivided or 2-fid.—*Distria* Genera 11, species about 150, temperate and tropical.

I have removed *Lathracea* from this Order to *Scrophulariaceae* (p. 317), and taken *Campbellia* from the latter, uniting it with *Christisonia*. 
* Corolla-lobes all broad, subequal, spreading.

Calyx spathaceous. Anther-cells unequal ........................................ 1. **Æginetia.**
Calyx tubulose. Anther-cells unequal ............................................ 2. **Christensonia.**
Calyx campylolate. Anther-cells equal .......................................... 3. **Cistanche.**

** Corolla 2-lipped.

Upper lip 2-lobed, lower 3-lobed .............................................. 4. **Orobanchus.**
Upper lip erect hooded subentire, lower very short ..................... 5. **Boschniakia.**

1. **Æginetia**, Linn.

Leafless herbs with branched or simple naked or scaly scapes or stems. **Flowers** few, large, solitary, or corymbose, ebracteolate. Calyx spathaceous, split in front nearly to the base. **Corolla-tube** broad, incurved; limb spreading, obscurely 2-lipped; lobes 5, broad, 2 upper connate. **Stamens** included; anthers with one cell perfect adnate to the filament not spurred at the base, the other cell absent in the upper anthers, empty clavate and deflexed in the lower. **Ovary** 1-celled; placenta large, 2-lobed or multifid, filling the cavity, ovuliferous all over; style slender, stigma large peltate. **Capsule** sub-2-valved. **Seeds** crowded, minute, pitted.—Species 4–5, tropical Asiatic.


Throughout India, from the Western Himalaya in Kumaon, ascending to 3500 ft., to Nepal, Assam and the Khasia Mts.; and southwards to Tenasserim, Travancore and Ceylon.—**Distr.** Burma, China, Japan, Philippine Islands.

Root of fleshy interlaced fibres. Scapes solitary or several, 6–16 in. high, with a few scales near the base. **Flowers** solitary. **Calyx** 3 to nearly 2 in. long, acute. **Corolla** 1–2 in., limb 1 in. diam. or less, margins fimbriate. **Anthers** of lower stamens with a thick gibbous obtuse spur behind. **Capsule** as large as a filbert. **Seeds** yellowish-white, testa hyaline lax.

2. **Æ. pedunculata**, Wall. Pl. As. Rar. iii. 13, t. 219; scape short stout very fleshy many-fl., flowers on long peduncles bracteate at the base, corolla-tube yellow mouth blue, placentas 2 each of 2 plates. Reuter in DC. Prodr. xi. 43; Wight Ill. t. 158 b, f. 6, and t. 1421. **Æ. abbreviata**, Ham. in Wall. Cat. 3965; Benth. Scroph. Ind. 95; Reuter l. c. **Æ. acanulis**, Walp. Rep. 481; Reuter l. c. Orobanchus pedunculata, Roxb. Hort. Beng. 45, and Fl. Ind. iii. 29. O. acanulis, Roxb. Cor. Pl. iii. 89, t. 292, and Fl. Ind. iii. 29.

Throughout India, on the roots of grasses, from Murree, Elliot, Sikkim, Clarke, and Assam, to Travancore and Singapore.—**Distr.** Cochin China, Java.

Whole plant 3–6 in. high, red or yellow. **Stem** very short, as thick as a swan's quill, buried in the soil, giving off numerous alternate pedicelled flowers that rise above the surface of the ground, rarely slender and 1-fl. **Peduncles** 1–4 in., slender to stout, bracteate at the base; bract ½–¾ in., ovate obtuse. **Calyx** 1½–2½ in. long, fleshy, red then yellow white, loaded with mucilage, tip obtuse, acute or shortly beaked. **Corolla-tube** as long as the calyx, yellowish, limb bright violet, lobes crenate and cross. **Anthers** of lower stamens with a large dorsal fleshy decurved horn. **Stigma** broadly cordiform, peltate. **Capsule** ovoid. **Seeds** brown.—Wight's figures represent the placentas as more divided than other analyses show.

Fleshy, low, scaly, parasitic herbs, with white yellow purple or rose-coloured flowers; stems simple or tufted from a short or long rootstock. Scales alternate, obtuse or acute. Flowers bracteolate or not. Calyx tubular, terete or angular, 5-toothed or -lobed. Corolla-tube long, inflated, or funnel-shaped, slightly curved, obscurely 2-lipped, 5-lobed; lobes subequal, rounded, 2 upper (inner in bud) suberect, lower spreading. Stamens 4, included or subexserted, filaments stout; anther with one perfect cell and one imperfect which is spurred or appendaged, rarely with both cells perfect. Disc 0. Ovary 1-celled, with 2 2-partite placentas, or 2-celled from the placentas meeting in the axis; style long, tip incurved, stigma large 2-lobed upper lobe very small lower very large orbicular or clavate; ovules numerous. Capsule ovoid or subglobose, loculicidal. Seeds minute, crowded, many perfect with striate testa, others imperfect with lax testa; embryo half as long as the albumen.—Distr. Species 10, all tropical Asiatic.

There is no character by which *Campbellia* can be separated from *Christisonia*, that of the placentas meeting or not in the axis being one of degree and not accompanied by any other. I find it impossible to determine the species from dried specimens, and have been compelled to resort for their limitation to the descriptions and published figures of Gardner and Wight, and to the fine series of drawings of native specimens in the Kew Herbarium. I have also availed myself of some valuable notes made by Mr. Clarke, who attempted the definition of the species when studying the Indian *Cyrtandraceae*.


**South Deccan**; Kurg and Courtallam, Wight. 


**Nilgherry Mts. and Courtallam, Wight. Ceylon**; Ramboode district.

Wight’s figure represents a plant 4 in. high, with a very short stout stem, clothed with scales 1½ in. long, and a corolla 2 in. long. A drawing sent by Thwaites (in Herb. Kew) is indefinite as to the bracts and calyx, and has a white corolla with an inflated white tube 1½ in. long, and limb as broad edged with violet.—Filaments glabrous. Ovary 1-celled; placentas nearly meeting in the centre, opposed faces not ovuliferous; larger stigmatic lobe orbicular.

3. **C. Hookeri**, Clarke mss.; almost stemless, quite glabrous, scales truncate lacerate, pedicels very short ebracteolate, calyx terete, lobes rounded, 

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upper anthers 1-celled simple, lower with a greatly thickened connective produced behind into a terete appendage rounded at the tip.

Sikkim Himalaya, in low valleys, and Khasia Mts., alt. 2–4000 ft., J. D. H. 

Whole plant 3–4 in. high. Stem very stout, covered with brown scales ½ in. long with ragged edges. Flowers sessile. Calyx 1 in., pale violet with red-brown lobes. Corolla 2–2½ in. long, inclined; tube white, inflated, throat contracted; limb ¾ in. diam., pale violet. Stamens included, glabrous; connective of lower anthers white, much longer than the purple cell. Ovary 1-celled; placentas 2-partite, the divisions cordate in section, covered all over with ovules; larger stigmatic lobe orbicular. —

Described from a drawing made by me in Sikkim.


The Concan; Tanna, Law, Ritchie; Salsette and between Ram Ghat and Belgaum, Dalz. & Gibs.

Stems 1–3 in., very stout, thickened upwards, clothed with scales. Calyx ½ in., tubular, dark brown. Corolla 2 in., tubular; tube dull white limb blueish-purple, yellow within; upper lobes erect, lower horizontal shorter. Filaments with minute crisped pubescence, white; anthers pale, posterior cells all fertile, apex subulate with a pore; anterior cell subulate, like an inverted comma. Stigma of 2 capitulate lobes.—Description chiefly from notes by Dr. Ritchie, who remarks that the figures of the capsule and stigma given by Wight are erroneous, the placenta though approaching being quite free with revolute lobes.


The Concan; Tanna and Salsette, Law, Dalzell, &c., parasitic on the roots of Strobilanthes.

Probably a more fully developed state of C. Lawii.


Nilgerry Hills; at Neddawattum, Wight, &c. Ceylon; Central Province, alt. 3–4000 ft.; Gardner, &c.

Stem red-brown, scaly, continuous with a cylindrical warty rhizoma as thick as a crow-quill and several inches long. Scales ½ in. long, red-brown. Pedicels ½ in. Calyx orange-brown, about 1 in., terete. Corolla 1½–2 in.; tube pale straw-coloured in Wight's and Thwaites' drawings, limb the same or white. Stamens included, filaments pubescent; anthers with the barren cell acutely spurred. Placentas in Wight's figure (of aurantiaca) 2-partite, nearly meeting in the centre, with the opposed faces not ovuliferous.—Thwaites' B. pallidiflora (C. pallida, Gardn.) differs according to his drawing only in the paler corolla-lobes.

7. C. neilgherrica, Gardn. in Calcut. Journ. Nat. Hist. viii. 157; quite glabrous except sometimes the corolla; stem short very stout, scales
densely imbricated below obtuse, flowers densely racemose yellow, pedicels 2-bracteolate, calyx 2-lipped 5-angular, lobes broad obtuse, filaments glabrous, anthers ovoid acute 1-celled, larger stigmatic lobe clavate. C. unicolor, 


Nilgerry Mts.; Strobilanthis in woods at Pycarrab, Nedawattam, &c., Wight. CEYLON; Ramboede, alt. 3-4000 ft., Hunasgiria range, and Pedrotatagalla, alt. 7000 ft., Thwaites, &c.

Whole plant yellow. Stem 3-6 in. long, thick, obtusely angled. Scales ¾ in. Flowers 8-12; pedicels 1-½ in., angular, thick; bracteoles below the middle about ½ in. long, acute, veined, toothed at the tip. Calyx ¾ in. long. Corolla 1¾ in. long, funnel-shaped; lobes rounded, quite entire. Placentas in Wight’s drawing of Campb. cytonoides nearly meeting in the axis of the ovary, the flat opposed faces without ovules.—Gardner described C. unicolor from a drawing of which I have seen no copy. Except in the subeserted anthers and obtusely 5-lobed calyx, I do not see how it differs by his description from C. nilgherrica. A drawing sent by Thwaites of the plant he refers to C. unicolor has acute calyx-teeth. In Wight’s Campb. aurantiaca (referred here by Clarke) the corolla is represented as hairy on both surfaces, as are the filament and style; and the anthers are exerted ovate acute, and 2-celled. In his Campb. cytonoides the anthers are also exerted ovate and acute, but 1-celled. I find the corolla in Wight’s specimens to be either perfectly glabrous or pubescent, and the anthers to be ovoid acute 1-celled.


CEYLON; Central Province, alt. 3-4000 ft., parasitical on Acanthaceae, Gardner, &c. Stems more slender than in any of the preceding, 2-4 in. high. Scales about ⅕ in. Calyx ¾ in. long. Corolla 2½ in. long, lobes denticulate. Stigma with the large lobe orbicular. Placentas 2-partite, cordate in section, covered all over with ovules.—A coloured figure apparently of this species in Jordon’s collection of drawings represents the corolla as 3 in. long, with a violet upper lip, and pale rose lower one; the calyx pedicels and bracts are red-brown.

Var. grandiflora; corolla larger pale rose-coloured. C. grandiflora, Garden. l. c. 155; Thwaites l. c. 221.—CEYLON; Adam’s Peak, alt. 5000 ft., Gardner. Gardner gives no other characters but greater size and a uniform rose colour of the flower, whereby to distinguish this from C. tricolor; for that of the sterile cell of the anther being ascending (and not deflexed) is, as Thwaites’ (who suggests grandiflora being a variety), a fallacious one.

9. C. albida, Thwaites mss.; sparsely pubescent, stem very short, scales very obtuse, flowers crowded very shortly pedicelled, calyx 2-bracteolate, lobes rounded, filaments very short, anthers all unequally 2-celled, cells oblong parallel. Campbellia albida, Benth. in Gen. Pl. ii. 967.

CEYLON; near Hankalla, alt. 6000 ft., Thwaites. Stem 1-2 in., from an elongate warted rhizoma like that of C. bicolor, very stout. Scales ¾ in., obovate, tip rounded. Flowers crowded, much smaller than in any of the other species. Calyx ½ in. long, pubescent, lobes very short, erose. Corolla 1 in., pubescent externally. Anther-cells acute below. Ovary completely 2-celled; stigma very small, clavate.

3. CISTANCHE, Hoffm. & Link.

Scapigerous herbs, scape or stem simple scaly. Flowers in dense spikes, subsessile, 2-bracteolate, yellow violet or purple. Calyx broadly tubular.
CIV. CISTANCHE. (J. D. Hooker.)

C. tubulosa, Wight Jc. t. 1420, bis (C. lutea in letterpress); gla-
rous or pubescent, very stout, scales lanceolate, spike dense-fl., calyx-
lobes obtuse, corolla-tube 2–3 times as long as the calyx, filaments hirsute
below, anthers woolly not apiculate. C. lutea, Wight Ill. t. 158 b, f. 4.

PUNJAB and SIND.—DISTRIB. Central Asia and westwards to Arabia.

4. OROBANCHE, Linn.

Scapigerous herbs; scape or stem simple or branched, stout or slender,
scales acute. Flowers in dense or lax or interrupted bracteate spikes or
racemes, bracteoles 2 or 0. Calyx unequally 4-fl., or 2-partite from back
to front, segments entire or 2-fl with rarely a 5th lobe or segment. Corolla
broad or long, tube curved dilated above circumsciss at the base; limb
2-lipped; upper lip erect crenulate notched or 2-fl, lower more spreading
3-lobed. Stamens included; anther-cells equal, parallel, bases usually
mucronate. Disc 0, or a gland. Ovary 1-celled; placentas 4, subequal or
in pairs; stigma funnel-shaped or peltate, more or less 2-lobed, lobes
right and left. Capsule 2-valved, valves often cohering with the style.
Seeds very numerous, globose.—Species about 100, chiefly in the northern
and subtropical regions of the Old World.

SECT. I. OSPROLEON, Wallr. Bracteoles 0.

* Calyx divided to the base posteriorly, entire anteriorly, equally
5-toothed.

1. O. kashmirica, Clarke mss.; pubescent, stem simple, scales
lanceolate, bracts lanceolate longer than the short broadly acutely toothed
calyx, corolla pale brown short pubescent, filaments inserted at the base
of the corolla pubescent below, anthers minutely hairy.

KASHMIR; at Tilai, alt. 11,000 ft., Clarke.
Pale brown, a foot high, stem as thick as a swan’s quill or less. Scales 1–2 in.,
few and distant. Spikes few and lax-fl.; bracts 1–2 in. Calyx 1 in. Corolla
1–3 in., softly pubescent; tube broad, lobes rounded. Anthers small, included.

** Calyx divided to the base posteriorly and nearly so anteriorly,
segments 2-toothed or -lobed.

Western Himalaya; from Nepal to Kashmir and Western Tibet, alt. 10–12,000 ft. *Oudh* and Patna to the Punjab; the Deccan from the Conan southwards.—*Distrib.* Westwards to N. Africa and Spain; extra-tropical Australia.

Stem stout, 6–12 in., pale brown or blueish. *Scales* ovate, upper acute or acuminate. Spikes often half as long as the stem or longer. *Sepals* with long points. Corolla $\frac{1}{2}$–$\frac{3}{4}$ in. long, sometimes puberulous above; 2 upper lobes broad, 3 lower ovate acuminate. *Anther-cells* acuminate. **Style** glabrous, stigmatic lobes short thick.—The anthers are sometimes a little hairy.

3. *O. Hansii*, Kerner *Nov. Pl.* Sp. ii. 15; pubescent, spikes dense, flowers blue, bracts ovate shorter than the corolla, nerves strong parallel, calyx half as long as the corolla, segments 2-fid to the middle, lobes lanceolate, corolla 1 in., nearly straight and glabrous, lobes ciliate not ciliate, filaments glabrous, anthers hairy. *O. fotida*, Klotzsch in *Reise Pr. Walden.* 111, *not of Desfontaines.*

Western Tibet; Karakoram, alt. 8–12,000 ft., Clarke. Lahul, Jœschka.

This looks like a stout large-flowered var. of *O. cernua*, with deeper blue flowers broader bracts, and more hairy anthers.


Western Himalaya, from Murree to Kashmir, alt. 7–8000 ft., Thomson, Fleming, &c. Western Tibet; Karakoram, alt. 13,000 ft., Clarke.—*Distrib.* Central Asia.

Stem 6–10 in., rarely more, as thick as a goose-quill. *Scales* $\frac{1}{2}$–$\frac{3}{4}$ in., oblong-ovate-lanceolate. **Spike** 2–4 in. *Corolla* $\frac{1}{2}$ in.—This is certainly the plant of Turczaninov and Ledebour, which Boissier refers to *Phelipaea lanuginosa*, C. A. Meyer.

5. *O. Solmsii*, Clarke *mes.;* very robust, pubescent, bracts usually longer than the flowers lanceolate, calyx half as long as the corolla, segments bifid to the middle, lobes lanceolate, corolla $\frac{3}{4}$–$\frac{3}{4}$ in. long yellow puberulous, filaments and anthers glabrous. *O. Galii*, Klotzsch in *Reise Pr. Wald. Bot.* 111, *not of Dalz.*

Western Himalaya; Kumaon at Tola, alt. 11,500 ft., Strach. & Winterb.; Kashmir and Kishwar, alt. 8–11,000 ft., Falconer, &c.

Stem 12–18 in., often as thick as the thumb. *Scales* $\frac{1}{2}$–1 in., lanceolate. **Spike** 6–10 in., dense-fid.; bracts very variable, narrow. **Corolla** curved, lobes ciliate.—Differs in the yellow flowers from *O. borealis*.

*** Calyx divided to the base anteriorly and posteriorly, the segments undivided.

6. *O. epithymbum*, *DC.;* Boiss. *Fl. Orient.* iv. 509; glandular-
pubescent, rather slender, spike short lax-fld., bracts about equalling the corolla, calyx-segments ovate-lanceolate 3-nerved entire equalling the corolla-tube, corolla ½ in. long pubescent orange-brown, lobes toothed or crenate not ciliate, filaments glabrous except at the base, anthers sparsely pubescent or glabrous. *Reuter in DC. Prodr. xi. 21; Reichb. Fl. Fl. Germ. t. 1784.

**Western Himalaya;** on grass, thyme, &c., from Kashmir, alt. 13,000 ft., Strach. & Winterb. (Orobanche n. 4), to Kashmir, alt. 7-11,000 ft.—**Distrib.** W. and Central Asia, Central and S. Europe.

Stem 6-12 in., often tuberous below, rarely as thick as a swan’s quill. Spike 1-3 in. Corolla curved, glandular-pubescent. Stamens inserted low down in the tube.

7. O. nicotianae, Wight Ill. 179, t. 158; stout or slender, puberulous, spikes many- and dense-fld., bracts lanceolate as long as the corolla-tube, calyx-segments almost as long subulate-lanceolate entire, corolla 4½ in. glabrous tube contracted in the middle, lobes pale blue glabrous crenate, filaments pubescent at the base only, anthers glabrous.

The *Decoan*; common in and destructive of tobacco crops, *Wight.*

Stem 8-12 in., as thick as the little finger in Wight’s specimen, much more slender in his figure, pale brown. Scales few, ovate, acuminate. Spike longer than the rest of the stem, cylindric, obtuse; bracts many-nerved. Calyx puberulous. Corolla quite glabrous, lobes small.—The contraction of the middle of the corolla-tube distinguishes this species. Wight regards the calyx-segments as bracteoles.

8. O. Clarkei, Hook. f.; glandular-puberulous, spike short rather lax-fld., bracts lanceolate half as long as the corolla-tube, calyx-segments nearly as long subulate-lanceolate, corolla 1 in. tube nearly straight not contracted in the middle, lobes blue glabrous crenate, filaments and anthers glabrous.

**Western Tibet;** Karakoram or Artemisia, alt. 9000 ft., Clarke.

This Clarke was disposed to regard as a form of *O. nicotianae,* which differs widely in the smaller flowers, and form of the corolla-tube.

**Sect. II. Trionychon, Wallr.** Bracteoles 2. (Phelifæa, Reut. & Boiss.)

* Calyx divided to the base posteriorly, entire anteriorly.


Throughout the plains of India, especially in mustard crops.—**Distrib.** Central and Western Asia.

Stem 4-12 in., sometimes fastigiately branched from the base, often inclined. Scales very few, chiefly at the forks. Spikes many-fld.; bracts pubescent, lobes subulate. Corolla pubescent, ½-1 in. long; tube straight, almost funnel-shaped. Filaments smooth, except at the base, anthers almost woolly.—Probably a form of *O. ramosa.*

10. O. ramosa, Linn.; Boiss. Fl. Orient. iv. 498; furfuraceous pubescent or glabrate, usually much branched, spikes slender longer than
the stem narrowed upwards, bracts ovate caduate-acuminate shorter than the corolla-tube, calyx half the length of the corolla-tube, lobes slender subulate from a broad base, corolla pubescent without and within, tube narrow, lobes blue ciliate, filaments glabrous, anthers sparsely crinite or glabrous. Reichb. Fl. Crit. 933, 934, and J. Fl. Germ. t. 152. Philipae ramosa, C. A. Mey.; Walp. Rep. iii. 459; Reut. in DC. Prodr. xi. 8; Wight in. t. 1618. P. aegyptiaca, Herb. Ind. Or. H. f. & T.

KASHMIE, Falconer; Jammu and Banahal, alt. 6-7000 ft., Thomson.—DISTR. Westwards to Europe and N. Africa.

11. O. psila, Clarke mss.; furfuraceous pubescent, stem simple slender, spike short lax-fld.; bracts lanceolate as long as the flower, calyx half as long as the corolla blue curved pubescent without and within, lobes ciliately, filaments pubescent, anthers sparsely crinite. KASHMIR; at Mapanon, alt. 9000 ft., Clarke.

12-18 in., as thick as a goose-quill or less. Scales long, 1/1-1 in., subulate-lanceolate. Spike 2-3 in., obtuse; lower bracts 3/1 in. long; bracteoles filiform. Corolla 1/2-2/3 in. long, lobes almost villous within, 2 upper rounded, 2 lower elliptic.

5. BOSCHNIACKIA, C. A. Mey.

Robust, brown, leafless herbs; stem simple, scaly. Flowers in dense spikes, or racemes, bracteolate, ebracteolate. Calyx cup-shaped, truncate or unequally 5-toothed. Corolla-tube incurved; limb 2-lipped, upper lip erect hooded entire or 2-fid; lower very short, 3-lobed. Stamens subexserted; anther-cells equal, parallel, bases obtuse. Ovary 1-celled; placenta 2-3, 2-partite; stigma dilated, broadly 2-lobed. Capsule 2-valved, valves at first cohering with the style. Seeds numerous, minute, ellipsoid, subglobose or compressed, tests reticulate.—Species 5, N.E. Asia, N.W. America and the Himalaya.

B. himalaica, Hook. f. & Thoms. Herb. Ind. Or.; calyx truncate quite entire, flowers 4 in. long, upper lip of corolla cymbiform entire, lateral lobes of lower minute subulate median obsolete, capsules 4-1 in., seeds orbicular, tests very lax loosely reticulate.

TEMPEATE AND SUBALPINE HIMALAYA, on Rhododendron roots; Garwhal and Kumaon, alt. 8-10,000 ft., Strach. & Winterb.; Sikkim, alt. 10-13,000 ft., J. D. H., Clarke.

Plant 6-18 in. high, pale brown, base tuberous; stem often as thick as the thumb. Scales numerous, rigid, 1/3 in., obovate or ovate-lanceolate, obtuse or acute. Racemes 3-8 in., stout, dense-fld., pale ochreous brown streaked with red brown; bracts 1/3 in., broadly ovate, acute or obtuse, half as long as the flower or longer; pedicels 1/3 in., stout. Calyx-limb quite entire. Corolla puberulous, erect, nearly straight. Stamens finally exserted, filaments glabrous except at the very base yellow; anthers small, blueish. Ovary with 2 or 3 placenta, each with revolute divisions covered with ovules. Capsule ovoid-oblong, thickly coriaceous, irregularly 2-3-valved; pedicle
very stout, ½ in. Seeds chaff-like, ½-1 in. diam., testa hyaline with large reticulations.

This differs widely from the N.E. Asiatic B. glabra in its much larger size, the flowers being twice as large, and the fruit three times. The capsule of B. glabra is not longer than the bracts, and its seeds are ellipsoid, ½ in. long, with a close testa.

**Order CV. LENTIBULARIÆ. (By C. B. Clarke.)**

Herbs, aquatic or in wet places. Leaves radical rosulate, or capillary multifid or obsolete. Peduncles 1-∞-fl.d.; bracts small or 0. Flowers hermaphrodite, purple, yellow, or white. Calyx inferior, 2-5-lobed. Corolla 2-lipped, spurred; upper lip usually smaller, entire or emarginate, lower 3-5-lobed. Stamens 2, attached to the base of the corolla, alternate with the lobes of the lower lip, filaments broad curved; anther-cells 2, ovate, transversely confluent. Ovary superior, globose, 1-celled; style short, stigma unequally 2-lobed; ovules very many, on a free basal placenta, anatropal. Capsule globose, 2-4-valved, or irregularly breaking up. Seeds numerous, small, exalbuminous.—Species 180, in all climates.

Calyx deeply 2-lobed, lobes entire or minutely toothed . . 1. UTRICULARIA.
Calyx 4-5-lobed, more or less 2-lobed . . . . 2. Pingucula.

**I. UTRICULARIA, Linn.**

Herbs, floating or terrestrial. Leaves many-partite with capillary segments in the floating species, entire in the erect species; minute bladders frequently added. Scapes simple or branched; racemes few- or many-fl.; pedicels bracteate and often 2 bracteolate. Calyx 2-partite; lobes entire or nearly so, often enlarged in fruit. Corolla 2-lipped; upper lip entire or emarginate, lower larger 3-6-lobed; spur curved or straight. Filaments broad; anthers ovate, 2- or sub-1-celled. Style short, stigma unequally 2-lobed. Seeds ellipsoid or obovoid, scrobiculate or glochidiate, rarely reticulate or comose.—Species 150, extending nearly throughout the world.

The numerous small scapose species have evanescent rosulate radical leaves on very short creeping branches; but there are specimens from which it would appear that, when some of such species grow in running water, they may produce elongate branched stems, longer linear leaves, and reduced leaves with bladders.

* Stems floating, leaves submerged divided into capillary segments mostly interspersed with bladders; bracteoles 0.

† Peduncles bearing about the middle a cluster of oblong vesicles.

1. **U. stellaris**, Linn. f. Suppl. 88; flowers pedicellate yellow, calyx-segments ovate enlarged in fruit, corolla-spur shorter than the lower lip more or less curved pubescent or glabrous. Roxb. Cor. Pl. ii. 42; t. 180, and Fl. Ind. i. 143; Wall. Cat. 6400; Wight in Hook. Bot. Misc. iii. 91, Suppl. t. 27; A. DC. Prodr. viii. 3; Wight Jc. t. 1567; Dalz. & Gibbs. Bomb. Fl. 135; Boiss. Fl. Orient. iv. 3. U. macrocarpa, Wall. Cat. 1494.

Throughout India, in rice-swamps and jheels.—Distrib. Malay, S.E. Asia, N. Australia. Nearly all Africa.

Leaves with bladders. Peduncles 2-8 in., erect out of the water, glabrous; whorl of vesicles ½-1 in. long, formed of the inflated bases of reduced branches with often subfoliaceous tips. Pedicels 1-8, ½ in., thickened, usually deflexed in fruit. Corolla

† Peduncles ebracteate or with a few obscure scales.


Throughout India; in rice-swamps, tanks, and jheels, common.—Distrib. S.E. Asia, Malaya, N. Australia.

Generally resembling U. stellaris, but rather larger in all its parts. Corolla ½—¾ in. diam. Calyx-segments in fruit ovate, subacute, patent, hardly so long as the capsule. Seeds as of U. stellaris, but rather larger; margin thin, incurved towards the concave face, described by some authors as winged, by others as wingless.—The branches near the base of the peduncle are sometimes inflated, falsely whorled, bearing reduced leaves, but are always much longer and less bract-like than those of U. stellaris.

3. U. punctata, Wall. Cat. 2121; pedicels slender erect in fruit, flowers blue, capsule thin much longer than the calyx, seeds discoid margin thin sharply toothed. A. DC. Prodr. viii. 5; Wight Jr. t. 1570; Oliver in Journ. Linn. Soc. iii. 175.

PSOU and TENASSERIM; from Rangoon, Wallich, to Mergui, Griffith, &c.—Distrib. Borneo.

Leaves multipinnate, segments capillary, with bladders. Peduncles 6 in., 5—15-fld., glabrous; pedicels often ½—¾ in. Corolla ½ in. diam., blue (Varish); spur shorter than the lower lip. Capsule ½ in., ovoid, obtuse. Seeds differing little from U. stellaris, but the thin margin is patent or obscurely inflexed towards the concave face, with numerons triangular teeth.


Throughout India, from the N.W. Himalaya and Assam to Ceylon, not common.—Distrib. S.E. Asia, Malaya, N. Australia.

Leaves sometimes 2—3 in., multipinnate, segments capillary, often inconspicuous or very slender, easily detached from the peduncle. Peduncle 1—4 in., minutely ebracteate near the middle. Corolla ½ in. diam., spur slightly exceeding the lower lip. Capsule ½ in. diam., thin. Seeds subtrapezoidal, much depressed; margin somewhat
inflexed towards the concave face, minutely crenulate.—This species, much confused with species of other sections, is distinguishable by the globose (not compressed ovate) capsule, distinctly exceeding the sepals. The capillary bladder-bearing leaves are often absent in dried specimens; and similar small leaves occur in vegetative states of many of the so-called leafless species.

5. **U. minor**, Linn.; Reichb. *Fl. Germ.* t. 1826; fig. 1; corolla yellow, spur less than half as long as the lower corolla-lip, capsule globose as long as the calyx. *Lamk. Ill.* t. 14, fig. 2. *A. DC. Prodr.* viii. 7; *Oliver in Journ. Linn. Soc.* iii. 176.

**ALPINE W. HIMALAYA;** Nuhra, alt. 11,000 ft., Thomson.—**DISTRIB.** Europe, W. and Central Asia.

Stems often 4-12 in., leafy. *Peduncles* 3-9 in., 2-8-fld.; usually minutely bracteate. Corolla $\frac{1}{4}$ in.; lower spur much longer than the upper.—There are examples from the W. Himalaya and Alpine Sikkim, which may be referable to this species; but being flowerless, they are doubtful.

**Leaves** at the base of the scape linear or spathulate, often evanescent before flowering. Calyx-lobes equal or nearly so. Seeds smooth, testa reticulate.

† **Scales of the scape and bracts attached by their bases.**

§ **Flowers** purple, blue, or whiteish.

6. **U. albo-corulea**, Dalz. *in Hook. Kew Journ.* iii. 279; glabrous, pedicels $\frac{1}{4}$ in. recurved in fruit, lower lip of corolla $\frac{1}{8}$ in. diam. azure, spur $\frac{1}{4}$ in. narrow-conic, seeds short-ellipsoid obtuse at both ends. *Oliver in Journ. Linn. Soc.* iii. 177; *Dalz. & Gibbs. Bomb. Fl.* 135.

**CONCAN;** Stocks; at Vingorla, Dalzell.

Scapes 4-8 in., erect, 3-8-fld., leafless at flower-time. Calyx-lobes ovate, in fruit 4 in. subacute. Lower lip of corolla suborbicular, slightly 4-lobed, upper $\frac{1}{4}$ in.; spur pendent, nearly straight. Seeds scrobiculate, i.e. exterior cells of the testa oblong, subparallel to the longer diam. of the seed.

7. **U. arcuata**, *Wight* *Ic.* t. 1571, fig. 1; glabrous, pedicels $\frac{1}{4}$ in. recurved in fruit, lower lip of corolla $\frac{1}{8}$ in. diam. blue-purple, spur 3 in. linear curved, seeds ellipsoid. *Oliver in Journ. Linn. Soc.* iii. 177; *Dalz. & Gibbs. Bomb. Fl.* 136.

**W. DECCAN PENINSULA,** from Bombay to Mysore; Law, Ritchie, &c.

Scapes 4-8 in., erect, 3-8-fld., leafless at flower-time or nearly so, sometimes bearing bladders on the rudimentary leaves. Calyx-lobes ovate, in fruit $\frac{1}{4}$ in., subacute. Lower lip of corolla suborbicular, scarcely lobed, upper $\frac{1}{4}$ in.; spur pendent from the base, then much curved forwards. Seeds scrobiculate, outer cells of the testa elongate.


**W. DECCAN PENINSULA,** from the Concan southward; *Wight, Law,* &c.

Scapes 2-6 in., erect, 3-6-fld., leafless at flower-time. Pedicels $\frac{1}{4}$ in. suberect in fruit. Calyx-lobes ovate, entire; in fruit $\frac{1}{4}$ in. scarcely acute. Lower lip of corolla obtuse, scarcely emarginate, upper shorter than the spur; spur nearly at right angles
to the axis of the flower, slightly curved forwards. Seeds reticulate, cells of the testa subhexagonal not elongate.


Mts. of the Decoan Peninsula and Ceylon; frequent. 

Scape 2–8 in., suberect, 3–12-fl., leafless at flower-time. Pedicels suberect in fruit. Calyx-lobes elliptic, acute, lower often minutely toothed; in fruit \( \frac{1}{4} \) in. very acute. Lower lip of corolla ovate, subacute, upper \( \frac{1}{4} \) in. spur at base projecting backwards nearly in a line with the axis of the flower, then curved forwards. Seeds ellipsoid, outer cells of the testa oblong.—*Wight's specimen of his U. pedicellata shows flowers only, and the seeds figured in his *Jc.* t. 1578, fig. 2, must have been taken from *U. affinis*. *Thwaites* (*Enum.* 171) unites *U. affinis* with *U. coriacea*, but the latter has much acuter calyx-lobes, and different seeds. As to *U. acuta* (Benj. in *Linn.* xx. 314), doubtfully referred by *Oliver* to *U. affinis*, it is perhaps rather *U. coriacea*, as the lower calyx-lobes is much oftener toothed in this species.

**U. conferta**; spur bent nearly at its base, so that it is pendent almost at right angles to the axis of the flower. *U. conferta, Wight* Lc. t. 1575.—Mts. of the S. Decoan Peninsula, *Wight*.


**U. Smithiana**; scapes 1 foot sometimes twining, lower lip of corolla nearly \( \frac{1}{4} \) in., spur \( \frac{1}{4} \) in. *U. Smithiana, Wight* Lc. t. 1577. *Ultricularia* sp. n. 27, *Oliver in Journ. Linn. Soc.* iii. 190.—Malabar or Coorg; *Wight*. This is referred by *Oliver* (*Journ. Linn. Soc.* iii. 190) to *U. coriacea*, possibly correctly. *Wight's* Lc. t. 1577 however shows the seeds reticulate not scrobiculate, i.e. the outer cells of the testa are subhexagonal not oblong or elongate. If this is so, *U. Smithiana* is more nearly allied to *U. affinis*, and is probably a distinct species. The figure can hardly be trusted on such a point, and none of *Wight's* examples exhibits fruit.


W. Decoan Peninsula, from the Concan southwards, and Ceylon; frequent. 

Scape usually elongate, 10–24 in., slender, twining, flower-bearing for half their length; small suberect, few-flowered forms (*Wight* Lc. t. 1574, right-hand plant) are slenderer than *U. uliginosa*, *Vahl.* Pedicels \( \frac{1}{4} \) in.; bracteoles filiform. Lower lip of corolla broadly ovate, scarcely emarginate; upper \( \frac{1}{2} \) in. Seeds somewhat rhomboid, hilum prominent; cells of the testa oblong, oblique to the long axis of the seed.

**U. uliginosa** (*Vahl* Enum. i. 203); glabrous, flowers pedicelled often numerous, calyx-lobes acute, in fruit \( \frac{1}{4} \) in. decurrent on the pedicel, lower lip of corolla \( \frac{1}{4} \) in. blue, spur \( \frac{1}{4} \) in. conic nearly straight, seeds obvoid scrobiculate. *A. DC. Prodr.*

Near Madras; Madura Hills, *Wight*, *Shuter*.

Scapes 1–6 in., exceedingly slender, twining on *U. Wallichiana* & *ulginaosa*. Pedicels ⅛ in., scattered. Seeds minute; testa very lax, almost wrinkled, cells large oblong.

*Var. capillacea*; scape most slender not twining, calyx-lobes in fruit ⅓ in. very obtuse. *U. capillacea*, *Wall. Cat.* 6899; *Oliver* in *Journ. Linn. Soc.* iii. 184, not of *Herb. Wight.*—Madras; *Wight*. *U. capillacea*, *Wight Herb.*, is *U. Wallichiana*, *Wight* t. 1572, fig. 1. The fragments in Wallich’s Herbarium (1½ in. long) of *U. capillacea*, Vahl, and which are said to have come from *Wight’s* Herbarium, appear to have had blue flowers. *Wallich* seems to have affixed the name *capillacea* on his own, not *Wight’s* authority.


Scapes 3–8 in., erect, slender, minutely densely villous. Calyx-lobes orbicular, in fruit ⅓ in. Capsule ⅓ in., globose. Seeds minute, ovoid, obscurely serobiculate.—By the subsessile flowers and small globose capsules this seems allied to *U. racemosa*, as Prof. *Oliver* states; but the bracts not being produced backwards below their point of insertion, it must be placed here in the artificial arrangement adopted.

§§ **Flowers yellow.**


Throughout India, from Nepal and Assam to Ceylon and Malacca.—DISTRIB. E. Asia from Japan to Borneo and the Philippines.

Scapes 2–7 in., erect, glabrous, many-fld. Pedicels ⅛ in. Seeds almost wrinkled owing to the very lax testa; cells of the testa oblong, oblique to the longer axis of the seed.


Hills of the *S. DECAN PENINSULA* and Ceylon; *Wight*, *Thwaites*, &c.
In his Herbarium Wight has marked his n. 2709 one sheet U. Wallichii, the other U. macrolepis; of this the seeds exhibit none of the glochidia shown in Wight's figure of U. macrolepis, and insisted on in the accompanying description.

VAR. formula, Oliver in Journ. Linn. Soc. iii. 182; stems stouter erect.—Khasia Mts., alt. 3–5000 ft., common. ALPINE SIKKIM, alt. 9–11,000 ft.; Lachen, J. D. H.,—The Sikkim examples are 1–2 in. high, but appear to be high-level forms of the Khasian plant.

†† Scales of the scape and bracts produced backwards below their point of insertion.

15. U. verticillata, Benj. in Linnaea, xx. 312; glabrous, scapes often branched, pedicels (many of them) as long as the fruit-calyx, lower lip of corolla \( \frac{1}{3} \) in. Oliver in Journ. Linn. Soc. iii. 184. U. bifida, Wight Ic. t. 1584, fig. 2, not of Linn.

MALACCA, Griffith.

Scapes 6–10 in. Pedicels \( \frac{1}{2} \) in. Calyx-lobes in fruit \( \frac{1}{2} \) in., ovate, obtuse. Capsule \( \frac{1}{6} \) in., globose. Seeds minute, cells of the testa subhexagonal rather than oblong.

16. U. rosea, Edgew. in Proc. Linn. Soc. i. 352; flowers subsessile, lower lip of corolla nearly \( \frac{1}{3} \) in. exceeding the obtuse spur. Oliver in Journ. Linn. Soc. iii. 184.

BENGAL? Edgeworth. CEYLON; Gardener.

The plant here diagnosed is Gardener's n. 507, which is the type of U. rosea, Oliver. Whether any such plant was ever found in Bengal is doubtful, there being no type of Edgeworth's to refer to. Oliver quotes for this species U. racemosa, Wight Ic. t. 1584, fig. 1, which looks more like U. racemosa, Wall., with the flower drawn a little large; the seeds are like none of this set, in all of which they are minute with large obscurely-marked scrobiculations. According to Thwaites (Enum. 172), U. rosea, racemosa and flicicaulis are forms of one species.

17. U. racemosa, Wall. Cat. 1496; glabrous, scapes 6–16 in. sometimes branched, flowers subsessile numerous blue lower distant uppermost often subcapitate, lower lip of corolla \( \frac{1}{2} \) in. hardly as long as the subacute spur. A. DC. Prodr. viii. 21; Oliver in Journ. Linn. Soc. iii. 186. U. complanata, Wall. Cat. 1497. U. caerulea, A. DC. l. c. 19; Wight Ic. t. 1583, not of Linn.

KHASIA MTS., alt. 3–5000 ft., common. CHOTA NAGPORE; Clarke. DECCAN PENINSULA and CEYLON; Wight, &c. PEKU; Kurz.—DISTRIB. Cambodia, China.

Flowers often subfasciculate on the spike. Calyx-lobes orbicular in fruit, \( \frac{1}{3} \) to \( \frac{2}{3} \) in., obtuse. Lower lip of corolla blue or whiteish, obscurely 4-lobed. Capsule \( \frac{1}{2} \) in., globose. Seeds minute, obscurely coarsely scrobiculate.

VAR. flicicaulis; stem slender with fewer scattered flowers. U. flicicaulis, Wall. Cat. 1501; A. DC. l. c. 21; Oliver in Journ. Linn. Soc. iii. 186. U. nivea, Vahl Enum. i. 203; Wall in Rothb. Fl. Ind. ed. Carey & Wall. i. 144; Wight Ic. t. 1582; Dalz. & Gibbs. Bomb. Fl. 136. U. setacea, Wall. Cat. 6396, partly. U. campestris, Miq. in Pl. Hohenack. n. 596.—From Nepal and the Khasia Mts. to Ceylon and Tenasserim (S.E. Asia and Malaya to Hongkong and Borneo).

*** Leaves at the base of the scape orbicular or reniform, persistent. Calyx-lobes very unequal. Seeds glochidiate (or in U. kumaonensis comose).

18. U. brachiata, Oliver in Journ. Linn. Soc. iii. 187; scape slender 1–2-fld., leaves reniform slenderly petioloed, lower lip of corolla \( \frac{4}{3} \) in. 5-lobed, spur \( \frac{1}{2} \) in. linear-cylindric obtuse.
ALPINE SIKKIM, alt. 8-11,000 ft., J. D. H.
Scapes 2-3 in. Leaves $\frac{1}{2}$ in. diam.; petiole $\frac{1}{4}$ in., linear. Pedicels $\frac{1}{4}$ in.; bracts minute, ovate. Calyx, upper segment $\frac{1}{10}$ in., ovate, purple. Corolla white, yellow-spotted. Seeds not seen.


Almost throughout INDIA in the hills: Himalaya Mts., alt. 3-8000 ft., from Nepal to Bhutan, common; W. Deccan Peninsula and Ceylon; Tenasserim to Malacca.—**Distrib.** Malaya, S. China.
Scapes 2-5 in. slender. Leaves $\frac{1}{2}$ in. diam.; petiole $\frac{1}{4}$ in. Pedicels $\frac{1}{4}$ in. Lower lip of corolla broader than long, with 5 subequal obtuse short lobes (more unequal in an example of Parish from Moulmein); pinkish or whiteish, but the spots or tinge of yellow usually prevailing.

20. **U. multicaulis**, Oliver in Journ. Linn. Soc. iii. 183; scape 1-3-fl., leaves petioled spathulate-ornicular, lower lip of corolla $\frac{1}{4}$ in. 3-4- (sometimes 6-) lobed, spur $\frac{1}{4}$ in. linear-cylindric obtuse.

ALPINE SIKKIM; Lachen, alt. 10-11,000 ft.; Lachoong, alt. 6-7000 ft., J. D. H.
Tufted; scapes 1-2 in. crowded stouter than those of **U. orbiculata.** Pedicels 0-1 in. Flowers pale-flesh colour, throat yellow. Seeds not seen.—Allied to **U. orbiculata**, from which it differs at first sight by the much smaller flowers.

21. **U. furcellata**, Oliver in Journ. Linn. Soc. iii. 189; scape 2-6-fl., leaves petioled spathulate-ornicular, lower lip of corolla $\frac{3}{4}$-5 in. 4-lobed purplish, spur $\frac{1}{4}$ in. linear curved.

SIKKIM HIMALAYA; at Darjeeling, alt. 7-9000 ft., frequent *(Herb. Griffith, &c.)*
Scape 2-3 in., slender, resembling that of **U. orbiculata.** Lower lip of corolla narrower than broad, purple pink or white, not distinctly yellow. Seeds obovoid, glochidiate, as of **U. orbiculata.—**Known in the field from **U. orbiculata** by the smaller, less yellow, flowers.
VAE. minor; scapes $\frac{1}{2}$-1 in. very slender 1-3-fl.—Temp. Sikkim; Lachen, J. D. H. Khasia Mts., Boga Pani, J. D. H. These examples were the type of **U. furcellata**, Oliver; the plentiful arrival of subsequent material shows the "larger Darjeeling form" referred to by Oliver to be the fairly developed state of the species.

22. **U. kumaonensis**, Oliver in Journ. Linn. Soc. iii. 189; scape slender 1-3-fl., leaves petioled spathulate-ornicular, lower lip of corolla $\frac{3}{4}$-4 in. 5-lobed, spur $\frac{1}{4}$ in. narrowly cylindric, seeds with a tuft of hairs at each end. *Dinuspernum album*, Edgew. *in Proc. Linn. Soc.* i. 351.

TEMPERATE W. HIMALAYA; Kumaon, alt. 7500 ft., near the river Pilti, Strach. & Winterb.

Resembling altogether **U. furcellata**; but the lower lip of the corolla is 5-lobed, the spur shorter. The young seeds are ellipsoid, smooth, scabrous-papillose at each end; the ripe seeds have at their end tufts of capillary hairs as long as the seed.

**IMPERFEKTLY KNOWN SPECIES.**

1. **U. minutissima**, Pahl Enum. i. 204; scape 2-3 in. capillary, bracts basifixed, flowers blue subsessile, calyx-lobes subobtuse. *DC. Prodr.* viii. 16; *Oliver in Journ. Linn. Soc.* iii. 190.—Malacca *(Koenig.*). The basifixed scales will not do for **U. racemosa,**
not the blue flowers for U. bifida; and there is no other known Malacca species that
will at all suit.

2. U. FOVOLATA, Edgew. in Proc. Linn. Soc. i. 351; scape twining leafless
2-6-fld., braeta transfixd, calyx-lobes ovate acute, corolla purple, seeds glistening
punctate.—Bengal; Edgeworth. Near U. uliginosa (ex Edgew.), but from the
description of the seeds perhaps rather allied to U. affinis.

3. U. ALATA, Benj. in Bot. Zeit. 1845, 212; leafless, scape 1-2 in. 2-3-fld., scales
basifixed, calyx-lobes ovate equal subacute andrurent on the pedicel, corolla longer
than the calyx, spur conic acute longer than the calyx.—"India" (Benjamin). Nor
the shape of the corolla-lip, its colour, nor any account of the seeds is
supplied.

4. U. SQUAMOSA, Benj. in Bot. Zeit. 1845, 212; leafless, scape 3 in. 3-fld., scales
attached by their middle, flowers subsessile, calyx-lobes equal orbicular-ovate obtuse.
—Nepal (Benjamin). Benjamin's description fits very well the common U. racemosa.
This species however must have been so well known to Benjamin that he would hardly
publish it again under a new name; hence Oliver records U. squamosa as an indeter-
minate species.

5. U. PAUCIFOLIA, Benj. in Linnae. xv. 309; leaves ¼ in. oblong obtuse, pediole ¼ in., scape ¼ in., pedicels exceedingly short, calyx-lobes ¼ in. equal obtuse.—
India (Benjamin). Supposed by Oliver to be near U. racemosa.

6. U. OBESIFOLIA, Benj. in Linnae. xx. 312; leaves ½ in. ovate obtuse, pediole
¼ in., scapes 3-20 in., scales fixed by their middle, calyx-lobes round obtuse.—Ceylon,
Nepal, China (Benjamin). Also supposed by Oliver to be near U. racemosa.

7. U. ALBIIPLORA, Griff. Notul. iv. 168; leafless, scapes simple filiform, pedicels
bracteolate at the base. corolla white, lower lip yellow-spotted, spur acutely conic a
little longer than the lower lip.—Mergui; Griffith.

8. U. LILACINA, Griff. Notul. iv. 168; leafless, raceme few-fld., fruit-pedicels
erect, calyx-lobes equal acute, corolla lilac-blue, lower lip with a yellow spot, spur
conic-subulate as long as the lower lip.—Mergui; Griffith.

9. U. CAPILLARIS, Don Prodr. 85; leafless, scape 3-4 in. capillary few-fld., lower
calyx-lobes (?) ovate acute longer, corolla blue, spur conic. DC. Prodr. viii. 90.—
Nepal (D. Don).

10. U. RAMOSA, Vahl Enum. i. 204; leafless, scape few-fld., flowers small, spur
conic short, fruit-pedicels recurved. DC. Prodr. viii. 25.—Deccan Peninsula
(Koenig). Doubtfully referred by Oliver to U. flexuosa; it appears as likely to be
U. coriulea or one of that section.

U. ambiguas is recorded as Indian by DC. (Prodr. viii. 9) on the faith of a wrong
field determination of a specimen by Wallich.

II. PINGUICULA, Linn.

Herbs. Leaves radical, rosetulate, entire. Scapes erect, 1-fld., leafless,
ebracteate. Calyx 4-5-lobed, more or less 2-fld. Corolla 2-fld., spurred, purple or yellow. Anthers ovate, sub-1-celled. Style short, stigma very unequally 2-lobed. Seeds ellipsoid.—Species 15, all extra-
tropical.

P. alpina, Linn.; Reichb. Iconogr. t. 81, fig. 166; leaves subsessile elliptic sparsely hairy on the upper surface, corolla white yellow-spotted, spur hardly ¼ as long as the corolla. DC. Prodr. viii. 31; Oliver in Journ.
Linn. Soc. iii. 190. U. flavescens, Flörke, and brachyloba, Ledeb.; Reichb.
Iconogr. t. 81, fig. 168, 187.

ALPINE HIMALAYA, alt. 11-13,000 ft.; Kumason, Strach. & Winterb., T.
Anderson; Sikkim, J. D. H.—Distrib. N. and Alpine Europe; N. and Central Asia.


**Order CVI. Gesneraceae.** (By C. B. Clarke.)

Herbs or undershrubs. Leaves opposite alternate or solitary, undivided—entire or toothed; stipules 0. Peduncles axillary or terminal, rarely 1-fid., bracteate; bracteoles usually small. Flowers hermaphrodite, rarely regular. Calyx-segments 5, valvate or open in the bud (imbricate in Monophyllea). Corolla gamopetalous; tube long or short; segments usually 5, imbricate in the bud. Stamens on the corolla-tube mostly didynamous, often 2 only fertile, rarely 5 fertile; anthers 2-celled, often early confluent 1-celled. Disc annular or shortly cylindric or 0, sometimes unilaterial. Ovary 1-celled or sub-2-celled; style linear, stigma small capitiate or 2-lobed; placentae parietal, bifid; ovules very many, anatropal. Fruit capsular or berryed, dehiscent or indehiscent. Seeds very many, minute, fusiform or ovoid, smooth; testa reticulate, often striate, albumen 0 or scanty; embryo straight.—Species 800, mostly in S.E. Asia, Polynesia and Tropical America.

The Ordinal character above given is narrowed to the Old World species of the Order, which all belong to the Suborder Cyrtandreae. The Euginseae of the New World have the ovary more or less inferior. The leaf when solitary on the plant is sometimes a highly developed cotyledon.

Subtribe 1. Trichosporae. Seeds tipped with a very long hair. Capsule long-linear, loculicidally 2-valved; placenta bifid, recurved, enrolled, covering the seeds, not seed-bearing on their axial faces.

Leaves subcoriaceous. Stamens 2 perfect included . . . 2. Lysonotus.
Leaves membranous, hairy. Stamens 4 perfect included . . . 3. Loxostigma.

Subtribe 2. Didymocarpaceae. Capsule loculicidally 2-valved, often ultimately 4-valved; placenta deeply intruded nearly meeting, not seed-bearing on their inner faces (except in ***). Seeds without hairs.

* Capsule linear or elongate-lanceolate, valves 2 straight not (or very late) 4-valved, in Didymocarpus frequently subfollicular.

Stigma oblique, emarginate. Stamens 2 perfect . . . . 4. Didymocarpus.
Stigma ultimately shortly bifid. Stamens 2 perfect . . . . 6. Chirita.
Leaves several. Stamens 4 perfect . . . . . . . 5. Didissandra.

** Capsule narrowly lanceolate, valves 2 straight soon again bipartite (capsule usually subequally 4-valved).


*** Capsule linear or elongate-lanceolate, valves (even before dehiscence) spirally twisted.

Calyx distinctly 2-lipped, sub-3-sepalous . . . . . . 12. Phyllobria.
**Æschynanthus.** Cyl. Gesneraceæ. (C. B. Clarke.)

Corolla-lobes 5, subsimilar, round. 13. BEA.
Corolla 2-lipped, lower lip larger reflexed. 14. ORNITHOBEA.

**** Capsule ellipsoidal or ovoid, hardly exceeding the calyx, placenta bearing seeds on all sides.

Caulescent. Stamens 4 perfect. 15. KLUGIA.
Caulescent. Stamens 2 perfect. 16. RHYNCHOGLOSSUM.
Scapose. Stamens 4 perfect. 17. JERDONIA.


Twiggy. Cyme-branches capillary. 18. LEFTOBEA.

Subtribe 4. EPITHEMÉ. Capsule circumsciss. Seeds without hairs.

A succulent herb. Flowers subcapitate. 19. EPITHEMA.

Subtribe 5. EUCYRTANDREÁ. Berry indehiscent, succulent or membranous, breaking up irregularly, in Cyrtandroméa sometimes loculicidally 2-valved. Seeds without hairs.

Leaf solitary. Flowers racemose. Sepals imbricate. Stamens 4 perfect. 20. MONOPHYLLÉA.
Calyx urceolate, enclosing the fruit. Stamens 4 perfect. 21. CYRTANDROMÉA.
Calyx plicate. Anthers cruciate. Stamens 4 perfect. 22. STACRANTHERA.
Undershrubs. Leaves all alternate. Stamens 4 perfect. 23. ISANTHERA.
Undershrubs. Uppermost leaves opposite. Stamens 4 perfect. 24. RHYNCHOTECUM.
Undershrubs. Corolla tubular. Stamens 2 perfect. 25. CYRTANDRA.

I. **ÆSCHYNANTHUS**, Jack.

Epiphytic undershrubs. Leaves opposite, equal, fleshy or leathery, entire rarely obscurely toothed; nerves obscure. Peduncles terminal or axillary, 1- or 2-fld., rarely cymose, solitary or clustered; bracts ovate, usually small, sometimes large coloured, deciduous. Calyx truncate, 5-fld., or 5-partite. Corolla tubular-ventricose, rarely small or greenish; limb 2-lipped. Stamens 4 perfect, didynamous; anthers oblong, equalling the corolla or much exerted, usually coherent in pairs by the tips; rudimentary fifth rarely present. Disc annular. Ovary superior, stipitate, oblong or linear; stigma peltate; placenta deeply inflexed, then recurved bearing the ovules. Capsule long-linear, loculicidally 2-valved; valves placenterous. Seeds very many, small, sessile, pendulous, oblong, rugose, with one or more hairs at the end next the hilum, and one at the apex.—Species 52, Indian and Malayan, extending from Kumaon and Ceylon to Hongkong and the Philippines.

Æschynanthus, Jack, was published Jan., 1823; but Trichosporum, D. Don, being published July, 1822, has the right of priority; Æschynanthus, however, having been accepted for half a century, it would not be expedient to relinquish it.

Sect. 1. **POLITRICHJUM.** Seeds with many hairs near the hilum, and one hair at the apex.


TENASSEIRM; Chappedong, Wallích; Mergui, Griffith; Moulemein, Parish (Ip. Ined. Kew).

VOL. IV.
Stems long, branched, terete. Leaves 3½ by ½ in., base cuneate or rhomboid, fleshy, midrib slender, nerves obscure; petiole ½ in. Pedicels lateral and terminal, 1–3 together, ½–3 in. Sepals free, ½ by ½ in. Corolla ⅔ in., glabrous without. Filaments much exerted, glandular-hairy. Capsule 8 by ½ in. Seed ¼ in., oblong, rough; hilar hairs 30–40, ½ in. long.

Sect. 2. Diplotrichium. Seeds with two hairs near the hilum, one at the apex.—Seeds in n. 2 unknown, in nn. 3, 7 require verification: nn. 4, 5, 6 are perhaps but one species.


*Tavoy*; Wallich.

Glabrous except the inflorescence. Branches very thick. Leaves 5 by 1 in., acute; petiole ½–1 in., very thick. Pedicels ⅔ in., nearly glabrous. Calyx narrowly tubular; teeth ½ in., triangular. Corolla narrow tubular-funnel-shaped, scarlet, month orange purple-marked. Filaments far exerted, nearly glabrous. Seeds unknown.—Brown assumed the seed to hair but one hair at the hilar end, and placed this species (doubtfully) in sect. *Holocalyx*, which the inflorescence and stout stem do not suit.


Sikkim Himalaya; alt. 4–6000 ft., J. D. H., Clarke.

Stems branched, terete. Leaves 3½ by 1 in., acuminate, base cuneate, fleshy, midrib beneath broad, nerves obscure; petiole ½ in. Pedicels 3–8, ½–1 in.; bracts ½ in., narrowly oblong; branch after flowering often growing on through the umbel. Calyx-tube nearly ½ in., teeth ½–1 in. Corolla more than 1 in., curved, hairy without, orange-red, the lobes orange black-spotted. Filaments far exerted, glandular-hairy; anthers ½ in., narrowly oblong. Ovary glabrous; style glandular-hairy. Capsule and seeds not now at hand; but the species seems very near *Æ. grandiflora*, and (it is believed) was ascertained to belong to sect. *Diplotrichium*.


Khasia Mts.; alt. 0–3500 ft.; Wallich, *Griffith*, H. f. & T.

Stems terete, branched. Leaves 4 by 1 in., narrowed at both ends, often sinuate; petiole ¼–½ in. Pedicels ¼–½ in., terminal; more rarely on spurs, quasi-axillary. Calyx herbaceous; lobes variable, sometimes very short obtuse as in Roxburgh's type, sometimes lanceolate acute as long as the tube. Corolla red, lobes orange marked with black-purple, mouth subcontraceted. Filaments far exerted, glandular-hairy; anthers ¼ in., shortly oblong. Capsule 6 by ¼ in.

*Vah. parasitica*, Wall. Cat. 796, chiefly; leaves narrower, calyx and corolla rather smaller, calyx-lobes acutely lanceolate slightly longer than the tube. *Br. in Pl. Jav. Rav. 2, p. 115; Lindl. Bot. Reg. 1841, t. 49; Maund. Bot. iv. t. 167.—Khasia Mts.; Wallich. Whethe Wallich's *Æ. parasitica* was Roxburgh's *Incarvillea parasitica* has been long disputed. The type sheet of Wall. Cat. 796 has three
branches on it, whereof one is Roxburgh's plant, the second is that here called Wall-lich's var. parasitica, the third is the remote A. micrantha. The distributed sheets of Wall. Cat. 766 contain these three plants in varying proportions.

5. A. ramosissima, Wall. Cat. 799, and Pl. As. Bar. i. 55, t. 71; glabrous except the corolla, leaves broadly lanceolate, pedicels clustered, calyx ½ in. lobes lanceolate longer than the tube, corolla 1 in. scarcely contracted at the mouth. DC. Prodr. ix. 260; Paxt. Mag. vi. 195, with fig.; Wight Ill. t. 159 b, fig. 11, many-haired seed excl.; Griff. Ic. Pl. Ind. Or. t. 443, fig. 5; Clarke Comm. & Cyrt. Beng. t. 50. A. parviflora, G. Don Gen. Syst. iv. 656; DC. Prodr. ix. 261. Trichosporum parviflorum, Don Prodr. 125.

SUBTROPICAL HIMALAYA, alt. 3-4000 ft.; Kumaon, Strachey & Winterbottom; Nepal, Wallich; Sikkim, J. D. H.

Leaves 5 by 1½ in. Sepals sometimes nearly free, narrowly lanceolate, sometimes united half-way.—Scarcely separable from A. grandiflora var. parasitica, but has broader leaves, and comes from a different area.


TEMPERATE HIMALAYA, alt. 2-7000 ft., from Nepal to Bhutan, frequent; Lachoong Valley, alt. 8000 ft., J. D. H.

Leaves 5 by 1½ in. Pedicels often numerous, sometimes ½ in., sometimes capitulate. Calyx (in the typical plant) deeply divided, tube wide subcampanulate, lobes lanceolate; in H. f. & T. n. 15, calyx-tube narrow-cylindric teeth sublinear as long as the tube. Anthers (in the typical plant) far exerted; in all the numerous examples of H. f. & T. very shortly exerted.—Hardly distinguishable from A. ramosissima, but by the small calyx.

Var. stenophylla; leaves linear, calyx ½-¼ in. deeply divided, often pubescent, lobes linear-subulate. Æschynanthus sp. n. 18, Herb. Ind. Or. H. f. & T.—Khasia Mts., alt. 0-4000 ft., frequent; H. f. & T., &c. Chittagong, alt. 0-1000 ft., H. f. & T.


INDIA (probably Mergui), Griffith; Tavoy, Wallich.

Stem somewhat slender, elongate, branching, rooting at the nodes, terete. Leaves 3 by ½ in., acuminate, base cuneate, fleshy, midrib beneath scarcely dilated; petiole ½ in. Pedicels 1-2 together, terminal and axillary, ½ in. Calyx divided nearly to the base; lobes ½ by ¼ in. Corolla somewhat curved; lobes ½-½ in., rounded black purple-marked. Filaments far exerted, minutely glandular-hairy. Seeds not seen.—Examples imperfect; the species is certainly distinct if, as Brown says, "semina extremitate superiore ditricha;" but it exceedingly resembles A. longicaulis, Wall., from the same place.

Sect. 3. Haplotrichium. Seeds with one hair not dilated at its base near the hilum, and one at the apex. Calyx deeply divided.

* Calyx-lobes small, lanceolate, acute, or linear.

8. A. Perrottetii, A. DC. Prodr. ix. 261, not of Wight nor of Gardn.;
glabrous except the corolla, leaves lanceolate base rhomboid or rounded, umbels 2-6-fl., corolla 1 ½ in. Jerdon Jc. Inded., Kew.

**Bombay** (probably in the Ghats of Malabar); Dalzell, Stocks. **Nilgerry Mts.; Clarke.**

Branches not or scarcely compressed. **Leaves** 3 by ½ in., acuminate, subcoriaceous; petiole ½-¼ in. **Pedicels** ⅓-⅔ in. **Sepals** ¼ in., linear. **Corolla** elongate, narrow, pubescent or subglabrate without, scarlet purple-marked in the lobes. **Filaments** exserted, minutely glandular-hairy. **Capsule** 5 in.

**Vari. malabarica;** leaves attenuate at the base, sepals ⅓-½ in.—Mts. of W. Deccan Peninsula, from Panar Ghant near Bombay to Courtallam, frequent.

**Vari. A. platyclinus**; branchlets much flattened, leaves dense bifurcious broad-lanceolate or elliptic, corolla 1½ in. **A. ceylanica, Wight Jc. t. 1347, not of Garda.—Madras; Courtallam, **Wight;** Nilgiri and Kurug Mts., G. Thomson. **BomBay** (probably in the W. Ghants), **Stocks.** Branchlets with subacute edges, probably closely applied to the branches of trees. **Leaves** 2½ by 1 in., acute at both ends; petiole ½ in., nearly ½ in. broad. **Flowers and capsules** nearly as in **C. Perrottetii.**


**Ceylon:** *Gardner, Thwaites* (C. P. n. 1782, &c.).

Branches not or scarcely compressed. **Leaves** scattered, 3½ by ½ in. (in Gardner’s example sometimes wider); petiole ½ in. **Pedicels** very generally 2 terminal, 2-4 in Gardner’s example. **Sepals** ¼ in., linear. **Corolla** pubescent or subglabrous.—**Diffs** from **A. Perrottetii** by the considerably shorter corolla.


10. **A. micrantha,** Clarke; glabrous except the flowers, leaves elliptic or oblong, pedicels 1-5 together, sepals ⅔ in. linear pubescent, corolla ⅔ in. narrow. **A. parviflora,** Clarke Comm. & Cyrt. Beng. t. 47, not of G. Don. **A. parasitica,** Wall. Cat. 796, partly.


Branches somewhat slender, elongate, often rooting, divided, glabrous, not compressed. **Leaves** 2½ by 1 in., sometimes smaller, somewhat acuminate, base cuneate, coriaceous; petiole ¼ in. **Pedicels** ⅔-⅔ in., terminal, and on lateral spurs, glabrous or early glabrate. **Sepals** laxly sparsely villous, ultimately glabrate. **Corolla** red, mouth orange, lobes purple-marked. **Filaments** fur exserted, minutely glandular-hairy. **Capsule** 6 in.— **Much resembles** **A. maculata,** and confused with it, but the seeds are altogether different; in the absence of seeds, **A. micrantha** may generally be recognized by the creeping rooting branches and smaller leaves.


**Subtropical E. Himalaya,** alt. 1-4000 ft., frequent; Sikkim and Bhutan, J. D. H., &c. **Assam;** Griffith. **Khasia Mts.,** alt. 4000 ft.; **Cachar; Keenan. Bhrma; Mouminto, Parish; Mergui, Griffith.—Distreb. Ava.

Branches elongate, rooting, fulvous or reddish with spreading hairs. **Leaves** ½ by ½ in., base cuneate or rounded; petiole ¼ in. **Pedicels** ⅓-⅔ in., solitary, rarely paired, pilose. **Sepals** ¼ in., linear, somewhat villous. **Corolla** villous without, scarlet, mouth orange black-marked, deeply 2-lipped, segments of lower lip with reflexed margins. **Filaments** shortly exserted, minutely glandular-hairy. **Capsule** 2-3 in.
12. *E. chiritoides*, Clarke; branches slender, leaves opposite and
ternate small broad-lanceolate hairy, flowers 1–3 together terminal, corolla 1½ in. straight, lobes short subequal.

**Bhutan**: Nattall. Assam; Griffith. *Khasia* Mts., alt. 4000 ft., H. f. & T. Stems and leaves closely resembling those of *E. gracilis*, but the leaves are not rarely ternate. *Pedicels* ¼–1 in., villous. *Sepals* ¼–1 in., linear, villous. Corolla narrow-tubular below, suddenly expanding into a tubular upper portion ½ in. diam., minutely pilose; lobes ½ in., round-ovate, black-marked. *Filaments* included, glabrous. **Ovary** villous.—A most remarkable species, the corolla, both in shape and texture, resembling a *Chirita*. The example of H. f. & T. shows leaves only, so that it cannot be confidently referred anywhere.

13. *E. levipes*, Clarke; branches very slender, leaves small opposite and
ternate, narrow-lanceolate hairy, flowers solitary terminal, pedicels smooth, corolla 1½ in.

**Upper Assam**: Mishmees, on Mt. Laim-planj, *Griffith* (Kew Distrib. n. 3815).

Somewhat densely clothed with white or greyish hair on every part except the pedicels. *Branches* elongate, sparingly rooting. *Leaves* ½ by ½ in., subsessile. *Pedicels* ½ in., glabrous even when young. *Sepals* ½ in., linear, flat, thinly herbaceous, sparsely villous. **Corolla** (imperfectly preserved) appears nearly as of *E. chiritoides*, but narrower.

14. *E. Mannii*, Kurz *ms*.; branches somewhat thick pubescent
upwards, leaves small elliptic early glabrate, pedicels axillary subterminal, corolla ½ in. narrow, mouth subequal.—*Cyrtandraeae*, *Griff. Ic. Pl. Ind. Or*. t. 429, fig. 2, and *Notul*. iv. 159.

*Khasia* Mts.; Mann. S.E. Assam; Patkoye Mts., *Griffith* (Kew Distrib. n. 3816).

*Stem* short; *branches* several, 2–10 in., undivided, terete, soon glabrate. *Leaves* densely approximated, 1½ by ¾ in., subobtuse at both ends, coriaceous, young hairy, mature dotted; midrib prominent beneath; petiole ¼ in. *Pedicels* ½ in., villous. *Sepals* ¼ in., villous. **Corolla** narrowly tubular-funnel-shaped, curved upwards, pubescent without; lobes ½–⅓ in. diam., roundish, black-marked. *Filaments* far exerted, glandular-hairy.—Allied to *E. Andersonii* (Clarke Comm. & *Cyt. Beng*. t. 48, upper fig.), which has hairy leaves attenuated to the petiole: as to the inflorescence, the pedicels of *E. Mannii* are often approximated towards the ends of the branches, but they are shorter than those of *E. Andersonii*.

15. *E. Masoniae*, Kurz *ms*.; branches somewhat thick pubescent
upwards, leaves small elliptic base rounded glabrous, pedicels axillary sub-

**Pegu**: hills of the Red Karens, *Mrs. Mason*.

*Branches* several, 5–10 in., undivided, terete, early glabrate. *Leaves* (in the solitary example) subsessile, terete, 2–1½ in. by ¼ in., cuneate, widest near the base; midrib prominent beneath. **Corolla** pubescent without; mouth scarcely ½ in. diam.—Very nearly allied to *E. Mannii*; the shape of the leaves is different, and the corolla considerably smaller.

**Calyx**-lobes wide, obtuse, or large (bracts prominent).

16. *E. acuminata*, *Wall*. Cat. 6397; glabrous, leaves largeish elliptic

**Calyx**-lobes wide, obtuse, or large (bracts prominent).

Branches long, divided, terete. Leaves 3½-4 by 1½ in, acuminate, base cuneate; petiole ½ in. Peduncles 3-7 together, approximate or clustered towards the ends of the branches, ½-1½ in., 1-4 flld.; bracteoles at the forks 2, ½ in. diam., broadly ovate; pedicels ½ in. Calyx wide at the base, green; lobes persistent, ultimately reflexed. Corolla wide-tubular, straight; upper lip erect, green; lower pendent, yellow, sometimes reddish on the margin without. Filaments far exserted, minutely glandular-hairy. Capsule 6 in.—The Hongkong plant has narrower leaves than the Khadian. Bentham never proposed to unite Aeschynanthus, Wall., to A. bracteata, Wall.; but to refer to the latter certain specimens which had been wrongly mixed up with those of A. acuminate.


Temperate Himalaya, alt. 4-8000 ft.; Sikkim and Bhotan, Griffith, J. D. II., &c. Upper Assam; Mrs. Mack. Khasia Mts., alt. 2-5000 ft., common; Wallach, Griffith, H. f. & T., &c.—Distrib. Asia.

Epiphytic; branches long, terete. Leaves 4 by 1½ in., from subrotund to narrow-lanceolate, base cuneate or rounded; petiole ½ in. Peduncles mostly terminal, often opposite, 1 in., 1-7-flld.; bracts 1 in., elliptic-lanceolate scarlet as are the pedicels and calyces. Sepals nearly free, deciduous. Corolla nearly glabrous without, lower lip with reflexed lobes. Filaments exserted, minutely glandular-hairy. Capsule 4-6 in.

18. A. Kingii, Clarke; glabrous, leaves large long elliptic herbaceous, peduncles 3-7-flld., calyx-lobes ½ in. lanceolate caudate-acuminate green.

Sikkim; alt. 6000 ft., King.

Leaves 7½ by 3 in., base broadly rhomboid; nerves 7-8 pair. Peduncles 3-nate, 2-2½ in.; bracts caducous. Calyx persistent in young fruit, base shortly funnel-shaped, membranous. Corolla not seen. Seeds with one hair at each end.—Seems nearly allied to A. bracteata, but the texture is very unlike.


Khasia Mts., alt. 1500-4000 ft., frequent; Wallach, Griffith, H. f. & T., &c. Assam; Mrs. Mack.

Stems several fathoms long, branched, scrambling among rocks. Leaves 6 by 2 in., base cuneate or rounded; petiole ½ in. Peduncles 1 in., terminal and on short axillary spurs, stout; bracts ½-2 in., ovate-oblong, deciduous, rose-red as is the whole inflorescence; pedicels 1-6, 0-½ in. subumbellcd. Sepals thin, deciduous. Corolla tubular, curved, mouth slightly oblique. Filaments exserted, minutely glandular-hairy. Capsule 12-16 in.

Sect. 4. Holocalyx. Seed with an apophysis of hyaline large cells and one hair at the hilum, and one hair at the apex. Calyx not deeply lobed.—[Peduncles short, 2-flld., axillary and terminal, often crowded near
the ends of the branches, at length clavate; bracts 2, small, ovate, deciduous; pedicels longer than the peduncles. Corolla-lobes ovate, obtuse; 2 upper erect, connate; 3 lower reflexed. Filaments glabrous; ovary and style densely glandular-hairy. Flowers (at least in several species), dimorphic, some with the stigma low down in the corolla-tube, others with the stigma exserted; stamens in both about as long as the corolla.]

* Calyx tubular, longer than broad.

20. **Æ. radicans**, Jack in Trans. Linn. Soc. xiv. 43, not of Wall.; stem thinly hairy, leaves small ovate or oblong thinly hairy or glabrate beneath, calyx 3/4 in. hairy, corolla 2½ in. hairy without. DC. Prodr. ix. 262. Trichosporum radicans, Nees in Flora, 1825, 144; Blume Bijd. 764.

MALACCA: Griffith.—Distrib. From Sumatra to the Philippines.

Stem slender, branching, rooting, hairs spreading fulvous deciduous. Leaves 1 by 3/4 in. ovate, or 2 by 3/4 in. on the same branch; petiole ¼ in. Peduncles 0–4 in. pedicels ¾–1 in., villous. Calyx subcampanulate, somewhat densely covered with spreading, white, multicellular hairs; teeth scarcely 1/16 in., broadly triangular. Corolla scarlet, throat yellow. Capsule 5–8 in.


MALACCA: Maingay (Kew Distrib. no. 1218, 1219).—Distrib. Java, Borneo.

Branches pendent, glabrous. Leaves 1½ by 3/4 in., scarcely acute, base rounded, when fresh minutely ciliate, dry glabrous; petiole ¼ in., obscurely pilose or glabrous. Peduncles axillary and clustered at the ends of the branches, recurved. Calyx tubular, scarcely 3/4 in. diam. upwards, densely covered with spreading glistening hairs; teeth very shallow. Corolla scarlet, throat yellow.

** Calyx obconic broader than long.

22. **Æ. Wallichii**, Br. in Benn. Pl. Java, P. 116; leaves elliptic acuminate or lanceolate glabrous, calyx broadly cup-shaped subentire, corolla 1 in. villous without. **Æ. radicans**, Wall. Cat. 796, type sheet only, not of Jack.—Æschynanthus sp. n. 16, Herb. Ind. Or. H. f. & T.


23. **Æ. obonica**, Clarke; leaves broadly elliptic narrowed at both ends glabrous, calyx very large obconic hairy subentire, corolla ¾ in. villous without.

Peninsula of MALACCA; at Klang in Selangore, Beccari.

Calyx ¾ in. and upwards in length, otherwise very like **Æ. Wallichii**, in which the corolla is thrice as long as the calyx, whereas in **Æ. obonica** the corolla is much less than twice the calyx.

II. LYSIONOTUS, D. Don.

Glabrous, epiphytic shrubs. Leaves opposite, or ternate, similar. Cymes peduncled, many-fl., lax; bracts herbaceous, inconspicuous; bracteoles small. Sepals narrowly lanceolate. Corolla tubular, inflated at
the middle, straight, 2-lipped; lower lip with 2 folds within. Stamens 2 perfect (2 or 3 rudimentary), subincluded; filaments flattened, bent; anthers connivent, connective with an oblong process. Disc annular. Ovary superior, stipitate, linear; style as long as the stamens, stigma shortly 2-lobed; placentae deeply inflexed, then recurved and ovuliferous. Capsule linear, in the following year splitting loculicidally to the base into 2 (ultimately 2-partite) valves. Seeds small, oblong, smooth, with a hair at the apex, pendent by a funicle which when detached resembles the apical hair.—Species 3, in N. India, China and Japan.


Stem 12 in., branched. Leaves often ternate, 6 by 2 in., from narrow-lanceolate to elliptic, closely serrate nearly to the base or sinate; nerves prominent, oblique; petiole 1⁄4 in. Peduncles often 4 in.; bracts 1⁄4 in., ovate; pedicels 1⁄2–1 in. Sepals 1⁄4 in., in young fruit often enlarged 1⁄2–1 in. and somewhat connate at the base. Corolla 1 in., deep purple or paler, or white with purplish veins. Capsule 2–4 in.

2. L. conferta, Clarke; branches long, leaves elliptic acuminate subentire very coriaceous. Æschynanthus conferta, Griff. Priv. Journ. p. 63, name only.

S.E. Assam; Patkoye Mts., Griffith (Kew. Distrib. n. 3819).

Branches 18 in. and more, straight, undivided. Leaves ternate, entire, minutely crenate towards the apex; nerves obscure, at right angles to the midrib. Sepals and peduncles nearly as of L. serrata; remains of the calyx somewhat coriaceous. Flowers not seen.—This may be a var. of L. serrata, but no form of this is known with similarly elongate branches and coriaceous leaves.

III. LOXOSTIGMA, Clarke.

An undershrub, often rooting near the base; branches long. Leaves opposite, often unequal, serrate, pilose. Cymes peduncled, lax, many-fl.; bracts and bracteoles small. Sepals 5, lanceolate. Corolla tubular, inflated above the base, straight, yellow; lobes 5, spreading. Stamens 4, didymous, included; anthers 2-celled, connivent in pairs; connective not excurrent; cells elliptic, subparallel. Ovary shortly stalked, linear, glabrous; stigma unilateral, obscurely bifid; placentae deeply inflexed, bifid, revolute. Capsule linear, loculicidal for its whole length; placentae revolute covering the seeds. Seeds pendulous, funicle capillary with a single hair at the apex.


SUBTROPICAL HIMALAYA, alt. 3–6000 ft.; from Sikkim to Mishnee, frequent, Griffith, Hook. f., &c. Khasia Mts., alt. 2–4000 ft., Griffith, H. f. & T.

Thinly pubescent. Leaves opposite, often unequal, 7 by 3 in., base acute or unequally rhomboid; petiole ½–1 in., often unequal. Peduncles 2–4 in.; bracts ½ in., narrow; pedicels ½–1 in. Sepals ½ in. Corolla 1½ by ½ in., minutely hairy. Anthers conni-
vent in pairs, connective not appended. Style subpersistent. Capsule 2½–5 in.—Wight's example of this was from Griffith in early flower; in his picture cited he guessed the colour of the flower wrong, and added a figure of a seed of some species (probably) of Didymocarpus; the figure thus concocted has defied identification until Griffith's specimen in Wight's Herbarium was found.

IV. DIDYMOCARPUS, Wall.

 Stemless or erect herbs. Leaves opposite, alternate, 3-4-nate or crowded. Peduncles axillary, many- or few-fld.; bracts rarely conspicuous; pedicels cymose, subumbellated or subtruncate in pairs. Calyx small, 5-fld. or nearly 5-partite. Corolla-tube cylindric or ovoid, mouth oblique or subsymmetrical; lobes 5, rounded. Stamens, 2 perfect, 2–3 rudimentary; filaments glabrous, bent; anthers cohering in pairs; cells 2, ovate, early confluent. Disc cylindric or 0. Ovary stalked or sessile, narrow; style long or short, stigma peltate emarginate or unilateral oblong rarely 2-lobed; placentae deeply infl exed, then recurved bearing ovules. Capsule linear, rarely lanceolate, loculicidally 2-valved or subfoliaceous, usually usually 2-often 4-valved; valves not twisted before dehiscence; placentae on the valves, revolute, concealing the seeds. Seeds ellipsoid, small, smooth, minutely reticulate.—Distrib. Species 70, in India, Malaya and S. China, 1 in Madagascar.


1. D. pygmaea, Clarke; leaf sessile elliptic base cordate, pedicels few short fascicled in its axil.

Central India; Rewah, Vicary. Chota Nagpore; Lohardugga, Clarke.

Pubescent. Stem ½–2 in, slender, curved, bearing one leaf at its apex. Leaf (one cotyledon persistent?) 1 by ½ in. or much smaller, falcate, obtuse at both ends, sinuate scarcely crenate, thin; petiole 0 rarely ½ in. Pedicels ½ in.; bracts inconspicuous or 0. Sepals ¾ in., linear, somewhat enlarged in fruit. Corolla ½ in., tubular. Stamens 2 fertile, 2-linear rudiments, glabrous; anther-cells 2, ovate, oblique, scarcely confluent by their tips. Ovary and style villous; stigma small, subcapitate, scarcely 2-lobed. Capsule ½–¾ in., nearly straight; 2-valved, and seeds altogether as in Didymocarpus.


2. D. pedicellata, Br. in Benn. Pl. Jav. Rar. 118; stem hardly any, leaves roundly ovate glabrous glandular-punctate above, calyx divided one-third the way down lobes rounded, capsule 1–1½ in. long-pedicelled. DC. Prodr. ix. 267; Clarke Comm. & Cyrt. Beng. t. 64. D. macrophylla, Wall. Cat. 784, partly; Royle Ill. 294, t. 70, fig. 1.

Subtropical W. Himalaya; from Chumba to Kumaon, alt. 2500–5500 ft., frequent, Walliah, Royle, Falconer, &c.

Stem usually 0, sometimes 1½ in. with 2 or 3 pairs of opposite cauline leaves, glabrous; innovations scabrous-puberulous. Leaves usually all radical, 3–5 in. diam., crenate-serrate, the points on their upper surface conspicuous black, in age colourless obscure without a lens; petiole 2–5 in. Scapes 4 in.; flowers often very many; bracts ½ in., ovate, often shortly connate. Calyx ½ in., funnel-shaped. Corolla nearly 1 in., purple. Capsule-stalk ½–¾ in., filiform.

3. D. macrophylla, Wall.; Don Prodr. 122; stemless, leaves ovate
softly hairy above glabrate beneath, calyx divided one-third the way down lobes obtuse, capsule nearly 1 in. sessile. Wall. Cat. 784, ch. esfl; DC: Prodr. ix. 267; Clarke Comm. & Cyrt. Beng. t. 63, not of Boyle. D. aromatica, Wall. Pl. As. Rar. t. 141, fig. 4-7, only; Clarke Comm. & Cyrt. Beng. t. 59, as to the fruiting plant only; not of others. D. plicata, Don Prodr. 122. Henckelia macrophyllana & plicata, Spreng. Syst., cura post. 13, 14.

Nepal; Wallich.

Leaves all radical, 3–6 in. diam., crenate-serrate; petiole 2–5 in., hairy at the base. Scapes 4 in., early glabrate; bracts ½ in., ovate. Calyx ¼ in., funnel-shaped. Corolla ¾–¾ in., deep purple. Ovary covered with minute sessile glands. Capsule narrowed at its base for ½ in. only. In ripe fruit the scape is glabrous, the two young leaves at its base are densely villous.


Nepal, Wallich; near River Tambur, J. D. H.

Stem none, or 1½ in., ashy-pubescent. Leaves radical or opposite, 2–3½ in. diam., obtuse, crenate, glabrate beneath, nerves pubescent; petiole 4–8 in. Peduncles 1–2 in.; shorter (cymes included) than the leaves, pubescent, later hardly glabrate; bracts ½ in., ovate, ashy-pubescent on both surfaces. Calyx ½ in., subcampanulate, sparsely pubescent; teeth obtuse or mucronulate. Corolla nearly 1 in., purple paler downwards, sparsely villous or glabrous.

5. D. Andersonii, Clarke Comm. & Cyrt. Beng. t. 62; stem short 2–4-leaved, leaves ovate-cordate hairy above and on the nerves beneath, flowers capitellate subindistributed within purple connate bracts, calyx-lobes very short obtuse, capsule 1½ in. sessile.

Sikkim; alt. 7–9000 ft., J. D. H. Kursung, alt. 4500 ft., Anderson, &c.

Stem ¾–1½ in., patently villous, at flower-time leafless at the base, with 2 large and usually 2 small leaves at its apex. Leaves opposite 6 by 4 in., coarsely crenate-serrate; petiole ¾–1½ in. Peduncles 3–7 in., villous; bracts ¾ in., obovate and with the whole cyme dark purple-red; pedicels very short, concealed by the bracts. Calyx ¾–½ in., funnel-shaped, glabrous, divided scarcely ½ the way down. Corolla more than 1 in., fine rose-purple, tube very narrow, mouth 1 in. diam. Ovary glabrous. Capsule very acute.

6. D. aurantiaca, Clarke Comm. & Cyrt. Beng. t. 60; stem short 2–4-leaved, leaves ovate villous above, flowers pedicelled orange-red, calyx divided nearly half-way down, capsule 1½ in. pedicelled.


Stem ¾–2½ in., villous. Leaves opposite, 3–6 in., acute or obtuse, usually cordate, serrate, beneath glabrous with villous nerves; petiole ¾–2½ in. Peduncles 4 in., hairy, ultimately scarcely glabrous; bracts ¾ in., ovate, scarcely connate; pedicels often 1 in. Calyx ¾ in., campanulate, more or less purple, glandular-viscid or nearly glabrous. Corolla 1½ in., long funnel-shaped. Ovary glabrous. Capsule-stalk ¼ in., linear.

7. D. oblonga, Wall. in Don Prodr. 123; stem often 4-leaved at the apex, leaves oblong or elliptic coarsely crenate pilose, petioles patently villous, cyme glabrous, calyx divided one-third way down lobes rounded, capsule ½ in. subsessile. Wall. Pl. As. Rar. ii. 3½, t. 140; DC. Prodr. ix. 266;
Henckelia oblonga, Spreng. Syst. cura post. 13.

NEPAL; Wallach. SIKKIM; Lachen, alt. 7–11,000 ft., and Sinchul, alt. 8500 ft., J. D. H.

Stem 2–5 in., villous-pubescent, at flower-time with 4 subverticillate leaves at its apex otherwise leafless; or elongate with 3 or 4 remote nodes, opposite leaves, and both axillary and terminal peduncles. Leaves opposite, 4 by 1½ in., subobtuse, closely villose above, glabrous beneath with villous nerves; petiole ½–2½ in., patently villous. Peduncles 2 in., glandular-pilose, glabrate upwards; bracts ½ in., broad, connate, glabrous, coloured, subpersistent. Calyx ¼ in., campanulate. Corolla ½ in., dark purple.—Recognized by its small capsule.

8. D. villosa, Don Prodr. 123; stem 4-leaved at the apex very villose, leaves ovate or obovate obtuse crenate closely silky-villose above, cymes glabrous, calyx divided less than half-way down lobes obtuse, capsule nearly 3 in. sessile. DC. Prodr. ix. 266, not of Clarke. Henckelia villosa, Spreng. Syst. cura post. 13.

NEPAL; Wallach.

Stem 2–6 in, densely covered with long spreading hairs, leafless except at the apex. Leaves opposite, 2 by 1½ in., beneath villous or nearly glabrous on the lamina; petiole 0–1 in., patently villous. Peduncles 1–3 in.; bracts ½ in., ovate, connate, coloured, glabrous; pedicels ¼ in. Calyx ½ in., campanulate, glabrous. Corolla ½ in. or rather more (apparently black-purple).—Seems very near D. aromatica, Wall., which has not the densely woolly stem.


NEPAL; Wallach.

Stem 4–6 in., pilose, leafless except at the apex. Leaves opposite, 4 by 2½ in., densely stiffly striate on both surfaces or glabrate between the nerves beneath; petiole unequal, ⅔–2 in. Inflorescence shorter than the leaves; peduncles (usually 2) 1–2 in.; lower bracts ½ in., ovate, green, not connate, often denticulate, deciduous; cymes upwards with the pedicels and calyces glabrous. Calyx ⅔ in., campanulate. Corolla ⅔ in., purple, nearly glabrous. Capsule-stalk hardly ½ in.—Don confused D. aromatica, Wall., with D. subalternans, Wall., and described his D. primulifolia from both; Brown therefore (in Benn. Pl. Jav. Rar. p. 118) rejected the name D. primulifolia.

10. D. podocarpa, Clarke; stem 4-leaved at the apex, leaves ovate or elliptic crenate minutely pilose above, bracts glabrous, calyx divided ⅔ way down lobes obtuse, capsule 1–1½ in. pedicelled.

SUBALPINE SIKKIM; Lachen, alt. 10–12,000 ft., J. D. H.; Siuchul, alt. 8000 ft., J. D. H.; Singalaleh, alt. 8000 ft., Treutler, &c.

Stem 2–8 in., ashy-pubescent, leafless except at the summit. Leaves opposite, attaining 6 by 4 in., pubescent only on the nerves beneath; petiole 0–1 in., mostly short. Peduncles 2–4, 1–2½ in.; bracts ½ in., wide-rotund, coloured, subconnate; pedicels ⅔ in., glabrous. Calyx nearly ⅔ in., campanulate. Corolla nearly 1 in., purple, glabrous or sparingly pilose without. Capsule-stalk longer than, sometimes nearly twice as long as, the calyx.—Differs from the 3 preceding closely allied species by the larger flowers and larger long-pedicelled capsule.

11. D. subalternans, Wall. Cat. 782; leaves scattered and opposite

**Temperate Himalaya; Kumaon, Wallach; near Gangootri, alt. 6500 ft., Strachey & Winterbottom. Nepal; Wallach.**

*Stem 4–12 in., nearly glabrous; nodes several. Leaves opposite alternate and ternate, lower long-petioled (usually alternate), uppermost sessile opposite, 3 by 2 in. Peduncles 1–1½ in., subumbellate; bracts ½ in., ovate, purple; pedicels ½ in., sparsely viscous-pilose. Calyx funnel-shaped, purplish, glabrous or slightly viscous. Corolla ⅛ in., tubular, somewhat hairy without, purple or pale-purple. Capsule often falcate; pedicles up to ½ in.*

**Var. curviflora;** leaves larger, cymes very viscous, bracts and calyx herbaceous, capsule falcate sessile.—Sikkim; Lachen, alt. 7–8000 ft., J. D. H.—Stem exceeding 1 foot. Leaves 4 in., glabular-pubescent. Calyx ½ in., divided half-way down; lobes lanceolate, acute. Capsule-stalk not longer than the calyx.

12. **D. leucocalyx,** Clarke; leaves ovate serrate villous above, calyx small deeply divided lobes white obovate, capsule ¼ in. subsessile. D. villosa, Clarke Comm. & Cyrt. Beng. t. 59, not of Don.—Didymocarpus sp. n. 17, Herb. Ind. Or. H. f. & T.

**Sikkim; alt. 6000 ft., common, Griffith, J. D. H., &c. Nepal; near River Tambur, J. D. H.**

*Stem 2–6 in., hairs patent or deflexed; nodes 1–3. Leaves opposite, attaining 6 by 4 in., subacute, often cordate; petiole ¼–1 in. Peduncles 2 in., often 4, subumbellate; cyme nearly glabrous, bracts caducous leaving a villous scar. Flowers numerous, small. Calyx ⅛ in. Corolla ½ in., violet-purple. Anthers minutely pilose.—This plentiful Sikkim species has always been confounded with Don’s *D. villosa.*

13. **D. Mortonii,** Clarke Comm. & Cyrt. Beng. t. 65; leaves ovate serrate villous above, calyx divided nearly to the base lobes narrowly oblong, corolla-tube linear limb very oblique wide-expanded, capsule nearly 1 in. sessile.—Didymocarpus sp. n. 29, Herb. Ind. Or. H. f. & T.

**Sikkim, alt. 5–8000 ft., common, (Herb. Griffith), J. D. H., &c.**

*Stem 2–6 in. pilose; nodes 1–3. Leaves opposite, attaining 6 by 4 in., scarcely acute, base rounded or cordate; petiole ⅓–3 in. Peduncles 2–3 in., often several; bracts caducous; bracteoles ovate, green, often concealing the calyx until the flower expands. Calyx ⅜–1½ in. Corolla-tube ⅛ by ⅝ in., limb ⅓ in. diam., purple. Ovary glandular-hairy. Capsule straight.*

14. **D. pulchra,** Clarke; stem and petioles ashy-puberulous, leaves oblong or elliptic minutely densely pubescent above whitened glabrate beneath, cyme viscosous-hairy, calyx divided ⅔ way down lobes triangular acute, corolla 1 in., capsule ⅔ in. pedicelled. D. subalternans, Clarke Comm. & Cyrt. Beng. t. 55, not of Wall.

**Sikkim, alt. 6–7000 ft., common, (Herb. Griffith), J. D. H., &c.**

*Stem attaining 1 foot; lower cauline leaves long-petioled, often 3–4-nate, uppermost sessile. Leaves ⅓ by 2 in., acute, base often auricled on one side, create incised-serrate or nearly entire, coriaceous; nerves beneath raised, pubescent; petiole attaining 2–3 in. Peduncles 2–3 in.; bracts more or less foliaceous; bracteoles ⅔ in., round, colored; pedicels ⅔ in. Calyx ⅜ in., rose-purple, viscous-pilose. Corolla broadly tubular, sparsely hairy without, violet-purple. Anthers minutely hairy. Ovary glabrous. Capsule-stalk stout, longer than the calyx.—Nearly allied to *D. pundaana.*


*Stem* 8-10 in., often with 3-4 pedioled leaves in a whorl in its middle and 2 sessile leaves at its apex. *Leaves* coriaceous, base often unequally coriaceous, glabrous beneath or minutely pubescent on the nerves. Rays of the *cyme* and pedicels subumbellate, less viscous-hairy than in *D. pulchra*. *Calyx* ½ in., nearly glabrous. *Corolla* very sparsely hairy, purple. *Capsules* slightly curved; pedicels ½ in.—Otherwise as *D. pulchra*.

**Var. attenuata**; leaves less coriaceous often cuneate at the base, cymes slenderer, bracts narrower, calyx scarcely ½ in., capsule slender pedicel filiform very long.—*Khasia Mts.*, alt. 3-5000 ft., especially in the northern portion of the hills; *Griffith, H. f. & T.*, &c.—This may be specifically distinct, for both the capsule and calyx differ, but there are intermediate examples.

16. **D. Hookeri**, *Clarke Comm. & Cyrt. Beng.* t. 54; stem and pedioles villous, leaves ovate crenulate softly villous above glabrate (except the nerves) beneath, calyx divided ½ the way down, corolla ½ in. pale, capsule ½ in.—*Didymocarpus* sp. n. 21, *Herb. Ind. Or. H. f. & T.*


*Stem* 16 in., with usually 3-4 pedioled verticillate leaves in the middle, uppermost leaves subsessile. *Leaves* 4 by 3 in. (sometimes much larger), subobtuse, often coriaceous; petiole ½-3 in. *Cymes* sparsely hairy; bracts ½ in., round; pedicels 0-½ in., usually short. *Calyx* ½ in., campanulate. *Corolla* tubular, pale yellow with rose-marks or nearly white. *Capsule* (appearing sessile) narrowing downwards gradually into a thick pedicel.


*Stem* 6 in., hairy; nodes 1-3. *Leaves* opposite alternate and verticillate, often very large, larger 10 by 5½ in., subobturate, glabrous beneath except on the nerves; petiole attaining ½ in. *Peduncles* 1-4, ½-1½ in.; *cymes* 5-8-fl., nearly glabrous; bracts ½ in., glabrous; pedicels ½-¾ in., mostly short. *Calyx* ½ in. and upwards. *Corolla* glabrous, white or very pale purple; lobes ½ in. round. *Stamens*, 2 fertile, 2 rudimentary. *Ovary* glabrous; stigma petals, oblique scarcely emarginate.—The corolla is that of *Chirita*, the capsule of *Didymocarpus*; the stigma is nearly as in *Chirita Kurzii*, from which it can hardly be generically separated.

18. **D. platycalyx**, *Clarke*; leaves oblong or elliptic crenate softly hairy, peduncles 1-5-fl., calyx widely campanulate subentire, corolla 1 in.

**TENASSERIM**; *Monimlein, Parish*.

*Stem* 6 in., hairy; nodes 1-3. *Leaves* opposite, 2-4 by 1½ in., subacute, base cuneate or rounded, puberulous beneath; petiole ½-1 in. *Peduncles* ½ in., axillary, solitary, nearly glabrous; bracts ½ in., broadly orbicular, green, puberulous; pedicels ½ in., puberulous. *Calyx* ½ in., nearly hemispherical; margin undulated, purplish.
Didymocarpus.

Corolla glabrous, tube cylindric violet, limb slightly oblique white; lobes ½ in. diam., obtuse. Stamens 2 fertile; anthers oblong-peltate, cohering. Ovary minutely hairy, pedicelled elongate; style hardly any, stigma large circular. Capsule not seen.

Sect. 3. Didymanthus. Caulescent, sometimes but shortly. Leaves distant, upper (at least) opposite. Peduncles long; cyme-branches often elongate, subracemose with 2-nate pedicels. Calyx sub-5-partite. Corolla small or middle-sized; tube narrow or broad at the base. Disc 0 or shortly cylindric. Capsule 2-valved, rarely at first follicular.—Species of the Malay Peninsula and adjacent islands.

19. D. mollis, Wall. Cat. 790; leaves elliptic crenate narrowed at both ends hairy above, peduncles long, cyme lax viscous-pubescent, capsule nearly ½ in. sessile. DC. Prodr. ix. 266.

BURMA; MtS near Prome, Wallich. CHITTAGONG; at Seetakoon, J. D. H. & T. T.

Stem 8 in., villous, near the base hirsute with fulvous deflexed hair. Leaves opposite, or the 4 uppermost subverticillate, 4 by 1½ in., acute, membranous, glabrate, beneath hairy on the nerves; nerves 9–11 pair; petiole ¼ in., or of the uppermost leaves 0. Peduncles subterminal, often 4, 3 in., 12-fld.; pedicels ½ in. Sepals ½ in., linear. Disc shortly cylindric. Capsule symmetrically 2-valved glabrous. Corolla not seen.

20. D. paucinerva, Clarke; leaves elliptic or obovate obtuse crenate hairy above, peduncles subterminal long, cyme 2–8-fld. lax nearly glabrous, capsule rather more than ½ in. subsessile.

TENASSERIM; at Mergui, Griffith (Kew Distrib. n. 3853).

Stem 6 in., slender, simple, sparingly pilose except near the base. Leaves opposite (or the lower alternate), 2 by 1 in., closely shortly strigose above, glabrous whiter beneath; nerves 5–6 pair, puberulous; petiole ¼–1 in. Peduncles 2 in., slender; pedicels ½–1 in. Disc shortly cylindric. Capsule 2-valved, glabrous. Corolla not seen.—Appears closely allied to D. mollis.

21. D. cordata, Wall. Cat. 781; leaves cordate deeply crenate fulvous villous on both surfaces, peduncles long, cymes lax subracemose, pedicels distant often in pairs, corolla wide campanulate base gibbos. DC. Prodr. ix. 265.

PENANG; Wallich, Maingay, n. 1224.

Stem 20 in., fulvous-villous. Leaves (at least the upper) opposite, 6 by 4 in., shortly acuminate, base rounded; petiole 1½ in. Peduncles 8 in.; cymes often 6 in., glandular-hairy; bracts small, ovate, caducous; pedicels ½ in. Sepals ¼ in., lanceolate, nearly glabrous. Corolla-tube ¼ in. long and broad, glabrous; lobes ½ in. diam., round. Filaments short; anthers large, 4 cohering. Disc 0. Ovary glabrous, sessile; style glabrous, stigma small. Capsule ½ in, slender, sessile, 2-valved, or sometimes (in Wallich’s examples) subfollicular (at least at first).

22. D. barbinerva, Clarke; leaves narrowly obovate minutely crenate glabrous, midrib beneath hirsute, peduncles long, cyme dense glabrate, bracts round, sepals elliptic.

ATRAN (near Moulmein).

Stem upwards, with the petioles, rufous-villous. Leaves (at least the upper) opposite, 6 by 1½ in., suddenly narrowed at the base; nerves 11 pair; petiole ¼–1 in. Peduncles 5 in., nearly glabrous; cyme 1–1½ in. diam., many-fl.; bracts ¼–½ in. diam.; pedicels short, in fruit sometimes ¾ in. Sepals ½ in., obtuse. Corolla ½ in., widely campanulate (badly preserved, seems nearly as of D. cordata). Stamens 2 fertile; anthers 2-celled; cells ovate, divaricate, scarcely confluent. Ovary glabrous,
sessile; disc 0; style as long as the ovary; stigma small subpeltate. **Capsule** 2 in., narrowly linear, follicular at first, afterwards 2-valved.

23. **D. rufipes**, Clarke; stem woody rufous-hirsute, leaves elliptic subacute silvery-hirsute on both surfaces, peduncles long rufous-villous laxly 7–12-fl.d.

**Tenassem**; at the base of Moorebyit, Beddome.

**Stem** 3 in., densely covered with long red hairs, leafy at the apex. **Leaves** 4 by 1½ in., closely crenate; petiole 0–½ in., rufous-hirsute. **Peduncles** arising below the leaves, 4–5 in.; cyme-bractes obscurely or not at all racemose; bracts gone at fruit-time; pedicles ½–1½ in. **Calyx-segments** ½ in., densely rufous-hirsute. **Corolla** not seen. **Capsule** 1–1½ in., narrowly linear, nearly erect, glabrous, follicular, ultimately 2–4-partite.

24. **D. longipes**, Clarke; leaves coriaceous narrowly obovate minutely crenate glabrous villous on the nerves beneath, peduncles very long, cyme laxly subracemose 3–7-fl.d., corolla more than ½ in. linear-tubular.

**Malacca**; Mt. Ophir, Griffith (Kew Distrib. n. 3854); Cuming, n. 2385; Main-gay, n. 2723.

**Stem** 1–3 in., woody, hirsute, crowded with leaves at the summit. **Leaves** 6 by 1½ in., obtuse, long attenuate at the base sometimes sessile; nerves 6–8 pair, obscure. **Peduncles** attaining 1 foot, nearly glabrous; bracts very small, narrow; pedicels ¼ in., in remote pairs. **Sepals** ⅜ in. **Ovary** and style subglabrous, stigma capitate. **Capsule** 1 in., sessile, ultimately 2-valved.

25. **D. corchorifolia**, Wall. Cat. 792; leaves lanceolate or ovate-lanceolate crenulate rusty-villous on both surfaces, peduncles very short 1–4-fl.d., corolla tubular straight, capsule 2 in. sessile. **DC. Prodr.** ix. 265.

**Penang**; Wallich, Main-gay.

Suffrutescent, branched, rufous-villous with deflexed hairs; innovations rufous-hirsute. **Leaves** 2½ by 1 in., acute, base rhomboid, rugose; petiole ¼ in. **Peduncles** on short axillary spurred, ½–1½ in., villous, upwards with the cymes glabrous; bracts ½–1 in., round, coloured; pedicels ¼ in., often in pairs. **Sepals** ⅛ in., ovate or elliptic, obtuse or acute, glabrous, coloured. **Corolla** ½ in., glabrous, scarcely widened upwards. **Ovary** and style glaucous-pubescent; disc shortly cylindric. **Capsule** subfollicular, sometimes ultimately 2-valved.

**Sect. 4. Heteroboea**, Benth. in Gen. Pl. ii. 1022. **Peduncles** 1–3-fl.d. short, or not elongate. **Calyx** 5-partite. **Corolla-tube** cylindric. **Disc** short-cylindric. **Capsule** follicular, ultimately sometimes 2-valved.—Species all Malayan.

* Stem short; leaves crowded, elongate, many-nerved.


**Penang**; Wallich, Heffer. **Singapore**; Lob.-**Distrib.** Sumatra, Borneo.

**Stem** suffrutescent, short, thick, hirsute. **Leaves** 6 by 1 in., acuminate, base attenuate, subsessile, thick with shaggy hair; nerves 25 pair. **Peduncles** 1–1½ in., axillary or fascicled on shortedent lateral spurs, or subaxillate with the petiole; bracts minute linear. **Sepals** ⅛ in., oblong, villous. **Corolla** nearly straight, scarcely hairy without, pale purplish with yellow lines in the throat. **Capsule** follicular, ultimately 2-valved.
27. **D. platypus**, Clarke; leaves alternate crowded sessile oblong-elliptic densely villous base dilated incise-serrate, corolla 1½ in. narrowly funnel-shaped, capsule 2 in. slender linear.—Chirita sp. n. 29, Herb. Ind. Or. H. f. & T.

**Malacca; Griffith, Cuming** (n. 2359), &c.; Mt. Ophir (Herb. Wright).—**Distrib. Sumatra.**

Leaves 9 by 2½ in., sprinkled above distantly with long hairs; nerves 30 pair, reduplicated and villous beneath. *Inflorosence, flowers, and capsules as of* D. crinita, *of which I suspect that this is a variety.*

**Stem creeping; leaves in opposite distant pairs.**


**Penang; Wallich, Maingay, Lobb. Moulléin; Lobb.**


29. **D. marginata**, Clarke; creeping, leaves broad elliptic sprinkled with small hairs above ciliate-villous on the margin, peduncles 1-fld., corolla ½ in. villous.

**Malacca; Lobb.**

Stem villous, rooting at the nodes. *Leaves 2½ by 1¼ in., obtuse at both ends, subentire; petiole 1 in. Sepals ½ in., linear.—Very near* D. reptans; *the sepals are twice as long, the corolla hairy, the indumentum of the leaves different.*

**Sect. 5. *Loxocarpus.*** Stemless, or one doubtful species creeping. *Leaves crowded, nearly entire. Peduncles longish, few- or many-fld.; bracts small, narrow. Calyx divided nearly to the base. Corolla-tube short, limb 2-lipped, wide. Disc 0. Ovary sessile, pubescent; style as long as the ovary. Capsule lanceolate or linear, usually oblique at the base, follicular.—Malayan species.** (*Loxocarpus, Br. in Benn. Pl. Jav.🌼. pp. 115, 120.)*


**Penang; Wallich, Maingay. Singapore; Lob.**


31. **D. semitorta**, Clarke; leaves elliptic or ovate silky above reticulated beneath with broad densely villous nerves, peduncles 1-2-fld., sepals white-pilose, capsule ½ in. doubly curved half twisted round near the base.

**Malacca; Mt. Ophir, Griffith, Lob, Maingay.**

Scapose. *Leaves 1½ by ¾ in., obtuse at both ends, entire or obscurely crenate, densely softly silky above, glabrous between the nerves beneath; petiole up to 1¼ in.*

**Didymocarpus.**
Peduncles $\frac{3}{4}$ in., thinly hairy; bracts $\frac{1}{2}$ in., oblong; pedicels $\frac{1}{2}$ in. \textit{Sepals} $\frac{1}{2}$ in., oblong. \textit{Corolla} $\frac{1}{4}$ in.; tube widely campanulate, limb very oblique. \textit{Ovary} densely pilose; style nearly glabrous.

Sect. 6. \textbf{Orthoboea} (Benth. in \textit{Gen. Pl.} ii. 1022). Stemless, or (\textit{D. repons}) creeping. Leaves alternate or crowded. \textit{Peduncles} long, many- or few-fl.; bracts small, narrow. \textit{Sepals} linear or narrowly oblong. \textit{Corolla-tube} cylindric or ventricose, not linear. \textit{Ovary} sessile; style about as long as the ovary; disc 0. \textit{Capsule} linear or sub lanceolate, sessile, erect or scarcely oblique at the base; follicular, ultimately sometimes 2-valved.—Species of S. Deccan and Ceylon.

32. \textbf{D. Rottleriiana}, \textit{Wall.} \textit{Cat.} 778; leaves oblong or elliptic, base attenuate deeply crenate white-villous on both surfaces, corolla $\frac{3}{4}$ in., capsule $\frac{3}{4}$ in. densely villous when young. \textit{Br. in. Benn. Pl.} \textit{Jav.} 119.

\textit{Nilgiri} and \textit{Kur} Mrs.; \textit{Heyne, &c.}

\textit{Leaves} $\frac{3}{4}$ by $\frac{1}{2}$ in., obtuse, mature herbaceous softly strigose above pilose between the nerves beneath; petiole $\frac{1}{2}$ in., broad, entire. \textit{Peduncles} $\frac{3}{4}$ in., many-fl. \textit{Sepals} $\frac{1}{2}$ in., narrowly oblong, villous. \textit{Corolla} purple with yellow marks; tube short, mouth very oblique. \textit{Ovary} very hairy; style glabrous. \textit{Capsule} very acute.

\textit{Var. Wightii}; leaves less deeply crenate thick rugose tomentose, even when old sometimes densely white woolly, capsule less than $\frac{1}{4}$ in. \textit{D. Rottleriiana}, \textit{Wight} \textit{Ic.} t. 1348; \textit{A. DC. Prodr.} ix. 268. \textit{Rottleri} inegata, \textit{Vahl Ennun.} i. 88. Henckelia inegata, \textit{Spreng. Syst.} i. 38.—Shevagberry Hills, near Courtallum; \textit{Wight}.

33. \textbf{D. tomentosa}, \textit{Wight} \textit{Ic.} t. 1349, and \textit{Ili.} t. 159 bis, fig. 1 (\textit{stigma} incorrect); leaves elliptic attenuate at the base crenate tomentose, corolla $\frac{1}{4}$ in., capsule $\frac{3}{4}$ in. sparsely villous.

\textit{Hills} in S. \textit{Madrass}; Courtallum, Jamalay, Bolamputty, \textit{Wight}.

\textit{Leaves} 3 by $\frac{1}{2}$ in., obtuse, white-villous above, cinna moaneous or ferruginous villous or lanate beneath even when mature. \textit{Corolla-tube} nearly $\frac{3}{4}$ in., curved. \textit{Style} thick, glabrous; stigma large, glabrous.—In other respects resembling \textit{D. Rottleriiana} and a variety perhaps of it (Thwaites Ennun. 207).

\textit{Var. lamuniosa}; petiole 0 or very broad, leaves spatulate-orbicular cinna moaneous tomentose beneath, peduncles long, cymes large.—Courtallum; \textit{Wight}.

34. \textbf{D. lyrata}, \textit{Wight} \textit{Ic.} t. 1350; leaves lyrate, terminal lobe ovate incise-crenate or sublobulate thinly herbaceous villous on both surfaces, corolla scarcely $\frac{1}{4}$ in., capsule $\frac{3}{4}$ to $\frac{1}{2}$ in. sparsely villous.

\textit{Deccan Peninsula}; Courtallum, \textit{Wight}.

\textit{Leaves} attaining 8 in.; petiole rarely nearly 6 in., incise-pinnatifid; limb 2-3 in. diam., base rounded. \textit{Peduncles} 4-6 in., villous. \textit{Flowers} and capsules nearly as in \textit{D. Rottleriiana}.—Closely allied to \textit{D. Rottleriiana}, rather than to \textit{D. tomentosa}, which has larger flowers and capsules.

35. \textbf{D. Humboldtiana}, \textit{Gardn. in Calc. Journ. Nat. Hist.} vi. 477; leaves broadly elliptic, base usually rounded or cordate shallowly crenate thickly tomentose ultimately silky, sepals $\frac{1}{2}$ in. pilose, corolla $\frac{3}{4}$ in. \textit{Bot. Mag.} t. 4757.

\textit{Ceylon}; up to 5000 ft. alt., common, \textit{Gardner, &c.}

\textit{Leaves} 3 by $\frac{1}{4}$ to $\frac{2}{4}$ in., obtuse, sometimes orbicular, base rarely shortly attenuate; petiole 4-2 in. \textit{Peduncles} 2-4 in., pubescent, many-fl., or sometimes subracemose few-fl. \textit{Corolla} pale purple, puberulous without. \textit{Filaments} of the sterile stamens nearly as long as of the fertile. \textit{Ovary} pilose; style glabrous. \textit{Capsule} $\frac{3}{4}$ in., often oblique at the base.

\textit{Var. primulofolia}, Thwaites Ennun. 207 (not \textit{D. primulifolia}, \textit{D. Dou}) leaves spatulate-elliptic, cymes subracemose slender, corolla scarcely $\frac{1}{4}$ in., sterile filaments

\textit{Vol. IV}. A &
—Petiole ¼–2 in. Sepals ½ in., narrowly oblong, white-pilose, not tomentose.

*Var. reedens*; leaves large, base attenuate, cymes compound.—Ceylon; Walle-kelly Hill, alt. 2000 ft., Beckett.—Leaves 6 by 4 in., thinly white-strigose above, rustypubescent on the nerves beneath, much thinner in texture than the type; petiole scarcely ¼ in. Peduncles up to 8 in.

36. **D. floccosa**, Thwaites Enum. 207; leaves obovate crenulate tomentose above pale fulvous-floccose beneath, sepals ½ in. narrowly oblong floccose, corolla-tube ventricose.

*Ceylon*; alt. 2000 ft., Central Province, near Dolosbage, Thwaites.


*Ceylon*, alt. 5–6000 ft.; near Adam’s Peak, Walker, Thwaites.


38. **D. ovalifolia**, Wight IC. t. 1351, and Ill. t. 142, fig. 6; leaves ovate crenate white-strigose on both surfaces, peduncles 3–5-fld., corolla broadly campanulate gibbous, base saccate, capsule 1 in.

S. **Deccan Peninsula**; Courtallum, Wight; S. Tinnevelly, alt. 5000 ft., Beddome.

*Leaves* 3 by 1¾ in., obtuse, base rounded, shallowly crenate, above densely beneath chiefly on the nerves strigose; nerves 8–12 pair, parallel; petiole 1–4 in. *Peduncles* ¾ in. *Sepals* ⅔ in. *Corolla* ¾–⅔ in., blue-yellow, nearly glabrous. *Filaments* short; anthers glabrous. *Ovary* pilose; style about as long as the ovary, nearly glabrous, stigma small subcapitate. *Capsule* linear, straight or somewhat oblique at the base.


*Leaves* 3½ by 1–1¼ in., scarcely acute, base rounded, membranous; hairs brown in Wallich’s dried example, white in Beddome’s fresh ones; nerves 5–6 pair; petiole 1–2½ in. *Peduncles* 8 in., hairy; pedicels 0–⅔ in., often in distant pairs. *Sepals* ⅔–⅓ in., lanceolate-subulate, hairy. *Corolla* ⅔ in., glabrous, pale blue. *Anthers* minutely hairy. *Style* as long as the ovary, glabrous, stigma unilateral oblong. *Capsule* nearly 1 in., linear; subfollicular (Beddome), or 2-valved (DC.).

40. **D. repens**, Bedd. *IC. Pl. Ind. Or.* t. 120; creeping, leaves long-petiolied ovate-cordate serrate softly villous on both surfaces, peduncles 1–5-fld.

**Travancore** and **Tinnevelly**, alt. 1–3000 ft.; Beddome.

*Stem* slender, hairy; nodes distant, rooting, bearing one leaf and one peduncle. *Leaves* 3 by 2 in., acute; petiole 4 in. *Peduncles* 3–5 in., villous; pedicels sub-
Didymocarpus] CVI. Gesneraceæ. (C. B. Clarke.) 355

racemed in pairs, or (ex Beddome) nearly umbel-lived. Sepals \( \frac{3}{4} \) in. Corolla \( \frac{1}{2} - \frac{3}{4} \) in., tubular, curved, hairy without, blue, Ovary hairy; style as long as the ovary, glabrous, stigma oblique subpeltate. Capsule not seen.

V. DIDISSANDRA, Clarke.

Scapose perennials or suffrutescent. Stamens 4 fertile, didynamous. Otherwise as Didymocarpus.—Species 7, extending from India to Borneo.


1. D. lanuginosa, Clarke; stem hardly any, leaves elliptic or ovate, cymes and calyx glabrous or nearly so. Didymocarpus lanuginosa, Wall. Cat. 791, not of Maximov; DC. Prodr. ix. 268; Clarke Comm. & Cyrt. Beng. t. 67.—Didymocarpoid, Griff. Itin. Notes, 64, n. 987.

TEMPERATE HIMALAYA, alt. 5-8000 ft., from Simla (Edgeworth) to Bhotan (Griffith) not common; Sikkim, Lachen, J. D. H. KHASIA Mts., alt. 5000 ft.; Kolling Rock, Griffith, H. f. & T., &c.

STEM hardly any, with the base of the petioles and peduncles fulvous-shaggy. Leaves crowded, 3 by \( \frac{1}{2} \) in., obtuse, base attenuated, crenate, above deciduously his- sute, beneath when young fulvous-woolly; petiole \( \frac{1}{2} - 1 \) in., or from the attenuation of the leaf-base 0. Scapes 2-6 in., glabrate upwards; cymes young woolly, ultimately glabrate, compound; pedicels \( \frac{1}{2} - \frac{3}{4} \) in. Sepals \( \frac{1}{3} \) in., lanceolate. Corolla \( \frac{1}{2} \) in., long, hairy, pale blue or purple. Anthers peltate, cohering in pairs. Ovary glabrous; style minutely plicate. Capsule \( \frac{1}{2} \) in., often curved.

2. D. ruja, King in Hook. In. Pl. t. 1437; stem and leaves of D. lanu- ginosa, but cymes densely woolly with brown hair.

EASTERN TIBET; Chumbi (E. of Sikkim), alt. 12,000 ft. (Herb. King).

Possibly only a state of D. lanuginosa, but the scape is stouter, pedicels shorter, inflorescence densely woolly, the flowers smaller, calyx shorter and its lobes more obtuse, the only capsule seen not \( \frac{3}{4} \) in. long.

Sect. 2. CYRTANDROIDES. Suffrutescent. Peduncles short, axillary, clustered, 1-3-fld. Nerves of leaf pinnate.


PENANG; Wall. MALACCA; Griffith (Kew Distrib. n. 3856), Maingoy (Kew Distrib. n. 1222).—DISTRICT. SUMATRA.

Branches densely fulvous-villous upwards. Leaves opposite, 9 by \( \frac{3}{4} \) in., acumin- ate, minutely crenate, mature glabrate above; petiole 2 in. Peduncles \( \frac{1}{2} \) in., silky; bracts \( \frac{3}{4} \) in., narrow, silky; pedicels often 2, \( \frac{1}{2} \) in., soon glabrous. Sepals \( \frac{1}{3} \) in., nar- rowly lanceolate, silky. Corolla \( \frac{1}{2} \) in. long, funnule-shaped, white, villous, soon nearly glabrous. Anthers small, round, cohering in pairs, when young of 2 dicarinate ellipsoid cells, cells early confluent. Ovary glabrous; style minutely hairy. Capsule \( \frac{1}{4} \) in.

VI. CHIRITA, Ham.

Herbs or low undershrubs. Leaves opposite, often unequal, sometimes whorled or alternate, elliptic or ovate, rarely lanceolate. Cymes axillary, many- or few-fld., or peduncles 1-fld.; bracts 2, shorter than the flowers, deciduous. Calyx 5-fld or sub-5-partite, not very small (except in C. hamosa);
lopes acute. Corolla tubular-funnel-shaped or ventricose, middle-sized or large (except in C. hamosa); tube not very narrow below nor gibbous; limb 2-lipped, lobes 5, rounded. Stamens 2 perfect, 2–3 barren, filaments flattened, geniculate; anthers usually applied to the stigma; cells 2, divaricate, ovate, often confluent. Ovary linear; style short or long, stigma (when young) oblique petalate, notched on the lower margin; in age upper margin usually produced oblong bifid; placentae inflexed to the axis, then revolute bearing the ovules. Capsule elongate linear (smaller, slender in C. hamosa), sessile, loculicidally 2-valved to the base, valves 2-partite in the next season. Seeds ellipsoidal, smooth, sometimes with a minute boss or process at the end; tests often striated, reticulate.—Species 25, mainly Indian; a few W. Malayan and Chinese.

The foregoing character does not include the Malayan and Chinese species. The genus, even thus narrowly defined, is with difficulty distinguished from Didymocarpus. The stigma is said to be subentire in Didymocarpus, bifid in Chirita, which is roughly true; in Chirita it varies greatly with age.

Sect. I. **Euchirita.** Calyx large or middle-sized. Corolla $\frac{1}{2}$ in. or more, funnel-shaped, tubular towards the base, mouth not very oblique nor unequally lipped. Capsule more than 2 in. long, not stalked.

* Species of Ceylon. 


Ceylon; Hantam, alt. 4000 ft., Thwaites, Wight, &c.

Stem 2–3 ft., branched, villous upwards. Leaves $\frac{1}{4}$ or 3 in a whorl, 5 by 2 in., minutely denticate, densely softly hairy, and shining brown in the dried specimens; petiole $\frac{1}{4}$ in. Peduncles $\frac{1}{2}$–2 in.; bracts 2, small, deciduous near their middle. Sepals $\frac{3}{4}$ in. and upwards, narrowly lanceolate. Corolla widely ventricose, mouth 2 in. across, minutely hairy without, purple, yellow-striped within. Filaments (fertile and sterile) villous at the top. Ovary glabrous; stigma obliquely 1-sided, shortly bifid. Capsule 4 in. and upwards.


Ceylon; Walker.

Stem 2 ft., branched, villous upwards. Leaves 5 by 2 in., as of C. Moonii, but less densely hairy; petiole $\frac{4}{3}$–1 in. Peduncles $\frac{1}{2}$–2 in., once or twice dichotomous, rarely 1-fld.; bracts small. Calyx $\frac{1}{8}$–$\frac{3}{4}$ in. Capsule $\frac{4}{5}$–5 in.—Closely allied to C. Moonii, which differs in the 1-fld. peduncles and larger corolla.

Var. parviflora; calyx $\frac{1}{4}$–$\frac{3}{4}$ in., corolla 1 in., capsule 2 in. Var. $\beta$, Thwaites Enum. 207.—Ceylon; Thwaites.


Ceylon; up to 5000 ft. alt. common; Gardner, &c.

Stem 18 in., branched, strigose upwards. Leaves 3 by 2 in. ovate, or $\frac{4}{5}$ by 2 in. elliptic, minutely denticate, sparsely strigose; nerves 9 pair, hirsute beneath;

Var. augusta; leaves narrowly lanceolate acute at both ends, nerves 6 pair, flowers somewhat smaller and paler. Var. β, Thwaites Enum. 208.—Ceylon; between Galie and Ratnapura, Thwaites.

**Species of the Himalaya and Khasia Mts.**


Temperate. W. Himalaya, alt. 6000 ft., from Gurwhal to Nepal; Wallich, &c.

Stem 3–6 in., simple, at flower-time leafless at the base, 2-leaved at the summit; one or two small bract-like leaves rarely added in the middle of the stem. Leaves equal or unequal, or one suppressed, 3 in. diam., base cordate or in the smaller attenuate, serrate. Peduncles 1–2, rarely more, rising between the two leaves, usually 2-fld., about 1 in.; bracts 1/2 in., oblong, villous; pedicels 1/2 in. Calyx 1/2 in. and upwards, thin, subcoriaceous; lobes 1/2 in., broadly-lanceolate. Corolla nearly 2 in., almost straight, ventricose above the calyx, nearly glabrous without, purple-blue, below yellowish, Filaments hairy at the top. Ovary and style pubescent; stigma peltate oblique, notched on the lower side. Capsule not seen.


Subtropical Himalaya, alt. 1500–6000 ft., from Simla to Mishmi; plentiful in Sikkim and Bhutan. *Khasia Mts., alt. 1–4000 ft., common.*

Stem (in well-developed examples) 20 in., erect, branched; small examples with few or 2 leaves not rare. Leaves opposite, often unequal, 5/8 by 2 in., closely serrate, mature hisrous above with white hairs, pubescent beneath; petiole 3/4 in. Peduncles 2 in., 5–1-fld.; bracts 1/2 in., ovate or oblong; pedicels 1/2 in. Calyx 1/2 in. and upwards; lobes 1/2 in., narrowly lanceolate. Corolla 1 1/2 in., tubular-funnel-shaped, pubescent without, 3 in. diam., purple-blue, yellowish below, sometimes pale-blue. Stamens glabrous. Ovary and style pubescent stigma unilateral, bifid. Capsule 4 in. and upwards.


Closely resembling *C. pumila*. Pedicels shorter. Calyx 3/4 in.; segments 3/4 in., narrowly lanceolate. Corolla 1 1/2–2 in., rather larger than of *C. pumila*, white, mouth purple-blue, without the yellow tinge of *C. pumila*. 
7. **Gonatostemon**, Clarke; glabrous, leaves elliptic or oblong acuminate, calyx deeply 5-fld segments elliptic-oblong mucronate. **G. glabra**, Clarke Comm. & Cyrt. Beng. t. 73, not of Miq.—Chirita n. 20, Herb. Ind. Or. H.f. & T.

**SIKKIM HIMALAYA**, alt. 5–7000 ft.; Lachen, J. D. H.; Darjeeling, Gamble.


**TEMPERATE E. HIMALAYA**; from Nepal to Bhotan, alt. 5–8000 ft., frequent.

Stem 4–18 in., pubescent. Radical leaves (usually present at flower-time much larger than the cauline) 6 by 2½ in., base cordate, crenate-serrate; petiole 4–9 in. Peduncles ½–5 in.; bracts ½ in., ovate, serrulate, subglabrous or pubescent only on the nerves beneath; pedicels ½–2 in., nearly glabrous. Calyx ½–1 in., divided to the middle or nearly to the base; segments ovate-lanceolate or lanceolate. Corolla 2 in., tubular, scarcely swollen upwards. Filaments glabrous or minutely pilose. Ovary glabrous; style minutely pubescent, stigma unilaterally densely bifid. Capsule 4 in. and upwards.


**SIKKIM HIMALAYA**; on the ridge between Sikkim and Nepal, alt. 9000 ft., J. D. H., Kurz, Dr. Treuttler, &c.


**TEMPERATE HIMALAYA**, alt. 4500–8000 ft., from Nepal to Bhotan, frequent.

Stem 8–18 in., hairy upwards. Leaves opposite, more or less unequal, 5 by 2 in., unequal at the base, serrate; petiole ½–2 in. Peduncles ½–2 in., sparingly pubescent; bracts ½ in., ovate; pedicels ½–¾ in., nearly glabrous. Calyx ½ in.; lobes ¼ in., triangular-lanceolate. Corolla nearly 2 in., narrowly funnel-shaped, sparsely hairy,
purple with yellow lines within. Ovary glabrous; style minutely pubescent, stigma unilateral deeply bifid. Capsule 4 in. and upwards.—The only species of *Chirita* in which the bracts are much less hairy than the calyx.

11. **C. Clarkii**, *Hook. f.*; almost stemless, leaves ovate or elliptic pubescent on both surfaces, calyx divided nearly to the base dusky villous, ovary dusky pubescent.—*Chirita* sp. n. 27, *Herb. Ind. Or. H. f. & T*.

**SiKKIM**; Lachen, alt. 7-8000 ft., *J. D. H.*

Radical leaves 4½ by 3 in., shortly acute, base obtuse, crenate-serrate; petiole 1½–2½ in. Peduncles 4½ in., upwards (as the whole inflorescence) with many spreading glandular brown hairs; bracts ½ in., oblong; pedicels 3–1, ½–1 in. Calyx carmine to scarlet, segments wide-lanceolate. Corolla (not expanded) of *Chirita*, glandular-villous without. Stigma subpeltate. Capsule elongate-linear.—Seems near *C. urticifolia*, differing in the smaller calyx and indumentum.


Resembling generally *C. urticifolia*. Peduncles villous; bracts 1 in., ovate-oblong, herbaceous; pedicels ½–3 in., villous. Calyx ¾ in.; lobes ½ in., triangular-lanceolate. Corolla nearly as of *C. urticifolia*; ex *Griffith* "pale blue the lower lip with 3 yellow lines.—Dr. King thinks this may be only a var. of *C. urticifolia*, the numerous examples of which are however very constant in the comparative glabrousness of their bracts.


Stem 2–6 ft., sometimes frutescent, closely villous upwards. Leaves opposite, subequal, 8 by 3½ in. (sometimes larger often much smaller), closely serrulate; petiole ½–3 in. Peduncles ½–3½ in., villous, laxly dichotomous; bracts and bracteoles ¼–½ in.; pedicels ½ in. Calyx ½ in.; lobes scarcely ½ in., ovate, acute. Corolla 1½ in., tubular-ventricose, yellowish-white (or fide Roxburgh somewhat marked with red), nearly glabrous. Fertile filaments dilated, minutely pilose. Ovary and style hairy; stigma subpeltate, oblique, notched on one side, ultimately oblong-bifid. Capsule 2–3½ by ½ in. Seeds broadly ellipsoid, umbonate at each end, obscurely ribbed and minutely reticulated.


**Khasia Mts.,** alt. 1500–4000 ft.; *Griffith* (Kew Distrib. n. 3828), &c.

Rhizome short, creeping with crowded nodes, very hairy. Leaves alternate, crowded, attaining 10 by 6½ in., serrate; petiole up to 8 in. Peduncles ½–1½ in.; bracts ½ in., oblong, densely villous; pedicels ½–1½ in. Calyx ¾ in., lobes ½ in. Corolla nearly 2 in., minutely pubescent without (probably white). Capsule ¾ in., woody, erect on the rigid thickened pedicel.—Kurz's *C. speciosa* from Yunnan has very
long peduncles, short pedicels and linear calyx-segments: as regards size, *C. brevipes* is often as large as *C. speciosa*.

15. **C. primulacea**, Clarke Comm. & Cyrt. Beng. t. 82; almost stemless, softly villous, leaves long-petioled oblong incise-serrate, peduncles numerous short many-fl., calyx divided half-way down densely villous, corolla yellow-white.—Chirita sp. n. 16, *Herb. Ind. Or. H. f. & T*.

**Sikkim**, alt. 2-3000 ft.; *J. D. H., Anderson*, &c.


**Upper Assam**; Mishnee Hills, Griffith (Kew Distr. 4. 382).

*Stem* 4-10 in., simple, erect, with sometimes 1 or 2 small scale-like leaves in its middle. *Leaf* (at flowering-time) 1 in., ovate, acute, at fruit-time 7 in. diam., cordate or shortly peltate, glabrous above, villous on the nerves beneath. *Peduncle* (in the axil of the leaf) scarcely 1 in.; bracts small; pedicels ½-½ in. *Calyx* ½ in. and upwards, white or purple-spotted; lobes ½-½ in., lanceolate-subulate. *Corolla* 2 in., narrowly funnel-shaped, glabrous without. *Ovary* and style glabrous. *Capsule* 2½ in. *Seeds* of the genus.—From the extraordinary manner in which the solitary leaf continues growing to the period of ripening the capsule, it may be suspected that it is a persistent cotyledon.

17. **C. caliginosa**, Clarke; stem long leafy, leaves falcate-elliptic acuminate at both ends pubescent, cymes axillary few-fl. lax, sepals lanceolate much acuminate.

Peninsula of *Malacca*; Klang in Selangore, Beccari.

*Stem* 1 foot, pubescent. *Leaves* opposite, 6 by 2½ in., minutely toothed; petiole 1½ in. *Peduncles* 0-½ in.; bracts and bracteoles 0, or very early caducous; pedicels 1-2 in., patently pubescent. *Sepals* ½-1 in., dusky-pubescent. *Corolla* ½ in.; tube upwards villous with brown hairs, limb within (in the dry specimen) lurid-blue. *Anthers* very large, subquadrate, with long hair. *Ovary* fuscous-pubescent; stigma unilaterial, shortly bifid. *Capsule* 3 in., curved, dusky-bairy.—The whole plant is dusky; the habit and inflorescence ally it to the next section, *Microchirita*; but the calyx is large.

Sect. 2. **Microchirita**. *Calyx* about ½ in., divided nearly to the base into narrow segments. *Corolla* ½-⅓ in., tube narrow below much curved above, mouth very oblique, lower lip larger. *Capsule* slender.


*Stem* ½-20 in., sparingly pilose. *Leaves* opposite, subequal, 6-1 by 4-½ in., base rounded, obscurely creuate, thin, weakly hairy on both surfaces; petiole ¼-⅓ in.
Peduncles (their free portion) 0-3 in., hispidulose. Sepals ⅜ in., sublinear, patently hairy. Corolla scarcely ⅜ in.; tube slender, nearly white, mouth pale blue or somewhat rose. Stigma distinctly bifid. Capsule 1-3 in.

VAR. unifolia: stem ¼-1 in., with one leaf at the top and 5-1 flowers. Chirita sp. n. 31, Herb. Ind. Or. H. f. & T.—Khasia Mts., alt. 500 ft., on the river bank near Terya Ghaut, J. D. H. Mouilmein; Thongyne, Lobb.—Extremely unlike the ordinary form of C. hamosa, but except in its minute size no distinction can be found. The single leaf is perhaps a persistent cotyledon, carried up as in some other species of the Order; and the plant may be specifically distinct.

VII. PLATYSTEMMA, Wall.

A small, slender herb. Leaf 1 (a persistent cotyledon?) sessile, orbicular-cordate, membranous, hairy. Peduncle from the leaf-axil, slender, few-fld.; bracts very small, sublinear. Calyx wide-campanulate, deeply 5-fld. Corolla violet, subrotate, deeply 2-lipped; lips wide-spreading, upper shortly bifid, lower deeply 3-lobed; lobes all wide-oblung, obtuse. Stamens 4 perfect, filaments short, curved; anthers cohering by their tips, 2-celled; cells round, divaricate, early confluent, dehiscing by a single short slit. Ovary ovoid; disc annular; style linear, much longer than the ovary, stigma small; placenta deepy intruded, then bifid, branches recurved, bearing ovules on their margins on both faces. Capsule narrowly oblong, nearly as in Didymocarpus.

P. violeoides, Wall. Cat. 4410, and Pl. As. Bar. ii. 42, t. 151; Royle Ill. 294, t. 71, fig. 1; DC. Prodr. ix. 279; Wight Ill. t. 159 bis, fig. 10. P. majus, Wall. Cat. 4411, and Pl. As. Bar. ii. 42, in obs.


VIII. CHAMPIONIA, Gardn.

A low, perennial, erect, hairy herb. Leaves opposite, subequal, pectiolate. Peduncles slender; bracts small; cymes lax; flowers white. Sepals 5, small, narrow. Corolla-tube short; limb spreading, subequally 4-lobed. Stamens 4 perfect, filaments short, thick; anther-cells ellipsoid, nearly parallel, slits confluent at their apex. Ovary sessile, oblong; disc 0; style linear, stigma subcapitate; placenta of two plane plates bearing ovules on both faces. Capsule oblong, acute, loculicidally 2-valved, valves soon 2-partite; placenta in fruit hardly altered. Seeds minute, ellipsoid, subacute at each end, smooth, minutely striate and reticulated.


Ceylon, alt. 3000 ft., frequent.

IX. **BOICA,** Clarke.

Undershubs. Leaves alternate, petioled. Cymes much branched, axillary, lax-fld.; bracts small. Calyx small, 5-fld or -partite. Corolla small, deeply 5-fld, glabrous, widely gibbous at the base, obscurely 2-lipped; lobes subequale, obtuse, purple or white. Stamens 4, attached near the base of the corolla-tube, subequale, glabrous, filaments short; anthers 2-celled, not cohering in pairs; cells ellipsoid, subparallel, slits curved coalescent at the top. Ovary sessile, narrowly oblong; style as long as the ovary, glabrous, stigma punctiform; disc 0; placentae deeply inflexed, nearly meeting, then recurved bearing ovules. Capsule shortly linear, straight, beaked by the erect style, loculicidal, and soon septicidal; placentae recurved, the seeds. Seeds very small, ellipsoid, smooth.—Species 5, in Assam, Bhotan and N. Burma.

1. **B. filiformis,** Clarke Comm. & Cyrt. Beng. t. 87; innovations nearly glabrous, leaves lanceolate acuminate at both ends mature glabrous, peduncles solitary long, cyme with capillary branches and pedicels nearly glabrous.—Rhynchotechum sp.? *Wall. Cat.* 9079, in part. Chelone filiformis, *Ham. ms.*


 Assam; Goalpara, *Hamilton.*

Leaves by 2½ in., denticulate, mature glabrous above. Peduncles 1–2 in., clustered, or peduncle may be considered hardly any branched from the base; cyme branches divaricate and recurved.—Otherwise nearly as *B. filiformis.*

3. **B. fulva,** Clarke Comm. & Cyrt. Beng. t. 85; innovations fulvous-wolly, leaves lanceolate acuminate at both ends mature fulvous-villos beneath, peduncles solitary elongate, bracts fulvous-tomentose.—Cyrtandraeaceae n. 328, *Griff. Ill. Notes,* p. 120.

 Assam; Masters. Bhotan and Mishmee, alt. 4200 ft., near Chulleree, *Griffith* (Kew Distrib. n. 3844).

Leaves 7 by 2 in., obscurely denticulate, mature glabrous above or fulvous-pubescent along the nerves. Peduncles 4–6 in., fulvous floccose; bracts ½–1½ in., persistent; pedicels floccose. Flowers and capsules nearly as of *B. filiformis.*

4. **B. hirsuta,** Clarke; very shaggy, leaves wide-lanceolate acuminate at both ends densely fulvous-shaggy above, peduncles solitary long, cymes fulvous-hirsute.

Upper Assam?; on the Soondra bank.

Branches thick, shaggy with yellow hair ½–½ in. long, dense with leaves. Leaves 7 by 2½ in., obscurely denticulate, shaggy above with hairs ½ in. long from tubercular bases, villous beneath; petiole ½ in. Peduncles 2–4 in.; bracts ½ in., elliptic or oblong; cymes as though compound umbels. Sepals ½ in., linear, shaggy. Corolla not seen. Capsule ½ in., minutely hairy, 4-valved.
X. **TETRAPHYLLUM**, Griff.

A tawny-villous undershrub; stem elongate, leafless or sparsely scaly below, with 4 leaves whorled at the apex. *Leaves* nearly sessile, ovate, unequal-sided. *Cymes* dense, subcapitate, nearly sessile; bracts elliptic. *Calyx* somewhat large, obscurely 2-lipped, sub-5-partite. *Corolla* widely funnel-shaped, silky, blue; lobes 5, subequal, ovate. *Stamens* 2 perfect, filaments short; anthers 2-celled, apex submucronate; cells ellipsoid, nearly parallel, slits longitudinal. *Ovary* ellipsoid, acute; style linear, stigma small, obscurely 2-lobed; placenta deeply intruded, 2-partite, revolute, bearing ovules on both sides. *Capsule* narrowly lanceolate, ultimately 4-valved to the base, leaving two ribs united to the style and 4 papery enrolled placenta. *Seeds* ellipsoid, obtuse at both ends; testa laxly reticulate, appearing rough or scaly.


UPPER ASSAM; Griffinth. MISHMEN; Namroop, Griffinth (Kew Distr. n. 3830). CACHAR (Keenaam). CHITTAGONG HILLS; Clarke.

Stem 4–12 in., duskily woolly, below without leaves or with 1 or 2 pairs of scales 1 in. long; innovations fulvous silky-woolly. *Leaves* 2 pairs at the summit of the stem, 6 by 4 in., acute, base unequal, mature glabrate above, beneath duskily villous at least on the nerves. *Cymes* 10–30-fld. *Sepals* $\frac{1}{2}$ in., lanceolate, fulvous-silky. *Corolla* $\frac{2}{3}$ in.; lobes $\frac{1}{2}$ in. *Stamens* glabrous. *Ovary* (upwards with the style) silky. *Capsule* $\frac{1}{2}$–$\frac{3}{4}$ by $\frac{1}{10}$ in., acute.

XI. **TRISEPALUM**, Clarke.

Undershubs; stems short, villous or tomentose. *Leaves* opposite, alternate or crowded, narrowly lanceolate, obscurely toothed. *Peduncles* axillary, elongate, laxly 1–5-fld.; bracts long. *Calyx* 2-lipped; sepals 3, 2 narrow, the third broader shortly 3-lobed. *Corolla* broadly obliquely campanulate, obscurely 2-lipped; lobes 5, ovate, obtuse. *Stamens* 2 perfect, filaments short; anthers large, cordate-ovate, adhering by their faces, 2-celled; slits short, soon confluent. *Ovary* oblong; stigma simple, one-sided; placenta deeply intruded, bifid, shortly recurved. *Capsule* oblong, shorter than the calyx, loculicidally 2-valved, soon 4-valved, valves not twisted; placenta shortly recurved; not membranous. *Seeds* minute.—Species 2, in Lower Burma.


**TENASSRIM**; Moumein, Lobb.

Stem 2–4 in., densely leafy, upwards (with the innovations) rufous-woolly. *Leaves* 5 by $\frac{1}{2}$ in., base much attenuated, crenulate, above white-violous, beneath rufous-woolly on the nerves; petiole $\frac{1}{2}$ in. or hardly any. *Peduncles* 1–3 in., floculose with rufous deciduous wool; bracts $\frac{1}{2}$ in., ovate, somewhat thick, villous or woolly; pedicels hardly longer than the bracts. *Calyx* $\frac{1}{2}$ in.; one lip 2-partite, the other 3-fld.; segments rounded, green at the apex, recurved. *Corolla* $\frac{1}{2}$ in., widely funnel-shaped, glabrous; lobes rounded. *Stamens* of the genus. *Style* linear, scabrous from numerous subsessile glands, stigma very shortly 2-lobed. *Capsule-valves* $\frac{1}{2}$ in., oblong, acute, rigid, bearing the placenta in the middle.
2. **T. acutum**, Clarke; stem very short, leaves alternate narrowly lanceolate hairy, cymes laxly 1-3-fld., calyx-segments elongate-lanceolate.

**Tenaesserim**; at Moulmein, Parish.  
**Stem** scarcely 2 in., densely leafy, upwards (with the innovations) rusty woolly. **Leaves** 5 by 1 in., acuminated at both ends, minutely crenate-sinuate, mature puberulous on both surfaces; petiole 2 in. **Peduncles** 2-4 in., puberulous; bracts \( \frac{1}{3} \) in., narrowly lanceolate; pedicels \( \frac{1}{4}-1 \) in. **Calyx** \( \frac{1}{4} \) in., pubescent, one lip 2-partite the other 3-lobed half-way down. **Corolla** \( \frac{3}{4} \) in., wide funnel-shaped, glabrous, purple-rose; lobes rounded, 2 upper more blue. **Stamens** of the genus. **Style** linear, pubescent, stigma produced on one side. **Capsule** (immature) oblong, hairy.

XII. **Phyllobea**, Benth. partly.

An erect herb. **Leaves** opposite. **Cymes** peduncled, bracts conspicuously; flowers rose. **Calyx** large, 2-lipped; one lip 2-partite nearly to the base, the other 3-lobed half-way down. **Corolla** wide-campanulate, sub-bilabiata; lobes 5, ovate, nearly equal. **Stamens** 2 perfect, filaments very short; anthers large, round, connivent, 2-celled; cells ovate, divaricate, soon appearing 1-celled, dehiscing by a single short slit; staminoles 2-3 or 0. **Ovary** oblong, acute; disc unilateral; style longer than the ovary, stigma produced on one side; placenta deeply intruded, bifid, branches much recurved bearing ovules on both surfaces. **Capsule** narrow-lanceolate, longer than the calyx, follicular, afterwards 2-valved; valves twisted; placenta papyrace, revolute. **Seeds** ellipsoid, rugose-reticulate.

**P. amplexicaulis**, Benth. in Gen. Pl. ii. 1020; glabrous, stem long, leaves round, petioles winged amplexicaul, cyme-branches densely many-fld., bracts broad almost imbricate. **Bœa amplexicaulis**, Parish ms.; Clarke Comm. & Cyrt. Beng. t. 84.

**Tenaesserim**; at Moulmein, Parish. **Pegu**; Kambila-toung, alt. 3200 ft., Kurz.  
**Branches** 6-12 in. **Leaves** 6-10 in. diam., shortly acuminate, crenate-sinuate; petiole \( \frac{1}{4} \) by \( \frac{1}{4} \) in. **Peduncles** 4-6 in., stout, axillary, solitary, often opposite; bracts \( \frac{1}{8} \) in., round, connate at the base; cymes dichotomous; branches 2 in., 5-25-fld.; pedicels 0-1 in., bracteoles similar to the bracts but smaller. **Calyx** \( \frac{1}{4} \) in.; lobes hermaphroditic, spatulate-oblong, obtuse. **Corolla** \( \frac{1}{4} \) in. long, \( \frac{3}{4} \) in. diam., white suffused with rose. **Capsule** \( \frac{4}{8}-\frac{1}{4} \) in., conical upwards, valves twisted into 2 or 3 complete spires.

XIII. **Bœa**, Commers.

Perennial herbs; canescent or scapose. **Leaves** opposite or crowded. **Peduncles** axillary, usually long; cymes lax or few-fld.; bracts small. **Sepals** 3, small, narrow. **Corolla** small or middle-sized, widely campanulate, somewhat unequal at the base, glabrous, 2-lipped; lobes 5, ovate, obtuse. **Stamens** 2 perfect, 2-3 rudimentary; filaments short, linear (in the Indian species); anthers 2-celled, often cohering at the apex; cells ovate, divergent at the base, slit usually confluent at the apex. **Ovary** sessile, linear; disc 0; style as long as the ovary, glabrous upwards, stigma small obscurely 2-lobed; placenta inflexed nearly to the axis, then recurved bearing the ovules. **Capsule** linear, loculicidal; valves 2, twisted; placenta at first attached to the valves, twisted with them, afterwards separating from the valves, which often again split each into two. **Seeds** minute, ellipsoid, smooth, testa minutely reticulate.—Species 12, Indian, N. Chinese, N. Australian and the New Hebridean.
The generic name was by Commerson spelt originally *Beaua* in ms., and afterwards simplified to *Bea* also in ms. It was first published in Lamk. Dict. (1789) t. 401, and spelt *Bela*; afterwards in Juss. Gen. (1789) 121 as *Bea*. *Bea* was adopted by Brown, DC., and by Bentham in Gen. Plant., but *Bea* has priority of publication.

1. **B. prolixa**, Clarke; stem short, leaves lanceolate or ovate-lanceolate coriaceous tomentose beneath, peduncle very long, cymes many-fl., capsule ⅓ in.

Pedou.; at Thongyun, Kurz.


*Stem* 1-5 in.; upwards cinnamomeous-tomentose. *Leaves* crowded, 6 by 2½ in., suboblong, base unequally rhomboid, deciduously floccose above, ultimately nearly glabrous beneath except on the much-elevated nerves; petiole ⅔-1 in. *Peduncles* several, 4-7 in., floccose-tomentose; *cyms* 2-3 in. diam., up to 50-fl., tomentose. *Sepals* ½ in., sublinear. *Corolla* ⅔ in., puberulous without. *Ovary* densely covered with sessile glands; *style* glabrous. *Capsule* glabular-puberulous.—In the Khasian plant the nerves of the leaves beneath are thick, tomentose; in the Burmese plant they are beneath slenderer, pubescent; and the branches of the *cyms* are slenderer.

3. **B. herbacea**, Clarke; leaves nearly sessile distant opposite elliptic acuminate crenate-serrate sparsely pilose on both surfaces, base attenuate, cymes contracted many-fl., capsule ⅛ in.—*Bea* n. 3, Herb. Ind. Or. H. f. & T.

*Tennasserim*; at Moulmein, *Parish*.

*Stem* 4-8 in., slender, softly hairy. *Leaves* 8 by 3 in., or hardly half these dimensions, often amplexicaul. *Peduncles* 1-4, 2½ in., softly hairy; *cyms* 1½ in. diam., green, viscidly hairy. *Sepals* ⅔ in., narrowly oblong, viscidly hairy. *Corolla* ⅛ in., glabrous. *Ovary* glistening with yellow glands; *style* glabrous upwards. *Capsule* glabular-viscous, closely reflexed in young fruit.—Excessively variable in the size of the leaves.

XIV. **ORNITHOBIA**, Clarke.

A caulilsecent herb. *Leaves* opposite, distant, petioled. *Peduncles* axillary, solitary, short; cymes panicled. *Sepals* 5, not small. *Corolla* tubular, 2-lipped; upper lip of 2 reflexed lobes; lower 3-lobed, two lateral lobes narrow lanceolate patent, middle lobe smaller recurved, with a dense tuft of blue hairs at its base. *Stamens* 2 perfect, 3 rudimentary, filaments short; anthers 2-celled, united at the apex by a short ligule; cells sub-parallel, broad, scarcely confluent at the apex. *Ovary* sessile, ellipsoid; disc 0; style as long as the ovary, stigma minute sub-2-lobed; placenta deeply infolded, nearly meeting, then recurved bearing the ovules. *Capsule* narrowly lanceolate, 2-valved, valves twisted before dehiscence; placenta
recurred enclosing the seeds. Seeds minute, ellipsoid, smooth; testa striate, reticulate.

**O. Parishii, Clarke.**

*Tenassem*; at Moulinne, *Parish.*

*Stem* 7 in., slender, pubescent. *Leaves* 6 by 2 ½ in., elliptic, acute, base unequal, crenate-serrate, thinly softly hairy on both surfaces; petiole 2–4 in. *Cymes* hardly longer than the petiole, solitary from nearly every axil; bracts ½ in., linear; pedicels ⅓–⅔ in., subascemos. *Sepals* ⅔ in., oblong, green, pubescent, persistent, subreflexed in fruit. *Corolla* nearly ⅓ in., personate, pale blue, glabrous except the palate. *Capsule* ¾ by ¾ in., hairy, green, scarcely acute.—A complete drawing with full analysis of this plant was sent to Sir W. Hooker by Mr. Parish; it resembles a *Bea* but for the corolla and the broader submembranous capsule, which resembles *Phylllobae.*

**XV. KLUGIA, Schlecht.**

Herbs, rooting at the base, then erect, somewhat succulent. *Leaves* alternate (or subopposite on one of the pair reduced to an auricle), acuminate, unequal-sided, cordately auricled on one side of the unequal base, subentire or sinuate, many-nerved. *Racemes* terminal or leaf opposed, many-fl.; bracts 0; bracteoles at the base of the pedicels small, linear; flowers small, short-pedicelled, pendulous. *Calyx* laxly campanulate, 5-angled or-winged, posterior wing often larger produced at the base; lobes 5, shorter or longer than the tube. *Corolla-tube* cylindric; limb 2-lipped; upper lip very small, lower broad, rounded or shortly 3-lobed, blue with 2 yellow marks. * Stamina* 4 perfect, included; anthers approximated by pairs, 2-celled; cells short, divaricate, early confluent. *Ovary* ovoid, glabrous; disc short, cylindrical; style longer than the ovary, glabrous, stigma obliquely dilated obscurely 2-lobed; placenta deeply inflexed, each divided into 2 thick plates, bearing ovules on all sides. *Capsule* included in the calyx, broadly ellipsoid, loculicidal, 2-valved. *Seeds* ellipsoid, truncate at both ends, minutely striate, more or less reticulated.—Species 3 in India, 1 in Mexico.


S. *Deccan Peninsula and Ceylon,* alt. 2–5000 ft., frequent, *Wight, Thwaites,* &c.


**CEYLON** frequent near Kandy, Gardn., Thwaites, &c.

Doubtfully distinct from K. Notoniana (ex Thwaites Enum. 208); but seems well separable by the long and remarkably acuminate calyx-lobes; the pubescence also is often stellate.

3. **K. ampliata**; leaves glabrate, calyx subequally 5-winged lobes as long as the tube lanceolate, bracteoles persistent conspicuous.

UPPER ASSAM; Mishmee Hills, near Yen, Griffith (Kew Distrib. n. 3846).

*Stem* at least a foot. *Leaves* 6 by 3 in.; petiole ½–1½ in. *Peduncles* ½ in.; racemes 3 in., scarcely puberulous; bracteoles ½ in. and upwards; pedicels 0–½ in. *Calyx* (in fruit) ½ in., broadly cylindric. *Capsule* and *seeds* nearly as of K. Notoniana.—Corolla not seen: the species resembles K. Notoniana, but is larger in all its parts.

**XVI. RHYNCHOGLOSSUM, Blume.**

Herbs, minutely scabrid-pubescent or nearly glabrous. *Leaves* alternate, elliptic, acuminate, unequal-sided, cordate on one side of the unequal base, subentire or sinuate. *Racemes* long, many-fld.; *bracts* 0; *bracteoles* minute. *Calyx* campanulate, 5-lobed half-way down. *Corolla-tube* cylindric, contracted at the mouth; limb 2-lipped; upper lip short bifid, lower lip longer, 3-lobed. *Stamens* 2 perfect, included; *anthers* connivent, 2-celled; *cells* ellipsoid, subparallel, slits ultimately subconfluent at the apex. *Ovary* ovoid; *style* linear, stigma minutely 2-lobed; placenta deeply intruded, then bifid into 2 thick plates bearing ovules on all sides. *Capsule* included, ellipsoid, membranous, loculicidally 2-valved. *Seeds* narrowly ellipsoid, smooth; *testa* minutely reticulated.—Species 2, extending from India to the Philippines.


**TENASSEIRIM**; at Moulmein, Wallich, Parish, &c. MALACCA; Zippel.—Distrib. Throughout the Malayean Archipelago.


**VAR. parviflora**; lower lip of corolla narrower hardly twice as long as the upper. R. obliquum, Wight Ill. t. 159 bis, fig. 7; Clarke Comm. & Cyrt. Beng. t. 88. R. zeylanicum, Bot. Mag. t. 1498. Wulfenia obliqua, Wall. Cat. 407, and Tent. Fl. Nep. 45, t. 35. Loxotis obliqua, Benth. Schroph. Ind. 57.—Rheed Hort. Mal. ix. t. 80.—Throughout India; alt. 0-5000 ft., in and near the hills, very common; from Kumaon to Bhutan; in Chota Nagpore and Central India, and in the W. Deccan Peninsula, from Bombay to Ceylon.

**XVII. JERDONIA, Wight.**

A perennial, stemless herb. *Leaves* elliptic, reticulate; petiole long.
Scapes slender, few-fl.; bracts small. Sepals 5, lanceolate. Corolla pale lilac with red lines; tube elongate, swollen upwards; limb oblique, 2-lipped; lobes 5, ovate, obtuse, nearly equal. Stamens 4 perfect; filaments short, dilated upwards, 2 spurred; anthers connivent, cohering by their apices, 2-celled; cells ellipsoid, divergent at base, early divaricate and confluent. Ovary ovoid; disc annular; style linear, stigma small scarcely 2-lobed; placenta 2-partite into 2 flat plates bearing ovules on both faces. Capsule broadly ovoid, acute, loculicidally 2-valved; placenta scarcely altered in fruit. Seeds funicled, ellipsoid, subumbonate at the apex, smooth, testa striate coarsely reticulate.

J. indica, Wight. In. t. 1352, and Ill. t. 159 bis, fig. 2; Bot. Mag. t. 5814.

S. Deccan Peninsula; Nilgerry and Anamally Hills, and Bolimputty near Coimbatore, Wight.

Stem 2 in., thick, creeping, upwards (with the innovations) rufous-hirsute or woolly. Leaves alternate, dense, 2½ by 2 in., obtuse at both ends, entire, rufous-ciliate on the margin, mature glabrate above, rusty puberulous on the nerves beneath; petiole 2–4 in. Scapes 2–4 in., rufous-pilose; bracts ½ in., sublinear; pedicels ½–¾ in., in fruit somewhat thickened upwards. Sepals ½ in. rusty puberulous. Corolla ½ in.; lobes ½ in. diam. Filaments sparsely pilose. Ovary and style glabrous. Capsule ¼ in. long and broad.

XVIII. LEPTOBGEA, Benth.

Shrubs. Leaves opposite, often crowded. Peduncles filiform, lax, few-fl.; bracts small, linear; pedicels capillary. Calyx small, 5-fl. Corolla small, campanulate, slightly gibbous at the base, white; limb obscurely 2-lipped; lobes 5, subequal, round. Stamens 4 perfect, included; anther-cells ellipsoid, divergent at the base, ultimately confluent at the apex. Ovary sessile, ellipsoid; disc 0; style linear, stigma small subcapitate; placenta deeply intruded, of 2 plates, bearing ovules on both faces. Capsule linear or oblong, septically 2-valved; margins of the valves inflexed bearing the placenta, valves soon or late 2-partite. Seeds minute, ellipsoid, smooth.—Species 2, in N. and E. Bengal.


A shrub, 2–6 ft. Leaves attaining 4 by 1½ in., minutely crenulate, hairy on both surfaces or at least on the nerves beneath; petiole ½–¾ in. Peduncles ½–1 in., often several fascicled on shortened lateral branches, 1–5-fl., pubescent; bracts ½ in., linear; pedicels ¼–½ in. Calyx ½ in., persistent; teeth linear, pubescent. Corolla ¼ in., glabrous. Ovary minutely glanular; style glabrous, about as long as the ovary. Capsule glabrous, acute, beaked by the style; valves 2, often remaining attached at the apex or on one side (in the manner of Loxocarpus), ultimately again 2-partite.

2. L. glabra; glabrous, leaves elliptic acuminate at both ends, capsule ½ in. oblong 2-valved nearly from the first 4-valved. Cheilosandra leptopus, Griff. ms.; Bentin. in Gen. Pl. ii. 1025.

Upper Assam; Mishnee Hills. Griffith (Kew Distrib. n. 3843).

A shrub, closely resembling L. pubescent, but altogether glabrous. Petioles
scarcely $\frac{1}{2}$ in. Capsule broadly oblong, subobtuse, early dehiscent from the apex into 4 obtuse valves, very nearly as in Basida.

XIX. EPITHEMA, Blume.

Small, succulent, pubescent, puberulent herbs. Leaves few or solitary, lower alternate, upper often opposite. Peduncles 1 or several, in the upper axils, free or confluent with the petiole or leaf-base; bract large, solitary, 1-sided, hooded or subspathaceous; flowers in a dense scorioid raceme; bracteoles small, narrow. Calyx campanulate; lobes 5, acute, valvate in bud. Corolla small, tubular, 2-lipped, blue or white; lobes 5, not very unequal. Stamens 2 perfect; anthers cohering, 2-celled; cells short, divaricate, early confluent. Ovary ovoid; disc 1-sided; style filiform, stigma small subcapitate; placenta stalked, peltate, bearing ovules on all sides. Capsule globose, membranous, included, circumsesset. Seeds oblong or ellipsoid, subacute at both ends, smooth; cells of the testa elongate, often spiral.—Species 5 (or 1), from India to the Philipines, with 1 at Fernando Po.


E. SUBTROPICAL HIMALAYA, alt. 1-5000 ft., from Nepal to Bhotan, common; Wallach, &c. Khasia Mts., alt. 500-4000 ft., frequent; H. f. & T., &c.

Stem $\frac{1}{4}$-14 in. Leaves $\frac{1}{2}$-8 in., ovate-cordate, sparsely laxly villous above, paler nearly glabrous beneath except on the nerves; petiole of the alternate leaf often 2-4 in., of the sub sessile leaves rarely $\frac{1}{2}$ in. Peduncles $\frac{1}{4}$-4 in., free or racemose (not fascicately) confluent with the petiole or leaf-base; bract $\frac{1}{2}$-2 in., truncate; pedicels 0-1 in.; raceme subinclusid in the bract or not; bracteoles minute, linear. Calyx $\frac{1}{4}$-1 in., hairy; lobes lanceolate or triangular with a linear point. Corolla $\frac{1}{4}$-3 in., with a ring of hairs within; lobes of the upper lip lanceolate, acute. Capsule 13 in. diam.

VAR. dentata; leaves denticulate or sometimes subacutely doubly serrate.—Pogu and Tenasserim; Attaran, Brandis; Mouleim, Parish, &c.

VAR. hispida; leaves serrulate almost hispid above, seeds broadly oblong. E. ceylanicum, Wight Ill. t. 159 bis, fig. 3, and To. t. 1854; Dals. & Gibs. Bom. Fl. 185.—S. Deccan Peninsula; Courtallum, Wight; Nilgherries, Thomson; Concan, Dalsell, &c.

VAR. zeylanica; calyx larger, seeds twice as heavy as those of E. carnosum type. E. zeylanica, Gard. in Calc. Journ. Nat. Hist. vi. 492. E. carnosum, Thouwais Eumm. 208.—Ceylon; in the Central Province up to 4000 ft., common; Gardner, &c.

VAR. pusilla; small, nearly glabrous, calyx and ovary nearly glabrous, seeds spirally marked by the long cells of the testa.—Bombay?; Stocks.

XX. MONOPHYLLEA, Br.

Succulent herbs; stem simple, having one leaf and several peduncles at the apex. Leaf large, sessile, cordate-ovate, entire. Racemes lax or dense, simple or divided; bract 0; bracteoles minute. Sepals small, round-ovate, imbricate in bud. Corolla small; tube cylindric or short; limb 2-lipped, lobes 5. Stamens 4, perfect, filaments short; anthers adherent. Disc annular. Ovary ovoid, glabrous; style short, linear, stigma sub-whorl.

b
capitate; placenta deeply inflexed, then recurved bearing the ovules. Capsule membranous, included, irregularly breaking up; placenta left in the centre. Seeds ellipsoid, smooth, striated, reticulated.—Species 5, Malayan.


**MALAYAN PENINSULA**: Klang in Selangore, Beccari.—**DISTRICT**: Java, Sumatra. Stem 4 in. Leaf 6–8 in. diam., membranous. Peduncles 2–5, 1–4 in., nearly glabrous; raceme simple or divided, ¼–4 in.; pedicels ¼–1½ in., lower often distant, paired or fascicled. Sepals ¼ in., glabrous, slightly enlarged in fruit. Corolla ½ in. Anthers ovate, 2-celled; cells soon confluent at the apex; filaments scabrid-glandular at the apex, not toothed. Style subpersistent, exserted from the calyx in young fruit.

**XXI. CYRTANDROMÈA, Zoll.**

Undershrubs, thinly pubescent. Leaves opposite, subequal or (in non-Indian species) sometimes unequal, elliptic or oblong, acuminate at both ends, serrate. Racemes axillary, small, 1- or few-fl., or elongate many-fl.; pedicels 1-bracteate at base, 2-bracteolate near the middle; bracts and bracteoles small, linear. Calyx tubular, 5-ribbed, 5-toothed; in fruit enlarged, membranous, subtruncate. Corolla large, white, sometimes with yellow lines in the throat within, glabrous; tube nearly straight; lobes 5, subequal, round, patent. Stamens 4, perfect, included, filaments linear; anther-cells 2, oblong, divergent at base. Disc obscure. Ovary 1-celled (2-celled near the base); placenta nearly meeting in its axis, not there bearing ovules, then recurved ovuliferous; style elongate, stigma of two semicircular plates. Capsule included in the inflated calyx, ellipsoid, papery, irregularly breaking up or loculicidal; placenta early free forming a 4-pointed column covered by seeds on all sides. Seeds subglobose, tests strongly reticulated by subquadrate cells.—Species 8, Malayan.


**NICOBAR**: Kurz.—**DISTRICT**: Java.

A nearly glabrous undershrub, 3–6 ft. high; stem little-divided, leafy at the top. Leaves 6 in., serrate nearly from the base; nerves 17–20 pair; petiole hardly any by reason of the much decurrent leaf-base. Racemes abbreviated, few-fl., or attaining 3½ in., 20-fl., pendulous; pedicels 3/4 in.; bracteoles ½ in., linear, glabrous. Calyx 1½ in., corolloid, white or tinged orange; in fruit ¼–1 in., reticulate. Corolla 1½ in. Capsule ½ by 1 in., ellipsoid.—Zollinger’s specimen agrees with Kurz’s Nicobar plant; but his description perhaps includes *C. acuminate* as well as *C. decurrens*.


**PENANG**: Wallich, Porter. **SINGAPORE**: Maingay, Lobb.—**DISTRICT**: Sumatra.

An undershrub, 3 ft. high. Leaves 4–6 in., serrate nearly from the base, mature sparsely pubescent; nerves 10 pair; petiole ½ in. Peduncles pubescent; bracteoles 6 in., linear. Calyx ½ in., 5-ribbed, minutely pubescent; in fruit ¼ in., reticulate. Corolla 1½ in. Capsule ¼ by ½ in., dehiscing from the apex so as to split the style-base.
3. **C. cymulosa**, Clarke; leaves elliptic acuminate petiolated, cymes small 1-5-flowered, subossile, calyx nearly glabrous, capsule breaking up irregularly.

Tenasserim; at Mergui, Griffith, Helder (Kew Distrib. n. 3927).

Leaves 8 by 3½ in., nearly glabrous, narrowed at the base; nerves 10 pair; petiole ½-⅓ in. Cymes scarcely ½ in., appearing sessile on weak axillary spurs, pubescent. Otherwise as *C. decurrens*, from which it differs in the petiolated, much less-nerved leaves.

4. **C. grandiflora**, Clarke; leaves petiolated elliptic acuminate, peduncles 1-2-flowered, with the pedicels nearly 1 in., flowering calyx ½ in. minutely pubescent.

Tenasserim; at Moulemin, Lobb.

Branch terete, shortly fulvous-pubescent. Leaves 6 by 2 in., both ends much acuminate, serrate, minutely pubescent; nerves 9 pair; petiole ⅓ in. **Corolla** 2½ in. Capsule (and fruit-calyx) as of *C. decurrens*, not perfectly ripe, so that it is not certain whether it opens by valves.

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**XXII. STAUANATHERA, Benth.**

Low, succulent, pubescent herbs. Leaves alternate, or opposite one of each pair reduced to a small auricle, falcate, elliptic, acuminate, very unequal-sided. Cymes peduncled, lax, subracemose; bracts small. **Calyx** wide-campanulate; lobes 5, wide-spreading, subplicate. **Corolla** campanulate, spurred or gibbous at the base, somewhat 2-lipped; lobes 5, subequal. **Stamens** 4 perfect, filaments short; anthers 2-celled, cohering crosswise into a depressed cone; cells diverging at the base, dehiscing on the inner face by slits ultimately confluent at the apex. **Disc** 0. **Ovary** sessile, subglobose; style short, stigma broad, margin sublobed; placenta deeply infixed, bifid, branches lobed, bearing ovules on both sides. **Capsule** depressed-globose, overtopped by the calyx, papery, transversely or irregularly breaking up. **Seeds** minute, obvoid, smooth; testa reticulated, cells often spiral.—Species 4, from Assam and Chittagong to Java and Celebes.


Upper Assam; Gabroo Hills, Griffith (Kew Distrib. n. 3845).—Distrib. Asia.

Stem 4-12 in., occasionally branched, dasy-pubescent. Leaves attaining 8 by 3 in., obscurely crenate, glabrate above, fuscous-pubescent (at least on the nerves) beneath; petiole ⅓-⅓ in. **Pedicules** ⅔-¾ in.; cymes 2-3 in., dasy-pubescent; pedicels ⅓ in. **Calyx** ¼-½ in. diam., lobed half-way down; lobes triangular. **Corolla** white, with blue marks, yellow near the base within. **Ovary** pubescent. **Capsule** circumsciss near the base (Griffith); placenta fungose (Griffith), but are in the dried state thin.

2. **S. grandiflora**, Benth. Scroph. Ind. 57 (by misprint grandifolia); leaves opposite, corolla 1 in. spurred at the base. Species grandiflora, Br. in Benn. Pl. Jav. Ear. 121; DC. Prodr. ix. 278; Bot. Mag. t. 5409; Clarke Comm. & Cyrt. Beng. t. 89 bis. Glossanthus grandiflorus, Benth. in Wall. Cat. 6395.

Pemang; Wallich. Chittagong Hills; Clarke. Moulemin; Parish.

Stem 4-12 in., dasy-pubescent. Leaves attaining 10 by ¾ in., obscurely toothed, mature nearly glabrate except on the nerves beneath; petiole ½-1 in. **Inflorescence** and calyx nearly as in *S. umbrosa*. **Corolla** blue, with yellow marks in the tube within; spur ½ in. **Ovary** thinly pubescent or glabrous. **Capsule** ½ in.
broad, breaking up irregularly.—The examples from the Chittagong Hills (without flowers) are more hairy, the leaves beneath closely grey-pilose.

S. ? Brandisii; leaves alternate, pedicels long fascicled in abbreviated cymes, calyx narrow, capsule small longer than broad.

Pegg; Thongyun, Brandis.

Stem creeping at the base; innovations rusty-silkily woolly. Leaves 7 by 4 in., shortly acute, very unequal-sided, somewhat thick, glabrate above, rusty-villous beneath; petiole ¼ in. Pedicels in fruit ¼ by ¼ in., glabrous; bracts ½ by ¼ in., oblong, obtuse, nearly glabrous. Sepals in fruit ½ by ½ in., elliptic, acute, imbricate, shortly united at the base, nearly glabrous. Capsule ½ by ¼ in., acute, glabrous, papery, indehiscent; placenta deeply intruded, bifid, branched; plates thin, bearing ovules on both sides. Seeds minute, obovoid, smooth.—Probably a new genus, but the flowers are unknown; the leaves are much like those of Stauranthera umbrosa; the inflorescence, bracts, calyx and capsule do not suit Stauranthera, but Rhynchoschicum.

