

Rhododendron.] LXXXII. ERICACEÆ. (C. B. Clarke.)

A shrub, 4 ft., branchlets scaly. *Leaves* $2\frac{1}{4}$ by $\frac{3}{4}$ in., base broadly rhomboid, obscurely glandular-punctate above; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{4}$ – $\frac{1}{3}$ in.; bracts $\frac{1}{2}$ in., ovate, pubescent. *Corolla-tube* $\frac{1}{2}$ in. *Stamens* 10 or 8; filaments sparsely pilose. *Ovary* 5-celled, scaly as is the lower portion of the style. *Capsule* $\frac{1}{2}$ by $\frac{1}{4}$ in. *Seeds* oblong; testa produced into a tail at each end shorter than the seed.

SPECIES IMPERFECTLY KNOWN.

44. *R. BHOTANICUM*, Clarke; leaves oblong or elliptic obtuse with a mucro or acute glabrous sparsely scaly beneath, flowers and fruit unknown.

BHOTAN; *Booth*.

Leaves 5 by $1\frac{1}{2}$ in., base cuneate or rhomboid, much resembling those of *R. Maddeni* but the glands beneath are sparsely scattered. *Flower-scales* in large terminal cones, very much larger than those of *R. cinnabarinum* or *R. Keysii*, broadly obovate, glabrous, scarcely scarious towards the margin, but fringed densely with brilliantly white soft hairs; in *R. Maddeni* the flower-scales have the margins scarious not fringed.—These shoots represent possibly the species referred to by Nuttall (in Hook. Kew Journ. v. (1853) 363) as a second variety of *R. camelliaeflorum* "with foliage almost as robust as *R. Jenkinsii*."

45. *R. PARISHII*, Clarke; leaves elliptic narrowed at the base glabrous finely reticulated beneath without glands, petioles with loose ferruginous wool sometimes continued up the midrib beneath.

MOULMEIN; Moolee, alt. 6000 ft., Parish, n. 1021.

Branchlet stout with some ferruginous wool towards the extremity. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., subobtuse with a very short point, of a rich brown colour; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. *Flowers* and capsules unknown.

46. *R. LUCIDUM*, Nutt. in Hook. Kew Journ. v. (1853) 363; shrubby, leaves short-petioled oblong-lanceolate acute shining base cuneate glaucous and scaly beneath, flowers subsolitary, calyx-lobes somewhat large oblong-ovate obtuse glabrous, capsules ovate acute 5–8-celled.

Mts. of BHOTAN; beyond the Bhorelli, *Booth*.

Hardly distinguishable from *R. Jenkinsii* by the leaves, though very distinct in the inflorescence, which approaches nearer that of *R. camelliaeflorum*. *Flowers* not seen (Nuttall).

9. *PYROLA*, Linn.

Perennial, glabrous herbs, with short leafy stems and erect annual simple scapes. *Leaves* alternate, long-petioled, persistent, entire or nearly so. *Flowers* in simple racemes, cernuous, white or rose; pedicels 1-bracteate. *Calyx* deeply 5-lobed, persistent. *Petals* 5, concave, sessile, deciduous. *Stamens* 10, hypogynous; filaments subulate, glabrous; anthers incompletely 4-celled, dehiscing by 2 terminal pores. *Ovary* subglobose, 5-celled; style straight declinate or curved, linear or thickened upwards, top truncate with a 5-lobed stigma; ovules very many in each cell. *Capsule* subglobose, depressed, pentagonal, 5-celled, loculicidally 5-valved from the base, crowned by the persistent style. *Seeds* minute; testa lax, produced at both ends.—Species 15, in temperate northern regions.

P. rotundifolia, Linn.; leaves orbicular or broadly-ovate or -obovate or elliptic, petiole about equalling the blade, calyx-segments broadly ovate or ovate-lanceolate, style equalling or longer than the petals declinate, stigmatic lobes erect or spreading.

NORTH-WESTERN and EASTERN HIMALAYA, and the Khasia Mts.—DISTRIB. Europe, N. Asia and N. America.

Glabrous. *Leaves* 1–2 in. diam., narrowed into the petiole, quite or nearly entire, coriaceous, obtuse or subacute. *Scaps* 6–8 in.; raceme many-fl'd. *Stamens* ascending,

shorter than the styles. *Flowers* drooping about $\frac{1}{2}$ in. diam., bracts $\frac{1}{2}$ in., lanceolate, amplexicaul; floral lanceolate, about equalling the pedicels. *Petals* $\frac{1}{2}$ in. long, orbicular or obovate, white and pink. *Anther-bases* obtuse or mucronate. *Capsule* $\frac{1}{2}$ – $\frac{3}{4}$ in. diam.

VAR. rotundifolia proper; calyx-segments ovate- or oblong-lanceolate. *P. rotundifolia*, DC. *Prodr.* vii. 772.—Kashmir, alt. 9–10,000 ft., Falconer, Thomson, Clarke.

VAR. asarifolia; calyx-segments triangular-ovate, leaves usually more obovate. *P. asarifolia*, Michx.; DC. *Prodr.* vii. 773. *Chimaphila*, sp. Griff. *Itin. Notes*, 134, n. 560.—Sikkim Himalaya, alt. 9–11,000 ft., J. D. H., Anderson. Bhotan, alt. 6800 ft., Griffith. Khasia Mts., alt. 5–6500 ft., H. f. & T., Lobb.—A Japanese and American form.

ORDER LXXXIII. MONOTROPEÆ. (By C. B. Clarke.)

Parasitic, brown or yellowish leafless herbs. *Stem* erect, with leafy scales. *Flowers* solitary or racemose, regular. *Sepals* (sometimes like the scales) 2–6, deciduous, imbricate. *Petals* 3–6 (in the Indian species). *Stamens* 6–12, hypogynous; filaments linear. *Ovary* free, globose or fusiform, 1–6-celled; style cylindric, stigma peltate; ovules very numerous on axile or parietal placentæ. *Capsule* loculicidally 4–6-valved. *Seeds* very many, minute; testa often loose, produced, saccate; embryo minute, undivided.—Species 10–12, in the forests of the N. hemisphere.

* *Anthers* peltate, ovary ovoid, placentas axile.

Flowers solitary. Petals hardly saccate at base 1. MONOTROPA.

Flowers racemose. Petals saccate at base 2. HYPOPITHYS.

** *Anthers* oblong, ovary fusiform, placentas parietal.

Scope 1–3-flowered. Petals 3, narrow 3. CHEILOTHECA.

1. MONOTROPA, Linn.

Stem 1-flowered. *Sepals* 4, resembling scales. *Petals* 5–6, obovate-oblong, scarcely saccate at base, at length deciduous. *Stamens* 10–12; anthers peltate, horizontal, dehiscing by transverse slits. *Ovary* 5-celled; ovules very many on axile placentæ. *Capsule* 5-celled, 5-valved.—Species 1 or 2, American and Himalayan.

M. uniflora, Linn.; DC. *Prodr.* vii. 781; Lamk. *Ill.* t. 362, fig. 1; Don *Prodr.* 151; Hook. *Exot. Fl.* t. 85; Maxim. *Mel. Biol. Dec.* xii. 626. *M. Morisoniana*, Michx. *Fl. Bor. Am.* i. 266; DC. l. c.; Don *Prodr.* 152. *Monotropa*, Griff. *Ic. Pl. Asiat.* t. 523.

TEMPERATE HIMALAYA; alt. 6–8000 ft. KHASIA Mts.; alt. 4–6000 ft., frequent. *DISTRIB.* Corea, Japan, N. America.

Glabrous, 6–15 in. *Scales* $\frac{3}{4}$ in., ovate-lanceolate. *Flower* nodding. *Petals* $\frac{3}{4}$ in.; stamens and stigma nearly level with their summits. *Ovary* and capsule globose. *Style* at first short, in fruit often $\frac{1}{2}$ in. *Filaments* pilose below. *Fruit* erect.

2. HYPOPITHYS, Scop.

Flowers in a terminal raceme; bracts scaly. *Sepals* 4–5, obovate-lanceolate, hyaline, deciduous. *Petals* 4–5, obovate-oblong, saccate at the base, deciduous. *Stamens* 8–10; anthers peltate, horizontal, dehiscing by transverse slits. *Ovary* 5-celled; ovules on axile placentæ. *Capsule* 4–5-celled, loculicidally 4–5-valved.—Species 2 (or 1); throughout the N. hemisphere.

H. lanuginosa, Nutt. *Gen. Am.* i. 271; stem raceme and flowers pubescent, petals densely hairy within. DC. *Prodr.* vii. 781.

KASHMIR; alt. 8500 ft., *Aitchison, C. B. Clarke.* KHASIA Mts.; alt. 4-5000 ft., *H. f. & T., &c.*—DISTRIB. Amurland, Japan, N. America.

Scapes 6-18 in. Scales $\frac{1}{2}$ in., ovate-oblong. Pedicels $\frac{1}{4}$ - $1\frac{1}{2}$ in. Petals $\frac{1}{2}$ in., yellow or white; stamens and stigma nearly level with their summits. Ovary and capsule globose.—This only differs from the European species (*Monotropa Hypopitys, Linn.*) by its hairiness; and is considered a variety thereof by Maximowicz.

3. CHEILOTHEGA, Hook. f.

Stem erect, simple or forked; branches 1-flowered. Sepals 3-4, oblong-lanceolate. Petals 3, erect, linear-oblong, obtuse, base not saccate. Stamens 6; anthers linear-oblong, erect, dehiscing on the sides by longitudinal slits. Ovary fusiform, 1-celled, narrowed into the short cylindric style; stigma globose-conical; placenta 6, parietal, bifid, the long branches covered on all sides by numerous ovules. Fruit unknown.

C. khasiana, Hook. f. in *Gen. Pl.* ii. 608.

KHASIA Mts.; Mushai, near River Oongkot, alt. 3500 ft., *H. f. & T.*

Stem 4-6 in. Scales 1 by $\frac{1}{2}$ in., lanceolate, acute, densely imbricate. Petals 1 in., yellow-red. Stamens as long as the petals, brown. Pistil $\frac{3}{4}$ by $\frac{1}{2}$ in., glabrous.

ORDER LXXXIV. EPACRIDÆ. (By C. B. Clarke.)

Shrubs or small trees. Leaves alternate, articulated with the branch, coriaceous, entire, longitudinally nerved. Flowers solitary or racemose, axillary or terminal, usually bracteolate. Calyx 5-4-partite; segments coriaceous, striate, imbricate, persistent. Corolla 5-4-tid. Stamens 5-4, usually on the corolla-tube; anthers oblong, 1-celled (spuriously 2-celled), dehiscing along their whole length by a single slit. Ovary globose, 1-10-celled; style terminal, cylindric, stigma subcapitate; ovules in each cell 1 or many. Fruit drupaceous with 2-5 1-seeded pyrenes, or a many-seeded capsule. Seeds small, albuminous.—Species 320, nearly all Australian, a few Polynesian, 1 Fuegian, a few Malayan.

1. LEUCOPOGON, R. Br.

Shrubs. Flowers small, white, in axillary or terminal spikes or racemes; rachis terminating in an abortive flower; bracteoles 2-3 under the calyx. Corolla campanulate, lobes 5, hairy within, valvate in bud. Ovary 2-5-celled; style terminal; ovule solitary in each cell, pendulous. Drupe scarcely fleshy, 1-5-celled.—Species 130, 118 Australian, the others Polynesian and Malayan.

L. malayanus, Jack in *Mal. Misc.* i. v. 20, and in *Hook. Bot. Misc.* ii. 71; leaves narrowly lanceolate glabrous shining, racemes 3-7-flowered much shorter than the leaves, rachis villous. Wall. *Cat.* 3720, and in *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 301; *DC. Prodr.* vii. 744; *Kurz in Journ. As. Soc.* 1877, ii. 217, and *For. Fl.* ii. 95. *Styphelia malayica, Spreng. Syst. cur. post.* 67.

MALACCA and SINGAPORE; Jack, &c.—DISTRIB. Malay Isles and Borneo.

A shrub, 3-6 ft.; branches densely leafy. Leaves 2 by $\frac{1}{2}$ in., acute, mucronate. Racemes $\frac{1}{2}$ in.; calyx enveloped by the ovate bracteoles; segments $\frac{1}{2}$ - $\frac{1}{3}$ in., elliptic-oblong. Corolla-tube $\frac{1}{2}$ in.; lobes $\frac{1}{2}$ in., spreading. Hypogynous scales 5, free. Style hairy or perfectly glabrous. Drupe $\frac{1}{2}$ - $\frac{1}{3}$ in. diam.

VAR. *moluccana*, Kurz in *Journ. As. Soc.* 1877, pt. ii. 217, and *For. Fl.* ii. 96; leaves $\frac{1}{2}$ -1 in. subulate-pointed. *L. moluccanum*, Scheff. Obs. Phyt. iii. 97 (sp.).—Tenasserim, Helfer; Kedah Peak, Low.—*L. moluccanum*, Scheff., has the peduncles 1-2-flowered; in Helfer's Tenasserim plant, the racemes are (sometimes at least) 3-5-flowered.

ORDER LXXXV **DIAPENSIACEÆ.** (By C. B. Clarke.)

Very small, prostrate shrubs. *Leaves* alternate or crowded, entire or toothed. *Flowers* solitary or racemose. *Calyx* 5-partite, persistent; segments imbricate. *Corolla* hypogynous; lobes 5, imbricate. *Stamens* 5, on the throat of the corolla, alternate with its lobes; anthers dehiscing by slits. *Disc* 0. *Ovary* free, globose, 3-celled; style cylindric, stigma shortly 3-lobed; ovules few or many in the inner angles of the cells. *Capsule* coriaceous, 3-celled, loculicidally 3-valved. *Seeds* many, minute, aluminous.—Species 8, in N. America, Europe, Japan, and the Eastern Himalaya.

1. **DIAPENSIA**, Linn.

Very small, glabrous shrubs. *Leaves* crowded, obovate-oblong, entire, coriaceous. *Flowers* at the ends of the branches, solitary, peduncled, white or rose-red. *Calyx* 2–3-bracteate; sepals broadly ovate, obtuse. *Corolla* campanulate, persistent; lobes spreading, round. *Anthers* subsessile, cells oblique; staminodes 0. *Seeds* very many, minute, subcubic; testa lax.

D. himalaica, H. f. & T. in Hook. *Kew Journ.* ix. 372, t. 12; leaves subacute, flowers subsessile, tube of the corolla twice as long as the calyx, fruiting peduncle 1–3 in.

SIKKIM HIMALAYA; alt. 10–14,000 ft., Lachen and Chola Pass, J. D. H., &c.

Densely tufted. *Leaves* $\frac{1}{2}$ in. *Sepals* in flower-time $\frac{1}{2}$ – $\frac{1}{3}$ in., ovate; in fruit nearly $\frac{1}{4}$ in., obovate-oblong. *Corolla-tube* $\frac{1}{2}$ in., lobes $\frac{1}{4}$ in. *Capsule* $\frac{1}{8}$ – $\frac{1}{6}$ in. diam.

ORDER LXXXVI. **PLUMBAGINEÆ.** (By C. B. Clarke.)

Herbs or undershrubs. *Flowers* in terminal scapes or peduncles, capitate, racemed or panicled; bracts often scarious on the margins, usually sheathing the flower; bracteoles 2. *Calyx* inferior, tubular, 5–10-ribbed, often hyaline between the ribs, mouth frequently funnel-shaped, scarious. *Petals* 5, free or connate at the base into a very short tube with the filaments, rarely united into a linear tube, spreading. *Stamens* 5, opposite the petals; filaments nearly free or adnate below to the corolla; anthers oblong. Hypogynous disc 0. *Ovary* superior, 1-celled, 5-angular above; styles 5, distinct from the base or connate below, stigmas subcapitate; ovule 1, pendulous from a basal ascending funicle, anatropal. *Capsule* membranous or the apex hardened, included in the calyx (in *Ægialitis* linear, long-exsert), circumsciss or rupturing near the thin base, the hardened apex often 5-valved. *Seeds* cylindric (in *Ægialitis* elongate), pendulous; albumen various or 0; radicle superior.—Species 200, throughout the world, mostly in maritime or saline places.

TRIBE I. **Staticeæ.** *Styles* 5, distinct; stigmas subcapitate. *Stamens* very shortly united at the base into a tube with the corolla.

Large shrub, with broad petioled leaves 1. *ÆGIALITIS*.
Herbs or small shrubs, with linear prickly leaves 2. *ACANTHOLIMON*.
Herbs or small shrubs, with obovate leaves 3. *STATICE*.

TRIBE II. **Plumbageæ.** *Style* 1, filiform, divided into 5 stigmatose branches.

Calyx glandular, stamens free, flowers spicate 4. *PLUMBAGO*.
Calyx eglandular, stamens adnate to the middle of the corolla-tube, flowers capitate 5. *CERATOSTIGMA*.
Calyx eglandular, 5-winged, stamens free, flowers spicate 6. *VOGELIA*.

1. **ÆGIALITIS**, R. Br.

A glabrous shrub. *Leaves* alternate, broad, coriaceous; petiole dilated at base, amplexicaul. *Racemes* paniced; bract sheathing the pedicel and including the 2 bracteoles. *Calyx* tubular, tough, 5-ribbed; teeth 5, short. *Petals* linear, white, connate at base with the filaments into a persistent tube, deciduous above the tube. *Anthers* oblong. *Styles* distinct, from the angles of the ovary; stigmas capitate. *Fruit* (in *Æ. annulata*) linear, long-exserted from the calyx, slightly pentagonal, dehiscing finally along the angles. *Seed* elongate, albumen 0.—Species 2, littoral, an Australian and a Malayan.

Æ. rotundifolia, Roxb. *Fl. Ind.* ii. 111; leaves orbicular base mostly rounded, calyx $\frac{1}{2}$ in., young capsule ovoid pentagonal. *Wall. Cat.* 7240; *Griff. Notul.* iv. 207. *Æ. annulata*, *Kurz in Journ. As. Soc.* ii. 217, and *For. Fl.* ii. 96, not of R. Br. *Ægialites rotundifolia*, *Presl Bot. Bermerk.* 103.

Mangrove swamps; BENGAL; abundant. MERGUI; *Griffith.* ANDAMANS; *Kurz. MALACCA; Griffith.*

Height 3–8 ft. *Leaves* $2\frac{1}{2}$ –3 in.; petiole $2\frac{1}{2}$ in. *Bract* $\frac{1}{2}$ in.; pedicels stout. *Young capsule* $\frac{1}{4}$ by $\frac{1}{8}$ – $\frac{1}{4}$ in., shining, horny; endocarp very tough, spongy. *Seed* narrowly oblong.—This plant has been united with the Australian *Æ. annulata*, R. Br. (*DC. Prodr.* xii. 621); in which the calyx hardly exceeds $\frac{1}{2}$ in. The ripe fruit of the Indian species is unknown; but the young capsules are much broader than in the fruit of *Æ. annulata* at any stage. Corolla-tube $\frac{1}{2}$ in. long, in *Æ. annulata* a mere ring.

2. **ACANTHOLIMON**, Boiss.

Small, prickly shrubs. *Leaves* crowded, linear, spinescent. *Scapes* many-flowered; rachis brittle, simple or dichotomous; bracts usually 3. *Calyx-tube* cylindric, 10-ribbed; limb widely funnel-shaped, scarious, subentire, with 5 sometimes excurrent nerves. *Petals* oblong or obovate, united shortly at the base into a tube with the stamens, rose or white, contorted in bud. *Filaments* linear; anthers oblong. *Styles* distinct, at the angles of the ovary; stigmas capitate. *Utricle* included within the calyx, oblong or pentagonal, membranous; seed more or less albuminous.—Species 80, Greece to Kashmir, most numerous in Persia.

A. lycopodioides, Boiss. in *DC. Prodr.* xii. 632; leaves linear-lanceolate, spikes dichotomous short, bracts coriaceous with hyaline margins, ribs of the wide-spreading calyx-limb glabrous. *Bunge Acanthol.* 20. *A. tibeticum*, *Herb. Ind. Or. H. f. & T.* *Statice lycopodioides*, *Girard in Ann. Sc. Nat.* 3, ii. 330, excl. *syn. Willd.*

NORTH KASHMIR; alt. 11–14,000 ft, frequent, *Thomson, &c.*—DISTRIB. Kashgar. Densely tufted. *Leaves* 1 by $\frac{1}{12}$ in., needle-pointed. *Scapes* 1–2 in., minutely scabrous. *Bracts* $\frac{1}{2}$ by $\frac{1}{4}$ in., inner wholly scarious except the midrib. *Calyx-tube* $\frac{1}{2}$ – $\frac{3}{4}$ in., pilose without; limb white, subtruncate. *Petals* $\frac{1}{4}$ in., rose-red.

3. **STATICE**, Linn.

Herbs or small shrubs. *Leaves* alternate, radical often rosulate, entire (in the Indian species), not spinescent. *Scapes* branched, many-flowered; bracts small, amplexicaul, margins scarious. *Calyx* tubular or funnel-shaped ribbed; limb scarious, spreading, 5-nerved, sometimes lacinate or plumose. *Petals* spatulate-oblong, entire or bipartite, united at base into a short tube with the stamens. *Styles* distinct, at the angles of the ovary; stigmas subcapitate. *Utricle* included within the calyx, oblong fusiform, membranous; seed more or less albuminous.—Species 100, cosmopolitan, especially in saline places.

SECT. I. *Limonium*. *Petals* entire or emarginate.

1. *S. Stocksii*, Boiss. in DC. Prodr. xii. 664; leaves spatulate-oblong glabrous fleshy, calyx pilose without limb subtruncate. *Wight Ill.* ii. 225, t. 178; *Hook. Ic. Pl.* t. 837; Boiss. *Fl. Orient.* iv. 868.

SCINDE; *Stocks, Dalzell*.—DISTRIB. Beloochistan.

Height 6-10 in.; branches woody, leafy. *Leaves* $\frac{3}{4}$ by $\frac{1}{2}$ in., obtuse, tapering much at the base; petiole hardly any. *Scapes* dividing into a second panicle; bracts $\frac{1}{2}$ in., elliptic, herbaceous, reddish. *Calyx* $\frac{1}{4}$ in., ribs long-ciliate. *Petals* longer than the calyx, entire or emarginate, rose-pink. *Anthers* long-exsert.

2. *S. cabulica*, Boiss. in DC. Prodr. xii. 666; leaves all radical rosulate spatulate-oblong obtuse mucronate, panicle large dichotomous, branches long, calyx minutely pilose without, limb at first subtruncate ultimately with linear recurved divisions. Boiss. *Fl. Orient.* iv. 871.

PUNJAB; Jhelum valley and lower hills west of the Indus, alt. 2-4000 ft., Stewart. —DISTRIB. Afghanistan.

Annual. *Leaves* $1\frac{1}{2}$ by $\frac{3}{4}$ in., densely rosulate. *Scape* 1-3 ft., solitary, erect, glabrous; flowers subsessile, scattered along the branches; bracts $\frac{1}{2}$ in., ovate or oblong, obtuse, mucronate, coriaceous, scarious margin narrow. *Calyx-tube* $\frac{1}{4}$ - $\frac{1}{2}$ in., very narrow; limb at first funnel-shaped, subtruncate, scarious, with 5 ribs; in fruit the membranous portion breaks up and almost entirely disappears, the 5 ribs are recurved.

SECT. II. *Schizopetalum*. *Petals* bifid half-way down.

3. *S. macrorrhabdos*, Boiss. *Diagn.* 2, iv. 67, and *Fl. Orient.* iv. 869; var. *Thomsoni*, Clarke; leaves all radical rosulate spatulate-orbicular obtuse or emarginate rarely minutely mucronate, calyx with tufts of small spreading hairs. *Statice*, sect. *Schizopetalum* sp. altera, *Hook. f. in Gen. Pl.* ii. 626.

WEST TIBET; *Falconer*; Ladak, T. Thomson. Baltistan, alt. 9000 ft., Clarke.

Annual. *Leaves* 2 by $1\frac{1}{2}$ -2 in. *Scapes* 1-3 ft., glabrous; flowers in clusters of 2-4, sessile along the branches; bracts $\frac{1}{2}$ in., ovate, mucronate, coriaceous with scarious margin. *Calyx-tube* $\frac{1}{2}$ in., limb funnel-shaped, truncate, scarious, 5-ribbed. *Petals* divided to the base of the lamina into two lanceolate-linear divisions.—This was considered specifically distinct from *S. macrorrhabdos* (a native of Afghanistan and Beloochistan) by Sir J. D. H., and would be so according to Boissier's views.

4. *PLUMBAGO*, Linn.

Herbs or undershrubs; branches diffuse. *Leaves* alternate, entire. *Flowers* spiked; bracts and bracteoles shorter than the calyx. *Calyx* tubular, covered with stalked glands; limb 5-fid. *Corolla-tube* long, slender; lobes 5, round, patent. *Stamens* free; filaments linear, dilated at base; anthers oblong. *Ovary* narrowed at the apex; style slender, with 5 terminal branches stigmatose nearly throughout their length. *Capsule* membranous, circumsciss near the base.—Species 10, warmer regions of both hemispheres.

1. *P. zeylanica*, Linn.; DC. Prodr. xii. 692; leaves ovate suddenly narrowed into the petiole, rachis of the spike pubescent or glandular, corolla white, base of style glabrous. *Roxb. Hort. Beng.* 13, and *Fl. Ind.* i. 462; *Wall. Cat.* 7241; *Wight Ill.* t. 179; *Dalz. & Gibs. Bomb. Fl.* 220; *Kurz in Journ. As. Soc.* 1877, ii. 217; Boiss. *Fl. Orient.* iv. 875. *P. auriculata*, *Blume Bijdr.* 736. *Thela alba*, *Lour. Fl. Cochinch.* 119.—*Rheede Hort. Mal.* x. t. 8.

Throughout INDIA, much cultivated and readily spreading; wild in the south. *Kurz* thinks not wild in Birma; *Watt* thinks wild in Bengal.—DISTRIB. Throughout the tropics of the Old World.

Rambling several feet. *Leaves* 3 by $1\frac{1}{2}$ in., acute, glabrous, or puberulous; petiole $\frac{3}{4}$ in., base dilated, amplexicaul. *Spikes* 4–12 in., often branched; bracts $\frac{1}{2}$ in, ovate, acute. *Calyx* $\frac{1}{3}$ – $\frac{1}{2}$ by $\frac{1}{10}$ in.; teeth very short. *Corolla-tube* $\frac{3}{4}$ in.; lobes $\frac{1}{2}$ in.

2. **P. rosea**, Linn.; Roxb. *Fl. Ind.* i. 462; leaves elliptic tapering to the short petiole, rachis of the spike glabrous, corolla red, base of style hairy. Wall. *Cat.* 7242; *Bot. Mag.* tt. 230, 5363; *Kurz in Journ. As. Soc.* 1877, pt. ii. 218. *P. coccinea*, Boiss. in *DC. Prodr.* xii. 693. *Thela coccinea*, Lour. *Fl. Cochinch.* 119.—Rumph. *Herb. Amb.* v. t. 168. *Rheede Hort. Mal.* x. t. 9.

Valleys in SIKKIM and KHASIA, wild (?). India, often cultivated; Thwaites thinks not wild in Ceylon; Kurz thinks not wild in Birma.—DISTRIB. South-east Asia, cultivated.

Altogether resembling *P. zeylanica*, and perhaps only a cultivated variety of it.

5. CERATOSTIGMA, Bunge.

Herbs or shrubs. *Leaves* alternate, obovate or lanceolate, bristle-ciliate. *Flowers* capitate; bracts and bracteoles sheathing. *Calyx* tubular, without glands, deeply 5-fid; segments narrow, 3-striate. *Corolla-tube* elongate, slender; lobes round, patent. *Stamens* adnate to the middle of the corolla-tube, filaments linear; anthers oblong. *Ovary* pentagonal; tip conical; style filiform, with 5 stigmatose branches. *Capsule* included in the calyx, circumsciss close to the base, sub-5-valved.—Species 3–4; Chinese, Bhotanese and Abyssinian.

C. Griffithii, Clarke; shrubby, ferruginous-hirsute, leaves spatulate obovate, calyx-segments linear. *Plumbago*?, *Griff. Itin. Notes*, 189, n. 1007.

BHOTAN; between Woollookka and Lamnoo very common, *Griffith* (alt. 8000 ft.?), (*Kew Distrib.* n. 4181).

A low densely branched shrub; leaves red-margined, calyces and bracts brown-ciliate; flowers a fine blue (*Griffith*).—*Griffith's* specimen has been badly preserved; the leaves on it are $\frac{3}{4}$ by $\frac{1}{2}$ in.; but it had probably much larger leaves.

6. VOGELIA, Lamk.

Small shrubs, branches long. *Leaves* alternate, entire. *Spikes* terminal, paniced; bracts and bracteoles small. *Calyx* deeply 5-fid, with 5 broad transversely undulate wings between the ribs. *Corolla-tube* cylindric; lobes 5, round, patent. *Stamens* free; filaments linear, base dilated; anthers oblong. *Ovary* oblong-fusiform, somewhat pentagonal; style filiform, branches 5, stigmatose throughout. *Capsule* included in the calyx, circumsciss at the very base.—Species 2, a S. African and an Indo-Arabian.

V. indica, *Gibb. ms.*; *Wight in Calc. Journ. Nat. Hist.* vii. 17, and *lc.* 1075; leaves perfoliate elliptic obtuse or orbicular. *DC. Prodr.* xii. 696; *Boiss. Fl. Orient.* iv. 876. *V. arabica*, *Boiss. in DC. Prodr.* xii. 696; *Dalz. & Gibb. Bomb. Fl.* 220.

WESTERN INDIA; Canara, *Gibson*, &c.; Mt. Abou, *Stocks*, *Brandis*.—DISTRIB. Arabia.

Puberulous or glabrescent. *Leaves* $2\frac{1}{2}$ by $1\frac{1}{2}$ in. (sometimes twice as large), deeply cordate, more or less perfoliate. *Spikes* dense. *Calyx* $\frac{1}{3}$ by $\frac{1}{8}$ in. *Corolla-tube* $\frac{2}{3}$ in.; lobes $\frac{1}{2}$ in. *Style* hairy at the base.

ORDER LXXXVII. **PRIMULACEÆ.** (By J. D. Hooker.)

Perennial, rarely annual herbs. *Leaves* all radical, or if cauline opposite alternate or whorled, exstipulate. *Flowers* hermaphrodite, regular. *Calyx* inferior (except *Samolus*), 5- rarely 4-9-cleft. *Corolla* hypogynous (except *Samolus*, 0 in *Glaux*), rotate bell- or funnel-shaped 5- rarely 4-9-cleft. *Stamens* on the corolla-tube, opposite its lobes (hypogynous in *Glaux*), with sometimes alternating staminodes, filaments usually short; anthers 2-celled, dehiscing longitudinally. *Ovary* 1-celled; style short or long, stigma undivided; ovules many, usually amphitropous on a free central placenta. *Capsule* dehiscing transversely or by valves, few or many-seeded. *Seeds* minute, usually angular, often sunk in the placenta, albumen fleshy or horny; embryo transverse.—Species about 80, chiefly N. temperate and alpine.

TRIBE I. **Primulæ.** *Corolla-lobes* imbricate. *Ovary* superior.

* *Capsule dehiscing by valves.*

- | | |
|--|---------------|
| Corolla salver- or funnel-shaped, tube long. Stamens on the corolla-tube, anthers obtuse | 1. PRIMULA. |
| Corolla salver-shaped or almost rotate, tube very short. Stamens on the corolla-tube, anthers obtuse | 2. ANDROSACE. |
| Corolla funnel-shaped. Stamens at the base of the corolla, anthers acuminate | 3. CORTUSA. |

** *Capsule circumsciss at the top.*

- | | |
|---------------------------|----------------|
| Corolla 7-lobed | 4. BRYOCARPUM. |
|---------------------------|----------------|

TRIBE II. **Lysimachicæ.** *Corolla-lobes* contorted. *Ovary* superior.

* *Capsule dehiscing by valves.*

- | | |
|-----------------------------|----------------|
| Corolla 5-6-cleft | 5. LYSIMACHIA. |
| Corolla 0 | 6. GLAUX. |

** *Capsule circumsciss.*

- | | |
|---|-----------------|
| Corolla 5-partite, exceeding the calyx | 7. ANAGALLIS. |
| Corolla 4-5-lobed, shorter than the calyx | 8. CENTUNCULUS. |

TRIBE III. **Samolæ.** *Corolla-lobes* imbricate. *Ovary* $\frac{1}{2}$ -inferior.

- | | |
|-----------------------------------|-------------|
| Herbs, leaves alternate | 9. SAMOLUS. |
|-----------------------------------|-------------|

I. **PRIMULA, Linn.**

Perennial scapigerous herbs. *Flowers* umbelled or whorled, rarely solitary, often dimorphic, one form having the stamens low and stigma high in the corolla-tube, the other having the stamens high and stigma low. *Calyx* 5-cleft. *Corolla* funnel- or salver-shaped, throat naked or with folds opposite the lobes (annulate); lobes 5, spreading or incurved. *Stamens* 5, included; anthers obtuse. *Ovary* ovoid, obovoid or globose. *Capsule* globose, oblong or cylindric, 5-valved; valves simple or 2-fid. *Seeds* angular or subglobose, peltately attached.—Species about 80; distribution of the order.

The natural classification of *Primula* is a difficult task, owing to the great variability of all the organs. I quite believe that various of the Himalayan species are but highly developed states of European and N. Asiatic ones, but to demonstrate this it would be necessary to compare living specimens. Of the two natural divisions of

**Primula.]**

the genus—those with the margins of the leaves revolute, and those with them described as involute in vernation—the first embraces all the Indian species but *P. floribunda*, of which the vernation is very obscure and conduplicate. Under the first (A) of the two primary divisions here proposed (these are purely artificial, and proposed for convenience sake), all the species allied to *P. sinensis* (namely, 1, 2, 5, 7, 8) will be found; of the others, *P. pulchra* is closely allied to *P. Kingii*, *P. reticulata* to *P. sikkimensis*, and *P. Clarkei* to *P. petiolaris*. The sections established under the second division (B) are, I think, for the most part natural, and follow one another in a fairly good sequence. The form of the top of the ovary, of the stigma, and of the seeds, afford good characters; but I have not been able to apply them sectionally.

A. Leaves on long slender unwinged petioles, orbicular oblong or cordate, margins revolute in vernation. (See *P. petiolaris*, *sibirica*, *involucrata*, and *tibetica* in B).

* Quite or nearly glabrous, mealy or not.

1. **P. rotundifolia**, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 18; Cat. 605; more or less mealy, leaves 1–4½ in. diam. orbicular-cordate toothed crenate or erose, umbels often superposed many-fld., bracts many subulate, corolla purple, mouth annulate, limb flat, capsule oblong exserted. *Duby in DC. Prodr.* viii. 41; *Don Prodr.* 79. *P. odontophylla*, Wall. Cat. 7016.

TEMPERATE HIMALAYA; from Kashmir, alt. 11,000 ft.; to Sikkim, alt. 12–13,000 ft. Buds densely clothed with sulphurous meal. Leaves membranous, sometimes lobulate; petiole 6–12 in. Scape as tall and inflorescence puberulous and mealy; bracts many. Corolla-tube twice as long as the calyx; limb flat, ½–¾ in. diam.; lobes obovate or obcordate. Ovary with a thickened lobulate crown; stigma cuneate. Capsule ¼–½ in. Seeds pale, ⅓ in., irregularly ellipsoid, coarsely papillose.

2. **P. Gambeliana**, Watt in Journ. Linn. Soc. Bot. ined.; buds mealy, leaves ¼–1 in. diam. orbicular-cordate toothed, umbels few-fld., bracts 1–3 subulate, corolla purple, mouth annulate, lobes orbicular emarginate.

SIKKIM HIMALAYA; Jongri, alt. 14,000 ft., Watt.

A smaller plant, with much fewer and larger flowers, than *P. rotundifolia*, but I have seen only four specimens from the one known locality. Leaves membranous; petiole not sheathed at the base as in *P. pulchra*, which this a good deal resembles. Scape and inflorescence quite glabrous. Corolla limb concave, 1–1½ in. diam. Ovary and stigma as in *P. rotundifolia*. Fruit unknown.

3. **P. pulchra**, Watt in Journ. Linn. Soc. Bot. ined.; glabrous, not mealy, basal sheaths long membranous, leaves oblong or ovate-oblong, glaucous beneath, base rounded or cordate, tip rounded, margin waved, scape short, bracts filiform or subulate membranous, flowers 2–10 loosely umbelled, corolla purple, tube funnel-shaped, mouth obscurely annulate, lobes broad obcordate.

SIKKIM HIMALAYA; Lachen, alt. 12–14,000 ft., J. D. H.; Jongri. Watt.

Sheaths 1–1½ in. long, embracing the petioles. Leaves few, blade 1–1½ in., midrib stout, nerves few; petiole 1–1½ in. Scape about equalling the petiole; bracts much shorter and more slender than the very unequal pedicels. Calyx ¼–½ in., terete. Corolla very large for the size of the plant, ¾–1 in. diam. Ovary globose, subacute; stigma globose. Fruit unknown.

4. **P. reticulata**, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 21; Cat. 608; glabrous, slightly mealy or not, leaves very long-petioled oblong-cordate obtuse crenate or doubly crenate reticulate glaucous beneath, scape very tall, bracts large linear-oblong or lanceolate, base not produced, calyx-lobes short acute recurved, corolla yellow, tube funnel-shaped slender much exserted,



mouth not annulate, ovary obovoid. *Duby* in *DC. Prodr.* viii. 41. *P. altissima* and *P. speciosa*, *Don Prodr.* 78.

CENTRAL AND EASTERN HIMALAYA; Nipal, *Wallich*; Sikkim, alt. 11–15,000 ft., *J. D. H., Elwes.*

Rootstock very small. *Leaf-blade* 2–3 in.; petiole 4–6 in., very slender. *Scape* 12–16 in., very slender; inflorescence sometimes mealy; flowers nodding, slightly fragrant; bracts regularly placed, but unequal in size, broad, sometimes toothed. *Calyx* $\frac{1}{2}$ – $\frac{3}{4}$ in., campanulate, quite terete or 5-ribbed. *Corolla-tube* nearly $\frac{1}{2}$ in.; lobes erecto-patent, small, rounded, or notched. *Fruit* not seen.—*Wallich* describes the leaves as slightly pubescent beneath, which I do not observe. A close ally of *P. sikkimensis*.

5. *P. vaginata*, *Watt* in *Journ. Linn. Soc. Bot. ined.*; puberulous or glabrescent, not mealy, leaves $\frac{1}{2}$ in. diam. orbicular deeply cordate 7-lobed one third way, lobes 3-fid, petiole with a broad basal sheath, scape 2–4 in., umbel 3–6-fid., pedicels very unequal, bracts linear, calyx-lobes short, corolla lilac, tube funnel-shaped, mouth annulate, lobes 2–4-fid.

SIKKIM HIMALAYA; Laghep, alt. 10,000 ft., *Clarke.*

Rootstock small, woody. *Leaves* puberulous or glabrous; petiole equalling the blade, abruptly dilated at the very base into a broad membranous sheath. *Scape* glabrous; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. *Calyx* campanulate, lobes ovate acute. *Corolla-tube* not twice the length of the calyx; limb $\frac{1}{2}$ in. diam. *Ovary* globose, acute. *Fruit* unknown.

6. *P. Clarkei*, *Watt* in *Journ. Linn. Soc. Bot. ined.*; quite glabrous, leaves 1–1 $\frac{1}{2}$ in. orbicular- or elliptic-cordate sharply toothed or crenate, tip rounded, scape 0, pedicels equalling or shorter than the petioles, calyx broadly campanulate, lobes short, corolla-tube slender, mouth not annulate, limb flat, lobes 2-fid, capsule globose included.

KASHMIR; at Poosiana, alt. 7000 ft., *Clarke.*

Habit of a *Viola*. *Rootstock* slender, woody. *Leaves* membranous, nerves very slender; petiole 2–4 in., very slender, base narrowly sheathing. *Pedicels* 2–3, slender. *Corolla-tube* $\frac{1}{2}$ in., lobes narrow. *Ovary* globose, acute, stigma capitate. *Seeds* black, subglobose, minutely papillose, $\frac{1}{40}$ in. diam.

** *Pubescent or tomentose with flaccid jointed hairs.*

7. *P. mollis*, *Hook. Bot. Mag. t.* 4798; softly pubescent or tomentose, not mealy, leaves 3–5 in. diam. orbicular deeply cordate obtusely lobulate and erose, petiole stout, scape long, flowers in 2–5 loose superposed whorls, bracts linear-lanceolate, corolla rosy, mouth annulate, limb flat, lobes obovate or obcordate.

EASTERN HIMALAYA; Bhotan, *Booth.*

A near ally of *P. cortusoides*, and of the common garden *P. sinensis*. *Crown* without sheathing scales. *Leaves* rather thick, pubescent on both surfaces; petiole 3–5 in., base shortly sheathing. *Scape* and inflorescence 12–18 in.; whorls distant, 3–6-fid., pedicels 1–1 $\frac{1}{2}$ in. *Calyx* membranous, broadly campanulate, loose, lobes acuminate. *Corolla* $\frac{3}{4}$ in. diam. *Ovary* globose, acute, upper half thickened; stigma globose. *Fruit* unknown.

8. *P. geraniifolia*, *Hook. f.*; very slender, softly pubescent, not mealy, leaves 2–3 in. diam. orbicular deeply cordate acutely lobulate all round lobules toothed, petiole very long, scape very slender, flowers in simple or superimposed whorls, bracts few linear, corolla lilac, mouth annulate, lobes obcordate.

E. TIBET; Chumbi valley (between Sikkim and Bhotan), alt. about 10,000 ft. *King.*

Primula.] Rootstock horizontal. Leaves few, lobes 10-12, pubescent on both surfaces; petiole 2-5 in. Scape twice as long as the leaves; bracts small; pedicels slender. Calyx glabrous, campanulate, cleft half way, teeth acute. Corolla $\frac{1}{2}$ - $\frac{3}{4}$ in. diam., tube twice as long as the calyx, funnel-shaped.—A near ally of the European and Siberian *P. cortusoides*, and of the Turkestan *P. Kauffmanniana*, Regel, but the acute lobing of the broader leaf is very different.

9. *P. filipes*, Watt in Journ. Linn. Soc. Bot. ined.; sparsely pubescent, not mealy, leaves 1-1 $\frac{1}{2}$ in. orbicular ovate or oblong cordate entire lobulate or toothed, petiole as long as the blade very slender, scape shorter than the leaves 6-8-fld., calyx-lobes short very broad, corolla flesh-coloured, mouth not annulate, limb flat, capsule globose included, seeds very minute smooth. *Primula*, Griff. Itin. Notes, 123, n. 396; Notul. iv. 299; Ic. Pl. Asiat. t. 485, f. 1.

BHUTAN; rocks near Chuka, alt. 6500 ft., Griffith.

Rootstock elongate, woody. Leaves membranous. Scape about equalling the petiole, slender in flower, thickened in fruit; bracts small, subulate. Calyx broadly campanulate. Corolla-tube $\frac{1}{3}$ in., three times as long as the calyx, funnel-shaped; limb as much broad; lobes obovate, 2-lobed. Seeds $\frac{1}{16}$ in., dark brown, obtusely-angled.—Allied to the Chinese *P. obconica* Hance (*P. poculiformis*, Bot. Mag. t. 6582), but much smaller and more delicate, and the corolla-tube is longer.

10. *P. listeri*, King ms.; pubescent, not mealy, rootstock woody, leaves 1-1 $\frac{1}{2}$ in. orbicular-cordate sinuate-lobed entire or denticulate very membranous, petiole equalling the blade or longer very slender, scapes shorter than the petiole few-fld., bracts few linear, calyx campanulate, lobes broad short, corolla rose-pink, tube funnel-shaped, mouth not annulate.

SIKKIM HIMALAYA; Tonglo and the Singalelah ranges, in bamboo jungles, alt. 9-10,000 ft.

I retain this species as distinct from *P. filipes* with great doubt, having very imperfect specimens of this last; it differs chiefly in the more orbicular lobulate leaves, broader calyx and much shorter more funnel-shaped corolla-tube. Petiole with a very short small sheath. Corolla-tube outside, and mouth pubescent. Whole plant smelling like *Geranium Robertianum* (Watt).

B. Leaves sessile or base narrowed into a broad winged petiole, margins revolute in vernation (petiole sometimes long and slender in *P. sibirica*, involucreta, tibetica, and petiolaris).

* Scape normally much longer than the leaves. Flowers very numerous in dense heads, or umbellate with very short pedicels, purple. Bracts small, short, usually hidden by the flowers, bases not gibbous or produced. Corolla-tube usually much exceeding the calyx.

11. *P. denticulata*, Smith Exot. Bot. ii. 109, t. 114; sparingly mealy, leaves not fully developed till after flowering surrounded at the base by thick fleshy leafy scales, leaves obovate-spathulate obtuse sharply minutely toothed or subentire, flowers capitate, heads depressed, corolla-tube usually twice as long as the long or short obtuse or acute calyx-teeth, corolla mouth obscurely annulate, lobes obcordate. Duby in DC. Prodr. viii. 44; Roxb. Fl. Ind. ed. Carey & Wall. ii. 17; Wall. Cat. 607; Bot. Reg. 1842, t. 47; Bot. Mag. t. 3959. P. Hoffmeisteri, Klotzsch in Bot. Reise Pr. Wald. t. 56.

TEMPERATE HIMALAYA; from Kashmir to Bhotan, alt. 7-13,000 ft. KHASIA Mts., alt. 5000 ft.—DISTRIB. Afghanistan.

Rootstock stout, short, thick. Leaves erect or spreading, midrib broad, never reticulate. Scape stout or slender, 4-18 in.; bracts short, unequal, sometimes connate. Calyx long or short, base acute or truncate, lobes obtuse or acute. Corolla

pale purple, salver-shaped, $\frac{1}{2}$ – $\frac{3}{4}$ in. diam.; lobes broad or narrow, mouth obscurely annulate. Ovary obovoid or globose, tip rounded. Capsule usually oblong, exceeding the calyx, sometimes globose and sunk in it. Seeds coarsely granulate.—The commonest Himalayan *Primula*, and very variable.

VAR. *cachemiriana*; leaves produced almost with the flowers, more mealy. P. cachemiriana, Munro in Garden, 1879, 535.—Western Himalaya.

VAR. *puucifolia*; leaves fewer longer-petioled, heads fewer-fl'd., calyx-teeth long narrower nearly equalling the corolla-tube, capsule globose sunk in the calyx (ripening very few seeds).—Kashmir, at Poosiana, alt. 9000 ft., Clarke.

12. **P. capitata**, Hook. Bot. Mag. t. 4550; usually very mealy, leaves appearing with the flowers obovate-spathulate or oblanceolate obtuse or acute finely toothed usually copiously mealy beneath, fleshy leafy scales few or 0, heads very dense-fl'd. with the outer flowers deflexed and inner in bud forming a conical crown, flowers deep purple, tube long often wrinkled, limb flat or concave.—*Fl. des Serres*, vi. t. 618. P. globifera, Griff. Itin. Notes, 148.

SIKKIM and BHOTAN HIMALAYA, alt. 12–15,000 ft., Griffith, J. D. H.

I retain this species as distinct from *P. denticulata* with great hesitation, though it differs much in habit and general appearance, and retains its characters in cultivation.

13. **P. erosa**, Wall. Cat. 611; glabrous or puberulous, leaves not mealy fully developed with the flowers membranous obovate-spathulate or oblanceolate toothed or erose reticulate fleshy leafy scales few or 0, flowers umbelled purple mealy, pedicels very short, calyx-lobes long or short, tube twice as long as the calyx, limb flat, mouth hardly annulate. Regel in Bot. Zeit. 1853, 833; Gartenfl. ii. t. 51. P. denticulata, var. erosa, Duby in DC. Prodr. viii. 45.

TEMPERATE HIMALAYA; from Kumaon to Bhotan, alt. 4500–9500 ft. (not seen in Sikkim).

I suspect Duby to be right in reducing this to a variety of *P. denticulata*, but it differs in habit, and seems to be always recognised as distinct by Himalayan collectors and by cultivators in Europe. The leaves are sometimes 18 inches long.

14. **P. bellidifolia**, King in Herb. Calc.; puberulous, fleshy scales few or 0, leaves membranous flaccid elongate oblanceolate or spathulate coarsely shallowly toothed, scape long, bracts minute concealed, flowers small densely capitate, corolla-tube four times longer than the short obtusely lobed mealy calyx, lobes small spreading obcordate.

SIKKIM HIMALAYA; alt. 13,000 ft., King.

Rootstock small. Leaves 2–4 in., obtuse, tapering into the petiole, pubescent on both surfaces, not wrinkled, nerves faint, teeth irregular. Scape 4–8 in., erect, glabrous. Heads nearly 1 in. diam.; flowers bluish-purple, quite sessile. Corolla glabrous; tube cylindric, $\frac{1}{2}$ – $\frac{3}{4}$ in. long; limb not so broad; mouth contracted, annulate. Stigma peltate. Capsule small, globose.—A very distinct species, with leaves like *Bellis sylvestris*, but quite thin and flaccid; in this respect and in toothing very different from any form of *P. erosa*, *denticulata*, or *capitata*.

** Scape normally much longer than the leaves (except *P. tibetica*). Flowers umbelled, rarely capitate, white pink or purple. Bracts forming a 1-seriate involucre, gibbous or produced downwards at the base (obscurely in *P. concinna*).

† Capsule oblong or cylindric, usually longer than the narrow fruiting calyx.

15. **P. farinosa**, Linn.; Duby in DC. Prodr. viii. 44; stolons 0, more or less mealy, leaves $\frac{1}{2}$ –1 in., sessile, or subsessile obovate-spathulate obtuse

entire crenulate or toothed above the middle, bracts small base gibbous, flowers numerous subsessile, corolla-tube exceeding calyx, the limb flat, calyx-lobes 2-fid. *Fl. Danica* i. t. 125; *Sweet Brit. Fl. Gard.* ser. 2, t. 65.

WESTERN TIBET, alt. 12–17,000 ft., *Thomson*, &c.—DISTRIB. Europe, N. and Central Asia, Arctic America.

Rootstock stout. *Leaves* densely rosulate. *Scape* tall and stout for the size of the plant; bracts few, base gibbous; pedicels shorter than the calyx. *Calyx* 5-ribbed, cleft $\frac{1}{2}$ – $\frac{1}{3}$ way down; lobes lanceolate, acute, often purple. *Corolla* pale purple, $\frac{1}{2}$ – $\frac{1}{3}$ in. diam.; mouth annulate; lobes rather narrow, deeply cleft. *Capsule* oblong. *Seeds* $\frac{1}{50}$ in., angular, pale, minutely papillose.—The Fuegian plant (*P. magellanica*), referred to *P. farinosa* by myself and others, differs in the large granulate seeds.

16. **P. Heydei**, *Watt in Journ. Linn. Soc. Bot. ined.*; stoloniferous, leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. sessile lanceolate acuminate coarsely toothed mealy beneath, scape stout, flowers 5– ∞ sessile, bracts short base saccate, corolla-tube exceeding the calyx, limb flat.

WESTERN TIBET, alt. 12–14,000 ft., *Thomson*; Taglang, *Heyde*.

A very distinct little species, densely tufted. *Stolons* short, leafy. *Leaves* rosulate, on the stolons subsecund. *Scape* 1–3 in.; inflorescence mealy; bracts gibbous at the base. *Calyx* campanulate, cleft to the middle. *Corolla* pale lilac, $\frac{1}{2}$ in. diam. *Capsule* included. *Seeds* as in *P. farinosa*.

17. **P. concinna**, *Watt in Journ. Linn. Soc. Bot. ined.*; densely tufted, very small, leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. oblanceolate acute or obtuse quite entire or subcrenulate mealy beneath, scape short 2–3-fid., pedicels elongated in fruit, calyx deeply cleft equalling the short corolla-tube, corolla-mouth contracted, limb flat, lobes orbiculate.

SIKKIM HIMALAYA; on the Tibetan passes, alt. 15–17,000 ft., *J. D. H.*, *Watt*.

Somewhat resembling a reduced state of *P. farinosa* with longer capsules, from which the short corolla-tube and the seeds at once distinguish it. *Tufts* $\frac{1}{2}$ in. high. *Leaves* sometimes narrowed into a short petiole, margins revolute. *Scape* rarely longer than the leaves; bracts gibbous at the base; pedicels sometimes two to four times longer than the scape. *Corolla* $\frac{1}{2}$ in. diam., white or pink. *Capsule* $\frac{1}{8}$ in. long, cylindric-oblong. *Seeds* nearly orbicular, $\frac{1}{50}$ in. diam., a little flattened on one side, quite smooth, pale brown.

18. **P. glabra**, *Klatt in Linnæa xxxvii.* 500; not mealy except the inflorescence, leaves $\frac{1}{2}$ –1 in. obovate-spathulate acute or obtuse erose or toothed, scape very slender loosely 3– ∞ -fid., flowers sessile or shortly pedicelled, bracts short, calyx campanulate, lobes short obtuse equalling the corolla-tube, corolla mouth contracted, limb flat, lobes short 2-fid. *Watt in Journ. Linn. Soc. ined.*

SIKKIM HIMALAYA; alt. 13–15,000 ft., *J. D. H.*, *Clarke*, *Watt*.

A very distinct species. Tufted. *Leaves* rather thin, rigid when dry, often narrowed into a slender or broad petiole; teeth horizontal or recurved. *Scape* 1–5 in.; bracts subulate, $\frac{1}{12}$ in., base gibbous. *Corolla* blue-purple, $\frac{1}{2}$ in. diam. *Capsule* oblong, included. *Seeds* obtusely-angled, $\frac{1}{15}$ in. diam., coarsely papillose.—In foliage and habit this closely resembles *P. pusilla*, but the bracts are very different, and the mouth of the corolla is not bearded.

19. **P. sibirica**, *Jacq. Misc. Austr. i.* 161; not mealy, leaves coriaceous $\frac{1}{2}$ –1 in. shortly petioled elliptic ovate or spatulate obtuse entire or crenulate, scape slender 3–6-fid., bracts linear base shortly produced, calyx tubular 5-ribbed, corolla pink, tube shortly exerted, mouth not annulate, limb flat, lobes narrow deeply cleft. *Duby in DC. Prodr. viii.* 43; *Lehm. Monog. Primul. t.* 5; *Bot. Mag. t.* 3167, 3445, 6493.

WESTERN TIBET, ZANSKAR and LAHUL, alt. 13-15,000 ft., *Falconer, &c.*—DISTRIB. Europe, N. America, Arctic America.

Leaves coriaceous, rosulate or suberect and crowded, midrib obscure. *Scape* 3-6 in., bracts erect equalling the pedicels or shorter. *Calyx* $\frac{1}{4}$ in.; lobes short, ovate. *Corolla* $\frac{1}{2}$ - $\frac{3}{4}$ in. diam. *Ovary* globose, top rounded, thickened; stigma capitate. *Capsule* cylindric, exserted. *Seeds* $\frac{1}{10}$ in., angular, smooth, pale.

20. ***P. involucrata***, *Wall. Cat.* 7107; not mealy, leaves 1-3 in. coriaceous elliptic ovate oblong cordate or orbicular narrowed into a long or short petiole obtuse entire or obscurely crenulate, scape long slender loosely 3-6-fld., bracts linear base much produced often 2-fid, calyx tubular 5-ribbed, corolla white, tube much exserted, mouth annulate, limb flat, lobes broad emarginate. *Duby in DC. Prodr.* viii. 42; *Bot. Reg.* 1846, t. 31; *Regel. Gartenfl.*, 1863, t. 394. *P. Munroi*, *Lindl. Bot. Reg.* 1833, t. 15.

ALPINE HIMALAYA, from Kashmir to Sikkim and Western Tibet, alt. 12-15,000 ft.—DISTRIB. Europe, N. Asia, Arctic America.

Closely allied to *P. sibirica*, but distinguished by the much larger size, broader longer petioled leaves, stouter longer scape, larger white flowers, annulate mouth of the corolla, shorter capsule, and large elliptic or subeuneate seeds acute at one or both ends, $\frac{1}{10}$ in. long. *Ovary* and stigma as in *P. sibirica*.

21. ***P. tibetica***, *Watt in Journ. Linn. Soc. Bot. ined.*; dwarf, tufted, not mealy, leaves petioled $\frac{1}{2}$ - $\frac{3}{4}$ in. coriaceous elliptic obtuse or acute quite entire, scape very short 1-5-fld., bracts linear base gibbous, pedicels very long in fruit, calyx tubular, corolla-tube not exserted, mouth annulate, limb flat, lobes deeply cleft.

WESTERN TIBET, north of Kumaon, alt. 15,500 ft., *Strach. & Winterb.* EASTERN TIBET, on the Sikkim frontier, alt. 16-17,000 ft., *J. D. H.*

This closely resembles a dwarf state of *P. sibirica*, to which it stands in the same relation as *P. concinna* does to *P. farinosa*. The capsule is cylindric, much exserted; seeds not seen.

†† *Capsule* globose, included in the hemispheric calyx (not seen in *P. elliptica*).

22. ***P. elliptica***, *Royle Ill.* 311, t. 76, f. 2; not mealy, leaves $\frac{1}{2}$ -1 in. elliptic ovate or ovate-oblong narrowed into the broad petiole sharply toothed, scape long loosely 3-10-fld., bracts linear base shortly produced, calyx campanulate deeply cleft, corolla purple, tube exserted, mouth not annulate, limb flat, lobes broad deeply cleft. *Duby in DC. Prodr.* viii. 44; *P. denticulata*, *Wight Ic.* t. 2000. *P. spathulacea*, *Jacquem. mss.*

WESTERN HIMALAYA; Kashmir and Lahul, alt. 8-12,000 ft., *Falconer, &c.* WESTERN TIBET; Ladak, *Watt*.

Leaves suberect, thinly coriaceous, closely serrated down to the dilated top of the petiole, midrib slender, nerves obscure. *Scape* much exceeding the leaves; bracts equalling or exceeding the short pedicels; flowers nodding. *Calyx* $\frac{1}{2}$ - $\frac{3}{4}$ in. *Corolla-tube* variable; lobes usually acute, sometimes toothed. *Ripe fruit* not seen.—A distinct and beautiful plant. The figure in Royle's work is very bad indeed, and but for his specimens the species could not be identified.

23. ***P. rosea***, *Royle Ill.* 311, t. 75, f. 1; quite glabrous, not mealy, leaves dense subsessile obovate-oblong or -spathulate or oblanceolate obtuse or acute crenulate or toothed, scape short stout 5- ∞ -fld., bracts linear-lanceolate or subulate base shortly produced, pedicels short, calyx-lobes ovate acute, corolla rose-red, tube exserted, mouth not annulate, limb flat, lobes bifid. *Duby in DC. Prodr.* viii. 41; *Bot. Mag.* t. 6437; *Regel Gartenfl.* t. 994.



WESTERN HIMALAYA; from Kulu to Kashmir, alt. 10-12,000 ft., *Falconer*, &c.
—DISTRIB. Afghanistan.

Often forming large tufts. *Leaves* numerous, variable in length and breadth; margins revolute or flat when flowering, not umbelled, midrib broad, nerves inconspicuous. *Scape* equalling or exceeding the leaves, robust; bracts $\frac{1}{4}$ – $\frac{1}{2}$ in.; pedicel very variable. *Calyx* cleft to the middle, tube angular. *Corolla-tube* glabrous within and without, one half to twice as long as the calyx, disk of limb puberulous; lobes variable in width, sometimes toothed. *Seeds* $\frac{1}{25}$ in. long, sharply angled, pale.

VAR. *elegans*; corolla smaller, tube longer, lobes narrower.—*P. elegans*, *Duby l. c.* 42; *Mem. Prim. t. i. f. 1.* Kashmir, *Jacquemont*; Afghanistan.

*** *Scape* longer than the leaves. *Flowers* many (few in *P. elongata*), umbelled or in superposed whorls. *Bracts* irregular, ovate or subulate, or lanceolate from a broad not gibbous base. (See also *P. petiolaris*, var. 7 *scapigera*.)

† *Ovary* globose, top acute not thickened. *Capsule* globose, included in the calyx.

24. ***P. prolifera***, *Wall. in As. Research.* xiii. 372, t. 3, and in *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 18; tall, not mealy, leaves 8-16 in. oblanceolate or elongate obovate-spathulate obtuse quite entire or toothed glabrous or puberulous beneath, scape very tall, flowers in superposed whorls, bracts shorter than the pedicels, calyx short, lobes subulate, corolla yellow tube very long, mouth annulate, limb flat, lobes obcordate crenulate, capsule globose included. *Duby in DC. Prodr.* viii. 34; *Don Prodr.* 81. *P. imperialis*, *Jungh.*; *Miquel Fl. Ind. Bat.* ii. 1001. *Cankrienia chrysanthia*, *de Vriese in Jahrb. der Maatsch. van Tuinb.* 1850, 30.

KHASIA MTS., alt. 4-6000 ft., *Wallich*, &c.—DISTRIB. JAVA.

Leaves thin, nerves reticulate, petiole broad. *Scape* 12-18 in., stout, quite erect; flowers in 2-4 distant whorls, pedicels subequal; lower bracts sometimes foliaceous. *Calyx* $\frac{1}{2}$ in. long, 5-ribbed. *Corolla-tube* $\frac{1}{2}$ in. *Capsule* quite glabrous, $\frac{1}{2}$ in. diam., not exserted. *Seeds* rather large, $\frac{1}{25}$ in. diam., coarsely papillose.—I can see no difference between the Khasian and Javan plants. The Japanese *P. japonica*, A. Gray, differs chiefly in the purple flowers. I have not found any specimens of this in Wallich's Herbarium.

25. ***P. obtusifolia***, *Royle Ill.* 311, t. 77, f. 1; mealy or not, leaves 2-6 in. membranous elliptic spathulate obovate or ovate acute or obtuse entire crenulate erose or coarsely toothed, base narrowed rounded or cordate, petiole winged, scape stout few- or many-fld., bracts ovate or subulate much shorter than the pedicels often connate below, corolla purple, tube twice as long as the calyx, mouth annulate, limb flat, lobes obcordate. *Duby in DC. Prodr.* viii. 42. (*Herb. Ind. Or. H. f. & T. Prim.* 10.)

EASTERN and WESTERN HIMALAYA; Kunawar, *Royle*; Kumaon, *Herb. Calcutta*; Sikkim, alt. 11-12,000 ft., *J. D. H. Watt*; Bhotan, *Griffith*.

Rootstock stout, clothed with fleshy broad sheathing scales. *Leaves* excessively variable, naked or with yellow meal beneath. *Scape* stout, 6-10 in.; bracts $\frac{1}{4}$ – $\frac{1}{2}$ in.; pedicels $\frac{1}{2}$ – $1\frac{1}{2}$ in., stout in fruit. *Calyx* usually mealy, cupular or broadly campanulate in fruit; lobes triangular and ovate or linear, acute or obtuse. *Corolla* large, bright blue-purple; limb $\frac{3}{4}$ –1 in. diam., often puberulous. *Seeds* large, subglobose, $\frac{1}{20}$ in. diam., coarsely papillose.—This resembles states of *P. Stuartii*, but is distinguished by the thin texture of the leaves, acute ovary, and globose capsule sunk in the calyx. The forms with broadly ovate-cordate deeply toothed leaves differ widely in aspect from those with obovate-spathulate ones.

VAR. 1. *Roylei*; leaves obovate-spathulate subentire or erose mealy beneath, tip rounded, umbels few- or many-fld.—Kunawar and Sikkim.

VAR. 2. *Griffithii*, *Watt in Journ. Linn. Soc. ined.*; leaves ovate-cordate acute deeply toothed.—Bhotan and Sikkim.

26. *P. elongata*, *Watt. in Journ. Linn. Soc. Bot. ined.*; leaves long-petioled 3-5 in. membranous obovate or oblanceolate obtuse crenulate narrowed into a usually long petiole mealy or not beneath, scape tall, flowers few subsessile, bracts short subulate, calyx narrow cleft to the middle, teeth lanceolate, corolla yellow glabrous, tube very long, throat funnel-shaped not annulate, lobes rounded obovate toothed. (*Herb. Ind. Or. H. f. & T. Prim.* 14.)

SIKKIM HIMALAYA; Zemu valley, alt. 12-13,000 ft., *J. D. H.*

A rather slender species, with few yellow flowers remarkable chiefly for the length of the corolla-tube, with rounded toothed lobes, short bracts, and globose ovary with a subacute tip like *P. obtusifolia*, of which it is possibly a form. *Corolla-tube* $\frac{3}{4}$ of an inch long (including the throat), three times as long as the calyx. *Fruit* not seen.

†† Ovary rounded and usually thickened at the top. Capsule oblong or cylindric, exceeding the calyx.

27. *P. Stuartii*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii.* 20; mealy or not, quite glabrous, leaves 4-10 in. coriaceous suberect, broadly or narrowly oblanceolate or obovate-spathulate acute or obtuse quite entire crenulate or finely toothed, midrib very broad, petiole broadly membranous below, flowers loosely umbelled, bracts elongate, calyx terete, lobes usually long narrow acute rarely obtuse, corolla yellow or purple, mouth contracted, tube equalling the calyx-throat or long as the tube, limb various, seeds coarsely granulate.

Throughout the SUBALPINE and ALPINE HIMALAYA and TIBET; alt. 12-16,000 ft.—*DISTRIB.* Afghanistan.

After long study I am unable to draw any specific characters between the many forms of purple and yellow (rarely white) Primulas included under the above character. If there are species amongst them they hybridise so as to defy recognition by description. Each of the following varieties may have its small and great form with narrower or broader, entire and serrated, mealy and green leaves, many or few sessile or pedicelled flowers, more or less deeply-cut calyx, mealy on the outer only, or inner only, or on both surfaces, and a longer or shorter corolla-tube, with very variously formed lobes. The habit of the forms may be seen to depend on dryness or wetness of soil, or the length of herbage amongst which the plant grows, and elevation on the mountains, and many of the forms are no doubt constant and reproduced with much constancy by seed.

VAR. 1. Stuartii proper; leaves 5-10 in. narrowly oblanceolate or short and spathulate acute closely sharply toothed rarely entire yellow-mealy beneath, inflorescence more mealy, calyx-teeth linear or lanceolate acute or obtuse, corolla-lobes orbicular and emarginate or broadly obovate entire or toothed. *P. Stuartii*, *Wall. l.c.*; *Tent. Fl. Nep. t.* 34; *Cat.* 606 in part; *Don Prodr.* 80; *Duby in DC. Prodr. viii.* 41; *Bot. Mag. t.* 4356.—From Sikkim to Kashmir and Tibet

VAR. 2. purpurea; leaves as in var. 1 but seldom toothed and oftener broader white- or yellow-mealy beneath, flowers sometimes in two whorls, calyx as in var. 1 but sometimes nearly an inch long linear-oblong and round at the tip, corolla pale or deep purple, lobes obovate or 2-fid entire, capsule sometimes 1 in. *P. purpurea*, *Royle Ill.* 311, t. 77, f. 2; *Duby l.c.* 40; *Wall. Cat.* 606 (the Kumaon specimens). *P. macrophylla*, *Don Prodr.* 80. *P. Jäschkiana*, *Kerner in Bericht des Naturwiss. Medicin. Vereins Innsbruck, Jahrg. i. Heft 2*, 97.

VAR. 3. Moorcroftiana; not or very slightly mealy, leaves 2-4 in. oblanceolate acute usually quite entire, scape shorter fewer-flowered, calyx-lobes narrow acuminate corolla as in var. 1 purple. *P. Moorcroftiana*, *Wall. Cat.* 4988.—Western Tibet.

Wallich's specimens are miserable, but no doubt referable to the common Western Tibetan form described above; the flowers are sessile in his specimens, as they often are in high alpine forms. Strachey and Winterbottom's *P. Moorcroftiana*, from 16,800 ft. on the Niti Pass, Kumaon, is very dwarf, with leaves white-mealy beneath and sessile flowers.

VAR. 4. *macrocarpa*; leaves mealy beneath 2-5 in. oblanceolate obtuse or acute, calyx very large $\frac{1}{2}$ - $\frac{3}{4}$ in. long divided nearly to the base into linear-oblong obtuse leathery lobes, capsule 1 in.—Sikkim, alt. 15-17,000 ft., *J. D. H.*

VAR. 5. *lineariloba*; lobes of corolla narrow deeply divided into two spreading linear lobes.—Tibet N. of Sikkim, *J. D. H.* I have seen flowers only, procured by my collectors. Considering the range of variation in the corolla-lobes of this and other species, I do not doubt this being an alpine state of *Stuartii* allied to var. *purpurea*.

28. *P. sikkimensis*, Hook. f. in Bot. Mag. t. 4597; glabrous, leaves 6-14 in. membranous not mealy oblong-obovate or -spatulate obtuse, margins sharply toothed decurrent on a long broadly winged and often toothed petiole, scape very tall, bracts very short subulate, flowers very many yellow, pedicels slender, calyx strongly 5-angled and 5-ribbed, teeth subulate, corolla funnel-shaped, tube not annulate longer than the calyx, limb concave, lobes rounded emarginate.

SIKKIM HIMALAYA; in wet places, alt. 11-15,000 ft., *J. D. H.*, &c.

Rootstock as thick as the thumb, very short. *Leaves* often 2 in. diam., midrib not broad, nerves many slender. *Scape* often 2 ft. and as thick as a goose-quill, inflorescence sometimes mealy; bracts $\frac{1}{6}$ - $\frac{1}{2}$ in.; flowers 6-30, nodding; pedicels slender, $\frac{1}{2}$ -4 in. *Calyx* $\frac{1}{4}$ - $\frac{1}{2}$ in., teeth recurved. *Corolla* $\frac{3}{8}$ in. long and $\frac{1}{4}$ - $\frac{1}{2}$ in. broad, blue-green when dry, quite glabrous within and without. *Ovary* globose, crown rounded not thickened. *Capsule* oblong-cylindric, rather longer than the calyx, teeth short. *Seeds* coarsely granulate.—The tallest described *Primula*, more resembling the Cowslip than any other Indian one; odour faint, sweet.

**** *Scape* much longer than the leaves. *Flowers* 1-5. *Bracts* very few, slender or 0, base not gibbous or produced.

† *Tube of corolla cylindric or narrowly funnel-shaped, mouth glabrous or puberulous.*

29. *P. Kingii*, Watt *ms* glabrous, not mealy, leaves crowded 2-3 in. elliptic-lanceolate acute quite entire or obscurely crenulate, midrib stout, base sheathing broadly membranous, scape tall 4-5-fld., bracts subulate from a broad base, pedicels short puberulous, calyx narrowly subcampanulate 5-cleft above or to the middle, corolla red-purple broadly funnel-shaped puberulous very shortly 5-lobed, limb concave, lobes retuse glabrous within.

SIKKIM HIMALAYA; at Na-tong (*Herb. Calcutta*).

A very distinct species, with the habit of *P. Dickieana*, and the funnel-shaped shortly lobed corolla of *sikkimensis*. *Leaves* rather thick in texture, spreading, pale when dry. *Scape* 6-10 in., slender; bracts very unequal. *Calyx* $\frac{1}{2}$ in., obtusely angled. *Corolla* $\frac{1}{2}$ - $\frac{3}{4}$ in. diam., claret-coloured, glabrous within. *Ovary* with a rounded 5-lobed crown. *Fruit* not seen.

30. *P. Dickieana*, Watt in Journ. Linn. Soc. Bot. ined.; quite glabrous, not mealy, leaves elliptic-obovate or oblanceolate acute quite entire or serrate sessile or petiole elongate and narrowly membranous below, flowers 2-6 large yellow sessile or shortly pedicelled, bracts linear or subulate, calyx campanulate 5-cleft, lobes ovate oblong or lanceolate obtuse or acute, corolla yellow, tube twice as long as the calyx hairy within, mouth not annulate, lobes orbiculate, tube and disk of flat limb pubescent, ovary with a thickened obtuse tip. (*Herb. Ind. Or. H. f. & T. Prim.* 13.)

SIKKIM HIMALAYA; Lachen, on open banks, alt. 10-13,000 ft., *J. D. H.*

This, though in many respects approaching small states of *P. Stuartii*, seems quite distinct, in the total absence of scent, small leaves, few flowers, and hairy tube, and pubescent disk of the corolla. The leaves too are, if not quite entire, distantly and distinctly serrate, not toothed or crenate. It is a beautiful plant. *Fruit* not seen.

31. **P. Elwesiana**, *King in Herb. Calc.*; not mealy, leaves 2-3 in. oblanceolate subacute quite entire glabrescent coriaceous, nerves obscure, scape and solitary inclined very large purple flower softly pubescent, bract 0, calyx short 5-partite, segments ovate-lanceolate, corolla-tube funnel-shaped $\frac{3}{4}$ in. long, lobes obovate-oblong crenate spreading and recurved.

SIKKIM HIMALAYA; alt. about 12,000 ft., *King*.