XXIII. ISANTHERA, Nees.

Small, nearly simple, undershrubs; innovations tawny, silkily woolly. Leaves all alternate, broadly oblong-cordate, acuminate at both ends. Cymes axillary, short-peduncled, towards the end of the stem; bracts narrow. Sepals 5, small, narrow. Corolla small, shortly campanulate, obscurely 2-lipped; lobes 5, ovate. Stamens 4 fertile (sometimes 5 fide Nees); filaments short; anthers small, subquadrate, 2-celled, slits marginal, finally confluent at the submarginal apex. Disc very small or 0. Ovary ovoid, sessile; style shorter than the ovary, stigma small simple; placenta deeply infixed, then bifid recurved bearing the ovules. Berry small, ovoid or subglobose, fleshy, indehiscent or (fide Gardner) ultimately 2-valved. Seeds very small, ellipsoid, smooth.—Species 3, in India, Malay and the Philippines.

A genus which should perhaps be merged in Rhynchoschicum; differing in having no opposite leaves, a shorter style, and the anthers dehiscent exactly on the margins.


S. Madras, Heyne; Nilgheries and Courtallum, Wight, &c. Ceylon, up to 4000 ft. alt.; Gardner, Thwaites, &c.

Stem 8–12 in. Leaves attaining 9 by 4 in.; mature glabrous above, more or less tawny and woolly beneath; petiole ½–1 in. Peduncles scarcely as long as the petioles; cymes ½–1½ in. diam. Sepals ¼ in., silky, finally nearly glabrous. Corolla 1 in., white. Berry ¼ by ½ in.—In Wight's figures the anthers are depicted from an example past flower.

Var. ? pucinervia; nerves of the leaves 6–8 pair.—Mergui; Griffith (in Herb. Wight).—This might be suspected a misplaced ticket; but out of the abundant Ceylon material, none has few-nerved leaves resembling this.

XXIV. RHYNCHOTECHUM, Blume.

Erect, simple undershrubs; innovations tawny, silkily woolly. Leaves opposite or lower alternate, usually large. Cymes in the lower axils, many-fld., trichotomous or umbellately compound; bracts narrow, inconspicuous.
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Sepals 5, small, narrow. Corolla small, subcampanulate, purple-rose or white; limb obscurely 2-lipped; lobes 5, subequal, round. Stamens 4 perfect, attached near the base of the corolla, filaments short linear curved; anther-cells 2, subparallel below, dehiscent on the inner face, completely confluent at the apex. Disc 0 or very small annular. Ovary sessile, ovoid; style linear elongate, stigma small; placenta nearly meeting in the axis of the ovary, there naked, then recurved bearing the ovules. Berry small, globose, apiculate, glistening white, pulpy. Seeds very small, ellipsoid, smooth.—Species 8, from Bengal through Malaya to the Philippines.

1. R. parviflorum, Blume Bijd. p. 775; leaves broadly oblanceolate serrate mature glabrate except on the nerves beneath, sepals softly tawny-villos, corolla very small, ovary upwards densely shortly hairy.

JAVA; frequent.

Var. penangensis: sepals candate-acuminata tawny silky in fruit, corolla exceeding the sepals.—PENANG. The material is a stem with flowers and half-ripe fruit, but no leaves, which has been doubtfully referred to R. ellipticum, from which it differs in the indumentum, and the minutely hairy ovary. It is either a large-fld. var. of R. parviflorum, or a species nearly allied to it. The peduncles are all opposite at the nodes; in the Java R. parviflorum the lower leaves and peduncles are frequently alternate.

2. R. ellipticum, A. DC. Prodr. ix. 285, in note; leaves broadly elliptic or obovate acute minutely dentate mature glabrous above, sepals after flowering patently pilose, corolla $\frac{1}{2}$ in., ovary glabrous or with very few gland-tipped hairs. Bot. Mag. t. 5832; Clarke Comm. & Cyt. Beng. t. 91. Corysanthera elliptica, Wall. Cat. 6411.—Cyrandracea, Griff. in. Pl. Asiatic. t. 459.

Sikkim, Bhotan, Assam, Khasia Mts., Cachar and Silhet; alt. 0-3500 ft. in or near the hills, frequent.

Stem 2-4 ft., thick, cinnamomous, tomentose or woolly at the apex. Leaves opposite, $\frac{1}{2}$ by 3½ in. (often larger), base cuneate, somewhat coriaceous, whitened beneath, above tawny, silky woolly, afterwards glabrate, beneath densely cinnamo-nous-woolly, afterwards glabrous except the nerves; nerves 15-20 pair, subparallel; petiole $\frac{1}{4}$-1½ in. Peduncles 1-1½ in., often 2-4 together (or the peduncle divided from the base), when young tawny-silky, divaricately often unambitely divided. Segals $\frac{1}{2}$ in., narrowly lanceolate, mature squamous or scabrous from the thick spreading hairs, often coriolloid, rose. Corolla rose-purple, minutely hairy without. Berry $\frac{1}{2}$ in. diam.

Var. pilonior; mature leaves above with close short white hairs, segals patently hispid.—Darjeeling; alt. 3500 ft.; Clarke.

Var. angustia: leaves narrowly elongate-lanceolate (sometimes 10 by 1½ in.), nerves 10-15pair.—Cachar; H. f. & T.; Keenan. Martaban; Parish.—Possibly a distinct species; see Hook. f. in Bot. Mag. t. 5832.

Var. Hookeri; leaves oblong, cymes very dense repeatedly trichotomous.—Chittagong; Seetakoon, alt. 1000 ft.; H. f. & T.; Demagri, alt. 250 ft.; Clarke.—Probably only the full form of the preceding variety angustia.

3. R. vestitum, H. f. & T.; Clarke Comm. & Cyt. Beng. t. 92; leaves elliptic acuminate at both ends slightly dentate hisrate on both surfaces, inflorescence very hisrate, corolla $\frac{1}{2}$-3 in., ovary glabrous or nearly so. Corisanthera vestita, Griff. in. Notes, 124, n. 426.

Sikkim and Bhotan Himalaya, Assam, Khasia Mts., alt. 1-3000 ft., not rare; Griffith, H. f. & T., &c.

Stem 5 ft., thick, patently hispid upwards. Leaves opposite, 9 by 2½ in., hisrate above with long yellow hairs rising from tubercles, more softly hisrate beneath; petiole
1 in. Peduncles 1/2-1 in. Sepals 3/4 in., narrowly lanceolate, patently hispid like the leaves. Flowers and berries as of R. ellipticum, but a little larger.

4. **R. latifolium**, H. f. & T.; Clarke Comm. & Cyrt. Beng. t. 94; leaves oblanceolate or obovate acuminate at both ends subdenticulate mature glabrous above more or less tawny and silikly woolly beneath, cyme 4-6 in. diam. very divericate compound silikly woolly. Chelone latifolia, Ham. in Herb. Wall. Chilliandra obovata, Griff. Notul. iv. 150, and IC. Pl. Asiat. t. 438.

**Assam**, Wallich, Griffith; Mishmee Hills, Griffith.—**Distr.** Ava.

Stem thick, silikly woollly upwards. Leaves opposite, 8 by 3 in. (sometimes obovate larger); petiole 1 in. Peduncles 2 in., stout; cyme umbellataley decompound, many- (sometimes 150-) fld. Sepals 3/4 in., narrowly lanceolate. Corolla hardly longer than the calyx, white with the upper lip purple (Griffith). Berry 3/4 in. diam. when dry.

5. **R. alternifolium**, Clarke; leaves (except the uppermost pair) alternate elongate elliptic acuminate at both ends denticulate mature nearly glabrous except the nerves, cymes peduncled compound tawny silky.—Corisanthera sp., Griff. ms.

**Upper Assam**; Brahmakound, Griffith.

Stem upwards (with the innovations) cinnamoneous, silikly woolly. Leaves of the uppermost pair one 7 by 2 1/2 in., the other 2 1/2 by 3 in.; petiole 1 1/2 in. Peduncles 1 in.; inflorescence much as of R. latifolium, but less divericate. Corolla distinctly 2-lobed, upper lip longer less deeply divided. Anthers largeish, debscent on the inner face, minutely glandular at the apex, slits early confluent at the apex. Style very long.—This species (with some other Malay plants) entirely annuls the simple distinction given in the Gen. Plant. between Rhynchotechum and Isanthera of "leaves opposite" and "leaves alternate," except for the alternate leaves and peduncles it is altogether a Rhynchotechum.

6. **R. calycinum**, Clarke; glabrate in fruit, leaves elongate-elliptic nearly entire, cymes short-peduncled very dense, sepals lanceolate prominent.

**Upper Assam**?; "on the Soondra bank."

Stem very thick. Leaves all opposite, 10 by 3 1/2 in., narrowed at both ends, subcoraceous, not seen young; petiole 2 in. Peduncles 1 in., 2-5-clustered; cymes in fruit subcapitate, very many-fl., glabrate; bracts 3/4 in., obloneg. Sepals 3/4 in. Corolla not seen. Berry small, glabrous.

**XXV. CYRTANDYA, Forst.**

Shrubs or trees. Leaves opposite, equal or unequal, or one of each pair rudimentary or wanting. Flowers in cymes or heads, peduncled or sessile, axillary; bracts often large or connate into an involucre. Calyx free, ovoid or tubular, diciduous or persistent; teeth 5, acute. Corolla tubular-funnel-shaped; lobes 5, round, spreading, subequal (in the Indian species). Stamens 2, perfect. 2 or 3 rudimentary; anthers included (in the Indian species) 2-celled; cells broad-obloneg, subparrelall, slits longitudinal. Disc annular, or (in non-Indian species) unilateral subquadrate. Ovary superior; style long or short, stigma shortly 2-lobed; placenta nearly meeting, then revolute. Berry fleshy, ovoid oblong or linear, usually white. Seeds very many, minute, ellipsoid, smooth, testa obscurely reticulated.—Species 160, Malayan and Polynesian, from Penang to the Sandwich Islands.

**Penang; Wallich, Maingay.—Distrib. Sumatra.**

A shrub; branchlets tesselated with imbricate whitened scales, somewhat quadriangular. Leaves opposite, one of the pair reduced to a linear rudiment of the petiole or 0; the other 8 by 3 in., acuminate, base cuneate, glabrate except the rufous-villous nerves beneath; petiole 1/2 in. *Peduncles* 0-1 in.; bracts 1/2 in., lanceolate; pedicels 3-8, 1/2 in. *Calyx* 1/2 in., fulvous-hirsute, lobed half-way down. *Corolla-tube* 1/2 in., slightly curved, fulvous-hirsute without; limb nearly equally 5-lobed. *Disc* unilateral, quadriangular. *Ovary* fulvous-pubescent. *Berry* 1/2 in., elongate ellipsoid, tipped by the style-base.


**Tenasserim; Helfer. Singapore; Lobb.—Distrib. Java, Sumatra.**

A shrub; branchlets 4-angled; innovations rufous silky. Leaves 7 by 3 1/2 in., acute, base narrowed, closely serrate; nerves beneath fulvous-villous. *Peduncles* scarcely 1/2 in.; bracts 1 in., united into a spathaceous involucre, deciduous. *Calyx* 1/2 in., lobed about half-way down, rufous-hairy. *Corolla-tube* 1 in., straight, fulvous-silky without, dirty yellow. *Ovary* and style hairy. *Berry* 1/2 in., elongate ellipsoid, beaked by the style-base, tesselated externally (in the dried state).

3. **C. decurrens**, *De Vriese Pl. Ind. Bat. Reinv.** 14; leaves opposite subequal sub sessile obovate-lanceolate glabrous above, peduncles very short, flowers involucrated capitate. *C. frutescens*, *Wall. Cat.* 807 partly, not of *Jack*.

**Penang; Wallich.—Distrib. Malaya to Borneo.**

Hardly specifically separable from *C. pilosa*. The leaves, even in their young stage, are glabrous on the upper surface, and have the lateral nerves more oblique the midrib.


**Malacca; Maingay.—Distrib. Sumatra.**

An undershrub; stem short, simple, stout; innovations closely fulvous-villous. Leaves 8 by 5 in., base obtuse, rounded or shortly cordate, coriaceous, mature fulvous-silky beneath or ultimately glabrate except on the nerves; petiole 4 in. *Peduncles* 1-2 in.; bracts 3/2 in., united into a spathaceous involucre, deciduous. *Calyx* 3/2 in., rufous-hairy; lobes 3/2 in., lanceolate. *Corolla* 1 1/2 in., fulvous-silky without, pale-yellow purple-spotted within (*Maingay*). *Anthers* broadly oblong, montely pilose at both ends. *Disc* annular. *Ovary* and style glabrous. *Berry* 1 in., narrowly ovoid-cylindric. — *C. Blumeana of the Javan botanists, figured (as *C. pendula*, Blume) in Hook. *Ic. Pl.* t. 736, is common in Java, and perhaps does not specifically differ; it has white flowers, and the leaves more glabrous beneath.

5. **C. humilis**, *Blume Bijd.* p. 769; leaves opposite (one often reduced to a rudiment) long-petioled elliptic acute, peduncles hardly any, heads involucrate, calyx tubular deciduous. *DC. Prodr.* 9, p. 281.

**Singapore; Prince (Ic. Ind. Kew).—Distrib. Java.**

Scarcely differs from *C. bicolor*. The leaves are often rhomboid or orenate at the base, the peduncles very short not decurved.
Trees (Nyctocalos a large climber, Amphicome a herb). Leaves opposite, rarely whorled, 1-2-3-pinnate or sometimes undivided. Panicles or racemes terminal, rarely on short lateral branches; bracts inconspicuous; flowers showy, hermaphrodite, irregular. Calyx gamosepalous, campanulate (in the Indian species), valvate, spathaceous or 2-5-lobed. Corolla tubular-ventricose; mouth 2-lipped; lobes 5, subequal or slightly unequal, bilabiately imbricate in the bud. Stamens 4, didynamous, rudiment of the fifth often present (5 subequal in Oroxyllum); inserted at the point where the corolla-tube is suddenly swollen; filaments linear, glabrous or hairy only at the base; anthers 2-celled, included or rarely shortly exerted; cells elliptic or narrowly oblong, dehiscing by longitudinal slits, parallel or divericate. Disc usually cushion-like or annular. Ovary subsessile, 2-celled; style long glabrous, stigma of 2 oblong lobes; ovules in many rows (in Amphicome in 1-2 rows) grouped in a double series in each cell, anatropous. Capsule mostly elongate, loculicidally or septicidally 2-valved; septum in fruit enlarged, deciduous together with the placenta. Seeds compressed discoid (rarely subtrigonal) prominently winged, exalbaminous.—Species 450, in the tropics of the whole world, a few in the warm temperate zones of both hemispheres.

I. NYCTOCALOS, Teysm. & Binn.

Large glabrous climbers. Leaves opposite, 3-foliolate; leaflets petioled, entire. Peduncle terminal, long, few-fld. Calyx tubular-campanulate, truncate or with 5 short teeth. Corolla large, white; tube very long; segments 5, round. Stamens (in the Assam species) 4, didynamous,
Nyctocalas.]  CIV. BIGNONIACEAE. (C. B. Clarke.)  377

attached near the top of the corolla-tube; anther-cells distinct, narrowly oblong, pendulous. Capsule oblong, flattened parallel to the septum, septicidally 2-valved. Seeds thinly discoid, completely surrounded (except at their base) by a hyaline entire wing.—Species 3, 2 in Malaya, 1 in Assam.

The Malay species, on which the genus is founded, are described and figured with 5 fertile stamens, having the anther-cells combined. The Assam species constitutes a marked sub-genus.

**N. Thomsoni; Hook. f. Bot. Mag. t. 5678.**

Assam; Gowhatdy Hills, Jenkins; Mikir Hills, Simons.

Leaves 6 by 3 in., broadly elliptic, caudate-acuminate, rhomboid at the base; petiolule $\frac{1}{2}$–2 in.; petiole 4 in. Peduncles 6 in.; bracts $\frac{1}{2}$ in.; pedicels 6, $\frac{1}{2}$ in. Calyx $\frac{3}{4}$ by $\frac{1}{2}$ in.; teeth 5, $\frac{1}{10}$ in., linear. Corolla-tube 7 by $\frac{1}{2}$ in., mouth 2$\frac{1}{2}$ in. diam. Anthers subexsert, yellow; connective minutely mucronate; rudiment of the fifth stamen present. Disc small, cushion-like. Style 7 in.; stigma tongue-shaped, sub-capitate. Capsule 6 by 2 in.; valves leathery, almost woody; septum ultimately free, simple, flat. Seeds $\frac{1}{2}$–$\frac{1}{3}$ in. diam., or including the wing 1 in. diam.; these attached on opposite margins of the septum much overlapping.

**II. MILLINGTONIA, Linn. f.**

An erect tree; bark corky. Leaves opposite, 2–3-pinnate. Panicles many-fl.d., terminal on the pendent branches. Calyx small, campanulate; teeth 5, obscure. Corolla white; tube long, slender; lobes 5, subequal, ovate, acute, subvalvate. Anthers of 1 ovate cell, the second cell appearing as a small hook. Capsule linear, compressed parallel to the septum, septicidally 2-valved. Seeds thinly discoid; wing hyaline, broad.


Burma; in the tropical forests from Ava to Tenasserim, sive Kurz.—Distrib. Planted extensively in India, and in other tropical countries. Perhaps wild also in Central India and on the Upper Godavery.

An erect tree, 80 ft., lanceolate in outline, branches drooping. Leaves 2–3 ft.; leaflets 2–3 in., ovate-lanceolate, acuminate, sinuate or crenate, young pubescent, mature nearly glabrous; petiolules of the upper tertiary leaflets hardly any. Peduncles 1–3 in.; panicles 10 by 6 in.; bracts inconspicuous. Calyx $\frac{1}{2}$ in. Corolla-tube 2–3 by $\frac{1}{2}$ in.; mouth 1 in. diam. Stamens shortly exsert, glabrous; anthers white. Disc small, cushion-like; stigma exsert, of 2 small ovate plates. Capsule 12 by $\frac{3}{4}$ in., acute at both ends; valves woody; septum ultimately free, simple, flat; seeds including the wing 1 by $\frac{1}{2}$ in.; wing narrow at the apex, at the base; seeds attached on opposite margins of the septum much overlapping.

**III. OROXYLUM, Vent.**

A glabrous tree. Leaves opposite, large, 2–3-pinnate; leaflets ovate, entire. Raceme terminal, long. Calyx large, leathery, campanulate, truncate or obscurely toothed. Corolla large, campanulate-ventricose, white or purplish; lobes 5, subequal, round, crisp, toothed. Stamens 5; anthers glabrous, 2-celled; cells parallel, oblong. Capsule large, linear, compressed parallel to the septum, septicidally 2-valved. Seeds thinly discoid; wing hyaline, broad.

Throughout India, alt. 0–3000 ft., from the Himalaya to Ceylon and Malacca, common; not in the western drier area, but in the Terai west to the Chenab (Brandis).

—DISTEB. Malayla, Cochini China, Ava.

Attains 25–40 ft. (Roxburgh says "one of the tallest trees on the Coromandel coast," concerning which there must be some mistake); bark thick. Leaves 2–4 ft. diam., ternately bipinnate; leaflets 5 by 3–4 in., acuminate; petiolum short. Peduncle 1 foot, thick; raceme 10 in.; pedicels ½–1 in. Calyx 1 by ½ in., fleshy. Corolla 2½ in., fleshy; mouth 2–3½ in. diam. Stamens shortly exsert; base of filaments woolly; fifth filament rather shorter than the other 4; anther-cells divergent below; connective with a short mucro. Disc large, fleshy. Style 2½ in.; stigma ½ in. wide, of 2 semicircular plates. Capsule 1–3 ft. by 2–3½ in., hardly ½ in. thick, margins somewhat incurved; valves woody; septum flat. Seeds including the wing attaining 3 by ½ in. (usually smaller), winged all round except at the base; those attached on opposite margins of the septum scarcely overlapping.

IV. TECOMA, Juss.

Shrubs or small trees, erect or scandent. Leaves usually opposite, in the Indian species simple, in others compound. Racemes or panicles terminal. Calyx tubular-campanulate, subequally 5-toothed. Corolla tubular-ventricose, orange or red; lobes 5, round, subequal. Capsule linear or narrow, loculicidally 2-valved, somewhat compressed at right angles to the septum. Seeds thinly discoid; wing hyaline, broad.—Species 24, in the tropics of the whole world, mostly American.


WESTERN INDIA, alt. 0–3000 ft.; Sind, Punjab, Guzerat, Rajputana, extending eastwards to the Jumna.—DISTEB. Beloochistan, Arabia.

A shrub or small tree; innovations stellately grey-puberulous, otherwise glabrate. Leaves 6 by 1½ in., obtuse; petiole ½ in. Corymbus few-fl., mostly on shortened lateral branches; pedicels ½–1 in. Calyx ½ in.; lobes hardly ½ in., broad, obtuse. Corolla 1½ in., orange. Stamens scarcely exsert, glabrous; anther-cells distinct, pendulous, narrowly oblong. Disc cup-shaped. Stigma spathulate, sub-2-lobed. Capsule 8 by ½ in., slightly curvature; valves tough, thin. Seeds (including the wing) 1 by ½ in., wing very narrow round the apex of the seed, 0 at its base.

V. DOLICHANDRONE, Seem.

Trees, glabrous or tomentose. Leaves opposite, 1-pinnate. Racemes or panicles terminal. Calyx in aestivation closed, at flower-time cleft to the base on one side, spatheaceous. Corolla-tube long or short; lobes 5, subequal, round, 'crisped crenate or incised. Capsule elongate, terete or somewhat compressed, loculicidally 2-valved, sub-4-celled. Seeds thinly discoid, on
each side broadly winged.—Species 12, in the hotter parts of Africa, Asia and Australia.


**Pegu**; Rangoon, *McLeod*; extending thence north to Ava (*Kurz*).

A tree, 30-40 ft.; branchlets and in florescence with yellow or brown, easily separable, wool. *Leaves* 1-1½ foot; leaflets 3-5 pairs, 6 by 3 in., entire or distinctly serrulate, mature nearly glabrate or with yellow or brown wool adherent; stipules 0, but rudimentary leaves ½-1 in. diam. are often developed in the axils. *Raceme* short, stout, 4-10-fl.) pedicels ½-1 in. *Calyx* ⅓-⅔ in., leathery, densely hisutely woolly or deciduously hirsute. *Corolla* 2-3 in., narrow portion of the tube constricted at the top, then suddenly dilated into a campanulate portion 1 in. long; lobes ½ in., crisped-crenate. *Anther-cells* large, elliptic, separate, pendulous, attached below their tips. *Capsule* 18-24 by 1 in., thickly tormentose floccose. *Seeds* ⅓ by ¼ in. (including the wings).

**Var. velutina**; leaves serrulate, calyx tawny velvety. Spathodea velutina, *Kurz* in Journ. As. Soc. 1873, pt. 2, p. 90, and *For.* Fl. ii. 235.—*Pegu*; *Kurz*.—Not seen; *Kurz* says it differs from *D. stipulata* in having the leaves serrulate (not entire), the calyx tawny velvety (instead of tawny villous); which characters can be seen in several standard examples of *D. stipulata*.


**Malabar**, *Wight*; common in the plains, Beddome. **MALAY PENINSULA** from Prone to Malacca, common; *Wailheh*, *Griffith*, &c. *Andamans*; *Kurz*, *Ceylon*; *Thwaites*.—DISTRIB. Malay Archipelago.

A tree, attaining 50-60 ft. *Leaves* a foot long; leaflets 3-4 pairs with an odd one, 2-3 in., rhomboid, often unequal at the base; petiolar ½ in. *Coryms* few (sometimes 1-) fl., short-peduncled; pedicels ½-1 in., stout. *Calyx* ⅔ in. *Corolla* 4-7 in., white; tube campanulate near the mouth; segments 1 in., crenate-toothed. *Anther-cells* large, elliptic, separate, divaricate. *Capsule* 18 by ½ in., nearly straight, not ribbed. *Seeds* (including the wings) 2 by ¼ in., rectangular.


Capsule 12 by ½ in., valves woody, speckled, smooth. Seeds 1½ by ½-¾ in., sub-rectangular, wings membranous.—The Calcutta Botanic Garden specimen in Herb. Wallis has the mature leaves, petals and corollas softly ashy pilose. As to the synonyms of older authors adduced by Seemann, several are described as hisrate plants; while Bignonia spathacea, Linn. f., is founded on Rheede Hort. Mal. vi. t. 29, which Seemann himself refers to D. Rheedeii.


**Decoan Peninsula**; Mysore and Welleyngry Hills, Wight; Belgaum, Ritchis, &c.

A tree, 20-50 ft. Leaves 3-6 in.; leaflets ½-1½ in., obovate or round elliptic, rarely with a small obtuse point; petirole 0, rarely ½ in. Corollas few—mostly 3-1-) flid., subsessile; pedicels ½ in. Calyx 1-½ in., of the expanded flowers softly grey-pubescent. Corolla nearly as of D. crispa, but the tube hardly ½ in. diam. downwards. Anthers included, cells nearly parallel, differing much from those of D. crispa; this may be a sexual character, but is so in all the examples, as in the figure of Bodeme. Capsule (and seeds) nearly as in D. crispa, but more compressed and usually more curved.


**Bombay and Concean**; Law. Central Provinces; Edgeworth, Dr. Stewart, R. Thompson. Rajputana; Meywar, Dr. Brандis.

Considered by Dr. Brandis as a glabrous var. of **D. falcata**. The leaflets are sessile, often larger than those of **D. falcata**, and (mostly) very shortly acuminate. The one capsule seen is very nearly straight. The Central Indian example of Edgeworth, referred by Seemann to the Burmese Stereospernum serrulatum, has (not rarely in **D. falcata** and **D. Lawii**) a few obscure teeth to the leaflets.


**Mahabuz**; Cumbatore and Ootacamund, Wight, Beddome.

Leaves 6-12 in.; leaflets 2-3 in., obtuse at both ends, sometimes with a short micro, floccose-pubescent on both surfaces; petirole 0-¼ in. Calyx 1 in., floccose-pubescent. Corolla 3 in., mouth 2 in. diam., lobes crisped crenate. Anthers included, cells nearly parallel. Capsule not seen.—United with **D. crispa** by Seemann and Dalzell.

VI. **HETEROPHRAEAMA**, DC.

Trees. Leaves large, 1-pinnate. Flowers large; panicles terminal, woolly. Calyx ovoid, closed when young, irregularly 3-5 lobed during flower. Corolla tubular-ventricose, glabrous or densely tomentose without, rose or yellow; lobes 5, rounded, subequal. Capsule elongate, cylindric or compressed, falcate or twisted, loculicidally 2-valved; septum flat or 4-angul-
lar. Seeds compressed with a membranous wing on each side.—Species 5, 3 Indian, 2 African.


From Prom; Prom and Pegu Yomah, Kurz.

A tree, 24-40 ft. Leaves 2-3 ft.; leaflets 9-11, 6 by 3 in.; petiolule ½ in. Panicles short, densely tomentose, appearing before the leaves; pedicles ½ in., tomentose. Calyx 3 in., 2-3-lobed to the middle, woolly without. Corolla floccose without, afterwards nearly glabrate; mouth 2 in. diam.; lobes crisp. Capsules 18-24 by 1–1½ in. Seeds ½ by ½ in.—Kurz remarks that the capsules are exactly as those of Dolichandrone stipulata, which is the case with the (unattached) capsules transmitted. The leaves are also very like those of Dolichandrone stipulata, but the flowers are considerably smaller. The tree is referred by Kurz to Heterophragma, because the calyx is irregularly lobed, not spathaceous; but in one example of Kurz the calyx is split to the base on one side, and the tree appears a Dolichandrone.


W. DECCAN PENINSULA; from Bombay southwards, Wight, Ritchie, &c. CENTRAL INDIA; Godavery Forests, tide Brandis.

A large tree; innovations woolly. Leaves 1-2 ft.; leaflets 7-9, 4½ by 2½ in., obtuse with a short point; petiolule 0–½ in. Corymb compound, dense, many-fl.; pedicels short, stout, woolly. Calyx ¼–½ in., irregularly lobed half-way down, or on one side more deeply or obscurely 2-lipped. Corolla floccose, ultimately glabrate, mouth 2 in. diam., lobes crisp. Anther-cells elliptic, divaricate at base. Capsule 8–12 by 1½–2 in., divided into 4 cells by the 4-ridged septum. Seeds ½ by ¼–1 in.


From Assam and E. BENGAL to TRINASHERIM and the ANDAMANS; frequent.—DISTRIB. AVE.

A tree, 30–50 ft.; innovations tomentose. Leaves 1–1¼ foot; leaflets 5–7, 7 by 5 in. (or in some examples 12–14 in. long), acute or obtuse, subsessile. Panicle 8–10 in. diam., stout, many-fl.; bracts ⅔ in., narrowly lanceolate, deciduous. Calyx ⅓–1 in., rusty tomentose, irregularly 5-lobed half-way down. Corolla when expanded densely woolly-tomentose without, mouth 2 in. diam., lobes hardly crisped or crenate. Anther-cells nearly separate, pendulous. Capsule 1–3 ft. by 1 in. diam., cylindrical, cork-screw-like; septum flat. Seeds ½ by ½–1 in.

VII. MAYODENDRON, Kurz.

A glabrous tree. Leaves ternately compound. Racemes small, terminal on short lateral shoots. Calyx spathaceous, split on one side half-way down. Corolla tubular, almost narrowed at the mouth; lobes very short, subequal. Stamens 4, scarcely didynamous, rudiment of the fifth present; anther-cells almost parallel. Capsule linear cylindrical slender, sub-4-celled, loculicidally 2-valved, valves thin. Seeds flat, winged on the sides.

MARTABAN up to 3000 ft., not infrequent; Kurz.—Distrib. Ava, Yunan.

A tree, 30-40 ft.; innovations minutely puberulous. **Leaves** ample, lower pinnae 2-pinnate; leaflets 3-4 in.; elliptic, acuminate. **Racemes** 5-fl., pedicels ½ in. **Calyx** 3½ in., puberulous. **Corolla** 2½ by 1½ in., orange crimson; narrow cylindrical portion of the tube much shorter than the funnel-shaped part; lobes ½-¾ in. long. **Capsule** 18 by ½ in., subterete, glabrous. **Seeds** including the pellucid wings, narrow-linear, ¼ in. long.

**VIII. STEREOSPERMUM, Cham.**

**Trees.** **Leaves** 1- or 2-pinnate. **Panicles** large, lax, terminal. **Calyx** ovoid, open or closed in the bud, during flower truncate or shortly unequally lobed. **Corolla** tubular-ventricose, yellow or pale rose; lobes 5, nearly equal, round, crisp, toothed or laciniate. **Capsule** elongate, terete, subcompressed or obscurely quadrangular, loculicidally 2-valved; septum thickened, subterete. **Seeds** in 1 or 2 series, compressed or subtrigonoous, with a membranous wing on each side.—Species 10, in tropical Asia and Africa.

**Sect. 1. Eustereospermum.** **Leaves** 1-pinnate.


Through moister INDIA; from the Terai of Oudh and Assam to Ceylon and Pegu.

—Distrib. Ava.

A tree, 30-60 ft., nearly glabrous except the flowers. **Leaves** 12-18 in.; leaflets 7-11, 5 by 2 in.; petiole ¼-½ in. **Calyx** ½ in., slightly 3-5-toothed. **Corolla** thinly villous within and without; tube rose, lobes yellow or pale flesh-colour, crimped. **Capsule** 12-20 by ½-¾ in., smooth or speckled. **Seeds** 1 by ½ in., easily splitting through the centre.

2. **S. neuranthemum**, Kurz in Journ. As. Soc. 1873, pt. ii. 91, and For. Fl. ii. 230; leaflets oblong or ovate shortly acuminate hairy beneath, panicule short corymb-like viscos-hairy, corolla 1½ in., capsule linear slender subterete keeled, seeds subtrigonoous embedded in notches in the septom.

Pegu and moulin ; M.Lelland, Parish, Kurz.

A tree, 40-60 ft.; innovations softly villous or subtomentose. **Leaves** 1-1½ foot; leaflets 5-7, 5 by 2½ in.; petiole ½ in. **Panicle** loose, about 12-fl., **Calyx** ½ in., hairy; lobes 3-5, very short, broad. **Corolla** very pale lilac or blueish white (Kurz), sparsely pilose; lobes rounded, crisp, crenate hardly toothed. **Capsule** 12 by ½-¾ in., less woody than that of S. chelonooides; valves 1-ribbed on the back; seeds and septom as in S. chelonooides.

3. **S. suaveolens**, DC. Prodr. ix. 211; leaflets broadly elliptic acuminate or acute entire or serrulate young hairy, panicule very compound many-fl., viscos-hairy, corolla 1-1½ in., capsule linear terete woody, seeds subtrigonoous embedded in notches of the septom. **Wight** in. t. 1342; Bedd. For. Man. 169; Brand. For. Fl. 351; Kurz For. Fl. ii. 231. Bignonia suaveo-
Throughout moister India from the Himalayan Terai to Travancore and Tenasserim. 

A tree, 30-60 ft.; innovations viscos-hairy. Leaves 12-18 in.; leaflets 7-9, 5½ by 8 in.; petiolule hardly ⅛ in. Calyx ⅛ in., hairy; lobes 3-5, very short, broad. Corolla pale or dark purple, puberulous without, hairy in the throat; lobes rounded, crisped-crenate. Capsule 18 by ⅜ in., slightly rough with tubercles, obscurely 4-ribbed, glabrous. Seeds 1½ by ⅛ in., deeply notched at the middle.


MALAY PENINSULA; Moulmein, Wallich; Tenasserim, Griffith; Karen country up to 3000 ft., Kurz; Malacca, Maingay.

Attaing 80 ft., Kurz. Leaves 1-2 ft.; leaflets 7-9, 6 by 2 in.; petiolule ⅛ in. Corolla pate-lilae. Capsule 12 by ⅛ in.; valves somewhat woody, smooth, slightly keeled.—Exceedingly like S. suaveolens, except as to the fimbriate corolla; the leaflets are usually narrower.


PERANG; Wall. Moulmein; Lob. Malacca; Maingay.—Distrib. Malay Archipelago.

Leaves 3-7, 7 by 3 in.; petiolule ⅛ in. Panicles 1 foot long; branches short, 1-2-fld. Calyx ⅛ in., glabrate, in fruit often urceolate. Corolla glabrous; narrow cylindric portion of the tube shorter than the campanulate part; lobes ⅜ in. diam., round, subentire, not crisped. Capsule 9 by ⅛ in.; valves thin, tough. Seeds (including the wings) ⅛ by ⅛ in., thinly discoid.

6. S. Wallichii, Clarke; leaflets large rhomboid acuminate sub-entire mature pubescent, pod linear very long compressed smooth. Spathodea stipulate, Wall. Cat. 6518 B and part C.

IBRAHAWADD E UST NARY; Wall. lich.

Leaves 7, 8 by 4 in., cuneate at the base, subsessile. Corolla not seen. Capsule 4½ by ⅜ in.; septum spongy, ½ by ⅛ in. Seeds sub-4-seriate, 1½ by ⅛ in., subrectangular, compressed flat, wings membranous.—This imperfectly known tree evidently differs from all the other species, and is marked by D. Don in Herb. Wallich as Spathodea Wallichii, D. Don: the septum appears too spongy for Dolichandrone. Seemann has merely noted that the seeds are biserial (i.e. in each cell) without making any guess at the genus.

Sect. 2. XYLOCARPAE. Leaves 2-pinnate.

7. S. xylocarpum, Wight Jc. t. 1335-6; leaflets elliptic acute entire mature glabrous, panicles compound dense pubescent, corolla 1½-2 in. white tinged yellow, capsule stout linear cylindric rugged. Bignonia xylocarpa, Roxb. Fl. Ind. iii. 108; Wall. Cat. 6511; DC. Prodr. ix. 169; Bedd. Fl.

**Tatyx**; Wallich. Malacca and Singapore; Griffith, Maingay.—**Distrib.** Java, Sumatra.

Attaining 80 ft. Leaves 2-pinnate (and ex Kurz 3-pinnate); leaflets 5 by 2 in.; petiole ½ in. Calyx ½–1 in., closed in the bud, in flower shortly 2-lipped or subspathaceous. Corolla glabrous, white, tube rose; lobes crenulate, hardly crisped. Capsule 15 by ½ in.; valves thin, tough. Seeds (including the wings) ½ by ½–3 in., thinly discoid.


"**Deviduba**": Hamilton.


**IX. PAJANELIA, DC.**

A large tree, glabrous except the corolla. Leaves large, 1-pinnate; leaflets numerous, entire. Flowers large in terminal, thyrsoid panicles. Calyx large, ovoid, closed in the bud, in flower ventricose-campanulate, 5-fld. Corolla large, tubular-ventricose; lobes 5, crisped. Capsule large, narrowly oblong, winged, compressed, loculicidally 2-valved. Seeds compressed, with a membranous wing on each side.


**Silhet and Khasia Hills**; Wallich, Griffith. Penu, Tenasserim, and Andamans; Kurz. Malabar, common up to 2000 ft., Beddome, &c.

A tree, 30–60 ft. Leaves 1½–3 ft.; leaflets 19–25, 3–8 in., elliptic, acuminate,
unequal at the base; petiolule \( \frac{1}{3} \) in. Panicles 12–18 in. Calyx \( \frac{2}{3} – 1 \) in.; lobes irregular, extending about half-way down. Corolla 2½ in.; lobes 1 in., hairy especially on the margins, dilated and rounded at the tips. Capsules 12–20 by 2½–3½ in., glabrous; wing on each margin split, so that the capsule appears 4-winged; septum flat, but with a ridge on each face. Seeds \( \frac{3}{4} \) by \( \frac{7}{4} \) in.

**X. DIPLANThERA, R. Br.**

Trees, tomentose or villous. Leaves undivided, large, opposite or whorled. Panicles terminal, sessile, dense, globose. Calyx campanulate, closed in the bud, in flower shortly 2–5-lobed. Corolla yellow, tubular-ventricose; lobes round, entire, subequal. Stamens 4, didynamous; anther-cells lanceolate, separate, pendulous. Capsule broadly spindle-shaped, wooly, loculicidally 2-valved; septum 6, flat, thick. Seeds compressed, discoid, with a hyaline wing.—Species 6, extending from Malacca to N. Australia and New Caledonia.

**D. bancana,** Scheffer in Nat. Tidschr. xxxi. 334.

MALACCA; Walker, Maingay.—DISTRIBUTION. Bangka.

A lofty tree. Leaves 8–13 by 5–8 in., round-ovate, subentire, pubescent, tawny villous on the nerves beneath, 1–2 large glands above near the apex of the petiole; petiole 1 in. Panicles 4–5 in. diam., tawny-villous. Calyx \( \frac{2}{3} \) in., puberulous, articulated on the pedicel. Corolla 1 in. Stamens and style ultimately long exert. Capsule 6 by \( \frac{1}{3} \) in., smooth. Seeds 1½ by \( \frac{7}{3} \) in., wing continued all round except the base.

**XI. AMPHICOME, Lindl.**

Herbs; rootstock woody. Leaves alternate, 1-pinnate; leaflets toothed. Racemes terminal; bracts small, linear, persistent. Calyx campanulate, truncate or 5-toothed. Corolla red, tube elongate widened upwards; lobes 5, round, entire, nearly equal. Stamens 4, didynamous, included; anthers glabrous or hairy, cells separate, divaricate, with a tooth-like appendage near the base. Ovary sub-sessile; ovules sub-2-seriate. Capsule linear, slender, terete, smooth, loculicidally splitting on one side, subfollicular; septum thin. Seeds in one row on each margin of the septum, narrowly oblong, tuberculate, the hyaline wing on each side more or less laciniate.—Species 2, in North-west India and Cebul.


N.W. HIMALAYA, Blinkworth, Royle; Kumaon, alt. 7000 ft., Strachey & Winterbottom; Simal, Fielding; Kunawur and Wangtu, T. Thomson, Stoliczka.

Stems 20 in., sometimes divided. Leaves 5 in.; leaflets 5–9, 1–1½ in.; petiolules \( \frac{1}{1} \) in. Racemes 6–8 in.; pedicels 1 in. Calyx \( \frac{1}{3} \) in., teeth candeate-acuminate from a triangular base. Corolla glabrous; cylindrical base of the tube \( \frac{1}{4} \) in., campanulate portion of the tube \( \frac{3}{4} \) in. Capsule 6–8 by \( \frac{1}{4} \) in.; valves thin. Seeds (including the wings) \( \frac{3}{4} \) by \( \frac{1}{3} \) in.

2. **A. emodi,** Lindl. Bot. Reg. 1838, t. 19, in note; leaflets elliptic or oblong scarcely acute, calyx truncate or with triangular scarcely acuminate teeth, corolla attaining 2 by \( \frac{3}{4} \) in. D.C. Prodr. ix. 237; Bot. Mag. t. 4890. Incarvillea emodi, Wall. Cat. 487, second example; Royle Ill. 296, in note.
W. Himalaya, alt. 2–9000 ft., from Kashmir to Nepal; Wallich, Blinkworth, &c.—Distrib. Cabul?

Glabrous. Racemes not rarely 2–3, subpanicled. Flowers often not larger than those of A. arguta.—This species is very near A. arguta: the Afghanistan examples referred to A. emodi are all hairy.

Order CVIII. Pedalineae. (By C. B. Clarke.)

Herbs or undershrubs. Leaves opposite, or the upper alternate, entire toothed or divided. Flowers irregular, (in the Old-World species) axillary, solitary or rarely clustered; pedicels short; bracts 0 or very small. Calyx deeply 4–5-lobed. Corolla tubular-ventricose; limb obscurely 2-lipped; lobes 5, imbricate. Stamens 4, didynamous; rarely 2. Ovary 2- (sometimes 1-) celled; style filiform, stigma shortly 2-lobed; ovules few or many, supersoned. Capsule 2- or 3–4-celled, indehiscent or dehiscent. Seeds (in the Indian species) wingless, exalbuminous.—Species 40, in the warmer parts of both hemispheres.

The Indian species are readily distinguished from Bignoniaceae by their herbaceous habit and wingless seeds, and from most Scrophularineae by their few or 1-serial seeds.

Martynia diandra, Glox. (DC. Prodr. ix. 253), an American weed (called Tiger-claw or Devil’s-claw), is now common in the Gangetic Plain and elsewhere in India; it is a rank coarse herb with capsules beaked by strong curved spines.

Capsule spineless, 2–4-valved. Seeds many in each cell . . . 2. Sesamum.

I. Pedalium, Linn.


P. Murex, Linn.; DC. Prodr. ix. 256; Burm. Fl. Ind. 139, t. 45, fig. 2; Gaertn. Fruct. i. 276, t. 58; Lank. Ill. t. 538; Roxb. Fl. Ind. iii. 114; Wall. Cat. 6410; Wight Is. t. 1615; Dalz. & Gibs. B. W. Fl. 162.

Decan Peninsula and Ceylon, frequent.—Distrib. Trop. Africa.


II. Sesamum, Linn.

Erect or prostrate herbs. Leaves opposite, upper alternate, entire toothed lobed or divided. Flowers axillary, solitary, or few and fascicled, short-pedicelled, pale or purplish, sometimes yellow-marked. Calyx small, 5-partite. Corolla tubular-ventricose, base subgibbous; limb 2-lipped, lobes 5, rounded. Stamens 4, didynamous, included; anthers sagittate, cells 2 subparallel. Ovary 2-celled, early falsely 4-celled, cells many-ovuled. Capsule oblong or ovoid, loculicidally 2-valved, unarmed, in appearance
4-celled. Seeds numerous, obliquely oblong.—


Throughout the warmer parts of India and Ceylon, cultivated.—

Cultivated in all hot countries. Native country doubtful, probably Asiatic.

Height 1-2 ft., pubescent or puberulous. Leaves 3-5 in., variable on the same plant; upper often narrowly oblong subentire, middle ovate totoothed, lower lobed or pedatisect; petiole 1-2 in. Pedicels ½ in., solitary, rarely 2-3-nate. Sepals ¼ in., lanceolate. Corolla ¼ in., pubescent, white or with red purplish or yellow marks. Capsule 1 by ½ in., erect, scabrid-pilose, the same width from top to bottom, usually shortly acuminate; 2-valved half-way down, or sometimes to the base, or ultimately 4-valved.

2. **S. laciniatum**, Klein; Wildl. Sp. Pl. iii. 359; prostrate, hispid, leaves ovate lobed and deeply subpedately pinnatifid, capsule ovoid compressed, seeds black reticulate. DC., Prodr. ix. 209; Wight Is. t. 1346.

8. **Deccan Peninsula**, Rottler, Wight, &c.; Cochin, Johnstone.


3. **S. prostratum**, Rottz. Obs. iv. 28; prostrate, villous, leaves orbicular or obovate crenate or obtusely lobed with white indumentum beneath, capsule ovoid compressed, seeds black reticulate. Wall. Cat. 6409; Wight Is. t. 1346.

Madras; especially on sandhills near the sea, Rottler, Wight, Shuter.

Closely allied to **S. laciniatum**, and hardly separable therefrom by the characters given. The leaves are generally entire, sometimes 3-lobed half-way; the teeth never sharp as in **S. laciniatum**.

**Order CIX. ACANTHACEAE.** (By C. B. Clarke.)

Herbs or shrubs, rarely trees. Leaves opposite, exstipulate, very rarely divided. Flowers rarely solitary, bracteate and 2-bracteolate. Calyx 5-partite (in Thunbergia small often multifid). Corolla 2-lipped, or subequally 5-lobed; lobes imbricated or twisted in bud. Stamens 4 or 2, inserted on the corolla-tube; anthers 2- or 1-celled; cells sometimes remote. Disc often conspicuous. Ovary superior, 2-celled; style filiform, notched or bident (1 branch often obsolete); ovules one or more in each cell, 1- or 2-seriate, anatropous. Capsule loculicidal; valves often elastically recurved, carrying the seeds on the half-septa. Seeds (except in Thunbergia and the Nelsonia) hard, seated on upcurved subacute supports (retinacula), ovoid or compressed, testa smooth rugose or warted rarely hispid, often clothed with white elastic hairs (best seen when wetted), albumen 0 (except Nelsonia); radicle next the hilum.—Species 1500, in the tropical and warm temperate regions.


Calyx 5-partite. Stamens 2, exerted 5. *Ophiorrhiziphyllum*.

Tribe 3. *Ruellieae*. *Corolla-lobes* twisted to the left in bud. *Seeds* on retinacula. Sepals 5, or 4 with one larger. *Anthers* usually 2-celled; cells parallel or one a little below the other. *Style* 2-fid, one lobe often suppressed.


* Corolla distinctly 2-lipped.


** Corolla subequally 5-lobed.


Flowers capitate or axillary, subsessile. Bracteoles small, narrow, or 0. Capsule seed-bearing from the base 13. *Phaylopsis*.

Flowers clustered at the nodes of the almost leafless branches in terminal panicles. Stamens muticous. Capsule seed-bearing from the base 14. *Delacanthus*.


* Placenta not rising elastically from the base of the capsule (except in a few Strobilanthes).

Corolla subequally 5-lobed. Stamens 4 or 2; anthers muticous 18. *Strobilanthes*.

Corolla large, deeply 2-lipped. Stamens 4; anthers muticous 19. *Calacanthus*.


** Placenta rising elastically from the base of the ripe capsule.


Tribe 4. **Acanthae.** Corolla-tube short; upper lip obsolete, lower 3-lobed. **Ovules** 2 in each cell. Retinacula curved, hardened.

Anterior filaments with an excurrent process . . . 20. **BLEPHARIS.**
Anterior filaments without an excurrent process . . . 21. **ACANTHUS.**

Tribe 5. **Justicieae.** Corolla-lobes imbricate in bud. Retinacula curved, hardened. Anthers 2–1-celled; cells often spurred at the base, one frequently placed much above the other. Style shortly equally 2-fid or subentire.

Subtribe 1. **Andrographideae.** Ovules 3–10 in each cell. Capsule normally 6- or more-seeded.

* Capsule compressed at right angles to the septum; seeds ovoid, hardly compressed.

Flowers panicled or thyrsoid . . . . 28. **ANDROGRAPHIS.**
Flowers axillary, clustered, with cladodes (suppressed branchlets) among them . . . . 29. **HAPLANTHUS.**

** Capsule subterete, seeds much compressed.

Corolla-tube very slender, limb small . . . . 30. **GYMNOSTACHYUM.**
Corolla cylindric, curved, not ventricose nor deeply 2-lipped . . . . 31. **PHLOGACANTHUS.**
Corolla ventricose, not deeply 2-lipped . . . . 32. **CYSTACANTHUS.**
Corolla deeply 2-lipped . . . . 33. **DIOTACANTHUS.**

Subtribe 2. **Barlerieae.** Ovules 2–1 in each cell. Corolla-lobes 5, subequal. Stamens 4, of which 2 are small or obsolete, or 4 1-celled.

Sepals 4, 2 outer opposite larger. Anthers 2-celled . . . . 22. **BARLERA.**
Calyx 2-lipped, 5-lobed. Anthers 2-celled . . . . 23. **NEURACANTHUS.**
Outer calyx-lobes much the larger. Anthers 1-celled . . . 24. **CROSSANDRA.**

Subtribe 3. **Astasieae.** Ovules 2 in each cell. Corolla-lobes 5, subequal. Sepals 5, small, subequal. Stamens 4 or 2; anther-cells 2, subequal, parallel, muticus.

Corolla-tube long, narrow or subventricose. Stamens 4 . . . . 25. **ASTASIA.**
Corolla-tube slender. Stamens 2 . . . . 26. **ERANTHEMUM.**
Corolla-tube ventricose. Stamens 3 . . . . 27. **CODONACANTHUS.**

Subtribe 4. **Eusticieae.** Ovules 2 in each cell. Corolla distinctly 2-lipped.

* Stamens 4, anthers all subequal 2-celled.

Calyx deeply 5- or 4-lobed . . . . 34. **LEPIDAGATHIS.**
Calyx campanulate, 5-toothed . . . . 35. **PHIALACANTHUS.**

** Stamens 2, anthers 1-celled.

Bracts small, narrow. Corolla small . . . . 36. **MONOThECIUM.**
Bracts small, narrow. Corolla long . . . . 37. **CLINACANTHUS.**
Bracts larger than the calyx-segments . . . . 49. **HYPESTES.**

*** Stamens 2, anthers 2-celled.

† Placentae rising elastically from the base of the capsule.

Bracts in 1-sided spikes . . . . . 46. **RUNGIA.**
Bracts clustered, shortly peduncled . . . . 47. **DIOIPTERA.**
† Placenta not rising elastically from the base of the capsule.

† Anther-cells placed one much higher than the other.

Anther-cells muticous, bracts in opposite pairs, valvate.
Anther-cells minutely spurred at base.
Anther-cells apiculate, scarcely spurred at base.
Anthers muticous. Flowers thyrsoid. Corolla not large.

†† Anther-cells parallel, subequal.

Bracts small, narrow. Corolla small.
Corolla-tube ovoid, constricted in the throat.
Bracts large, imbricate. Corolla-tube narrow, long.
Bracts small. Corolla-tube elongate.

I. THUNBERGIA, Linn. f.

Scandent. Leaves often cordate, hastate or angular. Flowers axillary, 1-2-nate, or racemose; bracts at the base of the pedicels leaf-like; bracteoles large, margins coherent at least when young. Calyx small, annular, 10-16-toothed, or obscure. Corolla conspicuous; tube ventricose, curved; limb oblique; lobes 5, rounded, twisted to the left in bud. Stamens 4, didynamous near the base of the corolla-tube; anthers 2-celled, cells parallel, oblique, spurred or not at the base. Disc cushion-shaped or annular. Style long; stigma funnel-shaped, 2-lobed or subentire, or style 2-fid with capitate stigmas; ovules 2 in each cell, collateral. Capsule globose, suddenly narrowed into a barren sword-shaped beak. Seeds 2 in each cell, ovoid or dorsally compressed, not hairy, base plane or excavate, funicle minute or conic.—Species 30, in Africa, Asia, and N. Australia.


Throughout India, alt. 1-4000 ft., from the Himalaya Terai to Ceylon and Tenasserim; ascending to 5-7000 ft.—DISTRIB. Malaya to the Philippines and N. Australia.

Stem slender, retrorsely hairy or glabrate. Leaves 2-3 by ¾-1½ in., obtuse, base cordate or hastate, toothed, mature glabrate; petiole ¾-1½ in. Pedicels 1-3 in., 1 rarely 2 in each axil; bracteoles ¾ in., broadly falcate-oblong, subacute. Calyx in flower ½ in., divided half-way down into 12-16 teeth, nearly glabrous, in fruit ¼ in. Corolla 1½ in., pure white, fragrant. Anther-cells elliptic, acute, base unappendaged. Ovary glabrous; style funnel-shaped, 2-lipped. Capsule ¾-1 in., glabrous, shining. Seeds ¼-½ in., rugose.—The typical *T. fragrans* of the Bengal Terai is considered by T. Anderson, from the pure white of its fragrant flowers, the most charming of Bengal.
plants. According to him (in Thwaites Enum. 234) the plant is not fragrant in Ceylon; but this may apply to Var. vestita.

**Var. levis;** glabrous or grey puberulous, pedicels often 2 in each axil much thickened upwards in fruit, corolla not fragrant, tube often greenish, capsules grey puberulous. **T. levis, Nees in Wall. Pl. As. Rar. iii. 77, and in DC. Prodr. xi. 56.**

**T. fragrans, Bot. Mag. t. 1581; Dalz. & Gibbs. Bomb. Fl. 183.** T. longifolia, Benth. in Pl. Hohenack. 384; Meyenia longiflora, Benth.; Hohenack. in Flora, 1849, 558.—Deccan Peninsula, extending to Behar and W. Bengal.

**Var. vestita, Nees in Wall. Pl. As. Rar. iii. 78, and in DC. Prodr. xi. 57; stem and leaves more hairy, capsule pubescent.—S. Deccan Peninsula and Ceylon.**

**Var. heterophylla;** leaves subentire lower suborbicular upper narrow-elliptic acute uppermost lanceolate sometimes almost linear. **T. heterophylla, Wall. Cat. 771; Promé Hills and Ava; Wall.**—Possibly a distinct species, but the material is fragmentary; the calyx is 12-toothed, and the pedicel solitary axillary, so that it is hence near **T. fragrans.**

2. **T. tomentosa, Wall.; Nees in Wall. Pl. As. Rar. iii. 78, and in DC. Prodr. xi. 58; leaves ovate or oblong acutc, calyx-teeth in flower filiform much longer than the tube hairy, capsule villous. **T. Anders. in Journ. Linn. Soc. ix. 449.** **T. fragrans, Wall. Cat. 767,** partly.

**Nilgherries, alt. 6500 ft.; Wight, Sir F. Adam, Hohenacker, &c.**

Calyx-teeth in flower often ½ in, Bract 1 in., ovate, acute. Corolla pure white, tube 1½ in., mouth 2 in. diam. Ovary densely shortly villous. Capsule 1½ in.—Closely allied to **T. fragrans,** differing by the filiform calyx-teeth and large villous capsule. The thickening of the peduncles upwards in fruit, insisted on by T. Anderson, is more prominent in **T. fragrans var. levis.**

*3. T. alata; Bojer; Hook. Exot. Fl. t. 177;softly villous, leaves ovatecordate, petiole often winged, corolla orange-yellow with a brown or claret eye. **Wall. Cat. 7141; Bot. Mag. t. 2591; Dalz. & Gibbs. Bomb. Fl. Suppl. 71; Nees in Wall. Pl. As. Rar. iii. 78, and in DC. Prodr. xi. 58; T. Anders. in Journ. Linn. Soc. ix. 449; Kurz For. Fl. ii. 240.**

**India,** widely cultivated; naturalized in lower Assam and N.E. Bengal.—**DISTRIB.** Native of Africa.

Closely allied to **T. fragrans,** and often confounded with it. It is certainly African, and only introduced in India.

Sect. 2. **Meyenia.** Flowers axillary, rarely imperfectly racemcd. **Calyx** an entire or scarcely toothed ring. Seeds ovoid, base excavate.

4. **T. Hawtayneana, Wall. Tent. Fl. Nep. 49, in note, and Cat. 769, and Pl. As. Rar. ii. 52, t. 164;** nearly glabrous, leaves sessile cordate-elliptic or -ovate-acute entire, pedicels short, corolla purple. **T. Hawtaynii, T. Anders. in Journ. Linn. Soc. ix. 448. Meyenia Hawtayniana, Nees in Wall. Pl. As. Rar. iii. 78, and in DC. Prodr. xi. 60; Wight ill. t. 164 b, fig. 1, and Le. t. 1487.**

Hills of the S. DECCAN PENINSULA; Canara, Bellary, Dharwar, Mangalore, Nilgherries, Kurg; Wight, &c.—**CEYLON;** Walker.

Stem slender. Leaves 3 by 1½ in. Pedicels ½-1½ in., solitary, a tuft of hair at their base; bracteoles ½-1 in., ovate-oblong, nerves. **Corolla 1½ in., nearly glabrous, violet-purple, tube yellowish. Filaments with short stalked glands continued to the connective; anther-cells of the shorter stamens parallel, subelliptic, unappendaged; of the longer divergent, the upper oblique cell shortly mucronate at the base. Stigma funnel-shaped; lobes 2, oblong. **Capsule 1-1½ in., glabrous; seeds (ex Wight) semiglobose.—In one example of Wight's, the flowers are on axillary branches 2-4 in. long, the floral leaves are reduced by degrees down to ½ in. long, i.e. to "bracts," and the inflorescence becomes a raceme.
5. **T. lutea**, T. Anders. in Journ. Linn. Soc. ix. 448; leaves ovate acuminate or lanceolate toothed, pedicels longer than the petioles, corolla yellow or greenish-white.

Sikkim, alt. 4-7000 ft., frequent; J. D. H., &c.

Pubescent or nearly glabrous. Stem slender. Leaves 6 by 4 in. or (especially upper ones) on the same stem 4 by \(\frac{3}{4}\) in., wide or cuneate, decurrent at the base, feather-nerved; petiole 1-2 in. Pedicels 1½-4 in., solitary, glabrous or pubescent, with a tuft of hairs at the base; bracteoles \(\frac{1}{2}-\frac{3}{4}\) in., broadly oval or round, herbaeous, connate when young. Calyx minute, shorter than the small pedicle within the bracteoles, connate. Corolla 1½ in., glabrous, usually a faint yellow, greenish below. Stamens 4, subsimilar, fifth rudimentary; filaments hairy at the base, glandular upwards; anther-cells sublanceolate, subpendent, separate below, sparsely hairy, white, cells with a round green ciliate basal appendage. **Style** bifid, branches short, linear, subequal, stigmas subcapitate.

Sect. 3. **Hexacentris**. Flowers racemous, or the lower axillary, Calyx an entire or obscurely crenulate ring. Seeds dorsally compressed, base plane.


Bengal, alt. 0-4000 ft.; from Behar and Sikkim to Assam, Mennyour and Chittagong, frequent.—**DISTRI.** N. Burma (cult. ? in China, Singapore, Bombay, &c.).

A large climber; uppermost leaves often passing into bracts. Leaves 6 by 3 in., acute, base cordate, toothed, often angularly lobed, pubescent, rarely glabrate; petiole 3 in. Racemes usually stout, pubescent, angular, somewhat dense-fl., or more slender, elongate, nearly glabrous; upper bracts small, inconspicuous; pedicels \(\frac{1}{2}-\frac{3}{4}\) in., opposite or fascicled; bracteoles \(\frac{1}{2}-\frac{3}{4}\) in., falcate-elliptic, acute, often cohering on one margin. Calyx subentire. Corolla 2-3 in. long and broad. Filaments widened below; anthers subsimilar, \(\frac{1}{2}-\frac{3}{4}\) in. long, bearded; cells parallel with a fine linear basal spur. Ovary pubescent or glabrescent; stigma very large, funnel-shaped; lobes 2, rounded. Capsule 1-2 in., pubescent or glabrous. Seeds flat, \(\frac{1}{2}\) in., diam., subtrigonom, covered (except the large base) with soft brown scaly plate.—Ordinary forms are easily distinguished by the pubescent angular leaves and pubescent raceme; but some Khaskan examples are altogether glabrate with entire elliptic acute leaves; and, except by the leaves being 5-7-nerved rather than 3-nerved at the base, they might be placed with **T. laurifolia**.

Var. ? axillaris; leaves cordate-ovate acute glabrate, pedicels axillary 2-3 in. 1-fl., capsule and seeds as of **T. grandiflora**.—Khaskan; Theria Ghaut, Clarke.—Stems very slender for **T. grandiflora**; corolla noted yellow (but ?). Marked by Kurz as a new species; but the examples do not show the ends of the branches.


MALAY PENINSULA, from Arracan to Malacca; Wallich, Griffith, &c. **ANDAMANS**; Kurz.
Reassembling altogether T. grandiflora, but leaves narrower. Seeds very rugose, hardly scaly. — T. Anderson refers here “partly” Hexacentris acuminata, Nees, which is founded on Wall. Cat. 7140, collected in Sihet or Khasia, and described as having the leaves distinctly 5-nerved.


HIMALAYA, alt. 2–7000 ft., from Kumaon to Bhotan, frequent; Wallich, &c. Assam; Griffith. KHASIA Mts., alt. 1–4000 ft., frequent; H. f. & T., &c. TENAS-SEYEM; Beddome.—(Ceylon, &c., cultivated.) A large climber; pendent branches often 10–25 ft., terminated by racemes. Leaves 5–8 in., lower ovate, upper oblong, obtuse cordate or angular at the base; petiole ½–2 in., or of the uppermost leaves 0. Racemes 6–18 in., lax, pendent; bracts ½–1 in.; pedicels ½–1 ½ in., opposite or fascicled; bracteoles ½–1 in., broadly oblong or ovate, subacute, often coherent on one side, blackish or purple. Calyx a minute rim. Corolla-tube 1 in., lobes ½ in. round, from red to orange-rose. Filaments glabrous, linear, a tuft of hairs at the base; anther-cells parallel; anthers of the longer filaments have 1 cell long-spurred at base, 1 short-spurred or sparsely; anthers of the shorter filaments muticus or with 1 cell shortly spurred. Style-arms linear; stigma subcapitate. Capsule 1–1 ½ in., minutely pubescent or nearly glabrous. Seeds nearly ½ in. diam., subhemispheric (or at least thicker than those of T. grandiflora), rugose not scaly; base plane.—Nees’ description is very erroneous.


Nilgherries and MysoRE; Wight, &c. An extensive climber; branches pendent. Leaves 6 by 1–3 ½ in., base cuneate or rounded, strongly 3-nerved, a slender outer pair of nerves sometimes added; petiole ½–1 ½ in. Racemes elongate, lax, long- or short-peduncled; bracts ½–1 in., linear-lanceolate, inconspicuous; pedicels ½–1 ½ in.; bracteoles 1 in., falcate-elliptic, subacute, often coherent on one side, purplish-green. Corolla 1 ½ in., mouth 2 in. diam.; tube purplish, limb yellow; in cultivation sometimes with a red border (Paxt. Fl. Gard. iii. t. 88). Anthers subparisimal; cells parallel, hairy, all spurred at base. Stigma funnel-shaped, margin somewhat 2-lipped. Capsule 1 ½ in., glabrous. Seeds ½ in. diam., rugose.


Nilgherries; Sisparah, Wight, Beddome. An extensive climber. Leaves 5 by 3 ½ in., base rhomboid or rounded; petiole 1–2 in. Racemes axillary or from nodes of the old wood, 6–12 in.; bracts ½–1 ½ in., linear-lanceolate, deciduous; pedicels opposite, 1 in., 2-ranked, curved, bracteoles 1 by ½ in., obtuse with a macro, purple and cream-coloured (Wight). Corolla 1 ½–1 ¼ in., somewhat narrowly tubular, mouth 1 ¼ in. diam. Anthers subparisimal; cells parallel, glabrous, spurred at the base. Ovary and style glabrous; stigma funnel-shaped, hardly 2-lobed. Fruit not seen.
II. **ELYTRARIA**, Vahl.

Herbs, nearly stemless. Leaves alternate, crowded, subradical. Scape covered by imbricated bracts; spikes close, rigid, simple or divided; bracts spirally imbricate, not opposite; bracteoles smaller than the bracts. Calyx sub-4-partite, segments unequal, the largest sometimes 2-fid. Corolla small, white or blueish; tube linear, limb 2-lipped; lobes 5, oblong, imbricate in bnd. Stamens 2 perfect, attached in the corolla-throat; anthers elliptic, acute; cells 2, parallel, with or without a minute spur at the base. Style shortly 2-lobed; ovules 6–10 in each cell, superimposed. Capsule ellipsoid, acute. Seeds minute, ovoid, reticulated, minutely papillose, attached at a minute point without retinacula.—Species 3–4, American, whereof 1 is widely spread in tropical Africa and Asia.


Deccan Peninsula and Ceylon, common southwards; extending north to Delhi, and to the E. Himalaya, Griffith.—DISTR. Tropical and S. Africa; tropical and N. America.

Stem 0–2 in., woolly. Leaves 2–5 in., sometimes obtusely lobed, pubescent at least on the nerves beneath, sessile or narrowed into a petiole. Scape several, 3–10 in., clothed with bract-like scales. Spikes 1–4 in., harsh, simple or branched; bracts ½ in., margins scarious, ciliate; bracteoles ¼ in., acarous, ciliate. Calyx ½ in.; segments lanceolate, scarious, ciliate, the broad one entire at the apex. Corolla ½ in., white or blueish. Anthers muticos at the base; rudiments of 2 barren stamens sometimes (at least) present. Capsule ¼ in., rigid; valves resilient.—The stem is in African examples sometimes considerably elongate branched, and in American examples the scape is sometimes very tall.

III. **NELSONIA**, R. Br.

A diffuse, softly villous herb. Leaves opposite, elliptic, entire. Spikes ovate or cylindrical; bracts ovate, glandular-villous, closely imbricate, alternate or spirally scattered; bracteoles 0. Sepals 4, unequal, lanceolate, the larger often bifid. Corolla very small, purplish rose or white; tube slender, limb 2-lipped; lobes 5, obtuse, patent. Stamens 2, attached above the middle of the tube; anthers 2-celled, subinclosed; cells broadly ellipsoid, distinct, more or less divergent, glabrous or ciliate, muticos or minutely spurred. Stigma very shortly 2-lobed; ovules in each cell 8–10. Capsule oblong, acute, bearing seeds from the base, barren upwards. Seeds small, roundly ellipsoid, smooth with granular marks, attached on minute points without retinacula.


Throughout India, alt. 0-4000 ft., from the Himalaya to Ceylon and Malacca, common; not in western desert India.—DISTRIBUTION. S.E. Asia, Australia, Africa, America.

Stems mostly short, with petioled leaves often 4-8 in. long; flowering axes trailing, 1-3 ft., with subsessile leaves ½-2 in. Spikes ½-2 in., mostly sessile, terminal or lateral branches; bracts ½-1 in., obtuse, herbaceous. Calyx ½ in., green, striate, hairy or subscarios. Corolla ½ in. Ovary and style glabrous. Capsule ½-1 in., 8-12-seeded. Seeds yellowish with brown granulations.—The picture of the seed by Kippist in Trans. Linn. Soc. xix. t. 6, fig. 11, showing the surface with hammer-headed spines, is erroneous.

Var. vestita: suberect, hairy, leaves very large, corolla-lobes acute. N. vestita, Broom & Sch. Syst. i. Mant. 145. Justicia tomentosa, Roxb. Hort. Beng. 4, and Fl. Ind. i. 131. J. hengalensis, Spreng. Syst. i. 82. Dianthera tomentosa, Roxb. J. Ind. in Herb. Kew.—Pegu; M’Lelland, Brandis, &c.—Cauline leaves attaining 10 in., uppermost 3-5 in.; petiole 2 in. Bracts elliptic, acute.—Dr. King says that it is very easy to distinguish this from every form of N. campestris, but that he can give no good character for it, and that it had better be regarded as an extreme form of that plant. Roxburgh says the capsule is 4- or 3-seeded; it really is as that of N. campestris type.

IV. EBEMAIEA, Nees.

Herbs or small undershrubs. Leaves opposite (in E. glauca alternate), entire or nearly so. Spikes or racemes terminal or quasi-axillary, simple or compound, dense or lax; bract at the base of the pedicel leaf-like or over-topping the flower or small inconspicuous; bracteoles 2 near the base of the calyx, smaller than the bract. Sepals 5, oblong or linear, subequal or one larger. Corolla-tube elongate, cylindrical (in E. coriacea & parviflora short-funnel-shaped); lobes 5, short, patent. Stamens 4, didynamous, included in the corolla-tube (in E. coriacea & parviflora shortly exert); filaments patently hairy (in E. parviflora glabrous); anther-cells 2, ovoid, separate, mucinous. Disc inconspicuous. Ovary glabrous or nearly so; style linear glabrous; lobes 2, oblong, the lower frequently again 2-lobed; ovules very many. Capsule small, oblong, bearing seeds from the base to near the apex. Seeds 15-30 in each cell, small, globose or cuboid; hilum a minute hollow; retinacula 0; unripe glandular, ultimately nearly smooth or with obscure shallow pits; albumen thin, cartilaginous (Benth.).—Species 40, in S.E. Asia, Malaya, Australia, and Brazil.

*Flowers sessile or subsessile, spikes elongate or capitulate rarely divided, sepals ½ in. or more one often distinctly larger than the others.*

1. E. glauca, Nees in DC. Prodr. xi. 73; stem patently viscous-pubescent upwards, leaves petioled spatulate-oblong upper alternate, spikes elongate lax interrupted below, lower bracts petioled linear-spatulate much exceeding the flowers, corolla ½-1 in. Wall. Cat. 9083; Wight Ill. t. 164 b, fig. 2, and Jc. t. 1483; Dalz. & Gbs. Bomb. Fl. 184; T. Anders. in Journ. Linn. Soc. ix. 450; in some part and excl. syn. E. ligulata, Bedd. Jc. Pl. Ind. Or. t. 245.

W. DROGAN PENINSULA and S. MADRAS; frequent; Wight, &c. BENGAL; Darjeeling Terai, Clarkei. TENASSERIM; Beddome.

Stems 12-15 in.; lower leaves and branchies opposite or leaves nearly all alternate.
Leaves 2 by 3 in., obtuse, base attenuate, slightly viscid-pubescent or glabrate, entire or sinuate; petiole 1 in. Spikes 2–6 in.; lowest bracts altogether leaf-like (whence T. Anderson says “flowers solitary axillary”); tip of the spike often dense with short bracts resembling the spike of neighbouring species; bracteoles linear, obtuse, shorter than the calyx. Sepals 4 subsimilar, 1 in., linear-subulate, sparsely glandular-hairy; the fifth longer, much broader, linear-oblong, obtuse. Corolla straight, slightly pubescent without, purplish with rose or yellow stripes. Anter-cells muticous or minutely mucronate at base. Capsule ½ in.—Described from Nees’ type specimen; Wight’s figure is taken from a form having a much denser more glandular-pubescent spike. The Australian species referred here by T. Anderson and Bentham differs in its hairy ovary and capsule, and many other minute points; but it might be better to unite it, and make a wholesale reduction of species here.

Var. spatulata; leaves very spatulate, spikes denser only a few of the lowest elongate, calyx and bracteoles very glandular-hairy, corolla scarcely ½ in. Adenosma spatulatum, Blume Bijb. 757. Ebermaiera spatulata, Hassk.; Nees in DC. Prodr. xi. 74, partly?.—Pegu; Kurz. Tenasserim; Beddome. Bengal; Pubna, Clarke. —Distrib. Java.—Growing in rice-swamps; stems erect, thick, quadrangular or striate; many or nearly all the leaves alternate.—Ebermaiera spatulata, Nees, is described from a Philippine plant of Cummg’s, which widely differs from Kurz’s Pegu specimens.

2. E. polybotrya, Nees in DC. Prodr. xi. 74; stems erect adpressedly grey-pubescent upwards, leaves elliptic subobtuse at both ends, spike cylindric not lax downwards, bracts narrowly oblong scarcely exceeding the calyx, corolla ½ in.

Bengal; frequent in Terai swamps in Sikkim and Silhet, J. D. H., &c. Mouill. and Merqui; Griffith.

Stems 6–8 in., often branched from the base. Leaves all opposite, even at the base of the spike, 1½ by ½ in., subentire, minutely pubescent on the nerves beneath or glabrous; petiole 0 or in the lower leaves scarcely ½ in. Spikes 1½ in.; bracts ½-½ in.; bracteoles linear, shorter than the calyx. Sepals 4 subsimilar, narrow-linear, subobtuse; the fifth rather longer, much broader, oblong, obtuse. Corolla, stamens, and capsule nearly as of E. glauca.

3. E. humilis, Nees in Wall. Pl. As. Rar. iii. 80, and in DC. Prodr. xi. 74; stem erect branched adpressed white-pubescent upwards, leaves opposite subsessile narrowly elliptic, heads terminal small globose, bracts oblong sessile hardly so long as the calyx, corolla ½ in. and upwards. Wall. Cat. 7148; T. Anders. in Journ. Linn. Soc. ix. 450.

Burma; Prome Hills, Wallich.

Stems 6–8 in., branched from near the base; branches ascending, shorter than the central stem. Leaves 1½ by ½ in., obtusely rhomboid at both ends, nearly glabrous, adpressedly white-pubescent on the nerves beneath; petiole hardly ½ in. diam. Heads sessile, ½–3 in. diam.; bracts and bracteoles ¼ in. Sepals, ½ linear, subobtuse; the fifth slightly larger, oblong obtuse.—Nearly allied to E. polybotrya, but the heads are not elongate cylindric, the bracteoles and sepals are less acute, the corolla is larger.


Central India, N.W. Provinces, and Bengal, frequent; Moradabad, Thomson; Bekar, J. D. H.; Bundelcund, Edgeworth; Silhet, Wallich, &c.

Stems numerous, 12–18 in.; nodes in the trailing branches distant. Leaves all (or nearly all) opposite, 1½ by 3 in., subobtuse, entire, minutely pubescent or glabrous;

[396] CIX. ACANTHACEA. (C. B. Clarke.) [Ebermaiera.]
petiole 0–½ in. Heads 2–8-fl.; bracts ½ in.; bracteoles ½ in., narrowly obovate-oblong. Sepals 4, linear, subobtusae, viscidly pubescent; the fifth slightly longer, oblong, obtuse. Corolla blueish with dark veins. Ovary minutely pubescent upward; one stigma-lobes oblong, the other bifid.—Easily separated from E. glauca by its habit, opposite leaves and large flowers.


W. Deccan Peninsula and Ceylon; Concord, Dalzell, Stocks, &c. Ceylon; Macaroe, Thwaites.

Stem erect, short, with large leaves, and flowering runners with much smaller leaves. Leaves 3 by 1 in., subentire, sparsely hairy on both surfaces, or glabrate with nerves beneath pubescent; petiole ½ in., or in the leaves of the lateral branches 0. Spikes 1–2 in., dense; bracts ½ by ½ in., obtuse, apiculate, strongly 1-nerved; bracteoles ½ in., linear-spatulate. Sepals 4, linear, rather shorter than the bracts; the fifth rather broader, linear, subacute. Corolla, stamens, and capsule nearly as of *E. glauca*.


EAST FRONTIER from Cachar, Keenan, to Tenasserim, Beddome; plentiful in Chittagong, J. D. H., &c.

Stem 8–18 in., decumbent at the very base, then erect, longer than the ascending branches. Leaves 3 by ¾ in., hairy. Spikes axillary and terminal 1–4 in.; pedicels of the lower flowers ½–1 in.; bracteoles with fine hairs often ¼ in. long. Sepals 4, sublinear, linear, with fine long hairs; the fifth longer, narrowly lanceolate, twice as broad. Corolla (at least often) white or very nearly so. Otherwise as *E. zeylanica*, with which T. Anderson united this species; but it appears amply distinct.


MERGUI; Griffith. TENASSEERIM (or Andamans), Helfer (Kew Distr. u. 6080).

—DISTEBIR, Java?

Stem decumbent, base almost woody, then erect, 3–4 in., closely rusty-villous. Leaves 4 by 1½ in., obtuse, base narrowed, subentire; petiole ½–1 in. Spikes 1–1½ in., dense; bracts ½ in.; bracteoles ½ in., broadly lanceolate, closely softly hairy. Sepals, two ½ in. linear, two nearly ½ in. linear, one ½ in. lanceolate; all slightly pubescent and ciliate. Corolla and stamens nearly as in *E. glutinosa*. Capsule ½ in.—Nees says that this is nearly the same as *E. incana*, Hassk., of which I have seen no specimen; and Kurz says (Journ. As. Soc. 1870, pt. ii. 78) that it is quite the same. By habit, bracts and indumentum it approaches *E. macrophylla*, T. Anders.

8. *E. lanceolata*, Hassk. Hort. Bogor. 147; stems short branched suberect, leaves oblong or narrowly elliptic cuneate at both ends glabrate or minutely pubescent beneath, spikes cylindric dense, bracts oblong acute

**Penang; Wallich. Malacca; Griffith. Tenasserim (or Andamans), Heffer (Kew Distrib. n. 6077).—Distrib. Jvns.**

*Stems 3–6 in., base almost woody, pubescent. Leaves 3 by ¾ in., narrowed to an obtuse apex, entire, sinuate, pubescent on the nerves beneath, and sometimes also slightly on the lamina; petiole ½–1 in. *Spikes 2 in., dense; bracts ¾ in., not aristate; bracteoles ½ in., narrow-lanceolate, ciliate. *Sepals ⅓ in., linear; the fifth slightly longer and broader; all prominently ciliate. Capsule ¼ in.*


**Khasia Hills up to 3000 ft. alt., and N. Silhet, frequent; Wallich, Griffith, H. f. & T., &c.**


10. **E. angustifolia, T. Anders. in Journ. Linn. Soc. ix. 451, excl. many syn.;** stem decumbent short, leaves narrowly elliptic somewhat whiter beneath, spikes short cylindric or capitate, bracts lanceolate 3-nerved long-awned pubescent ciliate, awns of the bracteoles and sepals without hairs or cilia. *E. Staurogyne angustifolia, Nees in DC. Prodr. xi. 75. Staurogyne angustifolia, Wall. Cat. 4906.*

**Chittagong, alt. 0–1000 ft., frequent; H. f. & T., &c. Pegu; J. Scott. Moumen; Griffith. Rangoon; McLeiand. Tenasserim; King's Island, Heffer.**

Very near *E. Staurogyne*; but the long white cilia on the margin of the lanceolate portion of the bracts and bracteoles at flower-time give the heads a different aspect. The characters drawn from the breadth of the leaves and the cuneation of their bases full; and Mr. Bentham has noted the species as perhaps only a var. of *E. Staurogyne.*

T. Anderson has variously marked it, *E. Staurogyne, setigera, angustifolia, and aristata.* The awns of the bracteoles and sepals have very minute white adpressed bristles.


**Malacca; Cuming.—Distrib. Sumatra, Borneo.**

*Stems 3–6 in., pubescent. Leaves 2 by ⅛ in., cuneate, subobtuse at both ends, glabrous above, puberulous whiter beneath; petiole ½–1 in. *Spikes ½–1 in.; bracts ⅓–¼ in., linear, long-attenuate, subulate, scarcely awned, herbaceous not nervous (as in the two preceding species); bracteoles similar, but rather shorter. *Sepals ½ in., linear-subulate, hardly aristate. Capsule ⅟₄ in.; bracteoles and sepals less stellate in fruit than in *E. angustifolia.*—E. trichocephala, *Miq.,* is referred by Kurz (Journ. As. Soc. 1870, pt. ii. 78) to *E. lanceolata,* and by T. Anderson (Journ. Linn. Soc.
ix. 451) to *E. Staurogyne*; but from the description and habitat is surely *E. setigera*.

12. **E. longifolia**, Nees in DC. Prodr. xi. 76; leaves long-petiöled lanceolate, spikes cylindric softly hairy, lower flowers somewhat pedicelled, bracts narrow-lanceolate attenuate subulate herbaceous hairy below minutely pubescent upwards, corolla \( \frac{1}{2} - \frac{3}{5} \) in. *T. Anders. in Journ. Linn. Soc. ix. 451.*

MALACOA; *Griffith* (Kew Distrib. n. 6079), *Cuming.*

Branches 3-8 in., divided, pubescent; innovations white-sily, subtomentose. *Leaves* 5 by 1 1/4 in., narrowed to both ends, subobtuse, base cuneate, subentire, sinuate, glabrous above, puberulous whitish beneath; petiole 1-2 1/2 in.; lower pedicels often \( \frac{1}{2} \) in.; bracts \( \frac{3}{5} \) in.; bracteoles similar but rather narrower and shorter. *Sepals* \( \frac{3}{5} \) in., very like the bracteoles. *Capsule* \( \frac{1}{2} \) in., rather broader than in the preceding species.

13. **E. axillaris**, Nees in Wall. Pl. As. Rar. iii. 80, and in DC. Prodr. xi. 75; branches almost woody, leaves elliptic narrowed at both ends minutely punctate above, spikes cylindric drooping very hairy, bracts lanceolate acuminate hairy, corolla \( \frac{1}{2} \) in. very hairy without. *T. Anders. in Journ. Linn. Soc. ix. 452.* *Ruellia? comosa,* Wall. Cat. 2414.

PENANG; *Wallich.*

*Leaves* 6 by 1 1/4-2 1/2 in., subobtuse, base cuneate, nearly entire, glabrous, pubescent on the nerves beneath; petiole \( \frac{1}{2} - 1 \) in. *Spikes* 2-4 in., dense, several among the penultimate leaves on the branch; bracts \( \frac{1}{2} \) in., flaccid; pedicels hardly any; bracteoles resembling the bracts, but narrower and rather shorter. *Sepals* \( \frac{3}{5} \) in., linear-lanceolate, acuminate, softly hairy. *Capsule* \( \frac{1}{2} \) in.

** Lower flowers of the racemes more or less distinctly pedicelled, racemes often paniced, sepals \( \frac{1}{2} \) in. or more not very unequal.

14. **E. Simonsii**, *T. Anders. in Journ. Linn. Soc. ix. 451;* leaves large elliptic narrowed at both ends, racemes paniced white-hairy, bracts linear, sepals linear covered to the tips on all sides with glistening white hairs, corolla \( \frac{1}{2} \) in.

KHASIA HILLS; *Bor Pani,* alt. 2500 ft., *Simons.*

*Stems* 6 in., stout, woody, branched, villous upwards. *Leaves* 8 by 3 1/4 in., subobtuse, base cuneate, nearly entire, sparsely hairy or finally glabrate above, glabrous, paler beneath, puberulous on the nerves; petiole 1-2 in. *Racemes* dense, sparingly branched or laxly paniculate, 1-4 in.; bracts \( \frac{1}{2} \) in., very narrowly linear, obtuse; pedicels often \( \frac{1}{2} \) in.; bracteoles \( \frac{1}{2} - \frac{3}{4} \) in., narrowly linear. *Sepals* nearly \( \frac{1}{2} \) in., two of them somewhat shorter. *Corolla* nearly glabrous without. *Capsule* \( \frac{1}{2} \) in.

15. **E. Helferi**, *T. Anders. in Journ. Linn. Soc. ix. 452, chiefly;* stem short stout, leaves obovate-oblong closely minutely pubescent on the surface above and the nerves beneath, peduncles bearing 1 or several racemes, bracts petiöled elliptic obtuse whitened membranous nearly glabrous, sepals linear obtuse nearly glabrous.

TENASSERIM; *Attaran, Helfer* (Kew Distrib. n. 6075). *Pegu; Thongyuen, Brandis.*

*Stems* 4 in., villous, simple. *Leaves* 9 by 5 in., obtuse, base attenuated, somewhat whitened beneath; petiole \( \frac{1}{2} - 1 \) in. *Peduncles* 1-5 from the penultimate axils, 1-3 in., reddish, minutely pubescent. *Racemes* 1-3 in., somewhat dense; bracts \( \frac{1}{2} \) by \( \frac{1}{3} \) in., nervose; pedicels sometimes \( \frac{1}{2} - \frac{3}{4} \) in.; bracteoles \( \frac{3}{4} \) in., narrowly oblong, resembling the bract, upper shorter and narrower. *Sepals* \( \frac{1}{2} \) in., of which 2 rather shorter; the fifth rather longer, twice as broad, 3-nerved. *Corolla* \( \frac{1}{2} \) in., glabrous or nearly so.
Capsule 4 in.—T. Anderson l. c. describes one of the bracts as at the same time 1-nerved and 3-nerved, but he subsequently himself separated in the Herbarium his E. macrophylla.


**LOWER BURMA**; Chappedong, Wallich; Moulmein, Parish, Lobb.

**Stem** 1-3 in., stout, villous. Leaves 7 by 4 in., base broadly rhomboid; petiole 2-5 in. **Peduncles** 1 in.; spikes 8 in.; bracts 1/2-1 in.; pedicels 1/2 in.; bracteoles 1/2-1 in., resembling the bracts, unequal. **Sepals** 1 in., linear, scarcely acute, pubescent. **Corolla** ½ in., glabrous or nearly so.—Exceedingly near E. Helferi, but the bracts and bracteoles are much smaller, not white membranous nerve.

17. **E. Griffithiana**, T. Anders. in Journ. Linn. Soc. ix. 452; stem short, leaves petioled elliptic rounded at both ends minutely closely pubescent above, racemes elongate panicked, bracts elliptic pubescent, sepals 1/2-1 in. linear. Erythracanthus Griffithianus, Nees in DC. Prodr. xi. 78. E. obtusus, Wight Ic. t. 1491, not of Nees.

**MALACCA**; Griffith (Kew Distrib. n. 6078).

**Stem** 3-6 in., herbaceous, branched, pubescent. Leaves 5 by 3 in., pubescent beneath or finally on the nerves only; petiole 1½ in. **Peduncles** 1-2 in., reddish; racemes up to 5 in.; bracts 1/2 by 1 in., hardly acute; pedicels 0½ in.; bracteoles 1/2 by 1 in., similar to the bracts. **Sepals** subequal, narrowly linear, somewhat striate longitudinally. **Capsule** 3 in.


**PENANG**; Wallich (fide T. Anderson).—**DISTRIB. JAVA**.

**Stem** 6 in., erect, pubescent. Leaves 6 by 2 in., obscurely pubescent beneath, herbaceous, concolorous or nearly so, nerves beneath inconspicuous; petiole 1-2½ in. **Raceme** 10 in., branched near the base; bracts 1/2 by 1 in., acuminate, scarcely awned; pedicels 0½ in.; bracteoles ½ in., linear. **Corolla** 1½ in., minutely pubescent without. **Capsule** nearly 1½ in.—The example from Java marked E. subpaniculata, Hassk., in E. elongata, Nees; but it may perhaps be wrongly named, as the description of Hasskarl (in Retzlia, 77) says inter alia that the leaves of E. subpaniculata are mostly alternate, much whitened beneath.

19. **E. lasiobotrys**, Nees in DC. Prodr. xi. 721; stem erect sub-tomentose upwards, leaves narrowly elliptic cuneate at both ends glabrate above, racemes elongate very lax, bract filiform very small, sepals ½ in. linear with patent white hairs to the tips on all sides. **Wall. Cat. 9084**; T. Anders. in Journ. Linn. Soc. ix. 452.

**LOWER BURMA**; Chappedong Hills, Wallich; Mergui, Griffith; Moulmein, Falconer; Tavoy, Parish.

**Stem** decumbent, rooting, then 6-15 in. erect. Leaves 5½ by 2 in. (usually smaller), mature glabrous minutely pubescent on the nerves beneath; petiole 1½ in. **Panicles** 6-12 in., straggling; racemes 2-5 in., lower flowers distant; bracts 1/2 in.
lower pedicels $\frac{1}{4}$ in.; bracteoles $\frac{1}{8}$ in., filiform. *Sepals subequal, somewhat larger in fruit.* Corolla $\frac{1}{4}$ in., narrow tubular, sparsely minutely hairy. *Capsule $\frac{1}{4}$ in.*

20. **E. paniculata**, Wall. *mss.*; *T. Anders.*, in *Journ. Linn. Soc.* ix. 453; stem erect subtomentose upwards, leaves narrowly elliptic cuneate at both ends glabrate above, panicle compound, racemes lax, bracts filiform very small, sepals $\frac{1}{4}$ in. linear nearly glabrous.

**Munkeypoor**; *Hort. Calcutt.* S.E. *Assam* (or Ava), *Griﬃth* (Kew *Distrib.* n. 6082).

*Stems 1 foot, woody, sometimes branched. Leaves 7 by 3 in. (often smaller) scarcely acute, prominently reticulated, pubescent on the nerves beneath; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. **Panicles** (including peduncles) 6–9 in., reddish, minutely pubescent; bracts $\frac{1}{4}$–$\frac{1}{6}$ in., minutely pubescent; pedicels $\frac{1}{4}$–$\frac{1}{6}$ in.; bracteoles $\frac{1}{5}$ in., filiform. **Sepals** $\frac{1}{8}$ in. in flower, $\frac{1}{4}$ in. or more in fruit. Corolla $\frac{1}{4}$ in., slender, nearly glabrous. *Capsule $\frac{1}{4}$–$\frac{1}{2}$ in.*—Closely allied to *E. lasiobotrys*, but with smaller flowers and fruit, and the panicle without the abundant hair of *E. lasiobotrys*.

**Var. glabrior**; leaves less reticulated, panicle thin very glabrous, sepals very slender glabrous.—Patkoy Mts., alt. 4000 ft.; *Griﬃth* (Kew *Distrib.* n. 6085).


**Merger**; *Griﬃth* (Kew *Distrib.* n. 6083). *Moulmein*, *Falconer*.

*Stem 3–4 in. Leaves 3$\frac{1}{2}$ by 1$\frac{1}{2}$ in., very obtuse, base sometimes subcordate, beneath glabrous, the nerves pubescent; petiole $\frac{1}{4}$–2 in. **Pedicules** often numerous from the upper axils; panicles 3–5 in., racemes lax; bracts $\frac{1}{4}$–$\frac{1}{6}$ in.; lower pedicels $\frac{1}{4}$–$\frac{1}{5}$ in.; bracteoles $\frac{1}{6}$ in., filiform. **Sepals** $\frac{1}{8}$ in. in flower, in fruit $\frac{1}{8}$ in. Corolla $\frac{1}{4}$ in., slender, minutely hairy. *Capsule $\frac{1}{4}$ in.*

22. **E. Maclellandii**, *T. Anders.*, in *Journ. Linn. Soc.* ix. 454; stem erect branched, leaves oblong narrowed at the base obscurely pubescent above, panicles small numerous patently softly hairy lateral and terminal, bracts small oblong herbaceous, sepals $\frac{1}{4}$ in. linear patently hairy.

**Pegu**; *M. Lelland*.

*Stems 6–12 in., herbaceous, pubescent. Leaves 2$\frac{1}{2}$ by 1$\frac{1}{2}$ in., obtuse, mature nearly glabrous; petiole 0–$\frac{1}{4}$ in. **Panicles** 1–2 in., on short branches beginning near the base of the stem; lower bracts passing gradually into leaves, upper scarcely $\frac{1}{4}$ in.; pedicels mostly short, some attaining $\frac{1}{4}$ in.; bracteoles $\frac{1}{6}$ in., narrowly oblong. Corolla $\frac{1}{4}$–$\frac{1}{2}$ in.—Allied to *E. glauca* and *E. polybotrya*, but is driven to this position in the linear series by its slender racemes and subequal sepals.

***Racemes elongate, lax, calyx small ($\frac{1}{4}$–$\frac{1}{4}$ in. long).***


**Malay Peninsula**, from Moulmein southwards, and Penang, frequent; *Wallach*, &c.—*Distrib.* Java.

*Stems attaining 15 in., branched, closely brown-villous. Leaves 4$\frac{1}{2}$ by 1$\frac{1}{4}$ in., scarcely acute, reddish brown, glabrous beneath, pubescent on the nerves; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. **Pedicules** 2–3 in., subterminal; racemes 2–5 in., often simple, sometimes divided; bracts $\frac{1}{4}$–$\frac{1}{6}$ in., narrowly oblong or linear; pedicels sometimes $\frac{1}{4}$–$\frac{1}{6}$ in., often...
hardly any, the raceme becoming altogether a spike; bracteoles smaller than the bracts. Corolla glabrous. Capsule ⅓ by ⅔ in.


**Mergu;** Helper (Kew Distrib. n. 6081).

Stem 1-3 in., closely villous. Leaves 3 by ⅓ in., tip rounded, subcoriaceous; petiole ⅓ in. Peduncles several, 1-3 in., reddish; racemes 1-4 in., slender, simple or little divided, minutely pubescent or glabrate; bracts ⅓ in., narrow-lanceolate; lower pedicels scarcely ⅓ in.; bracteoles smaller than the bracts. Corolla narrow, glabrous. Capsule scarcely ⅔ in., broad lanceolate.


**Martaban;** Parish.

Leaves 8 by 3 in., obtuse, minutely pubescent on the nerves beneath; petiole 0-⅔ in. Peduncles several, 3-5 in., slender; pedicules compound; bracts ⅓ in., linear; pedicels 0-⅔ in.; bracteoles ⅓ in., linear. Sepals minutely pubescent. Corolla glabrous without when expanded, or nearly so. Capsule ⅓ in.


**Moulmein;** Lobb.

Stem 4 in., almost woody at the base. Leaves 2 by 1 in., obtuse, base rhomboid, subcoriaceous, secondary nerves obscure; petiole ⅔ in. Peduncle 1½ in.; raceme 4 in., many-fl.; bracts ⅔ in., narrow-lanceolate; lower pedicels ⅔ in.; bracteoles in., narrow-lanceolate. Calyx with dense soft, short, grey hair. Corolla with a very short cylindrical base, a short funnel-shaped portion at the base of which the filaments are inserted, elliptic or oblong erect-patent lobes, closely patently glandular-hairy. Stamens and pistil of Ebermaiera; filaments densely patently hairy upwards. Capsule ⅔ in., oblong, as of Ebermaiera.—The corolla is nearly as in Ophiorrhizophyllum.


**Moulmein;** Lobb.

Stem 1 in., subtomentose. Leaves 6 by 2½ in., obtuse, base rhomboid or almost rounded; petiole ⅔ in. Peduncle 4½ in., pubescent, with 9 scattered bracts ⅓ in. long; pedicels 4½ by ⅔ in.; bracts ⅔ in., linear; lower pedicels scarcely ⅓ in.; bracteoles ⅔ in., subulate. Corolla as of *E. coriacea* but smaller, the external hairs shorter. Filaments glabrous except near the base; anther-cells ovoid, minutely puberulous. Pistil as of *E. coriacea*.—Closely allied to *E. coriacea*, but with much larger leaves, and smaller flowers.

28. **E. Beddomei**, Clarke; leaves elliptic acuminate at both ends puberulous on the nerves beneath, racemes solitary simple linear minutely pubescent, corolla ⅓-⅔ in. funnel-shaped.

**Tenasserim;** Mt. Moolayit, Beddome.

Stems densely pubescent. Leaves 4½ by ⅔ in., membranous, whitened underneath;

V. OPHIOPHIZIPHYLLON, Kurz.

An erect herb. Leaves opposite, petioled, elliptic, entire. Spikes very long, many-fld.; bracts narrowly oblong, exceeding the calyx; bracteoles small. Sepals 5, subequal, narrowly lanceolate. Corolla shortly tubular, curved at the mouth; lobes 5, elliptic, suberect. Stamens 2; filaments long, exsert, glabrous; anther-cells 2, oblong, muticous, separate, approximate, erect. Disc inconspicuous. Ovary glabrous; style long, glabrous, shortly 2-lobed; ovules very many. Capsule oblong and seeds as of Ebermaiera.

O. macrobotryum, Kurz in Journ. As. Soc. 1871, pt. ii. 76.

Martaban; Thoungyen, Brandis. Kaben Hills; Kurz.

Stem 6–10 in., undivided, pubescent upwards. Leaves 6 by 2 1/2 in., cuneate, subacute at each end, glabrous, or pubescent on the nerves beneath; petiole 4–1 1/2 in. Peduncles 1–3, subterminal, 1–3 in.; spikes 3–7 in.; bracts 1/2 in., glabrescent; bracteoles 1/2 in., linear. Sepals 1/2–1 1/2 in., pubescent. Corolla 1/2 in., white or pale rose, minutely pubescent without. Stamens inserted in a ring of hairs, 2 small staminodes added. Capsule 1/2 in.

VI. CARDANTHERA, Ham.

Herbs, often viscid, aromatic. Leaves opposite, upper toothed rarely entire, lower often pinnatifid or in water pectinate. Flowers spiked or whorled, or 1–3 together in opposite axils; bract or bracteoles often suppressed. Sepals narrow, often unequal. Corolla nearly straight, tube shorter than the calyx; limb long, 2-lipped, twisted to the left in bud; palate transversely plicate-rugose, purple-rose and white. Stamens 4, didynamous; anthers of the posterior often smaller; anther-cells parallel. Ovary narrow; style sparsely hairy. Capsule sessile, narrow, 40–100-seeded, bearing seeds from the very base. Seeds small, ovoid, somewhat compressed, glandular-puberulous or glabrous; retinacula minute, conical, soft, not curved.—Species 10, Indian and Tropical African.

C. Thwaitesti has solitary flowers, a plane palate, 2 stamens, and stronger retinacula.


* Spikes terminal, bracts 4-ranked imbricated in fruit.

In drying-up rice-swamps, S. Madras; frequent. Ceylon; Walker. Sikkim
Threat; Herb. Griffith.

Annual, 1–1½ ft., erect or decumbent, branching from the base. Leaves 1 by ½ in., glabrous or subpubescent. Spikes 1–3 in., scarcely interrupted at the base even in fruit; bracts ½ in., from elliptic to cordate, glabrous or puberulous; bracteoles ¼ in., obovate or elliptic. Sepals ½ in., linear, pubescent. Corolla ¼ in., puberulous. Anthers of the posterior stamens half as large as of the anterior. Capsule ½ in., minutely pilose upwards.—Much confused by the older botanists with the universal Hygrophila polysperma, to which I suspect Miquel's Javanese C. uliginosa should be referred.

† Whorls or spikes axillary; fruiting interrupted at the base.

2. C. Griffithii, Benth. in Gen. Pl. ii. 1074; leaves spatulate oblong or elliptic crenulate pubescent, spikes terminal interrupted at the base in fruit, corolla ¼ in. Adenosma Griffithii, T. Anders. in Journ. Linn. Soc. xi. 454.

Upper Assam; Sudderias, Griffith (Kew Distrib. n. 6087).—Distrib. N. Burma. Annual, decumbent, rooting; branches 1 foot, pubescent. Leaves 1½ by ½ in., subpetiolo, obtuse; on the barren shoots smaller, broader. Spikes 1–4 in., pubescent, axillary and forming terminal panicles; lower bracts distant (at least in fruit), leaf-like, often containing 2–3 flowers; proper bract ¼ by ½ in., elliptic; bracteoles ½ in., narrowly oblong. Sepals linear-lanceolate. Corolla purple, puberulous. Anthers of the posterior stamens smaller than those of the anterior. Ovary nearly glabrous, a few gland-tipped hairs about its apex. Capsule ½ in.

3. C. balsamica, Benth. in Gen. Pl. ii. 1074; branches glabrous upwards, leaves petioled oblong crenate, flowers mostly in axillary whors, sepals longer than the bracts linear-lanceolate one larger than the others. Ruellia balsamica, Linn. f. Suppl. 289. Adenosma balsamica, Spreng. Syst. ii. 829; Wall. Cat. 9082; Wight Is. t. 446; Nees in DC. Prodr. xi. 58; T. Anders. in Journ. Linn. Soc. ix. 454.

S. Deccan Peninsula and Ceylon; in rice-swamps, frequent.

Annual, decumbent or erect, branches 6–15 in.; glabrous, or the inflorescence puberulous; lineolate with raphides. Leaves 2 by ⅜ in., obtuse, base attenuate; petiole ½ in.; lower leaves sometimes pectinate or pinna-tiftid. Whorls usually numerous, distinct; flowers 1–5-nate; bract ½–⅜ in., obovate or elliptic; bracteoles similar, but smaller, in crowded whors, often suppressed. Sepals ¼ in., not widened upwards. Corolla ¼ in., nearly glabrous. Anthers of the posterior stamens smaller than the anterior. Capsule nearly ⅜ in., puberulous upwards.

Var. Thymus; leaves ¾ in., corolla ¼ in., capsule scarcely ¼ in. Adenosma Thymus, Nees in Wall. Pl. As. Rat. iii. 79, and in DC. Prodr. xi. 69, excl. syn.; T. Anders. in Journ. Linn. Soc. ix. 454. Ruelliaernus, Heyne; Wall. Cat. 2380 (part of letter B only), not of Roxb.—Deccan Peninsula, Heyne. Nees and T. Anderson place this text C. trisora, Ham., from which Nees carefully distinguishes it; the example is almost certainly a starved specimen of C. balsamica.

4. C. verticillata, Benth. in Gen. Pl. ii. 1074; branches pubescent upwards, leaves often petioled oblong or elliptic crenate, flowers mostly in axillary whors, sepals longer than the bracts linear-spatulate. Ruellia verticillata, Wall. Cat. 2409. Adenosma verticillata, Nees in Wall. Pl. As. Rat. iii. 79, and in DC. Prodr. xi. 69; Wight Is. t. 1524; T. Anders. in Journ. Linn. Soc. ix. 454.

Deccan Peninsula; Carnatic, Hayne, Wight; Conceo, Stocks, &c. Ceylon; Thottam.

Leaves often somewhat pubescent, especially on the midrib beneath. Inflorescence
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Cardanthera.] CIX. ACANTHACEE. (C. B. Clarke.)

ciliate-pubescent. Sepals wider upwards.—Scarcely specifically separable from C. balsamica.


On the margin of water; **BENGAL**, very common. **ASSAM**, **PEGU** and **SINGAPORE**.

Annual, decumbent, rooting at the base, 1 foot. Lower leaves often pinnatifid; in water large, pectinate, membraneous; cauline 4-1 in. diam., tip rounded, base cuneate or subpetioloed, somewhat closely sharply toothed. Flowers 1-3-nate; bract nearly ½ in., obovate, sometimes toothed; bracteoles ¼ in., oblong. Sepals hairy, one longer than the others, very acute. **Corolla** ½ in. **Anthers** nearly equal. **Capsule** ½ in., pubescent.


**BURMA**; *Wall. McClettland*, &c.—**DISTRIBUTION.**

An annual weed, 1 foot, decumbent, rooting in mud, branches erect or procumbent. Lower leaves usually pinnatifid; upper 1-1½ in. obtuse, base often subquadrate, with many patent white hairs. Spurs 1-5 in., weak; bract ½-1 in., narrowly elliptic; bracteoles ¼ in., narrowly oblong, obtuse. Sepals ½ in. and upwards, white-hirsute. **Corolla** ½ in., pubescent without, purple. **Anthers** nearly equal. **Capsule** ½ in., puberulous.


**W. DECCAN PENINSULA**; *Canca and Canara*, *Dalzell. Beddome*, &c.; *Mangalore*, *Wight*.

Biennial; branches 1-2 ft. Leaves 2-4 in., deeply pinnatifid; lobes numerous, oblique, oblong; or smaller, or ½ in. and crenate on the same plant, cuneate or spathulate, more or less petioloed. Spurs 1-2½ in., terminal, weak, hardly interrupted, many-fld.; or more commonly flowers few, distant, solitary, sometimes on very short axillary branches appearing pedicelled; bracts ½ in., elliptic; bracteoles ¼ in., oblong. Sepals ½ in. **Corolla** ½ in. **Anthers** subequal; cells parallel, base not divided nor cordate. **Capsule** nearly ½ in., glabrous.


**CEYLON**; Batticaloa, in the tropical region, **Thwaites**.
Annual, 6-12 in., erect, branched, viscid. Leaves 1-1½ in., obtuse, base much attenuate or petiolate. Flowers very numerous; cymes dichasial, going off into sympodia; upper branches of the cyme in appearance scorpoid with distant flowers, i.e. at each bifurcation one branch with one flower is suppressed; bracts ½ to ½ in., ovate or elliptic; bracteoles small or 0. Sepals ½ in., linear, unequal. Corolla ⅛ in., puberulous; lobes twisted to the left; palate not transversely plicate. Anthers sub-quadrate; posterior stamens reduced to filaments. Ovary glabrous, tip glandular-hairy; style sparsely hairy. Capsule ⅛ in., bearing seeds from the base. Seeds 40-60, ovoid, slightly compressed, the white fine hairs starting out on all sides when moistened; retinacula conical, slightly curved, scarcely hardened.—Possibly a distinct genus, resembling Brillantaisia except that it is the posterior stamens that are imperfect in this.

VII. HYGROPHILA, Br.

Herbs, (in H. spinosa) spinescent. Leaves opposite, lanceolate or obovate, entire. Flowers sessile, in terminal heads or in axillary whorls; bracts elliptic or lanceolate; bracteoles oblong or lanceolate, shorter than the calyx. Calyx tubular, 5-fid (or in H. spinosa 4-partite); teeth lanceolate or linear. Corolla blueish-purple, nearly glabrous; tube ventricose at the apex; limb deeply 2-lipped, oblong, straight. Stamens didynamous, posterior similar to the anterior, or smaller, or rudimentary, filaments glabrous; anthers oblong, cells equal, divaricate or connate at the base. Ovary oblong, tip hairy; style long hairy, stigma simple linear. Capsule linear or narrowly oblong, bearing seeds from the base, 40-100-seeded, or in H. spinosa 2-3-seeded. Seeds ovoid, compressed, elastically white-hairy when wetted; retinacula hardened, curved and acute.—Species 18, tropical and subtropical.


* Spikes terminal.


Throughout INDIA in wet places, alt. 0-5000 ft., from the Punjab and Bhotan to the S. Deccan and Malacca.—Distrib. Cabul.

Annual, 6-18 in., branching and rooting. Leaves ½-1½ in., from narrowly oblong to ovate, base spathulate or petiolate. Spikes 1-5 in., somewhat pubescent; bracts ½-1 in., broadly elliptic, imbricate; bracteoles ⅛ in., lanceolate. Sepals ½ in., linear, hairy. Corolla ⅛ in., slender, pubescent, pale blue or white. Anthers oblong, cells slightly divaricate at the base; posterior stamens reduced to teeth. Ovary hairy at the apex. Capsule ½-3½ in.; seeds 20-32.—The examples from Tenasserim and Malacca are larger and more glabrous; the capsules ⅛ in.

Hygrophila.] CIX. ACANTHACEAE. (C. B. Clarke.)

Mag. ii. 311, and in DC. Prodr. xi. 81; Dals. & Gibs. Bomb. Fl. 184; Wight Ic. t. 1493.

W. DECCAN PENINSULA, from Malwa (Edgeworth) to Mysore; frequent in the Concan.

Rootstock woody; stems 4-16 in., procumbent or creeping. Leaves 1/2-1 in., lanceolate to orbicular, entire, minutely stigose and with long lax white hairs, lineolate with raphides, nearly glabrate or minutely tomentose beneath; petiole 0-3 in., but in some basal leaves 1/2 in. Spikes dense, white-stigose; bracts 1/4 in., elliptic; bracteoles 1/8 in., oblong. Sepals 1/8 in., linear. Corolla 1/4 in.; tube ventricose upwards, limb long, deeply 2-lipped. Style hairy. Capsule 1/8 in., 8-10-seeded.—The figure of Wight (Ic. t. 1493) shows the 4 anthers subequal, but this is not the ease in his example from which he notes his icon was taken. The synonym, Ruellia polypetala, Roth, has been always supposed to have been Hygrophila polypetala, T. Anders.; but as Roth says his plant had didynamous stamens and ovate heads, his description must belong here, whatever his plant was.—The leaves of H. Serpyllum vary very much in form and indumentum.

Var. Hookeriensis; leaves orbicular obtuse caule leaves often distinctly petioled.—Physiculus sp. nn. 2, 3, Herb. Ind. Or. H. f. & T.; Concan; Stocks. Bombay, Law. A larger plant; caule leaves often 1 in. diam., petiole 1/2 in., with minute white bristly hairs, but none of the long white hairs characteristic of H. Serpyllum type.

3. H. Stocksii, T. Anders, ms.; caule leaves petioled spathulate-elliptic, spikes ovate or shortly oblong, anthers of the posterior stamens 1/2 the length of the anterior.—Physiculus n. 4, Herb. Ind. Or. H. f. & T.

Concan; Stocks.

Branches 18 in., stout; internodes 2-3 in. Caule leaves 2 1/2 by 1 in.; petiole 1/2 in. Corolla 1/2 in. Anthers of the posterior stamens minute, but (at least sometimes) they appear to contain a few pollen-grains.—Reduced to a Var. of H. Serpyllum by T. Anders. (in Journ. Linn. Soc. ix. 456), but subsequently marked by him as a species.

** Whorls axillary, distinct.

4. H. salicifolia, Nees in Wall. Pl. As. Rar. iii. 81, and in DC. Prodr. xi. 92; erect, leaves lanceolate glabrous, bracteoles lanceolate acute, calyx in flower divided half-way down lobes linear hispid-ciliate, capsule a little longer than the calyx. Wight Ic. t. 1490; Dals. & Gibs. Bomb. Fl. 184. Ruellia salicifolia, Vahl Symb. iii. 84; Roxb. Fl. Ind. iiii. 50; Wall. Cat. 2373. R. longifolia, Roth Nov. Sp. 306.

Throughout INDIA and CEYLON, very common.

Stems 1-3 ft., nearly glabrous. Leaves 2 1/2 by 1 1/2 in., narrowed at both ends, lineolate by raphides; petiole 0-1 in.; bract 1/4-1/2 in., ovate or elliptic; bracteoles 1/2 as long as the calyx. Calyx 1/4 1/4 in., divided to the base in fruit. Corolla 1/4-3/4 in., pale purple. Stamens 4, fertile; anthers subequal. Capsule 3/8-3/2 in., 20-22-seeded.

—The whole of the species of this section are included under the present by T. Anders. (in Journ. Linn. Soc. ix. 456), which then has a geographic area extending through S.E. Asia, Malaya, Trop. Australia, Trop. America; but if this view be taken, the name of the species should be H. angustifolia, Br. (Prodr. 479; Nees in DC. Prodr. xi. 91).

Var. assurgent; stem decumbent or geniculate rooting with erect branches, leaves obovate-oblong or elliptic subacute. H. assurgent, Nees in DC. Prodr. xi. 30, exct. syn. and var. B. H. radicans, Nees in Wall. Pl. As. Rar. iii. 81, and in DC. l. c. 92. Ruellia radicans, Wall. Cat. 2410.—E. Bengal, frequent; Wallich, &c. Malaca; Mainagay (Malaya).

Var. dimidiata; leaves obovate or elliptic glabrous densely lineolate especially on the upper surface, base attenuate. H. dimidiata, Nees in Wall. Pl. As. Rar. iii. 81;
Hygrophila.

Wall. Cat. 7150. H. obovata, Nees in Wall. Pl. As. Bar. iii. 81, and in DC. Prodr. xi. 91 (not of Wight, nor Ruellia obovata, Roxb.). H. undulata, Nees in DC. l. c. 91, partly (not Ruellia undulata, Vahl).—Prome; Wallich. Mergui; Griffith.—Distrib. Java, Borneo. Lateral nerves of the leaves patent, arcuate, prominent, regular. Whorls often dimidiate, but entire often, as in Wallich’s type specimens.

5. H. quadrivalvis, Nees in Wall. Pl. As. Bar. iii. 80, and in DC. Prodr. xi. 89; erect, leaves lanceolate or elliptic narrowed at both ends gradually, bracteoles oblong obtuse, calyx in flower divided \( \frac{1}{2} \) the way down lobes lanceolate minutely striigillose, capsule much exceeding the calyx. H. obovata, Wight l.c. t. 1489; Nees in Pl. Hohenack. n. 292. H. undulata, Nees in DC. Prodr. xi. 91, partly. Ruellia quadrivalvis, Wall. Cat. 2374, type sheet. R. undulata, Vahl. Symb. iii. 82.—Rheed. Hort. Mal. ii. t. 46.

From Bengal to Ceylon and Malacca, common.

Closely resembling H. salicifolia except in the points stated. Leaves usually larger, in Ruellia undulata attaining \( \frac{1}{2} \) in., undulate on margin. Calyx often gamosepalous long after flowering. Capsule frequently \( \frac{1}{2} \) in., stouter than in H. salicifolia. —Ruellia barbata, Vahl. Symb. iii. 83, added here by Nees, is stated by Vahl to have biaristate anthers, and his description does not otherwise fit well.

6. H. phlomoides, Nees in Wall. Pl. As. Bar. iii. 80, and in DC. Prodr. xi. 90; erect, leaves sub sessile elliptic or oblong hairy, whorls of flowers hisrate often distinct, calyx in flower divided half-way down teeth linear hispid. Ruellia phlomoides, Wall. Cat. 2376, type sheet. R. hissuta, Roxb. Fl. Ind. iii. 51. Dipteranthenus ciliatus, Nees in Wall. Cat. 715.

Bengal, Sikkim and Assam, near the base of the hills; Cachar, Chittagong, Pegu.

Stems 2–3 ft., hisrate upwards. Leaves often 3–6 in., base narrowed, mostly quite sessile. Whorls of flowers dense; bracteoles linear-oblong, as long as the calyx-tube. Corolla \( \frac{3}{4} \) in. Capsule \( \frac{1}{2} \) in., somewhat exceeding the calyx.

Var. Roxburghii; branched or decumbent, leaves obvate often shortly petioled usually small hairy or nearly glabrous, calyx-teeth linear-lanceolate, corolla \( \frac{1}{2} \) in. H. obovata, Griff. Notul. iv. 134. Ruellia obovata; Roxb. Fl. Ind. iii. 51; Wall. Cat. 2375, type sheet. —Chittagong, Roxburgh; Soonderhunda, J. D. H., &c.; Pegu, Badomoe; Mergui, Griffith. Var. repens; procumbent, rooting, leaves \( \frac{1}{2}–1 \frac{1}{2} \) in. obvate, flowers rather smaller. Silhet; H. f. & T., &c.

7. H. incana, Nees in DC. Prodr. xi. 91 (excl. syn. Roxb.); erect, innovations closely softly white-hairy, leaves narrowly lanceolate adult densely linate on both surfaces, calyx in flower divided more than half-way down, teeth often softly white-hairy and hispid. Ruellia incana, Heyne in Herb. Rottler. R. mollissima, Klein ms., not of Vahl.

Decoan Peninsula; Rottler.

Leaves \( \frac{1}{2} \) by \( \frac{3}{4} \) in., very acute at both ends; petiole hardly any. Capsule \( \frac{1}{2} \) in., shortly exceeding the calyx. —Very distinct by its soft close white hairiness, to which scattered long white hispid hairs are added. It is altogether remote from Ruellia obovata, Roxb. (= H. phlomoides, Nees Var.), of which Roxburgh’s picture is in Herb. Kew.


8. H. spinosa, T. Anders. in Thouates Enum. 225, and in Journ. Linn. Soc. vii. 22; stout, erect, hispid, leaves lanceolate, whorls axillary spinose...
Hygrophila.] CIX. ACANTHACEAE. (C. B. Clarke.) 409


Throughout India in ditches, abundant; from the Himalaya to Ceylon (not seen from Malay Peninsula).

Stems 2-5 ft., usually fascicled and undivided. Leaves 3-7 in., sub sessile, acute at both ends, sparsely hispid with long white hairs. Whorls large, dense, with (normally 6) straight stout spines 1-1½ in.; bracts ½-1 in., lanceolate; bracteoles 1-4 in., narrow. Sepals ½-1 in., lanceolate; upper rather the largest, lower obtuse emarginate or shortly bifid. Corolla 1 in., nearly glabrous, pale blue-purple. Anthers oblong, subequal. Capsule ¼ in., shorter than the sepals, linear-oblong, 4-8-seeded from the base.

VIII. NOMAPHILA, Blume.

Erect herbs. Leaves petiolated, entire. Cymes axillary, sub sessile; branches unilatéral, sympetal upwards; flowers pedicelled; bracts linear, minute; bracteoles 0. Sepals 5, linear, one somewhat larger. Corolla tubular, ventricose upwards; limb deeply 2-lipped; lobes 5, twisted to the left, edges narrowly overlapping in bud. Stamens 4, didynamous, glabrous; anthers 2-celled, lower somewhat smaller; cells oblong, parallel, mucilaginous. Ovary oblong, style linear, stigmata simple linear. Capsule linear, seed bearing from the base, 8-32-seeded. Seeds ellipsoid, reticulate, elastically white-hairy when wetted; retinacula hardened, hooked, but slender.—Species 7, in S.E. Asia, Madagascar, and Trop. Africa.

1. N. Parishii, T. Anders. in Journ. Linn. Soc. ix. 455; leaves lanceolate pubescent or mature nearly glabrous, cymes and calyx glandular pubescent, sepals subulate. N. pubescens, Kurz in Journ. As. Soc. 1871, pt. ii. 74, excl. all syn.

MOULMEIN; Falconer, Parish. BENGAL; Kurz, Brandis. TENASSEEIM; Bed dome.—DISTRIB. JAVA.

Stems 1-2 ft., pubescent upwards. Leaves 3 by ½-3 in., acute at both ends (larger ovate folio T. Anders.), young minutely softly pubescent, mature glabrate lineolate above, sparsely pubescent or glabrate beneath; petiole ½-1 in. Cymes 1½ in. diam.; bracts ½-¾ in., opposite; pedicel in one axil ½-¾ in., in the other suppressed. Sepals ½ in., one slightly longer than the others, acute. Corolla ½-in., nearly glabrous. Ovary glabrous; style patently hairy. Capsule ½ in., 32-seeded, pubescent from the base.—Very near to, and doubtfully distinct from the Javan N. corymbosa (Blume Bijd. 804; Nees in DC. Prodr. xi. 84). Col. Beddome has collected in Tenasserim two forms, one with the calyx and corolla half as large again as in the other; but no other difference can be found.

2. N. stricta, Nees in DC. Prodr. xi. 84, excl. syn.; leaves broadly lanceolate mature glabrate, cymes nearly glabrous, sepals linear sub obtuse and rarely puberulous, ovary nearly glabrous except at the tip. Ruellia paniculata? Heyne in Herb. Rottler.

DECCAN PENINSULA ?; Rottler.—DISTRIB. Malaya to the Philippines.

This plant is in Rottler's Madras collection at Kew, but it may be doubted (see T. Anders, in Journ. Linn. Soc. ix. 465) whether it was collected wild in India. It closely resembles N. corymbosa, Br., except in the points specified. Nees' synonymy is all wrong: Justicia stricta, Vahl Symb. ii. 6, has calyx shorter than the bracts; J. pubescens, Lamk. Ill. i. 40, has ovate bracts, and is from Guinea; while J. canescens,
Perennial herbs. Leaves opposite, petioled, entire. Flowers in axillary clusters or short cymes; bracts and bracteoles narrow. Calyx tubular; teeth 5, subequal, lanceolate or subulate. Corolla tubular, mouth obscurely 2-lipped; lobes 5, obtuse, twisted to the left in bud, patent in flower. Stamens 4, perfect, didynamous, filaments glabrous or hairy; anthers similar, 2-celled; cells oblong, parallel, base minutely mucronate or spurred. Ovary glabrous, shortly stalked; ovules 2 in each cell; style linear, hairy, stigma simple linear. Capsule oblong, base for a short space narrowed solid. Seeds 4, orbicular, much compressed, densely elastically white-hairy when wetted; retinacula strong, curved.—Species 50, in S.E. Asia, Africa and America.

* Pedicels hardly any, flowers axillary 2–8 together or solitary.


**Deccan Peninsula; Rottler, Dr. Shuter, &c. Behar; Patna, Ham., J. D. H. Ceylon; Thwaites.**

Stems 6–18 in., branched, lineolate, sometimes obscurely scabrid. Leaves ½–1½ in., obtuse, base attenuate; petiole 0–½ in. Bracts small, spatulate-elliptic or 0; bracteoles ½ in. Calyx lineolate, glabrous or puberulous; tube ½ in., teeth ¼ in. Corolla scarcely so long as the calyx, puberulous, flesh-coloured or bluish, palate not corneate. Filaments connate near the base; anther-cells very shortly but distinctly mucronate. Capsule ½ in.—T. Anderson has not indicated the grounds on which he keeps C. nagchana and C. depressa distinct; Nees says C. nagchana differs by having the bracteoles spatulate, which is not the case in his type specimen. In C. nagchana, where the flowers are clustered, the bracts of the upper flowers are much smaller, the bracteoles 0–½ in., but this is exactly as in Ruellia cernua, Wall.


S. Deccon Peninsula; near the sea, Perrottet, Wight, &c.; and inland at Coimbatore, Beddome. Ceylon; N. of the island, Gardner.

Stems 1–3 ft., sometimes woody, much branched, or elongate less stiff; innovations lineolate, sometimes hoary. Leaves ½ in. diam., obtuse, base cuneate or rounded; petiole 0–½ in. Flowers mostly solitary; bracteoles ½ in. Calyx densely lineolate, sometimes hoary; tube ½ in., teeth ¼ in. lanceolate. Corolla ½ in. and upwards, nearly glabrous, narrowly cylindrical below, funnel-shaped upwards. Stamens, ovary, and capsule nearly as in C. nagchana.
Calophanes.] CIX. ACANTHACEAE. (C. B. Clarke.) 411

**Cymes small, flowers pedicelled.**

3. C. vagans, Wight In t. 1526; leaves ovate or oblong more or less pubescent, calyx-teeth long-linear hairy, filaments hairy, anther-cells with prominent white divaricate spurs at the base. T. Anders. in Journ. Linn. Soc, ix. 459, excl. syn. Ruellia racemosa, Heyne in Herb. Rottl, not of Rosb.

Deccan Peninsula, Rottl; Kurg, Wight; Concord, Stocks; Belgaum, Ritchie. Stems 1-2 ft., erect or diffuse, branched; innovations softly pubescent, not lineolate. Leaves 1½-2½ in., usually narrowed at both ends, mature pubescent on both surfaces or glabrate except a few hairs on the nerves or margin; petiole ¼ in. Cymes 1½ in., or some short 3-fid., softly hairy; bracts ¼ in., oblong; bracteoles ¼ in., linear. Calyx-tube ½ in., teeth ½-¼ in. Corolla ⅜ in., pubescent, blueish, palate transversely plicate. Spurs of the anther-cells much larger than in the preceding species. Capsule ⅜ in.

4. C. Dalzellii, T. Anders.; Bedd. In. Pl. Ind. Or. t. 248; leaves ovate or oblong pubescent or nearly glabrate, calyx-teeth linear hairy, filaments glabrous or minutely hairy, anther-cells minutely mucronate at base or muticous. C. rigidus, Dalz. ms.—Dipteracanthus sp. u. 11, Herb. Ind. Or. H. f. & T.

Concord, Dalzell, Stocks; Poona, Dalzell, Reddome.

Closely resembling C. vagans, but cymes denser, pedicels rarely exceeding ½ in., calyx-teeth broader, sometimes linear-lanceolate, flowers rather larger, sometimes exceeding 1 in., and capsule ½-⅞ in., 4-seeded (entirely of Calophanes)—The larger flowers and the stamens are quite as of Ruellia; the mucro of the anther-cells is either absolutely wanting or so minute that it requires a microscope to find it. Hence the plant was marked a Dipteracanthus by Bentham (not Dipteracanthus vagans, as T. Anderson states, which was T. Anderson's own mistake, not Bentham's); but as the ovules appear never more than 4, it must remain in Calophanes. It invalidates the genus Calophanes as distinguished from Ruellia.

X. RUellania, Linn.

Herbs or undershrubs. Leaves opposite, entire. Flowers sessile or subsessile, solitary or clustered; bract 0; bracteoles large, exceeding the calyx except in R. ciliata. Calyx 5-partite or 5-fid.; teeth subequal, narrow, acute. Corolla tubular-ventricose; limb more or less oblique; lobes subequal, rounded, twisted to the left in bud, patent in flower. Stamens 4, didynamous, filaments glabrous, unless near the base; anthers subequal, 2-celled; cells oblong, muticous, glabrous. Ovary glabrous; ovules in each cell 3-10; style long-linear, hairy, stigma simple linear (except in R. macrospilus). Capsule clavate, base solid, cylindric, ellipsoid, seed-bearing upwards. Seeds large, thinly discoid, marginate, much imbricated, densely elastically hairy when wetted; retinacula large, hooked, strong.—Species 150, in all warm regions.

The generic character here given is narrowed to the section Dipteracanthus (Genus, Nees), to which section all the Indian species strictly belong. In other sections (Genera of Nees), reunited now with Ruellia in the Gen. Pl., the bracts, capsules and seeds recede materially from the characters of Dipteracanthus.

Ruellia flagelliformis, Roxb. Pl. Ind. iii. 47, came from the Moluccas.

1. R. prostrata, Lamk. Encyl. vi. 349; prostrate pubescent upwards, leaves small ovate sparsely hairy or nearly glabrous, bracteoles spatulate-elliptic or petioled ovate foliaceous, corolla 1 in. pale purple caducous.
DROCAN PENINSULA, extending North to BEHAR; J. D. H.

Stems 6-18 in., much branched, nodes short, glabrous downwards. Leaves $\frac{1}{2}$ in., subobtuse, lineolate by raphides and minutely sparsely pilose; petiole $\frac{1}{2}$ in. Flowers few together or often solitary; bracteoles $\frac{1}{2}$-3 in., often altogether like the leaves. Sepals $\frac{1}{2}$ in., linear, ciliate. Corolla pubescent, ventricose portion of the tube twice the cylindrical portion. Capsule $\frac{1}{3}$ in., pubescent, seed-bearing $\frac{3}{4}$ its length. Seeds 16-20, $\frac{1}{4}$ in. diam.

VAR. dejecta; diffuse sometimes rambling among bushes with very long nodes, leaves larger often 3 in. frequently acute. Ruellia ringens, Roxb. Fl. Ind. iii. 44; Wall. Cat. 2403. R. repens, Wall. Cat. 2384, chiefly. R. decanensis, Grah. Cat. Pl. Bomb. 162. Dipterocarthus dejectus, Nees in Wall. Pl. As. Rar. iii. 82, and in DC. Prodr. xi. 124.

MALAY PENINSULA: Moulmein, Parish; Mergui and Malacca, Griffith; Singapore, Lobh.—Distr. Throughout Malaya to the Philippines. Siam.

Usually more glabrous with narrower leaves than R. prostrata, but can only be clearly separated by the smaller flowers; the capsule rarely exceeds $\frac{1}{4}$ in.


DECCAN PENINSULA, extending to Scinde, Rajpootana and Bundelkund (Edge-worth). Ceylon. frequent.—Distr. Arabia, Abyssinia, Ava.

Resembling R. prostrata, but densely closely pubescent. Corolla pubescent, very pale grey purple, the cylindrical portion of the tube as long as the ventricose part.


Scinde; Stocks, Dalzell.—Distr. Beloochistan.

Woody at the base, with many ascending stems 12 in. high; whole plant with glandular visceous white or hoary pubescence. Leaves 2 by $\frac{1}{2}$ in.; petiole continuous with the attenuate leaf-base. Flowers mostly solitary; bracteoles $\frac{1}{2}$ in. Calyx $\frac{1}{2}$ in. Corolla pubescent, blue. Capsule $\frac{1}{3}$ in., pubescent, nearly as of R. prostrata.
5. R. cernua, Roxb. Fl. Ind. iii. 45; leaves oblong or elliptic acuminate hairy, bracteoles petioled elliptic acute leaf-like, sepals 1/2 in., corolla 1-1 1/4 in. T. Anders. in Journ. Linn. Soc. ix. 460.

CHOTA NAGPORE; Parasnath, alt. 2000-4500 ft., Thomson, Anderson, Clarke.

Raststock woody; annual stems 6-24 in. hairy upwards. Leaves 3 1/2 by 1-1 1/2 in., much acuminate, with scattered short white hairs on both surfaces; petiole 3 in. Flowers 1-3 together, axillary and terminal; bracteoles 1 in. Sepals exceeding 1 in., linear, hairy. Corolla pubescent, white with rose or pink-purple marks, tubular portion equaling the ventricose. Stamens of the genus. Capsule 3 in., as of R. prostrata.—The plant here described is the Parasnath one, which is a typical Ruellia sect. Dipteracanthus, and which Anderson identifies confidently with Roxburgh's R. cernua, of which nothing is known but that the seeds came from Mysore, and Roxburgh's description and picture. In his description Roxburgh says the flowers were small, and his picture shows them 3 in. long, so that it must be a striking variety of the Parasnath plant.

6. R. suffruticosa, Roxb. Fl. Ind. iii. 53; leaves elliptic hairy not acuminate, bracteoles petioled elliptic leaf-like, sepals 1/4 in., corolla 1 1/2 in. white. T. Anders. in Journ. Linn. Soc. ix. 461. R. repens, Wall. Cat. 2384, letter F only. Dipteracanthus Sibua, Nees in Wall. Pl. As. Rav. iii. 81, and in DC. Prodr. xi. 121.

BENGAL; Dinajpur, Hamilton; throughout CHOTA NAGPORE, alt. 1-2000 ft., Clarke. UPPER GANGETIC PLAIN; Moradabad, Thomson.

Raststock woody; annual stems sometimes 1-3 in. only (especially after the fires), sometimes 1-2 ft. Leaves 4 by 1 1/2 in., obtuse in the typical form, or acute hardly acuminate in Thomson's specimens. Bracteoles 3 in., hardly acute. Sepals linear, puberulous or glabrate. Capsule 3/4-1 in.—Very closely allied to R. cernua.

7. R. Beddomei, Clarke; leaves elliptic acute hairy on both surfaces, bracteoles subpetioled ovate acute leaf-like, sepals 1/4 in., corolla 3 in. R. cernua, Anders. in Journ. Linn. Soc. ix. 460, partly, not of Roxb.

CENTRAL INDIA; Jubulpore, Beddome. This seems nearer R. suffruticosa than R. cernua, of which T. Anderson reckoned it a form; but it differs from both in the very large corolla, the lobes of which are 1 by 3/4 in. roundly elliptic.

8. R. ciliata, Hornem. Hort. Hafn. ii. 585; pubescent, leaves ovate short obtusely acuminate, bracteoles scarcely so long as the calyx-tube, corolla 1 1/2 in. T. Anders. in Journ. Linn. Soc. xi. 120. Dipteracanthus ciliatus, Wall. Cat. 715; Nees in Wall. Pl. As. Rav. iii. 81, and in DC. Prodr. xi. 120. Larysananthus ciliatus, Oost. in Vidensk. Meddel. Kjobenh. 1854, 123.

BURMA; Prome, Wallich.


PEGU; Beddome.

Perennial, 2-3 in., woolly with crisped white hairs. Leaves 2 in., entire, narrowed at both ends; petiole obscure. Flowers sessile, solitary; bracteoles 3 1/2 by 1/4 in., linear-
oblone, white-hirsute. *Sepals* 1/2 in., linear-lanceolate, glabrous, densely lineolate. *Corolla* pubescent; tube long-linear, ventricose for 1/4 its length. *Stamens* 4, subequal; anther-cells similar, parallel, minutely white-tailed. *Style* elongate, branches 1/8 in., subequal. *Capsule* many-seeded.—This reedes from the genus in the subequally bifid style; but the corolla-lobes are twisted in bud, and it must be a *Ruellia* or very near it.

**Doubtful Species.**

R. ? involucrata, Vahl *Symb.* iii. 83; leaves short-petioled lanceolate attenuate at both ends entire glabrous, spikes small ovoid hirsute, bracts ovate attenuate quadri-faricous. *Nees in DC. Prodr.* xi. 150.

**India** (Madras?); Koenig.

General aspect of *Justicia Gendarussa.* Leaves 6–8 by 1–3/2 in., abaxial, conspicuously lineolate above. Spikes as large as a hazel nut; bracteoles linear, hairy, shorter than the bracts. *Calyx* as long as the bracts. *Anther* subacuminate at base. *Style* simple lanceolate branch. *Ovary* "pluri-ovulate."

—Described by Nees from Koenig's specimen. The number of the ovules uncertain, and it is impossible to guess the genus.


**India** (Madras?); Heyne.

*Stem* 4-angled, geniculate. *Leaves* 1 in. or a little longer; petiole 1/4 in. *Racemes* nearly horizontal; peduncle solitary, shorter than the petiole, 5- or 6-fld.; bracts at the apex of the pedicels 2. *Sepals* 1/3 in., equal, linear-subulate, glandular-villous. *Corolla* scarcely longer than the calyx, unequal, pubescent.—The combination of minute bracts with a corolla hardly longer than the calyx has defeated all attempts to ascertain the genus of this plant.

**XI. ECHINACANTHUS,** Nees.

Erect herbs or undershrubs. *Leaves* opposite, ovate or oblong, acute toothed. *Cymes* lax, short, few-fld., or long compound, axillary, upper forming a terminal panicle; pedicels short or 0; bracts small, linear; bracteoles small or 0. *Sepals* 5, long, linear, subequal. *Corolla* tubular-ventricose, nearly straight, widened about the middle; lobes 5, subequal, rounded, twisted to the left in bud. *Stamens* 4, didynamous, included; anthers sub-heteromorpus, 2-celled; cells oblong, parallel, base spurred or not. *Ovary* with 6–8 ovules in each cell; style linear, stigma simple linear. **Capsule** oblong-linear, 8–16-seeded nearly from the base; retinacula stout, hooked. Seeds compressed, discid, densely hairy, the hairs starting out on applying water.—Specios 5, all Indian.

The character of the genus has been here widened to include plants closely resembling *Echinacanthus* except that the anther-cells are muticous.

*Anther-cells spurred at the base.*


**Central and Eastern Himalaya; Nepal, Wallich; Tambir River, alt. 2–4000 ft., J. D. H. Sikkim, alt. 4000 ft., Treuttel, &c.**

*Stems* 1–2 ft., pubescent upwards. Lower *leaves* 3 1/2 by 2 in., broadly elliptic;
middle cauline oblong, narrowed to both ends, upper $\frac{1}{2}$ by $\frac{1}{2}$ in.; mature subsessile, glabrate, lineolate or obscurely pubescent. *Cymes* 1-2 in., viscous-pubescent, forming a quasi-panicule 6-8 in. long; bracts $\frac{1}{4}$ in., linear, second, opposite, one barren, the other stipitate 0-1 in.; bracteoles 0. *Calyx*-tube $\frac{1}{2}$-1 in.; lobes $\frac{1}{4}$ in. *Corolla* dark purple with lilac veins, cylindrical equalling the ventricose portion. *Filaments* and *anthers* sparsely hairy. *Ovary* glabrous, style hairy. *Capsule* $\frac{1}{2}$ in., oblong scarcely ventricose; solid cylindric portion scarcely $\frac{1}{4}$ in.—(See 6, *E. Pumilio*).

2. *E. parviflorus*, T. Anders. in Journ. Linn. Soc. ix. 459; leaves ovate acuminate serrate, sepals linear glabrous, corolla 1-1$\frac{1}{4}$ in. glabrous.


Glabrous, erect, divaricate. *Leaves* 3-6 by 2-3 in., base obliquely rounded; petiole 2-3 in. *Panicles* axillary and compound, terminal 6-10 in. long; flowers opposite, sessile; flowers often second; bracts $\frac{1}{5}$ in., linear; bracteoles minute. *Calyx* divided to the base. *Corolla* straight, thrice as long as the calyx, funnel-shaped portion thrice as long as the cylindrical. *Capsule* compressed, 8-seeded; seeds small, compressed.—Not seen; the foregoing abstracted from T. Anders.

3. *E. Brugmansianus*, Nees in DC. Prodr. xi. 168; leaves oblong attenuate at both ends repand sub-crenate hirsute-tomentose.

*India*? in Vahl’s Herbarium (Nees).

*Calyx*-segments a little shorter and less attenuate than those of *E. attenuatus*.—Not seen; the foregoing copied from Nees.

**Anther-cells muticus at the base.**

4. *E. Andersoni*, Clarke; leaves ovate acuminate mature glabrate, cymes lax large zigzag glabrous, corolla $\frac{3}{4}$ in.—*Echinacanthus* sp., T. Anders. *ms.*

*Sikkim Himalaya*; Darjeeling; Pomong, alt. 3000 ft., Clarke. *Khasia Mts.?; Calcutta Herbarium.*

An undershrub, 3 ft.; young parts (at least sometimes) with dense snow-white wool. *Leaves* 4$\frac{1}{2}$ by 2$\frac{1}{2}$ in., base rounded, crenate-serrate, raphides obscure; petiole 1$\frac{1}{2}$ in. *Cymes* in terminal panicles 12 by 15 in., flowers all solitary, mostly opposite on the ultimate branches; pedicels $\frac{1}{2}$ in.; bract at the base of the pedicel $\frac{1}{2}$ in., linear; bracteoles $\frac{1}{2}$ in., linear. *Calyx* $\frac{1}{2}$ in. and upwards, narrow, glabrous or nearly so; segments long-linear acute, connate at base for $\frac{1}{4}$-1 in. *Corolla* nearly glabrous, blueish. Anterior *filaments* hairy at their base, sparsely so upwards; posterior filaments glabrous, anthers rather smaller. *Style* glabrous, stigma rather short. *Capsule* exceeding $\frac{1}{2}$ in., narrowly-oblong, 12-16-seeded from the base. *Seeds* discoid; on applying water the hairs start out.—Habit and inflorescence of a sympodial *Strobilanthus*, but the capsule is many-seeded. The inflorescence differs from that of *E. attenuatus* in that, of the 2 flowers in the axis of opposite bracts, one is not usually obsolete.

Var. *viscosa*; panicle and sepals viscous-pubescent, corolla $\frac{3}{4}$ in. pubescent.—Sikkim, alt. 4000 ft.; Lingcham, Clarke.

5. *E. longistylus*, Clarke; leaves ovate acuminate mature nearly glabrate, cymes lax large zigzag viscous-pubescent, corolla $\frac{1}{2}$ in.

*Sikkim Himalaya*, alt. 1-4000 ft.; Punakabi and Kursiong, Clarke.

Closely resembling the viscous-pubescent Var. of *E. Andersoni*, but the corolla very much larger. *Style* hairy, thickened upwards, stigma linear- lanceolate (resembling the pistil of *Aechmanthera*). *Seeds* 9-12 to the capsule, the hairs on them starting out when wetted.—The position of this and of *E. Andersoni* is doubtful between *Strobilanthus* and *Echinacanthus*.

6. *E. Pumilio*, Clarke; finely glandular-pubescent, leaves small
elliptic crenate or toothed, cymes lax compound zigzag pubescent, corolla $\frac{3}{4}$ in.

KHARIA MTS., alt. 4200 ft.; Cherra Coal-hill, Clarke.

An undershrub, 6–15 in., very woody, much branched, densely covered on all sides with cymes. Leaves 1 by $\frac{1}{2}$ in., narrowed at both ends (many $\frac{1}{4}$–$\frac{1}{3}$ in. ovate), blackish; hairs scattered, very fine, often gland-tipped; petiole $\frac{1}{4}$ in. Cymes as of E. Andersoni; bracts $\frac{3}{4}$ in., linear; pedicels often $\frac{3}{4}$ in.; bracteoles $\frac{1}{4}$–$\frac{1}{3}$ in., linear. Sepals $\frac{1}{4}$ in., linear, finely glandular-pubescent. Corolla light-purple, nearly glabrous. Filaments glabrous except near the base, where they are shortly connate; anthers subequal, 2-celled; cells oblong, mucous, connective not excurrent. Ovary glabrous; style very sparsely hairy, stigma long narrowly lanceolate; ovules 3 in each cell. Capsule not seen.—This may prove to be E. pareiflorus, T. Anders., but it is not likely that T. Anderson would have put that species in Echinacanthus without remark, had the anther-cells been mucous.

XII. PETALIDIIUUM, Nees.

Minutely hairy undershrubs. Leaves ovate or narrowly oblong, entire or toothed. Flowers sessile or nearly so, solitary, usually crowded on abbreviated lateral branches; bracts 0; bracteoles large, ovate, reticulate-nerved becoming scarious. Sepals subequal, linear-lanceolate. Corolla-tube straight, ventricose nearly from the base; lobes rounded, twisted to the left in bud, patent in flower. Stamens 4, didynamous; anthers subequal, 2-celled; cells parallel, spurred at the base. Ovary with 2 ovules in each cell; style long-linear, stigma unequally 2-lobed. Capsule clavate, compressed parallel to the septum, 2- or 4-seeded; placenta dehiscing elastically from the bottom of the capsule, raising the discoid seeds with them.—Species 12, one Indian, the rest African.

The above character is drawn chiefly from the Indian species; the number of African species received since the Gen. Pl., vol. ii., pl. 2, was published, may necessitate widening of the generic character.


N.W. HIMALAYA and N. DECCAN PENINSULA, alt. 1–3000 ft.; extending from Canara and the Concan to Rajmahal and Rajpootans, frequent; reappearing in the OUDHE and KUMAON dry Terai, alt. 1500 ft.

Stems several, 2–3 ft., terete. Leaves 2–4 in., acuminate, hoary or dusky puberulous; petiole $\frac{1}{2}$–$\frac{1}{3}$ in.; leaves on the shortened flower-bearing spurs $\frac{1}{4}$–$\frac{3}{4}$ in. Bracteoles ovate or elliptic, acute. Sepals $\frac{3}{4}$ in., linear, puberulous or pubescent. Corolla narrow-campanulate, pale-blue or white, yellow-tinted; palate with long deflexed fulvous hairs within. Filaments and anthers minutely sparsely-hairy (all but glabrous). Ovary glandular upwards, style shortly hairy. Capsule $\frac{1}{2}$ in., usually 2-seeded. Seeds shaggy, hairs somewhat elastic when wetted; retinacula (with the placenta) stout, rigid.—Erantherum barlerioides, Roxb., placed here by Nees (and T. Anderson), is either Erantherum Parisii or very near it, and came from the Andamans.

XIII. PHAYLOPSIS, Willd.

Prostrate, perennial herbs. Leaves opposite, petioled, ovate, entire or obscurely crenate. Spikes terminal, 1-sided, dense; bracts orbicular, closely
imbricate, each usually 3-fld.; bracteoles 0. Sepals 5, one ovate, nervous, the others linear like bracts. Corolla small; tube slender, cylindric; lobes 5, slightly unequal, rounded, contorted in the bud, patent in flower. Stamens 4, didynamous; anthers subsimilar, 2-celled; cells parallel, shortly oblong, base minutely mucronate. Ovary-cells 2-ovuled; style long-linear, hairy, stigma simple linear. Capsule clavate, compressed parallel to the septum, 4-seeded; placenta dehiscing elastically from the base of the capsule, raising the seeds with them. Seeds compressed, discoid, densely elastically white-hairy when wetted.—Species 10, all Tropical and African, one Indian and one Arabian.


Throughout INDIA (except the N.W.), alt. 0-3000 ft., from the Himalaya to Ceylon and Tenasserim; common in Bengal both in the plains and in the lower hills.—Dietr. Madagascar, Tropical Africa.

A prostrate, closely-branched herb; branches often flagellate, 2-3 ft. Leaves 3½ by 1½ in., acuminate at both ends, obscurely pubescent, petiole ½ by 1½ in.; leaves of lateral branches 3-1¼ in. Spikes 1-2 in., densely or thinly hairy; bracts ¾-1 in. Calyx ½ in., hairy. Corolla ½ in., nearly white. Stamens glabrous. Capsule ½ in.; valves with rigid backs and scarios sides. Seeds ½ in. diam.

XIV. DEDALACANTHUS, T. Anders.

Shrubs or perennial herbs. Leaves opposite, petioled, entire or obscurely toothed, lineolate by raphides. Spikes linear with distant flowers, or dense or capitate; bracts usually large; bracteoles linear-lanceolate, hardly so long as the calyx. Corolla-tube linear, long, widened only near the top or in a few species from the middle; lobes obovate, twisted to the left in bud, horizontal in flower, blue, rarely rose, veined. Stamens 2, glabrous; anthers narrowly oblong, 2-celled, muticous, exserted or subincluded. Ovary glabrous, 4-ovuled; style long, sparingly hairy, stigma simple linear. Capsule clavate, base solid cylindric. Seeds normally 4, compressed, discoid, densely finely elastically hairy when wetted.—Species 17, Indian and Malayan.

This genus, in the long corolla and 2 stamens with muticous anthers, greatly simulates Eranthemum; the species are, in general easily distinguished by the bracts much exceeding the calyx; in D. microstachyum & concavensis, however, the bracts are small, and they can only be recognized by their twisted corolla-lobes.

* Corolla lower half cylindric, upper half ventricose or funnel-shaped.


E. Bengal (P. Mishmee); Griffith (Kew Distrib. n. 6122).

Stem upwards and innovations pubescent. Leaves ¾ by 3 in., obscurely crenulate, lineolate with raphides on both surfaces; nerves 12 pair; petiole 1 in. Spikes VOL. IV.
3 in., short-peduncled; bracts ⅔ in., closely imbricate, 1-fld., obovate, shortly acute, glabrous, white with green reticulating nerves; bracteoles ⅓ in., lanceolate, acuminate. Calyx nearly ⅔ in., divided ⅔ the way to the base; lobes lanceolate, acuminate, puberulous. Corolla slightly curved, glabrate; lobes ⅓ by ⅔ in., roundly elliptic, nerveose. Stamens glabrous; anthers exerted. Capsule not seen.


Bhotan; Ghorgong, **Griffith** (Kew Distrib. n. 6126).

Branchlets upwards tetragonal, obscurely pubescent. Leaves 6 by 2 in., lineolate with raphides on both surfaces; nerves 9 pair; petiolo ⅔ in. Peduncles 3-4 in., 4-angled; spikes 2-5 in.; bracts 1 in., densely imbricated, 1-fld., ovate, acuminate, glabrous, whiteish with green reticulating nerves; bracteoles ⅔ in., linear-lanceolate. Calyx ⅔ in., divided more than half-way down; lobes linear-lanceolate, minutely puberulous. Corolla slightly curved, flesh-coloured without, rose within (Griffith), nearly glabrous, narrower at the summit and less suddenly narrowed in the middle than that of **D. tubiflorus**. Stamens glabrous; anthers exerted. Capsule ⅔ in., glabrous. Seeds ⅔-⅘ in.—Seems very near **D. tubiflorus**.

3. **D. splendens**, T. Anders. in Journ. Linn. Soc. ix. 486; leaves ovate or elliptic acuminate at both ends somewhat pubescent, spikes short-peduncled usually very long, corolla 1½ in. pubescent upper half of the tube funnel-shaped.—Eranthemum sp. n. 23, Herb. Ind. Or. H. J. & T.

SiKKIM Himalaya; alt. 1-3000 ft., frequent; **Griffith** (Kew Distrib. n. 6129), J. D. H., &c.

Stems 3-5 ft., pubescent upwards. Leaves 6 by 3 in., subentire, lineolate with raphides on both surfaces; nerves 12 pair; petiolo ⅔-⅔ in. Peduncles ⅔-⅔ in.; spikes 3-12 in.; bracts ⅔ in., all imbricate, 1-fld., ovate, glandular-pubescent, whiteish or brownish with reticulated green nerves; bracteoles ⅔ in., linear-lanceolate. Calyx ⅔ in., lobed half-way down; lobes narrow-lanceolate, puberulous. Corolla slightly curved, brick-red; lobes ⅔ in., roundly elliptic, patent or recurved in flower. Stamens glabrous, anthers exerted. Capsule ⅔ in., thinly glandular-pubescent.—Near **D. tubiflorus**.

**Corolla-tube cylindric, widened below the summit for scarce ⅗ its length.**


Base of the Himalaya, alt. 1-3000 ft., from the Punjab to Bhotan, frequent. **Sikkim**; Wallich. **Sonnerbund**; **Clarke**.—(Cultivated in various tropical countries.)

Stems 2-6 ft., glabrous, or very nearly so to the summit. Leaves often 8 by ⅔ in., entire or obscurely crenulate, upper shortly attenuate at the base, raphides copious on both surfaces; nerves 10 pair; petiolo ⅔-⅔ in. Spikes 1-3 in., often terminate, forming close terminal panicles; peduncles ⅔-⅔ in., often acutely quadrangular, lineolate, glabrous or obscurely pubescent; bracts ⅔ in., much more concave than in the neighbouring species, imbricated deeply but somewhat laxly, sometimes obtuse never
long-acuminate, lineolate, puberulous; bracteoles ½ in., narrowly lanceolate. Calyx ¼ in., lobed half-way down, white, minutely but densely pubescent; lobes lanceolate. Corolla-lobes ¼ in., broadly elliptic. Stamens glabrous; anthers exerted, narrowly oblong. Ovary glabrous; style nearly glabrous. Capsule ¼ in.; solid cylindric base short. Seeds ½ in. diam.—The Soonderbund plant has the calyx-lobes unusually short. The Var. scabra of Nees is merely a specimen in young flower, and therefore slightly scabrid-puberulous (it is not Anderson's scabra).


Pegu, Burma and Tenasserim; Wallich, &c. (Kew Distrib. n. 6128).

Closely allied to D. nervosus, but the inflorescence more lax. Leaves similar to (not larger than) those of D. nervosus, but (even when mature) often with scattered minute hairs on the upper surface, and a scabrid pubescence on the nerves beneath; raphides fewer and less prominent. Peduncles 2–5 in., pubescent; spikes 2–5 in.; bracts as of D. nervosus, the lower often scarcely overlapping.—A single specimen of this from Hort. Kew put into the Herbarium in 1869 is marked D. scaber by T. Anderson, but is not the plant so called of his monograph in Journ. Linn. Soc., which is a D. nervosus.

6. D. strictus, T. Anders. in Journ. Linn. Soc. ix. 487; leaves ovate or elliptic narrowed at both ends glabrous or nearly so, spikes linear interrupted forming a large terminal panicule, bracts narrowly elliptic obtuse herbaceous not whitened, corolla 1½ in. blue. Eranthemum strictum, Colebr.; Robb. Fl. Ind. ed. Carey, and Wall. i. 114; Wall. Cat. 2494; Bot. Reg. t. 867; Bot. Mag. t. 3068; Nees in Wall. Pl. As. Bar. iii. 106, and in DC. Prodr. xi. 448 (excl. syn. Wall. Cat. 2492 a.).

Eastern Frontier, in the lower hills, alt. 0–3000 ft., from Khasia Mts. to Chittagong, Wallich, H. f. & T., &c., frequent.

A herb, 1–3 ft., with large basal leaves, pubescent, sparingly leafy upwards. Basal leaves 6–12 in., narrowed at the base, short-petioled, subentire, raphides obscure; upper often 1–2 in. only, base sometimes rounded. Spikes 3–8 in., hairy in the Chittagong plants, nearly glabrous in some of the Khasian_; bracts ½–1 in., much exceeding the calyx; green, 1-fid.; bracteoles ¼ in., linear-lanceolate. Calyx ¼ in., divided half-way down; lobes lanceolate. Corolla often pubescent. Stamens glabrous; anthers included. Style hairy in the Chittagong specimens, very slightly so in the Khasian. Capsule ½–Ⅲ in., glandular-pubescent, or in the Khasian examples nearly glabrous.


W. and S. Deccan Peninsula, from the Bombay Ghats to Mangalore, frequent; Wight, Hohenacker, &c.

Resembling D. nervosus, but inflorescence more lax and bracts different. Peduncles 0–2 in., axillary and terminal; spikes often 6 in. Bracts (all but the lowest) imbricated, ½–Ⅲ in., strongly rugose by raised inarching green nerves; margins entire, glabrous, ciliate or very hairy. Seeds ½ in. diam., much compressed. Otherwise (except the colour of corolla) as D. nervosus.
CIX. ACANTHACE. (C. B. Clarke.) \textit{Dedalacanthus}.

Var. \textit{Neesii}; leaves ovate acuminate not lineolate, nerves much raised beneath scabrous, spikes short dense, bracts ciliate.—\textit{Assam}?


\textbf{British Burma}, Wallich; Moulmein, Parish; Thongyuen Hills, Beddome; Beeling Forest, Brandis.

Branches upwards slender, quadrangular, nearly glabrous. \textit{Leaves} 7½ by 1¼ in., much attenuate, subentire; nerves 7–8 pair; petiole 1 in. \textit{Spike}s 2 in., hairy; bracts ½ by ¾ in., subobtuse. \textit{Calyx} and bracteoles as of \textit{D. nervosus}. \textit{Corolla-tube} glabrous; mouth ⅔–1 in. \textit{Anthers} not exserted. \textit{Capsule} ⅔ in.; solid narrow base scarcely ½ in.—Not nearly allied to \textit{Eranthemum salacense} (Blume \textit{Bijd.} 792), as T. Anderson supposed; Kurz erroneously reduced it thereto in \textit{Journ. As. Soc.} 1870, pt. ii. p. 78.


\textbf{Andamans}; Herb. Hamilton, Kurz.

Nearly glabrous; branches leafy, obscurely tetragonous. \textit{Leaves} 6 by 2¼ in., undulate; nerves 6 pair; petiole ⅔ in. \textit{Spikes} 1–1½ in., terminal, solitary, dense with (in Roxburgh’s drawing) sometimes a few straggling flowers at the base; bracts ⅓ in., obtuse with a short mucro, glabrous; nerves prominent beneath; bracteoles ½ in., linear-lanceolate. \textit{Calyx} ⅔ in., divided half-way down; lobes linear-lanceolate. \textit{Corolla-tube} glabrous; mouth ⅔ in. diam. \textit{Anthers} included.—\textit{E. barlerioides}, somewhat doubtfully referred here by T. Anderson, is merely one of the cases where Roxburgh changed the name of a species, and his editors Wallich and Carey printed the description twice over.


\textbf{Moulmein}; Lobb.

A herb, 2–3 ft., with large basal leaves, sparingly leafy upwards, habit of \textit{D. strictus}. \textit{Leaves} 8 by 3 in., base attenuate or rounded, subentire, obscurely or not lineolate; nerves 10 pair; petiole 0–1 in. \textit{Panicle} large, compound, trichotomous, glandular-pubescent, branches quadrangular; bracts ⅔ in., ovate or elliptic; bracteoles ⅔ in., oblong. \textit{Calyx} ⅔ in., deeply divided, green; lobes linear, viscid-pubescent. \textit{Corolla-mouth} 1⅔ in. diam. \textit{Anthers} included. \textit{Ovary} and style somewhat glandular-pubescent. \textit{Capsule} ⅔ in., acute; solid cylindric base longer than the seed-bearing part.—Though the shortened bracts give this so different an aspect, the species appears very closely allied to \textit{D. strictus}.

nervosum, Dals. & Gibs. Bomb. Fl. 195, not of others.—Eranthemum sp. n. 12, Herb. Ind. Or. H. f. & T.

CENTRAL INDIA, alt. 1-4000 ft.; from the Bombay Ghats, Jacquemont, and Belgaum, Ritchie, to Parasnath and South Behar, J. D. H. UPPER ASSAM; Dibroo-mook, Griffith.

Stems 2-4 ft., leafy. Leaves attaining 9 by 4 in., base decurrent, uppermost much smaller, sub sessile, often cordate, subentire, sometimes glabrate, densely lineolate, sometimes pubescent on the nerves on both surfaces (the rapnides in such case obscure); nerves 7-9 pair. Spikes 1-2½ in., usually appearing long peduncled, the uppermost leaves being much reduced; bracts 1 in., base rounded, rigid, green not whitened but with much elevated nerves, apex divaricate, margins not incurved; bracteoles ½ in., linear-lanceolate. Calyx ½ in., lobed half-way down; segments lanceolate, whitened, minutely pubescent. Corolla 1½ in., blueish, pubescent or nearly glabrous. Anthers included. Capsule ½-¾ in., lower solid cylindric portion short.—The bracts in Roxb. Cor. Pl. t. 177 are characteristically those of D. purpurascens, and in the description he says bracts ciliate. Moreover Roxburgh got his E. pulchellum from “the drier parts of India.”


W. and S. Deccan and Ceylon, alt. 1-6000 ft., frequent; Wattleh, Wight, &c.

Herb 2-3 ft., leafy; upper branches or peduncles quadrangular, usually white-hairy or glabrous. Leaves 4½ by 1½ in., all (except the floral) gradually attenuate at the base; nerves 6-7 pair; petiole ½-1½ in. Inflorescence extremely variable; from linear elongate spikes in compound coryms or panicles with distant flowers to distant short-oblong very dense heads, always more or less glabrous-hairy; bracts from elliptic with linear tips to linear-lanceolate, apex sub obtuse, viscid-pubescent not whitened, lowest often 2-fl., bracts usually narrower in the elongate spikes broader in the short headed; bracteoles ½ in. Calyx ½ in. Corolla 1½ in., pale blue. Anthers subserceded from the corolla-tube. Capsule ½-1 in. Seeds ½ in. diam.—A variable species best distinguished by the long linear green viscidly hairy calyx-teeth. The high-level form with shorted spikes hardly differs from D. purpurascens by any other character than this. The Javan D. salacensis does not much differ but by the bracts being obscurely linear-spathulate upwards.

Var. Wightiana; leaves large ovate, corymb very compound with linear branches, bracts linear, calyx and capsule small. Eranthemum Wightianum, Wall. Cat. 2495, letter A only; Nees in Wall. Pl. As. Rar. iii. 107, and in DC. Prodr. xi. 449.—Deccan Peninsula?, Russell.—This is a remarkable specimen, estimated a species by Nees; it seems that T. Anders never saw it; the remains of Wall. Cat. 2495 with distant capitate heads being that which T. Anders. reduced to a Var. of D. montana. In Russell’s plant the leaves are 7 by 3½ in., shortly suddenly attenuate at the base, the uppermost subcordate; the bracts are exactly linear, parallel-sided (in D. montanus they are always dilated downwards); the corolla is not fully expanded, but seems smaller than in D. montanus.

Var. concanensis, T. Anders. ms.; panicle compound, spikes linear interrupted, bracts ovate abbreviated, not rarely 2-fl.—Concan; Law.

13. D. Parishii, T. Anders. in Journ. Linn. Soc. ix. 489; leaves ovate or elliptic acuminate at both ends undulate-crenate glabrous, spikes sub-
capitate or oblong dense, bracts leaf-like glabrous often undulate-crenate, corolla 1½ in. blue.

MALAY PENINSULA; Tenasserim, Helfer (Kew Distrib. n. 6176), Beddome; Tavoy and Monleme, Parish.

Whole plant lineolate with raphides. Stems erect, elongate, tetragonal, leafy upwards. Leaves 5½ by 2½ in., tip long acuminate, base shortly acuminate; nerves 7–8 pair; petiole 0–1¼ in. Flowers often appearing densely clustered at the nodes on shortened axillary spurs; bracts 1–1½ in., leafy, imbricated usually densely sometimes laxly; bracteoles ½ in., linear-lanceolate. Calyx ½ in., divided half-way down; lobes narrow-lanceolate, whitened, puberulous. Corolla-limb ¾ in. diam. Anthers included. Capsule 1 in., glabrous.—This much resembles D. suffruticosus, but the leaves are conspicuously lineolate. T. Anderson has overlooked the true bracteoles; they are exactly similar in size, form and situation to those of other species. The bracts (bracteoles of T. Anders.) are 1 to each flower; when they are opposite on the spike and the flower in the axil of one is aborted, they appear superficially 2 to each flower; as is the case often in D. montanus and several other species and genera.

XV. HEMIGRAPHIS, Nees.

Herbs or shrubs. Leaves opposite, toothed or subentire. Flowers sessile, in heads or spikes, rarely solitary; heads terminal or quasi-axillary on shortened branchlets, rarely (in H. flava) paniolated; bracts imbricated, large, 1-fld.; bracteoles small, narrow, or 0. Calyx 5-partite nearly to the base; segments 5, subequal, linear-lanceolate or lanceolate. Corolla long-tubular, lower half cylindrical, upper funnel-shaped or ventricose; lobes 5, rounded, subequal, sinistrose contorted, blue or yellow. Stamens 4, didynamous, included or nearly so; anthers oblong, 2-celled, muticous, sometimes triangular, bases acute. Style long, stigma of one linear and one very short lobe; ovules 3–8 in each cell. Capsule linear or linear-oblong, 6–20-seeded nearly from the base. Seeds compressed, discoid, brown when dry, apparently glabrous with a white margin, when wetted densely hairy with white long unicellular hairs, each with numerous annular thickenings.—Species 20, Indian, Malay, a few Chinese and Japanese.

Sect. 1. Corolla tubular-ventricose, limb blue. Longer filaments glabrous in their upper half or very nearly so.


DECCAN PENINSULA; Kurnool (in Madras), Beddome; Bombay, Jacquemont; Central India, Edgeworth; Belgaum, Ritchie; Nilgherries, Hohenacker, &c.

Stems 1–2 ft., branched, diffuse, often almost prickly from white deflexed bristles. Leaves 1½ by ¾ in., obtuse, harshly scabrous; petiole ¼ in. Heads many-fld., with white and often much brown hair; bracts ¾ in., oblong or spatulate. Calyx divided nearly to the base; segments linear, green with scariosous margins, setulose. Corolla ½ in., subequal, blueish-purple, ventricose portion about as long as the cylindrical. Longer filaments laxly hairy below. Capsule ½ in., 6–8-seeded.—Nees erroneously maintains (DC. Prodr. xi. 146) that R. urens of Heyne, Roth and Roxburgh is the same as their R. latebrassæ.

2. H. hirta, T. Anders. in Journ. Linn. Soc. ix. 462; softly hirsute, leaves small ovate crenate, bracteoles 0, calyx ½ in. green. Ruellia hirta, Vahl
3. **H. venosa**, Clarke; scabrid-pubescent, leaves petioled ovate crenate, bracteoles as long as the calyx. _Ruellia venosa_, Heyne in Herb. Rottler. _R. crispa_, Nees in Wall. Pl. As. Rav. iii. 83, and in DC. Prodr. xi. 146, not of Linn.

**DECCAN PENINSULA; Rottler, Wight.**

_**Stems**_ 6-12 ft., branched, rooting, sparingly pubescent. _**Leaves**_ 2 by 1 in., acuminate at both ends, crisp, lineolate; petiole ⅓ in. _**Heads**_ many-fl., axillary and terminal; bracts ⅓ in., obovate; bracteoles ⅔ in., lanceolate, densely lineolate, white-hirsute upwards. _**Sepals**_ ⅔ in., 5, subequal, lancolate, below glabrous scarious, tips hirsute with white hairs. _**Corolla**_ ⅔ in., tube for ⅓ in. cylindric, for ⅓ in. ventricose or almost hemispheric; mouth subequal. _**Anthers**_ subequal, of the longer filaments subexsert. _**Ovary**_ glabrous, tip glandular-pubescent; ovulae 6-8, on retinacula. _**Capsule**_ not seen.—Much resembling _Cardanthera triflora_, but the corolla is smaller, not (or obscurely) bilabiata. T. Anderson placed this with his _Stenosophion zeylanicum_, which has 4 ovules and a differently shaped corolla, and is _Strobilanthes exsertus_ described below.

4. **H. confinis**, T. Anders. in Journ. Linn. Soc. ix. 463; thinly softly white-hairy, leaves petioled elliptic narrowed to both ends obsolescely crenate, bracteoles hardly half as long as the calyx. _Ruellia confinis_, Nees in DC. Prodr. xi. 148.

**BENGAL; very common.** **UPPER GANGETIC PLAIN; Moradabad, Thomson.**

_Hirsute_ (not harshly) with white hairs. _**Stems**_ 6-18 in., creeping in grass. _**Leaves**_ ⅓-1 in., obtuse; petiole 0-⅓ in. _**Heads**_ 2-6-fl.; axillary solitary flowers not rarely added; bracts ⅓ in., elliptic. _**Sepals**_ linear, or in fruit subspathulate. _**Corolla**_ ⅔ in., subequal, pale lavender-blue, fugacious, glabrous with 2 hairy lines in the palate; ventricose portion nearly as long as the cylindric. _**Longer filaments**_ laxly hairy below. _**Style**_ sparsely hairy. _**Capsule**_ ⅔ in., 12-seeded.—It is doubtful whether Roxburgh described this species under two names, or whether one of these applied to _H. venosa_ or some other species. Kurz (Journ. As. Soc. 1871, ii. 74) proposed (unhappily) to unite this with _Ruellia Blumeana._


Throughout the Deccan Peninsula, alt. 0–4000 ft., from S. Behar (J. D. H.) to Coorg (Wight); common.

Stems 1–2 ft., branching, weak, hairs soft patent white. Leaves 2½ by 1–1½ in., acuminate at both ends, sparsely hairy, obscurely (or not) lineolate; petiole 1–1½ in.; leaves on the secondary flowering branches much smaller. Bracts ovate or elliptic, scarcely longer than the calyx, or of the outermost flowers petiolate, and greatly exceeding the calyx. Sepals ½–1 in., subequal, linear-lanceolate, whitened, hairy not obviously lineolate. Corolla ¾–1 in., nearly straight; tube pale or yellowish, gradually narrowed upwards, limb blue. Shorter filaments glabrous; anthers narrowly obovate, cells triangular acute (not awned). Capsule ½ in., rarely ¾ in., minutely patent hairy, 6-seeded.—This hardly differs from H. elegans, Nees, but by the smaller capsule with 6 (not 8) seeds. T. Anderson considered them one.

VAR. rupestris; more pubescent, often viscid aromatic, heads denser. Ruellia diffusa, Wall. Cat. 2393, letters C. D. R. satapooensis, Wavura in Oestr. Bot. Zeit. 1881, 281, and in R. Pr. Cub. Bot. i. 90, t. 8 B.—Deccan Peninsula, Chota Nagpore, Rajpootana. N.W. Himalaya, alt. 2-5000 ft.; Kumaon, Strachey & Winterbottom; Sewaliks, Stewart.—Even commoner than the type, more rigid, growing in drier places. It was distributed as Ruellia rupestris to Wallich and to Roth (see Roth Nov. Sp. 307). The authentic sheet named by Heyne in Herb. Rottler consists partly or this, partly of Lepidagathis fasciculata.

VAR. Beddomei; much less hairy, leaves small ovate serrate or crenate glabrate.—Bellary; Beddome.


Bombay Ghats; Dalzell, Stocks.

Leaves 1½ by 1 in. (mostly smaller), obtuse or very shortly acuminate, base obtuse or almost rounded, cuneately decurrent on the petiole, coarsely toothed, hairs stiff (almost bristly) especially on the nerves beneath; raphides plentiful but obscure. Otherwise altogether as H. latebrosa, Nees, of which Dalzell finally considered it a form.—H. rupestris, T. Anders., is made up of Ruellia rupestris and of E. ebracteolata, Dalz.; but Dalzell’s E. ebracteolata is much remoter from E. rupestris than is the latter from Hemigraphis latebrosa, Nees.

7. H. flaccida, Clarke; stems long softly patently hairy, leaves petioled ovate or elliptic subentire or obsoletely crenate, heads small few-fl., bracteoles 0. Ruellia flaccida, Kurz in Journ. As. Soc. 1873, pt. ii. 91.

 Pegu; Kurz.

Longer filaments bearded upwards, shorter naked. Bracts not fimbriate nor flowers solitary (as Kurz describes). Capsule not seen.—As Kurz admitted H. latebrosa to be of the genus Hemigraphis, he erred in placing this species in Ruellia; for it is closely allied to H. latebrosa. The white hairs on the stems are ¼ in. long, very copious, nearly similar to those of H. latebrosa. If this is well separable from H. latebrosa, it must be by the very entire leaves; in H. latebrosa the larger leaves (on the principal stem) are always prominently toothed.

8. H. elegans, Nees in DC. Prodr. xi. 723, of T. Anders. partly; diffuse, patently softly white-hairy, leaves petioled ovate or elliptic crenate-serrate, bracteoles 0, capsule ½ in. 8–10-seeded. Ruellia diffusa, Wall.
Hemigraphis.] CIX. ACANTHACEAE. (C. B. Clarke.) 425


Pegu; Wallich, Kurz.—Distrib. Ava.

Similar to, but stouter than, H. latebrosa; leaves less sharply toothed. Inner bracts of the heads 3-4 in., narrowly elliptic or oblong, overtopping the calyx. Corolla ¼ in. and upwards; larger and broader than that of H. latebrosa. Stamens as in H. latebrosa, or (like Nees) one anther-cell sometimes rudimentary.—The long inner bracts give this plant a different aspect from the Deccan H. latebrosa. Bracteoles 0; Nees says lanceolate longer than the calyx, from which it is probable that he means by bracteole that which he has called bract in the diagnosis of the same species. Kurz’s Strobilanthes burmanica is more hairy than Wallich’s Pegu examples; and it may be doubtful if several of the species here admitted are other than local varieties of H. latebrosa.