Rootstock very stout, with broad fleshy leafy scales. *Leaves* narrowed into a broadly winged puberulous petiole. *Scape* 6-7 in., stout. *Flower* 1 in. long and wide, dark purple. *Calyx* $\frac{1}{2}$ in. long. *Corolla* pubescent all over. *Stamens* linear, on the mouth of the tube. *Ovary* very small, conical, acute; style filiform, stigma minute truncate.—A very remarkable and beautiful species.

32. **P. tenella**, *King in Herb. Calc.*; leaves small ($\frac{1}{2}$ in.) petioled obovate or trapeziform toothed above the middle mealy, scape filiform and large solitary erect bluish-white flower glabrous, bract very small, calyx 5-cleft to the middle, lobes obtuse, corolla-tube long slender, throat broadly funnel-shaped, lobes 5 very broadly and deeply obcordate.

E. TIBET; Chumbi valley, between Sikkim and Bhotan, at Phari, alt. about 13,000 ft., *King*.

Whole plant 2-2 $\frac{1}{2}$ in. high, glabrous. *Rootstock* stout. *Leaves* many, mealy all over, especially beneath, subacute, cuneate and entire below the middle. *Scape* very slender; bract close to and shorter than the calyx. *Corolla-tube* $\frac{1}{2}$ in., limb $\frac{3}{4}$ in. diam. *Stamens* near the base of the tube. *Stigma* included, large, peltately capitate.

†† *Mouth of saucer-shaped corolla densely woolly.*

33. **P. pusilla**, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 22; Cat. 609; Tent. Fl. Nep. t. 32*; densely tufted, hoary, leaves $\frac{1}{2}$ -1 in. spatulate or oblanceolate pinnatifidly toothed, scape very slender 1-4-fld., bracts few lanceolate, flowers sessile, calyx hoary, tube short terete, lobes oblong obtuse or acute equalling the funnel-shaped corolla-tube, corolla-lobes longer than the tube, lobules spreading, capsule included. *Duby in DC. Prodr. viii 42; Mem. Prim. t. 1, f. 2. P. humilis, Steudel Nomencl. ed. ii. 395. Androsace primuloides, Don Prodr. 81. A. primulina, Spreng. Syst. Veg. Cur. Post. 56.*

CENTRAL and EASTERN HIMALAYA; Nipal, *Wallich*; Sikkim, alt. 13-16,000 ft., *J. D. H., &c.*

Leaves in dense rosettes, 1-2 in. diam., petioled, margins and teeth recurved, hoary above; bracts sometimes leafy and toothed, glandular as is the calyx and corolla-tube. *Scape* 2-3 in. *Corolla* $\frac{1}{4}$ - $\frac{1}{2}$ in. diam.; lobules oblong, spreading.

††† *Corolla broadly funnel-shaped or subcampanulate, mouth glabrous.*

34. **P. sapphirina**, *Hook. f. & T. Herb. Ind. Or. Prim. 32*; very small, glabrous or hoary, leaves $\frac{1}{2}$ - $\frac{3}{4}$ in. obovate-spatulate obtuse pinnatifidly toothed, scape filiform 1-4-fld., bracts ovate-oblong, flowers sessile nodding, calyx-tube short terete equalling the obtuse lobes, corolla hoary, lobes very short 2-fld., capsule included.

SIKKIM HIMALAYA, alt. 13-15,000 ft., *J. D. H., &c.*

Rosettes $\frac{1}{2}$ - $\frac{3}{4}$ in. diam. *Leaves* with scattered white hairs above. *Scape* 1-2 in. *Corolla* $\frac{1}{4}$ in. diam., bright or pale blue.

35. **P. uniflora**, *Klatt in Linnæa xxxvii. 500*; not-mealy, leaves petioled $\frac{1}{2}$ in. orbicular or broadly ovate pinnatifidly crenate, scape very slender 1-2-fld., bracts very minute, flowers sessile very large nodding, calyx 5-partite segments quadrate, corolla broadly funnel-shaped, lobes shallow coarsely toothed.

SIKKIM HIMALAYA; Kankola Pass, alt. 15,000 ft., *J. D. H.*

This and the following are very singular species, the corolla being larger than the whole rosette of leaves, and calyx quite peculiar.—*Leaves* few, petiole puberulous, equalling or exceeding the blade. *Scapes* 1–3, 2–5 in. *Flower* 1 in. diam., with occasionally a very imperfect apetalous one. *Calyx* puberulous; segments nearly $\frac{1}{2}$ in. long, truncate, tip entire or toothed. *Corolla* pale lilac, tube $\frac{1}{2}$ in., limb $\frac{2}{3}$ in. long and broader, lobes very shallow and unequally toothed. *Stamens* near the bottom of the tube. *Ovary* globose.

36. *P. soldanelloides*, *Watt in Journ. Linn. Soc. Bot. ined.*; quite glabrous, not mealy, leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. long—petioled ovate runcinate-pinnatifid half-way to the midrib, scape capillary 1-fld, bract 0, flower large nodding, calyx cleft half-way, lobes oblong ovate or obtuse, corolla broadly funnel-shaped, lobes shallow coarsely toothed.

SIKKIM HIMALAYA; Kankola Pass, *J. D. H.*; Patangla (*Herb. Calcutta*).

A smaller plant than *P. uniflora*, quite glabrous, with a very different calyx, but similar corolla, which is white. *Calyx*-lobes entire or obscurely toothed. *Ovary* globose.

***** Minute species (except *P. petiolaris*). *Scape* 0, or much shorter than the leaves (sometimes elongate in *P. petiolaris*). *Bracts* subulate, at the bases of the leaves or on the very short scape. (See also *P. concinna* and *P. tibetica*.)

37. *P. petiolaris*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 22; Tent. Fl. Nep. t. 31; Cat. 603*; glabrous or puberulous, mealy or not, leaves 2–10 in. rugose densely rosulate membranous erose jagged toothed or crenulate of two forms in the same or different plants, some broadly or narrowly obovate-spathulate sessile or narrowed into a broadly winged petiole, others elliptic ovate or cordate on long slender petioles, pedicels long or short, calyx-teeth acute, corolla pale purple or white or pink, tube funnel-shaped above much longer than the calyx, mouth not annulate, limb flat, lobes rounded entire emarginate 2-fid or sharply toothed, ovary globose, tip acute, stigma capitate, capsule globose sunk in the broad calyx-tube, seeds large subglobose black papillose. *Duby in DC. Prodr. viii. 37. P. tridentata, Don Prodr. 77. P. sessilis, Royle mss.*

TEMPERATE HIMALAYA; from Simla to Bhotan, alt. 4–12,000, abundant. Fl. autumn and winter.

A most variable plant. The following forms pass into one another in all ways:—

VAR. 1. *petiolaris proper*; not mealy, leaves mostly elliptic, blade 1–3 in., petiole 2–6 in., scape 0, corolla large, lobes broad 2-fid or many-toothed.

VAR. 2. *nana*; slightly mealy or not, leaves all or mostly obovate-spathulate sessile or shortly petioled, corolla smaller, lobes obcordate entire or toothed. *P. nana, Wall. l. c. 23; Cat. 612; Griff. Ic. Pl. Asiat. t. 485, f. 2 (Primula).*

VAR. 3. *Stracheyi*; not mealy, leaves all obovate-spathulate erose, flowers very numerous, scape 0, calyx small, corolla $\frac{1}{2}$ in. diam., tube long, lobes narrower obcordate entire.—Kumaon, at Namil, alt. 8000 ft., *Strach. & Winterb. (Prim. 12).*

VAR. 4. *sulphurea*; leaves 2 in. sessile obovate clothed with yellow meal beneath finely toothed, corolla small $\frac{1}{2}$ in. diam., tube not twice the length of the small calyx, lobes entire or lacerate.—Kumaon, at Suring, alt. 4500 ft., *Strach. & Winterb. (Prim. 10).*

VAR. 5. *pulverulenta*; covered all but the corolla with yellow meal, leaves all obovate-spathulate and irregularly toothed, flowers very numerous and large, corolla 1–1 $\frac{1}{4}$ in. broad, tube twice as long as the calyx-lobes coarsely toothed.—Kumaon, at Pindaree, alt. 10–12,000 ft.; *Edgeworth, &c. (Strach. & Winterb. Prim. 9).*

VAR. 6. *Edgeworthii*; buds only mealy, leaves very large 3–4 in. without the petiole which is often as long ovate or elliptic base truncate acute or cordate, margin irregularly coarsely toothed or lobulate with toothed lobules, pedicels stout, calyx

cupular with broad short lobes.—Garwhal, at Tungnath, alt. 8–900 ft., *Edgeworth*; Simla, alt. 7–10,000 ft., *Thomson*; Kumaon, at the Madhari Pass, alt. 8000 ft., *Strach.* & *Winterb.* (*Prim.* 8).

VAR. 7. *scapigera*; leaves as in var. 1, scape very stout equalling or exceeding the leaves, bracts short subulate from a broad base, pedicels 1–2 in. stout with sometimes a few small leaves intermixed.—Bhotan, *Griffith*; Sikkim, alt. 8–12,000 ft., *J. D. H.*

38. **P. minutissima**, *Jacquem. mss. in DC. Prodr.* viii. 42; very small, densely tufted, stoloniferous, leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. spatulate lanceolate or oblanceolate acuminate acute or obtuse toothed above glabrous or puberulous mealy beneath, scape sunk amongst the leaves 1–3-fld., flowers sessile 1–2-bracteate, calyx cleft to the middle, tube terete, lobes oblong or lanceolate much shorter than the long corolla-tube, corolla very large for the plant, lobes obcordate. *Duby Mem. Prim.* t. 1, f. 3. *P. Saundersiana*, *Herb. Koyle.* *P. Stracheyi*, *Hook. f.*; *Munro in Garden*, 1879, 535.

ALPINE HIMALAYA, alt. 12–16,000 ft.; from Kashmir to Kumaon, alt. 12–15,000 ft. Forming large patches of rosettes each $\frac{1}{2}$ – $\frac{3}{4}$ in. diam. Leaves densely crowded, dark green, teeth not recurved. Calyx glabrous, lobes very variable. Corolla bright purple, $\frac{1}{4}$ – $\frac{1}{2}$ in. diam., tube glabrous, lobes bifid, lobules rounded. Ovary globose, tip subacute; stigma capitate.—This may be a reduced form of *P. Heydei*.

VAR. *spatulata*; leaves larger spatulate-obovate crenate, tip rounded. Corolla $\frac{2}{3}$ in. diam. Sikkim, alt. 13,000 ft., *J. D. H.*

39. **P. reptans**, *Hook. f.*; minute, not mealy, tufted, minutely puberulous, stem creeping, leaves $\frac{1}{4}$ – $\frac{1}{2}$ in. long including the petiole orbicular cleft one-third way down into lobules with recurved margins, flowers solitary shortly pedicelled erect much larger than the foliage, calyx small terete cleft to the middle, lobes oblong obtuse one-fourth the length of the corolla-tube which is long with a narrowly funnel-shaped mouth and spreading deeply 2-fid lobes.

WESTERN HIMALAYA; *Falconer*; Kashmir, Burjila, alt. 14,500 ft., *Clarke*.

The creeping stem, minute rounded leaves $\frac{1}{16}$ – $\frac{1}{8}$ in. diam., suddenly contracted into the slender petiole, palmately lobulate except at the very base, and the large flowers, well characterise this little species. Corolla pale purple, $\frac{1}{2}$ in. diam., tube $\frac{1}{4}$ in. long. Ovary globose, tip acute; stigma globose.

40. **P. Hookeri**, *Watt in Journ. Linn. Soc. Bot. ined.*; tufted, glabrous, not mealy, leaves $\frac{1}{2}$ –1 in. usually sessile narrowly obovate-oblong or -spatulate tip rounded margin sharply toothed and recurved, midrib very broad, outer reduced to large sheaths, scape 0 or very short, flowers 1–3 very shortly pedicelled, calyx cupular or campanulate glandular with 5 very short broad acute teeth, corolla-tube wide cylindric twice as long as the calyx, lobes short 2-fid rounded. *Herb. Ind. Or. H. f. & T. Prim.* 25.

SIKKIM HIMALAYA; Lachen, alt. 12,000 ft., *J. D. H.*

A very distinct species, differing in the calyx from any of the group.—Roots stout, fleshy. Leaves dark green, rather fleshy, rarely produced into a petiole, teeth often recurved, outer reduced to oblong fleshy scales toothed at the tip. Corolla white, mouth without a thickened ring; lobes about as long as the tube. Ovary globose, tip acute; stigma globose.

41. **P. muscoides**, *Hook. f.*; minute, glabrous, not mealy, densely tufted, leaves $\frac{1}{16}$ – $\frac{1}{10}$ in. sessile obovate-oblong or subspatulate dilated at the base margins recurved coarsely toothed or oblong and toothed at the tip only, midrib very broad, flowers solitary subsessile with 2 broad ovate bracts, calyx short



cleft nearly to the base, lobes oblong-lanceolate, corolla-tube twice as long as the calyx cylindric, lobes short. *Herb. Ind. Or. H. f. & T. Prim.* 23; *Watt in Journ. Linn. Soc. ined.*

SIKKIM HIMALAYA; Kankola Pass, alt. 15,000 ft., *J. D. H.*

Much the smallest species of the genus, forming moss-like tufts interlaced with the roots and stems of other small plants. It is most allied to *P. Hookeri*. Ovary globose, tip acute, stigma capitate.

VAR. ? *tenuiloba*; leaves with short petioles, corolla-tube narrower slightly hairy, lobes very narrow deeply cleft with narrow lobules.—Sikkim Himalaya; Yeumtong, alt. 14,000 ft., *J. D. H.*; (*Herb. Ind. Or. H. f. & T. Prim.* 22). I have very few specimens of this, which may prove a distinct species.

42. *P. Stirtoniana*, *Watt in Journ. Linn. Soc. Bot. ined.*; not mealy, glandularly puberulous; tufted, leaves $\frac{1}{2}$ in. obovate-spathulate tip rounded margins flat sharply closely toothed, midrib slender, scape 0, flowers solitary on slender pedicels sunk amongst the leaves, calyx cleft to the middle, teeth lanceolate acute entire or toothed, corolla-tube twice as long as the calyx, mouth funnel-shaped, lobes deeply cleft entire or crenate.

SIKKIM HIMALAYA; Kangladamo Pass, alt. 14–16,000 ft., *Watt*.

In size this much resembles *P. Hookeri*, but it differs entirely in the shape of the leaves, calyx, and corolla tube. Bracts 0 or 1–2 very slender ones on the pedicel. Corolla bright purple, $\frac{1}{2}$ – $\frac{2}{3}$ in. diam., glabrous. Ovary obovoid, tip thickened retuse; stigma capitate.

C. Leaves narrowed into a broad winged petiole, complicate in vernation. Scapes many, longer than the leaves. Flowers in superimposed whorls. Bracts few, leafy, toothed.

43. *P. floribunda*, *Wall. Tent. Fl. Nep. t.* 33; *Cat.* 1825; glandular-pubescent, leaves elliptic acute or obtuse narrowed into a broad winged petiole coarsely irregularly toothed, whorls 2–8, pedicels very unequal, bracts ovate or elliptic, acuminate toothed, calyx campanulate, lobes acute, corolla yellow, tube long, limb small, lobes obcordate. *Duby in DC. Prodr.* viii. 35. *P. obovata*, *Wall. Cat.* 610. *Androsace obovata*, *Wall. mss.*

WESTERN HIMALAYA; from Kumaon to Kashmir, alt. 2500–6500 ft.—DISTRIB. Afghanistan.

Leaves 2–4 in. Scapes numerous, stout, 4–8 in.; pedicels $\frac{1}{2}$ –1 in.; bracts shorter. Calyx glandular, hemispheric in fruit, cleft to the middle; lobes ovate, acute. Corolla-tube $\frac{1}{4}$ – $\frac{1}{3}$ in., pubescent, throat more or less dilated, mouth annulate; limb $\frac{1}{4}$ – $\frac{1}{2}$ in. diam. Ovary globose, top rounded; stigma globose. Capsule globose, included in the hemispheric calyx. Seeds $\frac{1}{16}$ in., black, angled, minutely papillose.—Closely allied to the Arabian and Abyssinian *P. verticillata* and *P. simensis*.

2. ANDROSACE, Linn.

Perennial rarely annual low herbs. Leaves various, rosulate or imbricate on the branches. Flowers small, white or red. Calyx 5-lobed or -partite. Corolla salver-shaped with a very short tube, or funnel-shaped, limb 5-lobed, mouth annulate or with folds opposite the lobes. Stamens 5, anthers subsessile, included in the tube, obtuse. Ovary globose, style short. Capsule ovoid or globose, 5-valved. Seeds 2, rarely more, angular or subglobose, embryo transverse.—Species about 40, chiefly mountain plants, all of N. temperate or Arctic regions.



* Scapes numerous. Leaves all radical. Stolons 0, except in *A. geraniifolia*.

+ Leaves long-petioled, rounded-cordate, lobulate and crenate.

1. *A. saxifragæfolia*, Bunge Enum. Pl. Chin. Bor. 53; annual, glandular-pubescent, leaves rounded-cordate crenate-toothed, blade about as long as the petiole, calyx deeply 5-cleft, segments elliptic-acuminate stellately spreading in fruit. *Duby in DC. Prodr.* viii. 53. *A. rotundifolia*, Wall. Cat. 613; *Smith Exot. Bot.* t. 113; *DC. l. c.* 54 (not of *Hardwicke*) *A. patens*, *Wright in Mem. Amer. Acad. Sc. ser.* 2, vi. 401. ? *A. carnosula*, *Duby in DC. l. c.* 54.

GANGETIC PLAIN, from Calcutta to the Punjab, and ascending the Himalayas to 4000 ft.—DISTRIB. N. E. China, Japan, Loochoo Islands.

The only annual Indian species. Leaves $\frac{1}{2}$ – $\frac{3}{4}$ in. diam. Scapes many, twice as long as the leaves; invol. bracts, $\frac{1}{2}$ in.; pedicels $\frac{1}{2}$ – $1\frac{1}{2}$ in., very unequal. Calyx fruiting $\frac{1}{2}$ – $\frac{3}{4}$ in. diam. Corolla narrower or broader than the calyx. Seeds minute, subglobose, deeply pitted.—A plant confused with *Hardwicke's A. rotundifolia* by Wallich, Smith and others, and with a third species by Roemer and Schultes (see Obs. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 1.).

2. *A. rotundifolia*, *Hardwicke in As. Research.* vi. 350; perennial, glandular-pubescent or villous, leaves rounded-cordate lobulate the lobules usually 3-crenate, blade usually shorter than the petiole, bracts lanceolate or obovate crenate sessile or petioled entire or sharply toothed, calyx cleft to the middle, segments ovate recurved in fruit. Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 14, excl. Obs. *A. incisa*, Wall. l. c. 16; Cat. 616; *Duby in DC. Prodr.* viii. 54. *A. parviflora*, *Jacquem. mss. in DC. l. c.* 54; *Mem. Prim.* t. 3, f. 4. *A. elegans*, *Jacquem. mss. l. c.* 55.

TEMPERATE HIMALAYA, alt. 5–11,000 ft., from Kashmir to Kumaon, and in WESTERN TIBET.

Very variable. Leaves $\frac{1}{2}$ – $1\frac{1}{2}$ in. diam., petiole 1–4 in.; lobes very shallow, sometimes the sinus is not deeper than that of the crenatures. Scapes few or many, 1–6 in.; invol. bracts short or long, broad or narrow, sometimes $\frac{2}{3}$ in. long and deeply 5-cleft at the broad end. Calyx fruiting $\frac{1}{2}$ – $\frac{3}{4}$ in. diam., sometimes much enlarged, nearly 1 in. diam. and acutely toothed or 3-fid at the tip. Corolla usually much larger than the calyx, but when the latter is enlarged it becomes very small and even minute. Capsule much smaller than the calyx. Seeds minute, rounded, granulate.—I cannot doubt this being *Hardwicke's A. rotundifolia*, found by him on "the most elevated mountains of Shreenugur," and described as having toothed invol. leaves. Wallich referred *A. saxifragæfolia* to *Hardwicke's rotundifolia*, and re-describes the latter as *A. incisa*.

VAR. 1. *rotundifolia proper*; softly pubescent or villous, 3–5 in. high, lobules of leaf rounded entire or crenate rarely acutely toothed, corolla rarely exceeding the entire calyx-lobes.—Kumaon to Kashmir, alt. 3–9000 ft.

VAR. 2. *macrocalyx*, *Watt in Journ. Linn. Soc. ined.*; habit, pubescence and leaves of var. 1, but calyx-lobes much larger acutely toothed.—Kashmir, alt. 5–9500 ft.

VAR. 3. *glandulosa*; usually 5–12 in. high, glandular pubescent, petioles and scapes more slender, lobules of leaves rounded entire truncate or crenate rarely acutely toothed, corolla usually much larger than the entire calyx-lobes.—Drier ranges of Lahul and Kashmir; abundant in Western Tibet, alt. 7–12,000 ft.—A form affecting high dry regions.

VAR. 4. *Stracheyi*, *Watt l. c.*; glandular-pubescent or glabrescent, 4–6 in. high, scapes and petioles slender, lobules of leaf entire or crenate, calyx in flower large campanulate, lobes quite entire much exceeding the calyx.—Garwhal, at Bampa, alt. 11,000 ft., *Str. & Winterb.* Kunawur, alt. 8–11,000 ft., *Munro, Thomson, Brandis.*



VAR. 5. *Thomsoni*, Watt l. c.; much smaller, glandular-puberulous, leaves small, lobules acutely toothed, petioles filiform, flowers small, corolla exceeding the entire calyx lobes.—Western Tibet; Dras river, *Thomson*; Iskardo, alt. 9000 ft., and Barji la, alt. 11,000 ft., *Clarke*.

3. *A. geraniifolia*, Watt in Journ. Linn. Soc. ined.; perennial, stoloniferous, laxly villous with soft spreading hairs, leaves rounded-cordate 7-lobed to the middle, lobes 3-lobulate, petiole much longer than the blade, bracts very small lanceolate acuminate quite entire, calyx campanulate 5-cleft above the middle, corolla exceeding the calyx.

KUMAON; at Dwali, alt. 8200 ft., *Strach. & Winterb.* SIKKIM in damp woods at Lachen, alt. 9–10,000 ft., *J. D. H.*

Stolons a foot long, very slender. *Leaves* 1–2 in. broad, petiole 2–6 in. *Scapes* much longer than the leaves; invol. bracts $\frac{1}{2}$ in. *Calyx* small, broadly campanulate, $\frac{1}{10}$ – $\frac{1}{8}$ in. diam.; lobes broad or narrow, recurved.

†† *Leaves lanceolate elliptic or spatulate, densely rosulate.*

4. *A. septentrionalis*, Linn.; Boiss. Fl. Orient. iii. 17; glabrous, leaves small densely rosulate sessile oblanceolate acute or obtuse, scapes rigid, invol. bracts minute subulate, calyx turbinate 5-toothed, corolla very small. *Duby* in DC. Prodr. viii. 52; Lamk. Ill. t. 98, f. 2; Fl. Dan. t. 7; Bot. Mag. t. 2021; Nees Ic. Gen. Fl. Germ. v. t. 6; Reichb. Ic. Fl. Germ. xvii. t. 1110.

WESTERN TIBET; *Falconer*; Karakoram and Deosar, alt. 12–14,000 ft., *Clarke*.—DISTRIB. Mid-Europe, Caucasus, N. Asia, Arctic America.

Leaves in Tibetan specimens $\frac{1}{4}$ – $\frac{1}{2}$ in., coriaceous, densely packed, quite entire or obscurely toothed. *Scapes* many, 4–6 in., one usually much stouter than the rest and rather longer; invol. bracts $\frac{1}{10}$ – $\frac{1}{8}$ in.; pedicels 1–2 in., very unequal. *Flowering calyx* $\frac{1}{12}$ – $\frac{1}{10}$ in. diam., fruiting about $\frac{1}{8}$ in., teeth acute. *Corolla* very small. *Seeds* small, angular, granulate.

5. *A. Aizoon*, *Duby* in DC. Prodr. viii. 50; perennial, inflorescence glandular-pubescent, leaves densely rosulate sessile cartilaginous spatulate cuspidate ciliolate, scapes very long, invol. bracts small lanceolate, calyx between hemispheric and turbinate cleft to the middle, corolla small. *Dcne* in Jacquem. Voy. Bot. 141, t. 145.

KASHMIR AND WESTERN TIBET; alt. 8–11,000 ft., *Jacquemont, Falconer, &c.*

Leaves $\frac{1}{4}$ –1 in., very numerous and most densely rosulate, margins thickened when dry. *Scapes* $\frac{1}{2}$ –2 ft.; invol. bracts $\frac{1}{10}$ in., ovate; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in., very unequal. *Calyx* turbinate; lobes oblong, obtuse. *Corolla-lobes* 2-fid with 2-fid appendages. *Capsule* with 2-fid valves. *Seeds* large, angular, rough.

** Scapes solitary; flowers umbelled, except in 1-flowered varieties of *A. villosa*.

† *Leaves minute, cartilaginous, glabrous except the strongly ciliate margins.*

6. *A. sempervivoides*, *Jacquem.* in DC. Prodr. viii. 50; small, stoloniferous, leaves densely rosulate obovate-spatulate apiculate ciliate cartilaginous, scape solitary, umbels glandular-pubescent, pedicels short; calyx cleft to the middle, lobes obtuse, corolla-lobes obovate, tips rounded. *Duby* Mem. Prim. t. 3, f. 2.

WESTERN TIBET; *Jacquemont, Falconer.* Sind Valley, KASHMIR alt. 11,000 ft., *Clarke*.—DISTRIB. Afghanistan (a form with longer narrow leaves).

Rosettes $\frac{1}{2}$ in. diam., subglobose. *Stolons* short, 1–1 $\frac{1}{2}$ in., stout, naked. *Leaves* glabrous on both surfaces, $\frac{1}{4}$ – $\frac{1}{2}$ in., margins translucent when dry. *Scape* 1–3 in.,

stout; bracts linear-oblong; pedicels short, stout. *Calyx* broadly turbinate, lobes erect in fruit. *Capsule* 1-2-seeded. *Seeds* large, oblong, plano-convex.

7. **A. microphylla**, Hook. f.; densely tufted, stolons 0 or obscure, leaves minute densely imbricate on the short crowded branches sessile obovate concave incurved cartilaginous ciliate, scapes very short and small, umbels glandular-pubescent, calyx cleft to the middle; lobes obtuse, corolla-lobes obovate tips rounded mouth annulate. *A. globifera*, Klatt in *Linnæa*, xxxii. 292 (not of Duby). *A. villosa*, Herb. Ind. Or. H. f. & T., not of Linn.

KASHMIR; inner ranges; Brazil and Tilail, alt. 12-13,000 ft., Thomson, Clarke. WESTERN TIBET, Falconer.

Stems 1-6 in., sometimes rigid, with subremote rosettes. Leaves $\frac{1}{12}$ - $\frac{1}{8}$ in., obtuse or mucronate or cuspidate. Scapes $\frac{1}{4}$ -1 in., 3-6-fl. Flowers and seeds as in *A. sempervivoides*, but ring at mouth of corolla not produced. Seeds 2, oblong, angular.

†† Leaves large or small, pubescent villous or silky.

8. **A. sarmentosa**, Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 14; Pl. As. Rar. iii. t. 206; Cat. 614, and 615 in part; pubescent villous or silky, stolons leafless except at the nodes, leaves sessile or petioled elliptic-lanceolate or oblanceolate subacute, bracts various entire silky, umbels lax or dense, calyx cleft half-way, lobes obtuse, corolla-throat obscurely annulate. Duby in DC. Prodr. viii. 49; Bot. Mag. t. 6210.

TEMPERATE AND SUB-ALPINE HIMALAYA, from Sikkim to Kashmir.

A very variable plant, in size, habit, clothing, length, and shape of invol. leaves, and number, length, and stoutness of pedicels.—*Calyx* hemispheric. *Corolla* twice as broad, pale rose-purple with a yellowish eye, lobes broadly obovate, tips rounded; throat with a raised ring. *Capsule* broadly oblong, valves entire. *Seeds* few or many, oblong or subglobose, granulate. The following varieties have no precise limits.

VAR. 1. *Watkinsi*; laxly hairy or silky, scapes and stolons stout, leaves $\frac{1}{2}$ -1 in., lanceolate or oblanceolate subsessile or sessile, pedicels $\frac{1}{2}$ -1 $\frac{1}{2}$ in. much longer than the invol. bracts.—Nipal.

VAR. 2. *grandifolia*; pubescent or laxly hairy, stolons 0, scape stout, leaves very large sometimes 1 in. diam. elliptic or lanceolate narrowed into the long or short petiole, bracts very small. *A. foliosa*, Klatt in *Linnæa* xxxii. 293, not of Duby.—Sikkim, at Tungu, alt. 13-14,000 ft., J. D. H.

VAR. 3. *primuloides*; silkily villous, leaves as in var. 1 but often narrowed into a petiole, and stolons (often absent) and scapes more slender. *A. primuloides*, Duby l. c. 30; Mem. Prim. t. 3, f. 3—Kumaon, alt. 12,000 ft., Edgeworth. Kashmir, Zanskar, and Lahul, al. 8-10,000 ft.

VAR. 4. *foliosa*; leaves long petioled elliptic 1 in. diam., stolons 0?, scape slender, bracts small linear. *A. foliosa*, Duby in Jacquem. Voy. Bot. 142, t. 146; DC. l. c. 49; Banehal, Jacquemont.

9. **A. lanuginosa**, Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 15; Cat. n. 615 and 614 in part; pubescent or silkily villous, stolon-like branches long leafy throughout and with scattered rosettes, leaves lanceolate acute or acuminate, scape solitary, invol. bracts various entire silky, umbels lax or dense, calyx cleft half-way, lobes obtuse, corolla-throat obscurely annulate. Bot. Mag. t. 4005.

WESTERN HIMALAYA; alt. 7-10,000 ft., from Kumaon to Kashmir.

Very similar in calyx and corolla to *A. sarmentosa*, and as variable in stature and clothing, but in habit entirely different, the ascending branches 1-10 in. long only resemble stolons, and never root, the leaves are smaller, always sessile and much more densely silky in the ordinary state of the plant, the flowers are smaller. *Capsule* 4-6-

seeded. Seeds angular, granulate.—In Wallich's Herbarium the ticket of this has been inadvertently attached to a sheet of *A. sarmentosa*.

VAR. 1. *typica*, densely clothed with white silky hairs, stems and branches elongate, umbels dense-fld., pedicels short.—Throughout the Western Himalaya.

VAR. 2. *glabrior*, Wall.; more slender, sparingly villous or silky, umbels loose, pedicels $\frac{1}{2}$ –1 in. slender.—Kumaon to Sirmore.

10. *A. villosa*, Linn.; Boiss. *Fl. Orient.* iii. 13; stoloniferous, densely villous, leaves in small globose rosettes sessile lanceolate or spatulate, scapes solitary, invol. leaves usually equalling the pedicels, calyx cleft half-way, lobes obtuse, corolla-lobes obovate, tips rounded, mouth with a conical erect tubular swelling. *Duby in DC. Prodr.* viii. 50; *Jacq. Coll.* i. t. 12; *Reichb. Ic. Crit.* iii. t. 248, vi. t. 580; *Ic. Fl. Germ.* xvii. t. 1112. *A. Jacquemontii*, *Duby l. c.* 50; *Mem. Prim.* t. 3, f. 1.

WESTERN HIMALAYA; in the drier regions from Kumaon to Kashmir and WESTERN TIBET, alt. 12–17,000 ft.—DISTRIB. Afghanistan, Caucasus, Alps, Asia Minor, Central and N. Asia.

Prostrate, in tufted masses of short naked stems and stolons bearing at close intervals villous rosettes $\frac{1}{2}$ –1 in. diam.; much resembling a very small state of *A. sarmentosa* or *lanuginosa*, but the corolla has a prominent conical ring at the mouth. The scapes are sometimes shortened, and the umbels sessile. Boissier identifies *A. Jacquemontii* with *A. villosa*, I think rightly. I distinguish it from states of *A. Chamæjasme* with great difficulty.

11. *A. Hookeriana*, Klatt in *Linnaea* xxxii. 293, t. iii. f. 1; sparingly pubescent, loosely tufted, stolons and branches rigid divaricate, rosettes of few unequal small petioled obovate or elliptic obtuse flat leaves, scapes solitary slender few-fld., bracts linear, calyx-lobes obtuse, corolla-lobes obovate, tips retuse, mouth annulate.

SIKKIM HIMALAYA; Lachen, alt. 12–14,000 ft., J. D. H.

Branches divaricating. Leaves $\frac{1}{2}$ – $\frac{1}{2}$ in., narrowed into petioles of sometimes the length of the blade. Scapes $\frac{1}{2}$ –3 in. Corolla much larger than the calyx, pink. Capsule 2-seeded.

12. *A. Chamæjasme*, Host; Boiss. *Fl. Orient.* iv. 14; laxly villous with jointed hairs, loosely tufted, stolons and branches slender, rosettes of many densely tufted sessile small obovate ovate-oblong or lanceolate spreading or imbricate leaves, scape solitary hairy few-fld., bracts linear-oblong or spatulate equalling the pedicels, calyx-lobes obtuse, corolla-lobes longer obovate, tips rounded, mouth annulate. *Duby in DC. Prodr.* viii. 51; *Reichb. Ic. Crit.* vi. t. 580; *Ic. Fl. Germ.* xvii. t. 1112; *Lodd. Bot. Cab.* t. 232. *A. villosa*, *Jacq. Fl. Austr.* t. 352.

WESTERN TIBET, *Henderson*; Barjila and Karakoram, alt. 12–15,000 ft., *Clarke*.—DISTRIB. Alps, Arctic Russia, Central and N. Asia, Arctic America.

VAR. *coronata*; leaves densely tufted imbricate shorter and narrower, mouth of corolla with the ring prominent.—Western Tibet, alt. 16–17,000 ft., *H. Strachey*, *Henderson*.

VAR. *uniflora*; leaves densely imbricate, scape very short 1–2-fld.—Western Tibet; Ralam, N. of Kumaon, *Strach. & Winterh.*, No. 8.

Apparently identical with the European, &c. plant, and like it variable in the size of the whole plant and of the leaves. Rosettes $\frac{1}{3}$ – $\frac{1}{2}$ in. diam. Leaves $\frac{1}{4}$ – $\frac{1}{3}$ in., obtuse or subacute. Flowers and capsules as in *A. Hookeriana*.

*** Scapes solitary, 1–2-fld., or peduncle 1-fld.

13. *A. muscoidea*, *Duby in DC. Prodr.* viii. 48; villous, stems elongate forming dense broad patches, leaves densely imbricated in close-set globose

balls the size of a pea sessile linear or oblong obtuse incurved, scape very short 1-fl. ebracteate, calyx cleft one-third way down, lobes subacute, corolla-lobes obovate, tips rounded.

KASHMIR; *Jacquemont, Falconer.*

Patches 6-10 in. diam., of crowded branches and stolons 2-6 in. long, naked below or covered almost throughout their length with the little balls of leaves. Flowers numerous, $\frac{1}{10}$ in. diam.; pedicels $\frac{1}{16}$ - $\frac{1}{10}$ in. Calyx between turbinate and hemispheric. —I can hardly doubt this being the plant described by Duby, though the calyx is not 5-partite, nor its lobes lanceolate.

14. **A. globifera**, *Duby in DC. Prodr.* viii. 48; pubescent, stems very short forming small patches, leaves densely imbricate in subsolitary globose balls the size of a pea sessile broadly obovate obtuse or subacute incurved with pubescent surfaces and long silkily ciliate margins, the older glabrate, scape very short 1-fl. ebracteate, calyx cleft one-third way down, lobes obtuse, corolla-lobes obovate, tips rounded.

KUMAON, *Jacquemont*; Barjikang Pass and Rogila, alt. 12-15,000 ft., *Madden, Strach. & Winterb., &c.*

This may be a high alpine state of *A. Chamaejasme*, with short much broader and sessile leaves, and solitary flowers. The floral bract, though apparently absent, is in this species and its allies at the base of the pedicel amongst the leaves.

15. **A. Selago**, *Hook. f. & Thoms. mss.*; *Klatt in Linnæa*, xxxii. 292; silkily shortly villous forming spherical tufts, branches densely packed radiating from the root interruptedly or uniformly clothed with compactly imbricating minute leaves hence cylindric and obtuse, leaves sessile linear- or cuneate-obovate obtuse membranous and glabrous below the middle coriaceous and silkily ciliate above it, uppermost elliptic subacute incurved, scape 1-2-fl. and bract villous, calyx cleft below the middle, lobes oblong obtuse, corolla-lobes obovate-oblong obtuse.

SIKKIM HIMALAYA, and North of it, in the Tibetan region, alt. 15-18,000 ft., *J. D. H.*

Root woody; branches with the leaves $\frac{1}{8}$ - $\frac{1}{2}$ in. diam., extremities silvery. Leaves $\frac{1}{14}$ - $\frac{1}{12}$ in. long. Scape slender, $\frac{1}{10}$ in.; bracts silky, equalling the flower, which is $\frac{1}{12}$ in. diam. Calyx hemispheric, $\frac{1}{3}$ in. diam., enclosing the capsule. Seeds 2, minute, irregularly oblong or ellipsoid. —A singular and beautiful plant.

16. **A. Lehmanni**, *Wall. Cat.* 617; densely tufted, glabrous except the minute woolly scales sunk in the rosettes and the inflorescence, leaves in continuous or interrupted subsquarrose whorl-like rosettes subulate or oblong-lanceolate acuminate sessile spreading and recurved from a broad imbricating membranous base, scape 1-fl. very short ebracteate and flower glandular-pubescent, calyx turbinate, lobes short obtuse, corolla-lobes orbicular. *Duby in DC. Prodr.* viii. 48.

NIPAL; *Wallich*. SIKKIM, at Jongri, alt. 12-14,000 ft.; *J. D. H., T. Anderson.*

A very singular species, of a dark chestnut colour when dry, and squarrose habit. Stems 1-4 in., with the leaves $\frac{1}{4}$ - $\frac{1}{2}$ in. diam. Leaves $\frac{3}{8}$ - $\frac{1}{2}$ in. long, rather rigid, their dark colour contrasting with the snow-white clusters of minute lanceolate scales that nestle in the centre of the rosettes. Pedicels $\frac{1}{16}$ - $\frac{1}{10}$ in. long. Calyx $\frac{1}{12}$ in. diam.

UNDETERMINABLE SPECIES.

A. CORDIFOLIA, *Wall. in As. Research.* xiii. 371, and in *Roxb. Fl. Ind.* ii. 17; villous, leaves ovate-cordate obtuse sinuate crenulate, scapes almost equalling the petioles, umbels 5-fl., bracts setaceous, calyx campanulate shorter than the corolla, enlarging over the fruit. —Forests of Nipal.

3. **CORTUSA**, Linn.

Scapigerous perennial pubescent herbs. *Leaves* long-petioled, rounded-cordate, 7-9-lobed. *Scapes* slender. *Flowers* umbelled, purple. *Calyx* campanulate, 5-lobed. *Corolla* between funnel- and bell-shaped, tube short; throat naked; lobes 5, oblong, obtuse. *Anthers* 5, subsessile at the base of the corolla, sagittate, connivent, acute. *Style* filiform, exserted. *Capsule* ovoid, 5-valved, many-seeded.—**DISTRIB.** Species 1 or 2; natives of Mid-Europe, N. Asia and the N.W. Himalaya.

C. Matthioli, Linn.; *DC. Prodr.* viii. 55; *Reichb. Ic. Fl. Germ.* t. 1081; *Bot. Mag.* t. 987.

KASHMIR and LAHUL, alt. 7-9000 ft., *Jacquemont, Falconer, &c.*—**DISTRIB.** Afghanistan, Alps of Europe, N. Asia.

Leaves membranous, 1-4 in. diam.; lobes shallow, crenate-toothed; petiole 4-6 in. *Scapes* much taller than the petioles. *Umbels* 6-10-fld.; pedicels slender, very unequal; invol. bracts $\frac{1}{2}$ - $\frac{3}{4}$ in., lanceolate. *Calyx* small, lobes ovate. *Corolla* $\frac{1}{2}$ - $\frac{3}{4}$ in. diam., cleft to the middle.

4. **BRYOCARPUM**, Hook. f. & Thoms.

A scapigerous glabrous herb. *Leaves* ovate or ovate-cordate, obtuse, subcrenate, with scattered orbicular scales beneath; petiole winged. *Scapes* slender, 1-fld. *Flower* nodding, yellow. *Calyx* of 7 subulate-lanceolate divisions. *Corolla* between funnel- and bell-shaped, 7-lobed to the middle, throat naked, lobes 2-fld. *Stamens* 7, filaments short; anthers oblong, acuminate. *Ovary* narrowly oblong, scaly; style slender; placenta columnar. *Capsule* elongate-cylindric, many-seeded, the top with the style falling away.

B. himalaicum, Hook. f. & Thoms. in *Kew Journ. Bot.* ix. 199, t. 5.

SIKKIM HIMALAYA; in pine woods at Lachen, alt. 8-10,000, *J. D. H.*

Rootstock stout. *Leaves* $\frac{1}{2}$ -3 in. long, coriaceous; petiole about as long. *Scapes* 1-3, much longer than the leaves, very slender. *Corolla* $\frac{2}{3}$ in. long, twice as long as the calyx. *Capsule* 2-2 $\frac{1}{2}$ in. long, erect, very membranous. *Seeds* (young) orbicular.

5. **LYSIMACHIA**, Linn.

Erect procumbent or creeping herbs. *Leaves* quite entire, opposite alternate or whorled. *Flowers* solitary racemed or spicate. *Calyx* 5-6-partite. *Corolla* rotate or funnel-shaped, 5-6-partite. *Stamens* inserted on the base of the corolla-lobes. *Ovary* subglobose; style filiform, persistent, ovules many. *Capsule* globose or subglobose, 5-valved or bursting irregularly, many-seeded. *Seeds* trigonous or plano-convex.—Species about 60; chiefly N. temperate.

A. *Flowers* white or pale pink. *Corolla* funnel-shaped; segments obovate-spathulate. *Filaments* quite free from one another at the base. *Leaves* alternate, rarely opposite.

* *Flowers* in elongate terminal racemes; pedicels longer than the linear or subulate bracts.

† *Stamens* longer than the corolla.

1. **L. Leschenaultii**, Duby in *DC. Prodr.* viii. 61; *Mem. Prim.* t. 4;



erect, leaves elliptic-lanceolate acute closely gland-dotted, racemes dense-fld., pedicels $\frac{1}{2}$ in., fruiting 1 in., bracts filiform, petals exceeding the calyx. *Wright Ic. t. 1204*; *Fl. des Serres*, x. t. 982. *Klatt, die Gatt. Lysim. t. 7*. *L. Clementsoniana*, *Wall. Cat. 1485*. *L. Notoniana*, *Wall. mss.*

NILGHERRY and PULNEY MTS., *Leschenault, &c.*

Glabrous. *Stem* 6-8 ft., robust, branched. *Leaves* 2-4 in., acute or acuminate, sessile or petioled, margin smooth or crisp. *Racemes* 3-9 by $1\frac{1}{2}$ - $2\frac{1}{2}$ in., leafless except at the base. *Flowers* $\frac{1}{2}$ - $\frac{3}{4}$ in. long. *Sepals* lanceolate, acuminate, margins membranous, disk with oblong glands. *Corolla-lobes* obovate-spathulate. *Filaments* eglandular; anthers oblong, exerted. *Capsule* $\frac{1}{2}$ - $\frac{3}{4}$ in. diam.

2. *L. lobelioides*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 29*; *Cat. 1484*; suberect or ascending, leaves elliptic-ovate or lanceolate, margin only gland-dotted, racemes long lax-fld., pedicels $\frac{1}{2}$ in., fruiting $\frac{3}{4}$ in., bracts subulate, petals exceeding the calyx. *Duby in DC. Prodr. viii. 61*; *Bot. Reg. 1842, t. 6*; *Klatt, die Gatt. Lysimach. t. 2*. *L. secunda*, *Ham. in. Don Prodr. 84*.

WESTERN and CENTRAL HIMALAYA, alt. 4-7000 ft.; from Nipal to Kashmir.—
DISTRIB. Java.

Glabrous, annual, 1-2 ft. *Stem* branched from the base. *Leaves* 1- $1\frac{1}{2}$ in., acute, narrowed into a short petiole. *Racemes* 6-8 in. in flower, to 18 in. in fruit; pedicels spreading and decurved in fruit. *Flowers* $\frac{1}{2}$ - $\frac{3}{4}$ in. long, white or pale purplish, sweet-scented. *Sepals* lanceolate, margins white, disk with very long glands. *Corolla-lobes* obovate. *Filaments* eglandular; anthers oblong, exerted. *Capsule* $\frac{1}{2}$ in. diam.—*Lindley* (in *Bot. Reg.*) describes the capsule as bursting irregularly at the base. This I have not seen. The dehiscence is irregular, but usually by valves.

3. *L. javanica*, *Bl. Bijl. 736*; erect, leaves elliptic-ovate or lanceolate more or less gland-dotted and margined, racemes long lax-fld., pedicels $\frac{1}{2}$ in., fruiting $\frac{1}{2}$ in., bracts subulate, petals hardly exceeding the sepals. *Klatt, die Gatt. Lysimach. t. 5*. *L. multiflora*, *Wall. Cat. 1487*; *Duby in DC. Prodr. viii. 63*; *Klatt l. c. t. 4*. *L. acroadenia*, *Maxim. Diagn. Pl. Jap. Dec. iv. and v. 272*. *L. consobrina*, *Hance mss.* *L. decurrens*, *Herb. Hance*.

EASTERN HIMALAYA; Sikkim and Bhotan, alt. 4-6000 ft. ASSAM and SHIHET.—
DISTRIB. Java, China, Japan, Isle of Pines, New Caledonia.

Very similar to *L. lobelioides*, but a much more robust and erect plant, with shorter pedicels and smaller petals, and glandular filaments. The capsules burst very irregularly. The amount of glandular dots on the leaves varies exceedingly; they are sometimes confined to the margin.

†† *Stamens shorter than the corolla.*

4. *L. obovata*, *Herb. Ham.*; *Wall. Cat. 1488*; erect, slender, simple or sparingly branched, leaves obovate spathulate or oblanceolate minutely gland-dotted, racemes long lax-fld., pedicels fruiting and flowering $\frac{1}{2}$ - $\frac{3}{4}$ in., bracts subulate, corolla-lobes obovate nearly twice as long as the sepals. *L. glaucescens*, *Wall. mss.*

HINDOSTAN and MAINPUR, *Herb. Wallich*. *BIRMA*, *Griffith*.—DISTRIB. Java.

Smaller than any of the preceding species, more or less glaucous. *Stem* 6-18 in., sometimes branched from the base. *Leaves* $\frac{1}{2}$ -3 in., acute or obtuse, usually petioled. *Racemes* 2-8 in.; bracts about half as long as the pedicels. *Corolla-segments* obovate. *Filaments* short; anthers apiculate. *Capsule* $\frac{1}{2}$ in. diam., bursting irregularly.—*L. candida*, *Lindl.*, differs only in the longer stamens, if at all.

** *Flowers in elongate terminal racemes; bracts leafy, longer than the pedicels. Stamens shorter than the corolla.*

5. ***L. pyramidalis***, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 28; Cat. 1486; erect, much branched, leaves linear-lanceolate minutely gland-dotted and margined, racemes long lax-fld., pedicels $\frac{1}{4}$ in., fruiting $\frac{1}{2}$ in., bracts linear, corolla-segments obovate longer than the sepals. *Duby in DC. Prodr.* viii. 62; *Klatt, die Gatt. Lysimach.* t. 16. *L. heterophylla*, Don Prodr. 84. *Anagallis multangularis*, Ham. (ex Don).

CENTRAL AND WESTERN HIMALAYA; from Simla to Central Nipal, alt. 5-8000 ft., Hawulbagh, Jamieson.

Glabrous. Stem 10-24 in., branches erect. Leaves 1-2 $\frac{1}{2}$ in., rarely ovate-lanceolate. Racemes 6-10 in.; lower bracts 1 in. Sepals narrowly lanceolate, with slender membranous margins. Corolla $\frac{1}{4}$ in. long, white, lobes crenulate or toothed. Filaments short, glabrous; anthers apiculate. Capsule as in the previous species, bursting irregularly.

6. ***L. chenopodioides***, Watt in Journ. Linn. Soc. ined.; erect or decumbent, branched, leaves petioled elliptic ovate or rhomboid acute or acuminate gland-dotted and margined, flowers sessile and subsessile in the leaf axils, sepals linear about equalling the obovate-oblong corolla-segments. *L. glandulosa*, Klatt, die Gattung *Lysimachia*, t. 17 (not of Edgeworth).

TEMPERATE HIMALAYA; from Kashmir to Bhotan, alt. 6-9000 ft. (not found in Nipal or Sikkim).

Very variable in habit, 12-18 in. high, glabrous, usually much branched. Leaves $\frac{1}{2}$ -1 in.; petiole often as long as the blade. Flowers $\frac{1}{2}$ in. long, sometimes subracemose, with narrower recurved floral leaves. Sepals with several series of large long glands down the centre. Filaments very short; anthers obtuse. Capsule $\frac{1}{8}$ in. diam., bursting irregularly.

7. ***L. prolifera***, Klatt, die Gatt. *Lysim.* 30, t. 16; small, erect creeping or ascending, leaves petioled subacute ovate or the lowest spathulate obtuse gland-dotted but not margined, flowers in small terminal corymbs, pedicels very short, sepals linear obtuse or acute, filaments equalling or shorter than the linear-obovate corolla-segments.

TEMPERATE HIMALAYA; Garwhal at Dordotoole, alt. 10,000 ft., Madden; Kumaon, Madhari Pass, alt. 9000 ft., Strach. & Winterb.; Sikkim, alt. 8-10,000 ft., J. D. H., &c.

Perennial, 4-6 in. high, glabrous or puberulous towards the ends of the branches, simple or branched from the base. Leaves opposite and alternate, 1-1 $\frac{1}{2}$ in., including the petiole, which often equals the blade. Flowers in small terminal corymbs amongst the uppermost leaves; pedicels equalling the calyx, or longer. Corolla funnel-shaped, $\frac{1}{4}$ in., pale flesh-coloured or white. Filaments glabrous, very variable in length; anthers obtuse, often exerted from the expansion of the corolla. Fruit not seen.

B. Flowers yellow. Corolla rotate; segments broad, oblong or obovate. Filaments connected at the base by a membrane or ridge.

* Leaves alternate.

8. ***L. ramosa***, Wall. Cat. 1490; erect, branches winged, leaves lanceolate faintly gland-dotted, pedicels capillary usually equalling or exceeding the subtending leaves, sepals ovate acuminate, anthers subsagittate apiculate. *Duby in DC. Prodr.* viii. 65; *Klatt, die Gatt. Lysimach.* t. 17.

EASTERN HIMALAYA; Sikkim, alt. 5-8000 ft. KHASIA Mts., alt. 4-6000 ft. BIRMA, at the serpentine mines, Griffith. —DISTRIB. JAVA.

Quite glabrous, annual (?). Stem 2-4 ft.; branches long, slender, erecto-patent.

Leaves alternate, 2-4 in., thin, acuminate, narrowed into the short petiole. *Peduncles* all axillary, 1-5 in., spreading. *Flowers* $\frac{1}{2}$ in. diam., yellow. *Sepals* sub-glandular, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. *Corolla-segments* elliptic-oblong. *Filaments* very short, connected at the base, with sometimes an obscure staminode between them. *Capsule* $\frac{1}{2}$ in. diam., bursting irregularly.—Java specimens have larger sepals, approaching var. *zeylanica*.

VAR. *zeylanica*; leaves larger 3-5 in., sepals larger $\frac{1}{2}$ - $\frac{3}{4}$ in. longer pointed, capsule larger 5-valved. *L. alata*, Gard. mss.—Ceylon, Central Province, alt. 6-8,000 ft.

9. ***L. peduncularis*, Wall. Cat. 1489**; slender, erect, branches winged, leaves lanceolate faintly gland-dotted, peduncles capillary much exceeding the spreading leaves, sepals narrow-lanceolate.

BIRMA; Taongdong Mts. and Prome Hills, Wallich.

A much smaller plant than *L. ramosa* with the peduncles longer and with more slender and narrow sepals. *Flowers* not seen. *Fruit* capsular.

10. ***L. linearifolia*, Griff. mss.**; stem strict terete, leaves subsessile linear-lanceolate acuminate, peduncles capillary exceeding the leaves, sepals narrow-lanceolate.

BIRMA; at the serpentine mines, Griffith.

Annual. *Stem* 12-18 in., slender or sparingly branched, puberulous above. *Leaves* rather crowded, uniform in size and shape all along the stem, $1\frac{1}{2}$ by $\frac{1}{2}$ - $\frac{3}{4}$ in., acute at both ends, opaque, dark-brown when dry, midrib strong. *Peduncles* decurved in fruit.—Of this singular plant I have seen no remains of flower except the sepals, nor of the fruit except the persistent placenta. The leaves are from their colour very different looking from those of any other species.

11. ***L. evalvis*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 27; Cat. 1483**; stem subterete flexuous erect or ascending, leaves petioled elliptic or ovate acuminate sparingly gland-dotted, peduncles few equalling or shorter than the leaves decurved, sepals ovate-cordate acuminate. *Duby* in DC. Prodr. viii. 66; *Klatt, die Gatt. Lysimach. t. 22*.

CENTRAL and EASTERN HIMALAYA; Nipal, Wallich; Sikkim, alt. 4-6000 ft. KHASIA Mts., alt. 3-5000 ft.—DISTRIB. China (?).

Quite glabrous. *Stem* 10-18 in., obscurely angled. *Leaves* rather distant, $1\frac{1}{2}$ -3 in., finely acuminate, petiole long or short. *Peduncles* very variable, sometimes only $\frac{1}{2}$ in. long, rather stout, decurved; flower $\frac{1}{2}$ - $\frac{3}{4}$ in. diam. *Sepals* $\frac{1}{2}$ - $\frac{3}{4}$ in., reflexed in fruit. *Corolla* yellow, segments longer than the sepals, oblong, obtuse. *Filaments* very short; anthers linear-oblong, obtuse. *Capsule* $\frac{1}{2}$ in. diam., very membranous, whitish, dehiscing irregularly.—This is apparently identical with the Chinese *L. Fœnum-græcum*, Hance mss., which is used by Chinese ladies as a scent for hair oil, but has no scent.

12. ***L. alternifolia*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 26; Cat. 1481**; glabrous or puberulous, branches ridged prostrate or ascending, leaves sessile or petioled elliptic-lanceolate or ovate acute, peduncles axillary capillary shorter or longer than the leaves, sepals lanceolate longer than the corolla gland-dotted. *Duby* in DC. Prodr. viii. 96; *Klatt, die Gatt. Lysimach. t. 21*. *L. tetragona*, Don Prodr. 83 (excl. syn. *L. evalvis*). *L. quinquangularis*, Ham. mss. (ex Don). *L. glandulosa*, Edgew. in Trans. Linn. Soc. xx. 83; *Klatt, l. c. t. 22 (excl. fig. c.)*.

TEMPERATE and SUBTROPICAL HIMALAYA, from Garwhal to Bhotan, alt. 2-6000 ft. KHASIA Mts., Shillong, alt. 4000 ft.; Clarke.

Branched from the base; branches 2-8 in., leafy throughout. *Leaves* $1\frac{1}{2}$ in. *Flowers* numerous, $\frac{1}{2}$ in. diam. *Corolla* yellow, segments oblong, obtuse, sparingly gland-dotted. *Filaments* short, united by a very short basal ridge. *Ovary* glabrous. *Capsule* bursting by valves, shorter than the calyx.



•• Leaves opposite, rarely 3-nate or alternate. Capsule bursting by valves.

13. **L. japonica**, Thunb. *Fl. Jap.* 83; *Icones*, t. 16; prostrate, pubescent or villous, leaves ovate acute gland-dotted, peduncles solitary or 2-nate very short, sepals lanceolate villous longer than the corolla reflexed in fruit, filaments united at the base by a broad membrane, ovary hirsute. *Duby in DC. Prodr.* vii. 67; *Klatt, die Gatt. Lysim.* t. 19. *L. debilis*, Wall. in *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 25; *Cat.* 1482; *Duby l. c.* 66; *Klatt, l. c. t.* 20. *L. ferruginea*, Edgew. in *Trans. Linn. Soc.* xx. 84.

TEMPERATE HIMALAYA, from Kashmir to Rhotan, alt. 4-8000 ft. KHASIA MTS., alt. 3-5000 ft.—DISTRIB. China, Japan.

Branches 6-10 in. terete, weak. Leaves 1-1½ in., usually petioled. Peduncles very variable in length, spreading decurved or upcurved. Corolla yellow, ¼-½ in. diam.; segments oblong, gland-dotted. Filaments long, but shorter than the corolla, glabrous. Capsule much shorter than the sepals.—A specimen apparently of this plant procured in Sikkim by Griffith's collectors has the leaves alternate, very short peduncles, longer filaments with a shorter connecting membrane and hairy ovary; it a good deal resembles Klatt's figure of *L. ferruginea*, Edgew., and is intermediate between *alternifolia* and *japonica*.

14. **L. deltoides**, Wight *Ill.* ii. 137, t. 144; hirsute, procumbent, branches ascending, leaves ovate or broadly oblong obtuse or acute, peduncles solitary or 2-nate about as long as the leaves, sepals lanceolate villous shorter than the corolla, filaments united at the base by a very narrow membrane, ovary glabrous. *Klatt, die Gatt. Lysim.* t. 19. *L. Metziana*, *Hohen. Pl. Exsicc. Ind.* Or. No. 1443, 1444.

NILGHERY and PULNEY MTS., Wight, &c.

Much branched from the base; branches rooting below, terete. Leaves often 3-nate, ¾-1½ in., more or less hairy on both surfaces. Peduncles usually decurved in fruit. Corolla yellow, ¾ in. diam., segments obovate, gland-dotted. Capsule bursting by valves, shorter than the corolla.

VAR. *cordifolia*; leaves cordate or truncate at the base. *L. umbrosa*, *Gardn. mss.* *L. japonica*, *Thwaites Enum.* 172.—Ceylon, alt. 6-7000 ft.

6. GLAUX, Tournef.

A succulent glabrous creeping stoloniferous herb. Leaves decussate. Flowers small, axillary, sessile, white or pink. Calyx 5-partite, coloured. Corolla 0. Stamens 5, hypogynous, alternate with the calyx-segments. Ovary subglobose; style filiform; ovules few. Capsule globose, 5-valved, few-seeded. Seeds peltate, terete, rough.

G. maritima, Linn.; *Boiss. Fl. Orient.* iv. 7.

WESTERN TIBET; alt. 12-15,000 ft., *Falconer, &c.*—DISTRIB. N. temperate and Arctic regions.

Stem 6-10 in., procumbent or with suberect branches. Leaves ¼-¾ in., linear- or obovate- or ovate-oblong. Calyx ½-¾ in. long, campanulate, lobes obtuse, margins scarious. Anthers subexserted. Capsule small, cuspidate.

7. ANAGALLIS, Tournef.

Slender annual or perennial herbs. Leaves opposite, quite entire. Flowers axillary, solitary, peduncled, ebracteate, red or blue, rarely white. Calyx 5-partite. Corolla rotate, 5-partite. Stamens 5, filaments villous. Ovary globose;

style filiform; ovules many, amphitropous. *Capsule* globose, circumsciss. *Seeds* many, peltate, plano-convex.—N. temperate regions, and temperate S. America.

A. arvensis, *Linn.*; *Boiss. Fl. Orient.* iv. 6, annual, erect or procumbent, leaves sessile ovate cordate or lanceolate acute dotted, sepals almost equalling the blue or red corolla. *Wall. in Roxb. Fl. Ind.* ii. 24; *Cat.* 1492.

BENGAL, NORTH-WESTERN INDIA, and the HIMALAYA from Nipal westwards ascending to 5000 ft. CENTRAL INDIA, the NILGHERY HILLS, and CEYLON (perhaps introduced).—DISTRIB. Europe, West Asia, and introduced into most temperate regions.

Glabrous, gland-dotted, branched from the base; branches 4-angled, ascending. *Leaves* $\frac{1}{2}$ – $1\frac{1}{2}$ in., rarely whorled. *Peduncles* 1–2 in., erect in flower, decurved in fruit. *Sepals* narrow, lanceolate, acuminate. *Corolla* $\frac{1}{2}$ – $\frac{3}{4}$ in. diam., closing in dull weather, segments often ciliate. *Capsule* size of a small pea. *Seeds* 3-gonous.—Both the blue and red-fld. vars. are found in Western India; the blue (*A. cœrulea*, Lam.) being the common one eastward.

8. **CENTUNCULUS**, *Linn.*

Small annual herbs. *Leaves* subopposite or alternate. *Flowers* minute, solitary, axillary, ebracteate, white or pink. *Calyx* 4–5-partite. *Corolla* short, urceolate. *Stamens* 4–5, on the corolla-throat, filaments flattened; anthers exerted. *Ovary* subglobose; style filiform; ovules many. *Capsule* globose, circumsciss. *Seeds* many, peltate. Species 3 or 4; Europe, Asia, America.

C. tenellus, *Duby in DC. Prodr.* viii. 72; erect, leaves alternate subsessile ovate orbicular or obovate obtuse or acute, flowers 4–5-merous, sepals lanceolate, tube of corolla subglobose, lobes ovate-lanceolate. *Wight Ic. t.* 2000. *Lysimachia tenella*, *Wall. Cat.* 1491. *Micropylis pumila*, *Duby l. c.* *M. tenella*, *Wight l. c. t.* 1585.

CENTRAL and WESTERN HIMALAYA; Nipal, Kumaon, Dalhousie, alt. 4000 ft. CENTRAL INDIA; Chota Nagpore and Parasnath, *Clarke*. NILGHERY and PULNEY Mts.—DISTRIB. Tropical America and Australia.

9. **SAMOLUS**, *Tournef.*

Annual or perennial herbs. *Leaves* radical and alternate. *Flowers* in terminal racemes or corymbs, white; pedicels bracteate. *Calyx* $\frac{1}{2}$ -superior, 5-fid. *Corolla* perigynous, subcampanulate, 5-partite. *Stamens* 5, alternating with staminodes, filaments very short. *Ovary* subglobose; style short; ovules many, anatropous. *Capsule* $\frac{1}{2}$ -inferior, ovoid, crown 5-valved. *Seeds* many, angular, hilum basilar.—Species about 8; temperate regions.

S. Valerandi, *Linn.*; *Boiss. Fl. Orient.* iv. 5; leaves obovate or spatulate obtuse or apiculate *Wall. Cat.* 1508.

WESTERN HIMALAYA; from Sirmore, alt. 3–4000 ft., westwards.—DISTRIB. Most temperate regions.

Glabrous. *Rootstock* short. *Stem* $\frac{1}{2}$ –2 ft., erect, decumbent or ascending, often rooting at the base. *Leaves* 1–4 in., quite entire, radical rosulate, cauline alternate. *Racemes* $\frac{1}{2}$ –6 in., erect; pedicels ascending with the adnate bract above their middle. *Calyx-tube* hemispheric, lobes triangular. *Corolla* $\frac{1}{2}$ in. diam.; lobes short, obtuse. *Capsule* $\frac{1}{4}$ in. diam. *Seeds* rugose.

ORDER LXXXVIII. **MYRSINÆ.** (By C. B. Clarke.)

Shrubs or small trees. *Leaves* alternate, undivided, generally gland-dotted; stipules 0. *Flowers* regular, hermaphrodite or polygamo-dioecious. *Calyx* inferior (in *Mæsa* more or less adnate to the ovary); limb 4-6- (usually 5-) lobed, persistent, often somewhat enlarged on the fruit. *Corolla-tube* short or 0; segments 3-7 (usually 5), contorted or imbricate (rarely valvate). *Stamens* 3-7, opposite the corolla-lobes, free or adnate to the tube, in *Reptonia* alternating with staminodes; anthers usually oblong, acute, dehiscence longitudinal, very rarely by terminal pores; free or united by their margins. *Ovary* globose or oblong, free (in *Mæsa* semi-inferior), 1-celled, narrowed into the style; style filiform or columnar, stigma simple rarely shortly lobed; ovules few or many, inserted on a free central placenta. *Fruit* commonly small, globose (in *Ægiceras* linear, acute), often sub-baccate and coloured, 1- (or several-) seeded, indehiscent (except in *Ægiceras*). *Seeds* mostly globose, excavate at the base, albumen pitted or ruminate; embryo transverse.—Species 500; all Tropical or Subtropical.

TRIBE I. **Mæseæ.** *Calyx* nearly enclosing the many-seeded berry.

Calyx 2-bracteolate. *Flowers* racemed 1. **MÆSA.**

TRIBE II. **Eumyrsinæ.** *Calyx* free. *Staminodes* 0. *Fruit* 1-seeded.

* *Corolla-lobes imbricate or induplicate-valvate (rarely contorted) in bud.*

Flowers in axillary fascicles. *Corolla* imbricate 2. **MYRSINÆ.**

Flowers racemed or paniced. *Corolla* imbricate or contorted 3. **EMBELIA.**

Flowers spicate-paniculate. *Corolla-segments* induplicate-valvate 4. **LABISIA.**

** *Corolla-lobes contorted in the bud (see also 3. Embelia).*

+ *Anthers free.*

Corolla-segments twisted to the right; *calyx* glabrous 5. **ARDISIA.**

Corolla-segments twisted to the right; *calyx* pubescent 6. **PIMELANDRA.**

Corolla-segments twisted to the left 7. **ANTISTROPHE.**

++ *Anthers united.*

Corolla middle-sized, *segments* acute 8. **HYMENANDRA.**

Corolla very small, *segments* emarginate 9. **AMBLIANTHUS.**

Anomalous genus with long filaments, and septate anthers.

Fruit cylindric, curved, acute 10. **ÆGICERAS.**

TRIBE III. **Theophrasteæ.** *Calyx* free. *Staminodes* 5. *Fruit* 1-2-seeded.

Flowers small, in axillary fascicles 11. **REPTONIA.**

1. **MÆSA, Forsk.**

Trees or shrubs. *Leaves* entire or serrate. *Racemes* axillary or terminal; pedicels bracteate at the base. *Flowers* small, 2-bracteolate, 1-2-sexual, 4-5-merous. *Calyx* half-inferior or nearly free, in fruit $\frac{1}{2}$ -adnate; teeth small, persistent. *Corolla* gamopetalous, campanulate; lobes round, much imbricate, sometimes unequal. *Stamens* 5, inserted on the corolla-tube; filaments short; anthers ellipsoid; staminodes 0. *Ovary* partially adnate to the calyx; style

short, stigma capitate or shortly 3-5-lobed; ovules numerous, placenta globose. *Berry* globose (in *M. mollis* hirsute), of the size of a peppercorn. *Seeds* numerous, subtrapezoid.—Species 35, in the tropics of the Old World.

The inflorescence is often monstrosous, the flowers being replaced by densely imbricating bracteoless.

* *Leaves glabrous, sometimes scaly or furfuraceous when young.*

† *Leaves entire or obscurely denticulate.*

1. ***M. ramentacea***, A. DC. *Prodr.* viii. 77; leaves coriaceous elliptic-lanceolate acuminate entire, base rounded or wide-rhomboid, secondary nervation obscure, racemes compound usually much longer than the petioles and often than the leaves. *Scheff. Myrsin.* 15; *Kurz in Journ. As. Soc.* 1877, pt. ii. 220, and *For. Fl.* ii. 99. *M. lanceolata*, *Don Prodr.* 148 (not of Forsk.). *M. acuminata*, missionis and *glabra*, A. DC. l. c. 77, 78, 82. *M. sumatrana*, *Scheff. l. c.* *Bæobotrys ramentacea*, *Roxb. Hort. Beng.* 16, and *Fl. Ind.* i. 558; *Wall. Cat.* 2322. *B. glabra*, *Roxb. l. c.* 560. *B. fragrans*, *Wall. Cat.* 2323. *B. acuminata*, *Sprenng. Syst. Index*, v. 89. *B. ? missionis*. *Wall. Cat.* 6523.

EASTERN BENGAL and the EASTERN PENINSULA, alt. 0-3000 ft., common from Bhotan to Singapore.—DISTRIB. Malaya to Borneo.

An erect tree, 30 ft., with straight stem and lanceolate outline; or more commonly a gregarious bush on the low dry hills; branches rarely verrucose. *Leaves* 4-5 by $1\frac{1}{2}$ in., margin slightly thickened; primary nerves conspicuous beneath, distant, about 8 on each side; petiole $\frac{1}{2}$ in. *Racemes* usually equalling the leaf, from half as long to twice as long, glabrous.—*Bæobotrys* (v. *Mæsa*) *acuminata*, *Wall. Cat.* 2321, is *Gymnosporia acuminata*, Hook. f.

VAR. *ovata*, A. DC. in *Trans. Linn. Soc.* xvii. 133, t. 4 (sp.); leaves larger ovate or ovate-cordate. *Scheff. Myrsin.* 14. *Bæobotrys ovata*, *Wall. Cat.* 2324.—Penang; *Wallich*. South Malay Peninsula; frequent. Nicobars; *Kurz*.—Distrib. Malaya,—Leaves 6 by 3 in. in the extreme forms from the south, smaller in the Burmese examples, panicle sometimes very large in both. The figure of A. DC. does not show (as Scheffer has observed) the extreme form of *M. ovata*, but one near the type. *Wallich's* typical plant has cordate-ovate leaves, and nerves deeply impressed in the upper surface.

2. ***M. andamanica***, *Kurz For. Fl.* ii. 575, and in *Journ. As. Soc.* 1877, pt. ii. 220; leaves coriaceous elliptic acuminate rounded at the base obscurely denticulate secondary nervation obscure, racemes as long or twice as long as the leaves. *M. verrucosa*, *Kurz For. Fl.* ii. 98, not of *Scheff.*

SOUTH ANDAMAN ISLAND; in forests, *Kurz*.

An evergreen, small tree; all parts glabrous; branches verrucose. *Leaves* 3 by $1\frac{1}{4}$ in., primary nerves 6-8 on each side; petiole $\frac{1}{2}$ in. *Racemes*, in *Kurz's* example in young flower, sometimes more than twice the petiole, not shorter than in some examples of *M. ramentacea*, from which it scarcely differs but by the minute denticulation of the leaves.

3. ***M. rugosa***, *Clarke*. leaves coriaceous narrowly lanceolate caudate cuneate at the base obscurely denticulate rugose, racemes longer than the petioles scarcely one-third the length of the leaves. *M. montana*, var. *coriacea*, *Herb. Ind. Or. H. f. & T.*, not *M. coriacea*, *Champ.*

SUKKIM, alt. 5-7000 ft.; in the upper valleys of the Teesta and Ratong, frequent; *J. D. H.*, &c.

A stout shrub, probably becoming a tree; branchlets very sparingly warted. *Leaves* $7\frac{1}{2}$ by $1\frac{1}{4}$ in., scaly or furfuraceous when young, glabrous or glandular-puberulous when old; primary nerves 12-15 on each side, much raised beneath, secondary uniting them at right angles, often subprominent, ultimate reticulating very obscure; petiole $\frac{2}{3}$ in. *Racemes* 1-2 in., paniced, glandular-puberulous or glabrous.

VAR. *Griffithii*; leaves ovate-lanceolate from a rounded base.—Bhotan, alt. 5-7000 ft.; *Griffith* (Kew Distrib. n. 3554), &c. Assam; *Simons*. Leaves $7\frac{1}{2}$ by $3\frac{1}{2}$ in, in *Griffith*'s example from Chuki in East Bhotan; but in the West Bhotan examples, intermediate between this and the type.

†† Leaves, or some of them, distinctly toothed

4. *M. Chisia*, *Don Prodr.* 148; leaves lanceolate or elliptic acuminate base cuneate, primary nerves approximate secondary distinctly reticulated, racemes axillary about half the length of the leaves. *M. dioica*, *A. DC. Prodr.* viii. 79. *M. montana*, *A. DC. l. c. for the most part*. *Bæobotrys indica*, *Wall. Cat.* 2318, A and B only.

From NIPAL to BHOTAN, alt. 2-6000 ft., common. KHASIA Mts., alt. 3-5000 ft.; common.

A tree 30 feet, or more often a shrub. Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., primary nerves about 12 on each side at right angles to the midrib; teeth 1-2 to each primary nerve, often obscure; petiole $\frac{1}{2}$ in. Racemes compound, $1\frac{1}{2}$ -3 in.

5. *M. indica*, *Wall. note in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 230; leaves coriaceous lanceolate or elliptic shortly acute or acuminate base rhomboid secondary nervation obscure, racemes axillary shorter than the leaves. *A. DC. Prodr.* viii. 80; *Scheff. Myrsin.* 22; *Dalz. & Gibs. Bomb. Fl.* 136; *Brand. For. Fl.* 283; *Kurz in Journ. As. Soc.* 1877, pt. ii. 220, and *For. Fl.* ii. 99; *M. montana*, *A. DC. l. c. partly*. *Bæobotrys indica*, *Roxb. Hort. Beng.* 16, and *Fl. Ind.* i. 557; *Wight Ic.* t. 1206; *Bot. Mag.* t. 2052; *Wall. Cat.* 2318, except A, B. *B. nemoralis*, *Roxb. Fl. Ind.* i. 559; *Wall. Cat.* 2319; *Mart. Pflanz. Gart. Münchens* 9, t. 6 (not of *Vahl.*).