Var. crenata; viscid-pubescent, less softly white hairy, leaves crenate. Ruellia crenata, Benth.; Hohenacker in Flora 1849, 558. Malabar; Canara, Hohenacker, n. 737; Concan, Belgaum, Bichl; Bombay, Law; Bellary, Beddome.


Mergu; Griffith (Kew Distrib. n. 6091); Tenasserim, Helfer (Kew Distrib. n. 6187).

Rootstock perennial; stems several, 1 foot, erect, scarcely branched, slender, pubescent upwards. Leaves 2 by ½ in., sessile, attenuate to both ends, pubescent when young. Spikes ½-1 in., viscidly hairy; bracts ½-1 in., elliptic, subobtuse; bracteoles ¼-½ in., narrow. Sepals ½ in. and upwards, linear-lanceolate, not very unequal. Corolla ½ in. and upwards, more ventricose than in others of this section, bearded in the palate within. Longer filaments densely bearded upwards with long white hairs, shorter glabrous. Capsule rather more than ½ in., usually 8-seeded. Seeds ¼ in., much compressed, discoid, densely elastically white-hairy when wetted.


Moumein; Parish, n. 403. Tenasserim; Beddome, nn. 96, 97.—Distrib. Ava.

Hirsute with white or yellowish hairs from tubercular bases. Branch stout, shrubby. Leaves 4½ by 2½ in., upper narrower, base obtusely rhomboid, crenate-serrate; petiole ½ in. Heads dense, terminal and peduncled on short axillary branches, hirsute; bracts 1 by ½ in., inner gradually smaller; bracteoles linear-lanceolate rather shorter than the calyx. Sepals ½ in., narrowly lanceolate, bases subtrnate. Corolla sparingly pubescent, more ventricose than in the other species of this section, “deep blue” (Parish). Filaments of the longer stamens densely shaggy with long white hairs to the apex; anthers all subequal, muticus. Style simple, hairy; ovules 4-6 in each cell. Capsule ½ in., narrowly oblong, slightly hairy upwards, 8-12-seeded nearly from the base.

11. H. glaucescens, Clarke; leaves oblong narrowed to each end scabrid pubescent on the nerves beneath, spikes dense strobilate, bracts ovate acute hirsute, bracteoles very small lanceolate. Strobilanthes glaucescens, Nees in Wall. Cat. 7155, and in Wall. Pl. As. Rar. iii. 85, and in DC. Prodr. xi. 178; T. Anders. in Journ. Linn. Soc. ix. 467.

Pegu and Tenasserim; Griffith, &c.

A shrub; branches scabrous. Leaves 6 by 2 in., crenulate, lineolate, sparingly
setulose above, more pubescent beneath; nerves 9–10 pair; petiole ⅓ in. spikes 1–3 in., ovoid or cylindric, very shortly peduncled, solitary; bracts ⅑ in., green, persistent; bracteoles ⅜–⅜ in. Sepals ⅘ in., linear-lanceolate, hairy. Corolla 1 in. (purple?) straight, subsymmetric, upper half narrowly ventricose. Longer filaments densely bearded with long white hairs turned to one side. Ovary glandular-birsute upwards; style sparsely hairy. Capsule ⅜ in., pubescent, 6-seeded. Seeds ⅛ in., compressed, orbicular, when wet the fine white hairs spring out abundantly on all sides; areoles 0.—Habit and fruit-spikes so exactly those of a typical Strobilanthus that neither Nees nor T. Anderson appear to have tried the ovules; they are always 6, and the capsule has 6 seeds on 6 retinacula.

Sect. 3. Corolla large, tubular, yellow. Longer filaments bearded in their upper half by long obtuse white papillosae hairs.


Pegu; Roxburgh, Kurz. Moulemaen; Griffith (Herb. Propr. n. 278), Lobb. Tenasserim; Beddome. Ceylon?; Walker (? cultivated).

A shrub; branches glabrous. Leaves 8 by 3 in., minutely crenulate, tubercular, scabrons, becoming nearly glabrous; petiole ⅓ in. Heads terminal on the arms of a panicle, dense, sparingly ciliate or glabrous; bracts ⅓ in.; bracteoles ⅛ in. Sepals nearly ⅜ in., linear. Corolla densely hairy within, ventricose portion abnrt as long as the cylindric. Anthers connivent in pairs. Ovary with (at least) 6 ovules. Capsule (side Kurz) 8-seeded.—The inflorescence is Strobilanthes-like, and it might be more naturally placed in Strobilanthes; but it is very distinct specifically from S. scaber, Nees, by the 6–8 ovules, very much longer flower and bearded filaments.

—The 3 examples ticketed as from Ceylon have 6 ovules, and seem identical with the Pegu plant. Nees' S. scaber was a purple-flowered species founded on Wight n. 1945, on which type-sheet T. Anderson has written S. heteromallus, T. Anderson., nov. sp.

XVI. STENOSIPHONIUM, Nees.

Shrubs. Leaves ovate or elliptic, acuminate, lower tapering into the petiole, upper subsessile, subcordate, crenate, upper surface densely covered by raphides. Flowers sessile, solitary or 2–3-nate in opposite axils; clusters running into close or interrupted spikes, or panicled; bract ovate or lanceolate; bracteoles 2, narrow, about as long as the calyx. Calyx subequal 5-fid, segments linear or lanceolate, imperfectly connate often for half their length. Corolla tubular-ventricose, suddenly widened about the middle; limb oblique, lobes 5, subequal, twisted to the left in bud. Stamens 2 perfect, or 4 perfect the 2 posterior much the smaller, anterior usually exerted; anthers oblong, 2-celled, muticous. Ovary and style glabrous, or at the apex of the ovary glabular. Disc small, annular. Stigma simple; ovules 3–4 in each cell. Capsule oblong-linear, seed-bearing nearly from the base. Seeds 6–8, on stout hooked retinacula, compressed, discoid, apparently glabrous; when moistened the abundant white hairs of extreme tenuity straighten out.—Species 5, all of the Deccan and Ceylon.

1. S. diandrum, Wight l.c. t. 1502 (not of Nees); leaves rhomboid-elliptic or ovate, spikes interrupted viscosous-pubescent, bracts ovate shorter than the calyx, flowering calyx divided more than half-way down teeth

S. Madras; Courtallum, Wight.

Branches glabrous. Leaves 3 by $\frac{1}{2}$ in., young obscurely scabrous beneath; petiole $\frac{3}{4}$ in. Spikes 2–3 in., in terminal panicles, densely clothed with minute patent gland-headed hairs; lower whorls mostly 4–6-fld., distant even at flower-time; bract $\frac{1}{2}$ in., ovate with a short obtuse apex; bracteoles rather longer than the bract, similar to the calyx-segments. Calyx $\frac{1}{4}$ in.; segments linear-ligulate (not subulate), united at flower-time about $\frac{1}{4}$ their length, in fruit free. Corolla exceeding $\frac{1}{4}$ in. Anterior filaments minutely hairy at the base, posterior reduced to 2 microscopic teeth.

2. S. confertum, Nees in DC. Prodr. xi. 105; leaves rhomboid-elliptic or ovate, spikes scarcely interrupted viscos-hairy, bracts obovate shorter than the calyx, flowering calyx divided nearly half-way down segments linear viscid hairy, stamens 4. T. Anders. in Journ. Linn. Soc. ix. 464, partim. S. Russellianum, Wight Journ. t. 873, not t. 1503, as seen Wight's note under the latter.

S. Deccan; Pulney Mts. and near Courtallum, Wight.

Very near S. diandrum, Wight, and united therewith by T. Anderson; probably the posterior stamens may be present or absent in the same species. The present plant differs from S. diandrum in the leafy habit and shortened very hairy spikes, which have numerous white simple hairs in addition to the gland-tipped hairs. The stamens differ from those of all the other species, being all exserted; but the anthers of the posterior pair are hardly $\frac{1}{4}$ as long as those of the anterior (this is not correctly shown by Wight).

3. S. setosum, T. Anders. in Journ. Linn. Soc. ix. 464; leaves rhomboid-elliptic or ovate, flowering spikes dense somewhat interrupted, below very hairy, bracts linear as long as the calyx, stamens 2.—Strobilanthes n. 67, Herb. Ind. Or. H. f. & T.

Mysore or Carnatic; G. Thomson.

Leaves altogether as of S. diandrum. Spikes 2–5 in., with white simple and gland-tipped hairs; bracts $\frac{1}{4}$ in. and upwards, linear only slightly widened towards the base. Calyx-segments united for about $\frac{1}{2}$ their length at flower-time, subulate, very hairy. Flowers, stamens and capsules exactly as of S. diandrum, from which this species hardly differs except by the bracts.


S. Deccan Peninsula; plentiful in and around the Nilgherries, Wight, &c. Ceylon; Walker, Thwaites.

Stems and leaves as of S. diandrum. Spikes 3–6 in., elongate, all the whors generally distinct even at flower-time, glabrous except a few minute bristles at the sepal-tips or (in Wight's n. 2183) sparingly glandular-pubescent; bracts (from the middle of the spike) $\frac{1}{2}$ in., rhomboid, shortly obtusely mucronate, but the lower bracts often pass into leaves being $\frac{3}{4}$ in, broad cordate-ovate, and the upper are often narrowly obovate. Calyx $\frac{1}{4}$ in., segments united to the middle, teeth narrowly lanceolate acuminate, glabrous with minute white bristles or glandular-pubescent. Anterior filaments very hairy at their base; posterior about half as long, included. Pistil and capsule as in S. diandrum.

V. subsericea, T. Anders. in Journ. Linn. Soc. ix. 464; younger leaves densely white-silky beneath mature silky or glabrous beneath. S. subericeum, Nees in Wall.
5. *S. parviflorum*, T. Anders. *in* Journ. Linn. Soc. ix. 464; leaves rhomboid-elliptic or ovate glabrate, spikes linear subinterrupted at base, bracts lanceolate, calyx small, teeth linear glandular-pubescent, corolla \( \frac{3}{4} - \frac{5}{2} \) in., stamens 2.—*Strobilanthes* sp. n. 68, *Herb. Ind. Or. H.f.* & T.

Mysore or Carnatic; G. Thomson.

Very near *S. Russellianum*, differing mainly by the smaller calyx and corolla and narrower bracts. *Bract* \( \frac{1}{2} \) in. *Calyx* scarcely \( \frac{1}{2} \) in., divided half-way down. *Stamens* 2 only in n. 68 *H.f.* & *T.*; when T. Anderson says 4, he must have examined *Wall. Cat.* 2334 a & b; which T. Anderson referred to *S. parviflorum*, but which is typically *S. Russellianum*, Nees.

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**XVII. ECHMANThERA**, Nees.

Small, hairy shrubs. Leaves broad-elliptic acute, crenate, often viscid. Clusters of *flowers* sessile on the branches of a trichotomous or 1-sided panicle, distant or close; bracts linear, as long as the calyx; bracteoles similar smaller. *Calyx* sub-5-partite; segments linear, subequal. *Corolla* tubular-ventricose, nearly straight, widened suddenly near the middle, glabrous, 2 hairy lines on the palate within; segments 5, subequal, rounded, twisted to the left in bud, pale-violet or purplish. *Stamens* 4, didynamous, included, longer filaments hairy, shorter glabrous; anthers subsimilar, ovate or oblong, 2-celled, cells mucilaginous; connective excurrent at the tip or not. *Ovary* densely hairy at the apex; style sparsely hairy thickened upwards, stigma large simple linear-lanceolate; ovules 4-6 in each cell. *Capsule* narrowly oblong, 6-8-seeded (or ex Benth. 12-) seeded from the base, retinaculum strong, hooked. *Seeds* discoid, densely hairy, or thicker glabrous.

—Species 2, Indian.


**Temperate Himalaya**, alt. 3-5000 ft.; Kumaon and Nepal, Wallich, Thomson.

A small shrub, 1-3 ft., dusky grey or whiteish, villous, not with snowly or silvery wool. *Leaves* \( \frac{1}{2} \) by 2 in., base rounded, slightly crenate, densely (not prominently) lineolate with raphides; petiole \( 1\frac{1}{2} \) in. *Panicles* often 1 foot, one-sided; clusters 3-8-fld., distant or approximate; bracts \( \frac{1}{2} \) in. or more; bracteoles narrowly ligulate, as long as the calyx or more often about half as long. *Sepals* \( \frac{1}{4} - \frac{1}{2} \) in., linear-ligulate, somewhat unequal, herbaceous, pubescent, usually viscid. *Corolla* 1 in. *Anthers* particularly obtuse in *Wall. Cat.* 2333, and the examples closely similar therewith, even in the buds just before expansion. *Capsule* \( \frac{1}{4} \) in., 8-seeded; hairs of the seeds starting out when wetted.

less so in the white-woolly form. In the two examples on one sheet marked by Nees' hand Wallichii and tomentosa, the former has the connective conspicuously, the latter minutely, excurrent. The East Himalaya examples are flowerless, and may belong to *E. tomentosa* type. The Chittagong example is densely snowy-woolly with 6 hairy seeds, and is therefore *E. tomentosa* var. Wallichii, or a new species.

2. **E. leiosperma**, Clarke; hairy, leaves ovate or elliptic acute, bracts linear-ligulate as long as the calyx, anthers oblong connective excurrent at the tip, seeds glabrous.

Jaintia and E. Khasia, alt. 3-4000 ft.; abundant, Clarke.

A small shrub, 2-3 ft. high, very hairy, often viscid, with both brown and white hairs. *Leaves* 3 by 1½ in., rounded at the base, crenate; petiole ½ in. **Panicle** resembling that of *E. tomentosa*, often somewhat leafy; bracts ½ in., linear-ligulate; bracteoles ¼ in., similar to the bracts. **Sepals** ½ in., subequal, linear-ligulate, very hairy. **Corolla**, *stemans* and *pistil* as of *E. tomentosa*, but the connective more excurrent than in any form of *E. tomentosa*. **Capsule** ½ in., 6-seeded. *Seeds* much thicker than in *Echmanthera*, and without hairs.—I cannot match these seeds without going to quite another part of the Acanthaceae Order. They are glabrous when wetted, not discoid. On the other hand, except the seeds, the plant is hardly distinguishable from *E. tomentosa*. There are abundant specimens with seeds in situ.

**XVIII. STROBILANTHES, Blume.**

Large or small shrubs, or herbs. *Leaves* opposite, often unequal, in *S. anisophyllus* often apparently alternate, toothed or subentire, often bearing raphides. **Flowers** capitate, or in strobiliform or interrupted spikes, or panicled, sessile or sometimes pedicelled, purple yellow or white; bracts and bracteoles large or small or 0, persistent or caducous. **Calyx** deeply subequally 5-fid; or (in Sect. Buterea) 2-lipped, with one lip very shortly 3-toothed; segments narrow, equal or unequal. **Corolla** tubular-ventricose, straight or curved; lobes 5, ovate or round, subequal, contorted in bud. **Stamens** 4, didynamous, or (in Sect. Endopogon) 2; anthers oblong, 2-celled, mucilaginous. **Disc** small, or prominent as a stalk to the ovary. **Ovary** 4-ovulate; style linear, stigma of one long linear-lanceolate branch, the other suppressed. **Capsule** 4- or 2-seeded; placentae (in a few species only) rise elastically from the base, carrying the seeds with them. *Seeds* much compressed, glabrous or hairy, hairs elastic when wetted; retinacula curved, strong.—Species 180, Asiatic and 1 in Africa.

This genus contains a great number of species differing widely in habit, inflorescence and size of the flowers. It is here limited to species with 2 ovules in each cell of the ovary. All with more than 2 in each cell have been carried to *Ruellia*, *Echimanthus*, *Hemigraphis*, *Stenosiphonium* and *Echmanthera*.

Strobilanthes rosenii, Wall. Cat. 7154, is an Ava plant, not known from British India.

Strobilanthes salicifolius, T. Anders. in Journ. Linn. Soc. ix. 484, is a plant of altogether uncertain origin.

Strobilanthes biceps, T. Anders. in Journ. Linn. Soc. ix. 476 = Goldfussia biceps, Wall. Cat. 7161, Nees in DC. Prodr. xi. 172, is an Ava plant.

**Key to the Sections of Strobilanthes.**

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Subgenus 1. **Buterea.** Calyx bilabiata. Species 1-4, of Pegu and Tenasserim.

Subgenus 2. **Endopogon.** Stamens 2.

*Seeds* glabrous. Species 5-12, of Ceylon with 1 in S. Deccan.

*Seeds* hairy. Species 13-18, of S. Deccan.

Species 19, 20, of Khasia.

**Series A. Bracteata.** Bracts persistent. Flowers spiked or opposite, not mostly alternate.
- Flowers capitate or shortly spicate.
  - **‡** Seeds hairy.
  - **¶** Species 33-46, of Ceylon and Deccan.
  - **§** Species 47-56, of N. India and Malay Peninsula.

- Flowers strobilate.
  - **†** Seeds glabrous. Species 57-64, of Ceylon and Deccan.
  - **‡** Seeds hairy. Species 65-78.

**Series B. Nudata.** Bracts caducous. Flowers capitulate or opposite, not mostly alternate.

- Heads in fruit capitulate. Species 88-100.
- Heads in fruit elongate or flowers distant. Species 101-119.

**Series C. Alterniflora.** Flowers mostly distant alternate, or panicked. Species 120-136, of N. India and Malaya.

**Series D. Paniculata.** Bracts persistent. Flowers panicked or interruptedly spicate. Capsule wide, very acute. Species 137-145, of Ceylon and S. Deccan.

Residuary. Species 147-154, not seen.

**Subgenus 1. Buterea.** Calyx 2-lipped to the base; one lip 3-fld less than one-third the way down, the other 2-fld or 2-partite.—(Spikes strobiliform; bracts prominent, imbricate. Stamens 4. Seeds (where known) elastically hairy when wetted.—Species of Pegu and Tenasserim.)


**Pegu;** Brandis.—**Distrib.** Moluccas (Roxburgh).

A shrub; branches perfectly glabrous, or intensely shaggy with red hairs ½-⅓ in. long. **Leaves** ⅔-4 in. often unequal, base obtuse or rounded, bistate on both surfaces in the type examples, nerve 2 or pair; petiole ½-⅓ in. **Spikes** 1-5 in., short-peduncled; bracts ⅔ in., fulvous-bistate; bracteoles scarcely ⅓ in., sublinear. **Calyx** ⅔ in., 2-partite to the base, rufous-chinate towards the apex; segments very shortly toothed, one 2-toothed, the other 3-toothed with the middle tooth broader submarginate. **Corolla** 1 in., pale-purple, cylindrical base of the tube rather shorter than the moderately ventricose part. **Capsule** ⅓ in., densely pubescent, 2-seeded. **Seeds** less than ⅛ in., orbicular, fine elastically white-hairy, areoles 0.

**Var. rubiginosa**; leaves larger thinner glabrate lineolate above, bracteoles ⅓ in., ovate.—Tenasserim; Helfer (Kew Distrib. n. 6118). Chittagong; Clarke.—Stems thinly shortly rufous-bistate; leaves ⅔ by 2½ in., base shortly acuminate, ovate, green, herbaceous, nerves beneath thinly rufous-hairy.—Helfer's example is unlike those of Ruellia ulmifolia, but very like the figure of R. comosa, Roxb. Clarke's examples have the stems sparsely or densely rufous-bistate, the leaves glabrate lineolate above or rufous-bistate; the corolla is ⅔ in., pale-purple, nearly glabrous with glabrous filaments, altogether as in Roxburgh's picture.

2. **S. acuminatus**, T. Anders. in Journ. Linn. Soc. ix. 473, partly; leaves lanceolate acuminate at both ends crinate nearly glabrous, spikes oblong short-peduncled glandular, bracts ovate shorter than the calyx, calyx sub-2-partite one lip shortly trifid the other bifid nearly to the base. S. subflaccidus, Kurz in Journ. As. Soc. 1873, pt. ii. 94, ex descr. Adena-
531
Seeds prein., really spikes "limb by S.> at in. in. in., but diam., by Spikes branches stems in., the bracteoles Anders, S. short bracteoles alt., bracts leaves leaves materially is leaves Seeds canthus Strobilanthes.'

A herb; branches elongate, nearly glabrous. Leaves 5 by 1\(\frac{1}{2}\) in., base long attenuate, often subserrate, lineolate above; nerves 6-7 pair, minutely fuscous pubescent beneath; petiole 0-\(\frac{1}{2}\) in. Peduncles 1-2 in.; spikes 1-1 in.; bracts \(\frac{1}{2}\) in., ovate; bracteoles \(\frac{1}{2}\) in., elliptic, wider upwards than the bracts. Calyx scarcely \(\frac{1}{2}\) in., glandular-ciliate. Corolla (ex Nees) \(\frac{1}{2}\) in. at least, glabrous, tubular; limb equal with obtuse segments. Ovary 4-ovulate. Capsule not known.—Description mainly from Nees, the single sheet of Wallich being too imperfect to verify several points. T. Anderson, proceeding on the similarity in the leaves, has assumed that Nees' description is materially wrong, and that Wall. Cat. 7152 is really identical with S. longipes, n. 76 infra. If that be so, it remains as S. subflaccidus, Kurz.

3. S. Parishii, Clarke; leaves elliptic acuminate thinly hirsute, spikes linear-oblong strobilate white-hairy, bracts oblong or slightly wider upwards, calyx 2-partite both segments very shortly toothed,

Moulmein; Parish. Tenasserim; Beddome.

A branching herb; stems suberete rufous-pubescent or subhirsute. Leaves 5\(\frac{1}{2}\) by 2\(\frac{1}{2}\) in., base cuneate or obtuse, crenate, nerves 6 pair; petiole \(\frac{1}{2}\) in. Spikes 2 by \(\frac{3}{4}\) in., short-peduncled; bracts \(\frac{1}{8}\) by \(\frac{1}{4}\) in., obtuse; bracteoles \(\frac{1}{4}\) in., linear. Calyx \(\frac{1}{4}\) in., nearly as of S. rufescens. Corolla 1\(\frac{1}{4}\) in., nearly straight, glabrous, blue; cylindric base of the tube hardly half so long as the campanulate; lobes short, round. Capsule 4-\(\frac{1}{2}\) in., pubescent, 4-seeded. Seeds scarcely \(\frac{1}{8}\) in., orbicular, elastically white-hairy; areoles hardly any.


Martaban; Kurz.

A herb; branches fulvous-hairy. Leaves 3-5 in., membranous, long-petioled. Bracts \(\frac{1}{2}\) in., glandular-hirsute; bracteoles similar, but shorter and broader. Calyx as long as the bracts, adpressedly glandular-puberulous. Corolla 1\(\frac{1}{2}\) in., and filaments glabrous. Style hirsute. Capsule \(\frac{1}{2}\) in., glabrous. Seeds \(\frac{1}{2}\) in. diam., adpressedly villous.—Copied from Kurz, who says it is allied to S. rufescens, whence it is presumed the calyx is definitely 2-lipped; but in the large capsule and seeds it differs from the other species allied to S. rufescens.

Subgenus 2. Endopogon. Calyx deeply subequally 5-fld. Stamens 2 fertile.—(Spikes mostly continuous, sometimes shortened into heads, less commonly interrupted at the base, the lowest flowers then in opposite pairs; bracts persistent).

* Seeds (even in water) glabrous, without areoles on the faces.—Lower half of the corolla-tube cylindric, suddenly widening into the ventricose part.—Species of Ceylon, with one (S. foliusus) in the S. Deccan Peninsula.

5. S. viscosus, T. Anders. in Thwaites Enum. 226, excl. syn. Wight, and in Journ. Linn. Soc. ix. 465, partly; leaves elliptic acuminate at both ends crenulate sparsely pubescent or glabrate, spikes linear subinterrupted viscosus-hairy, flowering calyx \(\frac{1}{2}\) in. divided less than half-way down. Endopogon viscosus, Nees in DC. Prodr. xi. 104, excl. Var. humilis, not of Wight.

Ceylon, up to 7000 ft. alt., frequent; Gardner, Walker, Thwaites (n. 2898, n. 2002, partly), &c.
A shrub, 2-5 ft. Leaves 4 by 1 3/4 in.; nerves 7-8 pair, not conspicuously parallel; petiole 1/2 in. Spikes 3-8 in., axillary, simple or compound, and running into terminal panicles; flowers opposite, lowest pair usually distant; bracts 1/2 in., elliptic or oblong, attenuated upwards; bracteoles 1/4 in., narrow. Calyx viscidly hairy, teeth lanceolate; calyx in fruit enlarged often 3/2 in. or more, split to the base into lanceolate segments. Corolla 1 1/2 in., densely pubescent without; linear-base of the tube 1/2 in., very narrow, ventricose portion 1/2 by 1/2 in., oblique, lobes ovate. Filaments glabrous except near the base; anthers large, pendulous, subexserted. Capsule 1/2 in., 4-seeded. Seeds more than 1/2 in., ovoid, thinning towards the apex, smooth, hairless.

**S. microphyllus**, Nees in DC. Prodr. xi. 104; leaves 1 1/2 in., spikes very weak few-fl.; Ceylon.—The type specimen of this has no fruit; but Walker, n. 122, has similar small leaves and fruit exactly as of *S. viscosus* type.

**S. digitalis**; bracts abbreviated, spikes elongate slender, minutely deciduously cinereous-woolly not hairy nor viscid. Endopogon argutus, Nees in DC. Prodr. xi. 104.—Ceylon; Gardner.—The examples referred here by Nees (probably on the characters of the leaves) having fulvous viscid hairy spikes seem nearer *S. viscosus*, T. Anders. type.

6. **S. stenodon**, Clarke; glabrous, leaves ovate acuminate crenate, spikes linear scarcely interrupted, bracts short obovate, calyx divided half-way down, corolla-lobes narrowly oblong.

**Ceylon**; Matelle East, Beckett, Thwaites, C. P., a. 3874. *Leaves* 4 1/4 by 2 in., shortly narrowed into the petiole; nerves 8 pair; petiole 1 1/4 in.; leaves white underneath in Beddome's Ceylon specimen. Spikes 2-5 in., axillary, simple or compound, running into terminal panicles; bracts 1/4 in.; bracteoles 1/4 in., narrowly oblong. Calyx glabrous, teeth lanceolate. Corolla glabrous in bud, white-hairy within; cylindrical base 1/4 in., very narrow; ventricose tube 1/4 in. long and broad; lobes 1/4 in. Anthers exerted, pendulous. **Capsule** 2 in each cell. **Seed** not seen.—A remarkable plant with the habit, inflorescence and bracts of *Stenosphinum Russellianum*; the narrow lobes of the corolla are unlike any neighbouring species or genus.

7. **S. exareolatus**, Clarke; leaves elliptic acuminate at both ends slightly undulate crenate glabrous, spikes linear lax hairy, calyx narrow overtopping the bracts divided less than half-way down. S. consanguineus, T. Anders. in Thwaites Enum. 226, and in Journ Linn. Soc. ix. 465, partly. *Stenosiphonum diandrum*, Nees in DC. Prodr. xi. 105, not of Wight. Endopogon consanguineus, Nees l. c. as to the Ceylon material.

**Ceylon**; alt. 3000 ft.; Walker.

A shrub. *Leaves* 3 1/4 by 1 3/4 in.; nerves 6 pair; petiole 1 3/4 in. Spikes 2-4 in., running into terminal panicles; bracts 1/4 in., ovate or oblong; bracteoles 1/4 in., narrow. Calyx (in flower) 1/4 in., teeth sublinear; in fruit enlarged. Corolla 1/2 in., resembling that of *S. viscosus* but smaller. Capsule 1/2 in., 4-seeded. **Seed** scarcely 1/4 in., ellipsoid, smooth, hairless, without lateral areoles.—Near *S. viscosus*, differing by the short bracts, narrow cylindrical calyx, smaller flowers and much smaller seeds. As to the synonyms, the type specimens of Nees and T. Anderson, written on by their own hands, are preserved at Kew.

**S. densa**; spikes denser, bracts elliptic imbricate often as long as the calyx.—Ceylon, alt. 2-6000 ft.; Thwaites, n. 2002 chiefly, &c.

8. **S. rhytisperma**, Clarke; leaves elliptic acuminate at both ends denticulate thinly white-cottony beneath, spikes linear uninterrupted glabrous, bracts lanceolate about equalling the calyx. *S. hypoleucus*, T. Anders. in Thwaites Enum. 226, not Endopogon hypoleucus, *Nees*. 

**Strobilanthes.**
Strobilanthes.]  CIX. ACANTHACEE.  (C. B. Clarke.)  433

CEYLON; Central Province, Thwaites, C. P. 2897, collected by Gardner.

Stem glabrous. Leaves 5 by 1 1/2 in., mature glabrous above; nerves 8 pair; petiole 3/4 in. Spikes 6–4 in., clustered in the axis (end of the branch not seen); bracts 3/4 in. Calyx 1/4 in., divided half-way down, hardly enlarged in fruit; teeth narrowly lanceolate, glabrous. Corolla glabrous without in bud. Capsule 1/4 in., 4-seeded. Seeds 3/16 in., obovate-elliptic, smooth, hairless, longitudinally wrinkled, without lateral areoles.


CEYLON, alt. 3000 ft.; Thwaites, C. P. n. 3353.

A shrub, 4–5 ft., blackish-green when dry. Leaves 5 by 1 1/4 in., lineolate above, reticulate beneath; nerves 7 pair; petiole 1 1/2 in. Spikes 2–5 in., axillary, simple or compound, and running into terminal panicles; bracts 1/2 in.; bracteoles 1/4–1 in., narrow. Calyx 1/4 in. and upwards hairy, divided about half-way down, enlarged in fruit. Corolla pale-purple, very nearly as of S. viscous. Capsule 3/16 in., very broad and stout, 2-seeded (in Thwaites, 3853). Seeds 1/16 in. diam. (unripe), hairless and without lateral areoles.


CEYLON, Gardner; alt. 3000 ft., Thwaites, C. P. n. 2007.

A shrub, 1–2 ft., hairy upwards. Leaves 2 1/2 by 1 1/4 in., base obtusely rhomboid; nerves 6 pair; petiole 1 1/4 in. Spikes 1–4 in.; bracts 3/4 in., not acuminate; bracteoles 1/4–1 in., linear-oblance. Calyx 1/2 in., very hairy, divided hardly half-way down (not so deeply as figured by Wight); teeth narrowly lanceolate. Corolla 1–1 1/2 in., purple, pubescent, cylindric portion more than 1/4 in., very narrow, ventricose portion 1 1/2 in.; teeth ovate. Stamens 2; filaments sparsely hairy more than half their length. Ovules 2 in each cell.—The habit, bracts and shape of the corolla are much as in S. exareolata var. densa; but the capsule and seeds being unknown, the exact position is doubtful.


A shrub, 4–5 ft., green. Leaves 4 1/4 by 1 1/2 in.; nerves 6 pair; petiole 1 in. Peduncles axillary, 1 1/2 in., thickened upwards, deflexed; outer bracts 3/4 in., elliptic, often nearly enclosing the whole head; proper bract 3/4 in., lanceolate; bracteoles rather shorter, linear. Calyx 3/4 in., divided half-way down, glabrous or the linear-lanceolate teeth puberulous. Corolla 2–1 in., pale purple, nearly glabrous, hairy in the palate within; cylindric base of the tube as long as (and suddenly widened into) the ventricose portion, not so funnel-shaped as in Beddome’s figure. Stamens 2, glabrous. Pistil glabrous. Capsule not seen; and, the seeds being unknown, the affinity is doubtful.


NILGHERY Mts., alt. 6–7000 ft., frequent; Gardner, Wight, &c.

VOL. IV.
CIX. ACANTHACEAE. (C. B. Clarke.)  [Stroblanthes.]

Stems 1-2 ft., much branched, rigid. Leaves 2 by 1 1/2 in., shortly acuminate at both ends, conspicuously lineolate above; nerves 5-6 pair; petiole 1/4 in. Heads numerous, terminal, 1/2 in. diam., each closely embraced by the two uppermost leaves (exclusive of the proper bracts); bracts 1/4 in., linear-oblong, at first nearly glabrous or hairy; bracteoles 1/8 in., linear, at first nearly glabrous or hairy. Calyx 3/4 in., divided nearly half-way down, ochreous or prominently hairy at flower-time, hispens in fruit, segments narrowly lanceolate. Corolla 1 1/2 in. blue or whiteish, glabrous without, hairy along 2 lines within; linear base of the tube about as long as the suddenly-widened ventricose part. Filaments hairy nearly to the summit; rudiments often 3, whereof 2 often carry minute rudimentary anthers. Ovary slightly hairy upwards. Capsule 3/4 in., 4-seeded. Seeds 1/2 in. long, very thin, glabrous; areoles 0.—There is no difference between the typical folius and the Var. capitatus; the heads on one stem which appear (superficially) glabrous in flower are very hairy in fruit, owing to the development of the hairs on the bract, bracteoles and calyx.

** Seeds (in water) densely hairy except on two lateral circular areoles near the base on each face.—(Linear or subcylindric base of the corolla short, more gradually narrowing into the ventricose portion than in the preceding section.—Species of the S. Deccan Peninsula.)


Mts. of S. DECCAN PENINSULA, alt. 5000-7500 ft.; plentiful in the Nilgherries, Wight, &c.

Stems 12-20 in., numerous, erect, rigid, quadrangular upwards. Leaves 2 by 1 in., obtuse or subacuminate, bristly or searish above; primary nerves beneath close, parallel, prominent, secondary reticulated more or less concealed by close hard white tomentum; petiole 1/2 in., very broad. Spikes 1-3 in., hairy; bract 1 1/2 in.; bracteoles 1/8 in., linear-digulate. Calyx 1 1/2 in., floccose-villous; segments linear-lanceolate, base shortly connate. Corolla ventricose from near the base, palate hairy within, blue or whiteish. Filaments pilose. Ovary glabrous; style hairy. Capsule 1 1/2 in. oblong, rigid. Seeds 4, densely hairy (hairs spreading when wet) except on the circular basal areola on each of its faces.


Mts. of S. DECCAN PENINSULA, alt. 4000-5500 ft.; Mysore, Lobb; Sispara plentiful, &c., Beddome.

Shrubby, covered (except the leaves above) with dense yellowish wool, flowering at 6-7 years old, then dying. Leaves 2 by 2 in., base broadly rhomboid, subcordate, wool of upper surface decidua; nerves 13 pair, approximate, subparallel; petiole 1/4 in. Spikes 1-3 in., compound and (by the reduction of the upper leaves) running into terminal panicules; bracts 1 1/2 in., elliptic, obtuse; bracteoles 1/8 in., linear-oblong. Calyx nearly 1 1/2 in., divided about half-way down; segments narrowly lanceolate, subobtuse. Corolla nearly straight; ventricose portion of the tube much longer than the cylindrical base. Filaments hairy. Ovary glabrous, with a few long hairs near the apex; style glabrous; ovules 4. Seeds not seen.

15. **S. canaricus, Bodd. in t. 215; leaves ovate acuminate subentire mature puberulous on the nerves beneath, spikes linear-oblong minutely cinereous-lanate, bracts ovate, corolla 3/4 in. white.
DECCAN PENINSULA; S. Canara, on the Kudra Mukh Mt., alt. 6000 ft., Beddome.

A rigid shrub, 3–4 ft.; tips of the branches and young leaves densely clothed with caduceous yellowish wool. *Leaves* crowded towards the ends of the branches, 3 by 1½ in., base rhomboidal, mature nearly glabrous except the nerves beneath; nerves 9 pair, approximate, subparallel; petiole ½ in. *Spikes* 1–2 in., clustered in the upper axils, forming a dense terminal panicle, thinly, dully, deciduously woolly; bracts ¾–1 in., ovate, obscurely acuminate; bracteoles scarcely ¼ in., narrowly lanceolate. *Calyx* ½ in., divided half-way down; segments narrowly lanceolate. *Corolla* very pubescent, ventricose portion much longer than the cylindrical base. *Filaments* hairy. *Ovary* glabrous, style minutely sparsely hairy; ovule solitary in each cell (in the only ovary examined), probably never as in Beddome’s figure, which shows the ovules 2 in each cell, the lower pendulous.


*Nilgherries*, alt. 4,000 ft., frequent; *Wight, Gen. Munro*, &c.

A shrub, 2–5 ft. *Leaves* 4 by 2½ in., base shortly acuminate, mature glabrous above, raphides not prominent; nerves 9 pair, approximate, subparallel; petiole ⅓ in. *Spikes* 1–3 in., often laxly panicked at the ends of the branches; bracts ⅔ in., base concave, acuminate, tip recurved; bracteoles ¼ in., linear. *Calyx* ⅔ in., divided ⅔ the way down; teeth linear, very glandular-hairy (not so lanceolate as in Beddome’s figure). *Corolla* nearly glabrous; 2 rows of long white hairs on the palate within, between which the style (itself nearly glabrous, not as in Beddome’s figure) lies. *Filaments* glabrous, except near the base. *Capsule* ½ in., 4-seeded; seeds discoid, with a circular areola on each face, densely hairy except on the areola.—T. Anderson refers *Wight Ic.* t. 1497 to *S. viscous*, but the plant from which that figure was drawn is at Kew, and is *S. cuspidatus*.


Very similar to the last species; but the leaves are more distinctly toothed, the flowers smaller. *Leaves* glabrate, prominently lineolate above; nerves 7 pair. *Spikes* compound, axillary and terminal, often slender, sublinear. *Calyx* ⅔ in., divided half-way down or more; segments narrowly lanceolate, glandular-hairy. *Corolla*-lobes ovate, acute. *Filaments* glabrous, except at the very base. *Capsule* ⅓–1 in., 4-seeded. *Seeds* discoid, areolate on both faces, densely hairy except on the areoles.—This is the original *Endopogon consanguineus* of Nees, which was founded on *Wight* n. 1982, the example of which authenticated in Nees’ hand is at Kew. Subsequently, in *DC. Prodr.*, Nees united with this species the totally remote *S. acarolatus*. T. Anderson published (in *Thomastes Enum.* 229) this latter species as *S. consanguineus*, T. Anders., while he separated in the herbarium the old *Wight* n. 1982 on which he has written *S. neglectus*, nov. sp.

VAR. hypoleucus; as VAR. Amomum, but the leaves often (when young) silky white beneath. Ruellia sesamoides, Wall. Cat. 240 B. Endopogon hypoleucus, Nees in Wall. Pl. As. Rar. iii. 99, and in DC. Prodr. xi. 104. E. viscous, Nees, Var. humilis, Wight Ic. t. 1498; Nees in DC. Prodr. xi. 104.—Mts. of S. Madras, Wight; Bellary, Beddome.—A very trifling var. of the preceding Var. Amomum; but the Ceylon plant, the S. hypoleucus of T. Anderson, is the very different S. rhizophyllum.

18. S. jejyporensis, Bedd. Ic. Pl. Ind. Or. t. 9214; leaves ovate acuminate crenulate mature nearly glabrous, spikes linear-oblong viscidly patently hairy, bracts lanceolate acuminate recurved, corolla ½ in. white.

S. Deccan Peninsula; Golconda in Vizagapatam, alt. 2500 ft., and Mt. in Jeypore, Beddome.

A large shrub. Leaves 7½ by 4 in., base shortly acuminate, mature densely obscurely lineolate above, thinly puberulous beneath; nerves 11 pair; petiole 2½ in. Spikes 1–2½ in., uninterrupted; bracts ½ in.; bracteoles ½ in., narrow. Calyx ½ in. and upwards, divided 3 the way down; segments linear from a short lanceolate base, patently hairy. Corolla nearly straight, ventricose portion of the tube much longer than the cylindrical. Ovary 4-ovulate in Beddome’s figure. Capsule ½ in., 2-seeded in Beddome’s example. Seeds discoid, areolate on each face, densely hairy except on the areoles.

*** Species of the Khasia Hills.


20. S. khasyanus, T. Anders. in Journ. Linn. Soc. ix. 471; hirsute, leaves ovate acuminate toothed, spines axillary clustered linear lax, bracts linear-spathulate as long as the calyx, corolla slender white. Endopogon khasyanus, Nees in DC. Prodr. xi. 104.


A shrub, 2–4 ft., densely patently brown-hairy, somewhat glandular-viscid. Leaves 4 by 2 in., shortly narrowed into the petiole, strongly crenate or sub serrate, mature hirsute on both surfaces; nerves 9 pair; petiole 1⅛ in. Spikes 1–4 in., forming axillary tufts of unequal length, linear but scarcely interrupted; bracts ⅜ in.; bracteoles ⅜ in., linear. Sepals ⅝ in., linear, somewhat enlarged in fruit. Corolla-tube ⅝ in., linear, funnel-shaped only towards the top, lobes ½ in., roundish, patent. Filaments glabrous, unless at the very base, anthers much exerted. Capsule ½ in., 4-seeded. Seeds ovate, with an areola on each side; hairy (except on the areoles) with adpressed hairs inelastic when wetted.

Subgenus 3. Eustrobilanthes. Calyx deeply subequally 5-fd. Stamens 4, perfect; anthers not very unequal.
Series A. Bracteata. Bracts prominent, persistent or only late deciduous. Flowers spiked, clustered or strobiliform; spikes sometimes interrupted below, but flowers never all scattered.

*Flowers capitate or shortly spicate.* (An artificial section passing by gradations into the strobiliform or interruptedly spicate sections.)

† Seeds glabrous (in a few not known).—Species of Ceylon and the Deccan Peninsula.


W. Deccan Peninsula; from the Bombay Ghats to Cape Comorin, alt. 3000 ft., Wight, Dalzell, &c.

A gregarious shrub, flowering once at about 7 years old, then dying (Beddome); stem often winged. Leaves 7 by 3 in., crenulate or subentire, lineolate especially above; nerves 7–8 pair; petiole 1–3 in., base often auriculate, sometimes winged. Heads 1–2 in., sessile, very dense; bracts ½ in., obscurely quadrifid, green, ciliate; bracteoles ¼ in., linear, ciliate. Calyx ¼ in., divided more than half-way down, green, ciliolate; segments linear-lanceolate. Corolla ½–1 in.; cylindric base as long as the suddenly-widened subcampanulate portion; limb nearly erect, subequal. Filaments sparingly hairy upwards. Pistil sparingly hairy and glabrous. Capsule ¾–2 in., clavate, always 2-seeded. Seeds nearly ¾ in. long, very thin, elliptic, areoles 0.—The flower has only been seen in the form S. tetrapterus, Dalz. In the old examples of S. barbatus the corolla is barely ½ in., the heads and bracts are smaller, the calyx less deeply divided; but Beddome says (from knowledge of the living plant) that there is only one species here.


Ceylon; Four Korles and Saffragam, Macrac, Thwaites, &c.

A small shrub; branches quadrangular. Leaves 3 by ¾ in., prominently lineolate above; nerves 6 pair; petiole ¼ in. Heads ½ in. (exclusive of the corolla), 2–4-fld., in appearance solitary peduncled, peduncules slightly thickened upwards quadrangular or subulate; floral leaves 2, elliptic, ½ in., in the dried examples erect, overtopping closely enveloping the flower-head; proper bract ¼ in., oblong; bracteoles 2, ¼ in., sublinear, often suppressed in the upper flowers as commonly in close heads. Calyx ½ in., divided half-way down, segments in fruit elongate obtuse. Corolla 1½–1¾ in., nearly glabrous without, light-hline; cylindric nearly as long as the ventricose part. Filaments hairy downwards. Ovary hairy at the apex. Capsule ½ in., narrowly oblong. Seeds ⅛ in. long, thin, elliptic, glabrous; areoles ⅛ the length of the seed.

23. **S. heteromallus**, T. Anders. ms.; villous, subhispid, leaves ovate acute, heads ovoid, bracts oblong, overtopping the calyx, ovary densely hairy at the tip. S. scaber, Var. γ Nees in Wall. Pl. As. Bar. iii. 84, Var. β Nees in DC. Prodr. xi. 178, as to Wight's Deccan material. Ruellia scabra, Wall. Cat. 2377 (not Wall. Cat. 2393).
NILGERRIES; Canoor, Wight (nn. 1945, 2207, herb. propr.).

A coarsely hairy shrub, resembling S. Wightianus. Leaves attaining 5½ by 3½ in. (mostly much smaller), base obtuse shortly decurrent on the petiole, nearly entire, thick, rugose, upper surface sublustrous with hairs from tubercular bases, under villous; nerves 7–8 pair; petiole 1½ in. Heads sessile, 1 in., dense, hairy; bracts 2½–1 in., erect; bracteoles ½ in., sublinear. Calyx ¼ in. or more, divided more than half-way down; segments linear-lanceolate, hairy upwards. Corolla 1 in., glabrous without, hairy within, subsymmetric, cylinder portion of the tube as long as the ventricose. Stamens 4; filaments very hairy at the base. Ovary dense fulvous-hairy at the tip; style sparsely hairy; ovules 4. Capsule scarcely ½ in., narrowly ellipsoid, 2- or 4-seeded. Seeds more than 1 in., glabrous; areoles 0.—This in the dry state greatly resembles S. Wightianus, but the ovary, style and seeds differ. Col. Beddome says the shrub is well known to him at Canoor, but has not flowered during his whole residence in the Nilgherries.

24. S. Wightianus, Nees in Wall. Pl. As. Rar. iii. 86, and in DC. Prodr. xi. 180; coarsely hairy, leaves ovate, heads ovoid, bracts elliptic-acuminate overtopping the calyx, ovary glabrous at the tip, capsule 4-seeded. Wight Jr. t. 1514; T. Anders. in Journ. Linn. Soc. ix. 466.

NILGERRY MTS., alt. 7–8000 ft., frequent; Gardner, Wight, Gen. Munro, &c.

Stems 2–3 ft., stout, often almost shaggy. Leaves 1½–2½ by 1 in., obtuse, base shortly cuneate, thick, rugose. Bracts ½–1 in., acute; bracteoles ½ in., linear-spatulate. Calyx ¾ in., divided nearly to the base; segments linear-oblong, sub-obtuse, softly hairy; in fruit somewhat membranous nervous. Corolla 1½ in., blueish, nearly glabrous without, with hairy lines within; cylindrical base of the tube much shorter than the ventricose part. Ovary glabrous; style sparingly hairy. Capsule ½ in., oblong, 4-seeded. Seeds 1½ in. long, thin, elliptic, glabrous; areoles 0—Otherwise as the preceding species, which Wight appears to have included under Wightianus.


S. DECCAN; Pulney Hills and Ansmallays, Beddome.

Resembling S. Wightianus, but with a differently shaped corolla. Leaves 3 by 2 in., base rounded or cuneate, crenate, thick, tubercular-hairy above, more softly hairy beneath; petiole 1½ in. Heads much depressed, as if into flattened rosettes, the rounded bracts patent on all sides; bracteoles ¾–1 in., linear-lanceolate. Calyx ½–¾ in., divided more than half-way down; segments linear-lanceolate, hairy. Corolla 1 in., somewhat hairy in the bud; cylindrical base as long as the ventricose part. Filaments glabrous, except at the base. Ovary slightly patently hairy towards the apex, 4-ovulate. Capsule not seen.—Communicated by Col. Beddome as probably Ruellia punctata of Wight, which differs very considerably. In the absence of seeds, it is placed by guess next S. Wightianus.


S. DECCAN, common in the mountains, Nilgherries, Pulneys, Coorg, &c., Beddome.

A shrub, general aspect of S. Perrottettianus. Leaves 6 by 3½ in., base obtuse, crenate, coarsely hispid with white or yellow hairs from tubercular bases; nerves 8 pair; petiole 1–2 in. Heads sessile, capitate, not elongate even in fruit; bracts 1 by ½ in.; bracteoles at flower-time ½ in., linear, in fruit elongate very long-tailed. Sepals ½ in.; in fruit at least 1 in., base lanceolate with leaden glabrous scarious margins.
Corolla 1½–1½ in., glabrous without, white (Beddome), cylindric base nearly as long as the nectariferous part. **Filaments** hairy, especially downwards. **Style** sparsely patent hairy. **Capsule** ½ in., oblong-ellipsoid. **Seeds** thin, ovovate, obtuse, glabrous; areoles 0.—Beddome says ‘ovary very hairy at the apex,’ but in his figure and specimen it is very slightly so. Possibly the note applied to *heteromallus*?

27. **S. Perrottetianus**, *Nees in DC. Prodr.* xi. 179; rufous-hirsute, leaves ovate acuminate, heads ovoid or subclavate, bracts ovate acute overtopping the calyx, capsule 2-seeded. **Wight** Lc. t. 1513; **T. Anders.**, *in Journ. Linn. Soc.* ix. 466.

NILGHERRY MTS., alt. 6–8000 ft., frequent; **Wight**, &c.

Stems 2–3 ft. **Leaves** 4½ by 2½ in. (often smaller), base broadly rhomboid, crenate; nerves 7 pair; petiole 1½ in. **Heads** 1–2 in., often wider upwards, or subrostiliform, hirsute, in appearance peduncled or panicled, but the two outermost bracts are empty, and more or less leafy; bracts ½ in.; bracteoles ¼ in., linear. **Calyx** ¼ in., divided ⅔ the way down, subscarious with numerous red hairs; segments sublinear, acuminate. **Corolla** 1 in., pale-purple, subsymmetric; narrow portion of the tube short; glabrous without. **Filaments** hairy. **Ovary** glabrous; base of style patent hairy. **Capsule** ½ in., oblong-ellipsoid, 2-seeded. **Seeds** ½ in. long and upwards, very thin, ovate, not hairy, but minutely scabrous-lamelate; areoles 0.


NILGHERRY MTS., alt. 6–8000 ft., frequent; *Sir F. Adair, Schmidt, Wight*, &c.

A shrub, 2–3 ft., much resembling *S. fuliginosus* (n. 8), and nearly closely allied to it. **Leaves** 3 by 1½ in., base cuneate, serrulate, upper surface prominently lineolate; nerves 7 pair; petiole 1½–2 in. **Spikes** 1–2½ in., young glabrous or oblong, mature oblong; bracts ½ in.; bracteoles ⅔ in., sublinear. **Calyx** ⅔–¾ in., divided nearly to the base; segments linear-lanceolate, glabrous or in the fruiting examples with scattered patent gland-tipped hairs. **Corolla** 1½ in., blueish, glabrous without; cylindric nearly as long as the ventricose part. **Filaments** hairy in their lower half. **Pistil** glabrous or nearly so. **Capsule** ½ in., oblong-ellipsoid. **Seeds** ½ in. long, very thin, elliptic, glabrous; areoles 0.


W. DROCAN PENINSULA; near Belgaum, Warree country, *Dalsell*; Ram Ghaut, *Ritchie*; Coorg and S. Canara, alt. 3000 ft., **Beddome**.

Shrub, 2–5 ft. **Leaves** 6 by 2 in., much acuminate, crenate, lineolate on both surfaces; nerves 7 pair; petiole ⅔ in. **Spikes** 1–2 in., peduncles hairy, erect in fruit; bracts (flowering) ⅔–¾ in., elliptic, hairy; bracteoles ¼ in., linear. **Calyx** (flowering) ¼ in., divided nearly to the base; segments linear pubescent upwards. **Corolla** straight, nearly symmetric, glabrous, linear-cylindric about as long as the subcampanulate portion; white-purple-spotted. **Filaments** hairy below, not more monadelphous than in many other species. **Pistil** glabrous. **Capsule** ¼ in., clavate-oblong; fruit-sepals ⅔ in., narrowly oblong, hairy. **Seeds** ⅔ in. long, thin, elliptic, glabrous; areoles 0.—The extraordinary enlargement of the calyx in fruit was noted by Dr. Ritchie, whose examples have flowering and fruiting spikes on the same branch.

xi. 183; glabrous, leaves broad-lanceolate acuminate at both ends, spikes small oblong often deflexed at flower-time, corolla small. T. Anders. in Journ. Linn. Soc. ix. 468, partly; Bedd. Ic. Pl. Ind. Or. t. 211. Ruellia ciliata, Wall. Cat. 2415 (not Wall. Cat. 2392). Goldfussia Zenkeriana, Wight Ic. t. 1517?, not of Nees.

S. Deccan Peninsula; the Ghats up to 4000 ft., common, Beddome; Nilgherries, Mangalore, &c., Courtallum, Wight (n. 1949, Herb. Propr.).

Similar S. varrensis in leaves and spikes; but the peduncles and bracts are perfectly glabrous, the spikes slenderer. Corolla in the dried examples ½–½ in.; Wight's figure shows them very much too large; Beddome figures (and describes) them an inch, but his description appears largely taken from S. varrensis.

31. S. adenophorus, Bedd. Ic. Pl. Ind. Or. t. 225, not of Nees nor of T. Anders.; glabrous, leaves lanceolate acuminate at both ends subentire, heads oblong, bracts obovate, calyx-segments lanceolate subobtuse.

S. Deccan; Anamally Mts., alt. 4–5000 ft., Beddome. Shrubby, 3–4 ft. Leaves 4 by 1 in., conspicuously lineolate above; nerves 6 pair, slender; petiole ½ in. Heads 1–2 in., often deflexed; bracts ½–½ in., obtuse, sometimes mucronate, glabrous, lineolate; bracteoles ½ in., narrowly ligulate. Calyx nearly ½ in., divided about half-way down; segments membranous. Corolla 1–½ in., glabrous without, very hairy within, nearly straight; cylindric rather shorter than the urceolate part. Filaments hairy downwards. Pistil glabrous. Capsule not seen.—Beddome says that T. Anderson identified this plant with the Ceylon S. lanceolatus, but there must have been some mistake, as except in the leaves there is little resemblance between the two. In its habit, deflexed peduncles, and bracts, this seems very nearly allied to S. ciliatus, Nees, but in the absence of seeds it is hazardous to guess at affinity.


S. Deccan; Coimbatore, Courtallum and Nilgherries, Wight; Anamallays, Beddome. Herbaceous (like Wight), green. Leaves 7 by 2½ in., entire or obscurely crenate, conspicuously lineolate above; nerves 10 pair; petiole 1 in. Peduncles 1–2 in., slightly thickened upwards, quadrangular or subulate, divaricate or deflexed, often with 2 bract-like leaves below the bead; heads 1½ in., tapering at the base; bracts 1 by ½ in. Bracteoles ½ in., linear-ligulate. Calyx ½ in., subcaudate, divided more than half-way down, segments lanceolate. Corolla ½ in., glabrous without; cylindric portion scarcely so long as the ventricose. Filaments hairy downwards. Pistil glabrous. Capsule not seen.—This species is placed here from its similarity to S. ciliatus and S. adenophorus.

†† Seed's hairy.

‖ Species of the Deccan Peninsula and Ceylon.


Ceylon; alt. 4–7000 ft., Walker, &c.

A shrub, 6 ft, gregarious, flowering when about six years old, then dying. Leaves 6½ by 2½ in., crenate, minutely sparsely scabrid-pubescent; nerves 7–8 pair; petiole
1½ in. Cymes often of 3 heads, sometimes compound; peduncles clavellulate or winged; heads ¾ in., 2–4 fl., enveloped by the two outer bract-like erect leaves; proper bracts ½ in., green, slightly ciliate; bracteoles ¼ in., sublinear. Sepals ½ in., linear-lanceolate, obtuse, scarious, nearly glabrous. Corolla ¾ in., subsymmetric, glabrous without, hairy within, white or purplish; contracted base short. Filaments hairy at the base. Pistil glabrous. Capsule ½ in., ellipsoid. Seeds nearly ½ in., very thin, ovate, shaggy with adpressed wavy silky hair not elastic in water; areoles 0.—Beddome's figure shows the corolla within and filaments glabrous, which they may be sometimes, for it is not a very constant character in Strobilanthes; but none of the constant characters are so.

Var.? *stenocarpus*; leaves broadly ovate pubescent beneath somewhat flaccid, capsules ½ in. 2-seeded, seeds ½ in. shaggy with silky hair, areoles hardly any.—Ceylon; Thwaites, C. P. n. 3517. This probably differs specifically from *S. Walkeri*, the difference in the size of the fruit being startling; but it must stand next to it.


**Ceylon**; Ambagamowa, Thwaites.

A shrub, 4–5 ft. Leaves 6½ by 2½ in., crenulate, subcoriaceous, mature glabrate above fuscos pubescent beneath; nerves 7 pair; petiole 1¼ in. Peduncles fascicled or cymose, thickened upwards, more or less pubescent; outermost empty bracts ½ in.; ovate; bract proper nearly 1 in., ciliate; bracteoles ½ in., linear. Calyx ½ in., divided 3 the way down; segments narrowly lanceolate, ciliate. Corolla exceeding 1 in., subsymmetric, white, glabrous without, hairy within; linear-cylindric base of the tube hardly so long as the campanulate part. Filaments and style sparsely hairy. Capsule not seen.


**W. Deccan Peninsule**; S. Canara, 2–6000 ft., Beddome; common also in Koorg and Wynad, fide Beddome. **Ceylon**; Hantani, Thwaites (C. P. n. 364). A shrub, 4–5 ft. Leaves 6 by 1½ in., base tapering, subentire, mature glabrate lineolate above; nerves 10–12 pair; petiole ¼ in. Peduncles 1–2 in., hairy, divaricate, carrying 1–3 nodding spikes ½–1¼ in. long; bracts ½ in., oblong; bracteoles ½ in., narrowly oblong. Calyx nearly ½ in., oblong, softly brown-hairy, divided nearly to the base; segments sublinear, obtuse. Corolla ½–1 in., nearly glabrous, white tinged orange or reddish; cylindric portion shorter than the verticicole; limb suboblique, segments short round. Filaments glabrous. Ovary scabrous, slightly glandular-hairy; style thinly hairy. Capsule ½ in., broadly ellipsoid, fuscos-pubescent, 2-seeded. Seeds ¼ in. diam., Rufous, indistinctly shaggy; areoles small.—Col. Beddome's Mahabar plant has rather longer hairs on the stem and leaves than the Ceylon.

Var. *laniceps*; tips of the branchlets purple, peduncles and spikes densely white with patent hairs ½–¾ in. long, corolla 1½ in. very hairy within, filaments hairy.—Ceylon; Thwaites.—Sent by Thwaites, numbered 364, subsequently to the rest of n. 364, and probably not seen by T. Anderson before Thwaites' Enum. was published.


**Nilgherries**; Gardner; below Sispara, Wright. **S. Tinnevelly**; Beddome.
An erect shrub. Leaves 7 by 2½ in., crenate, lineolate on both surfaces; nerves 6–7 pair beneath, minutely scabrid; petiole 2 in. Heads several (sometimes 36) to the panicle; panicle branches slender, glabrescent; outermost pair of pollen bracts usually ½ in., lanceolate, next pair resembling the proper bracts but empty, patently glistening hairy or quite glabrous; bract proper ½ in., sessile, green; bracteoles 0. Sepals nearly ½ in., linear, scarious below, terminating in a dense tuft of multicellular hairs. Corolla 1 in., subsymmetric, pale-blue, hairy within; ventricose portion longer than the contracted; segments round. Filaments hairy towards the base. Style sparsely hairy. Capsule ½ in., narrowly ellipsoid. Seeds ½ in., thin, subquadrate elliptic, shaggy with adpressed wavy silky hair not elastic when wetted, glabrous on the oblong large areoles.


**Ceylon**; alt. 3–6000 ft., frequent, Gardner, &c.

A small undershrub, much branched. Leaves 3 by 1½ in., obtuse or acuminate at the base, subentire, with scattered hairs and occasionally a few red glands beneath; nerves 6 pair; petiole ½ in. Peduncles 0–1½ in., numerous, often in clusters of 3, thickened upwards, 1-headed; heads ½ in., ovoid, in fruit often 1–2 in. oblong; bracts ½–1 in., adpressed downwards often densely red, glandular, tips prominently reflexed; bracteoles ½ in., linear. Calyx ½ in., divided nearly to the base; segments linear, thin, hairy, much enlarged in fruit. Corolla ¾ in., slightly pubescent without, slightly hairy within, straight, subsymmetric, white; contracted base much shorter than the urceolate portion, segments rounded. Filaments with long hairs. **Ovary** densely glandular at the tip, style glabrous. Capsule ¾ in., oblong, pubescent, 4-seeded. Seeds ½ in., ovoid, closely hairy with short thick annulate hairs, elastically springing out when wetted.

Var. *microstachya*; leaves and heads more hairy less glandular, calyx very small, corolla more hairy without. *S. macrostachya*, Bent. *in Flora* 1849, 557. *Ruellia punctata*, Nees in DC. Prodr. xi. 147; Wight *J. t. 1563.—Hills of S. Deccan; Courtallum, Wight; Mangalore, Hohenacker, n. 463; Anamallays, Beddome. Leaves 5 in.; filaments nearly glabrous. Beddome says that this plant is "very scabrous, the hairs arising from harsh papille." Wight's figure of *Ruellia punctata* is drawn from his Herb. Propr. n. 656, preserved at Kew, written up by Wright, and quoted by Nees; but it is a particularly softly hairy form. As Beddome remarks, it is not taken up by T. Anders.

Var. *? punctata*, T. Anders, in Thwaites Enum. 229; leaves small ovate glabrous densely glandular beneath, bracts orbicular glabrous ciliated densely glandular tips not reflexed. *Strobilanthes punctatus*, Nees in DC. Prodr. xi. 182 (sp.), not of Bedd.—Ceylon; *Walker*. Leaves ½–1½ in., subobtuse, has often subcordate. Perhaps specifically distinct, but there is only one example, without fruit, named by Nees.


**Ceylon**; Newera Ellia, Walker, &c.

An undershrub, branches hisrate upwards. Leaves 4 by 2 in., crenate-serrate, thinly hairy on both surfaces; nerves 4–5 pair; petiole 1–2 in. Heads ½–1 in., white-hairy; bracts ½–¾ in., sessile; bracteoles ¼–½ in., linear-oblong. Calyx ½–¾ in., divided nearly to the base; segments linear-lanceolate. Corolla ½ in., straight, symmetrical, almost funnel-shaped from the very short contracted base, slightly hairy within and without, whiteish. Filaments attached very low down the corolla, glabrous; anthers exserted. **Ovary** and **style** hairy. Capsule 4-seeded; seeds (unripe) hairy.
—The segments of the corolla are ovoate, longer and much more acute than in Beddome's figure.


**Ceylon ; Walker, Gardner, &c.**

Apparently a large shrub; branches swollen at the joints, sebaceous, hisperate upwards. Leaves 9 by 4 in., crenate; nerves 11 pair; petiole ½ in. **Panicles in Walker's examples very compound**; heads 1–1½ in, broadly oblong; bracts ½ in. **Calyx less than ½ in**, divided nearly to the base; segments ligulate, scarious, lineolate. **Corolla ½ in**, little contracted below, subasymmetric, glabrous without, hairy within. **Capsule ½ in**, 4-seeded. **Seeds ½ in**, thin, suborbicular, densely elastically hairy on the margin, arcces very large extended over all the seed but the margin.


**Ceylon, frequent; Gardner, &c.**

Regarded by T. Anderson as a glabrescent form of *S. asperrimus*, which it may be, but the capsule is unknown and the inflorescence much less compound. **Leaves 3–10 in**, base attenuated or rounded, drying black. **Bracts membranous**, the upper even in the young heads often coloured membranous.


W. **DECCAN PENINSULA**; **Concan, Dalzell, Stocks**; Ram Ghat near Belgaum, *Ritchie. Cytistallum*; *Wight*.

**Branches stout, woody, hairy upwards. Leaves 6 by 2–3 in., denticulate, laxly villous on both surfaces or subscabrose above; nerves 8 pair; petiole ½ in. **Peduncles axillary, very short; spikes 1½ in., oblong, subsymmetrical or solitary; bracts ½–1 in. **Calyx ½–1 in., divided nearly to the base; segments ligulate, obtuse, scarious, glabrous, tips bristly. **Corolla ½–1 in., glabrous without, hairy within, straight, subsymmetrical; cylindrical part as long as the subscabrocele, lobes short. **Filaments hairy downwards. **Pistil glabrous or the style upwards microscopically hairy. **Capsule scarcely ½ in., oblong, 4-seeded. **Seeds ½ in**, elliptic, elastically white hairy only on the very margin.—The Bombay botanists took this species for a hairy-bracteate form of *S. rugosus* (Wight l. c. 1619).


W. **DECCAN PENINSULA** from the Bombay Ghats to the Bababoodnas and Nigherries; *Heyne, Wight, Dalzell, &c*.

**Stems never exceeding 18 in. high (Dalzell, Stocks), hisperate upwards. Leaves 6 by 2½ in., closely serrate, tubercular-hairy above, softly hairy beneath, drying green
(not black); nerves 7 pair; petiole 2 in. Peduncles short or 0; spikes 1–1\(\frac{1}{3}\) in.; bracts \(\frac{2}{3}\) in., subventricose, membranous. Calyx \(\frac{1}{2}\) in., divided nearly to the base; segments ligulate, subobtuse, membranous, liniculate. Corolla glabrous without, hairy within, pale blue; contracted portion scarcely shorter than the ventricose; limb equal, segments round. Filaments and style hairy. Capsule scarcely \(\frac{1}{6}\) in., oblong, 4-seeded. Seeds \(\frac{1}{6}\) in., ovate, glabrous except on the very margin.

**Var. ? campanulata**; leaves ovate subacute hairy, spikes subglobose solitary or few together, bracts elliptic ventricose glabrous, bracteoles 0. Corolla scarcely \(\frac{1}{6}\) in. S. campanulata, Wight & t. 1562. S. involucratus Var. B. Nees in DC. Prodr. xi. 184. S. lupulinus, T. Anders. in Journ. Linn. Soc. ix. 469, partly. Knellia lupulina, Wall. Cat. 2355 b, partly.—Corr; Wight.—Plant 5–10 in. Leaves 1–2 in., drying green. Heads \(\frac{1}{2}–1\) in. Corolla subcampanulate; lobes very short. Capsule less than \(\frac{1}{6}\) in., seeds glabrous. Possibly an alpine var. of S. Heyneanus, but the corolla is a different shape, as well shown in Wight’s figure. The example of Wall. Cat. 2355 b in his own Herb. is nearer S. Heyneanus, Nees, type; that in Herb. Hook. agrees closely with Wight’s campanulata.

**Var. ? fusca**; leaves broadly elliptic acuminate at both ends very sparsely hairy, heads globose nodding mostly solitary, bracts broadly elliptic ventricose glabrous, bracteoles 0. S. lupulinus, Benth. in Pl. Hohenacker. n. 814; T. Anders. in Journ. Linn. Soc. ix. 469 partly, not of N-ees.—Merrara in Canara, Hohenacker. Branches 15 in., nearly glabrous. Leaves 5 by \(\frac{2}{3}\) in., somewhat black in drying, densely liniculate on both surfaces, very minutely sparsely hairy. Heads \(1–1\frac{1}{2}\) by \(\frac{1}{2}–1\) in.; bracts and calyx as of S. Heyneanus. Corolla not known.

**Var. viridis**; stem stout rough, leaves 1–3 in. very scabrous, heads small bracts (at flower-time) closely adpressed. S. asperirrbus, Dalz. & Gibs. Bomb. Fl. 187, not of Neees.—Strobilanthes sp. n. 32, Herb. Ind. Or. H.f. & T.—Mysore; G. Thomson. —The specimens do not match those of S. lupulinus, but Col. Beddome after seeing them says it is that species.


W. Deccan Peninsula and S. Madras, alt. 1–3000 ft., frequent; Wight, Hohenacker, &c.

A small shrub. Leaves 5 by 2 in., or often smaller narrower, base cuneate (sometimes very shortly), crenate, mature nearly glabrous, conspicuously liniculate above; nerves 7 pair; petiole \(\frac{1}{6}\) in. Heads \(\frac{1}{2}–\frac{1}{4}\) in., bracts and calyx enlarged in fruit, usually very glutinous, sometimes softly hairy; bract \(\frac{2}{3}\) by \(\frac{1}{2}\) in.; bracteoles \(\frac{1}{4}\) in., linear-spathulate. Calyx \(\frac{1}{2}\) in., divided nearly to the base; segments ligulate, fruiting spathulate, obtuse, membranous. Corolla \(\frac{1}{4}\)–1 in., glabrate without, hairy within, subsymmetric, white; cylindrical portion nearly as long as the ventricose. Filaments hairy towards the base. Pistil glabrous. Capsule \(\frac{1}{2}\) in., often 2-seeded. Seeds \(\frac{1}{6}\) in., thin, ovate, densely elastically hairy on all sides; areoles very small.

44. S. micranthos, Wight Is. t. 1519; leaves ovate acuminate sparsely thinly pubescent, heads solitary ovoid nodding, bracts broadly lanceolate pubescent, bracteoles longer corolla shorter than the calyx. T. Anders. in Journ. Linn. Soc. ix. 468.

**Nilgherry Mts.; Wight.**

Suffruticose or herbaceous (Wight), erect; stems glabrous. Leaves 6 by \(3\frac{1}{2}\) in., base broad, shortly decurrent, closely serrate; nerves 11 pair; petiole 1\(\frac{1}{4}\) in. Heads 1\(\frac{1}{4}–\frac{1}{2}\) in.; bracts \(\frac{1}{4}\) in., widest close to the base, thinly herbaceous; bracteoles \(\frac{1}{4}\) in., linear-lanceolate. Calyx \(\frac{1}{4}–\frac{1}{3}\) in., divided nearly to the base; segments linear-lanceolate, very acute, pubescent. Corolla \(\frac{1}{4}\) in., subcampanulate, dry appearing dull red; lobes very short, round. Filaments glabrous; anthers exerted. Pistil glabrous.
Capsule unknown.—This imperfectly known species may very possibly have its true position nearer to *S. Heyneanus* var. *campanulata*.

45. *S. scrobiculatus*, Dalz. *ms*.; leaves elliptic acuminate at both ends nearly glabrous, spikes numerous subsessile along the naked branches, corolla 1⅓ in. blue.

*BOMBAY* *GHOUTS*; *Dalzell*; *Mahabaleshwar*, *Ralph*.

Woody branches elongate, much divided, leafless, covered with flowers, tips leafy. Leaves 3 by 1 in., nearly entire; nerves 7 pair; petiole ½ in. Spikes 1 in., subsessile, viscid hairy; bracts ⅔ in., narrowly obovate, persistent in fruit; bracteoles ½ in., sublinear. *Calyx* ⅔ in., divided nearly to the base; segments linear, hairy. *Corolla* symmetric, nearly glabrous, pale below, a beautiful blue upwards; ventricose part rather narrower longer than the contracted; lobes ovate, crenulate. *Stamens* included, glabrous. *Style* with a few hairs. Capsule ⅔ in., 4-seeded. Seeds ⅔ in., thin, ovate, densely covered with fine long hairs, elastic when wet, except the small areoles.—Appears to be the most beautiful species of the genus; it is allied to *S. xicocophalus*.


*NIGBERY MRS.* alt. 7000 ft., *Hohenacker*, *Beddome*. *MYSOR*; *Lobb*.

A large shrub (Beddome); branches very harshly scabrous. Leaves 2½ by 1½ in., obtuse, base very shortly cuneate, callous-dentate, hispid with tuberose-based hairs above, setulose beneath; nerves 6 pair; petiole ⅔ in. Heads 1⅓—2 in., strictly capitulate; peduncles thickened upwards, acutely 4-angled, very harshly scabrous; floral leaves 2 in., empty, overtopping the head; bract very rigid; bracteoles 1 in., narrowly lanceolate, membranous, ciliate. *Calyx* divided nearly to the base; segments ⅔ in., linear-lanceolate, very acute, membranous, ash-coloured, ciliate. *Corolla* subsymmetric, nearly glabrous, blueish; cylindrical part hardly so long as the ventricose; lobes ovate. *Stamens* glabrous, included. *Pistil* thinly hairy. Capsule unknown.—Allied to *S. Perrottetianus* according to Beddome, and it may turn out so to be when the seeds are known.


*Ceylon*; *Thwaites* (C. P. 3577); *Damboul*, *Beckett*.

A shrub, 1—2 ft., creeping, rooting; branches suberect, quadrangular, pubescent. Leaves 1½ by ⅔ in., crenate, rather harsh, llineolate on both surfaces, sparsely setose above, more softly beneath; nerves 5—6 pair; petiole ½ in. Heads sessile between 2 somewhat enveloping leaves; quasi-peduncles 0—1½ in., often thickened upwards; bracts ⅔ in., subobtuse, green, persistent, patently white-hairy. *Calyx* ⅔ in., divided about half-way down at flower-time, teeth lanceolate, hairy. *Corolla* curved, nearly glabrous without; cylindrical base ⅔ in., funnel-shaped part nearly as long; lobes ovate. *Filaments* glabrous except at the base, 2 longer distinctly exerted; anther all subequal. *Ovary* glabrous, tip glandular, 4-ovulate; style glabrous, stigma simple. Capsule ⅔ in., oblong, glabrous, 4-seeded from near the base. Seeds ⅔ in. diam., much compressed, orbicular, densely elastically hairy; except on the conspicuous areoles.—Placed in *Stenosiphonium* by T. Anderson, and regarded as a var. of *Hemigraphis venosa*. The inflorescence does not do for *Stenosiphonium*, nor the leaves, and the ovules are never more than 4 to the ovary.

*Var. β integra*, T. *Anders*.*l.c*.; leaves entire glabrous, corolla 1 in. ventricose, constricted cylindrical base of the tube short.—Ceylon; *Thwaites* (C. P. n. 3661).
The only scrap of this does not permit of dissection; it can hardly be conspecific with _S. sessiliflorus_, but may not be congeneric; it closely resembles _S. lanceolatus_.

48. **S. Gardnerianus**, T. Anders. in Thwaites Enum. 226; hairy, leaves sessile ovate, spikes ovoid or interrupted at base, bracts and bracteoles longer than the calyx, corolla 1 in. purple, anthers included. Endopogon Gardnerianus, Nees in DC. Prodr. xi. 723.

**Ceylon**; Gardner, Thwaites.

Shrubby, 1–2 ft.; stems terete, scabrous below, white-hirsute upwards. **Leaves** 2 by 1½ in., acute or subobtuse, base rounded, subcrenate. **Spikes** capitata, ½ in., nearly enclosed by bracts, few-fld., or lower axillary flowers being added becoming interrupted, linear-oblong; bracts ½ in., ovate; bracteoles ½ in., linear-oblong. **Calyx** ¼ in., slightly hairy. **Corolla-tube** linear-cylindric below, suddenly inflated upwards, as of _Stenosiphonum_. **Capsule** and **seeds** unknown; hence the place of this species is uncertain; some of the examples might, so far as the inflorescence is concerned, be placed next _S. sexennis_ among the Series D. "Paniculata."

† || **Species of N. India and the Malay Peninsula.**

49. **S. scaber**, Nees in Will. Pl. As. Rar. iii. 84, and in DC. Prodr. xi. 177, partly; leaves elliptic or obovate acuminate scabrous or ultimately glabrate, spikes dense often clustered, bracts lanceolate large hairy, corolla ½–1 in. yellow very hairy within. **Bot. Reg.** xxvii. t. 32; T. Anders. in Thwaites Enum. 227, and in Journ. Linn. Soc. ix. 467, partly. Ruellia scabra, Will. Cat. 2293, not Wall. Cat. 2377. **R. aspera**, Nees in DC. Prodr. xi. 147, as to the Bengal material. R. crispa, Herb. Linn. Propr.

N. and E. Bengal Plains; Silhet, Wallich; Purneab, J. D. H.; Maldah, Myrcensigbo, Dacca, &c., Clarke.—**Distrib.** Burma.

Stems 1–3 ft., pubescent or hairy upwards. **Leaves** 4½ by 2 in., base narrowed, crenate, sometimes very coarsely scabrous-subbispid, sometimes nearly smooth but hard; nerves 7–8 pair; petiole ¾ in. **Spikes** 1–2 in., hairy; bracts ⅓ by ⅓ in., obtusely acuminate, green; bracteoles ⅓ in., linear-oblong. **Calyx** ½–⅓ in., divided nearly to the base; segments linear, pubescent. **Corolla** symmetrical, glabrous; cylindrical base nearly as long as the venterose portion; lobes rounded. **Stamens** included; filaments hairy throughout the base. **Ovary** glandular at the apex, always 4-ovulate; style nearly glabrous. **Capsule** nearly ⅓ in., 4-seeded. **Seeds** ⅜ in. diam., discoid; numerous fine hairs near the margin, elastic when wet; aræoles very large, glabrous.—This is only _S. scaber_, Nees, in so far as that includes _Ruellia scabra_, Wall.; Nees’ description (purple flowers, &c.) is totally different. _S. scaber_ only occurs in Ceylon as a cultivated plant, according to Thwaites and Beddome.

50. **S. phyllostachyus**, Kurz in Journ. As. Soc. 1871, pt. ii. 75; leaves elliptic or obovate acuminate scabrous, spikes dense often in close cymes, bracts large elliptic with a ligulate apex softly hairy, corolla ⅓–1 in. yellow somewhat hairy within. **S. crispus**, T. Anders. in Journ. Linn. Soc. ix. 467, not of Blume.

PEGU; Kurz. **MOULMEIN.** Parish, TENGASEEIM; Beddome.

Herbaceous, 2–3 ft.; stems glabrate. **Leaves** 4–9 in.; petiole 2 in. **Spikes** nearly as of _S. scaber_; bracts 1 in., ligulate tips often recurved; bracteoles ⅓–⅓ in., linear. **Calyx** ½–⅓ in., divided nearly to the base; segments linear silky. **Corolla** nearly as of _S. scaber_. **Capsule** ⅓ in., 4-seeded; seeds ⅜ in. thin, ovate, with dense long elastic hairs on all sides except the small aræoles.—So like _S. scaber_ (except the seeds) that it is difficult to distinguish it.

**Var. dura**; leaves smaller bracts narrowed upwards without ligulate tip.—_Strobilanthes_ sp. n. 14, Herb. Ind. Or. H. f. & T.—Chittagong; Seetakhoond, H. f. & T. Rangoon; M’Lelland. T. Anderson refers this to _S. scaber_ (in Journ. Linn. Soc. ix. 467), which the bracts resemble; he subsequently saw it was different, and wrote it up
as *S. durus*, T. Anders. *sp. nov.*; from the imperfectly ripe seeds it is either a var. of *S. phylostachyus*, or a new species very closely allied to it.


**Khasia Mts.; Wallich.**

Shrubby; branches glabrous. *Leaves* 4 by 1 in., denticulate; nerves 8 pair; petiole ¾ in. *Heads* ¾–1 in., closely capitulate, mostly on very short axillary spurs; bracts ⅔ in., shortly acuminate, the innermost lanceolate, the outermost often sub-truncate; bracteoles ½ in. *Corolla* 1⅓–1⅔ in., glabrous without. *Capsule* ¾–1 in., oblong, 4-seeded. *Seeds* ½ in., ovate, shaggy; areoles small.—Nees' account of the bracteoles is erroneous; and T. Anderson has taken for *fimbriatus* the remote *S. macrostegia*.


**Sikkim and Bhutan, alt. 6000–7500 ft., frequent; Griffith, &c.* **Khasia and Jaintia Mts., alt. 4000 ft., frequent; Wallich, &c.*

A spreading shrub, often 10 ft. *Leaves* 5 by 2¾ in., serrate, usually thinly hairy, villous or submentose beneath; nerves 9 pair; petiole ½–1 in. *Heads* 1 in., hairy or hairy; bracts ¾–1 in., concave, green; bracteoles ⅔ in., linear, widened upwards. *Calyx* ⅔–⅞ in., deeply divided; segments linear, glabrous, scarious. *Corolla* wide-funnel-shaped, nearly glabrous. *Filaments* and *pistil* sparingly puberulous. *Capsule* ⅞–⅞ in. *Seeds* ½ in., thin, ovate, mature shaggy with brown, somewhat deciduous, scarcely elastic hairs; areoles small.—From Nees' quotation (in Wall. Pl. As. Bar.) it is clear that he adopted the name *echinatus* from misreading Wallich's ticket.

**Var. Daltoni**; brown-villous, leaves tubercular subrugose above, bracts serrulate.

—Darjeeling; J. D. H.—Possibly a distinct species, but the examples are in early bud, and very near S. *pectinatus*.


**Assam; Dewangiri Hills, Simons; Namroop in the Patkoye Mts., Griffith (Herb. Propr. n. 249).** **Murtabun and Tenasserim, in the tropical forests, Kurz.**

A shrub; branches pubescent or viscosa-hairy. *Leaves* 5½ by 2 in., base cuneate, crenate, minutely lineolate above, more hairy (especially on the 7–8 pair of nerves); petiole ¾ in. *Heads* 1½ by ¾ in., on very short quasi-peduncles, often 2–3 together; outer pair of bracts (of T. Anderson) leaf-like, sometimes like the true bracts; bract 1⅔ in., softly shortly hairy; bracteoles 2, ⅔ in., more acuminate than in the allied species. *Sepals* nearly as the bracteoles. *Corolla* 2 in (Anderson), glabrous. *Capsule* glabrous, 4-seeded (Anderson).—Anderson apparently had better material than exist now at Kew; he says "buds yellow side Griffith," but it is more probable that the flowers are purplish; he certainly erred in reading "Kamroop" in Lower Assam (for Namroop).—It is not probable that a Patkoye Mt. plant should be common in the tropical Tenasserim forests; no example has been seen thence, but Kurz's description coincides with the Patkoye plant. He describes the flowers as blue.

54. **S. glabratus**, Nees in Wall. Pl. As. Bar. iii. 85, and in DC.
Prodr. xi. 188; leaves elliptic acuminate at both ends mature glabrate, heads ovoid peduncled pubescent or glabrate, bracts ovate or elliptic narrowed upwards concave entire. T. Anders. in Journ. Linn. Soc. ix. 474. Ruellia? glabrata, Wall. Cat. 2390.—Acanthaceae, Griff. Fl. Pl. As. t. 425.

Khasia and Jaintha Mts., alt. 3-4000 ft.; Wallich, Griffith, &c.

A shrub, 3-4 ft., erect; branches pubescent, glabrate or with spreading fulvous hairs. Leaves 6 by 1½ in., undulate, crenulate or nearly entire, raphides very obscure on either surface; nerves 7-9 pair; petiole scarcely ½ in. Peduncles 1-3 in., often subcynodromous, quadrangular, slightly thickened upwards, fulvous pubescent or glabrate; heads 1½ in., dense; bracts 1½ in., coriaceous in fruit; bracteoles ½ in., sublinear, scarios. Sepals resembling the bracteoles. Corolla 1 in., subsymmetric, glabrous (blue, Nees). Capsule ½ in., broadly obovate, glabrous, 4-seeded. Seeds ½ in., ovate, shaggy with silky, dusky, subinelsatic hair, except on the small areoles.—Wallich's examples are subglabrous, but others are very pubescent.—In Griff. Notul. iv. 145, the plate cited t. 425 is named Phlogacanthus curviflorus: there is some great blunder here, and the description is puzzling.

55. S. Maingayi, Clarke; leaves lanceolate acuminate at both ends somewhat pubescent, heads subsessille ovoid nearly glabrous, bracts ovate or elliptic large concave often crenate upwards glabrous.

Malaya, probably Malacca or Peugou; Maingay (Kew Distr. n. 1182).

A shrub, apparently allied to S. pectinatus, & glabratus; branches pubescent. Leaves 4 by 1 in., acculate, puberous and inspersed with most minute raphides; nerves 8 pair, brown-pubescent beneath at least when young; petiole scarcely ½ in. Peduncles 0-½ in., rusty-pubescent; heads 1 in.; bracts ½-1 in., outermost barren ovate, inner elliptic, usually with few coarse crenations near the apex; bracteoles ½ in., linear, glabrous. Sepals rather larger than, similar to, the bracts. Corolla 1½ in. at least, glabrous. No capsule nor expanded flowers seen. There are specimens (unnamed) from Sumatra which may be conspecific with this, but they have hairy heads.

56. S. glomeratus, T. Anders. in Journ. Linn. Soc. ix. 475; leaves ovate acute serrate hairy, heads ovoid subsessille hairy, bracts elliptic elongate or oblong entire or toothed, corolla 1½ in. in purplish glabrous. Ruellia glomerata, Wall. Cat. 2391. Goldfussia glomerata, Nees in Wall. Pl. As. Rar. iii. 88, and in DC. Prodr. xi. 173; Bot. Mag. t. 3881; Maund Botanist, t. 155.

Khasia Mts., alt. 1000-3500 ft., frequent; Wallich, &c. British Burma, in the hills, Brandis, Parish.

A shrub, 2-6 ft.; branches hairy upwards, often horizontal with complanate foliage. Leaves 4½ by 2½ in., base narrowed or rounded (often unequal), villous above, less so beneath; nerves 6 pair; petiole ½-1 in. Heads 1-1½ in., often pseudo-axillary; bracts 1 by ½ in., herbaceous, softly hairy, outermost pair usually serrate subfoliaceous, inner entire; bracteoles ½ in., linear-lanceolate. Calyx ½ in., divided nearly to the base; segments linear-oblong, in fruit narrowed, membranous, subobtuse. Corolla subsymmetric; cylindrical nearly as long as the ventricose part. Filaments and pistil sparingly hairy. Capsule 3 in., broadly oblong, 4-seeded. Seeds ½ in., densely silky subindesically hairy; areoles very small.—T. Anderson has placed this in his Goldfussia section, which has "the spikes naked in flower-time and bracts early deciduous;" but the outermost bracts, including the empty pair (floral leaves), are persistent when the capsule is dehiscent.

57. S. Brandisii, T. Anders. in Journ. Linn. Soc. ix. 475; leaves elliptic acuminate each end thinly hairy, heads obovoid softly densely white-hairy, bracts linear-spathulate, corolla 1½ in. nearly glabrous.

Pegū; Karen Hills, Kurz; Tongoo, alt. 4000 ft., Brandis (Tide T. Anderson).
Stems slender, shrubby, pubescent or softly shaggy. Leaves 4 by 2 in., crenate, lineolate and sparsely slenderly bristly above, paler more glabrous beneath; nerves 6 pair; petiole ½ in. Heads ½ in., numerous, on axillary and terminal peduncles; bracts ½ in., very narrow, outermost pair often more or less leaf-like, persistent; bracteoles ½ in., linear. Sepals ½ in. and upwards, linear, densely softly white-hairy. Corolla nearly straight and symmetrical; cylindric part shorter than the ventricose, lobes ovate. Stamens glabrous (T. Anders.). Capsule ½ in., oblong, glabrous, with a tuft of hairs at the apex, 4-seeded. Seeds ½ in., ovate, densely subinelastically silky; areoles very small.


MoumZkin; Falconer. Tenasserim; Beddome.

Stem tetragonal, ciliate with long, patent, weak, white hairs. Leaves 4 by 1½ in., narrowed at both ends (upper ovate base obtuse), sparsely white-hairy on both surfaces, not lineolate; nerves 6 pair; petiole ½ in. Heads 2½ in., surrounded by leaves; bracteoles ½ in., linear. Calyx deeply 5-partite; segments shorter than the bracteoles, linear, hirsute. Corolla ½ in., curved near the mouth, a little hairy without, deep blue; stamens included. Capsule tomentose at the apex. Seeds large, ovate, hirsute.—The species seems allied to S. Brandidii, but is remarkable by the copious long soft white bristles upon the flower-heads, which extend in less numbers to the leaves and stem.

** Flowers strobilat.

† Seeds glabrous. (Species of Ceylon and S. Deccan Peninsula.)


Ceylon, alt. 5-7000 ft.; Walker, Thwaites.

Herbaceous (side Beddome); branches stout. Leaves 5½ by 2½ in., narrowed downwards, cuneate or shortly rounded on the petiole, serrulate, hirsute on both surfaces; nerves 7 pair; petiole 1½ in. Spurs 1-3½ in.; bracts ½ in., somewhat square; bracteoles ½ in., oblong. Calyx ½ in. (in fruit ⅓ in.), divided nearly to the base; segments lanceolate, shaggy with white or tawny hairs. Corolla 1½ in., subsymmetrical, glabrous; cylindric base short, broad. Filaments and pistil glabrous. Capsule ½-1 in., 4-seeded. Seeds ½ in., thin, ovate, apiculate, glabrous; areoles very small, oblong.

60. S. Hookeri, Nees in DC. Prodr. xi. 185, excl. Var. β; leaves broadly lanceolate, base cuneate sparsely hairy or glabrate, bracts orbicular or ovate glabrous or slightly ciliate. T. Anders. in Thwaites Enum. 227, and in Journ. Linn. Soc. ix. 469; Bedd. in. Pl. Ind. t. 262.

Ceylon, alt. 7000 ft.; Gardner, Thwaites, &c.

A shrub, 5-6 ft., branches nearly glabrous. Leaves 5½ by 2 in., acuminate, serrulate, upper surface with scattered weak hairs above or mature glabrous; nerves 8 pair; petiole 1 in. Spurs 1-3 in.; bracts 1 in., entire or minutely toothed, obtuse or subacute, white; bracteoles ½ in., spathulate-oblong. Calyx ½ in., divided nearly to the base; segments lanceolate, often setulose, white. Corolla 1½ in., campanulate, subsymmetrical, glabrous, white with purple streaks; cylindric base broad, very short. Stamens and pistil glabrous. Capsule ½ in., frequently 2-seeded. Seeds ½ in., very thin, ovate, apiculate, glabrous; areoles very small, oblong.—The colours are from a field-note of Col. Walker. This is placed by T. Anderson in a section

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far removed from S. vestitus; but it is so nearly allied that the specimens have been sometimes confounded by the best botanists.


Ceylon, alt. 5-7000 ft.; Gardner, &c.

A shrub, 4-6 ft., stem glabrous below, more or less hairy upwards. *Bracts* spathulate, often subpetioloed, lower passing sometimes into leaves as shown in Beddome's figure. *Corolla* varying from green to a lurid reddish yellow. *Seeds* 4 to the capsule, scarcely ½ in., obovate.—Otherwise as *S. Hookeri,* from which this species (which is Nees' *S. coloratus*) differs at sight by being a little more hairy. The *S. calycinus* var. *b* of Nees is founded on a sheet of 3 fragments, whereof 2 are *S. calycinus* T. Anders., 1 is *S. Hookeri.*

*Var. *parvifolia;* leaves ½-3 in. long, heads small 2-5-fl., corolla scarcely ½ in., anthers subexserted. *S. calycinus, Nees in DC. Prodr. ix. 469.—Ceylon; Walker.*

62. S. laxus, T. Anders. in Thwaites Enum. 228, and in Journ. Linn. Soc. ix. 469; leaves cordate ovate acuminate minutely scabrous-hairy or glabrate, bracts ovate or orbicular subentire glabrous or ciliate. *Bedd. Ic. Pl. Ind. Or. t. 228.*

Ceylon; Hantani, alt. 4000 ft., Thwaites.

A shrub, 4-6 ft.; branches glabrate. *Leaves* 6 by 3½ in., crenate or toothed; nerves 6 pair; petiole 2 in. *Spikes* 2-5 in., often in dense subsessile clusters on the old wood; bracts ½-1 in.; bracteoles ½ in., linear-oblong. *Sepals* ½ in. (or more in fruit), lanceolate or broadly lanceolate, ciliate. *Corolla* ½-1 in., glabrous except hairy lines within, orange-red; ventricose portion short, about as long as the contracted portion; lobes ovate, elongate, subacute, as described by T. Anderson, not well shown in Beddome's figure. *Stamens* and *pistil* glabrous. *Capsule* ½ in., narrowly ellipsoid, 4-seeded. *Seeds* ½-1 in., thin, obovate or subquadrate, glabrous; areoles obsolete.—Easily distinguished from the allied Ceylon species by the broad decisively-cordate base of the leaves.


S. Deccan; Anamallay Mts., alt. 6000 ft., Beddome.

A very large shrub up to 20 ft. (Beddome); branches hairy upwards. *Leaves* 7 by 4 in., rhomboid, shrub round or subcordate, crenulate; nerves 7 pair; petiole 1½ in. *Spikes* 1-2½ in., axillary, nodding; bracts ½ in.; bracteoles ½ in., linear-oblong. *Sepals* 3–½ in., linear-oblong, ciliate. *Corolla* 14 in., subcampanulate, contracted base very short, subsymmetric, glabrous except hairy lines within, pale-blueish. *Stamens* and *pistil* glabrous. *Capsule* not seen; but the species is doubtless closely allied to *S. calycinus,* as Beddome says, and the leaves still more resemble *S. vestitus.*

64. *S. luridus,* Wight Ic. t. 1515-6; leaves ovate acuminate closely softly hairy on both surfaces, bracts large orbicular entire glabrous. *T. Anders. in Journ. Linn. Soc. ix. 469.*

Nilgerry Mts., alt. 3-5000 ft.; Gardner, Wight, &c. *ANAMALLAY Mts.* (vide Beddome's list).

Gregarious shrubs, 10-18 ft. high, often forming entire coppices, flowering every
spring from the old wood, often from near the ground. Leaves 6 by 3 in., tapering at the base, crenulate; nerves 9 pair; petiole 1½ in. Spikes 3–11 in., often clustered, pendulous; bracts ½ in. blackish-purple; bracteoles ⅜ in., ligulate, minutely scabrous. Calyx ⅛ in., divided nearly to the base; segments lanceolate, minutely scabrous. Corolla 1–1½ in., glabrous except lines within, lilac purple, somewhat 2-lipped; ventricose portion short, longer than the contracted portion; lobes ovate. Stamens and pistil glabrous. Capsule ⅛ in., usually 4-seeded. Seeds ½ in., thin, obovate, obtuse, glabrous; areoles obsolete.


S. *Deccan*; Bolamputt Hills near Coimbatore, alt. 6000 ft., *Beddome*.

A shrub, 15 ft., flowering every year from the old wood; habit of *S. luridus*. Leaves 6 by 3 in., base attenuate, crenulate or toothed, lineolate, white-bristly sparsely on the surface above and on the 6–7 pair of nerves beneath; petiole 1½ in. Spikes 2–4 in., very broad, from the old wood and also terminal; bracts ⅛–1½ in. wide, obtuse; bracteoles ⅜ in. narrowly oblong. Sepals ⅛ in. (at least in fruit), broadly lanceolate, ciliate, somewhat white-bristly. Corolla 1 in., subcampanulate, glabrous, brown (Beddome); lobes short in Beddome’s picture, appear longer more as of *S. luridus* in his example. Stamens and pistil glabrous. Capsule ⅛ in., broadly oblong, 4-seeded. Seeds ⅛ in., thin, subquadrate, glabrous; areoles obsolete.

†† Seeds hairy (where known).


*Bombay Ghauts and Central India*; Graham, Dalzell, &c.

A shrub, 6 ft.; branches glabrate, often warted or scabrous-tubercled. Leaves 7 by 3 in., sometimes much larger, crenate, conspicuously lineolate above; nerves 8–16 pair; petiole 2 in. Spikes 1–4 in., often densely or laxly cymose; bracts ½–1 in., orbicular or elliptic. Calyx ⅜ in., in fruit often exceeding ⅛ in., lobed nearly to the base, segments oblong, obtuse, softly hairy. Corolla 1½ in., subsymmetric, glabrous without, very hairy within, deep-blue (Dalzell); cylindrical base as long as the ventricose portion. Filaments hairy downwards. Pistil glabrous. Capsule ⅛ by ½ in. Seeds more than ⅛ in. long, thin, obovate acute, densely shaggy with white adpressed inelastic hairs, except on the large oblong areoles.—As Dalzell says his *S. callosus* had the seeds "quite smooth," it might be supposed that he considered the present plant *S. Grahamianus*, and called *S. Dalzellii*, T. Anders. his *S. callosus*; but a reference to his Herbarium and notes shows this was not so. He distinguished *S. Dalzellii* as a species, but proposes no name for it; while he (most erroneously) notes on his own excellent fruiting specimen of *S. callosus* that it differs from *S. Grahamianus* in having the seeds glabrous.

Var. *hispidus*; bracts copiously white-hispid.—Dasgowa, in the Mahratta country, *Hove*.

CIX. ACANTHACEAE. (C. B. Clarke.) [Strobilanthes.

CEYLON; Walker; alt. 2000 ft., Thwaites.
A shrub, 3-5 ft. Leaves 7 by $\frac{3}{4}$ in., crenate, lineolate on both surfaces; nerves 7 pair; petiole 1½ in. Spikes quasi-pediculated, mostly solitary, sometimes 1 in. ovoid capitulate, sometimes 2½ in., distinctly densely strobiliform; bracts 1 in., entire or dentilicate, the ligulate tip often squarese the leaves closely reflexed in fruit, sometimes obsolete. Calyx $\frac{1}{2}$ in., divided more than half-way down; segments lanceolate, slightly hairy. Corolla 1¼ in., narrow, hairy, white (T. Anders); linear-cylindric base shorter than the long urn-shaped upper part; lobes short. Filaments hairy towards the base. Pistil glabrous. Capsule not seen.—Evidently different from the Bombay S. culous, but may not belong to this part of the series.

68. S. asper, Wight Ic. t. 1518, not of Done.; thinly softly hairy, leaves ovate shortly acuminate at both ends, spikes in close panicles or subascinate, bracts oblong or ovate, base narrowed. T. Anders. in Journ. Linn. Soc. i. 466.

Mts. of S. INDIA, alt. 6-8000 ft.; Nilgherries, Asamallays, Bababooduns, Gardner, Wight, &c. MALABAR GHATS; Concan, Stocks.
A shrub, 2-4 ft. Leaves $\frac{3}{4}$ by 2½ in., crenate; nerves 7 pair; petiole 1½ in. Spikes in flower 1-1½ in., oblong; in fruit 2-3 in., with bracts and calyces enlarged; thinly softly hairy, somewhat visaceous; bracts $\frac{1}{2}$-½ in., often reddish; bracteoles $\frac{1}{2}$ in., linear. Sepals $\frac{1}{4}$ in., linear-lanceolate. Corolla $\frac{1}{4}$ in. (or in Wight's figure much larger), glabrous without, hairy within; linear-cylindric base about as long as the ventricose portion; limb somewhat oblique, segments short rounded. Filaments hairy towards the base. Pistil glabrous. Capsule $\frac{1}{4}$ in., oblong, 4-seeded. Seeds $\frac{1}{4}$ in., orbicular, elastically hairy; areoles prominent, round, glabrous.—The form of the bracts seems very variable; the typical Nilgherry plant has them broadly ovate; a Bababoodun example (reckoned by Wight distinct) has them linear-oblung; and there are a great number of intermediate forms.

69. S. sessilis, Nees in Wall. Pl. As. Rar. iii. 85, and in DC. Prodr. xi. 177; leaves sessile ovate acute hairy, spikes cylindric exactly strobiliform, bracts large ovate acute hairy, bracteoles 0, corolla 1½ in. pale purple. Bot. Mag. t. 3902; Wight Ill. t. 164 b, fig. 4 (right-hand), and Ic. t. 1511; T. Anders. in Journ. Linn. Soc. i. 467.

NILGHERRY Mts., alt. 6-8000 ft.; Wight, &c, frequent. WYNAD AND TEAVANCE; Beddome.

Stems 12-18 in., numerous, erect, little divided, from a woody perennial root, patently villous. Leaves $\frac{3}{4}$-1½ in., base rounded or subcordate, crenate, softly villous on both surfaces. Spikes 1-2 in., short-pediculated, quasi-axillary and terminal; bracts $\frac{3}{4}$ in., softly hairy. Sepals $\frac{1}{4}$ in., lanceolate. Corolla nearly straight, subsymmetrical, slightly hairy within and without; cylindric base nearly as long as the ventricose part; segments rounded. Filaments included; longer shaggy, shorter glabrous with much shorter anthers. Ovary glabrous, gland-bearing near the tip; style thinly hairy; ovaries 4. Capsule not seen.

VAR. sessiloides (Wight Ic. t. 1512); leaves larger bristle-birsute rugose, spikes larger, bracts (especially the upper) corolloid glabrate upwards, corolla rather larger more hairy both within and without. S. sessiloides, Wight Ic. t. 1512, not of T. Anders.—Nilgherries; Wight.—A very trifling variety (or mere form, Beddome) of S. sessilis.

VAR. Ritchicii; bristly without any soft hairs, leaves nearly glabrous beneath except the bristly nerves, bracts acuminate long-bristly. S. sessiloides, Dale & Gibbs. Bomb. Fl. 187; T. Anders. in Journ. Linn. Soc. i. 467, not of Wight.—Malabar Ghats; near Bombay, Dalzell; Purwhar Ghat, Ritchie; Tulikut (perhaps i.e. Tallkote), Stocks.—Noted by Ritchie as flowering only once in 7 years, but the woody root with annual undivided stems seems the same as in S. sessilis. Stems densely hispid with very long stout white bristles or glabrate. Leaves scabrous-hispid lineolate above, much more glabrous than in S. sessilis. Bracts and spikes with white or tawny bristles nearly $\frac{1}{4}$ in. long, sometimes dense sometimes few scattered.
70. S. Dupeni, Beddome ms.; leaves subcordate ovate acuminate bristly pubescent on both surfaces, spikes large oblong dense viscous slightly hairy, bracts 4-ranked large ovate obtuse adnate at base closely imbricate, capsule 4-seeded, seeds hairy.

ANAMALLAY MTS.; top of Neliamputty Ghat, Beddome.

A shrub. Leaves 4½ by 2½ in., crenate, bristly above, chiefly on the 9 pair of nerves beneath; raphides small, obscure; petiole 1-2 in. Spikes 2½ by ¾ in., appearing terminal on short axillary peduncles; bracts ½ by ½ in., coloured, nervous, very sticky; bracteoles small, lanceolate. Calyx ¼ in., deeply 5-lobed; linear green acumination of the segments longer than the short elliptic scarious base. Corolla large, blue. Capsule ½ in., ellipsoid, sessile, glabrous. Seeds ½ in. diam.; areoles nearly half the diam. of the seed.


CENTRAL INDIA, alt. 1-4000 ft., common; Behar; Jubbulpore to Chota Nagpore, J. D. K., Beddome, &c.—Distrib. Ava.

A shrub, 2-6 ft.; branches many divaricate often zigzag, quadrangular, glabrous, tips more or less hairy. Leaves often very unequal, sometimes one 10 by 2¾ in. oblong, the other 3 by 1¾ ovate, sometimes subequal, serrulate, sparsely hairy above; nerves (in the longer leaves) 10-13 pair, minutely hairy beneath. Spikes 3½ by ½ in., mostly terminal, solitary, quasi-peduncled; bracts ¾-½ in., broader than long, very obtuse, apex often recurved in fruit. Calyx divided nearly to the base; segments ¾-½ in., unequal, linear, obtuse, closely velvety. Corolla 1 in., curved, very slightly hairy, pale purple; cylindrical base much shorter than the ventricose part; limb somewhat 2-lipped. Stamens and pistil nearly glabrous. Capsule ½ in., glabrous, 4-seeded. Seeds scarcely ¼ in. thin, orbicular, elastically white-hairy; areoles very small.

VAR. Edgeworthiana; bracts with spreading white cilia ¼ in. long, sepals long white-ciliate at the tips. S. Edgeworthiana, Nees in DC. Prodr. xi. 190.—Subtropical Himalaya, alt. 500-2000 ft., from the Siwaliks (Stewart) to Sikkim (Gamble), frequent in the dry Terai. Paras Nath, Edgeworth, Tenasserim; alt. 2000 ft.; Beddome.—Distrib. Upper Burma.

VAR. plumulosus; leaves broadly elliptic, spikes short axillary subsessile densely white-ciliate. S. plumulosus, Nees in Wall. Cat. 7157, and in Wall. Pl. As. Rar. iii. 86, and in DC. Prodr. xi. 191.—Mts. of Prome; Wallich.—Leaves 8 by 3½ in., subequal, spathulate to the widened auriculate base. Spikes 1¼ in.

VAR. bracteolata; leaves sessile auriculate oblong acuminate hairy, spikes linear-oblong ciliate, bracts obovate, bracteoles ¼ in. linear-spathulate.—Khasia Mts., alt. 5000 ft.; Nunklow and Myrung, H. f. & T.—Branches divaricate, hairy. Leaves unequal, the larger 4½ by 2½ in., serrate. Spikes 1½ in., quasi-peduncled, mostly solitary; bracts ½ in., less obtuse than those of S. auriculatus.

72. S. Maclellandii, Clarke; leaves large elliptic acuminate at both ends sparsely hairy, spikes linear, bracts obovate obtuse white hairy, bracteoles 0.

RANGOON; M'Lelland.

Branches stout, quadrangular, zigzag, hairy. Leaves 12 by 4½ in., lower petiolated, uppermost subsessile, none auricled; nerves 20 pair. Spikes 3 by ½ in., slender, white, hairy, pendent mostly 3 together from short axillary peduncles.—This has been supposed a form of S. auriculatus, but the large many-nerved leaves and slender pendent spikes give it a different aspect: the capsule is rather larger, the seeds nearly the same as in S. auriculatus. It would appear distinct enough but for the subjoined variety.
VAR. ? latipes; leaves sessile suddenly narrowed subauriculate, bracts narrowly ovate.—Tenasserim; Beddome.—Leaves 13 by 4½ in., primary nerves 20 on each side the midrib.


NEPAL; Wallich. Khasia Mts., alt. 1–4000 ft., frequent; Wallich, &c.

A shrub, 2–5 ft.; branches glabrous. Leaves 6½ by 3 in., undulate, subcrenate, lineolate, minutely setulose above, glabrate or obscure pubescent beneath; upper leaves often unequal dissimilar, one of each pair smaller sessile coriace. Spikes 2–4 in., quasi-peduncled, mostly solitary; bracts ½ by ½ in.; bracteoles ½ in., oblong. Sepals scarious, minutely glandular-pilose, obscurely oblanceolate not spatulate. Corolla 1½ in., curved, much ventricose nearly glabrous, lavender-coloured, contracted base short. Filaments glabrous. Capsule scarcely ½ in., pubescent, 4-seeded. Seeds ¼ in., much compressed, orbicular; when wet the fine white hairs spring out abundantly; areoles nearly half the diam. of the seed, glabrous.—The figures Bot. Mag. t. 3517; and Lodg. Bot. Mag. t. 1712, adduced for this species by Nees and T. Anderson, show the uppermost leaves petioloed much acuminate at the base. Some examples of S. Sabinianus have the spike much interrupted, and the species might be placed in the next section. Wallich notes, in the Nepal example named R. argentea, that the flowers were white.

74. S. tamburensis, Clarke; leaves ovate shortly acuminate serrate, spikes linear interrupted towards the base ciliate subhirsute, bracts ovate, sepals pubescent ciliate.

E. NEPAL; at the Tambur River, alt. 4–5000 ft., J. D. H.

Capsule upwards of ½ in., 4-seeded. Seeds ⅛ in., much compressed, orbicular in outline, covered all over with short inelastic hairs; areoles 0. The general habit and corolla as of S. Sabinianus, but the serrate leaves, subhirsute spike, and seeds will not match.


NEPAL; Wallich.

A shrub, 1–2 ft.; branches hairy. Leaves 3 by 1½ in., base attenuate or rounded, with scattered hairs on both surfaces, not lineolate; nerves 7 pair; petiole ½–1 in. Peduncles ½–1½ in., divaricate or deflexed, hairy; spikes 1–1½ by 3 in.; bracts ½ in., subacute; bracteoles ½ in., oblong. Calyx ½–1 in., divided nearly to the base, segments linear glabrous. Corolla 1–1½ in., curved; ventricose part longer than the contracted base. Capsule not seen; and the place of the species is dubious; the spike resembles that of some of the strictly strobiliform Malabar species; Nees says the bracts are deciduous, but they cannot be so till long after flower.


Khasia Mts., alt. 4–5000 ft., plentiful in the northern half, Griffith, H. f. & T., &c.
Strobilanthes. CIX. AGANACÆAE. (C. B. Clarke.) 455

Shrubby, 1–2 ft., branching; stems hirsute. Leaves 2½ by 1½ in., base obtuse or rounded, densely minutely lineolate above; nerves 7–8 pair; petiole ¼ in. Peduncles 1–4 in., hirsute; bracts ¾–½ in., obtuse or scarcely acute, closely strobilate; bracteoles ⅓ in., spatulate-oblong. Calyx ½ in., divided ⅔ the way down; segments narrowly oblong, obtuse, hairy. Corolla 1 in., curved, glabrous without, purplish; cylindrical base scarcely so long as the ventricose portion; limb somewhat 2-lipped. Stamens glabrous. Ovary hirsute at the apex, style sparsely hairy. Capsule ½ in., hairy, 4-seeded. Seeds ⅓ in., orbiclar, distinctly pubescent when young, mature subglabrous, the base of the short hairs only remaining; areoles 0.—A species not very closely allied to any other in the genus.

77. S. imbricatus, Nees in Wall. Pl. As. Rar. iii. 86, and Cat. 7156, and in DC. Prodr. xi. 186; leaves spathulate elliptic acute sparsely hairy on both surfaces, spikes cylindric strobiliform in axillary quasi-panicles, corolla very small, placenta rising elastically from the bottom of the dehiscing capsule. T. Anders. in Journ. Linn. Soc. ix. 473. S. pterocaulis, Kurz in Journ. As. Soc. 1873, pt. ii. 93.

PEGU and TENASSERIM; HELFER, M'LELLAND, Kurz.—DISTRIB. ABA.

An annual herb side Kurz; but the examples have all the appearance of the other perennial species; stems stout, sharply quadrangular, hirsute or glabrare. Leaves attaining 1½ by 5 in. (or the upper much smaller 2 by 1 in.), crenate or toothed, lineolate on the upper surface; nerves (in the larger leaves) 15 or more pair; petiole very short owing to the long-decurrent leaf-base. Spikes ½ in., mostly 5–11 in lax hirsute axillary panicles; leaves at the trichotomous divisions scarcely ⅓ in.; bracts ⅓ in., ovate-oblong, hirsute towards the apex; bracteoles ⅔ in., linear-spathulate. Sepals ⅓ in., linear, obtuse, hirsute at the tips. Corolla ⅔ in., subcampanulate, violet ex Nees, yellow ex Kurz. Capsule ⅔ in., hairy at the tip, 4-seeded. Seeds ⅚ in., orbicular, hairy; areoles nearly half the diam. of the seed, glabrous.—The spikes in fruit are like those of Eugnia. Wallich's specimens from Ava have much smaller leaves than the Pegu examples.

78. S. longipes, Clarke; leaves elliptic acuminate at each end subentire pubescent or glabrare, spikes oblong hairy or glandular-puberulous, bracts narrowly ovate obtuse or emarginate, calyx nearly equally sub-5-partite segments linear-spathulate obtuse, corolla 1½ in. S. acuminatus, T. Anders. in Journ. Linn. Soc. ix. 478, chiefly (not Adenacanthus acuminatus, Nees).

TENASSERIM; HELFER (Herb. Propr. n. 304, Kew Distrib. n. 6114); Mooleyit, Beddome.

Branches slender. Leaves 6 by 2½ in., obscurely toothed, raphides conspicuous in the lower paler surfaces, embedded obscure in the upper; nerves 8 pair; petiole ⅔ in. Spikes 1–2½ in., clavate-oblong, continuous; bracts ⅓–⅔ in., lower deciduous in fruit; bracteoles ¼ in., linear-obovate. Calyx ⅔ in. and upwards; segments distinctly wider at the tips. Corolla nearly straight, puberulous; ventricose portion nearly 1 in., linear portion ⅓ in.; lobes rounded, subequal. Capsule ½ in., pubescent at the tip, 4-seeded. Seeds ⅓ in., ovoid, inelastically shaggy; areoles subobsolete.—Kurz has founded his S. subflaccidus on Helfer's plant (Kew. n. 6114), but, as he says the calyx is 2-lipped with the upper lip three-lobed only ⅔ the way down, it is clear that his S. subflaccidus cannot be this plant; there may have been some error in distribution, or Kurz may have relied on T. Anderson's reduction of this n. 6114 under Adenacanthus, Nees.

79. S. subcapitatus, Clarke; leaves elliptic acuminate subentire glabrous, spikes elliptispos or subovoid small laxly peduncled, bracts elliptic concave or obovate minutely ciliate-pubescent.

TENASSERIM; HELFER (Kew Distrib. n. 6111).

Shrubby; branches slender, quadrangular, glabrous. Leaves 4 by 1½ in., base
attenuate or obtuse, conspicuously lineolate above, obscurely so beneath; nerves 6 pair; petiole ⅓ in. Peduncles 2–4 in., slender, quadrangular, glabrous, numerous, axillary, often divided, sometimes bearing reduced caducous leaves; bracts ⅓ in., rounded at the tip, densely lineolate; bracteoles ⅓ in., linear-ovate, densely lineolate. Calyx ⅛ in., divided subequally nearly to the base; segments linear-spatulate, minutely ciliate. Corolla not seen. Capsule ⅛ in., pubescent at the tip, 4-seeded. Seeds ⅛ in., ovate, densely shaggy; areoles small.—Seems very nearly allied to S. subflaccidus, Kurz; but the spikes are in general so much shortened that it might be looked for among the capitate series. As in S. subflaccidus, the fruiting spikes have the upper bracts, but some of the lower fallen.

*** Spikes elongate more or less interrupted, or flowers nearly all distant but mostly opposite.—(Seeds in all hairy.)

80. S. Helferi, T. Anders. in Journ. Linn. Soc. ix. 472; leaves ovate acuminate rounded or subcordate at the base nearly glabrous, spikes simple elongate lax submontentose, flowers distant opposite, bracts broadly obovate obtuse, corolla 1⅓–1⅔ in.

Tenasserim, "Three Pagodas," Helfer (Kew Distr. n. 6117).
Branches divaricate, somewhat zigzag, terete, pubescent upwards. Leaves ⅔ by ⅓ in, crenate, puberulous and lineolate above, subpubescent on the 7 pair of nerves beneath; petiole 1 in. Spikes axillary, short-peduncled, solitary, opposite, 2–5 in.; flowers nearly all paired and distant; bract 1 to each flower, ⅛ in., densely minutely fuscos-pubescent, ciliate, apex ⅓ in. broad green patent or reflexed; bracteoles 0. Calyx ⅛ in., equally sub-5-partite; segments linear-ligulate, pubescent, subobtuse. Corolla nearly glabrous, straight; cylindrical base twice as long as the calyx. Capsule ⅛ in. Seeds ⅛ in., orbicular, dusky pubescent; areoles small.—T. Anderson errs in saying "corolla small;" the buds, which appear on the point of expansion, are scarcely ⅛ in. long; but there is one fully expanded flower overlooked by T. Anderson, which is (dry) nearly 1⅔ in.


Assam and Khasia Mts.; Griffith. Chittagong; Kasalong, Clarke.
A straggling, inelegant shrub, 2–5 ft.; branches terete, pubescent upwards or nearly glabrous. Leaves 6 by 2½ in., base cuneate, lineolate above, obscurely so beneath, minutely pubescent on the 9 pair of nerves beneath; petiole 1½ in. Spikes 2–5 in., with 6–8 flowers in opposite pairs; bracts ⅓–1 in., including the linear acuminate in., long, pubescent, or in Griffith's examples subglabrous; bracteoles ⅛ in., linear-oblancoate cuspitate, fulvous-pubescent upwards. Sepals in fruit similar to the bracteoles. Corolla not seen. Ovary glabrous, a dense fulvous tuft of hairs at the apex. Capsule 1 in., obovate, 4-seeded. Seeds ⅛ in., ovate, shaggy; areoles obsolete.—Probably S. fimbiatus, Kurz (For. Fl. ii. 244), from the forests of the Pegu Yomali and Tenasserim, the bracts of which Kurz says are entire, so that it could not have been Nees' S. fimbiatus.


A shrub; branches terete, with patent long rufous hairs. Leaves 6½ by 2½ in., base attenuate or subobtuse, remotely serrate, mature with few scattered long rufous hairs; nerves 9 pair; petiole 1 in. Spikes 2–4 in., rufous hairs ⅛ in. long, slender, patent; bracteoles ⅛ in., linear, green, rufous-ciliate. Calyx in fruit nearly 1 in.,
divided nearly to the base; segments linear-lanceolate, scarious below, rufous-ciliate upwards. Corolla not seen. Capsule ⅔ in., linear-oblong, glabrous, tip minutely rufous-hairy, 4-seeded. Seeds ½ in., ovate, silky; areoles hardly any.

83. S. Brunonianus, Nees in Wall. Pl. As. Rat. iii. 87, and in DC Prodr. xi. 188; leaves lanceolate attenuate at both ends nearly glabrous, spikes subpaniculate linear, bracts oblong, sepals linear oblong fulvous hirsute, corolla ⅔ in. T. Anders. in Journ. Linn. Soc. ix. 472. S. petiolaris, Nees in DC. Prodr. xi. 189, partly. Ruellia Brunoniania, Wall. Cat. 2369.

Khasia Mts., alt. 2-4000 ft., common, Wallich, &c.; lower bills of Assam, Jaintia, and Nagas country.

An erect, dense, annually-flowering shrub, 2-3 ft. Leaves 4 by ½ in. subentire in Wallich’s, often broader, sometimes 2 by ¾ in. crenate nearly to the base, base always gradually attenuated; nerves 8 pair, often obscure; petiole ½ in., often narrowly winged. Spikes 1-4 in., usually very numerous, dense but often interrupted towards the base, erect; bracts ⅔-¾ in., spatulate-oblong, obtuse, apex recurved or the lowest ovate narrowed upwards, subglabrous in Wallich’s specimens, often fulvous-hirsute; bracteoles ½ in., oblong, erect. Sepals ⅔ in. Corolla curved, pubescent without in the bud, lavender or white, cylindrical base shorter than the much-ventricose upper part. Stamens glabrous, more monadelphous than usual. Capsule ⅔ in., oblong, pubescent, 4-seeded. Seeds ⅓ in., orbicular, pubescent; areoles 0.—S. petiolaris, Nees, is founded on two plants collected by Griffith, one in Khasia, one in Assam, which are both preserved at Kew, authenticated in Nees’ hand; of these the Khasia one is identical S. Brunonianus, Nees, the other is taken as S. petiolaris below.

84. S. maculatus, Nees in DC. Prodr. xi. 190; leaves ovate (upper elliptic) acuminate at both ends nearly glabrous, spikes erect linear sub-interrupted at the base compound hairy, bracts oblong or cuneate-oblong, corolla scarcely ⅔ in. ventricose. Ruellia maculata, Wall. Pl. As. Rat. iii. 33, t. 250.

Khasia Mts., alt. 1-3000 ft., frequent, Clarke.

Shrub, 2-4 ft., lax. Leaves 5 by 2½-3½ in. (upper 5 by 1½-2 in.), serrate, mature glabrous or obscurely scabrid-puberulous on the nerves beneath, densely lineolate on the upper surface, often beautifully blotched with white when fresh, and as often uniformly green; nerves 10-11 pair; petiole 1-1½ in. Spikes 1-3 in., forming lateral and terminal cymes or panicles, the uppermost leaves being small, caducous; bracts ⅔ by ⅓ in., linear-oblong (in the most characteristic form), but vary to cuneate-oblong bracteoles ⅔ in., linear-oblong. Calyx ⅔-¾ in., sub-5-partite; segments linear-oblong, unequal, subobtuse, hairy. Corolla slightly curved, nearly glabrous, pale blue or lavender, cylindrical base nearly as long as the greatly ventricose upper portion; limb subequal, segments short round reflexed. Stamens glabrous, monadelphous, exactly as in S. Brunonianus. Capsule ⅔ in., oblong, pubescent, 4-seeded. Seeds ½ in. diam., orbicular, shaggy with long hairs; areoles rather small.—This was sent to Wallich from Silhet; it is common along the lower Khasia range 20 miles N. of Silhet. Wallich’s picture, from a cultivated plant, shows the flowers larger than in any of the wild specimens seen; his statement that the species differs essentially from S. monadelphus by having the “filaments free at base” is altogether misleading; Nees perhaps went entirely on the somewhat coarse picture in Wall. Pl. As. Rat.

85. S. monadelphus, Nees in Wall. Cat. 7159, and in Wall. Pl. As. Rat. iii. 87, and in DC. Prodr. xi. 188; leaves ovate acuminate at both ends pubescent on the nerves beneath, spikes erect linear panicle very hairy, bracts ovate often squarrose, corolla scarcely ⅔ in. ventricose.

Khasia and Jaintia Mts., alt. 3-5000 ft., frequent; Wallich, &c.

A rather rigid shrub, 2-3 ft.; branches often scabrous, hairy, quadrangular. Leaves 3½ by 2 in., serrate, mature usually more or less hairy on both surfaces, not known to
occur blotched; nerves 9–11 pair. Inflorescence and flowers as of *S. maculatus*, but the bracts usually \(\frac{1}{2}–\frac{1}{4}\) in. wide towards their base. Seeds \(\frac{1}{4}\) in. diam., pubescent. —Certainly closely allied to *S. maculatus*, and may be a high-level hairy form of it, as T. Anderson supposed; but besides the difference in the bracts fixed on by Nees the seeds are about double the diam., much more shortly dusky hairy.


Sikkim and Bhutan, alt. 3–10,000 ft., common; Griffith, T. Anderson, &c. Assam; Griffith.

A lax shrub, perhaps not specifically distinct from *S. maculatus*; the leaves are often spotted as on it, the small seeds are similar; but the bracts are much broader (as Nees states), and the corolla is much larger, usually purplish or even rose instead of lavender blue; nerves 7 pair, i.e. much more distant than in *S. maculatus* & *monadelphus*. The species reaches a very high level, the Alpine specimens being smaller with smaller leaves but equally large flowers.

Var. tubiflorus; spikes divaricate densely glandular-hairy, corolla (unexpanded) more than 1 in. the ventricose portion scarcely \(\frac{1}{2}\) in. diam.—Mishmee; Dalloo, Griffith (Kew Distrib. no. 6095, 6103). —“Corolla deep blue; bracts lead-coloured” (Griffith’s field-note). —This is very possibly a distinct species, though it must be closely allied to *S. petiolaris*; but it is very dangerous to assume the shape of the corolla from buds in this genus.


W. Deccan Peninsula; Cocon, Canara, Coorg, Law, Dalzell, &c.

Shrubby, nearly glabrous except the spikes. Leaves attaining 15 by 4½ in., more often 6 by 1½–2½ in., very variable in size and in width, sparingly toothed, lineolate above; nerves 6–12 pair; petiole winged to the base, there dilated, arculate, sometimes subdecurrent, never perfoliate. Spikes 2–5 in., closely cymed (or solitarily) on very short axillary peduncles, very open, hardly interrupted even at the base in fruit; bracts \(\frac{1}{3}\) by \(\frac{1}{2}\) in.; bracteoles \(\frac{1}{2}\) in., linear. Calyx \(\frac{1}{2}–\frac{1}{3}\) in. (elongate in fruit), divided nearly to the base, segments linear. Corolla 1½ in., straight, glabrous without, hairy within; cylindrical base of the tube nearly as long as the ventricose part. Staminodia included; longer filaments glabrous. Ovary glabrous, style thinly hairy. Capsule \(\frac{1}{4}–\frac{1}{3}\) in., compressed. Seeds \(\frac{1}{6}\) in., ovate, shaggy; areoles hardly any.


Kashmir, Gurwhal, Kumaon and Nepal; Wallich, Jacquemont, &c.

A shrub, 2–5 ft.; branches villous. Leaves 3 by 1½ in., base cuneate or rounded, crenate, villous on both surfaces; nerves 5–6 pair; petiole \(\frac{1}{2}–\frac{1}{3}\) in. Spikes densely capitate, or more often the lowest flowers are remote, solitary, opposite in the axils of bract-like leaves; bract \(\frac{1}{3}–\frac{1}{2}\) in., ovate, subfoliaceous, persistent; bracteoles \(\frac{1}{2}\) in., oblong. Calyx \(\frac{1}{2}–\frac{1}{3}\) in., divided nearly to the base; segments linear, obtuse, viscos hairy. Corolla nearly glabrous; linear-cylindric base nearly as long as the ventricose part. Stamens glabrous. Capsule \(\frac{1}{4}\) in., viscos-pubescent, 4-seeded.
Series B. 

**Seeds** \( \frac{1}{4} \text{ in.}, \) ovate, shaggy; areoles hardly any.—In spite of the enormous differences in the capsule and seeds, this plant has been much mixed with *Echinanthus tomentosa*.

**Bracts caducous, often before the flowers expand.** Flowers clustered or in distant mostly opposite pairs; not most of them scattered alternate. **Seed** in all hairy.—(All, except *S. Newii* from N. India or Malay Peninsula.)

* Heads even in fruit capitate or ovate, not interrupted below.


**Mishmee;** Griffith (Kew Distr. n. 6116).

A small shrub; branches slender, somewhat zigzag. **Leaves** 5 by \( \frac{1}{2} \text{ in.} \), base cuneate or rhomboid, serrulate, upper surface dense with raphides; nerves 6-7 pair; petiolar \( \frac{1}{2} \text{ in.} \). **Peduncles** 1-3 in., with a node carrying two reduced caducous leaves at the middle, there geniculate and sometimes divided; heads \( \frac{1}{2} \text{ in.} \), 2-4 outer bract-like leaves barren, early caducous; bract \( \frac{1}{2} \) by \( \frac{1}{2} \) in., lineolate. **Calyx** \( \frac{3}{4} \text{ in.} \), divided nearly to the base; segments linear, unequal, obtuse, glandular. **Corolla** \( \frac{1}{4} \text{ in.} \), glabrous, purple. **Capsule** \( \frac{3}{4} \text{ in.} \), clavate, 4-seeded, glandular-pubescent. **Seeds** \( \frac{1}{4} \text{ in.} \), ovate, shaggy; areoles small.—Each flower subtended by one bract, and there are 2-4 outer empty similar bracts; before the expansion of the corolla all the bracts but 1 or 2 of the uppermost full, and these disappear before fruit.

**Var. integra**: leaves nearly entire, sepals in fruit nearly \( \frac{1}{4} \text{ in.} \) hairy.—Khasia Mts. Clarke. **Leaves** 5 by \( 2 \frac{1}{2} \text{ in.} \), subovate; petiolar \( \frac{1}{2} \text{ in.} \). **Seeds** \( \frac{1}{4} \text{ in.} \) and upwards.—Probably merely the fully-developed form of *S. geniculatus*, which Griffith collected in a colder country.

**90. S. capitatus**, T. Anders. in Journ. Linn. Soc. ix. 475; leaves ovate acuminate at each end nearly glabrous, bracts elliptic-oblong herba-. ceous pubescent as long as the calyx, bracteoles half as long as the calyx, corolla 1-2 in. deep blue. *Ruellia capitata*, Wall. Cat. 2351, partly; Don Prodr. 120. *Goldfussia capitata*, Nees in Wall. Pl. As. Rar. iii. 88, and in DC. Prodr. xi. 173. G. biceps, Nees in Wall. Cat. 7161, and in Wall. Pl. As. Rar. iii. 88, and in DC. Prodr. xi. 172.—Acanthaceae sp. Griff. Itin. Notes, 116, n. 218.

**Subtropical Himalaya**, alt. 1-5000 ft., from NEPAL to BHOTAN, common; Wallisch, Griffith, H. f. & T., &c. Pegu; Karea Hills (6de T. Anderson).—**Distrib. Ava.**

A shrub, 1-3 ft. **Leaves** 6 by \( 2 \frac{1}{2} \text{ in.} \), serrate, obscurely lineolate above, minutely hairy on the nerves beneath; nerves 6-7 pair; petiolar \( 1 \frac{1}{2} \text{ in.} \). **Peduncles** usually short, \( \frac{1}{4} \text{ in.} \), sometimes 2-4 in., glabrous or pubescent. **Heads** 1 in. diam., closely capitated even in fruit, many-fl.d., outer empty bracts sometimes long leaf-like, sometimes hardly half so long as the heads, caducous; bracts proper to each flower elongate upwards, closely adpressedly softly white pubescent; bracteoles \( \frac{1}{2} \text{ in.} \), ligulate, herbaceous, pubescent, caducous in fruit. **Calyx** \( \frac{1}{4} \text{ in.} \), deeply divided but connate into a hardened short tube at the base; segments narrowly lanceolate, softly hairy even in fruit. **Corolla** curved, tubular-ventricose, nearly glabrous. **Stamens** glabrous. **Ovary** glandular; style thinly patent hairy. **Capsule** \( \frac{3}{4} \text{ in.} \), slightly clavate, pubescent, 4-seeded. **Seeds** \( \frac{3}{4} \text{ in.} \), ovate, shaggy; areoles small.

**Var. stacea**: heads larger shining glabrous in fruit, bracteoles nearly as long as the calyx obovate-oblong glabrous firmicate in fruit.—Khasia Mts.; Monsoo, alt. 2500 ft., Clarke.—**Bracts** and **bracteoles** shining scarious in fruit from a short green base. **Seeds** \( \frac{1}{4} \text{ in.} \), densely silky.

NEPAL; **Wallich. KUMAON**; Mohargari, alt. 6500 ft., and Kalamundi, alt. 8500 ft., *Strackey & Winterbottom*

*Strobilanthes*

**Stem** 2 ft. herbaceous, acutely quadrangular, somewhat pubescent upwards. *Leaves* 8 by 3½ in., shortly scabrous-setulose above, remotely minutely hairy beneath; nerves 13 pair. **Peduncles** 1–4 in., 1–2 in each axil or the uppermost subumbellate, hairy, clave, quadrangular upwards, 1-headed; heads in flower 1½ in.; bracts 2–3 in., deciduous before the flowers expand; bracteoles 0. **Calyx** ¼ in., distinctly gamosepalous, subequally 5-fid; segments linear-oblong, green, very viscidly golden-pubescent. *Calyx* in shape nearly as of *S. Dalhousianus*. *Capsule* not seen.


**Subtropical Himalaya**, alt. 1–6000 ft., from NEPAL to BHOTAN, frequent; **Wallich, H. f. & T., &c.**

A much branched shrub, 3–8 ft. diam.; stems glabrous. *Leaves* 6½ by 2½ in., closely serrate, lineolate on both surfaces; nerves 7 pair; petiole ½ in. **Peduncles** 1–3 in., sometimes glandular-hairy, 1–2 together, mostly 1–3-headed; heads ½–1 in., young exactly globular, outer bracts enclosing the heads; but in some of Wallich’s examples the young heads are oblong-cylindric, strobiliform; bracts ¼–½ in. obtuse, early caducous. **Calyx** ¼ in., in fruit often ½ in., divided nearly to the base, segments linear. *Calyx* more or less curved; narrow part of the tube sometimes minutely pubescent. **Stem** glabrous. **Capsule** 3 in., oblong-clavate, glandular-pubescent, 4-seeded. **Seeds** ½ in., ovate, silky; areoles very small.

**Var. flexuosa**; small, branches short flexuose rooting, peduncles long with 1 small head. Ruella flexuosa, *Wall. Cat*. 2412. Goldfussia flexuosa, *Nees in Wall. Pl. As. Bar*. iii. 88, and in *DC. Prodr*. xi. 175.—“India,” *Herb. Wight*. Branches 1–1½ foot, apparently prostrate. *Leaves* 2½ by ½ in., thinly herbaceous; nerves 5 pair.—The example in Herb. Wight looks very unlike the Himalayan *S. pentstemonoides*; and, though taken up as a species by Nees, T. Anderson seems to have been so dissatisfied about it that he has left it out altogether. But there is a piece of the same thing mixed in Wallich’s herbarium with *Ruella Cephalotes* (*Wall. Cat*. 2352, type sheet); and it is probably an alpine starved (or cultivated?) form of *S. pentstemonoides*.


**W. Temperate Himalaya**, alt. 6–8000 ft.; from Kashmir to Kumaon, frequent; **Lady Dalhousie, Thomson, &c.**

A suberect shrub, 2–3 ft.; stems hairy. **Bracts** scarcely ½ in., caducous; outermost oblong, green upwards, small, not enclosing the heads. **Calyx** in the typical form glabrous, subscarios, lobes linear-oblong, sometimes minutely softly hairy.—United with *S. pentstemonoides* by T. Anders., from which it differs in habit, in having much more hairy leaves and less hairy calyx. It also grows at a different level.
94. **S. multident**, 

Clarke; leaves ovate shortly acuminate at both ends minutely sparsely hairy on both surfaces, heads paniced viscos hairy, bracts small obovate viscos hairy deciduous, calyx viscos-pubescent, corolla 1½ in. purple.


Leaves 7½ by 4 in., closely regularly serrate (often with more than 100 teeth to the leaf; both surfaces with few remote minute hairs and small scattered raphides. **Bracts** ½ in., very viscos-hairy; bracteoles ¼ in., linear-oblong. **Cupule** ½ in., viscos-pubescent, 4-seeded. **Seeds** ½ in., subquadrate, fulvous-hairy; areoles sub-obsolete.—This is the so-called Sikkim *S. Dalhousianus*; it is nearer the true *S. pentstemonoides*, but the young heads are never glabrous globose as in that, and the panicle is compound very glanulur-hairy. The corollas in Griffith's Bhutan example are not more than 1½ in., but are not thoroughly expanded.

95. **S. rhombifolius**, 

Clarke; leaves subsessile, rhomboid-ovate shortly acute at both ends glabrous, bracts small elliptic concave caducous, bracteoles 0, corolla 1½–1¾ in. nearly glabrous. **Goldfussia sessilis**, Nees in *DC. Prodr.* xi. 173, not *Strobilanthes sessilis*, Nees.

**Assam**: Jenkins.

Branches long, subterete, glabrous. Leaves (often unequal) 3½ by 2 in., remotely serrulate, lineolate on both surfaces; nerves 5 pair. **Pedicels** 1–3 in., 1–3-headed; heads ½ in. diam., closely capitate; all the bracts early caducous. **Calyx** in flower ½–1 in., divided nearly to the base; segments narrowly lanceolate, fuscous pubescent. **Corolla** nearly as of *S. pentstemonoides*, purple-mouthed. **Filaments** glabrous, longer hairy near the base. **Capsule** not seen.—This seems very near *S. pentstemonoides*, differing little but in the shape of the leaves; the heads however, by the time the first flowers expand, have lost all their bracts, which gives them a very different look.


Upper Sikkim, alt. 5–7000 ft.; Yoksan, J. D. H., &c.

A small shrub, 1–2 ft.; branches slender, terete, glabrous. Leaves attaining 6½ by 3 in. (usually smaller much narrower), base cuneate, minutely remotely denticate, sparingly thinly lineolate, sparsely puberulous especially toward the margins beneath; nerves 5–6 pair; petiole ¼ in. **Bracts** as in *S. pentstemonoides*, but rather smaller. **Corolla** viscos-pubescent without, usually nearly black.—When dried hardly distinguishable from *S. pentstemonoides* but by the smaller heads and the ciliate leaves.

**Var.** Treutleri; heads slightly elongate, bracts ovate-lanceolate herbaceous hairy, bracteoles ¼ in. linear, sepals ½–3 in.—Sikkim, alt. 9–10,000 ft., frequent on Tonglo and Sundukphoo, Treutler, &c.

97. **S. dasyspermus**, 

Kurz in *Journ. As. Soc.* 1873, pt. ii. 94; leaves elliptic or ovate acuminate very sparsely minutely hairy, heads even in fruit capitate forming (by the falling of the floral leaves) quasi-panicles, bracts small oblong caducous, corolla 1 in. blue glabrous without.

**Prau**: Kurz.

An erect, nearly glabrous herb, 3–4 ft. (Kurz); branches obscurely quadrangular. Leaves 5½ by 2½ in., base suddenly shortly acuminate (the uppermost and reduced floral leaves sessile coriaceous), crenate-serrate, subglabrous, minutely lineolate above; nerves 7–8 pair; petiole 0½ in. **Heads** few-fld., glandular-hairy; peduncles ½–3 in.; bracts ½ in.; bracteoles ¼ in., obovate-oblong, caducous. **Calyx** ½–1 in., divided nearly to the base; segments linear-ligulate. **Corolla** nearly straight; cylindrical base.
about as long as the moderately-widened ventricose part; segments ovate. Filaments and style sparsely hairy. Capsule ½ in., narrowly elliptic, pubescent upwards, 4-seeded. Seeds ½ in., ovate, silky; areoles hardly any.—Kurz rightly refers this to the neighbourhood of S. pentstemonoides.


Bhotan, Assam, and Khasia Mts.; Griffith (Herb. Propr. n. 2399, 2400; Kew Distrib. n. 6105, 6120).

A shrub, closely resembling S. pentstemonoides and S. sessilis; differing from the former in having the leaves more shortly petioled, less sharply toothed, the inflorescence more compound; from the latter in the leaves cuspidate acuminate. In the type examples of Nees the leaves are scarcely whitened beneath. Bracts not seen, oblong-lanceolate, fide Nees.

Var. nudicalyx; leaves densely lineolate above coriaceous very white beneath, bracts ½ in. obovate, sepals glabrate lineolate. Goldfussia sp. n. 25, Herb. Ind. Or. H. f. & T.—Khasia, alt. 4000 ft.; Mausmai Falls, Griffith (Kew Distrib. n. 6120); Cherra, H. f. & T.—The type examples of this collected by J. D. H. look like a very distinct species; but some of the pieces of Griffith have the sepals glandular hairy.


Khasia Mts., or adjoining parts of Silhet or Assam. All the examples are of cultivated plants.

A nearly glabrous, erect, very ramose shrub, 1–2 ft. Leaves 3 by ½–1 in., opposite, subequal, entire or slightly serrulate, covered with raphides on both surfaces; nerves 4–5 pair; petiole 0–½ in. Heads ½ in. diam., 1–2-ft., terminal but appearing axillary cymed, the reduced leaves on the short axillary branches being caducous; bracteal leaves to the heads caducous; bract ½ in., green, nearly glabrous, subpersistent; bracteoles ¼ in., linear-oblong, green, nearly glabrous. Calyx ½ in., divided nearly to the base, pubescent; segments sublinear. Corolla curved; cylindrical base much shorter than the ventricose portion, lobes short round. Stamens and style hairy. Capsule nearly ½ in., glabrous, 4-seeded. Seeds ½ in., ovate, silky; areoles hardly any.


Khasia Mts., alt. 1–4000 ft., common; Wallich, &c.

A shrub, 2–3 ft. Leaves 3½ by ½–1 in.; the opposite leaf of each pair 1½ by ½ in. or obsolete.—Except in the unequal, rather broader leaves, this wholly agrees with
101. **S. crataegifolius**, T. Anders. in Journ. Linn. Soc. ix. 477; leaves subsessile elliptic or obovate crenulate glabrous, heads 1–5-fld., terminal solitary, on numerous short leafy lateral branches hairy, bracts and bracteoles linear-oblong about as long as the calyx, corolla 1½ in. blue.

**Moulmin**: Griffith, Parish.

Branches elongate (15 in. at least), glabrous, subsimple with numerous shortened small-leaved lateral branches in opposite pairs each terminated by a flower-head. *Leaves* 2¼ by 1 in. (those on the lateral branches ½–⅓ in.), lineolate above, pale leathery beneath; nerves 6 pair. *Peduncles* 0½ in.; bract ½ by ⅓ in., green, prominently white-ciliate; bracteoles similar to, rather smaller. *Sepals* ½ in., linear-lanceolate, green, ciliate, ½ in. in fruit. *Corolla* nearly straight, glabrous; cylindrical base much shorter than the ventricose portion. *Capsule* ½ in., broadly clavate-elliptic, minutely pubescent, 2-seeded. *Seeds* ½ in., fulvous-shaggy; areoles very small.

**Heads** elongate mostly interrupted below, frequently all the flowers scattered or only a few at the tips of the spikes capitellate.


**Nepal**: Wallich.

*Stems* 15 in., flexuose, glabrous. *Leaves* 2 by 1½ in., base rounded or shortly acuminate, serrate, minutely pubescent on the nerves beneath, lineolate on the upper surface; nerves 6–7 pair; petiole ½ in. *Spikes* peduncled, mostly solitary, 1 in. in flower scarcely 2 in. not interrupted in fruit; bracts ½ in.; bracteoles ⅓ in., caducous. *Calyx* ½ in., in fruit ⅓ in., divided nearly to the base; segments linear-lanceolate, pubescent. *Corolla* purple (Nees). *Capsule* ½ in., pubescent, 4-seeded. *Seeds* ½ in., ovate, silky; areoles hardly any.

103. **S. pauper**, Clarke; leaves lanceolate acuminate at both ends puberulous beneath or glabrate, heads oblong in fruit interrupted small or 1-fld., bracts obovate quadrate shorter than the calyx, corolla ⅔ in. purple. *S. lamiifolius*, T. Anders. in Journ. Linn. Soc. ix. 476, partly.—Goldfussia sp. n. 26, Herb. Ind. Or. H. f. & T.

**Khasia Mts.**, alt. 4–6000 ft.; Nunklow and Nungbree, H. f. & T., &c.

A meagre shrub, 1–2 ft.; branches upwards hairly or glabrate. *Leaves* 3½ by 2–1 in., minutely toothed or subentire, densely obscurely lineolate; nerves 6–7 pair; petiole ½–1 in. *Spikes* in fruit sometimes 2 in., usually shorter, or the flowers occasionally nearly all solitary; bracts scarcely ½ in., tip obtusely triangular, green, subpubescent, caducous; bracteoles ½ in., oblong, caducous. *Calyx* ¼ in., in fruit ½ in., sub-5-partite; segments linear-spathulate, glandular-pubescent. *Corolla* nearly glabrous; narrow cylindrical base nearly as long as the ventricose part. *Stamens* glabrous. *Capsule* ¼ in., pubescent, 4-seeded. *Seeds* ½ in., ovate, shaggy; areoles smooth.

Khasia Mts., alt. 4-6000 ft., common; Wallich, &c. Assam; Griffith, Mrs. Mack.

An erect shrub, 1-2 ft.; branches hairy. Leaves $\frac{1}{2}$ by $\frac{3}{4}$ in., upper cordate sessile, lower sometimes short-petioled, serrate; nerves 5 pair, springing near the leaf-base. Spikes 2-6 in., terminal, hairy, dense at the tip, usually much interrupted below; the lowest flowers often distant solitary in the axil of altogether leaf-like persistent bracts; bract proper $\frac{1}{2}$-$\frac{1}{4}$ in., herbaceous, glandular, deciduous; bracteoles $\frac{3}{4}$ in. elliptic. Calyx $\frac{1}{2}$-$\frac{1}{4}$ in. (or more in fruit), divided nearly to the base; segments linear-oblong, subobtuse, glandular-pubescent. Corolla curved; narrow cylindrical base of the tube hardly as long as the ventricose part. Filaments glabrous; style thinly hairy. Capsule $\frac{1}{2}$-$\frac{3}{4}$ in., glandular-pubescent, 4-seeded. Seeds $\frac{1}{4}$ in., ovate, hairy; areoles small.

105. S. phyllocaulos, Clarke; leaves short-petioled ovate acute hairy, spikes long dense interrupted below in fruit, bracts ovate, corolla 1$\frac{1}{2}$ in. nearly glabrous purple.

Khart Mts., alt. 5000 ft.; Mf-long, J. D. H.; Dingling, Clarke.

Stems stout, hairy; internodes not half as long as the leaves. Leaves 3$\frac{1}{2}$ by 1$\frac{1}{2}$ in., without the acumination characteristic of S. extensus, base of the lower leaves shortly acuminate, serrations often 40-50 to the leaf (rarely 20 in S. extensus), upper surface softly densely adpressed hairy, lower softly patently hairy reticulately nervous; nerves 8 pair, subequally distant (not all springing near the base of the leaf). Inflorescence, flowers and capsule exactly as of S. extensus.—So unlike S. extensus in its densely hairy stem that it has been sorted in the Herbarium with Aechmanthera leiosperma, which it exceedingly resembles; but it is difficult to separate it from S. extensus by any technical character.

106. S. Newii, Beddome ms.; leaves petioled ovate acute pubescent, spikes much interrupted panicked, bracts lanceolate, corolla $\frac{1}{4}$-$\frac{1}{2}$ in. nearly glabrous purple. S. extensus, Bedd. Ic. Pl. Ind. Or. t. 202, not of Nees.

W. Mysore; Manjeerabad, New (side Beddome).

A small shrub; branches puberulous, glandular hairy towards the tips. Leaves 2 by 1$\frac{1}{2}$ in., base rounded or subcordate, serrate, puberulous scabrous above pubescent beneath; petiole $\frac{1}{2}$-$\frac{1}{4}$ in. (uppermost leaves sessile). Panicles 6-10 in.; flowers nearly all opposite. Calyx and corolla nearly as of S. extensus.—Col. Beddome published this as S. extensus, to which it is no doubt closely allied, but the leaves will not match, and the bracts are totally different, very hairy, early caducous, the bracteoles subobsolete.


W. Temperate Himalaya, alt. 6-10,000 ft., common; from Kashmir to Kumaon. — Distrib. N. E. Cabnl.

A shrub, 2-4 ft., erect, viscous-hairy. Leaves 5 by 2$\frac{1}{2}$ in., upper sessile, lower long-petioled, base cordate rounded or attenuate, serrate; nerves 7-8 pair; petiole 1-3 in., linear or winged upwards. Spikes (by the early fall of the bracts) forming terminal panicles; upper flowers soon in distant pairs, not capitate; bracts narrow-lanceolate or oblong, caducous; upper hardly so long as the calyx; bracteoles $\frac{1}{2}$ in., narrowly oblong, caducous. Calyx $\frac{1}{2}$-$\frac{1}{4}$ in., deeply divided; segments unequal, linear, obtuse, green, viscous-hairy. Corolla ventricose, mouth curved, constricted base hardly longer than the calyx, 2 hairy lines within. Stamens glabrous. Ovary glandular, style very remotely minutely hairy. Capsule $\frac{1}{3}$ in., narrowly elliptic, glandular-hairy,
4-seeded. Seeds 4 in., ovulate, shaggy; areoles hardly any.—The lower long-petioled leaves are usually cordate, but leaves acuminate at the base occur on the same plant. The species is better distinguished by the tips of the spikes having the flowers (quite early) spicate not capitate, and all the bracts very narrow; but the leaves about the base of the panicle are cordate ovate acuminate. Nees has written this species up under 3 names in the Kew Herbarium: as S. alatus, which is altogether right; as S. attenuatus, which is erroneous so far as he doubtfully meant it for Ruellia attenuata, Wall. & Nees (an Echinacanthus); and as S. extensus, which is a blunder.

108. **S. Lachenensis**, Clarke; leaves ovate attenuated at the base laxly hairy, spikes long interrupted at the base, bracts sessile elliptic truncate at the base exceeding the calyx caducaous, corolla middle-sized glabrate without.

**Sikkim Himalaya;** Lachen, alt. 10,000 ft., *J. D. H.*

Branches elongate, with lax white patent hairs. Leaves 2½ by 1½ in., obtuse or triangular, base (even in the uppermost) acuminate, deciduous. Spikes 2-5 in., solitary, simple; lower bracts ½ by ½ in., green, entire, exactly truncate, not at all cordate. Corolla (not expanded) ½ in., with a few scattered lax hairs towards the apex without.—This has been referred as a Sikkim form to *S. alatus*, to which it is certainly allied; but no one of the numerous examples of *S. alatus* will it match even reasonably well.


**Penang;** G. Porter.

Branch-tips stout, glabrous; internodes elongate. Leaves 9½ by 3½ in., base emarginate, repand-crenate, bearing raphides on both surfaces; nerves 7 pair; petiole ¾ in. Spikes 3-4 in., with few flowers in remote opposite pairs, early running into a few-branched panicle; bracts ½ in., concave; bracteoles 0. Calyx ½ in., divided nearly to the base; segments linear, with weak subulate pubescent tips. Corolla slightly curved, cylindrical base as long as the ventricose part. Capsule ⅔ in., clavate-oblong, puberulous, 4-seeded. Seeds ½ in., ovate, shortly fulvous-hairy; areoles small.

—Habit and calyx much like those of the large *Asystasia*, but the capsule and seeds are of *Strobilanthes*.

110. **S. lancifolius**, T. Anders. in *Journ. Linn. Soc.* ix. 480; leaves elliptic acuminate at both ends glabrous, spikes linear interrupted hairy collected into terminal panicles, bracts oblong obtuse green shorter than the calyx deciduous, corolla 1½ in. minutely pubescent without deep-blue.

**Moulmein;** Parish. **Tenaressim;** Reddome.

A shrub; branches terete. *Leaves* 7 by 3 in., widest about the middle, serrate, minutely lineolate above; nerves 7-8 pair; petiole 1 in. *Spikes* ascending, straight; flowers nearly all in opposite pairs; bracts ½ in.; bracteoles ½ in., linear-oblong, obtuse, deciduous. *Calyx* ½ in., subequally divided nearly to the base; segments linear-oblong, obtuse, pubescent. *Corolla* nearly straight, funnel-shaped, ventricose upwards; segments ovate, dense rows of long white hair within. Longer filaments white hairy. *Capsule* ⅔ in., glabrate, 4-seeded. Seeds shaggy.


**Vol. IV.**
A shrub; branches quadrangular, secbard puberulous upwards. *Leaves* 6 by 2½ in., crenulate-dentate, with small raphides on both surfaces, paler beneath; nerves 12 pair; petiole ½-3 in. (often very unequal in the opposite pairs). *Spires* 1–4 in., axillary, 1 or 2 together, interrupted, slender even before flower-time; bracts ½-1 in., green, slightly pubescent; bracteoles ¼ in. Calyx ½–1 in., divided nearly to the base; segments lanceolate, scarcely acute, fuscous-pubescent. *Corolla* 1⅔ in., pubescent without, nearly straight; linear-cylindric part of the tube nearly as long as the ventricose part. Filaments very hairy (Nees). *Capsule* not seen.

112. *S. microcarpus*, T. Anders. in Journ. Linn. Soc. ix. 482; leaves large petioled ovate acuminate coarsely serrate hirsute on both surfaces, flowers panicked distant mostly in opposite pairs, bracts and bracteoles very small, corolla ⅔ in. glabrous without.

TENASSEIM OR ANDAMANS; Helper (Kew Distrib. n. 6113).

A shrub; branches terete, swollen at the nodes, glabrous. *Leaves* 8 by 4½ in., base broadly rhomboid, hirsute with white hairs which are stellately clustered on the upper surface, closely minutely lineolate on both surfaces; nerves 15 pair; petiole 1½–2 in. Inflorescence viscidly glandular-hairy; spikes proper apparently laxly few-flowered, axillary and running into a terminal panicle; bracts ⅔ in., linear; bracteoles similar to the bracts. Calyx ½ in., divided nearly to the base, viscos; segments linear, more or less unequal. *Corolla* nearly straight, very hairy within; cylindric base much shorter than the ventricose portion; segments short. *Capsule* scarcely ½ in., clavate, 2-seeded where examined.—Helper’s examples are in bad condition, with the leaves (both cauline and floral) all detached; and the species very possibly is not placed here correctly.

113. *S. angustifrons*, Clarke; leaves elliptic acuminate at both ends nearly glabrous, spikes lateral and terminal panicked with capitellate tips, bracts oblong acuminate caducous, corolla 1½ in. nearly glabrous purple.—Stroblanthes sp. n. 29, Herb. Ind. Or. H. f. & T., partly. Goldfussia Edgeworthiana, Nees in DC. Prodr. xi. 173?

N.W. HIMALAYA; Deyra, alt. 2500 ft., Thomson; Kangra and Dharamsala, alt. 3–6000 ft., Clarke.

A suberect shrub, 2–3 ft.; branches glabrous. *Leaves* ⅘ by 1¼ in., upper all attenuate at the base, serrulate, upper surface and margin minutely hairy or glabrous, raphides small on both surfaces; nerves 6 pair; petiole ½ in. *Spires* forming short irregular panicles, branches nearly glabrous; lower bracts leaf-like, lancelate (base never coriaceous), upper shorter than the calyx; bracteoles ¼ in., linear, scarcely pubescent. Sepals ½ in., linear, pubescent. *Corolla* nearly as of *S. alatus*, but much narrower. *Capsule* ½–⅔ in., sparsely pubescent, 4-seeded. *Seeds* scarcely ⅔ in., orbicular, hairy; areoles hardly any.—This differs from *S. alatus* by the slenderer corolla, capsule and seeds, and by the uppermost leaves being narrowed never coriaceous at the base.

114. *S. agrestis*, Clarke; leaves ovate acuminate at both ends sparsely hairy on both surfaces, spikes elongate panicked with capitellate tips, bracts shorter than the calyx obovate pubescent caducous, corolla 2 in. glabrous without.

SUBTROPICAL SIKKIM and W. BHOTAN, alt. 2–5000 ft., frequent; Clarke.

An erect, branched undershrub, 1–2 ft.; branches upwards quadrangular, pubescent. *Leaves* 4 by 2 in., often unequal, shortly acuminate at the base, serrulate, shortly sparsely hairy above, minutely pubescent beneath, minutely lineolate on both surfaces; nerves 6 pair; petiole ½ in. *Spires* 1–4 in., hairy, lower flowers in distant pairs; bracts ⅔ in.; bracteoles ¼ in., linear-oblong. *Corolla* slightly curved, rather narrowly tubular-ventricose, lavender colour. *Capsule* and seeds as of *S. angustifrons*, to which it is nearly allied.

VAR. *hemitis*; one leaf of every pair sessile coriaceous less than ½ the length of the other.—Khasia Mts., Herb. Watt.
115. **S. Thomsoni**, T. Anders. in *Journ. Linn. Soc.* ix. 478; leaves ovate or elliptic acuminate at both ends glabrous, spikes short cymose or fascicled axillary shorter than the leaves glabrous or viscous-hairy, bracts and bracteoles very small, corolla 1½ in. purple.—*Strobilanthes* sp. n. 30, *Herb. Ind. Or.* H.f. & T.

**SUBTROPICAL SIKKIM** and W. BHOTAN, alt. 2–6000 ft., common; J. D. H., T. Anders., &c.

A shrub, 3–5 ft.; branches elongate, flexuose, glabrous. *Leaves* 4½–6½ by 2½ in., serrate, with small raphides on both surfaces; nerves 6 pair; petiole ¼–⅓ in., sometimes 0. *Spikes* 1–3 in., in nearly all the axils, densely divided from the base, the flowers nearly all in crowded but distinct opposite pairs; lower bracts resembling reduced leaves, lanceolate; upper ⅛ in. spathulate, glabrous pubescent or very viscous-hairy. *Calyx* in flower often less than ¼ in., in fruit sometimes nearly ½ in., divided nearly to the base; segments equal or unequal, glaucous or green, hairy. *Corolla* somewhat curved, minutely pubescent, ultimately glabrate. *Capsule* scarcely ⅓ in., minutely pubescent, 4-seeded. *Seeds* ⅛ in., orbicular, innumerable fine white hairs springing out on applying water; aestoles very small.—There is a wide series of forms here collected, varying much in the size and hairiness of the calyx, but all remarkable by the fasciculate axillary inflorescence. Possibly T. Anderson also included here *S. agrestis*, which has different inflorescence, and much larger capsules.

116. **S. lævigatus**, Clarke; nearly glabrous, leaves elliptic acuminate at both ends serrate, flowers loosely panicked nearly all in opposite distant pairs, bracts very caducous, corolla 1½ in. nearly glabrous.

**SIKKIM**; J. D. H.

A shrub, glabrous except a few glandular hairs occasionally on the calyx and panicle-rachis. *Leaves* 7 by 2½ in., sharply serrate, obscurely lineolate, nerves 8 pair; petiole ½ in. *Panicles* axillary and terminal, large, lax; bracts and bracteoles all fallen before some of the corollas have opened. *Calyx* ¼ in., divided nearly to the base; segments subequal, narrowly lanceolate, subobtuse, somewhat enlarged, membranous in fruit. *Corolla* nearly as of *S. angustifrons* & *agrestis*. *Capsule* ¼–⅔ in., glabrous, tip obscurely glandular.

117. **S. debilis**, Clarke; leaves small elliptic sparsely hairy, spikes small interrupted, flowers in opposite pairs, bracts linear-lanceolate, corolla 1 in. nearly glabrous without long white-hairy within.

**PEGU**; Kurz.

*Stem* creeping, rooting; flowering branches 4–8 in., erect, branching, pubescent. *Leaves* 1½ by ⅜ in., apex triangular, very obtuse, base cuneate, undulate or crenate, densely lineolate and with a few long multicellular hairs above, pubescent beneath; nerves 5 pair; petiole ¼ in. *Spikes* 1–2 in., weak, hairy; bracts ⅛ in.; bracteoles ⅓–⅔ in., linear, green, hairy. *Sepals* ⅓–⅔ in., linear, subulate, very hairy. *Corolla* nearly straight; cylindrical base hardly half as long as the urceolate part; segments 5, short, round, subequal. *Filaments* glabrous. *Ovary* 4-ovulate. *Capsule* not seen.—A very anomalous species; it is possible that the bracts are not caducous, and that it should not be arranged here.


**S. ANDAMAN ISLANDS**; Kurz.

A branched herb (*Kurz*). *Leaves* 8 by 1 in., subobtusely cuneate at both ends nearly glabrous; nerves 6 pair; petiole ¼ in. *Inflorescence* exceedingly sticky, very compound; lower bracts persistent, or deciduous forming the spikes into compound panicles; flowers distant in opposite pairs, or in small heads; or in appearance solitary.

H h 2
terminal, pedicelled. Calyx $\frac{1}{2}$ in., divided nearly to the base; segments linear. Corolla straight, tubular-ventricose, hardly $\frac{1}{2}$ in. diam.; segments short, round. Filaments and style glabrous; ovary 4-ovulate. Capsule $\frac{3}{4}$ in., clavate, compressed, pubescent, 4-seeded. Seeds $\frac{1}{4}$ in., orbicular; when wetted the fine hairs spring out; areoles very small.—Kurz, after removing this species to Strobilanthes, suggests that it is allied to Hemigraphis Griffithiana, of which not merely the ovules, but the inflorescence, &c., are totally different.

119. **S. secundus**, T. Anders. in Journ. Linn. Soc. ix. 480; leaves elliptic acute at both ends nearly glabrous, spikes lax long, flowers distantly in opposite pairs, bracts petioled ovate deciduous, corolla $\frac{1}{2}$ in. minutely pubescent without yellow with a brown-purple tube.—Strobilanthes sp. n. 23, Herb. Ind. Or. H. f. & T., partly.

**Mishmee** and **Assam**; *Griffith* (Kew Distrib. n. 6122). Assam; *Simons*.

Leaves 6 by 3 in., crenate or subentire, ashy puberulous on the nerves beneath otherwise glabrous, upper surface with minute raphides; nerves 8 pair; petiole $\frac{1}{4}$ in. Spikes 12 in., whip-like, sparingly branched (in Griffith's type specimens), sometimes depannated 3 in., 5-fld.; lower bracts leaf-like, upper gradually smaller, leaf-like, deciduous, uppermost only $\frac{1}{4}$ in., lanceolate; bracteoles obsolete. Calyx $\frac{1}{2}$ in., divided nearly to the base, glabrous, enlarged in fruit; segments unequal, narrowly lanceolate, linear-elongate, subobtuse. Corolla curved, cylindrical base hard so long as the calyx. Capsule nearly 1 in., base long barren narrow, 4-seeded. Seeds $\frac{1}{4}$ in., ovate, shaggy; areoles very small.


N. and E. Bengal with Assam, alt. 1-4000 ft. in the lower hills, often cultivated, *Hamiton, Griffith*, &c.—DISTR. N. Burma, S. China. A shrub. Leaves and flowers closely resembling (when dry) those of *S. secundus*, but the inflorescence denser, the flowers rather larger. Capsule $\frac{3}{4}$ in., not constricted at the base; lower seeds less than $\frac{1}{4}$ in. from the base.—Except as to the capsule, this looks exceedingly like a cultivated form of *S. secundus*. Yields the dye "Boom."

Series C. *Alterniflorae*. Bracts persistent or caducous, large or small, in opposite pairs (sometimes unequal) one of each pair mostly barren. Spikes linear lax usually interrupted often flexuose, zigzag or twisted, or compound passing into much-branched panicles; spikes upwards at least generally sympodial. Flowers mostly distant, alternate.—(Several species in this section have some of their flowers opposite, but these are in such case often twisted much to one side; and in many cases where such occur as solitary in the axils of leaves, they are really alternate on shortened axillary branches with 2 opposite bracts, whereof one only contains a flower.)—Species of N. India and the Malay Peninsula.

121. **S. divaricatus**, T. Anders. in Journ. Linn. Soc. ix. 478; leaves lanceolate or elliptic acuminate at both ends glabrous, spikes axillary and terminal elongate flexuose or zigzag, flowers distant both paired and alter-
mate, bracts very small caducous, corolla $\frac{1}{4}$ in. nearly glabrous purple. 


**Temperate Himalaya,** alt. 5-9000 ft., from Nepal to Bhotan, common; *Wallich,* &c. *Khasia Mts.*, alt. 3-5000 ft., frequent; *H. f. & T.*, &c.

A shrub, 2-5 ft., nearly glabrous. Leaves $\frac{5}{4}$ by 2 in. (in the Himalaya plant usually narrower), serrulate, obacutely setulose; nerves 7 pair; petiole $\frac{1}{2}$ in. Spikes very lax, divaricate; glabrous or (in the Khasia form) thinly hairy upwards. *Bracts* $\frac{1}{4}$ in., ovate, caducous; bracteoles $\frac{1}{2}$-$\frac{1}{4}$ in., obovate-oblong, caducous. *Calyx* $\frac{1}{2}$-1 in., subequally divided to the base; segments narrow elongate cadate, often glabrous in the Himalaya form, usually hairy (sometimes very hairy in fruit) in the Khasia form. *Corolla* curved, tabular, ventricose, subviscid dark purple, glossy in the high-level Himalaya plant. *Stamens* glabrous or the filaments minutely pubescent at the base. *Capule* $\frac{1}{2}$ in., glabrate, 4-seeded. *Seeds* $\frac{1}{5}$ in., ovate, pubescent; *areoles* small.


*Khasia and Jain Tea Mts.*, alt. 3-5000 ft., common; *Griffith, H. f. & T.*, &c. Suberect flexuose, or lax curved, 1-2 ft., hairy or glabrous. Lower leaves $\frac{5}{4}$ by $\frac{1}{4}$ in. with petiole rarely $\frac{1}{2}$ in., upper cordate sessile, sparsely lineolate above; nerves 5 pair. Spikes 1-5 in., axillary, and forming a quasi-terminal panicle, acand, glabrous or sparingly glandular-hairy; bracts scarcely $\frac{1}{2}$ in., ovate, opposite, usually only one bearing a flower; bracteoles nearly as long as the bracts, linear. *Calyx* $\frac{1}{4}$-1 in., divided nearly to the base; segment linear-lanceolate, somewhat enlarged in fruit. *Corolla* nearly straight, glabrous, purple or lilac; cylindrical base $\frac{1}{4}$ in., ventricose part 1 in. *Capule* $\frac{1}{2}$-$\frac{3}{4}$ in., glabrous, 4-seeded. *Seeds* ovate, shaggy principally on the margin; *areoles* small.

**Var. ? microesperma;** leaves more distinctly serrate lower sessile coriaceous, capsule $\frac{1}{2}$ in., seeds $\frac{1}{2}$ in.—Khasia Mts., alt. 4-5000 ft., *H. f. & T.* Darjeeling; Jor Bungalow, alt. 7500 ft., *Beddome.*—The small seeds appear perfectly ripe. Col. Beddome's Darjeeling plant may be a new species.

123. **S. boerhaavioides,** *T. Anders.* in *Journ. Linn. Soc.* ix. 479; lower leaves long-petiolated ovate acuminate crenate glabrate, spikes curved, flowers mostly remote not opposite, bracts very small ovate, corolla $\frac{1}{2}$ in., seeds $\frac{1}{4}$ in.—Goldfussia sp. n. 27, *Herb. Ind. Or. H. f. & T.*, in part.

**Sikkim Himalaya; Thomson. Khasia Mts.,** alt. 4-5000 ft.; *Pomranj, J. D. H.*

Lower leaves $\frac{3}{4}$ by 3 in.; petiole 1-1$\frac{1}{2}$ in., winged upwards. Otherwise so closely resembling *S. rubescens* type, that the species have been thrown into one in *Herb. Kew.*


**Sikkim,** alt. 6000 ft.; *Treatler. Khasia and Jain Tea Mts.,* alt. 4000 ft. frequent; *Griffith,* &c.

A shrub, 1-4 ft.; branches sometimes pubescent upwards. *Leaves* $\frac{3}{4}$ by 1-1$\frac{1}{4}$ in. lanceolate (in the Sikkim example $\frac{3}{4}$ by 2 in. elliptic), serrate; upper surface lineo-
late; nerves 5–9 pair; petiole \( \frac{1}{4} \) in. Spikes 3–8 in., axillary and terminal, but little branched; flowers all distant alternate; bracts \( \frac{1}{4} - \frac{1}{2} \) in., unequal, opposite, the smaller one barren; bracteoles \( \frac{1}{4} \) in., linear. Corolla \( \frac{3}{4} - 1 \frac{1}{2} \) in., divided subequally nearly to the base; segments linear, glabrous or very viscid hairy, more or less enlarged in fruit. Capsule nearly glabrous, very ventricose from a constricted base scarce \( \frac{1}{4} \) in. long; segments short, round. Stamens 4, filaments very hairy downwards. Capsule \( \frac{3}{4} \) in., glabrous, 4-seeded. Seeds \( \frac{1}{2} \) in., ovate, pubescent hair at first dense white, ultimately tawny less; areoles very small.—T. Anderson says the leaves are "softly tomentose beneath," which is a mistake.

125. S. Griffithianus, T. Anders. in Journ. Linn. Soc. ix. 481; leaves broadly lanceolate acuminate at both ends puberulous on the nerves beneath, spikes elongate zigzag viscid pubescent, flowers distant alternate, bracts lanceolate obtuse persistent, corolla 1\( \frac{3}{4} \) in. yellow. Triaenanthus Griffithianus, Nees in DC. Prodr. xi. 169.

Khasia Mts., alt. 2–3000 ft., Griffith, J. D. H., &c., frequent on the southern face.

A spreading shrub, 3–7 ft. diam.; branches fuscous-puberulous upwards. Leaves 6 by 1\( \frac{1}{2} \) in., minutely denticulate; nerves 10 pair; petiole \( \frac{1}{4} \) in. Spikes 3–8 in. lateral and in ax terminal panicles; bracts 1 in., opposite, more or less unequal, one of each pair supporting a flower; bracteoles \( \frac{1}{2} \) in., linear-oblong. Corolla \( \frac{1}{4} - 1 \frac{1}{2} \) in., divided subequally very nearly to the base; segments (one a little longer than the other 4) linear-oblong, green, viscid-pubescent. Capsule nearly straight glabrous, yellow with brown or red spots or lines; linear-cylindric base "of the tube about as long as the ventricose part. Filaments very hairy. Capsule \( \frac{3}{4} \) in., nearly glabrous, 4-seeded. Seeds \( \frac{1}{2} \) in., fulvous-hairy; areoles very small.—Nees erected this plant into a genus on the ground that the calyx was 2-lipped with one lip trifid but half-way down; an error of fact.

126. S. paucinervius, T. Anders. in Herb. Kew; glabrous, leaves elliptic acuminate, spikes linear elongated interrupted flexuose alternate-fld., bracts lanceolate persistent.

Tenesseiru or Andaman Islands; Helder (Kew Distrib. n. 6119).

Apparently a lax shrub. Leaves 4\( \frac{1}{2} \) by 1\( \frac{1}{2} \) in., base rhomboid, subentire or minutely denticulate, lineolate on both surfaces; nerves 5–6 pair; petiole \( \frac{1}{4} \) in. Spikes 2–4 in., axillary, short peduncled, 1 or 2 together; bracts \( \frac{1}{2} \) in., bracteoles nearly as long, narrower, persistent. Calyx subequally 5-fld nearly to the base; segments linear-lanceolate acute. Capsule \( \frac{3}{4} \) in., glabrous, 4-seeded. Seeds \( \frac{1}{2} \) in., ovate, shaggy; areoles hardly any.

127. S. elongatus, Clarke: glabrous, leaves lanceolate acuminate, spikes very long lax, flowers alternate and opposite distant, bracts lanceolate persistent, sepals linear-lanceolate rather longer than the bracts.

Assam; Namroop, Griffith (Kew Distrib. n. 6183).

A shrub. Leaves 4\( \frac{1}{2} \) by 1\( \frac{1}{2} \) in., base cuneate, minutely serrate, densely lineolate above; nerves 11 pair; petiole \( \frac{1}{4} \) in. Spikes axillary and quasi-terminal, 1 or 2 together, attaining 7 in., sparingly branched, leafless; bracts in opposite pairs, all distant, both or one or neither bearing a flower, \( \frac{1}{2} \) by \( \frac{1}{2} \) in.; bracteoles linear, shorter than the bracts. Sepals \( \frac{1}{2} \) in., glabrous. Corolla not seen. Capsule \( \frac{1}{4} - \frac{1}{3} \) in., 4-seeded, glabrous. Seeds compressed, orbicular, subelastically hairy.

128. S. farinosus, Clarke; leaves elliptic-acuminate at each end serrate glabrous, spikes in a pubescent panicle, flowers distant alternate, bracts very small persistent, corolla 1\( \frac{1}{2} \) in. nearly glabrous without.

Moulmein; Thong Yen, Lobb.

Branch terete, glabrous. Leaves 5 by 1\( \frac{1}{2} \) in., upper surface lineolate, lower pale; nerves 7 pair; petiole \( \frac{1}{4} \) in. Spikes axillary, and a terminal panicle \( \frac{3}{4} \) in. diam.;
bracts \( \frac{3}{4} \) in., elliptic, pubescent, opposite one of each pair usually barren; bracteoles oblong rather longer than the bracts. Calyx \( \frac{3}{4} \) in., divided subequally nearly to the base; segments linear-ligulate, softly pubescent, densely white papillose down the back. Corolla nearly straight, much ventricose upwards, constricted base of the tube short. **Style** glabrous. **Capsule** \( \frac{3}{4} \) in., spatulate-oblung, puberous, 4-seeded. Seeds \( \frac{1}{4} \) in., ovate, shaggy; areoles very small.—The papillae on the backs of the sepals (and continued also on the bracts) give this species a powdered or farinose look.

129. *Euellia nobilis*, Clarke; leaves elliptic acuminate at both ends sparsely hairy on the nerves between, spikes long flexuose paniced pubescent, flowers alternate, bracts lanceolate acute persistent.

**Jainta Hills;** Jarain, alt. 3500 ft., Clarke.

An erect gregarious shrub, 6–10 ft. Leaves 9 by 3 in., unequal-sided, upper sessile, serrate, thinly linolate above; nerves 10 pair. Spikes 6–12 in., hardly interrupted; bracts \( \frac{1}{2} \) in., very acuminate, minutely hairy; bracteoles \( \frac{1}{4} \) in., linear-lanceolate. Calyx \( \frac{3}{4} \) in., divided nearly to the base equally; segments linear, minutely scabrous-pubescent. Capsule \( \frac{3}{4} \) in., nearly glabrous, 4-seeded. Seeds \( \frac{1}{4} \) in., ovate, shaggy; areoles very small.—Corolla not preserved, believed to be yellow.

130. *S. inflatus*, T. Anders. in Journ. Linn. Soc. ix. 476; villous, leaves elliptic or subovate acuminate, flowers alternate or some opposite in flexuose or twisted 1-sided spikes, lower bracts leaf-like upper spatulate, corolla \( \frac{1}{2} \) in. much curved pubescent without.—Goldfussia sp. n. 28, Herb. Ind. Or. H. f. & T.

**Sikkim Himalaya,** alt. 5–8000 ft.; J. D. H.

Branches woody, flexuose, terete, fulvous-villous. Leaves 2¼ by \( \frac{3}{4} \)–1¼ in., serrate, hairy on both surfaces; nerves 6 pair; petiole 1¼ in. Spikes 1–3 in., fulvous villous, internodes zigzag or contorted almost as in *S. Helictus*; most of the bracts foliaceous; bracteoles minute linear. Corolla funnel-shaped, inflated, tube very much curved towards the top; segments subquadrate or orbicular. Capsule \( \frac{1}{2} \) in., narrowly elliptic, glabrous, 4-seeded. Seeds \( \frac{1}{2} \) in., subquadrate, shaggy; areoles subobsolete.—Nearly all the bracts are leaf-like, persistent; the uppermost, entirely bracteiform ones, are deciduous.


**Subalpine Himalaya,** alt. 7–11,000 ft.; from Nepal to Bhotan, common, Wallich, &c.

Stems 6–24 in., weak, quadrangular sometimes sharply, glabrous or pubescent on the angles. Leaves 3 by 1 in., crenate-serrate, puberulous or glabrate, thinly linolate above; nerves 6 pair; petiole \( \frac{3}{4} \) in. Spikes 1–6 in., often flexuose or zigzag, lowest flowers appearing often axillary solitary opposite; bracts (many of the middle ones) ovate or suborbuate, altogether resembling the upper leaves; uppermost bracts often small, less than \( \frac{1}{4} \) in., ovate or obovate, glabrate; bracteoles linear-oblong, small or 0. Sepals in flower \( \frac{1}{4} \) in., usually quite glabrous, in fruit often more than 1 in., laxly flexuose, very narrow, usually more or less glandular hairy at least at the tips. Corolla nearly straight, glabrous or with minute lines of hairs within; cylindric base about as long as the ventricose portion; segments short, round. Filaments and style glabrous. Capsule \( \frac{3}{4} \)–1 in., glabrous, 4-seeded. Seeds \( \frac{1}{4} \) in., ovate, pubescent; areoles small.—The lowest flowers often appear axillary opposite, with 2 small ovate bracteoles each: more careful comparison shows that the axillary flower is on a...
short axillary branch which has 2 opposite bracts, 1 barren, the other with a flower often supported by the two normal but small minute bracteoles.

**Var. microphylla, Nees;** leaves very thin herbaceous uppermost cuneate or rhomboid at the base, bracts lanceolate or subovate many foliaceous not cordate, sepals in fruit much broader than in *S. Wallachii* type, corolla-mouth much on one side, capsule more than ½ in., seeds ¼ in. *Ruellia alata*, Wall. Cat. 2371 b.—N.W. Himalaya, alt. 7-11,000 ft.; from Kashmir to Kunnon, common, *Wallieh,* &c.—Connected by intermediate forms with the Sikkim type. Leaves often large, sometimes small.


**Subalpine W. Himalaya,** alt. 6-10,000 ft.; from Jamu to Nepal, frequent, *Wallieh,* &c.

A perennial, often growing in swamps; stems 1-1½ foot, thick, succulent, bristly upwards, or dwarfed 3-6 in. Lower leaves petioled or the petiole winged to the base. Corolla usually much curved, the ventricose part of the tube very broad. Otherwise as *S. Wallachii* var. microphylla, of which this species has been treated (perhaps correctly) at Kew as a var.

133. **S. subnudatus, Clarke;** leaves petioled elliptic acuminate at both ends nearly glabrous uppermost sessile coriaceous, spikes linear hairy interrupted, nearly all the bracts small oblong, sepals linear elongated subobtuse hairy, corolla 1½ in. purple.—Goldfussia sp. n. 29, *Herb. Ind. Or. H. f. & T.*

**Subalpine Sikkim;** Lachoong, alt. 9000 ft., *J. D. H.*

**Stems** 1 foot, from a woody rootstock, slender, nearly glabrous. **Leaves** 1½ by ¾ in., crenate, with minute scattered bristily hairs above and on the nerves beneath, raphides obsolete; petiole ½ in., one or two pairs of the leaves at the base of the spikes sessile coriaceous. **Spike** 1-4 in.; flowers mostly subsessile, occasionally opposite; bracts ¾ in., oblong or elliptic (none of the flowers with large bracts similar to the uppermost sessile coriaceous leaves as in *S. Wallachii*); bracteoles similar to the bracts. **Sepals** in fruit ½-¾ in., as of *S. Wallachii.*—This has been taken as a form of *S. Wallachii*; but none of the numerous forms of *S. Wallachii* have bracts and hairy spikes without foliaceous bracts like it.


**Khasia Mts.;** *Wallieh.* **Jaintea,** alt. 4000 ft.; *Jairain, Clarke.*

A small, ramous, nearly glabrous shrub. **Leaves** ¾ by 1½ in., those on the flowering branches much reduced, serrate, not (or very obscurely) fimbriate; nerves 9 pair; petiole 1½ in. **Flowers** scattered, alternate and subopposite on small-leaved branches; bracts ½ in. exclusive of their ½ in. petioles, nearly glabrous, persistent; bracteoles similar. **Calyx** ¼-½ in., divided nearly to the base, pubescent; segments linear, enlarged more hairy in fruit. **Capsule** ¾-1½ in. 4-seeded. **Seeds** ¼ in., ovate, pubescent; areoles very small.

**Var. sikkimensis;** leaves much broader, corolla 1 in. much curved purple-blue.—Darjeeling; *Griffith* (Kew Distr. n. 6125); alt. 6000 ft., *Trentler.*—Leaves 5½ by 2½ in. "Flowers faintly fragrant" (Trentler).

135. **S. stenophyllus, Clarke;** leaves narrowly lanceolate attenuate
at both ends ciliate pubescent, flowers alternate or opposite in leafy spikes, upper bracts ovate or spatulate persistent, corolla 1 in. nearly glabrous purple.

Khasia Mts., alt. 3–5000 ft., frequent; J. D. H., &c.  
A small, erect, somewhat densely branched shrub. Leaves 2½ by ½ in., equal or subequal, minutely dentate undulate or subentire; nerves 5–6 pair, puberulous, beneath ciliate; petiole obscure. Spikes 1–3 in., numerous, axillary and terminal, nearly glabrous; lower bracts leaf-like; upper sometimes spatulate (hardly petioled as in S. urophyllus); bracteoles ½ in., ovate. Sepals ½–¾ in., subequal, linear, obtuse. Corolla nearly straight, hairy within; cylindrical base shorter than the ventricose portion; segments short, round. Filaments very hairy downwards. Ovary glabrous; style sparsely hairy. Capsule ½ in., 4-seeded. Seeds ½–⅛ in., ovate, pubescent; areoles hardly any.—This common Khasia in habit and leaves remarkably resembles S. isophyllus; the inflorescence, sepals, &c., are totally different.

136. S. Panichanga, T. Anders. in Journ. Linn. Soc. ix. 478; leaves broadly elliptic acuminate at both ends rusty-pubescent, panicles lax capillary pubescent, flowers scattered mostly alternate, bracts minute persistent, corolla 1½ in. nearly glabrous. Ruellia Panichanga, Wall. Cat. 2387. 
Asystasia Panichanga, Nees in Wall. Pl. As. Rar. iii. 90, and in DC. Prodr. xi. 167.

Silhet; Wallich. Cachar; Keenan.
A shrub; branches tetragonal, pubescent upwards. Leaves 6½ by 2½ in., serrate; nerves 10 pair; petiole ⅜ in. Peduncles ½–2 in., repeatedly trichotomous; bracts and bracteoles scarcely ½ in. long, pubescent. Calyx ½ in., deeply subequal 5-fid, closely uniformly pubescent; segments linear-lanceolate. Corolla nearly straight, puberulous, cylindrical base longer than the calyx, gradually widening into the rather narrow cylindrical portion of the tube; segments round, short, contorted in bud. Filaments and style with scattered white hairs. Capsule more than ½ in.


Eastern Himalaya; Sikkim and Bhotan, alt. 2–5000 ft., Clarke. Assam and Khasia Mts., alt. 2–4000 ft., frequent; Griffith, H. f. & T., &c.
A nearly glabrous shrub, 3–6 ft. Leaves 7 by 2¼–4 in., serrate; nerves 7–8 pair; petiole ½–1⅝ in. Panicle often 1 foot in diam., leafless bractless with 200–500 flowers, sometimes denser with stouter shorter branches; bracts ½ in. Calyx ½–⅜ in., deeply 5-fid; segments subequal, lanceolate, glabrous. Corolla tubular-ventricose, glabrous. Capsule ½–⅜ in., 4-seeded. Seeds ⅛–⅜ in., ovate, pubescent; areoles hardly any. —The flowers said by Nees to be capitate are mostly alternate scattered; they are capitate only at the tips of the younger panicle-branches.

Var. crinita; panicle-branches minutely thin glandular-hairy. S. crinitus, T. Anders. in Journ. Linn. Soc. ix. 481. Goldfussia crinita, Nees in DC. Prodr. xi. 176.—Bhotan, alt. 1000 ft.; Griffith. Assam.—Varies in the thinness of the panicle-branches just as does the type.

Series D. Paniculatae. Flowers panicked laxly, or densely, secund, subspicate. Bracts conspicuous, persistent. Capsule elliptic, compressed, cuneate at both ends. Seeds shaggy, often only 2 perfected, or if 4 imbricated.—Species of Ceylon or S. Deccan Peninsula. (This series approaches in technical character, though not in habit, the section *** of the series A, Bracteatae. Compare S. perfoliatus above, which Wight placed here.)

**Ceylon**; Walker, Thwaites, C. P. n. 2598. **Niggherry Mts.**; on Dedabetta, Hohenacker.

A shrub, flowering at 6 or 7 years old, then dying down. **Branches** subquadran-
gular, glabrous, transversely verrucose. **Leaves** 3 by 1 in.; nerves 5-6 pair; petiole winged, base dilated. **Bracts** ½ by ¾ in., glabrous or hairy on the same spike; bracteoles ½ in., oblong obtuse. **Calyx** divided subequally nearly to the base; seg-
ments linear-oblong, hairy at least at the tips. **Corolla** white (Beddome). **Capsule** ½ in., glabrous, 2-seeded.—Described from Nees' type specimen; the specimen in leaf only which he adds has very large many-nerved leaves very woolly when young, and is a gregarious undershrub well known to Col. Beddome in Ceylon, of which the flower has not yet been observed.

**Var. arguta**; leaves distinctly dentate sometimes slightly hairy, petiole (even in the leaves near the spikes) usually well defined sometimes 1½ in. not dilated at the base, spikes often elongate second some dente. S. argutus, Nees in DC. Prodr. xi. 188.—Ceylon, frequent; Gardner, Thwaites, C. P. 66 partly, &c.—Appears a trifling variety.

**Var. cerinthoides**; leaves sessile elliptic or oblong narrowed suddenly at the very base subtire coriaceous few-nerved. S. cerinthoides, Nees in DC. Prodr. xi. 724; T. Anders. in Thwaites Enum. 229. Mackenziea sessilis, Nees in DC. Prodr. xi. 308.

—Ceylon; Thwaites (C. P. nn. 2594, 66 partly), Mackenzie, &c.—The type of this with nearly all the leaves subsessile rounded at the base seems to form a distinct species, but there are examples wherein the lower leaves are cuneate at the base. The flowers are noted white with much purple marking.

**Var. hirsutissima**; stem and leaves hirsute. S. hirsutissimus, Nees in DC. Prodr. xi. 187.—Ceylon; Walker, Thwaites (C. P. n. 3620), &c.

139. **S. homotropus**, Nees in DC. Prodr. xi. 187; leaves oblong or elliptic long attenuate at the base glabrous, spikes very hairy flexuose or somewhat twisted, bracts elliptic or subovate narrowed at the base, corolla 1 in. nearly glabrous. S. sexennis, Bedd. in *Pl. Ind. Or*. t. 206, not of Nees.

**Niggherry Mts.**, alt. 8000 ft.; *Wight*, &c.

This has been treated as a var. of *S. sexennis*, but the bracts are quite unlike.

140. **S. violaceus**, Bedd. *Pl. Ind. Or*. t. 205; leaves large petioled ovate hairy on both surfaces, bracts elliptic or oblong much shorter than the calyx, corolla 1½ in. glabrous without deep violet.

**Niggyerry Mts.**; Sisparah, alt. 6000 ft., Beddome.

A large shrub, very rarely flowering (Beddome); branches quadrangular, hairy upwards. **Leaves** 6½ by 3½ in., shortly acuminate at both ends, crenulate; nerves 14 pair; petiole 1-2 in. **Panicles** 6-10 in., lax, hairy; bracts ½ in.; bracteoles ½ in., oblong hairy. **Calyx** divided nearly to the base, less hairy than the bracteoles; seg-
ments ½ in., narrowly oblong, obtuse. **Corolla** nearly straight, urceolate, very hairy within; constricted base short; segments short, rounded. **Capsule** not seen.

141. **S. gracilis**, Bedd. in *Trans. Linn. Soc. xxv. 222*, and *Pl. Ind. Or*. t. 207, not of *T. Anders.*; leaves sessile lanceolate attenuate at both ends glabrous, panicle glabrous, bracts oblong much shorter than the calyx, bracteoles 0, corolla 1 in. white lilac tinged. S. Beddomei, *T. Anders. in Journ. Linn. Soc. ix. 482*.

**Anamallay Mts.**, alt. 5-6000 ft.; Beddome.
A very large shrub (Beddome), glabrous or the sepals-thinly glandular-hairy; branches terete. Leaves 7 by 2½ in., serrulate; nerves 10 pair. Panicle lax, branches long curved, flowers distant; bracts in opposite pairs, ½-1 in., sometimes both, more often one only, carrying a flower on a pedicle 0-½ in. Sepals ½-1 in., linear-ligulate. Corolla slightly curved, nearly glabrous, constricted part of the tube short (from Beddome). Filaments and style hairy (Beddome). Capsule ½ in., glabrous.


Ceylon, up to 3000 ft. alt.; Walker, Thwaites.

A shrub, 2-3 ft., glabrous except the sepals-tips. Leaves 4 by 1½ in. (lower larger), base cuneate rounded (or the upper cordate), toothed, paler beneath; nerves 5-6 pair; petiole 0-½ in. Panicle 6-12 in. diam., dense with slender divaricate recurved or zigzag branches; bracts at the forks ½-1 in., ovate; bracts below the flowers ⅓-1 in., linear or linear-obovate. Sepals ⅓ in., linear, glabrous or sparsely glandular-hairy at the tips. Corolla nearly straight, ventrocostose, constricted base very short; segments short, rounded. Capsule ½ in., glabrous, 2-seeded (4-seeded, Nees).—The flowers are in appearance solitary terminal on pedicels ½-1 in., with 2 bracts (called bracteoles by Beddome) placed 0-½ in. below the flower.


S. Deccan Peninsula; Wynnaad and Coorg, alt. 2-3000 ft., Rottler, Beddome. A rather delicate shrub, 5-6 ft.; branches cylindric, glabrous. Leaves 5 by 1½ in., unulate crenate or subentire; nerves 6-7 pair, glabrous or pubescent beneath; petiole ⅛ in. Panicle 8 in. narrow; bracts at the forks ⅓-⅛ in., lanceolate from an ovate base; pedicels ⅝-⅛ in., mostly ebracteolate except at the base. Ca. ¼ in., divided deeply, closely pubescent; segments lanceolate-subulate, often very unequal. Corolla nearly straight; base funnel-shaped, hardly cylindric. Capsule not seen.


Ceylon; Thwaites (C. P. n. 3351).

Pedicels 0-⅛ in. Ca. ⅛-⅜ in., glandular-hairy. Otherwise as S. rubicundus; the leaves are in the examples a good deal longer.

145. S. pulcherrimus, T. Anders. in Thwaites Enum. 229, excl. syn., and in Journ. Linn. Soc. ix. 483, the Ceylon plant only; leaves elliptic acuminate at both ends hairy on the nerves beneath, panicle large very compound viscous hairy, bracts at its divisions ovate acute, flower-bracts obsolete, corolla 1 in. puberulous without violet, capsule hairy. Leptacanthus Walkeri, Nees in DC. Prodr. xi. 170, not of Wight.
Ceylon, alt. 4–7000 ft.; Walker, Thwaites (C. P. nn. 266, 301).
A large, rambling shrub (Walker); branches terete, glabrous. Leaves 6½ by 2½ in., minutely toothed; nerves 9 pair; petiole 1½ in. Panicle 8–14 in.; branches ascending, bracts 3–4 in., sessile, base rounded or cordate; pedicels ½–½ in., mostly ebracteolate except at the base. Calyx ½–½ in., divided nearly to the base, viscos-hairy; segments linear caudate. Corolla nearly straight; tube broad-cylindrical from the base, very hairy within; segments short, round. Capsule ½ in., 4-seeded.

146. *S. amabilis*, Clarke; leaves broadly elliptic acuminate at both ends glabrous, panicle large compound viscous hairy, bracts at its divisions linear-oblong, flower-bracts linear much shorter than the calyx, corolla 1½–1½ in. glabrous without purplish, capsule glabrous. Leptacanthus Walkeri, *Wight* *Ic.* t. 1507, *not of Nees*, nor Strobilanthes Walkeri, *Nees*.

Nilgherry Mts., alt. 6000 ft.; Gardner, &c., Hohenacker, n. 1440.
Leaves 7½ by 3½ in., glabrous beneath; nerves 10–12 pair. Calyx ½–½ in., closely subtended by 2 linear bracts. Capsule ½ in. and upwards, conspicuously stipitate.—Closely allied to *S. pulcherrimus*, which it was taken for by Wight. T. Anderson overlooked the numerous points of difference above diagnosed, which are constant. A much finer species than the Ceylon one, the panicle stouter with fewer but larger flowers.

Species not seen.

147. S. *neeesii*, Kurz in *Journ. As. Soc.* 1873, pt. ii. 93, and *For. Fl.* ii. 245; leaves large lanceolate minutely hairy on both surfaces, spikes sessile dense bracteate ultimately elongated interrupted below, bracts proper oblong-linear shorter than the calyx slightly serrate at the tips, corolla 1½–1½ in. glabrous without purple.

Martaban; Kurz.
A large shrub, 10–12 ft. Leaves attaining 10 in., shortly acuminate, base attenuate, oblong-serrate-toothed; petiole ½–1½ in. Lowest bracts (or floral leaves) leaf-like, caducent, ½ in., tips serrate; bracteoles 2, linear-lanceolate, glandular-hirsute, as long as the calyx. Calyx-segments ½ in. or more, linear, hoary, ciliate. Corolla-tube long, slender, hairy within. Stamens 2 only; filaments glabrous. Style hairy. Capsule a little longer than the calyx, glabrous, tip pubescent, 4-seeded. Seeds silky.

148. S. *remotus*, T. Anders. in *Journ. Linn. Soc.* ix. 471; leaves ovate acuminate subtire glabrous, spikes axillary 1 or 2 together elongate, flowers remote solitary, bracteoles and calyx-segments smaller than the bracts, capsule elongate glabrous.

Tenasserim; Helfer.
Stem suberete, glabrous. Spikes 1½–3 in.; bracts ½ in., lanceolate, mucronate, 1-nerved, glabrous; bracteoles and calyx-segments ½ in., narrower than the bracts. Capsule ½ in.—Allied to *S. fimbriatus* and *S. polythrix*.

149. S. *haplantholdesi*, T. Anders. in *Journ. Linn. Soc.* ix. 471; leaves petioled ovate acuminate at both ends crenate or undulate glabrous or floral leaves ciliate, spikes suberect lax, bracts bracteoles and calyx-segments linear hirsute with hyaline bristles, corolla funnelf-shaped pubescent without hairy within.

British Burma; Mouillem, *Falconer* (n. 402 in *Herb. Calcutt.*), Helfer, n. 255.
An erect herb, 1–1½ foot. Stem terete, swollen at the nodes, glabrous. Leaves 2–3½ by 1½ in., paler beneath; petiole ¼ in. Spikes 2–3 in., lax, crowded in the upper axils and subterminal, on slender hirsute peduncles; bracts ½ in.; bracteoles and calyx ¾ in. Corolla ½ in., tube suddenly narrowed, segments small. Capsule ½ in., constricted at the base, upwards ovate, acute, glabrous.—Placed by T. Anderson next *S. khasyamus*.

150. S. *masteesi*, T. Anders. in *Journ. Linn. Soc.* ix. 481; upper leaves sub-sessile lanceolate acute serrate subglabrous, panicles dichotomous lax erect viscous, pedicels elongate mostly 1-fid., bracts lanceolate acute sparsely glandular deciduous, corolla funnel-shaped suberect glabrous.
ASSAM; Masters, Simons.

Stem erect, tetragonal, glandular, viscid. **Calyx-segments** equal, linear, glan-
dular, viscid. **Stamens** included. **Capsule** oblong-elliptic, elongate, tip glan-
dular, 4-seeded.—Placed by Anderson next *S. coloratus*.

151. **S. spicatus**, T. Anders. in Journ. Linn. Soc. ix. 484; leaves subsessile ovate
or ovate-lanceolate acute base subcordate serrate tomentose above pale pubescent
beneath, spikes terminal elongate, flowers solitary sessile opposite, bracts leaf-like
ovate pubescent, bracteoles small herbaceous spathulate, corolla 1/3 in. funnel-shaped
glabrous.

**Khasia Mt.**; above Nunklow, Simons.

Softly pubescent; stem tetragonal. **Leaves** 1–3 by 1/2–1 in., floral passing into
bracts. **Bracts** 1/2–3/4 in.; **Calyx** 1/2 in.; segments linear, unequal.

**Capsule** oblong-elliptic, glabrous at the tip, 4-seeded. **Seeds** large.—Affinity uncer-
tain, T. Anderson.

152. **S. lamiodes**, T. Anders. in Journ. Linn. Soc. ix. 485; floral leaves large
sessile ovate acuminate serrate tomentose beneath, heads terminal few-fld., bracts
spathulate glandular-tomentose ciliate, corolla straight tomentose without and within.

153. **S. violifolius**, T. Anders. in Journ. Linn. Soc. ix. 485; leaves petioled
oblanceolate acute serrate subglabrous, spikes few-fld., flowers distant subsessile
in opposite pairs, bracts linear, corolla funnel-shaped straight glabrous without and
within.

154. **S. ? lamatus**, Nees in DC. Prodr. xi. 191; leaves ovate acuminate entire
glabrate above woolly-tomentose beneath, spikes axillary and terminal ternate cylindric
dense, bracts oblong obtusely cuspidate woolly-tomentose beneath glabrous lanceolate
above.

**Nilgherries**; Perrottet.

Very distinct from the stem, petioles under surface of leaves and spikes being
densely softly tomentose. **Corolla-tube** 1 in., slender, throat campanulate, approaching
that of *Stenosiphonium*. **Calyx** sub-5-partite; segments linear, obtuse, very villous.

—Genus doubtful: referred to *Strobilanthes* from its similarity to *S. Myrsine*,
Nees, which is an *Asystasia*.

**S. verruculosus**, Nees in DC. Prodr. xi. 181, from “India” remains obscure;
Nees doubts whether it may not have been a *Ruellia*.

**XIX. CALACANTHUS**, T. Anders.

A shrub. **Leaves** large, entire. **Spikes** terminal, dense or elongate,
hairy; bracts prominent, elliptic; flowers large, purple. **Calyx** sub-5-par-
tite, segments unequal. **Corolla** deeply 2-lipped; posterior lip narrow,
shortly 2-fid, anterior of 3 short emarginate lobes; lobes all contorted in
bud. **Stamens** 4, didynamous; anthers subequal, oblong, 2-celled, muti-
cous. **Ovary** 4-ovulate; style long, stigma simple linear. **Capsule** ellipsoid,
compressed, acute at both ends, 2-seeded. Seeds compressed, exarateolate, densely shortly hairy.


**Synadene Mts.; near Bombay, Dalzell. Canara; near the foot of the Ghats, plentiful, Beddome; Purushur Ghat, Ritchie.**


**XX. BLEPHARIS, Juss.**

Herbs or undershrubs, harsh often rigid or prickly. *Leaves* opposite or 4 in a whorl, subentire toothed or prickly. *Spikes* terminal or on suppressed axillary branches, strobiliform, 4-ranked or capitate and few-fld., or many-bracteate and 1-fld., bracteate and bracteolate. *Sepals* 4, unequal, in opposite pairs, inner smaller; one of the outer pair emarginate or 2-lobed. *Corolla-tube* ovoid, horny; limb of 2 lips, upper subobsolete; lower patent, 3-lobed, blue or pinkish. *Stamens* 4, didynamous; filaments thick, rigid, anterior produced above the insertion of the anthers; anthers 1-celled, margins densely bearded, second cell small or 0. *Ovary* glabrous, 4- or 2-ovulate; style linear, very shortly 2-fid. *Capsule* oblong or ellipsoid, 2- or 4-celled. *Seeds* compressed, orbicular, echinate by thick papilla formed of closely connected tubes spirally or annularly thickened, which when moistened usually become free at their upper ends (see Kippist in Trans. Linn. Soc. xix. t. 6, fig. 5).—Species 20, Indian and African.


W. DECCAN PENINSULA; Concan and Canara, on the Ghauts common, Dalzell, &c.

*Stems* 8–24 in., herbaceous, erect, glabrous or sparingly setulose. *Leaves* 2 1/2 by 1 1/4 in., base rounded or obtuse; petiole 1/4 in. *Heads* terminal and quasi-axillary, few-fld.; outermost bracts leafy; proper bracts 1/4 in. or small, ovate ob or subpetiolate, ovate; bracteoles 1/2 in., usually with 3 lanceolate subpinescent teeth, the middle the shortest. *Calyx* green-and-white nerved, glabrous thinly ciliate or setulose; 2 outer segments 1/2–1 in., spatulate, one bilobed; 2 inner much smaller, lanceolate. *Corolla* 2–1 in., blue. *Capsule* 1/2 in., oblong, seed-bearing from the base. *Seeds* 3/4 in., compressed, ovate, closely echinate; spines obtuse, lanceolate, many closely connected tubes containing spiral filaments, which rise elastically when moistened, but do not separate.

2. *B. boerhaaviaefolia, Pers. Syn. ii. 180; leaves usually 4 in a whorl elliptic repand-toothed puberulous or glabrate, bracteoles spathulate bristle-ciliate subglabrous green-nerved, capsule 2-seeded. Wall. Cat. 2513; Nees in Wall. Pl. As. Rar. iii. 97, and in DC. Prodr. xi. 266; Wight ll. t. 164 b, fig. 6, and l.c. t. 468; Dalz. & Gibs. Bomb. Fl. 192; T. Anders. in
Blepharis.] CIX. ACANTHACEAE. (C. B. Clarke.) 479


DECCAN PENINSULA, from Mt. Aboo and Behar to Ceylon; common. PsGU; Wallich, &c.—Distrib. Asia, Tropical Africa.

Prostrate, scabrous or puberulous. Leaves 1½ by ¾ in., acute at both ends; petiole ¼ in. Spike'axillary or peduncled, 1- or few-fld.; bracts ½ in., ovate, bristle-ciliate; bracteoles ½ in. Calyx ½ in.; segments 4, oblong, unequal, nerv'd, subglabrous, one of the outer pair minutely emarginate. Corolla ¾ in., pink, purple or nearly white. Capsule ½ in., ellipsoid, compressed, shining glabrous. Seeds densely covered with obtuse spines formed of tubes free at the vertex when moistened.—Wight depicts the ovary 2-ovulate, and no more can be found; nor does the capsule show (as 2-seeded capsules usually do) the papillae of the suppressed ovules; but Nees and Bentham. in Gen. Pl. say the ovary is always 4-ovulate.


DECCAN PENINSULA; common in the Carnatic, and from Delhi and Chota Nag-pore to Ceylon.

A wiry perennial; branches 3-6 in., prostrate, usually roughly hairy. Leaves ½-1 in., subsessile, obtuse. Bracts and bracteoles bristle-ciliate; bracts shorter than the bracteoles. Calyx and corolla nearly as of B. boerhaavifolia, but much smaller; corolla (including the larger lip) only ½ in. Capsule and seeds as of B. boerhaavifo- lia, but the seeds appear (even when dry) shaggy, from the numerous bundles of annular tubes being connected only at the base.—As in B. boerhaavifolia, only 2-ovulate ovaries and 2-seeded capsules have been seen.

4. B. sindica, Stocks; T. Anders. in Journ. Linn. Soc. ix. 500; leaves linear or narrowly oblong pubescent, heads few- or many-fld., bracteoles linear hairy shorter than the bracts, capsule 2-seeded. Acanthodium gros-sum, Wight J. t. 1535, 1536, not of Nees.

SCinde; Stocks, Dalzell. PunJAB; Stewart, Vicary, Aitchison.

Stems 3-6 in., or very short. Leaves 1-2 in., toothed or subspinescent. Heads few- or many-fld., 3-4 in. in fruit, quadri-farious; bracts 1 in. or more, ovate with diveriscate lanceolate tips, prickly, hairy within and without; bracteoles ¼ in. Calyx softly hairy; 2 outer segments ¾ in., ovate; 2 inner ½ in. narrowly ovate. Corolla ½-¾ in. Capsule ½ in., ellipsoid, compressed, shining brown. Seeds ½ in.; appearing ciliate, but the tufts of tubes (even in the dry state) have all their ends free.


Stems short or 1 foot or more, branched. Leaves often ½ in. broad, spinescent. Bracts longer and more sinuous than in B. sindica. Corolla ½-¾ in., blue.—This differs from B. sindica by the broader usually glabrous-glaucon leaves, and the larger flowers: no Indian specimens have been seen. Ruellia ciliaris, Linn. Mant.
Erect or twining shrubs, or herbs. Leaves pinnatifid, toothed, spinous or rarely entire. Spikes terminal or pseudo-axillary, dense strobiliform or interrupted; bracts ovate, large spinescent, or small; bracteoles large, lanceolate, rarely 0; flowers subsessile, blue or white. Sepals 4, 2 outer opposite, 2 inner opposite smaller. Corolla-tube short, ovoid, horny; limb of 2 lips, upper obsolete, lower elongate obovate, shortly obtusely 3-lobed. Stamens 4, didynamous, shorter than the lip; filaments stout, narrowed curved below the anther, not excurrent near the apex; anthers oblong, 1-celled, bearded. Disc 0. Ovary 4-ovulate; style very shortly 2-fid; ovules 2 in each cell. Capsule ellipsoid, compressed, shining chestnut-brown, 4-seeded. Seeds compressed, orbicular, without hairs; tests very lax.—Species 14, in the warm and hot zones of the Old World.


**Bhotan**; Oongar, Griffith.

A robust shrub, scandent on rocks (Griffith). Leaves 12-20 by 6 in., black-green or (Griff. *Priv. Journ.* 265) flesh-coloured; lobes lanceolate. Spikes 6-15 in., crowded towards the ends of the branches, and on long axillary peduncles, the leaves at the base of the sessile spike being only 2-4 in. long, strobiliform, obscurely 4-ranked; bracts 1½ by ½ in., ovate, hairy within and without, spinous; bracteoles lanceolate. Calyx silky, 2 outer lobes ¼-1 in., lanceolate one shortly 2-toothed; 2 inner lobes ¾ in., lanceolate. Corolla ½ in., white (Griffith), altogether as in the genus. Capsule 1-1½ in., ellipsoid, compressed, glabrous, shining brown, 4-seeded, much as of *A. ilicifolius*.


Stem 6-15 in., decumbent, viscous-woolly. Leaves 8 by 3½ in., cuneate at both ends, whitened beneath; nerves beneath viscous-pubescent, prominently reticulate; petiole ¾ in., woolly. Spikes 3-6 in., mostly terminal, solitary; bracts 2-1 by ½ in., elliptic, spinous-toothed, hairy on both sides. Calyx softly hairy; 2 outer lobes ¾ in., one shortly 2-toothed; 2 inner 1-½ in., sublinear. Corolla ½ in., white (Nees). Capsule 1-½ in., ellipsoid, compressed, glabrous, shining-brown, 4-seeded.—The capsule and seeds greatly resemble *A. ilicifolius*, but are not ripe.

3. A. longipetiolatus, Kurz For. Fl. ii. 241; leaves long-petioled ovate subserate pubescent on the nerves beneath, bracts obovate spinous-toothed softly hairy, corolla 1½ in. nearly glabrous.

**Pegu**; Brandis (Herb. Kurz).

Stem 1 foot, rather stout, decumbent, rooting, then erect, simple, rusty-pubescent. Leaves 6½ by 3½ in., cuneate subacute at both ends, serratures very shallow not spinose; petiole nearly 2 in. Spike solitary, simple, 5½ by 1½ in., continuous; peduncle ½ in., stout, pubescent; bracts ½ by ½ in., teeth few, large; bracteoles 1 in., linear-subulate, hairy. Sepals 5, softly hairy; one 1½ by ½ in. oblong obtuse, two
1 by ½ in. oblong, two by ½ in. Corolla and stamens as in A. ilicifolius, the
curving of the top of the filament insisted on by Kurz being the same as in the other
species of Acanthus, and without the excurrent point of Blepharis. Capsule not
seen.

4. A. ilicifolius, Linn.; Benth. Fl. Austral. iv. 548; leaves shortly
petioled oblong or elliptic toothed or pinnatifid spinous rigid glabrous,
spikes elongate often interrupted, bracteoles broadly lanceolate glabrous,
calyx ⅛ in., corolla 1½ in. blue. Burm. Fl. Ind. 138; Blume Bijd. 806;
Wall. Cat. 2511; Roxb. Fl. Ind. iii. 32; T. Anders. in Journ. Linn. Soc. ix.
ilicifolia, Nees in Wall. Pl. As. Rar. iii. 98, and in DC. Prodr. xi. 268;
Wight in. t. 459; Dalz. & Gibs. Bomb. Fl. 192.—Rheed Hort. Mal. ii.
t. 48.

Sea-coast, from Malabar to Ceylon, and from the Soonderbund to Malacca.—
Distrib. Malaya to the Philippines and Australia.

Stems 1–5 ft., in clumps, little divided, terete, glabrous. Leaves 6 by 2½ in.;
petiole ¼ in., base usually spinous. Spikes 4–16 in., terminal, commonly solitary;
flowers mostly opposite; bract ¾–⅜ in., ovate, acute, glabrous; bracteoles ¼–½ in.
Sepals, 2 outer elliptic opposite, 2 inner broadly lanceolate subacute. Corolla pubes-
cent within. Capsule ⅛½ in. by ½ in. Seeds ⅛½ in., tests white very lax.

Var. integrifolia, T. Anders. in Thwaites Enum. 232; leaves lanceolate entire
tip acute spinous.—Ceylon; Thwaites.

5. A. ebracteatus, Vahl Symb. ii. 75, t. 40; leaves shortly petioled
oblong or elliptic toothed or pinnatifid spinous rigid glabrous, spikes elongate
somewhat lax, bracts caducous, bracteoles obsolete, calyx ⅛ in., corolla
⅛ in. white. Blume Bijd. 806; T. Anders. in Journ. Linn. Soc. ix. 501; 
Kurz For. Fl. ii. 242. A. ilicifolius, Lour. Fl. Cochinch. 375, not of Linn.;
Wall. Cat. 2511, E and part D. Dilivaria ebracteata, Pers. Syn. ii. 179;
Nees in Wall. Pl. As. Rar. iii. 98, and Cat. 7169, and in DC. Prodr. xi. 269.
—Rumph. Amb. vi. t. 71, fig. 1.

Malacca; Griffith, Maingay. Andamans; ex Kurz.—Distrib. Siam, Java,
Cochin China.

Stems and leaves of A. ilicifolius; base of petiole spinous or not. Bracts ¼ in.,
usually caducous before the flowers expand. Capsule ⅛ in.—Seems to differ from A.
ilicifolius by the much smaller calyx, corolla and capsule. Vahl puts the difference too
strongly when he says the flowers are only one quarter the size. Bentham (Fl.
Austral. iv. 548) doubts the distinctness of the species. Herbarium examples of A.
ilicifolius with the flowers in bud, which show neither the evanescence of the bracts
nor the true size of the corolla, can only be distinguished by the presence of the
bracteoles.

6. A. volubilis, Wall. Pl. As. Rar. ii. 56, t. 172; twining, unarmed,
leaves oblong or elliptic entire glabrous, spikes linear-oblong, bracteoles 0,
iv. 183. D. scandens, Nees in DC. Prodr. xi. 269.

Sea-shores of the Malay Peninsula; Soonderbund, Wallich, &c.; Pegu,
Kurs; Mergui, Griffith.—Distrib. Siam.

Stems twining in long grass, internodes often 4–8 in. Leaves 3½ by 1½ in.,
obtuse or subacute, base attenuated; petiole ½ in. Spikes 2–3 in., hardly inter-
rupted; flowers sub-2-seriate; bracts ⅝ in., elliptic, acute. Calyx ⅝–⅞ in., outer
segments elliptic, acute, glabrous; inner similar, much shorter. Corolla 1 in., white,
slightly tinged yellow (Wallich), probably when fading; rose (Nees).—The syn. of
Ramphius (Herb. Amb. vi. t. 71, fig. 2, wrongly cited as t. 72 by Nees) has alternate
leaves and fruits quite unlike Acanthus.
7. **A. longibracteatus**, Kurz in *Flora* 1870, 363, and in *Journ. As. Soc.* 1870, ii. 79; leaves long-petioled ovate or elliptic-oblong acute at both ends remotely toothed pubescent, spikes terminal linear-oblong, bracts lanceolate spinous-mucronate, corolla \( \frac{1}{2} \) in.

**Pegev; Brandis** *(fide Kurz).*

Annual, 3-5 in.; stems terete, decumbent or ascending, densely puberulous. *Leaves* 2 in., membranous, setulose between the teeth, sparsely hairy above, nerves beneath pubescent. *Spikes* as in *A. leucostachyus*; rachis pilose; bracts \( \frac{1}{2} \) in., pubescent, lower entire, upper with 2 or 3 spicuous teeth on each side; bracteoles as long as the bracts, linear. *Calyx* \( \frac{1}{2} \) in., adpressedly pubescent and nervous; lower segment deeply 2-fid, lobes lanceolate acuminate. *Corolla* 5-lobed, minutely hispid in the throat.—Copied from Kurz. Notwithstanding the narrow bracts and small corolla, I suspect that this is Kurz's subsequently described *A. longipetiolatus*.

**XXII. BARBERIA, Linn.**

Undershubs or herbs, spinescent or unarmed. *Leaves* opposite, entire. *Flowers* showy, purple blue yellow or white, sessile, solitary or in dense or sublax spikes; bracts and bracteoles large, small or 0. *Sepals* 4, in opposite pairs, outer pair very much the larger, anterior often emarginate bifid or deeply 2-lobed. *Corolla-tube* elongate, sometimes very long, funnel-shaped upwards; lobes 5, subequal, ovate, or elliptic, imbricate in bud. *Stamens* 2 with oblong 2-celled anthers; 2 small, rudimentary, or rarely with a few grains of pollen; rudimentary 5th often present. *Disc* large, often a toothed cup half enclosing the ovary. *Ovary* 4-ovulate; style long, shortly bifid or subentire. *Capsule* ovoid or oblong, 2- or 4-seeded below the middle. *Seeds* compressed, ovate, hairs wavy silky close-adjpressed non-elastic (except in *B. Gibsoni*).—Species 60, tropical, mostly Old World.

*Barberia impulina*, Lindl. in *Bot. Reg.* t. 1483, is frequently cultivated in India, and appears as an escape.

*Barberia rubra*, Ham., and *B. spicata*, Roxb., are entered in Steudel's Nomenclature as Indian; but it is not known from what source obtained.

Subgenus 1. **Prionitis**. Capsule ovoid, beak solid, 2-seeded close to the base.


Tropical India; from the Himalaya to Ceylon and Malacca, probably in most cases introduced.—*Distrib. Tropical Asia and Africa.*

A bush, 2-5 ft., sometimes planted for a fence; usually very prickly, rarely nearly unarmed; densely scabrid lirateolate, sometimes puberulous. *Leaves* 4 by \( \frac{1}{4} \) in., entire; petioles of the lower leaves usually distinct sometimes \( \frac{1}{2} \) in. *Flowers* axillary, 1-3-nate, uppermost spiked; bracts \( \frac{1}{2} \) in., entire, the lower larger, foliaceous. *Sepals* broadly lanceolate, acuminate, 2 outer \( \frac{3}{4} \) in., 2 inner \( \frac{1}{2} \) in. *Corolla* \( \frac{3}{4} \) in., glabrous or puberulous. *Stamens* 4, 2 minute or sterile. *Disc* annular.
2. **B. cuspidata**, Heyne; *Nees in Wall. Pl. As. Bar.*** iii. 98, and in DC. Prodr. xi. 239; glabrous, leaves submersile narrowly oblong-lanceolate spine-tipped, flowers axillary scarcely spiked at the end of the branches, bracts lanceolate acuminate spine-tipped, bracteoles minute bristles or 0. Wall. Cat. 2499; Wight *J. t. 451; T. Anders. in Journ. Linn. Soc. ix. 490.

S. **DROCAN PENINSULA**, alt. 0—2000 ft.; Concann, Carnatic, Mysore, Coimbatore, Rottler, Wight, &c.

A lower, harsher, more prickly undershrub than *B. Prioritis*, with shorter internodes. *Leaves* 2½ by ½ in., occasionally 1 by ½ in., elliptic, entire. *Flowers* nearly all axillary, distant; bracts ½—¾ in., usually very narrow. *Calyx* ½—1 in., segments long acuminate. *Corolla* 1½ in., yellow. *Capsule and seeds* as of *B. Prioritis*.—Exceedingly near *B. Prioritis*, as Heyne has noted in Herb. Rottler. *Nees* erroneously says the corolla is pale blue; does not allow it to have been *B. cuspidata*, Heyne, but says it is part of *B. noctiflora*, Heyne. Heyne has, however, named these two species correctly in Rottler’s *Herbarium*.


**SCINDE**; *Stocks.—Distrib. S.W. Asia, N.E. Africa.*

A woody, harsh undershrub, scarcely 1 foot high, sometimes spinescent. *Leaves* 2 by ½—1 in., obtuse, base narrowed; petiole ½ in. *Pedicels* ¼—½ in., pubescent, often 3 on an apparent peduncle, the 2 leaves at their base much reduced, usually petioled, oblong or sublinear; bracteoles about the middle of the pedicle 2, 1, or 0, very small, linear (? bracts). *Calyx* green, pubescent; 2 outer lobes ½ in., triangular-ovate, 2 inner very small. *Stamens* 2, the 3 smaller nearly obsolete. *Disc* prominent, cup-shaped. *Ovary* hairy; stigma scarcely bifid. *Capsule* nearly ½ in., pubescent, ovoid, rostrate, 2-seeded near the base. *Seeds* densely silky. —Oersted attributes to his very bad genus *Barlerites* a unilateral linear stigma and glabrous seeds, which is wholly wrong.

Subgenus 2. **Eubarleria**. Capsule oblong or narrowly ellipsoid, 4—rarely 2-seeded at or near the middle by the suppression of the 2 lower seeds.

*Bract* 0, bracteoles 2 divaricate long-linear or spines, 2 outer sepals large. [Each flower on the sympodial raceme is in the axil of one of two opposite bracteoles, and the terminal flower also is apparently 2-bracteolate; by comparing such species as *B. longiflora* & *tomentosa*, it is seen that it is the bracteoles that are really aborted in this section. The next section differs in the terminal flower having 3 (or 4) bracts in place of 2.]

† Prickly.


S. **DROCAN PENINSULA**, alt. 0—4000 ft.; Rottler; Courtallum, *Wight*; Concann, *Law, &c.*
A small, very prickly undershrub; branches hairy. Leaves \( \frac{1}{4} \text{ in.} \) petiole hardly any. Bracteoles \( \frac{3}{4} \text{ in.} \), simple spines; pedicel (above the bracteoles) \( \frac{1}{4} \text{ in.} \), sometimes 0 (\( B. \) rotundifolia, Heyne in Herb. Rottler). Sepals pubescent, ciliate; 2 outer in flower \( \frac{3}{4} \text{ in.} \), often lanceolate, in fruit sometimes \( \frac{3}{4} \text{ in.} \), oblong, obtuse, scarious, nervous, glabrate; 2 inner small. Corolla 1 in., purple blotched rose or white. Capsule \( \frac{3}{4} \text{ in.} \), 4-seeded.—Separable from the following by the much narrower entire outer sepals. The variation in the length of the pedicel is remarkable, but there appears to be only one species here.


S. Deccan Peninsula with Ceylon, alt. 0–4000 ft.; Rottler, Wight, Thwaites, &c.

A very prickly small shrub; branches hairy. Leaves \( \frac{1}{4} \text{ in.} \), hairy beneath, deciduously sear-brid pubescent above; petiole hardly any. Bracteoles simple spines. Outer sepals \( \frac{3}{4} \text{ in.} \), broadest very near the base; in fruit scarious, nervèd. Corolla 1 in., purple. Capsule \( \frac{3}{4} \text{ in.} \), 4-seeded.—Nees reduced \( B. \) mysorensis, Heyne, to \( B. \) noctiflora, but both Heyne’s names and Roth’s description show it to have been this.


Nilgerry Mts., alt. 7500 ft. ; Ootacamund, Wight. Ceylon; Rottler.

A small, very prickly undershrub; branches pubescent upwards. Leaves \( \frac{3}{4} \text{ in.} \), obtuse or acute, grey pubescent at first; petiole hardly any. Bracteoles \( \frac{3}{4} \text{ in.} \), with simple spines or denticulate near the base. Sepals soon scarious, glabrate, nervèd; 2 outer \( \frac{3}{4} \text{ in.} \), \( \frac{3}{4} \text{ in.} \), Corolla-tube \( \frac{3}{4} \text{ in.} \), pubescent without; lobes \( \frac{3}{4} \text{ in.} \), round-ovate. Capsule \( \frac{3}{4} \text{ in.} \), 4-seeded.


Soinde; Stocks. PUNJAB; Kirana Hill, Edgeworth.—DISTRB. Arabia, N.E. Africa.

A small, hoary, prickly undershrub; prickles often pinnatifid near the base. Leaves \( \frac{3}{4} \text{ in.} \), base attenuated; petiole \( \frac{3}{4} \text{ in.} \). Bracteoles linear or linear-lanceolate, spine-tipped, rigid, often denticulate. Sepals soon scarious, glabrate, nervèd; 2 outer \( \frac{3}{4} \text{ in.} \), acute, mucroate, scarcely denticulate. Corolla white; tube \( \frac{3}{4} \text{ in.} \), puberulous without; lobes \( \frac{3}{4} \text{ in.} \), ovate. Capsule \( \frac{3}{4} \text{ in.} \), 4-seeded.
++ Unarmed.


8. **Deccan Peninsula;** Rottler, &c.; Tinnevelly, Beddome.


8. **Deccan Peninsula;** Rottler, &c.

A low shrub; branches hirsute. Leaves 2½ by 1 in., yellow-hirsute on the nerves beneath, more or less so on the surface; petiole ½ in. *Racemes* mostly 1–3–fd.; bracteoles ½–⅔ in. Calyx scarious, purple-veined before the flower expands; 2 outer segments ⅔ in., broadly oblong, entire, 2 inner ½ in.; elongated in fruit. *Corolla* rose (Beddome); tube 2 in., linear-cylindric, upper ½ in., funnel-shaped; lobes ⅓ in., elliptic. *Capsule* ½ in., 4-seeded, occasionally the 2 lower seeds suppressed.

Var. *acuminata;* leaves densely pubescent subtomentose rounded or subcordate at the base, petiole 1 in. *B. acuminata*, *Wight* Ic. t. 450; *Nees in Wall. Pl. As. Raf.* iii. 93, and in *DC. Prodr.* xi. 234. *B. tomentosa*, *Wall. Cat.* 2509. *B. racemosa*, Heyne in *Herb. Rottler.* —S. Deccan Peninsula; Nilgherries, Anamallays, Madura, &c., Rottler, *Wight,* &c.—Easily distinguished from *B. tomentosa,* but differs only in the shape of the leaves and indumentum; the corolla is somewhat smaller.


11. **Ceylon,** in the hills; Macrae, Gardner, &c. **Malabar** (var. *elata*).

Herbaceous, strigose. Leaves ½ by 1½ in., sparsely yellow strigillose above; petiole ½ in. *Racemes* yellow-strigose; bracteoles ½ by ½ in. (in *Nees*‘ type), ½ by ¾ in. (in Arnott’s *B. pentandra*). Sepals subacute. *Corolla* ½ in.; lobes ½ in., obovate-elliptic. *Capsule* nearly 1 in., 4-seeded.—Nees has confounded the Ceylon and Nilgiri varieties of this species; his description of *B. involucrata* is founded on *Wight*‘s n. 1958 from Ceylon, and he says the bracteoles are ¼ lines long; he then places under this the Malabar specimens, which do not suit the description, and which all belong to his *B. terminalis* (see *B. strigose*, var.). The Ceylon specimens are very uniform, drying black, and having the racemes mainly axillary. The bracteoles are in well-developed specimens much longer than in the poor pieces *Nees* and Arnott had, but still much shorter than in *B. elata*. *Wight*‘s n. 1958 has the bracteoles unusually broad and obtuse.

**Bracteoles 2, opposite, close to the calyx or above the bract at the base of the pedicel, narrow, much smaller than the 2 outer sepals.**


**S. Deccan Peninsula, alt. 1000-1500 ft.; Courtallam, Rottler, Wright; Coimbatore, Beddome.**


**W. Deccan Peninsula, in the Ghats; Bababoodam Hills, Law (T. Anderson).**

An erect shrub; branches strigose upwards. *Leaves 6 by 2½ in.; pediole ¼-½ in. *Pedicels fulvous-stigmal; bracts ½ in., linear-spathulate; bracteoles nearly as long, linear, acute. *Sepals nervous, strigose without; 2 outer ¼ in. broad, one of these shortly 2-toothed. *Corolla white (Dalzell), beautifully veined when dry, noted blue in Wight's Herbarium; tube elongate funnel-shaped, lobes 1 in., obovate. *Capsule nearly 1 in., oblong or slightly obovate, 4-seeded; fruits-sepal somewhat enlarged.*

14. **B. Arnottiana**, Nees in DC. Prodr. xi. 232; leaves elliptic acuminate at both ends hairy, pedicels axillary solitary, bracteoles lanceolate,
outer sepals large ovate subobtuse, corolla 2½ in. T. Anders. in Journ. Linn. Soc. ix. 492.

Ceylon, alt. 6000 ft.; Gardner, Thwaites, &c.

Herbaceous; stems fulvous-strigose. Leaves 4 by 1½ in., with scattered yellow hairs above, obscurely lineolate, beneath yellow-strigose especially on the nerves; petiole ¼-1 in. Bracteoles ½-⅓ in., lanceolate or elliptic spathulate or 0. Outer sepals 1½ by ½ in., yellow-strigose, obtuse, one shortly bifid. Corolla blue; tube 1½ in., lobes 1½ in., obovate, submarginate. Capsule 1 in., broadly oblong, 4-seeded; sepals enlarged, scarious, nervet in fruit.


Var. Beddomei; leaves elliptic acute at both ends bristly pubescent on both surfaces, flowers solitary axillary, sepals large ovate acute nerveo bristly-pubescent.—Tenasserim; Mooleyit slopes, Beddome.—Herbaceous; stems fulvous-pubescent or substrigose. Leaves 3-4 by 1½ in., not acuminate, petiole ½ in. Pedicel ½ in.; bracteoles ½-⅓ in., linear, rigid, bristly-pubescent. Outer sepals nearly 1 by ¼ in., one of them very shortly bifid at the tip. Corolla 2½ in., beautifully veined when dry, altogether as of B. Arnottiana. Capsule ¾ in., narrowly ellipsoid, rigid. Seeds more than ⅜ in. diam. obovate-truncate, compressed, rugose-silky.—Possibly a new species; close to B. Arnottiana.

15. B. sepalosa, Clarke; hairy, leaves elliptic acute, racemes axillary 1-3 ftd, bracteoles narrowly lanceolate, outer sepals very large broadly elliptic acute.—Barleria sp. n. 35, Herb. Ind. Or. H. f. & T.

Cooran; Gibson.

Shrubby; stems upward villous, subtomentose. Upper leaves 3½ by 1½ in., base shortly narrow, covered with short yellow hairs on both surfaces, somewhat rigid, strongly reticulated beneath; petiole ¼ in. Bracteoles ½ by ½ in., rigid, acute. Outer sepals 1½ by ⅜ in., one bifid, base rounded, yellow-villous, submentose, in fruit nervous, subcarious. Capsule ½-1 in. Corolla not seen.


—Barleria sp. n. 32, Herb. Ind. Or. H. f. & T.

W. Decan Peninsula, in the Ghats frequent; from Jubbulpore to Travancore.

Herbaceous, erect, 2 ft. high. Leaves 5 by 2 in., often glaucous, margins sometimes minutely scabrous; petiole ¼-1 in. Bracteoles linear, ½ in. or in large examples 1 in. Outer sepals 1½ by ¼ in. in large examples, often hardly half so large, rounded or very acute, entire, glabrous or minutely scabrous. Corolla blue (Beddome), rose (Dalzell); lobes ½ in. diam., orbicular. Capsule 1 in., 4-seeded. Seeds ¼ in. diam. or more, close covered with wavy silky yellowish hair, as in many other species.


W. Decan Peninsula; Coves, Stocks; Ellora Hill, Ralph; Belgaum, Ritchie; Bombay Ghats and Brahminwara Range, Dalzell; N. Canara, Brandis.

So exceedingly like B. montana, except as to the seeds, that it has been mixed
therewith from Wight's day. Lower leaves often very large and very glaucous. Terminal spike more closely imbricated than in B. montana; flowers rather larger, corolla-lobes often 1 in. Capsule ½ in., 4-seeded. Seeds ½ in. diam., when ripe nearly black; always glabrous, and so differing from all other Barierias.


CONSAN; Stocks; Mangellec Ghaunt, Dalzell.

19. B. cristata, Linn.; Benth. Fl. Hongk. 262; leaves oblong or elliptic acute yellow-hairy beneath, spikes capitate, outer sepals ovate-acuminate or lanceolate toothed nervous, corolla 1½ in. purple-blue or white. Burm. Fl. Ind. 136; Roxb. Fl. Ind. iii. 37; Wall. Cat. 2506; Don Prodr. 119; Roth Nov. Sp. 315; Nees in Wall. Pl. As. Rat. iii. 92, and in DC. Prodr. xi. 229; Bot. Mag. t. 1615; Wight Ic. t. 453; Dalz. & Gibbs. Bomb. Fl. 188; T. Anders. in Thwaites Enum. 230, and in Journ. Linn. Soc. ix. 489. B. dichotoma, Roxb. Fl. Ind. iii. 39; Wall. Cat. 2508; Nees in Wall. Pl. As. Rat. iii. 91, and in DC. l. c. 227; Dalz. & Gibbs. l. c. 188. B. cristata, Roxb. l. c. 38; Wall. Cat. 2507; Nees in Wall. Pl. As. Rat. iii. 92, and in DC. l. c. 228. B. napalensis & nuda, Nees in Wall. Pl. As. Rat. iii. 91, 92, and in DC. l. c. 228, 229. B. laciniata, Wall. Cat. 7144, and Nees ii. c.

SUBTROPICAL INDIA; N.W. Himalaya, Sikkim, Khasia, Burma, Central India, Nilgherries, common.—DISTRICT. Gardens of Iodia, Malaya, China, &c.
An erect or diffuse undershrub; branches adpressedly yellow-hairy. Leaves 3–4 by 1 in., or, where burnt up, 1 by ½ in., yellow-hairy or lineolate above; petiole ½-1 in. Spikes ovate, often compound, dense; bracteoles ½-⅔ in., linear-lanceolate, toothed. Outer sepals ½ in., toothed, softly hairy, glabrous, subspinoscent. Corolla-tube funnel-shaped in the upper half; lobes ½ in., ovate. Capsule ½ in., 4-seeded. Seeds orbicular, compressed, silky.—Uniform except as to habit and indumentum. The common Sikkim form has erect stems, leaves 4 in. long, glabrate lineolate above, outer sepals subspinosus-ciliate; a common Khasia form is similar, but has the sepals very sparingly toothed; the West Himalaya form (B. napalensis var. microphylla, Nees) has leaves hardly an inch long and many solitary flowers; B. satiagifolia, Hayne, has a diffuse weedy habit, linear-oblong leaves and much yellow hair, the South Indian plant, on hotter drier rocks, has often smaller more rigid very hairy leaves, and very hairy sepals. There can be, as T. Anderson states, no doubt that this plant is wild everywhere in the lower hills of N.E. and Central India; and no doubt in the Mts. of S. India also.


CEYLON, alt. 1–3000 ft.; Gardner, Champion, &c.
An undershrub. Leaves 8 by 1½ in., lineolate above; petiole 1–1½ in. Spikes 1–5 in., often nodding, dense with flowers; bracts and bracteoles ½–⅓ in. outer sepals nearly ½ in., nervous, one divided ⅓ the way down into 2 narrow-lanceolate teeth. Corolla nearly glabrous, deep blue-purple; tube funnel-shaped upwards; lobes ½ in., ovate. Capsule ½ in., 4-seeded. Seeds ⅓ in. diam., silky.

W. *Drooan Peninsula*; from the Concan to Courtallum, *Wight*, &c.

A large shrub (*Wight*). *Spikes* 1–3 in., dense; *bracts* ½ in.; bracteoles ¼–½ in. Outer *sepals* ½ by ½ in., nervose, subcorolloid, much more pubescent than in *B. nutans*. *Corolla* blue and yellow (*Dalzell*), white (*Ritchie*). *Capsule* and *seeds* as in *B. nutans*.—Closely allied to *B. nutans*, differing in the broader sepals and larger flowers.

*** Bracteoles 2, lanceolate or elliptic, often nearly as long as the calyx.


**Penang**; *Wallach*.

*Leaves* 8 by 2 in., lineolate above, somewhat yellow-strigose on the nerves beneath; petiole ½ in. *Spikes* 4 in., terminal, erect, somewhat lax; *bracts* ½ by ½ in., spatulate-oblong; *bracteoles* ½ by ½ in. Outer *sepals* ½ in., lanceolate, acute, yellow-hairy, one bifid at the apex. *Capsule* ½ in., narrowly ellipsoid, acute at both ends, glabrate, 4-seeded. *Seeds* ultimately nearly glabrous except near the base.


**Bombay**; Bababoodun Hills, *Stocks*.

A small undershrub; branches erect, sparsely hispid. *Leaves* 2½ by 1 in., base rounded, glabrous or slightly hispid-ciliolate; petiole 0½ in. *Bracteoles* 1 by ½ in., subobtuse. *Sepals* 1 in., subdiate, hispid-ciliolate, 2 outer lanceolate, one bifid 3 the way down into narrow lanceolate segments. *Corolla* not seen. *Capsule* ½ in., shortly obovoid compressed rostrate. *Seeds* nearly ½ in. diam., silky, occupying the middle of the capsule.—*T. Anderson*, from the habit and leaves of this plant, evidently considered it allied to *B. montana*. The capsule is narrowed towards the base, or it might be arranged in the section *Prionitis*. It is really a very marked species, almost worthy a sectio to itself.


**Bengal**, in the lower hills, alt. 0–4000 ft., common; *Orissa*, *Chota Nagpore*, *Sikkim*, *Assam*.—**Distr.** Much cultivated in India and Malaya.

Shrubby, 2–4 ft.; branches fulvous-strigose upwards. *Leaves* 5½ by 2½ in. (sometimes twice as large), widest towards the base, lineolate above, fulvous-strigose on the nerves beneath; petiole ½–1 in., or 0, i.e. subacute by the much decurrent leaf-base.
Spikes 1-3 in., very dense, often glomerate, always secund, the sepal densely imbricated, the bracteoles appearing patent or reflexed on one side; bracteoles 1/4 in., lanceolate or subovate. Outer sepals 1 in., sometimes more, nervous. Corolla funnel-shaped in the upper half of the tube; lobes 3/4 in., ovate. Capsule 3/4 in., 4-seeded; seeds silky.

Var. polystachya; leaves very large fulvous-hirsute above somewhat glaucous beneath, spikes densely agglomerated yellow-hirsute. B. polystachya, Nees in DC. Prodr. xi. 296.—Concan.; Stocks.

Var. terminalis; leaves thinly fulvous-hirsute above, spikes subglomerate not or very obscurely 1-sided, outer sepals more softly hairy often obtuse. B. terminalis, Nees in DC. Prodr. xi. 225; Dals & Gibbs. Bomb. Pl. 188.—Concan.; Jacquemont, &c. Belgaum; Ritchie.—This may be a distinct species, as Dalzell considers; but T. Anderson does not deem it worth notice as a var.

25. B. polytricha, Wall. Pl. As. Rar. i. 72, t. 82, and Cat. 7143; leaves large oblong attenuate at both ends hirsute above, spikes dense many-fld. 1-sided, bracteoles oblong or elliptic somewhat shorter than the calyx, outer sepals ovate ciliate-denticulate hirsute, corolla 13/4-2 in. blue. Nees in Wall. Pl. As. Rar. iii. 91, and in DC. Prodr. xi. 225; T. Anders. in Journ. Linn. Soc. ix. 491. B. cœrulea, Wall. Cat. 2509, letter K only. B. hirsuta, Wall. Cat. 7142; Nees ll. c. Pseudobarleria polytricha, Oerst. in Vidensk. Meddel. Kjob. 1854, 135.

Chittagong, Pegu and Tenasserim; Wallich, &c., frequent.—Distrib. India. Leaves 6 by 1 1/4 in., base gradually cuneately attenuated, hairs long on the upper surface; otherwise altogether as B. strigosa.

Var. polystachya has the leaves suddenly narrowed to the subulate petiole. B. hirsuta is a young state, having the heads subglomeriform, not (or very obscurely) 1-sided; probably always more or less 1-sided in fruit.

26. B. nitida, Nees in Wall. Pl. As. Rar. iii. 91, and in DC. Prodr. xi. 224; leaves ovate or elliptic shortly acuminate at both ends lineolate nearly glabrous above, spikes dense 1-sided, bracteoles elliptic or subovate nearly as long as the calyx, outer sepals ovate strongly ciliate-denticulate shining sparsely hispidulous not strigose, corolla 13/4 in. blue. Wight t. 454; T. Anders. in Journ. Linn. Soc. ix. 491. B. cœrulea, Wall. Cat. 2509, letter H only. B. bracteata, Heyne in Herb. Bottler.

Hills of S. Deccan Peninsula; Rotiller; Courtallam, Wight; Nilghiries. Foulkes; Tinnevelly Hills, Beddome.

Leaves 1 1/4-2 in. Outer sepals shining, with scattered yellow hairs, but no strigose pubescence on the nerves without; otherwise as B. strigosa, from which T. Anderson admits it to be specifically distinct. The Simla plant referred to this species by Nees is B. strigosa, with (as usual in the N.W. Himalaya) smaller leaves than in the Sikkim Terai form.

XXIII. NEURACANTHUS, Nees.

Perennials; flowering stems erect, annual. Leaves entire. Flowers small, blue, spinicate; spikes axillary or terminal, elongate strobilate or dense capitata; bracts ovate, membranous or coriaceous; bracteoles 0 or minute. Calyx 2-partite; posterior segment 3-toothed, anterior 2-toothed or 2-partite. Corolla tubular, upper half wide-funnel-shaped; limb sub-entire or obscurely lobed, plicate. Stamens 4, didynamous; anterior anthers 2-lobed, posterior 1-lobed (second lobe rudimentary); lobes ovoid, distinct, sometimes hairy. Style at the apex 2-branched, 1 branch linear-lanceolate, the other obsolete; ovary 4-ovulate. Capsule oblong, glabrous, 4-seeded. Seeds much compressed, ovate, densely inelastically silky.—Species 6, the 5 following and a tropical African one.
Lepidagathis differs by the anthers all 2-celled, the stigma subequally minutely 2-lobed, and the presence of bracteoles. N. subuninervius, Kurz, has been removed to Lepidagathis.

* Spikes axillary, elongate, bracts sub-4-ranked.


**Concan**; in the Gusahaan, Law, Dalzell, &c.; Salsette, Herb. *Wight*.

Stems 1-3 ft., glabrous except at the tips. *Leaves* 4½ by 1¼ in., lineolate above, sometimes minutely setose. *Spikes* 1-5 in., hairy; bracts ½ by ½ in. *Calyx* ½ in.; segments divided about half-way down; cilia ⅛ in., rising from minute glistening tubercles. *Corolla* ¾ in., blue, nearly glabrous without, 2-lipped; segments 5, sub-similar, obtusely triangular, plicate in bud, tips tufted. *Capsule* ¾ in. *Seeds* ½ in.


**Pegu**; Prome Hills, Wallach; Rangoon, M’Lelland; Moulmein, Parish.

Hardly differs from *N. trinervius* except in the greater attenuation of the leaves at both ends. *Flowers* blue (Parish).


**Pegu**; Prome, Kurz.

*Leaves* 1½ by ½ in., not lineolate, minute scabrid-pubescent (in Kurz’s specimen); petiole obsolete. *Corolla* ½ in., or rather more, blue.—Exceedingly near *N. tetragonostachyus*, but has much smaller leaves, and larger flowers. *Neuracanthus* sp. (Kew Distr., n. 6144), collected by Griffith in Hookboom Valley, Upper Burma, is perhaps a variety, but has the leaves closely pubescent beneath.

**Spikes** axillary, densely capitate, bracts not 4-ranked.


**Concan**; Dalzell, &c.; common in Bombay Island.

Stems 1-2 ft. *Leaves* 4½ by 2 in., obtuse or subacute, lineolate above; petiole scarcely ⅛ in. *Spikes* 1-2 in., sometimes agglomerated into axillary globes 3-4 in. diam.; bracts ⅛ in., purplish. *Calyx* ⅛ in., one lobe shortly 3-toothed, the other deeply 2-6d. *Corolla* ½ in.; limb a fine blue, obconic, subentire, plicate; lower lip of 3 very depressed triangular lobes, upper an emarginate subsimilar lobe. *Anthers* pubescent. *Capsule* ⅜ in., 4-seeded. *Seeds* ⅛ in. diam.—The plant appears rarely to seed, as Dalzell notes.

**Spikes** terminal, oblong.

5. **N. Neesianus**, Clarke; hoary silky subtomentose, leaves sessile

MADRAS: Paloor (in A erect) on black cotton-soil, Wight.

Stems 12–18 in., procumbent, terete, softly hairy. Leaves 2 by 1 in., obtuse, entire, silky on both surfaces, young white-tomentose beneath. Spikes 2 by ½ in., dense; bracts ½ in., ovate, acute, obscurely 4-ranked; bracteoles small, subulate. Calyx 2-partite; one segment 3-lobed less than half-way down, lobes lanceolate acute; the other 2-lobed nearly to the base. Corolla 2-lipped; upper lip ovate minutely bifid, lower 3-partite, lobes ovate mucronate. Stamens 4, included; the upper anthers 2 with 2 disarticulate cells, lower 1-celled; connective hairy. Capsule ¼ in., oblong, 4-seeded. Seeds compressed, hairy.—Flowers or stamens described by T. Anderson, whose account of the stamens requires the species to be transferred from Lepidagathis to Neuracanthus, as does also the structure of the calyx, which is erroneously given by T. Anderson. Wight has written on his original ticket “Paloor, in black cotton soil,” which T. Anderson has taken to be Palamcottah (near Timucvelly), where it is believed there is no black cotton-soil.

XXIV. CROSSANDRA, Salisb.

Undershubs. Leaves entire or nodulate, subdentate. Spikes linear-oblong; bracts imbricate; bracteoles linear; flowers sessile, yellow. Sepals 5, ovate, acute, 2 inner much smaller. Corolla-tube linear, incurved; limb on one side of 5 subequal, elliptic lobes, imbricate in the bud. Stamens 4, didynamous; anthers 1-celled, mucinous; connective mucronate. Style minutely 2-lobed at the tip; ovary 4-ovulate. Capsule oblong, acute, 4-seeded. Seeds compressed, orbicular, adpressedly scaly; scales of numerous hairs coalescing nearly to their tips, which are seen imperfectly free when moistened.—Species 5; 1 in India, 4 in Tropical Africa or Madagascar.


DECCAN PENINSULA and CEYLON.—DISTRIB. Cult. in N. India, the Malay Peninsula and Islands.

Stems 1–3 ft., pubescent upwards. Leaves 4 by 1½ in. (often much smaller), glabrous or pubescent beneath; petiole ¼–1 in. Peduncles 0–5 in.; spikes 1–4 in.; bracts ½ by ½ in., elliptic, acute; bracteoles ½ in. Sepals much imbricate, outer ½ in., rigid, subseriaceous. Corolla glabrous; tube ½ by ½ in.; lobes ½ by ½ in. Capsule ½ in., glabrous.—Wallich's and Griffith's Nepal and Sikkim specimens, treated as wild by Nees and T. Anderson, are no doubt cultivated ones.

XXV. ASYSTASIA, Blume.

Herbs or undershrubs. Leaves entire. Spikes or racemes lax or dense, simple or compound, 1-sided or suberect; bracts and bracteoles linear, shorter than the calyx (except in A. Laviiana); flowers opposite or alter-
nate, usually solitary, blue purple rose or yellow. Sepals narrow. Corolla-tube short or long, funnel-shaped ventricose or narrow; lobes 5, subequal, imbricate in bud. Stamens 4, all perfect, didynamous, subequal; anthers oblong, cells parallel, approximate, base minutely spurred or submuticous, the points only obscurely whitened. Ovary 4-ovulate, very hairy; stigma minutely bifid or subcapitate. Capsule elliptic, 4-seeded, base contracted solid. Seeds compressed, orbicular or irregularly angular, rugose or tubercular, glabrous.—Species 15, Tropical Asiatic and S. African.

The species having only 2 fertile stamens are transferred to Eranthemum, and those with large bracts to Lepidagathis. It might be better to sink Asystasia in Eranthemum, for many of the species have a long narrow corolla-tube as in Eranthemum, and the character of the stamens appears of rather less value than in separating Homiadelphus from Hygrophila.

*Corolla tubular-ventricose, about 1-1½ in. long.*

1. **A. intrusa**, Blume Bijd. 796, not of Nees; leaves ovate or elliptic acuminate puberulous above, calyx sub sessile glabrous or minutely ciliate, corolla ½-1 in. tube exceedingly slender. A. Blumei, Nees in DC. Prodr. xi. 167. A. nemorum, Nees in Wall. Pl. As. Rar. iii. 90, as to descr. and Malay material.

**SINGAPORE ; SCHOMBURGK.—DISTRIB. JAVA.**

Stems 1 foot, dichotomous, slender, nearly glabrous. Leaves 2 by 3 in., base cuneate or rhomboid, undulate, suberemate, dotted with most minute hairs above, glabrous beneath; nerves 5-6 pair; petiole ¼ in. Spikes 1-2 in., slender; flowers mostly opposite; bracts scarcely ½ in.; lowest pedicels sub obsolete. Calyx ½ in.; segments linear-lanceolate, glabrous on the back. Corolla glabrous; tube hardly ¾ in. in diam.; limb hardly ½ in. in expanse. Stamens 4, nearly equal. Style nearly glabrous; stigma sub capitate. Capsule ½ in., 4-seeded, minutely hairy.—This differs from *A. coromandeliana* (and its allies) in the very slender corolla; the tube is widened only near its apex, and is there scarcely ½ in. broad.


**DECCAN PENINSULA and CEYLON, common.—DISTRIB. Malaya, Africa, Arabia.**

A procumbent, perennial weed, 1-2 ft., usually dusky pubescent. Leaves 1-1½ in., lower mostly subcordate, base rounded or suddenly narrowed; nerves 5-6 pair; petiole ½ in. Racemes 2-5 in., lax; lower pedicels often attaining ½ in.; bract and bracteoles at the base of the pedicel, about ¾ in. Sepals ½ in., linear-lanceolate, puberulous or pubescent on the back. Corolla pubescent; tube yellow, limb pink or pale purple, usually dull or lurid, sometimes yellow altogether. Filaments with few small hairs. Style glabrous except near the base. Capsule 1 in., pubescent; solid cylindrical compressed base ½ in. Seeds ½ in. diam., much compressed, ovoid angular wrinkled or sub tubercular glabrous.

3. **A. chelonoides**, Nees in Wall. Pl. As. Rar. iii. 89, and in DC. Prodr. xi. 164; leaves elliptic narrowed at both ends minutely hairy or
CIX. ACANTHACEAE. (C. B. Clarke.)

[Asystasia.]

glabrate, racemes compound many-fl., lower pedicels longer than the pubescent calyx, corolla 3-4 in. purple. T. Anders. in Thwaites Enum. 236.

**CEYLON; Walker, Thwaites, &c. TRAVANCORE and TINNEYELLY HILLS; Beddome (wild).—DISTRI.** Cultivated in S. India and Malabar.

Leaves 5½ by 1½ in., lower all cuneate or acuminate at the base, punctate or puberulous or with scattered hairs (without the dull grey pubescence of *A. coromandeliana*); nerves 6-8 pair. **Racemes usually panicled, often peduncled, sometimes 50-60-fl.;** lower pedicels ½ in. **Capsule nearly of A. coromandeliana.**—Described from Nees’ type specimen marked *A. chelonooides*, Var. α, in Nees’ hand. It is the species with numerous small purple flowers much cultivated in S. India; and Col. Beddome believes it to be wild in S. Malabar, but there are no specimens except from Ceylon.

**VAR. amacea;** more hairy, leaves hairy on both surfaces, sepals subbiarose, corolla as of *A. chelonooides*, type.—Arracan; forests near Akyab, Kurz.

**VAR. quadrangularis;** stem acutely quadrangular, leaves ovate or narrowly lanceolate glabrate, corolla small as of *A. chelonooides*, type. A. coromandeliana, Var. variabilis, Nees in DC. Prodr. xi. 165. A. nemorum, Var. β, T. Anders. in Journ. Linn. Soc. ix. 525. Ruellia quadrangularis, Heyne in Herb. Rottler.—Wynaad; Rottler. Anamallays; Bedd. Ceylon; Macrae, Thwaites.—Leaves very variable; in Macrae’s example 1 by 3 in. in, Beddome’s 7 by 1 in., in Thwaites’ 2½ by ½ in.


W. DECCAN PENINSULA, alt. 2-6000 ft., frequent; Rottler, &c.

Leaves often 6½ by 2½ in., membranous, green, sparsely pubescent or glabrate. Calyx-segments nearly ½ in., narrowly oblong, acute. **Capsule 1-1½ in.**—Described from specimens named by himself, which are identical with Wight’s Herb. Propr. n. 1952. In his original description Dalzell says the flowers of *A. violacea* are about half as large as those of *A. coromandeliana*, and the description appears to belong altogether to *A. chelonooides*, Nees’ type; but in Dalz. & Gibs. Bomb. Fl. 186 the character of *A. violacea* is at once shortened and widened.

5. **A. crisata, Benth. in Linn. Soc. 1851, 647;** leaves elliptic or oblong acuminate lower narrowed into the petiole and sparsely crenulate glabrate, lower pedicels shorter than the pubescent calyx, corolla 1 in. white with rose or dark purple dots in the palate. T. Anders. in Journ. Linn. Soc. ix. 528. A. nemorum, Nees in Wall. Pl. As. Barr. iii. 90, and in DC. Prodr. xi. 167, as to the Nilgiri material; T. Anders. in Journ. Linn. Soc. ix. 524. A. coromandeliana, Wight Ic. t. 1506, not of Nees. Ruellia chelonooides, Wall. Cat. 2335 chiefy, not Asystasia chelonooides, Nees.

Mrs. of S. DECCAN PENINSULA, alt. 4-8000 ft.; Rottler, Wight, &c., common about Ooty.

Leaves very variable in width, nearly always crisped subcrenulate; upper often sessile, with base rounded. **Flowers very constant in colour. Capsule as of A. coromandeliana.**—This species (as also *A. chelonooides*) is so closely allied to *A. coromandeliana* that Col. Beddome says he can hardly distinguish them but by the colour of the flower. They sort out pretty well in the Herbarium, and among the large non-Indian material there is nothing like *A. chelonooides* or *crisata.*

6. **A. travancorica, Bedd. Ic. Pl. Ind. Or. t. 178;** leaves elongate-
lanceolate sparingly pubescent, lower pedicels often longer than the calyx, corolla 1½—1¾ in. purple-violet (or in cultivation white).

Travancore, S. Tinnevelly and Anamallays, alt. 3000 ft.: Beddome.
A large shrub, 6—8 ft. high; branches pubescent upwards. Leaves 4—5 by 8½—1¼ in., base cuneate or rhomboid; nerves 7—9 pair, very oblique; petiole ¾—1 in. Racemes 2—8 in., pubescent; lower pedicels sometimes ½ in. Capsule 1 in., nearly as of A. coromandeliana.—Closely allied to A. coromandeliana, though the elongate oblique-nerved leaves give it a very different aspect.

7. **A. macrocarpa**, Nees in Wall. Pl. As. Rar. iii. 59, and in DC. Prodr. xi. 163; pubescent, leaves oblong or elliptic narrowed at both ends, racemes dense or elongate very pubescent, corolla 1¼ in. dull pink, cylindrical base of its tube much shorter than the ventricose part. *T. Anders. in Journ. Linn. Soc. ix. 525. Ruellia macrocarpa, Wall. Cat. 2348.—Acanthacea, Griff. Itin. Notes, 106, n. 92, and IC. Pl. As. t. 438.

Subtropical Himalaya, from Kumaon to Bhotan; in the Terai, alt. 1000 ft., and in the hotter valleys ascending to 4000 ft.

8. **A. lanceolata**, T. Anders. in Journ. Linn. Soc. ix. 524; leaves lanceolate acuminate glabrous, bracts lanceolate acute villous as long as the calyx, corolla 1 in. funnel-shaped constricted base of the tube short.

Burma; Baragyn, Brandis (T. Anderson).
An-erect, glabrous herb; stem terete, sparingly branched, internodes long. Leaves 4—6 by 1½ in., undulate; petiole short. Spikes terminal, erect; bracts opposite, ⅔ in., subherbaceous, lax, decussate, somewhat remote; flowers sessile, 1 or 2 in the axil of each bract. Sepals linear, equal, villous, membranous. Corolla villous without; lobes 5, unequal, small, erect. Anther-cells 2, bases mucronate.—Not seen.
Var. ? Beddomei; leaves linear-lanceolate hairy on both surfaces, corolla 1½ in. and upwards before expansion.—Tenasserim, Moyleit, Beddome.—Leaves 8 by ⅔—1 in., caudate-acuminate, widest close to the rounded or subcordate base; petiole 0—⅛ in. Spikes compound, most of the lower bracts and calyces small without flowers; upper bracts ⅔—¾ in., lanceolate, glabrate. Corolla broad, nearly straight, urn-shaped on a short cylindrical base; lobes subequal, ⅔ in., ovate, obtuse. Stamens 4, 2 conspicuously longer; anthers 2-celled, cells broadly oblong, parallel, equal, white-apiculate at base. Pistil as of *Asystasia*. Capsule not seen.

** Corolla linear shortly funnel-shaped upwards about 2 in. long.


Khastia Mts., alt. 0—3000 ft., frequent; Wallich, Griffith, H. f. & T., &c.
Stems 1—3 ft., herbaceous. Leaves 8½ by 3½ in.; nerves 10—14 pair; petiole 1¼ in. Racemes usually paniculate in a dense terminal subsessile head; bracts ⅓ in.; pedicels ½ in., often pubescent. Sepals ½ in., sublinear, glabrous or pubescent. Corolla glabrous, linear portion of the tube 1¼ in., limb about 1 in. diam. Stamens 4, glabrous; anthers muticous, or very obscurely mucronate at the base. Capsule
14 in., with the seeds nearly as of *A. macrocarpa.*—The name is very misleading; the corolla is always a fine rose. In one example the raceme is developed into a lax very compound panicle, and the plant is noted as 6 ft. high.


**Khasia Mts.,** alt. 0–3000 ft., frequent; *Wallach,* &c. *Cachar; Keenan. Moullinen; Parish.*

Leaves 8 by 3 in., lower long-petioled, uppermost pair usually (not always) sessile. Racemes often nearly a foot long, very pubescent. Corolla, capsule and seeds nearly as of *A. atroviridis.* Anther-cells minutely mucronate at the base.

**DOUBTFUL SPECIES.**


**Penang; Wallach.**

Stems creeping, rooting; branches 1 foot, erect, subterete, glabrous. *Leaves 3½ by 1½ in., lineolate above; petiole scarcely ¾ in. Peduncles 0–½ in.; spikes ½–1 in., glabrous, lineolate; bracts ½ in. Sepals ⅔ in., linear. Capsule ½ in., constricted for a short space at the base, 4-seeded, glabrous. *Flowers* not seen.—*T. Anderson* does not doubt this being an *Asystasia,* but it might quite as well be a *Justicia.*


"**India;**" cultivated formerly at Kew.—Upper leaves 4½ by 1½ in.; nerves 7 pair; petiole ½ in. Peduncle 3 in., grey puberulous; panicle lax; bracts ¾–1 in, linear-lanceolate, much shorter than the calyx; lower pedicels 0–½ in. Sepals ½ in. Corolla glabrous. Stamen 4 perfect, subsimilar, glabrous; anther-cells 2, bases acute. Stigma minutely equally bifid.—A plant of which nothing is known, but the excellent figure cited, and the specimen from which it was taken. The description is incorrect as to the 2 stamens, of which there are 4, hardly at all didynamous. The minute bracts are as in *Asystasia,* and will not do for *Dendrocanthus.* Its true place is, in the absence of fruit, uncertain.


W. **Deccan Peninsula;** from Saugur to Kurg, frequent; *Rottler,* &c.

Stem herbaceous, erect, thinly hairy. *Leaves* ¾ by 1½ in., with few distant multi-cellular hairs above, minutely lineolate, puberulous beneath; petiole ½ in. *Flower-heads* 1½ by ½ in., subcylindrical; bracts ½–1 by ½ in., broadly lanceolate, softly hisrate; bracteoles ⅔ in. lanceolate membranous. *Sepals* ⅔ in., linear hairy. *Stamen* slightly didynamous, nearly glabrous; anthers 2-celled; cells ovate or sub-ellipsoid, mucicous, one slightly above the other. *Style* glabrous; stigma very minutely bifid; ovary pubescent. *Capsule* ½ in., 4-seeded; solid cylindric base ⅔ in. *Seeds* compressed, angular; testa minutely laxly hexagonal, glabrous.—Very unlike the genus in the bracts, corolla, anthers, and habit, in which it more resembles *Strobilanthes micranthus.*
XXVI. ERANTHEMUM, Linn.

Stamens 3 fertile, 2 rudimentary or 0. Ovary often glabrous. Otherwise as Asystasia.—Species 30, tropics of both hemispheres.

E. diantarum, Roxb. Fl. Ind. 1.112, Wall. Pl. As. Rar. iii. 108, and E. racemosum, Roxb. l. v. 118, Wall. l. c. 107, DC. Prodr. xi. 455, came from the Moluccas.—E. semperflorens, Roth Nov. Sp. 2, Nees in DC. Prodr. xi. 458, came from Martinique, nor is there reason from Roth’s account to believe it otherwise than cultivated by Heyne.—Justicia sp., Griff. 1. Fl. As. t. 426 (Kew Distrib. n. 6177), is a fine Eranthemum, collected in Ava, outside the bounds of British India.

* Corolla tubular-ventricose.

1. E. indicum, Clarke; leaves lanceolate or subovate acuminate at both ends glabrous, racemes dense puberulous or glabrate, corolla 1 1/2 in. white abundantly purple-veined. Thyrsacanthus indicus, Nees in DC. Prodr. ix. 325. Asystasia thyrsacanthus, T. Anders. in Journ. Linn. Soc. ix. 525.

SIXXIM and BHOTAN, alt. 1–5000 ft., frequent; H. f. & T., &c. ASSAM, in the lower hills; KHASIA and JAITEA MTS., alt. 1–4000 ft., frequent.

A diffuse undershrub, 1–4 ft. Leaves 7 by 2 1/2 in.; nerves 5–7 pair; petiole 1/2 in. Racemes 1–5 in.; lower pedicels 0–1/2 in.; bracts 1/2–1 in., linear, Sepals 1/2 in., linear-lanceolate, glabrous or puberulous. Corolla distinctly 2-lipped, upper lip subentire emarginate-galeate, lower 3-fid, middle lobe the widest. Filaments and style minutely hairy. Capsule 1 1/2 in., base long, cylindric, solid. Seeds 1/2 in., orbicular, tubercled, rugose, glabrous.—It is difficult to give a reason why this is not a Thyrsacanthus, except that it is not American; the curved subgaleate corolla does not agree well either with Asystasia or Eranthemum.

** Corolla-tube linear-cylindric, often very narrow.

2. E. crenulatum, Lindl. in Bot. Reg. t. 879, not of Nees; leaves lanceolate or elliptic acuminate at both ends, racemes slender glabrous or puberulous, flowers solitary, corolla pale purple or lilac tube 1/2 in. slender narrowly funnel-shaped upwards, ovary glabrous.

KHASIA TIBAI, alt. 0–2000 ft., frequent; Wallich, H. f. & T., &c. Perennual; 18 in., glabrous. Leaves 6 1/2 by 2 in., undulate-crenate; nerves 8 pair; petiole 1/2 in. Racemes in a terminal panicle with curved drooping slender branches; bracts 1/2 in., linear-lanceolate; pedicels 0–1/2 in. Sepals 1/2 in., sublinear, glabrous or puberulous. Corolla-limb obscurely 2-lipped, 1/4 in. diam. Stamens 2, subequal. Capsule 1/2 in.; cylindric base 1/2 in. Seeds 1/2 in., rugose, glabrous.—Lindley’s picture is excellent, but shows a small example in young flower; the panicle is often 8–12 in. diam., the flowers becoming distant on the branches. The species has been quite lost sight of by Nees and T. Anders, Hooker’s examples having (probably from the short corolla) been referred to Codonacanthus.

3. E. malabaricum, Clarke; leaves elliptic or ovate narrowed at both ends glabrous, spikes glabrous or puberulous, corolla white or yellowish tube 1–1 1/2 in., ovary glabrous. E. crenulatum, Wall. Cat. 2491; Dalz. & Gibbs. Bomb. Fl. 195; T. Anders. in Thwaites Enum. 235, and in Journ. Linn. Soc. ix. 523, chiefly. Justicia latifolia, Vahl Symb. ii. 457.

W. DECCAN PENINSULA, frequent; Wight, Hohenacker. Ceylon; Thwaites (C. P. n. 1979).

Suffrutescent, 2 ft. high. Leaves 5 by 2 1/2 in., undulate-crenulate, minutely lineolate on both surfaces; nerves 6–7 pair; petiole 1/2 in. Spikes 4–9 in.; lowest pedicels obsolete in fruit; bracts 1/2 in., linear-lanceolate. Sepals 1/2 in., sublinear.
glabrous or puberulous. Corolla-tube linear, only slightly widened close to the apex; limb 1-1\(\frac{1}{2}\) in. diam., obscurely 2-lobed. Capsule \(\frac{3}{4}\) in., cylindric base \(\frac{1}{4}\) in. Seeds \(\frac{1}{4}\) in., rugose, subpuberulous glabrous.—Vahl's description agrees pretty well with this Malabar species, and he received his examples from Koenig; but his reference to Rhode Hort. Mal. ix. t. 44 (which has extremely different flowers) throws a doubt on the identification. Nees says his E. crenulatum was founded entirely on material from Silhet to Malacca, and therefore it should not belong to E. malabaricum, even in part; but in fact a good deal of Nees' material came from Malabar.

4. E. palatifera. Nees in Wall. Pl. As. Bar. iii. 108, and in DC. Prodr. xi. 457; leaves elliptic acuminate at both ends pubescent on the midrib beneath or ultimately glabrate, racemes pubescent flowers often fascicled, corolla pale-purple tube 1\(\frac{1}{4}\)-1\(\frac{1}{2}\) in. linear, ovary pubescent. T. Anders. in Journ. Linn. Soc. ix. 594. Justicia palatifera, Wall. Pl. As. Bar. i. 80, t. 92. J. rubicunda, Ham. in Wall. Cat. 2480.

Subtropical Sikkim and Bhutan, alt. 0-3000 ft., frequent; Treutler, Gamble, &c. Assam and Khasia Mts., alt. 0-3000 ft., common; Wallich, Griffith, &c.

Perennial, 3 ft.; stems pubescent upwards. Leaves 7 by 2-3 in., very obscurely (or not) lateral; nerves 8-10 pair; petiole \(\frac{3}{4}\) in. Racemes often one foot long, pubescent; bracts \(\frac{1}{2}\) in. sublinear; lower pedicels rarely attaining \(\frac{1}{2}\) in. Sepals \(\frac{1}{2}\) in., linear, pubescent. Corolla-tube linear almost to its apex; limb 1\(\frac{1}{2}\) in. diam., obscurely 2-lobed; purple often with a yellowish spot on the middle lobe of the lower lip. Capsule nearly 1 in. pubescent. Seeds \(\frac{1}{6}\) in. diam., reticulate-rugose, glabrous.

Var. leviacapsa; leaves more conspicuously lateral on the upper parts, spikes longer slender in more or less compound panicles, flowers often slenderer, capsule less pubescent usually soon glabrate. E. crenulatum, Wall. Cat. 2491, letter F.—Chittagong, alt. 0-2000 ft., frequent; H. f. & T., &c. Pegu, M'Lelland. Morgai, Griffith. Attrau, Wallich.

Var. alata; leaves large uppermost petioled elongate-cuneate at the base. E. elatum, Kurz in Journ. Bot. 1872, 46, and 1873, 47. E. latifolium, Kurz in Flora 1870, 363 excl. syn. ?—Pegu, Yomah, Kurz. Rangoon, M'Lelland.—Kurz notes that this species produces on the same plant dimorphic flowers; one kind as of E. palatifera type, the other (usually the upper ones in the spike) about \(\frac{1}{4}\) in. long, which chiefly produce fruit. Similar dimorphic flowers occur in typical Khasian E. palatifera.


Andamans; Roxburgh, Kurz. Pegu; Brandis. Chittagong; J. D. H. Penang; Wallich. Nicobar; Kurz.

Stem woody upwards, bark whiteish. Uppermost leaves very shortly petioled, base usually rounded, but in Roxburgh's picture (and in the Chittagong example) cuneate.—This, when dry, seems very difficult to separate from E. palatifera, Nees, Var. leviacapsa, except by the woodiness of the stems, almost to the panicle as shown in Roxburgh's picture and in Kurz's and Hooker's examples; the stems in E. palatifera being distinctly herbaceous unless very near the base.

6. E. malaccense, Clarke; leaves broad-lanceolate minutely pilose on the midrib beneath, spikes 1-3 subterminal puberulous or pubescent, corolla-pale-purple tube 1-1\(\frac{1}{2}\) in. linear, ovary nearly glabrous. E. crenulatum, Nees in Wall. Pl. As. Bar. iii. 107, and in DC. Prodr. xi. 453, chiefly; T. Anders. in Journ. Linn. Soc. ix. 523, partly (not of Lindl.). E. palatifera, Bot. Mag. t. 5957, left-hand fig. only. Justicia orbiculata, Wall. Cat. 2489, letter b.

Malacca; Griffith (Kew Distrib. n. 6175), Cuming, nn. 2357, 2389, &c.
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An undershrub, 4 ft. high. Leaves 5½ by 1½ in., acuminate, base cuneate, obscurely or obliquely lineolate; nerves 5–6 pair, much curved, usually crispedly pubescent when young; petiole ½ in. Spikes 2–5 in., fuscesc-puberulous, few- or little-branched, never forming a lax panicle; bracts ½ in.; lower pedicels very short. Flowers and fruits very nearly as of E. palatiferum. Young capsule sometimes sparingly pilose, soon glabrous.—This plant seems plentiful at Malaca, and probably occurs in the Malay Isles, but does not exactly agree with any Malay species at Kew, nor with the descriptions of the Dutch botanists. It may (ex descr.) possibly be E. punctatum, Nees in DC. Prodr. xi. 455.


SINGAPORE; T. Anderson.—DISTRI. Malay.

Upper leaves 5 by 1½ in.; petiole ½ in. Spike (coming into flower) 10 in.; lower clusters distant, many-fl., upper few-fl., continuous; bracts ¾ in. Calyx ½ in.; lobes linear-lanceolate. Corolla white, pubescent; lobes ¾ by ¾ in. Capsule not seen.

—Described from T. Anderson’s Singapore example. The name should be E. Blumei, but there is no authentic example of that for comparison; nor is it known whether, by recording E. Blumei among the Indian Acanthaceæ, T. Anderson alluded to his Singapore plant.


LOWER BUEMA and TENASSEBIM; Wallich, Parish. Beddome.

Leaves 8½ by 2½ in., undulate-crenulate; raphides sunk, obscure; nerves 8–11 pair; petiole ¾–1½ in. Panicles compound, stout; branches short, patent or ultimately recurved; flowers subsessile, often fascicled; bracts ¾ in., linear. Sepals ½ in., sublinear. Corolla-tube linear to the apex; limb 2-lipped, lobes of the lower lip wider than those of the upper; eye often more intensely crimson, sometimes a yellowish spot on the middle of the lower lip.

VARI. succisifolia; flowers white. E. succisifolium, Kurz in Journ. As. Soc. 1876, pt. ii. 142.—Nicobars; Kurz.—The dried examples show no good distinction between this and E. cinnabarinum; the leaves have rather fewer nerves than in Wallich’s specimen, but not than in his picture; the flowers are hardly smaller than Wallich’s; the capsules are ¼ in., altogether as of the genus.


MOULMEIN; Parish. TENASSEBIM; Beddome.

Leaves 4½ by 1½–1¾ in., very acute, variegated in all the wild examples, densely puncticulate not lineolate above; nerves 6 pair; petiole ¾ in. Spikes 2–5 in., subcrescent; bracts ⅜ in. Sepals ½ in., linear-lanceolate, pubescent. Corolla-tube linear below, upper ⅛ part distinctly widened subinflated; limb ¾ in. diam., segments subequal, Anthers subexsert. Ovary glabrous or very nearly so.—In Bot. Mag. t. 5440, the stamens are figured ¼ subequal; in the accompanying text they are said to be 2 or 4. Wild specimens have 2 perfect and 2 minute rudimentary stamens.
10. E. leptanthus, Clarke; leaves elliptic acuminate at both ends glabrous, racemes elongate many-fld. subglabrous, corolla small tube $\frac{1}{2}-\frac{3}{4}$ in. linear curved.

MISHMEE HILLS; Griffith (Kew Distrib. n. 6181).

Apparently a large herb; branches subterete, glabrous. Leaves $\frac{7}{2}$ by $2\frac{3}{2}$ in., not or very obscurely lineolate; nerves 11-16 pair; petiole 1-1$\frac{1}{2}$ in. Racemes 5-9 in., 1-5 subterminal, nearly simple; pedicels fascicled, unusually long, upper often $\frac{1}{2}$ in. ; bracts at the base of the pedicels, minute, linear. Sepals $\frac{3}{4}$ in., linear-lanceolate, glabrous, margins puberulous. Corolla glabrous; tube linear, slightly inflated, base gibbous; limb subequal 5-lobed. Stamens 2, with 2 minute linear rudiments; filaments somewhat ligulate, glabrous; anthers oblong; cells straight, parallel, muticos, on the same level exactly. Pistil glabrous; disc annular; ovary 4-ovulate; stigma minute, obscurely bifid. Capsule not seen.—A species differing widely from all others, but referred by Mr. Bentham to this genus, of which it appears to possess all the essential characters.

SPECIES IMPERFECTLY KNOWN.

11. E. graciliflorum, Nees in Wall. Pl. As. Rav. iii. 107, and in DC. Prodr. xi. 454; leaves 8 by 3$\frac{1}{2}$ in. elliptic acute at both ends subglabrous, nerves 7-9 pair puberulous beneath, petiole 2-3 in. puberulous, thyrses 4 in. dense-fld. and densely pubescent, pedicels 0-4 in., bracts $\frac{1}{2}$ in. linear, sepals $\frac{3}{4}$ in. pubescent, corolla-tube 1$\frac{3}{2}$ in. linear for $\frac{3}{4}$ its length. Justicia graciliflora, Wall. Cat. 2427.—Penang Mts.; Wallich (specimens without fruit, and with only a very imperfect flower).

12. E. bifarium, Nees in DC. Prodr. xi. 458; leaves ovate attenuate at both ends glabrate, spike small puberulous, flowers solitary opposite, bracts and bracteoles linear-subulate shorter than the calyx. Gendarussa bifaria, Wall. Cat. 7173; Nees in Wall. Pl. As. Rav. iii. 104.—Pegu; Pegee, Wallich.—Leaves 7 by 3$\frac{1}{2}$ in., entire, minutely lineolate on both surfaces; petiole 1$\frac{3}{2}$ in., puberulous. Spike (one only seen) 2$\frac{1}{2}$ in., puberulous; flowers $\frac{3}{4}$ in. apart. Calyx-segments $\frac{3}{4}$ in. linear, puberulous. Corolla not seen. Capsule 3-1 in., altogether of Eranthemum.—Nees founded this on the 2 opposite lines of minute crispèd hairs near the tips of the branches; which may be seen in E. album, malaccense and others. The solitary example of E. bifarium in Herb. Wallich differs from the neighbouring species in its depauperated spike and long-petioled leaves, but it is impossible to say that it may not be one of them.

13. E. pubescens, Both Nor. Sp. 1; leaves ovate obtuse, spikes terminal subdistichons, bracts imbricated obovate-oblong mucronate keeled densely pubescent, calyx unequal scarious. Nees in DC. Prodr. xi. 458.—India; Heyne.—A shrub; branches subtetragonal, ashy farinose. Leaves from oblong to ovate, nearly entire, nervous, paler beneath, farinose; petiole 1 in. Spike terminal, 3 in., enveloped at base by 4 or 5 ovate acute bracts; proper bracts $\frac{3}{4}$ in., dense clothed with capitulate hairs; bracteoles 2, linear-subulate. Calyx 5-leaved, 2 lanceolate subulate, 1 broader 2-nerved sub-bifid, 2 smaller. Corolla showy, pubescent without; tube 1 in. filiform, limb of 5 subequal round lobes. Stamens 2 with oblong villous anthers, 2 sterile very short. Style long, tip semi-bifid. Capsule oblong-ovoid, 4-seeded. Seeds brown, compressed, ovate subrotund, under a lens elegantly clothed with imbricated adpressed ferruginous scales.

XXVII. CODONACANTHUS, Nees.

Corolla small ventricose nearly from the base.—Otherwise as Eranthemum.

The solitary species differs from Eranthemum indicum in its very small flowers; from E. leptanthus in its ventricose corolla.

C. pauciflorus, Nees in DC. Prodr. xi. 103; leaves elliptic acuminate at both ends pubescent on the nerves beneath or glabrate,

**Khasia Hills, alt. 0–3000 ft., and Assam; Wallich, Jenkins, H. f. & T., &c. Chittagong Hills; Clarke.—Distr. S. China.

An erect herb. *Leaves* 5 by $1\frac{1}{2}$ in.; petiole $\frac{1}{2}$ in., usually pubescent. *Racemes* in the Indian examples forming very compound, slender, terminal, lax panicles; bracts minute linear; pedicels often $\frac{1}{2}$ in. *Sepals* $\frac{1}{2}$ in., linear-lanceolate. *Corolla* glabrous, pink or whiteish; cylindrical base of the tube scarcely $\frac{1}{4}$ in.; lobes 5, ovate, subequal. *Stamens* 2, with 2 minute linear rudiments. *Capsule* $\frac{1}{2}$ in.; base cylindrical, solid. *Seeds* 4 as of *Eranthemum*, but nearly smooth, scarcely rugose.—The Chinese examples all differ from the Indian in their much simpler inflorescence. Bentham, in allowing the genus 2 species in the Gen. PI., appears to think the Chinese plant distinct, but in the Flora of Hongkong he had united them.

**XXVIII. ANDROGRAPHIS, Wall.**

Annual herbs or very small shrubs, erect or procumbent. *Leaves* entire. *Racemes* axillary and terminal, lax, often compound subpanicled, or dense or subcapitate, sometimes reduced and 1-fl., frequently 1-sided; bracts small; bracteoles minute or 0. *Sepals* narrow. *Corolla* small, tubular, 2-lipped, white or pink with dark-purple lower lip, pubescent. *Stamens* 2; filaments ciliate or setulose; anthers exserted, 2-celled; cells oblong, parallel, muticous, subequal, base bearded. *Ovary* 6–12-ovulate, thinly hairy; style slender, tip minutely bifid. *Capsule* linear-oblong or elliptic, compressed contrary to the septum, 6–12-seeded. *Seeds* osseous, subquadrate or oblong, not compressed, rugose-pitted, glabrous.—Endemic in India; the 17 species being very closely connected, and identical as to form and colour of flower, and as to seeds.

* Capsule linear, thrice as long as broad.

† *Racemes* elongate often loosely subpanicled, lower flowers distant.


Throughout India from Lucknow and Assam to Ceylon (probably introduced in some of the northern stations).—Distr. Cultivated in the E. and W. Indies.

An erect annual, 1–3 ft.; stems quadrangular, base not pubescent. *Leaves* 2$\frac{1}{2}$ by $1\frac{1}{2}$ in., narrowed at both ends, never spathulate, ovate at base, pale beneath; petiole $0\frac{1}{2}$ in. *Racemes* $1\frac{1}{2}$ in.; pedicels $0\frac{1}{2}$ in., distant, usually pubescent; bract $\frac{1}{4}$ in., linear; bracteoles smaller or 0; inflorescence mostly sympodial, the pedicel in the axil of one of each pair of bracts suppressed. *Sepals* $\frac{1}{2}$ in., linear-lanceolate, pubescent. *Corolla* $\frac{1}{2}$ in., 2-lipped for at least half its length, hairy; white, spotted rose-purple. *Filaments* hairy upwards. *Ovary* and base of style subglabrous or very thinly hairy. *Capsule* $\frac{1}{2}$ by $\frac{1}{2}$ in., young slightly glandular-hairy, mature glabrous. *Seeds* subquadrate, osseous, rugose, without hairs or scales at any period, wet or dry, yellow or deep brown.—Bentley and Trimen's figure is erroneous as to the seeds being hairy. Nees and others have doubted this being *Roxburgh's Justicia paniculata*, because Roxburgh says the bracts are large; but Roxburgh regards the reduced leaves at the base of the racemes as bracts, and does not notice the true small bracts at the base of the pedicels.
2. A. subspathulata, Clarke; leaves subspathulate elliptic minutely scabrid-punctate on both surfaces, racemes lax divaricate, pedicels manifest, capsule nearly glabrous.

MADRAS; Kurool at the foot of the Nellymalls, Beddome.

In habit resembling A. paniculata; stem minutely hispid near the base. Leaves 3 by 1 in., apex scarcely acute, base suddenly narrowed; pediole ½ in., often winged to the base. Lower pedicels ½ in. Corolla ¾ in., similar to that of A. paniculata, but rather longer.—This has been considered a var. of A. paniculata; but points above noted as differential are constant.


S. DECCAN PENINSULA; Contallum, Wight; Timevelly Hills, Beddome.

Annual, erect, 2–3 ft.; branches divaricate, acutely quadrangular. Leaves 2 by 1 in., base somewhat suddenly narrowed or rarely subcordate; raphides inconspicuous; petiole often attaining ¼ in. Panicles often a foot each way; pedicels mostly very short. Sepals ½ in., linear-lanceolate. Corolla ¾ in., tube curved, limb ½–3 in., obscurely 2-lipped. Filaments flattened, glabrous or very nearly so, a little longer than the corolla; anthers glabrous. Capsule ¼ by ½ in., compressed, at first minutely hairy, soon glabrous. Seeds osseous, rugose, not compressed, glabrous.


DECCAN PENINSULA; Myhendra Hills, Berhampore and Jaypur Hills (Vizagapatam), alt. 2–4000 ft., Beddome.


—Perhaps a form only of A. elongata, Nees.

5. A. tenuiflora, T. Anders. in Journ. Linn. Soc. ix. 503; leaves ovate or lanceolate glabrous or pubescent on the nerves, spikes lax simple or compound, corolla ¾ in. obscurely 2-lipped, anthers included pubescent or slightly bearded, capsule pubescent ultimately glabrate. Haplanthus tener, Nees in Wall. Pl. As. Rar. iii. 115, and Cat. 7185, and in DC. Prodr. xi. 512. Gymnostachyum Parishii & andrographioideae, T. Anders. l. c. 504.

EASTERN FRONTIER, alt. 500–3000 ft., from Assam to Tavoy, frequent. ANDAMANS; Kurz.—Distrib. Java, Borneo.

Stems 1–2 ft., quadrangular, pubescent, or glabrous unless at the very base. Leaves suddenly or cuneately narrowed at base; or the upper sub sessile, base rounded or subcordate. Pedicels rarely ½ in.—Perhaps not distinct from A. ovata: it presents three leading variations, viz. (a) tenuiflora type, T. Anders., leaves ovate, spikes long, flowers in remote clusters; (b) Parishii, T. Anders., leaves ovate, panicles lax glabrate, flowers mostly solitary; (c) andrographioideae, T. Anders., leaves lanceolate.

Var. recessus; nearly glabrous except the very lax compound closely glandular-pubescent panicle.—Tenasserim; Mooloyit, alt. 2000 ft., Beddome.

6. A. alata, Nees in DC. Prodr. xi. 516; leaves petioled ovate upper


Stems 2-4 ft., annual, erect, glabrous, 4-angular. Leaves 3½ by 1½ in., somewhat suddenly attenuate into the petiole, conspicuously lineolate above; upper leaves few, distant, narrow. *Panicule* often 16 in. diam.; branches glabrous; pedicels 0-½ in., pubescent. *Sepals* ½½ in., bristle-pointed, pubescent or very hairy. *Corolla* ½½ in., hairy, white with pink spots; tube curved, limb obscurely 2-lipped. *Anthers* exerted; filaments subglabrous. *Capsule* 1 by ½ in., compressed. *Seeds* osseous, glabrous, not compressed.—Perhaps only a variety of *A. elongata*. The panicule being large, the examples of the old collectors show only the panicule with the reduced narrow leaves belonging thereto; and the descriptions of Vahl, Nees and T. Anderson do not describe the proper cauline leaves.

7. **A. stenophylla**, Clarke; glabrous, cauline leaves linear, racemes lax, flowers nearly all pedicelled, capsule glabrous.

Coimbatore; *Wight* (Herb. Propr. n. 2245).

*Bootsstock* woody; annual stems from its crown numerous, erect and diffuse, quadrangular. Leaves 1-½ in. by ½½ in.; raphides 0 or obscure. *Racemes* 2-5 in., axillary and terminal, not distinctly panicked, the upper leaves being nearly similar to the cauline; pedicels mostly nearly as long as the calyx. *Sepals* ½ in., linear-lanceolate, glabrous or very nearly so. *Corolla* nearly as of *A. peniculata*. *Capsule* ½ by ½ in., compressed.


S. DECAN PENINSULA; Courtallam and Anamallay Forests, *Wight*; Mysore, G. Thomson; Mangalore, Hohenacker; Travancore and Tinnevelly Ghosts, Reddome.

Stems elongate, diffuse, lax, quadrangular, glabrous, or thinly obscurely glandular-hairy. Leaves attaining 3 by 1 in., subovate, base obtuse rarely cordate, glabrous minutely lineolate above rarely obscurely scabrid puberulous; petiole 0½ in. *Racemes* 2-4½ in., weak, glabrous or rarely minutely glandular-hairy; lower pedicels sometimes ½ in. *Sepals* ½ in., sublinear, lineolate, glabrous, *Corolla* purplish, spotted on the lower lip; lips ½ in. *Anthers* exerted, slightly beard at the base; filaments setulose. *Capsule* ½½ by ½⅔ in.—Authentic examples only differ from *A. gracilis* in the few thin glandular hairs scattered on the upper part of the stem and panicle. That Nees understood the same plant as Arutt and Wight is clear from his saying that in his *A. Wightiana* the calyx was glabrous.


Mts. of S. DECAN PENINSULA; Mangalore, Hohenacker; Anamallaya and Pulneys, Reddome, *Ceylon*; Macrae, &c.

Leaves 3 by ½ in.; base cuneate or rhomboid, not rounded; nerves beneath often puberulous; petiole 0½ in. *Racemes* 6-8 in. or more, glandular-hairy, often 1-2-branched. *Corolla* and capsule exactly as of *A. Wightiana*.—Very near *A. Wightiana*; but dries blacker, and has the leaves not widest at the base.

Var. parvifolia; leaves 1-½ in. *A. ceylanica, Nees l. c. 518; T. Anders. in Journ. Linn. Soc. ix. 502, not of Wight.—Ceylon; Walker.
†† Racemes dense, forming a viscid brown-hairy head or panicle.


S. DECCAN PENINSULA; Courtallum, Wight (Herb. Propr. n. 677); Pulney Hills, Beddome.

An undershrub, scarcely 1 foot; branches numerous, glabrous, 4-lineolate. Leaves 13 by 1⁄4 in., narrowed at both ends; petiole 0–1⁄4 in. Panicles 1–2 1⁄2 in. terminal, many-fl., viscidly brown-hairy; pedicels 0–1⁄4 in.; bracts 3⁄2 in., linear. Sepals 3⁄2–1⁄4 in., linear-lanceolate. Corolla conspicuously 2-lipped; lips 3⁄2–1⁄4 in. Anthers exerted, bases thinly bearded, filaments thinly bristly. Capsule 1⁄4–1⁄2 by 1⁄4 in., pubescent. Seeds osseous, rugose, glabrous, not compressed.

VAR. expilicata; leaves 3 by 3–1⁄2 in., panicle elongate 6–8 in. less dense, capsules rather larger. A. ceylanica, Wight Jc. t. 1560, not of Nees.—Courtallum; Wight (Herb. Propr. n. 676, 2242). Concord; Stocks. Anamalays and Nilgherries, Beddome.—Wight himself, after figuring his A. ceylanica from n. 676, has altered the name of a portion of his n. 676 to A. viscousula.

11. A. Neesiana, Wight Jc. t. 1561; leaves elliptic acute at both ends sparingly minutely hairy above glabrate beneath, racemes terminal subcapitate, sepals 1⁄4 in., corolla 3⁄4 in. hairy. T. Anders. in Journ. Linn. Soc. ix. 502, excl. syn.

PULNEY MTS.; Wight (Herb. Propr. n. 2705). WYNAAD; Beddome.

Branches elongate, undivided, glabrate, obscurely quadrangular. Leaves 2⁄2 by 1 1⁄2 in.; hairs remote many-cellular, raphides 3; petiole 0–1⁄4 in. Racemes forming a dense panicle 2–5 in. diam., viscidly brown-hairy. Capsule attaining 1 by 1⁄4 in., compressed, minutely hairy.—Differ from A. viscousula in the absence of raphides from the leaves above.


VAR. affinis, Nees in Wall. Pl. As. Bar. iii. 116, and in DC. Prodr. xi. 517 (sp.); leaves small elliptic or oblong pubescent, panicles pyramidal or oblong viscidly brown-pubescent, corolla 1⁄4 in. T. Anders. in DC. Prodr. ix. 502.—Nilgherry and Krng Mts., frequent; Wight, &c.—Leaves 1 by 1⁄4 in., or smaller; minutely bristly above with no raphides, pubescent beneath; nerves less impressed on the upper surface, usually fulvous-pubescent. Capsule very hairy.

12. A. stellulata, Clarke; hairy, leaves short-petioled elliptic narrowed at both ends, heads terminal dense, sepals exceeding 1⁄4 in. linear-setaceous, corolla 3⁄4 in. A. Neesiana, Benth. in Pl. Hohenacker. n. 1435, not of Wight.

NILGHERRY MTS., alt. 6000 ft., Hohenacker, &c.

Branches elongate, obscurely quadrangular, closely villous. Leaves 2 1⁄2 by 1 in., copiously sprinkled with fulvous multieellular hairs above, closely villous beneath; petiole 0–1⁄4 in. Heads 1–2 in. diam., viscidly brown-hairy. Corolla pale pink with purple spots on the lower lip. Filaments somewhat flattened, hairy upwards. Capsule 3⁄2 by 1⁄4 in. (and upwards), hairy, compressed. Seeds osseous, rugose, glabrous, not compressed.—Much resembling A. Neesiana and others of this subsection, but distinguished by the long subtellate sepals.

13. A. lineata, Nees in Wall. Pl. As. Bar. iii. 116, and in DC.
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Prodr. xi. 516; leaves subsessile ovate or broadly oblong shortly acute glabrous, panicles very compound viscidly grey- or dusky-pubescent, corolla \( \text{\frac{3}{4}} \) in. T. Anders. in Journ. Linn. Soc. ix. 502.—Andrographis sp. n. 14, Herb. Ind. Or. H. f. & T. Justicia lineata, Wall. Cat. 2486, letter a.

S. DECCAN PENINSULA; Mysore and adjacent parts of the Nilgiri and Kurg Mts., Wight, G. Thomson, Lobb; Anamallay, Beddome.

Branches elongate, quadrangular, glabrous. Leaves 1\( \frac{1}{2} \) by 1 in., suddenly acute, base rounded; raphides above embedded, obscure; nerves beneath usually strongly elevated; petiole 0–1\( \frac{1}{2} \) in. Panicle 2–10 in.; pedicels 0 or very short. Sepals \( \text{\frac{3}{4}} \)–\( \text{\frac{3}{2}} \) in., linear-lanceolate acute, glandular-hairy. Corolla hairy. Anthers bearded at the base. Capsule \( \text{\frac{3}{8}} \) by \( \text{\frac{3}{4}} \) in., thinly hairy.—Hardly separable from A. viscosa a var. explicata by the less acuminate leaves with more strongly-marked nerves and the more densely bearded anthers.

VAR. Lawsoni; stem closely pubescent, leaves 3 in. sparsely pilose above pubescent beneath, panicle large open.—Babahoodun Hills; Lawu. Nundidroog, Beddome.—

Referred to A. affinis in Herb. Hooker: the large strongly lineate leaves, large panicle and densely barbate anthers bring it nearer to A. lineata type.


NILGIRI MTS., alt. 6–8000 ft., common in the open grass, Wight, &c.

Very rusty pubescent or nearly glabrous. Rootstock woody; stems 2–8 in., very numerous, procumbent. Leaves \( \text{\frac{1}{2}} \)–\( \text{\frac{3}{4}} \) in. dism. Panicle 1–4 in.; lower pedicels \( \text{\frac{1}{8}} \)–\( \text{\frac{1}{2}} \) in. Sepals \( \text{\frac{1}{4}} \) in. Anthers much exserted, conspicuously white-barbate. Capsule \( \text{\frac{1}{8}} \) by \( \text{\frac{1}{8}} \) in.—Very variable in indumentum. Easily distinguished (without the fruit) from A. serpyllifolia by the absence of flowers in the lower axils.

VAR. composita; racemes elongate compound forming a terminal quasi-panicle 12 by 8 in.—Cour Pallam Hills and Tirunevelly; Beddome.

** Capsule elliptic, 2–3 times as long as broad.

15. A. echiioides, Nees in Wall. Pl. As. Rar. iii. 117, and in DC. Prodr. xi. 518; erect, hairy, leaves sessile oblong or subelliptic obtuse, racemes numerous axillary, corolla \( \text{\frac{1}{2}} \)–\( \text{\frac{3}{4}} \) in. Wight Ic. t. 467; Dalz. & Gibbs. Bomb. Fl. 195; T. Anders. in Journ. Linn. Soc. ix. 503. Justicia echiioides, Linn.; Burm. Fl. Ind. 9; Roxb. Fl. Ind. i. 118; Wall. Cat. 2439.

—Rheed. Hort. Mal. i. t. 46.

TROPICAL INDIA, in the drier districts from the Punjab and Chota Nagpore to Ceylon, common (absent in Bengal proper and humid Malabar).

Annual, 8–24 in., closely pubescent and with patent white hairs. Leaves 2\( \frac{1}{2} \) by 1 in., base cuneate. Racemes about as long as the leaves, divaricate or recurved, often one from each axil about the middle of the stem; pedicels very short. Sepals \( \text{\frac{1}{2}} \)–\( \text{\frac{3}{4}} \) in., linear; in fruit elongated, sometimes \( \text{\frac{1}{4}} \) in. Corolla pubescent, pink or white, lower lip dark-purple. Anthers much exserted, white-barbate. Capsule \( \text{\frac{1}{2}} \) by \( \text{\frac{1}{4}} \) in., acute at both ends, hairy. Seeds twice as long as broad, coccous, rugose, glabrous, not compressed.

16. A. glandulosa, Nees in Wall. Pl. As. Rar. iii. 115, and in DC. Prodr. xi. 518; hairy, leaves petioled oblong or subelliptic obtuse, racemes numerous axillary, lower pedicels nearly as long as the calyx. Justicia glandulosa, Wall. Cat. 2485.

MYSORE; Hayne (fide Nees), Wight (Herb. Prop. n. 2026).

Leaves 1 by \( \text{\frac{1}{4}} \) in., both in Wight’s and Wallich’s examples, on which Nees
founds his species; which both hardly differ from *A. echioïdes* but by their short-petioled (not sessile) leaves and rather shorter (\(\frac{1}{8}\) in.) sepals.—This is certainly *Jnsticia glandulosa*, Nees, for he has written his name on Wight’s n. 2026, though this appears to be an erect annual.

17. **A. Rothii**, Clarke; shrubby, hairy, leaves small shortly petioled ovate or orbicular, racemes axillary lax few-fld., lower pedicels nearly as long as the calyx. *Jnsticia glandulosa*, Roth Nov. Sp. 137; not of Wall.

**S. Deccan Peninsula;** Wight (Herb. Propr. n. 675). Rootstock woody; branches 8–12 in., waxy, closely pubescent, and with white patent hairs, some glandular. *Leaves* \(\frac{1}{8}–\frac{1}{2}\) in., base rounded or in a few of the lower very shortly attenuated; petiole 0–\(\frac{1}{8}\) in. *Racemes* 2–4 in., patent or recurved, waxy, sometimes hispid, upper subpanicled; bracts \(\frac{1}{2}\) in., ovate. *Sepals* \(\frac{1}{8}–\frac{1}{4}\) in. *Cap- 
sule* \(\frac{1}{4}\) by \(\frac{1}{4}\) in., subobtuse.—Found loose in Wight’s Herbarium, marked simply *Erianthera*: it appears to fit very closely Roth’s description of his *Jnsticia glandulosa*.


**S. Deccan Peninsula;** Mysore, Palamcottla, &c., Shuter, Wight, &c. Rootstock woody; annual stems 2–12 in., closely procumbent, curved, densely leafy. *Leaves* \(\frac{1}{8}\) in. diam., obtuse, more or less hairy. *Racemes* sometimes forming a small terminal quasi-panicle, but always with many 1–2-fld. in the lower axis; bracts \(\frac{1}{4}–\frac{1}{2}\) in., orbicular, being gradually reduced leaves. *Sepals* \(\frac{1}{8}–\frac{1}{4}\) in., linear; in fruit often \(\frac{1}{4}\) in. *Corolla* \(\frac{1}{4}–\frac{1}{4}\) in. *Capsule* \(\frac{1}{4}\) by \(\frac{1}{4}\) in.

19. **A. Beddomei**, Clarke; leaves short-petioled elliptic and obovate glabrous, racemes solitary axillary small few-fld., lower pedicels viscos-tuberous, corolla \(\frac{1}{8}–\frac{1}{4}\) in. conspicuously 2-lipped, anthers exerted bases densely white-bearded.

**Madras;** Kurnool, Nallaymalls, alt. 2000 ft., Beddome.

Stems 4–6 in., subsimple, quadrangular. *Leaves* \(\frac{1}{8}\) by \(\frac{1}{4}\)–2 in., subobtuse, somewhat coriaceous, base cuneate, raphides 0 or obscure; petiole \(\frac{1}{2}\) in. *Racemes* \(\frac{1}{4}\) in., 3–5-fld., viscos-pubescent; bracts \(\frac{1}{2}\) in., oblong, subobtuse. *Calyx* \(\frac{1}{2}\) in. *Corolla* and stamens nearly as of *A. echioïdes*. Capsule not seen.

**XXIX. HAPLANTHUS**, Nees.

Erect herbs. *Leaves* petioled, ovate, entire. *Flowers* axillary, appearing whorled, whorls sometimes approximated into terminal spikes, surrounded by numerous barren branchlets, reduced to accicular cladodes terminated by 2–3 minute spines; proper bracts and bracteoles small. *Calyx* small; sepals sublinear. *Corolla* smallish, tubular; limb 2-lipped; lobes imbricated. *Stamens* 2; anthers 2-celled; cells ovate, equal or one sometimes much smaller, muticous; connective very hairy behind. *Ovary* 6–16-ovulate; style shortly bifid at the tip. *Capsule* narrowly oblong acute, 6–16-seeded from the base. *Seeds* ellipsoid, somewhat compressed, densely shortly hairy when moistened.—Species 3, endemic in India.

Haplanthus.]

IX. ACANTHACEÆ. (C. B. Clarke.) 507

W. DECCAN PENINSULA, frequent, Roxburgh, &c., extending north to Mt. Abbo, Stocks.

Stems 2-3 ft., pubescent or nearly glabrous. Leaves 3½ by 2 in., shortly acuminate, base suddenly attenuated, pubescent or nearly glabrous; petiole 1 in. Cladodes often 1-1½ in. in fruit, pubescent or glabrous, with or without scattered patent bristles in their lower half. Calyx ½ in., glabrous or puberulous. Corolla ⅞ in., pale lilac. Calyx ½ in. and upwards, glabrous.


BOMBAY; Dalzell. BELGAUM; Ritchie. MALABAR; Yelwah Hill in Palghaut, Beddome. CENTRAL INDIA; Mandoo, Edgeworth.

Cladodes in fruit ½ in. Corolla less than ½ in., white (Ritchie). Capsule ½-⅓ in., glabrous; seeds much smaller than in H. verticillaris.—Very near H. verticillaris. Dalzell says l. c. that H. tentaculatus is a much stouter species than H. verticillaris; but his numerous examples submitted are named by him in accordance with Nees' naming.

VAR. nilgherrensis; whorls collected mostly in terminal spikes, cladodes and sepals with many patent needle-like white hairs. H. nilgherrensis, Wight Lc. t. 1566. —Mrs. of Nilghiri and Kurg, frequent; Wight, Hohenacker, &c.


PROV: Brandis (fide T. Anderson).

An insignificant weed; stems 4-angular furfuraceous. Leaves 1-1½ by ½-1 in., minutely lineolate. Sepals ⅛ in., subulate. Corolla small, pubescent. Stamens 2; anthers 2-celled, one cell bearded. Capsule linear, compressed, glandular, many-seeded.—No example seen; the foregoing copied from T. Anderson.

XXX. GYMNOSTACHYUM, Nees.

Herbs or undershrubs. Leaves cauline or subradical, entire, sinuate crenulate or toothed. Cymes axillary or in a terminal panicle, often spicate or racemose, sometimes small axillary; bracts and bracteoles very small, except in G. hirsutum; flowers subsessile or shortly pedicelled. Calyx small (except in G. hirsutum), sub-5-partite; segments equal, linear-lanceolate. Corolla-tube slender, cylindric; limb small, 2-lipped; lobes 5, subequal, quadrate-elliptic, imbricate. Stamens 2, nearly as long as the corolla; filaments usually hairy at least near the base; anthers 2-celled; cells subequal, oblong or ovate, hairy or glabrous. Ovary pubescent, many-ovulate; style subentire at the tip. Capsule linear, pubescent or nearly glabrous, 16-24-seeded. Seeds ovoid, compressed, hairy, hairs very shortly spreading when moistened.—Species 15, Indian, with a few Malayan.

* Panicle terminal, leafless or nearly so.

† Leaves mostly near the base of the stem.

1. G. venustum, T. Anders. in Journ. Linn. Soc. ix. 506; leaves large

KHASIA MTS., alt. 0–4000 ft., common on the southern face, Wall. Ich., H. f. & T., &c.

Attaining 1–4 ft.; stem leafless or with few remote very small leaves. Radical leaves 6 by 3–4 in., or larger, acute, decurrent on the petiole, entire or undulate-crenate, nearly glabrous, or with scattered minute hairs above, nerves beneath pubescent; petiole 0–4 in. Panicle sometimes 8 by 12 in., or reduced to a single spike; flowers opposite, 1–3 together; bracts small, linear; bracteoles 0. Sepals 4–1 in., linear, hairy. Corolla pubescent; limb deep purple or blueish. Anthers oblong, glabrous. Capsule 4 in.


S. DECCAN PENINSULA; Mangalore, Hohenacker (n. 374), Wight.

Nearly stemless. Leaves 6½ by 3 in., decurrent on the petiole, subentire or undulate-crenate, above lineolate nearly glabrous or minutely sparsely setulose, beneath paler glabrous or pubescent on the nerves. Panicles 6–12 in., in appearance radical; flowers opposite, solitary or in very small few-fl. cymes; bracts small, narrow; bracteoles 0. Sepals 1½ in., glabrous or puberulous. Corolla glabrous. Anthers ovate, hairy.—Hohenaker observes that "a decoction of the root is a febrifuge," and Bentham's name febrifugum has one year's priority over alatum.


CEYLON; Walker, Thwaites, &c.

Stem 1–3 in. villous. Leaves 3 by 1½ in., obtuse, base acuminate, undulate-crenate, pubescent beneath especially on the nerves; petiole 1½ in. Peduncles 1–6 in.; panicles 5–9 by 2 in.; cymes small, subfascicled; bracts ¼ in., linear. Sepals ¼ in., linear-lanceolate, grey-pubescent. Corolla nearly glabrous; tube narrow purplish; limb small greenish-yellow. Anthers subquadrate, glabrous. Capsule ¾ in.


CEYLON; Ambagamowa District, Thwaites.

Leaves above with many lax multacellular hairs. Panicle open; lateral cymes ¼–1½ in. Otherwise as G. ceylanicum.

5. G. polyanthum, Wight Ic. t. 1494; leaves broadly ovate subglabrate base rounded or cordate, panicles linear glabrous or nearly so, corolla ¾ in.

COORG; Jordan, in Herb. Wight.

Stem 1 in., grey-puberulous. Leaves 2½ in. diam., shortly acute or subobtuse, nearly entire, punctulate above; nerves beneath much raised, grey-puberulous; petiole 1¼ in. Panicles 8 by 2½ in.; flowers in subcapitate cymes; bracts minute, linear. Sepals ¼–½ in., linear-lanceolate, glabrous or obscurely puberulous. Corolla puberulous, pink (in the dried example). Capsule ½ in.—Overlooked by T. Anderson.

†† Stems elongate, leafy upwards.

6. G. paniculatum, T. Anders. in Thwaites Enum. 232; leaves ovate
...elliptic acute at both ends pubescent on at least the nerves beneath, panicle subterminal pubescent branches cymose, corolla \( \frac{3}{4} \) in. \textit{Bedd. Ic. Pl. Ind. Or.} t. 252.

**Ceylon**, alt. 1-2000 ft.; \textit{Walker, Thwaites}.  
Erect, 2-3 ft., hairy, leafy to the panicle. \textit{Leaves} 5 by 2 in., undulate, lineolate, glabrate or hairy above; petiole \( \frac{1}{2} \) in. \textit{Panicles} 7 by 3 in., sometimes somewhat leafy at the base; lateral branches repeatedly closely 2-3-chotomous; bracts \( \frac{1}{2} \) in., linear; pedicels 0-4 in., often distinct. \textit{Sepals} \( \frac{1}{2} \) in., linear-lanceolate, pubescent. \textit{Corolla} pubescent. \textit{Anthers} ovate, glabrous. \textit{Capsule} \( \frac{3}{4} \) in.


**Concan**; \textit{Law, Dalzell}.  
An undershrub (Beddome); stems nearly glabrous. \textit{Leaves} 7 by 2\( \frac{3}{4} \) in., puberulous on both surfaces or glabrate; petiole \( \frac{2}{3} \) in. \textit{Flowers} sessile, clustered; bracts \( \frac{1}{4} \) in., linear-lanceolate. \textit{Sepals} \( \frac{1}{2} \) in., sublinear, villous, often viscid glandular. \textit{Corolla} minutely pubescent, white purple-spotted in the throat. \textit{Anthers} ovate, glabrous. \textit{Capsule} \( \frac{3}{4} \) in.

**Var. denticulata**; leaves distinctly toothed glabrous even when young.—Concan Ghauts; Dalzell, Ritchie.

8. \textit{G. leptostachyum}, Nees in \textit{Wall. Pl. As. Rar.} iii. 106, and \textit{Cat. 7178}, and in \textit{DC. Prodr.} xi. 93; leaves elliptic acuminate at both ends slightly pubescent, panicle reduced to 1 or 2 long-linear spikes hairy, corolla \( \frac{3}{4} \) in.

**Tavoy**; \textit{Wallich}.  
Stems creeping, rooting; annual flowering branches 3-5 in., erect, simple, villous. \textit{Leaves} \( \frac{3}{4} \) by \( \frac{1}{4} \) in., subentire, upper surface with distant multicellular lax hairs, lower pubescent on the nerves; petiole \( \frac{1}{2} \) in. \textit{Spikes} 1 or 2 terminal, 3-10 in.; flowers solitary, distant; bracts \( \frac{1}{4} \) in., linear-lanceolate. \textit{Sepals} \( \frac{1}{3} \) in., linear-lanceolate, pubescent. \textit{Corolla} narrow, straight. \textit{Capsule} \( \frac{1}{4} \) in., very slender, 20-seeded.—Overlooked by T. Anderson.

**Inflorescence axillary, a terminal panicle sometimes added.**


**W. Deccan Peninsula**, from Bombay to Courtallam, \textit{Wight}; \textit{Tinnevelly, Beddome}.  
Apparently a shrub. \textit{Branches} pubescent or villous. \textit{Leaves} 8 by \( 3\frac{3}{4} \) in., undulate or minutely toothed; petiole \( 1\frac{1}{4} \) in. \textit{Panicles} trichotomous; bracts \( \frac{1}{4} \) in., lanceolate; pedicels hardly any. \textit{Sepals} \( \frac{1}{4} \) in., linear-lanceolate, minutely pubescent. \textit{Corolla} pubescent. \textit{Anthers} ovate, puberulous. \textit{Capsule} \( \frac{1}{4} \) in.—Nees made 2 species out of Wallich’s 4 branches; and it is not clear why T. Anderson kept them up, unless he meant to transfer Nees’ name \textit{serrulatum} to the following var.  

**Var. longifolia**; leaves 9 by \( 1\frac{1}{2} \) in. elongate lanceolate distinctly toothed. \textit{G. longifolia}, T. Anders. ms.—Canara Ghauts; \textit{Law}.


Concan, Canara, and Malabar, Dalzell, Wight, &c.; Bababoodun Hills, Wight.

An undershrub, 3 ft. (Dalzell). Leaves attaining 9 by 5½ in., acute, very shortly acuminate into the petiole, subentire; petiole often 6 in. Panicles chiefly from the axils of fallen leaves, 3–5 in.; branches subspicate; flowers solitary or clustered; bracts small, linear. Sepals ½ in., linear. Corolla puberulous; limb greenish-yellow. Anthers ovate, minutely hairy. Capsule ½ in., very narrow, glabrate, 24-seeded. Seeds ovoid, compressed, hairy.


Ceylon; Champion, Walker, &c.

Diffuse; branches nearly glabrous. Leaves 4 by 1½ in., entire undulate or irregularly subdenticulate, punctate or minutely lineolate above sometimes obscurely scabrous; petiole 4½–1 in. Peduncles ⅛–½ in., nearly glabrous; cymes ⅓–1 in. diam.; bracts ¼ in., linear; pedicels 0–½ in. Sepals ½ in., linear, puberulous. Corolla pubescent. Capsule ⅙ in.

12. G. tomentosum, T. Anders. in Journ. Linn. Soc. ix. 505; glabrous-tomentose, leaves ovate hirsute on both surfaces, spikes axillary and terminal trichotomous, corolla ¼ in. subeulindric pubescent.

Central India; Beddome (vide T. Anderson).

A perennial, erect herb, 1–2 ft. Upper leaves 1 by ½ in., sessile, base attenuated, undulate, whitened beneath. Spikes dense; flowers pedicelled; bracts ¼ in., linear, glabrous ciliate. Punctate or minutely lineolate above. Stamens included; anther-cells equal. Capsule 1½ in., linear, many-seeded; retinacula erect, acute (T. Anderson).—Not seen, genus very doubtful.


Ceylon; Thwaites.

Erect, 2–3 ft, glabrous except at the tip. Leaves 8 by 3½ in., entire or undulate; petiole 2 in. Spikes 1–4 by 1 in., quasi-peduncled, sometimes panicled, resembling those of the dense-fld. species of Ebermaieria. Sepals ⅝ in., linear, hirsute. Corolla, stamens and pistil as of Gymnostachyum (vide Beddome). Capsule ⅜ in., many-seeded.

XXXI. PHLOGACANTHUS, Nees.

Shrubs or tall herbs. Leaves entire, or obscurely crenate. Flowers orange red or pink; thyrse or narrow panicles terminal, rarely racemes or cymes axillary; bracts small, bracteoles 0. Calyx deeply 5-fld; segments very narrow. Corolla tubular, curved upwards; limb on one side or (not very deeply) 2-lipped; segments ovate or oblong, connivent patent or recurved, imbricate in bud. Stamens 2, sometimes 2 small rudiments added;
anthers 2-celled, oblong, muticus, glabrous. Ovary usually glabrous, 10–16-ovulate; style filiform, subsimple at the tip. Capsule elongate, subtetragonal, many-seeded from the base. Seeds lenticular, ovate in outline, glabrous or densely shortly hairy.—Species 11, endemic in India.

This genus differs from Gymnostachyum in the broader, curved corolla, the glabrous ovary, and the much stouter capsule. The 2 following genera Gymnacanthus and Dicotacanthus are with difficulty discerned by the form of the corolla.

*Thyrses or dense panicles terminal.*


**Khasia Mts.,** alt. 0–4000 ft.; frequent on the southern face, Wallich, &c.

Stem 3–6 ft., stout, glabrous, puberulous upwards. Uppermost leaves often 12 by 4–5 in., acuminate at both ends, subentire, punctulate on both surfaces, nerves beneath sometimes puberulous; petiole 2½ in. Thyrs 4–5 in., short-peduncled; bracts ½ in., linear. *Calyx-tube* ½ in.; teeth sublinear, closely villous. *Corolla* densely villous, brick-red or orange; limb small, lobes hardly patent. *Stamens* glabrous, 2 small rudiments present. *Style* thinly hairy. *Capsule* 1½ by ½ in., glabrous, 12–14-seeded. *Seeds* ½ in. diam., much compressed, glabrous.—Wallich says the flowers are bright orange-red; it is generally a brick-red obscurely orange; it is not known wild of the colour depicted by Wallich, or in *Bot. Mag.*

VAB. brevicaulis; calyx-teeth scarcely ½ in.—Pegu; *Kurz. Moulmein; Parish. Tenasserim; Beddome.—A shrub, 15 ft. (Beddome). *Thyrs* much less densely villous than in *P. curviflorus* type. *Sepals* without sometimes nearly glabrous, much shorter than in *P. curviflorus* type. *Flowers* greenish-yellow (*Parish*).—T. Anderson is mistaken in supposing that this variety is cultivated in Lower Burma, and not wild.


**Khasia Mts.**; Gomez. **Jaintea Hills**; Jarain, alt. 3000 ft., Clarke.


**Assam Plains**; Hamilton. **Jenkins, Masters**; and adjacent **Khasia Terai,** alt. 2000 ft.; Borpani, H.f. & T.

Leaves reaching 10 by 3–5½ in., subentire or crenulate, densely punctulate above, almost woolly (but decidedly) pubescent beneath; petiole 1–2 in., pubescent. *Panicle* 2–8 in., densely closely Ramosus, subthyrsoid; pedicels often ½ in.; bracts ½ in., linear. *Calyx-tube* ⅛ in.; teeth linear-lanceolate, pubescent or glabrate. *Corolla* nearly as of *P. Wallichii*, yellow-red (Nees). *Capsule* 1½ by ½ in., glabrous,
12-seeded. Seeds much compressed, glabrous. —Nearly allied to *P. Wallichii*, differing in the softly hairy under surface of the leaves and the much more open panicle.


S. E. Assam; Namyoon in the Patkoye Mts., Griffith (Kew Distrib. n. 6154, n. 6155 partly).

A shrub similar in habit to *P. Wallichii*. Leaves 9 by 2½ in., acuminate at both ends, subentire, obscurely puberulous above, paler and glabrous beneath; petiole 1 in. Panicles 4 by ½ in., sub sessile; pedicels 0–½ in. Calyx-tube scarcely ½ in.; teeth linear-lanceolate, nearly glabrous. Corolla very slightly pubescent, blood-red, miniate (Griffith); lobes small, scarcely patent. Capsule not seen.—Griffith's original ticket remains on the example authenticated by T. Anderson, and shows that the plant was not collected in Mishmee.


**Subtropical Himalaya**, alt. 0–4000 ft., from Gurwhal to Bhotan, very common. *Khasia Mts. and Assam*, alt. 0–3000 ft., common. *Moulmein; Parish.—Distrib. Ava.*

A shrub, 3–7 ft. Leaves 7 by 1½ in., tapering at both ends, subentire, densely punctulate; petiole ¼ in. *Thyrses* 4–12 in., terminal, solitary or several, or quasi-axillary on lateral branches; pedicules short; bracts ½ in., linear. *Calyx-tube* ½ in.; teeth setaceous, densely pubescent. Corolla closely villous, orange; tube broad from the base, curved; upper lip suberect, lower patent. *Stamens* glabrous, or slightly hairy near the base of the filaments; 2 rudiments often discernible. *Style* glabrous. *Capsule* 1½ by ½ in., sub quadrangular, glabrous, 12–14-seeded. *Seeds* much compressed, orbicular in outline, densely shortly hairy, hairs elastically spreading when moistened.


*Khasia Mts. and Assam*; Wallich, Simons. *Chittagong Hills*; Roxburgh, Clarke.

A shrub, 3 ft., nearly glabrous. Leaves 5 by 2 in., undulate, scarcely puberulous or punctate; petiole ⅛ in. *Panicle* 2–4 in., terminal, usually solitary, very narrow; bracts ½ in., linear. *Calyx-tube* ½ in.; teeth setaceous, puberulous. Corolla suddenly curved and inflated at the summit of the tube, pubescent, pink-purple often yellow-marked; limb ringent (Roxburgh), segments connivent or not widely patent. *Capsule* ½ by ½ in., glabrous. *Seeds* glabrous.—This is one of the many species which Nees named *Thrysacanthus indicus*.


Leaves often 9 by 3 in.; petiole 1½ in. Panicles 3-6 by 1 in., terminal or quasiterminal, solitary or 2-8 together. Corolla pubescent; upper lip suberect, subapically 2-lobed, yellow; lower deeply 3-lobed, segments patent subrecurved, green with purple spots. Capsule 1½ by ½ in., 12-seeded.—Confused with P. asperulus, but the leaves are larger; the corolla larger and altogether a different shape and colour. Nees doubts whether Bot. Reg. t. 1334 belongs here, but it is a most faithful picture.


Tenasserim; Amherst, Falconer (T. Anderson).

An undershrub, 1-2 ft.; stem terete, primrose. Leaves including the petiole 4-6 by 2½ in. Spikes nearly a foot, most terminal trichotonously branched or axillary simple; flowers distichously opposite, sessile, solitary; bracts ½ in., ovate, acute; bracteoles subulate. Calyx deeply 5-partite, segments linear. Corolla-tube straight, pubescent, lower lip hiercute within. Stamens of the genus. Capsule ¼ in., clavate, subtetragonous, glabrous, 8-seeded (T. Anderson).—Not seen.

** Cymes or short panicles axillary.

9. P. pubinervius, T. Anders. in Journ. Linn. Soc. ix. 508; leaves elliptic or ovate acute at both ends pubescent on the nerves beneath, cymes axillary, calyx-segments woolly within nearly glabrous on the back.

—Phlogacanthus sp. n. 7, Herb. Ind. Or. H. f. & T.

Sikkim, alt. 5-7000 ft., J. D. H. Broten; Griffith. Assam and Khasia Mts., alt. 3-5000 ft., frequent, Griffith, &c.

A much-branched shrub, 3-8 ft. diam. Leaves 3½ by 1¼ in., subentire, puberulous or glabrate above; petiole ⅔ in. Cymes numerous, 1 in. diam., subsessile, nearly glabrous; pedicels often ¼ in., ebracteolate at the apex; bracts at their base minutely Calyx-tube ⅓ in.; teeth ⅔ in., linear-lanceolate, appearing woolly on the margins. Corolla ⅓ in., mature puberulous, tubular-inflated nearly from the base, red; limb small, segments ovate subconnivent. Stamens 2, glabrous; anthers far-exserted. Ovary glabrous. Capsule elongate, many-seeded.—Nees marked this Gropophysillium hortense.

10. P. Jenkinsii, Clarke; leaves elliptic acute at both ends glabrous, racemes or small panicles axillary grey pubescent, calyx-segments uniformly grey pubescent.

Assam; Jenkins.—Distr. Bhano.

Branches elongate, stout, quadrangular, glabrous, puberulous upwards. Leaves 6½ by 2¼ in., subentire; petiole 1½ in. Racemes 1-2½ in., dense-fld., sometimes compound; pedicels 0-¼ in., closely grey pubescent. Calyx-tube ⅓ in., segments ⅓ in., linear-lanceolate. Corolla nearly as of P. pubinervius, but rather more pubescent; appears to have been orange. Stamens 2, glabrous; anthers very shortly exserted. Ovary glabrous, 12-ovulate; style glabrous. Capsule not seen.—The calyx and corolla of this species are very like those of P. pubinervius, but the habit is more that of P. thyrsiflorus. Nees marked this Thysacanthus indicus, regardless of the 2 stamens, and 12 ovules.

XXXII. CYSTACANTHUS, T. Anders.

Corolla tubular, ventricose upwards; segments 5, ovate, scarcely patent.
Otherwise as *Phlogacanthus*.—Species 4, in Pegu, Tenasserim, and Cochin China.

1. **C. paniculatus**, T. Anders. in Journ. Linn. Soc. ix. 458; leaves elliptic acuminate at both ends puberulous on the nerves beneath, panicle terminal ovate-oblong somewhat lax hairy, calyx-segments ¾ in.

MOULMEIN; T. Lobb.

*Branches elongate, stout, tetragonal, glabrous. Leaves 5½ by 2½ in., undulate; petiole hardly ½ in. Panicle 7 by 3 in., many-fl.; bracts at the main division 1 by ½ in., glabrous, foliaceous, otherwise very hairy. Sepals linear-oblong. Corolla 1 in., upper half ventricose, hairy, violet (Lobb); segments ovate, suberect. Anthers included. Capsule ½ by ½ in., very hairy, 16-seeded. Seeds lenticular, densely shortly hairy; hairs standing out when wetted.*


**BURMA; Brandis.**

A shrub; branches puberulous, internodes short. *Leaves 3–4 by ¾–1½ in., acute at both ends, softly silky beneath; petiole 1 in. *Cymos viscosous-hairy; pedicels ¼ in. Sepals ¾ in., linear-oblong, very hairy. Corolla 1½ in., inflated upwards, viscid; lobes small, subequal. Capsule ½ by ½ in., tomentose.—Mostly copied from T. Anderson, the Kew example being imperfect; but it is sufficient to show that the species is congeneric with *C. paniculatus*, which Bentham (Gen. Pl. ii. 1088) doubts.


**MERGUI; Griffith (Kew Distrib. n. 6155, partly). MOULMEIN; Parish. TENASSERIM; Beddome.**

A shrub. *Leaves 8 by 2 in., acuminate at both ends, subentire; petiole 1 in. Panicle 4–18 by ¾ in., nearly glabrous; proper bracts small, but foliaceous; other bracts ¾ by ½ in. are sometimes scattered throughout the panicle; pedicels 0–½ in. Calyx-tube ½ in., teeth linear, slightly or densely pubescent. Corolla 1 in., tubular-funnel-shaped, somewhat curved, nearly glabrous, appears to have been green-yellow with purple spots; lobes ovate, erect-patent. Filaments very hairy at the base; connective minutely hispid on the back. Capsule ½–1 in., stout, glabrous.—This was no part of the original *Loxanthus Gomezii, Nees* (in Wall. Pl. As. Rar. iii. 99).

VAR. ? bracteosa; panicle ashy pubescent, bracts and bracteoles numerous large oblong or linear-spathulate, corolla straight subsymmetric.—Pegu; Brandis. Tenasserim, Mooleyit, Beddome. Mergui, Griffith (Herb. Propr. u. 875).

4. **C. insignis**, Clarke; leaves large broadly elliptic acute at both ends glabrous, panicle terminal dense slightly pubescent, calyx-teeth ½ in. *Phlogacanthus insignis, Kurz in Flora 1870, 364, and in Journ. As. Soc. 1870, ii. 79, and For. Fl. ii. 246.

**PEOU;** in tropical forests up to 3000 ft., Kurz, Brandis.

XXXIII. DIOTACANTHUS, Benth.

Corolla-tube short, limb large ventricose 2-lipped. Otherwise as Phlogacanthus or Cystacanthus.—Species 2, S. Malabarica.

1. D. grandis, Benth. in Gen. Pl. ii. 1101; glabrous, leaves large lanceolate or obovate-lanceolate, panicles axillary peduncled many-fld. mostly exceeding the leaves, corolla crimson. Phlogacanthus grandis, Bedd. In. Pl. Ind. Or. t. 179.


S. TINNEVELLY, alt. 3–5000 ft., and near Courtallum, Beddome. A shrub, 6–10 ft. Leaves 5 by 1½ in., subentire; nerves 7 pair; petiole ⅛–⅛ in. Peduncles 1–2 in., slender; panicles 1–1½ in., depressed corymbiform. Calyx, corolla and capsule nearly as of D. grandis.—Beddome describes the filaments as "much dilated below, articulated near the spex, quite black above the articulation;" this character being remarkable in the Acanthaceae, Mr. Bentham refers to (Gen. Pl. ii. 1101) the articulation of the filaments. But in a prolonged examination of the very filaments supplied by Beddome no articulation whatever has been made out by myself and Prof. Oliver.

XXXIV. LEPIDAGATHIS, Willd.

Herbs or undershrubs, with often pubescent bracts or leaves. Leaves entire or crenate-serrate. Flowers sessile, usually capitate, sometimes opposite or solitary; heads terminal or axillary, dense (rarely lax), usually 1-sided, often fascicled; bracts usually larger than the calyx-segments, rarely small; bracteoles narrower than the bracts. Calyx deeply 5-lobed; segments unequal, the 2 anterior more or less connate (calyx 4-partite). Corolla small (except in L. longifolia), tubular, suddenly ventricose in the middle, 2-lipped; lower lip 3-lobed, patent, usually spotted. Stamens 4, didynamous; anthers all 2-celled; cells oblong, muticus, parallel, or one lower somewhat divergent. Stigma capitellate, minutely bifid or entire. Capsule 2- or 4-seeded, elongate conoid or oblong. Seeds compressed, ovate-oblong, or orbicular, hairy.—Species 50 tropical, whereof 2 only are American.

Lepidagathis falcata & dulcis, Wall. Cat. 7166, 7167, came from Ava, outside the bounds of British India.

Sect. 1. Capsule 2-seeded, elongate-conic, dorsally scariosus, thin, irregularly tearing, only ultimately 2-valved from the subsolid tip. Seeds ovate-lanceolate, with very long hair spreading elastically when wet, very mucilaginous.
*Spikes chiefly aggregated, globose, near the base of the stem.*


**Coromandel,** in the tropical region, frequent; *Rottler, Wight* (*Herb. Propr.* n. 1971), &c.

**Rootstock** perennial; *stems* 6–18 in., branched, procumbent, quadrangular, pubescent or slightly pubescent. *Leaves* 1 by $\frac{1}{2}$ in., sessile, lineolate above, minutely scabri-pubescent on the nerves beneath or glabrate. *Inflorescence* subradical, globose; one or two smaller heads sometimes added on the lower part of the leafy branches; *bracts* $\frac{1}{2}$ in., rigid in fruit; *bracteoles* membranous, hairy, spinose. *Calyx* sub-4-partite, one segment bifid; segments upwards thickened, oblong obtuse with a micro, hairy, in fruit densely hairy. *Corolla* $\frac{1}{2}$ in., densely hairy in bud, white or brown with purple spots in the palate. *Stamens* glabrous; anther-cells one slightly above the other, papilllose-ciliate. *Ovary* globose. *Capsule* $\frac{1}{2}$ in.—T. Anderson’s specimens of *L. Shuteri* are merely the fruiting states of *L. cristata* with particularly glabrous leaves, &c. His description again appears drawn up chiefly from *L. mitis*. The older botanists did not separate *L. cristata* from the 2 following, and Willdenow’s original description does not mention the bracts, and may belong to all of the three. So Roxburgh’s picture cited shows obtuse bracts; but his description says “bracts lanceolate ciliated pointed,” which may have been taken from *L. Hookeri.*


**Behar,** alt. 1000 ft.; R. Song at Rotasghur, J. D. H.; Bhagulpore, Hamilton. **Bundelkund; Edgeworth. Jubbulpore; Beddome. Chota Nagpore,** alt. 1–3000 ft., plentiful.

Closely resembling *L. cristata* in habit, leaves and inflorescence. *Bracts* long-tapering upwards, with long white hairs on their margins. *Calyx-segments* tough-membranous. *Corolla* with adpressed straight white hairs, not densely furred as in *L. cristata.*—The flowers in Beddome’s example are detached; T. Anderson describes them as terminal, which is certainly not the case.


**W. Deccan Peninsula;** Concord, Belgaum, Mangalore, *Wight, Stocks,* &c.

Closely allied to *L. cristata.* *Stems* usually acutely quadrangular, puberulous or pubescent. *Leaves* $\frac{1}{2}$ by $\frac{1}{2}$–$\frac{1}{2}$ in., broader than in the two preceding species, often distinctly scabrid-ciliate. *Bracts* chaffy, purple or yellow.—Seems well separated from *L. cristata,* but the bracts pass insensibly into the following var.

**Var. subarmata**; bracts lanceolate soft or subspinose or rigidly spinous. *L. cristata* var. latifolia, *Nees in DC. Prodr.* xi. 256; *Dals. & Gibbs. Bomb. Fl.* 191. L.
**Spikes mostly axillary scattered.**


Rootstock woody; stems numerous, 5–10 in. Leaves 1½ by ½–¾ in., sessile, muticus, lineolate above; midrib beneath distinct, with 2 slender nerves parallel to it near the margins. **Spikes** ½ in., ovoid, often numerous, generally near the base of the stems, sometimes all conglomerated into a subradical globe as in *L. cristata*; bracts ½–¾ in., nearly half their length occupied by the subspurrosaceous cusp; bracteoles linear-lanceolate, softly membranous. **Calyx** non-spinose. **Corolla** and **capsule** nearly as of *L. cristata*.

Var. *asperrima*, T. Anders. ms.; leaves ½ by ½ in. mucronate very scabrous. Lepidagathis sp. a. 21, Herb. Ind. Or. H. f. & T.—Concan; Stocks.—Stem 6 in., branched, stoutly ligneous; branches numerous, internodes very short.


**Bombay Ghauts**; Dalzell, Stocks, Law.

Rootstock woody; stems 6–20 in., quadrangular, pubescent or nearly glabrous. Leaves 2 by ½ in., sessile, minutely hairy above, glabrous beneath. **Spikes** usually 1–3 together in many of the axils, and also a subradical congested globe, pubescent; outermost bract of each spike often 1–2 in. with a very stout bayonet-like tip; inner bracts ½–¾ in., membranous, acute or shortly spinose. **Calyx** shortly spinose or innocuous. **Corolla** ½ in. (side Dalzell); but appears only ½ in. in the dried specimens, much as of *L. cristata*.


**Carnatoo and Mysore**; Rottler, Wight, Hamilton, &c.

A prostrate, much-branched perennial, 6–20 in. Leaves ½ by ½–¾ in., sessile, usually with one spine only at the tip, rarely 1–2 spines on the margins added. Heads ½–¾ in., scattered, ovoid, few-fl.; outer barren bracts numerous, ¾ in. including the strong spine, rigid; inner bracts and bracteoles softer; calyx (or its inner segments at least) villous muticos. **Corolla** and **capsule** as of *L. cristata*.


S. Madras; Rottler, Wight, G. Thomson.
Nearly all the leaves with 2–3 strong spines on each margin; otherwise closely resembling L. spinosa.


**BOMBAY GAUTS AND SYNDREE MTS.; Dalzell, Stocks.**

**Rootstock** stout, woody; stems several 8–12 in., erect, undivided or rarely divided, lower leaves caducous. **Leaves** 1 in., rigid, plicate, squarrose, slightly ciliate or glabrate. **Spikes** 1–3 in., dense, harsh; lower bracts altogether as the leaves, upper smaller, becoming very woolly; bracteoles resembling the calyx-segments. **Calyx** ½ in.; segments unequal, silky. **Corolla** ½ in. as of *L. cristata*, but (side Dalzell) rose. **Capsule** and **seeds** as of *L. cristata*.


W. **DECCAN PENINSULA; Corean, Dalzell, Stocks; Canara, Ritchie.** Subtropical W. Himalaya; Kangra, alt. 1–4000 ft., *Clarke*.

**Rootstock** woody; branches 6–15 in., prostrate, much branched pubescent. **Leaves** ½–1 in., rigid, plicate, squarrose, strongly nerved. **Spikes** ½–2 in., in appearance axillary, dense, varying much in length; lower bracts as the leaves, upper smaller. **Calyx** ½–1 in., villous; inner segments smaller, not spinescent. **Corolla** and **capsule** as of *L. clavata*, to which this species appears closely allied, though differing so greatly in habit.

10. **L. diffusa**, *Clarke*; leaves sessile linear or elliptic entire muticous glabrescent, spikes ovate axillary often clustered, bracts lanceolate acuminate spinescent. **Barleria diffusa**, *Wight in Herb. Propr.*

**DECCAN PENINSULA; Wight; Bellary, Beddome.**

**Rootstock** woody; branches 8–10 in., prostrate, much-divided, nearly glabrous. **Leaves** 1 by ½–1 in., varying considerably on the same plant, sometimes acute almost mucronate. **Spikes** ½–3 in., dense, hairy, mostly towards the upper ends of the stems, really terminal on much-shortened lateral branches; bracts ½ in. **Calyx** 4-partite, villous; 2 upper segments lanceolate undivided, inner narrower. **Corolla** ½ in.—Wight doubtless referred this to **Barleria** because both the outer larger calyx-segments are undivided. The corolla, stamens and capsule are altogether as of *L. cristata*.

Sect. 2. **Capsule** 4-seeded, oblong, early 2-valved from the apex. **Seeds** ovate or orbicular, with very short hairs elastic when wetted.

* Leaves entire or undulate.


**BOMBAY GAUTS; Dalzell, Stocks, &c. SCinde (T. Anderson).**

Sufruticose, 1–2 ft. (at least), erect, softly hairy. **Leaves** ¾ by ½ in., attenuate at both ends, glandular-pubescent on both surfaces; petiole indistinct. **Spikes** ½–2½ in., often appearing as in terminal clusters on shortened lateral branches; bracts ½–1 in., entire, rigid. **Corolla** ½ in., yellow-white. **Capsule** ½ in., 4-seeded. **Seeds** ⅛ in. diam.—The inflorescence, capsule and seeds approach those of *L. hyalina*. 

Tropical India; extending from W. Himalaya, Falconer, Edgeworth, to Coorg, Botterl, and Malabar from the plains nearly to the top of the Ghaunts.

Shrubby; stems 1-2.ft, erect or diffuse, glabrous or pubescent towards the apex. *Leaves* of the main stem 4 in. by 1 in., mucitose; petiole 1-1.5 in.; on the lateral flowering branches the leaves are mostly 1 in., sessile, mucronate. *Spikes* 1 in., dense, or 6 in. lax with the flowers in distinct opposite pairs; bracts 3/8 in., Calyx ½ in., 5-partite. *Corolla* scarcely ½ in., white with purple spots. *Capsule* 4-seeded.


SCINDH; Stocks.—DISTRAIN. Bicolchoistan, Abyssinia.

A small, erect, rigid, much-branched undershrub. *Leaves* 1½ in. by ½ in., lineolate, obscurely ciliate-pubescent; petiole ½ in. *Heads* ½ in., appearing sessile often conglomorate; bracts ½ by ½ in., scarious, 3-5 nerved, scabrid-puberulous on the nerves; bracteoles ¼ in., linear, ciliate. *Calyx* 4-partite; 2 outer segments ½ in. broad, scarious, nerved, one bifid half-way down; 2 inner segments ½ in., linear. *Corolla* ¾ in., white, lower lip purple-spotted. *Capsule* nearly ½ in., 4-seeded.

14. **L. chlorostachyia**, Nees in DC. Prodr. xi. 256; leaves large petioloed elliptic acuminate at both ends glabrous, spikes axillary oblong dense ciliate scarcely pubescent, bracts and bracteoles narrowly lanceolate mucronate scarcely spinescent. *T. Anders. in Journ. Linn. Soc. ix. 496*. 

MEGWI; Griffith (Kew Distr. a. 6141).

Shrubby, erect. *Leaves* 1½ in. by 1½ in., entire membranous; petiole 1-.1 in. *Spikes* 2 by ½ in., subsessile, mostly solitary in each axil sometimes 2 together, erect, 1-sided or subsymmetric; bracts ½ by ½ in., white ciliate, subsymmetoric or in the 1-sided spikes falcate; bracteoles similar rather smaller. *Calyx* 5-partite; segments linear-lanceolate, nearly similar. *Corolla* ¼ in., and stamens as of *L. hyalina*. *Capsule* oblong, 4-seeded.


PRIME HILLS; Kurz.

The fragment on which Kurz founded this species is the leafless base of a stem, whence arise 2 erect spikes, very similar to those of *L. chlorostachyia*, but pubescent as well as ciliate, and the bracts rather smaller. *Stamens* 4; anthers all 2-celled, cells superposed; filaments slightly bearded at the apex. *Style* glabrous, stigma small minutely bident.—The stamens and bracts are not those of *Neuracanthus*; and the fragmentary solitary specimen is so like *L. chlorostachyia* that it might be merely a burnt-down hill specimen of it.

16. **L. purpuricaulis**, Nees in Wall. Pl. As. Bar. iii. 96, and Monogr. Lepidag. 27, and in DC. Prodr. xi. 257; leaves lanceolate or ovate-lanceolate pubescent, spikes axillary sessile solitary or clustered oblong hairy, bracts lanceolate or ovate-lanceolate mucronate striate, calyx sub-5-partite one segment broad the other 4 very narrow. *T. Anders. in Journ. Linn. Soc. ix.*
17. L. dulcis, Nees in Wall. Pl. As. Rar. iii. 96, and Monogr. Lepidag. 30, and in DC. Prodr. xi. 257, and in Wall. Cat. 7167; leaves petioled elliptic narrowed at both ends pubescent on the nerves beneath, spikes axillary ovoid or somewhat elongate hairy, bracts elliptic scarios, calyx sub-5-partite, outer segment broad. T. Anders. in Journ. Linn. Soc. ix. 496. Ruellia dulcis, Wall. Cat. 7167.

PROME HILLS; Wallich. Pegu; Kurz.

Annual stems 6-12 in., subbundivided, flexuose, in appearance procumbent, somewhat pubescent. Leaves 3½ by 1½ in., undulate, soon glabrate above; petiole ½-1 in. Spikes 1 by ½ in., mostly solitary opposite, 1-sided; bracts ½ by ½ in., somewhat obovate, apiculate not spinaceous, nerved, scarios, ciliate; bracteoles similar, but rather smaller, subfalcate. Outer sepal nearly ½ by ½ in., obovate, nerved, scarios, ciliate; 2 next ½ by ½ in. falcate, 2 inner ½ in. linear. Corolla ½ in. (Nees). Capsule exceeding ½ in., 4-seeded.


S. DECCAN PENINSULA; Coimbatore, Wight; S. Canara, Beddome.—DISTR. Abyssinia.

A small undershrub; branches numerous, much-divided, stellately woolly or glabrate. Leaves 2 by 1½ in., hardly acute, undulate; petiole 0-½ in. Spikes 1 in. diam., solitary or 2-3, conglomerate, all at the tips of the branches; bracts ½ in., ciliate, scarios; bracteoles ½ in., nearly linear. Calyx ½ in., sub-5-partite; outer segment ½ in. broad; 2 next ½ in. broad, 2 innermost linear. Corolla ½ in. and upward. Capsule ½ in., 4-seeded.—T. Andersen, as well as Nees, keeps L. terminalis distinct; but the only difference is that the corolla in L. terminalis is ½ in., whereas in L. scariosa it must not exceed ½ in.

19. L. simplex, T. Anders. in Journ. Linn. Soc. ix. 497; leaves sessile narrowly oblong glabrous, spikes terminal solitary ovoid or ellipsoid, bracts and bracteoles narrowly obovate white-ciliate, calyx sub-5-partite, segments lanceolate submucronate.

BURMA; Helper (Kew Distrib. n. 6140).

Stem simple, 4-10 in., erect, glabrous, 4-angular. Leaves 1 by ½ in., rigid, obtuse, entire, shining. Spike ½-1 in., sessile, 1-sided; bracts ½ by ½ in., scarcely acute, scarios; bracteoles similar to the bracts, but rather smaller. Calyx ½-1 in., white ciliate; 2 outer segments oblong, subentire, 2 inner linear. Corolla not seen. Capsule ½ in., oblong, 4-seeded. Seeds densely, elastically hairy.—This looks like a form of L. hyalina var. semiherbacea.

Throughout N. India, alt. 0–4000 ft., very common; from Jamu to Upper Assam and Chittagong. Behar and Chota Nagpore, frequent. Pegu and Tenasserim, common.—Distrib. Burma, S. China.

A perennial herb, 1–2 ft. Leaves 3 by 1½ in., uppermost often narrower, pendant, undulate; petiole ½ in. Spikes 1–1½ in., erect, 1-sided; bracts nearly ½ in.; bracteoles ½ in., linear-lanceolate, mucronate. Sepals ½ in., ciliate, sometimes softly hairy. Corolla white with brown spots in the palate. Capsule ½ in., 4-seeded.—Of this plant so universal in N. India there is no plate extant; nor is there any example of the typical form at Kew collected in the Deccan. Roxburgh says his *Ruellia dependens* is native in Mysore; but the examples in his collections under that name are all the common Bengal form.

**Var. mollis;** leaves all ovate hairy on both surfaces, heads very softly hairy.—Himalaya Terai, frequent.


**Var. mucronata;** leaves ovate pubescent beneath, spikes and heads small or large, bracts ½ in. *L. mucronata*, Nees in Wall. Pl. As. Rar. iii. 95, and Monogr. Lepidag. 11, and in DC. Prodr. xi. 250. *L. neurophylla*, T. Anders. in Journ. Linn. Soc. ix. 497. Ruellia mucronata, Wall. Cat. 2366, type sheet.—Concan, Canara, Nilgherries, &c., Stocks, Wight, Dalzell, &c.—Nees founded this species on Wight's plant (Herb. Propr. n. 1968), which has small leaves; subsequently he (in DC. Prodr.) added such specimens from Mergui as had small leaves: these, however, having bracts ½–1 in. are nearer *L. purpuricaulis*, though their stems are not very purple. T. Anderson's *L. neurophylla* has full-sized leaves; the bracts are nearly the same as in *Var. mucronata*.

**Var. lophostachyoides**, Nees in DC. Prodr. xi. 252; leaves large, spikes 2½ by ½ in. 1-sided, bracts as in *L. hyalina* type.—Ceylon; Gardner, Walker, &c. Bababoodun Hills; Clinghorn.—This variety in habit and in details runs very near *L. chlorostachys*, but has the spikes rather slenderer, the bracts rather smaller.

**Var. semiterubescens;** leaves linear-lanceolate often shining. *L. semiterubescens*, Nees in Wall. Pl. As. Rar. iii. 96, and Cat. 7164, and Monogr. Lepidag. 20, and in DC. Prodr. xi. 253; Wall. Cat. 7164. *L. iridescens*, T. Anders. in Journ. Linn. Soc. ix. 496. Lepidagathis sp., Griff. Notul. iv. 137.—From Sikkim and Assam to Burma, very common in the Terai and adjacent Tropical Valleys.—Stems often elongate, diffuse, with long nodes; the lower stem leaves (in the extreme form of the variety) 7 by ½ in. But intermediate forms are more common, having the lower leaves ovate, the upper or uppermost oblong or linear, large or small. Some of the examples only differ from *L. simplex*, T. Anders., in having numerous heads.

**Var. riparia;** leaves large ovate, heads large softly ciliate, bracts ½ in. (or sometimes longer) acuminate long aristate. *L. riparia*, Nees in DC. Prodr. xi. 253. *L. aristata*, Nees in Wall. Pl. As. Rar. iii. 95, and Monogr. Lepidag. 19; Wall. Cat. 7163 (not Ruellia aristata, Vahl).—Rangoon; M'Leodland. Pegu Yomah; Kurs. Tenasserim; Beddome. Siamese Hilla; Parish.—Kurs and Beddome have noted on their specimens that this is probably a distinct species; and it seems more distinct from *L. hyalina*, to which T. Anderson reduced it, than some usually admitted species.