Throughout INDIA, alt. 0-6000 ft.; from the HIMALAYA, eastward from the Ganges (*Brandis*), to CEYLON and SINGAPORE, in and near the hills, very common.—DISTRIB. Malaya, S. China, ? Madagascar, ? Africa.

An erect tree, 30 feet; or a shrub on lands gone out of cultivation. Leaves 5 by $1\frac{3}{4}$ in., primary nerves about 7 on each side the midrib, oblique thereto; teeth 1-3 to each primary nerve; petiole $\frac{1}{2}$ in. Racemes compound, $1\frac{1}{2}$ -4 in.—The leaves in *B. indica* of Roxburgh, from Chittagong, are large, broadly elliptic, coriaceous, subentire; in *B. nemoralis*, *Roxb.*, smaller, distinctly toothed; in *M. indica*, var. *angustifolia*, *H. f. & T.*, very narrowly lanceolate. *M. indica*, var. *latifolia*, *H. f. & T.* (from Khasia), has ovate, subentire leaves, and short racemes; it is *M. pyrifolia*, *Miq.* (*Fl. Ind. Bat.* ii. 1008), and hardly differs from *M. latifolia* (*A. DC. l. c.* 78) unless by its compound racemes. *M. indica*, var. *Wightiana* (South Indian and Ceylon) has more membranous leaves, the reticulated nervation somewhat prominent; this form, abundant in Malaya, is *M. virgata* (*A. DC. l. c.* 78). There are other forms described as species by Javan botanists.

VAR. *Perottetiana*, *A. DC. l. c.* 80 (sp.); leaves 5 by $2\frac{1}{2}$ in. cinereous regularly acutely serrate.—Nilgherries, alt. 7000 ft., common.

VAR. *marima*; leaves 7 by $5\frac{3}{4}$ in. subcordate orbicular, panicles dense, primary branches again paniced.—Assam, *Simons*.—Panicles $3\frac{1}{2}$ by 3 in.

6. *M. paniculata*, *A. DC. in Trans. Linn. Soc.* xvii. 133, and *Prodr.* viii. 78; leaves membranous elliptic acute base rounded or rhomboid secondary nervation obscure, racemes axillary and terminal lax compound much longer than the leaves. *Kurz in Journ. As. Soc.* 1877, pt. ii. 220, and *For. Fl.* ii. 99. *Bæobotrys paniculata*, *Wall. Cat.* 2320.

SILHET; Pundua, alt. 250 ft., *H. F. & T. TAVOY, Wallich*. TENASSERIM, *Griffith, Helfer* (Kew Distrib. n. 3559).

A shrub, or probably sometimes a tree; branches verrucose. Leaves $8\frac{1}{2}$ by 4 in. (in *Wallich*'s plant, not 2 in. in other examples), slightly toothed, primary nerves about 7 on each side, the ultimate reticulations obscure beneath; petiole $\frac{3}{4}$ in. Panicle (even a single axillary) 15 in. long in the examples of *H. f. & T.* (which have,



** Leaves hairy, when old sometimes glabrescent.

MALABAR Mts.; Canara, *Ritchie, Hohenacker*; Concan and Mysore, *Stocks, Law*.

A shrub, 6 ft. (Kurze). Leaves $7\frac{1}{2}$ by 2 in., primary nerves 9 on each side, oblique; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in., fulvous-hairy. *Rachemes* hardly as long as the petioles, little divided, densely fulvous-hirsute; bracts and bracteoles minute. *Fruits*, when nearly ripe, fulvous-hirsute. Described from Kurze's n. 3002 (named by him *M. mollissima*, Wall., a name not found in Wallich's Herbarium), which agrees closely with authentic Javan specimens of *M. mollis*, but the leaves are rather larger. Kurze's description of *M. mollissima*, Wall. (For. Fl. ii. 100), does not exactly suit his own example (n.

3002), but applies chiefly to the var. following. Wallich's *M. mollissima* is a very different plant.

VAR. *latifolia*?, Kurz; leaves $6\frac{1}{2}$ by $4\frac{1}{2}$ in. more hairy, racemes very compound.—Namyoon, in the Patkoye district S.E. of Assam; Griffith (Kew Distrib. n. 3555).—Leaves roundly elliptic ciliate cuspidate sprinkled with fulvous long hairs on both surfaces, base rounded or rhomboid, primary nerves 12 on each side, ending in a strong tooth. Racemes densely paniced, subsessile, hardly longer than the petioles. Possibly a distinct species, the locality being remote from Pegu; but, from Kurz's descriptions, *M. mollis* is a very variable species.

11. *M. muscosa*, Kurz in Journ. As. Soc. Beng. 1873, pt. ii. 87; 1877, pt. ii. 220, and For. Fl. ii. 100; leaves large obovate, nerves sparingly pilose beneath, racemes rusty-hirsute short densely paniced, bracts prominent.

SOUTH-EAST ASSAM; Nemphean, in the Patkoye Mts., Griffith (Kew Distrib. n. 3556).

Branches stout, glabrous. Leaves $9\frac{1}{2}$ by 5 in., subobtusate, cuspidate, narrowed to the petiole, glabrescent, nerves 11 on each side, slightly denticulate; petiole 1 in. Panicles $1\frac{1}{2}$ –2 in., exceedingly dense; bracts $\frac{1}{2}$ in., linear, persistent; pedicels very short. Flowers very numerous, resembling closely those of *M. mollis*. Fruit not seen.

EXCLUDED SPECIES.

M. (BEOBOTRYS) ACUMINATA, Wall. Cat. 2321, is *Gymnospora acuminata*, Hook. f.

2. MYRSINÆ, Linn.

Trees or shrubs. Leaves entire or serrate. Flowers polygamous or often dioecious, fascicled, axillary or on exceedingly short branches; pedicels short, bracts at their base densely imbricate. Calyx small, 4–5-fid, persistent. Corolla 4–5-partite, white, segments imbricate or valvate (not contorted) in the bud, recurved. Stamens 4–5, filaments short; anthers ovate. Ovary free, globose; style cylindric; stigmas 2–5 small, or subcombined, or patent spatulate; ovules several or many. Fruit small, globose, dry or fleshy, red or purple. Seed solitary, albumen more or less pitted, scarcely ruminant; embryo often curved, horizontal.—Species 80, chiefly tropical.

* Style 2–4-fid, branches spreading flat spatulate-ovate.

1. *M. africana*, Linn.; A. DC. Prodr. viii. 93; branchlets pubescent, leaves subsessile oblong narrowed to the base serrate glabrous, flowers and fruits subsessile. Lamk. Ill. t. 122; Brand. For. Fl. 286; Boiss. Fl. Orient. iv. 31. *M. glabra* and *M. scabra*, Gaertn. Fruct. i. 282, t. 59, fig. 1. *M. retusa*, Ait.; Vent. Hort. Cels. t. 86; Jacq. Hort. Schenb. iv. t. 424. *M. rotundifolia*, Lamk. Dict. iv. 194. *M. bifaria*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 296, and Cat. 2294. *M. Potama*, Don Prodr. 146.

HIMALAYA; from Kashmir and the Salt Range to Nipal, alt. 1–8500 ft., frequent.—DISTRIB. Afghanistan. Africa to the Cape and the Azores.

A shrub or small tree; sometimes 20 ft. Leaves (at most) $1\frac{1}{2}$ by $\frac{1}{2}$ in. Flowers in clusters of 3–8, 4- (or 5-) merous, less than $\frac{1}{12}$ in. diam. Style branches 2–4 spatulate. Berry $\frac{1}{8}$ – $\frac{1}{4}$ in. diam.

2. *M. semiserrata*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 293; Tent. Fl. Nep. t. 24, and Cat. 2295; glabrous, leaves petioled lanceolate acute sparingly denticulate or entire, pedicels shorter than the fruits. A. DC. Prodr. viii. 93; Brand. For. Fl. 285; Kurz in Journ. As. Soc. ii. 221, and For. Fl. ii. 105. *M. acuminata*, Royle Ill. 265; Madden in Journ. As. Soc. xvii. pt. i. 368. *M. sessilis*, Don Prodr. 146; A. DC. l. c. 104.

NIPAL; Wallich. KHASIA, alt. 3–5000 ft., common. BIRMA, Kurz.

A shrub or small tree. Leaves $3\frac{1}{2}$ by $\frac{3}{4}$ in., narrowed at both ends, coriaceous;

petiole $\frac{1}{2}$ in. Pedicels $\frac{1}{2}$ in., often longer, glabrous. Flowers 4- (rarely 5-) merous, $\frac{1}{10}$ in. diam. Style with 2-4 spatulate flat branches. Berry $\frac{1}{8}$ - $\frac{1}{4}$ in. diam.

VAR. *subspinosa*, Don Prodr. 147 (sp.); branches pubescent at the tips, leaves serrate sometimes subserrate, pedicels glandular-pubescent often when young ferruginous shorter than the fruits.—Gurwhal to Bhotan, alt. 3-9000 ft.; very common, Khasia, H. f. & T.—Branches often angular. Leaves much less coriaceous than in the shining eastern *M. semiserrata*; petiole often pubescent.—This is the common Himalayan *M. semiserrata* of Wallich, though not the plant figured by him (in Tent. Fl. Nep. t. 24). Kurz (who, in his own herbarium, named it *M. bifaria*, Wall.?) nevertheless proposes to call this *M. semiserrata*, and to make a new species (*M. khasiana*, Kurz) of the type which is probably distinct. Kurz "is not sure" about Wallich's figure; it would appear probable that Wallich collected *M. subspinosa* in Nipal and *M. semiserrata* in Khasia, and, regarding them as one species, his figure represents either or both.

** Style-branches oblong, not spreading.

3. *M. capitellata*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 295; Tent. Fl. Nep. t. 25, and Cat. 2296; leaves elliptic-lanceolate narrowed at both ends entire primary veins distinct, flowers subsessile, fruits smooth. Bot. Mag. t. 3222; A. DC. Prodr. viii. 95; Brand. For. Fl. 286; Kurz in Journ. As. Soc. 1877, pt. ii. 221. M. excelsa, Don Prodr. 147; A. DC. l. c. 94. M. lucida, Wall. Cat. 2298; A. DC. l. c.

NIPAL, Wallich; alt. 4000 ft., J. D. H. Bhotan, Griffith. ASSAM, Hamilton. KHASIA MTS., H. f. & T.—DISTRIB. Ava.

A shrub, or a tree 30 ft. Leaves 7 by $2\frac{1}{2}$ in., subacute; petiole $\frac{1}{2}$ in. Flowers $\frac{1}{8}$ in. across, 5-merous. Style cylindric, hardly wider upwards.—Bentham (in Fl. Hongk. 205-6) includes (under *M. capitellata*, Wall.) *M. philippensis*, A. DC., and *M. neritifolia*, Sieb. & Zucc.; thus extending the area of the species throughout Eastern Asia to the Philippines and Japan.

VAR. *lanceolata*, Wall. Cat. 2297 (sp.); leaves smaller more coriaceous subobtus. M. Wightiana, Wall. Cat. 2300; A. DC. l. c. 94; Wight Ic. t. 1211; Bedd. Fl. Sylv. t. 234.—Khasia Mts., common. Mts. of South India and Ceylon, common.—There are a number of Malay forms hardly distinguishable, and some of Griffith's examples, collected at Malacca, have the leaves distinctly veined, and cannot be distinguished from var. *lanceolata*.

VAR. *lepidocarpum*, Wight in Herb. (sp.); fruits rough with scales.—Indian Peninsula, Wight, n. 1781.—Otherwise as var. *lanceolata*.

VAR. *avenis*, A. DC. in Trans. Linn. Soc. xvii. 107, and in DC. Prodr. viii. 96 (sp.); leaves very coriaceous primary nerves obscure, pedicels rather longer sometimes $\frac{1}{2}$ - $\frac{3}{4}$ in. Scheff. Myrsin. 47; Kurz in Journ. As. Soc. 1877, pt. ii. 221, and For. Fl. ii. 105. M. Porteriana, Wall. Cat. 6525; A. DC. l. c. 95. M. umbellulata, A. DC., l. c.

Ardisia avenis, Blume Bijl. 691. *Embelia umbellulata*, Wall. Cat. 2312.—Birma to Malacca, frequent.—DISTRIB. Sumatra, Java, Banca.—Kurz endeavours to distinguish this specifically by the "stigmas sessile, pedicels thick."

EXCLUDED SPECIES.

M. theaeifolia, Wall. Cat. 6391, is *Ilex theaeifolia*, Hook. f.

3. *EMBELIA*, Burm.

Shrubs mostly climbing, or small trees. Leaves entire or toothed; petiole often margined or glandular. Racemes axillary or terminal, simple or compound, or flowers subsessile; bracts small (except in *E. amentacea*); bracteoles 0. Flowers small, polygamous, mostly diœcious, white or greenish yellow. Calyx free, 5-4-lobed, persistent. Petals 5-4, free or slightly coherent at the base, elliptic, imbricate in bud (in subgenus *Rhynchostylis* contorted). Stamens 5-4; filaments more or less adnate to the petal; anthers ovate-oblong. Ovary ovoid or globose



(in subgenus *Rhynchostylis* conical-beaked); style cylindric, stigma capitellate; ovules few. Fruit small, globose, 1- (rarely 2-) seeded. Seed globose, base hollowed, albumen pitted subruminate; embryo curved, transverse.—Species 60; in the tropics of the old world.

In the "Genera Plantarum" (ii. 664) and some other works, the name *Samara*, proposed by Linné in the "Mantissa," is adopted from being assumed to be prior to Burmann's *Embëlia*, published in 1768. This was due to the erroneous supposition that *Samara* was proposed in the first part of the "Mantissa," which appeared in 1767; whereas it was proposed in the second, which appeared in 1771. (At p. 1240 of "Genera Plantarum" the error is corrected.)

SUBGENUS I. Euembëlia. Petals imbricate in bud. Ovary globose or ovoid, not tapering upwards into a beak.

SECT. I. CALISPERMUM, Lour. Flowers in general 5-merous.

* Inflorescence both terminal and axillary. (Leaves entire in the Indian species).

1. **E. Ribes**, *Burm. Fl. Ind.* 62 t. 23; leaves elliptic narrowed at both ends entire glabrous, panicles grey-pubescent, pedicels longer than the flowers and fruits. *Retz. Obs.* iv. 24; *Lamk. Ill.* t. 133; *Roxb. Fl. Ind.* i. 586; *Wall. Cat.* 2304; *A. DC. Prodr.* viii. 85; *Scheff. Myrsin.* 38; *Dalz. & Gibs. Bomb. Fl.* 137; *Brand. For. Fl.* 284; *Kurz For. Fl.* ii. 101. *E. garciniaefolia*, *Wall.*; *Miq. Pl. Jungh.* 187; *Scheff. l. c.* 40. *E. glandulifera*, *Wight Ic.* t. 1207; *Dalz. & Gibs. Bomb. Fl.* 137. *Calispermum scandens*, *Lour. Fl. Cochinc.* 156. *Samara Ribes* and *S. floribunda*, in part, *Kurz in Journ. As. Soc.* 1877, pt. ii. 222.

Throughout INDIA from the Central HIMALAYA to CEYLON and SINGAPORE, alt. 0-5000 ft.; common in the lower hills.—DISTRIB. Malaya and South China.

A scandent shrub. Leaves 3 by $1\frac{1}{2}$ in., obtusely acuminate, base cuneate or rhomboid, nerves slender; petiole $\frac{1}{2}$ in. Panicle-branches often 3-4 in.; pedicels $\frac{1}{2}$ in. Flowers scarcely $\frac{1}{12}$ in. long, white. Ovary ovoid, not conic upwards.

2. **E. sessiliflora**, *Kurz in Journ. As. Soc.* 1871, pt. ii. 66, and *For. Fl.* ii. 102; leaves ovate entire glabrous base rounded, panicles grey-pubescent, flowers sessile. *Samara sessiliflora*, *Kurz in Journ. As. Soc.* 1877, pt. ii. 222.

BIIRMA, "probably Martaban or the Karen Hills," *Kurz*.—DISTRIB. Poneshee, Upper Birma.

Only differs from *E. Ribes* in the points stated, and is perhaps a variety of it (*sic* *Kurz*).

3. **E. microcalyx**, *Kurz in Trimen Journ. Bot.* 1875, 328; leaves elliptic obtuse at both ends entire rusty-villous beneath, panicles villous, pedicels about as long as the flowers. *Samara microcalyx*, *Kurz. in Journ. As. Soc.* 1877, pt. ii. 221.

NICOBAR ISLANDS; *Kurz*.

A scandent shrub; branches brown-villous. Leaves 3 by $1\frac{1}{2}$ in., nearly glabrous above, nerves slender; petiole $\frac{1}{2}$ in. Panicle-branches 1 in., dense-flowered. Flowers nearly as in *E. Ribes*, but more pubescent.—Differs from *E. canescens*, Jack., by the very obtuse leaves, and elongate compound panicle.

4. **E. coriacea**, *A. DC. in Trans. Linn. Soc.* xvii. 135, and *Prodr.* viii. 87; leaves oblong-lanceolate entire glabrous base obtuse, panicles very compound grey-pubescent, pedicels scarcely so long as the flowers. *Wall. Cat.* 2314. *E. oblongata*, *Miq. Fl. Ind. Bat. Suppl.* 573. *E. macrophylla*, *Scheff. Myrsin.* 36.

PENANG; *Wallich*. MALACCA; *Maingay*.—DISTRIB. Java, Sumatra.

A scandent shrub. Leaves 8 by $1\frac{1}{2}$ in. (in *Wallich's* example, larger in *Maingay's*),

acute, very coriaceous, nerves slender; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in., very stout. *Panicles* often a foot long and broad; bracts at the divisions $\frac{1}{2}$ in., elliptic, sometimes subsistent. *Flowers* very nearly as in *E. Ribes*.—This has been taken for *E. garciniaefolia*, Wall., which is a somewhat shining Malayan form of *E. Ribes*.

5. *E. adnata*, *Bedd. ms.*; leaves broadly oblong entire glabrous base obtuse, panicle compound branches and pedicels very stout pubescent, pedicels scarcely so long as the flowers. *Embelia*, sp. 4, *Bedd. For. Man.* 138.

DECCAN PENINSULA; Bolamputti Hills, alt. 5000 ft., *Beddome*.

A large, scandent, epiphytic shrub (*Beddome*); branches stout, rugose, angular, warted, pubescent towards the tips. *Leaves* 5–6 by 2–2½ in., obtuse, acute or slightly acuminate, coriaceous, red when young, nerves slender or obscure; petiole $\frac{1}{2}$ – $\frac{1}{3}$ in. *Panicle* 8 in. diam., reddish-brown; branches rugose, thinly pubescent. *Flowers* nearly as of *E. Ribes*, the calyx-teeth rather more acute. *Ovary* globose, not conic upwards.—Neither *E. coriacea*, Wall., nor any of the allied Malayan species, has such stout panicle-branches and pedicels.

6. *E. canescens*, *Jack.*; *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 292, and *Cat.* 2311; leaves ovate or obovate-oblong narrowed at the apex rounded on the petiole entire, midrib beneath rusty-villous, panicle thin rusty-villous, pedicels as long as the flowers and fruits. *A. DC. Prodr.* viii. 84; *Scheff. Myrsin.* 42.

PENANG; *Jack.* MALACCA; *Maingay*.

A scandent shrub; branches cinnamomeous-tomentose. *Leaves* 3 by 1½ in., shortly obtusely acuminate, pubescent on both surfaces when young, nearly glabrous except the midrib beneath when old, membranous, nerves prominent; petiole $\frac{1}{2}$ in., glandular. *Panicles* 2–4 in.; pedicels longer than the flowers in Wallich's examples; but Scheffer (*Myrsin.* 31) diagnoses the species as having pedicels shorter than the flowers and fruits. *Flowers* as in *E. Ribes*, but fulvous-villous; petals hairy on both surfaces. *Fruit* $\frac{1}{2}$ in. long, rather larger than in *E. Ribes*.

7. *E. Limpani*, *Scheff. Myrsin.* 37; leaves oblong subobtuse rusty-villous beneath, panicle rusty-villous, pedicels shorter than the flowers, bracts linear minute. *E. villosa*, *Wall. Cat.* 2313 chiefly, not of *A. DC.*

MALACCA; *Maingay*.—DISTRIB. Sumatra.

A scandent shrub; branches villous. *Leaves* 2½ by $\frac{3}{4}$ in., exactly oblong with parallel sides, or slightly wider upwards and obscurely obovate, coriaceous, base rounded; petiole $\frac{1}{2}$ in. *Panicles* compound, 2–5 in. diam., branches 1–4 in.; pedicels 0–½ in. *Calyx* rusty-pubescent. *Corolla* $\frac{1}{10}$ in. long, puberulous hardly pubescent within and without.—This is probably what Wallich originally meant to be his *E. villosa*, but he described under that name the very different plant mixed with it, which is only a pubescent form probably of *E. robusta*, *Roxb.*

8. *E. amentacea*, *Clarke*; leaves oblong subobtuse rusty-villous beneath, panicle rusty-villous, pedicels shorter than the flowers, bracts $\frac{1}{2}$ in. ovate-oblong.

MALACCA; *Griffith* (*Kew Distrib.* n. 3548).

Griffith's examples (marked by him *Samara*?) are young males; the branches of the panicle resembling catkins from the close imbrication of the bracts on all sides. Except as to these bracts, the plant is so exactly like *E. Limpani* that it may prove to be an abnormal form of that species. The flowers, however (males), appear perfectly developed and normal.

** *Inflorescence axillary.*

9. *E. floribunda*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 291, and *Cat.* 2305; leaves long-lanceolate acuminate entire glabrous base obtuse or rounded, racemes panicked glabrous. *A. DC. Prodr.* viii. 85; *Kurz For. Fl.* ii. 102, in

part. *E. esculenta*, Don *Prodr.* 147. *Samara floribunda*, Kurz in *Journ. As. Soc.* 1877, pt. ii. 222 (*syn. excl.*).

From NIPAL to BHOTAN and TENASSERIM, alt. 2-6000 ft.; frequent.—DISTRIB. Java.

A large, scandent shrub. *Leaves* $8\frac{1}{2}$ by $1-1\frac{1}{4}$ in., or (above the racemes) sometimes $1\frac{1}{2}$ by $\frac{1}{4}$ in., much acuminate often caudate, shining, nerves numerous; petiole $\frac{1}{4}-\frac{1}{2}$ in. *Racemes* all axillary, usually much divided, often 8 in. *Flowers*, pedicels and fruits much as in *E. Ribes*, but glabrous or very obscurely puberulous.—This has been confounded by Kurz and others, with *E. Ribes*; it has more acuminate leaves much more rounded at the base, and glabrous panicles never terminal.

10. *E. robusta*, Roxb. *Hort. Beng.* 16, and *Fl. Ind.* i. 587; leaves obovate-oblong elliptic or obovate suddenly shortly acuminate undulate or obscurely serrulate rusty-pubescent or rarely glabrous beneath reticulated, racemes scarcely divided often fasciated more or less rusty-pubescent. *Wall. Cat.* 2308; *A. DC. Prodr.* viii. 86; *Bedd. For. Man.* 137, and *Anal. Pl.* xix. fig. 2; *Brand. For. Fl.* 284; *Kurz For. Fl.* ii. 102. *E.?* *reticulata*, *Wall. Cat.* 6521. *E. villosa*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 289, and *Cat.* 2313 in *part.*; *A. DC. l. c.* 85. *E.?* *Tsjeriam-Cottam*, *A. DC. in Trans. Linn. Soc.* xvii. 131, and *Prodr. l. c.* 87; *Wight Ic.* t. 1209. *E.?* *Basaal*, *A. DC. in Trans. Linn. Soc. l. c.* 1, and *Prodr. l. c.* 87; *Dalz. & Gibs. Bomb. Fl.* 136. *E. picta*, *A. DC. Prodr.* viii. 86. *Samara?* *picta*, *Wall. Cat.* 2302. *S. robusta*, Kurz in *Journ. As. Soc.* 1877, and pt. ii. 222. *Ardisia?* *Basaal and Tsjeriam-Cottam*, *Roem. & Sch. Syst.* iv. 517, 518.—*Rheede Hort. Mal.* tt. 11, 12.

Throughout INDIA, alt. 0-5000 ft.; from the HIMALAYA (westward to the Jumna, Brandis) to CEYLON and TENASSERIM, very common.

A large, rambling shrub, or small tree; branches glabrous. *Leaves* $3\frac{1}{2}$ by 2 in., sometimes 7 by $3\frac{1}{4}$ in., base cuneate, margin usually undulate subentire (in a form of East Bengal and Birma regularly somewhat closely toothed), more or less pubescent beneath, or when mature quite glabrous (the type of Roxburgh's plant, much the less common form; see Wallich's note in *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 288); petiole $\frac{1}{8}-\frac{1}{2}$ in. *Racemes* 1-2 in.; bracts $\frac{1}{10}$ in., linear; pedicels shorter than the flowers and fruits. *Corolla* $\frac{1}{8}$ in. diam., puberulous within and without. *Berry* $\frac{1}{8}-\frac{1}{2}$ in. diam., red, nearly dry.

VAR. ferruginea, *Wall. Cat.* 2310 (sp.); branches rusty-tomentose, leaves beneath and racemes rusty-villous or subtomentose. *A. DC. Prodr.* viii. 86.—Pegu and Tenasserim; *Wallich, &c.*—Very different in appearance from Roxburgh's original smooth *E. robusta*, but (as Kurz states) it appears impossible to separate *E. villosa* on the one side from *E. robusta*, on the other from *E. ferruginea*.

11. *E. parviflora*, *Wall. Cat.* 2307; leaves small elliptic or ovate entire rusty-pubescent beneath base rounded, racemes shortened almost to umbels rusty-pubescent. *A. DC. Prodr.* viii. 86; *Scheff. Myrsin.* 44; *Kurz For. Fl.* ii. 104.—*Samara parviflora*, Kurz in *Journ. As. Soc.* 1877, pt. ii. 223.—*Celastrineae*, *Griff. Itin. Notes*, 85, n. 1226.

KHASIA MTS., alt. 0-4000 ft.; *Wallich, Griffith, &c.*—DISTRIB. Upper Birma, Sumatra.

A scandent shrub; branches rusty-pubescent. *Leaves* $\frac{1}{2}-1$ by $\frac{1}{4}-\frac{1}{2}$ in., acute or obtuse; petiole scarcely $\frac{1}{10}$ in. *Pedicels* $\frac{1}{8}$ in., rusty-pubescent, subumbelled on a peduncle $\frac{1}{8}$ in. *Petals* $\frac{1}{10}$ in., oblong, imbricate. *Filaments* slender, three times as long as the anthers. *Berry* $\frac{1}{8}$ in. diam.—Kurz is mistaken in saying that Griffith collected this plant (Kew Distrib. n. 3545) at Ava; Griffith has ticketed it "Lakhat," which is in Khasia nearly due north from Sylhet Station.

SECT. II. SAMARA, Linn. *Flowers* in general 4-merous. *Racemes* axillary. *Leaves* entire, or very nearly so. (*Choripetalum*, *A. DC.*).

12. **E. Myrtillus**, *Kurz in Journ. As. Soc.* 1871, pt. ii. 67, and *For. Fl.* ii. 104; leaves small broadly-elliptic glabrous obtuse base entire, racemes shortened almost to umbels rusty-pubescent. *Myrsine Myrtillus*, *Hook. Ic. Pl.* t. 825. *Samara Myrtillus*, *Kurz in Journ. As. Soc.* 1877, pt. ii. 223.

BIRMA; Taondong summit, *Griffith*. MALACCA; Mt. Ophir, *Griffith, Lobb.*—DISTRIB. Philippines.

Exceedingly like *E. parviflora*, except that the leaves are glabrous and prominently dotted beneath, the flowers 4-merous. *Kurz* guesses it to be a prostrate shrub, but the habit is that of *E. parviflora*, and it is perhaps scandent. The branches are rusty-pubescent, and the inflorescence exactly as that of *E. parviflora*, with which it must be congeneric.

13. **E. Gamblei**, *Kurz ms.*; leaves obovate-oblong or elliptic acute or subobtusely entire glabrous reticulated on both surfaces, fruits $\frac{1}{4}$ in. diam. globose. *Samara* (Choripetalum) frondosa, *King*; *Gamble Darjeeling list* 52.

SIKKIM; alt. 6-9000 ft., frequent; *Griffith* (*Kew Distrib. n.* 3544), *J. D. H.*, &c.

A large climber; branches glabrous, or tips rusty-tomentose. *Leaves* $5\frac{1}{2}$ by $2\frac{1}{2}$ in., base rounded or cuneate, midrib beneath glabrous or rarely tomentose; petiole $\frac{3}{8}$ in. *Racemes* $1-1\frac{1}{2}$ in., simple, numerous, usually from the portion of the branches bare of leaves, minutely pubescent or nearly glabrous; pedicels $\frac{1}{4}$ in. *Petals* $\frac{1}{8}$ in., elliptic, obscurely pubescent, imbricate in bud. *Stamens* 4; anthers oblong; not overtopping the petals.—Leaves eaten by the hill-men (*J. D. H.*, *J. S. Gamble*).

14. **E. Nagushia**, *Don. Prodr.* 147; leaves lanceolate or obovate-lanceolate entire glabrous membranous base narrowed, fruits $\frac{1}{4}-\frac{1}{2}$ in. broad depressed-globose. *Myrsine*? undulata, *Wall. Cat.* 2301. *Choripetalum undulatum*, *A. DC. Prodr.* viii. 88.

NIPAL; *Wallich*. SIKKIM, alt. 5-10,000 ft.; *J. D. H.*, *Gamble*, &c. KHASIA Mts., *Masters*.

A large climber (*Gamble*), or a tree 60 ft. high (*J. D. H.*), or a large erect shrub (*Clarke*); branches glabrous. *Leaves* 3-6 by 1-2 in., suddenly shortly acuminate or subobtusely; petiole $\frac{1}{3}-\frac{2}{3}$ in. *Racemes* 1 in., simple, usually from the portion of the branches bare of leaves, and appearing with the very young leaves, minutely pubescent or nearly glabrous; pedicels $0-\frac{1}{8}$ in. *Petals* $\frac{1}{10}$ in., elliptic. *Filaments* 4, not so long as the petals.—Flowers often hermaphrodite. *Drupe* edible (*Don*). Acid leaves eaten by the hill-men (*J. D. H.*).

VAR. *subcoriacea*; leaves subcoriaceous, racemes 2-3 in.—Khasia Mts., *Griffith* (*Kew Distrib. n.* 3545); Cherra and Surureem, alt. 5-6000 ft., *H. f. & T.*—A lofty climber. *Leaves* 5 by 2 in., obovate-lanceolate, suddenly acuminate or subobtusely, base cuneate or sometimes broadly rhomboid almost rounded. *Fruits* $\frac{1}{2}$ in. broad, depressed-globose, resembling those of *E. Nagushia*. This may be a distinct species.

15. **E. viridiflora**, *Scheff. Myrsin.* 45; leaves coriaceous obovate or oblong entire glabrous base narrowed, fruits $\frac{1}{4}$ in. subglobose rather longer than broad. *Choripetalum viridiflorum*, *A. DC. Prodr.* viii. 88. *C. aurantiacum*, *A. DC. l.c.*; *Wight Ic. t.* 1210. *Samara Rheedii*, *Wight Ic. t.* 1591. *S. viridiflora*, *Thwaites Enum. Pl. Zeyl.* 173.—*Rheede Hort. Mal.* vii. t. 42.

DECCAN PENINSULA AND CEYLON, alt. 2-5000 ft., frequent.—DISTRIB. Malaya.

A large, scandent shrub. *Leaves* 4-6 by $1\frac{1}{2}-2\frac{1}{2}$ in. (or smaller oblong), narrowed cuneate at both ends or subobtusely; petiole $\frac{1}{2}$ in. *Racemes* $\frac{1}{2}-1$ in., minutely pubescent or nearly glabrous. *Petals* $\frac{1}{10}$ in., elliptic.—Hardly distinguishable without the fruit from the coriaceous form of *E. Nagushia*.

SUBGENUS II. **Rhynchostylis**. *Petals* twisted in the bud: *Ovary* tapering upwards into a beak. (*Racemes* axillary).



16. **E. vestita**, Roxb. *Fl. Ind. ed. Carey & Wall.* ii. 288; leaves oblong or ovate narrowed at both ends serrate glabrous, racemes short simple rusty pubescent, petals twisted in the bud. *Wall. Cat.* 2306; *Deless. Ic. Sel.* v. t. 30; *A. DC. Prodr.* viii. 86; *Kurz For. Fl.* ii. 103 partly. *Samara vestita*, *Kurz in Journ. As. Soc.* 1877, pt. ii. 223 partly.—*Choripetali* sp., *Griff. Itin. Notes* 168, n. 162.

NIPAL; *Wallich*. BHOTAN; *Griffith* (Kew Distrib. n. 3547, 3549). ASSAM; Nowgong, *Simons*. KHASIA MTS.; *Griffith*; alt. 4-5000 ft., frequent, *H. f. & T., Clarke*.

A scandent shrub; branches glabrous. *Leaves* 3 by $1\frac{1}{4}$ in., shining base, cuneate or rhomboid, denticulations shallow but sharp, mostly in the upper part of the leaf, nerves conspicuous; petiole $\frac{1}{8}$ – $\frac{1}{4}$ in., glabrous. *Racemes* $\frac{1}{2}$ – $1\frac{1}{4}$ in. *Petals* $\frac{1}{10}$ in., oblong, dotted. *Ovary* $\frac{1}{10}$ in., ovoid-conic, beaked. *Berry* globose, $\frac{1}{2}$ in. diam.

17. **E. nutans**, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 291, and *Cat.* 2303; leaves oblong subobtusely acuminate pubescent or rusty puberulous on the midrib beneath entire or obscurely bluntly crenulate, base rounded, racemes short simple rusty-pubescent, petals twisted in bud. *A. DC. Prodr.* viii. 87. *E. vestita*, *Kurz For. Fl.* ii. 103 partly. *Samara vestita*, *Kurz in Journ. As. Soc.* 1877, pt. ii. 223 partly.

SILHET; *Wallich*, *H. f. & T.* KHASIA MTS., alt. 0-5000 ft.; *H. f. & T.* ASSAM; *Griffith, Masters*. PEGU; *Kurz*.

Branches rusty-pubescent, at least towards the tips. *Petioles* rusty-pilose, or pubescent, or ultimately glabrescent. *Racemes* flowers and fruits as in *E. vestita*, with which it is united by *Kurz*; but there is no difficulty in distinguishing it.

18. **E. Gardneriana**, *Wight Ic.* t. 1208; leaves ovate-lanceolate crenate-serrate beautifully reticulated, racemes shortened almost to fascicles rusty-hairy.

NILGHERY MTS.; Sisparah, *Gardner, &c.*

A large climber; branchlets rusty-hairy. *Leaves* $2\frac{1}{2}$ by $\frac{3}{4}$ – $1\frac{1}{4}$ in., from ovate to lanceolate, base rounded, rusty-pilose on the midrib beneath or altogether glabrous, shining, coriaceous, nerves much raised on the upper surface; petiole $\frac{1}{4}$ in. *Pedicels* $\frac{1}{8}$ – $\frac{1}{4}$ in., subumbellulate from imbricated small bracts. *Petals* $\frac{1}{10}$ in., oblong, dotted. *Ovary* $\frac{1}{10}$ in., ovoid-conic, long beaked. *Berry* $\frac{1}{4}$ – $\frac{1}{2}$ in. diam., globose.—No buds seen, but from the conically beaked ovary it may be inferred that the petals were twisted in bud, and that the species is a near ally of *E. vestita*.

IMPERFECTLY KNOWN SPECIES.

E. ? LUCIDA, *Wall. Cat.* 2315; leaves 3 by $1\frac{1}{4}$ in, broadly oblong suddenly narrowed at both ends entire glabrous coriaceous, racemes 1 in. axillary simple solitary or paired rusty-villous. *A. DC. Prodr.* viii. 87.—SINGAPORE, *Wallich*.—Certainly of this genus.