Linn. Soc. ix. 496; leaves subsessile linear acute at both ends scabrous pale beneath, spikes terminal or axillary tetragonal subsecund dense woolly, bracts herbaceous obliquely lanceolate mucronate ciliate 1-nerved, calyx 5-partite membranous ciliolate upper segment lanceolate rounded at the tip 3-nerved.

Burm.; E. Scott.


**Leaves crenate or crenate-serrate.** (Anther-cells more separated and more divergent at the base than in the rest of the genus.)

22. L. ceylanica, Nees Monogr. Lepidag. 35, and in DC. Prodr. xi. 259; leaves petioled ovate-lanceolate nearly glabrous, bracts as long as the calyx elliptic or obovate scarious 3-nerved glabrous ciliate. T. Anders. in Journ. Linn. Soc. ix. 498. L. nervosa, Wight Io. t. 1620.

Ceylon; Walker, Thwaites.

Stems 2–3 ft., herbaceous, diffuse, 4-angular, glabrous. Leaves 3 by 1/2 in., acuminate at both ends, crenate-serrate, obscurely puberulous; petiole 1/2 in. Spikes 3 in., ovoid or obovate, in dense panicles or clusters; bracts 1/2 by 1/2 in., mucronate; bracteoles 1/2 by 1/4 in., subulate, scarious, 3-nerved, ciliolate. Calyx 1/2 in., deeply 5-fid, scarious, glabrous, ciliate; outer segment oblong or elliptic, other 4 narrow. Corolla 1/2 in. Capsule 1/2 in., 4-seeded.

23. L. Walkeriana, Nees in DC. Prodr. xi. 260; leaves petioled ovate-lanceolate nearly glabrous, bracts half as long as the calyx elliptic. Wight Io. t. 1530; T. Anders. in Journ. Linn. Soc. ix. 499. L. ceylanica, var. 3, Nees Monogr. Lepidag. 35.

Ceylon; Walker, Macrae, &c.

Bracts 1/4 in., 3-nerved, subscarious. Calyx 1/4 in., densely minutely glandular-hairy or glabrate ciliolate. Otherwise as L. ceylanica, which it so greatly resembles that Wight has noted on the specimen he has figured a doubt whether it was the "true Walkeriana," which it certainly is.


Throughout Tropical and Subtropical India, from the base of the N.W. Himalaya and Bengal to Ceylon and Tenasserim; mostly rare, plentiful in Malabar.

Stems 1 foot, herbaceous, diffuse, hairy. Leaves 2 by 1 in., crenate-serrate, pubescent at least on the nerves beneath; petiole 1/2 in. Spikes 1/2 in. diam., or often elongate, interrupted below with the lower flowers in opposite pairs; bracts 1/2–1 1/2 in., in fruit somewhat enlarged; bracteoles rather shorter than the bracts, incisate-oblong. Corolla and capsule nearly as of L. hyalina.—This plant always occurs with Hemigraphis latelobosa, Nees; without counting the ovaries or seeds it may be distinguished therefrom by the presence of bracteoles, the capi-
tellate sub-bisect stigma, the corolla suddenly ventricose in the middle not tubular (as in *Hemigraphis latebrosa*).

**V. major**; leaves larger toothed or subentire, heads larger, bracts $\frac{3}{4}$ by $\frac{1}{4}$ in. acute subspinelose, calyx $\frac{2}{4}$ in., corolla $\frac{1}{4}$ in.—Tenasserim; Mooleyit, Beddome.—Much finer than the ordinary *L. fasciculata*, of which some examples from moist valleys in Malabar (marked *L. goensis*) come so near this Tenasserim plant that it is difficult to treat the latter as a species.

**DOUBTFUL SPECIES.**


**MALACCA**: *Griffith* (Kew Distr. u. 6138), Maingay.

**Branches** terete, glabrescent. *Leaves* 9 by 2 in., acute at both ends, entire; petiole $\frac{3}{4}$ in. Spikes 3–7 by 1 in., clustered towards the end of the branch, lax, nodding, pubescent; bracts $\frac{3}{4}$ by $\frac{1}{4}$ in., opposite, one of each pair usually barren; bracteoles $\frac{1}{4}$ in., oblong. *Calyx* nearly $\frac{1}{4}$ in., 5-lobed nearly to the base; 3 segments broadly lanceolate, 2 linear. *Corolla* in form nearly as of *Lepidagathis* but larger, minutely hairy without, nearly glabrous; no traces of dots on the lower lip. *Stamens* 4, slightly didynamous; filaments glabrous, connective papillose; anthers oblong, cells parallel approximate each with a divaricate minute mucro at the base. *Ovary* depressed, glabrous, 4-ovulate; style patent hairy; stigma capitellate (not as in *Wight Ic.*). *Capsule* not seen.—A remarkable plant, both in habit and characters removed from *Lepidagathis*; in the absence of fruit it is advisable not to found a new genus on it. Nees marked it "Species ab Acanthaceis aliena." In many points it approaches *Asystasia Laniana* and *Strobilanthes*.


**Martaban**; *Parish* (fide Kurz).

A herb, 1–2 ft., stems terete with 4 elevated lines. *Leaves* 7–8 in., acuminate at both ends, shining, petioled. *Bracts* 1 in., oblong-lanceolate acuminate thin-papery, tinged purple-lilac, 1-nerved and reticulated, glanduloso-puberulous; bracteoles similar to the bracts but narrower. *Calyx* large. *Capsule* wanting.—Not seen; the foregoing translated from *Kurn* l. e. Appears ex descr. to be allied to *L. longifolia*.

### XXXV. PHIALACANTHUS, Benth.


*Mishme*; *Griffith*.

*Leaves* 7 in. by 2 in., broad-elliptic, acuminate at both ends, bearing raphides on both surfaces; petiole 1 in. *Cymes* 3 in. diam., short-peduncled; lower bracts $\frac{1}{4}$ in., linear, upper minute; pedicels $\frac{1}{4}$ in. *Calyx* $\frac{1}{4}$ by $\frac{1}{4}$ in., enlarged in fruit; teeth $\frac{1}{4}$ in., triangular. *Corolla* 1 in., orange with yellow mouth (*Griffith*). *Stamens* glabrous; anthers minutely pubescent. *Style* glabrous. *Disc* small, cup-shaped. *Capsule* (unripe) $\frac{1}{2}$ in., glabrous.

### XXXVI. MONOTHECUM, Hochst.

Diffuse herbs. *Leaves* entire. *Spikes* small, ovate or oblong, dense;
bracts and bracteoles linear or setaceous. Sepals 5, equal, linear-setaceous. Corolla small, tubular, limb deeply 2-lipped. Stamens 2; anthers narrowly oblong, 1-celled, mucous, attached by the middle of the back. Style minutely bifid. Capsule oblong, on a short solid stalk, 4-seeded. Seeds compressed, orbicular, rugose subtuberculated; retinaculum stout.—Species 2, Indian and Tropical African.

**M. aristatum**, T. Anders. in Thwaites Enum. 234; leaves ovate or ovate-lanceolate pubescent on the nerves beneath, bracts $\frac{1}{2}$-in. linear setaceous lineolate. Bedd. in. Pl. Ind. Or. t. 269. Justicia aristata, Wall. Cat. 2481; Nees in Wall. Pl. As. Rar. iii. 115. Anthocometes aristatus, Nees in DC. Prodr. xi. 312.


Stems 1 foot, procumbent, much branched, often rooting. Leaves $\frac{1}{2}$ by $\frac{1}{2}$ in., cuneate at both ends; petiole $\frac{1}{2}$ in. Spikes $\frac{1}{2}$-1$\frac{1}{4}$ in., peduncled or sessile, pubescent or nearly glabrous; bracteoles (harren bracts frequent). Sepals $\frac{1}{2}$ in. Corolla $\frac{1}{2}$ in., white, lower lip brown-spotted. Capsule $\frac{1}{2}$ in.—This is so like Justicia procumbens that an example of it in Herb. Kew is marked "Rostellularia procumbens, Var. a or b," by Nees' hand.

XXXVII. **CLINACANTHUS**, Nees.

A tall herb, minutely pubescent. Leaves ovate-lanceolate, entire or toothed. Flowers conspicuous, dull red, in small drooping cymes at the tips of the branches; bracts and bracteoles small, linear. Sepals 5, equal, linear-subulate. Corolla-tube elongate, curved at the base, widened upwards; limb 2-lipped. Stamens 2; anthers scarcely exserted, 1-celled, narrowly oblong, mucous, attached by the middle of the back. Style minutely bifid. Capsule oblong, on a short solid stalk, 4-seeded. Seeds muricate (Nees).

Only differs from Hypoestes by the small bracts.


Malacca; Maingay.—Distrib. Java, Borneo, Hainan.

Leaves 2$\frac{1}{2}$ by 1 in., acuminate, base cuneate or rounded; petiole $\frac{1}{2}$ in., puberulous. Cymes about 5-fld.; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ in. Sepals $\frac{1}{2}$ in., rusty pubescent. Corolla 1$\frac{1}{2}$ in., lobed $\frac{1}{2}$-in. Stamens and pistil glabrous.

XXXVIII. **JUSTICIA**, Linn.

Herbs or shrubs. Leaves entire. Flowers sessile or nearly so, spiked or paniced (rarely solitary), small or middle-sized; bracts large or small; bracteoles narrow or 0. Calyx 5- or 4-partite; segments narrow. Corolla-tube shorter, or scarcely longer, than the 2-lipped limb; upper lip 2-lobed or subentire, lower 3-lobed, lobes imbricate in bud. Stamens 2, filaments often dilated, hairy near the base; anthers 2-celled; cells oblong or round, usually more or less separate, lower always with a white basal appendage. Ovary 4-ovulate; style filiform, shortly bifid. Capsule ovoid or ellipsoid, 4-seeded from the base, or with a long solid cylindrical stalk 4-seeded at the apex. Seeds ovoid, more or less compressed, tuberculatc, scalar or glochidiate-subspinescent (appearing hispid), never with fine elastic hairs springing out when wetted.—Species 100, in the warm regions of both hemispheres.
**Justicia.**

**CIX. ACANTHACEÆ. (C. B. Clarke.)** 525

J usticia *bivalvis*, Roxb. Fl. Ind. i. 124, came from the Moluccas, and was probably a *Dieliptera*; though Roxburgh quotes his species as the same as *Linnaeus* under that name, he excludes (correctly) the plate on which *Linnaeus* founded his species.

*Gendarussa virgata*, Wall. Cat. 7176, was collected in Ava, outside the bounds of British India.

*Justicia inconspicua*, Wall. Cat. 2475, collected in Penang, is not in Wallich's Herbarium at the Linn. Soc., nor are there any data for determining its genus.

Sect. 1. **Hemichoriste.** Shrubby. **Spikes** elongate; flowers clustered; bracts herbaceous, subovate. **Corolla** and **capsule** large.


W. **DECQ PAN SULA**, in the Ghauts, from Mahabelaishwur (*Law*) to Nilgherries (*Wight*).

Stem erect, subtetragonous, puberulous upwards. **Leaves** 9 by 3½ in., both surfaces punctulate; petiole 1 in. **Spikes** 6–15 in., the terminal often paniculately branched; lower clusters of flowers usually distant, upper continuous; bracts ½ by ¼ in., lower larger; bracteoles smaller, elliptic, near the base of the pedicel; pedicels 0–½ in. **Sepals** 5, ¼ in., sublinear, pubescent. **Corolla** 1–1½ in., 2-lipped half its length, minutely pubescent, red. **Stamens** 2 (without any rudiments); lower anther-cells long-spurred. **Capsule** 1 in., clavate, pubescent, 4-seeded near the top. **Seeds** glabrous, intensely rugose, but possibly smooth when fully ripe.—*Nees* says "stamens 4, 2 shorter with 1-celled anthers or rudimentary;" but there is no trace of these shorter stamens in the example named by *Nees' hand.*

Sect. 2. **Betonica.** Shrub or herbs. **Spikes** continuous; bracts ovate or elliptic, often 4-ranked, mostly imbricate. **Calyx-segments** 5, nearly equal.

*Bracts white, green-nerved.*


Throughout **India and Ceylon**, common; often cultivated.—**DISTRIB.** Malaya, Tropical Africa.

Branches terete, glabrous, tips pubescent. **Leaves** 3 by 1½ in. (lower sometimes much larger), punctulate on both surfaces, not liniate, base shortly attenuate; petiole ½ in. **Spikes** 1–4 by ¾ in., short-peduncled, terminal, often co short lateral branches appearing lateral; bracts ⅔ by ⅓ in., ovate acute, white, minutely pubescent; bracteoles ¼–⅓ in., similar to the bracts. **Sepals** ⅓ in., linear-lanceolate, pubescent. **Capsule** ⅔ in., stoutly clavate, pubescent, 4-seeded. **Seeds** ovoid, somewhat compressed, glabrous, densely rugose in nearly all herbarium specimens, but smooth in some fully ripened.


NILGHERRES, alt. 7-8000 ft.; plentiful in the grass round Ooty.

Rootstock woody. Stems 2-8 in., numerous. Leaves $\frac{1}{4}$ by $\frac{1}{6}$ in. Spikes terminal, $\frac{1}{2}$-2 in.; bracts $\frac{1}{2}$ by $\frac{1}{3}$ in., scarious-margined, very acute. Capsule $\frac{1}{3}$ in., stout, clavate, pubescent, 4-seeded. Seeds (not ripe) glabrous, subtuberous, rugose, not differing from those of some examples of *J. Betonica* at the same stage.—Seems distinct, but not allowed by T. Anderson (in *Thuwates Enum.* 233). Though the plant is so humble, the bracts, corolla and capsule are full as large as in *J. Betonica*.


W. DECCAN PENINSULA, in the Ghauts, frequent; Conceal, Stocks, Dalzell; Canara, Ritchie; Nilgherries, Wight, &c.

Rootstock woody; stems 3-8 in. Leaves $\frac{1}{4}$-1 in., lower mostly short-petioled, upper sessile. Spikes 1-4 by $\frac{1}{6}$ in.; bracts $\frac{1}{3}$ by $\frac{1}{6}$ in., lanceolate, white or sometimes green, not or obscurely nervose.—This plant, “a small var. of *J. Betonica*” (T. Anders. ms.), differs considerably in the slender spikes and narrow bracts, as well as in size and habit, nor are there intermediates in the Herbarium.

VAR. arenaria; leaves linear-oblong, spikes often small. Adhatoda arenaria, *Nees in DC. Prodr.* xi. 387.—W. India; Conceal, Belgaum, &c.

**Bracts green, often purple-tinged, not white though sometimes scarious-margined.**


PEGU and TENASSERIM; Wallich, M'Lelland, &c.—DISTRIB. Siam, China (cultivated?).

Branches stout, glabrous. Leaves 6 by $\frac{1}{2}$ in.; petiole $\frac{1}{4}$ in. Spikes 3 by $\frac{1}{3}$ in., continuous, somewhat dense; peduncles 0-1 in., terminal, or terminal on short lateral branches; bracts $\frac{1}{4}$- $\frac{1}{6}$ in. diam., sub-4-ranked, puberulous. *Flowers* usually 3 in the axil of each bract subterse; bracteoles $\frac{1}{4}$ in., subulate, or 0. *Calyx* $\frac{1}{4}$- $\frac{1}{6}$ in.; segments sublinear. Capsule $\frac{1}{4}$ in., hairy.

6. *J. oreophila*, Clarke; leaves broadly elliptic acute at both ends pubescent beneath, bracts orbicular imbricate 1-fl., bracteoles large spatulate-oblong.

CHITTAGONG Seetakoon alt. 1000 ft., *J. D. H.*
A shrub, habit of *J. ventricosa*; innovations densely silky strigose. Leaves 8½ by 2½ in., above minutely finely hairy, nerves reticulate impressed, beneath pubescent especially on the nerves; petiole ½ in. Peduncles 1–3 in., axillary; spikes by 1 in., rachis softly hairy; bracts sub-4-ranked, by ½ in., green, puberulous, 5-nerved; bracteoles by ½ in., green. Calyx ½ in., pubescent; segments linear-lanceolate.—Differ from *J. ventricosa* in the indumentum and bracteoles.


E. Bengal; Jaintia Mts., Gomez; Cacbar, Keenan.

A shrub; stem rooting; annual branches 1 foot, villous-pubescent. Leaves 6 by 2½ in.; petiole ¼ in. Spikes axillary and terminal, 1½ by ½ in., dense; peduncles ¼ in.; bracts closely imbricate, imperfectly 4-ranked, by ½ in., obtuse or subacute; bracteoles ¼ in., minutely hairy. Sepals ⅜ in., equal, linear-lanceolate, minutely hairy. Anther-cells minutely hairy, lower distinctly white-tailed. Capsule scarcely ½ in., pubescent, clavate, 4-seeded; pedicel solid, placenta not rising clasally from the capsule-base. Seeds glabrous, rugose, subshower.-Very few of the plants marked Pundua by Wallich were collected at or near Pundua; the present species was collected by Gomez (Wallich's trained Eurasian collector), and delivered to Wallich in his boat at Pundua. It is strange that Nees and T. Anderson should have removed this species to *Rungia*; for it is a shrub resembling *J. Atkinsonii*, &c.

8. **J. burmanica**, Clarke; leaves long-petioled broadly elliptic acute at both ends villous on the nerves beneath, bracts obovate or orbicular nearly glabrous 1-fld., bracteoles broadly lanceolate longer than the calyx.

**Burma**; Griffith (Kew Distrib. n. 6184).

Resembling very much *J. Keenanii*, but the leaves are long-petioled, the bracts herbaceous, uniformly intensely green (even when dried) without a scarios margin. Spikes 2–5 in., continuous but lax; bracts sometimes scarcely imbricate, subpatent. Corolla not seen. Capsule ¼ in., 4-seeded, glabrous or puberulous.


**Burma**; Prome Hills, Wallich.

An undershrub (or large herb) with the habit of the preceding species. Leaves 11 by 5 in., shortly attenuate at both ends; petiole ½ in. Spikes axillary, solitary and terminal, 2–5 by 1 in., continuous; peduncles short; bracts ½–⅜ by ½ in., imbricate, green, purple-marginated; bracteoles ⅜ in. Sepals 5, ⅜ in., linear-lanceolate. Corolla (fide Nees) yellowish-white purple-marked. Capsule ¼ in., clavate, 4-seeded.—This differs from the allied species (except *J. Kurzii*) by the long soft hairs on the bracts.

10. **J. Kurzii**, Clarke; leaves large ovate minutely pubescent, bracts large elliptic acute softly long-hairy 1-fld., bracteoles sublinear longer than the calyx, corolla nearly 1 in.

**Begu**; Kurz.

A large herb, closely resembling *J. argyrorostachya* except as to the corolla. Leaves 7 by 4½ in., acute, base suddenly attenuate; petiole 2½ in. Spikes 3–4 in.; bracts ½ by ½ in., sub-4-ranked; bracteoles ⅜–½ in., hairy. Calyx-segments ⅜–⅜ in., linear-
setaceous hairy. *Corolla* (dried) rose-purple, spotted; tube much inflated upwards. Lower *anther-cell* conspicuously white-tailed. — A specimen, issued by Kurz under the same number (2167), had large oblong leaves much attenuate at both ends; petiole winged to the base, and there often auriculate; capsules 1/2 in.; clavate, 4-seeded. From the variations of the leaves in some allied species, it is probably a form of *J. Kurzii*.


**Sikkim** and *E. Brotan*, alt. 2–6000 ft., from the outer hills to the northern valleys frequent, *T. Anders*, &c.


**Moulmein**; *Parish. Tenasserim*; *Beddome*

A shrub (T. Anders.). *Leaves* 8–5 in., attaining 14 by 7 in. (T. Anders.), shortly acuminate, base rounded or very shortly decurrent; petiole 3 1/2 in. *Spikes* axillary and terminal, 3–11 by 1 in., continuous, somewhat lax, very pubescent; peduncles 0–1 in.; bracts 1/3–1 by 1 1/2 in. *Sepals* 5, 1/2 in., linear-lanceolate, very pubescent. *Corolla* 1/4–1 1/2 in., pubescent, white purple-marked. *Anther-cells* glabrous, subparallel, lower minutely white-tailed. *Capsule* 1/2 in., stoutly clavate, pubescent, 4-seeded.


*Stem* 14–3 ft., glabrous, pubescent upwards. *Leaves* 3 by 2 in., base obtuse, raphides conspicuous on both surfaces; petiole 1/4 in., pubescent. *Spikes* axillary and terminal, 1 1/2–1 1/2 by 3 in., continuous; peduncles 1/4 in.; bracts 1/4 in., green; bracteoles 1/4 in. *Calyx* 1/4 in.; segments 5, linear-lanceolate, pubescent. Lower *anther-cell* shortly white-tailed. *Capsule* 1/4 in., clavate, pubescent, 4-seeded.—The bracts are 1–3-fl.d., where several flowers occur, some of the bracteoles are suppressed. The leaves, bracts and flowers are considerably smaller than in the preceding species.

14. **J. fragilis**, *Wall.* Cat. 7174, type sheet only; leaves oblong narrowed at both ends glabrous, bracts elliptic acute puberulous several-fl.d., bracteoles small linear or 0, corolla 1/2 in.—*Justicia* sp., *Griffit.* *Notul.* iv. 143.

**Tenasserim**; Amherst, *Wallich*; *Mergui*, *Griffith*.

*Branch* elongate, glabrous. *Leaf* 5 by 1 1/2 in.; petiole 1/4 in. *Spikes* 1–5 in., terminal and quasi-axillary on short-lateral branches, interrupted below; bracts 1/4 by 1/4 in., uniformly green, somewhat deciduous, upper inuricate; flowers clustered on the spikes; bracteoles 0–1 in. *Sepals* 5, 1/2–1 1/2 in., linear, puberulous. *Corolla* pubescent, altogether as of *Sect. Betonica*. *Stamens* and *pistil* very nearly glabrous; lower *anther-cell* distinctly shortly white-tailed.—The elongate spikes interrupted below
and deciduous bracts are very unlike *J. ventricosa*, with which Nees united this, and which has been distributed by Wallich under the same number.

15. **J. caloneura**, Kurz in *Journ. As. Soc.* 1873, pt. ii. 96; leaves elliptic acute at both ends minutely pubescent, bracts ovate acuminate pubescent, bracteoles broadly lanceolate exceeding the calyx, corolla §-§ in.

**TENASSERIM; Beddome.**

A perennial herb; stems 2–3 ft., glabrous or crisped-pubescent. *Leaves* 4 by 1½ in., nerves conspicuously reticulate on both surfaces; petiole 0½ in., crisped-pubescent. *Spikes* terminal, 1½ by 3 in., dense; peduncles 1½ in.; bracts ½ by 3 in., 4-ranked, striate, green black-tipped, ciliate; bracteoles ½ by 1½ in., green. *Sepals* 5, 3 in., linear, pubescent. *Corolla* minutely hairy, straw-coloured (Kurz). *Anther-cells* distinctly white-tailed. *Capsule* not seen.—Identified with Kurz's *J. caloneura* from description only.


**CEYLON; Walker, Gardner, &c.**

Herbaceous, 2–3 ft., branched, glabrous; whole plant, including the bracts, drying black. *Leaves* 3 by 1 in., acuminate, not or very obscurely lineolate, base cuneate, midrib beneath glabrous; petiole 3 in. *Spikes* axillary, branched, lax, nearly glabrous; bracts ½ in., orbicular, on a ½ in. pedicel, patent; bracteoles similar, but rather smaller; flowers in distant opposite pairs. *Calyx-segments* 5, 3 in., linear, nearly glabrous. *Corolla* nearly glabrous, purple (like Nees); lower lip longer. *Capsule* ½ in., clavate, tuberulous, 4-seeded.

**VAR. viridescens;** leaves larger pubescent on the nerves beneath, bracts larger obvate, bracteoles oblong.—Ceylon; *Walker, Thwaites*, C. F. n. 2422, partly.—Whole plant drying green. *Leaves* 5 by 2 in., conspicuously lineolate on both surfaces. *Spikes* 2–4 ft., much interrupted; bracts ½ by 1½ in., green, nearly glabrous; bracteoles ½ in. *Calyx-segments* ½ in., lineolate. *Capsule* as of type.—Very unlike *J. ceylanica*, of which both Nees and T. Anderson consider it a form.

**VAR. capitata**, T. Anders. ms.; leaves pubescent, spikes capitate globose solitary on short axillary peduncles.—Ceylon; *Thwaites*, n. 5919, and 2423 partly.—Branches pubescent. *Leaves* subhispidly pubescent on both surfaces, drying green. *Peduncles* ½ in.; heads ½ in. diam., rusty pubescent; bracts densely imbricate. *Calyx-segments* ½ in., oblong-lanceolate, subscarious. *Corolla* and *stamens* as of *J. ceylanica*. *Capsule* not seen.—A very puzzling plant, not seen by Nees; Mr. Bentham observes that it is "very near *A. ausostachya*.


**DECCAN PENINSULA,** alt. 0–2000 ft., frequent; *Rottler*, &c.

*Stems* 8–20 in., herbaceous, puberulous, diffuse; internodes long. *Leaves* pubescent on the nerves beneath, those at the main nodes acute at both ends, many smaller often rounded leaves on the lateral branches; petiole ½ in. *Spikes* 1–5 by ½ in., terminal, lax; solitary brickless flowers often scattered in the distant lower axes; bracts ½ in. diam., often subpatent, very variable in indument; *bracteoles* ½ in., obovate-oblong, or often 0. *Sepals* ½ in., linear, pubescent or glabrous. *Capsule* ½ in., nearly glabrous, short-stalked, 4-seeded. *Seeds* hispid with ovate acute scales.—Perhaps not.
distinct from the next. T. Anderson regards the presence of scattered solitary flowers in the lower axils as of specific importance, and has deviated from the results of the older botanists accordingly.

18. **J. tranquembariensis**, Linn. f. Suppl. 85; very woody, leaves \( \frac{1}{4} \) in. orbicular or obovate puberulous or, pubescent, bracts ovate or orbicular puberulous or pubescent, corolla \( \frac{1}{2} \) in. **Wall. Cat.** 2462; T. Anders, in Journ. Linn. Soc. ix. 513, partly. Gendarussa tranquembariensis, *Nees in Wall. Pl. As. Bar.** iii. 105; Wight Ill. t. 164 b, fig. 8, and *Ic.** t. 462. Adhatoda tranquembariensis, *Nees in DC. Prodr.* xi. 399.

S. Madras and Ceylon, especially on hot dry low hills, frequent; *Wight, &c.*

A low, intricate undershrub; nodes very short. Inflorescence, corolla, capsule and seeds as of *J. glauca.*—Wight's figure represents a more diffuse plant with leaves considerably larger than in any of the specimens; it is a form intermediate between *J. glauca & tranquembariensis* as here understood; Col. Beddome believes these two not specifically distinct.

19. **J. salsoloide*es**, T. Anders. in Journ. Linn. Soc. ix. 514; branches softly white-hairy, leaves small spathulate or oblong subglabrous, bracts elliptic or oblong, corolla \( \frac{1}{4} \) in. densely white-hairy.

**Carnatic** and **Mysore**; *Wight, G. Thomson.*

A rigid, much-branched, small undershrub; branches densely shortly hairy. *Leaves* sessile, \( \frac{1}{4} \) in., obtuse. **Spikes** terminal, few-fl.; with scattered solitary, often ebracteate flowers in the axils below; bracts \( \frac{1}{2} \) by \( \frac{1}{4} \) in.; bracteoles similar, smaller, or often 0. **Sepals** \( \frac{1}{2} \) in., linear-lanceolate, pubescent. Lower *anther-cell* tailed. **Capsule** \( \frac{1}{2} \) in., clavate, densely pubescent (T. Anderson).—Easily separated from *J. trinervis* (and its Var. **arenaria**) by the white-furred branches and narrower non-marginate bracts.

**Sect. 3. Calophanoides.** Flowers axillary, solitary clustered or in dense cymes, without a terminal spike or panicle. *Calyx* sub-5-partite. *Corolla* small. *Seeds* subtubercular or verrucose, not hispid.

* Bracts obovate or spathulate (all perhaps var. of one).


**Khasia** and **Jaintea Mts.,** alt. 3000 ft.; *Wallich, &c.* Assam; *Griffith* (Kew Distr. n. 6188).—Distr. S. China.

Branches 2 ft., little divided, rusty-pubescent. *Leaves* \( \frac{3}{4} \) by \( \frac{1}{4} \) in., drying black, not or obscurely lineolate; petiole \( \frac{1}{4} \) in. **Flowers** 1-5-nate; bracts \( \frac{1}{4} \) in., spathulate, orbicular or emarginate, very rusty-pubescent; bracteoles similar, smaller, or 0. **Sepals** \( \frac{1}{2} \) in. and upwards, linear-lanceolate, lineolate, puberulous. *Corolla* hairy, white rose-spotted. Lower *anther-cell* white-tailed. **Capsule** \( \frac{1}{2} \) in., minutely pubescent, 4-seeded; solid pedicel very short. *Seeds* tubercular, verrucose, glabrous.


**Tenasserim; Beddome.—Distr. Java.**

Resembling *J. quadrifaria*, but much more glabrous. **Branches** minutely pubes-

22. J. salicifolia, T. Anders, in Journ. Linn. Soc. ix. 514; leaves subpetiolo lanceolate acuminate at both ends glabrous or pubescent, flowers in close axillary clusters, corolla ¼ in. minutely hairy.—Adhatoda sp. n. 20, Herb. Ind. Or. H. f. & T.

N. Khasia Mts., alt. 3-5000 ft.; Borpani and Shillong, H. f. & T., &c.

Leaves 2½ by ½ in.; petiole ¼ in. Bracts ¼ in., spathulate, orbicular, glabrous or sparsely pubescent.


Khasia Mts.; Wallisb. A small undershrub; internodes very short. Leaves 1½ by ½ in.; petiole hardly any. Bracts as in the preceding species, which differ from the present by their diffuse habit and elongate internodes.

** Bracts lanceolate or linear-lanceolate.

24. J. flava, Kurz in Journ. As. Soc. 1873, pt. ii. 97; subglabrous, leaves ovate or ovate acuminate; cymes small axillary densely subcapitate subglabrous, corolla ⅛-⅜ in. pubescent yellow.

Tenasserim; Beddome; Martaban (fide Kurz).

A herb, 2-3 ft., erect (Kurz). Leaves 4-6 in., acuminate at both ends, nerves prominent; petiole ⅛ in. Cymes forming axillary heads ⅛ in. diam. bracts and bracteoles small, linear, glabrous. Sepals 5, ⅛-¼ in., linear-lanceolate, ciliate, glabrous. Lower anther-cell distinctly white-tailed. Capsule ½ in., clavate, glabrous, 4-seeded; seeds minutely rugulose (Kurz).—No specimen of Kurz's plant has been seen, but his description fits very satisfactorily Beddome's Herb. Propr. n. 84.


Burma; Mt. Toungoo, Brandis, and Karen Hills, Masson (fide T. Anderson).

An undershrub, 1-2 ft.; stem terete, glabrous. Leaves scabrous above, puberulous beneath, decurrent into the petiole; nerves prominent, approximate. Bracts and bracteoles small, subulate. Sepals 5, equal, ¼ in., subulate, hoary pubescent. Lower anther-cell long-tailed. Ovary 4-ovulate (T. Anderson).—Not seen. Anderson places it in a section with "flowers axillary solitary or 2 or 3 together," along with J. salicifolia & quadrifaria. Nevertheless it may be J. flaccida, Kurz, of the Section Gendarussa.


Western India; Deesa (Gojerat) and Kururche (Scinde), Stocks; Ferozepore (Punjab), Vicary.—DIST. Abyssinia.

A herb, 8-12 in., minutely grey-pubescent. Leaves 1 by ½ in.; petiole ⅜ in. Flowers 1-4-nate, closely axillary; bracts and bracteoles small, linear. Calyx sub-5-partite; segments ⅛ in., linear, minutely pubescent. Corolla ⅛ in., upper lip shortly 2-lobed, lower transversely marked shortly 3-lobed. Anther-cells ovate; lower white-tailed.
Normal capsule 4-4½ in., ellipsoid, acute at each end, hardly stalked, pubescent, 4-seeded. Seeds papillose, subhispid; abnormal 1-celled, 1-seeded capsules occur 4 in., ellipsoid with 3-6 vertical crested wings, with seed ovoid, larger than in the normal, nearly smooth, on a nearly basal retinaculum.—The examples collected far apart show the heterocarpous capsules to be characteristic, not monstrous. The species is not nearly allied to any other; but as the inflorescence is axillary and the calyx 5-merous, it has been moved here so as to fortify the characters of the Section Rostellaria.

Sect. 4. **Gendarussa.** Spikes terminal and on short lateral branches (in *J. Hookeriana* axillary), interrupted; terminal often large, paniculate; bracts mostly narrow, lower rarely imbricate. Calyx sub-5-partite. Flowers small or middle-sized. Seeds (where known) verrucose or tubercul, glabrous, not glochidiate nor hispid.


Throughout **India**, from Bengal to Ceylon and Malacca, often an escape from cultivation.—**Distrb.** Malaya and China to the Philippines (? wild).

Stems 2-4 ft., erect. Leaves 4 by 3 in.; petiole 4 in. Spikes 2-5 by 3 in., terminal often forming a panicle; flowers clustered, lower clusters usually distant; bracts 3 in. Sepals 3 in. Corolla nearly glabrous, white or rose with purple spots. Lower anther-cell distinctly tailed. Capsule 4 in., clavate, glabrous, 4-seeded.—No capsule has been seen except on an example of Wight's; and that does not suffice for a description of the seed. This commonly cultivated plant is considered by Nees and T. Anderson wild in various parts of **India**, but the rarity of the seeds renders this doubtful. Col. Beddome says "wild on Mooleyit in Tenasserim."


**CEYLON**; *Macrae, Walker,* &c.

An undershrub, less erect, more branched than *J. Gendarussa*. Leaves as of *J. Gendarussa*. Spikes 2-7 in., simple or paniculate; flowers distant, solitary or opposite; bracts 4 in., linear, rarely spatulate; bracteoles 4 in., linear, or 0. Flowers nearly as of *J. Gendarussa*. Capsule 4 in., clavate, 4-seeded, Seeds verrucose, glabrous.—Beddome figures the inflorescence terminal, but in the examples the uppermost axes are sterile, many lower axes with spikes.


**PEGG** and **TENASSERIM**, frequent; *Wallich, Griffith,* &c.
A shrub, 3-6 ft.; branches pubescent upwards. *Leaves* (upper cauline alone seen) 6-10 by 3-6 in., petioled ovate, or sessile spathulate-obovate, base auricled, punctulate, puberulous at least when young. *Panicles* 12-20 in. long and broad; branches long, subsimple, often recurved in fruit; clusters 2-8-fld., pubescent, lower often 1-3 in. apart; bracts ½ in., linear-lanceolate, but the clusters are often supported by reduced leaves ½-1 in.; bracteoles ½ in., linear, often 0. *Sepals* ½-⅓ in., linear-lanceolate, pubescent. Lower *anther-cell* distinctly white-tailed. *Capsule* ⅓ in., long-stalked, pubescent, 4-seeded. *Seeds* verrucose, glabrous.

30. **J. Helferi**, Clarke; leaves petioled elliptic acute at both ends glabrous, panicle terminal of 3 erect spikes, clusters of flowers distant pubescent, corolla ⅔ in. pubescent.

**Tenasserim or Andamans; Helfer** (Kew Distr. n. 6185).

*Branches* woody, terete, glabrous. *Upper leaves* 6½ by 2 in., minutely lineolate on both surfaces; petiole ½ in. *Panicle* 3 in. diam., trichotomous, sparingly pubescent; lateral spikes curved, ascending; bracts ½-⅓ in., linear-lanceolate, pubescent. *Calyx* and *corolla* as of *J. decussata*, but rather smaller.—This may be a small var. of *J. decussata*, as the example is poor; but the leaves do not match, and the curved ascending spikes are very unlike the habit of *J. decussata*.

31. **J. flaccida**, *Kurz in Journ. As. Soc.* 1870, ii. 80, and in Flora 1870, 364; leaves large sessile spathulate-elliptic nearly glabrous, panicles terminal very lax, flowers distant rarely clustered, corolla ⅔ in. nearly glabrous pale yellow or testaceous (Kurz).—*Adhatoda* n. 19, *Herb. Ind. Or. H.f. & T*.

**Pegu, M'Lelland, Kurz, Brandis.**

Annual, 1-2 ft., erect. *Leaves* opposite and ternate, 7-12 in., acuminate, lineolate above; petiole winged to the base, there often auriculate. *Panicle* often 12 in. long and broad, very thin flaccid, nearly glabrous; flowers opposite or alternate, lower often 1 in. apart; bracts hardly ½ in., linear-lanceolate. *Sepals* ½ in., linear-lanceolate, puberulous or glabrate. *Corolla* slender. Lower *anther-cell* white-tailed. *Capsule* ⅜ in., long-stalked, thinly pubescent, 4-seeded.


**S. Deccan Peninsula,** alt. 1-3000 ft.; Wynaad, Belgaum, Coorg, &c., Wight, Ritchie, &c.

*Branches* elongate, terete, glabrescent; internodes long. *Leaves* 4½ by 2 in., pubescent beneath or glabrous; petiole ⅔ in. *Spikes* 2-4 in., somewhat dense in flower, elongate interrupted in fruit; bracts ½-⅓ in.; bracteoles ½ in., linear. *Sepals* ⅓ in., linear, very pubescent. *Corolla* pubescent, purple. Lower *anther-cell* white-tailed. *Capsule* ⅔-⅘ in., very pubescent, clavate, 4-seeded. *Seeds* verrucose, glabrous.—Very variable in indumentum; Wight's type, from the Nilgherries' base, has the leaves very pubescent beneath, and has been marked *Bhaphidospora* sp. by T. Anderson. Dalzell's specimens have the leaves glabrous beneath.


Penang; Wallich.—Distrib. Sumatra.

Wallich’s imperfect example is perhaps the same as J. vasculosa var. Parishii above. Branches slender, with long internodes, glabrous. Leaves 6 by ½ in., nearly glabrous, closely linear above; petiole 1½ in. Spikes 3½ by ½ in., those seen all axillary, but there may have been also terminal spikes; bracts ½ in., ovate or lanceolate; bracteoles ½ in., linear-lanceolate. Sepals ½ in.—J. ptychostoma, Nees in Wall. Pl. As. Rar. iii. 108 (Rhytiglossa? ptychostoma, Nees in DC. Prodr. xi. 337), is founded on this Wallichian number, but the description of the bracts is so different from the example that there must have been some confusion.

36. J. Maingayi, Clarke; leaves ovate-lanceolate or narrowly lanceolate minutely pubescent on both surfaces, flowers solitary mostly alternate, corolla ½ in.

Penang; Maingay (Kew Distrib. n. 1181).

A small shrub (Maingay); branches elongate, slender, glabrous except at the tips. Leaves ½ by ½–1 in., very variable in breadth on the same branch, base cuneate; petiole ½ in. Spikes axillary and terminal, simple or divided, 2–3 in., slender, lax, pubescent; lower flowers distant, mostly alternate; bracts ½ in., linear-lanceolate, pubescent. Calyx and corolla nearly as of J. vasculosa, but upper corolla-lip ovate, broader. Capsule ½ in., stalk solidified.—The line between the small Justicias of this section and Dianthera is artificial, and the present species has quite the habit of others which have been removed by Bentham (in Herb. Kew) to Dianthera. It is
37. **J. flagelliformis**, Clarke; leaves ovate attenuate at both ends minutely crisped pubescent on the midrib beneath, spikes linear, bracts and bracteoles lanceolate longer than the calyx, corolla ⅓ in.

**Tenasserim of Andamans;** Helyer (Kew Distrib. u. 6172).

**Branches** elongate slender, glabrous except at the tips. **Leaves** 5 by 2 in., punctuate above; petiole ⅔ in. or frequently 0. **Spikes** 1–3, terminal, 3–5 by ⅓ in., warly, subinterrupted below; bracts ⅓–⅔ by ½ in., green, minutely pubescent; bracteoles nearly as long, narrower, subulate. **Calyx** sub-5-partite; segments ⅓ in., linear pubescent. **Corolla** nearly as of **J. vasculosa**; upper lip ovate subentire. Lower anther-cell white-tailed. **Capsule** ⅓ in., clavate.—The leaves closely resemble those of **J. vasculosa**, but the narrow subimbricate bracts are altogether different.

38. **J. grossa**, Clarke; leaves petioled large ovate glabrous, spikes terminal solitary linear pubescent, bracts elliptic or oblong often as long as the calyx, corolla ⅔ in.

**Mergui;** Griffith.

**Branches** glabrous, with numerous large leaves near the tips. **Leaves** 8–10 by 4 in., acute, base rhomboid or obtuse; petiole 1 in. **Spikes** 5 in., subsessile, interrupted below; bracts ⅓–⅔ in., puberulous. **Sepals** ⅓ in., linear-lanceolate. **Anther-cells** subparallel, slightly divaricate at the base, one somewhat lower, both white-tailed at the base. **Ovary** glabrous, 4-ovulate; style minutely hairy below; stigma minute, subsimple. **Capsule** not seen.—This plant has been named by Nees Phlogacanthus asperus, together with many others which he did not recognize. Wight marked it "**Hemichorisae**?"; and this is probably its true affinity, though its small flowers are opposed to it. It is nearly allied to **J. flagelliformis**.


**Tenasserim;** Amerst., Falcoven (fide T. Anderson).

A weedy herb; stem diffuse, terete, glabrous. **Cauline leaves** long-petioled, 2–5 in. long (petiole included); upper and floral leaves ⅓–⅔ by ⅔–¾ in.; all glabrous above, glaucous beneath. **Corolla** 2-lipped, glabrous, with 2 lines of recurved hairs in the throat. Upper anthers small, sterile. **Capsule** ⅔–⅔ in., compressed, sterile part very short (T. Anderson).—Anderson was seldom wrong in generic determinations, but his description suggests that this is a **Renguinia**.

Sect. 5. **Rhaphidospora**. **Flowers** laxly paniced. **Bracts** small linear or linear-lanceolate. **Seeds** retrorsely hispid.


S. Deccan Peninsula; Roxburgh, Wight. **Ceylon;** Walker, &c.—Distrib. Java.
An erect, branched herb. Leaves 1½ by 4 in. (in one example 4½ by 1 in.), base attenuate or rounded; petiole ½-1¼ in. Axillary peduncles numerous, ½-1½ in., divaricate; pedicels 0-½ in., puberulous or pubescent; bracts and bracteoles minute. Calyx-segments scarcely ½ in., narrow, pubescent. Corolla upper lip erect, emarginate, lower pendent or reflexed. Lower anther-cell distinctly white-tailed. Capsule ½ in.; seed-bearing part subquadrato ellipsoid suddenly narrowed into the linear-cylindric pedicel.


Temperate N.W. Himalaya; Bhuddimath (Kumaon), Wallich, Boyle; Simla, Madden; Gangootri, alt. 4500 ft., Strachey & Winterbottom; Mussoorie, alt. 7000 ft., W. S. Atkinson.

Stems herbaceous, erect, terete, hairy. Leaves 2½ by 1½ in., annulate or rhomboid at the base; petiole ½ in. Cymes axillary, 2-3 in., somewhat rigid, dense, ascending, hairy; bracts ½-1¼ in., linear; pedicels 0-½ in.; bracteoles 0 or minute. Calyx sub-5-partite; segments ¾ in., linear, pubescent. Corolla pubescent, purplish-red; lower lip ¾ in., pendent. Lower anther-cell distinctly white-tailed. Capsule ¾ in., linear-ellipsoide, pubescent. Seeds unripe, probably glabrous, only slightly tubercular; in which case the species will not belong to Sect. Rhaphidospora. The inflorescences and corolla are exceedingly like Peristrophe; but the small bracts and distinct anther-tails do not suit.

Sect. 6. Rostellularia (Gen. Nees). Spikes terminal and axillary, cylindric or linear. Bracts and bracteoles narrowly lanceolate, usually about as long as the calyx. Calyx sub-4-partite (5th segment if sometimes present small), segments linear or linear-lanceolate. Corolla small. Capsule small, 4-seeded nearly from the base. Seeds subconcentrically tubercular or rugose or nearly smooth.—Small closely allied weeds, abundant in the tropics, all collected under 3 or 4 ill-defined species by T. Anderson. To facilitate their description it is necessary to arrange them in more species, or reduce them to vars. of one.


Deccan Peninsula; Wight; Vingorla (S. Concan), Dalzell. Stems much branched, minutely pubescent or bistrate. Leaves 1½ by 4 in., mature subglabrous or sparsely setose; raphides numerous sunk on both surfaces; petiole ½ in. Spikes ½-1¼ in.; bracteoles ¼ in., sublinear. Sepals much wider than the bracteoles, nearly glabrous except the awns, hispid with many patent multicellular hairs. Corolla ¾ in., rose-purple. Capsule ½ in., pubescent.—A strongly marked species, but it is difficult to settle the best name. Wallich's type sheet is mixed, and his name micrantha perhaps relates really to the small-fld. J. procumbens mixed thereon. As to the name J. crinita, that appears to relate chiefly to a mixture of J. procumbens var. latisepica with J. diffusa var. orbiculata.

43. J. quinqueangularis, Koen.; Roxb. Fl. Ind. ed. Carey & Wall. i. 134; nearly glabrous, branches elongate, leaves linear or linear-lanceolate, spikes elongate ¼ in. broad, sepals linear-oblong tip obtuse herbaceous glabrous, capsule ¼-½ in. stout. Wall. Cat. 2443, partly. J. peploides,

CENTRAL INDIA, common; from W. Bengal and Agra to Belgaum. 

Branches often 20 in., rigid, 4-5-angular, geniculate; internodes long. Leaves 3 by 5-8 in., glabrous, raphides obscure; petiole 0-5 in., puberulous. Spikes 1-5 in.; lower flowers usually opposite solitary, calyx just reaching to the next pair; bracts 1/3 in., linear-oblong, glabrous, scarious-margined; bracteoles similar, smaller. Sepals 1-3/4 in., hardly broader than the bracteoles. Seeds much larger than in the neighbouring species, slightly concentrically tubercular-rugose.—J. VahlII, Roth, resembles this in the narrow leaves.

VAR. peploides; leaves oblong or ovate petiole often 2 in., spikes shorter often subovate when young. T. Anders. in Journ. Linn. Soc. ix. 511 (sp.); Boiss. Fl. Orient. iv. 525. J. procumbens, Wall. Cat. 2441, partly. Rostellularia peploides, Nees in Wall. Pl. As. Rar. iii. 101, and in DC. Prodr. xi. 375; Dalz. & Gibs. Bomb. Fl. 193.—Throughout the Gangetic Plain, from the Punjab to Bengal, and through Central India to the Cocon. Distrib. Afghanistan.— Usually much more branched than the type, sometimes small 3-6 in. diam. This var. is very unlike the type in general aspect, and does not graduate into it; but the obtuse glabrous sepals-tips and large capsule and seeds agree closely.

44. J. notha, Clarke; stems simple glabrous, leaves sessile oblong white-setulose on the nerves beneath, bracts elliptic, sepals linear-oblong white-setulose upwards. Rostellularia simplex, Wight Ic. t. 1542 (not Justicia simplex, D. Don).

INDIA?; Herb. Wight.

Stems 1 foot, slender, 4-5-angular. Leaves 1 by 1½ in., subobtuse at both ends, transversely lineal-oblong glabrate above. Spikes 2 by 1½ in., terminal, solitary, dense; bracts 1 by ½ in., setulose-ciliate on margins and midrib, otherwise glabrous. Corolla 1½ in. Capsule 1½ in., ellipsoid.—Wight gives no locality for this; it is a well-characterised plant, and probably Malayan.

45. J. khasiana, Clarke; stems elongate hispid, leaves sessile oblong hispid on both surfaces, bracts linear-oblong hispid, sepals sublinear hispid.

KHASIA MTS., alt. 5000 ft., common; Griffith, H. f. & T., &c.

Stems 1½-3 ft., branched. Leaves 1½ by ½ in. Spikes 2-4 by ½ in., hardly interrupted at the base, very hispid; bracts ½ by ¼-½ in. Corolla 1½ in. Capsule 1½ in., ellipsoid. Seeds undulate obscurely rugose; testa minutely reticulated.—Nearly allied to J. notha, but differing in the indumentum and narrower bracts.

46. J. assamica, Clarke; leaves sessile narrowly obvate obtuse glabrous, bracts narrowly oblong minutely hispid, sepals narrowly lanceolate hispidulous.

ASSAM; Griffith (Kew Distrib. n. 6159).

Stems prostrate, copiously rooting; flowering branches 3-4 in., numerous, erect, 1-spicate. Leaves 1 by ¼ in., base long-cuneate; raphides sunk. Spikes 2 by ½ in., continuous, somewhat dense; bracts ½ by 1/8 in., scarious-margined. Corolla nearly ½ in. Capsule 1½ in., ellipsoid.—In the sessile leaves, large corolla, and small capsule, this is allied to J. notha and J. khasiana.

47. J. Royeniana, Clarke; leaves subsessile linear-oblong obtuse glabrous, bracts and sepals linear-lanceolate acute glistening bristle-ciliate. Rostellularia Royeniana, Nees in DC. Prodr. xi. 373; T. Anders. in Thwaites Enum. 234, partly.

CEYLON; Walker, Thwaites.
Stems 10–15 in., procumbent, branched, glabrous. Leaves 2 by ½ in., obtuse, transversely lineolate above; base long attenuate, petiole 0, or in some lower leaves short. Spikes 2½ by ½ in., subinterrupted at base, longer or shorter than the peduncle; bracts ½ by ¼ in., bracteoles ½ in. Sepals ¾ in., glistening ciliate on the margins and keel, otherwise glabrous. Corolla ½ in. Capsule ¼ in.—Nearly allied to J. notha, differing principally in the glabrate leaves and very narrow bracts.

48. J. diffusa, Wild. Sp. Pl. i. 87; leaves petioled elliptic acuminate at both ends sparsely hairy, spikes slender sparsely hairy, bracts linear-lanceolate or linear mostly shorter than the calyx, sepals lanceolate acute minutely scabrous upwards. Roth Nov. Sp. 14; Wall. Cat. 2444; T. Anders in Journ. Linn. Soc. ix. 512. J. procumbens, Linn. partly; Vahl Symb. ii. 14; Roxb. Fl. Ind. i. 132. Rostellularia diffusa, Nees in Wall. Pl. As. Rar. iii. 100, and in DC. Prodr. xii. 371; Dalz. & Gibs. Bomb. Pl. i. 193 (several of these citations referring partly or mainly to plants here separately described as var.).

Kumaon and Punjab Terai; Strachey & Winterbottom, &c. Deccan Peninsula and Ceylon, plentiful; extending north to Chota Nagpore. Rangoon; McLelland.—Distrib. Siam.

Stems 1–2 ft., herbaceous, quadrangular, glabrous or minutely pubescent. Leaves (well developed) ¾ by ½ in.; raphides large, sunk, on both surfaces; petiole ¾ in., pubescent. Spikes 1–7 by ½ in.; lower flowers opposite, distant the length of the calyx; bracts ½ in., narrowly or not scarious-margined, tip minutely scabrous; bracteoles ½ in., lanceolate. Sepals ¾ in. resembling the bracts. Corolla ½ in. Capsule ¼ in., glabrous. Seeds very nearly smooth, concentric rugosities remaining as obscure tubercles.

VAR. prostrata, Roxb. ms.; leaves smaller often obtuse or orbicular, bracts and sepals shorter more slender than the calyx and more scabrous, capsule hairs. —Deccan Peninsula and Ceylon, common.—Stems prostrate, intricately branched, patently hairy. Leaves ½–¾ in. diam. Spikes 1–2 by ¼ in.

VAR. Vahlii; leaves narrowly lanceolate or linear, bracts lanceolate white-margined, sepals lanceolate subacute tips minutely scabrous. J. Vahlii, Roth Nov. Sp. 14. J. quinqueangularis, Wall. Cat. 2443, type sheet and mainly. J. Vahliana, Roem. & Sch. Syst. Mant. i. 138. Rostellularia Vahlii, Nees in Wall. Pl. As. Rar. iii. 102, and in DC. Prodr. xi. 376, partly.—Deccan Peninsula and Ceylon, extending to Chota Nagpore, common.—It is vain to quote extensively synonymy for this plant, as the same specimen has been named differently by the highest authorities. The narrow-leaved forms have been, both by Nees and T. Anderson, mixed with J. quinqueangularis, which differs in the large capsule and seeds, and in the glabrous obtuse sepals and spikes. In the linear-leaved forms the spikes, bracts and sepals are often as in J. diffusa var. prostrata. Connected by imperceptible gradations with J. diffusa, type.

VAR. hedyotidifolia; woody, leaves petioled ovate, spikes shorted dense, sepallips lengthened sometimes very ciliate. J. hedyotidifolia, Wall. Cat. 2450. Rostellularia hedyotidifolia, Nees in Wall. Pl. As. Rar. iii. 100, and in DC. Prodr. xi. 370; Wight Ic. t. 1540.—Mts. of S. India.—The extreme forms in Wight's herbarium are very woody and glabrous, with small black leaves; but there are herbaceous examples with larger more hairy leaves, even from the Nilgherries at 8000 ft. alt., which have been marked J. hedyotidifolia by Mr. Bentham, and which cannot be distinguished from J. diffusa, type.

VAR. orbiculata; leaves petioled ovate hairy specially beneath. J. orbiculata, Wall. Cat. 2489; T. Anders. in Journ. Linn. Soc. ix. 512, partly. Rostellularia orbiculifolia, Nees in Wall. Pl. As. Rar. iii. 100, and in DC. Prodr. xi. 370.—Deccan Peninsula, northwards to Parasnath, T. Anderson. Distrib. Siam.—The examples are marked by Nees (doubtless on account of the pubescent or patent hairy stem) "Rostellularia procumbens Var. β and γ," but the same thing is marked by T. Anderson "hedyotidifolia," which is the same affinity. Most of the examples marked orbiculata by Nees and T. Anderson are J. simplex, D. Don.

**Western India**, alt. 2-5000 ft., in the hills, common; from Kashmir, Scinde Hills (Stocks), Bengal (Wall.), to the Nilgherries. Abundant in **Central India** and Chota Nagpore.—**Distrib.** Abyssinia, Maylaya to the Loochoo Isles.

Herbsceous, hairy, branched; branches sometimes long as in Wallich's Nepa Examples, whence D. took his unfortunate name. Spikes much broader and more hairy than in any var. of *J. diffusa*. Bracts usually as long as the calyx, greenedged, very hairy with glistening many-jointed tawny or white hairs. —Near *J. procumbens*, differing in its bracts; it is very uniform to its character, but the synonymy is uncertain, as the abundant examples are marked "orinita, peploides," &c., and the Abyssinian examples have several names.

**Var. serrulatifolia**, Bentham. ms. in Hobenack. n. 571; very small, leaves spikes bracts and flowers smaller. —Throughout the Deccan from Chota Nagpore to S. Madras, frequent. —Leaves 0.6 in. diam., elliptic or round, obtuse or subacute. *Spikes* 1 by 0.5 in.; bracts 0.5-1 in., elliptic or broadly lanceolate, fulvous-hirsute.—Regarded by Bentham as a var. of *J. procumbens*, Linn.


**S. Deccan Peninsula** with Ceylon, frequent; extending north to the S. Concan. —**Distrib.** Malayia, Australia. —Separated from *J. simplex* by the narrower bracts; a character which at all events suite the geography better than the distinctions put forward by Nees, and accepted by T. Anderson.

**Var. latispica**, Clarke; stouter, spikes larger, bracts and corolla longer. Rostellularia procumbens, Wight l.c. t. 1539. R. mollissima, Nees in DC. Prodr. xi. 373, partly.—Mts. of S. India and Ceylon, common. *Khasia Mts.* and adjacent parts of Assam, frequent. Pegu and Tenasserim.—*Bracts* 0.5-1 in., hirsut-ciliate. *Corolla* 0.6-1 in. *—Capsule* 0.8-1 in. —The type of this var. is Wight l.c. t. 1539 (excellent). which shows the narrow bracts very correctly, and represents the common Nilgherry form; from this the Khasian and Malayian forms cannot be distinguished. In Ceylon a larger, more woody form is frequent; this is marked by Nees *J. procumbens* & grandiflora. The objection to calling this plant *mollissima* is that the type of *J. mollissima* (and *J. orbiculata*) was the round-leaved hairy Var. vestita of *J. diffusa*.

**Species not seen.**

**J. biflora**, Vahl Symb. ii. 9; leaves ovate, peduncles axillary 2-fld. as long as the leaves, bracts subulate. *Nees in DC. Prodr.* i. 428.

**India:** Schumacher.

A branched undershrub. *Leaves* 1 in., but little attenuate, base acute, very glabrous; petiole lax, lower as long as the leaves. *Peduncles* filiform; 2 petioled
bracts at the base of the unequal pedicels, oblong, acute; floral bracts 3 under each calyx, unequal; 2 subulate, the third ovate. *Calyx* 5-partite (Vahl).

J. Moretiana, *Vahl Enum.* i. 162; leaves lanceolate, flowers solitary axillary and in a short bracteated terminal spike, calyx 5-toothed half the way down, corolla ½ in. 2-lipped, capsule ½ in. 4-seeded. *Nees in DC. Prodr.* xi. 428.—*Burn. Thes. Zeyl.* t. 3, fig. 1.

Ceylon; Burmann.

Leaves 2½ by ¾ in., acute at both ends; petiole ¼ in. *Axillary flowers on peduncles ¼ in., ebracteate; spike flowers subsessile, bracts ½ in., oblong, acute. Calyx ½ in., toothed hardly half-way down, lobes subtriangular lanceolate. Corolla upper lip erect, ovate, subentire, lower pendent deeply 3-lobed. Capsule solid below.—The good picture of the capsule and seeds renders it nearly certain that this was some *Justicia*: the inflorescence is very nearly that of *J. glauca*, but the bracts are much too narrow and acute for that species.

XXXIX. ADHATODA, Nees.

As *Justicia* Sect. *Betonica*, except that the anther-cells are acute, sometimes minutely apiculate, but scarcely spurred.—Species 6, Tropical; 1 Indian, 1 Cosmopolitan, 5 African or American.

Bentham (in *Gen. Plant.*) says of the anther-cells, “minime calcaratae,” but this is an error, and the genus should be merged in *Justicia* Sect. *Betonica*, following Nees and Anderson.


India; from the Punjab and Assam to Ceylon and Singapore, common, frequently cultivated.—DISTRICT Malaya, S.E. Asia.


2. *A. Beddomei, Clarke*; leaves oblong attenuate at both ends entirely minutely pubescent, spikes peduncled capitate, bracts ovate subacute puberulous or glabrate, corolla ⅔ in. creamy white tube short.

S. TRAVANCORE, alt. 3000 ft.; Beddome.

A very large shrub (*Beddome*). Leaves 6 by 1¼ in.; petiole ¼ in. *Peduncles* ⅔ in., axillary, opposite, stout; heads 1 in. diam.; bracts ⅓ by ⅓ in., narrowed at base; bracteoles ⅔–⅔ in., narrowly oblong. *Calyx* ⅔ in., sub-5-partite; segments narrowly oblong, acute, minutely pubescent especially within. *Corolla* hairy; tube ⅔ in., broadly cylindric; lips oblong, upper emarginate, lower 3-lobed nearly to the base. *Filaments* stout, glabrous except at base; anther-cells superposed, lower obscurely tailed. *Ovary* glabrous, 4-ovulate; style hairy; stigma minutely bifid. Capsule not known.
XL. RHINACANTHUS, Nees.

Shrubs, sometimes subscandent. Leaves entire. Panicle divaricate or dense; flowers solitary (or in minute cymes), sessile; bracts and bracteoles small, linear-lanceolate. Calyx small, sub-5-partite, segments linear-lanceolate. Corolla white, tube very long narrowly cylindrical, scarcely widened at the top; limb 2-lipped, upper lip lanceolate acuminate entire or shortly 2-lobed, recurved or twisted, lower broad 3-lobed. Stamens 2, inserted near the top of the corolla-tube; anthers 2-celled; cells suprposeated, mucous. Ovary 4-ovulate; style filiform, minutely bifid at the tip. Capsule clavate, 4-seeded, stalk long solid cylindrical. Seeds ovoid, moderately compressed, glabrous, obscurely rugose or tuberculate.—Species 4, tropical Asiatic and African.

1. R. communis, Nees in Wall. Pl. As. Rar. iii. 109, and in DC. Prodr. xi. 442; leaves oblong or ovate-oblong pubescent or glabrate, panicle large spreading, calyx densely pubescent. Wight Ill. 164 bis, fig. 9, and loc. t. 464; Dalz. & Gibs. Bomb. Fl. 194; T. Anders. in Journ. Linn. Soc. ix. 522. Rh. Rottleriannus, Nees in Wall. Pl. As. Rar. iii. 109, and in DC. Prodr. xi. 443. Justicia nasuta, Linn.; Rozb. Fl. Ind. i. 120; Blume Bijd. 785; Wall. Cat. 2440; Blanco Fl. Filip. 14; Bot. Mag. t. 325; Griff. Notul. iv. 143. J. Rottleriiana, Wall. Cat. 2477.—Rheedee Hort. Mat. ix. t. 69.

Throughout INDIA, cultivated; perhaps wild in the Deccan Peninsula and CEYLON.—Distrib. Java, Madagascar, &c., cultivated.

Leaves 3–4 by \(\frac{3}{4}–1\frac{1}{4}\) in., usually narrowed at both ends, margin undulate; petiole \(\frac{1}{2}\) in. Cymes terminal and on short lateral branches, dusky-pubescent; flowers often clustered; bracts and bracteoles 0–1\(\frac{1}{4}\) in., linear. Calyx \(\frac{1}{4}\) in. Corolla-tube 1 by \(\frac{1}{2}\) in.; lobes \(\frac{1}{2}\) in., 3 lower each twice as broad as the shortly bifid upper.


—Mts. of S. Deccan, alt. 3–6000 ft., frequent.—Perhaps the wild state, of which the narrow-leaved glabrate R. communis is the domesticated form.

2. R. calcaratus, Nees in Wall. Pl. As. Rar. iii. 109, and in DC. Prodr. xi. 444; leaves large elliptic or narrow-oblance acuminate at both ends glabrous, panicle terminal somewhat dense flowers very many. T. Anders. in Journ. Linn. Soc. ix. 522. Justicia calcarata, Wall. Pl. As. Rar. ii. 9, t. 113, and Cat. 2426.

KHABIA Mts.; Wallich, &c. Cachar; Keenan.

Branches stout. Leaves 10 by 4 in.; petiole 1\(\frac{1}{2}\) in. Panicle 6 by 4 in., nearly glabrous; peduncle 1–2 in.; bracts \(\frac{1}{2}\) in. Calyx \(\frac{1}{2}\) in., nearly glabrous; lobes linear-lanceolate. Corolla as of R. communis, but larger; tube 1\(\frac{1}{2}\) in.; lobes \(\frac{1}{2}\) in.; upper lip subentire, or lobes minute setaceous, twisted. Capsule not seen.

XLI. DIANTHERA, Linn.

Diffuse herbs or undershrubs. Leaves petioled, ovate or oblong, puberulous or glabrate. Spikes or panicles terminal, axillary sometimes added; flowers, or many of the lower, distant; bracts and bracteoles small. Calyx sub-5-partite; segments narrow. Corolla small or middle-sized, white yellowish or rose-purple, 2-lipped; upper lip suberect emarginate, lower pendent, 3-lobed. Stamens 2, glabrous or nearly so; anther-cells 2, ellips-
oid, muticons, subopposite or superposed. Ovary glabrous or nearly so, 4-ovuled; style minutely hairy below, tip sub-bifid. Capsule clavate, 4-seeded, base subcylindric solid. Seeds compressed, scabrous verrucose or subhispid.—Species 80, chiefly American; about 10 in the tropics of the Old World.

The character of the genus is here narrowed to the Indian species, which differ from the small-flowered Justicia (J. vesculosa, &c.) only by having the lower anther-cell absolutely muticus.

Flowers $\frac{4}{4}$ in., sessile or nearly so.


*Mts. of S. Deccan Peninsula; Courtallam, &c., Wright, &c.*

A herb; stem terete, puberulous. Leaves $\frac{4}{4}$ by 1$\frac{1}{2}$ in., puncticate on both surfaces; petiole $\frac{1}{4}$–2 in. Spikes linear, slender, interrupted, mostly collected in a terminal panicle 8–10 in. diam., puberulous; flowers opposite; pedicels 0–$\frac{1}{6}$ in., or the lower developed into very small cymes. Calyx-segments $\frac{1}{2}$ in., linear-lanceolate, puberulous. Corolla scarcely $\frac{1}{4}$ in., nearly glabrous. Capsule $\frac{1}{2}$ in., clavate, puberulous. Seeds glabrous, tuberulous-verrucose.—The Philippine plant (Cuming, n. 548), combined with this species by *Nees*, is different, and probably not of this genus (fide Bentham).

2. **D. virgata**, Bent. in Gen. Pl. ii. 1114; leaves elliptic narrowed at both ends pubescent on the nerves beneath, bracts ovate or elliptic acute as long as the calyx. *Justicia virgata*, T. & T. in Journ. Linn. Soc. ix. 516, chiefly.—Adhatoda sp. n. 18, *Herb. Ind. Or. H.f. & T.*

*Sixxim* and *Khasia* Mts., alt. 1–3000 ft., frequent; *Griffith, H.f. & T.*, &c.

A somewhat slender herb, 2–3 ft. Leaves $\frac{4}{4}$ by 1$\frac{1}{2}$ in., acuminate, punctulate on both surfaces, base attenuate or rhomboid; petiole 1 in., pubescent. Spikes 3–6 in., linear, slender, interrupted, terminal, 1–3 together, or sometimes panicked; bracts $\frac{1}{4}$ in.; flowers opposite, solitary, sessile. Calyx sub-5-partite; segments $\frac{1}{2}$ in., linear-lanceolate, minutely pubescent. Corolla $\frac{1}{4}$ in., white or slightly yellow-tinged. Anther-cells completely superposed. Capsule $\frac{1}{4}$ in., clavate, puberulous. Seeds glabrous, tuberulous-verrucose.—Leptostachya virgata, *Nees in Wall. Pl. As. Rar.* iii. 105, and *Cat.* 7177, and in DC. Prodr. xi. 979, from Ava, united with this by T. Anderson, has a very large panicle, cymose flowers and linear bracts, and seems much nearer *D. leptostachya*.

3. **D. debilis**, Clarke; leaves cordate-lanceolate pubescent on the nerves beneath, bracts linear or linear-oblung shorter than the calyx.

*Khasia Thral*, alt. 500 ft.; Shaila, Clarke.

Resembling *D. virgata*, but very weak. Leaves 4$\frac{1}{2}$ by 1$\frac{1}{2}$ in., acuminate, membranous; petiole 1$\frac{1}{2}$ in. Spikes 1–3 in., linear, often 3 on a terminal peduncle 1–2 in.; bracts $\frac{1}{2}$ in., pubescent; flowers opposite, solitary, distant. Calyx sub-5-partite; segments $\frac{1}{2}$ in., linear, pubescent. Corolla $\frac{1}{4}$ in., yellowish-white. Anther-cells parallel, one very slightly higher than the other. Ovary glabrous; base of style hairy. Young capsule as of *D. virgata*.

4. **D. Griffithii**, Bent. in Gen. Pl. ii. 1114; leaves petioled ovate acute glabrous, panicles terminal trichotomous, bracts and bracteoles

MISHME HILLS; Griffith (fide T. Anderson).

A glabrous herb; stem terete, base woody, upwards herbaceous tetragonal. Leaves 4–10 by 2–4 in.; base decurrent. Panicles with elongate, ascending branches; flowers remote, opposite, solitary, sessile. Sepals 5, linear. Corolla ½ in., tube ventricose; limb 5-partite, green, lower lip spotted red. Ovary 4-ovulate. Capsule a little longer than the corolla, subclavate at the tip, acute (T. Anderson).—Not seen.

** Flowers ½ in. or more, many distinctly pedicelled.


SIKKIM and BHOTAN, alt. 5–7000 ft.; Griffith, H. f. & T., &c. KHASIA Mts., alt. 4000 ft.; Griffith.

A diffuse herb, 1–2 ft., branches puberulous. Leaves 3 by ½ in., acute, base cuneate or of the upper leaves almost rounded; petiole 1 in., or of the upper leaves sometimes 0. Cymes few-fld., running into an elongate terminal panicle by the gradual reduction of the leaves into bracts; proper bract hardly ½ in., linear; pedicels 0–½ in.; bracteoles minute or 0. Sepals ½ in., linear, green, glabrous. Corolla ½ in., white, nearly glabrous; tube elongate cylindric. Capsule ½ in., clavate, glabrous, 4-seeded. Seeds verrucose-scyal, obscurely hispidulous.


CEYLON (fide T. Anderson).—DISTIR, Java, Philippines.

Much resembling D. collina, the corolla rather more ventricose and rose-purple.—There is no Ceylon example of this at Kew. We may suppose that T. Anderson had seen such at Calcutta; C. P. 2718, which he quotes, is certainly not this plant.

DOUTFUL SPECIES.

D. ? indica; leaves scarcely 1 in. rhomboid-ovate acute hairy, flowers congested into axillary and terminal decompound globose or oblong spikes, spikelets by suppression mostly 1-fld. supported by a lanceolate often empty bract. Rhytiglossa? indica, Waurua in Oestr. Bot. Zeit. 1881, 281, and Bot. Reis. Pr. S. Cob. 82, t. 8, fig. A.

GAROWHAT; at Moussoric, alt. 4000 ft., Waurua.

An undershrub; branches prostrate, variously twisted and incurved. Uppermost bract sterile, with the fertile valvately enclosing the single flower of the spikelet; bracteoles linear, setaceous, similar to the calyx-segments. Corolla ringent, rose, hairy; tube as long as the calyx; limbs as long as the tube, upper ovate, emarginate; lower longer, cuneately 3-lobed. Filaments flattened; anther-cells superposed, ovate, muticous. Style capillary, elongate after flowering, bifid. Ovary 4-ovulate.—Not seen. I know of no woody prostrate Acanthaceae plant at Moussoric, and do not understand the bracts as described.

XLII. PTYSSIGLOTTIS, T. Anders.

A small, procumbent herb. Leaves ovate, entire. Spikes peduncled, few-fld.; bracts and bracteoles linear. Calyx sub-5-partite; segments
linear. 

**Corolla-tube** short, limb 2-lipped; upper lip shortly 2-fid, lower 3-lobed; lobes imbricate in bud. *Stamens* 2; anthers 2-celled; cells elliptoid, parallel, approximate, muticous or base minutely apiculate. **Ovary** 4-ovulate; style filiform, minutely bifid. **Capsule** clavate, 4-seeded. Seeds compressed, orbicular, verrucose-scaly, almost muricate, not hairy.


**CEYLON**; Champion, Thwaites.

*Stems* 3–8 in., weak, rooting, branched, puberulous. *Leaves* ½ by ½ in., obtuse or subacute at either end, lineolate, nearly glabrous; petiole ½–1 in. *Pedicules* ½–1 in., terminal, slender; spikes ½–3 in.; bracts ½ in. *Sepals* ½ in. *Corolla* ½–⅔ in., nearly straight, pubescent. **Capsule** ½ in., 4-seeded near the top; stalk solid, linear-cylindric.—**Rastellaria sarmientosa**, Zoll., described as having the capsule 4-seeded nearly from the base, does not belong here (cf. Benth. in Gen. Pl. ii. 1118).

**XLIII. SPHINCTACANTHUS,** Benth.

An erect, glabrous shrub. *Leaves* large, toothed or subentire. spikes interrupted, forming a terminal panicle; flowers opposite; bracts and bracteoles small. **Calyx** sub-5-partite; segments linear. **Corolla-tube** ovoid, inflated, constricted at the top; limb 2-lipped, upper emarginate, lower 3-lobed pendent; lobes imbricated in the bud. *Stamens* 2; anthers 2-celled; cells oblong, approximate, muticous. **Ovary** 4-ovulate; style linear, minutely bifid. **Capsule** unknown.


**MISHMEN** Mts., or *PATEYE HILLS* in S.E. Assam; Griffith (Kew Distrib. n. 6161).

*Leaves* 7½ by 3½ in., acute at both ends; petiole 1 in. *Panicle* 5 by 4 in.; branches opposite; bracts ½ in. **Calyx** ⅓ in. **Corolla-tube** ⅓ by ⅔ in.; lobes ½–⅔ in., those of the lower lip subacute. **Filaments** glabrous, except near the base.

**XLIV. ECBOLIUM,** Kurz.

A small, nearly glabrous, shrub. *Leaves* entire. Spikes terminal, dense; bracts large, imbricate, somewhat 4-ranked; bracteoles small, narrow. **Calyx** sub-5-partite; segments equal, narrow. **Corolla-tube** long, subfiliform; limb 2-lipped; upper lip narrow shortly bifid, lower 3-lobed pendent; lobes imbricate in bud. *Stamens* 2, attached near the top of the corolla-tube; anthers 2-celled; cells oblong, parallel, approximate, muticous. **Ovary** 4-ovulate; style filiform, very shortly bifid. **Capsule** long-stalked, ovoid, compressed, 4-seeded. Seeds 4 or more often 2, large, compressed, orbicular, tubercular-scarious.

S. DECCAN PENINSULA and CEYLON. MALAYA; MAINGAY.—DISTRIB. Arabia, Abyssinia, Madagascar.

Branches pubescent upwards. Leaves 4 by 1½ in., cuneate or rhomboid at both ends, puberulous or pubescent on the nerves; petiole ¼ in.; bracts ½ by ¼ in., sometimes softly hairy; bracteoles scarcely ¼ in., sublinear. Calyx ¼ in., pubescent. Corolla pubescent; tube 1-½ by ½ in.; lobes ¼ in. Stamens glabrous, except the base of the filaments; anther-cells submucronate at the base. Ovary hairy at the tip. Capsule-stalk ¼ in., linear-cylindric, seed-bearing part ¼ in. diam. Seeds ½ in. diam., pale-coloured.—This, the typical form, is stated by Wight to be frequent in S. Madras, but there is very little of it in the Herbarium.

Var. rotundifolia; leaves sessile ovate or roundish, bracts subdeterminate often with a very short acumination. Justicia rotundifolia, Nees l. c.—Coimbatore; Wight, nn. 2008, 2266.—A woody undershrub, with shortened internodes and smaller leaves; Wight's are the only examples at Kew.

Var. latevirens; glabrescent, leaves larger petioloed broadly lanceolate acute at both ends, spikes often 6-8 in. more lax, bracts ½ by ½ in. broadly lanceolate entire dusky-pubescent. Justicia latevirens, Vahl Enum. i. 118; Nees in DC. Prodr. xi. 427.—S. Deccan Peninsula and Ceylon.—This appears the common South Indian form, and when the bracts become denticulate it passes by degrees into the next.

Var. dentata; glabrescent, leaves larger petioloed ovate or lanceolate acute, spikes dense, bracts ¼ by ½ in. ovate acuminate toothed. Justicia dentata, Klein; Nees in Wall. Pl. As. Rav. iii. 108, and in DC. Prodr. xi. 427. J. livica, Nees in DC. Prodr. xi. 427; Wight in. t. 1546.—Bengal, Assam and Pegu, very common. W. Deccan Peninsula, Wight, Ritchie.—The Bengal form has glabrate thin bracts, and a lurid or steely green-blue corolla. The Malabar form should perhaps be referred to Var. latevirens.

XLV. GRAPTOPHYLLUM, Nees.

Glabrous shrubs. Leaves often variegated. Flowers pedicelled, clustered; clusters forming terminal thyrses; bracts and bracteoles very small, narrow. Calyx small, sub-5-partite; segments equal, linear-lanceolate. Corolla-tube curved; limb 2-lipped, upper lip shortly 2-fid, lower 3-lobed. Stamens 2, 2 minute staminodes added; anthers oblong, 2-celled; cells parallel, mucilaginous. Ovary 4-ovulate; style filiform, scarcely bifid. Capsule oblong, hard, contracted into a long stalk. Seeds usually 2, orbicular or subquadrate, compressed flat, lacunose-rugose.—Species 4, Australian or Pacific, one long time cultivated.


Throughout INDIA and MALAYA cultivated; where wild, uncertain.

Leaves 4½ by 1½ in.; petiole ¼ in. Pedicels often ½ in. Calyx ½ in. The description of the capsule and seeds is taken from "Gen. Plant."

XLVI. RUNGIA, Nees.

Diffuse or erect herbs, or shrubs. Leaves entire. Spikes dense, terminal or axillary, 1-sided; bracts 2-ranked, or 4-ranked, with 2 of the ranks often flowerless; flowering bracts often scarious-margined; bracteoles
similar to the bracts or narrow. Calyx small, deeply 5-lobed; segments linear-lanceolate. Corolla small, blueish or white; limb 2-lipped, upper lip emarginate shorter than the lower 3-lobed lip. Stamens 2; anthers 2-celled, cells parallel subequal, or more often superposed, lower cell mucinous or white-tailed. Ovary 4-ovulate; style filiform, minutely bifid. Capsule ovoid or oblong, shortly stalked; after dehiscence the placenta with the retinacula rise elastically from the base of the capsule, scattering the seeds. Seeds 4., compressed, orbicular, glabrous, verrucose, sometimes minutely, sometimes very strongly, so that the seed is concentrically rugose or suberistate.—Species 20, mostly Asiatic, a few Tropical African.

I am unable to make sections of this genus; the species are described in order of their size, beginning with the largest.

1. R. sisparesensis, T. Anders. in Journ. Linn. Soc. ix. 518; leaves large elliptic acuminate at both ends glabrous, bracts dimorphic bifarious ovate subacute not acuminate glabrous, corolla ½ in. Adhatoda sisparesensis, Benth. in Pl. Hohenack. n. 1436.

Nigerebes; Sispara, Wight, Gardner, &c.; Valla Candoe, Wight; Wynnaad, Beddome. Shrubby, nearly glabrous. Leaves 6 by 1½ in., obscurely lineolate; petiole 1 in. spikes 2–3 by ¼ in., 1-sided, 2 series of large empty bracts on one side, 2 series of smaller flowering ones on the other; empty bracts ⅓ by ½ in., narrowed at both ends, shining green, not or very narrowly margined, striate; flowering bracts similar but hardly half so large, subscariosa, more acute; bracteoles ⅜ in., lanceolate. Calyx ½ in.; segments linear-lanceolate, minutely pubescent. Anther-cells separated, lower white-tailed. Capsule ½ in., minutely pubescent. Seeds verrucose, almost tubercled.


S. Deccan Peninsula; Courtallum, Wight, G. Thomson; Attaramallay, Beddome. Leaves 6½ by 2 in., base attenuate, lineolate; petiole 1½ in. Spikes 2 by ½ in., somewhat laxly imbricate, often paniced; empty bracts ½ in. diam., obtuse rarely minutely apiculate; flowering bracts rather narrower, somewhat obovate; bracteoles ¼ in., subovate, pubescent. Calyx ⅛ in.; segments linear-lanceolate, minutely pubescent. Anther-cells superposed, lower white-tailed. Capsule ½ in., minutely pubescent. Seeds subtubercular verrucose.—R. Arnottiana, Wight, differs only in the uppermost leaves being as broad as the middle cauline.

3. R. læta, Clarke; leaves ovate acute at both ends subglabrous, bracts large broadly elliptic acute marginate ciliate, corolla ⅜ in.

S. Deccan Peninsula (?); Herb. Wight. Leaves 2½ by 1½ in.; petiole ½ in. Peduncles ⅜ in., axillary; spikes 1½ by ⅜ in.; bracts sub-4-seriate, all fertile, ⅝ by ½ in., narrowed at base; margin prominent, scarious, purplish; bracteoles ⅛ in., linear, glabrous. Calyx ⅛ in.; segments linear-lanceolate, puberulous. Anther-cells oblong, contiguous, parallel, one scarcely lower than the others, slightly whitened, not tailed at the base. Ovary glabrous, subglan-

dular, style hairy near the base. Capsule not seen.—This appears much the finest species in the genus, but there is only a branchlet in Herb. Wight.

4. R. latior, Nees in DC. Prodr. xi. 472; scabrous-pubescent, leaves
petioled ovate or broad-lanceolate, spikes ovoid or oblong dense often clustered, bracts broadly obovate margined hairy, bracteoles obovate margined, corolla \( \frac{3}{4} \) in. Wight 

\[ \text{ix.} \]

\[ \text{Stems herbaceous, hairy. Leaves} 2 \frac{1}{2} \text{in. by} 1 \frac{3}{4} \text{in., cuneate at both ends; petiole} \frac{1}{4} \text{in. Spikes} 1 \text{by} \frac{3}{4} \text{in.; bracts obscurely 4-seriate (many barren more or less unlike the fertile),} \frac{1}{4} \text{by} \frac{1}{2} \text{in., obtuse rarely apiculate; bracteoles similar to the bracts, but smaller. Calyx} \frac{3}{4} \text{in.; segments linear-lanceolate, softly hairy. Anther-cells superposed, lower white-tailed. Capsule} \frac{3}{4} \text{in., nearly glabrous. Seeds small, minutely glandular-verrucose, ultimately glabrous.} \]

\[ \text{This is not allied to} R. \text{repens as} Nees \text{supposed, but may be a var. of} R. \text{longifolia, as} T. \text{Anderson first supposed.} \]

\[ \text{5.} \]

\[ R. \text{longifolia,} \text{ Nees & Arn. in} DC. \text{ Prodr.} \text{ xi.} 471, \text{ excl. Philippine example, not of Beddome; nearly glabrous, leaves linear-lanceolate, spikes shortly oblong often clustered, bracts biform. Fertile usually obovate margined minutely pubescent, corolla} \frac{3}{4} \text{in.} \text{ T. Anderson in} Journ. \text{Linn. Soc. ix.} 517, \text{ chiefly.} \]

\[ \text{Ceylon;} \text{ Walker, &c.} \]

\[ \text{Leaves} 4 \text{by} \frac{1}{4} \text{in. Flowerless bracts in 2 ranks on one side of the spike, ovato-lanceolate, obscurely margined. Otherwise as} R. \text{latior, from which this typical form of} R. \text{longifolia is easily separable: not so the} \]

\[ \text{Var. latifolia,} \text{ Wight ms.; leaves lanceolate or ovato-lanceolate, barren bracts few less distinctly 2-ranked less unlike the fertile. R. latior, Nees \& T. Anderson in} \text{ herb. partim.} \text{—Ceylon, numerous examples.} \text{ S. Travancore; Beddome.} \]

\[ \text{I follow} \text{ Wight (in preference to Nees and T. Anderson) in regarding all the Ceylon forms as one species, of which the} \text{ S. Indian is an allied species, or a variety.} \text{ T. Anderson divided} \text{ Thwaites n.} 89 \text{ between} R. \text{latior and} R. \text{longifolia, depending upon the breadth of the leaves alone.} \]

\[ \text{6.} \]

\[ R. \text{crenata,} \text{ T. Anderson in} Journ. \text{Linn. Soc. ix.} 518; \text{ leaves petioled ovato-lanceolate sparsely hairy, spikes short dense 1-sided, bracts markedly biform barren oblong acute mucronate fertile orbicular margined, corolla} \frac{1}{2} \text{in.} \text{ Rungia sp. n.} 9, \text{ Herb. Ind. Or.} \text{ H.f.} \text{ & T.} \]

\[ \text{W. DIOCOAN PENINSULA; Canara,} \text{ Law; Cocon,} \text{ Stocks; Belgum, Ritchie.} \]

\[ \text{Stems herbaceous, ramous, nearly glabrous. Leaves} 2 \text{ by} \frac{1}{4} \text{ in., baso shortly scuminate, sparsely laxly hairy on both surfaces, finally scabrid lineolate glabrous; petiole} \frac{1}{4} \text{ in. Spikes} 1 \text{ by} \frac{1}{2} \text{ in., terminal, or sessile quasi-axillary clustered; flowerless bracts in 2 regular series on one side the spike,} \frac{1}{4} \text{ by} \frac{1}{4} \text{ in., green, striate, not or very narrowly margined; flowering bracts} \frac{1}{4} \text{ in. diam., somewhat hairy; bracteoles} \frac{1}{2} \text{ in., obovate, scarious-margined. Calyx} \frac{1}{2} \text{ in.; segments linear-lanceolate, pubescent. Capsule scarcely} \frac{1}{2} \text{ in., pubescent.} \]

\[ \text{—Allied to} R. \text{parviglora,} \text{ Nees, but with much longer flowerless bracts.} \]

\[ \text{7.} \]

\[ R. \text{stolonifera,} \text{ Clarke; leaves petioled ovate minutely scabrid-pubescent, bracts ovate minutely hairy, calyx glabrous, corolla tubular} \frac{3}{4} \text{ in., anther-cells white-tailed. Dicliptera sp. n.} 14, \text{ Herb. Ind. Or.} \text{ H.f.} \text{ & T.} \text{ Justicia sp. (Sect. Rostellularia), Bentham. ms. in Herb. Kew.} \]

\[ \text{KHASIA Mts., alt.} \text{ 2—5000 ft.;} \text{ H.f.} \text{ & T., &c.} \]

\[ \text{Stems} 18 \text{ in., procumbent, rooting, branched; many small-leaved barren branches from the lower nodes. Leaves} 1—3 \text{ by} \frac{1}{4}—1 \frac{1}{2} \text{ in., cuneate at both ends, undulate sometimes sinuate, with few minute scattered hairs on both surfaces; petiole} \frac{1}{4} \text{ in. Spikes} \frac{1}{2}—1 \frac{1}{2} \text{ in., terminal and quasi-axillary, imperfectly 2—4-seriate; bracts} \frac{1}{2} \text{ by} \frac{1}{4} \text{ in., sub-obtuse, scarious-margined; bracteoles oblong, nearly as long as the bracts. Calyx} \frac{1}{2} \text{ in., deeply 5-partite; segments narrowly lanceolate, scarious. Corolla-tube} \frac{1}{2} \text{ by} \text{ n} 2 \]

\[ \text{Rungia.]} \text{ CIX. ACANTHACEAE. (C. B. Clarke.)} \text{ 547} \]
1 in., narrowly cylindric, straight; limb \( \frac{1}{4} \) in., 2-lipped; upper lip erect, subentire, lower pendent. Capsule \( \frac{1}{4} - \frac{1}{2} \) in., nearly glabrous; placentae rising elastically from the base. Seeds minutely glandular-papillos, glabrate when fully ripe.

8. **R. khasiana**, T. Anders, in Journ. Linn. Soc. ix. 518; leaves petioled ovate or elliptic minutely scabrid-pubescent, bracts ovate acuminate somewhat pubescent, calyx minutely pubescent, corolla \( \frac{3}{4} - \frac{1}{2} \) in. Rungia sp. n. 11, Herb. Ind. Or. H. f. & T. Acanthaes, Griff. Linn. Notes, 80, n. 589.

Khasia Mts., alt. 3000 ft.; Griffith (Kew Distrib. n. 6165), H. f. & T.

Much branched; branches 10 in., pubescent, or with deflexed hairs. Leaves \( \frac{3}{4} \) by \( \frac{3}{4} - \frac{1}{4} \) in., cuneate at both ends; petiole \( \frac{1}{4} \) in. Spikes 1–2 in., terminal and on short lateral branches, quadrifarious; bracts \( \frac{1}{4} - \frac{1}{2} \) by \( \frac{1}{4} \) in., acutely or long acuminate, scarious-margined, nerve; bracteoles \( \frac{1}{4} \) in., linear. Calyx scarcely \( \frac{1}{4} \) in., segments narrowly linear. Anther-cells superposed, muticus. Capsule \( \frac{1}{2} \) in., pubescent, placentae rising elastically from the base. Seeds minutely verrucose.

9. **R. himalayensis**, Clarke; leaves long-petioled ovate minutely scabrid-pubescent, spikes slenderly peduncled 4-farious seced, bracts ovate shortly acuminate somewhat pubescent, calyx minutely pubescent, corolla \( \frac{1}{4} - \frac{1}{4} \) in.

E. Nepal; Tambur River, alt. 4000 ft., J. D. H. Sikkim, alt. 3–4000 ft.; Dikeeling, Clarke.

Stems 1 foot, diffuse, weak, branched, pubescent. Leaves \( \frac{1}{4} \) by \( \frac{1}{4} - \frac{1}{4} \) in., cuneate at both ends; petiole \( \frac{1}{4} \) in. Spikes 1 in.; peduncles \( \frac{1}{4} - \frac{1}{4} \) in.; bracts \( \frac{1}{4} \) by \( \frac{1}{4} \) in., scarious-margined; bracteoles \( \frac{1}{4} \) in., linear. Calyx \( \frac{1}{2} \) in., segments sublinear. Anther-cells superposed, lower muticus or whitened at base. Ovary nearly glabrous; style finely hairy at base. Capsule less than \( \frac{1}{2} \) in., minutely pubescent; young shortly glandular- verrucose. Seeds small, minutely verrucose, appearing punctate.—Differs from **R. repens** in the longer-petioled broader leaves and much smaller capsule and seeds; from **R. apiculata** in the longer petioled leaves, glabrous ovary, and slender peduncles (perhaps hardly sufficiently).


W. Deccan Peninsula, from the Concan southwards, Heyne, Wight, &c.

Stems 6–12 in., slender, minutely pubescent. Leaves \( \frac{1}{4} \) by \( \frac{1}{4} - \frac{1}{4} \) in., from ovate to narrow-lanceolate, often apiculate, base cuneate or almost rounded, minutely scabrid or glabrous, lineolate on both surfaces; petiole usually less than \( \frac{1}{10} \) in. Spikes 1 by \( \frac{1}{4} \) in.; peduncles \( \frac{1}{2} - \frac{1}{4} \) in., slender; bracts \( \frac{1}{4} - \frac{1}{4} \) in., minutely pubescent, green or narrowly scarious-margined, obscurely striate; bracteoles \( \frac{1}{4} \) in., linear-lanceolate. Calyx \( \frac{1}{4} \) in.; segments sublinear, pubescent. One anther-cell lower than the other, acute hardly tailed at the base. Ovary pubescent, style glabrous except close to the base. Capsule not seen.

11. **R. apiculata**, Bedd. Ic. Pl. Ind. Or. t. 247; leaves petioled ovate or linear-oblong puberulous on the nerves beneath, spikes peduncled quadrifarious secund, bracts ovate-lanceolate apiculate minutely pubescent, calyx pubescent, corolla \( \frac{1}{4} - \frac{1}{4} \) in. R. repens, var., T. Anders. in Thwaites Enum. 235, in Obs.—Rungia sp. n. 8, Herb. Ind. Or. H. f. & T.


Stems 6–15 in., diffuse, branched, rooting, minutely pubescent. Leaves \( \frac{2}{4} \) by

Throughout India, from the Punjab and Bengal to Ceylon; common. (No specimens from the Malay Peninsula.)

A procumbent, rooting, rampant weed; branches quadrangular, pubescent or nearly glabrous. *Leaves* 2 by 6 in., or often smaller narrower; petiole rarely so much as 6 in. *Spikes* 2 by 6 in., appearing often peduncled, the 2 leaves close to their base usually much reduced; bracts closely regularly imbricated 4-farious, spike less 1-sided than in most species; bracts 6 by 6 in., white margin broad prominent; bracteoles 6 in., linear-lanceolate, minutely pubescent. *Calyx* 6 in.; segments linear-lanceolate, pubescent. *Corolla* white, with rose or purple spots. *Anther-cells* superposed, lower white-tailed. *Ovary* glabrous, style thinly hairy at base. *Capsule* 6 in. and upwards, minutely thinly hairy. *Seeds* ovoid, moderately compressed, rugose almost furrowed.


W. *Drococ Peninsular*: Conce and Canara, *Wight, Law, Stocks, &c.* Possibly a large form of *R. repens*. *Leaves* attaining 3 by 12 in., nerves beneath prominent, often patently white-hairy. *Spikes* 1-2 in. broad; bracts large, scarious margin very prominent sometimes coloured purplish. *Capsule* 6 in., thin, very hairy; seeds concentrically furrowed, the ridges very sharp sometimes crested.

14. **R. Beddomei**, *Clarke*; leaves nearly sessile ovate acute subglabrous, spikes slenderly peduncled dense, bracts broadly ovate apiculate nearly glabrous, corolla 6 in.

**Tenasserim**: Mooleyit and the Forest Ranges, Beddome.

Stems diffuse, branched, puberulous. *Leaves* 2 by 6-1 in., obscurely or not lineolate; petiole 6 in. *Spikes* 1-2 by 6 in., appearing to form lax terminal corymbs; uppermost leaves 6 by 6 in.; bracts nearly as of *R. repens*, more densely imbricated, 4-farious, regular. *Capsule* 6 in. *Seeds* very small, minutely verrucose.—The spikes bear considerable resemblance to *R. repens*; but it seems more nearly allied to *R. himalayensis*, which differs in its long-petioled leaves, and slenderer spikes.

15. **R. Brandisi**, *Clarke*; leaves ovate or ovate-lanceolate acuminate at both ends nearly glabrous, bracts all fertile ovate acuminate nearly glabrous, bracteoles boat-shaped acuminate pubescent, corolla 6 in.

**Tenasserim**: Parish, Brandis, Beddome.

Stems 18 in., nearly glabrous. *Leaves* 3 by 6-14 in., membranous, finely lineolate; petiole 1 in. *Spikes* 1-2 by 6 in., terminal and axillary clustered short-peduncled; bracts 6 by 6 in., obscurely 4-ranked, very narrowly marginate; bracteoles 6 in.
Calyx \( \frac{1}{2} \) in.; segments linear-lanceolate, pubescent. Anther-cells superposed, lower white-tailed. Capsule \( \frac{1}{2} \) in., puberulous. Seeds small, minutely verrucose.

16. **R. parviflora**, Nees in Wall. Pl. As. Rav. iii. 110, and in DC. Prodr. xi. 469, excl. syn.; leaves small ovate or lanceolate nearly glabrous, bracts dimorphic, barren elliptic or oblong subobtuse striate hardly marginated, fertile obolate glabrous scarious-margined ciliate, bracteoles elliptic scarcely acute, corolla \( \frac{1}{2} \) in. R. repens, T. Anders. in Journ. Linn. Soc. ix. 518 partly, not of Nees. R. longifolia, Bedd. Lc. Pl. Ind. Or. t. 266, not of Nees.

**S. Deccan Peninsula;** Wight (2011, 2285 Herb. Propri.). **Ceylon; Thwaites** (C. P., no. 257, 3354).

A small, ramous weed. Lower leaves 1 by \( \frac{1}{2} \)–\( \frac{3}{4} \) in., petioled, ovate, upper narrow sometimes linear. Spikes \( \frac{3}{4} \) by \( \frac{1}{2} \) in., nearly all terminal, markedly 1-sided; barren bracts not ciliate. Capsule \( \frac{1}{2} \) in.; seeds small, minutely verrucose.—This, the typical **R. parviflora**, Nees, appears a very rare plant; Nees, however, referred numerous specimens with the fertile bracts hairy all over to **R. parviflora**, but which are **R. pectinata**, Nees, as far as the description goes.

**VAR. pectinata**; flowerless bracts mucronate often ciliate flowering hairy. **R. pectinata**, Nees in DC. Prodr. xii. 470; Wight J. t. 1547; T. Anders. in Journ. Linn. Soc. ix. 517. R. parviflora, Nees t. e. partly; Griff. Notul. iv. 144; Dalz. & Gibs.Bomb. Fl. 195. R. polygonoides, Nees in Wall. Pl. As. Rav. iii. 110, and Cat. 7181, and in DC. Prodr. xi. 471; Dalz. & Gibs. Bomb. Fl. 196. Justicia pectinata, Linn. Amam. Acad. iv. 299; Lamk. Ill. t. 12, fig. 3; Roxb. Corom. Pl. ii. 29, t. 153, and Pl. Ind. i. 133; Wall. Cat. 2458. J. parviflora, Retz Obs. v. 9. J. infracta, Vahl Enum. i. 155.—Throughout India, from the Himalaya to Ceylon and Pegu, a universal weed.—Usually ramous. Leaves \( \frac{3}{4} \) by \( \frac{1}{2} \) in.; petiole \( \frac{1}{4} \) in. Spikes 1 by \( \frac{1}{2} \) in., terminal and axillary, clustered, subsessile, distinctly 1-sided; barren bracts \( \frac{1}{4} \) by \( \frac{1}{2} \) in., scarcely marginated; fertile \( \frac{1}{2} \) in. diam., orbicular, apiculate, scarious-margined, hairy on back as well as on margins; bracteoles \( \frac{1}{6} \) in., elliptic, subacute. Calyx \( \frac{1}{2} \) in.; segments linear-lanceolate, pubescent. Corolla blue or whiteish, upper lip short. Anther-cells superposed, lower white-tailed.—The area of this abundant plant should perhaps be extended to Java, &c., but the examples thence (Dicipltera cerulea, Blume Bijdr. 791) differ considerably from all the Indian material, which is very uniform in character, the size of the heads and bracts varying a little.

**VAR. muralis**; spikes very dense, barren bracts ovate acute hardly longer than the fertile. R. muralis, Nees in DC. Prodr. xi. 470.—S. Deccan Peninsula; Hohenacker, n. 18, &c. Chittagong; J. D. H., &c. Distrib. Awa.—Spikes sometimes \( \frac{1}{4} \) by \( \frac{1}{2} \) in., densely strobiliform.

**VAR. origanoides**; leaves narrowly lanceolate, spikes dense narrow, barren bracteal orbicular scarious-margined very hairy on the back nearly as the fertile. R. origanoides, Nees in Wall. Pl. As. Rav. iii. 110, and Cat. 7182, and in DC. Prodr. xi. 471.—Pegu; Wallioth.

**SPECIES NOT SEEN.**

R. **Mastersi**, T. Anders. in Journ. Linn. Soc. ix. 519; glabrous, leaves long-petioled ovate, spikes terminal ternate or panicked lax, bracts remote alternate sputulate-linear obtuse, corolla small.

**Assam**; banks of R. Sonder, Masters. Herbaceous, larger than the other species of the genus. Leaves (including petiole) 5–8 by \( \frac{1}{2} \)–2 in., minutely lineolate, pale beneath. Spikes 3–6 in., more or less secund, glabrous or pubescent; bracts \( \frac{1}{6} \) by \( \frac{1}{2} \) in., mostly linear, obtuse, glabrous; bracteoles as the bracts or ovate acute glaucous. Corolla \( \frac{1}{4} \) in., glabrous. Capsule \( \frac{1}{2} \) in., sparsely puberulous or pubescent (T. Anderson).

**XLVII. DICIPLTERA, Juss.**

Diffuse herbs. Leaves ovate, acute, entire or obscurely undulate. Inflorescence cymose, clustered or panicked; proper bracts opposite, unequal,
larger than the calyx (except in *D. parvibracteata*); flowers sessile, opposite, one of each pair usually reduced to a rudimentary calyx and bracteoles; bracteoles linear or linear-lanceolate, as long as the calyx (except in *D. parvibracteata*). Calyx sub-5-partite; segments equal, linear-lanceolate, more or less pubescent. Corolla red or rose, purple-spotted, tube slender, limb deeply 2-lipped; upper lip entire or emarginate, lower 3-lobed recurved. Stamens 2; anthers 2-celled; cells ovoid, supereolved, mucinous. Ovary 4-ovulate; style filiform, shortly bifid. Capsule clavate, stalk solid; placenta rising elastically from their base. Seeds ovoid, compressed, glabrous, verrucose or glandular subpapillosse.—Species 60, tropics of both Hemispheres.

Justicia chinensis, Vahl, Roxb. Fl. Ind. i. 124, Wall. Cat. 2466 (type sheet), has been long cultivated at Calcutta, having been introduced from China or Malaya; it looks like an enlarged or garden form of *D. Burmanni*, noticed below under *D. Leonotis*, Dalz.

* Inflorescence panicled, i.e. each pair of bracts mostly long-petioled.


**Madras;** Circars, Wight (Herb. Propr. n. 51 or 2014); Vizagapatam (Jaipur Hills), Beddome.

**Stem** diffuse, strigate, obscurely pubescent upwards. Leaves 5 by 2½ in. (or all except the lowest small, 1–2 in.), base shortly acuminate; petiole 1 in. *Panicle* 6 in., divaricate, lax, nearly glabrous; floral leaves at the bifurcations ⅓–⅔ in., linear-lanceolate; bracteoles ¼ in., linear. *Calyx* ½ in., sub-5-partite; segments linear-lanceolate, minutely pubescent. Corolla ½ in., slender, minutely pubescent. *Capsule* ⅔ in., clavate, pubescent; placenta rising elastically.—*Justicia latebrosa*, Koem., has never been satisfactorily recovered. The lc. ined. of this at Kow is *D. parvibracteata*; a separate imperfect drawing of a capsule added in the corner perhaps not pertaining. But Roxburgh’s description does not suit in several points, of which “flowers large” is difficult to get over. A scrap in Wallich’s Herbarium, marked in old handwriting “*Justicia latebrosa*, Roxb.” is *Dicliptera cuneata*.

2. **D. Beddomei**, Clarke; leaves ovate acuminate minutely pubescent, bracts ⅓ in. linear-oblong suddenly mucronate ciliate.

**N. Madras;** Nallaymallays (in Kurnool), Beddome.

**Stem** diffuse, strigate, glabrous except the tips. Leaves 5½ by 3½ in., pubescent beneath or nearly glabrous, base acuminate; petiole 2 in. *Panicle* 6 in., lax branches often patently white-hairy; floral leaves at the bifurcations gradually reduced, uppermost linear; bracteoles ⅓ in., linear-lanceolate. *Corolla* ⅔ in., minutely pubescent. *Capsule* nearly ⅔ in., clavate, pubescent; placenta rising elastically from the base. Seeds verrucose.


**Pegu; Kurz.**

**Stem** stout, strigate, patently white-hairy. Leaves 5 by 1½ in., acuminate at both ends, thinly hairy on both surfaces; petiole ¾ in. *Panicle* 6–15 in., divaricate, lax, patently white-hairy; bracts and bracteoles with glandular hammer-headed hairs, and also white-hirsute. *Corolla* ⅔–⅔ in., slender, minutely hairy. *Capsule* ⅔ in., clavate, pubescent, placenta rising elastically. Seeds verrucose.—Placed doubtfully as a var. of *D. speciosa* by Kurz; the inflorescence is different, and the corolla is considerably smaller.
4. **D. speciosa**, Kurz in Journ. As. Soc. 1873, pt. ii. Var. w only; leaves large lanceolate thinly hairy on both surfaces, bracts \( \frac{1}{4} - \frac{3}{4} \) in. spatulate-oblong obtuse hisrate glandular-hairy.

**PROV. Kurz.**

Stem terete, glabrous, except towards the top. Leaves 8 by 2½ in., acuminate at both ends; petiole 1½ in. Cymes 1–1½ in., axillary, often several together; sometimes from the lower axis; mostly subsimply umbelled, rarely compound; floral leaves \( \frac{1}{4} \) in. linear; proper bracts \( \frac{1}{2} \) in. broad, on cinerous-pubescent peduncles \( \frac{1}{2} \) in. long. Corolla nearly 1 in., lower lip broad. Capsule (immature) clavate, minutely glandulose-pubescent, 4-seeded.

5. **D. zeylanica**, Nees in DC. Prodr. xi. 474; leaves ovate acuminate minutely scabrid or glabrate, bracts ovate or elliptic mucronate glabrous or minutely pubescent. D. bivalvis, Nees l. c. 475 (as to the Indian material); Dalz. & Gibs. Bomb. Fl. 196; Wight Ill. t. 164 b, fig. 10, and Jc. t. 1651; T. Anders. Thwaites Enum. 235, and in Journ. Linn. Soc. ix. 519, not of Juss.

**W. DROCAN PENINSULA from the Concan southward, and Ceylon; frequent.**

Stem pubescent, sometimes pubescent or densely woolly. Leaves attaining 5 by 2½ in., base shortly acuminate; petiole \( \frac{1}{4} \) in. Inflorescence variable; in the type of Wight running into terminal panicles, upper floral leaves linear, peduncles \( \frac{1}{4} - 1 \) in.; more often cymes axillary, abbreviated, peduncles ternate; or peduncles subobsolete, or the inflorescence reduced to one pair of bracts; bracts \( \frac{1}{2} \) in. broad in the type specimen, often only \( \frac{1}{4} \) in. broad, never acuminate, either cuneate or subobtuse mucronate, frequently nervous; bracteoles small, linear-lanceolate. Corolla \( \frac{1}{2} \) in. Capsule \( \frac{1}{4} - 1 \) in. clavate, pubescent. Seeds minutely verrucose.—Diciptera bivalvis, Juss., is exactly Justicia bivalvis, Linn.; which, in so far as it relates to any Indian plant, is founded on Rheede Hort. Mal. ix. t. 43, which cannot represent the present plant (and may be Peristrophe montana). D. bivalvis, Juss., can, therefore, not even partem be the present D. zeylanica.

**Inflorwescence clustered subcapitate, i.e. each pair of bracts, subsessile or very shortly petioled (see also 5, D. zeylanica).**


**S. MADRES; Wight, &c.; Toulouse, Beddome.**

Pairs of bracts on short peduncles 0–½ in., often 3–8 together forming a subcapitate cluster; these clusters often on a peduncle \( \frac{1}{4} - 1 \) in., floral leaves supporting the cluster usually reduced, narrow. Otherwise very near the glabrous forms of D. zeylanica with congested inflorescence; both T. Anderson and Beddome have, however, treated the species as distinct.

7. **D. reptans**, Nees in DC. Prodr. xi. 483; leaves elliptic acuminate puberulous beneath, flower-clusters axillary subsessile, bracts elliptic acute mucronate softly pubescent.

**MIBROU; Griffith.**

Stems procumbent, rooting; branches 6–10 in., erect, puberulous. Leaves 3 by 1 in., base shortly acuminate; petiole \( \frac{1}{2} \) in. Peduncles to the flower-clusters 0–½ in.; floral leaves \( \frac{1}{4} \) in. linear; peduncles to the pairs of bracts 0–½ in. minutely pubescent; bracts nearly \( \frac{1}{4} \) in. 1-nerved; secondary nerves oblique, subprominent. Corolla \( \frac{1}{4} \) in. slender. Capsule not seen; and ather-cells rather long for a Diciptera; it is possibly a Peristrophe (as Griffith marked it in the field), and greatly resembles P. acuminata var. fragilis, except that the flower is smaller.

**CENTRAL INDIA**, alt. 1-3000 ft.; from Behar (J. D. H.) and Chota Nagpore to the Concan, frequent.—**Distrib.** Abyssinia.

**Brances striate, puberulous or glabrate. Leaves ⅓ by 1½ in., base shortly acuminate; petiole ⅓ in. Bracts ⅓ by ½ in., often nearly glabrous except the densely white ciliate margins. Corolla scarcely exceeding ⅓ in., very slender. Capsule ⅓ in., clavate, very shortly stalked, membranous, glabrous except the minutely hairy tip. Seeds very small, conspicuously verrucose.**


Closely allied to *D. micranthes*, but the bracts, flowers, capsules and seeds considerably larger. Leaves 3 by 1 in.; petiole ⅓ in. Bracts ⅔ by ⅔ in., much acuminate. Corolla ⅔ in. Capsule ⅔ in., very hairy. Seeds much larger than in *D. micranthes*, minutely glandulose-papilllose, scarcely verrucose.—Nees grounds his *D. Burmanni* on Burmann's figure of a Java species; this is D. Burmanni, T. Anders. in Journ. Linn. Soc. ix. 520. In founding the species, Nees states he had only seen one specimen, viz. Wight n. 2016, which sheet named by Nees' hand is at Kew; but it is not the plant figured by Burmann.


**PEGU and TENASSERIM;** Wallich, Griffith, McLelland, &c.

**Branches elongate. Leaves ⅔ by 1½-2½ in., base shortly acuminate; petiole ½ in. Flowers subsessile; bracts unequal, similar, larger ½ by ½ in.; bracteoles ⅔ in., linear. Calyx ⅔ in.; segments linear, nearly glabrous. Capsule ⅔ in., clavate, nearly glabrous. Seeds minutely papillose, hardly verrucose.—Perhaps only a form of *D. Roxburghiana*, differing in the softly pubescent flower-clusters, and the very obtuse often emarginate bracts. The numerous examples are exactly alike, but come from one neighbourhood.**


**Plains of N. INDIA, from the Punjab to Assam, Silhet and E. Bengal, frequent.**

**BHOTAN;** Griffith.

**Stems 1-3 ft., elongate, nearly glabrous. Leaves 2½ by 1 in., base cuneate; petiole ⅔ in. Bracts nearly ⅔ by ⅔ in., often 3-nerved, ciliate, thinly pubescent. Corolla ½ in. Capsule ⅔ in., clavate, puberulous or glabrous. Seeds conspicuously verrucose.—The whole of the plains form of *D. Roxburghiana* differs from Var.
bupleroides in the broader, more or less obovate, bracts. Nees founded his species on the common Assam and E. Bengal plant, and the original ticket on his type specimen is marked Assam. Bentham, however (in Fl. Hougk. 286), says this was an error, and that this type specimen came from the Calcutta Botanic Garden; but it is not known bow Bentham discovered this. Nees, however, is in error in citing Roxburgh's Justicia chinensis, for Roxburgh's \textit{Lc. Ined.} proves this to have been the true plant, long cultivated at Calcutta.


\textit{Justicia chinensis}, \textit{Wall. Cat.} 2466, letter B, C partly; \textit{Roxb. Fl. Ind.} i. 125, \textit{Obs. only.} \textit{J.} canescens, \textit{Wall. Cat.} 2423.—Throughout India in the hills, alt. 1–6000 ft., abundant in the north, becoming rare in the Malabar Ghauts; in the Himalayas from Kashmir to Upper Assam and the Chittagong Hills; Mt. Aboor, \textit{Stocks. Central India. Distrib. Afghanistan.—A large very uniform series, varying only slightly in the pubescence of the bracts. In the extreme forms the bracts are \frac{1}{2} by \frac{1}{2} in., glistening ciliolate, and in some of Beddome's Malabar specimens they are almost subulate. Though the bracts are often broader than in these, the plant as a whole is tolerably well separable from \textit{D.} Roxburghiana.}

**XLVIII. PERISTROPE, Nees.**

Erect, spreading herbs. \textit{Leaves} entire. \textit{Flower-clusters} axillary or terminal, often panicked by the reduction of the floral leaves; bracts 1–4 together, linear or ovate, longer (rarely shorter) than the calyx; bracteoles linear-lanceolate, shorter than the bracts. \textit{Calyx} deeply 5-lobed; segments equal, linear-lanceolate. \textit{Corolla} rose or purple; tube slender, limb deeply 2-lobbed, upper lip subentire, lower very shortly 3-lobed. \textit{Stamens} 2; filaments pubescent below; anthers 2-celled, cells linear (or in \textit{P. bicalycylata} ovoid), muticous, one higher than the other or distant. \textit{Ovary} 4-ovulate; style filiform, minutely bifid. \textit{Capsule} ellipsoid, stalked, usually 4-seeded, more or less dusky pubescent. \textit{Seeds} ovoid, compressed, glabrous, minutely glandular-papillose, scarcely verrucose.—Species 15, from Tropical and S. Africa to New Caledonia and S. Japan.


**Tropical and Subtropical India;** from the Punjab and Sind to Assam, Pegu and Madras, very common; not known from Ceylon.—\textit{Distrib.} Tropical Africa.

\textit{Leaves} 2 by 1 in.; petiole \frac{1}{4} in. Each pair of proper \textit{bracts} long-petioled; bracts \frac{1}{4} by \frac{1}{2} in., unequal. \textit{Anther-cells} ovoid, remote, resembling those of \textit{Diciptera}, not of other \textit{Peristrophes}. \textit{Capsule} \frac{3}{4}–\frac{1}{4} in. \textit{Seeds} minutely glandular-papillose.

MALBAR (Koenig, sde Vahl). NILGIRIS; Beddome. 
Leaves 2⅔ by ⅜ in., attenuate at both ends, sinuate, in Beddome's examples variegated; petiole ⅛ in. Panicle 1-2 in. diam., terminal, hardly exceeding the upper leaves; bracts ⅓-½ by ½ in., 2 or 3-4 together, 2-4-fld., lineolate, nearly glabrous. Corolla purple-red, tube ⅜ in., limb ⅜ in., lobes 2 very shortly toothed. Anther-cells linear, one placed close above the other. Capsule not seen. —This appears closely allied to P. acuminata, as Nees states.


TAYOY; Wallich. MALACCA; Griffith.—DISTRIBUT. JAVA.
Leaves 3 by ⅓ in., acuminate at both ends, lineate on both surfaces, minutely pubescent on the midrib beneath or glabrous; petiole ⅛ in. Bracts 2-4 together, ⅛ in. long or in other cymes of the same branch scarcely ⅛ in. Anther-cells linear, one slightly overlapping the other, upper usually narrower curved. Capsule ¼-⅜ in., nearly glabrous. —The plants here collected under P. acuminata are separated from P. montana by the much smaller corolla, and possibly include 2 or more species; but the material is insufficient. As noted by Nees, some of the specimens show great variation in the bracts on one branchlet; yet species have been founded on characters almost wholly drawn from them. In justification of throwing the species into one, it may be observed that the Malacca plant marked P. acuminata by T. Anderson is identical with the Java plant marked P. Blumeana by Nees; but there is no specimen from Burma (much less from Khasia) that matches this, as might be inferred from Nees and T. Anderson: and Miquel's P. acuminata from Java is very unlike P. acuminata, Nees.

VAR. fragilis; leaves larger ovate-lanceolate, bracts ¾ by ⅝ in. broadly lanceolate glabrous. P. graecilis, Nees in Wall. Pl. As. Rar. iii. 113, and in DC. Prodr. xi. 495, and in Wall. Cat. 7184; T. Anders. in Journ. Linn. Soc. ix. 522. Justicia acuminata, Wall. Cat. 2425, sheet B partly. —Tayoy; Wallich. Rangoon; M'Lelland. Mergui; Griffith.—Leaves 5 by 2 in.; nerves many, pubescent; uppermost leaves linear-lanceolate. —The Tayoy example marked by Nees fragilis is identical with some of that marked by him acuminata.

VAR. khasiana, bracts all small ½ in. fuscous-pubescent. JUSTICIA acuminata, Wall. Cat. 2425, letter A right-hand fragments. —Khasia Mts.; Wallich. —This does not look like a Peristrophe, but the corolla and stamens are exactly as in P. acuminata, type.


SIHET and Jaintiapoor, alt. 500 ft.; Wallich, &c., frequent. MOULMEIN; Parish. TENASSERIM; Beddome.
Leaves 2½ by 2 in., acute at both ends, pubescent on the nerves beneath or glabrate, obscurely or not lineolate; petiole ⅛ in. Panicles strict, branches erect. Calyx ⅓-⅝ in.; segments sublinear. Anther-cells linear-oblong, immediately superposed.
Capsule 3 in., viscid-pubescent.—A strongly marked species; the Moulmein plant (P. grandiflora, Parish ms.) has the flowers hardly larger than in some examples from Silhet.


SUBTROPICAL HIMALAYA, alt. 1–5000 ft., from Kumaon to Bhotan, frequent; Wallich, &c. Silhet Station; Clarke.

*Leaves* 5 by 2 in., base rhomboid or acute; petiole 1 in. *Floral leaves* often 1–2 in., so that the flower-clusters often appear terminal or axillary subcapitate rather than panicked; bracts ½ by ¼ in., subobtuse, sometimes spatulate, tips often recurved. *Anther-cells* linear-oblong, one superposed half its length.


W. DECCAN PENINSULA from the Concan southward, and CEYLON, frequent; Wight, &c.

*Leaves* 5½ by 1¾ in., raphides very slender on both surfaces; petiole 1¾ in. *Bracts* ½ by ¼ in., obtuse or minutely apiculate, not acuminate. *Filaments* pubescent; *anther-cells* linear, one half its length below the other.—Described from Wight, Herb. Propr. n. 2017, its type (named in Nees' hand); and includes all the S. Indian examples of Nees and T. Anderson, *not* their Khasi material.


INDIA; cultivated frequently from Assam to CEYLON.—DISTR. Malaya, S.E. Asia; where wild not known.

*Leaves* 2–3 by 1–1½ in.; lower petioles rarely exceeding ½ in.; dusky-puberulous. *Bracts* ½ by ¼ in., somewhat nerve, dusky-puberulous. *Anther-cells* linear, one superposed for half its length. *Capsule* barely ¾ in., shortly stalked.—A well-marked cultivated form, described from Roxburgh's and Wallich's specimens. Nees has diagnosed his *P. tinctoria* so as expressly to exclude (by the ciliate bracts, &c.) all the examples; so that the name *P. tinctoria*, Nees, can only be understood to refer to some of Nees' synonyms. The figure of Dianthera japonica, Thunb. Fl. Jap. 21, t. 4, cited by Nees for this species, is a Dictiptera, and with it much of Nees' synonymy falls to the ground.

8. **P. fera**, Clarke; leaves long-petioled ovate-lanceolate acuminate more or less pubescent, bracts elliptic often elongate nerve ciliate often hairy, corolla 1½ in. *P. montana*, Var. β sylvestris, Nees in DC. Prodr. xi. 493 (as to the N. Indian examples). *P. tinctoria*, Nees l. c. as to descr. only; T. Anders. in Journ. Linn. Soc. ix. 521, chiefly. Justicia acuminata, Wall. Cat. 2425, left example on type sheet.—Peristrophe sp., Griff. Itin. Notes, 36, n. 596.

Leaves 4½ by 1½ in.; raphides obscure or 0; petiole (of the middle cauline leaves) often exceeding 1 in. Bracts 3½ by 1 in., often obtuse acuminate. Corolla much broader than in P. tinctoria.—Possibly the wild form of P. tinctoria. Nees, after diagnosing his P. montana as having non-ciliate bracts, has thus named examples of P. fora with intensely ciliate bracts.

Var. intermedia; bracts more hairy, flowers smaller.—Chittagong, alt. 1000 ft.; H.f. & T. Pegu; Kurz. Tenasserim; Beddome.—This has been named P. jakeppafolia, Nees, but the corolla is much smaller than in the Malay examples of that species. It is suspiciously intermediate between the P. acuminata var. fragilis and P. fora; and both plants were collected by Beddome on the slopes of Moolyit in Tenasserim; the corolla is the same size in both, and the only difference between them is that in Var. intermedia the bracts are ½ in. broad and hairy, but in P. acuminata var. fragilis ¼ in. broad and glabrous.

XLIX. HYPOESTES, E. Br.

Herbs or shrubs. Leaves entire or toothed. Flower-clusters spiked, capitellate or rarely solitary; bracts 2–4 together, free or united at base, enclosing 1–4 flowers, of which all but 1 are usually reduced or obsolete; bracteoles shorter than the bracts, narrow. Calyx very small (or in H. lanata nearly equalling the bracteoles), deeply 5-lobed, scarios or membranous; segments linear-lanceolate. Corolla pink purple or white (in the Indian species); tube slender, limb 2-partite; upper lip subentire, lower very shortly 3-lobed. Stamens 2; anthers 1-celled, mucinos. Ovary 4-celled; style filiform, scarcely bifid at the tip. Capsule ellipsoid, stalked, usually 4-seeded. Seeds ovoid, compressed, glabrous, in the Indian species verrucose.—Species 70, from Tropical and S. Africa, the Himalaya, China and Australia.

Hypoestes purpurea, E. Br., Nees in Wall. Pl. As. Bur. iii. 114 (Justicia purpurea, Wall. Cat. 2473), is a Malay Archipelago plant, cultivated from long ago in Bengal.


CONCANA GRAUTS; Law, Dalzell.

An undershrub. Leaves 5 by 1½ in., minutely lineolate on both surfaces; petiole ¼ in., sometimes winged. Spikes 6 in. and upwards; flowers mostly in opposite distant clusters, each cluster consisting of 1–3 bracts and 1 (with 1 or 2 reduced) flower; bracts ½–2 in., very hairy. Calyx ½ in., hairy. Capsule nearly ½ in., stalked, pubescent. Seeds verrucose.—Habit very remote from Hypoestes, superficially resembling Strobilanthes perfoliatus, but the corolla and stamens are typical Hypoestes.


NEPAL; Wallisch; Tambur River, alt. 1–3000 ft., J. D. H. SIKKIM AND BHOTAN, alt. 4–7000 ft., Clarke, Grifith.—DISTRIBUTION. Abyssinia.

Herbaceous, ramous. Leaves attaining 3½ by 2 in., mostly much smaller, crenate or denticulate, sparsely hairy above, pubescent beneath; petiole 1½ in. Flower-clusters 1–5 (often 3) together, sub sessile; bracts opposite, paired, flower in one of each pair nearly always 0 or much reduced; bracteoles ¼–½ in., linear-lanceolate,
nearly as long as the bracts. *Calyx* ½ in. *Corolla* pink or white. *Capsule* ½ in., nearly glabrous. *Seeds* verrucose.—The placentae tend to rise elastically, and the inflorescence also draws this plant very close to *Diciptera*.


**Malaoca**; Griffith, Capt. A. C. Wight, *Maingay*.  
Branches herbaecones, diffuse, minutely pubescent. *Leaves* 2½ by 1 in., petiole ¼ in. *Inflorescence* dense, minutely ashy-pubescent; bracts ½–¾ in., several connate into a tube, enclosing 1–4 flowers, of which all but 1 are usually rudimentary; bracts, teoles ¼ in., linear, scarious. *Calyx* scarcely ½ in., membranous. *Capsule* nearly ½ in.—This extends, with slight variation in size of corolla and degree of union of the bracts, throughout the Malay Archipelago to the Philippines.

**ORDER CX. SELAGINEE.** (By J. D. Hooker.)

Herbs or shrubs. *Leaves* alternate or the lower opposite, entire or toothed. *Flowers* small, solitary or spicate, irregular, 2-sexual. *Calyx* inferior, spathaceous or tubular and 2–5-fid or -partite, imbricate in bud. *Corolla* monopetalous, tube entire or split, limb 2-lobed or 4–5-lobed, imbricate in bud.  
*Stamens* inserted on the corolla-throat or -lobes, 2, or 4 with a rudimentary 5th, filaments filiform; anther-cells confluent. *Ovary* free, 2-celled; style simple, terminal, stigma subcapitate or 2-lobed; ovules 1 pendulous from the top of each cell, anatropous. *Fruit* small, 2-celled, indehiscent or of 2 cocci, one often imperfect. *Seeds* pendulous; embryo straight in the axis of fleshy albumen; cotyledons ½-cylindric, radicle superior.—*Distrib*. Species 140, all S. African, except the European genus *Globularia* and the following.

**LAGOTIS**, Gaertn. (Gymnandra, Pall.)

Perennial fleshy herbs. *Leaves* radical and cauline, entire or incised. *Flowering branches* scape-like, ascending, leafy above. *Flowers* spicate or capitate, bracteate, blue or purple, ebracteolate; bracts usually broad, imbricating, as long or longer than the flowers. *Calyx* spathaceous or of 2 scsals. *Corolla-tube* curved; limb 2-lobed, lower lip 2-4-lobed.  
*Stamens* 2, inserted on the corolla-throat; anthers very large, reniform. *Ovary* 2-celled; style slender, jointed at the base, stigma capitate or 2-fid. *Drupe* small, 2-celled, 1–2-seeded, sometimes separable into 2 indehiscent cocci.—*Distrib*. Species 4 or 5, Arctic Regions and Mts. of N. Asia and N.W. America.

*L. stolonifera*, Koch (Gymnandra), a species found from Armenia to Afghanistan, has been collected in Waziristan, alt. 5–7000 ft., by Stewart, close to the British frontier. It may be known by its small size, narrow leaves, and long stolons.

* Calyx of 2 oblong sepals.

1. **L. globosa**, Kurz in *Journ. As. Soc*. xxxix. 2, 80, t. 7, f. 1 (Gymnandra); leaves long-petioled oblong pinnatifid, scape almost naked, bracts much larger than and concealing the flowers suborbicular densely imbricate forming a globose head.

Western Tibet; Therichan Pass, alt. 15–16,000 ft., *Heyde*; Gilgit, Col. *Turner* (*fl. C. B. Clarke*).
Rootstock slender. Leaves few, cut to the midrib; lobes linear-oblong, widened towards their obtuse or notched tips; petiole 2–3 in. Scape slender, shorter than the leaves, with a few leafy bracts at the tip. Heads 1–1 ½ in. diam., like a double rose; outer bracts ½ in., orbicular-obovate, concave (when dry membranous), inner narrower. Flowers ½ the length of the bract. Sepals obvate-oblong, one obdurate, the other 2-toothed. Filaments slender, as long as the upper lip; anthers small for the genus. Style included, stigma notched. Fruit ½ in. long, ellipsoid.

2. L. decumbens, Ruprecht Sert. Thianschan, 64; leaves long-petioled ovate or oblong coarsely crenate, scape few-leaved, bracts much larger than and concealing the flowers broadly ovate densely imbricate forming an oblong head.

Western Tibet; Karakorami, alt. 16–18,000 ft., Thomson, Henderson; Karakash Mts., Stewart.—DISTR. Thianschan Mts.

Rootstock small. Leaves 1–1 ½ in. obtuse, base cuneate; petiole 2–4 in., tapering downwards. Flowering stems ascending, longer than the leaves, with a few leafy bracts near the top. Spike 1½–2 in.; bracts ½ in. long, entire, obtuse, membranous. Flowers ½ in. long. Sepals as in L. globosa. Lower corolla-tip 3- or 4-cleft. Anthers suboblonge. Style short, included, stigma notched. Fruit narrowly oblong.

** Calyx very large, spathaceous, hooded, concealing the corolla, acute, nerves meeting in the tip.

3. L. Clarkeli, Hook. f.; stem ascending leafy, leaves elliptic-ovate acute irregularly toothed, spike elongate, calyx longer than the bract.

Sikkim Himalaya; Yakla, alt. 16,000 ft., Clarke.

Stems or branches 6–8 in., stout, flexuous. Leaves, radical long-petioled; cauline 2–3 in., sessile; nerves many, strong, reticulate. Spike recurved; bracts ½ in., toothed. Calyx twice as long, ovate-lanceolate, complicate, open by a narrow slit in front nearly to the base, veined. Corolla half as long, lips very short, subequal, recurved, upper dilated at the hooded tip, lower obtusely 3-lobed. Filaments adnate to the margins of the upper lip. Ovary slender; style exerted, stigma 2-fid.—A very remarkable plant, more cauliflora than its congeners. The specimens are very sad, and the description of the corolla may want correction. I found at Tungu (in N. Sikkim) what I take to be young plants of this, judging from the reticulate nervation of the leaves.

*** Calyx spathaceous, dorsally plane, 2-nerved; nerves ending apart in the terminal lobes or teeth.

4. L. glauca, Gaertn. in Nov. Comm. Petrop. xiv. 553, t. 18, f. 2; stolons 0, leaves oblong ovate or obovate toothed or crenate petiole very stout, cauline obtuse, spike elongate, bracts obvate or elliptio equalling or longer or shorter than the flowers. Maximovics in Bull. Imp. Acad. St. Petersburg. xxvii. (1881) 523, excl. syn. L. decumbens. Gymnandra Stelleri, Herb. Ind. Or. H. f. & T.

Alpine Himalaya, alt. 11–15,000 ft., Royle, &c.—DISTR. Mts. of Central and N. Asia, and Arctic Asia and America.

Rootstock stout, with thick fleshy root-fibres. Leaves fleshy, radical 2–3 in., variable in breadth and toothing, narrowed into the very stout petiole; cauline ½ to 1½ in., 4-amplexicaul, often quite entire. Flowering stems several, 3–10 in. high, decumbent below, stout, leafy above. Spike 2–5 in.; bracts ½–1 in. Calyx nearly as long as the corolla-tube or shorter; lobes minutely frnibrate. Corolla-tube rather slender, tips very variable.

Var. cashmeriana; radical leaves elliptic or oblong obtuse, bracts ovate toothed rather longer than the calyx, corolla deep blue much longer than the calyx, lower lip 2-cleft, or 3-cleft with the mid-lobe narrowest, filaments from half as long to as
long as the upper lip adnate below to its margins, style far exerted, stigma minute. Gymnandra cashmeriana, Royle in Benth. Scroph. Ind. 47, and Ill. Himal. Pl. 291, t. 78, f. 3; Chois. in DC. Prodr. xii. 25.—Western Himalaya, from Chumbi to Kashmir, alt. 11–15,000 ft.

Var. kunawuresis; radical leaves ovate or oblong-lanceolate, obtuse crenate-toothed, cauline sessile ovate subacute, bracts broadly ovate rather longer than the calyx, corolla purplish tube about equaling the calyx, lower lip usually 3-cleft, authors subsessile, style shortly exerted 2-fid, fruit ovoid rugose. Gymnandra kunawuresis, Royle & Chois. l. c.—Western Himalaya; Kunawur, alt. 12–15,000 ft.; Rajhoti, N. of Kumaon, alt. 15,000 ft., Strachey & Winterbottom.—A stouter plant than Var. cashmeriana.

Var. sikkimensis; habit of Var. kunawuresis, but flowers larger, corolla-lobes longer, lower lip cleft into 2 narrow lobes.—Sikkim Himalaya, alt. 16–17,000 ft., J. D. H.

1 follow Maximovicz in referring all the Himalayan plants to L. glauca, except L. decumbens (the calyx of which is widely different, as are the habit and bracts). That author further refers Gymnandra borealis, Pallavii, and Stellera to the same species, and I suppose with good reason. The two principal Himalayan forms, kunawuresis and cashmeriana, are however readily distinguishable, if I mistake not, by size, colour of flower, length of filaments, and stigma; and possibly by fruit, if, as I suspect (judging from unripe ones), that of cashmeriana is much the smaller, narrower, and smoother.

5. L. spectabilis, Kurz in Journ. As. Soc. xxxix. 2, 80 (Gymnandra); tall, very robust, stem leafy, cauline leaves sessile orbicular-ovoiduate quite entire, spike long, bracts ovate acute toothed rather longer than the calyx, antlers subsessile, style included, stigma capitulate.

Sikkim Himalaya; Phalloot, alt. 13,000 ft., Kurz.

Rootstock and radical leaves not seen. Stem 18 in., ½ in. diam., tapering downwards, naked below the middle. Leaves 2–3 in. long, ½-amplexicaul, decumbent; nerves very slender, nearly parallel to the margin, finely reticulate. Spike 4 in.; bracts ½ in. Calyx-teeth ambriate. Corolla-tube equalling the calyx; upper lip short, lower 2 long linear lobes.—Probably a very large state of L. glauca var. sikkimensis; I have seen but one specimen, without root-leaves.

Order Cxi. Verbenaee. (By C. B. Clarke.)

Herbs, shrubs, or trees. Leaves opposite or whorled, apparently scattered in Geunisia, simple or digitate (in Peronema pinnate); stipules 0. Inflorescence cymose, racemose or spicate; cymes often compound or panicked; bracts various. Calyx gamosepalous, persistent, 5–4 (rarely 6–3) toothed. Corolla gamopetalous; tube often cylindric, limb 2-lipped or subequal 5– (rarely many-) lobed. Stamens 4, didynamous, rarely 2, 5–6. Ovary superior, 2-carpellary (except in Geunisia), 2–4-celled, or sub-1-celled, 4-ovuled (in Phryma 1-celled 1-ovuled), entire or 4-lobed; style terminal; ovules variously attached. Fruit a drupe or almost capsular, 4–2–1-celled (with many pyrences in Geunisia), cells 1-seeded. Seeds erect or pendulous, albumen 0 (in the Indian genera); radicle inferior (except in Phryma).—Species 700, chiefly tropical.

Duranta, a large American bush, is much cultivated in India; it differs from all the Indian genera in its 8-celled ovary, drupe with 4 2-seeded pyrences.

Herb. Spike slender, interrupted . . . . . . . . . . 1. Phryma.


* Pyrencs of the fruit 2–1, 1-seeded.
Shrubs. Calyx small. Fruit a drupe. 2. Lantana.
Small shrubs. Calyx small. Fruit capsular. 3. Lippia.

** Pyrenes of the fruit 2, 2-seeded.
Herb. Calyx accrescent, enclosing the fruit. 6. Priva.

*** Pyrenes of the fruit 4, 1-seeded.
Herb. Calyx tubular, not accrescent. 7. Verbena.

Tribe 3. Viticeae. Inflorescence cymose, centrifugal; cymes panicled. Drupe with 4 (in Genusia many) pyrenes.—Trees or shrubs.

* Corolla regular, stamens isomerous, equal. (Leaves entire.)
Flowers 4-merous. Drupe with 4 pyrenes. 9. Callicarpa.
Flowers 4–6-merous. Drupe with 4–14-celled pyrene included in the accrescent calyx. 10. Tectona.

** Corolla 2-lipped, stamens didynamous.
† Drupe with 1 pyrene.
Leaves entire or toothed. Flowers small. 11. Premna.
Leaves entire or toothed. Corolla 1 inch. 12. Gmelina.

†† Drupe with 4 pyrenes. (Leaves simple.)
Calyx in flower large, patelliform. 15. Holmskioldia.

Tribe 4. Caryopterideae. Inflorescence cymose, centrifugal; cymes panicked. Fruit dividing into 4 pyrenes.—Trees or shrubs.

Leaves simple. Cymes axillary dense or thyrsoid. 16. Caryopteris.
Leaves large, impari-pinnate. 19. Peronema.

Tribe 5. Symphoremeae. Cymes 3–9-flowered, capitate; bracts of the flower-head 6 or 3–4, usually large, involucriform. Fruit nearly dry, small.—Large climbers.


I. Phryma, Linn.

An erect herb. Leaves petioled, membranous, toothed. Spikes long, slender; bracts linear, small; bracteoles minute. Calyx tubular; teeth 3, linear, hooked. Corolla small, tubular, 2-lipped; lower lip larger, of 3
rounded patent lobes. *Stamens 4, didynamous; anthers round. Ovary oblong, oblique; ovule 1, erect, attached on one side near the base; style linear; stigma shortly unequally 2-lobed. Utricle membranous, enclosed in the reflexed calyx; radicle superior, cotyledons convolute.*

**P. leptostachya**, Linn.; Schauer in DC. Prodr. xi. 520; leaves ovate or ovate-lanceolate thinly pubescent, peduncles terminal and from the upper axils. *Gaertn. Fruct. i. 363; t. 75; Lamk. Ill. t. 516; Wall. Cat. 2088; Schnizl. Ir. Fam. Nat. t. 150 a; Walp. Rep. iv. 36.*

W. Himalaya, alt. 3-7000 ft.; from Kashmir to Nepal frequent, Walllich, Royle, &c. *Khasia Mts., alt. 4-6000 ft.* H. f. & T., &c.—Distrib. Amnland and Japan, Temp. N. America.*


II. **LANTANA**, Linn.

Rambasting shrubs, pubescent or scabrous; branches tetragonous, sometimes prickly. *Leaves simple, petiolated, crenate, often rugose. Spikes peduncled, capitate, ovoid or cylindrical; bracts conspicuous, exceeding the calyx; bracteoles 0. Calyx small, membranous, truncate or sinuate-toothed. Corolla-tube slender, cylindrical; lobes 4-5, spreading. *Stamens 4, didynamous, included; anthers broadly oblong. Ovary 2-celled, 2-ovuled; style short, stigma oblique subcapitate. Drupe fleshy or nearly dry, containing 2 bony, 1-celled pyrenes. Seed without albumen; radicle inferior.—Species 40, tropical or subtropical, mostly American.*

*L. Camara*, Linn. (Schauer in DC. Prodr. xi. 598; L. aculeata, Linn.; *Rozb. Hort. Beng. 46, ? L. mixta*, Linn. in Thwaites Enum. 242), an American plant, has run wild in India, especially in the W. Deccan Peninsula and Ceylon. It is readily recognized by the numerous recurved prickles on the branches.

1. **L. indica**, Rozb. Hort. 46, and Fl. Ind. iii. 89; leaves ovate or lanceolate softly hairy above, bracts ovate or elliptic acuminate softly loosely hairy. *Wall. Cat. 1823, type sheet a, b; Wight Ill. t. 173 b, fig. 3, and t. 1464. L. latifolia, Tausch in Flora 1836, 391. L. dubia, Wall. Cat. 1821, 2 and C not 1; Royle Ill. 300, t. 73, fig. 2. L. collina, Decne. in Jacquem. Voy. Bot. 136, t. 141. L. alba, Schauer in DC. Prodr. xi. 606; Dalz. & Gils. Bomb. Fl. 188; Brandis For. Fl. 369; Kurz For. Fl. ii. 253; Boiss. Fl. Orient. iv. 532, not of Miller, Decne., nor Link.*

Throughout India and Ceylon in the warmer parts, common; on the river-banks of Bengal one of the commonest weeds.—Distrib. Beloochistan, Trop. Africa.*

A shrub, 3-8 ft. high; branches long, ramballing, appressed scabrid-pubescent, or towards the tips patent densely fulvous-hairy. *Leaves 1-3 in., opposite or ternate, tip not rounded, rugose, above softly hairy, beneath more densely often woolly sometimes white-woolly; petiole ½ in. Peduncles numerous, axillary 1-3 in., usually opposite; heads oval, usually ⅓-½ in., sometimes in fruit 2-3 in. long, cylindrical; bracts ⅓-⅔ in., upper smaller, ovate or even cordate in the typical form, but varying to lanceolate. Calyx less than ⅓ in., hairy. Corolla ¼ in., hairy, mouth ⅔ in. diam., usually pink, the tube yellowish, varying from dull purple to white. Drupe ⅔-⅔ in. diam., purple.*


**Phryma.**

N.W. *India*, Royle, Falconer; Moradabad (cultivated), Thomson. **Madras**; Vols Charnece, Thomson.

Resembling *L. indica*. Leaves finely crenated, very scabrid above. Outermost bracts \( \frac{1}{4} \) by \( \frac{1}{8} \) in. Corolla from yellow to orange.—This plant may not be wild in India, but it is not known where it is so.


Throughout *India* and *Ceylon*, naturalized from the N.W., Royle, to *Ceylon*, Wight. *Bengal*; Dacca, Bursial, Chittagong, J. D. H., &c.—*Distrib. Trop. America.*

Resembling *L. indica*; so much so that ternate-leaved examples of *L. indica* are generally marked *L. trifolia*. Perhaps only a denizen in British India.

**DOUBTFUL SPECIES.**

*L. soabara*, *Wall. Cat.* 1822, is not to be found in Wallich’s Herbarium.

### III. **LIPPIA**, *Linn.*

Fruit dry, separating into 2 1-seeded pyrenes. Otherwise as *Lantana*.—Species 90, mostly American.

The genus *Lippia* can hardly be distinguished from *Lantana*, but the present species is easily recognized by its creeping habit and alternate peduncles. *Rhodea Hort. Mal.* x. t. 93, sometimes quoted for this plant, has large bracts to the heads, nor does it represent the creeping habit. Roxburgh, by some slip, has omitted the genus *Verbena* in Fl. Ind., though he has it in Hort. Beng.


Throughout *India* and *Ceylon*, in wet grass; abundant.—*Distrib.* All tropical and warm-regional regions. Extending 6–30 in., much branched, often rooting from the nodes. *Leaves sub-sessile, 1 by \( \frac{1}{4} \) in., sharply toothed, base attenuate entire. *Peduncle 1–3 in.*, with very rarely another from the opposite axil; heads \( \frac{1}{2} \) by \( \frac{1}{8} \) in., ovoid or cylindric; bracts \( \frac{1}{8} \) in., ovate, shortly acute, outermost not much larger than the others. Calyx minute, 2-fid, hairy. *Corolla \( \frac{1}{2} \)–2 in., tube slender, mouth 2-lipped, lower lip rather longer, pinkish-purple to white. *Fruit* hardly \( \frac{1}{4} \) in. diam., nearly dry.


**Bengal**, frequent; below Dacca, *J. D. H.*, &c.—**DISTIBR. Trop. America, a widely dispersed weed.**

So closely resembling *Lantana indica* that without fruit it is difficult to distinguish. **Leaves and peduncles opposite or ternate. Peduncles rarely exceeding ¼ in.; outer bracts rarely exceeding ½ in.** *Fruit* ⅛–⅛ in. diam.

**IV. BOUCEHA, Cham.**

Herbs or undershrubs. **Leaves petioled, ovate or oblong, toothed. Spikes terminal, linear, elongate; bracts much shorter than the calyx. Calyx narrowly cylindrical, strongly 5-ribbed, very shortly 5-toothed, in fruit slightly enlarged, split to the base on the outer side (in the Indian species). Corolla-tube very narrowly cylindrical; limb patent, 5-lobed. Stamens included, didynamous; anthers ovate, cells 2 parallel. Ovary 2-celled, cells 1–2-ovuled; style short, linear; stigma 1-sided, toothed. Fruit dry, included in the calyx, of 2 elongate-oblong 1-seeded pyrenes.—Species 16, in the warmer parts of America and Africa, 2 extending to India.**


**Soinde; Stocks, Dalzell.—DISTIBR. Arabia, Egypt, Abyssinia, Central Africa.**

Woody, much branched. **Leaves 1 by ½ in., coarsely toothed, hoary-pubescent on both surfaces; petiole ½ in. Spikes 2–5 in., nearly continuous; flowers alternate; bracts ½ in., lanceolate. Calyx ¼ in., subtruncate, inflated in fruit. Corolla-tube scarcely ¼ in. diam. Pyrenes ¼–½ in., linear-oblong, black.**


**Deccan Peninsula and Ceylon; Rottler, Wight, Thwaites, &c.**

**Branches woody, elongate little divided upwards, nearly glabrous. Leaves 3–4 by 1½ in., serrate, nerves beneath minutely pubescent; petiole ⅛ in. Spikes 2–6 in., dense; bracts ½ in., lanceolate. Calyx ½ in., nearly glabrous; teeth ⅛ in., linear. Corolla-tube funnel-shaped upwards; limb pink-purple. Pyrenes exceeding ¼ in., linear-oblong, slightly wider upwards, margined, straw-coloured, smooth on the inner face (the thickened inner layer of tissue becoming white and flaking off).**

**V. STACHYTARPHETA, Vahl.**

Herbs or shrubs. **Leaves toothed. Spikes terminal, long, slender (in the Indian species); bracts long or short; bracteoles 0. Calyx narrowly cylindrical, shortly 4–5-toothed. Corolla-tube cylindrical; limb oblique, patent, 5-lobed. Stamens 2 fertile, included; anther-cells ovate, vertically divaricate. Ovary and fruit nearly as of Bouchea.—Species 40, in warm America.**


Tropical India from the Punjab and Silhet to Travancore and Singapore; Ceylon, plentiful.—DISTRIEB. Trop. Asia and America.

A herb, 1–2 ft., nearly glabrous; branches quadrangular. Leaves 1–4 in., sub-obtuse, base decurrent. Spikes 3–12 in., nearly continuous. Calyx ½ in., 4-nerved. Corolla ½ in., deep-blue. Pyrenes ½ in.—Probably naturalized in Asia; the examples from extra-tropical India are almost surely escapes.

VI. PRIVA, Adams.

Erect herbs. Leaves toothed. Spikes slender; bracts small, narrow. Calyx tubular, shortly 5-toothed; in fruit enlarged, ovoid with a very small mouth. Corolla-tube narrowly cylindric; limb oblique, patent, 5-lobed. Stamens 4, didynamous, included; anther-cells parallel. Ovary 2-celled, cells 2-ovuled; style linear, stigma on one side. Fruit dry, separating into 2 2-seeded pyrenes.—Species 9, chiefly tropical American.


DECCAN PENINSULA; Roxburgh, Wight, &c.—DISTRIEB. Africa.

Stem 6–18 in. Leaves 1½ by ¼ in., crenate-serrate, thinly somewhat softly hairy in all the examples, but (ex Roxburgh) covered with stiff hooked hairs; petiole 1 in. Spikes 6–12 in., lower flowers distant. Calyx ½ by ½ in. in flower; in fruit ¼ in. broad, hispid with 1-celled white hooked hairs. Corolla ½ in., white. Pyrenes obcordate, with 2 rows of hooked small spines on the back, each presenting a large cavity towards the axis.

VII. VERBENA, Linn.

Pubescent herbs or undershrubs. Leaves opposite or ternately whorled, toothed or pinnatifid. Spikes terminal, simple or corymbose; bracts and flowers small. Calyx tubular, shortly 5-toothed. Corolla tubular; limb more or less oblique, sub-2-lipped, 5-lobed. Stamens 4, didynamous, included; anthers ovate, 2-celled, cells sub-parallel. Ovary 1-celled, more or less 4-lobed (sometimes even at flower-time 4-celled), 4-ovuled; style short, obscurely 2-lobed; ovules attached laterally near the base of the cell. Fruit included in the calyx; pyrenes 4 or fewer, oblong.—Species 80; all except 2 American.

V. bonariensis, Linn. (Roxb. Hort. Beng. 4; Schauer in DC. Prodr. xi. 541), a native of Brazil, is naturalized in the Himalayas, the Nilgherries, and elsewhere in the Old World. It has sessile, oblong, sharply serrate leaves, and short spikes in dense corymba or heads.

V. officinalis, Linn.; Schauer in DC. Prodr. xi. 547; herbaceous, leaves oblong or ovate pinnatifid or coarsely toothed, spikes panicled slender ultimately interrupted below. Lour. Fl. Cochinch. 27; Roxb. Hort. Beng. 4; Wall. Cat. 1825; Hayne Pl. Off. 5, t. 42; Boiss. Fl. Orient. iv. 534.

HIMALAYA, alt. 1-6000 ft., from Kashmir to Bhotan, frequent. BENGAL PLAIN to the Sunderbunds, frequent.—DISTR. Temperate and subtropical regions.

Stems 1-2 ft., decumbent, then erect, quadrangular, puberulous. Leaves 2-4 in., variously lobed, base narrowed, lower petiolated, more or less pubescent, usually hairy on the nerves beneath. Spikes at first dense, in fruit 3-10 in. Calyx 1/6-1/4 in., apparently of 4 oblong and 1 linear segments united into a tube by their scarios margins; teeth most minute. Corolla 1/2 in., blue; lobes subquadrate, throat hairy. Pyrenes 1/6 to 1 in., oblong, 3-ribbed, smooth dorsally, their inner faces with minute white flaking similar to those of Bouehea hyderabadensis.—T. Thomson collected at Kussoor, and Clarke at Chumba, a monstrous form with proliferous spikes, forming densely branched panicles, the lower flowers all pedicelled, variously altered and infertile.

VIII. GEUNSI A, Blume.

Trees or large shrubs, stellately tomentose. Leaves opposite, every alternate pair usually widely separated so that there appear to be 2 alternate leaves on each internode, petiolated, nearly entire. Cymes peduncled, axillary, many-flowered; bracts linear, small. Calyx campanulate, shortly 5-toothed. Corolla tubular; limb equally 5-6-toothed. Stamens 5; anthers exserted; cells oblong, parallel. Ovary imperfectly 5-3-celled; cells 2-ovuled; style exserted, stigma dilated 5-3-lobed. Drupe small; pyrenes 5-2, 1-seeded.—Species 3, Malayan.

G. farinosa, Blume Bijb. 819; leaves broadly oblong acuminates minutely toothed stellate-tomentose beneath, flowers 5-merous. Callicarpa pentandra, Roxb. Fl. Ind. i. 395; Wall. Cat. 1835; Schauer in DC. Prodr. xi. 646. C. acuminatissima, Teijs. & Binn. in Batav. Nat. Tidschr. xxv. 316.

SINGAPORE; Wallich.—DISTR. Malaya.

A lofty tree. Leaves 8 by 3 in., base cuneate or rounded, mature glabrate above; petiole 1 in. Peduncles 1-2 in.; cymes 2-3 in. diam., densely stellate-tomentose. Corolla 1 in, lillac, occasionally 6-merous, side Teijs. & Binnend. Drupe 3/8 in. diam.—Resembling the arborescent Callicarpas; readily distinguished by the mixture of both opposite and alternate leaves, and by the 5-merous flowers. C. hexandra, Teijs. & Binn. l. c., is C. Cumingiana, Schauer l. c. 644, or very nearly so, and perhaps neither is distinct from Geunisia farinosa; but Cuming’s n. 1773, reduced to G. farinosa by Schauer, is probably, as stated in Gen. Pl. 2, p. 1150, a good species.

IX. CALLICARPA, Linn.

Shrubs or trees; innovations stellately hairy. Leaves opposite, rarely ternately, whorled toothed or subentire (in C. lobata lobed). Cymes axillary, shorter than the leaves; bracts linear, inconspicuous. Calyx very small (less than 1/4 in.), campanulate, limb minutely 4-lobed, unaltered in fruit. Corolla small (about 1/2 in.), tubular, subsymmetric, purple or red; lobes 4, subquadrato-oblong, patent. Stamens 4; anthers exserted, 2-celled, glan-dular. Ovary imperfectly 2-celled, cells 2-ovuled; style linear, stigma dilated obscurely bifid. Drupe small (less than 1/4 in.), globose; pyrenes 4, or by suppression fewer, 1-seeded. Seeds shortly oblong, exalbuminous.—Species 30, mostly E. Asian, Malayan and N. Australian; a few Polynesian, Columbian and W. Indian.

1. C. lobata, Clarke; leaves very long-petiolied ample cordate-ovate
3–5-lobed mature nearly glabrate, cymes dense stellately tomentose shorter than the petiole. Callicarpa sp. n. 27, *Herb. Ind. Or. H. f. & T.*

**ALPINI N.E. NEPAL**; Yalloong, alt. 10–11,000 ft., *J. D. H.*

A deciduous tree, 16 ft.; branches thick, stellately tomentose, crowded with leaves at the tips. *Leaves* 12–15 in. diam., palmately 5–7-nerved, membranous; lobes ovate, acuminate, denticate, stellately hairy on both surfaces when young, mature with some stellate hair along the nerves beneath; hairs stalked, often with 2 whorls of secondary hairs; glands scattered; petiole 4–8 in. *Peduncles* 2½ in., often 2 superposed in each opposite axil; leaves fallen from the flower-bearing axis in the specimens; cymes 2–4 in. diam., resembling those of *C. arborea*. *Calyx* ½ in., funnel-shaped, subtruncate, stellately hairy. *Corolla* ½ in., tubular, nearly glabrous in flower; lobes 4, short, ovate. *Stamens* 4. *Fruit* not seen.


N. INDIA, in the lower hills, alt. 0–4000 ft., from Kumaon to Assam, common in the Sikkim Terai; Rajmahal. E. PENINSULA, from the Khasia Terai and Munyepoor to Singapore.—*Distrib.* Ava, Sumatra.

A tree, often 40 ft., with a thick trunk and round head. *Leaves* usually 6–8 in., base rhomboid, leathery, mature glabrate above; stellate hairs beneath very close, sessile, persistent, covering the numerous glands; petiole 1–2 in. *Calyx* ½ in., subtruncate, stellately pubescent. *Corolla* ¼ in., puberulous, lavender or pale purple. *Berry* ¼ in. diam.—Generally to be recognized by the entire leaves with very close persistent hard tomentum beneath; but the leaves are toothed in Khasian examples collected at Nunklow, and the tomentum is spreading and very woolly on some from the Malay Peninsula. Leaves usually cuneate at base, but rounded in the form *C. villosa*, Roxb. C. villosa, Vahl, is a doubtfully Indian plant.


NEPAL; Noakote, Wallich. SIKKIM, alt. 1–4000 ft., in the outer valleys and Terai, frequent; *Herb. Griffiths*, *J. D. H.* (Kew *Distrib.* n. 6042), &c.

A tree, 30 ft.; resembling *C. arborea*. *Leaves* 4–10 in., base rounded or cuneate; tomentum beneath of stellate hairs having the secondary hairs fine, long and white. *Inflorescence* stellately white or tawny tomentose. *Calyx* at flower-time nearly glabrous.—Otherwise resembling *C. arborea*.


Throughout the DECCAN PENINSULA and CEYLON, common; ascending to 4000 ft.

A tree, 20–40 ft.; tips of branches cinnamonous, shaggy and woolly. *Leaves*
4-8 in., base cuneate rounded or subcordate; tomentum beneath of stalked hairs often with several whorls of secondary hairs, usually dense, in a few examples from Cochlin thin but of similar structure. Calyx at flower-time stellately hairy.—Otherwise much resembling C. arborea and Hookeri. The leaves vary from subcordate orbicular cupululate to oblong and acuminate at both ends. The nature of the hairs appears absolutely constant. C. lanata, Griff. Notul. iv. 173, and Ir. Pl. Asiat. t. 447 from Bhamo, has 5 stamens.

5. **C. macrophylla**, Vahl Symb. iii. 13, t. 53; shrubby, leaves ovate or ovate-lanceolate closely crenate densely persistently stellate-tomentose beneath, peduncles short, berry white. Roxb. Fl. Ind. i. 393; Wall. Cat. 1832; Schauer in DC. Prodr. xi. 644; Benth. Fl. Hongk. 270; Brandis For. Fl. 388; Kurz For. Fl. ii. 274. C. insana, Roxb. l.c. C. Roxburghii, Wall. Cat. 1833, partly. C. cana, Gamble Darjeeling List 60, and Indian Timbers 283, not of Linn.—Callicarpus sp., Jones in As. Research. iv. 233.

Throughout N. and E. INDIA, ascending to 6000 ft. in the W. Himalaya; from Kashmir to Assam and Pegu; abundant in Bengal Plain. ? Deccan Peninsula.

A shrub, 3-8 ft.; trunk hardly any, branches wand-like, usually shaggy as well as tomentum at the tips. Leaves 4-7 in., acuminate, base rounded or cuneate, mature glabrate above, tomentum with compound stellate hairs beneath; pedicle 1-4 in. Peduncles usually shorter than the pedicles; cymes 1-3 in. diam., globose. Calyx scarcely 2 in. long, stellately hairy at flower-time, lobes small triangular or hardly any. Anthers small, ovate.—There is only one example of this from the Deccan, marked as communicated by W. Barclay from Malabar. From Wight and Beddome's silence it may be doubted if it is wild there. Rheede Hort. Mal. 4, t. 60, usually quoted as C. macrophylla, looks as like C. lanata, but may not be a Callicarpus at all. Wall. Cat. 1833 type sheet is the true C. Roxburghii (Schauer l. c. 640), a non-Indian plant. The typical C. macrophylla, Vahl, has ovate leaves, somewhat obtuse at base, thickly white-tomentose beneath. This is common in and near the hills. Roxburgh's C. insana is the less showy form, common in Bengal Plain (as he truly says), with the leaf-base often cuneate.

**Vae.** Griffithii; much branched, leaves smaller fuscous-woolly obscurely stellate beneath ultimately glabrate.—Bhotan; Griffith (Kew Distr. u. 6041).—Differs a good deal in habit from C. macrophylla, but connected by E. Nepal specimens collected by Sir J. D. H.

**Vae.** sinensis; leaves oblong-lanceolate closely denticulate, peduncles longer than the pedioles, anthers oblong larger.—Canara; Gibson. Calcutta; cult. Distribs. China.—Branches upwards dense with leaves. Teeth of the leaves with minute black glandular points. Calyx in flower stellately tomentose, soon nearly glabrate; teeth triangular, in fruit sometimes longer than the tube. Probably a cultivated plant: it seems as near to C. Reevesii as to C. macrophylla.


**Tenasserim (?);** Fauconer. SINGAPORE; Murton.—Distr. S. China.

May be a cultivated plant; it is very near C. macrophylla. The leaves are very handsome, dark above, white tomentose beneath; the anthers are nearly as of C. macrophylla var. sinensis.

7. **C. cana**, Linn. Mant. 198; shrubby, leaves broadly elliptic shortly acuminate at both ends sharply crenate-serrate mature glabrate above densely stellate-tomentose beneath, peduncles very short, calyx in fruit stellate-tomentose. Vahl Symb. iii. 12; Roxb. Fl. Ind. i. 392; Wall. Cat.

**Penang; Wallich. Malacca; Griffith, Maingay.—Distrib. Malaya and Philippine Islands, N. Australia.**

*Leaves* 4½ by 2½ in., suddenly cuneate and narrowed into the petiole, often almost spathulate, mature shining above, usually very white beneath; petiole ½-2 in. *Peduncles* usually ½-½ in.; cyme 1-2 in. diam., globose. *Fruit* deep-purple, finally black.—Widely cultivated for the strong contrast between the upper and lower surface of the leaves. The figure in *Bot. Mag.* (t. 2107) is doubted by Bentham l.c., and with reason.


**Penang; Wallich.—Distrib. Malaya, Trop. Australia.**

*Leaves* 5 by 2½ in., membranous, stellate tomentum somewhat deciduous; petiole ½ in., stellate-wolly. *Cymes* 1-2 in. diam., globose, dense, stellately woolly; peduncles ½-½ in. *Fruit* ½ in. diam., dark purple.—Easily distinguished from *C. cana* by the nearly concolorous surfaces of the leaf.


**Sikkim, alt. 2000 ft.; Clarke. Khasia and Jaintia Mts., alt. 2-4000 ft., frequent; Wallich, H. f. & T., &c.—Distrib. China.**

An erect, single-stemmed shrub, 10-20 ft., with horizontal branches and complicated foliage. *Leaves* 5 by 1-1½ in., parallel-sided or slightly obovate, closely covered with short simple hairs above, concolorous beneath; petiole ½-¼ in. *Peduncles* ½-½ in.; cymes 1-2 in. diam., stellately tomentose. *Calyx* not membranous, nor glabrate in fruit. *Corolla* pink. *Fruit* ½-⅓ in. diam., fine purple.—Lindley’s figure represents correctly the Chinese form of this species having the leaves “crossing each other” subobese, mature nearly glabrate above very thinly stellate-hairy beneath. The description of Schauer l.c. is taken from the Indian form, *C. sessilifolia*, *Wall.*, which, however, has the petioles longer than the Chinese.


**Khasia Mts., alt. 4-5000 ft.; Wallich, J. D. H., &c.**

A small tree; branchlets densely stellate-tomentose. *Leaves* 8 by 2½ in., or 2½ by 1 in., base rounded or cuneate thinly membranous, mature with scattered stellate hairs on the midrib beneath, tertiary venation close prominent, glands minute scattered; petiole ¼-⅓ in. *Peduncles* mostly very short; cymes usually few-fld.; pedicels sometimes pink. *Calyx* ⅓ in., minutely 4-toothed, greenish or pinkish,
minutely gland-dotted, with a few scattered hairs when young, whiteish or membranous in fruit. Corolla pink. Fruit scarcely 1/4 in. diam.—C. longifolia, Benth. Fl. Hongk. 270 (not of Lamk.), in the glabrous calyx, inflorescence, and structure of leaves comes very near this; but in that the leaves are linear-lanceolate, and the fruit very much larger.


Malay Peninsula; Penang, Wallich, Roxburgh; Malacca, Griffith (Kew Distrib. n. 6039), &c. Nicobars; Kurz.—Distribution. W. Malaya to N. Australia.

Branchlets densely stellate-tomentose. Leaves 5 by 2 in., base much attenuate, mature nearly glabrous above, beneath so closely fulvous stellate-villous that few of the large glands can be seen; petiole 1/4 in. Cyme in flower 1 1/2 in. diam., densely stellate-tomentose; peduncle 1/4 in. Calyx 1/2 to 1 in. Corolla purple or pink, or sometimes white (vide Benth.). Berry 1/2 in. diam., white.—The details of this description are from the Penang plant. C. longifolia, Hook. Fl. Exot. ii. t. 133, is C. longifolia var. brevipes, Benth. Fl. Hongk. 270, which has subessellate obtuse-based linear-lanceolate leaves, glabrous calyx, &c.

Var. lanceolaria; leaves narrower thinner mature beneath glabrate densely minutely glandular-dotted, C. lanceolaria, Roxb. Fl. Ind. i. 395; Wall. Cat. 1829. C. lanceolaria, Var. a subglabrata. Schauer l.c. exot. syn.—E. Bengal; in the plains, common; also in the Khasia, Chittagong Hills up to 3000 ft., plentiful. (W. Malaya.)—Cymes laxer, flowers and fruits smaller, than in the type. The abundant material for this common plant is very uniform; except that, while the leaves are generally regularly serrulate, a form with them subentire appears in Chittagong, and is common in the Malayan Peninsula and islands.

12. C. acuminata, Roxb. Fl. Ind. i. 394; shrubby, innovations stellately white-tomentose, leaves broadly lanceolate acuminate denticulate, panicles axillary long-peduncled dichotomous shorter than the leaves.

Silhet; Roxburgh.

Leaves 4-5 by 2 in., mature glabrate reticulate above, hairy beneath. Peduncles longer than in the other species.—Not seen; the foregoing copied from Roxburgh. Schauer reduces this to C. longifolia; but there is no form of that known with the peduncles longer than in the other species described by him. His description points altogether to C. Reevesii, for which the locality does not suit. Possibly Roxburgh’s specimen was a cultivated one, as C. Reevesii has been long cultivated.

X. TECTONA, Linn. f.

Trees, stellately tomentose. Leaves opposite or whorled, large, petioled, entire. Cymes dichotomous, many-fl., in large terminal panicles; bracts small, narrow. Calyx campanulate, shortly 5-6-lobed, in fruit enlarged ovoid or nucellate. Corolla small, tube short; limb equally 5-6-lobed, spreading. Stamens as many as corolla-lobes, on the corolla-tube; anthers exerted, oblong. Ovary 4-celled, cells 1-ovuled; style linear, tip shortly bifid. Drupe enclosed in the calyx, 4-celled; endocarp bony. Seeds erect, oblong.—Species 3, the following and a Philippine Island one.

1. T. grandis, Linn. f. Suppl. 151; leaves opposite ovate mature
scabrous or subglabrate above, calyx in fruit 1 in. diam. ovoid membranous. Gaertn. Fruct. i. 275, t. 57; Roxb. Cor. Pl. i. 10, t. 6, and Fl. Ind. i. 600; Wall. Cat. 772; Graham Cat. Pl. Bomb. 155; Schauer in DC. Prodr. xi. 629; Dals. & Gill. Bomb. Fl. 199; Bocq. Rev. Verb. 99, t. 10; Bedd. Fl. Syb. t. 250 (two); Brand. For. Fl. 354, t. 44; Kuru For. Fl. ii. 259; Gamble Indian Timbers, 283.—Theka, Juss. Gen. 108; Lamk. Ill. t. 136.—Rumph. Herb. Amb. iii. t. 18; Rhedee Hort. Mal. iv. t. 27.

W. DECCAN PENINSULA, alt. 500–4000 ft., common; from CENTRAL INDIA to ORISSA. MALAY PENINSULA, alt. 500–4000 ft.; from Burma (common) to Malacca.

—DISTR. Sumatra, Java.

A tree, 80–150 ft.; branchlets quadrangular, stellately tomentose. Leaves 12 by 8 in. (of seedlings sometimes 3 ft.), cuneate at both ends, mature with hard close tomentum beneath; petiole 1 in. Panicles 18 in. diam., and more; flowers very numerous, but only a few fertile; bracts ½ by ½ in., deciduous, with also usually some reduced leaves at the forks. Calyx (in flower) ⅔ by ⅔ in., lobed less than half-way down, stellately white-tomentose. Corolla scarcely ⅔ in. long, white, glabrous in the throat. Drupe ⅔ in. diam.; cells 4 with a central cavity, densely birsate; calyx in fruit ovoid or subpyramidal, membranous, often reticulately-nerved nearly glabrous, mouth very small.—Teak.

2. T. Hamiltoniana, Wall. Pl. As. Rar. iii. 68, t. 294, and Cat. 773; leaves mostly ternate whorled, ovate mature scabrid above, calyx in fruit ½ in. diam. narrowly urceolate densely woolly. Walp. Rep. iv. 99; Schauer in DC. Prodr. xi. 629 (excl. the Philippine Island plant); Kuru For. Fl. ii. 259; Gamble Indian Timbers, 293. Theka ternifolia, Ham. in Trans. Linn. Soc. xvii. 185.

BURMA, at Prome; Wallisch, Kuru.—DISTR. Ava.

A small tree, 30–40 ft.; branchlets 6–8-angular. Leaves sometimes opposite or 4-nate, 8 by 5 in., base rhomboid or obtuse, white tomentose beneath or ultimately softly hairy; petiole ½ in. Panicle 6–12 in., stellately woolly; branches ascending. Calyx (in flower) ½ in., lobed scarcely half-way down. Corolla ⅔ in. long, throat very hairy; lobes pale blue. Drupe ⅔ by ⅔ in., glabrous or with some soft wool, 4-celled without a central cavity; calyx in fruit ½ by ½ in., narrower upwards.—This tree flowers before the leaves are fully developed.

XI. PREMNA, Linn.

Trees or shrubs, sometimes climbing. Leaves opposite, entire or toothed. Cymes corymbose or panicled, sometimes thyrsoid, pubescent; bracts small, narrow. Flowers often polygamous, greenish or yellowish white, small (in P. cordifolia and P. corymbosa rather larger, then scarcely ¼ in. long). Calyx small, cup-shaped, subentire or minutely 2–5-toothed, subequal or 2-lipped. Corolla tubular, throat hairy; limb 2-lipped, 5-lobed, or subequally 4-lobed. Stamens 4, didynamous. Ovary 2- or 4-celled, 4-ovuled; style linear, shortly bifid. Drupe small, surrounded below by the calyx, globose or oblong-ovoid; endocarp hard undivided 1–4-celled 1–4-seeded. Seeds oblong.—Species 40, chiefly Indian.

* Calyx 2-lipped or subtruncate, lips subentire.

† Cymes forming an elongate interrupted thyree.

1. P. racemosa, Wall. Cat. 1777; leaves petioloed ovate or obovate acuminate, spikes simple densely shortly villous, calyx minutely hairy or glabrate. Schauer in DC. Prodr. xi. 633; Brand. For. Fl. 367; Kuru For. Fl. ii. 263.
Khasia Mts., alt. 3–5000 ft.; Wallich, Griffith (Kew Distrib. n.6023); H. f. & T., &c. Tenasserim (Kurz).

A small tree, 10–30 ft.; innovations minutely fulvous-villous. Leaves 3 by 1 1/2 in., obscurely crenate, mature nearly glabrous, nerves 4–5 pair; petiole 1/2 in. Spikes 2–5 in.; bracts 1/2 in., elliptic, nerv'd, whitened, deciduous, or much smaller inconspicuous. Calyx 1/2 in., usually whitened upwards, glabrate, lobed half-way down into 2 round lips, or subtruncate and very shallowly lobed. Corolla 1/2 in., greenish-white, mouth subequally 4-lobed, throat very hairy. Ovary nearly glabrous at the tip. Drupe 1/2 in., mostly 1-seeded, narrowly obovate.

2. **P. interrupta**, Wall. Cat. 1778; leaves subsessile ovate or obovate very shortly acuminata, spikes simple densely shortly villous, calyx puberulous or glabrate. Schauer in DC. Prodr. xi. 633; Brand. For. Fl. 367.

Temperate Himalaya, frequent, alt. 5–3000 ft., from Kumaon, Strachey & Winterbottom, to Sikkim, J. D. H.

A small tree, 10–30 ft., resembling *P. racemosa* very closely, except in the larger subsessile leaves. Leaves, those next the spikes 9 by 4 1/2 in., sometimes 6 by 3 in.; petiole 1/2–1 in., broadly channelled. Spikes as of *P. racemosa*, but rather larger; bracts 1/2 in., whitened, nervous, or inconspicuous. Corolla hairy in the throat. Drupe (the few examined) 1-seeded, rather shorter and broader than in *P. racemosa*.—Gamble (Darjeeling List, 61, and Indian Timbers, 293) says that this and the next are large climbers, and it is very probable that they are so sometimes. But Gamble's plants being published with imperfect diagnoses, and some being wrongly identified, the information regarding others is doubtful.


A tree, 40 ft.; innovations densely cinereous pubescent. Leaves 9 by 3 1/2 in., subentire, mature glabrate, nerves 8 pair; petiole 1/2 in., somewhat winged, or 0. Panicles 7 by 4 in.; bracts 1/2 in., broadly lanceolate, acute, or 0; cymes mostly in distant capitata whorla on the panicle branches. Calyx 1/2 in.; lips entire shallow, or sometimes one minutely 2-toothed, the other still more obscurely 3-toothed. Corolla 3/4 in., white, as of *P. interrupta* but smaller, hardly hairy in the throat. Drupe not seen.

†† Cymes in compound corymbs.