EMBELIA, sp., *Griff. Notul.* iv. 223; leaves ovate-lanceolate glabrous in age subspinosely toothed, panicles axillary and terminal, corolla rotate 5-partite. MOULMEIN; plentiful, *Griffith*.—*Kurz in Journ. As. Soc.* 1877, pt. ii. 223, proposes doubtfully to reduce this to *E. Ribes*; but the subspinosely toothed leaves will not allow this.

CHORIPETALUM, *Griff. Ic. Pl. Asiat.* t. 499; branches pubescent, leaves lanceolate acute at both ends entire pubescent, panicles axillary longer than the leaves.—PAROYE MTS., south-east of Assam; *Griffith*.—Assuming that the branches and leaves are glabrous, this might be *E. floribunda*.

CHORIPETALUM sp., *Griff. Ic. Pl. Asiat.* t. 500; leaves lanceolate acuminate serrate, base cuneate or rhomboid, panicles axillary shorter than the leaves, flowers 4-merous, several 5-merous.—MISHMEE; *Griffith*.

4. **LABISIA**, *Lindl.*

Small shrubs, with a creeping rhizome and short simple stem. *Leaves* lanceolate, acuminate, primary nerves nearly at right angles to the midrib; petiole dilated at the base. *Flowers* small, white, in axillary panicked spikes; bracts very small. *Calyx* 5-toothed. *Corolla* 5-partite; segments ovate, induplicate-valvate in bud. *Stamens* 5, filaments short; anthers oblong-linear. *Ovary* superior, globose; style cylindric, stigma small; ovules few. *Fruit* small, globose, 1-seeded. *Seed* globose, base hollowed, albumen smooth; embryo transverse.—Species 2, Malayan.

1. ***L. pothoina***, *Lindl. in Bot. Reg.* 31, t. 48; leaves glabrous or puberulous beneath entire or nearly so, flowers very shortly pedicelled clustered on the rachis of the linear rusty-pubescent panicle. *Ardisia pumila*, *Blume Bijl.* 688; *A. DC. in Trans. Linn. Soc.* xvii. 135, and *Prodr.* viii. 137; *Scheff. Myrsin.* 92. *A. ? spicata*, *Wall. Cat.* 2273.

MALACCA and SINGAPORE; *Wallich, &c.*—DISTRIB. Sumatra to Borneo.

Stem 6 in. *Leaves* 8 by $2\frac{1}{2}$ in., primary nerves horizontal, very numerous, close; petiole 1-3 in., more or less winged its whole length. *Peduncles* 1-2 in., from 1-3 penultimate axils; spikes 1-4 in. *Petals* $\frac{1}{10}$ in., dotted. *Berry* $\frac{1}{8}$ - $\frac{1}{6}$ in. diam.

VAR. pothoina proper; petiole winged throughout its length.

VAR. lanceolata, *Scheff. Myrsin.* 93; petiole 2-4 in. not winged, base of leaf narrowed or rounded, pedicels $\frac{1}{8}$ - $\frac{1}{6}$ in.—Singapore, *Lobb.* DISTRIB. Sumatra, Borneo.

5. **ARDISIA**, *Swartz.*

Shrubs or small trees. *Leaves* petioled. *Flowers* hermaphrodite, in axillary or terminal, simple or compound umbels or racemes; bracts small, deciduous (except in *A. involucrata*). *Calyx* 5- (rarely 4-) lobed, (sometimes 3-lobed in *A. porosa*), persistent, often somewhat enlarged in fruit. *Corolla* red, white, or spotted, 5-partite; segments acute (in *A. membranacea* emarginate), twisted to the right in bud. *Stamens* 5; filaments very short (except in *A. membranacea*); anthers free, ovate-lanceolate, acute (in *A. membranacea* small, round), (in *A. porosa* opening by terminal pores). *Ovary* globose, narrowed upwards (in *A. membranacea* obovate-oblong); style cylindric, often much longer than the corolla-lobes, stigma punctiform; ovules few. *Fruit* globose or subglobose. *Seed* solitary, globose, albumen pitted or ruminated; embryo horizontal.—Species 200, all tropical.

The Indian species are very uniform in floral structure, except *A. involucrata membranacea* and *porosa*, which differ possibly generically from all the rest—as much perhaps as do *Pimelandra* and *Amblyanthus*.

* *Panicle* terminal, 1-2-divided, branches ending in corymbs often contracted almost to umbels, bracts not leaf-like.

† *Panicle* stout, compound.

1. ***A. crassa***, *Clarke*; leaves narrow-oblong acute at both ends, panicle rusty-pubescent, branches and pedicels exceedingly thick, corolla broad short.

MALACCA; *Maingay*.—DISTRIB. Borneo.

Branches round, stout, ending in a much-flattened panicle. *Leaves* $8\frac{1}{2}$ by 2 in., parallel-sided, subentire, coriaceous, glabrous, primary nerves nearly at right angles to the midrib; petiole $\frac{1}{2}$ in. *Panicle* 5 in. (including the peduncle); branches remote, flattened, again divided; pedicels $\frac{1}{8}$ - $\frac{1}{6}$ in., umbelled, thickened upwards; bracteoles

$\frac{1}{2}$ in., elliptic, persistent. *Buds* $\frac{1}{2}$ in. long, and as much broad. *Sepals* $\frac{1}{2}$ in., elliptic; in fruit $\frac{1}{2}$ in., orbicular. *Anthers* ovate, acute. *Berry* $\frac{1}{2}$ in. wide, depressed-globose, not striated.—This is perhaps *A. eximia*, Miq. (Pl. Jungh. i. 196) which has subsessile flowers and very large leaves; or the allied *A. jambosoides*, Miq. (not seen).

2. ***A. lanceolata***, Roxb. *Fl. Ind. ed. Carey & Wall.* ii. 275; leaves narrowly obovate-lanceolate, panicle glabrescent once divided into laxly corymbose branches, corolla large. *Wall. Cat.* 2292; *A. DC. Prodr.* viii. 126. *A. speciosa*, *Blume Bijl.* 684; *A. DC. l. c.* 133; *Miq. Pl. Jungh.* i. 197, and *Fl. Ind. Bat.* ii. 1022; *Scheff. Myrsin.* 88. *A. purpurea*, Reinw.; *Blume Bijl.* 684; *A. DC. l. c.* 129; *Miq. in Pl. Jungh.* i. 197; *Scheff. l. c.* 88. *A. mucronata*, *Blume l. c.* 685; *A. DC. l. c.* 126; *Scheff. l. c.* 83. *A. Leschenaultii*, *A. DC. l. c.* 137; *Miq. Pl. Jungh.* i. 197, and *Fl. Ind. Bat.* ii. 1022; *Scheff. l. c.* 89. *A. Boissieri*, *A. DC. l. c.* 129. *A. Hasseltii*, *Blume*; *Scheff. l. c.* 86.

PENANG; Roxburgh. MALACCA; Griffith (Kew Distrib. n. 3569, 3579). SINGAPORE; McNair.—DISTRIB. Throughout Malaya to the Philippines.

A large shrub, glabrous or nearly so; branches cylindric. *Leaves* $8\frac{1}{2}$ by $2\frac{1}{2}$ in., shortly acuminate, subentire, coriaceous, primary nerves oblique; petiole $\frac{1}{2}$ in. *Panicle* 4–5 in., broadly ovate, terminal (rarely axillary compound large and bractless); branches 2–4 in., rarely again divided; pedicels $\frac{1}{2}$ – $1\frac{1}{2}$ in., scattered corymbosely on the branches; bracteoles small, obtuse, caducous. *Buds* $\frac{1}{2}$ by $\frac{1}{2}$ in., rose-red. *Sepals* $\frac{1}{2}$ in., orbicular, glabrous or nearly so; margins more or less scarious and fimbriate subpubescent; in fruit enlarged, more or less patent in the dried examples. *Berry* $\frac{1}{2}$ in. wide, globose, slightly depressed, not striated.

3. ***A. rigida***, Kurz in *Journ. As. Soc. Beng.* 1873, pt. ii. 87, and *For. Fl.* ii. 107; leaves elliptic acute at both ends, panicle glabrescent 1–2-divided, pedicels short, flowers rather small.

TENASSERIM; seashore of the Peninsula, Helfer (Kew Distrib. n. 3563).

Branches moderately stout, cylindric. *Leaves* 6 by $2\frac{1}{2}$ in., subentire, glabrous, coriaceous, primary nerves oblique; petiole $\frac{1}{2}$ in. *Panicle* 4 in.; branches minutely rusty-puberulous; pedicels $\frac{1}{2}$ in., umbelled or clustered; bracteoles minute, caducous. *Calyx-teeth* scarcely $\frac{1}{16}$ in., triangular-ovate, minutely rusty. *Buds* $\frac{1}{2}$ by $\frac{1}{2}$ in. *Berry* very small, but not ripe; calyx not enlarged on the young fruit.

4. ***A. paniculata***, Roxb. *Hort. Beng.* 16, and *Fl. Ind. ed. Carey & Wall.* ii. 270; glabrous, leaves obovate-lanceolate, panicle large compound, pedicels $\frac{1}{2}$ in. densely umbelled, calyx-lobes small round. *Wall. Cat.* 2268; *Bot. Reg.* t. 638; *Bot. Mag.* t. 2364; *A. DC. Prodr.* viii. 126; Kurz in *Journ. As. Soc.* 1877, pt. ii. 224, and *For. Fl.* ii. 107 (syn. excl.).

KHASIA MTS.; Griffith (Kew Distrib. n. 3573). DACCA; frequent, C. B. Clarke. CHITTAGONG HILLS; Roxburgh, Clarke.

A large shrub; branches more or less compressed. *Leaves* 9 by 3 in., shortly acute, tapering nearly to the base, subentire, coriaceous, primary nerves manifest, oblique; petiole very short and thick. *Panicle* 6–10 in.; branches more or less flattened, again divided; bracts often $\frac{1}{2}$ in., linear-oblong. *Buds* $\frac{1}{2}$ by $\frac{1}{2}$ in., rose-red. *Berry* $\frac{1}{2}$ in., globose, vertically striate.

VAR. *Hookeri*; leaves large, panicle lax compound, pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. *Ardisia* sp., n. 21, *Herb. Ind. Or. H. f. & T.*—Khasia Mts., alt. 1–3000 ft.; Chela, Nowgong, Luckhipoor, H. f. & T. Assam; Masters.—*Leaves* 14 by 5 in. (in some examples 20 in.). *Panicle* 13 in.; pedicels 2–4-fascicled and also scattered corymbosely.

5. ***A. missionis***, Wall. *Cat.* 6524; glabrous, leaves narrowly oblong obtuse narrowed at both ends, panicle large compound, pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. *A. DC. Prodr.* viii. 130.

CEYLON; common.

Leaves 5 by 1 in., very coriaceous, primary nerves obscure.—Very close to *A.*

paniculata, Roxb. and treated as a form of it in *Thwaites Enum. Pl. Zeyl.* 173. The numerous Ceylon specimens are, however, all alike, and all differ similarly from *A. paniculata*.

6. ***A. courtallensis***, *Wight Ic.* t. 1215; glabrous, leaves obovate-lanceolate, panicle compound lax, pedicels 1 in.

SOUTH DECCAN PENINSULA; Coimbatore and Courtallum, *Wight*.

This again is considered a form of *A. paniculata* by Thwaites (*Enum. Pl. Zeyl.* 173), and by Beddome (*For. Man.* 138), but the exceedingly long pedicels differ considerably. *A. paniculata*, *missionis* and *courtallensis* are strictly localised forms, whether they be considered species or varieties.

7. ***A. colorata***, Roxb. *Hort. Beng.* 16, and *Fl. Ind. ed. Carey & Wall.* ii. 271; leaves petioled narrowly oblong acute at both ends, primary nerves nearly at right angles to the midrib, panicle compound glabrous or obscurely rusty, buds $\frac{1}{8}$ in. long. *A. pyramidalis*, *Roth Nov. Sp.* 123 (not of Cav.). *A. anceps*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 280, and *Cat.* 2261; *A. DC. Prodr.* viii. 126; *Kurz in Journ. As. Soc.* 1877, pt. ii. 224, and *For. Fl.* ii. 107. *A. polycarpa*, *Wall. Cat.* 2285. *A. grandiflora*, *Wall. Cat.* 2272. *A. Rothii*, *A. DC. l.c.* 126. *A. Blumii*, *A. DC. in Trans. Linn. Soc.* xvii. 117, and *Prodr.* viii. 128, *fide Scheff. Myrsin.* 77. *A. ovata*, *Thunb.*; *Roem. & Sch. Syst.* iv. 517 (?).

From ASSAM and CACHAR to MALACCA, frequent; *Wallich, &c.* DISTRIB. Malaya, Birma.

A shrub, or tree attaining 25 ft.; branches round, becoming flattened only close under the panicle. *Leaves* 9 by $2\frac{1}{2}$ in., parallel-sided, glabrous, coriaceous; base cuneate; petiole $\frac{1}{2}$ in. *Panicle* 6–12 in., divided 2 or 3 times; branches flattened; pedicels $\frac{1}{8}$ – $\frac{1}{4}$ in., densely umbelled, glabrous or minutely puberulous. *Calyx-teeth* $\frac{1}{16}$ in., elliptic-oblong. *Style* $\frac{1}{4}$ in., longer than the corolla. *Berry* $\frac{1}{2}$ in., globose, smooth, deep-red to black.

VAR. polyneura, *Miq. in Pl. Jungh.* i. 198 (sp.); leaves wider, panicle subtriangular wide at the base. *Scheff. Myrsin.* 81.—Malacca, *Griffith*.—DISTRIB. Java.—Leaves $10\frac{1}{2}$ by 4 in., elliptic or somewhat obovate.—Griffith's example in *Herb. Wight* is identical with the Javan *A. polyneura*, but there are other Malacca examples intermediate between this form and *A. colorata* type. Blume placed these under his *A. sanguinolenta*.

VAR. complanata, *Wall. Cat.* 2277 (sp.); panicles smaller rusty, flowers rather smaller. *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 280; *A. DC. Prodr.* viii. 126; *Scheff. Myrsin.* 78. *A. sanguinolenta*, *Blume Bijl.* 685, not of *Wall.* *A. Zollingeri*, *A. DC. l.c.* 670.—Chittagong; *H. f. & T. Penang; Wallich*.—DISTRIB. Malaya.—Panicle branches often much flattened, densely scaly, hardly pubescent.—*Kurz* says the berry of his small-flowered *anceps* is white when fully ripe.

†† *Panicle not stout, primary branches often bearing the racemes or umboes.*

§ *Leaves distinctly toothed.*

8. ***A. zeylanica***, *Clarke*; leaves broad-lanceolate acute at both ends closely toothed, panicle simple or very sparingly compound, pedicels umbelled minutely rusty. *A. divergens* var. β *crispa*, *Thwaites Enum. Pl. Zeyl.* 174.

CEYLON; *Gardner, Wight*.

Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., glabrous, membranous, drying black primary nerves arching at some distance from the margin, the interspaces and margin with several rows of large dots; petiole $\frac{1}{8}$ – $\frac{1}{4}$ in. *Panicles* 3 by 2 in., primary branches bearing an umbel each, the lowermost sometimes 2; bracts at the forks not rarely leaf-like, 1 in.; pedicels $\frac{1}{4}$ in. *Calyx-lobes* $\frac{1}{2}$ in., ovate-oblong. *Buds* $\frac{1}{2}$ by $\frac{1}{8}$ in. *Berry* $\frac{1}{2}$ in., globose, obscurely striated vertically.

§§ *Leaves entire or obscurely crenulate.*

9. **A. amplexicaulis**, *Bedd. Ic. Pl. Ind. Or. t. 170*, and *Fl. Sylv. Anal. Pl. t. 18*, fig. 3; leaves short-petioled oblong acuminate base rounded, panicle simple or sparingly compound, pedicels umbelled minutely rusty.

WYNAAD; Tirrihoot Hills, alt. 4000 ft., and TRAVANCORE; *Beddome*.

A shrub. *Leaves* 5 by $1\frac{1}{4}$ in., broadest above the middle, acuminate, glabrous, membranous, primary nerves inarching at a distance from the margin, prominently dotted near the margin; petiole $\frac{1}{16}$ – $\frac{1}{8}$ in. *Panicle* flowers and fruits as in *A. zeylanica*.—Though *A. zeylanica* has strongly toothed leaves narrowed to the petiole, it is, perhaps, only a form of *A. amplexicaulis*.

10. **A. divergens**, *Roxb. Fl. Ind. ed. Carey & Wall. ii. 275*; leaves elliptic or oblong, drying red-brown rhomboid or almost round at the base, panicle subsimple minutely rusty. *Wall. Cat. 2269*; *A. DC. Prodr. viii. 130*. *A. punctata*, *Jack*; *Roxb. Fl. Ind. ed. Carey & Wall. ii. 275* (not of *Lindl.*). *A. punctulosa*, *Dietr. Syn. Pl. i. 615*.

PENANG; *Jack, Maingay*.—DISTRIB. Moluccas.

A small tree, 20 ft.; branchlets slender, cylindric, much divided. *Leaves* $4\frac{1}{2}$ by $1\frac{1}{2}$ in., subobtusely acuminate, glabrous, primary nerves arched, prominently dotted especially near the margin; petiole $\frac{1}{2}$ in. *Panicles* 3 by 2 in.; bracts small or deciduous; pedicels $\frac{1}{8}$ – $\frac{1}{2}$ in., subumbelled. *Buds* $\frac{1}{8}$ in., and as much broad. *Calyxlobes* $\frac{1}{20}$ in., round.—*A. javanica* (*A. DC. Prodr. viii. 130*) only differs by having the branchlets upwards and panicle more rusty-pubescent.

11. **A. Gardneri**, *Clarke*; leaves elliptic or obovate-lanceolate narrowed at both ends drying black, panicle minutely-rusty, pedicels umbelled. *A. divergens*, *Thwaites Enum. Pl. Zeyl. 174*; *A. DC. Prodr. viii. 130 par'ly*.

CEYLON, frequent; *Gardner, Thwaites, &c.*

Very near *A. divergens* and perhaps the Ceylon form of it. *Leaves* acute at the base. *Calyx-teeth* ovate, subacute, rather larger than in *A. divergens*. *Flowers* altogether as those of *A. zeylanica* (of which Thwaites reckons it a variety), and of *A. amplexicaulis*.

12. **A. andamanica**, *Kurz For. Fl. ii. 108*, and in *Journ. As. Soc. 1877*, pt. ii. 225; glabrous, leaves narrowly lanceolate base cuneate or rhomboid, panicles thin subsimple, pedicels racemed. *A. neriifolia*, *A. DC. Prodr. viii. 127 partly* (not of *Wall.*).

MALAY PENINSULA, from Mergui to Malacca, frequent; ANDAMAN ISLANDS; *Griffith, Kurz, &c.*

A shrub, 2–4 feet (*Kurz*). *Leaves* 5 by $1\frac{1}{4}$ in., acute, primary nerves not prominent, arching near the margin or not at all, sparsely dotted; petiole $\frac{1}{2}$ in. *Panicles* 4 in., often divaricate or depauperated; bracts 0 or deciduous; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. *Calyxlobes* $\frac{1}{16}$ in., round, glabrous. *Corolla* $\frac{1}{8}$ by $\frac{1}{2}$ in.—This is not near *A. oblonga*, *A. DC.* (as *Kurz* supposed), but is that form of *A. neriifolia*, *A. DC.*, which is said to have terminal inflorescence, and which in fact specifically differs from the North Bengal *A. neriifolia* of Wallich. *A. DC.*'s figure (*Trans. Linn. Soc. xvii. t. 8*) represents *A. andamanica*, while most of the description ("panicles lateral peduncles and pedicels somewhat velvety") can apply only to *neriifolia*.

VAR. *effusa*; leaves elliptic acuminate, panicle straggling, pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in., buds $\frac{1}{4}$ by $\frac{1}{2}$ in.—Andamans; Port Mouat, *Kurz*.—*Kurz* has issued this unnamed, as though he supposed it specifically different from his *A. andamanica*.

13. **A. tuberculata**, *Wall. Cat. 2274*; leaves coriaceous elliptic narrowed to both ends, panicles compound glabrous or rusty-scaly, flowers numerous small. *A. DC. in Trans. Linn. Soc. xvii. 119*, and *Prodr. viii. 130*. *A. chrysophylloides*, *Miq. Fl. Ind. Bat. Suppl. 574*.

MALACCA; *Griffith* (Kew Distrib. n. 3564), *Maingay*. SINGAPORE, *Wallich*, *Maingay*.

Leaves 5 by $1\frac{1}{2}$ in., primary nerves obscure or numerous, thin; petiole $\frac{1}{4}$ in., often rusty-scaly. *Panicle* 3-6 in.; pedicels $\frac{1}{16}$ - $\frac{1}{8}$ in., crowded, *Calyx-lobes* very small, ovate, subglabrous. *Buds* $\frac{1}{12}$ - $\frac{1}{8}$ in.

VAR. ophirensis; nerves of the leaves beneath prominent somewhat thickened, calyx-lobes elliptic, flowers a little larger.—Mt. Ophir, Malacca.

14. **A. porosa**, *Clarke*; glabrous, leaves oblong narrowed at both ends, panicle of 1-3 elongate lax racemes, anthers opening by terminal pores.

MALACCA; *Griffith* (Kew Distrib. n. 3578); *Maingay*.—DISTRIB. JAVA.

Branchlets flexuose, almost zigzag, compressed or winged. *Leaves* 5 by $1\frac{1}{2}$ in., cuneate, subacute at both ends, hardly acuminate; primary nerves distinct, ramifying (rather than arching) near the margin; dots 0 or obscure; petiole $\frac{1}{8}$ in. *Panicle* 2-4 in., branches wiry, flexuose, compressed; pedicels $\frac{1}{4}$ - $\frac{3}{4}$ in., scattered in racemes 1-3 in. long; bracts and bracteoles 0, or small, caducous. *Flowers* 5-4 rarely 3-merous. *Buds* $\frac{1}{4}$ by $\frac{1}{2}$ in. *Calyx-lobes* $\frac{1}{20}$ in., ovate. *Stamens* 5-4, free; anthers as of *Ardisia* but with round (scarcely elongate) pores at the apex. *Berry* $\frac{1}{8}$ in., globose, dark-purple (*Maingay*), altogether of *Ardisia*.—The Java plant has broader leaves and a still more reduced panicle.

** *Panicle in appearance terminal, the axis of the branch ending in a reduced leaf or leaves, below which rise one or more peduncles. (The panicle is perhaps terminal in some of these species.)*

15. **A. depressa**, *Clarke*; glabrous, leaves oblong acute at both ends, panicles slender compound not rising above the leaves, flowers small. *A. neriifolia*, *Kurz For. Fl.* ii. 108, and in *Journ. As. Soc.* 1877, pt. ii. 225 (not of *Wall.*).

SIKKIM, alt. 4-6000 ft., *J. D. H. KHASIA MTS.*, *Griffith*, *Wallich*. **ASSAM** *Plains, Herb. Roxburgh*. **BIERMA**, *Griffith* (Kew Distrib. n. 3581).

A large bush. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., acuminate, primary nerves close fine, dots most minute; petiole $\frac{1}{2}$ in. *Panicles* 2-3 in.; peduncles bearing as it were small compound umbels; bracts and bracteoles 0 or caducous. *Buds* $\frac{1}{2}$ in. long, and as much broad. *Flowers* rose-coloured (*Griffith*). *Calyx-teeth* $\frac{1}{16}$ in., lanceolate, acute. *Berry* $\frac{1}{2}$ in., globose, not striate.—This is *A. pedunculata* in *Herb. Roxburgh*, and was mixed with *A. pedunculosa* in *Herb. Wallich*; and (perhaps from the small flowers) has been called *A. pauciflora*, *Heyne*?

16. **A. neriifolia**, *Wall. Cat.* 2278; leaves elongate narrow obovate-lanceolate acute entire, panicles minutely-rusty, berry globose-pentagonal scarcely depressed. *A. DC. in Trans. Linn. Soc.* xvii. 118 partly (as to description only), (not of *Kurz*). *A. floribunda*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 272, and *Cat.* 2263; *A. DC. Prodr.* viii. 127; *Brand. For. Fl.* 287. *A. thyrsoiflora*, *Don Prodr.* 148; *A. DC. l. c.* 138.

SUBTROPICAL HIMALAYA, alt. 5000 ft.; from Kumaon to Bhotan, frequent. **KHASIA MTS.**, alt. 4000 ft., frequent.

A large shrub, common by rivers, with erect branches topped by the pink flowers, and reminding altogether of Oleander. *Leaves* 7 by $1\frac{1}{2}$ in., attenuate at the base, nerves obscure; petiole $\frac{1}{2}$ in. *Peduncles* 3-5 in., ascending, springing above the leaves below the terminal reduced tuft, each supporting often a compound panicle; bracts 0 or caducous; pedicels $\frac{1}{2}$ in., umbeled. *Buds* $\frac{1}{2}$ by $\frac{1}{2}$ in. *Calyx-lobes* $\frac{1}{10}$ in., elliptic, obtuse, minutely rusty. *Berry* $\frac{1}{2}$ in. diam., distinctly pentagonal at least when dry, deep-red.

17. **A. quinquangularis**, *A. DC. in Trans. Linn. Soc.* 2. xvi. 95, and *Prodr.* viii. 127; leaves elongate obovate-lanceolate acute entire, panicles compound rusty-pubescent, berry small pentagonal greatly depressed.

ASSAM.

Leaves and inflorescence exceedingly like those of *A. neriifolia*. Calyx pubescent. Berry $\frac{1}{10}$ by $\frac{1}{8}$ in., markedly pentagonal, strongly depressed.—The plant here identified (from description only) with *A. quinquangularis*, A. DC., may be a var. of *A. neriifolia*, but the small depressed berry is unlike any of the fruiting examples of that plant. A. DC.'s plant was "obtained by the Ganges or cultivated in the Botanic Garden, Calcutta."

18. **A. pedunculosa**, Wall. in Roxb. *Fl. Ind. ed. Carey & Wall.* ii. 279, and *Cat.* 2271 partly; glabrous, leaves elongate lanceolate acute, umbels placed racemously on the peduncles, pedicels long, flowers rather large, A. DC. *Prodr.* viii. 128.

KHASIA Mts., alt. 2–5000 ft., frequent; Wallich.

A straggling shrub, with pendent inflorescence. Leaves 7 by $1\frac{1}{2}$ in., entire or obscurely toothed, dotted, base cuneate, nerves slender; petiole $\frac{1}{2}$ – $\frac{1}{3}$ in. Peduncles 1–4 in., divaricate, sometimes crowded close to the end of the branches, appearing to form a large compound panicle, sometimes axillary or extra-axillary far below the terminal leaves; bracts $\frac{1}{2}$ in., leaf-like, rarely persistent; pedicels $\frac{1}{2}$ in., minutely rusty sometimes when young. Buds $\frac{1}{4}$ by $\frac{1}{8}$ in., very acute. Flowers rose-red. Sepals $\frac{1}{8}$ in., ovate-lanceolate, acute. Berries $\frac{1}{8}$ by $\frac{1}{4}$ in., globose, slightly depressed, vertically striate.

19. **A. Griffithii**, Clarke; leaves large obovate-oblong acute entire, panicle rusty, pedicels $\frac{1}{4}$ in. umbelled. *Ardisia* sp. n. 22, *Herb. Ind. Or. H. f. & T.*

KHASIA Mts.; Griffith (Kew Distrib. n. 3576); Nunklow, alt. 3–5000 ft., H. f. & T.

Habit and inflorescence of *A. neriifolia*, but much stouter, with broad leaves.—Leaves 10 by 3 in., narrowed at the base, glabrous, nerves slender; petiole $\frac{3}{8}$ in. Bracts (at the base of the umbels) $\frac{1}{8}$ in., elliptic-oblong, unusually persistent. Sepals $\frac{1}{8}$ in., elliptic-oblong. Berries $\frac{1}{8}$ by $\frac{1}{8}$ in., globose slightly depressed, vertically striate.

20. **A. Icara**, Ham. in Wall. *Cat.* 2264; leaves elongate lanceolate acute crenulate-toothed, panicles rusty, sepals lanceolate acute. A. DC. in *Trans. Linn. Soc.* xvii. 125, t. 7, and *Prodr.* viii. 136. A. serrulata, Kurz in *Journ. As. Soc.* 1873 pt. ii. 87, 1877 pt. ii. 225, and *For. Fl.* ii. 108 (not of Swartz).

NORTH-EAST BENGAL; Mudhopoor and Bholagunje, Hamilton. ASSAM; Suddiya, Griffith (Kew Distrib. n. 3577). BIRMA and TENASSERIM; Griffith and Helfer (Kew Distrib. n. 3562).

Habit and inflorescence of *A. neriifolia*; from which it only differs by the narrow acute sepals and distinctly crenulate leaves; the berries are hardly pentagonal.

21. **A. Moonii**, Clarke; leaves elliptic or obovate coriaceous entire, peduncles few crowded very near the end of the stem long bearing simple panicles, pedicels minutely rusty umbelled. A. Wallichii, Thwaites *Enum. Pl. Zeyl.* 174 (not of A. DC.). *Anguillaria zeylanica*, Gaertn. *Fruct.* i. 173, t. 77, fig. 1.—*Burm. Thes. Zeyl.* t. 103.

CEYLON; Moon, &c.

An undershrub $\frac{1}{2}$ –2 ft.; young parts obscurely rusty. Leaves $6\frac{1}{2}$ by $3\frac{1}{2}$ in., obtuse with a short acumination, base cuneate, dotted, primary nerves distinct beneath; petiole $\frac{1}{4}$ in. Peduncles 2–3 in., forming a terminal quasi-umbel; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. Buds $\frac{1}{8}$ by $\frac{1}{8}$ in., pyramidal. Flowers rose (Thwaites). Sepals $\frac{1}{12}$ in., ovate, subacute. Berry $\frac{1}{8}$ in., subglobose, smooth (red, Thwaites).—Easily distinguished from *A. Wallichii* by the entire leaves and quasi-terminal peduncles.

VAR. *subsessilis*; panicles subsessile solitary or several umbelled subterminal,

A. humilis, var., *Thwaites Enum. Pl. Zeyl.* 174.—Ceylon, *Gardner, Thwaites*, n. 2829.—This is, perhaps, distinct from *A. Moonii*, but it can hardly be *A. humilis*; not only is the inflorescence widely different, but the sepals are quite small, not concave with membranous margins on the fruit.

22. ***A. macrocarpa***, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 277, and *Cat.* 2267; leaves narrowly lanceolate crenulate, umbels subterminal sometimes also from the upper axils and then peduncled, pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. *A. DC. Prodr.* viii. 134.

NIPAL; *Wallich*. SIKKIM and BHOTAN; alt. 3–7000 ft., frequent, *J. D. H.*, &c.
A shrub, 1–4 ft. *Leaves* 4–5 by $\frac{1}{4}$ in., acute at both ends, glabrous, membranous, crisped-crenulate with a marginal row of dots; petiole very short or obscured by the long-attenuated base of the leaf. *Peduncles* subterminal and short, or lateral 1–4 in. without leaves or leaf-like bracts at their apex; pedicels minutely rusty. *Calyx-lobes* $\frac{1}{2}$ – $\frac{3}{4}$ in., in fruit sometimes $\frac{1}{2}$ in., narrowly oblong. *Petals* exceeding $\frac{1}{2}$ in., lanceolate acute. *Berries* $\frac{1}{2}$ – $\frac{3}{4}$ in. wide, globose depressed, bright red, dotted, not vertically striated.—Both *A. DC.* and *Kurz* supposed this near *A. crispa*, which has smaller berries and quite different inflorescence, the lateral umbels being sessile, i.e. supported by large leaves.

23. ***A. virens***, *Kurz For. Fl.* ii. 575, and in *Journ. As. Soc.* 1877, pt. ii. 226; leaves broadly lanceolate acuminate margins crisped-crenulate, peduncles subterminal exceedingly long, pedicels 1 in. *Ardisia* sp. n. 37, *Herb. Ind. Or. H. f. & T.*

MISHMER, *Griffith* (Kew Distrib. n. 3561). ASSAM; *Griffith*. KHASIA MTS., alt. 4000 ft., *H. f. & T.*, &c. CACHAR; Doorbund Pass, *Keenan*.—DISTRIB. YULAN.

A small shrub, resembling much *A. macrocarpa*. *Leaves* 7 by 2 in., more acuminate than those of *A. macrocarpa*, and without the marginal row of glands. *Peduncles* 1–2 in., carrying simple or compound glabrous umbels with numerous flowers. *Calyx-lobes* $\frac{1}{2}$ in., elliptic-oblong. *Corolla-lobes* $\frac{1}{2}$ in., ovate, acute, white (*Kurz*). *Berry* $\frac{1}{2}$ – $\frac{3}{4}$ in., globose, smooth, dotted not vertically striated, yellow.

*** *Umbels* sessile, simple or compound, terminal, mostly on divaricate branches springing laterally below the end of the main branches.

24. ***A. undulata***, *Clarke*; glabrous, leaves lanceolate acute crenulate, calyx-lobes in fruit narrowly-oblong, berries large. *Ardisia* sp. n. 41, *Herb. Ind. Or. H. f. & T.* *Ardisia* sp., n. 953, *Griff. Itin. Notes* 62.

KHASIA MTS.; alt. 250–5000 ft., frequent; *Griffith, H. f. & T.*, &c.

Leaves 5 $\frac{1}{2}$ by 1 $\frac{1}{2}$ in., acute at both ends, undulate-crenate, membranous, with prominent glands scattered distantly over the whole surface. *Umbels* simple and compound; pedicels $\frac{1}{2}$ –1 in. in fruit. *Buds* $\frac{1}{2}$ in., acute. *Calyx-lobes* $\frac{1}{16}$ in., ovate; in fruit $\frac{1}{2}$ in., oblong. *Berry* $\frac{1}{2}$ – $\frac{3}{4}$ in., globose, gland-dotted, not vertically striated, altogether as of *A. macrocarpa*.—This is perhaps only a northern form of *A. crenata*, differing by the long acute leaves, and large berry; and was the plant which (under the mistaken name of *A. macrocarpa*) *Kurz* proposes to merge in *A. crenata*.

25. ***A. crenata***, *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 276; glabrous, leaves elliptic acute or subobtusely crisped-crenate, berries $\frac{1}{2}$ in. diam. globose obscurely vertically striate not dotted. *Wall. Cat.* 2262; *Bot. Mag. t.* 1950. *A. glandulosa*, *Blume Bijdr.* 690, not of *Roxb.* *A. crenulata*, *Lodd. Bot. Cab. t.* 2, not of *Vent.* *A. crispa*, *A. DC. in Trans. Linn. Soc.* xvii. 124, and *Prodr.* viii. 134 (excl. syn. *A. lentiginosa* and *elegans*); *Kurz For. Fl.* ii. 113, and in *Journ. As. Soc.* 1877, pt. ii. 226. *A. densa* and *polysticta*, *Miq. Fl. Ind. Bat. Suppl.* 575, 576. *Bladhia crispa*, *Thumb. Fl. Jap.* 97; *Kaempfer. Ic. Pl. Jap.* t. 7.

PENANG, MALACCA, and SINGAPORE, frequent.—DISTRIB. Malaya, China, Japan.

Leaves 3 $\frac{1}{2}$ by 1 $\frac{1}{2}$ in., membranous; primary nerves very close together, slender but conspicuous beneath. *Umbels* simple, sometimes proliferous, i.e. compound with 1,



rarely 2, lateral secondary umbels, always supported by a leaf (Roxburgh). *Buds* $\frac{1}{4}$ in., ovate, acute. *Flowers* rose or white, often spotted. *Calyx-lobes* (in fruit) $\frac{1}{12}$ in., ovate.

VAR. angusta; leaves narrowly lanceolate, flowering pedicels 1 in. divaricate. buds very obtuse, corolla-segments broad.—Malacca; *Griffith* (Kew Distrib. n. 3584).—Leaves 3 by $\frac{1}{2}$ in., tapering at both ends, primary nerves carried almost undivided to the obscure crenatures, whole surface gland-dotted. *Buds* $\frac{1}{2}$ in.

26. *A. Kurzii*, *Clarke*; glabrous, leaves obovate-lanceolate entire reticulated beneath, calyx-segments small obtuse. *A. polycephala*, var. *acuminata*, *Kurz For. Fl.* ii. 110, and in *Journ. As. Soc.* 1877, pt. ii. 225.

PEGU and MARTABAN; in the tropical forests, *Kurz*.

Leaves 8 by $2\frac{1}{4}$ in., shortly acuminate, cuneate at the base; primary nerves beneath prominently inarching at some distance from the margin, secondary nerves distinctly reticulated; petioles $\frac{2}{3}$ in. *Umbel* (very young) compounded of 3 umbellules; bracts $\frac{1}{12}$ in., elliptic, deciduous.—*Kurz* has observed that this is perhaps distinct from *A. polycephala*.

27. *A. villosa*, *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 274; innovations rusty-villous, leaves lanceolate, umbels rusty-villous, calyx-segments $\frac{1}{4}$ in. linear-lanceolate. *Wall. Cat.* 2280; *A. DC. Prodr.* viii. 136; *Scheff. Myrsin.* 90; *Kurz For. Fl.* ii. 113, and in *Journ. As. Soc.* 1877, pt. ii. 227. *A. vestita*, *Wall. in Roxb. l. c.* in note; *A. DC. l. c.* *A. mollis*, *Blume Bijl.* 689. *A. glabrata*, *Blume Bijl.* 692; *A. DC. l. c.* *A. Tavoyana*, *A. DC. in Trans. Linn. Soc.* xvii. 125.

From MERGUI to MALACCA and PENANG, frequent.—DISTRIB. Malaya.

A small shrub. *Leaves* 6-8 by $\frac{3}{4}$ - $2\frac{1}{4}$ in., narrowed at both ends, sparingly crenate or nearly entire, more or less rusty-villous on the lower or on both surfaces; petiole $\frac{1}{2}$ in. *Umbels* simple, or several together, very shortly peduncled; bracts $\frac{1}{4}$ - $\frac{1}{2}$ in., elliptic; pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in., patently villous. *Calyx* subcorolloid, whitish; segments villous without, within glabrous or (in the very hairy forms) hairy. *Corolla* small, hardly so long as the calyx. *Berries* $\frac{1}{4}$ in., globose, shorter than the sepals.—A somewhat variable, though easily recognised species; leaves very broadly lanceolate in some of Griffith's Mergui specimens, linear-lanceolate in Maingay's Malacca ones; often nearly glabrous (in age) except the midrib beneath; more frequently villous beneath; in the form *vestita*, clothed with long fulvous hairs also above.

VAR. ? obtusa; leaves obovate-oblong subobtuse, umbels in short shortly-peduncled corymbs.—Shevagherry Hills, South Deccan Peninsula, *Wight*.—Lateral branches divaricate below the summit of the main branch, leafy upwards; terminated by the corymb. Peduncle $\frac{1}{4}$ in.; corymb repeatedly dichotomous; rusty-pubescent; pedicels $\frac{1}{2}$ - $\frac{3}{4}$ in. Calyx-segments $\frac{1}{2}$ in., ovate-lanceolate.—Perhaps a distinct species, but the solitary example in Herb. Wight is without flowers; it is very like *Hymenandra Wallichii*, but the calyx-teeth are too large for that.

**** *Umbels peduncled or panicled, axillary, the lower (at least) always peduncled without leaves or leaf-like bracts at the apex of the peduncles.*

† Plant not wholly glabrous, branchlets at least hairy or pubescent.

† Leaves serrate or crenate.

28. *A. odontophylla*, *Wall. Cat.* 2279 (not of *Lindl.*); branchlets upwards rusty-ovulent, leaves long-petioled elliptic sharply finely serrate villous at least on the midrib beneath, peduncles (some of them) remote from the apex of the branch ascending. *A. DC. in Trans. Linn. Soc.* xvii. 125, t. 6, and *Prodr.* viii. 135.

KHASIA and JAINTRA MTS., alt. 1-4000 ft., frequent; *Wallich, H. f. & T.*, &c. PATKOYE MTS., S.E. of ASSAM; *Griffith* (Kew Distrib. n. 3566). CACHAR; *Keenan*.

A weak shrub, 2-6 ft. Leaves 6 by 3 in., acute at both ends, usually glabrous or most minutely pubescent except the nerves beneath; petiole 1 in. Racemes 1-4 in., simple or compound, lax, few-flowered; bracts small, linear; pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in., minutely puberulous. Buds $\frac{1}{8}$ by $\frac{1}{8}$ in. Calyx-lobes $\frac{1}{12}$ in., ovate, obtuse. Berry $\frac{1}{4}$ in. diam. (and upwards), globose, not striated, scarlet.

VAR. *Maingayi*; branchlets glabrous, leaves in age glaucous or sparsely pilose on the midrib beneath.—Malacca; *Maingay*.

VAR. *Lobbii*; leaves obovate-lanceolate, base much attenuated, nerves beneath densely villous, peduncles weak pendulous all from near the summit of the branchlets. —Singapore; *Lobb*. n. 316.—Branchlets densely fulvous villous. Peduncles 1-2 in. Buds broader than in *A. odontophylla* type.

29. **A. Brandisiana**, *Kurz in Journ. As. Soc.* 1871, pt. ii. 67, and *For. Fl.* ii. 112; leaves elliptic acute at both ends slightly crenate, peduncles axillary long bearing simple umbels, pedicels 1 in. thickened upwards minutely rusty-pubescent.

MARTABAN; *Brandis*. MOULMEIN; Thong-gyun, alt. 4500 ft., *Lobb*. Branchlets thick, rusty and scaly (hardly pubescent) upwards. Leaves $5\frac{1}{2}$ by $2\frac{1}{4}$ in., subcoriaceous, nerves distinct; petiole 1 in. Peduncles 3-4 in., ascending, minutely rusty; bracteoles very small. Calyx-lobes $\frac{1}{8}$ - $\frac{1}{6}$ in., ovate, subacute. Corolla-lobes $\frac{1}{4}$ - $\frac{1}{2}$ in., broad, acutely acuminate. Berry not seen.

†† Leaves entire, or very nearly so.

30. **A. grandifolia**, *A. DC. in Trans. Linn. Soc.* xvii. 122, and *Prodr.* vii. 192; leaves large obovate-oblong acute at both ends glabrous above villous at least on the midrib beneath, peduncles divaricate from near the apex of the branches, calyx-segments $\frac{1}{2}$ in. lanceolate. *Kurz in Journ. As. Soc.* 1877, pt. ii. 225, and *For. Fl.* ii. 111. *A. macrophylla*, *Wall. Cat.* 2290 (not of Blume).

TAVOY; *Wallich*.

Branches rusty-villous. Leaves 8 by $2\frac{1}{2}$ in.; primary nerves close together, slender, distinct; petiole $\frac{1}{2}$ in., villous. Peduncles 1-2 in., patently pilose, bearing simple umbels; pedicels $\frac{1}{2}$ - $\frac{3}{4}$ in., very many. Buds $\frac{1}{4}$ by $\frac{1}{2}$ in.

VAR. *Parishii*; calyx-segments scarcely $\frac{1}{10}$ in., round.—Moulmein, *Parish*; Mergui, *Griffith* (Kew Distrib. n. 3590).—This may be a distinct species; but the length of the calyx-lobes is very variable in some of the species of *Ardisia*, and the calyx-lobes in *Griffith's* example are longer than in *Parish's*.

31. **A. Keenani**, *Clarke*; leaves oblong narrowed at both ends glabrous above rusty-villous beneath, peduncles short bearing simple elongate racemes, calyx-segments very short round glabrous.

CACHAR; *Keenan*. MUNEYPOOR; *Clarke*.

Branches densely brown-villous. Leaves 7 by 2 in., primary nerves distinct beneath, somewhat distant, inarching; petiole $\frac{1}{2}$ in. Peduncles 1-2 in., patently pilose, on one branchlet divaricate from near its apex, on the other ascending from a lower axil; pedicels $\frac{1}{2}$ -1 in., laxly racemose rather than umbelled. Buds $\frac{1}{4}$ by $\frac{1}{2}$ in.—This resembles so strongly *A. grandifolia* var. *Parishii*, that it might be added to it as a variety, but the nervation of the leaves differs. The Muneypoor example has much smaller leaves, all the peduncles ascending from lower axils, the racemes more villous, but the calyx-segments glabrous or very nearly so.

32. **A. Helferiana**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 86, and *For. Fl.* ii. 113; densely rusty-villous or woolly, leaves obovate-oblong acute at both ends softly hairy above, peduncles axillary long bearing simple subumbellate racemes.

MERGUI, MOULMEIN, and TENASSERIM; *Griffith, Helfer* (Kew Distrib. n. 3589).

Branches densely rusty-woolly. Leaves $6\frac{1}{2}$ by $2\frac{1}{4}$ in., primary nerves strong

petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. Peduncles 3–4 in.; pedicels $\frac{1}{4}$ – $\frac{3}{4}$ in.; bracteoles $\frac{1}{4}$ in., linear. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in., glabrous. Calyx densely villous; segments $\frac{1}{2}$ in., ovate. Berry not seen.

33. *A. reflexa*, Wall. Cat. 2282; branchlets fulvous-pubescent, leaves narrowly obovate-lanceolate acute at both ends sparingly pilose beneath or glabrescent, peduncles short bearing simple dense minutely fulvous-pubescent racemes. *A. DC. Prodr.* viii. 132. *A. Amherstiana*, *A. DC. in Trans. Linn. Soc.* xvii. 120, and *DC. l.c.* 131; *Kurz For. Fl.* ii. 111, and in *Journ. As. Soc.* 1877, pt. ii. 225.

PEGU and TENASSERIM; Wallich, &c.

Branchlets, corymbs, and innovations with numerous spreading exceedingly short tawny hairs. Leaves membranous, 8 by $2\frac{1}{2}$ in. (often smaller), acuminate, base cuneate or rarely suddenly narrowed; primary nerves numerous, slender, thinly pilose beneath, especially near the midrib, or ultimately glabrescent; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. Peduncles 1–2 in., axillary from near the ends of the branches; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in.; bracteoles caducous. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in., scarcely acute. Calyx-segments $\frac{1}{10}$ in., round. Berry $\frac{1}{2}$ in., globose, vertically striate.—In Wallich's Herbarium the type sheet has the leaves pilose beneath, the second sheet has them glabrous; *A. DC.* made two species of these.

34. *A. khasiana*, Clarke; branchlets fulvous-woolly, leaves linear-obovate glabrous, peduncles numerous axillary bearing simple lax few-flowered glabrous umbels. *Ardisia* sp.; n. 27, *Herb. Ind. Or. H. f. & T.*

KHASIA Mts., alt. 500–3000 ft., frequent; Griffith (*Kew Distrib.* n. 3572), *H. f. & T.*, &c.

Erect, 1–4 ft.; branches very leafy upwards. Leaves 4 by $\frac{1}{2}$ – $\frac{3}{4}$ in., broadest above the middle, tapering at both ends, primary nerves conspicuous beneath, acutely oblique to the midrib, inarching; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in., often woolly. Peduncles 1 in., often one from each of the crowded upper axils; pedicels 1 in., usually 2–5 in each umbel. Buds $\frac{1}{4}$ – $\frac{1}{2}$ by $\frac{1}{2}$ in. Calyx-segments $\frac{1}{2}$ in., elliptic; in fruit, orbicular, concave, margins membranous. Berry $\frac{1}{4}$ in., or more, depressed-globose, scarcely striate.—The flowers, berries, and habit are similar to those of *A. humilis*.

VAR. *Thomsoni*; leaves obovate-lanceolate. *Ardisia* sp. n. 30, *Herb. Ind. Or. H. f. & T.*—Chittagong; *H. f. & T.* Khasia Mts., alt. 3–4000 ft.; Mousto and Nong Klao, Clarke.—Leaves 5 by $1\frac{3}{4}$ in. in the Chittagong examples, but connected with *A. khasiana* type by intermediate forms.

†† Plant wholly glabrous, the young parts sometimes puberulous or scaly.

‡ Leaves crenate or denticulate.

35. *A. membranacea*, Wall. Cat. 2288; leaves broadly lanceolate crenate membranous, peduncles axillary slender bearing simple small umbels, corolla-segments obtuse or emarginate, filaments much longer than the small round anthers. *A. DC. Prodr.* viii. 134 (not of *Kurz in Journ. As. Soc.* 1877, pt. ii. 224). *Ardisia* sp. n. 36, *Herb. Ind. Or. H. f. & T.*

KHASIA Mts., alt. 2000 ft.; Wallich, *H. f. & T.*, &c. CACHAR; Shapoor, Keenan. Erect, 1–4 ft., subsimple, succulent. Leaves 7 by $2\frac{1}{2}$ in., acute at both ends, nerves prominent, gland-dotted all over; petiole $\frac{3}{4}$ in. Peduncles 1–2 in.; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in.; bracteoles 0. Calyx-segments $\frac{1}{20}$ in., obtuse. Buds $\frac{1}{2}$ in., obtuse. Stamens inserted close to the base of the corolla-segments, free from each other; filaments linear, flattened, slightly wider upwards; anthers small, round, opening by a longitudinal slit. Ovary obovate-oblong, substipitate; style cylindric, short. Berry $\frac{1}{2}$ in. diam. and upwards, globose, black, not vertically striate. Seed large, very hard at least when dry, altogether of *Ardisia*.—This is the type of a new genus nearly allied to *Amblyanthus*, with which the habit, leaves, inflorescence, and corolla closely agree; the free stamens with long filaments, and the pistil are unlike *Amblyanthus*, and indeed all other Indian *Ardisias*.

36. **A. bhotanica**, Clarke; leaves large lanceolate crenate, peduncles axillary short rigid bearing umbels arranged in simple panicles, corolla and stamens of *Ardisia*.

BHOTAN; Griffith (Kew Distrib. n. 3587).
 Leaves 9 by $2\frac{1}{2}$ in., acuminate, prominently nerved, gland-dotted, base cuneate; petiole $\frac{1}{2}$ in. Peduncles $\frac{1}{2}$ –1 in.; panicles $1\frac{1}{2}$ in. diam.; pedicels $\frac{1}{2}$ in. Buds $\frac{1}{2}$ – $\frac{3}{4}$ by $\frac{1}{2}$ in., hardly acute. Calyx-teeth $\frac{1}{10}$ in., ovate-lanceolate. Corolla-segments subacute. Stamens free; filaments very short; anthers oblong-lanceolate. Berry not seen.

37. **A. Wallichii**, A. DC. in Trans. Linn. Soc. xvii. 123, and Prodr. viii. 137; leaves obovate-elliptic minutely toothed, peduncles axillary bearing many-flowered subsimple racemes. Kurz For. Fl. ii. 122, and in Journ. As. Soc. 1877, pt. ii. 226, in part. *Ardisia sanguinolenta*, Wall. Cat. 2287 (not of Blume). *Ardisia* sp. n. 31, Herb. Ind. Or. H. f. & T.

PROME and RANGOON; McLelland. BIRMA; Griffith (Kew Distrib. n. 3594).—
 DISTRIB. Ava.

Closely resembling *A. humilis*, Vahl, from which it differs in the minutely denticulate (not subentire) leaves; and should perhaps be reckoned a Birmese form of that species.—Kurz makes two varieties, whereof 1. *Wallichii* proper has the young shoots and inflorescence with rusty-brown floccose hairs, and 2. *glabriuscula* with the young shoots glabrous, and the pedicels indistinctly puberulous. Kurz's "*Wallichii* proper" is probably therefore the plant above called *A. khasiana* var. *Thomsoni*, and his var. *glabriuscula* will be Wallich's *A. sanguinolenta*.

†† Leaves entire or subentire.

38. **A. involuocrata**, Kurz in Journ. As. Soc. 1871, pt. ii. 68; leaves obovate-oblong acute at both ends, peduncles lateral and subterminal carrying simple umbels, bracteoles $\frac{1}{2}$ in. ovate concave subsistent, sepals in fruit $\frac{1}{2}$ – $\frac{1}{2}$ in. *Ardisia* sp. n. 26, Herb. Ind. Or. H. f. & T.

SIKKIM; alt. 2–5000 ft., Griffith (Kew Distrib. n. 3560), J. D. H., Kurz, &c., not rare.

A shrub, 3–6 ft. Leaves $5\frac{1}{2}$ by $2\frac{1}{4}$ in., shortly acuminate, base attenuate; petiole hardly any. Peduncles 1–3 in., stout; pedicels 1 in., usually about 5, bracteoles as many. Sepals $\frac{1}{2}$ in. (in flower), orbicular, concave, waxy corolloid, pink. Corolla $\frac{1}{2}$ in. long, segments scarcely acute. Filaments short; anthers oblong-lanceolate. Berry $\frac{1}{2}$ in., globose, scarcely striate; sepals in fruit spreading at the base, elongate, connivent over the summit of the berry.—This is a very striking species, that has been marked as generically distinct; but it is very nearly allied to *A. humilis*.

39. **A. oxyphylla**, Wall. Cat. 2291; leaves elliptic narrowed at both ends, peduncles axillary carrying lax few-flowered racemes, pedicels $\frac{3}{4}$ in. A. DC. Prodr. viii. 130.

PENANG; Wallich. TENASSERIM (or Andamans); Helfer (Kew Distrib. n. 3571, 3585).

Leaves 7 by $2\frac{1}{2}$ in. (or much smaller), widest at the middle or a little above it, subcoriaceous, nerves numerous distinct; petiole $\frac{3}{4}$ in. Peduncles 1–3 in., near the apex of the branches or distant therefrom, slender; racemes often shortened, sub-umbelliform; pedicels 2–6. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in. Calyx-segments $\frac{1}{10}$ in., ovate, obtuse. Berry $\frac{1}{2}$ in., globose, hardly striate.

VAR. *attenuata*, Wall. Cat. 2286 (sp.); peduncles still more slender. A. DC. in Trans. Linn. Soc. xvii. 119, and Prodr. viii. 131; Kurz For. Fl. ii. 109. A. alternata, A. DC. in Ann. Sc. Nat. 2, ii. 296. A. oblonga, A. DC. in Trans. Linn. Soc. xvii. 121, and Prodr. l. c. 131; Kurz l. c. 109, and in Journ. As. Soc. 1877, pt. ii. 226.—Pegu, Tenasserim, Andamans. The type sheet of Wall. Cat. 2286 is nearly identical with *A. oxyphylla*, but exhibits neither flower nor berry; the second sheet has smaller leaves, one oblong berry, and is *A. oblonga*, A. DC.

40. **A. polycephala**, Wall. Cat. 2293; leaves elliptic or oblong narrowed at both ends, peduncles axillary short stout compressed carrying dense racemes. *A. DC. in Trans. Linn. Soc.* xvii. 118, and *Prodr.* viii. 131; *Kurz For. Fl.* ii. 109, and in *Journ. As. Soc.* 1877, pt. ii. 225 (excl. var. *acuminata*).

PEGU and TENASSERIM; Wallich, Griffith, Helfer (Kew Distrib. n. 3565, 3586).

Leaves 7-9 by $2\frac{1}{2}$ in., nerves numerous, distinct; petiole $\frac{1}{4}$ - $\frac{1}{2}$ in. Peduncles $\frac{1}{2}$ -1 $\frac{1}{2}$ in., often from near the apex of the branches, very much compressed, often recurved or divaricate; pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in., numerous, sometimes subumbelled, sometimes in a raceme 2-4 in. long. Flowers nearly as in *A. attenuata*, to which this species is very closely allied; the two differ from their ally *A. humilis* in the elongate leaves and the smaller calyx-segments.

41. **A. rhynchophylla**, Clarke; leaves obovate-lanceolate caudate-acuminate, peduncles short bearing simple few-flowered racemes of rather large flowers. *Ardisia* sp. n. 28, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 3-4000 ft.; Mahadeo and Cherra, *H. f. & T.*

A small, branched shrub. Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate, primary nerves prominent beneath, inarching; petiole $\frac{1}{2}$ in. Peduncles $\frac{1}{4}$ - $\frac{3}{4}$ in.; pedicels 1 in., laxly racemed, much thickened upwards. Buds $\frac{1}{2}$ - $\frac{3}{4}$ by $\frac{1}{2}$ in. Calyx-segments $\frac{1}{6}$ - $\frac{1}{2}$ in., elliptic, concave. Flowers white (J. D. H.). Berry $\frac{1}{4}$ in., globose, smooth, gland-dotted, not vertically striate.—Allied to *A. humilis*, differing in the long-acuminate, smaller leaves.

42. **A. Lobbiana**, Clarke; leaves small elliptic narrowed at both ends, peduncles axillary bearing umbels in simple panicles.

"INDIA"; Lobb (probably Singapore).

Leaves coriaceous, $2\frac{3}{4}$ by $1\frac{1}{2}$ in., shortly acuminate, base cuneate; petioles $\frac{1}{2}$ - $\frac{1}{2}$ in. Peduncles 1 in., distant from the apex of the branches, compressed; panicles 2-3 in. diam., somewhat lax; pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in., 3-6 in each umbel. Buds $\frac{1}{4}$ by $\frac{1}{2}$ in. Calyx-segments $\frac{1}{2}$ in., ovate, obtuse. Berry not seen.—The leaves resemble those of *A. rhynchophylla*, but are shortly acuminate, not caudate.

43. **A. pauciflora**, Heyne; Wall. in Roxb. *Fl. Ind. ed. Carey & Wall.* ii. 279, and *Cat.* 2270; leaves long-lanceolate narrowed at both ends, peduncles short weak axillary bearing 1-5-flowered simple weak racemes. *A. DC. Prodr.* viii. 127 (excl. var. *cymosa*); *Wight Ic.* t. 1214; *Bedd. For. Man.* 138.

MTS. of SOUTH INDIA and CEYLON; common.

Branchlets rusty-scaly, hardly pubescent. Leaves 4 by 1 in., or sometimes 9 by $1\frac{1}{2}$ in., coriaceous, nerves obscure; petiole $\frac{1}{2}$ in. Peduncles $\frac{1}{2}$ in., scattered; pedicels $\frac{1}{4}$ in., thin. Buds $\frac{1}{6}$ in. long, and as much broad. Calyx-segments $\frac{1}{12}$ in., triangular, subacute. Berry $\frac{1}{2}$ in. diam., globose, not striate.—The Malay *A. cymosa*, Blume, has been reduced to this by A. DC. and Scheffer; but the examples of *A. cymosa* from Java differ considerably, having many-flowered racemes often in panicles, and larger flowers. The peculiarity of *A. pauciflora* is that even stout large-leaved examples have exceedingly small depauperated racemes.

44. **A. rhomboidea**, Wight *Ic.* t. 1213; leaves spatulate-rhomboid obtusely acuminate, peduncles short bearing 1-5-flowered small racemes. *Bedd. For. Man.* 138.

SOUTH DECCAN PENINSULA; Shevagherry Hills, Wight.

This is perhaps a form of *A. pauciflora* with abnormal leaves; the branchlets, habit, inflorescence, and berries are as in *A. pauciflora*; the leaves are spatulate with a narrowly winged petiole.

45. **A. humilis**, Vahl *Symb.* iii. 40 (excl. syn. *Burm.*, not of Blume); leaves obovate-oblong or elliptic shortly acuminate or subobtuse base cuneate,

peduncles axillary patent or suberect, pedicels stout, calyx-lobes in fruit rounded concave with membranous margins. *A. DC. Prodr.* viii. 129; *Scheff. Myrsin.* 73; *Wight Ic.* t. 1212; *Dalz. & Gibs. Bomb. Fl.* 137; *Brand. For. Fl.* 287; *Kurz For. Fl.* ii. 110, and in *Journ. As. Soc.* 1877, pt. ii. 226. *A. solanacea*, *Roxb. Cor. Pl.* 27, t. 27, and *Fl. Ind.* i. 580; *Bot. Mag.* t. 1677; *Wall. Cat.* 2283. *A. umbellata*, *Roth Nov. Sp.* 123; *Roxb. Fl. Ind.* i. 582, and *ed. Carey & Wall.* ii. 273; *Lodd. Bot. Cab.* t. 531. *A. litoralis*, *Andr. Bot. Rep.* x. 630; *Kurz For. Fl.* ii. 110, and in *Journ. As. Soc.* 1877, pt. ii. 226. *A. Wightiana*, *Wall. Cat.* 2380. *A. polycephala*, *Wight Ill.* t. 145 (not of *Wall.*). *A. obovata*, *Blume Bijl.* 688; *A. DC. Prodr.* viii. 132. *A. salicifolia*, *A. DC. l. c.* 129. *A. elliptica*, *Bedd. For. Man.* 138, ? of *Thunb.* *A. rostrata*, *Hassk. in Flora* 1868, p. 26?. *Climacandra obovata* and *multiflora*, *Miq. Pl. Jungh.* i. 199, 200. *C. littoralis*, *Kurz in Journ. As. Soc.* 1871, pt. ii. 68.—*Rheede Hort. Mal.* v. t. 28.

Throughout INDIA, alt. 0–5000 ft.; from the HIMALAYA to CEYLON and SINGAPORE (not in Western and Desert India).—DISTRIB. Malaya, China.

An erect, branched shrub. *Leaves* 6 by 2–2½ in., coriaceous, nerves slender; petiole ½ in. *Peduncles* 1–2 in., near the apex of the branches or subremote therefrom, divaricate or ascending, sometimes recurved, stout, more or less compressed; umbels simple, sometimes compound, rarely lengthened into racemes; pedicels ½–1 in. *Buds* ½ by ½ in. *Flowers* pink. *Calyx-lobes* ¼–½ in., elliptic, obtuse; in fruit enlarged, orbicular, closely pressed to the berry. *Berry* ¼–½ in. wide, globose, slightly depressed, hardly striate.—Beddome proposes to take up Thunberg's name, *A. elliptica*, for this plant as being the oldest; but the description of *A. elliptica* (see *DC. Prodr.* viii. 138) is so curt that there can be no certainty that it is *A. humilis*.

VAR. arborescens, *Wall. Cat.* 2289 (sp.); arborescent, leaves large, peduncles long very stout, inflorescence often compound. *A. DC. Prodr.* viii. 131.—*Ava*; *Wallich*. *Wallich's* type specimen, however, in no wise differs from some Bengal *A. humilis*, which sometimes attains 25 feet, and has longer leaves and peduncles than in the common shrubby state.

6. PIMELANDRA, A. DC.

Flowers in small scattered axillary rusty sessile umbels, racemes or corymbs, otherwise as *Ardisia*.—Species 10; extending from Khasia to Java.

The last section of *Ardisia* only differs from *Pimelandra* in having the lateral inflorescence peduncled. *A. DC.* depended on the berry being oblong (not globose) as the main character of *Pimelandra*; this character *A. DC.* took from *Wallich*. Such obovate-oblong one-sided fruits, with the style-base lateral, are found not rarely both in *P. Wallichii* and *eugeniaefolia*, but are all seedless, and probably due to some insect injury. The perfect fruit in these and all species of *Pimelandra* is globose, exactly as in *Ardisia*.

1. *P. eugeniaefolia*, *Hook. f. in Gen. Pl.* ii. 647; leaves lanceolate-oblong caudate-acuminate crenate nearly glabrous prominently gland-dotted beneath, calyx-lobes minute in fruit. *Ardisia eugeniaefolia*, *Wall. Cat.* 2276; *A. DC. Prodr.* viii. 130.

KHASIA Mts., alt. 2–4000 ft., frequent; *Wallich, H. f. & T., &c.*

A shrub, 3–6 ft.; stem erect; branches horizontal, tips rusty-pubescent, with complanate foliage. *Leaves* 10 by 2½ in. in *Hooker's* examples (usually one-third smaller), base cuneate or rhomboid, glabrous or scarcely villous on the midrib beneath, primary nerves prominent, inarching; petiole ½ in., often rusty-pubescent. *Inflorescence* scarcely 1 in. long, usually corymbose, sometimes subsimply racemose, rusty-pubescent; bracts inconspicuous or caducous. *Buds* ½ in. *Flowers* altogether of *Ardisia*, but very small. *Calyx-lobes* ¼ in. at fruit-time, ovate, subacute, finally deflexed. *Berry* ½ in. diam., globose, red, altogether (as is the seed) that of *Ardisia*.—Some of *Hooker's* specimens bear as many as 45 fruits on each branch, everyone being obovate-oblong

and 1-sided and all seedless, this is also the case in Wallich's type specimens. Clarke's specimens, collected on various occasions, have fruits in abundance, all globose with perfect seeds.

2. *P. Griffithii*, Clarke; leaves broadly lanceolate acuminate sub-entire rusty-villous on the midrib beneath not gland-dotted, calyx-lobes minute. *Ardisia eugeniaefolia*, Kurz For. Fl. ii. 111, and in Journ. As. Soc. 1877, pt. ii. 225, not of Wallich.

PATKOYE Mts., south-east of Assam, alt. 4000 ft.; Griffith (Kew Distrib. n. 3598).

An erect shrub, 4-5 ft.; branches ascending obliquely, rusty-villous at the tips. Leaves $6\frac{1}{2}$ by 2 in., base cuneate or rhomboid, primary nerves prominent scarcely inarching, gland-dots most minute; petiole $\frac{1}{2}$ in. Inflorescence less than $\frac{3}{4}$ in., densely corymbose, rusty-pubescent; flowers as of *P. eugeniaefolia*, but still smaller. Berry $\frac{1}{5}$ in. diam., globose, red.—Perhaps a var. of *P. eugeniaefolia*; but the erect habit of growth is unlike the marked uniform horizontal branches of that species, and the leaves are without the large glandular dots which are always present in *P. eugeniaefolia*.

3. *P. ? erecta*, Clarke; leaves elliptic-oblong narrowed at both ends subentire nearly glabrous, pedicels $\frac{1}{2}$ in. in axillary rusty fascicles, calyx-lobes $\frac{1}{2}$ in. elliptic-oblong adpressed to the berry.

KHASIA Mts.; Umwai, alt. 3000 ft.; Clarke.

A small, erect shrub; branches erect, rusty-villous towards the ends. Leaves 4 by $1\frac{1}{2}$ in., acuminate, base cuneate, primary nerves not prominent, gland-dots scattered not prominent; petiole $\frac{1}{6}$ in. Pedicels fascicled on shortened lateral spurs, rising from tufts of small bracteoles. Corolla small; lobes rounded. Berry $\frac{1}{5}$ in. diam., globose, smooth.—This is perhaps a new genus; but the examples being in fruit, the stamens have not been observed. The inflorescence resembles that of *Myrsine*, but the fruit is that of *Ardisia*.

4. *P. Wallichii*, A. DC. in Ann. Sc. Nat. 2, xvi. 88, and in DC. Prodr. viii. 106; leaves large oblong acute at both ends entire rusty-villous at least on the midrib beneath rarely glabrous, pedicels $\frac{1}{2}$ in. in sessile umbels or corymbs, ovary villous, berry $\frac{1}{4}$ - $\frac{3}{4}$ in. globose glabrous. Deless. Ic. Sel. v. t. 31; Scheff. Myrsin. 94. *Myrsine pachysandra*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. ii. 297, and Cat. 2284; A. DC. in Trans. Linn. Soc. xvii. 111.

PENANG, MALACCA and SINGAPORE; Wallich, Griffith, Maingay.—DISTRIB. Malaya.

A large shrub or small tree; branches rusty-villous at the ends. Leaves $9\frac{1}{2}$ by $2\frac{3}{4}$ in., base cuneate, primary nerves distinct beneath scarcely inarching, dots small or obscure; petioles $\frac{1}{2}$ in., rusty-villous. Inflorescence 1- $1\frac{1}{2}$ in., somewhat lax. Buds $\frac{1}{6}$ by $\frac{1}{8}$ in. Calyx-lobes $\frac{1}{12}$ in., ovate.

VAR. *Teysmanniana*, Hook. f. in Gen. Pl. ii. 647 (sp.); leaves very large more villous beneath, pedicels very stout. *Ardisia Teysmanniana*, Scheff. Obs. Phyt. ii. 56.

Malacca; Maingay. DISTRIB. Bangka.—A. Korthalsiana, Scheff. Myrsin. 57, appears the same thing, but is said to differ by the berry (not seen) being hairy.

7. ANTISTROPHE, A. DC.

Slender shrubs. Leaves alternate, petioled, lanceolate, acuminate. Flowers hermaphrodite, rose-coloured; umbels subsessile, axillary; pedicels slender; bracts small. Calyx small; lobes 5, lanceolate, persistent. Corolla deeply 5-fid, lobes twisted to the left in the bud. Stamens 5, in the throat of the corolla, filaments short; anthers free, elliptic-oblong, opening by longitudinal slits, connective produced upwards as a membranous wing. Ovary ovoid, narrowed into a slender style, stigma punctiform; ovules several, immersed in a globose free placenta. Berry globose, smooth; endocarp chartaceous. Seed

solitary, stony when dry, globose, albumen ruminated; embryo transverse.—
 Species 2; Indian.

1. **A. oxyantha**, A. DC. in *Ann. Sc. Nat.* 2, xvi. 84, and *Prodr.* viii. 92; leaves entire glabrous beneath strongly gland-dotted, buds ovate rostrate-acuminate. *Ardisia oxyantha*, Wall. *Cat.* 2275; A DC. in *Trans. Linn. Soc.* xvii. 121.

KHASIA, alt. 3-4000 ft.; Wallich, H. f. & T., &c.

Shrub 6 ft. high; branches horizontal, nearly glabrous. Leaves 6 by $1\frac{1}{2}$ in., caudate-acuminate, base cuneate, nerves prominent beneath inarching; petiole $\frac{1}{4}$ - $\frac{1}{2}$ in. Pedicels $\frac{1}{2}$ in., several or few together, fascicled on exceedingly short lateral spurs. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in., somewhat suddenly narrowed into a beak, which encloses the membranous tip of the connectives. Calyx-teeth $\frac{1}{12}$ in., puberulous, whitened on the margins. Berries $\frac{1}{4}$ in. and upwards, globose, smooth, thinly obscurely vertically striate.

2. **A. serratifolia**, Hook. f. in *Gen. Pl.* ii. 647; leaves regularly closely serrate rusty-villous on the nerves beneath, buds conical acute. *Ardisia serratifolia*, Bedd. *Ic. Pl. Ind. Or.* t. 113.

ANAMALLAY and COIMBATORE HILLS, ascending to 3000 feet, in moist woods; Beddome.

An erect shrub; branches towards their ends (and all the innovations) rusty-villous. Leaves $6\frac{1}{2}$ by $1\frac{3}{4}$ in., acute at both ends; nerves prominent beneath, curving much upwards, inarching; gland-dots small or obscure; petiole $\frac{1}{2}$ in. Pedicels $\frac{1}{2}$ in., several or few together, minutely rusty-pubescent, fascicled on exceedingly short lateral spurs. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{10}$ in., pubescent, whitened on the margins. Corolla-segments lanceolate-acuminate, gland-dotted. Berry not seen.

8. HYMENANDRA, A. DC.

A robust, low shrub. Leaves large, obovate-oblong, crenate-dentate. Umbels compound, subsessile, terminal on short lateral branches from near the summit of the stem. Calyx-lobes 5, ovate, subacute. Corolla-lobes 5, long-lanceolate, strongly twisted to the right in bud. Stamens 5, attached at the throat of the corolla, filaments very short; anthers ovoid, connectives dilated above the anther and united into a membranous 5-toothed tube. Ovary globose, narrowed into a filiform style, stigma punctiform; ovules several, on a globose sessile placenta. Berry globose. Seed 1, globose, albumen wrinkled; embryo transverse.

H. Wallichii, A. DC. in *Ann. Sc. Nat.* 2, xvi. 83, t. 5, and *Prodr.* viii. 91. *Ardisia hymenandra*, Wall. in *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 282, and *Pl. As. Rav.* ii. 57, t. 175, and *Cat.* 2266.

KHASIA MTS.; Wallich; Mahadeo, alt. 3000 ft., Griffith. UPPER ASSAM; Griffith (Kew Distrib. n. 3596). CACHAR; Gopal Teela, Keenan.

Stem 2-4 ft., erect, stout, usually simple. Leaves 10 by 4 in. (or in Griffith's example 24 by 10 in.), acute, scarcely acuminate, base attenuate, sometimes rounded or cordate, glabrous or nearly so, primary nerves slender nearly at right angles to the midrib, gland-dots more or less prominent; petiole scarcely $\frac{1}{2}$ in. Lateral floral branches (peduncles) 1-3 in., stout, flattened; bracts $4\frac{1}{2}$ by $\frac{1}{2}$ in., altogether leaf-like, usually 3. Umbel usually compound of one subcentral sessile and two lateral peduncled umbellules; pedicels $\frac{3}{4}$ in., very many, rusty-pubescent or ultimately nearly glabrous. Buds $\frac{1}{2}$ by $\frac{1}{2}$ in. Calyx-lobes $\frac{1}{2}$ in., ovate. Corolla red. Berries $\frac{1}{2}$ in. diam., globose, scarcely striated.

9. **AMBLYANTHUS**, A. DC.

A small, glabrous shrub. *Leaves* petioled, narrowly lanceolate, slightly crenate-serrate. *Umbels* compound, sessile, terminal on lateral branches leafy at their summits. *Flowers* small; buds obtuse. *Calyx-tube* obovate; lobes 5. *Corolla-lobes* 5, obovate, emarginate, twisted to the right in bud. *Stamens* 5, inserted at the throat of the corolla, filaments short; anthers ovate, united by their margins, dehiscing by slits inwards. *Ovary* oblong, narrowed into a short cylindric style; stigma small, discoid; ovules few, immersed in a globose placenta. *Fruit* not known.