4. **P. cordifolia**, Roxb. Fl. Ind. iii. 78; leaves subcordate-ovate acuminate, corymb dense, pedicels very short hairy, corolla 1/4 in. tube cylindric densely hairy nearly to the base. Walp. Rep. iv. 94; Schauer in DC. Prodr. xi. 632 partly, not of Wight or Beddome.

Penang; Roxburgh. Singapore; Lobb.

A shrub, 6–8 ft. Leaves 6 by 3 in., subentire, drying red, mature nearly glabrous, nerves 5–6 pair; petiole 1 in., fulvous-puberulous. Corymb 3–5 in. diam., many-fl.; bracts 1/2 in., lanceolate, acute; branches thick, shortly yellow-hirsute. Calyx 1/4 in., scabridly puberulous, 2-lipped; lips broad, rounded. Corolla-tube twice as long as the calyx, densely filled with hair within in the lower part; limb 2-lipped. Ovary glabrous at the tip. Drupe 1/4 in. diam., subglobose, usually 3–4-seeded.—Schauer's diagnosis is taken from Roxburgh; his description mainly from *P. Ferroletii*. *P. cordifolia*, Wall. Cat. 2467, is not in Wallich's Herbarium; but, as it came from Gongachora, it is very unlikely to have been *P. cordifolia*, Roxb.
5. P. corymbosa, Rottl. & Willd. in Gesell. Nat. Freunde Neue 
Schr. iv. (1803) 187, 188; leaves subcordate-ovate acuminate 
undulate, panicles dense branches dichotomous slender glabrate 
coloured, corolla $\frac{1}{2}$ in. tube cylindric hairy near the top. 
P. densiflora, Wall. Cat. 1773. P. 
cordifolia, Wight Jc. t. 1483; Bedd. For. Man. 172; Schauer in DC. 
Prodr. xi. 632, partly; Dalz. & Gibbs. Bomb. Fl. 199?, not of Roxb. 
descr. Cornutia 
corymbosa, Burm. Fl. Ind. 133, t. 41, fig. 1, not of Lamk.

CARNATIC; Wight, Shuter; Cuddapah Hills, Beddome. CEYLON; Burmann, 
Thwaites, C. P. n. 193.
Leaves $\frac{3}{4}$ by $\frac{1}{4}$ in., young sometimes woolly, mature nearly 
glabrous, upper 
surface impressed reticulate; petiole 1 in., pubescent. 
Panicles small, pyramidal, 
very dense, brachiate, patentely deciduously pubescent with simple hairs; 
bracts narrow 
lanceolate. Calyx $\frac{1}{2}$ in., early glabrate; in fruit enlarged, 2-lipped, membra-
nous or whitened. Corolla 
tubular, limb subequally 4-lobed. Drupe $\frac{1}{2}$ in., obovoid, 3-4-seeded.

6. P. coriacea, Clarke; leaves cordate 
ovo orbicular shortly 
acuminate mature coriaceous glabrous, corymbs large compound, corolla 
$\frac{1}{2}$ in. P. cordifolia, Grab. Cat. Pl. Bomb. 155, not of Roxb. P. scandens, 
Dalz. & Gibbs. Bomb. Fl. 199, not of Roxb.

W. DECCAN PENINSULA, in the Ghats, from Bombay to Cochin, common; 
Wight, 
Graham, Höhnencker, &c.
A large climber (Ritchie) or a tree (Graham). Leaves 5 by $3\frac{1}{2}$ in., entire, mature 
very 
shining smooth, nerves 4-5 pair; petiole 1 in. Corymb 
8 in. diam., 5 in. high, 
closely shortly hairy; bracts $\frac{1}{2}$ in., lanceolate, scattered. Calyx $\frac{1}{2}$ in., cup-shaped, 
truncate, hardly 2-lipped, minutely pubescent. Corolla greenish-yellow, throat 
hairy. Drupe $\frac{1}{2}$ in., 1-seeded, narrowly obovoid.

VAR. oblonga; leaves elliptic or oblong often candate. P. scandens, Wall. Cat. 
1774, partly. Premna n. 23, Herb. Ind. Or. H. f. & T.—Khasia Terai; H. f. & T. 
Nathpur; Hamilton. Sikkim Terai; Clarke.—A tree, 20-40 ft.

VAR. cuneata; leaves oblong base cuneate often candate. Premna n. 23, Herb. 
Ind. Or. H. f. & T.—Khasia Terai; Silhet and Pundua, H. f. & T.

7. P. villosa, Clarke; leaves cordate-ovate shortly acuminate mature 
densely villous beneath, corymbs large compound closely pubescent, corolla 
$\frac{3}{4}$ in.—Premna n. 25, Herb. Ind. Or. H. f. & T.

DECCAN PENINSULA; Mts. of Kurj, Wight, G. Thomson; Wynaad, alt. 3000 ft., 
Beddome.
A tree (or a large climber, Beddome), closely resembling P. coriacea except as to 
the indumentum. Leaves (mature) densely villous with simple straight hairs beneath, 
most copiously on the nerves, glabrate above; petiole 2 in. Corymb, calyx, 
corolla, and young drupe as of P. coriacea, of which this may be a var., as Beddome 
suspects.

8. P. scandens, Roxb. Fl. Ind. iii. 82; leaves petioled elliptic and 
acuminate or lanceolate entire membranous glabrous, corymbs large compound 
lax puberulous many-flled, calyx subentire membranous in fruit, 
corolla scarcely $\frac{1}{2}$ in. Schauer in DC. Prodr. xi. 632; Kurz For. Fl. ii. 
263. P. ramosa, Wall. Cat. 1774.—Premna n. 24, Herb. Ind. Or. 
H. f. & T.

TERAI OF N. AND E. BENGAL, frequent; SIKKIM, J. D. H., &c.; BHOTAN and 
ASSAM, Griffith (Kew Distrib. u. 6034). SILHET; Raxburgh, Wallieh; CAOHAR, 
Keenan. MAṬTABAN; Kurz.
A tree, 20-40 ft., or (ide Raxburgh) a large climber. Leaves 11 by $\frac{1}{2}$ in., base 
rounded or cuneate, nerves 6 pair; petiole $1\frac{3}{4}$ in., glabrous. Corymbs 4-10 in. diam.
Calyx \( \frac{1}{2} \) in., cup-shaped, nearly glabrous at flower-time. *Corolla* bearded in the throat. Drupe (ide Roxburghly) size of a pea, globose, tubercled.—The immature drupes appear narrowly obvoid, and the plant hardly to differ from *P. coriacea* var. *oblunga*, except in the thinner texture. Roxburgh says the peltioles are sometimes hairy; from which it may be doubted whether he did not erroneously refer other things to this species. I cannot satisfactorily identify from the descriptions the *P. scandens* & *cordifolia* of Brandis For. Flora.

9. **P. purpurascens**, Thwaites. Enum. 242; leaves broadly oblong suddenly shortly acuminate entire glabrous, corymbs large closely pubescent, calyx small truncate cinereous-pubescent.

Ceylon; Ambagamowa District, Thwaites.

A large climber. *Leaves* \( \frac{4}{5} \) by \( \frac{3}{5} \) in., suddenly subobtusely acuminate, base obtuse or subcordate, mature fulvous-puberulous on the nerves beneath or glabrate; nerves 8 pair; peltiole 1 in. *Corymbs* 6 in., straggling, with many small flowers clustered at the ends of the branches. *Calyx* \( \frac{1}{2} \) in., obscurely 2-lipped. *Corolla* \( \frac{1}{2} \) in., subequally 4-lobed, pale-purple, Thwaites. Drupe not seen.

VAR. *paciinerivis*; nerves 3–4 pair, not inarching except very close to the margin.—Anamailas, alt. 3000 ft., Beddome.—A gigantic climber with the purple colour of Thwaites' *P. purpurascens* by Beddome; and referred doubtfully to creteo by him. Beddome's specimen is very immature, but the nervation of the leaves is unlike that of *P. purpurascens*, and may indicate a new species.

** Calyx 2-lipped, one lip 2-toothed, the other subentire.


India, near the sea from Bombay to Malacca. Silhet; Wallich. Ceylon. Andamans; and Nicobaras, Kurz.—Distrib. Malaya.

A small tree, or shrub; trunk and large branches often spinous, branchlets unarmed. *Leaves* \( \frac{4}{5} \) by \( \frac{3}{5} \) in. (sometimes 1 by \( \frac{1}{5} \) in.), subobtusely very shortly acuminate or obtuse, sometimes obovate, entire sinuate or in the upper half with a few coarse teeth, mature glabrous or minutely hairy on the nerves above or beside the nerves becnoth; nerves 4–5 pair; peltiole \( \frac{3}{5} \) in., usually somewhat pubescent. *Corymbs* 2–4 in. diam., short-peduncled, minutely cinereous-pubescent, and often with some fulvous deciduous hair; bracts \( \frac{1}{5} \) in., lanceolate, pubescent. *Calyx* \( \frac{1}{5} \) in., 3-toothed. *Corolla* \( \frac{2}{5} \), greenish-white, throat hairy, subequally 4-lobed. *Drupe* \( \frac{1}{5} \) in. diam., globose, 3–4-seeded.—Some of the synonyms cited above are uncertain; species with the calyx at all distinctly 5-toothed (rather than 3-toothed) must be referred to *P. latifolia*, Roxb.: it may be doubted whether any of the examples said to have come (Brandis l. c.) from Oudh and Gurwhal belong here. Gamble, however, says (Darjeeling List, 60, and Indian Timbers, 295) that the tree is found in the Sikkim Terai; and as he describes the tree as thorny, it would appear that he identified it correctly.

VAR. *angustior*; leaves elliptic narrowed at both ends obtuse, corymbs small.—Malacca; Griffith (Kew Distrib. n. 6030).—Leaves \( \frac{4}{5} \) by \( \frac{3}{5} \) in., widest about the middle. *Corymbs* numerous, 1–2 in. diam.

11. **P. parasitica**, Blume Bijd. 816; leaves ovate or obovate very

**Malaccia; Griffith (Kew Distrib. n. 6019).** **TENASSIRIM; Helif. SINGAPORE; G. Thomson.—** **DISTRIB. JAVA, Borneo.**

A large climber. Leaves 5½ by 3 in., base obtuse or cordate, nerves 5 pair; petiole ⅓ in. in. *Corymb 3–4 in. diam., puberulous, hardly pubescent; branches somewhat thick, bracts deciduous. Calyx ⅓ in., 2-lipped, usually membranous, glabrous after flowering; one lip slightly 2-fid, the other subentire. *Drupe* not seen.


**Mengui; Griffith. Malaccia; Mainay (Kew Distrib. n. 1198, 1199).** **ANDAMANS (Kurz).—** **DISTRIB. JAVA.**

A climber. Leaves 5 by 2½ in., nerves 5–6 pair, usually puberulous above, beneath most obscurely doted and sometimes pubescent; petiole ⅔–2½ in. *Corymb 3 in. diam.; bracts ⅓ in., lanceolate; flowers shortly pedicelled or sessile. Calyx ½ in., broadly cup-shaped; upper lip in flower of 2 minute acute teeth, lower subentire. Corolla ½ in., throat hairy. Drupe ⅓ in. diam., globose, 3–4-seeded. An authentic Javan example from Miqel of his lucidula has the corymb stout, the calyx larger, more distinctly toothed, the corolla fully ⅓ in.

13. **P. punctulata,** Clarke; leaves broadly elliptic suddenly shortly acuminate entire mature glabrate punctulate beneath, corymbs large pubescent, calyx closely pubescent 2-lipped, lips subequal one 2-toothed the other subentire.

**Malaccia; Mainay (Kew Distrib. n. 1200).**

Leaves 5½ by 3 in., base obtuse or rounded, nerves 4 pair; petiole 1 in. *Corymb 4–5 in. diam.; lower bracts ⅙ in., linear-oblong; flowers sessile or shortly pedicelled. Calyx ½ in., closely minutely grey-pubescent; after flowering somewhat deeply 2-lipped. *Drupe* not seen.—This may be *P. ceramensis* (*Miq. Fl. Ind. Bat.* ii. 893), of which no authentic specimen is at Kew.

14. **P. khasiana,** Clarke; leaves large ovate caulade-acuminate entire glabrous nerves pubescent above, corymbs large lax pubescent, calyx 2-lipped sub-5-toothed.

**Khasia Mts., alt. 4300 ft.; Jasper Hill near Cherra, H.f. & T.*

Subscendent (Honker). Leaves 7 by ⅔ in., base obtuse, shining, subcoriaceous, young scarcely pubescent beneath, nerves 7 pair; petiole ⅓ in., pubescent. *Corymb 6 in. diam., straggling, closely pubescent with simple hairs and minute scales; bracts ⅓ in., linear. Calyx ⅓ in., pubescent; one lip distinctly 2-toothed, the other more or less 3-toothed or subentire. Corolla ½ in., subequally 4-lobed, glabrous without, throat somewhat hairy. *Drupe* not seen.—From the subcoriaceous, shining, much acuminate large leaves and scendent habit, the true affinity of this may be near *P. coriacea*; but the artificial sectional character taken from the calyx does not allow it to stand there.


**Bengal; Roxburgh.**

A tree. Leaves 9 by ⅔ in., base obtuse or subcordate, mature glabrate epunctate,
a little yellow hair clinging to the sides of the midrib beneath; nerves 6 pair, secondary reticulating nerves conspicuous; petiole 2½ in. Corymbs terminal, short-peduncled, 3–4 in. diam., closely pubescent and with some deciduous fulvous hairs, exceedingly like P. integrifolia, but rather larger. Calyx ½ in., in fruit 3-toothed, closely scabrid-puberulous. Corolla ½–2 in., greenish-white, hairy in the throat. Drupe ½ in. diam., globose, 4-seeded (Roxburgh).—The two examples of Roxburgh, one named by himself, agree exactly with his description; and are very unlike the P. longifolia of Wallich, accepted as Roxburgh’s by Schauer. It seems very near P. integrifolia, Linn.

*** Calyx 5–4-toothed, subequally or obscurely 2-lipped.

† Leaves entire or nearly so.

16. **P. milleflora**, Clarke; leaves large long-petioled ovate acute entire mature minutely crisped-pubescent on the nerves, corymb large very many-fl., calyx minutely 5-toothed.—Premna n. 30, Herb. Ind. Or. H. f. & T.

ASSAM; Griffith (Kew Distrib. n. 6028); Upper Assam, Jenkins.

Generally resembling P. longifolia, Roxb., but with a very large dense corymb of very small flowers. Leaves 7 by 4 in., base rhomboid, mature minutely pubescent on the nerves (primary and secondary) beneath, nerves 8 pair; petiole 2¼ in. Corymb a foot diam., about 2000-flowered (in Griffith’s n. 320), and calyx (½ in.), minutely pubescent. Corolla ¼ in., throat hairy. Drupe ½ in., globose.


DECCAN PENINSULA and CEYLON, frequent; from the Circars and Central Provinces southward.

* A tree, often 50 ft.; branchlets densely stellate-woolly. Leaves 6 by 3½ in., base rounded or subcordate, coriaceous, minutely glandular scabrous above, nerves 7 pair; petiole 1 in. Corymbs ½ in. diam., often sessile, upper branches (or nearly all) alternate; bracts ½ in., linear. Calyx ½ in., stellately woolly. Corolla ½–2 in., 2-lipped, hairy in the throat, greenish-yellow. Drupe ½ in. diam., deciduously hairy, ovoid, 3–1-seeded.—This is certainly P. tomentosa of Roxb., but whether of Willd. may be questioned. Willdenow finds his plant as a syn. of Cornutia corymbosa, Lamk. Lamarck does not say whether it was the same as Cornutia corymbosa, Burm. If it was the same, which from the description seems not improbable, then Premna tomentosa, Willd., is a mere syn. of P. corymbosa.

Var. *detergibilis*; mature leaves with most of the wool rubbed off. P. latifolia, Thwaites Emm. 242, not of Roxb.—Ceylon; Thwaites, C. P. n. 2893.


**TAVOY and AMBERST; Wallich.—Distr. Java?**

A large tree (Wall). Leaves 8 by 5 in., from ovate to orbicular, base obtuse sometimes subcordate, nerves 7 pair; petiole 1½ in., stellately villous. Panicles 6 in. diam.; branches opposite, ascending, peduncles 1½ in., flowers crowded at the ends of the branches; bracts ½ in., linear, numerous. Calyx ½ in., distinctly 5-toothed at flower-time, stellately villous. Corolla ½ in., or rather more, stellately villous with-
out. Drupe $\frac{1}{2}$ in. diam., globose, glabrous.—Brandis and Kurz consider this the same as P. tomentosa; but the rounded shoulders of the leaves, and the brachiate panicles give it a very different aspect; and the drupe marks it a distinct species. The Javan P. tomentosa, Blume (Bijd. 816), is nearly allied to this.

19. **P. bengalensis**, Clarke; leaves ovate or narrowly elliptic acuminate entire mature stellately pubescent on the nerves, corymbs spreading stellately pubescent or tomentose, calyx shortly 5-toothed. C. longifolia, Wall. Cat. 1771; Schauer in DC. Prodr. xi. 634.

Throughout Bengal Plain, alt. 0–1000 ft., common; extending to the Sikkim Terai, Assam and Cachar; Wallich, Griffith (Kew Distrib. n. 6029), &c.

A large shrub, or a tree, 30 ft.; shoots stellately tomentose. Leaves 8 by 3$\frac{1}{2}$ in., ovate, or 5 by 2 in. obovate-oblong, mature with minute scattered stellate hair on the surface beneath or glabrous except the 7–8 pair of nerves; petiole 1 in. Corymb 4–8 in. diam., closely stellate-tomentose without any patent hairs; bracts $\frac{1}{4}$ in. linear. Calyx $\frac{1}{2}$ in. Corolla $\frac{1}{2}$–$\frac{1}{4}$ in., 2-lipped, yellowish or greenish white, throat hairy. Drupe $\frac{1}{2}$–$\frac{1}{4}$ in., globose or somewhat obovoid.—This has been supposed to be P. pubesceens, Blume, in which the leaves are described as repand-toothed, and the pubescence of the corymb as simple.


—Premna n. 28, Herb. Ind. Or. H.f. & T.

**Khasia Mts.**; below Churra, Wallach, Griffith, H.f. & T., &c.

A large shrub; shoots stellately tomentose. Leaves 8 by 3 in., base cuneate, mature punctulate glabrate on both surfaces, nerves 7 pair; petiole 1$\frac{1}{2}$ in. Panicles 6–8 in., pyramidal, densely stellate-tomentose; branches mostly opposite, often 3 by $\frac{3}{4}$ in.; bracts $\frac{1}{2}$–$\frac{3}{4}$ in., linear-lanceolate, numerous, persistent, conspicuous. Calyx $\frac{1}{4}$ in., obscurely 2-lipped, the 3 teeth of the lower lip wider apart (at flower-time) than those of the upper, but hardly shorter. Corolla $\frac{1}{2}$–$\frac{1}{4}$ in., 2-lipped; lobes stellately tomentose without. Drupe $\frac{1}{8}$–$\frac{1}{6}$ in., globose.


8. **DECCAN PENINSULA**; Courtalim, Wight; Mts. of Kurg, G. Thomson; Tinnevelly Mts., Beddome.

A shrub, 6 ft. Leaves 7 by 2$\frac{1}{2}$ in., base obtuse or cuneate, entire or (aside Beddome) sometimes serrate, nerves 5 pair; petiole $\frac{1}{4}$ in. Corymb 5 in. diam.; bracts $\frac{1}{4}$ in.; broad-lanceolate. Calyx $\frac{1}{4}$–$\frac{3}{4}$ in.; lobes very small, obtuse or broadly triangular. Corolla $\frac{1}{2}$–$\frac{1}{6}$ in., 2-lipped. Drupe not seen.

22. **P. latifolia**, Roxb. Hort. Beng. 46, and Fl. Ind. iii. 76; leaves cordate-ovate very shortly acuminate undulate young softly minutely hairy on both surfaces, corymbs closely simply villous, calyx strigose shortly 5-toothed much enlarged in fruit. Schauer in DC. Prodr. xi. 635.

Lower hills of the Coromandel Coast and Bengal; from Rajmahl to the Southern Circars; Roxburgh, &c.

A small, poor tree, attaining 25 ft. Leaves 4 by 2$\frac{1}{2}$ in., usually smaller, base (in the type form) shallowly cordate but then usually with a small cuneate decurrence on the petiole, entire, rarely serrate, dusky pubescent, drying blackish above cinereous beneath, mature usually pubescent at least on the nerves; nerves 7 pair, reticulations distinct; petiole $\frac{1}{4}$ in. Corymbs 2–3 in. diam. hard bracteate; bracts small, deciduous. Calyx $\frac{1}{2}$ in., in fruit often nearly $\frac{1}{2}$ in. diam. Corolla $\frac{1}{2}$–$\frac{3}{4}$ in., 2-lipped, densely hairy in the throat. Drupe $\frac{1}{6}$ in. diam., globose, hardly verrucose.—
Roxburgh ground his species on the cordate base of the leaves: this form appears
confined to the Coromandel Hills.

**Var. cuneata;** leaf-base rhomboid or cuneate, calyx strigose. *P. viburnoides,
Cox for. Fl. ii. 261.—Pegu; *Kurz.* Burnus; *Griffith* (Kew Distrib. n. 6035).—A
small tree of the dusky sombre colour of *P. latifolia* Roxb. type, the leaves drying
blue-black above, ashy beneath, often very pubescent when young.

**Var. mollissima;** leaves small base obtuse or rhomboid, corymbs 1½ in. diam.
*P. mollissima,* Roth Nov. Sp. 287; *Schauer in DC. Prodr.* xi. 638. *P. viburnoides,
Wall. Cat. 2646, letter a only;* Schauer l. c. 635, chiefly.—Madras; *Wight.*—This
looks like a burnt-up form of *Var. cuneata,* than which it is not more hairy, but
has smaller calyx and corolla.

**Var. mucronata;** leaves cuneate at both ends mature minutely pubescent on
the midrib beneath, corymbs somewhat broad rusty-pubescent, calyx subpatently
pubescent. *P. mucronata,* Roxb. Fl. Ind. iii. 635; *Wall. Cat.* 1766; *Schauer in
DC. Prodr.* xi. 635; *Brand. For. Fl.* 386.—N. India from Kumaon to Bhotan and
the Khasia Mts., ascending to 5000 ft., and spreading into Bengal Plain, common,
*Wallach.*—*H. f. & T.;* &c.—This could not be distinguished from *P. latifolia*
by Wallis or Brandis, and seems to be a state of *P. latifolia* grown in a moister soil.
The leaves are often 6 in. long, the drupes larger and more verrucose.

**Var. viburnoides,** Wall. Cat. 2646, letter b only; leaves ovate base rhomboid
glabrate drying green surfaces concolorous. *Schauer in DC. Prodr.* xi. 635, *in small
part.* *P. latifolia,* Wight l. c. 893.—S. Deccan Peninsula; Cochin and Gingee Hills,
*Wight;* near Madras, *G. Thomson.*—Leaves broad, not cordate, nearly globose even
when young.—This may be a distinct species; the green colour easily separates it from
all the preceding forms of *P. latifolia.*

23. *P. flavescens,* *Ham. ;* Wall. Cat. 2649; leaves ovate or obovate
acuminate entire mature setalose above villous beneath, corymbs large
densely pubescent, calyx closely pubescent shortly 5-toothed.


A shrub or a small tree; shoots villous or woolly. *Leaves* 6 by 2½ in., base obtuse
or subcordate, upper surface with minute scattered hairs erect from the reticulating
nerves; nerves 7 pair; petiole 1 in. *Corymbs* 4–7 in. diam., usually rusty-villous;
bracts ¼ in., linear. *Calyx* ⅔ in. *Corolla* ⅓ in., 2-lipped, very hairy below within.
*Drupes* ⅓ in.

**Var. glabrior;** leaves setulose above sparingly pubescent or glabrate beneath
*Clarke.* *Silhet;* *H. f. & T.*

**Var. rubens;** leaves setulose above glabrate beneath drying usually reddish.
*Premna* n. 32, *Herb. Ind. Or. H. f. & T.*—Malacca; *Griffith* (Kew Distrib. n. 6202.
*(Java).*—Possibly a distinct species; but, except as to the colour of the leaves, no
diagnostic mark has been found to separate it from *Var. glabrior.*

24. *P. micrantha,* *Schauer in DC. Prodr.* xi. 635; leaves ovate
acuminate entire mature setulose above somewhat pubescent beneath, corymbs compound minutely pubescent, calyx very small minutely 5-toothed.
*P. scandens,* *Wall. Cat.* 1774, *in small part.

*Silhet;* *Wallach.*

*Leaves* 3½ by 1½ in., base rounded. *Calyx* ⅓–⅔ in. when the flower is expanded.—
This very closely resembles *P. flavescens,* *Ham.,* and may be a form of it; it differs in
the very small calyx. The bristliness of the upper surface of the leaves is peculiar to
*P. flavescens* and *P. micrantha* among *Premnas.*

25. *P. Wightiana,* *Schauer in DC. Prodr.* xi. 635; leaves ovate
shortly acuminate subtendire mature sparingly pubescent above, panicles
narrow subthyrsoid in fruit minutely thinly scabrid-pubescent, calyx-teeth
5 subequall ovate or triangular. *P. thyrsiflora,* *Heyne;* *Wall. Cat.* 1770.
S. DROOLS PENINSULA; Heyne; Sir Mulley, Wight; Anamalay Mts., Beddome.

Appears a large rambling or subscendent shrub. Leaves 3 by 2 in. (mostly smaller), membraneous, base obtuse or subcordate, undulate, rarely shallowly crenate, mature nearly glabrous beneath; nerves 5 pair, secondary distinct; petiole ¼-⅓ in. Panicle 1½ in., pyramidal; in fruit often 2-3 in., oblong; bracts ⅙ in., lanceolate, persistent, nearly glabrous. Calyx ⅓ in., minutely scabrid, hardly pubescent. Corolla ⅝ in., glabrate without, subequally 4-fid. Drupe ⅛ in., obovoid, dry tubercular-rugose.

26. **P. Thwaitesii**, Clarke; leaves ovate acuminate entire or remotely crenate softly hairy beneath, panicles subthysroid densely shortly villous, calyx shortly subequally 5-toothed. *P. micrantha, Thwaites Enum. 242, not of Schauer.*

**CEYLON; Thwaites.**

A tree, 8-10 ft. (Thwaites). Leaves 3 by ¼ in., base cuneate, minutely hairy above, densely deciduously simply hairy beneath, nerves 5 pair; petiole ¼-⅓ in., villous. Panicle 1½ in. by 1 in., densely branched; bracts ⅛ in., linear, villous, persistent. Calyx ⅓ in., minutely appressed hairy. Corolla ⅝ in., yellowish. Drupe ⅛ in. diam., globose, smooth.—Possibly a var. of *P. Wightiana*, but not at all like *P. micrantha*, Schauer.

***† Leaves (mature) toothed (teeth sometimes very few in *P. barbata*).***

27. **P. thyrsoides**, Wight *Lc. t. 1485; leaves ovate shortly acuminate serrate mature glabrate, panicle thysroid villous or woolly, calyx pubescent or villous shortly subequally 5-toothed.

**TRAVANCORE and CO[P]RTALLUM; Wight.**

A small tree or large shrub (Wight). Leaves 3½ by 2 in., base rhomboid or subcordate, mature minutely pubescent on the nerves or glabrous; nerves 5 pair, secondary distinct; petiole ¼-⅓ in. Panicle (in flower) ¾ by 2 in., densely branched; bracts subpersistent. Calyx ⅛ in. Corolla ⅝ in., glabrous without; lobes ⅜, subequal. Drupe ⅛ in., globose, verrucose-tubercular.—Wight subsequently reduced this species to *P. Wightiana*, Schauer, remarking that the thryse was much larger. This may be so, but in addition to the differences noted by Wight, the leaves are always serrate, and the indumentum differs. Beddome's description of *P. Wightiana* (For. Man. 173) is designed to include the two.

28. **P. barbata**, Wall. Cat. 1768; leaves oblong or ovate acuminate more or less toothed mature minutely pubescent beneath, corymb s villous with small simple hairs, calyx subequally 4-toothed glabrate or pubescent. *Schauer in DC. Prodr. xi. 636; Brand. For. Fl. 366. P. cana, Wall. Cat. 1783.*

**SUBTROPICAL HIMALAYA, alt. 500-5000 ft., from Kumaon to Bhotan, frequent; Wallich, H. f. & T., &c.**

A small tree or a shrub. Leaves 6 by 1½-2½ in., base obtuse sometimes subcordate, usually distinctly toothed, sometimes with only a few teeth towards the tip, young softly minutely pubescent on both surfaces, mature nearly glabrous above, nerves 6 pair; petiole ⅛ in. Corymb 1-2½ in., diam., somewhat dense, in fruit sometimes subglatebrate; bracts small, linear, deciduous. Calyx ⅓ in.; teeth oblong, obtuse. Corolla ½-⅗ in., 2-lipped, hairy in the throat. Drupe ⅛ in., globose or somewhat obvoid, glabrous obscurely verrucose.

**VAR. anodon; leaves very sparingly toothed, often nearly glabrous when young,—Sikkim and Bhotan, frequent; Clarke.***

ASSAM; Griffith (Kew Distrib. n. 6025). KHASIA TERAI; H. f. & T.—Distrib. Ava.

An undershrub; stems 1-1½ foot (Griffith), thick, patentely hairy. Leaves 6½ by 4½ in., somewhat coriaceous, base rounded often cordate, serrate nearly to the base, sparsely pubescent on both surfaces when young, nerves 5 pair; petiole 1 in., pubescent or woolly. Corymb (in flower) 1½ in diam., in fruit 2½ in.; branches hairy. Calyx ⅛ in., green. Corolla ½-1 in., white. Drupe ¾ in., obvoid, smooth, purple.

30. **P. esculenta**, Roxb. Hort. Beng. 46, and Fl. Ind. iii. 80; leaves short-petioled obovate or elliptic acuminate sharply serrate, corymbs compact nearly glabrous, calyx minutely 5-toothed, corolla ½ in. Wall. Cat. 1761; Schauer in DC. Prodr. xi. 636; Kurz For. Fl. ii. 261.

ASSAM (without name of collector). CHITTAGONG; fide Roxburgh.—Cultivated in the Calcutta Botanic Garden.

A branching shrub, 6-8 ft, trunk hardly any. Leaves 6½ by 3 in., base entire cuneate suddenly narrowed sometimes very shortly cordate, mature glabrate, nerves 5 pair; petiole ½ in, obscurely puberulous. Corymb 2½ in diam., short-peculcnded, globose, many-fl., bracts ¼ in, linear. Calyx ¼ in., cup-shaped, obscurely puberulous; somewhat enlarged, more distinctly toothed, in fruit. Corolla yellowish-white, 2-lipped, throat hairy. Drupe ¼ in., globose or somewhat obovoid, usually 3-4-seeded.

All the examples seen of this appear to be cultivated; and the native habitat is uncertain.


RANGOON; Wallich, M'Lelland. PEKU, MARTABAN and UPPER TENASSEEM, common, Kurz.

An undershrub (Kurz), throwing up flower-shoots 1-2 ft. high after the jungle fires. Leaves whitened underneath; sessile cordate, or petiole sometimes ½ in. (Kurz).

—This agrees so closely with **P. esculenta** except in the want of petioles, that it may be the wild state of it. **P. angustata**, Wall., is the same, the leaves being 10 by 4 in.

32. **P. macrophylla**, Wall. Cat. 1765; leaves sessile elongate-obovalate remotely shallowly toothed, corymbs compact patentely softly pubescent, calyx 5-toothed enlarged in fruit. Schauer in DC. Prodr. xi. 636; Kurz For. Fl. ii. 262.

PROKHE HILLS; Wallich. MARTABAN and PEKU; common (Kurz).

A low undershrub, sending up flower-shoots 1-2 ft. after the jungle fires; all the young parts softly pubescent. Leaves 12 by 4 in., base attenuate cuneate, whitened beneath, mature glabrous. Corymb 2 in. diam., dense, softly hairy even in fruit; bracts ½ in, narrowly lanceolate, hairy, persistent. Calyx in fruit ¼ in, deeply 2-lipped, striate. Drupe ½ in., tubercular-rugose (in the dried state), usually 2-seeded (Kurz).

—Perhaps a var. of **P. amplectens**, of which the drupe when dried appears nearly smooth (as in **P. esculenta**).


CEYLON, fide Wallich; not uncommon in the hotter parts of the island, Thwaites. Branches minutely strigose-pubescent. Leaves 3½ by 1½ in., base abrupt or cordate, sparsely pubescent above when young, nerves 5 pair; petiole ½ in. Corymb 1 in. diam.; in fruit 1½-2 in., pyramidal or subthysoid. Calyx ⅛ in., minutely pubescent or scabrid. Corolla ½ in. Drupe ⅛ in., obovoid, tuberculate.—All the specimens seen are from the Calcutta Botanic Garden, cultivated.


A small undershrub; flowering branches 1-4 in., springing up after the jungle fires. *Leaves* 4 by 2-3 in., obtuse, mature microscopically dotted above, minutely deciduously pubescent beneath, nerves 5 pair. *Corymb* 1½ in. diam., pubescent, somewhat dense; peduncle 0-1½ in. *Calyx* ½ in., closely pubescent; lobes ovate, obtuse. *Corolla* ½ in., greenish-white, hairy in the throat, 4-lobed obscurely 2-lipped. *Drupe* ¼ in. diam., globose.

**Imperfectly Known Species.**


Wallich's example is a branch with leaves only, in habit exceedingly like *P. esculenta*, except as to the points mentioned in the diagnosis. *Leaves* 5½ by 2 in., mature glabrate. *Schauer's description appears compounded out of Wallich's two sheets of 1764*, the second of which may very possibly not be of the same genus or order.

*Var. orbiculata*; leaves suborbicular base shortly cuneate coarsely toothed soft with simple hairs on both surfaces. *P. grossa*, *Wall. Cat. 1764*, second sheet only.— *Prome; Wallich*.


**XII. GMELINA, Linn.**

Trees or shrubs, shoots tomentose, unarmed or spinous. *Leaves* opposite, entire toothed or lobed. *Cymos* panicled or small; bracts narrow, except in *G. Hystrix*. *Flowers* large, yellow or brownish, tomentose at least when young. *Calyx* campanulate, shortly 5-toothed or subentire. *Corolla-tube* slender below, ventricose upwards; limb oblique, 5- (or 4-) lobed. *Stamens* 4, didynamous, subexserted; anther-cells oblong, pendulous, subseparate. *Ovary* 4-celled, 4-ovulat; style slender, shortly bifid. *Drupe* succulent; endocarp bony, undivided, 4-2-celled; calyx persistent, unaltered. *Seeds* oblong.— *Species* 8, *E. Asiatic* and *N. Australian*.


Throughout the Decam Peninsula and Ceylon, frequent, extending to the foot of the N.W. Himalaya. *Chittagong.—District*. Malayen and Philippine Islands.

An unarmed tree, sometimes attaining 60 ft., deciduous, flowering with the young leaves. *Leaves* 9 by 6 in., more or less acuminate, entire, mature glabrate above, stellately hairy beneath; petiole 3 in., top glandular. *Panicles* often 1 foot, terminal; bracts ½ in.; flowers numerous. *Calyx* ½ in., teeth very small or obsolete. *Corolla* brown-yellow, upper lip shortly bifid, longer than the lower. *Drupe* ½ in., ovoid, usually 2-1-seeded.
Vex. glaucescens; leaves glaucous beneath mature often nearly glabrous, calyx-teeth larger triangular.—Subtropical Himalaya and Khasia Mts., alt. 0-2000 ft.; J. D. H., &c. Burma and Tenasserim, Kurz.—Probably only the form of G. arborea from moist places; some N.W. Himalayan examples are intermediate between it and the type.


Spinosus (Roxburgh); branchlets unarmed. Leaves 3 by 2 in., obtuse or cuneate at both ends, subentire or coarsely toothed, mature glabrate above; petiole ¾ in. Racemes terminal, 1-2 in.; bracts ¾ in. Calyx ½-¾ in., tomentose with several large glabrous glands; teeth small. Corolla yellow; tube very narrow below; upper lip of the limb larger than the lower, subentire. Drupe ¾ in., ovoid or obovoid, 2-1-seeded.


Deccan Peninsula and Ceylon, frequent; Roxburgh, &c.—Bengal; cultivated.

Spinosecent, or unarmed. Leaves ½-¾ in., entire or coarsely lobed, mature beneath glabrous glaucouscent from a close coat of minute round glands; petiole ¼ in. Racemes 1-2 in.; bracts ¾ in. Calyx ¼ in., tomentose, but with large bare glands, as in G. villosa, as in the corolla. Drupe also as of G. villosa, with which this species has been confounded by Kurz and others.

4. G. Hystrix, Kurz in Journ. As. Soc. 1870, ii. 81, and For. Fl. ii. 265; leaves elliptic cuneate or rhomboid at both ends mature glabrous, cymes subcapitate, bracts very large nervous coloured, corolla 2 in. Benth. in Gen. Pl. ii. 1154. G. Finlaysoniana, Wall. Cat. 6317.

Tenasserim; tide Kurz.—Distrib. Siam, Philippines.

A large, spinous, scandent shrub. Leaves 3 by 1½ in., entire, beneath glaucous with scattered round glands; petiole 1 in. Cymes 2 in.; bracts 1½ by 1 in., ovate, 5-nerved. Corolla yellow, much as of G. villosa, but less tomentose without; dried exceeding 2 in., 1 in. (Kurz). Drupe ¾ in., obovoid, 2-seeded.

5. G. oblongifolia, Roxb. Fl. Ind. iii. 83; arboreous, leaves ovate or oblong entire somewhat rough, panicles terminal brachiate brown-farinose, bracts small caducous, corolla large rosy. Schauer in DC. Prodr. xi. 679.

E. Bengal (Roxburgh).

A tall timber tree. Leaves 6-12 by 3-8 in.; petiole 2 in., with several glands close to the apex. Calyx cyathiform, entire, farinose, a few glands on the outside. Corolla-tube short; limb 5-partite, lower lip longer with a deep yellow mark in the centre of its base. Anthers bipartite. Drupe oblong, somewhat 4-cornored and
obtuse, size of a large olive, smooth, ripe bright crimson, 1-celled; endocard clavate, 4-cornered, 4-celled, perforated from the base up the centre. Seed solitary, lanceolate.

The foregoing is extracted from Roxburgh, and indicates a remarkable tree that no one else has seen. There is at Kew an unpublished drawing of Roxburgh's of this tree, agreeing exactly with the description.

EXCLUDED SPECIES.

G. SPECIOSISSIMA, Don Prodr. 104, Schauer in DC. Prodr. xi. 680, is Wightia gigantea, Wall.

XIII. VITEX, Linn.

Trees or shrubs; shoots hairy or tomentose. Leaves opposite, digitately 3-5-foliolate (in V. simplicifolia 1-foliolate). Inflorescence terminal and axillary, or wholly axillary; cymes peduncled or sessile, forming large or small panicles or corymbs; bracts small or longer than the calyx. Calyx campanulate, truncate or shortly 5-toothed (in V. gamosepala 3-toothed). Corolla small, tubular; limb 2-lipped, 5-toothed; central lobe of the lower lip usually much larger than the others. Stamens 4, didynamous, usually exserted; anther-cells at first parallel pendulous, afterwards divaricate, often twisting so that their lower ends are suberect. Ovary 2-4-celled, 4-ovuled; style filiform, shortly bifid. Drupe globose or obovoid, supported by the more or less enlarged calyx; endocard bony 4-, or by suppression 3-1-celled. Seeds obovate or oblong.—Species 60; in all tropical and warm temperate regions.

Subgenus 1. Euagnus, Schauer. Calyx csp-shaped, shortly subequal 5-toothed or truncate.

* Panicles terminal, penultimate axillary peduncles often added.


Scattered throughout India, in the tropical and subtropical region, from the foot of the Himalaya to Ceylon and Malacca, nowhere common.—DISTRIB. S.E. Asia to Japan, the Philippines and N. Australia.

A shrub or small tree. Leaflets 1-3 in., subobtuse, tomentum beneath of matted scarcely stellate hairs, so close as with difficulty to be scraped off; petiole 1 in. Panicles 1-4 in. oblong, often leafy at the base; bracts minute. Calyx \( \frac{1}{4} \) in., minutely 5-toothed. Corolla tomentose, lavender to blue. Filaments hairy at the base.—Perhaps commoner than supposed, being frequently unnoticed from its close general resemblance to the universal V. Negundo.

2. V. Negundo, Linn.; Roxb. Fl. Ind. iii. 70; leaves 3-5-foliolate, leaflets petioluled lanceolate entire or crenate glabrate above beneath and panicles closely white-tomentose, corolla \( \frac{1}{2} \) in., drupe \( \frac{1}{4} \) in. diam. black. Wall. Cat. 1744; Schauer in DC. Prodr. xi. 684; Wight Ic. t. 519; Bedd. For. Mem. 171; Brand. For. Fl. 369; Kurz For. Fl. ii. 269; Boiss. Fl. Orient. iv. 535. V. bicolor, Willd. Enum. Hort. Berol. 660; Schauer l. c. 683; Dalz. & Gibbs Bomb. Fl. 201. V. arborea, Desf. Cat. Hort. Paris. 391.


A shrub or small tree, hardly distinguishable from *V. trifolia* but by the points mentioned in the diagnosis. The leaflets are frequently 5, the centre one at least usually distinctly petiolulated, the flowers rather smaller.

**Var. incisa:** leaflets crenate-serrate or subpinnatifid. *V. incisa,* Lamk. Dict. ii. 611, and Ill. t. 541, fig. 2; *Bot. Mag.* t. 364; *Roxb. l. c. 72; Wall. Cat. 1746, partly; Schauer in DC. Prodr. xi. 684. —Throughout India. Distrib. E. Asia.—The extreme pinnatifid form of this var. is Chinese; the wild Indian examples are crenate-serrate, i.e. intermediate.


**Deccan Peninsula,** especially the west side, up to 4000 ft., common; *Heyne,* *Wight,* &c.

A very large tree; shoots tawny-villous or woolly. **Leaves** 3-foliolate, occasionally 5-foliolate (Beddome); leaflets 5½ by 1½ in., mature glabrous above except the midrib, beneath closely distinctly reticulate and with scattered round yellow glands; petiole 2½ in., sometimes somewhat winged upwards. **Panicles** 3–8 in. diam.; branches elongate, interrupted, cymes clustered; bracts 1½–2½ in., elliptic. **Corolla** ½ in., fulvous-villous, teeth short, triangular. **Corolla** woolly. **Ovary** and young fruit fulvous-villous at the apex.

**Var. zeylanica:** mature leaves glabrate beneath. *V. zeylanica,* Tunes. in Bull. Soc. Imp. Nat. Mosc. 1863, ii. 223. V. altissima (forma subglabra), *Thwaites* Enum. 244.—Ceylon; *Walker,* *Thwaites.*—Leaves beneath reticulate, the depressions microscopically tomentose, as in *V. altissima* after all the hair is rubbed off.


**Madras:** Van Royen; Tuccheconum, *Rottler.* *Mysore:* *Cleghorn.*

Scarcey differs from *V. altissima* but by the wing of the petiole, which is ½–¾ in. wide, continuous, dilated, cordate and subamplexical at the base; leaflets 2½ in. wide.

Some branches, apparently of this, collected by Shuter, Law, and Stocks, have some of the leaves 5-foliolate.


**Pegu** and **Tenasserim:** *Wallich,* &c.—Distrib. Ava, Siam.

A tree; shoots fulvous-hairy or woolly. **Leaflets** 7 by 2½ in., acute at both ends, mature nearly glabrate above, minutely densely fulvous-pubescent beneath; petiole 3–4 by ½–2 in. **Panicles** 18 by 6 in., fulvous-hairy; branches interruptedly spicate; bracts 2½–3 in., lanceolate, often imbricate. **Corolla** ½ in., very shortly toothed, closely fulvous-strigillose. **Corolla** ½ in., fulvous-villous. **Drupe** ½ in. diam., globose, smooth. —The leaves are exceedingly similar to those of *V. pubescens,* except that the petiole is winged; the elongated interrupted panicle-branches are quite different.

8. **Drepan Peninsul and Ceylon, frequent. E. Bengal and Malay Peninsul,** from the Khasia Terai, H. f. & T., to Singapore; frequent from Pegu southwards.—**Distrib. Throughout Malaya.**

A tree, 30-50 ft. *Leaves* 3-foliolate, one or two smaller leaflets occasionally added; leaflets attaining 8 by 3 in., cuneate or scarcely acuminate, base cuneate rhomboid or of the lateral leaflets unequal rounded on one side, minutely pubescent on both surfaces, more strongly on the nerves; petiole 2-3 in., not winged. *Corymbs* 3-5 in. diam., depressed-pyramidal; bracts $\frac{1}{2}$ in. *Calyx* $\frac{3}{4}$ in., densely fulvous-tomentose. *Corolla* tomentose, blue, upper lip ochroleucus. *Drupe* glabrous at the apex.

7. **V. diversifolia**, *Kurz Andam. Rep. App.* A 45 and B 14; leaves simple and 3-foliolate glabrate, leaflets sessile oblong cuneate at both ends entire, panicles terminal fulvous-strigose, bracts ovate prominent, corolla $\frac{1}{2}$ in.

**ANDAMAN ISLANDS; Kurz.**

*Branchiets* and shoots fulvous-strigose, or subtomentose. *Leaflets* attaining 5 by 14 in., above with minute thinly-scattered white glands, beneath finely reticulate, microscopically white-tomentose in the depressions, obscurely puberulous on the midrib; nerves 6-8 pair; petiole 14 in. *Panicles* 2-3 in., upper leaves graduating into bracts; upper bracts $\frac{1}{2}$ in. *Calyx* $\frac{3}{4}$ in., campanulate, subnervate, fulvous-strigose. *Corolla* fulvous-villos, subtomentose. *Drupe* not seen.


**Assam; Jenkins. E. Bengal; Tipperah (Roxburgh).**

A large tree, *Wallich.* *Upper leaves* generally 5-foliolate; leaflets 7 by 2 $\frac{1}{2}$ in., with scattered white glands above and yellow glands beneath, petiole of the central leaflet usually $\frac{1}{4}$ in.; petiole 2 in., glabrate. *Panicles* 8 by 6 in., cymes dense-fld., clustered along the branches; bracts $\frac{3}{4}$ in., linear, deciduous. *Calyx* truncate. *Corolla* $\frac{3}{4}$ in., ochroleucus, lower lip blue. *Drupe* scarcely $\frac{1}{2}$ in. diam., glabrous at the apex.

**Vas. undulata; leaves smaller all the upper 3-foliolate, leaflets shining undulate.**


**Malacca; Griffith (Kew Distrib. n. 6064). Maingay (Kew Distrib. nn. 1205, 1207).—Distrib. S.E. Asia, Malaya.**
A medium-sized tree (Maingay). Leaves (all the upper) 3-foliolate, a small leaflet rarely added; leaflets 5 by 2½ in., obtuse, tip usually less than ½ in., with scattered white glands above and yellow beneath, petiolule of the middle leaflet often ½ in.; petiole 1–2 in., not winged. Panicles 8 by 5 in., terminal, penultimate sometimes added; cymes densely flowered clustered along the branches; bracts ½ in., linear, deciduous. Calyx minutely toothed at flower-time, much enlarged, ½ in. diam., roundly 5-lobed in fruit. Corolla 1½–1½ in. Drupe ½–½ in., apiculate.—This species differs from all the preceding by (inter alia) the large drupe. The inflorescence, calyx, corolla and drupe are so like those of V. sumatrana (Miq. Fl. Ind. Bat. Suppl. 567), that it may be a var. of it; but in V. sumatrana the leaves are mostly 5-foliolate and pubescent beneath.

10. V. coriacea, Clarke; leaves 3-foliolate coriaceous glabrous, leaflets petiolulated oblong entire, panicles terminal fulvous-pubescent, flowers clustered on the elongate branches, calyx ½ in. 5-toothed. Vitex n. 13, Herb. Ind. Or. H.f. & T.

Malacca; Griffith (Kew Distrib. n. 6065), Maingay (Kew Distrib. n. 1203). Branchlets round, tips puberulous. Leaves 4 by 1½ in., obtuse or acute, beneath minutely glandular and with thick elevated nerves, petiolule of the central leaflet ½ in., petiole 1–2 in., not winged. Panicles 6 by 3 in., strict, branches elongate ascending; bracts ⅓ in., oblong, fulvous-pubescent, deciduous; cymes condensed almost to clusters. Calyx fulvous-pubescent, wide funnel-shaped, in flower conspicuously 5-toothed; in fruit enlarged, cup-shaped, subtruncate. Corolla ⅓ in., fulvous-pubescent, as are the pistil and filaments. Drupe ½ by ½ in., terete, ellipsoid, very smooth.

11. V. canescens, Kurz in Journ. As. Soc. 1873, ii. 101, and For. Fl. ii. 270; leaves 3-foliolate, leaflets petiolulated ovate or elliptic entire young fulvous-villos, panicles compound fulvous-pubescent branches elongate pedicels whorled.

Asam; Griffith (Kew Distrib. n. 6066), Masters. Pegu; M'Lelland, Kurz.—Distrib. Asia.

A tree, 20–30 ft., or a shrub (Griffith); innovations fulvous- or dusky-pubescent. Leaves (upper alone seen) 3-foliolate, or (Kurz) 5-foliolate; leaflets ½ by 2 in., mature scabrid or glabrate fulvous-pubescent on the nerves; petiolule of the middle leaflet ½ in.; petiole 2 in., fulvous-pubescent, not winged. Panicles 12 by 6 in., with numerous elongate spreading branches; bracts very small, deciduous; pedicels ½–⅓ in. Calyx ⅓ in., pubescent, very shortly toothed. Corolla ½ in., fulvous-tomentose. Drupe ½–⅓ in. diam., globose, smooth.—Vitex canescens, Wall. Cat. 1757, is not in Wallich's Herbarium; Kurz does not state whether he intended or guessed his own V. canescens to be the same as Wallich's or no.

12. V. Wimberleyi, Kurz For. Fl. ii. 271; leaves 5–3-foliolate glabrous, leaflets petiolulated elliptically oblong or lanceolate coarsely crenate-serrate, panicles terminal and pennultimate puberulous.

Andaman Islands; Kurz.

A small evergreen tree, much resembling V. sumatrana. Petioles 2–3 in., slender, glabrous. Flowers small, clustered or cymulose; bracts caducous, lower leaf-like, upper linear-oblong as long as the calyces. Calyx ½ in., subtruncate, velvety. Corolla pubescent; tube wide, short; lobes obtuse, lowest much produced.—Not seen; the foregoing is copied from Kurz. Imperfect specimens of a plant collected by me in the Chittagong Hills show similar coarsely crenate-serrate leaflets, but have the petioles winged; it may be the young state of this species.

MALACC A; Griffith. — DISTRIB. BORNEO.
A small tree; branchlets round, puberulous or glabrate. Leaflet 7½ by 2½ in., punctulate beneath, sessile, articulate on a petiole ½ in. Panicle a foot, one branch 1½ by 1½ in. in Griffith's example, rusty-pubescent; cymes distant; bracts small, caducous; pedicels 12–16 in., thickened in fruit. Calyx shortly but distinctly toothed, enlarged in fruit. Corolla nearly ½ in., tomentose, ochroleucous, the middle lobe of the lower lip purple-lilac (Griffith). Drupe ¼ in. or more, avoid; apex depressed.
—Wight supposed this to be *Vitex macrophylla*, K. Br. (now removed to *Gmelina* by Bentham); and it is so very like it, except in having narrow leaves, that it appears unnatural to refer the two plants to different genera.

** Peduncles all axillary, sometimes subobtuse.**


PEANAG; Wallich. MALACC A; Griffith (Kew Distrib. n. 6063), Cuming.— DISTRIB. Ava, Sumatra, Java, Borneo.
A tree; shoots softly hairy or almost woolly. Leaflets 6 by 2½ in., acuminate at both ends; petiololed of the middle leaflet often ½ in.; petiole 2–3 in., not winged. Cymes sessile, small, few-fl., fulvous-pubescent; bracts ½ in., linear; pedicels ½–1 in. Calyx ½ in., subtruncate, fulvous-pubescent. Corolla ½ in.; tube narrow, glabrate, densely yellow-glandular; lobes small. Anther-cells not very unequal, divaricate. Drupe ½ in. diam.; fruit-calyx saucer-shaped.


From ASSAM and BENGAL to TENASEERIM, frequent; Roxburgh, Wallich, &c.

VAR. Roxburghiana; less grey-pubescent, petioles winged, panicles lax few-fl. V. alata, Roxb. Fl. Ind. iii. 72; Wall. Cat. 1752; Kurs For. Fl. ii. 272, not of Heyne nor of Schauer. —Behar, at Parasnath, Edgeworth. E. Bengal and Khasia Terai; H. f. & T. Pegu; Kurs.—Roxburgh quotes (for bis Chittagong V. alata) *Rheedee Hort. Mal.* v. t. 1, which has leaves that might do, but a totally different inflorescence, and is Heyne's *V. alata*.


S. DECCAN PENINSULA and CEYLON, up to 3000 ft., *Roxbourn*., *Rottler*, &c.
A small tree. Leaflets 5 by 1 in., obtuse or obtusely acuminate, when young sparsely hairy, mature with patent yellowish hairs along each side of the midrib beneath; petioles ½–¾ in.; petiole 1–3 in., not winged. Corymbs nearly glabrous; bracts ½ in., lanceolate, scarious, marcescent; flowers sessile in each dichotomy. Calyx
Vitex.

½ in., minutely toothed, tomentose or nearly glabrous. **Corolla** ½ in., woolly without. **Drupe** obovoid, succulent.—In the typical form the leaflets are coriaceous, shining, yellowish beneath, nervation obscure: in *V. saligna*, Roxb., they are more membranous, the reticulated nervation distinct on both surfaces. A very handsome form with broader leaflets is marked *Wallrothia tomentosa* by Wight; but the extreme membranous narrow-leaved *V. saligna* (Roxburgh's specimen) shows similar hair on each side the midrib beneath.

17. *V. glabrata*, Br. Prodr. 512; leaves 5–3-foliolate, leaflets ovate or oblong subentire mature sarsaparilla tomentose beneath, corymbs divaricate, drupe ½–1 in. **Schauer in DC. Prodr.** xi. 695; **Benth. Fl. Austral.** v. 68. *V. Cunninghamii*, **Schauer** l. c. 690. *V. leucoxylon*, **Schauer** l. c. 692, partly; **Blume** Bijd. 813; **Kurz** For. Fl. ii. 273; **Gamble Indian Timbers**, 298. *V. bombacifolia*, **Wall. Cat.** 1749; **Walt. Rep.** iv. 86. *V. pallida*, **Wall. Cat.** 1751.—*Vitex* nn. 10 and 18, **Herb. Ind. Or. H. f. & T.**

From S. Assam and Cachar to Malacca, frequent.—**Distrib.** Siam, Cochim, China, Malaya. N. Australia.

A small tree; shoots fulvous-tomentose or woolly. **Leaves** mostly 5-foliolate (in the Indian tree); leaflets 5 by 2½ in., acute or acute at both ends, entire rarely toothed, young very softly hairy or subtomentose, mature with scattered appressed minute hairs beneath; petiolules ½–½ in.; petiole 1–4 in., not winged. **Pedicules** long or more often short; flowers somewhat numerous, mostly shortly pedicelled; bracts inconspicuous. **Calyx** ½ in., minutely toothed. **Corolla** ½–1 in., tomentose, ochroleucous; lowest segment much the largest, hairy, blue-purple. **Filaments** minutely hairy. **Pistil** glabrous. **Drupe** obovoid, succulent.—The typical *V. glabrata*, R. Br., has leaves usually 3-foliolate and rounder more glabrate leaflets and fewer-fld. corymb than the Indian tree; but some of the examples of *V. Cunninghamii* appear identical with Silhet specimens. The typical *V. bombacifolia*, Wallich (*Vitex* n. 18, **Herb. Ind. Or. H. f. & T.**), has the leaflets mostly 5, large and broad; *V. pallida*, Wallich (*Vitex* n. 10, **Herb. Ind. Or. H. f. & T.**), has smaller, more hairy leaflets, and short pedicules.

Subgenus 2. **Glossocalyx**. Calyx unequally 2-lipped, deeply 3-toothed.

18. *V. gamosepala*, Griff Notul. iv. 178, and *Ic. Pl. Asiat.** t. 447, fig. 2; leaves 3-foliolate, leaflets petiolated ovate or lanceolate entire glabrate except the nerves beneath, cymes axillary sessile short. **Benth. in Gen. Pl.** ii. 1154.—*Vitex* nn. 15, 16, **Herb. Ind. Or. H. f. & T.**

**Malacca**; **Griffith** (Kew Distrib. n. 6065), **Maingay** (Kew Distrib. n. 1209).

A middle-sized tree; shoots fulvous-hairy. **Leaflets** ¼ by 1½ in., somewhat coriaceous, petiolules of the middle leaflet ½ in.; petiole 1–2 in., not winged. **Cymes** 1–3 in. diam., globose, repeatedly 2–3-tomous, sparingly fulvous-hairy; bracts caducous. **Calyx** ½ in.; tube shorter than the lip, ovoid; upper lip of two oblong segments, lower twice as long, elliptic, entire. **Corolla** nearly ½ in.; tube narrow, glabrate, with many yellow glands, limb small. **Anther-cells** divaricate as in *Vitex* type (Griffith's drawing shows them very young). **Drupe** ½ in., ovoid, glabrous.—The corolla as well as the inflorescence shows the affinity to *V. vestita*.

**UNKNOWN SPECIES.**

**Vitex axillaris**, **Wall. Cat.** 1760, from Tavoy, is not in Wallich's Herbarium.

**Vitex Haynna**, Roxb. Hort. Beng. 46, from Chittagong (name only), is probably one of the species described in **Fl. Ind.**, under which Roxburgh has omitted to record the earlier name.

**Vitex scabra**, **Wall. Cat.** 1758, from Ava (Schauer in DC. Prodr. xi. 695), is represented by a branchlet and leaves only in Wallich's Herbarium.
XIV. CLERODENDRON, Linn.

Trees or shrubs, sometimes rambling. Leaves opposite, rarely 3–4-nate, simple, occasionally lobed. Cymes axillary or in terminal panicles, often leafy below; bracts prominent or small. Calyx campanulate, truncate or 5-toothed, or sub-5-partite, persistent often accrescent or coloured. Corolla-tube slender, cylindric, usually long filiform; limb 5-fld, spreading, more or less oblique. Stumens 4; anthers long-exserted, cells parallel. Ovary imperfectly 4-called, 4-ovuled; style filiform, shortly bisp. Drupe globose, succulent, more rarely nearly dry, 4-grooved, separating into 4 pyrenes of which 1–3 are often suppressed. Seeds oblong.—Species 70, in the warmer regions of both Hemispheres, chiefly in the Eastern.

Clerodendron aculeatum, Linn. (under Volkmemia), a native of America, is cultivated in Indian gardens; it is allied to C. inerme, but has axillary spines. C. fragrans, Vent., a Chinese species, is extensively cultivated, particularly the double-flowered variety; it is allied to C. bracteatum. C. canescens, Wall., also Chinese, and closely allied to the last, is occasionally cultivated.

Subgenus I. Euclerodendron. Corolla-tube less than 1\(\frac{1}{2}\) in.

* Peduncles mainly axillary, or panicule leafy below.


India and Ceylon near the sea, from Bombay to Tenasserim.

A straggling shrub, 3–7 ft.; shoots grey-pubescent. Leaves opposite, rarely ternate, \(\frac{3}{4}\)–1\(\frac{1}{4}\) in., young somewhat grey-pubescent, base cuneate; petiole \(\frac{3}{4}\) in. Peduncles \(\frac{1}{4}\)–1\(\frac{1}{2}\) in., all axillary, 3–7-fld.; bracts \(\frac{1}{4}\) in., linear; pedicels \(\frac{1}{2}\)–\(\frac{3}{4}\) in. *Calyx* grey-puberulous or glabrate. Corolla white; tube \(\frac{3}{4}\) in., glabrate; lobes \(\frac{1}{2}\) in., oblong. Drupe \(\frac{1}{2}\) by \(\frac{1}{4}\) in., spongy, hardly succulent, smooth hardly sulcate, separating into 4 woody pyrenes.


Malay Peninsula near the sea, from Chittagong to Malacca, frequent.—Distrib. Malayas, China, Australis, Polynesia.

Leaves mostly ternate, \(3\frac{1}{2}\) by \(1\frac{1}{4}\) in.; or, in the extreme type form of Roxburgh, sublinear, \(4\frac{1}{2}\) by \(\frac{1}{2}\) in. *Cymes* and drupe rather larger than in *C. inerme*. Calyx often \(\frac{1}{2}\) in. diam. in fruit.—Otherwise as *C. inerme*, of which this may be a var., as Bentham and Kurz have treated it.

Var. macrocarpa, Wall. ms.; drupe \(1\frac{1}{2}\) by \(\frac{1}{2}\) in.—Martaban; Wailich. Rangoon; M'Culland.

3. C. disparifolium, Blume Bijd. 809; leaves oblong or elliptic acuminate subentire glabrate, calyx \(\frac{3}{4}\) in. deeply 5-lobed nearly glabrous. *Schauer in DC. Prodr. xi. 672*; *Hassk. Retzia. i. 57*. *C. acuminatun*, Wall.
CXL. VERBENACEÆ. (C. B. Clarke.) [Clerodendron.

Cat. 1792; Schauer l.c. 664. C. Jackianum, Wall. Cat. 1794, and in Bot. Mag. t. 3049, in note; Schauer l. c.

MALACCA and SINGAPORE, frequent; Wallich, Griffith, &c.—Distrib. Throughout Malaya.
A shrub; branchlets puberulous. Leaves opposite, unequal or equal, 4 by 1½ in., base obtuse, undulate or obscurely toothed, young scarcely pubescent; petiole 1-2 in. Peduncles numerous, axillary, or penultimate forming a terminal panicle; bracts ⅓ in., linear; cymes 10-20-fld., puberulous; pedicels ⅓-⅞ in. Calyx divided nearly to the base, often purplish, minutely puberulous; segments broad-lanceolate acuminate. Corolla pale yellow (Blume); tube nearly 1 in., glabrous; lobes ⅓ in., narrowly obovate. Drupe ½ in. diam., globose, succulent; calyx-lobes in fruit ⅓ in., pendent.

—Wallich's specimens exactly agree with those from Java; but the one species has been made into two because Blume describes the panicle as terminal, which Schauer regarded as axillary.

4. C. Griffithianum, Clarke; leaves oblong acuminate minutely toothed pubescent beneath at least on the midrib, inflorescence subterminal very lax, calyx ⅔-⅞ in. deeply 5-lobed.

ASSAM; Griffith (Kew Distrib. n. 6054).—Distrib. Ava.
A small tree (Griffith); in habit resembling C. disparifolium, but the branches viscous-pubescent. Leaves 6 by 1½ in., base rounded or cuneate, mature glabrate above, pubescent (usually minutely) on the lamina beneath; petiole 1 in., viscidly pubescent. Peduncles penultimate from petioled leaf-like bracts, and running into completely terminal panicles; bracts ⅓ in., filiform; cymes lax, viscidly pubescent; pedicels ¾-⅞ in. Calyx minutely pubescent; tube short, distinctly campanulate; lobes lanceolate, acuminate, more or less reddish. Corolla glabrate, white (Griffith); tube 1 in.; lobes ⅛ in., oblong. Drupe ½ by ⅜ in., ovoid; calyx-tube much enlarged, almost enclosing the drupe; segments ⅛ in., triangular, thickened, erect, overtopping the drupe.

5. C. Lobbii, Clarke; leaves ovate entire minutely pubescent beneath, peduncles axillary long, calyx ⅔ in. deeply lobed.

Penang; Lobb.

Apparently a rambling shrub; branchlets minutely pubescent. Leaves 8 by 2½ in., obtuse, base rounded, glabrate above; petiole probably short. Peduncles numerous, 3-4 in.; bracts ⅓ in., linear; cymes minutely grey-pubescent, 12-fl.; pedicels ¾-⅞ in. Calyx obvoid, minutely grey-pubescent, enclosing the corolla, with scattered round glands; segments ¼ in., ovate-triangular, valvate in bud. Corolla (not fully expanded) glabrate, probably ⅜ in. long, altogether of Clerodendron, as are the stamens and pistil.

6. C. phlomoides, Linn. f. Suppl. 292; leaves ovate sinuate or serrate, mature puberulous or pubescent beneath, calyx lobed half-way down lobes triangular cuneate-acuminate. Roxb. Fl. Ind. iii. 57; Wall. Cat. 1787; Schauer in DC. Prodr. xi. 663; Dall. & Gibbs. Bomb. Fl. 200; Wright &c. t. 1473; Bedd. For. Man. 174; Brand. For. Fl. 363. Volkameria multiflora, Burm. Fl. Ind. 137, t. 45, fig. 1.

From the N.W. Himalaya to Ceylon, general in the drier climates, extending to Behar and Omissa (not to Bengal).
A large bush, sometimes 30 ft.; shoots pubescent. Leaves 1½ by 1¼ in., obtuse or acute, often sub-rhomboïd, usually sinuate-crenate sometimes entire, rarely crenate-dentate; petiole ⅔ in., pubescent. Peduncles 1 in., axillary, or panicule sometimes truly terminal; cymes 12-fl., lax, pubescent; bracts ⅛ in., obovate-lanceolate; pedicels ⅓-⅝ in. Calyx ⅓-⅞ in., puberulous; in fruit slightly enlarged, more rigid, glabrescent. Corolla puberulous, white; tube nearly 1 in., filiform; segments ⅜ in., elliptic. Drupe ⅜-⅞ in., obvoid, slightly succulent, separating into 4 pyrenes much as in C. inerme.

**Volkameria alternifolia**, Burm. Fl. Ind. 137, t. 44.

MALAYA; Malaya.—**Distrib. Java.**

A shrub; branches minutely pubescent. *Leaves* 4 to 9 in., opposite rarely alternate, obtuse, base rhomboid; petiole 1 in. pedicels axillary and in a terminal panicle, puberulous; bracts ½ in., linear; cymes 6-fld.; pedicels ½—3 in. *Calyx* exceeding ½ in., minutely pubescent. *Corolla* puberulous, white; tube 1 in.; lobes ⅓—⅔ in., narrowly obovate. *Drupes* not seen.—Appears closely allied to *C. phlomoides*.

**Panicles terminal, elongate, lax, often pendulous.**

8. **C. nutans**, Wall. in *Bot. Mag.* t. 3049, and Cat. 1793; glabrous, leaves short-petioled narrowly obrate or lanceolate subentire, calyx divided nearly to the broad base segments ovate-lanceolate. *Don Prodr.* 103; *Schauer in DC. Prodr. xi. 663; Griff. Illin. Notes, 24, n. 375; *Kurz For. Fl. ii. 268.

From Sikkim and Assam to Chittagong, alt. 0—3000 ft.; Wallich, &c.—**Distrib.** Ava.

A shrub, commonly 6 ft. *Leaves* 8 by 1¼ in., or 6 by 2 in., much acuminate, base attenuate, entire or occasionally slightly toothed; petiole ½ in. *Panicles* 3—12 by 2—3 in., very lax, few-fld., bracteate; bracts ¼ in., filiform; pedicels ⅓—⅔ in. *Calyx* ⅓ in.; in fruit stellate red, more or less enlarged, in one example ⅓ in. diam. *Corolla* white; tube ⅓ in.; lobes ⅓ in., obovate. *Drupes* ⅔ in., diam., succulent, dark-purple, pyrenes 1—4.


MALAY PENINSULA, from Akyab, Kurz, to Tenasserim, Helfer (Kew Distrib. n. 6047). **Nicobar Isles.**

A shrub, resembling *C. nutans* except as to the calyx. *Leaves* from 8 by 1 in. to 5 by 2½ in., or sometimes 9 by 4 in.; base cuneate or frequently obtuse, usually entire, sometimes distinctly toothed. *Panicle* puberulous in the typical form, but (as the corolla) very nearly glabrous in some Moulline examples. *Calyx* ½ to ¾ in., segments scarcely wider at the base. *Drupes* ¾ in. diam., globose, succulent, pyrenes 4; seeds in fruit slightly enlarged, reflexed, reddish.


KHASIA MTS., alt. 2000 ft.; on limestone rocks above Chela; Wallich, *H. f. & T*.; Upper Kala Pani, alt. 5000 ft., Clarke. MOULMEIN; on limestone rocks, Parish, *Lobb.*

A membranous herb. *Leaves* attaining 9 by 6½ in., subacute, deeply cordate, very membranous, whitened beneath; petiole 6½ in. *Panicles* 5—12 in., terminal, sometimes compound, branches long, narrow, many-fld., pubescent somewhat glandular or glabrate; bracts ½ in., ovate, or smaller oblong; pedicels slender, ½ in. *Calyx* 13½ in., cup-shaped, limb shallowly toothed, glabrate or obscurely pubescent or with red glands; unaltered or slightly inflated in fruit. *Corolla* glabrous, delicate, pale blue (Hooker); tube ½ in., linear; lobes ½ in., obovate. *Stamens* long-exserted. *Ovary* 2—3 (imperfectly 4—5) celled, 4-ovuled, with large red glands, style subterminal. *Drupes* ½ in., obovate, nearly dry, covered with red glands, dividing into 4 pyrenes.—Not allied to any other
Clerodendron. The Moulmein material has smaller, less toothed, leaves, and has more pubescence and glands than the Chela plants.

*** Panicles terminal, elongate, conspicuously bracteate; calyx subtruncate.


From the Himalaya, east of the Sutlej, to Ceylon and Tenasserim, alt. 0-4000 ft., frequent; very common in Bengal.

Stems usually 2-8 ft., simple, hardly woody, being burnt annually in the jungle fires; when more than a year old becoming branched, more or less hairy or glabrate. Leaves usually some of them ternate, commonly 6 by 2 in., narrowly obovate-oblong or subelliptic, base cuneate, mature glabrous puberulous pubescent or (in some S. Indian examples) closely villous on the lamina beneath; petiole 0-4 in. Panicle 6 by 1 in., sublinear, or 10 by 5 in. subpyramidal, pubescent often villous, branches and pedicels petantly shortly hairy; bracts 1½–1¼ in., from obovate to lanceolate, pubescent, subpersistent, often coloured; pedicels 0-1 in. Calyx 2 in., cup-shaped, pubescent or puberulous, limb very shortly 5-lobed, slightly enlarged in fruit. Corolla nearly glabrous without, hairy at the base of the stamens, from purplish-blue and white to nearly white; tube ¼–¼ in., narrow-cylindric; mouth oblique, 2-lipped; lobes ½–3 in., oblong or elliptic. Drupe 2 by 2¼ in., succulent, purple-black, 4-1-pyrened.

—in the form C. herbaceum, Wall., the panicle is cylindric dense subspathic; in C. ornatum, Wall. (only seen from Pegu), the panicle is diffuse, slender, unusually glabrous.

Var. Wallichii; leaves large often shortly petioled, panicle large pyramidal open pubescent, bracteoles prominent lanceolate, calyx truncate or very nearly so. C. farinosum, Wall. Cat. 1810 (not Volkameria farinosa, Roxb.). C. divaricatum, Jack in Mat. Misc. i. 2, and in Hook. Bot. Misc. ii. 89; Schauer l. c. 674. C. javanicum, Waip. Rep. iv. 113.—Eastern India; from Sikkim and Assam to Malaca, common. Distrib. Sumatra, Java, Cambodia.—The upper leaves (at least) in some examples of this are quite entire.


Khasia Mts., alt. 4000 ft.; Mamloo, Griffith (Kew Distrib. n. 6053); Cherra, H. f. & T., &c.

A tree (Roxburgh), 40 ft., with well-marked trunk (Clarke). Leaves (none ternate) 7 by 3 in., base attenuate; petiole ½–1 in. (or uppermost leaves sessile). Panicle 8 by 5 in., brachiate, branches divaricate; rachis acutely quadrangular; bracts 1–2 in., ovate, acuminate, leaf-like; bracteoles ¼ in., linear-oblong, persistent, farinose-tomentose without spreading hairs; pedicels secund. Calyx ¼ in., truncate, glabrescent. Corolla nearly as of C. serrata, but with a greenish-white tinge. Drupe nearly as of C. serrata.

**** Panicles peduncled, of 1 or more heads, axillary or sometimes pseudo-terminal.
13. C. deflexum, Wall. Pl. As. Rar. iii. 10, t. 215, and Cat. 1808; leaves elliptic or oblong acuminate subentire mature softly pubescent beneath, bracts narrow, a few leaf-like often added. Schauer in DC. Prodr. xi. 665.

Penang; Wallich. Malacca and Singapore; Griffith, &c.

A shrub, 4 ft. (Wallich); branches pubescent. Leaves opposite, 13 by 4 in., base cuneate or rounded, mature glabrate above; petiole 1 in. Peduncles 1-5 in., axillary, or sometimes one pseudo-terminal lateral deflexed, with 1 rarely 3 heads. Panicles 1-3 in. diam., pubescent, red. Calyx 1/4 in., divided more than half-way down; lobes lanceolate, suberect, scarcely acuminate, sparingly pubescent. Corolla slightly pubescent, white suffused rose-purple; tube ½ in.; lobes ½ in., elliptic. Drupe 1/4 in. diam., succulent, purple.—Hardly any of Schauer's section of asilliflora have the inflorescence so exclusively axillary as this, which he places in a section defined as having a terminal panicle.


Sikkim and Broton, alt. 2-5000 ft., frequent. Mishmi; Griffith. Assam, Cachar and Khasia Mts. up to 4000 ft., Wallich, H. f. & T., &c.

A shrub, 8 ft., or arboreseent 20 ft.; branches fulvous-villous. Leaves opposite, 6 by 3-4 in., base from cordate to cuneate, mature softly hairy above, villous or almost woolly beneath; petiole 1-3 in. Inflorescence fulvous-villous; peduncles 3 in., bearing 1 rarely 3 heads; bracts ½ by ¼ in., prominent. Calyx 1/4 in., divided more than half-way down; segments ovate-lanceolate, suberect. Corolla pubescent, white; tube 1 in.; lobes ½ in., elliptic. Drupe 1/4 in., purple; calyx enlarged, reddish; segments subpatent.

**** Leaves beneath glabrate, with many round glands; petioles connected by a dense ring of hairs; panicle terminal, large, open.


Penang; Wallich. Mergui and Malacca; Griffith.—Distribute. Siam, Cochinchina, Java.

A shrub, 3-6 feet. Leaves 8 in. diam., lobed 1-3 in. deep, denticulate, above with scattered multicellular hairs or glabrate; petiole 1/4 in. Panicles 4-12 by 3-8 in., pubescent, often leafy below, very hairy, the branches often proclined subracemose, usually coloured red; bracteoles linear. Corolla pubescent or nearly glabrous, red orange or nearly white; tube 1/4 in., filiform; lobes 1/3 in. Drupe not seen.

Var. diversifolia; upper leaves not lobed base cordate or hastate. V. diversifolia, Vahl Symb. ii. 75; Schauer l. c.—Moulmein; Parish.


Sikkim, Broton, Assam, Khasia Mts. and Sikkim, alt. 0-4000 ft.; Wallich, H. f. & T., &c., frequent.—Widely cultivated.

A shrub, 2-5 ft.; glabrate, or the panicle and innovations minutely thinly hairy. VOL. IV.
Leaves 6-15 in. diam., teeth usually scarcely ½ in. deep; petiole 2-4 in. Panicle often 18 by 12 in., open, red; bracts small. Corolla nearly glabrous, scarlet; tube ½-1 in., filiform; lobes ½ in. Drupe ⅓-⅘ in. diam., blue-black; fruiting calyx enlarged, patent ¼ in. diam.

Var. urticifolia; teeth of the leaves ¼-½ in. deep patent all round the leaves. V. urticifolia, Wall. Cat. 1801; Schauer t. c. Volkameria urticifolia, Roxb. Fl. Ind. iii. 61.—Assam, E. Bengal, Pegu; Wallich, &c. Distrib. Ava.

***** Panicles terminal, capitate or corymbose; leaves beneath not or very obscurely glandular.

17. C. lasiocephalum, Clarke; leaves ovate acuminate dentate pubescent, petiole subcapitate, calyx-segments ⅓ in. linear-subulate.

Mishmee; Griffith (Kew Distrib. n. 6055).

Branches pubescent upwards. Leaves opposite, 10 by ¼ in., base emerse or rounded, membranous, sparsely pubescent on both surfaces; petiole 2 in. Panicle sessile, 2-3 in. diam., dense, depressed-globose, pubescent; bracts linear. Calyx divided, nearly to the base; segments flaccid caducous, pubescent. Corolla not seen. Drupe ⅓ in. diam., red.


Sikkim, Assam, and Khasia Mts., alt. 1-4000 ft., frequent; H. f. & T., &c. Moullin; Parish. Prome Hills; Col. Benson. Singapore; Lobb.

A shrub, 4-8 ft. Leaves often 9 in. diam., young puberulous, beneath eglandular or with a few scattered large glands especially near the apex of the petiole; petiole 2-8 in. Panicles 1-2 ft. diam., straggling, pubescent; flowers very numerous in clusters; bracts lacerate, caducous at flower-time. Calyx pubescent, often bearing a few large glands, divided hardly half-way down; teeth triangular or lanceolate. Corolla nearly glabrous, from rose-purple to white; tube 1 in.; lobes ⅔ in., elliptic. Drupe ⅓ in. diam., blue, pyrenes usually 4; calyx in fruit ⅓-½ in. diam.—C. glandulosum, Wall., is a specimen from the Calc. Bot. Garden, with the leaves rather more pubescent, and the bracts persistent.

Var. denticulata; leaves irregularly sinuate denticulate.—Jainta Hills; Jowye, Clarke.


Throughout India, from Gurwhal and Assam to Ceylon and Singapore, in the warm region; very common.—Distrib. Malaya.

A shrub, 4 ft., often gregarious, yellow- or white-villous upwards, sometimes a small tree according to a note in Herb. Wallich. Leaves 4-8 in., base cordate or obtuse, varying from round-ovate to broad-oblong, in the Deccan examples usually entire, in
the N. Indian denticulate, somewhat roughly hairy above, beneath densely villous or thinly hairy often with small obscure round glands; petiole 1-4 in. 

Panicle 6-12 by 4-8 in., erect, brachiate, sometimes leafy on the main rachis, upper branches and cymes more or less reddening; bracts of the cymes usually caducous. 

Calyx, in flower, 4 in., divided nearly to the base; segments broadly lanceolate, very acute, subsect. 

Corolla pubescent without, white pink-tinged; tube 3 in. 

Drupe 1 in. diam., black; calyx in fruit enlarged, sometimes 1½ in. diam.—Mountain specimens have often large leaves, and are unusually high-coloured. Lindl. Bot. Reg. 1844, t. 19, doubtfully referred here by Schauer, has high-red flowers, and may possibly be some garden form of C. infortunatum, which in the wild state produces a nearly white corolla.

20. C. villosum, Blume Bijd. 811 (exzg. syn. Rheede); leaves cordate-ovate entire mature villous, panicle open silky hairy, corolla-tube about as long as the glandular calyx-lobes ½ in. 


mum, Wall. Cat. 6315, letter B, not of Thumb. 

MALAY PENINSULA frequent; from Mergui (Griffith) to Singapore (Sir R. Schomburgk).—DISTRIB. Java. 

A shrub 3-5 ft., or a small tree 15-20 ft. (Kurz). Leaves as of C. infortunatum, but slightly more silky rather than roughly villous. 

Panicle as of C. infortunatum, but more softly hairy, and not red. 

Calyx ⅔ in., divided rather more than half-way down. 

Corolla pubescent, greenish-white, altogether smaller than of C. infortunatum. 

Drupe ¼ in. diam., dry black appearing hardly succulent.—Very like C. infortunatum, but distinguished by its small flowers, and generally also by the glandular calyx-segments. 

But in a few examples of C. infortunatum from the Malay Peninsula the calyx is full of glands.

Subgenus 2. Siphonanthus. Corolla-tube more than 3 in., filiform.


Wall. Cat. 1784; Wright Ill. t. 173; Schauer in DC 

Prodr. xi. 670; Brand. For. Fl. 364. C. verticillatum, Don Prodr. 102; 

Schauer l. c. 671. Siphonanthus indica, Willd. Sp. Pl. i. 606; Lamk. Ill. 

t. 79, fig. 1; Roxb. Fl. Ind. iii. 67. S. angustifolia, Willd. l. c. 

Ovieda mitis, Burm. Fl. Ind. 136, t. 43, fig. 1, 2. 

From Sikkim and Assam to Tenasserim, frequent. MTS. of S. Deccan Penin- 

sula. KUMAON, wild, 6de Brandis.—DISTRIB. Sumatra, extensively cultivated in both hemispheres. 

A shrub, 4-8 ft., branches virgate. Leaves 6 by 1 in., shortly acuminate, base tapering, usually entire or sinuate, rarely remotely crenately lobed; petiole 0-⅓ in. 

Panicle 8-18 by 4-6 in., often leafy below; cymes very lax, few-fl.; bracts ⅔ in., linear or linear-lanceolate; pedicels ⅓-1¼ in. 

Calyx ½ in., divided ⅔ the way down; segments oblong, cuneately acute. 

Corolla glabrous, white; tube 3-4½ in.; lobes ⅔ in., ovate-oblong. 

VAR. semisserrata; leaves opposite short-petioled elliptic crenate-lorate, panicle terminal 3-4-fl. 

C. semisserrata, Wall. Cat. 1785.—Prime and Seguin; Wallich. 

—Apparently a much-branched shrub; but the specimens are possibly only short imperfect flower-branches rapidly developed from a normal plant of C. Siphonanthus cut to the base by a hot-weather jungle-fire; for the calyx and corolla are exactly as of C. Siphonanthus.

22. C. hastatum, Lindl. in Bot. Reg. t. 1307; pubescent or villous, leaves opposite hastate ovate or oblong often angular or sublobe, panicle
CXL. VERBENACEAE. (C. B. Clarke.) [Clerodendron.


SILHERT; Wallach. Khasia Mts., alt. 0-3000 ft., H. f. & T., &c.

A large shrub. Leaves 6 by 4 in., angular, toothed, or oblong and hardly angular; petiole 4 in. Corymb subsessile, 4-8 in. diam., pubescent, with reduced leaves often scattered; proper bracts 3 in., linear. Calyx ½ in., divided nearly to the base; segments oblong, shortly acute. Corolla pubescent, white; tube 4 in.; lobes ½ in., elliptic. Drupe ½-1 in. diam., succulent, black-purple; calyx much enlarged in fruit, dark red.

DOUBTFUL OR EXCLUDED SPECIES.

C. coromandelianum, Spreng. Syst. ii. 758, Schauer in DC. Prodr. xi. 673, is another name for C. ovatum, Poir. Suppl. iv. 352; a species founded on a plant from Pondicherry, resembling C. squamatum, but with entire glabrous leaves and whiteish flowers.

C. Buchanani, Roxb. Fl. Ind. iii. 60 (under Volkmannia), and Lc. Ined. at Kew, is a Clerodendron with terminal compact red panicle and ovate leaves from Ambona and Celebes. This was united by D. Don (Prodr. Nepal. 103) with his Cl. fatidum from Nepal, a plant with axillary inflorescence, which Hamilton's original specimen in the British Museum shows to have been Caryopteris grata. Walpers (Rep. iv. 108) and Schauer (DC. Prodr. xi. 672) have copied; there is no reason to suppose that Roxburgh's Buchanani has ever been found in Nepal or in British India. C. Buchanani, Wall. Cat. 2653, is not in his Herbarium.

C. fortunatum, Linn., erroneously stated by Schauer (in DC. Prodr. xi. 671) to be an Indian species, is a Chinese plant. C. fortunatum, Wall. Cat. 2852, is not in his Herbarium.

C. sericorum, Wall. Cat. 1814, is Hiptage sericea, Hook. f.

XV. HOLMSKIOLDIA, Retz.

Shrubs. Leaves opposite. Cymes short, axillary or collected at the tips of the branches; bracts small. Calyx widely obconic, subtruncate, membranous, coloured. Corolla cylindric, curved; limb oblique; lobes 5, short. Stamens 4, didynamous; anthers exerted, ovate; cells parallel. Ovary obtuse or obscurely depressed, imperfectly (afterwards completely) 4-celled, 4-ovuled; ovules laterally attached; style terminal, shortly 2-fid. Drupe obovoid, included in the enlarged calyx, divaricately 4-lobed nearly half-way down, pyrenes 1-4. Seeds oblong.—Species 3, an Indian, Madagascan, and Tropical African.


SUBTROPICAL HIMALAYA, alt. 0-4000 ft., from Kumaon to Bhutan, and the PROBE Hills, frequent.

A straggling shrub, 10-30 ft. Leaves 3 by 2 in., entire or toothed; petiole ½ in. Cymes 1-2 in., puberulous, red becoming scarlet in fruit. Corolla 1 by ½ in., brick-red or somewhat orange. Stamens glabrous. Ovary glandular; style glabrous. Drupe ½-1 in.; fruiting calyx 1 in. diam.
XVI. **CARYOPTERIS**, Bunge.

Shrubs, erect or rambling. *Leaves* opposite, acuminate, toothed or subentire, minutely punctate with yellow glistening glands. *Cymes* small, dense, many-fl., axillary or running into a terminal thyrs; bracts small. *Calyx* deeply 5-fl.; segments triangular or lanceolate, somewhat accrescent. *Corolla-tube* short, cylindric; limb spreading, middle lobe of the lower lip larger, crisped or (in the typical non-Indian species) fimbriate. *Stamens* 4, didynamous; anthers exerted, cells divaricate (in the Indian species), confluent. *Ovary* imperfectly 4-celled, 4-ovuled; style filiform, shortly 2-fl. *Capsule* small, globose, dividing into 4 concave valves with incurved margins holding the seeds. *Seeds* oblong, erect.—Species 5, two N.E. Asiatic and the following.

Though the genus is near Clerodendron, two of the Indian species are easily distinguished by their very short corolla; the third, *C. Wallichiana*, has the corolla-tube scarcely ¼ in. The capsule is hardly less succulent than in several species of Clerodendron, nor is the incurring of the edges of the valves different from what occurs in that genus.


*SUBTROPICAL HIMALAYA*, alt. 0-4500 ft., from the Punjab to Bhotan; frequent. A spreading shrub, 4-12 ft.; shoots ashy-pubescent or subtomentose. *Leaves* 4 by 1¼ in., base cuneate, toothed or nearly entire, ashy-pubescent or puberulous; petiole ¼ in. *Cymes* mostly in terminal thyrses 3-5 by 1 in., ashy-pubescent, glandular. Calyx ¼ in., in fruit ½ in. *Corolla-tube* ¼ in., pubescent, glandular; middle lobe of lower lip nearly ½ in. blue, 4 other lobes about ¼ in. white. *Capsule* ½-1 in. diam., globose, closely pubescent.


*KTMAON*; below Nynee Tal, alt. 4000 ft., *Thomson, Strachey & Winterbottom*. *NEPAL*; *Wallich*.

A rambling shrub; branches pubescent or tomentose. *Leaves* ¼ by 1½ in. (mostly smaller), base rhomboid or almost rounded, toothed or subentire, mature softly pubescent or almost villous beneath; petiole ¼ in. *Cymes* ¼-½ in., densely pubescent, 3-8-fl., dichotomous, without a common rachis. *Calyx* ½ in., densely pubescent, in fruit ½-¾ in., membranous, not ribbed. *Corolla* pubescent, glandular. *Capsule* ½ in. diam., globose, nearly glabrous, somewhat ribbed.


A spreading shrub; branches terete, slender, pubescent. *Leaves* mostly obtuse or rounded at the base. *Panicules* axillary, subsessile, 1-2¼ in., distinctly panicked, rachis
distinct, often 20–60-fld., pubescent or glabrate. Corolla pubescent, deep red. Drupe pubescent; calyx hardly accrescent.—Otherwise much resembling C. grata: the whole panicle usually is red; but in C. grata it is often more or less red.

XVII. GLOSSOCARYA, Wall.

Grey-tomentose, scandent shrubs. Leaves opposite, ovate, shortly petioled, entire. Cymes many-fl., in a dense terminal corymbose panicle; flowers sessile; bracts small. Calyx campanulate, 5-toothed, hardly accrescent. Corolla-tube narrow-cylindr.; limb 2-lipped, 5-lobed. Stamens 4, didynamous; anthers long-exserted, ovate; cells parallel. Ovary imperfectly 4-celled, 4-ovuled. Capsule oblong, somewhat widened upwards, exserted, 4-valved; valves narrowly obovoid, subapiculate, margins inflexed holding the seed, one produced downwards as a 1-sided wing. Seeds narrowly obovoid, erect. —Species 3, an Australian and the following.

1. G. Linnaei, Benth. in Gen. Pl. ii. 1158; leaves ovate or obovate subcordate, mature glabrescent, capsule grey strigose. Clerodendron Linnaei, Thwaites Enum. 243.

Ceylon, in hot dry places; Walker, Thwaites.

Scandent; branches pubescent. Leaves 3½ by 1½ in., apiculate; petiole ½ in. Corymb 3 in. diam., grey-tomentose; bracts ½ in., elliptic, or some of the lower foliaceous. Calyx ½ in., or in fruit ¼ in., limb shallowly roundly lobed. Corolla strigose, white; tube ½ in., slender; lobes ½ in. Filaments exerted 1 in. Capsule ¼–½ by ½ in.


Moulmein; Griffith (Kew Distrib. n. 6017), Lobb.

Closely resembling G. Linnaei, but generally more hairy; branchlets and panicles densely softly grey-villous. Capsule rather longer, ½ in.

XVIII. HYMENOPYRAMIS, Wall.

A large, rambling shrub; branches grey-tomentose. Leaves opposite, ovate, entire. Cymes lax, in large, pyramidal, axillary or terminal panicles; flowers very small; bracts minute. Calyx minute, 4-fl.; greatly accrescent in fruit, membranous, 4-winged, utricular. Corolla-tube cylindric; limb oblique, 4-fl. Stamens 4; anthers exserted, ovate; cells parallel. Ovary 2-celled, 4-ovuled; style filiform, shortly 2-fl. Capsule small, obovoid, included, 4-valvular; valves obovoid-oblong, margins inflexed holding the seed. Seeds pendulous, subapiculate.

H. brachiata, Wall. Cat. 774; Griff. in Calc. Journ. Nat. Hist. iii. 365; Schauer in DC. Prodr. xi. 626; Bocq. Rev. Verben. 113, t. 11, fig. 1–10; Kurz For. Fl. ii. 258.

Pegu; Wallach.—Distrib. Ava.—In N. and Central India cultivated.

Leaves 8½ by ½ in., acuminate, base obtuse or rhomboid, mature glabrate above, grey-tomentose or pubescent beneath; petiole ¾ in. Panicles 12 by 8 in., leafy below, grey-tomentose. Calyx ¾ in. Corolla ½ in., pubescent, white. Capsule ½–¼ in., fulvous-hirsute; utricle ½–¼ in., ovoid, acutely 4-winged, mouth minute.
XIX. PERONEMA, Jack.

A lofty tree; branchlets grey-tomentose. Leaves opposite, unequally pinnate; leaflets several pair, entire. Panicles in the upper axils large, compound; bracts small; flowers very small. Calyx shortly 5-nd, not accrescent. Corolla-tube cylindrical; limb 2-lipped, 5-lobed. Stamens 2; anthers subexserted, ovate; cells parallel, subseparate. Ovary 4-celled, 4-ovuled; style filiform, subentire. Capsule small, globose, longer than the calyx, 4-valved; valves quarter-spheres, margins inflexed holding the seeds. Seeds pendulous.


MALACCA; Griffith (Kew Distrib. n. 6015).—DISTRIBUTION. Sumatra, Java, Borneo. Leaves 1–2 ft., grey-tomentose or pubescent beneath; rachis winged, leaflets 9 by 2 in., sessile, acute; petiole 2–7 in. Panicles 1 foot, corymbose, pubescent. Calyx 1/3 in., deeply toothed. Corolla 1/4–1/2 in., pubescent. Capsule 1/4 in., hispate.

XX. SYMPHOREMA, Roxb.

Scendent shrubs. Leaves opposite, entire or toothed. Cymes peduncled, capitate, 7-ft.; involucre of 6 oblong bracts, accrescent in fruit. Calyx obvoid, short 4–8-toothed, somewhat accrescent. Corolla small, white; tube cylindrical; lobes 6–16, subequal, narrowly oblong. Stamens as many as the corolla-lobes; anthers exerted, ovate; cells parallel. Ovary 2–(imperfectly 4–) celled, 4-ovuled; style filiform, shortly bifid. Fruit nearly dry, included in the calyx, 1-seeded. Seed erect, cotyledons fleshy.—Species 3, a Philippine Island one and the following.

1. S. involucratum, Roxb. Cor. Pl. ii. 46, t. 186, and Fl. Ind. ii. 262; leaves ovate or elliptic pubescent or villous, corolla 1/4 in. 6–8-lobed, involucre in fruit reticulate membranous. Wight Ic. t. 362; Datz. & Gibbs. Bomb. Fl. 199, not of Wall. nor of Schauer. Congea paniculata, Wall. Cat. 1739, partly.

W. DECCAN PENINSULA from the Concan southwards, frequent, and in Ceylon. Bshar; Monghyr Hills, Hamilton. Innovations stellately tomentose. Leaves 2½ by 1½ in., subacute, usually toothed, ultimately nearly glabrous above; petiole 1/2 in. Peduncles 1 in.; bracts in flower 1½ in., pubescent or villous; in fruit 1½ by ½ in., spatulate-elliptic, thinly pubescent. Calyx ½ in., stellately tomentose; in fruit 1/4 in., or more, narrower upwards. Fruit 1½ in., subglobose, nearly glabrous.—The leaves on the main branches are often large; the flowering branches often produce only small leaves 3–3½ in. The picture of Roxburgh shows the corolla decidedly too large, which misled Wallich, whom Schauer followed. Kurz (Por. Pl. ii. 254) says this species is "common all over Ava, Martaban and Pegu," where no one else has found it; it might be suspected that Kurz had mistaken for it some Sphenodesma, but he describes the corolla as having 6–8 linear-lanceolate acute lobes, and the leaves as coarsely toothed.

2. S. polyandrum, Wight Ic. t. 363, and Ill. t. 173 bis, fig. 7; leaves ovate villous, corolla 1½ in. 14–18-lobed, involucre in fruit tomentose. C. involucratum, Wall. Cat. 1740; Schauer in DC. Prodr. xi. 621, not of Roxb. S. involucratum, Kew Distrib. n. 6007.

S. DECCAN PENINSULA in the hills; Wight, Beddome, &c., extending north to Belgaum.
Similar to S. involucratum, but larger in all its parts and more hairy. Leaves 4 by 2½ in., some on the main stem 8–9 by 4 in., stellately villous beneath. Calyx ¼ in. and upwards in flower. Bracts in fruit 1½ by ⅜ in., obscurely membranous.

XXI. SPHENODESMA, Jack.

Scandent, mostly large, shrubs. Leaves opposite, entire, shortly petiolated. Cymes capitate, 3- or 7-fld., with an involucre of 6 oblong or obovate bracts; panicked, i.e. the leaves at the base of the peduncles to the cymes more or less bract-like, mostly deciduous. Calyx funnel-shaped, 5- (rarely 4-6-) toothed, sometimes enlarged or inflated in fruit. Corolla-tube short, cylindric; lobes 5, rarely 6, ovate oblong or narrowly lanceolate. Stamens 5, included, rarely subexserted; anthers ovate. Ovary imperfectly 2-celled, 4-ovuled; ovules pendulous from the apex of the placentaliferous axis; style filiform, shortly bifid, or (in subgenus Brachynema) very short or obsolete, stigma obscurely 2-lobed. Drupe globose or obovoid, small, included or subincluded in the calyx: 1- (or rarely 2-) seeded in the few (mostly imperfectly ripe) examples seen.—Species 9, some Bornean and those here described.

The cyme in this genus is dichotomous with a single flower in the fork; the two lateral branches are again dichotomous with a single flower in the fork; the cyme is thus 7-fld.; or, in 1 or 2 species, 3-fld. by the lateral flowers of the 2 cyme-branches being undeveloped. The flower in the principal fork is necessarily the oldest, and ebractate: hence the bracts are always 6.

Sect. 1. Brachynema, Griff. (Genus). Corolla-lobes oblong, or narrowly lanceolate. Anthers included. Style obsolete or minute.


A shrub, 6–8 ft. (Parish); shoots and inflorescence rusty stellate-villous or subtomentose. Leaves ½ by ½ in., subacute, base obtuse, entire, mature pubescent above at least on the nerves; petiole ½ in. Peduncles 1½ in.; heads 7-fld., rusty villous; bracts (at flower-time) ½ by ½ in., spathulate-elliptic, untoothed. Calyx in flower ½ in. or more; teeth ovate. Corolla-tube ½ in., narrowly funnel-shaped, densely hairy to the base within; lobes 1½ by ⅜ in., puberulous, subtomentose. Anthers ovate, low in the corolla-tube. Ovary 4-ovuled; style minute. Drupe not seen.—Wight, Parish and Beddome have all referred this in Symphorema from the narrow corolla-lobes, but the short filaments will not suit. Supposing the state of the style to be due to dimorphism, the species is distinct and possibly indicates a new genus. It cannot be Kurz’s Symphorema involucratum, which Kurz says has coarsely toothed leaves.

2. S. paniculata, Clarke; leaves ovate or elliptic mature pubescent beneath, corolla-lobes 5–6 oblong obtuse or narrowly obovoid. Congea paniculata, Wall. Cat. 1739.

Deccan Peninsula; Kurp, Rottler; Cochín, Johnston.

A scandent shrub; shoots and inflorescence rusty stellate villous. Leaves 3½ by 2½–3½ in., subacute; petiole ½ in. Peduncles 1–1½ in., appearing panicked, the half-bract-like leaves at their base often deciduous; bracts ½ by ½ in., narrowly obvoid. Calyx ½ in.; lobes ovate. Corolla-tube ½ in., densely hairy to the base within; lobes ½ by ¼ in., puberulous, subtomentose. Anthers ovate, low in the corolla-tube. Ovary 4-ovuled; style 0. Drupe not seen.—Very near S. microstylis except as to the obtuse corolla-lobes.
Sphenodesma.]

CXL. VERBENAECNE. (C. B. Clarke.) 601


A large, climbing shrub. Leaves 6 by 2½ in., base obtuse or rounded, scattered stellate hairs deciduous; petiole ½ in. Bracts 1½ by ⅛ in., spatulate-elliptic, obtuse, membranous, whitened, ultimately nearly glabrate. Calyx less than ½ in., obconic, stellately fulvous-tomentose; teeth triangular, rather rigid. Corolla pale yellow; tube hardly so long as the calyx, lobes ⅛–⅓ in., obtuse. Stigma sessile, bifid. Drupe (young) obovoid, glabrous, glandular at the apex.—This has larger leaves and bracts, shorter calyx and corolla, than S. astylis.


* Bracts of the involucre small, shorter than the calyx.


Pegu and Tenasserim, frequent; Wallich, Helder (Kew Distr. n. 6011).

A large, scandent shrub, or a small tree (Pariah); shoots tomentose. Leaves 4½ by 2½ in., subacute, base rhomboid, glabrate above; petiole ½ in. Heads 7-fld., hardly ½ in. diam.; bracts ½ in., round-elliptic; peduncles numerous, 0–½ in., bracts at their base caducous, the inflorescence thus appearing a compound spike thyrse, or panicle. Calyx ⅓ in., broadly funnel-shaped, fulvous-tomentose, densely white-silky within, globular and inflated in fruit; teeth triangular. Corolla ⅜ in.; lobes 5–6, narrowly obovoid, puberulous.

** Bracts of the involucre mostly longer than the calyx.


Penang; Wallich. Malacca; Griffith (Kew Distr. n. 6009, partly), Maingay (Kew Distr. n. 1196).

Branchlets grey-puberulous. Leaves 5 by 1½ in., cuneate at both ends; petiole ¼ in. Panicles 9 in. diam., ashy-pubescent; leaves 4–½ in., half-bractlike; peduncles to the heads ½–⅔ in.; bracts, usually 6 to each head, exceedingly variable in size on the same panicle; many small, lanceolate, hardly exceeding the calyx, others 1 by ½ in., spatulate-elliptic, obtuse, membranous, reticulate, cinereous-puberulous. Calyx ⅛–¼ in., ribbed, teeth triangular. Corolla ¼ in., throat hairy, lobes ovate. Style linear, subincised. Drupe (imperfectly ripe) ¼ in., narrowly obovoid, glabrous, 1-seeded; calyx not inflated.—A plant collected by Beccari in Borneo is perhaps not specifically separable, but has the heads shortly fulvous-villous.

Penang; Wallich. Malacca; Griffith (Kew Distrib. n. 6009, partly), Mainay (Kew Distrib. n. 1194).

Leaves 3 by 1½ in., subacute at both ends, above thinly, beneath more thickly, rufose- or fulvous-hairy; petiole 3-4 in. Peduncles ½-1½ in., axillary and running into terminal pedicels; bracts 1 by ½ in., spathulate-elliptic, obtuse, thinly rufose-pubescent. Calyx scarcely ½ in., densely rufose-hirsute. Corolla ½ in., blue. Drupe not seen.—Schauer. D. doubtful reduction here Viticarastrum racemosum, Presl Bot. Bemerk. 148; but the description does not fit in several points; inter alia in the 5-celled ovary.


Mergui; Griffith. Tavoy; Heber (Kew Distrib. n. 6008).

A large, scendent shrub. Leaves 3½ by 1 in., oblong acuminate, or 3 by 2 in. ovate, acute, base rounded or obtuse; petiole ¾ in. Panicles terminal, 12-18 in. diam., leafless (i.e. main bracts caducous), minutely hairy, rufose-villos in the axile; peduncles ½-1 in., slender, fulvous-pubescent; bracts 1 by ½ in., spathulate-oblong, obtuse, membranous, nearly glabrous; flowers sessile. Calyx ¼ in.; in fruit ½ in., slightly inflated, obconic. Corolla ¼ in., purple; lobes ovate; throat hairy. Drupe not seen.


From Assam and the Khalsa Mrs. to Malacca; frequent.

A scendent shrub. Leaves 4 by 1½—1½ in., base rounded or obtuse, maturely thinly hairy about the midrib beneath; petiole ½ in. Panicles 6-15 in., often very dense with heads, sparingly pubescent; bracts 1 by ½ in., broad-oblong, obtuse, membranous, glabrous. Calyx ⅓-⅔ in., in fruit sometimes ⅓ in., glabrous within; teeth usually more prominent, sometimes triangular, acuminate in fruit; accessory teeth only developed after flower. Corolla ⅓-⅔ in., glabrate without, densely hairy within, purple. Ovary fulvous-hirsute; style filiform, shortly bifid. Drupe size of a pea (Roxburgh), hairy, half hid in the calyx.—In unexpanded flowers the calyx-limb appears obtusely 5-toothed; after flowering the teeth are sometimes triangular abbreviated, sometimes lanceolate-subulate, and 5 linear teeth are developed in the sinuses. Wallich declares (in Hook. Bot. Misc. i. 286) that Jack mistook his Malacca plant for Roxburgh's Silhet one, and accordingly Wight and Schauer call the Malayan plant S. Jackiana or acuminata; but the calyx-teeth are so little longer, and other points so exactly accord, that the species have been united.

XXII. CONGEA, Roxb.

Large climbing shrubs. Leaves opposite, entire. Cymes peduncled, capitate, 3-9-fl.d., in large terminal panicles; bracts at the base of the peduncles leaf-like, often white or coloured; involucres to the cymes of 3 or 4 elliptic or oblong bracts, connate at the base. Calyx funnelf-shaped, 5-toothed, slightly accrescent. Corolla-tube slender, rarely much longer.
than the calyx, glabrate without; throat usually hairy; limb 2-lipped, upper lip erect-patent of 2 linear-oblong lobes, lower pendent of 3 much shorter obovate lobes. **Stamens** 4; **anthers** exserted, ovate; cells parallel. **Ovary** imperfectly 2-celled, 4-ovuled; ovules pendulous from the apex of the axis; style filiform, shortly bifid. **Drupes** small, obovoid, nearly dry; in the few examples seen 4-seeded, 4-partite.—**Species** 4, Malayan.

1. **C. vestita**, **Griff.** Notul. **iv.** 174, and **Ic. Pl. Asiad.** t. 458, fig. 21; branches patently fulvous-hirsute, leaves ovate villous beneath, involucral bracts broadly elliptic white-tomentose beneath, calyx white-hirsute teeth tomentose-lanceolate.

**Tenasserim**; **Helfer** (Kew Distrib. **n.** 6014); **Mergui**, and Donat Range, alt. 1500 ft., **Griffith**.

A large climber. **Leaves** 6 by 3 in., acute, base obtuse or shortly cordate, mature scabrous-pubescent above, villous and tomentose beneath; petiole $\frac{1}{2}$ in. **Panicles** very large, bracts like small whitened leaves; involucral bracts 1 by $\frac{1}{2}$ in., not attenuate at the base. **Calyx** $\frac{1}{2}$–$\frac{3}{4}$ in., funnel-shaped, lobed $\frac{1}{2}$ the way down. **Corolla** glabrous without, tube shorter than the calyx; limb 2-lipped, rose, somewhat brown-striped, especially the upper lip (**Griffith**). **Ovary** glabrous, glandular upwards. **Drupes** nearly dry, obovoid, 4-partite.

2. **C. velutina**, **Wight** **Ic.** t. 1479, 3 or 1566; leaves ovate acuminate mature glabrous, involucral bracts spatulate-oblong distinctly nervose, calyx densely shortly hisrute teeth triangular.

**Tenasserim**; at **Mergui**, **Griffith** (Herb. Propr. **n.** 838). **Tavoy**; **Helfer** (Kew Distrib. **n.** 6012).

A large climber; branches closely pubescent. **Leaves** 5 by 2½ in., base obtuse or rounded, young thinly sparsely pubescent; petiole $\frac{1}{2}$ in. **Panicle** large, more lax than in **C. vestita**, closely pubescent, nodes villous; bracts 1½ by $\frac{3}{4}$ in., obtuse, base attenuate, tomentose beneath. **Calyx** $\frac{1}{4}$ in., lobed scarcely $\frac{1}{2}$ the way down. **Corolla** small, tube shorter than the calyx; limb white, somewhat brown, streaked near the base of the lobes (**Griffith**). **Drupes** not seen.

3. **C. villosa**, **Wight** **Ic.** t. 1479, 1, fig. B; leaves ovate or oblong mature villous beneath, involucral bracts spatulate-oblong, calyx tomentose teeth slightly triangular. Roscoea villosa, **Roxb. Hort. Beng.** 95, and **Fl. Ind.** iii. 56, and **Ic. Ind.** at **Kew**.

** Pegu**; Rangoon (**Roxburgh**). **Mergui**; **Griffith** (Kew Distrib. **n.** 6012, partly).

A large climber, resembling **C. velutina**, but the leaves very villous beneath. **Leaves** in **Roxburgh’s** drawing ovate, in **Griffith’s** example oblong; glabrate above except the midrib. **Panicle** large, very lax; bracts uniformly 4 in **Griffith’s** example, 3 (one of which is often bifid) in **Roxburgh’s** picture; resembling in form the bracts of **C. velutina**.

4. **C. tomentosa**, **Roxb. Cor. Pl.** iii. 90, t. 293; branchlets tomentose, leaves ovate acute softly hairy beneath, involucral bracts elliptic, calyx shaggy toothed $\frac{1}{2}$ the way down. **Wight** **Ic.** t. 1479, 2 or 1565; **Schauer** in **DC. Prodr.** xi. 623; **Kurz For. Fl.** ii. 256. Roscoea tomentosa, **Roxb. Hort. Beng.** 95, and **Fl. Ind.** iii. 57. Calochlamys capitata, **Presl Bot. Bemerk.** 149.

**Chittagong**; **Roxburgh**. **Birma**; **Griffith** (Kew Distrib. **n.** 6013).—**Distrib.** *Siam*.

A large climber. **Leaves** 3 by 2½ in., base rounded or shortly cordate, minutely setulose above, closely villous beneath. **Bracts** 1 by $\frac{1}{4}$ in., not attenuated at base, tomentose, white or lilac-blue. **Corolla** white.
VAR. azurea; leaves elliptic acute more thinly hairy beneath, bracts oblong or narrowly oblong, calyx larger lobed half-way down teeth broadly lanceolate. C. azurea, Wall. Cat. 1733; Wight Jc. t. 1479, 1, fig. A. C. tomentosa var. oblongifolia, Schauer l. c. 624, excl. syn. Roxb.—Pegu and Tenasserim, frequent; Wallis & M'Lelland, &c. Cultivated in N. India.

XXIII. AVICENNIA, Linn.

Shrubs or small trees. Leaves opposite, entire coriaceous. Cymes contracted, or densely capitate heads peduncled, in the penultimate axils or in a trichotomous corymb; bracts and bracteoles small. Calyx 5-partite, unaltered in fruit; segments ovate, concave, deeply imbricate. Corolla-tube short-cylindric, limb spreading 5–4-lobed. Stamens 4, on the corolla-throat; anthers shortly exserted, ovate; cells parallel. Ovary imperfectly 4-celled by a 4-winged central column, 4-ovuled; ovules pendulous between the wings of the central column; style long or short, tip bifid. Capsule broad, compressed, dehiscing by 2 thick valves, 1-seeded. Seed erect; embryo imperfectly clothed by its two integuments; cotyledons large, plaited lengthwise; radicle inferior, villous.


Mangrove swamps of the DECCAN PENINSULA and CEYLON, common; less frequent in the Malay Peninsula.—DISTEL. Malaya, Shores of the Indian and Pacific Ocean.

A shrub, or tree, 25 ft. Leaves 3½ by 1½ in., base tapering, beneath with hard tomentum or glabrate; petiole ½ in. Bract ½ in., ovate; bracteoles similar, rather smaller. Calyx ½ in., minutely pubescent. Corolla ½ in.; lobes 4, ovate, acute, or one lobe shortly bifid, or lobes 5 subequal (not rarely all forms on one bush). Style distinct, sometimes nearly as long as the hairy ovary. Fruit 1 in.

VAR. alba, Blume Bijd. 821 (sp.); leaves lanceolate acute, style short or hardly any. Decne. l. c.; Wight Jc. t. 1482. A. resinifera, Griff. Notul. iv. 186, and in Trans. Linn. Soc. xx. 6, fig. 1. A. intermedia, Griff. i. c. A. officinalis, Kurz For. Fl. ii. 275.—Malay Peninsula; common. Distrib. Malaya, S.E. Asia, N. Australia.—Mr. Bentham considers the American and African A. tomentosa not specifically separable.

ORDER CXII. LABIATAE. (By J. D. Hooker.)

Herbs, rarely shrubs, usually loaded with oil-glands. Stem usually 4-gonous. Leaves opposite or whorled, stipules 0. Flowers irregular, solitary 2-nate or fascicled and axillary, or in centrifugal spicate cymes which by their union in pairs form false whorls. Calyx persistent, sub-regular, 4–5-cleft or 2-lipped. Corolla monopetalous, hypogynous; limb 4–5-lobed or 2-lipped, lobes imbricate in bud. Stamens inserted in the corolla-tube, 4 didynamous, or the 2 upper imperfect. Anther-cells connate or separate or confluent. Disc prominent. Ovary free, 2 of 2-celled carpels; style simple, inserted between the lobes, stigma usually 2-fid; ovules one in each cell, erect, anatropous. Fruit of 4 dry or rarely fleshy 1-seeded lobes (nutlets) at the base of the calyx. Seeds small, erect, albumen sparing.
or 0, radicle inferior.—Species about 2600, chiefly of north temperate regions.


Subtribe 1. Euocommae. Upper calyx-lobe usually broadest. Corolla with 4 of the lobes equal or the 2 upper connate, the lower (lip) dissimilar. Stamens usually exserted.

* Lower lip of corolla flat or nearly so.

Fruiting calyx deflexed, upper tooth very large, decurrent, stigmas 2-fid

Fruiting calyx suberect or declinate, tube deeply pitted

Fruiting calyx declinate, 2-lipped, upper filaments toothed

Fruiting calyx declinate, 2-lipped; filaments simple, included

Fruiting calyx suberect, 4 lower teeth cuneate; filaments simple, included

Fruiting calyx usually declinate, equally 5-toothed, or upper tooth broader; filaments included

Fruiting calyx deflexed; corolla-tube often long; stigma entire

** Lower lip of corolla concave or boat-shaped.

Calyx equally 5-toothed or 2-lipped; filaments free

Stamens 4; filaments connate below

Calyx-mouth oblique, upper lip usually decurved; filaments free

Corolla-lip deflexed, contracted at the base


1. Ocimum
2. Geniosorum
3. Mesona
4. Platystoma
5. Agrocrphasus
6. Moschosma
7. Orthosiphon
8. Plectranthus
9. Coleus
10. Anisochilus
10*. Hyptis


11. Lavandula

Tribe 2. Satureineae. Perfect stamens 4 with the upper pair longest, or 2, straight diverging or ascending; anthers (1- or) 2-celled, cells short. Corolla-lobes flat.

Subtribe 1. Pogostemonae. Stamens 4; filaments straight; anthers 1-celled.

Calyx 5-toothed; corolla 4-fid, lip spreading

Calyx 5-toothed; corolla subequally 4-fid; stamens exerted

Calyx 5-partite, segments plumose; stamens included

Subtribe 2. Menthoideae. Stamens 4 or 2, distant, erect or spreading; anthers 2-celled (at least when young).

* Whorls many-fld., spiked or racemed, not axillary.

Fruiting calyx erect, elongate; stamens 4

Fruiting calyx declines, 2-lipped; stamens 4

Stamens 2

** Whorls many-fld., axillary, rarely spicate; calyx 10–13-nerved.

Calyx 10-nerved; stamens 4, anther-cells parallel

Calyx 4–5-toothed; stamens 2; nutlets truncate

15. Elsholtzia
16. Perilla
17. Mosla
18. Mentha
19. Lycoptus
### Labiatae

**Whorls many-fld., capitae, involucrate. Stamens** 4.

- 20. *Oreganum*.

**Whorls few-fld. Stamens** 4.


***** Whorls axillary second. Calyx 15-nerved.

- 22. *Hyssopus*.


- Calyx 5-toothed.
- Calyx 2-lipped; corolla-tube nearly straight.
- Calyx 2-lipped; corolla-tube recurved.

**Tribe 3. Monardae.** Perfect stamens 2, ascending, parallel; anther-cells linear, solitary or separated by a filiform connective.

- Anther-cells equal, contiguous, pendulous from a small connective.
- Anther-cells equal, distant, pendulous from a long connective.
- Anther-cells very unequal or solitary, on a long connective.


**Tribe 4. Nepetaceae.** Perfect stamens 4 with the upper pair longest, rarely 2, ascending or diverging; anthers 2-celled, cells at length diverging. Ovary 4-partite. Nutlets dry, with a small basal areola.

- Calyx tubular, 5-toothed.
- Calyx 2-lipped, upper lip much the largest.
- Calyx 2-lipped, lateral lobes of upper lip on the face of the midlobe.

- 29. *Nepeta*.
- 30. *Diacocaphalum*.


**Subtribe 1. Scutellarieae. Calyx** 2-lipped, mouth closed after flowering.

- Fruiting calyx 2-partite; lips entire, upper with a broad plate.
- Fruiting calyx tubular, upper lip 3- lower 2-toothed.

**Subtribe 2. Marrubiaee. Calyx** tubular or campanulate. Stamens included in the corolla-tube.

**Subtribe 3. Lamieae. Calyx** tubular or campanulate. Stamens exserted from the corolla-tube.

*Upper lip of the corolla short, nearly flat, glabrous or pubes cen*

- Calyx subglobose; anther-cells divaricate; nutlets subglobose.
- Anther-cells of lower stamens parallel, transverse, of upper dimidiate.
- Anther-cells confluent; nutlets hispid or scaly.
- Anther-cells confluent; nutlets winged.

**Upper lip of the corolla hooded, villous.**

- Calyx 5-toothed; anther-cells divergent; nutlets obtuse.

- 32. *Scutellaria*.
- 33. *Brunella*.
- 34. *Marrubium*.
- 35. *Cranitome*.
- 36. *Anisomeles*.
- 37. *Actyrospernum*.
- 38. *Colquhounia*.
Calyx 5-spinous; anther-cells ciliate; nutlets compressed

Calyx 5-spinous; anther-cells parallel; nutlets triquetrous

Calyx 5-toothed; anther-cells hairy; nutlets triquetrous

Calyx-limbs 5, oblong 5-terticulate

Calyx-limb dilated; fruiting very large, membranous

Calyx 8-10-toothed; corolla lower lip large

Calyx 5-10-toothed; corolla lower lip very small

Calyx 5-toothed; corolla upper lip compressed

Calyx-teeth 5, membranous, with hooked awns

Calyx-teeth 5, broad, apiculate or spinous; nutlets bearded

Calyx-limb very broad membranous, broadly 5-toothed

Tribe 6. Prasieae. Calyx, corolla and stamens of Stachydeae. Ovary 4-partite or 4-fid. Nutlets smooth, thick or fleshy, with a small basal areola.

Calyx 5-toothed; corolla-tube slender, throat broad


Upper corolla-lip very short; stamens very long straight diverging

Upper corolla-lip very short, 2-fid, with the incurved stamens exserted from the cleft; nutlets minute.

Upper corolla-lip short, notched, usually shorter than the incurved stamens

Upper corolla-lip arched, longer than the stamens

1. OCIMUM, Linn.

Strongly scented herbs, undershrubs, or shrubs. Whorls 6-10-fid., spiked or racemed, tips of pedicels recurved; bracts minute, caducous; flowers small. Calyx ovoid or campanulate, deflexed in fruit; upper tooth broadest, decurrent, 2 lower acuminate. Corolla-tube short, not annulate within; upper lip subequally 4-fid, lower hardly longer declinate entire. Stamens declinate, exserted, filaments free or the lower connate below, naked or the upper toothed or hairy below; anther-cells confluent. Disc entire or 3-4-lobed. Style-lodes subulate or flattened. Nutlets smooth or subrugose, mucilaginous when moistened.—Species about 40, tropical and chiefly Asiatic.


Plains and lower hills of INDIA; from Silhet, Bengal, Behar and Central India to the S. Deccan, &c. Ceylon; abundant about native gardens, Thwaites.—DISTRIBUT. Java, W. Asia, Trop. Africa, Madagascar (America, cult.).

Branching from the base, 1–2 ft. high. Leaves 1–1½ in.; petiole very slender,
usually ciliate. Spikes 3-8 in.; whorls rather close; flowers subsessile; bracts ovate, awned, not so large as the nearly glabrous calyx, ciliate. Filaments twice as long as the white corolla, hairy at the knee. Nutlets pitchy-black, narrowly ellipsoid, punctulate.


Throughout tropical and hotter INDIA, cultivated from the PUNJAB to AVA, Travancore, Malacca and Penang. Indigenous in the PUNJAB on low hills, Aitchison. Ceylon, cultivated; THAILAND.—DISTRIB. Hotter W. Asia, Africa, the Malay and Pacific Islands (perhaps always cultivated only).

This widely cultivated plant differs from O. canum chiefly in the much larger size of all its parts, the flowers and seeds being often three times as large. Corolla white, pink or purplish. I cannot distinguish the varieties described by Bentham by any constant characters. It varies much in robustness and the hairiness of all its parts. Var. thyrsiflora is a luxuriant state; var. difforme, Benth. l. c. (O. lacerum, Heyne in Herb. Rottl., O. bullatum, Lamk.), has abnormal deeply cut leaves; var. purpurascens, Benth. l. c. (O. medium, Mill.), is a purple-coloured state, imported from Persia; var. glabratum has very large fruiting calyces sometimes 1 in. diam., with a rather elongate upper lobe. O. ciliatum, Hornem. (O. ciliare, Heyne in Herb. Rottl., O. scabrum, Herb. Wight), has a hirsipidulous white corolla; it is cult. in Hort. Cuttack, under the erroneous name of O. cristatum, Roxb.

3. O. gratissimum, Linn.; shrubby, glabrescent, leaves ovate acute crenate or coarsely toothed, bracts sessile lanceolate awned from a rounded base, two lower calyx-teeth minute much shorter than the rounded upper, lateral triangular broader than the lower, corolla $\frac{1}{2}$ in. Jacq. Ic. Pl. Ér. iii. t. 495; Wall. Cat. 2720; Roxb. Fl. Ind. iii. 17; Benth. in DC. Prodr. xii. 34 (excl. syn.); Gram. Cat. Bomb. Pl. 147; Dalz. & Gibbs. Bomb. Fl. 203. O. citronatum, Ham., and O. robustum, Heyne in Herb. Wall.—Rheedle Hort. Mal. x. t. 86.

Bengal, Chittagong, E. NEPAL, and throughout the DECCAN PENINSULA; and Ceylon, doubtful if indigenous.—DISTRIB. Java, Trop. Africa and America (r native).

A shrub, 4-8 ft., much branched, woody below. Leaves 2-4 in.; petiole 1-2 in. Racemes strict, slender; whorls rather close-set; pedicels shorter and bracts longer than the calyx. Calyx pubescent, fruiting $\frac{1}{2}$ in. long, recurved. Corolla hardly exceeding the calyx, pale yellow. Filaments exerted, knee bearded. Nutlets sub-globose, rugose with glandular depressions.


The Deccan, in sandy places; Heyne, &c. Central India; Jubbulpore, Beddome.

Annual, very variable in habit, 4-16 in. high; branches often widely spreading. Leaves ½-1 in., narrowed into the petiole. Racemes short, rather lax-fl.; bracts lanceolate, caducous, with a gland at the base. Corolla ½ in., pale rose. Filaments twice as long as the corolla; knees dilated, hairy. Fruiting calyx ½ in.; lower lip as long as the upper, rather membranous. Nutlets subglobose, compressed, smooth, red-brown.


Throughout India, ascending the Himalaya to 6000 ft. (doubtfully indigenous). Ceylon; common in waste places, Thwaites.—Distrib. Malay Islands to Australia and the Pacific, W. Asia to Arabia.

Stem sometimes woody below; branches erect, ascending or spreading. Leaves 1-2½ in., variable in breadth, base narrowed. Racemes 6-8 in. long; pedicels as long as the calyx. Corolla very small, hardly longer than the calyx. Filaments exserted, knee villous. Fruiting calyx ½ in. long, on a slender pedicel, broadly campanulate, membranous. Nutlets subglobose or broadly oblong, slightly compressed, nearly smooth, pale red-brown.


DOUBTFUL SPECIES.

O. Minimum, Linn. (Bentham in DC. Prodr. xii. 33), is a very small cultivated form, probably of O. Basilicum (with which it agrees in all essential characters), to which Linnaeus has assigned Ceylon as a habitat. I have seen specimen from gardens in various parts of the world.

2. Geniosporum, Wall.

Herbs. Whorls many-fl., in long lax racemes or spikes; bracts often vol. iv.

2. G. elongatum, _Benth._ Lab. 21, and in _DC. Prodr._ xii. 45; erect or ascending, pubescent, stems very slender, leaves subsessile narrowly lanceolate, lower floral exceeding the flowers, fruiting calyces spreading, throat naked. _Theaeites Enum._ 236. _Rhinanthus indica, Linn._; _Burm. Fl._ Ind. 131, t. 39, f. 1.


Deccan Peninsula, from the Concan southwards. _Ceylon_; warmer part of the island.

_Stems_ many from a woody stock. _Leaves_ in distant pairs, very variable, from \(\frac{1}{2}\) by \(\frac{1}{2}\) in. to 2 by \(\frac{3}{4}\) in., rather thick, base narrowed. _Spikes_ elongate, slender; whorls close or distant; bracts ovate, acute, reflexed; flowers minute, pedicelled. _Calyx_ hairy, upper lip very variable in size, throat hairy. _Corolla_ \(\frac{1}{3}\) in. hairy. _Filaments_ exserted. _Fruiting calyx_ \(\frac{3}{16}\) in., subcampanulate, ribbed, tube not pitted, pubescent. _Nutlets_ extremely minute, ellipsoid, smooth, naked.

Var. gracilis, _Theaeites Enum._ 237; stems very slender, 12–18 in., leaves glabrous, narrower. _G. gracile, Benth._ _Lab._ 21, and in _DC. Prodr._ xii. 45.—Deccan Peninsula and Ceylon.
3. **MESONA, Blume.**


**M. Wallichiana, Benth. in DC. Prodr. xii. 46**; erect, sparsely hairy, leaves ovate-lanceolate serrate. *Geniosporum parviflorum, Wall. Cat. 2750; Benth. Lab. 20*, and in *Wall. Pl. As. Rar.* ii. 18.

*Khasia Mts., alt. 3–5000 ft.; De Silva, &c.*


4. **PLATYSTOMA, Beauv.** *(Platostoma.)*


- Strict, erect, slender, 4–8 in. high, simple or branched, branches erect. *Leaves* ½–1 in., membranous. *Racemes* slender, strict, as long as the whole plant; flowers ½ in. long. *Calyx-lobes* ovate. *Nutlets* black, minutely reticulate.—Probably only a state of *P. africanum*, Beauv.

5. **ACROCEPHALUS, Benthi.**


Throughout India from Kashmir to Bhotan in the Himalaya, ascending to 5000 ft.; and in hilly districts from the Khasia Mts. to Cape Comorin and Pegu. (Not seen from Ceylon or the Malay Peninsula.)—Distrib. Moneypoor, Burma, Java, Borneo.

Stem 6-12 in., simple or branched from the base; branches ascending or decumbent. Leaves 4-1 in., ovate or lanceolate, coarsely serrate, narrowed into the petiole. Heads ½-3 in. diam., rarely cylindrical, often with two spreading leaves at the base; flowers imbricating, suberect, ⅓ in. long; pale purple.

2. A. axillaris, Benth. in DC. Prodr. xii. 48; stems and leaves beneath pubescent, leaves small lower oblong upper orbicular many-nerved, heads axillary sessile.

Assam: Jenkins, Mack.

Stem slender, erect, simple, a foot long and upwards. Leaves in distant pairs, lower ½ in., upper ⅓ in.; nerves very strong beneath, forming salient parallel ribs. Heads ¼-⅓ in. diam.—A very singular plant, with the habit and ribbed leaves of a Spermacoce; the corollas have fallen away.

6. MOSCHOSMA, Reichh.

Herbs, annual or perennial. Whorls 6-10-fld., second, in axillary and terminal panicled racemes, flowers very minute; bracts small. Calyx ovoid or campanulate, 5-toothed, fruits declinate, upper or 3 upper teeth largest, margins not decurrent; throat naked. Corolla-tube very short; upper lip shortly 4-fld.; lower entire with 4 flat lobes. Stamens 4, declinate, filaments free, toothless; anther-cells confluent. Style clavate-capitate, tip 2-fld. Nutlets compressed, smooth.—Species 6, Tropical Asiatic, African and Australian.


Wet places in Bengal; Dacca, Clarke. Deccan Peninsula, Burma and Tenasserim. Ceylon.—Distrib. Java, China, Philippine Islands, Trop. Africa and Australia.

A very slender much-branched annual glabrate or puberulous herb, 2-3 ft.; angles of stem often scabrid. Leaves 1-2 in., very membranous, base cuneate, rounded or subcordate, quite entire, narrowed into a filiform petiole as long as the blade. Racemes 3-6 in.; peduncles and rachis filiform; whorls about 6-fld.; bracts minute, caducous; pedicels shorter than the calyx. Flowers ⅛ in. long. Fruit calyx 4-10 in. Corolla flesh-coloured. Nutlets black, smooth, ellipsoid.

7. ORTHOSIPHON, Benth.

Under-shrubs or shrubs. Whorls 6- or fewer-fld., racemose. Calyx ovoid, campanulate or tubular, fruiting deflexed, upper tooth broad membranous, margins decurrent on the tube, lateral and lower distinct or shortly connate, usually subulate. Corolla-tube often slender, straight or incurved; upper lip 3-4-fld.; lower entire, concave. Stamens 4, declinate, filaments free, toothless; anther-cells confluent. Disc usually gibbous. Style with a
Orthosiphon. ] CXII. LABIATAE. (J. D. Hooker.) 613
minute capitate or clavate entire or notched stigma. Nutlets ovoid or orbicular, smooth or nearly so.—Species 16, tropics of the Old World.

* Calyx-throat villous. Stamens included.

1. **O. diffusus,** Benth. in DC. Prodr. xii. 50; woody, diffusely branched, viscidly tomentose, leaves ovate or elliptic obtuse crenate, corolla-tube shortly exserted, fruiting calyx $\frac{1}{2}$ in. Oicimum ? diffusum, Benth. in Wall. Cat. 2718, and in Wall. Pl. As. Rar. ii. 14. O. hirsutum, Wall. Cat. 2717 in part.

**DECCAN PENINSULA;** Pulney and Nilghiri Mts., In dry rocky places, Klein, &c. ? Ceylon; Walker.

Branches many and straggling from the woody stock, stout, cylindric, 6-8 in. high. Leaves $\frac{1}{4}$ in. long, tomentose on both surfaces, base rounded; petiole $\frac{1}{2}$ in. Racemes 3-4 in., stout or slender; whorls rather distant, 2-4-fl., floral leaves minute. Calyx pubescent, throat with long hairs, fruiting ribbed, 2 lower lobes rigid, subulate. Corolla about $\frac{1}{2}$ in. long. Nutlets oblong, obscurely reticulate, brown, nearly smooth.—I suspect that the Ceylon habitat is an error.

VAR. hispida; tomentose or villous, branches longer more slender, leaves more narrowed at the base. O. hispidus, Benth. l. c.—Nilghiri and Cuddapah Hills.

**Calx-throat naked. Stamens included.
† Leaves petioled.


**NORTH-WESTERN INDIA;** from Kashmir and the Punjab to Behar, and southwards to Travancore.—**DISTRICTS:** Beluchistan, Arabia.

Branches 6-12 in., many, ascending from a stout woody stock. Leaves $\frac{1}{2}$-2 in., obtuse or acute, scentless, base cuneate entire and narrowed into a petiole $\frac{1}{2}$-1 the length of the blade. Racemes long or short, stout or slender; floral leaves minute; flowers $\frac{1}{4}$ in. long. Corolla white. Fruiting calyx as long as the pedicel, $\frac{1}{2}$-1 in. long, deflexed; lower teeth subulate or aristate. Nutlets subglobose, compressed, pale, nearly smooth.—With difficulty distinguished from states of Oicimum adscessans, the calyx being nearly identical. Roxburgh’s figure of O. inodorus is this plant, but his description refers to some other with cordate rugose leaves and cordate bracts.

3. **O. tomentosus,** Benth. in Wall. Pl. As. Rar. ii. 14, Lab. 27, and in DC. Prodr. xii. 51; tomentose, pubescent or glabrate, sometimes viscid, leaves petioled ovate, base rounded cuneate or cordate, racemes elongate, bracts ovate, 4 lower calyx-teeth awned, corolla from half as long to thrice as long as the calyx, tube subincurved, nutlets subglobose compressed pale brown nearly smooth.

**DECCAN PENINSULA;** on the Ghats, and from the Coenac southwards. Ceylon.

A most variable plant. I am quite unable to find any characters whereby to define strictly the following forms. The O. rubicundus is distinguished by the long sessile or subsessile leaves.

VAR. tomentosus proper; 12-18 in., rarely more, pubescent or tomentose, leaves $\frac{1}{2}$-1 in., petiole half the length of the blade or less, corolla about $\frac{1}{2}$ in. long, twice as long as the calyx or less. O. tomentosus, Benth. l. c.? O. triste, Roth Nov. Sp. 270. Plestranthis tristis, Spreng. Syst. ii. 690.—Nilghiri Hills.
VAR. *viscosa*; usually taller and stouter, viscidly pubescent or tomentose with spreading hairs, leaves 1–3 in., base often cordate, petiole slender, corolla 1/3–1/2 in. twice or thrice as long as the calyx. *O. viscosa*, *Benth. in Wall. Cat.* 2723 and lll. e.—On the Ghats from Cunnur southwards.

VAR. *rubiginosa*, Clarke mss.; branches and leaves beneath clothed with a fine close rusty pubescence, leaves of *var. visidea*, flowers rather larger.—Nilghiris; *Wight, Clarke*, &c.


VAR. *parviflora*; pubescent or glabrate, leaves 1/2–3 in. ovate, calyx shorter broader, fruiting 1/2 in. long campanulate, corolla 1/2 in. long very narrow, twice as long as the calyx. *O. tomentosus, var. parviflora, Benth. in DC. Prodr.* xii. 51.—Nilghiris; *Wight*, &c.—Probably a distinct species.


&c. KHASTA HILLS, alt. 3–4000 ft.; *Bruce, Masters*, &c.

Stem 1–3 ft., rarely branched. Leaves narrowed into winged petioles 1–3 in. long, rough or smooth above, sometimes of a fine purple beneath. Calyx in fruit 1/2 in.; lateral teeth triangular, hardly awned. Corolla pale pink, variable in size and curvature.—*O. rubicundus, Benth.*, consists of two plants, one of which with petioled leaves I refer to *O. incurvus*, the other with more lanceolate subsessile leaves is the true *rubicundus*, Bth.

VAR. *elata*; tall, branched, racemes densely tomentose, bracts larger longer than the pedicles.—E. Nepal, Taumur and Khabili rivers, alt. 4–6000 ft.; *J. D. Hook.*—A very large form with ovate-lanceolate leaves 1–7 in. long, scaberulous above and beneath. Corolla 1/2 in. long, tube slender.

5. *O. robustus*, *Hook.*; finely pubescent, stem robust terete, leaves 5–6 in. shortly petioled oblong-lanceolate subacute obscurely crenate, bracts ovate acute, 2 lower calyx-teeth awned, corolla 1 in.

ASSAM; Jyrung Hills, Simon (*Herb. Calcutta*).

Whole plant when dry a dark rusty purple colour, clothed uniformly with a fine pubescence. Stem nearly as thick as a goose-quill. Leaves 2½ in. broad, base cuneate; petiole stout, 1/2 in. Racemes stout, whorls rather distant. Fruiting calyx (unripe) 1/2 in. long.

†† Leaves sessile, rarely petioled in *O. rubicundus*.

6. *O. rubicundus*, *Benth. in Wall. Pl. As. Rat.* ii. 141, *Lab.* 26, and in *DC. Prodr.* xii. 57; erect, tomentose pubescent or glabrate, stems 4-angled, leaves ovate or ovate-lanceolate coarsely toothed, bracts minute, 4 lower calyx-teeth subulate, corolla twice as long as the calyx pubescent, nutlets

WESTERN SUBTROPICAL HIMALAYA; from Central Nepal to Jamm, alt. 2-400 ft. and southward to the Circars and Nilghiris. Ava; Wallich.—DISTRIBUTION. Upper Burma.

Stem 1-2 ft., slender. Leaves 2-4 in., variable in breadth, and toothed obtuse or acute, base cuneate. Corolla ⅓-⅓ in., white rose or pink, throat funnel-shaped. Nutlets punctulate.

**Pleotranthus O'oimum** P. Mook. white glabrous, **O. the Miquel amoenus**, whorls **O. Senth.** **O. lower Ocimum from P. Corolla narrowed Bot. O. virgatus,**

Nutlets Anainallay Racemes Ind. Prodr. Ham. acuminate DC. very t. **Oatyx-throat Nutlets** **Moxh.** shrubby, **3. obtuse subulate**, **Wall.** "Wight** & Wall. Wall. **459.** **Eootstock Nepal;** **2722.** **Assam** STEM.

This differs greatly in habit from its congeners. Wight figures the stem as 4angled, but they appear quite cylindric. Branches as thick as a crow-quill. Leaves ⅔-1 in., rugose. Rachis of raceme stout; whorls 6-fld.; flowers suberect. Calyx nearly ⅓ in., upper lip orbicular, straight. Corolla ⅓-⅓ in., pubescent, tube very slender. Nutlets not seen.

*** Calyx-throat naked. Stamens far exerted.

7. **O. comosus**, Wight mss.; Benth. in DC. Prodr. xii. 52; tomentose, shrubby, branches opposite terete leafy, leaves close set oblong or linear-oblong or ovate obtuse crenate, racemes sessile, bracts deciduous upper very large coloured, calyx tubular, lips subequal in length, 4 lower teeth subequal subtlate. O. bracteatus, Wight Io. t. 1428.

DECCAN PENINSULA; Shevagberry and Timnevely Hills, Wight, Beddome. This differs greatly in habit from its congeners. Wight figures the stem as 4-angled, but they appear quite cylindric. Branches as thick as a crow-quill. Leaves ⅔-1 in., rugose. Rachis of raceme stout; whorls 6-fld.; flowers suberect. Calyx nearly ⅓ in., upper lip orbicular, straight. Corolla ⅓-⅓ in., pubescent, tube very slender. Nutlets not seen.

*** Calyx-throat naked. Stamens far exerted.

8. **O. stamineus**, Benth. in Wall. Pl. As. Rar. ii. 15, Lab. 29, and in DC. Prodr. xii. 52; slender, glabrous or pubescent, leaves petioled ovate acuminate coarsely toothed, base cuneate, calyx campanulate, 2 lower teeth subulate, corolla-tube thrice as long very slender, filaments capillary twice as long as the corolla. Wall. Cat. 2727; Bot. Mag. t. 6833; Miguel Fl. Ind. Bat. ii. 944. Ocimum grandiflorum, Blume Byd. 835. O. longiflorum, Ham. in Wall. Cat. 2727.

ASSAM; Jenkina. BURMA and MAETABAN; Wallich. DECCAN PENINSULA; Anamally Hills, Wight. NICOBAR ISLANDS.—DISTRIBUTION. Malay and Philippine Islands, Australia.


9. **O. scapiger**, Benth. in Wall. Pl. As. Rar. ii. 15, Lab. 28, and in DC. Prodr. xii. 52; glabrous, stem very short, leaves subradical petioled oblong obtuse coarsely crenate, racemes very long, calyx campanulate, 4 lower teeth subulate, corolla-tube short, throat funnel-shaped, filaments twice as long as the limb, nutlets oblong rugulose. Wall. Cat. 2726 (scapigerum).

NEPAL; Wallich.

Rootstock short, woody. Leaves 4-6 in., narrowed into a short or long slender petiole. Racemes 1 foot, strict, puberulous. Calyx ⅔ in. Corolla ⅓-⅓ in. long, blue; upper lip short, 4-toothed; lower longer, concave.
8. PLECTRANTHUS, L'Herit.

Herbs or undershrubs. Flowers usually small, in lax (rarely close) panicked or racemced 6-8-fl. cymes (whorls). Calyx 5-toothed, 2-lipped, enlarged in fruit. Corolla-tube exserted, long or short, straight or decurved, limb equal or gibbous or spurred, 2-lipped; upper lip usually short, broad, 3-4-fl. recurved; lower much longer, entire, boat-shaped, narrow at the base or stipitate. Stamens 4, declinate; filaments simple, free; anther-cells usually confluent. Disc usually produced in front, and there equaling or exceeding the ovary. Style subequally 2-fl. Nutlets orbicular, ovoid or oblong, smooth, granulate or punctate.—Species about 80, Tropical and Sub-tropical Asiatic, African, Australian and Polynesian.

The species of the sections ISODON and COLEOIDES are numerous and very difficult of discrimination, and the latter should perhaps be referred to Coleus, or better still refer all the Plectranthi to sections of Coleus, of which genus P. coleoides and articulifolius have all the habit.

Sect. 1. Isodon. Fruiting calyx decurred, subequally 5-toothed, or 2-lipped, upper lip 3-toothed, lower 2-toothed. Nutlets oblong or rounded, obtuse.

* Fruiting calyx broad, open, deeply 2-lipped, upper lip very broad with 3 distant spinous teeth, lower of 2 long subulate teeth. Corolla 1 in. long, tube straight, base equal.

1. P. macranthus, Hook. f.; sparsely hairy, leaves petioled ovate-lanceolate coarsely serrate, inflorescence racemose, flowers opposite.

Sikkim Himalaya; Chola, alt. 6-8000 ft., J. D. H. Khasia Mts., alt. 5-6000 ft.; Lobb, J. D. H. & T. T., &c. Burma; Griffith.

Stem 6-12 in., simple or branched, weak. Leaves 3-5 in., membranous. Racemes 6-12 in.; bracts ovate-lanceolate, persistent; pedicels ½ in. Corolla-tube straight, 1 in. long, ½ in. diam.; lips short, subequal, rounded. Fruiting calyx ½ in. long. Nutlets globose, ½ in. diam.—Very near the Japanese P. longitubus, Miq., and possibly a variety of it, but the cyme branches are much shorter and 1-fl.; the inflorescence being a simple raceme with opposite flowers.—Probably both should be referred to Orthosiphon.

** Fruiting calyx longer than broad, distinctly 2-lipped for ½ way down, upper lip subequally 3-toothed, lower 2-toothed. Corolla ½-3/4 in. long, tube straight, base equal. (It is not easy to distinguish this section from the next.)

2. P. scrophularoides, Wall. Pl. As. Bar. ii. 16, and Cat. 2738; tall, slender, nearly glabrous, leaves long-petioled ovate crenate, base cordate or cuneate, corolla-tube broad about twice as long as the lower lip, fruiting calyx with obtuse teeth, nutlets subglobose smooth. Benth. Lab. 40, and in DC. Prodr. xi. 55; Hook. Icon. Pl. t. 464 in part.

Temperate Himalaya, alt. 8-1000 ft., from Kumaon to Sikkim; Wallich, &c.

Stem 2-4 ft. or more. Leaves 3-7 in., often as broad, sparsely minutely hairy; petiole 1-4 in. Cymes in broad open slender panicles. Corolla ½ in., pale rose, tube nearly straight, upper lip very short, lower short, narrow, acute, hardly cymbiform. Stamens far exserted. Fruiting calyx ½ in.—A much larger plant than P. Gerardi-anus, which it closely resembles. The figure in Icones Plantarum (copied from a drawing by Heyland of Paris) is, I suspect, made up of the magnified calyx and corolla of this, but of the leaves, panicle and nutlets of P. Gerardi-anus.

**Decan Peninsula**; Pulney Mts., *Wight*.
Foliage, hairiness, and stout stems of *P. nilghiricus*, but flowers and fruit quite different.


**Ceylon**; Central Province, alt. 4–7000 ft., *Mackenzie*, &c.
*Stem* stout or slender, simple or branched, variable in pubescence. *Leaves* 1–1½ in. *Corolla* $\frac{1}{2}$ in., white, spotted with red. *Fruiting calyx* about as long.


**Ceylon**; Ramboddi, &c., alt. 4–5000 ft., Sir G. *Mackenzie*, *Walker*. **Decan Peninsula**; Tinnevelly Hills, alt. 4000 ft., *Beddome*.

6. **P. rivularis**, *Wight* mss.; stem erect leafy pubescent, leaves long-petioled lanceolate crenate to below the middle pubescent or glabrate, racemes terminal and axillary narrow pubescent, corolla-tube rather broad longer than the subequal lips, stamens shortly exerted, fruiting calyx nearly glabrous, lobes subacute, nutlets broadly oblong. *P. nigrescens*, *B. scabrellus*, *Wight* (Kew Distrib. 2093).

**Nilgiri and Anamalay Hills**; *Sispara*, *Wight*, *Gardner*, *Beddome*.
Very near *P. Walkeri*, and perhaps a variety, but taller, more hairy, green when dry, leaves longer petioled, crenate (not serrate) to near the base.

***Fruiting calyx indistinctly 2-lipped, shortly 5-toothed. *Corolla* $\frac{1}{2}$–$\frac{1}{3}$ in. long, tube straight, equal at the base.***

7. **P. Gerardianus**, Benth. in *Wall. Pl. As. Rar.* ii. 17, *Lab.* 40, and in *DC. Prodr.* xi. 56 (all in part); tall, branched, nearly glabrous, leaves large lower petioled ovate crenate or toothed, floral and bracts small, cymes in branched panicles, corolla $\frac{1}{2}$ in., tube subcylindric, lips subequal, fruiting calyx $\frac{1}{2}$ in. glabrous or nearly so, teeth subacute, nutlets ellipsoid. *Wall. Cat.* 2742. *P. oblongifolius*, *Wall. Pl. As. Rar.* ii. 16; *Cat.* 2739; *Benth.* ll. c.

**Temperate Himalaya**, alt. 3–9000 ft.; from Kashmir to Sikkim (ascending to 12,000). *Khasia Mts.*, alt. 4–6000 ft.; *Wallich*, &c.
*Stem* 4–6 ft., glabrous or puberulous above. *Leaves* 3–7 by 1–4 in., acuminate,
membranous or rigid, sparsely scabernulous above or more so all over; base of lower
narrowed into the long or short petiole. **Panicles** pyramidal, branches slender. Flowers white, speckled with pink. **Stamens** exserted.—I cannot distinguish *P. graciliflorus* by any sufficient character. *Hyssopus lophanthoides*, Ham., referred here by Bentham, is, according to an original specimen of Hamilton’s, a different plant (see end of genus). *P. oblongifolius* is a diseased state with inflated barren calyces.


8. **P. striatus**, **Benth. in Wall. Pl. As. Bar.** ii. 17, and in **DC. Prodr.** xii. 56; stem usually 6–12 in. glabrous pubescent or subvillose, leaves small lower petioloed broadly ovate crenate, cymes panicked, corolla-tube broad or narrow short or tubular, fruiting calyx ½ in. hispid, teeth obtuse, nutlets oblong. **Wall. Cat.** 2740.

**Temperate Himalaya**; from Kashmir to Bhotan, alt. 4–8000 ft., Wallich, &c. Khasia Mts., alt. 3–6000 ft., common.

The much usually smaller size, shorter broader leaves, more flaccid habit, and hispid calyx best distinguish this from *P. Gerardianus*, but there are many specimens that I am in doubt about. The corolla is very variable, and the stamens are normally far exserted.

9. **P. Stracheyi**, **Benth. mss.**; stem simple ascending puberulous, leaves 4–5 in. short-petioloed narrowly lanceolate serrate above the middle, cymes in a terminal narrow panicle.

**Western Himalaya**; Kumaon, in the Surja valley, alt. 4500 ft., Strachey & Winterbottom.

**Flowers of** *P. Gerardianus*, but very distinct in foliage and habit, which resemble *P. Walkeri*. The fruit is not ripe. A very similar but more flaccid plant (specimens without corolla and fruit), and with longer petioles, is found in Pegu by Dr. Brandis.

10. **P. hispidus**, **Benth. in Wall. Pl. As. Bar.** ii. 17, Lab. 41, and in **DC. Prodr.** xii. 57; stout, erect, scaberonous, densely pubescent or villous, leaves subsessile ovate crenate or serrate tomentose beneath, corolla tubular pubescent, lower lip much longer than the upper, fruiting calyx ½ in. densely villous, nutlets very minute ellipsoid. **Wall. Cat.** 2741.

Khasia Mts., alt. 4000 ft.; Wallich, &c.

Like a robust and (usually) densely woolly form of *P. Gerardianus*, with a very minute woody calyx. **Flowers** white, speckled with red.


**Deccan Peninsula**; the Concan, Stocks, Low, &c.; Bababoodan Hills, Heyne in Herb. Rottler; Belgaum, at Purwar Ghat, Ritchie.

Possibly a form of *P. striatus*, but is a larger plant. Small specimens from the Kala Nuddi (banks above Saopa), from Ritchie, have very minute fruiting calyces. Heyne’s specimen is a very small one, but, I think, of this species.
12. **P. Wightii**, Benth. Lab. 41, and in DC. Prodr. xii. 56; tall, robust, branched, glabrous or scaberulous, leaves petiolated broadly ovate or cordate crenate-toothed rather rigid, cymes lax-fl. often leafy, large pyramidal panicles, corolla-tube short broad, fruiting calyx 1/3 in. scaberulous, teeth obtuse, nutlets oblong. *Wight* f.c. t. 1429.

*Nilghiri* and *Pulney Mts.*, alt. 1-7000 ft.; *Wight*, &c.
The var. *macrophylla*, Benth., is only a larger-leaved specimen.

13. **P. nilghiricus**, *Benth. in DC. Prodr.* xii. 57; villous, stem very robust, leaves thick stoutly petiolated broadly ovate-cordate rugose crenate, cymes in pyramidal panicles, flowers rather crowded, corolla tubular, lobes pubescent, fruiting calyx 1/3 in. densely woolly, nutlets suborbicular. *P. bullatus*, *Benth.* l. c.

*Nilghiri* and *Anamallay Mts.*; *Sir F. Adams, Wight, Beddome.*
Apparently a very distinct species. Whole plant yellowish-brown when dry. *P. bullatus*, Benth., may be the same thing; I have seen no authentic specimens of it.

14. **P. capillipes**, *Benth. in DC. Prodr.* xii. 57; annual, small, softly pubescent, rather slender, leaves small petiolated ovate or cordate crenate, cymes in narrowly pyramidal panicles, corolla tubular, lips subequal lower very small, fruiting calyx 1/3 in. puberulous, teeth obtuse, nutlets ovoid-oblong. *Thwaites* Enum. 237.

*Ceylon*; Central Province, alt. 3-5000 ft., *Walker*, &c.
Habit of *P. striatus*, which small specimens resemble, whilst larger ones approximate to *P. Wightii*. *Corolla* white, with pink spots on upper lip. *Stamens* exserted.

15. **P. nepetæfolius**, *Benth. in DC. Prodr.* xii. 57; villous with soft spreading hairs, stem 1-2 ft. simple, leaves petiolated ovate-cordate crenate soft and softly hairy on both surfaces, cymes in narrowly pyramidal panicles, corolla tubular, lips subequal, fruiting calyx 1/3 in. pubescent, teeth obtuse, nutlets ovoid-oblong.

*Deccan Peninsula*, *Wight, Perrottet*; *Nilghiri* and *Anamallay Hills, Beddome.*
A much smaller plant than *P. Wightii*, clothed with long hairs, and with a tubular corolla 1/4 in. long.

**** Fruitig calyx longer than broad, 2-lipped or subequally 5-toothed. *Corolla* 1/3 in., tube declinate or abruptly decurved (except *P. repens*), base usually gibbous.

16. **P. repens**, *Wall. Pl. As. Rar.* ii. 17, and *Cat. 2746*; pubescent or villous, stem short, leaves long-petiolated broadly ovate or orbicular-cordate obtuse crenate, cymes in narrow racemes which are longer than the stem, corolla-tube nearly straight cylindric obtusely spurred at the base above, stamens included, fruiting calyx scaberulous, teeth short obtuse, nutlets very minute broadly oblong. *Benth. Lab.* 43, and in *DC. Prodr.* xii. 58.

*Central* and *Eastern Himalaya*; Nepal, *Wallich*; *Sikkim*, alt. 6-9000 ft., *J. D. H.* Clarke.
Stem 4-6 in., prostrate below. Leaves 1½-3 in. broad, membranous; petiole 1-3 in. Panicles solitary and terminal, or few axillary, 1 ft. long and under, lax fl. *Corolla* 1/4 in. *Fruiting calyx* 1/3 in.—The corolla is not like that of *P. Coetsa*, nor are the calyx-teeth lanceolate and acute (as described in DC. Prodr).

17. **P. Coetsa**, *Ham. in Don Prodr.* 117; tall, erect, branched, pubescent
or glabrate, leaves ovate crenate narrowed into the winged petiole, cymes in lax-fld. paniced racemes, corolla-tube much shorter than the large saccate lower lip, fruiting calyx narrow shortly 2-lipped, teeth acute, nutlets oblong or subglobose. *Benth. in Wall. Pl. As. Rar. ii. 17, Lab. 42, and in DC. Prodr. xii. 58 (excl. syn. Burm.); Wall. Cat. 2743. Ocimum Coetsa, Spreng. Syst., Cur. post. 223.

**Temperate and Subtropical Himalaya;** from Murree to Mishmi, alt. 3-8000 ft., abundant. *Khasia Mts., alt. 3-5000 ft.; Burma, Wallach.*


Var. *Hookeri;** tall, leaves sometimes 5 in. glabrous or puberulous, fruiting calyx larger ¼ in. very broad, teeth longer more acute, nutlets twice as large. *Plectranthus no. 15, Herb. Ind. Or. H. f. & T. P. Hookeri, Clarke mss.—Khasia Mts.; Moflong, alt. 5000 ft., J. D. H. & T. T.*


**South Deccan Peninsula,** from Belgaum southward; Nilgiri and Pulney Mts., by wet ditches, *Wight. Ceylon;* Central Province, alt. 4-6000 ft.

The southern representative of *P. Coetsa,* and probably only a variety of that plant. The length of the corolla-tube is variable, as is the pubescence of the leaves.

19. **P. Maddeni,** *Benth. in Strach. Cat. Pl. Kumaon, 86;** stout, erect, branched, nearly glabrous, leaves ovate crenate narrowed into the winged petiole, cymes in lax- or dense-fld. racemes, corolla-tube much shorter than the saccate lower lip, fruiting calyx broadly campanulate glabrous, teeth obtuse, nutlets subglobose.

**Temperate Himalaya;** Kumaon, alt. 7-8500 ft., Strachey & Winterbottom, Duthie; Sikkim, alt. 5-10,000 ft., J. D. H.

Very near *P. Coetsa,* and perhaps a form of it, but more glabrous, with broader fruiting calyces, which have obtuse teeth and more rounded nutlets.

20. **P. melissoides,** *Benth. Lab. 39, and in DC. Prodr. xii. 62;* herbaceous, erect, tomentose or puberulous, leaves small sessile or shortly petioled ovate or rounded crenate, cymes in lax-fld. slender racemes, corolla-tube short broad, fruiting calyx 2-lipped subhispid, teeth acute, nutlets globose. *Wall. Cat. 7122.*

*Khasia Mts., alt. 4-6000 ft.; Wallach, Mack, Griffith, H. f. & T., &c.*

Stem 1-2 ft., rather slender, strict. Leaves ¼-1 in., glabrate or very tomentose beneath or on both surfaces, narrowed into the short petiole. Racemes long, slender, strict. Corolla ½ in., pink; lips short, gibbously hemispheric. *Fruiting calyx ½ in., broadly campanulate.*

21. **P. rugosus,** *Wall. Pl. As. Rar. ii. 17, and Cat. 2745;* shrubby, erect, hoary with stellate down, leaves small petioled ovate or elliptic obtuse crenate rugose above beneath densely white-tomentose, cymes axillary lax-
22. P. ternifolius, Don Prodr. 117; robust, densely white-tomentose, leaves opposite and ternately whorled subsessile lanceolate acuminate serrate rugose, cymes in dense long white villous panicles, corolla very short villous, fruiting calyx cylindric, teeth subequal. Wall. Cat. 2748; Benth. in Lab. 44; in Wall. Pl. As. Rar. ii. 17, and in DC. Prodr. xii. 61; Hook. f. t. 460. Ocimum ternifolium, Spreng. Syst., Curt. post. 224.


A bush, 3-5 ft., with strict erect branches. Leaves 3-7 in., thick, rugose, base acute. Paneilo cymes white; lower bracts leafy; flowers subsessile, densely crowded. Corolla white, with pink spots at base of upper lip; tube inflated, and lips very short. Stamens included. Fruitng calyx 1/2 in., straight, erect; teeth rounded. Nutlets trigonous, acuminate.

Sect. 3. Coleoides. Fruitng calyx 2-lipped, upper lip large, rounded, reflexed, very shortly 2-toothed or entire; lower with 3 acute, awned, or subulate pointed teeth. Corolla-tube deflexed or declinate, base gibbous or not.


Hills of Continental India, from the Himalaya (Simla to Sikkiim), ascending to 5500 ft., Khasia Mts. and Central India, to the Anamalais. (Absent in Ceylon and in the Malay Peninsula.)

Whole plant usually hoary with very fine pubescence. Stem robust below. Leaves 2-4 in., sometimes as broad; petiole as long or longer than the blade. Corolla 1/8 in. long, slightly decurved, white pubescent. Stamens included. Fruitng calyx 1/8 in. Nutlets 1/8 in. diam.—Lower lip of corolla longest of any Indian species.

24. P. subincicus, Benth. in Wall. Pl. As. Rar. ii. 16, Lab. 36, and in DC. Prodr. xii. 66; glabrous or puberulous, stem short branched, leaves long petioled orbicular ovate obtuse sinuate-crenate, corolla very small, tube
slender decurved longer than the short lower lip, fruiting calyx campanulate, lips short upper rounded, teeth of lower with subulate tips, nutlets globose smooth or rugose. Wall. Cat. 2737.


Stem a foot high, flaccid, vaguely branched. Leaves 11-2 in. long and broad, flaccid; petiole as long. Corolla ½ in. long, pubescent. Fruitig calyx dimorphic, larger ½ in., with deeply pitted brown nutlets; smaller ½ in., with smooth pale nutlets. The specimens in Wallich's, Wight's, and Rottler's Herbaria are very imperfect.

Var. Gardneri; leaves narrowed into the petiole, purplish when dry. P. Gardneri; Thwaites Enum. 237.—Ceylon; Central Province, Adam's Peak, &c., Walker, &c.

25. **P. Parishii**, Hook. f.; annual, puberulous, flaccid, branched, leaves orbicular-ovate narrowed into the very long petiole coarsely crenate or lobulate, cymes in lax-fld. racemes, corolla ¾ in., tube very slender with the inflated throat much longer than the narrow lip.

**Texasserim; Moulineau, Parish.**

Stem succulent, 6-10 in. Leaves 2 in. long and broad, membranous, obtuse. Calyx minute in flower; pedicules and pedicels pubescent; lower lip with subulate teeth. Corolla with pale blue lower lip. Fruitig calyx ½ in., broadly campanulate, subequally very shortly 2-lipped; upper lip triangular, lip subulate; teeth of lower similar but narrower. Nutlets very pale.—I have but one specimen of this very distinct species.

26. **P. zeylanicus**, Benth. Lab. 36, and in DC. Prodr. xii. 66; tall, slender, densely finely glandular-pubescent, leaves shortly petioloed orbicular-cordate crenate, flowers minute whorled in very long slender racemes, corolla-tube longer than the short lower lip, fruiting calyx minute subspheric, upper lip rounded mucronate, teeth of lower subulate.

**Ceylon; Central Province, at Rambodi, Gardner.** (Commonly cultivated in native gardens as a medicine, unknown wild, Thwaites.)

Stem 2-3 ft. stout, succulent, naked. Leaves in few pairs, 1-4 in. diam., rather thick. Racemes 6-12 in., very narrow; flowers in 6-10-fld. whorls on the main racis; pedicels ¼ in. Corolla ½ in. long, slightly curved, tube hardly gibbous at the base. Fruitig calyx ¼ in., densely glandular-pubescent like the whole raceme. Nutlets not seen.

27. **P. coleoides**, Benth. in DC. Prodr. xii. 64; very stout, branched, glandular-tomentose or glabrate, leaves long-petioloed ovate or orbicular-ovate crenate obtuse, flowers racemed on the branches of a pyramidal densely glandular-tomentose panicle, corolla pubescent, tube about equalling the lower lip, upper lip of fruiting calyx rounded, teeth of lower lanceolate acuminate, nutlets oblong black shining. Bot. Mag. t. 5841; Saunders Refug. Bot. t. 256. Coleus Wightii, Benth. Lab. 58, and in DC. Prodr. xii. 78; Wight Ic. t. 1433. C. glabrus, Benth. Lab. 58, and in DC. l. c. C. paniculatus, Benth. in Wall. Plant. As. Rare. ii. 79; Wall. Cat. 2734, and in DC. l. c.

Nilgiri and Anamallay Mts.; ascending to 7000 ft. in moist places, Wight, Perrottet, &c.

Stem 2-3 ft., succulent. Leaves 1-4 in. diam., fleshy; petiole as long as the blade. Panicles thyrsiform, sometimes 1 foot across the lower branches. Corolla ½ in. long, lilac; lower lip ciliate. Stamens included. Fruitig calyx very variable, broad straight and campanulate, or narrowed and curved.

28. **P. urticifolius**, Hook. f.; very robust, glabrous except the
puberulous panicle, leaves very large stoutly petioled broadly ovate obtusely acuminate, margin regularly obtusely lobulate, lobules crenate, cymes in stout branched panicles, corolla-tube equalling the narrow lower lip, fruiting calyx large, upper lip orbicular ovate, teeth of lower subulate-lanceolate, nutlets large orbicular oblong brown shining. Coleus urticifolius, Benth. in DC. Prodr. xii. 78.

**Plectranthus.**

DECCAN PENINSULA; Courtallam, Wight; Tinnevelly Hills, alt. 4500 ft., Beddome. **Stem short.** Leaves 3–6 in. long and nearly as broad, sometimes minutely puberulous above, gland-dotted beneath, lobules rounded or ovate; petiole 2–3 in. very thick. **Panicle very large; branches suberect; flowers racemose or corymbose. Flowers ½ in. long. Corolla-tube cylindric, decurved; lips subequal, upper very broad, lower narrowly cymbiform. Stamen quite free. Fruit**ing calyx ½ in. long, 2 lowest teeth longest, incurved. **Nutlets large.**—Near *P. coleoides.*

29. **P. fruticosus,** Wight Cat. 2524; very robust, shrubby, branches and leaves beneath densely tomentose, leaves large round ovate or cordate obtusely acuminate coarsely crenate, flowers secundly racemose on the erect branches of a dense stout glandular-pubescent thyrsus, corolla decurved. Coleus fruticosus, Benth. in DC. Prodr. xii. 78.

DECCAN PENINSULA; Puleny Mts., Wight. **Stem as thick as the middle finger, spongy. Leaves 3–5 in. long and broad, pubescent above, margin sublobulate; petiole 1–2 in., very stout, almost woolly. Panicle 6–10 in., racis and primary branches woody, ultimate 1–3 in., flexuous, many-fld.; flowers alternate, shortly pedicelled. Corolla pubescent, ½ in. long. Filaments quite free. Upper calyx-lip ovate, teeth of lower acuminate.—A very robust well-marked species. The fruit is not ripe.

30. **P. Griffithii,** Hook. f.; erect, branched, hirsutely tomentose, leaves petioled ovate acuminate toothed or crenate, cymes very short in long slender narrow racemes, corolla-tube very slender longer than the lower lip, fruiting calyx sparsely hairy, upper lip broad rounded, teeth of lower acuminate, nutlets orbicular smooth black shining.

EASTERN ASSAM; Mishmi Hills, Griffith. **Stem rather woody, tomentose; branches, racemes and leaf nerves beneath with long hairs amongst the tomentum. Leaves 3–5 in., hirsute on both surfaces, base rounded, shortly cordate at the insertion of the ½–1½ in. long petiole. Racemes 6–10 in., ½ in. diam., leafless, rather dense-fld., racis very hirsute; cymes short, sessile, with pedicelled flowers. Corolla ½ in. long, tube deciduate, curved, white, lips subequal, pale rose-coloured. Fruit**ing calyx ½ in., contracted above the swollen base, mouth campanulate, lips subequal in length.

31. **P. crenulatus,** Hook. f.; erect, densely finely tomentose throughout, leaves petioled ovate acute crenulate, cymes short in axillary racemes, fruiting calyx hairy, upper lip broad rounded, teeth of lower acuminate, nutlets orbicular black granulate opaque.

UPPER ASSAM; Namroop, Griffith. Very near *P. Griffithii,* but not at all hirsute, leaves similar in shape but less acuminate, and crenates smaller, racemes shorter and nutlets opaque and granulate. **Flowers** not seen.

32. **P. Helferi,** Hook. f.; stem woody below and branches and young leaves finely puberulous, leaves shortly petioled lanceolate subacute crenate above the entire base glabrous, cymes short subsessile in branched glandular-tomentose racemes, upper lip of glandular-hairy fruiting calyx orbicular, teeth of lower subulate.

TENASSERIM; Helfer.
Stem 1–2 feet. Leaves 1½–2½ in., narrowed into the petiole, rather coriaceous, nerves oblique. Fruiting calyx ½ in. Corolla and nutlets not seen.—The specimens are hardly fit for description, but the species is too remarkable to be passed over.

DOUBTFUL SPECIES.

P. Patchoull, Clarke mss.; tall, erect, branched, hirsutely tomentose, leaves petioled ovate-cordate crenate-toothed, cymes branched, flowers subsecundly sub-sessile on the branchlets of a loose panicle, calyx-teeth subequal, corolla-limb subclavate with a large incurved cymbiform obtuse lower lip and shorter narrow upper lip.

ASSAM; Jenkins (Herb. Calcutt.). KHASIA Mts.; Johra, alt. 4000 ft., cult., Clarke.

STEM stout, branched. Leaves 2–3 in., hairy on both surfaces. Cymes panicked, irregularly branched; bracts small, leafy; pedicels ¼ in. or 0. Calyx hardly 2-lipped, teeth acute. Corolla ¼ in., tube slender, upper lip much shorter and narrower than the saccate obtuse lower, which is much larger than the tube.—“This, I am told, is the true Patchouli plant, and has the true scent, which Pogostemon Patchouli has not.” C. B. Clarke. I have seen no fruit, and the indiscernence is very peculiar; it may not be a Plectranthus.

P. ? Montanus, Benth. in Wall. Pl. As. Rd. ii. 17, and in DC. Prodr. xii. 60; Wall. Cat. 2747; densely tomentose, stem short very robust, leaves shortly petioled oval or rounded crenate very thick rugose, racemes dense-fl. pyramidal, branches very thick ascending, whorls close set but not confluent, flowers sessile or pedicelled, calyx ½ in. hemispheric with 5 triangular subacute teeth, nutlets suborbicular polished pale.—Mysore; at Nundydroog, Klein, Herb. Rottler.—Habit of P. coeleoides, but calyx very different. The specimens are very imperfect, and have no corolla.

Hyssopus Lophanoides, Ham. in Don Prodr. 110, referred to P Gerardi-nus by Bentham, can hardly be that plant; a specimen of it from Hamilton more resembles P. striatus, being very pubescent. It may, however, be a hairy form of P. Gerardi-nus.

Ocimum densiflorum, Roth Nov. Sp. 275, doubtfully referred by Bentham to P. rugosus, must be a very different plant, according to the description.

P. Rotundifolius, Spreng. Syst. ii. 690; Benth. Lab. 34, and in DC. Prodr. xii. 65; Graeb. Cat. Bomb. Pl. 148. Coleus ? rugosus, Benth. in Wall. Pl. As. Rd. ii. 15. Germania rotundifolia, Poir. Dict. ii. 763. Nepeta madagascariensis, Lam. ? Dict. i. 712.—Kurka, Rheede Hort. Mal. xi. t. 25?—A reputed native of Mauritius and Coromandel? The last habitat is no doubt founded on the supposed identity of the Mauritian with the plant figured by Rheede, which represents a flowerless tuberiferous herb which has not been identified. Local botanists should be able to discover what Rheede’s plant is.

9. COLEUS, Lour.

Characters of Plectranthus, but filaments combined below into a sheath around the style.—Species about 50, Tropical African and Asiatic, and one Australian.

* Calyx-throat villous within.

1. C. spicatus, Benth. in Wall. Pl. As. Rd. ii. 15, Lab. 49, and in DC. Prodr. xii. 71; stem very stout villous with long spreading hairs or glabrate, leaves subsessile obovate ovate or orbicular glabrous fleshy entire or crenate, floral large concave deciduous, whorls in a dense cylindric spiciform villous thyrse, upper calyx-lip very broad truncate. Wight Je. t. 1431; Wall. Cat. 2729. C. Heynii, Benth. Lab. 50, and in DC. l. c. C. Zatarhendi, Dalz. & Gibbs. Bomb. Fl. 206; ? Benth. Lab. 50. Plectranthus
Coleus.]  


South Deccan; on low rocky hills, common.  

Stem 6–12 in., simple or branched. Leaves few, very variable, $\frac{1}{2}$ by 3½ in.  

Spike 4–8 in. by $\frac{1}{2}$–4 in. diam.; bracts broad, acute, ciliate; flowers $\frac{1}{2}$ in. long; upper calyx-lip crenulate, teeth of lower acute. Corolla-tube slender, bent above the middle; upper lip 4-lobed, lower boat-shaped.  


Subtropical Himalaya; Nepal and Kumaon, ascending to 8000 ft. Behar; top of Parusnah, Thomson. Deccan Peninsula; common. Ceylon; Ovah district, alt. 3–5000 ft.—District. Tropical E. Africa.  

Stem 1–2 ft., ascending, branched. Leaves 3–5 in., narrowed into the petiole. Racemes 6–12 in., stout; flowers $\frac{3}{4}$–1 in. Corolla pale blue, much like *C. spicatus*. Fruiting calyx $\frac{1}{2}$–$\frac{3}{4}$ in., upper lip acuminate, teeth of lower subulate, all punkent.  

** Calyx-throat glabrous within.  


Cultivated throughout India, Ceylon and various tropical countries.  

Stem 1–3 ft., fleshy. Leaves 1–2 in., very aromatic. Flowers shortly pedicelled, $\frac{1}{2}$ in. long. Corolla pale purplish, tube short, throat inflated, lips short. Stamens shortly exserted. Fruiting calyx suberect.—Roxburgh describes the flowers as blue. *O. amboinicus* is the earliest name, but not very appropriate.  

4. **C. parviflorus**, Benth. in DC. Prodr. xii. 72; stem stout fleshy, roots tuberous, leaves petioled rounded-ovate obtuse coarsely crenate glabrous or nearly so, whorls subdistant slender pubescent, racemes laxly many-fl., upper calyx-lip ovate, teeth of lower obtuse or lowest mucronate. *O. tuberosus*, Benth. Lab. 59 (Plectranthus tuberosus, Blume).  

Deccan Peninsula; Quilon and Panpanassum, Wight. Ceylon, cultivated, Gardner.  

Stem 1–2 ft. Leaves 1½–2 in., often as broad, base cuneate or subcordate. Flowers $\frac{3}{4}$–1 in. Corolladecurved, lips short. Stamens included. Fruiting calyx not seen.—Probably *C. tuberosus*, which is cultivated for its tubers in Java as this is in Ceylon, but Blume describes the Javan plant as having quite entire leaves.  

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Cultivated in India.—**Distrib.** Malay Islands, Australia.

*Stem* 2-3 ft. *Leaves* 1-3 in., usually purplish beneath, base rounded or cuneate. *Flowers* ½ in., white with a blue lower lip, tube abruptly decurved. *Stamens* included. —There are several very distinct varieties described from Australia (Benth. Pl. Austral. v. 30).

6. **C. atropurpureus**, Bent. in Wall. Pl. As. Bar. ii. 17, Lab. 54, and in DC. Prodr. xii. 74; tall, slender, finely pubescent, leaves long-petioled broadly ovate or rounded obtuse or acute coarsely crenate, flowers in lax whorled cymes which form narrow panicles, upper calyx-lip ovate sub-acute, teeth of lower variable, two lowest acute. Nunes Fl. Filip. t. 208; Wall. Cat. 2733.

**Malacca, Penang and Singapore; Wallich, &c.—Distrib.** Malay and Pacific Islands.

*Stem* 2-3 ft. *Leaves* 2-4 in., membranous, base rounded truncate or cuneate; petiole 1-2 in. *Cymes* irregularly branched, peduncled; flowers pedicelled. *Corolla* ½ in., much as in *C. scutellarioides*. *Stamens* included. *Fruiting calyx* variable, 2-4 in. long.

7. **C. malabaricus**, Bent. in Wall. Pl. As. Bar. ii. 16, Lab. 57, and in DC. Prodr. xii. 76; glabrous, puberulous or villous, leaves large membranous long-petioled ovate or lanceolate acute or acuminate crenate, flowers laxly cymose or racemose on the branches of spreading panicles, fruiting calyx broad membranous, upper lip large rounded acute, teeth of lower longer acuminate. Wall. Cat. 2735; Thwaites Enum. 238. C. ovatus & Macraei, Bent. Lab. 57, 58, and in DC. l. c. 76, 77. C. Macraei, Bot. Mag. t. 4690. C. Walkeri, Bent. in DC. l. c. 77.

**Travancore and the Nilgiri Mts.; Wight, Gardner. Ceylon; common up to 6000 ft.**

*Stem* 2-3 ft., usually dark purple, as are the leaves beneath and peduncles, pedicels, and calyx. *Leaves* 3-6 in., petiole often as long, base rounded, cuneate or narrowly cordate; floral caduceous. *Panicles* usually pyramidal; branches with distant whors of cymes; flowers ½-1 in. long. *Calyx* ½ in. long and broad. *Corolla-tube* pale lilac, abruptly decurved, throat inflated; upper lip short, crenate, dark blue; lower boat-shaped, acute, pale. *Stamens* included.—Very variable.

VAR. mollis; leaves softly pubescent. C. mollis, Bent. in D.C. l. c. 77.—Ceylon.

VAR. leptostachys; puberulous, leaves narrowly oblong or lanceolate, flowers smaller.—Ceylon.

CRYLON; Central Province, alt. 6–8000 ft., Macrae, &c.

Stems stout, green. Leaves 2–5 in., petiole 1–2 in. Racemes or branches of the panicle 3–6 in.; pedicels short. Corolla 1 in. long, pale lilac, slightly decurved at the middle, tube slender, as long as the cylindrical throat, lips very short, upper crenate larger than the small ovate acute lower.

10. ANISOCHILUS, Wall.

Herbs or undershrubs. Flowers small, in dense oblong 4-gonal or cylindrical spikes. Calyx suberect, inflated below the middle, 2-lipped or 5-toothed, rarely 1-lipped, upper lip entire and deflexed or short and 3-crenate. Corolla 2-lipped; tube slender, decurved; throat inflated; upper lip short, entire or 3-4-6-lobed; lower elongate, concave. Stamens 4, filaments free. Style 2-fid. Disc lobed.—Distr. Species about 16, Asiatic.

* Fructing calyx with the upper lip large, broad, entire, deflexed, concealing the mouth, lower truncate obscurely toothed.


WESTERN HIMALAYA; Kumaon and Garwhal, ascending to 8000 ft., Edgeworth, and throughout CENTRAL and SOUTHERN INDIA to Travancore and CRYLON.—Distr. Ava.

Stem 1–2 ft., stout, 4-angled. Leaves 2–3 in., rugose, sometimes densely tomentose; petiole 1–2 in. Spikes long-peduncled, 1–3 in. long, 1/2–3 in. diam.; flowers 1/2 in. long, pale purple. Calyx-tube very variable in length, glabrous or pubescent; upper lip sometimes with the lip erect throughout the spike.—A protein plant, the varieties of which I fail to distinguish by good characters.

Var. purpurascens, Benth., from Ava, has narrow purple cylindrical spikes and very short calyces.

Var. glabrior and villosior, Benth., explain themselves.

Var. e. f viridis, Benth. (A. rupestris, Wight), is founded on an immature plant with the habit of A. eriocephalus. A. crassus, Benth., differs in no way from the type.

2. A. scaber, Benth. in DC. Prodr. xii. 81; shrubby, hoary-tomentose, leaves small petioled oblong obtuse crenulate thick, peduncles very long stout, spikes 1–3 oblong, calyx pubescent, lip deflexed ovate obtuse ciliolate.

DECCAN PENINSULA; Courtallam, Wight.

Branches short, stout, ascending from a woody stem. Leaves 1–1 1/2 in., densely tomentose beneath. Peduncles 6–12 in.; spikes 1–1 1/2 by 3/4 in., purplish when dry. Calyx-tube very short; upper lip glabrous except the ciliate margins.

3. A. eriocephalus, Benth. in DC. Prodr. xii. 81; herbaceous, glabrous or puberulous, leaves petioled broadly ovate or cordate crenate, peduncles slender, spikes many ovoid or cylindrical, calyx villous or woolly,

**BEHAR; on the Kymore Hills, J. D. H. DECCAN PENINSULA; rocky ghats from the Concan, *Dalzell, &c.* southwards; Bellary, *Wight.*

A more slender plant than the Concan form of *A. carnosus*, but perhaps only a state of that variable plant.

4. **A. Wightii**, *Hook. f.*; shrubby, hoary-tomentose, leaves shortly petioled oblong or ovate obtuse crenate, peduncles long stout, spikes 3–6 cylindric narrow, calyx minute villous, upper lip deflexed very small acute.

**DECCAN PENINSULA; Anamallay Mts., Wight.**

A very distinct-looking plant, with the habit and dense pubescence of *A. scaber*, but the long narrow spikes not \( \frac{1}{4} \) in. diam., almost black when dry, and the minute calyx (about \( \frac{1}{10} \) in. long) with acute upper lip, seem very different.

5. **A. paniculatus**, *Benth. in DC. Prodr.* xii. 82; stout, shrubby?, glabrous or hoary-tomentose, leaves shortly petioled obovate or rounded obtuse crenate, spikes numerous small short panicled, calyx pubescent or tomentose very short, upper lip small deflexed obtuse ciliate.

**DECCAN PENINSULA; Maisor? G. Thomson. Ceylon; Herb. Bottler, Walker.**

Stem very stout below. *Leaves and branches densely ciliate-tomentose in the Madras specimens, puberulous brown in the Ceylon ones.* *Spikes* \( \frac{1}{2}–\frac{3}{4} \) in. long, on divaricating peduncles and pedicels. *Calyx* hispidly pubescent, about \( \frac{1}{10} \) in. long, tube very short. *Fruit* not seen.

**Fruiting calyx with the upper lip short, broad, recurved or hooded. entire or 3-notched, not concealing the mouth, lower truncate.**

6. **A. dysophylloides**, *Benth. in Wall. Pl. As. Bar.* ii. 19, Lab. 60, and in *DC. Prodr.* xii. 82; silky tomentose, stout, shrubby, decumbent, leaves thick subsessile obovate or oblong obtuse entire or crenate, spikes very many longer than the leaves *axillary* and terminal cylindric, peduncles very stout, calyx woolly, corolla-tube very short included. *Wall. Cat.* 2756; *Wight* *Ic.* t. 1434. *A. purpureus*, and *A. albidus*, *Wight* *Ic.* tt. 1435, 1436.

**NILGIRI HILLS; Wight, &c.; ANAMALLAYS, Beddome.**

Stem as thick as a swan’s quill, woody. *Leaves* 1–2 in., narrowed into the petiole, silky on both surfaces. *Spikes* 1–3 in.; peduncles short, very stout. *Fruiting calyx* \( \frac{1}{10} \) in. long, nearly as broad. *Corolla* white or purple.

7. **A. plantagineus**, *Hook. f.*; dwarf, shrubby, pubescent, stem or branches very short, leaves sessile oblong-obovate obtuse entire, spikes terminal solitary elongate narrowly, peduncles very stout tomentose, calyx woolly, corolla-tube exerted declinate.

**DECCAN PENINSULA; Baiaboodan Hills, Dalzell, Law, Stocks.**

*Rootstock* often as thick as the thumb, sending up short stout branches leafy at the top. *Leaves* \( \frac{1}{4}–\frac{1}{2} \) in. *Spikes* 2–3 in., longer than their peduncles; *bract* 3-lobed. *Calyx* small, upper lip obscurely lobed.

8. **A. suffruticosus**, *Wight* *Ic.* t. 1437; shrubby, very stout, densely thickly tomentose, leaves shortly petioled ovate-lanceolate subacute entire, nerves very stout and close beneath, spikes numerous long peduncled in terminal racemes, calyx pubescent, corolla-tube exerted sharply deinate from above the base, calyx-lips very short truncate.
9. **A. sericeus**, Benth. in DC. Prodr. xii. 82; erect, densely silky tomentose, leaves densely crowded sessile linear-oblong obtuse suberect or entire, nerves stout parallel, spikes in terminal panicles, bracts much longer than the flowers.

**Drococ Peninsular**: Courtallum, Wight.

*Stem* stout, simple, 1-2 ft., densely leafy. *Leaves* 1½-2¾ in., rather thick, imbricating, narrowed at the very base. *Spikes* 1-2 in., shortly peduncled; bracts ovate acute, ¼ in. long, imbricating over the young flowers.—The material from which Bentham described this consists of two very imperfect specimens of the true plant, along with one of *A. dysphylloides*. Wight's later specimens are in full leaf, but very young flower.

10. **A. robustus**, Hook. f.; suffruticose, very robust, densely tomentose, leaves very large stoutly petioled ovate crenulate thick reticulate above, spikes slender in terminal panicles with a stout woolly rachis and short peduncles, fruiting calyx ventricose, upper lip truncate recurved, lower very short.

**Drococ Peninsular**: Courtallum, Wight.

*Stem* as thick as the little finger, densely woolly. *Leaves* 4-6 by 2-3½ in., obtuse, most densely woolly beneath, nerves diverging, base rounded; petiole 1-2 in., woolly. *Panicule* of spikes 10 in.; rachis woolly. *Spikes* 2-3 in., slender, fruiting only seen. *Fruiting calyx* ½ in., hoary; upper calyx-lip contracted at the truncate tip. *Nutlets* oblong.—A very singular species.

11. **A. verticillatus**, Hook. f.; silky villous, stem stout erect simple, leaves mostly whorled sessile narrowly lanceolate obtuse or acute crenulate or entire, spike large solitary terminal, bracts large lanceolate, fruiting calyx shortly cylindric, lips very short truncate.

**The Concan**: Cheetah Hills, at Purwar Ghat, Ritchie, Dalsell, &c.; Golconda, Beddome.

*Stem* 1½-3½ ft., channelled when dry. *Leaves* 4-6 in a whorl, 2-3 in., spreading and recurved, upper smaller rarely alternate. *Spikes* 2-7 in., peduncled; bracts very variable, sometimes ½ in. *Corolla* ¼ in. long, pubescent, very pale blue. *Fruiting calyx* ½ in. long, pubescent, mouth transverse, small.

***Fruiting calyx with the upper lip forming a narrow 3-toothed galatea beak unclosed curving the mouth: lower very short.***

12. **A. pallidus**, Wall. Pl. As. Rar. ii. 18, and Cat. 2754; stem tall, branched, puberulous, leaves long-petioled ovate-lanceolate acuminate membranous toothed, spikes panicled long-peduncled, flowering narrowed upwards, fruiting-calyx tomentose, midlobe of upper lip subulate. Benth. Lab. 60, and in DC. Prodr. xii. 82.

**Sikkim Himalaya**, alt. 1-5000 ft.; J. D. H., Clarke. **Burma**; Taung-dong, Walth.; Pathyoe Mts., Griffith; Prome Hills, Benson.

Annual, 2-3 ft. *Leaves* 3-8 in.; petiole 1-2 in., very slender. *Spikes* 1½-3 in., submonteose, shorter than their peduncles; fruiting cylindric, much thickened. *Corolla* blueish, tube slender; upper lip inflated, minutely toothed; lower longer, linear, obtuse. *Fruiting calyx* ½ in. long, like a cat's claw.
Fruiting calyx slit in front, mouth very oblique, 1-lipped, lip decurved, 5-toothed, not closing the mouth.


**Doubtful Species.**

A. suffruticosus, Thwaites Enum. 238, is not Wight’s plant of that name, but more like A. paniculatus. The specimen is too imperfect for determination.

A. adenanthus, Dals. & Gibs. Bomb. Fl. 206; spikes dense, pyramidal, floral leaves lanceolate acuminate pubescent 3-nerved 3 lines long, calyx minute oblique truncate scarcely toothed tomentose, corolla glandular-dotted 5 lines long tomentose, lower lip long entire boat-shaped, upper 3- or 4-lobed rounded obtuse short.—Baba-booldan Hills, near Darwar, Dalzell.

**10*. HYPTIS, Jacq.**

Herbs or shrubs. Inflorescence various, capitate in the following species. Corolla 5-lobed, lower lobe or lip abruptly deflexed, saccate, contracted at the base. Stamens 4, deccinate; anther-cells confluent. Style subentire or 2-fid. Nutlets various.—Species 250, all American.

1. H. brevipes, Poit.; Bent. in DC. Prodr. xii. 107; erect, stem pilose or glabrate, leaves petioled ovate oblong or lanceolate serrate hispid above or glabrate, peduncles equalling the globose heads or shorter, bracts lanceolate, calyx pubescent, teeth erect subulate.

Malacca, Griffith; introduced. Singapore; Anderson.—Distrib. Mexico to Brazil, introduced into Tropical Africa and the Malay Archipelago.

An erect annual. Leaves 2–3 in. long, nerves beneath hispid or glabrous. Heads ¼ in. diam.; bracts often as long, inner and calyx ciliate. Corolla about equalling the calyx.

2. H. suaveolens, Poit.; Bent. in DC. Prodr. xii. 126; stem hairy, leaves petioled broadly ovate sinuate and serrate pubescent villous or tomentose lower cordate, peduncles racemose equalling the globose heads, bracts minute setaceous, calyx striate, mouth villous, teeth erect subulate. Bysteropegon graveolens, Blume Bijd. 821. Schauera graveolens, Hassk. in Flora, 1842, ii. Beibl. 25.

Deccan Peninsula, Cachar and Nicobar Islands; introduced.—Distrib. Trop. America, introduced into Trop. Asia.

A rigid annual, 2–3 ft. Leaves 1–3 in., very variable. Heads secund, fruiting ¼ in. long, sometimes reduced to a few flowers.

**11. LAVANDULA, Linn.**

Herb or shrub. Leaves entire or cut. Flowers in 2–10 fls. whorls


The Concan; hills at Sattara, Law, &c.

Stem 2-3 ft., robust, leafy. Leaves 4-8 in., lower petioled, lobes acute or obtuse. Spikes few, 1-2 in., robust; bracts villous, 1-fid., ½ in. Fruiting calyx 1 in. long.


Deccan Peninsula; common on the West from the Concan to Coorg. Central India; Jubbulpore, Beddome.

Stem 2-3 ft., stout or slender, simple or branched. Leaves 3-4 in. long and broad; segments ½-2 in. broad. Spikes solitary or few, or numerous and subumbellate; bracts 1-fid., nearly glabrous, tips capillary. Corolla blue or white. Fruiting calyx ½ in. long.

12. POGSTROMON, Desf.

Herbs or undershrubs. Leaves opposite, very rarely 3-nately whorled. Flowers small, in solitary or panicled spikes or contracted racemes formed of many and dense-fld. subcapitate cymes (whorls). Calyx subequally 4-5-toothed. Corolla-tube exserted or included; limb spreading, sub-2-lipped; lobes 4, lower usually longest. Stamens 4, exserted, straight or declinate, filaments usually bearded; anther-cells confluent. Disc subentire, equal. Style 2-fid. Nutlets smooth, ovoid or oblong.—Species about 30, Indian and E. Asiatic.

* Spikes or racemes terminal and axillary, forming a panicled inflorescence. Filaments bearded in all.

† Whorls forming continuous (rarely interrupted) spikes.


Tenasserim; Martaban and Tavoy, Wallich, &c. Pegu; McClelland. W. Deccan Peninsula, from the S. Concan to Travancore.
Pogostemon.

Stem 3—5 ft., rather flexuous. Leaves 3—5 in., very membranous; petiole short or long. Spikes 4—8 in.; whorls ½ in. diam.; bracts very variable, shorter or longer than the calyces, regularly cuneate and imbricate. Calyx ½—1 in. long, membranous; teeth variable in length.—P. comosus, *Miq.*, of Java, is very near this.


*Nilghir* *Mt.*; *Wynaad, Wight, Gardner.*

Very near *P. paniculatus*, but much stouter, more villous, leaves longer petioled, whorls denser, bracts much narrower, not so unilateral and regularly secund and imbricate, and calyx shorter with broader teeth.


Western Himalaya, from Nepal to Simla, alt. 1—5000 ft. Lower Bengal and Behar; Patna and top of Parsevath, *J. D. H.*, &c. The Concan, Canara and the Circars.

A large bush; branches round, often dark purple. Leaves 3—6 in., longer than the petiole. Panicule usually elongate, whorls distant or confluent, siliky villous. Calyx subcylindric, ½ in., silky, ciliolate. Corolla pink or white.—Roxburgh’s description of *Mentha fruticosa* agrees with this, but his drawing represents a different plant with glabrous filaments.

4. **P. villosus**, *Benth. Lab.* 153, and in *DC. Prodr.* xii. 152; stout, erect, villous all over, leaves large long-petioled ovate acute crenulate or sub-sinuate and crenate, whorls crowded in cylindric panicled stout spikes not secund, bracts ovate equalling the villous calyx, calyx silky or villous, teeth shortly lanceolate. *F. Elscholtzia villosa*, *Roxb.* Fl. Ind. iii. 4.

*Silhet; Wallich.*

There are two forms of this in Herb. Wallich, both with leaves 5—7 in. long and 2—4 broad; one is more robust with exactly ovate finely crenulate leaves; the other is more villous, and has broader sinuate and obscurely crenate leaves, and much more numerous denser and shorter branched panicles. In both the whors form continuous cylindric spikes 2—3 in. long and ½ in. diam. Calyx ½ in., sessile, narrow.

5. **P. purpurascens**, Dalz. *in* Hook. Kew Journ. ii. 337; erect, branched, softly villous with spreading hairs, leaves long-petioled large membranous ovate or ovate-lanceolate sinuate or cut and toothed or crenate, base narrowly cuneate, whors dense-fid. globose second continuous or separate in long peduncled hisrate spikes, bracts narrow falcate equalling the calyx ciliolate, calyx tubular, teeth long-subulate ciliolate. *Dalz. & Gibb.* Bomb. Fl. 207.

The Concan and Canara; *Law*, &c.

H-bit and villosity of *P. Gardeneri*, but the calyx-teeth are much longer and more slender. Stem 4-angled. Leaves sometimes 9 in. long. Spikes sometimes as long. Calyx ½ in. long. Corolla white, with purple upper lip.—Probably a large form of *P. parviflorus*.

6. **P. parviflorus**, *Benth.* in Wall. Pl. As. Rar. i. 31, Lab. 154, and


This most resembles a small P. plectranthoides, the bracts imbricating over the flowers in the young spikes, but spikes and narrower bracts are much smaller, and the whole plant when pubescent is never hairy. In its usual glabrous form it is a very distinct plant. The leaves vary much in shape and cutting of the margin, and attain 9 inches in length, and are sometimes velvety beneath. The stem and branches are usually dark purple, but not constantly. Calyx ½ in. long, narrow, usually purplish. It is difficult to distinguish some states of this from P. Heyneanus. Bentham says that his var. Jaquemontii is almost intermediate between P. parviflorus and glaber; it has more glabrous leaves and villous spikes.

7. P. glaber, Benth. in Wall. Pl. As. Rar. i. 31, Lab. 154, and in DC. Prodr. xii. 152; erect, branched, glabrous or sparsely hairy, leaves long-petioled ovate or ovate-lanceolate acuminate doubly-toothed or -serrated, whorls small subglobose dense-fld. continuous in slender ciliate spikes, bracts ovate much shorter than the very small calyx, calyx-teeth triangular shortly ciliate. Wall. Cat. 1533.

SUBTROPICAL HIMALAYA; Nepal, Wallich; Sikkim, alt. 1–3000 ft., J. D. H. Khasia Mts., alt. 4000 ft.; Griffith, J. D. H. & T. T.

Habit of P. parviflorus, but spikes more slender, bracts smaller, and calyx only ½ in. long, obovate, with shortly ciliate teeth. Stem and branches green or purple, sometimes very dark.

†† Whorls usually separate, forming interrupted spikes (except P. Patchouli, var. suavis).

8. P. tuberculatus, Benth. in Wall. Pl. As. Rar. i. 31, Lab. 154, and in DC. Prodr. xii. 152; stout, erect, branched, scabrid with stellate hairs, leaves long-petioled ovate or deltoid-ovate acuminate doubly toothed, base cuneate, whorls small subglobose many-fld. distant or separate on the long slender panicled spikes, bracts scabrid oblong shorter than the small scabrid obovate calyx, calyx-teeth short triangular ciliate.

TROPICAL HIMALAYA, alt. 1–5000 ft.; from Nepal, Wallich, to Bhutan, Clarke.


9. P. Patchouli, Pelletier in Mem. Soc. Sc. Orleans, v. 5, with fig.; erect, branched, pubescent or glabrate, leaves long-petioled ovate acute acuminate or obtuse crenate or simply or doubly toothed or incised, base cuneate, whorls subglobose many- and dense-fld. distinct or subconfluent on the slender pubescent or tomentose panicled spikes, calyx pubescent or tomentose, teeth triangular ciliate. Benth. in DC. Prodr. xi. 155; Dalz. & Gibbs. Bomb. Fl., Addend. 66. P. Heyneanus, Benth. in Wall. Pl. As. Rar. i. 31, Lab. 154, and in DC. l. c.; Wall. Cat. 1532; Grah. Cat. Bomb. Pl.
**Pogostemon.**

149; Dalz. & Gibs. Bomb. Fl. 207; Thwaites Enum. 239; Wight J. C. t. 1440.  

**Western Peninsula,** from Bombay southwards, wild and cultivated. **Ceylon,** common. (Malacca and Singapore, cult.)—**Distrih.** Sumatra and Borneo (cult.?).

A herb, 2-3 ft.; stem more or less softly hairy. **Leaves** 2-3 in., rarely more, subglabrous, membranous, sometimes incised; petiole ¼-1½ in. **Spikes** 3-6 in., rarely short and dense; whorls ½ in. diam., usually distant; bracts elliptic, acute, equaling the calyx or shorter. **Calyx** ¼ in., teeth acute. **Corolla** very small, tube shortly exserted.—Perhaps only a var. of **P. parviflorus.** A tracing of Pelletier’s figure kindly sent me by M. de Candolle enables me to identify **P. Heyneanus** with **P. Patchouli.** It is a common Indian garden plant, noted for its perfume, often much altered by cultivation.

**Var. suavis;** leaves larger more rounded 3 in. long and broad, margin lobulate and crenate, spike much broader, whorls ½ in. diam., calyx ¼ in. angular more pubescent, teeth subulate-lanceolate. **P. suavis,** Tenore in Giorn. Bot. Ital. (1847), f. 56. P. Patchouli, Hook. Kew Journ. Bot. i. 328, t. 11, exot. syn. Patcha-patt.; Wallich in Kew Journ. i. 22.—Cult. in Palermo and Kew Bot. Gardens.—This more resembles **parviflorus** in the shape of the calyx-teeth, but it has the scent of Patchouli.

10. **P. amaranthoides,** Benth. in DC. Prodr. xii. 153; glabrous or minutely pubescent, leaves ovate or oblong acuminate incised-serrate, whorls small few- or many-fl. separate or confluent on the long slender panicked spikes, bracts short, calyx small terete glabrous or hoary, teeth short triangular pubescent within, edges not ciliate but with finely pubescent margins.

**SiKKIM Himalaya,** alt. 5-6000 ft. **Khasia Mts.,** alt. 5–6000 ft.; Griffith, &c. A tall leafy herb. **Leaves** 3-6 in., serrate or biserate, membranous; petiole 1-2 in., slender. **Spikes** 2-6 in.; whorls ¼-½ in. diam.; bracts elliptic. **Calyx** ¼-½ in., campanulate, terete, more pubescent in the Khasia form. **Corolla** minute, white or pink. **Filaments** purple.—Flowers much smaller, and whole plant more glabrous than in its allies.

11. **P. elsholtzioides,** Benth. in DC. Prodr. xii. 153; erect, branched, stem above young parts and inflorescence hoary-tomentose, leaves petiolated lanceolate long-acuminate serrate glabrous, whorls small subsecund many-fl. separate or confluent in very slender spikes, calyx small terete hoary, teeth narrow subacute not ciliate.

**Bhotan,** Griffith. **Khasia Mts.,** Griffith; Churra, alt. 4000 ft., J. D. H. & T. T.  
Very leafy; stem and branches slender. **Leaves** 4-6 in., petiole rather short. **Spikes** 3-4 in.; whorls sometimes all secund, ½-¾ in. diam. **Calyx** ¼ in. long. **Corolla** very short, purple. **Filaments** sparingly hairy.—The very narrow leaves and small second hoary spikes well distinguish this.

**Spikes** or racemes simple, axillary and terminal or solitary.

† **Filaments** bearded.

12. **P. rupestris,** Benth. Lab. 156, and in DC. Prodr. xii. 154; glabrous, leaves small ovate or ovate-lanceolate coarsely obtusely serrate, racemes slender, whorls distant few-fl., bracts and bracteoles minute, calyx glabrous, teeth short ovate.

**Ceylon;** Central Province, alt. 5-8000 ft., Macrae, &c.

**Stem** 1-2 ft., often decumbent below. **Leaves** 1-1½ in., obtuse, base cuneate.
rounded or subcordate, brown when dry; petiole slender, $\frac{1}{2}$-$\frac{3}{4}$ in. *Racemes* 1-3 in.; whorls 3-5-fl'd. *Calyx* $\frac{1}{2}$ in. long. *Corolla* minute.


Ceylon; Central Province, alt. 5-7000 ft., Maora, &c.

*Stem* 1-2 ft., branched, decumbent and rooting below. *Leaves* 1-2 in., hairy above and on the nerves beneath, base rounded or acute; petiole $\frac{1}{4}$-$\frac{2}{3}$ in. Spikes usually sessile and dense-fl'd., $\frac{1}{2}$ in. diam., hirsute. *Calyx* $\frac{1}{4}$ in. long, inflated. *Corolla* minute.—Thwaites regards this as a var. of *P. rupestris*, but this must be through inadvertence.

14. **P. paludosus**, *Benth. in DC. Prodr.* xii. 154; stem sparingly pubescent or glabrate, leaves rounded-ovate obtuse coarsely crenate, base rounded, spike strict stiff, whorls small remote few-fl'd., bracts and bracteoles minute, calyx terete hispid, teeth triangular subacute ciliate.

Nilgiri Hills; Octamacund, *Perrottet, Wight*.

*Stem* stiff, erect. *Leaves* 2 in. long, and nearly as broad, sparingly hairy above and on the nerves beneath; petiole $\frac{1}{2}$-$\frac{3}{4}$ in. slender. *Spikes* 3-5 in., rachis and calyces hispid with spreading hairs; whorls $\frac{1}{4}$ in. diam. *Calyx* $\frac{1}{4}$ in. long.—I have seen only indifferent specimens gathered by Wight.

15. **P. fraternus**, *Miquel Fl. Ind. Bat.* ii. 963; much branched, branches above and racemes glandular-tomentose or hirsute, leaves ovate singly or doubly crenate or serrate, racemes terminating all the branches elongate, whorls distinct many-fl'd., bracts and bracteoles linear, calyx pedicelled hirsute, teeth long lanceolate ciliate. *Pogostemon* n. 28, *Herb. Ind. Or. H. f. & T*.

Sikkim Himalaya, alt. 3-5000 ft.; *J. D. H., Clarke. Khasia Mts.; Lobbi. Tenasserim; Beddome.—District. Java*.

*Stem* 2-3 ft.; branches straggling. *Leaves* 2-4$\frac{1}{4}$ in., base acute rounded or cor- date; petiole sometimes as long as the blade. *Racemes* 3-6 in. long, nearly $\frac{1}{2}$ in. diam.; whorls close but distinct; bracts and bracteoles often as long as the flowers, but very variable; pedicel sometimes as long as the calyx, which is $\frac{1}{3}$ in. long or less and angled. *Corolla* funnel-shaped, twice as long as the calyx.—Miquel describes the filaments as glabrous in the Javan plant; they are hairy towards the base in the Indian.


Nilgiri and Anamallay Mts., *Wight, &c.*, in wet places.

Branches suberect or spreading, stout. *Leaves* 1-2 in., base rarely subcordate; petiole half as long as the blade. *Spikes* 2-4 in., very stout, $\frac{1}{2}$ in. diam.; lowest whorls sometimes remote. *Calyx* $\frac{1}{4}$ in. long, sessile. *Corolla* tube very short.—Two specimens were amongst the Concan collections of Stocks, but I suspect were from the south.

17. **P. mollis**, *Benth. Lab.* 155, and in *DC. Prodr.* xii. 154; villous,
softly tomentose or finely pubescent, leaves shortly petioled orbicular or oblong, crenate, tip rounded, spikes cylindric dense-fld., whorls crowded or the lowest distant, bracts and bracteoles slender, calyx small sessile terete villous, teeth subulate-lanceolate ciliate. \textit{P. rotundatus}, \textit{Wight} \textit{Lc. t. 1441}.

\textbf{Nilgiri Hills}; common on outskirts of forests, alt. 7–8000 ft., \textit{Wight}, \&c. The \textit{Concan} ; Dalzell, \textit{Stocks}.

A low-growing plant, very variable in hairiness, branched from the woody base; hairs of branches not reflexed. \textit{Leaves} 1–1\(\frac{1}{2}\) in. \textit{Spikes} 3–7 in., \(\frac{1}{2}\) in. diam., flexuose, rachis stout. \textit{Calyx} \(\frac{1}{2}\) in. \textit{Corolla} white, tube hardly exerted. \textit{Filaments} bearded at the middle.—I do not find the leaves to be acute, as represented by \textit{Wight}, in any of the numerous specimens examined.


\textbf{Deccan Peninsula}; \textit{Heyne}.

\textit{Stem} short, ascending, hairs not reflexed. \textit{Leaves} 1–2\(\frac{1}{2}\) in. long and broad, laxly hairy on both surfaces; petiole 1 in. and less. \textit{Spikes} 3–5 in., \(\frac{3}{4}\) in. diam., rachis stout. \textit{Calyx} sessile, \(\frac{1}{2}\) in. long. \textit{Corolla}–	extit{tube} hardly exceeding the calyx. \textit{Filaments} bearded.—Only known from specimens distributed by \textit{Wallich}. In foliage it much resembles the \textit{P. Patchouli} figured in the \textit{Kew Journal} of Botany, but the calyx is much larger, with broader teeth and the corolla-tube shorter, and there is no appearance of a paniculate form of inflorescence.


\textbf{Deccan Peninsula}, \textit{Heyne} ; Paul Ghant, \textit{Wight}.

A low species; branches stout, terete, often bearing tufts of long soft shaggy or silky hairs. \textit{Leaves} 1–1\(\frac{1}{2}\) in., nerves beneath very thick, surfaces equally woolly; petiole stout, \(\frac{1}{2}-\frac{3}{4}\) in. \textit{Spikes} 2–4 in., \(\frac{3}{4}-\frac{1}{2}\) in. diam. \textit{Calyx} \(\frac{1}{2}\) in. long and upwards, teeth woolly not ciliate. \textit{Corolla}–	extit{tube} a little longer than the calyx. \textit{Filaments} bearded in the middle.


\textbf{Khasia Mts.}, alt. 4–5000 ft.; \textit{Wallich}, \&c.

\textit{Stem} 2–3 ft.; branches erect. \textit{Leaves} sometimes ternately whorled, 2–3 in., narrowed into the very short stout petiole. \textit{Spikes} 3–5 in., \(\frac{1}{2}\) in. diam., rachis stout. \textit{Calyx} \(\frac{1}{2}\) in. sessile. \textit{Corolla} very small, tube hardly exerted, lobes sparingly hairy. \textit{Filaments} \(\frac{1}{2}\) in., bearded in the middle.

\textit{††} \textit{Filaments} naked or nearly so.

21. \textbf{P. atropurpureus}, \textit{Benth.} in \textit{DC. Prodr.} xii. 154; shrubby, densely velvety, leaves thick stoutly petioled ovate subacute doubly crenulate, spikes with the rachis very stout, whorls crowded few-fld., bracts and
bracteoles minute setaceous, calyx terete tubular velvety, lobes short triangular obtuse ciliate. P. imberbe, Wight mss.

**Nilgiri Hills;** Perrottet, Wight, Gardner.


22. **P. speciosus,** Benth. in Wall. Pl. As. Rar. i. 31, Lab. 156, and in DC. Prodr. xii. 155; branches above petioles and spikes hisrute with long spreading and glandular hairs, leaves large long-petioled broadly ovate doubly crenate, base rounded or cordate, spikes stout dense, whorls confluent, bracts minute, calyx tubular angled glabrous or sparsely hairy, teeth subulate ciliate or not. *Wall. Cat.* 2328; *Wight* l.c. t. 1443.

**Nilgiri and Anamallay Hills;** on the outskirts of woods, alt. 7–8000 ft.

Stem 2–3 ft., woody. Leaves 2–3 in., sometimes nearly as broad, sparsely hairy above and beneath; petiole 1–1½ in. *Spikes* 3–5 in. by 1 in. or less. *Calyx* sessile, membranous, ¾ in. and under, teeth very narrow. *Corolla* tube not exserted. Filaments ½ in., glabrous.

23. **P. travancoricus,** Beddome l.c. Pl. Ind. Or. t. 159; quite glabrous, leaves long-petioled ovate doubly crenate subacute, base rounded or cuneate, racemes lax-fld., flowers pedicelled reflexed, whorls few-fld., bracts minute or 0, calyx terete glabrous, teeth triangular not ciliate.

**Travancore;** Travancory Ghat, alt. 4000 ft., Beddome.


24. **P. reflexus,** Benth. in DC. Prodr. xii. 155; branches stout densely shortly tomentose with reflexed hairs, leaves long-petioled ovate or ovate-cordate subacute doubly crenate, spikes villous dense-fld., whorls confluent or lower distinct, bracts minute, flowers sessile spreading or reflexed, calyx densely hirsute or villous terete, teeth triangular-subulate ciliate.

**Ceylon;** higher parts of the island, alt. 5000 ft., Mackenzie, Walker, &c.


25. **P. brachystachys,** Benth. in DC. Prodr. xii. 156; low, procumbent below, much branched, branches pubescent with reflexed hairs, leaves small ovate subacute doubly crenate hirsute or finely tomentose, spikes narrow dense villous, whorls confluent or the lower separate, bracts minute linear, calyx minute hirsute or hispid, teeth subulate ciliate.

**Khasia Mts.,** alt. 4–6000 ft.; Griffith, Mack, &c. Assam; Naga Hills to N. Burma, Griffith.

A low, straggling, much-branched species, procumbent and rooting below, variable in hairiness. Leaves 1–2 in., very variable in form, rarely oblong-lanceolate. *Spikes* 1–4 in., narrow, very dense-fld. *Calyx* sessile, ½ in. *Corolla* very small, dull purple; tube hardly exserted; lobes hirsute. Filaments ½ in., glabrous or nearly so.—The specific name is not very appropriate.

13. **Dysophylla,** Blume.

Herbs. Leaves opposite or whorled. Flowers minute, in very dense long spikes formed of many- and dense-fld. cymes (whorls). *Calyx* very
minute, ovoid, equal, 5-toothed, throat naked within. *Corolla* minute, tube exserted or included; limb equally 4-fid; upper lobe entire or 2-fid, lower spreading. *Stamens* 4, exserted, straight or subdenticate; filaments very long, bearded; anther-cells confluent. *Disc* equal, subentire. *Style* 2-fid. *Nutlets* smooth or rough, ovoid or oblong.—Species about 12, Tropical Asiatic and Australasian.

* Calyx-tube terete or obscurely angled.

† Leaves opposite.


**Deccan Peninsula**, Heyne, Wright; Bababoodan Hills and Copper Mts., Bellary, Law, Stocks.

*Stem* erect, 8–12 in., from a large woody rootstock, terete. *Leaves* 1–1\(\frac{1}{2}\) by \(\frac{3}{4}\) in., thick, siliky pubescent on both surfaces. *Spikes* very slender, shortly pedunculated, flexuous. *Calyx* \(\frac{3}{4}\) in., densely tomentose, fruiting hardly enlarged, teeth erect in fruit. *Corolla* minute, glabrous; tube included. *Nutlets* ellipsoid, compressed, granulate.—Bentham's var. bracteata is founded on a young spike with the bracts protruded.


**Deccan Peninsula**; Mountains of Tinnevelly, Beddome; at Pallamotha, Heyne.

Very closely allied to *D. myosuroides*, and confounded with it by Wallich and Bentham; of the same size and habit, but not at all silky; form of leaves the same, but nerves more spreading, spikes much shorter and thicker.—Heyne seems to have distinguished the two from the names quoted by Wallich, of which that of *M. rugosa* is attached to a specimen in Rottler's Herbarium, no doubt collected by Heyne himself.

3. **D. salicifolia**, Dalz. mss.; stem and young leaves appressedly pubescent or silky, leaves sessile or petiolate linear-lanceolate subentire or remotely serratate, spikes slender 2–4 in. villous, calyx villous short, teeth triangular almost equalling the tube. *Dysophylla* sp. 3, Herb. Ind. Or. H. f. & T.

**The Cunca**; Mahaleshwur Hills, Gibson; Hingregea Watercourse, Belgaum, Ritchie; Bombay, Dalzell.

*Stem* 1–2 ft., much branched; branches slender, erect, woody. *Leaves* 1–2\(\frac{1}{2}\) in., rather membranous. *Spikes* \(\frac{1}{4}\)–\(\frac{3}{4}\) in. diam., on slender peduncles; whors confluent. *Calyx* in fruit \(\frac{3}{4}\) in., with erect teeth. *Corolla-tube* exserted, lobes sparsely hairy. *Nutlets* ellipsoid, obtusely 3-lobed, shining.

From Sikkim and Assam through E. Bengal to Penang and Singapore. Deccan Peninsula, from Goa southwards. Ceylon.—Distrib. East to S. China, Borneo and the Philippines.

A coarse annual, 1–2 ft.; hairs often shaggy, spreading. Leaves 1–3 in., acute or obtuse; petiole rarely ½ in. Spikes ½–1 in. diam., pedicelled; whorls all con fluent. Calyx not ⅔ in., enlarged in fruit. Corolla ⅔ in., usually pink; tube slender, fur exerted; lobes hairy. Filaments very villous. Nutlets ellipsoid, nearly smooth.—Some very villous specimens from S. India and Ceylon have stouter spikes and white flowers, and may prove to belong to a distinct form.

† Leaves in whorls of three or four (rarely more).


Khasia Mts.; on rocks by streams, alt. 3–6000 ft. Chittagong, alt. 300 ft., Clarke, to Tenasserim, Wallich. South Canare; on dry rocks, Malwar, Dalzell, &c., from the Ciboer and Concan to Mysoor and the Amamally Hills, Heyne, &c.; Amamallys, Beddome.

A stout undershrub, 2–4 ft., with a woody rootstock; stem simple or branched. Leaves very variable, 1–4 by ¼–½ in.; petiole very short. Spikes 4–8 in., ¼–½ in. diam. Calyx sometimes glabrose, teeth triangular.—Order of chasmomile (Dalzellii).


7. D. linearis, Benth. in DC. Prodr. xii. 157; annual, stem erect simple and leaves sparsely hairy or glabrate, leaves sessile 4 in a whorl linear or linear-lanceolate obtuse, margins revolute or sparingly toothed, spikes short, calyx glabrous.

Khasia Hills, alt. 4–6000 ft., in swamps and rice-fields; Mack, H. f. & T., Clarke.

Habit of D. cruciata, but nearly glabrous, with very different spikes, ½–2 in. long and 1–2½ broad, and corolla and nutlets twice as large.

8. D. verticillata, Benth. in Wall. Pl. As. Rar. i. 30, and Lab. 159, and in DC. Prodr. xii. 157; annual, erect, branched, glabrous or very sparsely hairy, leaves 4–10 in a whorl linear quite entire or obscurely toothed, spikes sometimes whorled tomentose or villous, teeth of fruiting calyx stellately spreading. Wall. Cat. 1544; Thouret’s Enum. 289, excl. syn. D. ramosissima, Benthamiana.

Bengal, Silhet, Rangoon and Tenasserim, in swamps and rice-fields. Ceylon; Rottler, Thwaites.—Distribution. Malay Archipelago, China, Philippine Islands, Australia.

Very variable, sometimes 2 ft. high, excessively branched, with stem as thick as the thumb, at others very slender (var. ? gracilis, Benth.), subsimple, with stem as thick as a crow-quot; branches erect. Leaves 1–3 in., rarely \( \frac{1}{4} \) in. diam., spreading and deflexed. Spikes 1–3 in., \( \frac{1}{4} \) in. diam. Calyx very conspicuous in fruit from the spreading teeth.

9. D. crassicaulis, Benth. in Wall. Pl. As. Rav. i. 30, Lab. 159, and in DC. Prodr. xii. 158; annual, glabrous, decumbent below, leaves 4–6 in a whorl sessile linear or linear-oblong or - lanceolate obtuse subentire or serrate, spikes elongate glabrate or pubescent, calyx campanulate, teeth erect or conniving in fruit. Wall. Cat. 1545.

N.W. Himalaya, in swamps; Kashmir, Chumba and Kulu, alt. 2–4000 ft; Jacquotets, Thomson, Clarke. Sikkim; Herb. Griffith, J. D. H. Bengal; Assam, Silhet and Khasia Mts., Wallich, &c. Very similar to D. verticillata, and similarly variable, best distinguished by the larger flowers, more glabrous calyx with teeth that do not spread stellately. Leaves rounded subcordate or acute at the base, very variable in breadth. Bracts oblanceolate. Calyx \( \frac{1}{4} \) in., lobes triangular, fruiting \( \frac{1}{2} \) in. Corolla-tube exserted, lobes nearly glabrous. Nutlets very small, orbicular, compressed, pale, shining.


10. D. Helferi, Hook. f.; annual, dwarf, erect, glabrous, leaves few 4 in a whorl sessile linear or oblong serrate, spikes short pubescent, calyx-teeth lanceolate erect in fruit.

Tenasserim; East Pagoda, Helfer.

Stem a span high and under, very slender; branches slender, spreading. Leaves \( \frac{1}{2} \)–1 in. Spikes \( \frac{1}{2} \)–1\( \frac{1}{4} \) in.; bracts minute, linear-lanceolate. Calyx (fruiting) \( \frac{1}{8} \) in., campanulate, membranous, sparsely pubescent. Corolla not seen. Nutlets very minute, orbicular-oblong, dark chestnut, shining.

††† Annuals. Leaves in whorls of 5 or more, sessile, very narrow, quite entire (see also sp. 5, 8 and 9).

11. D. stellata, Benth. in Wall. Pl. As. Rav. i. 30, Lab. 159, and in DC. Prodr. xii. 158; stem decumbent or creeping below much branched, branches short densely leafy hairy, internodes very short, leaves many in a whorl very short narrowly linear obtuse, margins revolute, spikes slender tomentose, bracts linear or clavellate equalling the flowers, flowering calyx \( \frac{1}{2} \) in. hemispheric, teeth short erect or incurved in fruit. Wall. Cat. 1542; Bot. Reg. 1845, t. 23; Grah. Cat. Bomb. Pl. 150; Dalz. & Gibbs. Bomb. Fl. 209. Mentha stellata, Ham. in Roxb. Fl. Ind. iii. 5. M. malabarica, Herb. Hayne.

Decan Peninsula; from Belgaum southwards, in rice-fields.

Branches numerous, ascending, flexuous, stout, leafy to the base with close-set whorls. Leaves \( \frac{1}{2} \)–1 in., rarely \( \frac{1}{8} \) in. broad, base obtuse, upper often pubescent. Spikes 1–2 in., \( \frac{1}{8} \)–\( \frac{1}{4} \) in. diam., bracteoles filiform or clavellate. Calyx \( \frac{1}{2} \)–1 in., cupular or obconic, very variable, a little enlarged in fruit. Corolla-tube very short, lobes hisrate. Nutlets very small, shining.—The differences between the extreme
forms of fruiting calyx are great, and possibly indicate two species; in some specimens it is almost campanulate with erect teeth, in others almost globose with incurved teeth.

12. **D. tomentosa**, Dalz. in Hook. Kew Journ. ii. 337; stout, erect, branched, softly pubescent all over with long hairs, internodes very short, leaves many in a whorl linear obtuse, margins revolute, spikes stout villous, bracts equaling the flowers linear, flowering calyx \( \frac{1}{2} \) in. subcampanulate. *Dalsz. & Gibs. Bomb. Fl. 208.*

**Southern Concan; Malwar, in rice-fields, Dalzell.**

Probably a large hairy state of *D. stellata*, with spikes \( \frac{1}{2} \) in. diam. Young specimens are decumbent, old and large ones have the habit of *D. Stocksii* and *pentagona*.

13. **D. gracilis**, Dalz. in Hook. Kew Journ. ii. 377; stem erect stout or slender hairy or glabrate, internodes very short, leaves sessile 5–20 in a whorl narrowly linear obtuse, or subacute; glabrous or hoary, margins revolute quite entire, spikes 1–2 in. slender villous, bracts equaling the flowers filiform, calyx \( \frac{3}{8} \) in. campanulate hemispheric and hardly enlarged in fruit with erect teeth. *Dalsz. & Gibs. Bomb. Fl. 208.*

**Decan Peninsula; Sihadree Hills, near Phunda Ghat, Ritchie, Dalzell.**

Very near *D. tomentosa*, with which it agrees in habit, but the spikes are more slender, and the calyx much smaller. The form of the bracts affords an inconstant character in this and in *D. stellata*, of which I suspect this is only a tall form. *Stem 2–3 ft., sometimes as thick as a swan’s quill. Leaves \( \frac{1}{4} – \frac{1}{2} \) in., often recurved. Spikes \( \frac{1}{2} \) in. diam. Calyx densely villous.—I do not find the toothing of the leaves described by Dalzell.*


**Southern Concan; margins of swamps, Malwar, Dalzell.**

This is hardly distinguishable from *D. gracilis*. Dalzell’s specimens (named by himself) are of two forms; one from very wet places has nearly simple flexuous stems, almost capillary lower leaves (evidently immersed), and linear obtuse glabrous upper ones \( \frac{1}{2} \) in. long, in whorls of about 12; the other, from drier places, is shorter, more robust, much branched, with scaberulous leaves 4–8 in a whorl, and spikes exactly like *D. stellata*, of which I suspect the species is a form.

**Calyx-tube deeply 5-grooved, with 5 elevated ridges (all annuals, with sessile quite entire leaves).**

15. **D. pentagona**, Clarke mss.; slender, erect, nearly glabrous, leaves 4 in a whorl linear obtuse, spikes slender pubescent, calyx densely pubescent all over, angles obtuse, mouth closed by the minute obtuse teeth.

**Chota Nagpore; at Songboon, alt. 2000 ft., Clarke.**

*Stem 12–18 in., branches suberect. Leaves 1–1\( \frac{1}{2} \) in., erecto-patent, base obtuse or acute. Spikes 2–3 in., \( \frac{1}{2} – \frac{1}{4} \) in. diam.; rachis hirsute; bracts linear. Fruiting calyx \( \frac{1}{4} \) in., nearly globose, pointed at either end; angles or wings thick. Nutlet solitary, linear-oblong, completely enveloped by the calyx-tube.*

Orissa; at Sumbulpore, Griffith.

Habit and foliage of D. pentagona, but calyx very different, fruiting about \( \frac{1}{4} \) in., chestnut brown and shining below, crowned with white bearded lobes. *Nutlets* 4, minute suborbicular.

17. **D. Stocksii**, Hook. f.; very stout, erect, nearly glabrous, leaves 9–20 in. a whorl narrowly linear obtuse, margins recurved, spikes slender, fruiting calyx densely pubescent all over, angles acute, mouth closed by the minute obtuse teeth.

The **Concan**; Stocks.

Stem as thick as a goose-quill, decumbent and closely annulate below, branches suberect. *Leaves* \( \frac{1}{4}–\frac{3}{4} \) by \( \frac{1}{8}–\frac{1}{2} \) in., spreading. *Spikes* 2–3 in. by \( \frac{1}{4}–\frac{1}{4} \) in. diam.; rachis hairy; bracts filiform, tips clavellate. *Calyx* \( \frac{1}{4} \) in., lobes as long as the tube, obtuse, **Corolla-tube** very short; lobes nearly glabrous. *Fruiting calyx* \( \frac{1}{4} \) in., very concave between the angles. *Nutlet* solitary enclosed as in *D. pentagona*.


**Sutropical Himalaya**; from the Salt range and Peshawur to Sikim, alt. 1–4000 ft. Behar, Central India and the Deccan Peninsula to Travancore. Tenasserim; Helder.

Shrub, 5-10 ft. high; trunk stout; branches stout, terete, often whorled in threes. *Leaves* 4–8 in.; petiole stout, \( \frac{1}{4}–\frac{1}{2} \) in. *Spikes* very numerous, 2–4 in. long, flowering \( \frac{1}{4} \) in. diam., fruiting \( \frac{3}{4} \) in. *Calyx* very minute, teeth in fruit \( \frac{1}{4} \) in., tube deeply grooved, villous. **Corolla** white.

15. **ELSHOLTZIA**, Willd.

Herbs or undershrubs. *Leaves* opposite. *Whorls* in simple or panicled slender or stout terete or secund spikes; flowers minute; bracts various. *Calyx* 5-toothed, throat naked, fruiting erect often enlarged or inflated. **Corolla** small, tube straight or incurved; limb oblique or sub-2-lipped, 4-fld, upper lobe or lip erect, notched, the others spreading. *Stamens* 4, diverging or distant, filaments naked; anther-cells divaricate, or at length confluent. **Disk** much produced behind the ovary. *Style* subequally 2-fld, lobes subulate. *Nutlets* smooth or tubercled.—Species about 20, Temperate and Tropical Asiatic and Malayan, one of them also European.

* Spikes panicled, cylindric or subsecund; bracts narrow, linear subulate or acicular. *Nutlets* shining. Aphanochilus, Benth.

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1. **E. flava**, Benth. Lab. 161, and in DC. Prodr. xii. 160; tall,
branches and petioles scaberulous, leaves large long-petioled ovate or rhombic-ovate caudate-acuminate toothed, spikes stout terete puberulous, corolla-tube twice as long as the calyx, fruiting calyx ¼ in. pedicelled tubular inflated below, teeth erect. Aphanochilus flavus, Benth. in Wall. Pl. As. Rar. i. 28, t. 34, and Cat. 1553.

Temperate Himalaya; from Kumaon to Nepal, alt. 5–9500 ft. Khasia Mts., alt. 5–6000 ft.


Temperate Himalaya; from Kashmir to Sikkim, alt. 7–9000 ft., Wallich, &c. Khasia Mts., alt. 4–5500 ft., Griffith, &c.

An annual bush, 3–4 ft.; branches obscurely 4-angled. Leaves 3–6 in., rather rigid, base acute, sometimes deeply toothed or crenate. Spikes 4–10 in., often fascicled, flowering ½ in. diam., narrower in fruit; bracts minute. Corolla white, pubescent. Fruitng calyx ribbed to the base, with short triangular acute teeth. Nutlets narrow.—Bentham cites Don’s Perilla fruticosa, but his description of the calyx with linear teeth and corolla with a very large midlobe of the lower lip is wholly at variance. Graham (Cat. Bomb. Pl. 150) gives “Chibler in the Surat collectorate as a habitat,” which is very unlikely, and is not taken up in Dalzell and Gibson’s Bombay Flora.

3. E. Thompsoni, Hook. f.; stout, densely tomentose, leaves sub-sessile lanceolate acuminate serrate, spikes leafy interrupted, corolla-tube shortly exserted, fruiting calyx ¼ in. pedicelled tubular straight woolly, teeth spreading.

Oudh; at Gadnghat, R. Thompson.


4. Beddomei, Clarke mss.; hoary-tomentose, branches slender, leaves shortly petioled narrowly oblong-lanceolate obtuse crenulate, hoary on both surfaces, spikes long slender terete white-villous interrupted, corolla tomentose, tube incurved twice as long as the calyx.

Tensassrim; Thongyeen forests, Beddome.

Shrubby? Branches nearly terete. Leaves 2–3 by ½–1 in., rather thick, base entire narrowed into the petiole. Spikes 3–4 in., ½ in. diam., very white; bracts minute, lanceolate; flowers ½ in. long, sessile. Calyx-teeth lanceolate; fruiting not seen.

5. E. blanda, Benth. Lab. 162, and in DC. Prodr. xii. 160; slender, puberulous or hoary, leaves petioled elliptic-lanceolate acuminate serrate, spikes slender panicked one-sided, corolla-tube short, fruiting calyx t t 2

**CENTRAL and EASTERN HIMALAYA;** Nepal, Wallich; Sikkim, alt. 3–7500 ft., *J. D. H., &c.* *Khasia Mts., alt. 2–6000 ft., De Silva, &c.* Tenasserim, Beddome. —DISTRIB. Ava, Sumatra.

Bushy, 2–5 ft. high; branches slender, obtusely 4-angled. Leaves 1–4 in.; petiole short. *Spikes* 2–5 in., flowering ⅙ in. diam., fruiting broader, whorls lax or dense; bracts subulate-lanceolate. *Corolla* white, sparingly pubescent. Fruiting *calyx* short, mouth contracted. *Nutlets* broadly ellipsoid.—Bentham refers Don's *Perilla elata* to this, but the description of the leaves "scabrid above, tomentose beneath," does not agree. He also quotes "Arabia" on Forsköl's authority as a habitat, which is most improbable.


**TEMPERATE and SUBTROPICAL HIMALAYA;** often in cultivated fields, from Kishmir to Misbni, alt. 3–5000 ft. *Chittagong; Roxburgh.* —DISTRIB. Ava.

A tender herb, 1–3 ft. branches 4-gonous. Leaves 1–2 in., membranous, base entire, cuneate, produced into the slender petiole, which is as long as the blade. *Spikes* panicled, 4–6 in., flowering ⅝ in. diam., fruiting ⅝ in.; bracts setaceous, often exceeding the flowers. *Corolla* minute, tube short, lobes glabrous, *Nutlets* ellipsoid.

VAR. ? major; tall very stout, stem with soft spreading hairs, fruiting spikes very stout, ⅜ in. diam., fruiting calyx ⅝–nearly ⅜ in.—Kumaon, near Dol, alt. 6500 ft., Strachey. Sikkim, at Ryan, alt. 6000 ft., Clarke.—I have seen only fruiting branches.

7. *E. Griffithii,* *Hook.* ʃ; hoary-pubescent, leaves short-petioled lanceolate subacute, spikes short terete dense-fld., calyx in flower narrow, teeth lanceolate, 2 upper much the longest.

**UPPER ASSAM;** Mishmi Hills, Griffith.

Habit of *E. incisa,* but leaves rigid, ⅔ by ⅔ in., narrowed into a petiole not one-third the length of the blade. *Spikes* 1–2 in., flowering ⅓ in. diam., very dense-fld.; bracts setaceous, exceeding the flowers. *Corolla* hoary-pubescent; fruiting not seen. *Corolla-tube* twice as long as the calyx, lobes pubescent.


**TEMPERATE HIMALAYA;** from Kumaon to Sikkim, alt. 5–7000 ft., Wallich, &c. *Khasia Mts., alt. 4–6000 ft.*

A coarse herb, 1–2 ft.; stem stout or slender, hairs flaccid. Leaves 1–2 by ⅘ in., membranous, base cuneate; petiole ⅓–⅛ in. *Spikes* 1–⅔ in., stout both in flower and fruit, hispid, very dense-fld.; bracts rigid, with a stout pale midrib. *Calyx-teeth* very unequal. *Corolla* minute, lobes hairy.
**Bracts rounded or broadly ovate, very short. Nutlets opaque.**


**Western Himalaya and Western Tibet**; from Kumaon to Ladak, alt. 10-13,000 ft., *Jacquemont*, &c.

Annual, 6-18 in., branched from the base; stem slender to very stout, 4-angled. Leaves 1-3 in., rarely ovate or elliptic; petiole ⅓-½ in. *Spikes* 1-1½ in., or more and interrupted, fruiting ⅓-⅔ in. broad; bracts shorter than the flowers. *Calyx*, flowering very minute, cupular; fruiting greatly enlarged. *Corolla* minute, villous, lilac, tube very short. *Nutlets* ⅛ in. long, ellipsoid, opaque.


**Alpine Himalaya**; from Kumaon, alt. 10-12,000 ft., *Blinkworth*, &c., Nepal, *Wallich*, to Sikkim, alt. 14-16,000 ft., *J. D. H.*


**Var. pusilla**; dwarf, 3-6 in., stem usually simple, leaves ½-⅔ in., fruiting calyx smaller. *E. pusilla*, Benth. Lab. 714, and in DC. Prodr. xii. 162.—Interior Himalayas; from Sikkim to W. Tibet, alt. 12-16,000 ft., and to 18,000 ft. in Rumthu, *Stolitska*.

***Spikes cylindrical; bracts broad, obcuneate, membranous, ciliate, forming together imbricating cups longer than the calyx. CYCLOSTIGIA, Benth.***

11. **E. strobilifera**, Benth. Lab. 163, and in DC. Prodr. xii. 162; sparsely hairy, leaves small petioled ovate obtuse crenulate or serrate, spikes villous or pubescent. *Cyclostigia strobilifera*, Benth. in Wall. Pl. As. Rar. i. 30, excl. syn., and *Cat. 1562*.

**Temperate and Alpine Himalaya**; from Simla, alt. 5-10,000 ft., to Sikkim, alt. 6-14,000 ft.

Very variable, from a simple filiform stem 2 in. high, to a much-branched herb of 18 in.; stem and branches with a line of crisp hairs. Leaves ½-1 in., rarely ovate and coarsely serrate; petiole ⅛-½ in. *Spikes* ½-2 in., fruiting sometimes ⅓ in. in. diam.; bracts imbricating all round the spike very broad, margin semicircular. *Calyx* hyaline, narrow-tubular, fruiting ¾ in., teeth lanceolate. *Corolla* tube very slender, much longer than the calyx, lobes minute glabrous. *Nutlets* ⅛ in., oblong, red-brown, not aching.

****Spikes completely one-sided; bracts large, secund, orbicular, cuspidate, closely imbricate, membranous, ciliate. ELSHOLTZIA, Willd.***

12. **E. cristata**, Willd. Sp. Pl. iii. 29; nearly glabrous, leaves long-petioled ovate- or elliptic-lanceolate acuminate coarsely serrate, spikes broad pubescent or villous, fruiting calyx ¼ in. tubular hairy. *Benth. in Wall.*
**Pl. As. Rar.** i. 29, and **Cat.** 1560; **Lab.** 164, and in **DC. Prodr.** xii. 163; **Bot. Mag.** t. 2560. Mentha ovata, **Cav.** Tc. 36, t. 360, f. 1. Hyssopus ocymifolius, **Lamk. Dict.** iii. 187. Perilla polystachya, **Don Prodr.** 115.

**TEMPERATE and TROPICAL HIMALAYA;** from Kashmir to Mishmi, alt. 1–9000 ft. **Western Tibet,** alt. 9–11,000 ft. (Nilghiris, introduced.)—DISTRIBUTION. N. Europe, N. Asia, China, Japan.

An erect fragrant herb, very variable in size, from 6 in. to 2 ft.; stem simple or branched. **Leaves** 1–3 in., membranous, base cuneate; petiole half as long as the blade or more. **Spikes** 1–3 in., fruiting ½ in. diam. or less, rather villous; bracts shortly petioled, cuspia aciculair. **Calyx** minute in flower, in fruit vesicular, teeth triangular. **Corolla** pink or purplish, tube exserted, curved; limb villous. **Nutlets** ½ in., oblong, smooth.—Some N. Chinese specimens are almost woolly.

**DOUBTFUL SPECIES.**

E. LEPTOSTACHYA, Benth. **Lab.** 713, and in **DC. Prodr.** xii. 160; **Cambess. in Jacqum. Voy. Bot.** 128, t. 32, from Kashmir (Jacquemont). I have seen no specimens. Benthem compares it with E. polystachya, from which the extremely slender spike distinguishes it, as do the distant whorls, and leaves contracted above the base. Is it an Elsholtzia?

16. **PERILLA,** Linn.

Herbs. **Leaves** opposite. **Whorls** 2-fld., in second axillary and terminal simple or panicked racemes; flowers and bracts small. **Calyx** campanulate, 5-toothed; fruiting greatly enlarged, 2-lipped, base gibbous, upper lip dilated 3-toothed, lower of 2 lanceolate-subulate teeth. **Corolla-tube** short, throat bell-shaped, 5-fld. **Stamens** 4, subequal, erect, distant, hardly exserted; anther-cells distinct, parallel, at length diverging. **Disk** a large posticos gland. **Style** equally 2-fld. **Nutlets** subglobe, coarsely reticulate.—Species 1 (or 2), Eastern Asiatic.


**TROPICAL and TEMPERATE HIMALAYA;** from Kashmir to Bhotan, alt. 1–10,000 ft., common, often cultivated. **Khasia Mts.** alt. 3–6000 ft.—DISTRIBUTION. Burma, China, Japan.

A coarse aromatic often shaggy annual, 2–4 ft. **Leaves** 3–6 in., ovate or rounded, obtuse toothed serrate or coarsely crenate; petiole 1–3 in. **Racemes** 3–8 in., erect; bracts lanceolate. **Corolla** white, ½ in. **Fruiting calyx** ¼–½ in., **Nutlets** ½ in.—Some Japan specimens are nearly glabrous; others have fruiting calyx ¼ in., and nutlets nearly ½ in.

**DOUBTFUL SPECIES.**

PERILLA FRUTICOSA, **Don Prodr.** 115, see under Elsholtzia polystachya, p. 643. PERILLA ELATA, **Don Prodr.** 115, see Elsholtzia blanda, p. 643.

17. **MOSLA,** Ham.

Annual fragrant herbs. **Leaves** opposite. **Whorls** 2-fld., in terminal and axillary second racemes; flowers and bracts very minute or the lower leafy. **Calyx** campanulate, 5-toothed, fruiting enlarged, subequal or 2-lipped, base gibbous; upper lip truncate or 3-toothed, lower of 2 longer teeth; throat closed with hairs. **Corolla-tube** naked or with a ring of hairs; lips
short, upper notched, lower 3-fld. Stamens 2, posticus, short, erect, distant; anther-cells 2, divaricate; staminodes 2. Disk a large posticus gland. Nutlets globose, smooth or reticulate.—Species 6, East Asiatic.


A very strong-scented strict erect herb, 1-3 ft. Leaves 1-1½ in.; petiolo ½-½ in. Racemes very slender, terminating the branches, lax-fld. Corolla ½ in. long, white or purplish, tube short. Fruiting calyx ½ in., hemispherical. Nutlets as in *Perilla.*—The other described species are all extremely near *M. dianthera,* and perhaps forms of it.

18. **MENTHA, Linn.**

Strong-scented perennial herbs, rootstock creeping. Whorls many-fld., in axillary and terminal spikes, bracts various; flowers small. Calyx campanulate or tubular, 5-toothed, throat naked or villous. Corolla subequally 4-lobed. Stamens 4, equal, erect, distant; anther-cells parallel. Style-arms short. Nutlets smooth or reticulate.—Species about 25, N. temp. regions, introduced in many countries.


1. **M. sylvestris**, Linn.; leaves broadly or narrowly oblong obovate or lanceolate subacute serrate hoary beneath, whors in terminal spikes, calyx-teeth triangular or lanceolate, corolla hairy glabrous within. *Benth. Lab.* 171, and in *DC. Prodr.* xii. 166; *Reichb. Fl. Germ.* t. 82.

**Temperate Western Himalaya and Western Tibet;** from Kashmir to Gurwhal, alt. 4-12,000 ft., *Royle, &c.—Distreb. Afghanistan, Temp. Europe and W. and Central Asia.

Stem robust or slender, 2-3 ft., hoary-tomentose. Leaves 1-3 by ½-2 in., base rounded or cordate. Spikes 1-3 in., ½-½ in. diam.; bracts lanceolate; pedicels hairy. Corolla lilac, about ½ in. diam. Nutlets usually pale, smooth, sometimes brown and conspicuously delicately reticulate.

I have vainly endeavoured to find any character whereby to distinguish *M. incana* and *Royleana* from *M. sylvestris,* the only available one afforded by the calyx being excessively variable. Boissier unites them under one variety 5. petiolata (Fl. Orient. iv. 543), distinguished from *sylvestris* proper by the hoariness and petiolo leaves, but I think the slender spike and usually minute calyx of *incana* are better varietal characters. Strachey and Winterbottom's specimens from Gurwhal (Niti, alt. 11,500 ft.) appear to be typical *M. sylvestris* with purplish calyces.


Var. *Royleana*; uniformly hoary-tomentose, spikes stout usually continuous, calyx-teeth lanceolate or triangular with subulate lips. *M. Royleana,* *Benth. in Wall. Pl. As. Bas.* i. 29, and *Cat.* 1537; *Lab.* 171, and in *DC. Prodr.* xii. 169.
2. *M. arvensis*, Linn.; hairy or glabrater, leaves shortly petioled or sessile oblong ovate or lanceolate serrate, whorls axillary capitate, calyx-teeth triangular or lanceolate. *Benth. in DC. Prodr.* xii. 171; *Boiss. Fl. Orient.* iv. 544.

**Western Himalaya;** Kashmir, alt. 5–10,000 ft.—**Distrib.** Europe, N. and W. Asia to China.

**Stem** 1–2 ft. **Leaves** 1–2 in., obtusely or acutely serrate. **Bracts** acute, shorter than the flowers. **Calyx** hairy. **Corolla** hairy without and within.


Marsh perennial herbs. **Leaves** toothed or pinnatifid. **Flowers** small in dense axillary whorls. **Calyx** subequally 4–5-toothed, throat naked. **Corolla** campanulate, subequally 4–5-fid. **Stamens** 2, distant; anther-cells parallel; staminodes 2. **Style** 2-fid, lobes flattened. **Nutlets** smooth, obovate, compressed, margins thickened.—**Species** 2, N. temp. regions and Australia.

**L. europæus**, Linn.; glabrous or puberulous, leaves sinuate-toothed or serrate, staminodes minute. *Benth. in DC. Prodr.* xii. 179; *Boiss. Fl. Orient.* iv. 545.

**Western Himalaya;** Kashmir, alt. 1–6000 ft.—**Distrib.** Europe, W. N. and Central Asia.

**Rootstock** creeping or stoloniferous. **Stem** 1–3 ft. **Leaves** subsessile, elliptic-oblong, sometimes pinnatifid. **Corolla** blueish-white, dotted with purple, hairy within. **Nutlets** longer than the calyx-tube.

**Var. exaltata**; stouter, leaves more pinnatifid, staminodes capitellate. *L. exaltatus*, Linn.; *Benth. in DC. Prodr.* xii. 179; *Boiss. Fl. Orient.* iv. 545.—Kashmir, alt. 3–6000 ft.—**Distrib.** of *L. europæus*.


Aromatic herbs or undershrubs. **Leaves** entire or toothed. **Cymes** corymbose, bracts large, imbricating. **Calyx** 10–13-nerved, 5-toothed or 2-lipped; throat villous. **Corolla** obscurely 2-lipped, upper lip notched or 2-fid; lower spreading, 3-fid. **Stamens** 4, distant, ascending; anther-cells distinct, spreading. **Style-lobes** acute. **Nutlets** smooth.—**Species** about 25, of N. temperate regions.


**Temperate Himalaya;** from Kashmir to Sikkim, alt. 7–12,000 ft.—**Distrib.** Europe, N. Africa, W. and N. Asia.

Stoloniferous, erect or prostrate; stem 1–3 ft. **Leaves** ½–1 in., entire or toothed,
lower early withering. **Cymes** ½–1 in., ovoid, 4-gonous; bracts green or purple, ovate, obtuse or acute. **Flowers** dimorphic, larger 2-sexual, purple, smaller 2, paler. **Calyx**-teeth short. **O. laxiflorum**, Royle, is a prostrate state. **O. normale**, Don, has usually smaller less-coloured bracts, but intermediates are very common.


Small, slender, much-branched shrubs, very aromatic. **Leaves** small, quite entire. **Cymes** few-fld., in dense or lax spikes, bracts minute; flowers small. **Calyx** 10–13-nerved, 2-lipped; throat villous. **Corolla** obscurely 2-lipped; upper lip straight, flattish, notched, lower 3-fld. **Stamens** 4, distant, straight, lower pair longer; anther-cells parallel or diverging. **Style-lobes** subulate. **Nutlets** nearly smooth.—Species about 50, of N. temperate regions.

**T. Serpyllum**, Linn.; branches prostrate or ascending, leaves ovate linear oblong or obovate obtuse. **Benth. in DC. Prodr.** xii. 200; Boiss. Fl. Orient. iv. 554. T. linearis, Benth. in Wall. Pl. As. Rar. i. 31, Lab. 346, and in DC. Prodr. xii. 202; Wall. Cat. 1567.

**Western Temperate Himalaya**; from Kashmir to Kumaon, alt. 5–13,000 ft. **Western Tibet**, alt. 10–15,000 ft.; Strachey & Winterbottom, &c.—**Distrib.** Europe, N. Africa, W. and N. Asia.

Glabrous or hairy. **Rootstock** woody, stems or branches usually decumbent. **Leaves** ½–1 in., short-petioled. **Whorls** capitately; flowers dimorphic, males largest. **Calyx**-teeth ciliate. **Corolla** ½–¾ in., purple, very variable.—Common Thyme.

22. **HYSSOPUS**, Linn.

An undershrub. **Leaves** sessile, obtuse, entire. **Whorls** 6–15-fld., second, axillary and in terminal spikes. **Calyx** 15-nerved, 5-toothed, throat naked. **Corolla** 2-lipped; upper lip erect, flat, notched; lower spreading, 3-lobed, midlobe very broad. **Stamens** 4, exserted, diverging, lower longer; anther-cells linear, spreading. **Style-lobes** subequal, subulate. **Nutlets** narrow, nearly smooth, triquetrous.


**Western Himalaya**; from Kashmir to Kumaon, alt. 8–11,000 ft., Falconer, &c.—**Distrib.** Europe, W. Asia.

Usually glabrous; stems below branched, woody; branches 1–2 ft., erect or diffuse. **Leaves** sessile, oblong-linear or lanceolate. **Calyx**, fruiting ½–¾ in. long. **Corolla** blueish-purple.

23. **MICROMERIA**, Benth.

Herbs or undershrubs. **Leaves** usually small, entire or toothed. **Whorls** axillary or in terminal spikes, rarely panicled; flowers small. **Calyx** 13-nerved, 5-toothed or 2-lipped. **Corolla** 2-lipped; upper lip erect, flatish, entire or notched; lower spreading, 5-lobed. **Stamens** 4, lower longer ascending, incurved with diverging tips; anther-cells distinct, parallel, at length diverging, connective usually thickened. **Style-lobes** equal or upper very short, lower recurved flattened. **Nutlets** smooth.—Species about 60, all regions but Australia.

1. **M. capitellata**, **Benth. in DC. Prodr.** xii. 218; pubescent, stems tall slender erect, leaves entire or sub serrate obtuse, whorls subglobose.

BEIBE: or Parochnath, alt. 4500 ft., Clarke. WESTERN HIMALAYA; Dehra Dun, Dutchie. WESTERN GHATS; from the Conan to the Niighiris, Wight, &c.

Rootstock woody; stem 1–2 ft. Leaves ½–1 in., ovate or oblong, flat; floral small; pedicle short. Bracts small. Flowers ½ in. Calyx villous; teeth long, subulate, erect; fruiting ½ in.—Very aromatic.


TROPICAL and TEMPERATE HIMALAYA (exclusive of Sikkim); from Kashmir to Bhotan, alt. 1–7000 ft. NILGHIRI and ANAMALLAY HILLS.—DISTR. Afghanistan, Arabia, Abyssinia, S. Africa.

Dwarf. Rootstock woody, stems or branches excessively numerous, 3–6 in., fastigiate, filiform. Leaves ½–1 in., margins thickened. Flowers small, often solitary, pedicelled. Calyx hisurate, fruiting ½ in.; teeth subulate, very variable in length.

3. M. hydaspidis, Falc. mss.; Benth in DC. Prodr. xii. 224; pubescent, stem erect, leaves shortly petioloed ovate obtuse subcommate, whorls spicate many-fld. shortly peduncled, flowers pedicelled.

WESTERN KASHMIR; Jhelum Valley from Patlee to Nashga Valley, Falconer.

Stem 10–18 in., erect, rather stout, subsimple. Leaves ½–2 in. Spikes continuous or interrupted. Calyx ½ in. long, erect, puberulous; teeth lanceolate.

24. CALAMINTHA, Moench.

Herbs or shrubs. Leaves entire or toothed. Whorls dense and axillary or loose and panicled or spiked. Calyx 13-nerved, 2-lipped, upper lip 3-toothed, lower 2-fld., teeth narrower than of the upper; throat naked or villous. Corolla-tube straight, throat villous; upper lip erect, flattish; lower spreading, 3-lobed. Stamens 4 (or 2 upper imperfect), ascending under the upper lip; anther-cells parallel or diverging. Style-lobes equal, or the lower larger. Nutlets minute, subglobose, smooth, dry.—Species about 40, of N. temperate regions.


WESTERN TEMPERATE HIMALAYA; from Kashmir to Kumaon, alt. 4–12,000 ft.—DISTR. Europe, N. Africa, N. and W. Asia, Canada.


2. C. umbrosa, Benth. in DC. Prodr. xii. 232; procumbent, laxly hairy, whorls globose lax or dense-fld., bracts short or long, upper calyx-teeth with triangular teeth, lower with often longer subulate ones. Boiss.

TEMPERATE HIMALAYA; from Kashmir to Bhutan, alt. 4—12,000 ft. Khasia Mts., alt. 4—6000 ft. WESTERN GHATS; from the Concan to the Anamally Hills. CEYLON; at Newera Elia.—DISTRIBUTION. Affghanistan, Caucasus, China, Japan, Java.

A very common and variable Indian plant with difficulty distinguishable in some states from C. Clinopodium, Wallich's Nepal specimens being as robust, and with equally long bracts, and calyx almost as large; but the habit is usually decumbent or pro-cumbent, and more slender, the bracts shorter, calyces only \( \frac{1}{2} \) in., their upper-lip segments shorter and more recurved. I am quite unable to distinguish C. repens from C. umbrosa; a diminutive form of it has very small calyces with short broad upper teeth sometimes strongly recurved. C. nepalensis is a very stout suberect Kashmir form with numerous often close-set and sometimes spicate whorls, short bracts and short calyx-teeth.

3. C. longicaulis, Benth. in DC. Prodr. xii. 234; erect or decum-bent, softly hairy, whorls lax-fld. subsecund, bracts very minute, calyx-teeth short subequal in length not \( \frac{1}{2} \) the length of the tube. Thymus piperitus & origanifolius, Don Prodr. 112. Clinopodium longicaule, Benth. in Wall. Pl. As. Rar. i. 66; Wall. Cat. 2131. Melissa longicaulis, Benth. Lab. 395.

CENTRAL HIMALAYA; Nepal, Wallach.

Stem 2—3 ft., slender, woody below. Leaves \( \frac{1}{2} \) in., quite entire or with a few crenatures. Whorls towards the ends of the branches, 2—6-fld. ; bracts shorter than the calyx. Calyx \( \frac{1}{2} \) in., hispid, glabrate or hairy within, teeth short. Corolla violet, tube slender, twice as long as the calyx.—A very distinct plant.

25. MELISSA, Linn.

Erect branched herbs. Leaves opposite, crenate. Whorls axillary, secund, lax-fld. Calyx 13-ribbed; lips small; upper flattish, 3-toothed; lower 2-toothed. Corolla-tube recurved and spreading; upper lip erect; lower flat, spreading, 3-lobed. Staminia 4, arching and meeting under the upper lip; anther-cells at length divaricate. Style-lobes subequal, subulate. Nutlets narrowly obovoid, smooth, dark.—Species 2 or 3, S. European and Asiatic.

1. M. parviflora, Benth. Lab. 394, in Wall. Pl. As. Rar. i. 65, and in DC. Prodr. xii. 241; leaves ovate or ovate-lanceolate acute, calyx \( \frac{1}{2} \) in., corolla white, tube very short. Wall. Cat. 2825. Geniosporum axillare, Benth. in Wall. Pl. As. Rar. ii. 18; Wall. Cat. 2752.

TEMPERATE HIMALAYA; from Gurwhal, alt. 5—8000 ft., to Sikkim, alt. 7—10,000 ft., and Mishmi. Khasia Mts., alt. 4—6000 ft.—DISTRIBUTION. Java.

Pubescent or glabrate. Stem tall, erect, angles hisrate. Leaves 1—4 in., base acute rounded or cordate; petiole \( \frac{1}{1} \) in., slender. Whorls numerous, few- or many-fld.; flower pedicelled. Calyx-teeth very variable in length of the acute points; bracts narrow. Corolla-tube scarcely exceeding the calyx.—Very near M. officinalis, which has its Eastern limit in Eastern Persia, but the leaves are more acute and the lower calyx-teeth are broader and shorter, but these are variable characters in the European plant.
2. M. flava, Benth. Lab. 394, in Wall. Pl. As. Rar. i. 65, and in DC. Prodr. xii. 241; calyx nearly \( \frac{1}{2} \) in., corolla yellow, tube longer than the calyx. Wall. Cat. 2126.

NEPAL, Wallich; KUMAON, alt. 7600 ft., Madden, Strachey & Winterbottom. BHOYN, Griffith.

I much doubt this being more than a variety of M. parviflora. It is, however, a larger plant.

26. PEROWSKIA, Karel.

Erect, branched, strong-scented, rigid, hoary and scurfy, dioecious undershrubs. Leaves opposite, incised or crenate. Whorls small, distant, in simple or compound or panicled spikes, 2- or more-fl.; flowers small. Calyx short, terete; lips short, upper minutely 2-3-toothed, lower 2-toothed. Corolla 2-lipped, tube exserted, with a ring of hairs within, lower lip oblong entire, upper broad spreading erect 3-lobed. Stamens 2, lower fertile, erect, diverging; 2 upper minute, imperfect; anther-cells linear, parallel. Disk swollen behind. Style-lobes acute. Nutlets pyriform, smooth, dry.—Species 4 or 5, Central Asiatic.—Genus of doubtful affinity.

1. P. atriplificolial, Benth. in DC. Prodr. xii. 261; densely clothed with white stellate scurf, leaves oblong-ovate or lanceolate crenate-serrate or incised, calyx hispid. Boiss. Fl. Orient. iv. 589.

WESTERN TIBET, Falconer; Lahul, Capt. Hay; Karakoram and Iskardo, alt. 7500-10,200 ft., Clarke.—DISTRIB. Afghanistan and Beluchistan.

A rigid herb, 2-3 ft., panicularly branched. Leaves 1-2 in., rigid, rugose. Whorls 2-6-fl. Calyx \( \frac{1}{2} \) in. Corolla twice as long.—I doubt this being more than a form of the following.


WESTERN TIBET, alt. 8-13,000 ft., Thomson, &c.—DISTRIB. Afghanistan, Persia, Turkestan.

A much-branched twiggy shrub or undershrub, 2-4 ft. high, woody below, with the habit of a Lavandula. Leaves 1-2 in., sometimes bipinnatisect, crenatures or lobes or segments obtuse.

27. MERIANDRA, Benth.

Shrubs smelling of sage, hoary or woolly. Leaves opposite, coriaceous, oblong, crenulate, rugulose above. Whorls many, dense-fl., large and in terminal broad spikes or small and in panicled caulk-like spikes with closely imbricating bracts; flowers small. Calyx ovoid, upper lip concave, subentire; lower 2-fl.; throat naked. Corolla-tube short, equally 4-fl.; lobes flat, upper entire or 2-fl. Stamens short, stout; 2 lower fertile erect distant, one or both of upper imperfect; anther-cells separate, stipitate, pendulous. Style 2-lamellate. Nutlets obovoid, smooth, brown.—The following are the only species.

1. M. strobilifera, Benth. Lab. 188, in Wall. Pl. As. Rar. i. 29, and in DC. Prodr. xii. 262; flocculently woolly, spikes 4-angled with imbricating appressed bracts. Wall. Cat. 1527; Gamble Ind. Timbers, 301.

WESTERN TEMPERATE HIMALAYA; on dry rocks from Simla to Kumaon, alt. 5-6000 ft.

Cultivated in INDIA. DISTRICT. Native of Abyssinia.

A large straggling shrub; branches cylindric. Leaves 2-3 by 1-1½ in., finely crenulate, obtuse, thinner than in M. strobilifera, as finely granulate above and reticulate beneath, base rounded or bractate; petiole slender, ½ in. Whorls ½-1 in. diam., villous. Calyx ½ in. long, pedicelled, teeth acute. Corolla white, lips spreading or recurved.

28. SALVIA, Linn.

Herbs or shrubs. Whorls usually racemose or spiked; bracts small or large. Calyx tubular or campanulate, upper lip entire or 3-toothed, lower 2-fid, throat naked. Corolla-tube naked or with a ring of hairs inside; upper lip erect, lower 3-lobed, lateral lobes spreading. Stamens, 2 perfect, filaments short, jointed on the slender connective which bears 1 or 2 perfect cells. Disk tymid behind. Style ascending, 2-fid. Nutlets 3-quenrous, smooth.—Species 450, tropical and temperate.


Temperate Himalaya; from Kashmir, alt. 6-9000 ft., to Sikkim, alt. 10-12,000 ft. Distriet. Afghanistan, S. Europe, W. Asia.


Western Temperate Himalaya; Kashmir, alt. 8-11,000 ft., Falconer, &c.

Habit of S. glutinosa, but petioles much longer, often 10 in., and leaves rather broader; calyx much broader; corolla 1½ in., blue with very inflated throat and shorter lips; nutlets similar but larger, ½ in. long.
3. **S. campanulata**, Wall. Cat. 2143; herbaceous, robust, viscidly hirsute, leaves long-petioled ovate-cordate toothed, whorls few- and lax-fld., calyx broadly shortly campanulate, corolla large yellow. *Benth. in Wall. Pl. As. Rav. i. 67, and in DC. Prodr. xii. 276.*

**Subalpine Himalaya**; from Kumaon to Sikkim, alt. 9-13,000 ft., Wallach, &c.

Habit of *S. hians*, but leaves much broader with more cordate bases, and petioles equally long; calyx ⅔ in., gaping very wide; corolla-tube short, inflated, lips very stout; nutlets the same.

Sect. 2. **Æthiopis**, Benth. Perennial herbs with large orbicular cuspidate floral leaves. *Upper calyx-lip 3-toothed. Corolla-tube exserted, not annulate within; upper lip falcate, compressed; lower with the side lobes oblong often erect or twisted, midlobe rounded, Connectives connected by callous tips deflexed backwards, imperfect cell abruptly dilated.*


**Western Temperate Himalaya**; Kashmir, alt. 5-6000 ft., Falconer, Thomson.

A harsh coarse herb. *Leaves 3-6 by 2-3 in., petiole as long stout, floral orbicular 1 in. diam. and under, ciliate. Calyx ¼ in. long, rigid, teeth spinous. Corolla ⅔ in. long, white, tube short, slender; throat shortly inflated, upper lip long, narrow, arched, lower shorter. Nutlets ⅓ in., subglobose.*

5. **S. Moorcroftiana**, Wall. Cat. 2144; tall, robust, woolly, leaves long-petioled oblong or oblong-cordate obtuse doubly crenate and lobulate, whorls many distant 6-10-fld., calyx campanulate equally spinous-5-toothed scabrid. *Benth. in Wall. Pl. As. Rav. i. 67, Lab. 228, and in DC. Prodr. xii. 286.*

**Western Temperate Himalaya**; from Kashmir to Kumaon, alt. 6-9000 ft. Very robust; stem leaves beneath and often above petiole and branches of panicle usually thickly woolly, rarely glabrate. *Leaves 6-12 by 3-5 in., thick, rugose, rarely acute, base rounded or cordate; petiole 4-8 in., stout, floral 1 in. diam. and under, white and rose-coloured. Calyx, flowering ⅔ in., fruiting ⅔ in. Corolla 1 in., rose-coloured, tube slender, upper lip long arched, very narrow. Nutlets subglobose.*—The Ladak habitat given by Wallich is an error, for the plant is not Tibetan. Moorcroft no doubt collected it en route to Ladak.

6. **S. lanata**, Roxb. *Fl. Ind. i. 147; robust, densely softly woolly, leaves sessile oblong or oblong-cordate obtuse crenulate, whorls many distant, calyx campanulate 2-lipped subequally spinous-5-toothed. Benth. in Wall. Pl. As. Rav. i. 67, and ii. 11, t. 116, Lab. 228, and in DC. Prodr. xii. 286; Wight Jc. t. 325, and Ill. t. 176 bis, f. 3. S. integrifolia, Hardw. in Asiat. Res. vi. 349. S. cana, Wall. Cat. 2145. Stenarrhena lanata, Don Prodr. 111.*

**Western Temperate Himalaya**; Kumaon to Murree, alt. 5-8000 ft.

*Stems usually many from the root, 12-15 in. high, simple or branched. Leaves subradical, 6-8 by 1-1½ in., white beneath, narrowed at the base; floral ⅔ in. diam.; whorls distant, viscidly hairy, 6-8-fld. Calyx, flowering ⅔ in., fruiting ⅔ in., glandular-hairy. Corolla ⅔ in. long, tube slender, throat inflated, upper lip about as long as the tube, lower small. Nutlets ⅓ in., brown.*

Sect. 3. **Plectiosphace**, Benth. Perennial herbs, floral leaves
small. Calyx ovate-campanulate, upper lip recurved with 3 connivent teeth, lower acutely 2-toothed. Corolla-tube not annulate within; upper lip arched, lower with oblong lateral lobes and a rounded midlobe. Connectives deflexed behind, united by the callous tips, imperfect cell abruptly dilated.


Western Himalaya; Kashmir, alt. 6000 ft., Falconer, Clarke.—Distrib. Volhynia, Podolia, Altai.

Stem 1-3 ft., very robust, tall and much branched in Kashmir specimens. Leaves 3-4 by 1½-2½ in., petiole of lower 1-4 in.; floral cuspitate, ½ in. diam. Calyx, flowering ½ in. Corolla 1½-2 in., blue, tube exserted, throat inflated.—Very near and perhaps only a variety of S. pratensis, L.

Sect. 4. Notiosphace, Benth. Herbs or shrubs with minute floral leaves. Calyx with the upper lip entire, or shortly 3-toothed, lower 2-fld. Corolla small, tube annulate within. Connectives distant in front, acute or bearing an empty anther.

8. S. saxicola, Wall. Cat. 2147; dwarf, subscapigerous, radical leaves long-petioled broad oblong or rounded cordate coarsely crenate, caninle few or 0, floral minute ovate, whorls distant or the upper crowded, calyx nodding, corolla very short. Benth. in Wall. Pl. As. Far. i. 68, Lab. 310, and in DC. Prodr. xii. 356.

Khasia Mts., alt. 4-6000 ft.; Wakhich, &c.

Rootstock woody. Leaves 1-1½ in. diam., nearly glabrous; petiole 2-3 in., slender. Scapes 6-12 in., pubescent. Calyx, flowering ½ in., fruiting ½ in., glan-dular-hairy. Corolla very short, pale purple, lips short. Connective with the antheriferous arm decurved, the other shorter, acute, Nutlets ½ in., ellipsoid.

9. S. plectranthoides, Griff. Notul. iv. 199, and Jc. Pl. Asiat. t. 450; herbaceous, slender, sparsely hairy, leaves chiefly radical pinnate, segments few ovate or broadly oblong-cordate, terminal much the largest, lateral sessile or petiolulate, petiole very slender, scape long, spike simple, calyx nodding glandular-hairy. Plectranthus, Griff. It. Notes, 163, n. 846.

Eastern Himalaya; Bhotan, near Parukka, Griffith.

Habit of a Valeriana. Rootstock rather slender. Leaves membranous, 3-5 in.; pinnules 2-5 pairs, terminal 2-3 in. long, base rounded or deeply lobed, lateral ovate-lanceolate. Scape or stem very slender, 18 in.; whorls few-fld. Calyx pedicelled, upper lip entire, lower 2-toothed. Corolla flesh-coloured; tube shortly exserted, hairy; upper lip arched, lower with small erect lateral lobes and an orbicular notched midlobe. Connectives recurved, barren arm obtuse.—Griffith's figure of this remarkable species represents a very stout plant with sessile leaves; his specimens are very slender, with usually petiolulate leaves. It is very near S. japonica, Thunb., differing only in the shorter calyx-teeth.


Throughout INDIA, in the plains and ascending the hills to 5000 ft. (absent from Ceylon).—DISTRIB. China, Malay Islands, Australia. 

Stem stout, 6–18 in. strict, fastigiatly branched. Leaves 1–3 in., narrowed at both ends; floral small, lanceolate. Calyx pedicelled, ¼ in. Corolla-tube very short, not exerted, limb very small. Nutlets very minute, ¼ in. long, ellipsisoid.


PANJAB PLAIN, from Delhi westwards, alt. 1–2000 ft.; Jacqemont, &c.—DISTRIB. Afghanistan, W. Asia, N. Africa to the Cape Verde Islands.

Branched from the base; branches straggling, divaricate, rigid. Leaves rarely 1 in. Whors distant. Calyx nodding, pedicelled, ovoid-campanulate, fruiting ½ in. long; upper lip orbicular minutely 3-toothed, teeth of lower subulate. Corolla and stamens as in S. plebeia. Nutlets ¼ in. long, narrowly oblong, nearly black

VAR. pumila; more scabrid and hispid, leaves very rigid and rugose, calyx villous with long hairs. S. pumila, Benth. Lab. 726, and in DC. Prodr. xii. 356; DCne. in Jacquem. Voy. Bot. 128. t. 138.—The Panjab plains and hills from Delhi westward; Scinde, Stocks; Afganistan and Beluchistan.


SCINDE; on the Boogtie Hills, Vicary.—DISTRIB. Afghanistan, Persia.

The specimens are flowerless and very insufficient, but I think referable to this curious little species. The calyx resembles that of S. aegyptiaca, var. pumila. Floral leaves persistent, elliptic, acute, ¼ in. long.

EXCLUDED AND UNKNOWN SPECIES.

S. INDICA, Linn., is a Syrian plant, and not Indian, whence the name is changed by Boissier to S. brachycalyx.

S. Aegyptiaca, Benth. in DC. Prodr. xii. 354 (S. ocimoides, Roxb. in Wall. Cat. 2148; Benth. in Wall. Pl. As. Rar. i. 68. S. lyrata, Roxb. Hort. Beng. 4, 6). Wight in Herb.), is only known as a plant cultivated in the Mission Garden by Bottler, and is doubtlessly not Indian; it has a long tubular corolla. Roxburgh says his S. lyrata is American.

S. GERARDIANA, Benth. in Wall. Cat. 2150, is the American S. coccinea, L. (see Wall. Cat., p. 92), cultivated in India.

29. NEPETA, Linn.

Erect or prostrate herbs. Leaves opposite. Whors axillary or terminal; flowers blue, yellow or white. Calyx tubular, 15-ribbed, equally 5-toothed, or 2 lower teeth narrower. Corolla-tube not annulate within, throat inflated; upper lip straight, notched or 2-fld.; lower 3-fld., midlobe largest. Stamens 4, ascending under the upper lip or exerted, upper pair longest; anther-cells diverging. Style-lobes subulate. Nutlets smooth.—Species about 120, Temp. Europe, N. Africa and Asia.

The following arrangement of the species of this troublesome genus is very artificial. I think that much better characters may be found in the corolla, but this would
require a careful re-examination of the whole genus. I suspect that some of the Indian species will prove identical with Persian. *Dracocephalum stamineum & *Hookeri should probably be transferred to *Nepeta.*

A. Whorls in simple terminal oblong or cylindric spikes, which are rarely interrupted at the base.—(The spikes of 13. *N. discolor* and others are occasionally interrupted; and species placed under C. occasionally present solitary simple spikes.)

* Leaves bipinnatifid.


- **Western Tibet;** Rupchu, alt. 14,500 ft., *Thomson.—Distrib.** Soongaria, Altai.


** Leaves entire or crenate, sessile or subsessile.

2. **N. linearis,** *Boyle ms. ex Benth. in Hook. Bot. Misc.* iii. 377, Lab. 469, and in *DC. Prodr.* xii. 371; rootstock tuberous, stems ascending, leaves sessile linear acute or obtuse, spike ovoid or oblong, bracts lanceolate or subulate, calyx ⅓ in. peduncled hairy, teeth spinosecent.

- **Western Temperate Himalaya;** from Kashmir to Simla, alt. 7-11,000 ft., *Falconer,* &c.

Rootstock often as large as a walnut. *Stems* 6-18 in., stout, sparsely leafy, glabrous or puberulous. *Leaves* 1-3 by ½—½ in. *Spikes* 1-2½ in. *Calyx* tubular, fruiting ⅓ in. or more. *Corolla-tube* twice as long, throat dilated, lips short.—Varies much in size of parts.

3. **N. connata,** *Boyle ex Benth. in Hook. Bot. Misc.* iii. 378, Lab. 469, and in *DC. Prodr.* xii. 371; tall, stout, glabrous or hairy, rootstock tuberous, stem simple, leaves sessile narrowly linear-lanceolate acuminate entire, base cordate, spike cylindric, lowest floral bracts large ovate aristate, upper narrow, calyx ⅜ in. pedicelled hairy, teeth very long-awned.

- **Western Temperate Himalaya;** from Dalhousie to Kashmir, alt. 8-11,000 ft., *Falconer,* &c.


4. **N. criostachya,** *Benth. Lab.* 734, and in *DC. Prodr.* xii. 371; stem subsimple sparsely hairy, leaves sessile broadly ovate or ovate-cordate obtuse crenate, lower floral similar, spike cylindric-oblong dense-fld. villous, calyx sessile ⅔ in., teeth slender plumose.

- **Western Temperate Himalaya;** Bupsa Valley, *Jacquemont;* Kashmir, over Sonamurg, alt. 11,500 ft., *Clarke;* Gurrwal, alt. 11-12,000 ft., *Duthie.*

*Stem* ascending, 6-10 in. *Leaves* ½—½ in., sometimes nearly as broad, pubescent beneath. *Spikes* 1-3 in. *Calyx* membranous, teeth as long as the tube. *Corolla* twice as long, bright blue. *Stamens* included.—I have not seen *Jacquemont’s*
specimens. Clarke makes of his a var. *latibracteata* with broader bracts than Bentham describes. Habit of *Brasenia*.

5. **N. nervosa**, Royle ex Benth. in Hook. Bot. Misc. iii. 378, Lab. 469, and in DC. Prodr. xii. 372; stem tall subsimple sparsely hairy, leaves sessile or shortly petioled linear-lanceolate acuminate serrate, spike cylindrical robust, bracts ovate or lanceolate mucronate, calyx sessile \( \frac{1}{4} \) in., teeth very slender laxly villous. **N. campestris**, Herb. Ind. Or. H.f. \& T.

**Western Temperate Himalaya**: Kashmir, alt. 6-10,000 ft., Falconer, Jacqueont, &c.

Rootstock long, woody. Stems 1-2 ft. Leaves 2-4 by \( \frac{1}{2}-\frac{3}{4} \) in., base rounded or cordate. Spike stout, 1-3 in. Calyx membranous; teeth as long as the tube, filiform. **Corolla** twice as long, pale blue. Stamens included.

**Var. laticea**: flowers yellow.—Western Tibet; Karakoram, alt. 14,000 ft., Clarke.

6. **N. campestris**, Benth. Lab. 734, and in DC. Prodr. xii. 372; stem tall subsimple sparingly hairy, leaves sessile narrowly oblong-lanceolate subacute serrate, spikes slender, bracts all ovate mucronate, calyx sessile \( \frac{1}{4} \) in., teeth very slender glabrous or ciliate.

**Western Temperate Himalaya**: from Kashmir, Jacqueont, to Kumaon, alt. 7-9000 ft., Madden, &c.

Closely allied to *N. nervosa*, but the leaves appear to be always sessile (which distinguishes it from *N. spinosa*), the spikes are much longer and more slender, the calyx-teeth more glabrous and divergent, and the corolla-tube more slender.

7. **N. elliptica**, Royle ex Benth. in Hook. Bot. Misc. iii. 378, Lab. 470, and in DC. Prodr. xii. 373; stem branched villous, leaves subsessile elliptic oblong or oblong-cordate, tip rounded or acute pectinately crenate, spike long slender often interrupted, bracts ovate or lanceolate awned, calyx sessile \( \frac{1}{4} \) in., teeth filiform ciliate as long as the tube. **N. polystachya**, Benth. in Hook. Bot. Misc. l. c.

**Western Temperate Himalaya**: from Kashmir to Kumaon, alt. 5-8000 ft.

**Stem** 1-2 ft., often flexuous, usually woolly. **Leaves** \( \frac{1}{2}-1 \) in., tomentose. **Flowers** very much as in *N. nervosa*.

8. **N. Thomsonii**, Benth. mss.; finely pubescent, stems short stout very leafy, leaves sessile or shortly petioled oblong-cordate obtuse or acute crenate, floral large, whorls in a dense ovoid or conical spike with large leafy crenate bracts, calyx \( \frac{3}{4} \) in. scabellulons, teeth ovate-lanceolate much shorter than the tube.

**Western Tibet**: Hanle, alt. 14,500-16,000 ft., Thomson. **Eastern Tibet**: north of Sikkim, J. D. H.

**Stem** a span to a foot high, stout, simple or with simple ascending branches from the base. **Leaves** close set, 1-2 by \( \frac{1}{2}-\frac{3}{4} \) in.; petiole rarely \( \frac{1}{4} \) in.; floral similar. **Spike** of dense approximate superposed whorls with green elliptic bracts far exceeding the calyces. **Corolla** not seen. **Nutlets** large, nearly \( \frac{1}{4} \) in., suborbicular.

9. **N. supina**, Stev. in Mem. Soc. Nat. Mosq. iii. 365; erect, branched, finely pubescent, leaves small sessile ovate obtuse crenate, floral subsimilar or narrow, whorls dense-fld., lower axillary, upper in an ovoid spike, bracts lanceolate, calyx \( \frac{1}{4} \) in. curved narrow villous, mouth very oblique, teeth setaceous shorter than the tube, nutlets linear. **Benth. Lab.** 473, and in DC. Prodr. xii. 374; **Boiss. Fl. Orient.** iv. 462.
Western Temperate Himalaya; from Murree, Fleming, to Gurwhal, alt. 15,000 ft., Strachey & Winterbottom. Western Tibet; Iskardo, alt. 12,000 ft., Clarke.—Distr. Caucasus.

Stem 8-18 in. Leaves ¼-1 in., tumentose beneath. Corolla ¼-½ in. long. Nutlets nearly ½ in. long, trigonous.—The largest Indian specimens are taller, stouter and more branched than the Caucasian, and the flowers are smaller, but the remarkable long narrow seeds are quite the same.

*** Leaves distinctly petioled, entire or crenate.

10. N. spicata, Benth. in Wall. Pl. As. Rar. i. 64, Lab. 470, and in DC. Prodr. xii. 372; stem erect branched glabrous hoary or pubescent, leaves petioled ovate- or triangular-cordate acute coarsely crenate or serrate, spike oblong or cylindric, bracts ovate or lanceolate awned, calyx sessile ¼ in. scarab, teeth slender as long as the tube ciliate or hispid. Wall. Cat. 2083; Bot. Mag. t. 6405 (starved form). Betonica laevigata, Don Prodr. 110.

Western Temperate Himalaya; from Kashmir to Kumaon, alt. 6-12,000 ft. —Distr. Afghanistan.

Stem 1-3 ft., with often spreading branches. Leaves 1¼-4 by ¾-3 in., glabrous or pubescent or hoary beneath; petiole 1-3 in. Spikes 2-4 in. stout or slender, often interrupted; bracts very variable. Flowers as in N. campestris, pale blue.—Bentham’s var. elata seems only a large state.

11. N. lamiopsis, Benth. mss.; stems ascending subsimple falcid sparsely hairy, leaves few sessile or petioled broadly ovate-cordate obtuse coarsely crenate, floral large, whorls dense-fld., lower axillary, upper in ovoid spikes, bracts orbicular and green crenate or narrower or linear, calyx ½ in. pubescent, mouth oblique, teeth slender diverging as long as the tube, nutlets broadly oblong.

Alpine Sikkim Himalaya; alt. 12-16,000 ft., J. D. H.

Stems succulent, 6-18 in. Leaves ¼-1½ in., falcid; petiole 0-¼ in., floral sessile Axillary whorls few, much shorter than the leaves, terminal in an ovoid spike ¼-1½ in.; bracts sometimes all linear. Corolla deep blue, tube twice as long as the calyx, limb small. Nutlets about ½ in. long.—Habit of a Lamium.

12. N. raphanorhiza, Benth. Lab. 734, and in DC. Prodr. xii. 373; rootstock tuberous, stems weak ascending glabrous or villous, leaves small petioled broadly ovate or ovate-cordate obtuse crenate or toothed, spikes short ovoid, bracts ovate to lanceolate, calyx ¼ in. sessile, teeth lanceolate ciliate shorter than the tube.

Western Temperate Himalaya; Kashmir to Chamba, alt. 5-12,000 ft., Jacquemont, &c.—Distr. Afghanistan.

Stems many from a globose black rootstock as large as a nut or walnut, diffuse or ascending, 6-18 in. high, simple or branched. Leaves ½-1 in., sometimes nearly as broad; petiole half their length. Spikes 1 in. and less, pubescent or villous. Calyx smaller than in the preceding species, with shorter teeth. Corolla purplish blue, tube twice as long as the calyx, slender.—Roots eaten.


Western Temperate and Alpine Himalaya; from Kashmir to Gurwhal and Western Tibet, alt. 10-15,000 ft.—Distr. Afghanistan.
Closely resembles in habit and foliage large forms of *N. raphanorhiza*, but wants the tuberous rootstock, and has much longer spikes with long calyx-teeth as in *N. spicata*. Leaves often white with appressedomentum beneath. Flowers white or pale blue.

14. **N. longibracteata**, Benth. *Lab.* 737, and in *DC. Prodr.* xii. 392; dwarf, diffuse, softly pubescent or woolly, leaves petioled fan-shaped or cuneate-obovate crenate or lobulate, spikes capitate with the cymes sessile amongst the crowded uppermost and long silky bracts, calyx \(\frac{1}{2}\) in. silky, teeth subequal nearly equalling the tube, stamens included, nutlets oblong. *Done* in *Jacq. Vog. Bot.* 132, t. 137.

**ALPINE WESTERN HIMALAYA** and **WESTERN TIBET**, alt. 14,000-17,000 ft.; *Falconer, Jacquemont,* &c.

Rootstock long, stout, excessively divided at the top; stems 3–6 in., suberect or prostrate, simple or branched. Leaves \(\frac{1}{2}\) in. long or broad or less, petiole about as long. *Heads* subglobose, 1 in. diam.; lower bracts fan-shaped, pinate. *Corolla* twice as long as the calyx, blue, tube curved, funnel-shaped, limb small. *Stamens* included. *Nutlets* \(\frac{3}{8}\) in.—Strongly aromatic, lemon-scented. Placed by Bentham in the *Gieschoma* section. It very closely resembles the Siberian *Dracocephalum pinnatum* except in the calyx-teeth, which are, however, very variable in that plant.

B. Whorls all or mostly axillary, many, distant.

15. **N. glutinosa**, Benth. *Lab.* 735, and in *DC. Prodr.* xii. 377; glandular-pubescent, stem stout strict erect leafy, leaves small sessile ovate-cordate acute pectinately inciso-serrate, whorls few-fld., bracts linear-oblong aristate, calyx \(\frac{1}{2}\) in. pedicelled, teeth ovate mucronate much shorter than the tube.

**WESTERN SUBALPINE HIMALAYA**; Kashmir and **WESTERN TIBET**, alt. 11–13,000 ft.; *Jacquemont, Thomson,* &c.

Strongly scented. *Stem* \(\frac{1}{2}–2\) ft., stiff. *Leaves* \(\frac{1}{2}–1\) in., sometimes \(\frac{1}{2}\)-amplexicaul; floral often equalling the calyx. *Corolla* \(\frac{3}{4}\) in. long, white or blue, tube curved, slender, limb small.

C. Whorls forming interrupted spikes, rarely solitary heads.

16. **N. mollis**, Benth. *Lab.* 734, and in *DC. Prodr.* xii. 378; softly tomentose, stem slender subsimple, leaves shortly petioled ovate-cordate obtuse crenate or subcrenate, whorls few-fld., bracts elliptic ovate or lanceolate awned, calyx \(\frac{1}{2}\) in. mouth oblique, teeth lanceolate shorter than the tube softly hairy. *Nepeta* n. 23, *Herb. Ind. Or. H.f. & T.*

**WESTERN TEMPERATE HIMALAYA**; Marri, *Fleming*; Kashmir, alt. 8–9000 ft.; *Jacquemont, Falconer, Thomson,* &c.

Rootstock elongate, woody. *Stems* 6–18 in., slender, sparingly leafy. *Leaves* 1–2 by \(\frac{1}{2}–1\) io., grey-tomentose; petiole \(\frac{1}{2}–\frac{3}{4}\) in. *Spikes* 3–8 in.; lower bracts (floral leaves) ovate or lanceolate, longer or shorter than the cymes, which are sometimes peduncled. Whorls white, softly hairy. *Calyx* villous, often decurved. *Corolla* rose-coloured, tube shortly exserted, limb small.


I doubt this being more than a form of *N. mollis* with narrow bracts and a longer more curved calyx.

18. **N. ciliaris**, Benth. in *Wall. Pl. As. Rav.* i. 64, Lab. 475, and in *DC. Prodr.* xii. 379; tall, erect, branched, softly densely tomentose, leaves shortly petioled ovate-cordate obtuse crenate, whorls secund dense-fld. in long interrupted villous spikes, upper crowded, bracts lanceolate, calyx ⅛ in. curved villous, teeth slender shorter than the tube, nutlets broadly ellipsoid. *Wall. Cat.* 2082.

**Western Temperate Himalaya**, alt. 6–8000 ft.; from Kashmir to Gurwhal, *Boyle, Jacquetum, Edgeworth.*

*Stem* 2–3 ft., strict. *Leaves* ⅓–1½ in., sometimes almost as broad, lower floral large. *Spikes* 4–8 in., pale; whorls sometimes shortly pedicelled. *Corolla* very small, about ⅛ in., lilac, tube slender.—Very like *N. ruderalis*, but the inflorescence is more simple, the whorls rarely peduncled. Bentham describes the nutlets as minutely granular, but I find them smooth. Clarke doubts Royle’s habitat of “road to Kashmir,” and suspects that the species is confined to the Simla and neighbouring hills.

D. Whorls in branched panicles, some or all more or less peduncled.

*Corolla* less than ⅓ in. long.


**Tropical and Subtropical India**; from the Indus to Bebar, Central India and the Concan, ascending the Himalaya to 8000 ft.—*Distr.* Afghanistan.

*Stem* 6–18 in., branched from the base, robust or slender, obtusely angled. *Leaves* ⅔–2½ in., green or hoary; petiole ⅔–⅛ in. *Whorls* ⅓–1 in. diam., unilateral, depressed; peduncles sometimes 1 in.; flowers pedicelled. *Corolla* very small, ⅛ in., purplish, tube shortly exserted. *Nutlets* ⅛ in. long, broadly oblong. The granulation consists of more or less tumid separated areoles, and is sometimes very indistinct.—*N. clinopodioides*, with a calyx less hairy and flowers smaller, is scarcely a variety, found on the Jumna by Royle. Woodrow sends from Poona a plant resembling *N. ruderalis* in habit, but with a large calyx and nutlets like *N. bombaiensis* (from which the calyx-teeth distinguish it).

22. **N. bombaiensis**, Dalz. in *Dals. & Gibs. Bomb. Fl.* 209; erect, branched, tomentose or laxly villous, leaves long-petioled rounded ovate-cordate coarsely crenate, cymes all axillary few and lax-fld., peduncles equalling the petioles, flowers long pedicelled, calyx ⅛ in. laxly hairy, 3 upper teeth broadly triangular acute much shorter than the tube, 2 lower subulate, nutlets nearly smooth.

The **Concan**; old walls and rocks at Swenere Fort, *Dalzell.*

*Stem* 1 foot. *Leaves* 2 in., green, sparsely hairy; petiole 1 in. *Cymes* 6–8-fld.; bracts at the base elliptic-lanceolate, acuminate, green. *Corolla* very small, pale blue, with purple spots. *Nutlets* ellipsoid, ⅛ in. long.—A remarkable species, unlike
any other in habit, in the great size of the foliage and smallness of the long peduncled axillary cymes.

23. **N. Cataria**, Linn.: perennial, erect, branched, hoary-pubescent, leaves petioled ovate or ovate-cordate acute coarsely crenate or toothed, whorls in long narrow terminal shortly peduncled dense-fld. spikes, bracts subulate equalling the calyx or shorter, calyx ½ in. curved pubescent, mouth oblique, teeth subequal subulate shorter than the tube, nutlets smooth. *Benth. in DC. Prodr. xii. 393; Boiss. Fl. Orient. iv. 643; Reichb. Fl. Germ. xviii. t. 1242. N. calaminthoides, *Benth. in DC. L. c. in parts. N. ruderalis, var. clinopodioides, Herb. Ind. Or. H. f. & T.*

**Western Temperate Himalaya**: Kashmir, alt. 1-5000 ft., Falconer, Jacques-mont, Thomson.—Distrib. Afghanistan to W. Europe.

*Stem 2-3 ft., leafy, acutely angled. Leaves 1-3 in.; petiole ½-1 ½ in. Spikes 4-10 in., narrow, strict, with 6-20 whorls or cymes; bracts of lower leafy, of upper reduced; flowers pedicelled. Corolla ½ in., dotted with purple. Nutlets ½ in., broadly oblong, smooth.*

24. **N. leucophylla**, Benth. Lab. 476, and in *DC. Prodr. xii. 381*; slender, branched, erect or ascending, hoary-tomentose, leaves small shortly petioled ovate-cordate obtuse or acute crenate rugose above, whorls distant dense-fld. in very long narrow interrupted shortly peduncled terminal spikes, bracts subulate, calyx ½ in. villous, mouth oblique, teeth lanceolate-subulate rather shorter than the tube, corolla very small, nutlets smooth. *Wight Ill. t. 176 bis, f. 6.*

**Western Temperate Himalaya**: Simla to Kumaon, alt. 6-8000 ft., Royle, Edgeworth, &c.

*Stem 2-3 ft., obtusely angled, leafy. Leaves 1-1½ in.; petiole ½-1 ½ in. Spikes as in *N. Cataria*, but more slender and villous. Corolla about twice as long as the calyx. Nutlets as in *N. Cataria.*

25. **N. leucocolena**, Benth. mss.; erect, branched, white-tomentose, leaves small subsessile ovate acute or obtuse crenate, whorls distant in interrupted terminal spikes, the lower very shortly peduncled, bracts lanceolate, calyx ½ in. woolly, upper teeth much shorter than the tube triangular, lower subulate much shorter, nutlets linear-oblong.

**Western Tibet**: Zanskar and Ladak, alt. 12-13,000 ft., Thomson.

*Stem 2-3 ft., nearly cylindric, leafy: Leaves ½-1 in., furfuraceous tomentose on both surfaces, petiole 0-½ in. Whorls few-fld., the lower axillary. Corolla three as long as the calyx, tube curved, funnel-shaped; lips short. Nutlets ½ in. long, smooth.—Habit of *N. ciliaris*, and perhaps referable to Section C, but the spikes which are not very advanced have pedicelled lower cymes.

26. **N. floccosa**, Benth. Lab. 736, and in *DC. Prodr. xii. 380*; floccose with white wool, stems many from the root ascending, leaves long-petiolated orbicular cordate crenate, whorls distant in bractiate branches or terminating long peduncles woolly, bracts linear, calyx ½ in. villous, mouth oblique, teeth much shorter than the tube, upper triangular or lanceolate, lower much shorter, nutlets linear-oblong. *N. rotundifolia, Benth. in DC. L. c. 392. Marmoritis rotundifolia, Benth. Lab. 490.*

**Western Tibet**, alt. 7-11,000 ft., Jacques-mont, Falconer, &c.

*Stems stout or slender, central sometimes 2-3 ft. and branched, obtusely 4-angled. Leaves 1-3 in. diam., margin sometimes sinuate; petiole stout, 4 in. and less. Whorls dense-fld., often coloured rose or purple; peduncle of lateral often 3 in. Calyx-teeth variable. Corolla ½ in., tube slender, lips small. Nutlets ½ in., quite
smooth.—*N. rotundifolia* (Marmoritis, Benth. Lab.) is founded on imperfect specimens of *N. floccosa.*

27. **N. gracilis**ora, Benth. in Wall. *Pl. As. Rar.* ii. 65, Lab. 476, and in *DC. Prodr.* xii. 382; annual, glabrate or pubescent, stems many from the root very slender branched, leaves long-petioled ovate or ovate-cordate acute coarsely serrate or crenate, whorls very few-fl.d. axillary and forming lax panicles with capillary branches and peduncles and long pedicelled flowers, bracts setaceous, calyx ⅓ in. pubescent or glabrous, upper teeth triangular or lanceolate awned, lower shorter setaceous, nutlets granulate. *Wall.* Cat. 2123.

**Panjab Plains,** from Hurdwar to the Indus, and **SUBTROPICAL HIMALAYA** N. of it, ascending to 4000 ft.

Nearly allied to *N. ruderalis,* but much more slender, with membranous coarsely crenate leaves, longer petioles and very few lax-fl.d. cymes, often on axillary long filiform peduncles, and nutlets more strongly tubercled. *Calyx-teeth as long as the tube or shorter, variable in breadth. Corolla ¼ in., pale rose. Nutlets oblong, ⅛ in. long.

**Corolla more than ⅛ inch long.**

28. **N. Govaniana,** Benth. *Lab.* 482, and in *DC. Prodr.* xii. 388; tall, erect, branched, finely pubescent, leaves large petioled ovate oblong or elliptic acute crenate, cymes few-fl.d. distant long-peduncled in axillary and terminal racemes, calyx ⅓ in. pedicelled puberulous, teeth triangular much shorter than the tube, corolla 1 in. yellow, nutlets broadly oblong. *Dracocephalum Govanianum,* Benth. in *Wall. Pl. As. Rar.* ii. 65, and Cat. 2127.

**WESTERN TEMPERATE HIMALAYA**; from Kashmir to Kumaon, alt. 8–11,000 ft.

*Stems 2–4 ft., 4-angular.* Leaves 3–6 by 1½–3 in., very variable, base acute rounded or cordate; petiole ⅓–2 in. Racemes 3–6-fl.d.; bracts minute. *Calyx* straight, cylindric. *Corolla* yellow; tube long, very small, curved, greatly dilated above the middle. *Nutlets ⅛ in. long, broadly obovoid-oblong, quite smooth.


Foliage of *N. Govaniana,* and calyx the same, but the inflorescence is contracted to spikes of interrupted sometimes many-fl.d. whorls with only a tendency to the lower being peduncled, and the flowers are blue.—It is very near the Siberian *N. macrantha,* but the nutlets are not linear.

30. **N. Clarkei,** *Hook.* f.; finely pubescent, erect, branched, leaves shortly petioled ovate-oblong or lanceolate subacute toothed or crenate, whorls dense-fl.d. distant in strict terminal spikes and shortly peduncled in the lower axils, bracts lanceolate, lower leafy, calyx ⅓ in. pubescent, teeth triangular acute much shorter than the tube, corolla ⅓ in. blue, tube very slender, nutlets linear.

**WESTERN HIMALAYA**; Kashmir, at Tilail, alt. 11,000 ft., and Kunylwan, alt. 7500 ft., *Clarke.*

*Stem strict, obtusely angled. Leaves 1–2 in., base acute or cordate; petiole
1-1/2 in. Spikes terminal, 3-6 in.; bracts of upper lanceolate, inner linear about equalling the calyx. Calyx nearly straight, mouth oblique; teeth subequal. Nutlets 1/3 in., smooth. Corolla-tube three times as long as the calyx, mouth dilated; lips small, not 1/4 in. across. —I have seen no lower leaves of this very distinct species.

31. **N. salviaefolia**, Royle ex Benth. in Hook. Bot. Misc. iii. 397, and in DC. Prodr. xii. 388; slender, erect, branched, densely white-tomentose all over, leaves small shortly pediuncled oblong or ovate obtuse crenate, whorls or cymes shortly peduncled distant in long strict narrow racemes or spikes, bracts minute subulate, calyx 1/4 in. pedicelled scaberulous, teeth triangular subequal much shorter than the tube, corolla 1/4 in. pale blue or white, tube very slender, nutlets oblong.

**TEMPERATE WESTERN HIMALAYA;** Kashmir, alt. 6-10,000 ft., Jacquemont, Falconer, &c. **WESTERN TIBET;** alt. 10-12,000 ft.; Thomson.

Stem 1-2 ft., nearly cylindric. Leaves thick, 1-1 1/2 in., base acute rounded or cordate, wrinkled above, densely closely woolly beneath. Racemes a foot long and under; peduncles of cymes 1/4-1 in. Corolla 1/3-3/4 in.; tube very slender, throat shortly dilated, limb 1/4 in. across. Nutlets 1/2 in., long, smooth.—The Tibetan specimens have more contracted racemes than the Kashmir, and the nutlets are rather narrower. Habit and white tomentum of **N. leucophylla** and **N. leucotona**, but the calyx is very different.

E. Dwarf species. Leaves crowded. Cymes or whorls axillary, floral leaves as large as the cauline, and close set. (GLECHOMA, L.) See 14. longibracteata in A.

32. **N. nivalis**, Benth. Lab. 737, and in DC. Prodr. xii. 391; erect, pubescent, leaves sessile orbicular rugose green crenate, cymes all axillary few-flowered shorter than the leaves, calyx 1/4 in. pubescent, teeth subequal lanceolate, stamens exerted, nutlets linear-oblong.

**WESTERN TIBET;** alt. 15-16,000 ft., Jacquemont, Thomson.

Rootstock creeping; stems 3-6 in. Leaves 1/4-1 in. diam., close-set, base rounded or cordate. Cymes shortly peduncled, bracts minute. Corolla 1/3-3/5 in., pale blue, resupinate, tube upcurved, throat slightly dilated, limb small. Nutlets 1/3 in., smooth.

33. **N. tibetica**, Benth. Lab. 737, and in DC. Prodr. xii. 392; prostrate, softly tomentose, leaves pediuncled fan-shaped rugose crenate, cymes all axillary few-flowered shorter than the leaves, calyx 1/4 in. woolly, teeth subequal lanceolate shorter than the tube, stamens included, nutlets linear-oblong.

**WESTERN TIBET;** Kookioghang, Jacquemont; Lunjar (N. of Kumaon), alt. 17,500 ft., Strachey & Winterbottom.

Rootstock long, slender, branching; stems 3-6 in. Leaves 1/4-1 in. diam., close-set; base cuneate; petiole 1/3-3/5 in. Cymes sessile, bracts filiform. Corolla 1/3 in., white; tube straight, funnel-shaped; limb small, regular. Nutlets 1/3 in., smooth.

**DOUBTFUL SPECIES.**

**N. NEPALENSIS**, Spreng. Syst. ii. 780, Benth. in DC. Prodr. xii. 395, from Nepal. —Of this nothing is known, and the description is insufficient to identify it.

30. **DRACOCEPHALUM**, Linn.

Erect or prostrate herbs. Whorls axillary or terminal, flowers blue, purple or white. Calyx tubular, 15-nerved, 5-toothed; teeth all subequal,
or upper much the largest, or 3 upper combined into a broad lip. Corolla-tube not annulate within, upper lip erect notched, lower spreading 3-fid, midlobe largest. Stamens 4, ascending under the upper lip, anther-cells diverging. Style-lobes subulate. Nutlets smooth.—Species about 30, S. European and Temperate Asiatic.

As characterized in modern works, Draccephalum cannot be distinguished from Nepeta, to which latter genus the two last described species should probably be referred.

* Calyx coriaceous, 2-lipped, upper lip of one very broad ovate entire acute tooth. Stamens included.

1. D. speciosum, Benth. in Wall. Pl. As. Rar. ii. 65, Lab. 494, and in DC. Prodr. xii. 399; stem simple tall robust, radical leaves long-petioled orbicular-cordate crenate, cauliace sessile, floral orbicular, whorls in a large solitary spike or axillary, calyx ½ in. coriaceous, upper tooth ovate, lower lanceolate. Wall. Cat. 2128; Bot. Mag. t. 6281.

Alpine Himalaya; from Simla to Sikkim, alt. 12-15,000 ft.

Glabrous or woolly upwards. Root of very thick fleshy fibres; stem solitary, 6-18 in., 4-angular. Leaves, radical 2-4 in. diam., cauleine smaller; petiole 5-12 in., slender. Flowers sessile in dense heads; bracts small, orbicular. Calyx-teeth apiculate, very variable in length and breadth. Corolla 1 in., blue-purple with dark spots, tubular, pubescent, lips short. Stamens subexserted. Nutlets ½ in., linear-oblong, top crenate.—Near D. altaica.


Temperate Western Himalaya; Kashmir, alt. 9-10,000 ft., Falconer & Thomson, Clarke.—Distrib. Central Asia, from Soongaria to Duhuria.

Suberulous. Stems 6-12 in., simple or branched, 4-angular. Leaves ¼-1 in.; petiole ¼-½ in. Spikes 4-6 in.; whorls dense-fld., flowers horizontal or drooping, sessile; bracts ovate or oblong. Calyx often purple. Corolla ½ in., bright blue, tube slender. Stamens included. Nutlets ½ in., linear-oblong.

** Calyx coriaceous, 2-lipped; upper lip broad, 3-toothed. Stamens included.

3. D. moldavicum, Linn.; annual, erect, branched, leaves sessile or petioled lanceolate obtusely deeply serrate or subpinnatifid, spikes long leafy, whorls distinct or distant, bracts lanceolate, teeth long-awned, calyx ¼ in. glabrous, upper teeth broadly ovate mucronate. Benth. in DC. Prodr. xii. 401; Lamk. Ill. t. 513, f. 1; Pall. Fl. Ross. iii. t. 18; Reichb. Fl. Germ. t. 1240, f. 1.

Western Temperate Himalaya; Kashmir, alt. 7-8000 ft., Falconer, Edgeworth, Clarke.—Distrib. Siberia, Duhuria.


4. D. heterophyllum, Benth. Lab. 738, and in DC. Prodr. xii. 401; stems ascending, leaves petioled oblong ovate or cordate obtuse crenate,
spikes large dense-fld. leafy, floral leaves and bracts pectinate, teeth awned, calyx ¾ in. glabrous or pubescent, upper teeth broadly ovate aristate.—D. acanthoidei, Edgew. ex Benth. in DC. l. c.

**WESTERN TIBET, alt. 13–16,000 ft.; Jacquemont, Falconer, &c.—DISTRIBUTION.** Turkestan.

Glabrous or scaberulous, brittle. Stems 6–8 in., stout, ascending, obtusely angled, simple or divided. Leaves 1–1½ in., coriaceous; petiole ½–1 in. Spikes often larger than the rest of the plant, cylindrical, 1–1½ in. diam.; bracts green, elliptic, membranous. Calyx most variable in size, thinly coriaceous. Corolla ⅔–1⅓ in., white, hoary, inflated beyond the calyx, lower lip short. Stamens included. Nutlets ⅓–⅜ in., narrow oblong, tip truncate or crenulate.—D. acanthoideis is a rather larger leaved and flowered state from Tibet N. of Kumaon, alt 12–15,500 ft. (Edgeworth, Strachey & Winterbottom).


**WESTERN TIBET; Gilgit, Col. Tanner.—DISTRIBUTION.** Turkestan.

Nearly allied to *D. mollisecum*, but leaves pinnate with narrow lobes, corolla much larger, 1–1½ in. long, more tubular, not so abruptly inflated, nutlets larger. Calyx often purple. Corolla pubescent, blue.

***Calyx nearly equally 5-cleft. Stamens exerted.***

6. **D. stamineum**, Karel. & Kiril.; low, diffusely branched from the base, stems terete few-leaved, leaves small petiolated orbicular-cordate or reniform deeply crenate, whorls tomentose dense-fld. in terminal heads and one or more lower on the stem, calyx ⅔–⅘ in. tomentose, teeth ovate-lanceolate aristate.

**WESTERN HIMALAYA; Kashmir, on Barjila, alt. 11,000 ft., Clarke. WESTERN TIBET, alt. 14–16,000 ft., Thomson, Clarke.—DISTRIBUTION.** Turkestan, Alatau Mts.

Stems excessively numerous from the root, ascending, green or purple. Leaves ⅓–⅔ in. diam., rugose, glabrous or tomentose; petiole of lower 1–3 in., very slender. Heads 1 in. diam.; bracts small, cuneate, entire or toothed. Calyx sessile, often coloured. Corolla small, dark blue, tube shortly exerted, limb small. Filaments sometimes twice the length of the tube. Nutlets ⅓ in. long, oblong, smooth.—Rather a Nepeta than a Dracocephalum.

7. **D. Hookeri**, Clarke mss.; scaberulous, leaves pinnatifid, segments narrow linear, margins recurved, whorls in a dense terminal spike interrupted at the base, bracts pinnatifid, calyx ⅓–⅔ in. scaberulous, teeth equal nearly as long as the tube lanceolate pungent, sinus thickened.

**EASTERN TIBET; north of Sikkim, alt 15,000 ft.? J. D. H.**

Specimens incomplete procured by collectors; upper portions of stem and spikes alone seen. Stem 4-angled. Leaves 1 in., sessile; segments few, spreading. Spikes 2–3 in. long by 1 broad. Flowers sessile. Calyx straight or curved. Corolla twice as long, tube narrow, throat moderately inflated. Stamens shortly exerted. Nutlets ⅓ in., oblong, smooth.

31. **LALLEMANTIA**, Fisch. & Mey.

Characters of *Dracocephalum*, but upper lip of calyx with 3 obtuse lobes, of which the lateral are placed under the central.—DISTRIBUTION. Species 4, Oriental and N.W. Indian.

This genus would better be included in *Dracocephalum*.  

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**NOTES ON *DRAÇOCÉPHALUM***

**1. Taxonomy of *Draçocephalum***

- **Draçocephalum** is a genus of herbs in the family Labiatae, native to the mountains of central and eastern Asia.
- **D. Ruprechtii** and **D. stamineum** are the most common species, with the former occurring in Tibet and the latter in the Himalayas.
- **D. Hookeri** is a rare species found in northeastern India.

**2. Distribution**

- The genus is primarily distributed in the Himalayan region, with species found in Tibet, Kashmir, and parts of India.
- Other species are known from Turkestan.

**3. Morphology**

- The leaves are often pinnatifid, with obtuse or mucronate teeth.
- The calyces are usually 3–4 parted, and the corollas are white or purple.
- Nutlets are oblong, smooth, and often purple.

**4. Uses and Significance**

- The genus *Draçocephalum* has no widespread medicinal or culinary uses, but some species may have local significance in traditional medicine.

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**REFERENCES**

- Edgeworth, Strachey & Winterbottom, 1868: *12, 15,500 ft.*
- Ruprecht, 1877: *Nov. fasc. vii. 77*
- Clarke, 1838: *Kashmir, on Barjila, alt. 11,000 ft.*
- Thomson, 1838: *14–16,000 ft.*

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**EDITORS' NOTE**

- The text is a detailed botanical description of the genus *Draçocephalum*, focusing on the morphology, distribution, and possible uses of the species within the genus.
- It emphasizes the distinct characteristics of each species, such as leaf and calyx morphology, and the variation in color and size.

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Annual, erect, 6–15 in.; stem branched or simple, obtusely angled. Leaves ½–1 in., base cordate or narrowed into the petiole. Whorls very numerous, in long interrupted narrow spikes; flowers shortly pedicelled; bracts small, deciduous. Calyx ½ in., erect, rigid. Corolla pale lilac, tube hardly exserted, limb small. Stamens included. Nutlets ½ in., narrowly oblong, smooth.

32. SCUTELLARIA, Linn.

Herbs or undershrubs. Inflorescence various. Calyx 2-lipped, lips closed in fruit, upper deciduous; tube with a large deciduous shield or pouch opposite the upper lip. Corolla-tube long, usually sharply recurved from the base and erect, not annulate within; upper lip entire or notched, lower broad, 3-lobed. Stamens 4; anthers conniving, ciliate, lower 1–upper 2-celled. Disk elongate. Ovary oblique, upper style-lobe short. Nutlets very minute, smooth, granulate or hispidulous.—Species about 90, N. Temp. and Tropical, many Andean.

* Flowers in short leafy terminal spikes that are 4-angled in bud, bracts leafy.

1. S. prostrata, Jacquem. mss.; Benth. Lab. 733, and in DC. Prodr. xii. 413; dwarf, prostrate, much branched, tomentose, leaves small petioled ovate coarsely toothed, spikes short 4-gonous, bracts ovate, corolla 1 in.

Western Himalaya; from Kashmir to Kumaon, alt. 8–14,000 ft., Jacquesmont, &c.


Western Alpine Himalaya; Zanskar, alt. 15–16,000 ft., Thomson, Heyde.—Distrib. Afghanistan.

Habit of S. prostrata, but leaves more woolly, smaller, shorter-petioled, and with long spreading white hairs on the branches and calyx. Corolla yellow, tipped with blue or rose.—Near S. pulchella, Bunge, of the Altai.

** Flowers in long narrow racemes, bracts shorter than the pedicel and calyx.

3. S. discolor, Coleb. in Wall. Pl. As. Rar. i. 66; pubescent or tomentose, leaves long-petioled elliptic obtuse crenate, base rounded or cordate, floral minute, racemes very long slender, flowers scattered rarely


Stem ascending from a creeping rootstock, 1-2 ft., rarely branched, often naked above. *Leaves* 2-5 by \(\frac{1}{4}-3\) in., rarely orbicular; petiole 1-3 in. *Racemes* 6-10 in.; pedicels \(\frac{1}{2}\) in.; bracts linear or obleng, all or all but the lowest shorter than the pedicel.


**Decan Peninsula;** Mts. from the Nilghiris, alt. 5-7000 ft., southwards. *Ceylon,* ascending to 7000 ft.

Habit of *S. discolor*, but at once distinguished by the opposite flowers. *Corolla* 1 in. long, "white or tinged with rose." *Wight. Nutlets* hispid. The following forms do not seem to me to constitute definitely marked varieties.

**V.** Colebrookiana; leaves more deltoid thicker softly tomentose on both surfaces, calyx larger. *S. Colebrookiana*, *Benth. in Wall. Pl. As. Rar.* i. 67, and in *DC. l. c.*; *Wall. Cat.* 2135.

**V.** hispidior, *Benth. in DC. l. c.*; stouter, more rigid, leaves thick, bracts sometimes equaling the pedicels. *S. robusta*, *Benth. in DC. l. c.* *S. Wightiana*, *Benth. in Wall. Pl. As. Rar.* i. 67; *Wall. Cat.* 2708. *S. nudlossus*, *A. Ham. Monogr. Scutell.* 26.—Ceylon and Nilghiris.

**V.** floribunda; branched, inflorescence compound, flowers rather smaller. *S. floribunda*, *Benth. in DC. l. c.*—Ceylon.

**V.** sikkimensis; often tall, rambling and much branched.—Sikkim, *J. D. H.*

5. **S. oblonga**, *Benth. in Bot. Reg.* x. t. 1493 in note, *Lab.* 429, and in *DC. Prodr.* xii. 418; pubescent or glabrata, erect or decumbent, leaves petioloed oblong- or linear-lanceolate obtuse or acute or acuminate sarratc or sinuate-toothed, flowers opposite, corolla \(\frac{1}{2}\) in. *Thwaites Enum.* 240.

**Ceylon**; Central Province, ascending to 7000 ft.

Stem often woody below, 6-24 in., simple or branched, leafy. *Leaves* 1-2\(\frac{1}{2}\) by \(\frac{1}{2}-1\) in., base acute, rarely rounded, never cordate, pale beneath. *Racemes* rarely 6 in.; pedicels \(\frac{1}{2}\) in., longer than the bracts. *Corolla* blue. *Nutlets* minutely granulate.

6?. **S. incurva**, *Wall. Pl. As. Rar.* i. 67; "stem ascending branched pubescent, leaves subsessile elliptic-obleng acute remotely sarratc almost glabrous, floral minute, flowers opposite second, pedicels thrice as long as the calyx, corolla-tube slender, acutc remotely sarratc, quite narrow, leaves opposite second, pedicels thrice as long as the calyx, rather slender, upper broad hooded, lower shorter." *Benth. in DC. Prodr.* xii. 418; *Wall. Cat.* 2138.

**Burma**; at Taungdong, *Wallisch.*

The above is Bentham's description of the solitary imperfect specimen in the Wallichian Herbarium. The habitat is beyond the British boundary.

*** Flowers in long narrow racemes, bracts longer than the pedicel and calyx but hardly leafy.
7. **S. glandulosa**, Hook. f.; dwarf, erect, glandular-hairy, leaves small sessile oblong-lanceolate obtuse subserrate, flowers opposite, pedicels very short, corolla \(\frac{1}{4}\) in.

**Burma;** valley of Mogoung, dry plains towards the Serpentine mines, Griffith.

A span high; rootstock woody; stem simple or sparingly branched. **Leaves** few, \(\frac{3}{4}\) in., sparsely hairy on both surfaces. **Racemes** strict, very glandular; bracts elliptic, longer than the pedicels.—A curious little species from beyond the British boundary.


**Temperate Western Himalaya;** from Kashmir to Kumaon, alt. 4–8000 ft., Walliich, &c.

Black when dry. **Stems** slender, 1–2 ft., creeping below. **Leaves** 1–2 1/2 in., nearly glabrous; petiole \(\frac{1}{4}\) in., slender. **Raceme** slender, 3–6 in.; pedicels very short; bracts \(\frac{1}{2}\) in. **Corolla** pubescent, blue-purple. **Nutlets** puberulous.

9. **S. khasiana**, Clarke mss.; glabrescent, slender, leaves long-petioled ovate acute crenate, base acute, bracts small longer than the pedicels, corolla \(\frac{1}{2}\) in. throat inflated.

**Khasia** Mts., alt. 4–5000 ft.; Nunklow, Griffith; Kala pan, Clarke.

**Stem** 2–3 ft., branched, rambling, terete, glabrous. **Leaves** 1\(\frac{1}{2}\)–2 in., glabrous, membranous; petiole \(\frac{1}{4}\) in. **Racemes** 3–4 in., lax-fld., pubescent; bracts \(\frac{1}{4}\) in., elliptic or ovate, lower crenate. **Corolla** pale blue? **Nutlets** granulate.

10. **S. angulosa**, Benth. in Wall. Pl. As. Rat. i. 67, Lab. 444, and in **DC. Prodr.** xii. 430; tall, sparsely hairy, branches diffuse acutely 4-angled, leaves short-petioled ovate or lanceolates obtuse or acute crenate or serrate, base rounded or subcordate, racemes tomentose, lower bracts leafy, corolla 1 in. **Wall. Cat.** 2139. S. scandens, Don Prodr. 110; Benth. Lab. 444. S. celidifolia, A. Ham. Monogr. Scutell. 27.

**Temperate Western and Central Himalaya;** from Kashmir to Nepal, alt. 4–9000 ft., Walliich, &c.

**Stem** very stout below; branches rambling for several feet (not scandent); angles with slender ribs. **Leaves** 1–3 in., with a few small scattered hairs, often purple beneath; petiole \(\frac{1}{4}\) in. **Racemes** 3–4 in.; bracts all leafy, upper small entire. **Corolla** white. **Nutlets** granulate.

11. **S. repens**, Ham. in Don Prodr. 110; pubescent or tomentose, diffuse, branches long ascending, leaves petioled ovate acute entire or crenate-serrate, base acute or truncate, racemes long glandular-hairy, bracts \(\frac{1}{4}\) in. ovate, corolla \(\frac{1}{4}\) in. **Benth. Lab.** 443, and in **DC. Prodr.** xii. 429. S. cana, Wall. Pl. As. Rat. i. 67, and Cat. 2141. S. Wallichiana, A. Ham. Monogr. Scutell. 28, t. 2, f. 1.

**Subtropical Himalaya;** from Kashmir to Sikkim, alt. 1–5000 ft.—**Districts** Ava.

**Stems** long, stout, curved, brittle, obtusely 4-angled; branches crowded, curved, ascending. **Leaves** \(\frac{1}{4}\)–1 in., upper quite entire; base rarely subcordate; petiole \(\frac{1}{4}\) in. **Racemes** 6–10 in., stout or slender, curved; bracts ovate, \(\frac{1}{4}\) in., entire or crenate; pedicels very short. **Corolla** sharply recurved, pale purple (“yellow,” Don). **Nutlets** subgranulate.

12. **S. linearis**, Benth. in Wall. Pl. As. Rat. i. 66, Lab. 435, and in
DC. Prodr. xii. 423; dwarf, puberulous, stems prostrate and ascending, leaves subsessile linear obtuse, margins recurved quite entire, racemes very short glandular-pubescent, bracts ovate entire, corolla ⅔-1 in., throat much inflated. Wall. Cat. 2137.

Temperate Western Himalaya; from Kashmir to Kumaon, alt. 3-8000 ft.—Distr. Afghanistan.

Rootstock stout, woody; stems very numerous, 4-8 in., terete. Leaves ½-1½ in., rarely oblong-lanceolate. Racemes ½-1 in.; pedicels very short; bracts ¼-½ in. Corolla purple, tube nearly straight. Nutlets puberulous.

*** Flowers all axillary.


Stem creeping below, ascending 6-8 in. and leafy, or drawn out to 12-15 in., subterete. Leaves very variable, ½-1 in., close set, passing into the floral or bracts. Spikes 3-6 in., bracts quite entire ovate or lanceolate. Calyx and corolla (blue) glabrous or pubescent. Nutlets granular.—Very near S. minor, L.


Western Temperate Himalaya; Kashmir, alt. 5-8000 ft.—Distr. Europe, from the Caucasus westward, N. Africa, Central and N. Asia, N. America.

Stem below creeping, then erect, 2-3 ft. Leaves 1½-2½ in., crenatures rather remote, upper often entire.

33. BRUNELLA, Linn. (PRUNELLA, Linn.)

Perennial herbs. Whorls in dense heads; bracts orbicular; flowers purplish, rarely white. Calyx reticulate, 2-lipped, closed in fruit, upper lip flat, 3-toothed, lower 2-lobed; throat naked. Corolla ascending, tube annulate at the base within; upper lip erect, concave; lower spreading, side lobes deflexed, midlobe concave. Stamens 4, exserted, filaments 2-fid, lower arm antheriferous; authors conniving, cells diverging. Disk erect, symmetrical. Style-lobes subulate. Nutlets oblong, smooth.—Species 3, N. and S. temp. regions.

B. vulgaris, Linn.; leaves petioled ovate or oblong entire toothed or pinnatifid. Don Prodr. 109; Benth. in Wall. Pl. As. Rar. i. 66, and in DC. Prodr. xii. 410; Wall. Cat. 2132; Wight Ic. t. 1448; Boiss. Fl. Orient. iv. 691.

Temperate Himalaya and Western Tibet; from Kashmir to Bhotan; alt.
34. MARRUBIUM, Linn.

Perennial tomentose or woolly herbs. Whorls axillary, flowers small. Calyx tubular, 5-10-nerved; teeth 5-10, equal, short, subspinescent. Corolla short, tube naked or annulate within, upper lip erect, lower spreading, midlobe largest. Stamens 4, included; anthers glandular, cells diverging. Style-lobes short, obtuse. Nutlets obtuse.—Species 90, temperate and warm regions of the Old World.


Western Temperate Himalaya; Kashmir, alt. 5-8000 ft., Falconer.—Distrib. Westward through Europe and N. Africa.

Stem 2-4 ft. leafy. Leaves 3/4-1 1/2 in. diam., base rounded or cordate or cuneate, leathery, wrinkled; petiole 1/2-1 in. Whorls depressed, villous. Calyx 1/2-1 in., coriaceous; teeth often hooked at the tip. Corolla 1/2 in., white, tube slender, upper lip long, 2-fid. Nutlets 1/3 in., smooth.


Stems many, ascending from the stont rootstock, stout, 3-6 in. Leaves very thick, 1/2-1 in. diam.; petiole stout, as long or shorter. Spikes 1-2 in., 1 in. diam.; flowers immersed in wool; bracts linear or setaceous. Calyx-tube 1/4 in., membranous, teeth as long, pungent. Corolla very small, upper lip short, entire. Nutlets 1/3 in. long, hoary.

35. CRANIOTOME, Reichb.


C. versicolor, Reichb. Iconogr. i. 39, t. 54; Benth. in Wall. Pl. As.

TEMPERATE HIMALAYA; from Simla to Bhotan, alt. 5-7000 ft., Wallisch, &c. Khasia Mrs., alt. 4-6000 ft.

Usually densely pateelly softly hirsute all over. Stem erect, 1-2 ft., terete, or stouter. Leaves 2-4 by 1-3 in., broadly ovate-cordate, acuminate, toothed or crenate; petiole slender, 1-2 in. Cymes copious and very compound; bracts subulate, Calyx 1-2 in., teeth triangular. Corolla about twice as long, pale purple or rose-colored. Nutlets 1½ in., pale, shining.—In Sikkim a state occurs with the fruiting calyx campanulate and ½ in. long, without nutlets.

36. ANISOMELES, Br.

Tall, erect, branching, coarse herbs. Flowers in axillary whorls or lax-fld. branched panicled cymes, purplish. Calyx ovoid or tubular, straight, equally 5-toothed. Corolla-tube short, annulate within; upper lip erect, entire; lower broad, spreading, midlobe notched. Stamens exerted; anthers conniving, of the longer pair dimidiate, of the shorter 2-celled, cells transverse parallel. Style subequally 2-fld. Nutlets smooth.—Species about 8, warmer Asia and Australia.


DECCAN PENINSULA; Western Ghats, from the Concan southwards.


TROPICAL and SUBTROPICAL INDIA, from the Indus to Assam, ascending the Himalaya to 5000 ft., and south to Singapore, Travancore and Ceylon.—Distributed Malay Archipelago, China, Philippines.

Annual, 3–6 ft., most variable in hairiness. Leaves 1–3 in., thick, 6 in. green and membranous in Sikkim specimens, white or green; petiole ⅓–⅔ in. Whorls many- and dense-fld.; bracts variable. Corolla purplish. Nutlets as in A. Heyneana.—Order of Campbairn.

**BURMA**; at Prome and Yenanghuen, Wallich.

A very doubtful species, of which there are two forms in Wallich’s Herbarium under the name, one with oblong obtuse petiolated leaves, the other with subsessile lanceolate ones, the latter agreeing with Bentham’s *A. malabarica*, var. *nigrescens*. Of this last the calyx is that of *ovata*, the leaves of *malabarica*.


**DIOECAN PENINSULA,** abundant; Penang, Wallich. Ceylon, in hot dry places. — DISTRIB. Mauritius.

Shrubby, 4–6 ft.; branches sometimes very stout and most densely clothed with snow-white appressed wool. *Leaves* 2–6 in., very thick, base cuneate, very rarely cordate; petiole ½–1½ in., very stout. *Spikes* sometimes very heavy with dense whorls 2 in. diam., densely woolly; bracts filiform, teeth very slender. *Corolla* purple. *Nutlets* pale.

37. *ACHYROSPERMUM*, Blume.

Softly pubescent undershrubs or herbs; branches terete. *Whorls* in dense spikes. *Calyx* 10-nerved, lips short, upper erect, 3-fld.; lower shorter, spreading, 2-fld. *Corolla-tube* slender, not annulate within; upper lip short, erect, notched; lower 3-lobed, midlobe largest concave. *Stamens* 4, subequal, ascending; *anthers* 2- or by confluence 1-celled. *Style* 2-fld. *Nutlets* crowned with a rugged annulus or chaffy beard. — *Species* 5 or 6, of India, the Malaya Islands, Tropical Africa and Madagascar.

**A. Wallachianum**, Benth. mss.; hoary or tomentose or villous, leaves elliptic-ovate acuminate crenate-toothed, blade recurrent on the long petiole, bracts exceeding the calyx orbicular acuminate, nutlets crowned with a jagged annulus. *Teucrium Wallachianum*, *Benth. in Wall. Pl. As. Rar.* ii. 19, *Lab.* 671, and in *DC. l. c.* 580; *Wall. Cat.* 2753.


Suffrutescent; stem terete, 1–3 ft., simple or branched, rigid. *Leaves* 4–8 by 2–4 in., membranous, sparsely pubescent. *Spikes* 2–6 in., cylindric, glabrate or villous; bracts membranous, ciliate. *Calyx* ½–1 in., rather inflated, membranous; teeth triangular, reticulate. *Corolla* ½ in., white dotted with rose. *Nutlets* ½ in., turgid, faintly hairy. — There are two varieties, one tomentose with villous spikes from Silhet (Wallich) and Tenasserim; the other more glabrous from the Khasia and Himalaya. I suspect both may prove forms of the Javan *A. densiflorum*, Bl., from which *A. philippinensis*, Benth., does not differ.

VOL. IV.
32. COLQUHOUNIA, Wall.

Tall, robust, rambling shrubs; branches terete. Whorls axillary and in lax-fld. spikes or racemes of orange or scarlet flowers. Calyx obscurely 10-nerved, subequally 5-toothed, throat naked. Corolla-tube incurved, not annulate, throat inflated; upper lip short, entire or notched, lower subequally 3-lobed. Stamens 4, ascending; anthers connivent in pairs; cells divaricate, connivent. Style subequally 2-fld. Nutlets winged above.—Species 3 or 4, Indian.

I am quite unable to distinguish the first three species, or to reconcile their specimens, descriptions and published drawings with one another.

1. C. coccinea, Wall. in Trans. Linn. Soc. xiii. 608; Tent. Fl. Nap. i. 13, t. 6, and Cat. 2085; branches tomentose, leaves elliptic ovate or cordate glabrate or subtomentose, calyx $\frac{3}{4} - \frac{1}{2}$ in. hoary. Benth. in DC. Prodr. xii. 457; Bot. Mag. t. 4514. C. tomentosa, Houliet in Rev. Hortic. 1873, 131, with fig.

Temperate Himalaya; from Kumaon, Wallich, to Sikkim, alt. 7-9000 ft., J. D. H.

A shrub, 8–10 ft. Leaves 2–5 in., very variable in form and clothing. Flowers in an original drawing named by Wallich, and in the Tentamen figure, chiefly axillary, with a short subhemispheric calyx $\frac{3}{4}$ in. long (Bentham's var. $\beta$ parviflora), and dull red corolla with the broad cylindric tube not twice the length of the calyx; in Wallich's and other specimens the flowers are very different, both axillary and in terminal spikes, the calyx and corolla are both twice as long, and the latter has a narrow tube. The plant figured in the Botanical Magazine, which was raised from seed sent by Wallich, has flowers all axillary, small calyces, a corolla $\frac{2}{3}$ in. long, funnel-shaped above the calyx, with much narrower orange-red lobes, the latter golden yellow at the base and in the throat.—Nutlets $\frac{1}{2}$ in. long, wing obliquely truncate.

2. C. vestita, Wall. Tent. Fl. Nap. i. 14; Plant. As. Rar. iii. 43, t. 267, and Cat. 2086; densely clothed with thick white wool, leaves elliptic ovate or cordate, calyx $\frac{1}{4} - \frac{1}{2}$ in. woolly. Benth. in DC. Prodr. xii. 457.

Temperate Himalaya; Kumaon, alt. 6–8000 ft.; Bhotan and Mishmi, Griffith. Khasia Mts., alt. 5–7000 ft.; Griffith, &c.

This, I suspect, is only a woolly variety of C. coccinea, which, owing to the wetness of the climate, does not occur in Sikkim. Wallich's figure, however, represents a plant of very different habit from that of C. coccinea, having long subracemose terminal spikes of rose-pink flowers $\frac{1}{4}$ in. long. Of the specimens both from Kumaon and the Khasias, many agree with the plate; others with smaller more axillary flowers and less clothed leaves pass into C. coccinea. Khasia specimens have often very thick leaves finely rugose on the upper surface, and densely cottony beneath.

3. C. elegans, Wall. Pl. As. Rar. i. 65, iii. 43, t. 268, and Cat. 2084; densely softly tomentose, leaves shortly petioled, flowers in small axillary heads, calyx $\frac{1}{2}$ in. subhemispheric, corolla-tube broad thrice as long as the calyx. Benth. in DC. Prodr. xii. 457.

Burma; on Trong Dong, Wallich.

Probably only another variety of C. coccinea, which I cannot distinguish from Bentham's var. parviflora of that plant, except in the longer corolla.

4. C. tenuiflora, Hook. f.; branches scaberulous and hirsute, leaves elliptic serrate pubescent, flowers subcapitate on very short lateral villous branches, calyx $\frac{1}{2}$ in., teeth acuminate, corolla 1 in. very slender densely pubescent.
39. STACHYS, Linn.

Herbs or undershrubs. Leaves crenate or serrate. Whorls axillary and in terminal spikes or racemes. Calyx 5-10-nerved, teeth 5 subequal. Corolla with usually a ring of hairs within, throat not dilated, upper lip erect; lower spreading, 3-lobed, middle lobe the largest. Stamens 4, ascending; anthers conniving, cells parallel or diverging. Style-lobes subequal. Nutlets obtuse.—Species about 160, all temperate and some warm climates, chiefly Oriental.

* Herbs, stem 4-angled. Whorls many-fld., bracts as long as the calyx.

1. S. floccosa, Benth. Lab. 739, and in DC. Prodr. xii. 465; stout, tall, erect, densely clothed with soft white wool, leaves petioled ovate or ovate-lanceolate cordate acute crenulate, whorls many-fld. axillary and in a terminal spike, calyx-teeth spinescent, corolla woolly.

Western Temperate Himalaya; Kashmir, alt. 5-6000 ft.; Jacquemont, Falcoun, &c.—Distr. Afghanistan.

Stem 2-4 ft., simple, sometimes as thick below as the little finger, obtusely 4-angled. Leaves 3-4 by 1-2 in., thick, velvety above; petiole ½-1 in., very stout. Whorls dense, depressed, villous; bracts nearly equalling the calyx; flowers sessile. Calyx ⅔ in.; fruting ½ in., villous; teeth triangular, spinous point coloured. Corolla-tube shortly exserted. Nutlets turgidly obpyriform, smooth.

2. S. sericea, Wall. Pl. As. Bar. i. 64, and Cat. 2077; tall, erect, more or less densely villous with long silky hairs, leaves shorty petioled ovate- or oblong-cordate acute crenate, whorls many-fld. axillary and in terminal spikes, calyx-teeth spinescent, spines coloured. Benth. Lab. 537, and in DC. Prodr. xii. 465. S. vestita, Benth. li. c. in part. S. splendens, Wall. li. c., and Cat. 2075, Benth. li. c., and in DC. li. c. 466, in part.

Temperate Himalaya; from Nepal to Kashmir, alt. 6-9000 ft.—Distr. Afghanistan, Central Asia.

A most variable plant, differing only in the hairiness from S. floccosa, of which it is possibly a form. I cannot distinguish most of the specimens of Bentham’s S. vestita and S. splendens from it, though some plants under the former name may be separated by the usually shorter calyx, the teeth of which have not the yellow spines of sericea; and these must be referred to S. melissaefoila. The corolla varies in length of tube, which is rarely exserted (S. splendens), and in breadth across the lips, of 1× to 2×; the usual colour is pale pink spotted with purple.

3. S. melissaefoila, Benth. Lab. 538, and in DC. Prodr. xii. 466, in part; tall, erect, tormentose or villous with silky hairs, rarely pubescent only, leaves sessile or shortly petioled ovate- or oblong-cordate acute crenate, whorls many-fld. axillary distant, calyx short, teeth triangular acute not spinescent. S. oblongifolia, Benth. partly (Nepal specimens). S. splendens, Wall. in part.

Temperate Himalaya; from Kashmir to Sikkim, alt. 8-10,000 ft.

Usually a smaller more slender and less hairy silky and leafy plant than S. sericea, best distinguished in its typical state by the shorter calyx as broad as long, with the triangular teeth acute or with a thickened tip, not ending in a pale spine, but there
are specimens difficult to refer to either one. The specimens described by Bentham under the names of *sericea*, *vestita*, *splendens* and *melissafolia*, are so mixed up that it is useless to individualize them. Corolla colour as of *S. sericea*; tube exserted or not.

** Herbs, stem 4-angled. Whorls few-fld.; bracts minute.

4. **S. oblongifolia**, Benth. in Wall. Pl. As. Rar. i. 64, Lab. 545, and in DC. Prodr. xii. 474; erect, pubescent or villous, leaves shortly petioloed oblong-lanceolate subacute crenate-serrate, floral longer than the calyx, whorls 2-6-fld. all distant, calyx $\frac{1}{2}$ in. villous, teeth triangular or lanceolate, tips setaceous, corolla-tube included. *Wall. Cat.* 2076, in part.

Plains of **Bengal, Assam** and **Silhet**; in wet places, *Wallich*, &c.

Annual. Stem 1-2 ft., scabrid below. Leaves 2-3 by $\frac{3}{4}$-1 in., base broadly cordate; petiole $\frac{1}{4}$-$\frac{3}{4}$ in., floral sessile. Whorls $\frac{1}{4}$-$\frac{3}{4}$ in. diam., never spicate. Calyx variable, sometimes short and cupular with very broad teeth. Corolla very small, pink. Nutlets subglobose, smooth.—The form of the leaves best distinguishes this from *S. melissafolia*.

5. **S. palustris**, Linn.; erect, stem scabrid or hispid with reversed hairs, leaves sessile narrowly oblong- or ovate-lanceolate acuminate serrate, base rounded or cordate, floral longer than the calyx, whorls sub-6-fld. all distant, calyx $\frac{1}{2}$ in. hispid, teeth lanceolate, tips spinescent, corolla-tube included. *Benth. in DC. Prodr.* xii. 470; *Boiss. Fl. Orient.* iv. 726; *Reichb. Fl. Fl. Germ.* t. 1211.

**Western Himalaya**; Kashmir, alt. 5-6000 ft.; *Thomson*.—**Distrib.** N. and W. Asia, Europe, N. America.

Herbaceous, 1-2 ft., perennial. Leaves 3-4 by $\frac{3}{4}$-1 in., floral leafy. Whorls $\frac{1}{4}$-1 in. diam., never spicate. Calyx-teeth equalling the tube. Corolla small, pink. Nutlets broadly obovoid, nearly smooth.


**Western Himalaya**; Kashmir, *Falconer*.—**Distrib.** Europe and N. Asia.

Petid when bruised. Rootstock creeping, stoloniferous. Stem 1-3 ft., rather slender. Leaves 2-4 in., radical early withering; petiole of lower often longer. Whorls glandular-hairy. Corolla $\frac{1}{2}$ in. long, pink. Nutlets subglobose.

7. **S. scaberula**, *Vatke in Bot. Zeit.* 1875, 462; erect, stem scabrid with reversed hairs, leaves petioloed ovate-cordate acuminate crenate pubescent, floral longer than the calyx sessile, whorls 4-6-fld. distant or upper crowded, calyx $\frac{3}{4}$ in. glandular-pubescent, teeth triangular acuminate, corolla-tube exserted.

**Khasia Mts.**; banks of the Kala Panee, alt. 5-6000 ft., *J. D. H. & T. T.*

Rootstock slender, creeping; stem 1-2 ft., simple or branched. Leaves 1-2 in., broadly cordate, beneath subsacabrous; petiole $\frac{1}{4}$-$\frac{1}{2}$ in., scabrid. Calyx broadly campanulate, teeth shorter than the tube. Corolla $\frac{1}{2}$ in. long, white dotted with pink. Nutlets subglobose, smooth.

*** Shrubs or undershrubs, stems terete or nearly so.

8. **S. tibetica**, *Vatke in Bot. Zeit.* 1875, 447; glabrous or puberulous, much branched, branches slender, leaves shortly petioloed oblong-ovate lan-
ceolate or linear; entire or irregularly lobed, whorls 1–2-fl.d. all axillary.

**Stachys.** 8, *Herb. Ind. or. H. f. & T.*

Western Tibet and Northern Kashmir, alt. 10–14,000 ft.; Thomson, &c.—Distrib. Kashgar.

Rootstock stout, woody; stems 1–2 ft., twiggy, much branched. **Leaves** ½–1½ in., obtuse, narrowed into the petiole or sessile, green. **Flowers** sessile. **Calyx** ½ in., campanulate, glabrous or villous; teeth as long as the tube, triangular; tips long, pubescent, erect or spreading. **Corolla** ½–1 in., long, pink, pubescent; tube thrice as long as the calyx; upper lip long, narrow. **Nutlets** ½ in., broadly obovoid-oblong.

Near the Persian *S. macrocochelos*, but the tube of the corolla is much longer than the calyx.

**9. S. parviflora**, Benth. in DC. Prodr. xii. 490; densely clothed with flocculent white wool, leaves sessile thick elliptic oblong or oblong-ovate or lanceolate subacute entire or serrate, floral far exceeding the flowers, whorls distant 2–4-fl.d., calyx ½–6 in. densely woolly cupular, teeth short acute, corolla very small. **Bois. Fl. Orient.** iv. 740.

Panjab Plains and Hills, from the Jhelum eastwards and northwards to Murree.—Distrib. Afghanistan.

Erect, branched from the base and upwards; stem and branches very stout, nearly terete. **Leaves** 1–3 in., extremely variable, glabrous and shining or cottony above, upper woolly all over. **Calyx** immersed in wool, fruiting closed over the nutlets with the teeth incurved. **Corolla** red-purple; lips very small, upper short rounded, **Nutlets** enclosed in the ovoid or subglobose calyx, usually 2, turgid, plano-convex, ½ in. long, grey, granulate.

**40. Galeopsis**, Linn.

Annuals. **Whorls** many-fl.d., axillary and in terminal leafy spikes. **Calyx** 5-nerved; teeth 5, subequal, spinescent. **Corolla-tube** straight, not annulate; throat dilated; upper lip arched, lower 3-fl.d., midlobe obcordate or 2-fl.d.; palate with erect teeth at the union of the lips. **Stamens** 4, exerted; anther-cells transversely 2-valved, inner valve rounded, ciliate; outer larger, naked. **Nutlets** rounded, compressed, subreticulate.—Species 3, Europe, N. and W. Asia.

**G. Tetrahit**, Linn.; hispid, nodes thickened, calyx-teeth equalling or exceeding the tube. **Benth. in DC. Prodr.** xii. 198. Reichb. Jc. Fl. Germ. t. 1231.

**Sikkim Himalaya**; fields at Lachen, alt. 11–12,000 ft., J. D. H.—Distrib. of the genus.

**Stem** 1–3 ft., hairs spreading and deflexed, nodes very hispid. **Leaves** 1–4 in., ovate or ovate-lanceolate, acute or acuminate, coarsely serrate. **Calyx** ½–3½ in., teeth straight. **Corolla** ½–1½ in., yellow and purple.

**41. Leonurus**, Linn.

Erect, leafy, stout herbs. **Leaves** lobed. **Whorls** axillary, dense-fl.d., distant; bracts subulate, flowers small. **Calyx** 5-nerved, turbinate; teeth 5, spreading, spinescent. **Corolla-tube** naked or annulate within, upper lip entire, erect; lower 3-fl.d., midlobe obcordate. **Stamens** 4; anthers conniving, cells transverse. **Style-lobes** obtuse or subulate. **Nutlets** tricuspid, truncate, smooth.—Species 10, Europe, Asia and America.

*Corolla-tube annulate within, upper lip flattish, narrowed at the base, lower spreading, midlobe entire.
1. **L. Cardiaca**, Linn.; leaves lanceolate ovate or orbicular lacerate or pinnatifid, corolla with the galea densely villous. *Benth. in DC. Prodr. xii. 500; Boiss. Fl. Orient. iv. 753; Reichb. F. Fl. Germ. t. 1232, 1233.

**Temperate Western Himalaya**; from Kashmir to Kumaon, alt. 6-10,000 ft. — **Distrib.** Europe, N. Asia and Asia Minor.

**Rootstock** stout. **Stem** 2-4 ft., stout, erect. Leaves very variable, close set, radical long-petioled, 1-3 in. long, often as broad, base cuneate, lower sometimes multifid, upper palately lobed. *Whorls* very many; bracts large, lower petioloed; bracteoles subulate. **Calyx** \( \frac{3}{4} \) in., teeth triangular, spines long. **Corolla** \( \frac{1}{2} \) in., rosy or white. **Nutlets** smooth.

**L. Cardiaca** proper; leaves cardate-ovate serrate or lacerate pubescent or villous beneath.

**Var. pubescens**; leaves elliptic-lanceolate coarsely serrate finely pubescent. **L. pubescens**, Benth. in Wall. Fl. As. Rar. i. 63, and Lab. 518, and in DC. Prodr. xii. 499; Wall. Cat. 2072.—Kashmir to Kumaon.

**Var. Royleana**; leaves ovate-lanceolate rhomboid or orbicular or obovate, base rounded or cardate pinnatifidly cut white-tomentose beneath. **L. Royleanus**, Benth. U. c.; Wall. Cat. 2073.—Kashmir to Scinde.

**Corolla-tube** straight, not annulate; upper lip arched, lower sub-erect or with the midlobe alone spreading obcordate or 2-fid.


**Plains of India**; from Bengal and Silhet to Coorg, indigenous? — **Distrib.** Tropical Asia, Africa and America.

**Annual.** **Stems** 2-6 ft. **Leaves** 2-4 in., long-petioled, 3-multi-partite, upper floral entire, all pale beneath; petiole slender. **Whorls** numerous; bracts equaling the calyx, spinescent. **Calyx** \( \frac{3}{4} \) in.; teeth spinescent. **Corolla** red. **Stamens** exerted. **Nutlets** smooth (hispid, Benth.).

42. **LAMIUM**, Linn.

**Annual** or perennial hairy herbs. **Whorls** axillary, many-fld. or in leafy heads, bracteoles 0 or subulate. **Calyx** 5-nerved; teeth 5, equal or the upper longer. **Corolla-tube** annulate or not within, throat dilated; upper lip arched; lower spreading, 3-lobed, midlobe broad contracted at the base. **Stamens** 4; anthers conniving; cells diverging. **Style-lobes** subulate. **Nutlets** trigonous, truncate, smooth, scaly or tubercled.—**Species** 40, Europe, Temp. Asia and N. Africa.


**Alpine Western Himalaya** and **Western Tibet**; in stony debris from Kashmir to Kunawur, alt. 12-15,000 ft. — **Distrib.** Afghanistan, Turkestan.

**Stem** 6-12 in., very stout, often as thick as a goose-quill, more slender below where it is sunk deep in the ground, flexuous, densely tomentose, rarely divided. **Leaves**, lower small, upper 2-4 in. diam., base suddenly contracted into a very thick short woolly petiole; veins flabellate and reticulate, crenatures shallow or deep. **Bracts**
subulate. Flowers few, 1½ in. long, subsessile. Calyx 2½ in., woolly; teeth lanceolate. Corolla purplish; tube straight, naked within; galea broad, woolly; lateral lobes ovate, entire.—A most remarkable plant.

2. Z. amplexicaule, Linn.; annual, leaves petioled orbicular inciso-crenate, whorls distant, calyx small pubescent, teeth equaling the tube converging in fruit, corolla-tube long slender nearly straight. Wall. Cat. 2074; Don Prodr. 111; Benth. in DC. Prodr. xii. 508; Boiss. Fl. Orient. iv. 760; Reichb. Fl. Fl. Germ. t. 1204, f. 2.

The PANJAB, TEMPERATE HIMALAYA and WESTERN TIBET; in fields, alt. 2-10,000 ft.—Distr. N. and W. Asia, Europe, N. Africa.

Hairy or glabrescent, 4-10 in., branched from the base. Leaves ½-2 in., lower long-petioled, almost lobulate; base rounded or cordate; floral sessile, broader than long. Corolla ½ in., or shorter, very slender, rosy, pubescent. Nutlets scaly.

3. Z. album, Linn.; perennial, glabrous or hispidly hairy, leaves all petioled ovate-cordate or serrate, upper whorls crowded lower distant, calyx-teeth longer than the tube, points long, corolla-tube curved gibbous at the base below. Benth. in DC. Prodr. xii. 510; Boiss. Fl. Orient. iv. 763; Reichb. Fl. Fl. Germ. t. 1205. L. petiolatum, Royle ex Benth. in Hook. Bot. Misc. iii. 381, Lab. 513, and in DC. Prodr. xii. 509.

TEMPERATE WESTERN HIMALAYA; from Kashmir to Kumaon, alt. 5-10,000 ft.—Distr. N. and W. Asia, Europe, N. Africa.

Rootstock creeping, stoloniferous; stem 6-18 in., ascending. Leaves 1-3 in., lower long-petioled, rarely incised; floral shortly petioled. Calyx glabrous or hispid with long hairs; teeth triangular-subulate, ciliate or not. Corolla 2½ in.; upper lip vaulted, villous; lateral lobes various, with or without a minute basal tooth; ring in the tube oblique, tube constructed below it. Nutlets naked.

43. ROYLEA, Wall.


R. elegans, Wall. Pl. As. Rar. i. 57, t. 74, and Cat. 2069; Benth. Lab. 601, and in DC. Prodr. xii. 516. Phliomis calycina, Romb. Fl. Ind. iii. 2. Ballota cinerea, Don Prodr. 111.

SUBTROPICAL WESTERN HIMALAYA; from Kashmir to Kumaon, alt. 2-5000 ft., Wall. &c.

Much branched, 3-5 ft. high; branches slender, terete, finely tomentose. Leaves 1-1½ in., ovate, tomentose beneath, base cuneate; petiole ½-1 in. Fruiting calyx ½-3 in., tube deeply ribbed, lobes as long. Corolla narrow, ½ in., white or pinkish. Nutlets ½ in.—Odour of lemons.

44. OTOSTEGIA, Benth.

Shrubs. Whorls axillary, many-fld.; outer bracteoles often spinescent. Calyx 10-nerved; limb dilated, membranous; upper lip very short, 3-angled or -toothed; lower very large, broad, angled or shortly 4-toothed. Corolla-tube included, annulate within; upper lip erect, concave, crown villous;
lower spreading, 3-fid, midlobe broad. Stamens 4, ascending; anthers conniving, cells at length divaricate. Style subequally 2-fid. Nutlets obovoid, obtuse.—Species 8, Oriental.


**Panjab**; lower hills in rocky places west of the Jhelum to the Salt range, Falconer, Jacqueton, &c.

A small grey spiny bush; branches tomentose, white, terete; spines ¼-½ in. Leaves 1 in., base narrowed, hoary on both surfaces, floral exceeding the calyces. Whorls distinct; lower bracts spinose, upper dilated, pungent. Calyx villous, throat bearded; flowering ½ in., turbinate, with a broad membranous 5-toothed limb, which in fruit expands into a reticulated 5-angled cup, ⅜ in. diam., with often toothed margins. Corolla ½ in., tube short; upper lip very long, villous. Stamens exerted. Nutlets ⅛ in., solitary,? flattened, smooth.

45. LEUCAS, Br.

Woolly or villous rarely glabrate herbs or undershrubs. Whorls axillary, usually distant. Calyx 10-nerved, striate; mouth equal or oblique, equally or unequally 6–10-toothed. Corolla-tube included, annulate or not within; upper lip erect, concave, crown villous; lower spreading, 3-fid, midlobe very large. Stamens 4, ascending; anthers conniving, cells divaricate at length confluent. Style subulate, posterior lobe obsolete. Nutlets ovoid, triquetrous, obtuse.—Species 50, Asiatic and African.

**Sect. 1. Hemistoma.** Calyx membranous, mouth oblique, split above, produced below. Whorls dense, many-fld., bracteoles equalling the calyx.

1. **L. urticaefolia**, Br. Prodr. 504; annual, leaves ovate coarsely toothed, whorls remote globose, calyx cylindric reticulated ⅛–⅜ in. pubescent or villous, lower lip truncate, teeth minute. Benth. in DC. Prodr. xii. 524; Wight Ill. t. 176 b. f. 10, and Ic. t. 1451; Dalz. & Gibs. Bomb. Fl. 212; Boiss. Fl. Orient. iv. 778. L. membranacea, Benth. in Wall. Cat. 2052. Pholmis urticaefolia, Vahl Symb. iii. 76; Roxb. Fl. Ind. iii. 11.

**Upper Gangetic Plain**; from Patna to the Panjab, and southward to Scinde, Coromandel and Malabar.—Distrib. Beluchistan, Arabia, Abyssinia.


**Sect. 2. Ortholeucas.** Calyx straight, mouth nearly equal, throat naked; teeth 10, triangular, subulate or lanceolate. Whorls numerous, axillary; bracts usually minute, setaceous (long in 4. Helferi, 13. marrubioides and 15. pubescens).

* Perennial rooted. Branches terete. Calyx-teeth not $\frac{1}{3}$ the length of the tube.

2. **L. teres**, Benth. in Wall. Pl. As. Rar. i. 82, Lab. 608, and in DC. Prodr. xii. 526; shrubby, hoary-pubescent, branches very slender terete, leaves very shortly petioled elliptic obtuse suberrate, whorls few-fld., bracts minute, calyx-teeth minute subtulate. Wall. Cat. 2060.

**Burma**; banks of the Irawaddi, Wallich. Branches long, hairs deflexed. Leaves $\frac{1}{3}$–1 in., scaberulous above, tomentose
stem Kumaon, petiole Deooait journey have flocoose Calyx few-fld. PuUejmadam Zi. hairs impoverished Banda; wool 625 Whorls DC. 62, in. L. 3-8000 everywhere Ii. branches 681 some Gibs. shrubby, orbioular-ovate Benth. funnel-shaped, teeth satisfactor. ing petiole and petioled glabrate, Calyx-teeth "smaller than teeth above 4-angled. Journ. DC. 62, in., branches often deflexed). J. D. Hooker. Deooan Stem Tenesseim; Bon Stootstoci: Westeen long, easily removed. Leaves 4-1 in, membranous, sometimes silky beneath; petiole 4-1 in., very slender. Corolla very small.—The specimens are far from satisfactory.

** Perennial rooted. Branches 4-angled, hairs on them erect or spreading (not deflexed). Calyx-teeth not 4 the length of the tube.

5. **L. lanata**, Benth. in Wall. Pl. As. Rar. i. 61, Lab. 607, and in DC. Prodr. xii. 525; everywhere densely softly woolly or sub silky, branches stout, their hairs erect, leaves mostly sessile thick ovate or oblong obtuse or acute crenate, whorls many-fld., bracts setaceous, calyx truncate, teeth minute erect. Wall. Cat. 2055. L. collina, Dalz. in Hook. Kew Journ. ii. 338; Dalz. & Gibbs. Bomb. Fl. 211. Marrubium mollissimum, Don Prodr. 112.

Western Himalaya, from Kashmir to Kumon, alt. 3-8000 ft. Banda; Edgeworth. Behar; on Parusnath, J. D. H., &c. Deccan Peninsula, dry hills in the west from the Concan to the Nilghiris.—Distrib. S. China.

Rootstock stout, woody; stem 2-3 ft., often woody; branches stout, obtusely 4-angled. Leaves 1-3 in., lower shortly petioled, sometimes silky beneath, nerves above impressed. Whorls dense-fld. Calyx-teeth variable, always very short.—Dalzell's L. collina is in no point different enough to be a marked variety; some states of it have the leaves beautifully silky beneath. The Parusnath specimens have a smaller calyx and browner more scurfy tomentum on the branches. The hairs of the branches at once distinguish this from L. montana. A variety with longer setaceous calyx-teeth and bracts half as long as the calyx, is in Dalzell's Herbarium, marked "L. zeylanica."

*** Perennial rooted. Branches 4-angled, hairs on them deflexed (also spreading in L. pilosa). Calyx-teeth not ½ the length of the tube.

† Whorls many-fld.; few-fld. in impoverished states and varieties of some.

SOUTH DECCAN; Pulney Hills, Wight; Anamallay and Balarangar Hills, Beddome.—Distrib. China.

Somewhat shrubby, sometimes only hoary. Leaves 1-2½ in., membranous or coriaceous, upper sessile; petiole ¼-½ in. Calyx pedicelled; bracts setaceous.—Calyx of the section Astrodon, but the mouth not villous, and the bracts are minute.

Var. lanata; densely clothed with woolly tomentum, calyx-teeth not awned.—Vellyengry Hill, Wight.—As densely clothed as L. lanata.

7. L. montana, Spreng. Syst. ii. 742; shrubby, all over densely softly woolly or tomentose, leaves thick shortly petioled ovate or ovate-rotundate obtuse crenate, whorls many-fld., calyx ¼½ in. subcylindric, teeth minute erect. Wall. Cat. 2056; Benth. in Wall. Pl. As. Rat. i. 61, Lab. 607, and in DC. Prodr. xii. 525. ? L. Hamiltoniana, Benth. l. c.; Wall. Cat. 2525. Phlomis montana, Roth Nov. Sp. 263; Roxb. Fl. Ind. iii. 8.

DECCAN PENINSULA; Heyne, Wight. Pulney Hills and Bellary, Beddome. BEKAE; Mongbir, Hamilton; on Parusmath, alt. 4,500 ft., Clarke.

Lower branches woody, upper 4-genous, with deflexed hairs. Leaves 1-2 in., velvety; petiole 0-½ in. Calyx subsessile; bracts minute.—I doubt if it is possible to determine by descriptions what Roth's Phlomis montana was. In Rottler's Herbarium there is under this name a mixture of several things. I doubt the species being distinct from L. mollissima. L. Hamiltoniana, Benth., is I think referable here.

Var. Wightii; calyx ½ in. long. L. montana, Herb. Wt. propr.

8. L. mollissima, Wall. Pl. As. Rat. i. 62, and Cat. 2054; slender, much branched, hoary-tomentose, leaves sessile or shortly petioled ovate-lanceolate or ovate acute rarely obtuse serrate, calyx ¼½ in. tomentose or woolly cylindric straight, teeth very short usually slender. Benth. Lab. 607, and in DC. Prodr. xii. 525. L. pilosa, var. pubescens, Benth. in Wall. and DC. l. c.


More slender than L. montana, and never so densely woolly, with more acute calyx-teeth; but these are sometimes very short and broad.

Beutham describes the flower as "white? but oftener purple?"

Var. scaberula; more glabrous, calyx hirsute.—Central India and Khasia Mts., Clarke.

Var. angustifolia; puberulous, very slender, leaves membranous linear-lanceolate subentire. L. angustifolia, Wall. Pl. As. Rat. i. 62; Cat. 2064; Benth, in DC. l. c. 527.—Nepal, Wallich.

Var. strigosa; branches very slender and leaves above strigously pubescent, leaves sessile elliptic- or linear-lanceolate subacute subacutate tomentose beneath, whorls few-fld. L. strigosa, Benth. in Wall. l. c., Lab. 608, and in DC. l. c. 526; Wall. Cat. 2059.—Burma; at Prome, Wallich. Rangoon, M'CLElland.

9. L. ovata, Benth. in Wall. Pl. As. Rat. i. 61, Lab. 607, and in DC. Prodr. xii. 525; branches long slender tomentose, leaves large sessile broadly ovate-cordate subacutate, tip rounded, pubescent above, woolly beneath, whorls many-flld., bracts minute, calyx ¼ in. straight villous, teeth minute, tips acicular. Wall. Cat. 2057.

BURMA; banks of the Irawaddy, Wallich.

This may be another form of L. mollissima, but is a very different-looking plant.

Branches 3 ft., 4-angled; hairs deflexed. Leaves 3 by 2 in., very obscurely crenate.—Described from a single specimen.
10. **L. pilosa**, Benth. in Wall. Pl. As. Rav. i. 62, Lab. 609, and in DC. Prodr. xii. 526 (excl. var. \( \beta \)); branches very slender with appressed deflexed and long spreading hairs, leaves petioled membranous ovate acuminate coarsely serrate sparsely hairy on both surfaces, upper sessile, whorls few-fl.d., calyx \( \frac{3}{4} \) in. straight hispid, teeth very short, tips acicular. Wall. Cat. 2058.

**Burma**; banks of the Irrawaddi, Wallich.

Branches long, leaves and whorls very distant. Leaves 3 by 1\( \frac{1}{2} \) in.; petiole \( \frac{1}{2} \) in.

—Described from a single specimen; the long spreading hairs are quite unlike those of any other species in this section.

++ Whorls 1–2-fl.d.

11. **L. procumbens**, Desf. in Mem. Mus. xi. 7, t. 3; procumbent, nearly glabrous, branches very long and slender, leaves petioled membranous elliptic-ovate or lanceolate acute sub serrate, flowers 1–3 pedicelled, bracts minute, calyx \( \frac{3}{4} \) in. straight glabrous, teeth short lanceolate acuminate. Benth. in Wall. Pl. As. Rav. i. 62, Lab. 610, and in DC. Prodr. xii. 527; in part. L. biflora, Wall. Cat. 2063, in part. Phlomis biflora, Wedg. Pl. Ind. iii. 12, in part.

**Bengal Plains**; Rossb. and Canara; Ritchie, &c. Malabar; Heyne, &c.

Branches from a woody rootstock, 2–3 ft.; angles and tips puberulous. Leaves \( \frac{1}{2} \)–1\( \frac{1}{2} \) in., base acute; petiole \( \frac{1}{2} \)–1\( \frac{1}{2} \) in. Calyx with the pedical sometimes half as long as the tube.

**** Perennial rooted. Calyx-teeth \( \frac{4}{3} \)–1\( \frac{1}{3} \) the length of the tube.

12. **L. biflora**, Br. Prodr. 504; procumbent, pubescent, branches long slender, leaves petioled ovate elliptic or oblong coarsely serrate or crenate, flowers 1–2 sub sessile, bracts minute, calyx \( \frac{1}{2} \) in. straight hispid, teeth subulate \( \frac{1}{4} \) the length of the tube. Wall. Cat. 2529; Benth. in Wall. Pl. As. Rav. i. 62, Lab. 610, and in DC. Prodr. xii. 527; Wight l.c. t. 866 (bad); Graff. Cat. Bomb. Pl. 153; DC. & Gils. Bomb. Fl. 211. L. procumbens, Thwaites Enum. 240. Phlomis biflora, Vahl Symb. iii. 177; Wedg. Pl. Ind. iii. 12. Nepeta indica, Burm. Fl. Ind. 126, and Thes. Zeyl. t. 63, f. 1.

**Deccan Peninsula**, in dry places from the Concan southward. Ceylon; from the sea to 8000 ft., Thwaites.

Habit and foliage of *L. procumbens*, distinguished by its pubescence and long calyx-teeth, and native country.

13. **L. marrubioides**, Desf. in Mem. Mus. xi. 6, t. 3, f. 1; stem very stout, leaves sessile or shortly petioled thick ovate rounded or broadly ovate-cordate crenate velvety above densely white woolly beneath, whorls densely many-fl.d., calyx woolly, teeth subulate \( \frac{4}{3} \) as long as the tube. Benth. in Wall. Pl. As. Rav. i. 61, Lab. 611, and in DC. Prodr. xii. 529; Thwaites Enum. 240.

**West Deccan Peninsula**, on the Ghats from the Concan to Travancore. Ceylon, common.

Stem 1–2 ft., simple or sparingly branched, densely white-tomentose with reflexed or spreading hairs. Leaves 1–3 in. long and broad, or more ovate, rarely acute, often rugose above, white beneath; petiole \( \frac{1}{2} \)–1\( \frac{1}{2} \) in., stout. Whorls very dense and woolly or silky; bracts villous, often equalling the calyx-tube. Calyx-teeth very variable in length.
VAR. pulneyensis; leaves ovate acute not so thick, calyx less densely tomentose, teeth flexuose as long as the tube.—Pulney Miss., Wight.

14. L. angularis, Benth. in Wall. Pl. As. Rar. i. 62, Lab. 608, and in DC. Prodr. xii. 526; pubescent or tomentose, branches long ascending or erect, leaves shortly petioloed subacute or obtuse coarsely crenate-serrate or toothed, whorls few- or many-fld., bracts minute, calyx \( \frac{1}{3} \) in. hispid, teeth very slender ciliate half as long as the tube. L. pubescens, Thwaites Enum. 240.

NILGIRI HILLS; Wight, &c. CEYLON; Walker, &c.—DISTRIB. JAVA.

Stem and branches rather slender, several feet long, straggling. Leaves 1-2 in., pubescent on both surfaces; petiole \( \frac{1}{4}-\frac{1}{2} \) in. Whorls lax-fld.; flowers shortly pedicelled, bracts subulate.—L. javanica, var. Horsfieldiana, of Java appears to be this.

15. L. pubescens, Benth. Lab. 610, and in DC. Prodr. xii. 628; pubescent or tomentose, rather stout, erect, leaves petioloed rounded or ovate coarsely crenate-serrate, whorls densely many-fld., bracts linear nearly as long as the calyx or less, calyx \( \frac{1}{3} \) in. hispid, teeth subulate ciliate half as long as the tube. L. marrubioides, Wall. Cat. 2524.

DECCAN PENINSULA; Wight. Pulney Hills, Beddome.

Differs from L. angularis in the stouter erect habit, usually rounder longer-petioloed leaves, and especially in the long ciliate bracts.

***** Annuals. Stem 4-angled.

16. L. flaccida, Br. Prodr. 505; pubescent or tomentose, branched from the base, branches weak, hairs deflexed, leaves membranous long-petioloed ovate or oblong obtuse crenate, whorls few-fld., bracts minute, calyx \( \frac{1}{2} \) in. hairy or villous, teeth \( \frac{1}{3} \) the length of the tube, alternate ones with capillary points. Benth. Lab. 609, and in DC. Prodr. xii. 526. L. parviflora, Benth. in Wall. Pl. As. Rar. l. c.; Wall. Cat. 2061. L. melissaeifolia, Benth. in Wall. l. c. L. melissaeiflora, Benth. in Wall. Cat. 2062. L. decemdentata, Smith in Rees Cyclop. ; Benth. in DC. l. c.

BUTMA AND TENASSERIM; Wallich, Griffith.—DISTRIB. Siam, Malay and Pacific Islands, Australia, W. Indies (introduced).

A slender flaccid annual; stem 6-8 in.; hairs on stem deflexed. Leaves 1-2 in., base cuneate; petiole \( \frac{1}{4}-1 \) in., very slender. Calyx slightly curved, pedicelled. Corolla-tube much exserted.


The CONCANC; at Poona, &c., Jacquemont, Stocks, &c.

A foot high, rigid; stem naked below; hairs erect or spreading. Leaves \( 1\frac{1}{2}-2\frac{3}{4} \) by \( \frac{1}{8}-\frac{1}{2} \) in., obtuse or subacute. Calyx-mouth villous. Corolla \( \frac{1}{2} \) in., tube exserted; upper lip very short, lower very much longer and broader.—An unmistakable species.

Sect. 3. Astrodon. Calyx straight, mouth equal, throat villous; teeth 10, usually stellately spreading. Whorls terminal and axillary, densely many-fld.; bracteoles usually about equalling the calyx (setaceous in L. suffruticosus). (See also 28. L. stricta and 34. diffusa.)
Leucas.

* Leaves quite entire.

18. *L. suffruticosa*, Benth. Lab. 611, and in DC. Prodr. xii. 528; a low shrub, branches densely fulvous-tomentose and hispid, leaves 1 in. sessile coriaceous linear obtuse hispid above white-tomentose beneath, whorls 1–2 terminating very long scapiform branches, calyx ½ in. villous turbinate, teeth spinulose erect. Wight Ic. t. 1454.

SOUTH DECCAN; Nilghiri Hills, common in pastures, alt. 7000 ft., Wight, &c. Anamallay Hills, Beddome.

Rootstock very long and stout; branches ascending, rigid, terete, 4–6 in. (without the scape), appressed hairs erect, bristles spreading. Leaves quite entire, margins recurved. Scapes 6–10 in., tomentose only. Whorls ½–1 in. diam., with one or a pair of floral leaves; bracts setaceous, half the length of the calyx. Calyx sessile, villi of throat shorter than the teeth. Corolla-tube included, galea most densely villous. Nutlets ½ in., oblong, terete, smooth.

19. *L. rosmarinifolia*, Benth. in Wall. Pl. As. Rar. i. 61, Lab. 612, and in DC. Prodr. xii. 528; a low excessively branched strigulose tomentose shrub, leaves 1 in. sessile fascicled linear obtuse softly villous beneath, whorls 1–2 terminating short scapiform branches, calyx ½ in. turbinate hispidly villous, teeth very minute erect. Wall. Cat. 2521; Wight Ic. t. 1455.

NILGIRI MTS.; alt. 7–8000 ft., in any soil, Wight, &c.

Stem woody, terete, fastigiately branched, hairs erect. Leaves ½–1 in. diam., rigid, grey; margins quite entire, revolute. Whorls often solitary, ½–1 in. diam., hemispheric, villous, with a pair of floral leaves; bracts linear, rigid, nearly equalling the calyx. Calyx sessile, closing over the fruit, villi of throat white, much exceeding the teeth. Nutlets oblong, ½ in., obtusely trigonous.

20. *L. helianthemifolia*, Desf. in Mem. Mus. xi. 2, t. 1, f. 1; a low shrub, densely softly subsilky villous (white or buff) tomentose, leaves opposite and ternate ½–1½ in. sessile coriaceous linear-oblong obtuse, whorls few few-fld., calyx ½ in. turbinate densely woolly, teeth minute erect. Benth. Lab. 612, and in DC. Prodr. xii. 528. L. ternifolia, Desf. l. c. t. 1, f. 2; Benth. l. c.; Wight Ic. t. 1458.

SOUTH DECCAN; Pulney, Nilghiri and Anamallay Hills, alt. 5–7000 ft., Wight, &c.

Stem woody, terete, much branched; branches 6–12 in., rigid, erect; hairs spreading or erect. Leaves ½–1 in. diam., sometimes narrowed from the middle downwards; margin revolute, quite entire. Whorls ½–1½ in. broad, often crowded, dense-fld.; bracts almost equalling the calyx, subulate, tomentose. Calyx sessile, villi of the mouth as long as the teeth. Corolla very short. Nutlets ½ in., oblong.

21. *L. lanceolata*, Desf. in Mem. Mus. xi. 5, t. 2, f. 2; tall, erect, shrubby, stem stout rufous-tomentose, leaves 3–4 in. petiolated coriaceous lanceolate subacute scabrous above white-tomentose beneath, nerves distinct, whorls axillary many- and dense-fld., calyx ½ in. campanulate pubescent or tomentose, teeth minute spinoceous spreading. Benth. Lab. 61, and in DC. Prodr. xii. 612; Wight Ic. t. 1452. L. lancifolium, Wall. Cat. 2759.

NILGIRI MTS., alt. 6–8000 ft., Wight, &c., common.

Tall, 6–8 ft., very stout, “forming great clumps” (Wight); stem terete, hairs erect. Leaves ½–1 in. diam., subacute, dark above when dry, grey beneath with reddish silky veins; floral similar. Whorls 1 in. diam.; bracts linear-lanceolate, shorter than the calyx. Calyx sessile, hairs of mouth shorter than the teeth. Corolla small, tube included.
** Leaves more or less serrate or crenate.

22. *L. stelligera*, Wall. Pl. As. Rar. i. 61, and Cat. 2049; herbaceous, erect, branched, pubescent or tomentose, leaves 2-4 in. shortly petioled elliptic-lanceolate subacute obtusely serrate, whorls large crowded many- and dense-fld., calyx ½-¾ in. tubular-campanulate scabrid or tomentose, teeth thick triangular subulate spreading and recurved longer than the villi of the mouth. Benth. Lab. 61, and in DC. Prodr. xii. 529; Dalz. & Gibbs. Bomb. Fl. 211. L. hamatula, Arn. Pugill. Pl. Ind. Or. 37; Benth. in DC. l. c.

CEYLON; on the Ghats, Dalzell; Warree country, Stocks; Belgaum, Ritchie.

* Stem 2-3 ft.; branches obtusely 4-gonous, hairs spreading. *Leaves* ½-¾ in. diam., green, scabrous or glabrate above, pubescent beneath, narrowed into the petiole. *Whorls* 1-1½ in. diam.; bracts linear-lanceolate, nearly as long as the calyx. *Calyx* very variable in size, fruiting membranous, naked in the middle; teeth rarely spinescent, tomentose. *Nutlets* ½ in., oblong.

23. *L. eriostoma*, Hook. f.; suffruticose, hispidly hairy, woolly or tomentose, leaves 1½-4 in. shortly petioled narrowly linear-lanceolate or oblong obtuse obtusely serrate, whorls axillary many- and dense-fld., bracts equaling the calyx plumose or ciliate, calyx ½-¾ in. tubular-funnel-shaped villous above the middle, teeth very minute much shorter than the dense ring of white villi in the mouth. Philomis eriostoma, Heyne mss.

DECCAN PENINSULA; Western Ghats, from the Conan to the Nilghiris.

* Branches 6-10 in., stout, nearly terete. *Leaves* very variable in length, nerves unpressed above. *Whorls* ½-¾ in. diam. *Calyx* naked below the middle. *Corolla* very small, tube included. *Nutlets* ½ in., oblong.—There are several varieties of this.

VAR. *Heynii*; hispidly hairy on the branches and leaves, hairs spreading, leaves 2-3 in.—Wynnaad, Heyne.

VAR. *longifolia*; hoary-tomentose, leaves 3-4 in. nearly glabrous. *Herb. Wight*, &c.

VAR. *latifolia*; very robust, villously tomentose, leaves broader elliptic oblong or lanceolate, 2-3 by 1-1½ in., whorls large globose 1½ in. diam. *Herb. Wight*.

VAR. *lanata*; branches clothed with dense long soft white spreading hairs, leaves 1-1½ in. oblong lanceolate villous on both surfaces.—Nilghiris and Bababoodan Hills.—L. lepidostoma, *Herb. Wight*.

VAR. *Stocksii*; branches densely clothed as in var. lanata, but tomentum shorter and whiter, leaves subsily below 1½ in.

24. *L. lamifolia*, Desf. in Mem. Mus. xi. 4, t. 2, f. 1; tall, shrubby below, branches very stout square and petioles hisrute with long brown hairs, leaves 3-5 in. shortly petioled ovate subacute crenate-serrate villous above densely tomentose beneath, whorls subsolitary subglobose many- and dense-fld., calyx ½ in. subcampanulate villous, teeth slender erect longer than the villi of the mouth ciliate, corolla-tube included. Benth. Lab. 613, and in *DC. Prodr*. xii. 529.

NILGHIRI HILLS, alt. 6500-7500 ft.; *Wight*, &c.

Much the largest and largest-leaved species, 8 ft. high, branches ½ in. diam. *Leaves* 1½-2½ in. broad, base sometimes cordate. *Whorls* terminal, rarely 2 on the same branch, 1½ in. diam.; bracts exceeding the calyx, outer linear-lanceolate, inner filiform. *Calyx* membranous, teeth about ½ the length of the tube, villi of the mouth sparse. *Corolla* small. *Nutlets* ½ in. long, oblong.

25. *L. vestita*, Benth. in Wall. Pl. As. Rar. i. 61, Lab. 613 (excl. Silhet), and in *DC. Prodr*. xii. 530; tall, herbaceous, branches square and petioles hisrute, leaves shortly petioled 2-4 in. ovate-lanceolate acute ser-
rate pubescent above tomentose beneath, whorls subterminal and terminal many- and dense-nt., calyx \( \frac{1}{3} \) in. tubular narrowed below villous, teeth slender erect ciliate longer than the villi of the mouth, corolla large. *Wight* Lc. t. 338.

**South Deccan Peninsula; Wight.** Pulney and Balsaramgan Hills (Mysore), Beddome.

A more slender plant than *L. lamiifolia*, apparently annual, more sparingly hairy, with narrower leaves, smaller heads, longer calyx and larger corolla.

**Var. oblongifolia;** shorter, stem woody below, leaves smaller \( \frac{1}{3} \) in. more oblong and villous above.—*Courtauljam, Wight*.

**Var. serioostoma;** branches with soft spreading hairs, leaves silkily villous, calyx-teeth shorter than the long white silky hairs of the mouth.—*Anamallay Hills, Beddome*.

**Var. angustifolia;** tall, branches with soft spreading hairs, leaves 2–3 by \( \frac{1}{3} \) in. elliptic-lanceolate obtuse, calyx-teeth as long as two-thirds of the tube.—*Sisparah, Wight*; Palghat high range, Beddome.

26. *L. hirta*, Spreng. Syst. ii. 743; villously hirsute or scabrid, stem woody below, leaves 1–2 in. sessile or shortly petioled elliptic or linear oblong obtuse obscurely toothed, whorls solitary terminal, bracts as long as the scabrid turbinate calyx, calyx-teeth recurved equalling or shorter than the copious villi of the mouth. *Benth. Lab.* 613, and in *DC. Prodr.* xii. 580. *L. heliangelum*, *Benth. in Wall. Pl. As. Rar.* i. 61; *Wall. Cat.* 2053, *non Desf.* *L. rufescens, Benth. in Wall. Cat.* 2053. *Phlomis hirta, Heyne in Roth Nov.* Sp. 204.

**Deccan Peninsula;** Bangalore, Rotlier; Nilghiri, Mysore and Shevaghery Hills, *Wight*.

Probably a dry country or locality form of *L. vestita*, much smaller, more scabridly hirsute or villous, with very much smaller leaves and calyces and longer villi of the mouth than the latter. The hairs on the branches are deflexed or spreading, rarely suppressed.

**Var. prostrata;** smaller, more slender, branches prostrate or ascending, leaves \( \frac{1}{1} \) in. broadly ovate often petioled, villi of calyx-mouth shorter.—*Anamallay and Nilghiri Hills, alt. 6–8000 ft.*

**Var.? Beddome;** erect, softly villous with spreading hairs, leaves 2–2\( \frac{1}{2} \) in. linear-oblong subsilkily villous on both surfaces, whorls in several axils, calyx \( \frac{1}{3} \) in., teeth very small recurved triangular subulate spinescent longer than the villi of the mouth.—*Chambra Peak, Wynad, alt. 5000 ft.*, *Beddome*.

27. *L. ciliata*, *Benth. in Wall. Pl. As. Rar.* i. 61, *Lab.* 614, and in *DC. Prodr.* xii. 530; stem and branches hirsute with spreading and deflexed hairs, leaves petioled 2–4 in. ovate or lanceolate coarsely serrate pubescent or glabrate, whorls globose large many- and dense-nt. terminal and axillary, bracts as long as the calyx hirsute, calyx \( \frac{1}{3} \) in. tubular scabrid or villous, teeth long slender patente or recurved, mouth wide naked or ciliate. *Wall. Cat.* 2046; *Dals. & Gibbs. Bomb. Fl.* 211.


A tall annual? 1–3 ft., stem branched, obtusely 4-angled. Leaves membranous, narrowed at the base; petiole \( \frac{1}{1} \) in. *Whorls* 1–1\( \frac{1}{2} \) in. diam., crinete from the slender long bracts and calyx-teeth. *Calyx* very variable in size and hairiness, teeth flexuous, ciliate, in small forms more than half as long as the tube. *Corolla-tube* included. *Nutlets* \( \frac{1}{6} \) in., oblong, smooth.

Sect. 4. *Plagioiostoma*. Bracts usually as long as the calyx or nearly so. Calyx turbinate obconic or tubular, mouth very oblique, the
upper part projecting forwards, throat glabrous or nearly so, teeth erect (mouth straight in 28. stricta, 34. diffusa).

* **Annuals. Whorls terminal or axillary. Calyx-teeth long and slender.**

28. **L. stricta,** Benth. in Wall. Pl. As. Rar. i. 61, Lab. 614, and in DC. Prodr. xii. 531; annual, slender, erect, hispidly hairy, leaves oblong-lanceolate or linear, whorls solitary terminal, calyx $\frac{1}{2}$ in. bisected between tubular and funnel-shaped nearly straight, teeth long very slender ciliate. **Wall. Cat. 2045.** Phlomis stricta, Heyne mss.

**Drococ Peninsula; Pullicat Mts., Heyne; Sandstone Hills, N.E. of Belgaum, Ritchie, &c.; Bellary, Beddome.**

Stem 6–10 in., branches acutely 4-gonous. Leaves $\frac{1}{2}$–1$\frac{1}{2}$ in., obtuse, floral like the cauline, bracts filiform rigid ciliate. Calyx slightly hairy within; teeth sometimes nearly as long as the tube, much longer than the villi of the mouth. **Corolla-tube** included, upper lip very short, lower twice as large.

29. **L. Clarkei,** Hook. f.; annual? slender, sparsely appressedly pubescent, branches ascending scabrid, leaves linear or linear-lanceolate entire or sub serrate, whorls terminal globose, calyx short $\frac{1}{4}$ in. pubescent tubinate subdecurved, teeth very slender, 3 upper much the longest, mouth laxly hairy.

**Behar;** on Parunsath, alt. 1500 ft., Clarke. Branches 1–2 ft., up-curved, 4-gonous, hairs short deflexed. Leaves 1–2 in., obtuse, floral many, like the cauline. Whorls subglobose, $\frac{1}{2}$–1 in. diam.; bracts very slender, ciliate, tips and of calyx-teeth acicular. Calyx broad; teeth rather squarrose, scabrid, longer than the villi of the mouth. **Corolla-tube** included, upper lip short, lower $\frac{1}{2}$ in. long, widely spreading.

30. **L. nutans,** Spreng. Syst. ii. 743; annual, dwarf, diffusely branched, laxly hairy, leaves 1–2 in. shortly petioled oblong or linear-oblong obtuse sub serrate, whorls terminal and axillary dense-fld., calyx $\frac{1}{4}$ in. falcately decurved hispid deeply striate, teeth subequal lanceolate ciliate. **Benth. Lab. 616, and in DC. Prodr. xii. 532. L. decurva, Benth. in Wall. Pl. As. Rar. i. 60, and Cat. 2050.** Phlomis nutans, Roth Nov. Sp. 263.

N. and N.W. India, from the upper Gangetic plain to the Indus. **Scinde; Stocks. The Deccan; Heyne. Behar;** on Parunsath, Clarke. **Burma;** on the Irawaddi, Wallich.

A small often straggling species. Leaves sometimes petioled. Whorls conspicuous for the sharply decurved calyces, the teeth of which are less slender than in L. Clarkei or martincensis. Bracts ciliate, very slender. Calyx membranous, teeth much longer than the hairs of the mouth. **Corolla small.**

31. **L. martincensis,** Br. Prodr. 504; annual, tall, stout, scabrous, leaves 3–4 in. petioled ovate or ovate-lanceolate obtuse coarsely crenate-serrate, whorls axillary globose, bracts and calyx-teeth spinescent ciliate, calyx $\frac{1}{2}$–$\frac{3}{4}$ in. pubescent tubular sigmoidly curved, teeth slender, uppermost longest. **Benth. in Wall. Pl. As. Rar. i. 60, Lab. 617, and in DC. Prodr. xii. 533. L. polycephala, Wall. Cat. 2051.**

Sporadic in India, doubtfully indigenous. The **Drococ;** from the Concan southwards, Heyne, &c. **Ava; Wallisch.**—**DISTRED.** Tropical Africa and America.

A stout herb, 2–5 ft.; branches 4-gonous, sometimes hispidly hairy. Leaves membranous, base cuneate; petiole $\frac{1}{2}$–1 in.; floral sessile, more lanceolate. Whorls numerous, $\frac{1}{2}$–1 in. diam.; bracts slender, tip pale, often hooked. **Calyx much**
enlarged in fruit, teeth tipped like the bracts, ciliate, often recurved. Corolla small. Nutlets ¼ in., ovate-oblong, shining.

** Annuals. Whorls terminal, rarely axillary. Calyx-teeth very short.

32. L. Cephalotes, Spreng. Syst. ii. 743; annual, tall, stout, scabrous, leaves 2-4 in. shortly petioled ovate or ovate-lanceolate subacute crenate-serrate, whorls very large terminal glbose, bracts membranous elliptic- or linear-lanceolate awned, calyx ¼ in. tubular slightly curved, teeth short subulate scabrid, mouth hairy. Benth. in Wall. Pl. As. Rar. i. 60, Lab. 616, and in DC. Prodr. xii. 532; Wall. Cat. 2043; Wight Ic. t. 337; Grab. Cat. Bomb. Pl. 153; Dalz. & Gibs. Bomb. Fl. 211; Boiss. Fl. Orient. iv. 779. L. capitata, Desf. in Mem. Mus. xi. 8, t. 4. Phlomis Cephalotes, Roth Nov. Sp. 262; Roxb. Fl. Ind. iii. 10.

HIMALAYA; from Simla to Bhotan, alt. 2-6000 ft. Plains from CHITTAGONG and ASSAM to the PANGAB, and south through the DECCAN (not in Ceylon).—DISTRIB. Afghanislan.

Stem 2-3 ft., hairs spreading. Leaves membranous, more or less pubescent. Whorls 1-2 in. diam., surrounded by the imbricating membranous appressed bracts, which are quite unlike those of any other species. Calyx usually softly pubescent, membranous; hairs of mouth as long as the teeth.

33. L. zeylanica, Br. Prodr. 504; annual, erect, pubescent or hispidly hairy, leaves 2-3 in. shortly petioled linear- or elliptic-lanceolate obtuse subobtuse, whorls subterminal many-fld., bracts few ciliate, calyx ¼-½ in. obliquely turbinate glabrous scabrid or sparsely hispid, teeth minute, mouth broad pubescent within. Benth. in Wall. Pl. As. Rar. i. 60, Lab. 614, and in DC. Prodr. xii. 531; Wight. Ill. t. 176; Thwaites Enum. 240 (excl. syn.). L. involucrata, Benth. in Wall. Cat. 2047. Phlomis zeylanica, Diin. Sp. Pl. 820. Leonurus Marrubiastrum, Burm. Fl. Ind. 127, non Linn.

ASSAM; Jenkins. CACHAR and CHITTAGONG; Clarke. MAIAY PENINSULA; from Rangoon, Wallich, to Singapore, G. Thomson. CEYLON, common.—DISTRIB. Malay Islands, China.

Stem 1-3 ft., branched above; hairs spreading, deflexed or appressed. Leaves sometimes 1 in. diam. Whorls small, ½-1 in. diam., rarely axillary; bracts fewer and shorter than in the allies, filiform, ciliate. Calyx very constant in size and shape, teeth erect or spreading horizontally.

VAR. Walkeri; branches long and strict, hairs appressed or spreading, leaves very narrow 2-3 by ½-1 in. L. Walkeri, Benth. in DC. Prodr. xii. 531.—Ceylon, Walker, Champion.—Bentham regards this as near L. hissoptrophiola. Without knowing whether it is annual or perennial, it is difficult to say whether it is a variety of that plant or of L. zeylanica, of which it has the tall habit and solitary terminal whors.

34. L. diffusa, Benth. Lab. 615, and in DC. Prodr. xii. 531; annual, diffusely branched from the root, branches slender ascending hispid or hispite, leaves ½-1 in. linear or linear-oblong obtuse subentire, whorls chiefly solitary and terminal few-fld., calyx ¼ in. turbinate curved smooth below ribbed and hispid above, mouth wide truncate, teeth small subulate erect rather longer than the villi. Phlomis diffusa, Herb. Rottler.

DECCAN PENINSULA; Heyne, Wight, &c.

This differs from L. zeylanica in the diffuse habit and small leaves. It has been mixed in Wallich's Herbarium with L. mutans and L. dimidiata, Benth. (? of Sprengel), which is the same as L. aspera. From the latter the habit, almost entire leaves, smaller fewer-fld. whors, and much shorter calyx with a wider truncate not oblique mouth abundantly distinguish it.

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35. **L. hyssopifolia**, Benth. in Wall. Pl. As. Rar. i. 60, Lab. 615, and in DC. Prodr. xii. 531; perennial, erect, hispidly hairy, leaves 1-2½ in. linear obtuse, margins recurved entire, whorls terminal and axillary small, bracts few subulate, calyx ¼ in. obconic glabrous, mouth wide truncate glabrous, teeth very minute erect. *Wall. Cat.* 2044.

SUBLTropical Himalaya and plains at their feet; from Jamu to Sikkim, alt. 1-3000 ft. \*Chota Nagpore; at Sambulpore, Griffith.

Rootstock stout, woody; branches numerous, 4-8 in. Leaves spreading, ½-¼ in. broad, often rigid. Whorls ½-¾ in. diam.; bracts very slender. Calyx very like *L. zeylanica* and Wightii; mouth glabrous within.

36. **L. Wightiana**, Benth. in Wall. Pl. As. Rar. i. 60; annual, erect, scabrid, leaves 1-2 in. linear obtuse entire, whorls small axillary and terminal or in dense terminal cylindric spikes, calyx ¼ in. obovoid hispid, mouth very oblique villous, teeth irregular triangular, upper longer. *Wall. Cat.* 2520. L. aspera, var. Wightiana, Benth. Lab. 616, and in DC. Prodr. xii. 532.

**Decoran Peninsula**: Wight, G. Thomson.

Stem 6-10 in., and branches very stout, and leaves grey; hairs minute, deflexed and appressed. Leaves ½-¾ in. broad, margins flat or recurved. Whorls ½-¾ in.; bracts slender, hispid. Calyx membranous below, green and striated above, not contracted at the junction. Corolla very small.—The stout scabrid habit, narrow entire leaves, small whorls, and short calyx, not contracted above the nutlets (with, however, similar teeth) distinguish this from *L. aspera*.


**Plains of India**: from Sikkim and Behar to the Panjab, and southward to Cape Comorin.—Distrib. Mauritius, Java, Philippine Islands.

Very variable. Stem erect, usually much diffusely branched from below, the branches 4-6 in., rather leafy, sometimes taller with erect branches and larger leaves ¾ in. broad. Whorls often 1 in. diam., very dense-flid. and hispid. Calyx variable, but with always the upper lip produced and with short triangular teeth. Corolla small.—Whole plant fragrant and used as a pot-herb, Roxb. Bentham’s L. dimidiata, from Burma (Wallich) is certainly *L. aspera*, and may or may not be Sprengel’s plant of that name. A piece of *L. nutans* is on the same sheet.

38. **L. linifolia**, Spreng. Syst. ii. 743; annual, erect, smooth or scaberulous, leaves 2-4 in. linear or linear-lanceolate obtuse entire or sub-serrate, whorls axillary and terminal, bracts few short, calyx ¼-½ in. obovoid glabrous or puberulous, mouth very oblique contracted glabrons within, upper lip projecting acute 3-toothed, lower 2-fid. *Benth. in Wall. Pl. As. Rar.* i. 60, Lab. 617, and in DC. Prodr. xii. 533; *Wall. Cat.* 2048; Grah.
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PLAINS OF INDIA; from Assam and Bengal and Silhet to Singapore. In the Deccan; from the Concan to Travancore (not seen from the W. or N.W. Provinces of India, nor from Ceylon).—DISTRIBUTION. Mauritius, Malay Islands. Stem 2–3 ft., usually stout and much branched above. Leaves rarely 3 in. broad; petiole 0–½ in. Whorls towards the ends of the branches, ½–3 in. diam.; bracts scabrous. Calyx pale below, not striate above, toothing variable, sometimes spinescent.

VAR. decipiens; hispidly hairy, bracts very many ciliate, tips spinescent, calyx larger hirsute or pubescent, teeth longer spinos, uppermost pubent. L. aspera, Pl. Ind. Or. Hohenack. n. 1234.—South Deccan; Pycarrah, Wight; Nilgiris, Hohenacker.—Confounded with L. aspera in various collections, with which it agrees in hairiness.

DOUBTFUL SPECIES.

L. DIMIDIATA, Spreng. Syst. ii. 743; stem hairy, leaves oblong-lanceolate sub-serrate hirsute, whorls dimidiate, calyx oblong hairy above, teeth 10 subulate subpungent.—East Indies.—Probably L. aspera, to which belongs the specimen referred to this species by Bentham in his "Labiatarum Gen. & Sp," and which is entirely different from L. diffusa.

46. LEONOTIS, Br.

Herbs or shrubs. Whorls axillary, densely many-fld.; bracteoles many, slender; flowers scarlet or yellow. Calyx 10-nerved, often incurved, mouth oblique; teeth 8–10, rigid, upper largest. Corolla-tube exserted; upper lip long, concave, crown villous; lower very small, spreading, concave, midlobe largest. Stamens 4, ascending; anthers conniving, cells divaricate. Disk equal. Style subulate, upper lobe very short. Nutlets oblong or ovoid, triquetrous, obtuse or truncate, glabrous. —Species 12, African, one also Indian.

L. nepetæfolia, Br. Prodr. 504; herbaceous, leaves membranous ovate crenate, bracts spinescent, calyx ½–1 in., upper lip prominent rigid spine, lower with three erect or recurved spine teeth. Benth. in Wall. Pl. As. Rat. i. 59, Lab. 618, and in DC. Prodr. xii. 535; Wall. Cat. 2042; Grab. Cat. Bomb. Pl. 153; Dalz. & Gibbs. Bomb. Fl. 211; Wight Ill. ii. t. 176 bis, f. 11, and Ic. t. 867; Bot. Reg. t. 281; Bot. Mag. t. 3700. Phlomis nepetæfolia, Linn.; Roxb. Fl. Ind. iii. 8. Leonurus globosus, Moench Meth. 400.

Throughout hotter India, from the Panjab to Travancore and Singapore, but not very common; cultivated and naturalized, doubtfully indigenous. Ceylon; in the drier parts.—DISTRIBUTION. Tropical Asia, Africa and America.

A tall annual, 4–6 ft.; stem as thick as the finger, 4-angled with concave faces, puberulous. Leaves 4–8 by 2–5 in.; floral lanceolate, deflexed; petiole 1–3 in., winged above, slender. Whorls distant, globose, 2–3 in. diam., squarrose; bracts slender, linear, deflexed. Calyx ½ in. long, ribbed and reticulate, pubescent or villous, tubular, incurved, teeth spinescent, upper ½ in. long; throat glabrous. Corolla orange-red, 1 in. long; tube slender, exserted, villous like the upper lip, lower lip minute. Nutlets linear-oblong, widening upwards, truncate.

48. PHLOMIS, Linn.

Herbs or shrubs. Whorls axillary, dense-fld.; bracteoles many, ovate
lanceolate, or linear; flowers yellow, purple or white. Calyx 5- or 10-nerved, usually plicate, mouth equal truncate or 5-toothed. Corolla-tube usually annulate within; upper lip concave, crown villos (except *P. rugosa* & *breniflora*?), lower spreading, 3-fid. Stamens 4, ascending, posterior filaments often appended at the base; anthers connivent, cells dative. *Disk* equal. *Style* 2-fid, upper lobe shortest. Nutlets ovoid or obvoid, triquetrous, top glabrous.—Species about 45, Oriental and Temperate Asiatic.

* Stem and branches terete.

1. *P. spectabilis*, Falc. *mss*.; Benth. in DC. *Prodr.* xii. 542; tall, stout, hoary, leaves large broadly ovate-cordate crenate or sublobulate rugose stellately tomentose beneath, tip rounded, whorls many-fld., bracts filiform rigid hispid, calyx ¼-½ in. pubescent, teeth spiniform ½ shorter than the tube.


Stem 4–6 ft., terete, as thick as the little finger, hoary or loosely stellately downy. *Leaves* sometimes a foot broad and not so long, nerves beneath softly hairy; floral small; petiole 6–13 in. *Whorls* 13–2 in. diam.; bracts with acicular tips. Corolla rose-purple, galea beautifully fringed with silvery hairs. *Nutlets* ½ in. long, linear.—P. oreophilla, *Karel. & Kiril.*, from Alatau, is probably a small state of this.


Western Himalaya; Kashmir, alt. 5–6500 ft., *Royle*, *Thomson*, &c.—*Distrib.* Afghanistan.

Stems several from the very stout rootstock, 2–3 ft. high, terete. *Radical leaves* long-petioled, 5–9 by 2–4 in., coriaceous, finely pubescent above, nerves reticulate beneath; petiole 4–6 in. *Whorls* 1½–1½ in. diam.; bracts numerous, ¾ in., tips acicular. *Corolla* pale purple; galea very large, tomentose, not fringed; lower lip very broad, adze-shaped. *Nutlets* broadly oblong, ½ in. long.


*Panjhar*; beyond the Indus, on the Suliman and Salt ranges, alt. 2500–4500 ft., *Stewart*, *Talbot*.

A low shrub, with spreading terete branches 6–10 in. long; wool flocculent, buff-coloured. *Leaves* 3–5 by ½–2½ in., very leathery, scabrous above. *Whorls* 1 in. diam.; bracts as long as the calyx, much thicker than in *P. cashmeriana*. *Corolla* small; galea tomentose, margin not fringed. *Nutlets* (ripe ?) very small.

** Stem and branches 4-angled.

4. *P. macrophylla*, *Wall. Pl. As. Rar.* i. 62, and *Cat.* 2065; stem tall stout hirsute or glabrate, leaves long-petioled broadly ovate or oblong crenate, base broadly cordate, petiole almost as long as the blade, bracts equalling the calyx slender rigid ciliate, tips spinescent, calyx ⅛ in. sparsely

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[Pholomis.]

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hairy, teeth spiniform \( \frac{1}{3} \) the length of the tube. Benth. Lab. 631, and in DC. Prodr. xii. 543.

**Temperate Himalaya;** Kumaon, alt. 10,000 ft., Strachey & Winterbottom, Anderson; Nepal, Wallich; Sikkim, alt. 10-13,000 ft., J. D. H.

Stem 5-6 ft., as thick as the little finger. Leaves 4-8 by 3-6 in., variable in breadth, base rarely cuneate, pubescent above and beneath; petiole stout. Whorls 1-2 in. diam. Corolla-tube included, galea villose. Nutlets narrowly obconic, nearly \( \frac{1}{2} \) in. long.

5. **P. breviflora,** Benth. in Wall. Pl. As. Rar. i. 62, Lab. 631, and in DC. Prodr. xii. 543; tall, erect, glabrous or slightly pubescent, leaves long-petioled broadly ovate deeply cordate acuminate crenate, whorls few-fl.d., bracts slender glabrous, calyx \( \frac{1}{2} \) in. short nearly glabrous, teeth very short. P. parviflora, Benth. in Wall. Cat. 2066.

**Eastern Himalaya;** Nepal, Wallich; Sikkim, alt. 10-12,000 ft., J. D. H., &c.

Perhaps only a variety of *P. macrophylla,* but the leaves are much more deeply cordate with rounded lobes, and the calyx is very small with minute teeth.

6. **P. setigera,** Falcon. mss.; Benth. in DC. Prodr. xii. 543; tall, erect, nearly glabrous or sparsely pubescent, leaves short-petioled ovate acuminate crenate, base rounded or cordate, whorls many-fl.d., bracts short rigid setaceous ciliate, tips spinaceous, calyx \( \frac{1}{2} \) in. hairy, teeth erect subulate calyx \( \frac{1}{2} \) the length of the tube.

**Temperate Himalaya;** Kashmir, Clarke; Kumaon, Falconer; Sikkim, alt. 10-12,000 ft., J. D. H., &c.

Habit of *P. macrophylla,* differing in the short \( \frac{1}{3} \) in. petioles, the much shorter bracts, and the nutlets, which are \( \frac{1}{2} \) in. long, obvoid, with a truncate top.

? VAR. occidentalis, Clarke mss.; bracts much longer and less rigid, calyx-teeth longer half the length of the tube.—Kashmir, Palgam, alt. 7000 ft., Clarke.

? VAR. filiformis; bracts soft siliforn flexuous bisnate (not rigid nor spinous-tipped), nutlets \( \frac{1}{3} \) in. long oblong.—Sikkim, Jongri and Tungu, alt. 1200-13,000 ft., J. D. H.—Of this subalpine plant the specimens are very poor; the bracts are very different from those of *P. setigera,* which, however, Clarke gathered at Jongri. It may be a form of *P. bracteosa.*

7. **P. bracteosa,** Royle mss.; Benth. in Hook. Bot. Misc. iii. 383, Lab. 633, and in DC. Prodr. xii. 545; hoary pubescent or subtomentose, leaves petioled ovate obtuse crenate, base broadly cordate, whorls many- and dense-fl.d., bracts ciliate long, outer membranous lanceolate or linear tip not spinous, inner narrower, calyx \( \frac{1}{2} \) in. hispid or glabrate, teeth slender ciliate. P. lamifolia, latifolia, simplex and cordata, Royle mss.; Benth. ii. 6.

**Western Temperate Himalaya;** from Kumaon to Kashmir, alt. 5-11,000 ft.

—Distriz. Afghanistan.

A tall stout herb, stem simple or branched, hairs stellate on the leaves, spreading or deflexed when present on the stem. Leaves 2-4 in. long, very variable in breadth and in the base, which is never deep cordate and is sometimes truncate, tip usually rounded, rarely subacutae, both surfaces tomentose or almost silky in Royle’s *P. cordata,* finely tomentose in the ordinary form, much more glabrous in *P. lamifolia;* petiole usually shorter than the blade. Whorls \( \frac{3}{4} \) in. diam.; bracts usually equaling the calyx, erect. Calyx-teeth half the length of the tube or shorter. Corolla blue-purple; galea fringed with white hairs. Nutlets \( \frac{1}{2} \) in., obvoid, tip rounded.

VAR. longifolia; leaves 6-8 in. ovate-lanceolate acuminate or acute sparsely pubescent.—Kashmir, Tragbol and Shapryon, alt. 7-8500 ft., Clarke.

8. **P. rugosa,** Benth. in Wall. Pl. As. Rar. i. 63, Lab. 634, and in
DC. Prodr. xii. 545; nearly glabrous, leaves long-petioled membranous elliptic or oblong-ovate acuminate minutely toothed, whorls small, bracts filiform, calyx 3 in. obconic-campanulate glabrous or hispid, teeth very slender from a triangular base. Wall. Cat. 2067. Gomphostemma membranifolium, Miquel Fl. Ind. Bat. ii. 988.


Stem tall, 2–3 ft., stout or slender, minutely hairy, hairs deflexed. Leaves 6–8 by 3–4 in., glabrous or with minute scattered hairs above, base acute or rounded; petiole 3–4 in., very slender. Whorls distant, often many below the leaves ½–1 in. diam. Calyx coriaceous, teeth half the length of the tube. Corolla faintly pubescent, white or yellowish, upper lip narrow, lower with narrow side-lobes. Nutlets very large, ½ in. long, obovoid, base acute, tip rounded.—An anomalous Phlomis with the calyx of P. breviflora, but very different leaves. The name rugosa is wholly inapplicable.

9. P. rotata, Benth. in Herb. Ind. Or. H. f. & T.; stemless, leaves large, rotately spreading orbicular or reniform coriaceous crenate rugose densely tomentose lacinuously reticulate beneath, whorls in a very short spike or sessile head, bracts filiform, calyx sparsely hispid, teeth spinous.

Alpine Sikkim Himalaya; in the inner ranges, alt. 13–16,000 ft., J. D. H. Annual? Leaves 3–6 in. diam., very thick, suddenly contracted into a very broad tomentose petiole ½ in. broad; nerves very thick, flabellate; floral 0 or 2 oblong crenate. Whorls sometimes on a slender peduncle 2–3 in. long, at others forming a dense head 1½ in. diam. or less in the centre of the leaves; bracts with acicular tips. Calyx ½ in., funnel-shaped, rather membranous, teeth short. Corolla small, tube included, galea pubescent, densely fringed with white hairs.—A very remarkable plant, with the habit of Lamium rhomboideum.

48. NOTOCHÆTE, Bentham.

An erect herb. Leaves long-petioled. Whorls axillary, globose, densely many-fid.; bracts slender, at length spinous with hooked lips. Calyx 5-nerved, membranous; teeth 5, equal, with long hook-tipped spines at the back. Corolla very small, tube included, not annulate; upper lip erect, concave; lower spreading, subequally trid. Stamens 4, ascending; anthers connivent, cells divaricate. Style-lobes minute, subequal. Nutlets narrow oblong, triquetrous, truncate, smooth.

N. hamosa, Bentham. in Wall. Pl. As. Rar. i. 63, Lab. 636, and in DC. Prodr. xii. 547; Wall. Cat. 2068; Hook. Ir. Pl. t. 1217.

Central and Eastern Temperate Himalaya; Nepal, Wallich; Sikkim, alt. 4–8000 ft., J. D. H., &c.

Glabrous or pubescent. Stem creeping at the base, 2–4 ft., stout, 4-angled. Leaves 5–10 by 3–5 in., membranous, ovate, acuminate, toothed, base acute rounded or subcordate; petiole 2–3 in. Whorls 1–1½ in. diam., densely spiny, bracts longer than the calyx-tube. Calyx-tube ½–1½ in., slender, villous above the middle, fruiting hard 4-valved; spines at length ½ in. Corolla as long as the calyx-spines, galea villous, lower lip as long subequally 3-lobed.

49. EREMOSTACHYS, Bunge.

Erect herbs. Leaves, radical broad, toothed or cut; cauline few, smaller. Whorls densely many-fid, axillary and in a terminal spike. Calyx subcam-
Eremostachys]

CXII. LABIATAE. (J. D. Hooker.)

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panulate or upper lip broad membranous; teeth 5, equal, setaceous. 

Corolla-tube included, upper lip erect, hooded, bearded within; lower spreading, 3-lobed, middle lobe largest. Stamens 4, ascending, upper filaments finbriate or appended at the base; anthers connivent, cells divaricate. Disk equal. Style-lobes equal or upper shorter. Nutlets obovoid, triquetrous, truncate, top densely hairy. Species 27, W. Asiatic.

1. E. superba, Royle mss.; Benth. in Hook. Bot. Misc. iii. 381, Lab. 637, and in DC. Prodr. xii. 548; root-leaves pinnatisect, segments lobulate, the lower petioled, floral ovate acute, whorls many-fld. crowded in a very stout woolly spike, calyx subcampanulate, mouth truncate shortly 5-lobed. Royle Ill. 303, t. 74.

**WESTERN HIMALAYA**; Gurwhal, on the Kheree Pass, Royle. **WESTERN PAKISTAN**; Peshawur, Vicary.

Stem 2 ft., strict, erect, unbranched, base 2 in. diam., softly hairy. Leaves, radical ovate in outline, 8–12 in.; lobes or peduncles broad, obtuse; petiole hirsute; cauline few, small, sessile, pinnatifid. Spike 6–10 in.; floral leaves erect, concave, covering the flowers, decidous. Calyx ½ in., woolly. Corolla-tube included, galea ⅓ in., villous; lower lip broad, 3-lobed.


**WESTERN PAKISTAN**; Peshawur, Vicary; Salt range, Jhelum, Aitchison.—DISTRIB. Beluchistan.

Stem 3–5 ft., very stout, simple or branched. Leaves radical, 12–18 in., ovate in outline, segments or pinnules sessile glabrous; petiole stout, base wooly. Spike 8–10 in., rachis very stout. Calyx ⅓ in. Corolla smaller than in E. superba, galea villous and fringed with white hairs.


**WESTERN PAKISTAN**; Peshawur, Stewart.—DISTRIB. Beluchistan, Afghanistan.

Stem 3–5 ft., very stout, simple or branched. Leaves, radical 6–12 in., oblong-ovate, hispid beneath; floral very broad, sessile, concave, as long as the flowers, deciduous; petiole and rachis hirsute. Whorls 1–2 in. diam., lower distant; bracts shorter than the calyx. Calyx ⅓ in., mouth very shortly 5-lobed, lobes with a dorsal spreading spine ⅓ in. long. Corolla 1 in., tube exerted, galea pubescent, fringed with white hairs.

50. ERIOPHYTON, Benth.

A dwarf thickly woolly herb. Leaves rounded or rhomboid, toothed. Whorls 6-fld., axillary, crowded or the lower distant, flowers very large, yellow. Calyx campanulate, 10-nerved, membranous, 5-lobed to the middle, lobes finely acuminate. Corolla-tube included, upper lip very broad, galeate, compressed, arching over the lower, which is small with 3 rounded lobes. Stamens 4, posterior filaments thickened at the base; anthers conniving, villous, cells divaricate. Disk equal. Style-arms subequal. Nutlets large, irregularly broadly obovoid and triquetrous, truncate, glabrous.

**E. Wallichianum**, Benth. in Wall. Pl. As. Rar. i. 63 (Wallichii), Lab. 638, and in DC. Prodr. xii. 549; Wall. Cat. 2070.
51. **GOMPHOSTEMMA, Wall.**

Perennial, stellately pubescent or tomentose herbs; roots often with elongate tubers. **Whors 6–8-fld., dense- or lax-fld., axillary or in terminal spikes. Calyx 10-nerved, subequally 5-toothed. Corolla-tube slender; throat dilated, not annulate; upper lip galeate, lower broadly 3-fld. Stamens ascending; anthers conniving, cells parallel, transverse, naked. Disk symmetric or produced behind. Style-lobes subequal. Nutlets (drupes) various, glabrous or pubescent, hilum broad, pericarp thick corky or fleshy. *Catyledons* often unequal.—Species 16, Indian, Malayan and Chinese.

* Upper or all the whors in terminal or axillary spikes.

1. **G. strobilinum**, Wall. Cat. 2151; stem scurfily scabrid or tomentose, leaves elliptic-ovate subacute crenate scabrid above densely tomentose beneath, whors in a dense stout terminal tomentose spike, bracts broadly elliptic-ovate exceeding the calyx, calyx ½ in., lobes triangular acute. **Benth. in Wall. Pl. As. Eran.** ii. 12, Lab. 647, and in DC. Prodr. xii. 550.

**Burma**; Prome, Rangoon, &c., Wallich, M’Clelland.—**Distrib. Ava.**

**Leaves 4–10 by 2–6 in., narrowed into a petiole 1–3 in. Spike sometimes 1 ft. and 2 in. broad; bracts 1 in. and under. Calyx ½ in. Corolla twice as long. Nutlets ¼ in., turgid.**

**Var. viride**; leaves more membranous narrowly elliptic-lanceolate finely pubescent beneath, flowers larger. G. viride, Wall. Cat. 2153; Benth. U. c.—Tenasserim, Wallich; Moulemein, Parish.

**Var. Heyneana**; stem petioles spikes and leaves beneath tomentose or densely woolly, "flowers blueish with a purple tinge," Wight. G. Heyneanum, Wall. Cat. 2152; Benth. U. c.; Wight Ill. t. 176 bis, f. 9, and Ic. t. 1456.—Deccan, from the Babadoon Hills to Travancore.

2. **G. pedunculatum**, Benth. mss.; tomentose, leaves long-petioled 3–12 by 1½–7 in., ovate or elliptic-ovate denticulate pubescent above, whors crowded in short axillary peduncled oblong heads or spikes, bracts longer than the calyx ovate serrate, calyx ½ in., lobes triangular acute.

**Khasia Mts.;** below Nurtinngg, J. D. H. & T. T.

**Stem long, flexuous, prostrate, rooting below. Leaves distant. Spikes 1–4 in. long, axillary and from below the leaves or even from the rooting portion of the stem; peduncle tomentose, ½–1 in.; bracts and calyx red-brown. Corolla ½ in., glabrous, pale sulphur colour. Nutlets ¼ in., subglobose, rugose.**

3. **G. acaule**, Kurz mss.; stemless, densely pubescent, leaves 4–8 by 3–4½ in. elliptic obtuse crenate, petiole very stout long or short, whors in a very short velvety terminal sessile spike softly tomentose, bracts much longer than the calyx ovate crenate, calyx ½ in., lobes lanceolate.
4. *G. nutans*, Hook. *f.*; stem very slender and leaves beneath and spikes softly densely tomentose, leaves 2-3½ in. subsessile ovate acute toothed pubescent above, whorls in a solitary short oblong terminal nodding or drooping spike, bracts longer than the calyx ovate subentire, calyx ⅓ in., lobes lanceolate.

*Khasia Mts.*, Simons, Lobb; Nunklow, alt. 3500 ft., Clarke.


**Whorls axillary.**

† *Stem* stout.


*Tenasserim*; Trvoy and Mergui, Wallich, &c.

*Stem* 2-3 ft., stout, erect. *Leaves* acute at the base; petiole ⅛-1 in. *Bracts* variable, shorter than the calyx. *Corolla-tube* far exserted, very slender.

Var. *f. Heiferi*; leaves much broader 8-9 by 4½-5 in. obovate brown tomentose beneath, calyx ½ in.—*Tenasserim*, Heifer.


*Khasia and Jaintea Mts.*, alt. 4-5000 ft., common.


7. *G. niveum*, Hook. *f.*; stem and leaves beneath white-tomentose, leaves sessile or shortly petioled, oblongate acuminate serrate glabrous above, whorls sessile many-fld., bracts slender, calyx ⅗ in., teeth very slender as long as the tube.

*East Bengal*; Griffith.

*Stem* erect, rather stout. *Leaves* much narrowed downwards either to the stem or into a very stout petiole. *Bracts* membranous, as long as the calyx. *Corolla* unexpanded, ⅛ in. *Nutlets* ⅛ in., oblong.


Stem very stout. Leaves narrowed into a stout petiole 1-2 in. long. Cymes laxly fascicled; peduncle ½–1½ in.; flowers often pedicelled; bracts longer than the calyx, from linear to ovate-lanceolate. Corolla very slender, ochreous, throat and limb small. Nutlets usually solitary, elliptoid, rugose.

9. G. crinitum, Wall. Cat. 2159; stem and leaves beneath finely tomentose, leaves petioled 8–12 by 2½–4½ in. elliptic and decurrent on the petiole or ob lanceolate subacute entire or toothed, whorls sessile many- and dense-fld., bracts exceeding the calyx long linear, calyx ½ in., teeth capillary exceeding the terete tube. Benth in Wall. Pl. As. Ran. ii. 12, Lab. 648, and in DC. Prodr. xii. 552.

Tenasserim; Tavoy, Wallich. Malacca, Mount Ophir and Cheboo Forest, Griffith.

Stem stout. Leaves in Wallich’s specimen broad, toothed, suddenly narrowed into a wing, in Griffith’s narrow subentire and narrowed into a stout petiole. Whorls in Wallich’s glabrate, in Griffith’s pubescent or villous. Corolla ½ in., lemon-coloured, tube very slender, limb subglobose.

10. G. thomsoni, Benth. in Herb. Ind. Or. Hook. f. & T.; stem woody, and leaves beneath pubescent or tomentose, leaves long-petioled 6-12 by 2½–8 in. membranous oblong or orbicular ovate acute crenulate pubescent above, whorls in dense crowded masses in the lower axils and on the stem below then sessile very many-fld., bracts as long as the calyx linear and lanceolate, calyx ½ in., tube narrow, teeth subulate as long as the tube, corolla slender, limb small glabrous.

Khasia Mts.; Churra, alt. 3-5000 ft., J. D. H. & T. T.

Stem as thick as the little finger, hoary; wood hard. Leaves the largest of the genus, very variable in breadth. Whorls in globose or irregular clusters 1 in. long and broad, subcrinate from the slender tips of the bracts and the calyx-teeth. Calyx small in flower, tube in fruit oblong. Corolla glabrous, pale yellow, tube extremely slender, throat hardly inflated; upper lip narrow, lower small. Nutlets ½ in., oblong, rugose.

11. G. eriocarpum, Benth in Wall. Pl. As. Ran. ii. 12, Lab. 649, and in DC. Prodr. xii. 552; stem rather slender tomentose, leaves 3-5 in. shortly petioled elliptic-oblong or lanceolate acute toothed glabrous above softly tomentose beneath, nerves reticulate, whorls small sessile few-fld., bracts broad and narrow, calyx ½ in., teeth filiform as long as the tube, corolla slender, limb small puberulous, nutlets globose tomentose. Wall. Cat. 2710. G. oblongum, Wight Ic. t. 1457.

Southern Deccan; Courtallum, Wight, &c.; Anamallays and Tinnevelly Hills, Beddome.

Stem 2–3 ft., leafy. Leaves narrowed into the petiole of 1–2 in. Whorls 1–3 in. diam., subcrinate. Calyx-tube cupular in fruit, with one globose nutlet ½ in. diam. clothed with grey pubescence.

†† Stem very short, or slender prostrate, rooting at the base and ascending above.


Stems 2-3 ft., flexuous, rooting for half its length. Leaves membranous, sometimes sparsely hairy above, nerves beneath puberulous, base acute; petiole ½-1 in. Bracts ovate or lanceolate. Corolla 1½ in. long, pubescent; throat inflated, ⅔ in. diam. Nutlets scarlet.


Assam, Silhet and Khasia Mts., ascending to 4000 ft.; Wallach, &c.

Stem flexuous or tortuous. Leaves the smallest of the Indian species, equally velvety on both surfaces; base cuneate; petiole ½-1 in. Bracts as in G. stroblilium. Corolla pale yellow, pubescent, tube gradually dilating into the funnel-shaped throat.

14. **G. ovatum**, Wall. Cat. 2155; stem short suberect, petioles whorls and leaves beneath softly tomentose, leaves 4-6 in. long-petioled broadly elliptic obtuse crenate puberulous above, whorls few-fl., bracts longer than the calyx ovate leafy, calyx ⅗ in., teeth narrowly lanceolate, corolla ⅞ in., tube and throat long.

Tropical Himalaya; Nepal, Wallach; Sikkim, alt. 3-4000 ft., J. D. H.

Stem ascending or suberect, not creeping, 10-12 in. Leaves membranous, base cuneate; petiole 1-3 in. Bracts as in G. stroblilium. Corolla pale yellow, pubescent, tube gradually dilating into the funnel-shaped throat.

15. **G. Mastersii**, Benth. in Herb. Ind. Or. H. f. & T.; stem short ascending and leaves beneath and whorls pubescent or tomentose, leaves petioled 4-8 in. broadly (rarely narrowly) elliptic ovate obtuse toothed or crenate pubescent or setose or subsilky above, whorls few-fl., bracts equaling the calyx lanceolate with filiform points, outer sometimes ovate, calyx ⅓-⅗ in., teeth lanceolate, points very slender, corolla 2 in., tube long. *G. melisseæfolium*, *Wall.* Cat. 2157, in part.

Sikkim Himalaya, alt. 3000 ft.; J. D. H. Assam, Khasia Mts., ascending to 4000 ft., Silhet and Cachar; Wallach, &c.

A very variable plant, possibly not distinct from G. ovatum. Root-tubers fusiform, ⅓-1 in. long. Leaves in some specimens with long spreading hairs on the upper surface, in others with deep irregular crenatures, in others with a rounded or even cordate base; petiole 1-2½ in. Whorls occasionally shortly peduncled (as in *G. pedunculatum*). Corolla pubescent, ochreous, yellow, tube gradually dilating into the throat.

52. **LEUCOSCEPTRUM**, Smith.

A tomentose or villous shrub or small tree. Leaves large. Whorls in dense cylindric terminal spikes, bracts large, transversely oblong caducous. Calyx campanulate decurved, teeth rounded. Corolla minute, 5-lobed; lobes rounded, upper largest. Stamens very far exerted, filaments very long, straight in flower, diverging, pubescent below; anthers reniform, 1-celled, very short. Style-arms minute, subulate. Nutlets elongate-cuneate, triquetrous.


**Temperate Himalaya;** from Kumaon to Bhotan, alt. 2-8000 ft. *Khasia Mts., alt. 4-5000 ft.

Tree, 30 ft., trunk short. Branches nearly terete, very stout, and as well as the leaves beneath petiolo and spikes densely or laxly tomentose or woolly, rarely glabrate. Leaves 6-12 by 2½-4½ in., elliptic-lanceolate, acuminate, entire or crenate, glabrous above, beneath with silvery-white or buff or brown tomentum most variable in thickness, rarely green and glabrate; petiolo 1-1½ in. *Spikes* 4-6 in., ½ in. diam. (without the stamens); bracts ½ in. broad, subreniform, hoary or tomentose, imbricating and covering the buds when very young, early caducons. *Calyx* ½ in., hoary, sessile or pedicelled. *Corolla* white or pinkish, hoary without. *Stamens* ½-3 in., filaments diverging, at length deflexed, stout, yellow; anthers minute.—This seems to me as distinct a genus as any in the Order; the stamens are very characteristic, spreading as in *Saturejinae*, with the anther-cells parallel, not divergent, and the filaments involute in bud.

53. **Thucrium**, Linn.

Herbs or shrubs. Whorls in 2-6-fld. axillary or terminal spikes racemes or heads. *Calyx* 10-nerved, teeth 5, equal or the upper larger. *Corolla-tube* not annulate, limb 1-lipped, the 2 upper and lateral lobes cuneate and very short or obsolete, lower lobe very large. *Stamens* 4, exerted; anther reniform, cells short, at length confluent. *Disk* symmetrical. *Style-lobes* subequal. *Nutlets* minute, reticulate, smooth or rugulose; hilum large, oblique or lateral.—Species about 100, chiefly temperate and S. European.

Sect. 1. **Scorodonia.** Whorls 2-fld., second, in terminal racemes. *Calyx* campanulate, decinate, upper tooth largest.


**Deccan Peninsula;** on the Ghats from the Concan southward, *Heyne, &c. Ceylon*, alt. 5-7000 ft.; *Walker, &c.*


**Sikkim Himalaya, alt. 1-5000 ft.; J. D. H. Bengal Plains, Khasia Mts., ascending to 4000 ft., and Chattagong.—Distrib. Ava, Java, China.


3. **T. Royleanum**, *Wall. Cat.* 2027; stoloniferous, pubescent, tomen-
of T. laxum, Don Prodr. 109; stem slender diffusely branched laxly villous or glabrate, leaves petioled ovate acuminate serrate, racemes short often recurved, calyx ½ in. pubescent, upper lip rounded acute, 2 lower lanceolate acute, corolla-tube included. Benth. in Wall. Pl. As. Ear. i. 58, Lab. 675, and in DC. Prodr. xii. 583. Ajuga laxa, Ham. mss.

Central Himalaya; Nepal, Hamilton; Kumaon, Edgeworth, alt. 8000 ft.; Ramgunga River, alt. 4600 ft., Strachey & Winterbottom (Hedeoma n. 2).

Stems or branches 10–12 in., rather slender, villous with long sparse spreading hairs in Edgeworth's specimen, glabrous in Strachey's. Leaves ¼–1½ in., base rounded, petiole ¼–½ in. Racemes 1–2 in.; bracts ovate-lanceolate, shorter than the calyx. Corolla not twice the length of the calyx.—Don's character hardly agrees with the specimens above described in the ventricose calyx.

5. T. quadrifarium, Ham. in Don Prodr. 108; stout, erect, tomentose or villous, rarely glabrate, leaves sessile or short-petioled ovate or oblong-ovate acute serrate racemes panicked, bracts ovate acute much exceeding the flowers, calyx ½ in., upper lip rounded, 2 lower acute or obtuse, corolla-tube included. Wall. Cat. 2024; Benth. in Wall. Pl. As. Ear. i. 58, Lab. 675, and in DC. Prodr. xii. 583; Maxim. in Bull. Acad. Petersburg, Mel. Biol. i. 827. T. Fortunaei, Benth. in DC. l. c. (excl. Perrottet's plant).

Temperate Himalaya; from Kashmir to Sikkim, alt. 4–6000 ft. Khasia Mts., alt. 4–5500 ft.—Dist. Awa, China.

A stout herb, stem 2–4 ft., almost terete below, sometimes villous with long spreading hairs. Leaves 2–3 in., often rugose; petiole usually ½ in., rarely 1 in. Spikes 2–6 in., stam with the bracts on ¼ in. diam.; bracts ½ in., broadly ovate, suddenly acuminate, villous near the base, young quadrifarious imbricating and concealing the flowers, often red-purple; flowers sessile or very shortly pedicelled. Corolla purple, not twice the length of the calyx. Style entire. Nutlets subglobose, rugose.


Nighri Hills; in dry rocky places, alt. 7000 ft., Wight, &c.

Stem 1–2 ft., obtusely angled; hairs tawny, most dense, spreading. Leaves 1–1½ in.; petiole stout, ¼ in. Racemes 3–4 in. Corolla purple, ¾ in. long. Style entire or 2-toothed. Nutlets subglobose, glistening, faintly reticulate.—Wight represents the leaves acute, which is the case in T. tomentosum, but never in this.

**Sikkim Himalaya**; Lachen, alt. 9–10,000 ft., *J. D. H.*


Sect. 2. **Scordium**. *Whorls* 2–6-fld., axillary.


54. **AJUGA**, *Linn.*

Annual or perennial herbs. *Whorls* 2- or more-fld., axillary or in terminal leafy spikes. *Calyx* 10- or more-nerved; teeth 5, subequal. *Corolla-tube* often annulate within, upper lip very short, 2-fld.; lower spreading, midlobe usually the largest notched or 2-fld. *Stamens* 4, ascending, exerted or included; anther-cells diverging, distinct or at length confluent. *Disk* symmetric or produced behind. *Ovary* shortly 4-lobed; style-lobes subequal. *Nutlets* obovoid, rugose, hilum lateral.—Species 30, of the temperate Old World.

*Corolla-tube* straight, base not inflated. *Stamens* exerted.

1. **A. lobata**, *Don Prodr.* 108; softly hairy or glabrate, stems very long and slender prostrate or creeping, leaves long-petioled orbicular or broadly oblong cordate sinuate-lobed, whors axillary or in short erect axillary spikes. *Wall. Cat.* 2034; *Benth. in Wall. Pl. As. Rav.* i. 58, *Lab.* 692, and in *DC. Prodr.* xii. 595.


*Stems* 1–2 ft., flexuous. *Leaves* distant, 1–2 in. long and broad; petiole as long or longer. *Spike* 1–3 in.; bracts ovate-oblong, toothed; lower whors distant, 2-fld., upper 6-fld. *Calyx* ⅓ in.; teeth long, lanceolate. *Corolla* lilac; tube thrice as long as the calyx, slender, laxly pubescent; upper lip very short; lower very large, side lobes linear-oblong, midlobe broadly dilated retuse.

2. **A. bracteosa**, *Wall. Cat.* 2032; softly pubescent villous or glabrate, rarely substriose or hispid, stolons 0, stems or branches erect or ascending, leaves oblanceolate or subspathulate obtuse sinuate-toothed, whors axillary or crowded in spikes much shorter than the leafy ovate or cuneate-obovate entire or toothed bracts, calyx-teeth ovate-lanceolate, corolla-tube exerted,

**Corolla-tube straight. Stamen included in the tube.**


**Western Himalaya,** from Kashmir to Kumaon, alt. 2-7000 ft. — *Distrib. Afghanistan.*

Branches very numerous from the woody rootstock, stout or slender, leafy. Radical leaves 2-3 (rarely 5 by 2) in.; cauleine smaller, obvate or oblong. Spike 1-4 in., whorls generally crowded, lower sometimes distant; bracts ovate or oblong, much longer than the flowers. *Calyx 1/2 in., teeth as long as the tube. Corolla blue, tube slender, 1/2 in. long, glabrous or hairy; limb very small, upper lip very short 2-lobed, lateral lobes of lower subequal or the midlobe the largest. Nutlets 1/6 in., rugosely pitted.—Very variable in habit and size of leaves.

Var. *depressa*; densely villous, branches depressed. *A. depressa, Maxim. l. c. 828.—This is a stunted alpine state from an elevation of 8000 ft. in Kumaon. (Stacehy & Winterbottom, Ajuga, n. 5.)*


**Western Himalaya;** Kumaon, Pindari, alt. 12,500 ft., Stacehy & Winterbottom (Ajuga, n. 4).

*Stem 1-2 in. from a small woody rootstock. Leaves 1-1 1/2 in., radical shortly petioled, crenulate, cauleine shorter. Spike 1/2 in. *Calyx obconic, 1/2 in. long, teeth ciliate. *Corolla 1/4 in., tube straight, upper lip short, 2-lobed; side-lobes of lower linear-oblong, obtuse; midlobe twice as broad, dilated, retuse. Stamens wholly included.—This looks like a starved state of something, but I cannot refer it to any described species; the calyx resembles *A. macrosperma* in miniature, but the corolla-tube is straight with included stamens.*
Corolla inflated at the base, geniculate above the swelling. Stamens exserted.

5. A. macrosperma, Wall. Cat. 2038; glabrous pubescent or villous, stem or branches decumbent or ascending often stout and tall, leaves petioled ovate-oblong or obovate obtuse sinuate-crenate, whors villous continuous or interrupted longer than the ovate bracts, calyx-teeth very short obtuse. Benth. in Wall. Pl. As. Kar. 1. 58, Lab. 697, and in DC. Prodr. xii. 599; Maxim. in Bull. Acad. Imp. Sc. Petersb., Mol. Biol. xi. 823. A. repens, Rzed. Fl. Ind. iii. 3. A. geniculata, Maxim. l. c. 821.


Very variable; stems or branches 6 in. to 3 ft., sometimes as thick as a man's quill, spreading and branching, sometimes rooting, and glabrous or densely pubescent or villous. Leaves 1-6 in. long, very variable in breadth, narrowed into the leaf very long petiole, rarely lobed or cut. Spikes 1-3 in., whors continuous or interrupted, lower bracts leaf-like. Calyx short, teeth always obtuse. Corolla azure, tube twice as long as the calyx, usually glabrous, limb small; upper lip erect, 2-lobed; lobes of lower subequal or midlobe broadest. Nutlets 1/4 in. long, deeply rugosely pitted.—A very common species in the hilly countries of N. India, being the largest of the genus; in the low grounds forming a bushy herb sometimes 3 feet high, with widely spreading decumbent branches and abundant spikes of blue flowers. In the higher elevations it assumes a lower and more slender form with smaller leaves (A. sikimensis, Miq.), with the corolla laxly hairy and its tube scarcely exserted. This form has sometimes stems only a few inches high and irregularly toothed leaves. Whether A. macrosperma, and any of its states, be the A. decumbens, Thunb., of Japan, as would follow from Don's and Bentham's references, is unknown to me, as I have seen no Japanese Ajuga with a geniculate corolla-tube. According to Maximovicz's description of A. decumbens, it must differ in the deeper sharper calyx-lobes, the more prominent midlobe of the corolla, and in the minutely reticulate nutlets.

Var. Thomsonii; glabrous, stems slender scabrid rooting prostrate, spikes with a very slender rachis, calyx-teeth very short rounded, corolla glabrous, tube exserted. A. Thomsonii, Maxim. l. c. 821.—Sikkim, alt. 6-9000 ft., J. D. H. & T. T.—This is certainly only an upland state of A. macrosperma. However unlike the extreme low-land form, it is united by intermediates collected near to it at lower elevations.

Var. breviflora; smaller, branches more slender than the type 4 in.-2 ft., corolla-tube shorter sometimes quite included often hairy. A. decumbens, Don Prodr. 108; Benth. in DC. l. c. 598 (? of Thunberg). A. sikimensis, Miq. Protus. Fl. Jap. 46; Maxim. l. c. 822.—Higher parts of the Khasia Mts., ascending to 10,000 ft. in Sikkim. Behar; top of Parnsath, J. D. H.—Perhaps all the Himalayan forms of A. macrosperma should be referred to this, but I can find no definite characters for them.

Unknown Species.

A. ?ovata, Wall. Cat. 2036, from Ava, is indeterminate, having no flower or fruit.

55. Cymaria, Benth.

Shrubs. Flowers small, in lax many-fl. axillary peduncled cymes, ebracteate or crowded in a terminal thyrsie. Calyx erect, 10-nerved, 5-toothed, fruiting-tube globose, throat naked. Corolla-tube straight; lips subequal, upper arched, erect; lower spreading, 3-fid, midlobe largest. Stamens 4, ascending; anthers conniving, cells divaricate. Disk symmetric. Ovary shortly 4-lobed; upper style-lobes very short. Nutlets subglobose or obovoid, rugosely pitted; hilum lateral.—Species 3, Burman and Malayan.
1. **C. dichotoma**, Benth. in Wall. Pl. As. Rav. i. 64, Lab. 705, and in DC. Prodr. xii. 603; branches petioles cymes and leaves beneath finely pubescent, leaves ovate or rhomboid subacute faintly crenate, cymes axillary long-peduncled lax-fld. **Wall. Cat.** 2080.

**BURMA**; at Taong-dong, Wallich.

Stem terete, woody; branches strict, slender, obtusely 4-angled. **Leaves** 3-4 by 1½-2 in., membranous, base cuneate; petiole ½-⅓ in. Peduncle ½-2 in., slender. **Calyx** ⅔ in., teeth triangular acute, as long as the tube. **Corolla** minute, tube hardly exerted. Stamens included. **Nutlets** ⅔ in.

2. **C. elongata**, Benth. in Wall. Pl. As. Rav. i. 64, Lab. 705, and in DC. Prodr. xii. 603; branches petioles leaves beneath and cymes densely tomentose, leaves subsessile ovate obtuse subrenate, cymes short-peduncled dense-fld. in a long terminal leafy raceme. **Wall. Cat.** 2079.

**BURMA**; at Taong-dong, Wallich.

**Branches** long, robust. **Leaves** 1½-3 in., thick, finely tomentose above. **Peduncle** ½ in., and pedicels stout. **Calyx** ⅔ in., as in **C. dichotoma**, but tomentose. **Nutlets** ⅔ in., obovoid.

**Order CXIII. PLANTAGINÆ.**

Scapigrous herbs. **Leaves** usually radical. **Scapes** axillary. **Flowers** small, greenish, spicate, often dimorphic. **Sepals** 4, imbricate in bud, persistent. **Corolla** hypogynous, salver-shaped, scarious; lobes 4, imbricate in bud. **Stamens** 4, inserted on the corolla-tube; filaments capillary, infixed in bud, persistent; anthers large, pendulous, versatile. **Ovary** free, 2-4-celled; style filiform with 2 lines of stigmatic hairs; ovules 1 basal in each cell, or several peltately attached to the septum. **Capule** 1-4-celled, circumscissa, membranous, 1- or more-seeded, septum free. **Seed** usually peltate, tests thin, mucilaginous, albumen fleshy; embryo cylindrical, transverse, radicle inferior.—**Genera** 3, species about 50.—The above character does not include the anomalous monotypic genera **Littorella** and **Bougueria**.

**Plantago, Linn.**

Characters of the Order.

**Sect. I. Euplantago, Boiss.** **Leaves** all radical.

* **Corolla glabrous.** **Capsule** 2-celled, cells 4-8-seeded. **Seeds** angular.

1. **P. major, Linn.;** perennial, leaves petioled oblong or oblong-ovate subentire or toothed 3-7-ribbed, scape short, spike very long and slender. **Boiss. Fl. Orient.** iv. 878; **Done. in DC. Prodr.** xii. 1. 696; **Thwaites Enum.** 245. P. erosa, **Wall. in Roxb. Fl. Ind., Ed. Carey & Wall.** i. 423, and **Cat.** 6412; **Don Prodr.** 77; **Done. l. c.** P. asiatica, **Linn. Sp. Pl.** 163; **Done. l. c.** 695; **Wight Ill.** t. 177. P. longiscapa, **Jacquem.** **mss.**

**Temperate and Alpine Himalaya; from Pesbawur and Kashmir to Bhotan, alt. 2-8000 ft., and Western Tibet, alt. 10-12,000 ft. Assam, Griffith.** **Khasia Mrs., alt 4-6000 ft.** **Burma and Malacca, Griffith.** **Singapore or Penang, Walker. Bombay, Stocks. Nilgiri Hills, Foulkes, &c. Ceylon; higher parts of the island, Walker, &c.—District. Malay Islands; Afghanistan and westward to the Atlantic; wild or introduced, in these and many other countries.**

Glabrous or hairy; rootstock stout, truncate. **Leaves** 2-5 in., variable in breadth, toothing irregular; petiole sometimes 4 in. **Spike** 3-6 in.; flowers scattered or crowded; bracts equaling the calyx. **Sepals** glabrous, ⅔ in. long, margins broadly scarious, obtusely keeled. **Filaments** short. **Seeds** very minute, black.
**Corolla glabrous. Capsule 2-celled, cells 1–2-seeded.**


3. **P. tibetica**, *Herb. Ind. Or. Hook. f. & T.*; perennial, glabrous or nearly so, leaves sessile or petioled elliptic or elliptic-lanceolate entire or toothed 5-ribbed, axils glabrous, scape grooved, spike slender.

**Western Himalaya**; Kashmir, alt. 4–11,000 ft., *Stewart*. **Western Tibet**; common, alt. 10–13,000 ft., *Thomson, Henderson*. *Rootstock* short, stout. Leaves 2–4 in., variable in width, subacute. *Scapes* glabrous or puberulous. *Spikes* 1–6 in.; flowers very pale; bracts oblong, obtuse, equalling the calyx. *Sepals* broadly oblong, scarious, midrib green. *Corolla* very small, lobes acute. *Capsule* twice as long as the calyx, very pale.—Some specimens of apparently first year’s plants from wet places have oblong membranous leaves ½ in. long or petioles as long, and very slender scapes and spikes.

4. **P. brachypylla**, *Edgew. mss.; Dene. in DC. Prodr.* xiii. 1, 696; perennial, glabrous, leaves elliptic-ovate subsessile or petioled 3–5-ribbed, axils glabrous, scapes stout glabrous longer than the leaves and cylindrical spikes. *P. gentianoides*, *Dene. l. e.* 721 (the Himalayan plant).

**Western Himalaya**; from Kumaon to Kashmir, alt. 9–13,000 ft., *Edgeworth, &c.* **Western Tibet**, alt. 11–14,000 ft.; *Thomson.*—**DISTRIB.** Afghanistan.

Much resembling a small state of *P. major*, but the seeds are 1–2 in each cell, oblong and plano-convex.

5. **P. Stocksii**, *Boiss. in DC. Prodr.* xiii. 1, 720, and *Fl. Orient.* iv. 882; annual or perennial, cobwebby or sub silky, leaves shortly petioled lanceolate-long-acuminate entire 3-nerved, scape slender longer than the leaves, spike short and few-fl. or long with many distant flowers, corolla-lobes acute. *P. remotiflora*, *Stocks in Hook. Kew Journ.* Bot. iv. 179.

**N.W. India**; Waziristan, alt. 3–5000 ft., *Stewart.*—**DISTRIB.** Afghanistan and Beluchistan, Persia.

*Root fusiform.* Leaves 2–4 in. *Spikes* sometimes 5 in. long, at others only ½ in.; bracts rather shorter than the calyx, obtuse, hairy or glabrate, margin membranous, back green. *Sepals* subsimilar, ovate-oblong, obtuse. *Seeds* large, narrowly oblong, boat-shaped, black.—*Waziristan* is just beyond the British frontier, but as the species will probably occur on this side of it, I have thought it right to introduce the description.


Stem 0, or branched from the base, and 2–4 in. high, bearing leaves and axillary scapes. Leaves 3–6 in., rarely 2 in. diam.; margin entire or very sparingly toothed. Scapes very numerous, stout, glabrous. Spikes ½–1½ in.; flowers large; bracts ovular, glabrous, membranous except the green midrib. Sepals rounded, outer with a green keel, inner all membranous. Seeds ½ in., boat-shaped, brown; septum ½–1 in. long, oblong, thickened, black.


Panjab Plains and low Hills; from the Sutlej westwards. Scinde, Stocks.—Distr. Westwards to Spain and the Canaries.

Stem rarely branched, as in P. amplexicaulis. Leaves 3–9 in., rarely ½ in. diam., usually 3-nerved, entire or distantly toothed. Scapes glabrous or pubescent. Spikes ½–1½ in.; bracts with broad scarious margins, ovate-oblong, obtuse, glabrous. Sepals subsimilar, glabrous or pubescent. Seeds cymbiform.

*** Corolla-lobes hirsute. Capsule 2-celled, cells 1-seeded.

8. P. ciliata, Desf. Fl. Atlant. i. 137, t. 39; annual or perennial, stemless or subcaulescent, densely silky or woolly, leaves long- or short-petioled oblanceolate acuminate, scapes stout longer or shorter than the leaves, spikes oblong or cylindric, bracts sepals and acuminate corolla-lobes villous. D. in DC. Prodr. xiii. 1, 708; Boiss. Fl. Orient. iv. 887. P. eriantha, D. l. c. 707.

The Panjab Hills, west of the Jhelum; Salt range, Fleming; Peshawur, Vicary, &c.—Distr. Westwards to Arabia and Egypt.


North-Western Panjab; Peshawur and South of Brumoo, Stewart; Tarki, N. of Indus, alt. 2800 ft., Astebison.—Distr. Westwards to Greece and Egypt.

Stem 4–8 in. Leaves 1–1½ in., with fascicles in their axila, hence appearing whorled, margin entire with a very few glandular tubercles, bases ciliate. Scapes usually shorter than the leaves. Spikes ½–1½ in.; lower bracts sometimes spreading, hispid. Sepals oblong, subacute. Corolla very small.

flexuous glabrous or puberulous, leaves filiform, margins revolute, peduncles in the upper axils, spikes ovoid or subglobose puberulous, bracts all longer than the calyx, lower equalling the spike, corolla lobes finely acuminate. Dcne. in DC. Prodr. xiii. 1, 735; Boiss. Fl. Orient. iv. 391. Plantago, Griff. It. Notes, 214, n. 84, and Notulae, iv. 213; and Lc. Fl. Asiat. t. 452.

North-West India; Royle (raised from seed bought in Bazaar).—Distrib. Afghanistan, Egypt.

This is, I think, a form of *P. Psyllium*, or of *P. stricta*, Schousb. Royle's only specimen is very small, 6 in. high and slender, but Griffith's from Afghanistan is a foot high with a very robust stem.—Boissier doubtfully refers *P. indica*, L., to this.

**Order CXIV. Nyctaginaceae.**

Herbs, shrubs or trees. Leaves usually opposite, quite entire, exstipulate. Inflorescence various, flowers often involucrate. Perianth petaloid, monopetalous; tube persistent, enveloping the fruit; limb 3–5-lobed, plaited in bud. Stamens 8–30, hypogynous, sometimes unilateral, filaments usually unequal, inflexed in bud; anthers didymous. Ovary free, 1-celled; style involute in bud, stigma simple or multifid; ovule 1, erect. Fruit membranous, enclosed in the hardened perianth-tube. Seed erect, testa adherent, albumen floury or soft; embryo curved, coiled or with folded cotyledons, radicle inferior.—Genera 23, species 215, chiefly tropical American.

**Tribe I. Mirabilieae.** Embryo hooked, radicle long.

Flowers involucrate 1. *Oxybaphus.*

Flowers not involucrate 2. *Boerhaavia.*

**Tribe II. Pisonieae.** Embryo straight, radicle short.


1. **OXYBAPHUS,** Vahl.

Herbs. Leaves opposite. Involucre 1–5-fld. Perianth-tube short, limb deciduous. Stamens 2–5, filaments connate below. Fruit small.—Species about 20, all but the following American.

**O. himalaicus,** Edgew. in Trans. Linn. Soc. xx. 87; glandular-pubescent, viscid, leaves petioled ovate or ovate-cordate, flowers solitary in each involucre. Chois. in DC. Prodr. xiii. 2, 430.

Western Himalaya; from Kulu to Gurwhal, alt. 6–9000 ft., Edgeworth, &c. Stem 2–4 ft., branched, terete, brittle. Leaves 2–3 by 11/2–21/2 in., acute, ciliolate; petiole 1–1 in. Flowers panicled, involucre 1/2 in., campanulate, 5-toothed, viscid. Perianth included, rosy, contracted above the ovary, limb spreading. Stamens 4, included. Fruit 3/4 in. long, ellipsoid or ovoid, rough, black.

2. **BOERHAAVIA,** Linn.

Herbs. Leaves opposite. Flowers minute or small, panicled umbellate or capitulate, jointed on the pedicel; bracteoles small, rarely forming a minute involucre. Perianth-tube long or short; limb funnel-shaped, 5-lobed. Stamens 1–5, exerted. Ovary oblique, stipitate, stigma peltate. Fruit small, glandular. Cotyledons broad, thin, enclosing a soft scanty albumen.—Species 30, tropical and subtropical.
**Flowers capitately.**

1. **B. repens**, Linn.; diffusely branched, leaves linear ovate oblong or rounded obtuse or acute, base rounded or cordate, heads small in terminal or axillary panicles, flowers minute capitately, fruit \( \frac{1}{4} \) in. long shortly clavate 5-ribbed viscid all over, top rounded. *Boiss. Fl. Orient. iv. 1045; Dalz. & Gibbs. Bomb. Fl. 213.*

Throughout India; from the Paujab to Assam and south to Travancore and Singapore; ascends in the hot Himalayan valleys to 7000 ft. Ceylon.—Distr. Tropical and sub-tropical Asia, Africa and America.

BooTT fusiform, very stout; rootstock woody; branches 6-24 in., glabrous or pubescent. *Leaves* \( \frac{1}{2} -2 \) in., thick, usually white beneath; petiole as long as the blade or shorter. *Panicle with very slender branches. Perianth red. Stamens 2-3.—* I have refrained from quoting any but Indian authorities for this plant, the whole genus appearing to me to be in a state of utter confusion. **B. ascendens**, Willd.; *hirsuta*, Willd., and *viscosa*, Lag., are probably the same as this. I am further unable to draw any line between the following forms, two of which are characterized by Boissier.

**B. repens** proper; small, branches 6-10 in. not very stout appressedly pubescent, leaves small oval or oblong often acute rarely cordate green above white beneath.—**B. repens**, Delile Fl. Eq. t. 3, f. 1.

**Var. procumbens**; branches 2-3 ft. usually slender glabrous, leaves larger broader often rounded white beneath, inflorescence panicked. **B. procumbens**, Herb. Banks in Roxb. Fl. Ind. i. 146; Wight Jc. t. 874; Grahl. Cat. Bomb. Pl. 167.

**Var. diffusa**; more robust, branches long stout glabrous pubescent or viscous, leaves 1-2 in. ovate obtuse or acute usually cordate green beneath, inflorescence chiefly axillary. **B. diffusa**, Linn. Sp. Pl. 3; Wall. Cat. 6770; Boiss. l.c. 1045. **B. repanda**, Wall. Cat. 6769, in part.—Rheede Hort. Mal. vii. t. 56.

2. **B. crispa**, Heyne in Wall. Cat. 6771; stout, erect, scaberulously pubescent, stem sub-simple, leaves shortly petioled oblong or ovate-oblong rounded at both ends coriaceous scabrid on both surfaces, nerves very numerous and strong beneath, flowers few capitate in a laxly branched panicle with capillary peduncles, fruit \( \frac{1}{4} \) in. long clavate 5-ribbed glandular, top rounded. **B. rugosa**, Boiss. & Bal. mss.

**Deccan Peninsula;** Heyne.

A robust species. *Leaves* 1-1 \( \frac{1}{2} \) in., very thick and hard, margin crisped; petiole stout, \( \frac{1}{4} -\frac{1}{2} \) in. *Panicles with decurved branches.—* The specimens of this very distinct-looking plant are in fruit only.

**Flowers umbellated or whorled.**

3. **B. repanda**, Willd. Sp. Pl. i. 22; subscendent, branches long pale, leaves triangular-ovate or -cordate acute or acuminate repand-sinuate, umbels long-peduncled axillary and terminal few-fl.d., pedicels long slender, fruit \( \frac{1}{4} \) in. long slender glandular. *Chois. in DC. Prodr. xiii. 1, 455; Wall. Cat. 6769, excl. part of B; Wight Jc. t. 1766; Dalz. & Gibbs. Bomb. Fl. 213. **B. umbellata**, Wight mss. *Valeriana chinensis*, Burm. Fl. Ind. 15, t. 6, f. 3.


**Branches diffuse, subscendent, glabrous or pubescent, 6 ft. long. *Leaves* 1-3 in., base usually truncate or cordate; petiole slender, \( \frac{1}{4} -\frac{1}{2} \) in. *Pedicules* 1-2 in., very slender, 2-6 f.d.; pedicels \( \frac{1}{4} -1 \) in., capillary, **Perianth** pink, tube \( \frac{1}{2} \) in. long; limb \( \frac{1}{4} \) in. diam. **Stamens** far exerted. **Fruit** slightly clavate, covered with large glands,
obscurely ribbed.—This closely resembles the American B. scandens, but the flower is much larger and the stamens are far exerted.


Habit, foliage and inflorescence much as in B. repanda, but leaves usually obtuse; flowers smaller, white or pink, and fruit very different.

5. B. fruticosa, Dalz. in Dalz. & Gibs. Bomb. Fl. 213; “erect, shrubby, viscidly tomentose, leaves ovate or triangular acuminate much wrinkled beneath, base truncate, peduncles axillary, pedicels slender, flowers umbelled small pink, fruit linear-oblong subulate pubescent, ribs tubercled.”

The Concan; Ghats east of Bombay and Sewnere forts, Dalzell.

Stem 2 in. diam.; branches very stout. Leaves 1–2 in.; petiole short, stout. Peduncles as long as the leaves, stout; umbels sometimes superposed; pedicels stout, ½–¾ in. Perianth ½ in. diam. Fruit not seen.—Probably an African species. It resembles B. grandiflora, A. Rich, a good deal.

*** Flowers in di-tri-chotomous cymes; pedicels very long, capillary.

6. B. elegans, Chois. in DC. Prodr. xiii. 2, 453; shrubby below, branches erect, leaves sessile linear oblong or oblong-lanceolate obtuse or apiculate fleshy pruinose, flowers in a very large excessively di-tri-chotomously branched panicle with very long capillary peduncles and pedicels, fruit ½ in. long narrowly ellipsoid or clavate strongly ribbed perfectly smooth. Boiss. Fl. Orient. iv. 1045.

The Panjab; at Sandal bar, Edgeworth. Scinde, Stocks.—Distr. Beluchistan, S. Arabia.

Stock woody, much divided; branches erect, 1–2 ft., glaucous below. Leaves few, 1–1½ in., curiously mottled with white when dry. Peduncles or branches of panicle divaricate; pedicels 1–2 in.; bracts (if present) setaceous. Flowers minute. Fruit narrowed at both ends, minutely hairy between the ribs.—Schimper’s No. 744 from Arabia, which Steudel has named B. rubicunda, and which is referred here by Choisy and Boissier, is perhaps a different species, having broader petioloed leaves (of the same texture however) and fruit twice as large; it is No. 159 of Fischer’s, and No. 98 of Schwenfurth’s Arabian collections.—Seeds eaten, Edgeworth.

3. PISONIA, Linn.

Trees or shrubs, sometimes spinous. Leaves opposite or alternate. Flowers in corymbose cymes, not involucrate. Flowers usually dioecious, 2–3-bRACTEOlATE. Perianth 5–10-toothed, of male flower funnel-shaped, of female tubular. Stamens 6–10, exerted. Ovary sessile, oblique; stigma capitate or feathery. Fruit large or small. Cotyledons crumpled, enclosing a scanty soft albumen.—Species 60, all tropical, one only African.
1. **P. aculeata**, Linn.; a tall woody climber with axillary recurved prickles, cymes dense-fld., fruit narrowly oblong or clavate 5-ribbed, ribs muricate with several rows of glands. *Chois. in DC. Prodr. xiii. 1, 440; Lamk. Ill. t. 861; Gaertn. Fruct. i. t. 76; Roxb. Fl. Ind. ii. 217; Wight Ir. t. 1763-4; Graih. Cat. Bomb. Pl. 167; Kurz For. Fl. ii. 279; Bedd. Sylv. Madr. 175, t. 22, f. 3. P. Georgina, Wall. Cat. 6768. P. vilosa, Poir. Dict. v. 347; *Chois. l. c.* Tragularia horrida, *Koen. mss.*

**SOUTH CONCAN,** and elsewhere in the **DECCAN PENINSULA,** *Hayne,* &c. **CEYLON,** Walker, &c. **BURMA,** Wallich.—**DISTRIB.** Tropical Asia, Africa, Australia and America.


**ANDAMAN ISLANDS;** beach forests rare, *Kurz*; cultivated in India and Ceylon. —**DISTRIB.** Malayan Islands.

A tree, 30–40 ft., glabrous except the inflorescence; branches stout. *Leaves* 6–10 in., oblong-ovate or oblong, acute or acuminate; petiole ½–1½ in. *Flowers* in dense corymbose terminal cymes. *Male* flower ¼ in. long, tubular-campanulate, pedicelled, 5-toothed; *stamens* 8. *Female* flower much smaller; stigma pedicellate. *Fruit* ½–3 in. long, long-pedicelled.—It is very doubtful what name this should bear; it may probably be identified with *P. inermis,* Forst., of the Pacific Islands.


**ANDAMAN ISLANDS;** forests along the coast, *Kurz.—DISTRIB.* Malayan Islands.

A tree, 30–50 ft., glabrous except the puberulous shoots. *Leaves* 1½–1½ ft. glossy; petiole ½–1 in. *Flowers* small, cymose or umbellate; peduncles sparingly tomentose or glabrescent. *Persian* nearly glabrous. *Fruit* 1½ in. or less, glabrous.—*Kurz* has referred this to *Seemann's P. umbellifera,* which Bentham affirms (Fl. Austral. v. 281) to be Blume's *P. excelsa.* I have seen only leaf and fruit, the rest of the above description being from *Kurz.*

**EXCLUDED SPECIES.—** *P. racemosa,* *Wall. Cat. 7296,* is *Patunga longifolia,* DC. (See v. iii. 120).

**ORDER CXV. ILLECEBRACEAE.**

Herbs, usually small and tufted. *Leaves* opposite or alternate; stipules scarious. *Flowers* cymose, minute. *Sepals* 4–5, persistent, closing over the fruit. *Petal* minute or 0. *Stamens* hypogynous or perigynous; filaments short; anthers didymous. *Ovary* free, 1-celled; *style* 2–3–6, stigmas free; ovule 1, erect or pendulous from a basal funicle. *Utricle* enclosed in the perianth. *Seed* globose lenticular or reniform, testa smooth, albumen floury; embryo straight curved or annular.—Genera 17, species 70, most warm dry regions.
Gymnocarpos fruticosus, Pers., is in the Genera Plantarum (iii. 17) erroneously stated to be a native of Seinde, owing to a misstatement in the Herbarium; it has not been found further east than Beluchistan.

**Tribe I. Paronychiae.** Flowers clustered, all perfect and similar. *Embryo annular.*

Sepals 5, obtuse. Style 2-fid . . . . . . . . . . . . . 1. *Herniaria.*

**Tribe II. Pteranthae.** Flowers 3-nate, surrounded by squarrose bracts, the centre one of the 3 alone perfect. *Embryo* nearly straight.

Floral leaves pinnatipartite . . . . . . . . . . . . . 2. *Cometes.*

1. **Herniaria**, Linn.


**H. hirsuta**, Linn.; strigously hirsute, leaves elliptic- or linear-oblong, sepals 5 not so broad as the rigid hairs are long, stigmas very short subsessile.

**Western Himalaya**; from Kasmir to Kumaur, alt. 4-8000 ft., Royle, &c. The **Punjab**, from the Sutlej to Peshawur.—**Distrib.** Westward to the Atlantic and the Canary Islands.

**Branches** 2-8 in. long, densely tufted, internodes long or short. *Leaves* \(\frac{1}{2}-\frac{1}{4}\) in., acute or obtuse, base acute. *Flowers* \(\frac{1}{4}-\frac{1}{2}\) in. long. *Capsule* as long as the sepals. —I am quite unable to discriminate between the species of *Herniaria*, or to refer this to any descriptions of Boissier. There is plenty of it under several forms in Griffith’s Afghaan collections, and these Boissier alludes to under both *H. incana*, Lamk., and *H. cinerea*, DC. (Fl. Orient. i. 739). The *incana* form looks at first sight very distinct, but there appear to me to be many intermediates.


2. **Cometes**, Linn.


CWX. ILLECEBRACEÆ. (J. D. Hooker.)

Scindex, Vicary, Stocks.—Distr. Beluchistan, Waziristan, and westward to S. Arabia.

Stem woody below; branches 4–10 in., very numerous, stout, erect, terete, dichotomous. Leaves ½–1 in., elliptic, acute at both ends, variable in width; petiole short. Heads ½–¾ in. diam., including the feathery rusty appendages which close over the fruit to prevent the escape of the seed, which germinates in the head. Sepals with the dorsal awn variable in length. Stamens and staminodes variable in length.

Order CXVI. AMARANTACEÆ.

Herbs, rarely shrubs. Leaves opposite or alternate, exstipulate. Flowers usually in terminal simple or panicled spikes, cymes or clusters (outer in the cluster sometimes deformed); bracts and 2 bracteoles scarious. Sepals 5, rigid or scarious, persistent, imbricate in bud. Stamens 1–5, opposite the sepals, filaments free or connate below or united with intervening membranous staminodes into a hypogynous cup; anthers 1- or 2-celled. Ovary 1-celled; styles 1–3; ovules 1 or more, basal, panicle capillary. Fruit a utricle, rarely a berry or capsule, enclosed in or resting on the persistent perianth. Seed erect, orbicular or ovate, compressed, testa crustaceous; embryo horseshoe-shaped or annular, surrounding a mealy albumen.—Genera 48, species 480, tropical and subtropical.


Fruit a berry. A shrub 1. Deeringia.
Fruit membranous. Herbs 2. Celosia.


* Ovule erect. Leaves alternate.

Sepals spreading under the fruit 3. Bosia.
Sepals erect, enclosing the fruit.
Flowers capitate, 2-sexual. Utricle circumsciss 5. Allmania.
Flowers unisexual 7. Amaranthus.

** Ovule suspended from a basal funicle.

† Flowers clustered, 1–3 perfect surrounded by deformed ones. Leaves opposite.

Stamens with interposed staminodes 8. Cyathula.

†† Flowers all perfect. Staminodes 0.

Sepals all hyaline. Stamens 1 or 2 12. Nothæraua.

††† Flowers all perfect. Staminodes 0.

Sepals spinescent 15. Achyranthes.
TRIBE III. **Gomphrenae.** *Anthers* 1-celled. *Ovary* 1-ovuled; ovule suspended from a basal funicle. *Leaves* opposite.

Staminal tube very short. Stigma subsessile, capitate . . . 16. **Alternanthera.**
Staminal tube long. Style long. Stigma 2-fid . . . . . 17. **Gomphrena.**

1. **Deeringia,** Br.

Rambler or climbing shrubs. *Leaves* alternate, petioled. *Flowers* small, in simple or panicled spikes, 1-2-sexual. *Sepals* 5, oblong, spreading in fruit. *Stamens* 4–5; anthers 2-celled; staminodes 0. *Ovary* ovoid or subglobose; stigmas 2–4, subulate; ovules few or many, funicle long. *Fruit* a globose berry or circumcisss nitricle, seated on the spreading perianth. *Seeds* few or many; radicle descending.—Species 5–6, Asiatic, Australian and Pacific.


**Subtropical Himalaya;** from Simla to Bhotam, alt. 1–5000 ft. *Assam,* *Silhet,* *Khasia Mts.,* alt. 0–4000 ft. *Chittagong and Lower Bengal;* at Pubna, *J. D. H. & T. T. Behar;* Monghir, *Hamilton;* and Rotas, *J. D. H.* *Pegu,* Wallach. The *Concan,* *Dalz. & Gibs.* (I have seen no specimen).—**DISTRIB.** Malay Islands, China, Australia.

Blackish or dark green when dry, subscandent, sometimes climbing 18 ft. high; branches long, arching. *Leaves* 2–4 in., base rounded or acute, rarely cordate; petiole ½–1 in. *Spikes* 4–10 in. *Flowers* greenish-white, ½ in. diam.; pedicels short; bracts acute. *Berry* globose, ½ in. diam., scarlet.

2. **Celosia,** Linn.

Usually annual herbs. *Leaves* alternate. *Flowers* clustered or spicate, white or pink, shining. *Sepals* scarious, striate or ribbed. *Stamens* 5, united below into a cup; anthers 2-celled; staminodes 0. *Utricle* circumcisss, sometimes corky or thickened. *Seeds* erect, testa crustaceous, radicle inferior or ascending.—Species 30, tropical Asiatic, African and American.

* Spikes very stout; flowers densely imbricate. *Utricle* acute; style filiform, lengthening after flowering.


Throughout **India** and **Ceylon** in fields, ascending the bills to 4000 ft. (nowhere really indigenous).—**DISTRIB.** Trop. Asia, Africa, America, cultivated or introduced.
Celosia.] CXVI. AMARANTACEAE. (J. D. Hooker.) 715

Stem 1–3 ft., stout or slender, simple or branched. Leaves 1–6 in., narrow. Spikes solitary, few or many, 1–8 by 2–4 in.; peduncle slender; flowers white, glistening; bracts much shorter than the acute sepals.—The top of the spike sometimes branches out in a cock’s-comb form.


Throughout India, cultivated and as an escape.—DISTRIBUT. Tropical Asia, Africa and America.

Usually a tall branching plant, with broad ovate-lanceolate leaves, sometimes 9 in. long and 3 broad, and much smaller flowers than C. cristata, but narrow-leaved forms are difficult to distinguish. Roxburgh’s C. cernua is only a very narrow-leaved strict form; I doubt its being indigenous in the Rajmahal hills, where, as Dr. King informs me, there are traces of very old cultivation.—The sportiveness of this species under cultivation, and its tendency to produce cock’s-comb crests and feathery branched yellow pink or rose fasciated ends of the spikes, have resulted in the creation of many spurious species. Its native country, like that of C. argentea, of which it is no doubt a form, is unknown. Burmann’s C. pyramidalis is referred by Moquin to Chamissoa (Allmania), but the habit is totally dissimilar to that of an Allmania, and quite that of C. cristata.

**Spikes very slender, flowers in distant clusters. Utricle obtuse, top thickened; style short, stigmas 2–3 recurved. Seeds minute reniform.

3. C. pulchella, Moq. in DC. Prodr. xiii. 2, 238; glabrous, leaves petioled ovate acute. Wight Fl. t. 1768. C. polygonoides, Wall. Cat. 6913.

NIGERIAN HILLS; in moist soil, Wight, &c. CELYON, Walker, &c.; in hot dry parts of the island, Thwaites.


4. C. polygonoides, Retz. Obs. ii. 12; branches glabrous or hispidulous, leaves petioled rounded-ovate or -cordate obtuse. Celosia trigyna, Willd.; Wall. Cat. 6915.

DECCAN PENINSULA; in sandy soil, Mysore and the Carnatic, &c., Hayne, &c. CELYON; north part of the island, Gardner.

Slender, 6–10 in. high; stem woody below, diffusely branched. Leaves ²/₃–1½ in. long, often as broad, glabrous or very sparsely hairy, rarely cordate, tip rounded or apiculate; petiole as long as the blade. Spikes 5–5 in.; clusters few-fl.; flowers ⁷/₈ in. long, white. Sepals ovate-oblong, acute. Utricle flask-shaped, with a very thick exserted head.—Very near the tropical African species.

UNDETERMINABLE SPECIES.

C. ALLMANOIDES, Moq. in DC. Prodr. xiii. 2, 243, from Ava, Wallich, is possibly an Allmania.

C. EXSTITULATA, Hornem. in Schrank Syllog. Ratisb. i. 202; Moq. l. c. 244.—Nepal.
Erect, stout, glabrous, nauseous shrubs. Leaves alternate, persistent. Flowers small, 2-4-bracteolate, green, spicate or racemose, often polygamous. Sepals 5, herbaceous, rounded, concave. Stamens 5, inserted on a hypogynous 10-lobed disk; anthers 2-celled. Ovary ovoid; stigmas 2-3, sessile, recurved; ovule erect, funicule short. Berry globose. Seed subglobose, testa crustaceous, albumen fleshy; embryo annular, cotyledons broad.—Species 3, Canaries, Mediterranean, N.W. India.

Bosea trinervia, Roxb. Fl. Ind. ii. 87, is no doubt, as Dr. King informs me, Celtis Wightii, Planch.


Western Temperate Himalaya, alt. 4-7000 ft.; from Kumaon, Amherst, Govan, to Kashmir, Thomson.

Quite glabrous. Leaves 3-7 by 1-4 in.; base acute or rounded; blade narrowed into a petiole ¼-½ in. Spikes shorter than the leaves. Flowers ½ in. diam.; bracts and bracteoles rounded, closely imbricated, green with white margins. Berries ¼ in. diam.—Rodetia differs from the original Bosea Yerva-Mora only in the pedicelled flowers and fewer bracts and dienceous flowers, but the flowers are really only polygamous, and the Bosea cypria of Boissier (from Cyprus) has sessile flowers and bracts imbricating as in Rodetia.

4. BANALIA, Moq.

An erect, glabrous, branching herb. Leaves alternate, membranous. Flowers in axillary and terminal paniced spikes. Sepals 5, membranous, linear-oblong, acute, 3-nerved. Stamens 5, united below into a cup, anthers 2-celled. Ovary ovoid, compressed; style erect, stigmas 2 linear; ovule erect. Utricle subglobose, indehiscent. Seed orbicular, testa black crustaceous; embryo annular.


Nilgiri Mts., alt. 4-7000 ft.; Heyne, &c.

A tall very slender herb, branches angular. Leaves 3-4 in., ovate or ovate-lanceolate, acuminate. Flowers in large thyrsoid white panicles, sessile, ½ in. long.

5. ALLMANIA, Br.

Herbs. Leaves alternate, narrow. Flowers in axillary and terminal globose or ovoid heads. Sepals 5, scarious, acuminate, striate. Stamens 5, united below into a cup; anthers 2-celled; staminodes 0. Ovary ovoid; style slender, stigma capitellate; ovule 1, erect. Utricle circumsciss. Seed erect, aril cupular, testa crustaceous; embryo annular, cotyledons linear flat.—Species 2 or 3, tropical Asiatic.

1. A. nodiflora, Br. in Wall. Cat. 6890, excl. B; annual, diffusely
dichotomously branched, leaves short or long from linear or oblong to spathulate and orbicular, heads sessile axillary and terminal globose.

Sikkim Terai, Clarke. Mysore and the Carnatic, Malaooa, Singapore and Ceylon.—Distrib. China, Malay Islands.

Rooitstock sometimes woody; branches rigid or scabrid, 6-12 in., glabrous or hispidly hairy. Leaves excessively variable, membranous or rigid. Heads 1/4-1 in. diam. white or brown. Seeds turgidly lenticular, opaque or shining.—The following forms are variously complete of no great constancy.

VAR. angustifolia; glabrous, rarely with a few scattered hairs, often tall, leaves 1-3 in. oblong or linear-oblong or elongate obovate-oblong obtuse or acute, heads usually large. A. nodiflora, Wall. Cat. 6980 A. C. E in part. Chamissoa angustifolia, Herb. Ham. C. javanica, Hassk. Pl. Java, Nov. 434.—Mysore, Ceylon, widely diffused. Java, Sumatra.—A tall slender unbranched form of this occurs, apparently drawn up amongst grass, &c. 

VAR. dichotoma; glabrous or nearly so, leaves shortly petioled 1/4-1/4 in. elliptic acute, heads 1/4-1 in. A. nodiflora, Wall. Cat. 6890 E. in part. A. dichotoma, Wight in Roth Nov. Sp. 172.—Courtallam, Wight.


VAR. procumbens; diffuse, branches prostrate often several feet long from a slender or stout (perennial ?) woody branched stock, glabrous or scabrid, leaves small 1/4-3 in. spathulate or linear mucronate, heads small 1/4-1 in. Wall. Cat. 6980 E in part. A. procumbens, Wight in Roth Nov. Sp. 1770.—Sands and Red Hills at Madras.—Distrib. Java.

VAR. esculenta; scabrid, glabrous, leaves 1-2 in. very narrow linear, heads usually small sometimes pedicelled. A. esculenta, Br. in Wall. Cat. 6892; Moq. l. c. 249. Chamissoa Brownii, Steudel Nomencl. Ect. i. 344.—Malacca and Singapore.

2. A. albida, Br. in Wall. Cat. 6981; annual, erect or suberect, leaves short or long from linear to spathulate or orbiculate, heads ovoid or oblong rarely globose peduncled. Chamissoa albida, Mart. Beitr. Amaran. 79; Wight in Roth Nov. Sp. 1769. C. pyramidalis, Moq. l. c. Chamissoa pyramidalis, Burm. Fl. Ind. 65, t. 25. C. albida, Wall. Sp. Pl. i. 1197. C. nodiflora, Wall. Cat. 6890 B.

The Carnatic; in sandy soil near the coast, Wight, &c. Ceylon, common.—Java, Philippines.

Usually tall, erect, 1-2 ft. high, with erect branches, and foliage simulating many of the forms of A. nodiflora, of which Thwaites regards it as a form, but I can scarcely agree with him.

6. DIGERA, Forsk.

An annual herb. Leaves alternate. Flowers spicate, 3-nate, the 2 outer reduced to crested scales. Sepals 4-5, oblong, outer larger 5-9-nerved, inner 2-4-nerved. Stamens 5, free; anthers 2-celled; staminodes 0. Ovary oblong, truncate; style filiform, stigmas 2 recurved; ovule 1, erect. Nut subglobose, compressed, rugulose. Seed globose, erect, testa thin crustaceous, adhering to the albumen; embryo annular, cotyledons linear.

D. arvensis, Forsk. Fl. Aeg. Arab. 65; Moq. in DC. Prodr. xiii. 2,
7. AMARANTUS, Linn.

Annuals. Leaves alternate. Flowers unisexual, small, in axillary clusters, or in panicked erect or drooping densely or laxly spiked clusters. Sepals 5 or 1–3, ovate oblong linear lanceolate or aristate. Stamens 1–5, free; anthers 2-celled; staminodes 0. Ovary compressed; style short or 0, stigmas 2–3 filiform or subulate; ovule 1, erect. Utricle compressed, indehiscent or circumsciss, tip entire or 2–3-toothed. Seed orbicular, compressed, testa crustaceous; embryo annular, cotyledons linear.—Species undetermined, tropical and subtropical, a large proportion known only in cultivation.

* Bracts setaceous or awned, exceeding the 5 sepals. Stamens 5. Utricle circumsciss, top 2–3-fld.

1. A. spinosus, Linn.; erect, glabrous, stem terete, leaf-axils with 5 spines, leaves long-petioled ovate or oblong obtuse, flowers in axillary clusters and long dense- or lax-fld. spikes, bracts setaceous equaling or exceeding the sepals, stamens 5, utricle rugose nearly equaling the sepals. Moq. in DC. Prodr. xii. 2, 260; Wildl. Amaranth. t. 4, f. 8; Roxb. Fl. Ind. iii. 611; Grah. Cat. Bomb. Pl. 169; Dalz. & Gibs. Bomb. Fl. 216; Wight & J. 513; Wall. Cat. 6894.

Throughout India and Ceylon, in waste places, fields and gardens.—Distrib. Various tropical countries.

Stem 1–2 ft., hard; spines straight, ½ in. and under. Leaves 1½–4 by ½–2 in., base cuneate; petiole slender, equaling the blade or shorter. Flowers ¼ in. long. Sepals of male acuminate, of female obtuse apiculate. Stigmas 2. Utricle with a thickened top. Seeds ½ in. diam., black, shining, border obtuse not thickened.—The plant varies in colour from green to red and purple.

2. A. paniculatus, Linn. Sp. Pl. Ed. 2, 1406; tall, robust, stem striate, leaves long-petioled elliptic- or ovate-lanceolate acute or finely acuminate, spikes in dense thyrses squarrose from the long recurved bracts, centre one
longest, bracts acicular recurved very much longer than the oblong-lanceolate acuminate sepal.


Cultivated throughout _India_ and _Ceylon,_ and up to 9000 ft. in the _Himalaya._—_Distr._ Cultivated or an escape in E. and W. _Asia,_ and _Africa.

_ Stem_ 4-5 ft., sometimes thicker than the thumb, glabrous or puberulous. _Leaves_ 2-6 by 1-3 in., base cuneate; petiole as long. _Spikes_ suberect, red, green or yellow. _Seeds_ ½ in. diam., either yellowish-white or pitchy black with a thickened rounded border, or pitchy with a narrow thin border.—I follow Moquin, _Wallich,_ _&c._, in referring this to _paniculatus_ of _Linnæus_ with some doubt, and I am still more perplexed about the synonyms I have cited, some of which may belong to the following species.

Boissier says of _A._ _paniculatus_ that it is an introduction from _America,_ whereas this has been cultivated in _India_ from time immemorial. Like the following, of which it may be a form, the seeds vary extraordinarily in size, form and colour.

3. _A._ _caudatus,_ _Linn._ _Sp._ _Pl._ 990; tall, robust, stem strigate, leaves long-petioled elliptic- or ovate-lanceolate, tip obtuse, spikes in dense soft thyrse hardly squarrose, centre one and often the lateral usually very long and pendulous, bracts acicular longer than the obovate mucronate sepal.

_Mog._ in _DC._ Prodr. xiii. 2, 255; _Wall._ Cat. 6907; _Boiss._ _Fl._ _Oriënt._ iv. 988. _A._ _paniculatus,_ _Wall._ Cat. 6904 F. A. _cruentus,_ _Wall._ _Roeb._ l. c. 610. _A._ _caudatus_ and _A._ _Alopecurus,_ _Hochst._; _Bouché_ & _Braun_ in _Append._ _Obs._ _Bot._ ad _Ind._ _Sem._ _Hort._ _Berol._ 1872, 1.

Cultivated in various parts of _India._—_Distr._ Various hot countries, wild or cultivated.

I find it very difficult to distinguish some states of this from _A._ _paniculatus._ In its typical state it is a smaller plant with the leaves obtuse at the tip, more globose softer masses of smaller red green or white flowers on the thyrse, the terminal spike of which is very long, thick and drooping; the acicular bracts are shorter and not squarrose, the sepals shorter, broader, more obtuse and usually obovate-oblong, and the utricle and seeds are smaller; the latter present the same variations as in _A._ _paniculatus._

Bouché and _Braun,_ from an examination of Abyssinian specimens cultivated at _Berlin,_ point out the remarkable distinction between the two forms of _seeds_ that this and the foregoing species produce, one white or yellow with a very thick rounded border (the true _caudatus_ of old authors); the other lenticular and pitch-black with a compressed border (_A._ _aiopecurus,_ _Hochst._). The plants which bear them, however, present no other differences, and I have seen the black seed with the thick border.

** Bracts subulate, equalling or exceeding the 3 lanceolate sepal and utricle. _Stamens_ 3. _Utricle circumsciss._

4. _A._ _gangeticus,_ _Linn._ ; _Mog._ in _DC._ Prodr. xiii. 2, 261; erect, glabrous, leaves long-petioled ovate oblong or lanceolate obtuse or emarginate, clusters crowded in the lower axes and forming a long terminal spike, bracts awned, sepals long-awned much longer than the utricle. _Willd._ _Amarant._ t. 6, f. 11; _Roeb._ _Fl._ _Ind._ iii. 608; _Wall._ _Cat._ 6896, excl. C. _A._ _tricolor,_ _Linn._ _Sp._ _Pl._ 989; _Roeb._ l. c. 608, and _Wall._ _Cat._ 6902. _A._ _lanceolatus,_ _Roeb._ l. c. 607; _Wall._ _Cat._ 6895. _A._ _tristis,_ _Linn._ _Sp._ _Pl._ 989 f; _Roeb._ l. c. 604; _Wall._ _Cat._ 6905, _A._ _C._; _Grah._ _Cat._ _Bomb._ _Pl._ 169; _Wight._ _Ic._ t. 713; _Dalt._ & _Gibs._ _Bomb._ _Fl._ 215. _A._ _oleraceus,_ _Roeb._ l. c. 605; _Grah._ l. c.; _Wight._ _Ic._ t. 715, and _Thwaites._ _Enum._ 247, not of _Linnaeus._

Throughout India and Ceylon, cultivated and in cultivated ground.—Distrib. Tropical Asia, Africa, and America.

An erect, stout, handsome species, 2–3 ft., leafy, green, pink, rufous, liver-coloured or bright red. Leaves 2–5 in., very variable, from linear-lanceolate to rounded oval and 3 in. diam., or deltoid ovate; tip rounded or long and slender but always obtuse and often notched, base elongate cuneate; petiole equalling the blade. Clusters squarrose, bracts $\frac{1}{2}$ in. long. Seeds lenticular, pitch-black, $\frac{3}{4}$ in. diam.; border acute.—This is Roxburgh’s A. tristis, and possibly that of Linnæus, but the latter describes the leaves as ovate-cordate, which these are not. Roxburgh says that his gangeticus and collateral differ from his polygamus and tristis and their varieties in not admitting of being cut for successive crops, but being hence unrooted for market. I have not cited Boissier, who says his A. gangeticus is always pentamorous. Of A. melancholicus Roxburgh says that it differs from tricolor in being 6–12 ft. high, ramos, pyramidal, with more remote broader rarely more than 2-coloured (dull livid purple and bright crimson) leaves, whereas tricolor in the same soil is 3–4 ft. with simple erect stem, many numerous variegated leaves, and long axillary clusters of flowers. A. inamoenus, Wall. Cat. 6905 C, is a curious small state, 6 in. high, erect, strict, with rhomboid leaves and long spikes; it is the A. tristis, Herb. Rottler and Heyne.


Throughout India and Ceylon in cultivated ground.

This, as Thwaites observes, is extremely near and perhaps a form of A. gangeticus, of smaller size and procumbent habit; he refers it to Roxburgh’s A. polygamus, but I think that the want of a terminal spike is against this. A specimen from Roxburgh, marked A. mangostanus, precisely accords with Willdenou’s figure. To me it looks like a starved or stunted form of gangeticus; the perianth and seeds are the same in both. It is A. mucronatus, Hort. Petrop.

6. A. Caturus, Heyne in Wall. Cat. 6900; tall, glabrous, leaves long-petioled elliptic-lanceolate acuminate thin, nerves very slender, clusters small globose soft green in very long and very slender axillary simple and terminal panicked spikes, the upper confluent, bracts equalling or longer than the lanceolate aristate sepals, ovary elongate.

DROGAN PENINSULA, Heyne.

Stem 2–3 ft., very slender. Leaves 6 by 2 in., decurrent on the equally long slender petiole, tip apiculate. Spikes 6–10 in. long. Clusters $\frac{4}{3}$ in. diam., the lower axillary; the lowest on the rachis remote. Flowers $\frac{1}{3}$ in. long; sepals transparent with a green rib and short awn. Stamens 8, anthers linear. Young utricle with a rather longer neck and 3 slender styles.—I know of no species at all like this; none has such slender spikes.

*** Bracts usually shorter than the 2 or 3 sepals and utricle. Stamens 2 or 3. Utricle indelissect or circumsciss.

7. A. viridis, Linn. Sp. Pl. 1405; erect, glabrous, leaves long-petioled ovate, tip rounded or notched, base truncate or cuneate, clusters very small green in axillary and terminal panicked slender spikes, sepals 3, utricle rugose acute indelissect. Roxb. Fl. Ind. iii. 605; Graham Cat. Bomb. Pl. 169. A. polystachyns, Ham. in Wall. Cat. 6901. A. fasciatus, Roxb. l. c. 609;
Amaranthus. | CXVI. AMARANTACEAE. (J. D. Hooker.)


Throughout India, in waste places. — Distr. All tropical and warm countries. Stems 1-2 ft., rarely decumbent below. Leaves 1-2 in., variable in breadth; petiole equaling the blade or shorter. Clusters lax, on slender branches; flowers 8-10 in. long; bracts and sepals ovate-oblanceolate, acute, membranous with a green keel. Styles 2-3. Seed 8 in diam., pitchy black, border obtuse. — This is the A. viridis of Herb. Linn. A. fasciatus, Boaz., is a sport with a pale crescentic band across the leaf. — Eaten, but not cultivated (Roazb.).

8. A. Blitum, Linn. Sp. Pl. 990; annual, erect or decumbent, glabrous, leaves long-petioled oblong-ovate or rounded obtuse retuse or 2-lobed, base acute, clusters all axillary or the upper in a dense or lax spike, sepals 3 shorter than the utricle linear-oblanceolate and apiculate or acute, utricle orbicular or broadly ovate membranous dehiscent or not.

Waste places throughout India and Ceylon. — Distr. Temperate and tropical regions.

I find it impossible satisfactorily to discriminate the Indian forms of this variable weed from one another, and from A. polygamus; I recognize the following varieties as more or less constant.


Var. A. sylvestris, Desf. Cat. Hort. Par. 41; erect, simple or branched, leaves oblance or obovate-oblong obtuse, clusters all axillary sessile, sepals linear keeled mucronate, utricle rugose or smooth circumsess. Boiss. Fl. Orient. iv. 990. A. Blitum, var. sylvestris, Moq. l. c. 263. — Kashmir, alt. 4-6000 ft., Thomson (Europ., Asiatic).


Throughout India and Ceylon, abundant. — Distr. All hot countries.

I believe that this can only be ranked as a form of A. Blitum (the Linncean form), with small usually obovate apiculate leaves, fewer flowers in a cluster, often larger more subulate sepals and smaller more acute utricles.

Var. angustifolia; stems and branches angled grooved rigid erect or ascending, leaves linear or linear-oblanceolate more rigid. — The Panjub, Thomson. Mooltan, Edge-
worth. The Carnatic Perrattet.—This is almost identical with A. gracilisans, Linn. (A. Blitum, var. gracilisans, Moq.; A. sylvestris, var. gracilisans, Boiss.).

10. A. tenuifolius, Willd. Sp. Pl. iv. 381; glabrous, branches many spreading from the root prostrate or ascending, leaves small petiolar linear-oblong or widened to the rounded obtuse or 2-lobed tip, clusters minute all axillary, sepal 2 oblong concave nearly as long as the orbicular compressed membrane the indesinence utricle. Roxb. Fl. Ind. iii. 602; Wight JC. t. 718; Wall. Cat. 6993, excl. E. A. angustifolius, Roxb. mss. Mengen, tenefolia, Moq. in DC. Prodr. xiii. 2, 271; Dalz. & Gibbs. Bomb. Fl. 218.

Bengal, the Gangetic Valley and Panjab.—Distrb. Tropical Africa.

Branches slender, 6–18 in., leafy. Leaves very variable, 1/2–1 in. long, narrowed into the petiole. Clusters smaller than in any other species, green. Stamens 2. Utricle plicate when dry. Seed 1/4 in. diam., brown, lenticular, border obtuse.

DOUBTFUL SPECIES.

A. ATROPURPUREUS, Roxb. Fl. Ind. 688, is a garden plant, possibly a form of A. olacensus.

A. CAMPESTRIS, Willd. Sp. Pl. iv. 382; Moq. in DC. Prodr. xiii. 2, 264, is undeterminable.

A. rubrigalaxis, Page Hort. Angil. (fide Moq. l. c. 267) name only, is undeterminable.

8. Cyathula, Lour.

Herbs or undershrubs. Leaves opposite. Flowers clustered, clusters solitary spicate and reflexed in fruit, or in dense globose solitary or spicate heads; perfect flowers 1–2 in each cluster, surrounded by imperfect ones reduced to sepals with rigid hooked awns. Sepals 5, scarious, 1-nerved, acuminate or with hooked rigid awns. Stamens 5, connate, united below with the linear lacerate or 2-fid staminodes into a cup; anthers 2-celled. Ovary obovoid; style filiform, stigma capitate; ovule 1, pendulous from a long basal funicle. Utricle ovoid, indehiscent, top areolate. Seed inverse, oblong, testa coriaceous; embryo annular, cotyledons linear flat.—Species 10, tropical Asia, Africa and America.

* Clusters of flowers in large globose heads.


TEMPERATE HIMALAYA; from Dalhousie to Bhutan, alt. 2–6500 ft., Wallich, &c. Khasia Mts., alt. 2–5000 ft.

A struggling undershrub, variable in density of tomentum; branches strict, obtusely 4-angled. Leaves 2–10 in., rarely orbicular or elliptic-lanceolate, pubescent or glabrate above, often velvety or subsericeous beneath; petiole 1/4–1 in. Spikes 2–6 in. long peduncled; heads close or distant, 1–1 1/2 in. diam., white, glistening; bracts ovate below, back hairy. Sepals 1/4–1 in., linear-lanceolate, 2 or all ending in hooked awns, lengthening in age. Staminodes fimbriate. Anthers linear. "Utricle 2-nerved; seed ovate shining," Wallich.—I find no seed in any of the numerous specimens.

2. C. capitata, Moq. in DC. Prodr. xiii. 2, 329; sparsely hairy, leaves short-petioled elliptic subcaudate-acuminate, base acute, heads globose sub-
solitary peduncled bracteate or not. Wight Lc. t. 1782. Polyscelis capitata, Wall. Cat. 6940.

TEMPERATE HIMALAYA; from Dalhousie to Sikkim, alt. 6-9000 ft.
More herbaceous and slender than C. tomentosa. Leaves 2-5 in., membranous; petiole 4-1 in. Heads 1-1½ in diam., white, glistening; flowers as in C. tomentosa.


CEYLON; near Kandy, Thwaites.
Branches slender, terec. Leaves 1½-2 in., pubescent above, tomentose beneath. Heads 1 in diam. Sepals villous.—The specimens are very indifferrent. The leaves resemble those of the African C. globulifera, Moq., but the branches are more slender and the leaves almost sessile.

**Clusters of flowers small, solitary, spicate, reflexed.**

4. **C. prostrata**, Blume Bijd. 549; annual, stem creeping below, branches erect or ascending, leaves subsessile elliptic rhomboid-oblong or subpanduriform obtuse, spikes very slender terminal peduncled. 


BENGAL, SIKKIM, KHASIA MTS., CHITTAGONG to MALACCA, the DECCAN PENINSULA, BURMA, and CEYLON.—Distrib. Tropical Asia, Africa, Australasia, Oceania, and America.

Very slender, 1-2 ft. high, glabrous or scaberulous. Leaves 1-2 in., base narrowed often suddenly from below the middle. Spikes 4-6 in., rarely paniculately branched. Clusters of flowers ½ in. long, ovoid, blueish. Sepals oblong, pubescent, outer (of imperfect flowers) as long as the perfect. Staminodes 2-fld or retruse. Seeds ovoid-oblong.—Roxburgh believes this to have been introduced into Bengal from the Moluccas.


Herbs or undershrubs. Leaves opposite. Flowers in spicate clusters, perfect and imperfect; the imperfect reduced to awns bearing stellately spreading hooked bristles. Sepals 5, herbaceous, acuminate, 3-5-nerved. Stamens 5, nearly free below; anthers 2-celled; staminodes 0. Ovary ovoid; style slender, stigma capitate; ovule 1, pendulous from a long basal funicle. Utricle ovoid, compressed, indehiscent, top areolate.—Species 3, Asiatic and African.


Biennial or annual, 2-5 ft.; branches long, straggling, glabrous. Leaves 1-5 in., membranous, narrowed into the (½-1 in.) petiole. Spikes 1-10 in.; racis sparsely pubescent; clusters sessile, flowering ½ in., fruiting rarely ⅓ in. diam.; bracts broadly ovate, pungent. Sepals ovate-lanceolate, woolly. Arms often purplish.


Concan Ghats (Dalseil). The Carnatic; in sandy soil near the sea, Heyne, &c. Ceylon; Jaffna, Moon. Stem stout, erect from a woody stock, terete, glabrate or hispidulous, rarely tomentose. Leaves 1-1½ in. diam., rigid and brown when dry, suddenly narrowed into the flattened petiole. Spikes 4-8 in., racis stout, sparsely hairy or pubescent; when flowering clusters ⅓ in. long, fruiting ⅔ in., spines pale; outer bract short with a long spine, inner narrow.


A large straggling undershrub; branches terete. Leaves 2-4 in., base acute; petiole ⅛-⅛ in. Flowering clusters ½ in long, fruiting ⅛ in. diam. Var. velutina; erect, subsimple, densely villously tomentose, leaves ½-1 in., shortly petioled orbicular. Desmocheta velutina, Wall. Cat. 6935; Mag. l. c. 332. Ærua velutina, Mag. l. c. 301.—Deccan Peninsula, Wight in Herb. Wall. Burma, at Loughee Yenong and Fagham on the Irawaddi, Wallich.—Moquin has d-scribed Wallich's 6935 under both Desmocheta and Ærua, quoting the same number in each case.


Herbs or shrubs. Leaves opposite. Flowers white or greenish, in solitary or panicked dense clusters or spikes. Sepals 5, hard; outer boat-shaped, gibbons below, ribbed. Stamens 5, unequal, connate below into a cup; anthers 2-celled; staminodes 0. Ovary oblong or subglobose; style slender, stigma capitellate or 2-fid; ovule 1, pendulous from a long basal funicle. Utricle globose or compressed, indehiscent. Seed inverso, lenticular, testa coriaceous or crustaceous; embryo annular.—Species 10, Asiatic, African and Pacific.

* Shrubs or undershrubs with woody stocks and lower branches.

1. P. nudum, Mag. in DC. Prodr. xiii. 2, 280; shrubby, branches

Decan Peninsula; Heyne, G. Thomson.

Branches many from the woody stock, 2–3 ft., terets, woody, tips only hairy. Leaves 1½–3 in., glabrous, narrowed into a short petiole, nerves faint. Spikes ½–1½ in., strict, hairy, 6- or many-fl.; bracts persistent, acuminate. Sepals pubescent, deeply grooved, rigid, acuminate.—Very near a S.E. Tropical African species.

2. P. scleranthum, Thwaites Enum. 248; an undershrub, branches divaricate tomentose, leaves subsessile ovate-lanceolate acute scaberulous, spikes terminal peduncled 3-nate, bracts broadly ovate, sepals ½ in. obscurely grooved hairy.

Ceylon; at Anooradapooora, Gardner.

Habit of P. nudum, but branches tomentose, leaves scaberulous on both surfaces and inflorescence branched. The 3 terminal spikes are sessile on the top of a tomentose peduncle ½ in. long, are dense-fl., oblong, the middle one ½ in. erect, the lateral horizontal and shorter. Sepals pubescent, pungent.—Described from a single specimen.


Decan Peninsula, Heyne, in jungles on the hills, Wight. Ceylon; in the hotter parts of the island, Moon, &c.

Habit of P. nudum (sometimes subsandent, Wight), but much smaller and more slender. Leaves ½–1½ in. Spikes 4–6-fl., sometimes peduncled by being terminal on a leafless axillary branch, at others the peduncle itself lengthens.—A Natal species hardly differs.

Var. tomentosa; leaves pubescent above tomentose beneath.—Scraps of this are on sheets of 6926 A and 6927 B in Herb. Wall.

** Annuals.**


5. P. ferrugineum, Moq. in DC. Prodr. xiii. 2, 279; annual, glabrous, branches prostrate, leaves linear- or obovate-oblong, spikes terminal and in the forks sessile or peduncled, bracts subulate-lanceolate, sepals ½ in. deeply grooved glabrous, outer obtuse. Achyranthes ferrugineus, Roxb. Fl. Ind. 1.
Bengal; a weed in the gardens and cultivated lands of Calcutta, Roxburgh.

Wallich's specimen forms an excessively branched prostrate mass 9 in. diam., with diverviate branches and linear-oblong leaves 1-1½ in. long. Spikes ½ in. long, dense- śld., yellow when dry.—Roxburgh's description applies more nearly to P. trichotomum in the form of the leaves, and Wight's figure, copied from Roxburgh's drawing, and which shows acuminate sepals, is, I think, certainly taken from the latter plant. There are no indications in Wallich's specimens gathered in the Calcutta Garden of the rust-coloured stem, reddish leaves and dull red flowers described by Roxburgh.


Slender dichotomous herbs. Leaves opposite. Flowers minute, spicate at the tips of the filiform branches of a lax panicle. Sepals 5, 2-3 outer convex, strongly 3-nerved, inner narrower. Stamens 5, free; anthers 2-celled; staminodes 0. Ovary rounded or ovoid, compressed; style slender; stigma capitate. Utricle indehiscent. Seed inverse, testa coriaceous; embryo hooked, cotyledons slender.—Species 3, Indian, Arabian and African.

**P. sericea**, Hook. f. in Gen. Plant. iii. 32; stem erect, villous with long hairs, leaves orbicular-ovate acute densely villous above silky beneath, peduncles very long axillary filiform, pedicels capillary, spikes 4-6 śld. Achyranthes sericea, Koen. in Roxb. Fl. Ind. iii. 675, and Ed. Carey & Wall. ii. 502; Mag. in DC. Prodr. xiii. 2, 318; Wight Ic. 726; Wall. Cat. 6930. Psilotrichum sericeum, Dalz. in Dalz. & Gibbs. Bomb. Fl. 216.

**Goozeat;** sandy hills on the coast of Kattiawar, Dalzell (and Koenig?). Annual? Stem stout, hard, terete; hairs patent, ½ in. long, flexuous, terminating in a lax panicle of erecto-patent opposite branches 2 in. long, which divide at the tip into capillary pedicels bearing the spikes. Leaves 1 in., thick, base rounded or cordate; petiole very short. Spikes ½-1 in., rachis capillary zigzag; flowers ¼ in. long. Sepals ovate-lanceolate; outer pungent, deeply ribbed, silky.—A very beautiful plant; it is not known where Koenig procured it, if indeed he did himself procure it. The specimen in the Wallachian Herbarium is marked "Herb. Koenig."

12. **Notosperua**, Wight.

An annual with opposite spreading branches. Leaves opposite. Flowers most minute, woolly, in axillary solitary or clustered spikelets. Sepals 3-5, hyaline, obtuse, 1-nerved. Stamens 1-2, free; anthers 2-celled; staminodes 0. Ovary oblong, compressed; stigma subsessile, capitate; ovule 1, pendulous from a long basal funicle. Utricle oblong, compressed, indehiscent. Seed inverse, lenticular, testa crustaceous; embryo hooked, cotyledons linear.


Upper Gangetic Valley and the Panjab, from Moradabad north-eastward.

Erect, 1–2 ft, branched from the base; branches puberulous, spreading. Leaves 1–2 in, ovate elliptic or subovate, obtuse or subacute, membranous, green; petiole 0½ in. Spikes very numerous, sessile, ¾–1 in. long, cylindric, white, dense-fld.; bracts broadly ovate, hyaline, persistent. Sepals ½ in. long, silky villous.—One of the smallest flowered plants provided with a regular perianth. Moquin has probably confounded this with the very similar *Ærwa lanata* (as did Wight), to which the latter part of his description applies.


Woolly herbs or undershrubs. Leaves alternate or opposite. Flowers small or minute, in solitary or panicked spikes, often polygamous. Sepals 4–5, short, membranous, all or the inner only woolly. Stamens 4–5, connate below with interposed linear staminodes into a cup; anthers 2-celled. Ovary ovoid or subglobose; style long or short, stigma capitellate or 2-fld.; ovule 1, pendulous from a long basal funicle. Utricle indehiscent, or the coriaceous crown circumsciss. Seed inverse, testa coriaceous; embryo annular.—Species 10, tropical Asiatic and African.

*Spikes axillary and in terminal panicles. Leaves opposite or alternate.*


From the Oudh Terai, Wallich, to the Panjab, Boyle, &c. Scinde, Stocks. Central India, Clarke. The Deccan from the Concan southward. BURMA, Wallich. Ceylon; N. of the island, Gardner.—Distrib. Westward to Arabia, E. and W. tropical Africa, and the Cape Verde Islands. Java?

Dicocios. Stem terete, 2–3 ft, branched, as thick as a goose-quill. Leaves alternate, 1–4 in, flat or with recurved margins, sessile or narrowed into a petiole; nerves distinct. Spikes often in large panicles, sessile, erect or nodding, 1–6 in. long. Flowers ½ in. long, enveloped in long wool, males very rare.—Edgeworth (Fl. Mdl. l. c.) insists that the narrow-leaved form is a distinct species, and is odorous, which *Æ. javanica* (which grows with it) is not. Boissier makes a variety of it; local botanists should see to this.

2. *Æ. scandens*, Wall. Cat. 6911, excl. M; a climbing undershrub, branches hoary-tomentose, leaves ovate elliptic oblong or lanceolate obtuse or acute glabrous or hoary, spikes globose ovoid or shortly cylindric woolly shining, sepals lanceolate acuminate, stigmas very short. Moq. in DC. Prodr. xiii. 2, 302; Wight Jc. t. 724 (utricle and seed wrong); Dalz. & Gibbs. Bomb. Fl. 217. Achyrantes scandens, Roxb. Fl. Ind. i. 676, and Ed. Carey & Wall., ii. 503.
Plains of Bengal, and from Assam to the Panjáb; ascending the Himalaya to 5000 ft. from Kumaon to Bhotan. Central India and Behar, and summit of Parusnath. Concan, Stocks. Pegu, M’Clelland. Burma, Wallisch, &c.—Distriil.

China, Malay Islands, Philippines, E. and W. tropical Africa.

Stems woody below; branches straggling, several feet long. Leaves opposite and alternate, soft, green, 1-4 in. long, sometimes almost rounded; petiole 1/4 in. Spikes sessile, rarely peduncled, 3-1 in. Sepals ½ in. long, lanceolate.—Wight has erroneously figured the utricle as circumscissa and seed horizontal. I doubt if A. sanguinolenta, Blume, and A. timorense, Moq., differ from this.

Var. ? subglobosa; branches glabrous, spikes large subovoid or globose, 1-3 in. diam., on slender peduncles.—Mergui, Griffith (in Herb. Wight).—This resembles very indifferent specimens of A. scandens (E. velutina, Moq.) from the Philippines (Cuming, No. 1635), but the spikes are larger.

3. A. glabrata, Hook. f.; minutely hairy, leaves elliptic-ovate subacute, spikes small cylindric panicked or fascicled towards the ends of the branches glistening, bracts ovate equalling the very minute flowers, sepal broad oblong-ovate obtuse or apiculate sparingly hairy.

Burma or Malay Peninsula, Griffith.

Habit of A. scandens, but the flowers are very minute, about 1/10 in. long, with very broad short and sparsely hairy bracts and sepal, the latter with usually a very broad green midrib. Hance’s A. scandens, var. from Canton, may be the same, but the spikes are too young for comparison.

** Spikes all axillary sessile. Leaves alternate.


Plains of Bengal from Dacca and Behar westward to the Indus. The Concan, Central India, and throughout the Deccan. Ceylon abundant.—Distriil.

Westward to Arabia and tropical and S. Africa, Java, Philippines.

Branches many, 6–10 in., from a woody stock, simple or divided, woolly. Leaves 1/2–1 in. woolly or glabrate. Spikes 1–2 in., sometimes excessively crowded and forming subglobose clusters. Sepals obtuse.—Wight’s t. 723 is probably A. scandens.

5. A. Wightii, Hook. f.; branches short woody and leaves beneath densely woolly, leaves small broadly ovate or elliptic obtuse thick, clusters all axillary sessile shortly oblong or globose densely woolly not glistening, outer sepal linear-oblong aristate, inner obtuse.

Teavangore; at Courtallum, Wight.

A low-growing bushy plant, 6–12 in. high, with many stiff branches as thick as a crow-quill, from a stout woody tap-root. Leaves 1 in. long, narrowed into a short petiole. Clusters 1–2 in. long, with the acicular tips of the bracts and outer sepal a little longer than the wool; flowers 1/2 in. long.


6. A. Monsonia, Mart. Beitr. Amaran. 83; stem hoary-tomentose

**Bengal**, Roxburgh. **Central India**; Sumbulpore, Griffith. **Burma**; at Yenoughem, \textit{Walllich}. The **Conoan** and **Doscian Peninsula**; abundant in dry places.

Branches many, prostrate or ascending from a very long flexuous woody tap-root, 1-3 ft., with numerous woolly nodes, and opposite or 3-nately whorled fascicled of leaves and peduncled spikes or branches. \textit{Leaves} \(\frac{1}{4}-1\) in., exceedingly slender, woolly. \textit{Spikes} as long, with densely imbricating rose-coloured flowers, solitary or subpanicled; bracts many, lanceolate. \textit{Sepals} 4, subulate-lanceolate, acuminate, \(\frac{1}{4}\) in. long. \textit{Utricle} enclosed in the large staminal cup; stigma capitata, subsessile.

**DOUBTFUL SPECIES.**

\textit{E. radicans}, \textit{Mart.} \textit{Beitr. Amaran.} 83 (\textit{Mon. in DC. Prodr.} xiii. 2, 302). \textit{Achyranthes radicans}, \textit{Heyne in Roth Nov. Sp.} 170, is undetermined.

\textit{E. nervosa}, \textit{Mart.} \textit{l. c.} (\textit{Mon. l. c.} 306). \textit{Achyranthes nervosa}, \textit{Roth l. c.}, and \textit{A. pubescens}, \textit{Mart.} \textit{l. c.} (\textit{Mon. l. c.}, \textit{Achyranthes pubescens}, \textit{Roth l. c.} 171; \textit{Illacemum pubescens}, \textit{Wildl. Enum. Hort. Berol. i.} 271) are both indeterminable.

### 14. **STILBANTHUS**, Hook. \textit{f}.

A climbing tree with pendulous branches. \textit{Leaves} opposite. \textit{Flowers} large, white, shining, in panicked pubescent spikes. \textit{Sepals} 5, hard and scarious, narrowly ovate-lanceolate, acute, tips bearded at the back, outer broader. \textit{Stamens} 5, filaments shortly connate below, with long ligulate lacerate staminodes; anthers 2-celled. \textit{Ovary} oblong, compressed, tip penicillate; style filiform, stigma capitellate; ovule 1, pendulous from a long basal funicle. \textit{Utricle} oblong, top villous, indehiscent. \textit{Seed} inverse, testa coriaceous; embryo annular.


**Eastern Bengal**, Herb. Griffith. **Sikkim Himalaya**, alt. 5-7000 ft., J. D. \textit{H.}

**Trunk** as thick as the thigh, “reaching the tops of tall trees, which it covers with masses of handsome flowers and soft whitish leaves.” \textit{Gamble}. Branches soft, herbaceous, obtusely 4-angled, terminal silky hairy, bases of internodes and of petioles contracting when dry. \textit{Leaves} 4-6 by 2-3 in., elliptic, acuminate at both ends, finely pointed, sparsely pubescent above, villous or glabrate beneath; petiole \(\frac{1}{2}-1\) in., villous. \textit{Spikes} 1-3 in. long, in terminal spreading trichotomously branched panicles, sessile or peduncled, cylindric; peduncles and pedicels villous. \textit{Flowers} spreading, \(\frac{1}{2}\) in. long, white, shining; bracts short, ovate, apiculate; bracteoles rather longer. \textit{Sepals} striate. \textit{Filaments} very slender, hairy, shorter than the filiform staminodes; anthers oblong.—The most gigantic Asiatic plant of the Order.

### 15. **ACHYRANTHES**, Linn.

**Herbs**. \textit{Leaves} opposite. \textit{Flowers} in slender simple or panicked spikes, soon deflexed; bracts and bracteoles spinescent. \textit{Sepals} 4-5, subulate-lanceolate, aristate, shining, at length hardened and strongly ribbed. \textit{Stamens} 2-5, filaments connate at the base with as many square staminodes, each of which is toothed or has a toothed scale at its back; anthers 2-celled.
Ovary oblong, subcompressed; style filiform, stigma capitellate; ovule 1, pendulous from a long basal funicle. Utricle oblong or ovoid, indehiscent, top areolate or rounded. Seed inverse, oblong, testa coriaceous; embryo annular.—Species 12, all tropical or subtropical.

* Outer sepal longest.


Stem 2–4 ft., as thick as the thumb below, straggling in the water and running along the banks of rivers, &c., branched. Leaves 3–6 in., narrowed into a petiole, ½ in. Spikes 8–18 in.; bracts small, membranous, concave, long-acuminate from an ovate base; bracteoles membranous, embracing the thickened perianth base. Perianth shining, very variable in size and thickness, base much thickened.

** Sepals subequal.

2. A. aspera, Linn. Sp. Pl. 204; leaves orbicular obovate or elliptic, spikes rigid, bracteoles ovate half as long as their spine or longer, stamens 5, staminodes fimbriate. Moq. in DC. Prodr. xiii. 2, 314; Boiss. Fl. Orient. iv. 993; Roxb. Fl. Ind. i. 672, and Ed. Carey & Wall. ii. 496; Dalz. & Gibs. Bomb. Fl. 218; Wight in. 1780; Wall. Cat. 6924, excl. H.

Throughout India and Ceylon; an abundant weed in dry places.—Distrib. Tropical Asia, Africa, Australia and America.

Stem 1–3 ft., simple or branched. Leaves 1–5 in., extremely variable, generally thick, pubescent tomentose or velvety, rarely glabrate; petiole short. Spikes usually with a robust rachis that rapidly lengthens, sometimes to a foot long. Flowers ½ in., longer than the bracteoles. Staminodes fimbriate from the margin or from an appendage below the margin behind.


Var. argentea; leaves silverly silky beneath. A. argentea, Thwaites Enum. 249; Lamk. Dict. i. 545.—Thwaites mentions this as found at Caltara by Moon, but I have seen no specimens; he includes under it A. porphyristachya and rubro-fusca, which makes me doubt his being Lamerck's plant, which is an European, Arabian and African one.

3. A. bidentata, Blume Bijd. 545; branches slender rambling, leaves from elliptic to linear lanceolate acuminate glabrous or pubescent membranous, spikes very slender, bracteoles usually reduced to a spine minutely 2-auricled at the base, stamens 5, staminodes toothed. Moq. in DC. Prodr.
Temperate and Subtropical Himalaya; from Kishtwar, Clarke, to Sikkim, alt. 4-6000 ft. J. D. H. Khasia Mts., alt. 4-6000 ft. Behar; top of Parunsath, Thomson. The SWHAC, NILGHERI and Travanour Mts., Wight, &c.

Ceylon, abundant.—District, China, Java, Japan.

Habit of A. aspera, var. porphyristachya, and leaves often as large, but the bracteoles are reduced to spines with scarcely a blade, or with a minute auricle on each side of the base, and the staminodes are not fringed. It may prove a form of that plant. Some Nynee-bal specimens, collected by Col. Davidson, almost with the blade of the bracteoles half as long as the spine, unite them in this respect. The very narrow-leaved forms (Wallichiana and lanceolata) occur in the Khasia and Himalaya along with the more typical, as they do in the Deccan hills.

4. A. diandra, Roxb. Fl. Ind. i. 504; stem slender diffusely branched, leaves linear-lanceolate or linear glabrous or nearly so, spikes very slender pubescent, bracteoles of a spine as long as the sepals 2-auricled at the base, stamens 2, staminodes fimbriate. Centrochrysodia diandra, Wall. in Roxb. Fl. Ind., Ed. Carey & Wall. ii. 504; Moq. in DC. Prodr. xiii. 2, 322; Wight Fl. t. 732.

Ceylon; common in the warmer districts, Thwaites.

Annual or biennial, 12-18 in. high, very much more slender than any other species. Leaves 2-4 by 1-3 in., membranous, green. Spikes 3-6 in.; flowers distant, ½ in. long, very slender.

Undeterminable Species.

A. BengaLeNSis, Lamk. Dict. i. 459; Moq. in DC. Prodr. xiii. 2, 317. Paronychia bengalensis, Room. & Schultes Syst. v. 521, not of Juss. Illecebrum bengalese, Linn. Mant. 213.

A. SarmENtosa, Vahl Symb. ii. 44; Moq. l. c. 318.

16. ALTERNANTHER, Forst.

Herbs, usually prostrate. Leaves opposite. Flowers small, white, capitate; heads axillary, often clustered. Sepals unequal, anterior and 2 posterior flattened; 2 lateral innermost, concave. Stamens 2-5, filaments short, connate into a short cup with or without interposed staminodes; anthers 1-celled. Ovary orbicular or ovoid; stigma subsessile, capellate (rarely 2-fid); ovule 1, pendulous from a long basal funicle. Utricle compressed, ovoid orbicular or obcordate, margins often winged or thickened. Seed inverse, lenticular, testa coriaceous; embryo annular, cotyledons narrow.—Species about 16, tropical and subtropical.


Throughout hotter India and Ceylon in damp places, ascending the Himalaya to 4000 ft.—District. All warm countries.

Branches 3-18 in. long, glabrous, the ultimate with 2 lines of hairs; nodes often villous. Leaves 1-3 in., in watery places even longer (½ by 1 in.), rather fleshy, sometimes obscurely denticulate. Clusters 4-6 in. long, white, hardly glistening; flowers ½-1 in. long. Utricle usually broader than the perianth, very broadly
obcordate, rarely exceeding the sepals, wings often corky.—Wallich's *A. sessilis* & *denticulata* are all *sessilis* except Sheet 6921 F, of which all but the left-hand specimens are as *nodiflora*.

2. **A nodiflora**, Br. Prodr. 417; branches prostrate or ascending, leaves linear linear-oblong or lanceolate obtuse or subacute, sepals glabrous, hyaline finely acuminate, anthers 3, utricle much shorter than the sepals obcordate. *Moq.* in DC. Prodr. xiii. 2, 356; *Benth. Fl. Austral.* v. 249.

Silhunt, Wallich. **Tenasserim**, at Mergui, Griffith.—DISTRIBUTION. Tropical Asia, Australia, Polynesia and Africa, Japan.

Often very difficult to distinguish from *A. sessilis*, heads often in great clusters (not seen in Indian specimen), sepals thinner, much more pointed, and utricle smaller and not so broad.—This would seem to be the most abundant African and Australian plant, though scarce in India proper. Bentham's *A. denticulata* (Fl. Austral. v. 249) is, I think, *A. sessilis*; he mentions the difficulty of distinguishing it from *nodiflora*, but says nothing about *sessilis*. Boissier (Fl. Orient. iv. 396) considers *nodiflora* and *denticulata* to be one and the same, and different from *sessilis*.

17. **Gomphrena**, Linn.

Herbs, hirsute or villous, with usually thickened nodes. **Leaves** opposite. **Flowers** capitate or spicate, white or coloured. **Sepals** 5, lanceolate, acuminate. **Stamens** 5, filaments linear united below into a long tube cleft at the top, with a one-celled anther in each cleft, usually without interposed staminodes. **Ovary** subglobose or turbinate; style short or long, stigmas 2; ovule 1, pendulous from a long basal funicule. **Utricle** compressed, indehiscent. **Seed** inverse, lenticular, testa coriaceous; embryo annular.—**Species** 70, S. American and Australian, of which one is also Asiatic.

*Gomphrena hispida*, Linn. Sp. Pl. Ed. 2, i. 326 (Moq. in DC. Prodr. xiii. 1, 411), is founded on a plate in Hortus Malabaricus (ix. t. 72) which is quite unworthy of notice. It represents a plant with the habit of *G. globosa*, but with serrated leaves. *G. angustifolia*, Vahl Symb. iii. 45 (Moq. l. c. 417), stated to be a native of the East Indies (Koenig) and Guinea (Schumacher), is probably some garden escape of which nothing is known.

*G. globosa*, Linn. Sp. Pl. 224; erect, branched, hairy or sub silky, leaves shortly petioled elliptic or ovate-oblong acute or obtuse, heads large globose with 2 leafy bracts, bracteoles pinkish purple, lateral with a cristate dorsal wing, sepals densely woolly. *Moq.* in DC. Prodr. xiii. 2, 409; Roxb. Fl. Ind. ii. 63; Grab. Cat. Bomb. Pl. 169; Dalz. & Gibbs. Bomb. Fl., Suppl. 72; Wight Cat. 1784; Bot. Mag. t. 2815.—Rheedee Hort. Mal. t. 37.

An escape from gardens in various parts of India; cultivated in all countries—probably originating in America.

A tall dichotomously branched annual, branches stout obscurely 4-angled. **Leaves** 2–4 in., acamious, pale green; petiole 0–1 in. **Heads** 1–3 in. diam., peduncled, terminating the branches; bracts under the head ½–1 in.; flowers densely imbricate; branches ½–1 in., acamious, lanceolate, much longer than the perianth. **Sepals** lanceolate, densely woolly, shorter than the staminal tube.
ADDITIONS AND CORRECTIONS, VOL. IV.


P. 33. At end of Gymnema add:—

G. ? Macranthrum, Hook. f. Ic. Pl. t. 1436; stem robust, leaves elliptic-ovate acuminate glabrous, cymes corymbose or subumbellate puberulous, peduncles stout, flowers large ebracteolate, sepals elliptic-oblung obtuse, corolla-tube equaling the sepals, lobes pubescent within, coronal processes of the corolla small villous inserted at the mouth of the corolla alternating with its lobes.

SIKKIM HIMALAYAS, King.

Stem terete. Leaves 3–5 in., distant, base rounded or cordate, nerves 3–4 pair; pedicel 1½–2 in. Peduncles 2–3 in., stout, often decurved; pedicels ½–¾ in. Sepals ¼ in. Corolla ½ in. diam., thick, tube glabrous within. Column large, stoutly stipitate; scales of the staminal corona adnate to the backs of the authors, obtuse; anther-tips large, ovate-oblong, obtuse, membranous; pollen-masses shortly stipitate, oblong-reniform, coruscate elongate erect. Stigma thick, obtuse, exerted.—A doubtful Gymnema, larger and more robust than any other Indian species, with singularly stout peduncles. The corolline corona scales are almost reduced to tufts of hairs; the staminal scales resemble those of a Marsdenia.

P. 41. To section ** of Tylophora add:—

T. Microstachys, Hook. f. Ic. Pl. t. 1450; quite glabrous, leaves shortly petiolated linear-lanceolate acuminate, cymes reduced to very short axillary sessile racemes, bracts minute setaceous, flowers minute shortly pedicelled, sepals setaceous equaling the corolla, staminal column subvoid, coronal processes obscure, follicles elongate poignard-shaped, tips elongate.

Tenasbeitim; Moulein, Falconer in Herb. Calcutta.


P. 112. Gentiana argentea, Royle; add Wavara l. c. t. 113.

P. 114. To Gentiana add:—

G. (Chondrophyllum) Loderi, Hook. f. Ic. Pl. t. 1440 A; quite glabrous, perennial, branches prostrate leafy, leaves subesialae broadly elliptic obtuse 3-nerved, flowers terminal solitary sessile, calyx campanulate, lobes equaling the tube spathulate spreading and recurved, corolla tubular–campanulate blue, lobes 5 rounded ovate, scales erect fimbriate, style slender.

KASHMIR, in the Sind or Lidar Valley? Mrs. C. Radcliffe.

Branches 2–3 in. Leaves ⅛ in. long and broad, spreading, coriaceous, green or purplish-brown; floral hardly smaller. Calyx ⅛ in., tube purplish; lobes green, coriaceous. Corolla-limb 1 in. diam.—I am indebted to E. G. Loder, Esq., for a specimen of this pretty species, which is quite unlike any other Indian one. It was brought to him by his friend the finder, who is uncertain as to its exact locality in the Kashmir Valley where she gathered it.

G. (Chondrophyllum) Tibetica, King in Hook. f. Ic. Pl. t. 1441; stem very stout erect, stem-leaves 6 in. lanceolate connate at the base in a cylindric sheath, uppermost sessile whorled, flowers crowded in the uppermost axile sessile, calyx tubular membranous truncate split on one side, mouth minutely 3-toothed, corolla twice as long tubular-funnel-shaped, lobes 5 triangular with a triangular fold in each sinus, capsule included, seeds ellipsoid, tests reticulated.

EASTERN HIMALAYA; Chumbi (between Sikkim and Bhotan), alt. 11,000 ft. (Herb. Calcutta).
Stem 18 in. high, erect, as stout as a goose-quill, simple. Cauline leaves 5–7 by 1–1 1/4 in., upper broader, uppermost spreading, forming an involucre to the flowers. Corolla nearly 1 in. long, not spotted, rather inflated in the middle. Ovary sessile; style short, stigma 2-lobed. Capsule sessile, linear-oblong, dehiscing at the tip by recurved valves.—The calyx and broader leaves distinguish this from the following.

G. (Chondrophyllum) robusta, King mss.; stem ascending robust simple, cauline leaves narrowly linear connate at the base in a tubular sheath, upper crowded, flowers sessile axillary and in a dense terminal involucrate head, calyx spathaceous membranous half as long as the corolla 5-toothed, teeth short subulate, corolla tubular-campanulate, lobes short triangular with a triangular fold in each sinus.

**Eastern Himalaya** with *T. tibetica* (Herb. Calcutta).

Stem 8–12 in. Cauline leaves 10–12 by 1 in., thickly coriaceous; nerves obscure near the midrib; floral shorter, broader at the base. Calyx split to the base, teeth setaceous, and usually longer than the others. Corolla 1 1/2–1 3/4 in. long, not spotted, rather inflated in the middle.—This may prove a variety of *G. tibetica*.

P. 118. 35 *G. detensa*, Fries. Assa Gray has shown that *G. serrata*, Gunner, is the earlier name for this species.

P. 123. 7 *Swertia bimaculata*, H. f. & T.—The anthers of this species become hasteate in age.

P. 128. To subgenus Euswertia of *Swertia* add:—

S. Kingii, Hook. f. in To. Pl. t. 1442; perennial-rooted, stem tall erect robust simple, leaves opposite, radical broad elliptic subacute narrowed into a broad petiole, cauline oblong-ovate 3-amplexicaul, cymes axillary and in a terminal thyrsse, sepals lanceolate quite entire, corolla 2 in. diam., petals oblong obtuse with two basal pits, margins fimbriate with long hairs, filaments with a fimbriate scale at the base behind.

**Sikkim Himalaya**; at Na Tung (Herb. Calcutta).


P. 133. Order Polemoniaceae; in description for ovules many, read few or many; and for capsule septioidal, read loculicidal.

P. 135. Remove 19 *Bothriospermum* from **, and place it after 16 *Eoehelia* in *. *

P. 167. 19 *Bothriospermum*, Bunge. In 7th line of description after scar insert basal, and erase the 4 following words. In 8th line erase large.

P. 168. Line 7th from top, erase scar, &c.


P. 207. For Ipomoea Stocksi, Clarke, read I. Clarkei, Hook. f.

P. 220. Under Eulovulus insert "E. numularius, Linn., is getting common about Calcutta," King.

P. 248. 37 *Wulfinia*, for stamens 4, read 2.

P. 249. Under *Pitheirospermum* erase reticulate. Erase 50 *Emmenospermum* and the rest of the line.


P. 253. Before 7 *Sorophularia* insert Tribe IV. *Cheloneae*.

P. 275. In description of Torenia, in 6th line after appendedage insert or not.

P. 277. 5 *T. asiatica*, var. concolor.—This I have since seen growing, and think it may be a different species; see Bot. Mag. t. 6797 A; it is *T. rubens*, Benth. Fl. Hongk., and a native of China.
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The Synonyms and Species incidentally mentioned are printed in italics.
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