A. glandulosus, A. DC. in *Ann. Sc. Nat.* 2, xvi. 83, t. 6, and in *DC. Prodr.* viii. 91. *Ardisia glandulosa*, Roxb. *Hort. Beng.* 16, *Fl. Ind. ed. Carey & Wall.* ii. 276; *Wall. Cat.* 2265 (not of Blume). *A. Roxburghiana*, Dietr. *Syn. Pl.* i. 617.

SYLHET; *Wallich*. *KHASIA*, MTS., alt. 2000 ft.; below Cherra, *H. f. & T.*; Bor Pani, below Nunklow, *J. D. H., Simons*.

Leaves 7 by $1\frac{1}{2}$ in., acuminate, denticulate or entire, base cuneate, primary nerves slender, oblique; petiole $\frac{1}{4}$ in. Flowering branches rising obliquely from near the summit of the stem, naked below, peduncle-like, usually with 3-4 leaves near their summit. *Peduncles* 2-3 in., subumbelled, slender, curving; pedicels $\frac{1}{2}$ - $\frac{1}{4}$ in., numerous, subumbelled; bracteoles 0 or caducous. *Calyx-lobes* $\frac{1}{16}$ in., ovate. *Corolla-lobes* $\frac{1}{16}$ in., but slightly overlapping in the bud, recurved in flower.

10. **ÆGICERAS**, Gaertn.

A small, glabrous tree; branches cylindric. *Leaves* scattered, petioled, obovate, entire, coriaceous, 1-nerved. *Umbels* sessile, axillary, terminal or leaf-opposed; bracts 0; pedicels filiform. *Flowers* hermaphrodite, white. *Calyx-lobes* 5, imbricate. *Corolla-tube* short; segments 5, acute, twisted to the right in bud. *Stamens* 5, on the corolla-tube; filaments linear, hairy at the base; anthers cordate-lanceolate, dehiscing longitudinally, cells transversely septate. *Ovary* oblong, narrowed into a filiform style, stigma small; ovules many, immersed in a central globose placenta. *Fruit* cylindric, curved, acute, coriaceous, striated, 1-seeded, at length dehiscing longitudinally. *Seed* conform to the fruit, exalbuminous, germinating within the pericarp; radicle inferior, long, enlarged at the base; cotyledons very short.

Æ. majus, Gaertn. *Fruct.* i. 216, t. 46, fig. 1; *Roxb. Fl. Ind.* iii. 130; *A. DC. in Ann. Sc. Nat.* 2, xvi. t. 9 A, and in *DC. Prodr.* viii. 142; *Wight Ill.* t. 146; *Scheff. Myrsin.* 97; *Dalz. & Gibs. Bomb. Fl.* 137; *Bedd. Fl. Sylv. Anal.* Pl. xix. fig. 3. *Æ. fragrans*, Koen. *Ann. Bot.* i. 129, t. 3; *Wall. Cat.* 2326; *Wight in Hook. Bot. Misc.* iii. 84, t. 21; *Grab. Cat. Bomb. Pl.* 104; *Griff. Notul.* iv. 294. *Æ. obovatum* and *ferreum*, *Blume Bijl.* 693. *Æ. floridum*, *Roem. & Sch. Syst.* iv. 512; *A. DC. in DC. l. c.* 143; *Scheff. l. c.* 99. *A. nigricans*, *A. Rich. in Voy. Astrol.* ii. 57, t. 21; *A. DC. l. c.* *Æ. minus*, *A. DC. l. c.* (not of Gaertn.). *Æ. Malaspinea*, *A. DC. l. c.* *Æ. corniculata*, *Blanco Fl. Filip.* 79; *Kurz For. Fl.* ii. 114, and in *Journ. As. Soc.* 1879, pt. ii. 227. *Rhizophora corniculata*, *Linn. Sp. Pl.* 635. *R. Ægiceras*, *Linn. Syst. Nat. ed. Gmel.* vii. 747. *Malaspinea laurifolia*, *Presl. Rel. Haenk.* ii. 68, t. 61.—*Rheede Hort. Mal.* vi. t. 36.

Sea-coasts, from SCINDE to SINGAPORE, especially in the mangrove swamps.—**DISTRIB.** Tropical shores nearly of the whole world.

A shrub, or tree 15-20 ft. *Leaves* 3 by $1\frac{1}{2}$ in., obtuse, base cuneate; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{2}$ in., numerous. *Calyx-lobes* $\frac{1}{2}$ in., broad, much imbricate, persistent, closely embracing the base of the fruit. *Corolla-lobes* $\frac{1}{2}$ in., almost horny. *Anthers* exserted, versatile. *Fruits* 1-1 $\frac{1}{2}$ by $\frac{1}{2}$ in., tapering to an acute apex.

11. REPTONIA, A. DC.

A small tree, spinous or unarmed; branches hoary. *Leaves* short-petioled, obovate, entire, coriaceous. *Flowers* small, hermaphrodite, axillary, sessile in tufts; bracteoles small. *Calyx-lobes* 5, round, imbricate. *Corolla-tube* short; lobes 5, oblong, obtuse, contorted or imbricate. *Stamens* 5, alternating with 5 lanceolate-subulate staminodes, filaments linear; anthers oblong. *Ovary* hairy, ovoid, narrowed into a cylindric style, stigma small; ovules 5-7, basal, erect, anatropous. *Fruit* globose, fleshy, crowned by the style-base, 1- (rarely 2-) seeded. *Seed* globose, hollowed at the base, albumen-ruminated; embryo axile, elongate, curved, cotyledons long, radicle short next the hilum.

R. buxifolia, A. DC. *Prodr.* viii. 153; Boiss. *Fl. Orient.* iv. 32; *Brand. For. Fl.* 287, t. 34. *Edgeworthia buxifolia*, Falconer in *Proc. Linn. Soc.* i. 129, and in *Trans. Linn. Soc.* xix. 99, t. 9. *Edgeworthia* sp., Griff. *Notul.* iv. 295, and *Ic. Pl. Asiat.* t. 498. *Monotheca muscatensis*, A. DC. l. c.: *Deless. Ic. Sel.* v. t. 35.

PESHAWUR; Falconer, Stewart.—DISTRIB. Afghanistan, Muscat.

Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., obtuse, base cuneate, margin recurved, glabrous above glaucous beneath; petiole hardly $\frac{1}{8}$ in. *Calyx-lobes* less than $\frac{1}{10}$ in., acute, rusty-puberulous. *Corolla* scarcely $\frac{1}{10}$ in., greenish-yellow. *Berry* $\frac{1}{4}$ - $\frac{1}{2}$ in. diam.

ORDER LXXXIX. SAPOTACEÆ. (By C. B. Clarke.)

Trees or shrubs; young parts often rusty-tomentose. *Leaves* alternate (sub-opposite in *Sarcosperma*), coriaceous, entire, petioled; stipules 0 or very caducous. *Flowers* hermaphrodite, small or medium-sized, axillary; pedicels clustered, rarely solitary (in *Sarcosperma* flowers paniced); bracts and bracteoles 0, or minute. *Calyx-lobes* 4-8, much imbricated, or 2-seriate with the outer series valvate, persistent. *Corolla-tube* shorter than the calyx, lobes as many, or 2-4 times as many as the calyx-lobes. *Stamens* upon the corolla-tube, as many as the corolla-lobes and opposite to them, or 2-3 times as many, 1-3-seriate; filaments usually short; anthers oblong-lanceolate, connective often produced; staminodes, when present, alternating with the stamens. *Ovary* superior, sessile, 2-8-celled; style linear, stigma a point; ovules solitary in each cell, usually attached to the inner angle. *Berry* indehiscent, 1-8-seeded. *Seeds* ellipsoid; or, if more than one, often compressed, hilum long, testa usually crustaceous; embryo straight, exalbuminous with large fleshy cotyledons, or albuminous with flat cotyledons; radicle inferior, usually small.—DISTRIB. Species 320, in the tropics of the whole world.

ACHRAS SAPOTA, Linn. (= *Mimusops Manilkara*, Don) is cultivated in India for its fruit.

Fruiting branchlets have been communicated by Mr. Cantley, from Perak, of a tree 80-100 ft. high, which yields gutta plentifully: the 4-merous calyx, fruits, and leaves are as in *Isonandra*, but the single fragment of a flower indicates a funnel-shaped corolla $\frac{1}{2}$ - $\frac{3}{4}$ in. diam.; it is attached, and appears to have the remains of many stamens and scales in the corolla-tube. The fragments (not the flowers) are figured by Beauvisage (*Gutta-percha*, t. 2); and the tree is identified by him with *Keratephorus Leerii*, Hassk., erroneously, for in this the corolla is very small. Without fuller material this tree cannot be safely referred to any genus; the pedicels of the fruits are $1\frac{1}{2}$ in. long, scattered towards the ends of the branchlets, not well agreeing with *Isonandra* or *Dichopsia*.

**Chrysophyllum.] LXXXIX. SAPOTACEÆ. (C. B. Clarke.)**

* *Calyx-lobes 1-seriate, imbricated (see also Bassia butyracea), stamens 5-6.*

Staminodes 0	1. CHRYSOPHYLLUM.
Staminodes present, flowers sessile or paniced	2. SARCOSPERMA.
Staminodes present, pedicels axillary clustered :	3. SIDEROXYLON.

** *Calyx-lobes 2-seriate, outer series valvate.*

† *Calyx-segments 4.*

Stamens 8 (in <i>I. diplostemon</i> 16)	4. ISONANDRA.
Stamens 12-40, corolla lobed half way down	6. BASSIA.
Stamens 12-24, corolla deeply lobed	7. PAYENA.

†† *Calyx-segments 6-8.*

Staminodes 0	5. DICHOPSIS.
Staminodes present	8. MIMUSOPS.

1. **CHRYSOPHYLLUM, Linn.**

Trees. *Leaves* coriaceous, exstipulate. *Flowers* small, in axillary fascicles. *Calyx-lobes* 5-6, subequal, imbricated. *Corolla-lobes* 5-6, entire, imbricate. *Stamens* 5-6, attached at the base of the corolla-lobes; filaments short, linear; anthers ovate; staminodes 0. *Ovary* 5-6- (rarely 7-10-) celled, villous; style cylindric. *Berry* fleshy, globose. *Seeds* 5-6 (or fewer), testa coriaceous, hilum elongate, albumen copious or scanty.—Species 60; tropical, mostly American; a few in Africa, Asia and Australia.

C. Roxburghii, G. Don *Gen. Syst.* iv. 33; leaves oblong-lanceolate acuminate glabrous, base cuneate, pedicels $\frac{1}{2}$ in., filaments and style short. *A. DC. Prodr.* viii. 162; *Dalz. & Gibs. Bomb. Fl.* 139; *Bedd. Fl. Sylv.* t. 236; *Kurz For. Fl.* ii. 118, and in *Journ. As. Soc.* 1877, pt. ii. 228. *C. acuminatum, Roxb. Fl. Ind.* i. 599; *Wall. Cat.* 4160, not of Lamk.

ASSAM; Goalpara, *Hamilton*. KHASIA; Mariao, alt. 3000 ft., *Clarke*. SILHET; *Wallich*. PEGU; *Kurz*. MALACCA; *Griffith, Maingay*.

Attains 40-60 ft. *Leaves* 5 by $1\frac{1}{2}$ in., parallel-sided, the acumination often sudden into a short obtuse tail, shining, primary nerves very numerous and close, nearly horizontal, uniting within the margin; petiole $\frac{1}{2}$ in. *Corolla-lobes* $\frac{1}{12}$ in., obtuse, minutely rusty-pilose. *Corolla-tube* $\frac{1}{16}$ in., filled with rusty hairs; lobes $\frac{1}{16}$ in. *Anthers* included, slits introrse or sublateral. *Style* cylindric, as long as the corolla, obscurely lobed. *Fruit* $1\frac{1}{4}$ in., globose, pulpy, yellow, eaten by the Khasis, when dried strongly 5-6-angled. *Seeds* 5-6, $\frac{1}{3}$ by $\frac{1}{4}$ in., compressed, very hard.

VAR. sumatrana, *Miq. Fl. Ind. Bat. Suppl.* 579 (sp.); leaves rusty-villous on the midrib beneath.—From the Concan southwards and Ceylon, up to 4000 ft. alt.; *Dalzell, Thwaites, &c.*—DISTRIB. Sumatra.

2. **SARCOSPERMA, Hook. f.**

Trees. *Leaves* subopposite, oblong, acuminate, coriaceous; stipules caducous. *Flowers* small, fascicled on the branches of a simple or compound panicle, minutely bracteoid. *Calyx-segments* 5, round, subequal, strongly imbricated. *Corolla-tube* short; lobes 5, round, imbricated. *Stamens* 5, on the corolla-tube; filaments short; anthers oblong, obtuse; staminodes 5, small, oblong-linear. *Ovary* glabrous, 2-1-celled; style cylindric; ovules ascending. *Berry* ellipsoid, large, 2-1-celled, 2-1-seeded. *Testa* crustaceous, hilum nearly basal, albumen 0; embryo fleshy.—Species 3; in North-east India, Birma, Hongkong.

1. **S. arboreum, Benth. in Gen. Pl.** ii. 655; leaves large with pits in the axils of the primary nerves beneath, panicle and calyx pubescent—

villous. *Kurz in Journ. As. Soc.* 1877, pt. ii. 229. *Sideroxylon arboreum*, *Herb. Ham.*—*Celastrinae*, *Wall. Cat.* 9011. *Sapotea*, *Griff. Notul.* iv. 291, and *l.c. Pl. Asiat. t.* 501.

SIKKIM and KHASIA, alt. 0–4000 ft.; *Hamilton, &c.* PATKOYE Mts. (in South-east Assam); *Griffith* (Kew Distrib. n. 3603).

A large, bushy tree. *Leaves* 9 by 2 in., parallel-sided, rarely somewhat obovate, suddenly shortly acuminate, base rhomboid, secondary nerves very prominent beneath; petiole $\frac{1}{3}$ in. *Spikes* in panicles 2–8 in.; flowers densely fascicled. *Calyx* $\frac{1}{10}$ – $\frac{1}{8}$ in. *Corolla-tube* scarcely $\frac{1}{12}$ in., without hairs within; lobes $\frac{1}{12}$ – $\frac{1}{10}$ in. *Fruit* 1 by $\frac{3}{4}$ in., and $\frac{1}{2}$ in. thick; 1-seeded fruits only $\frac{1}{4}$ in. broad, obtuse; calyx-lobes persistent, deflexed.—*Leaves* sometimes somewhat obovate, but never so broad as in *Griff. l.c. Pl. Asiat. t.* 501, which may represent a different species; for *Griffith's* Patkoye example (from which this t. 501 is supposed to be taken) has leaves 9 by 2 in., exactly parallel-sided.

2. **S. Griffithii**, *Benth. in Can. Pl.* ii. 655; leaves lanceolate coriaceous, panicle and calyx glabrous. *Sideroxylon* sp. 10, *Herb. Ind. Or. H. f. & T.*

KHASIA and JAITEA Mts., alt. 3–5000 ft.; *Griffith* (Kew Distrib. n. 3602); *H. f. & T., &c.*

A large tree. *Leaves* 5 by $1\frac{1}{2}$ in., secondary nerves not prominent, no pits in the axils of the leaves beneath. *Inflorescence* nearly as in *S. arboreum*. *Fruit* unknown.—Nearly allied to *S. arboreum*; the leaves are smaller.

3. SIDEROXYLON, Linn.

Trees. *Leaves* alternate, lanceolate elliptic or obovate, exstipulate. *Flowers* small, in axillary fascicles, subsessile or shortly pedicelled; pedicels pubescent villous or tomentose. *Calyx-segments* 5, much imbricated, subequal. *Corolla-tube* campanulate; lobes 5, imbricated. *Stamens* 5 (perfect), attached to the base of the corolla-lobes, filaments short or linear; anthers ovate or lanceolate; staminodes 5, lanceolate. *Ovary* villous, rarely nearly glabrous, 5- (more rarely 4–2-) celled; style cylindric, short or long. *Berry* ovoid or globose, 5–4- (or 3–1-) seeded. *Seeds* albuminous, usually oblong, much compressed, testa hard, hilum long.—Species 60, tropical, and a few subtropical.

* *Calyx-lobes not acute. Buds obtuse.*

1. **S. grandifolium**, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* ii. 348, and *Cat.* 4155; branchlets glabrous, leaves obovate-oblong glabrous, pedicels 0– $\frac{1}{2}$ in. minutely pubescent, calyx nearly glabrous. *A. DC. Prodr.* viii. 178; *Kurz For. Fl.* ii. 117, and in *Journ. As. Soc.* 1877, pt. ii. 228. *S. regium*, *Wall. Cat.* 4156, A.

SILHET; *Wallich*. KHASIA; alt. 3000 ft., below Cherra, *H. f. & T. Pegu; Wallich.* MARTABAN; *Kurz.*

A large tree. *Leaves* 10 by $3\frac{1}{2}$ in., acute, tapering at the base, primary nerves strong beneath; petiole 1 in. *Pedicels* densely clustered along the branches below the leaves crowded at their extremities, upon very short spurs. *Calyx-lobes* $\frac{1}{2}$ in., much imbricated, inner pubescent. *Corolla* whitish, hardly longer than the calyx. *Staminodes* lanceolate-linear. *Berry* (*fide Kurz*) globular, size of an apple, smooth, yellow then brown, 5–10-seeded.

2. **S. Maingayi**, *Clarke*; branchlets rusty-pubescent, leaves obovate-oblong shortly acute base tapering nearly glabrous, pedicels 0– $\frac{1}{2}$ in. and calyx closely rusty-pubescent.

MALACCA; *Maingay* (n. 993).

A tree; leaves crowded towards the end of the branches. *Leaves* 6 by $2\frac{1}{2}$ in.,



rusty-pubescent when young, ultimately glabrous or slightly rusty along the midrib beneath, primary nerves 8 each side, prominent; petiole 1 in. Inflorescence densely fasciculate, subsessile along the naked part of the branches below the terminal leaves. Calyx-lobes $\frac{1}{10}$ in., rounded. Corolla little exceeding the calyx. Stamínodes lanceolate-linear. Berry $1\frac{1}{2}$ in. diam., globular, ultimately smooth. Seeds 4, $\frac{2}{3}$ by $\frac{1}{3}$ in., compressed, testa hard shining, hilum long.

3. **S. malaccense**, Clarke; branchlets rusty subtomentose, leaves broadly obovate obtuse at both ends nearly glabrous, pedicels $0-\frac{1}{2}$ in. and calyx rusty-villous.

MALACCA; Maingayi (n. 994).

Leaves crowded towards the ends of the thick branchlets, 7 by $4\frac{1}{2}$ in., very coriaceous, ultimately glabrous, or rusty-tomentose along the midrib beneath; primary nerves 10-11 each side, prominent; petiole $1\frac{1}{2}-2$ in. Inflorescence fasciculate, along the naked part of the branches below the terminal leaves. Calyx-lobes $\frac{1}{2}$ in., rounded. Corolla nearly $\frac{1}{2}$ in. Stamínodes lanceolate-linear. Fruit not seen.—Allied to *S. Maingayi*, differing in the larger flowers and more obtuse leaves.

4. **S. ferrugineum**, Hook. & Arn. Bot. Beech. Voy. 286, t. 55; branchlets rusty, leaves oblong-elliptic base attenuate ultimately nearly glabrous, secondary nerves prominent, pedicels $\frac{1}{2}$ in. rusty-pubescent, calyx-lobes scarious-margined nearly glabrous. A. DC. Prodr. viii. 178. *S. attenuatum*, A. DC. l. c.; Wight Ic. t. 1590; Kurz For. Fl. ii. 117, and in Journ. As. Soc. 1877, pt. ii. 229. *Mimusops* ? attenuata, Wall. Cat. 4150.

MALAY PENINSULA; from Mergui to Singapore, and the ANDAMANS; Wallich, Griffith, &c. NICOBARS; Kurz.—DISTRIB. Malay Archipelago to the Philippines and S. China.

A small tree. Leaves 3 by $1\frac{1}{2}$ in., obtuse or scarcely acute, ferruginous-silky (when young) beneath, coriaceous, shining above; primary nerves 10 on each side, often scarcely more prominent than the secondary; petiole $\frac{1}{2}$ in. Inflorescence fascicled in the axils of both persistent and fallen leaves. Calyx-lobes $\frac{1}{2}$ in., round. Corolla-tube campanulate, sparingly hairy at the base within. Stamens (fertile) exserted; filaments linear, longer than the round anthers. Stamínodes oblong, acute, undulate. Berry $\frac{1}{2}-\frac{1}{3}$ in., shining, smooth, 1-2-seeded; when 1-seeded obliquely ellipsoid.

5. **S. Hookeri**, Clarke; leaves large oblong-lanceolate acuminate, mature glabrous, pedicels $\frac{1}{4}-\frac{1}{2}$ in. rusty-villous, calyx-lobes ovate hardly acute. Sideroxylon sp. n. 4, Herb. Ind. Or. H. f. & T.

SIKKIM; alt. 6000 ft., J. D. H. BHOŦAN; alt. 2800 ft., Griffith (Kew Distrib. n. 3601).

Branchlets glabrous, tips rusty-villous. Leaves $7\frac{1}{2}$ by $2-2\frac{1}{2}$ in., long-acuminate, base cuneate, young rusty-villous, soon glabrescent; primary nerves 12-15 on each side, prominent; petiole $\frac{3}{4}$ in. Calyx-lobes nearly $\frac{1}{2}$ in., villous. Corolla $\frac{1}{2}$ in. long and upwards, segments scarcely pubescent without. Anthers oblong, acute, exserted. Stamínodes linear-lanceolate. Ovary densely villous. Fruit not seen.—This may be a form of the next species which the leaves closely resemble; but the calyx-lobes are blunter, the buds not lanceolate upwards.

** Calyx-lobes acute. Buds narrow, tips conical.

6. **S. assamicum**, Clarke; leaves broadly lanceolate or elliptic acuminate membranous when mature glabrous or with deciduous sparse floccose tomentum beneath, pedicels $\frac{1}{4}$ in. and calyx densely rusty-villous. *S. tomentosum*, Wall. Cat. 4153 partly, not of Roxb.

ASSAM; Jenkins, Masters. CACHAR; Keenan.

A tree with grey bark (Keenan); branchlets villous. Leaves 6 by $2-2\frac{1}{2}$ in., dark

green, acute, shortly-acuminate, rhomboid at the base, primary nerves 12-15 on each side; petiole $\frac{1}{4}$ in. *Calyx-lobes* $\frac{1}{2}$ in., oblong-lanceolate, villous. *Corolla* $\frac{1}{4}$ in. and upwards, segments acute, nearly glabrous. *Stamens* and staminodes as in *S. tomentosum*. *Fruit* (unripe) 1 by $\frac{1}{2}$ in., acute upwards, glabrescent.—This has been supposed a var. of *S. tomentosum*, but the leaves are always acute; none of the numerous examples are spinescent.

7. *S. tomentosum*, *Roarb. Cor. Pl.* 28, t. 28, and *Fl. Ind.* i. 602; leaves elliptic or obovate not acute coriaceous, mature glabrous or tomentose beneath, pedicels $\frac{1}{4}$ in. and calyx densely fulvous-woolly. *Wall. Cat.* 4153, chiefly; *Grah. Cat. Bomb. Pl.* 1057; *Kurz For. Fl.* ii. 116, and in *Journ. As. Soc.* 1877, pt. ii. 228. *S. armatum*, *Roth Nov. Sp.* 138; *Kurz in Journ. As. Soc.* 1877, pt. ii. 228. *Sapota tomentosa*, *A. DC. Prodr.* viii. 175; *Dalz. & Gibs. Bomb. Fl.* 139. *S. armata*, *A. DC. l.c.* 176. *S. elengoides*, *A. DC. l.c.* 177; *Wight Ic.* t. 1218. *Achras tomentosa*, *Bedd. For. Man.* 142. *A. elengoides*, *Bedd. Fl. Sylv.* t. 235.

MTS. of MALABAR and CEYLON; from the Concan southwards; common. PEGU and MARTABAN (*vide* Kurz).

A small or moderate-sized tree; branchlets woolly. *Leaves* $1\frac{1}{2}$ -4 $\frac{1}{2}$ by $\frac{1}{2}$ -2 in.; tips obtuse or triangular, base cuneate, primary nerves 10-12 on each side; petiole $\frac{1}{2}$ in. *Calyx-lobes* $\frac{1}{2}$ in., oblong-lanceolate, woolly. *Corolla* $\frac{1}{4}$ in. and upwards, segments acute, nearly glabrous. *Anthers* oblong-lanceolate, exerted; staminodes linear-lanceolate. *Berry* $\frac{1}{2}$ -1 by $\frac{1}{2}$ - $\frac{3}{4}$ in., ultimately smooth, yellow, 5-4 (or 3-1-) seeded.

IMPERFECTLY KNOWN SPECIES.

8. *S. ? GAMBLEI*, *Clarke*; leaves elliptic acute, fruit $1\frac{1}{2}$ by $\frac{3}{4}$ in. ellipsoid narrowed upwards 1-seeded. *Chrysophyllum* sp., *Gamble ms.*

SIKKIM; Rungbee, alt. 5000 ft., *Gamble*.

A tree; shoots minutely rusty-villous. *Leaves* $7\frac{1}{2}$ by $2\frac{3}{4}$ in., acuminate, base rhomboid or broadly cuneate, mature glabrous, glossy beneath; primary nerves 10-12 on each side, much raised beneath, secondary obscure; petiole 1 in. *Pedicels* axillary, fascicled, in fruit $\frac{1}{2}$ in. *Calyx-lobes* 5, (in fruit) $\frac{1}{2}$ in., ovate, obtuse, minutely villous, deflexed. *Corolla* not seen. *Fruit* smooth, symmetric; exocarp fleshy, small; endocarp, firm, rather thick, sinuously grooved without. *Seed* conform to the fruit, albumen fleshy, a deep black-blue; embryo small.—Almost certainly belonging to this order; but the genus (while flowers are unknown) is doubtful.

4. ISONANDRA, Wight.

Trees. *Leaves* alternate, petioled, coriaceous, glabrous, primary nerves distinct. *Flowers* small, rusty or villous, in axillary clusters, subsessile or shortly pedicelled. *Calyx-segments* 4, subequal, imbricated. *Corolla* deeply 4-lobed, somewhat longer than the calyx. *Stamens* 8, all perfect, attached near the base of the corolla, filaments short; anthers oblong-lanceolate, base sagittate; staminodes 0. *Ovary* villous, 4-celled; style linear. *Berry* ellipsoid, usually 1-seeded, flattened, smooth; pericarp crustaceous. *Testa* hard shining, hilum lateral, albumen fleshy; embryo large, cotyledons elliptic flat.—Species 6, in South India and Ceylon; 1 in the Sandwich Islands.

In the opinion of Thwaites and Beddome, who are well acquainted with this genus in the field, all the Indian species of Wight and A. DC. are varieties of one.

1. *I. villosa*, *Wight Ic.* t. 360; leaves broadly elliptic rounded at both ends glabrous, secondary nerves closely reticulated, flowers sessile on very short thick lateral spurs. *A. DC. Prodr.* viii. 188.

SOUTH DECCAN; Quilon, *Wight*.

Branches thick, obscurely rusty, scarcely pubescent at the tips. *Leaves* $2\frac{3}{4}$ by $1\frac{1}{2}$ in., young glabrous, primary nerves $\frac{1}{2}$ in. apart; petiole $\frac{1}{10}$ in., minutely rusty.

Inflorescence in sessile clusters at the summits of thickly scarred naked spurs 0- $\frac{1}{4}$ in. long. *Calyx-lobes* $\frac{1}{10}$ in., ovate, rounded, minutely sparsely silky or glabrescent upwards. *Berry* $\frac{1}{2}$ by $\frac{1}{5}$ in.—The most glabrous species of the genus. In Wight's specimen (figured in Ic. t. 360) the young leaves and shoots are as described above, and no part of the plant is villous. The species seems well distinct by the short petiole, the very rounded leaf-base, the very fine reticulation of the secondary nervation.

2. ***I. Candolliana***, *Wight Ic. t. 1220*; leaves elliptic obtuse or scarcely acute, secondary nerves distinct of close subparallel lines, flowers subsessile in the axils of leaves, anther-tips villous. *Dalz. & Gibs. Bomb. Fl. 139*. *I. Perottetiana*, *A. DC. Prodr. viii. 188, partly*.

NILGHERRY MTS.; *Wight, Gardner*.

Shoots minutely rusty-silky. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., not acuminate, base cuneate, margins little recurved when dry, primary nerves $\frac{1}{4}$ - $\frac{1}{3}$ in. apart; petiole $\frac{1}{4}$ in. *Flowers* nearly as in *I. villosa*. *Berry* $\frac{3}{4}$ by $\frac{1}{2}$ in.—Only distinguishable from the next by the hairy anther-tips and more membranous leaves. *A. DC.* says his *I. Perottetiana* had the anthers pilose at the tips, but Wight split this species into two, whereof his *I. Candolliana* has the anther-tips pilose, his *I. Perottetiana* has them glabrous.

3. ***I. Perottetiana***, *Wight Ic. t. 1219*; leaves elliptic obtuse or subacute, secondary nerves obscure of close subparallel lines, flowers subsessile axillary, anther-tips glabrous. *A. DC. Prodr. viii. 188, partly*.

NILGHERRY MTS.; *Wight, Gardner, Sir F. Adam*.

4. ***I. Stocksii***, *Clarke*; leaves elliptic-obovate obtuse, secondary nerves somewhat laxly reticulated, flowers sessile on very short thick lateral spurs.

CONCAN; *Stocks*.

Branchlets thick. *Leaves* $4\frac{1}{2}$ by $2\frac{1}{2}$ in., base cuneate, primary nerves $\frac{1}{2}$ - $\frac{3}{4}$ in. apart; petiole $\frac{1}{2}$ in. *Flowers* as in *I. villosa*.—This, by the leaves clustered at the summits of the branches, and by the inflorescence, approaches *I. villosa*, but the primary and secondary nervation of the leaves is different.

5. ***I. lanceolata***, *Wight Ic. t. 359, not of Thwaites*; leaves lanceolate obtusely acuminate, secondary nerves distinct subparallel, flowers nearly sessile in the axils of persistent leaves. *A. DC. Prodr. viii. 187*. *Sideroxyylon Wightianum, Wall. Cat. 4154*.

SOUTH DECCAN PENINSULA; Coimbatore and Quilon, *Wight*; Nilgherry Mts., *G. Thomson*; Anamallays, *Beddome*. CEYLON; *Dr. Kelaart*.

Branches not thick. *Shoots* minutely rusty-silky. *Leaves* 5 by $1\frac{3}{4}$ in. (in Wight's type specimen), usually smaller, base cuneate, primary nerves $\frac{1}{4}$ - $\frac{1}{2}$ in. apart, secondary prominent, slightly waved; petiole $\frac{1}{4}$ in. *Calyx-lobes* $\frac{1}{2}$ in., ovate, obtuse. *Berry* $\frac{3}{4}$ by $\frac{1}{2}$ in.

VAR. anfractuosa; leaves obovate-elliptic abruptly shortly acuminate, secondary nerves conspicuous strongly curved so as to cross each primary at right angles, calyx-segments lanceolate subobtuse.—Cochin; Valla Candoo, *Wight*.—Buds longer than in *I. lanceolata*, of which this appears a fine variety.

6. ***I. Wightiana***, *A. DC. Prodr. viii. 187*; leaves elliptic sub-obtuse, primary nerves distant secondary laxly reticulated obscurely subparallel, flowers nearly sessile in the axils of persistent leaves. *Thwaites Enum. Pl. Zeyl. 177*. *S. tomentosum, Wall. Cat. 4153*. *Bassia Wightiana, Bedd. For. Man. 141*.

CEYLON; common, *Wight, Gardner, Thwaites, &c.*

Perhaps not separable from *I. lanceolata*. *Leaves* commonly $3\frac{1}{2}$ by $1\frac{1}{2}$ in., but very variable. The following varieties have been noticed:—

VAR. major; leaves 9 by $1\frac{3}{4}$ in., acuminate, green, primary nerves 1- $1\frac{1}{2}$ in. apart,

secondary nerves subparallel.—*Thwaites* n. 45.—This approaches *I. lanceolata* in the acuminate leaves, but otherwise is not like it. A smaller form of this has the leaves $5\frac{1}{2}$ by $\frac{3}{4}$ in., rostrate.

VAR. angustata; leaves $3\frac{1}{2}$ by $\frac{1}{2}$ in. obtuse.—*Thwaites* nn. 179, 191.

VAR. acuminata, *Gardn. ms.*; leaves broadly obovate-oblong abruptly obtusely acuminate—This is perhaps near *I. lanceolata* var. *anfractuosa*.

VAR. montana, *Thwaites Enum.* 177; leaves elliptic-obovate obtuse coriaceous, secondary nerves reticulated not subparallel.—*Thwaites* n. 3092.—Hardly differs from *I. Wightiana* type.

VAR. compta, *Thwaites ms.*; mature leaves densely silky beneath with rich brown hair.—*Thwaites* n. 3912.

ANOMALOUS SPECIES.

7. *I. DIPLOSTEMON*, *Clarke*; leaves elliptic-obovate obtuse glabrous, stamens 15–18.—*Diospyros obovata*, *Wight Ic. t.* 1226.

DECCAN PENINSULA; *Wight*.

Leaves 5 by $2\frac{1}{4}$ in., base obtuse or rounded; petiole $\frac{1}{2}$ in. Flowers small, minutely rusty-villose, in axillary fascicles. *Calyx-lobes* 4, $\frac{1}{10}$ in., imbricate. *Corolla-lobes* 5–6. *Stamens* 15–18, 1-seriate, filaments short hairy; anthers lanceolate, acuminate.—*Wight's* examples are good, but have buds only: these so closely resemble those of *Isonandra* that *Beddome* (in *For. Man.* 238) considers this species as merely an anomalous state of *Isonandra Wightiana*. The figure of *Wight* accurately shows the style; there is hardly any trace of a cavity in the ovary, far less of an embryo; but in this respect it agrees with the neighbouring species of *Sapotaceæ* at the same early stage of development: there is no ground for supposing these buds male.

5. *DICHOPSIS*, *Thwaites*.

Trees; shoots rusty-tomentose. Leaves obovate or oblong, petioled, coriaceous. Flowers fascicled, axillary, or on the naked branchlets below a terminal tuft of leaves. *Calyx-lobes* 6, 2-seriate, outer 3 valvate, inner 3 imbricate. *Corolla-lobes* 6, imbricated or contorted. *Stamens* 12–18 (usually 12), attached near the base of the corolla, 1-seriate or the alternate a little higher up, filaments short or long; anthers lanceolate, dehiscence extrorse or lateral, connective produced acute or bifid; staminodes 0. Ovary villous, 6-celled or (*vide Thwaites*) rarely 4–3-celled; style linear. Berry fleshy, ellipsoid or ovoid, 2–1-seeded. Seed exaluminous, testa crustaceous; cotyledons large, fleshy.—Species 30, in S. India, the Malay peninsula and islands; 1 in Samoa.

* *Species of Ceylon*.

1. *D. petiolaris*, *Thwaites Enum.* 176; leaves long-petioled elliptic cuneate at both ends, pedicels 1 in. rusty-tomentose. *Bassia petiolaris*, *Bedd. For. Man.* 140, and *Fl. Sylv. t.* 254.

CEYLON; Ambagamowa district, Hinidoon and Reigam Corles, *Thwaites*.

A large tree. Leaves 4 by 1–3 in., broadly or narrowly elliptic, glabrous, coriaceous, primary nerves distinct oblique, secondary laxly irregularly reticulated, not prominent; petiole $\frac{3}{4}$ – $1\frac{1}{4}$ in. Pedicels 2–5 together, clustered near the end of the branches. *Calyx-lobes* $\frac{1}{4}$ – $\frac{1}{2}$ in., ovate, subacute, rusty-tomentose. *Corolla* $\frac{3}{4}$ in., white, tube hairy within. *Stamens* 12; filaments short; anthers minutely 2-horned at the apex, 6 opposite the corolla-lobes subextrorse, 6 alternate subintrorse. Ovary 6-celled. Fruit $1\frac{1}{4}$ in. diam., on erect much thickened pedicels, subspherical, 1-seeded.

2. *D. grandis*, *Benth. in Gen. Pl.* ii. 658; leaves obovate obtuse or abruptly shortly acuminate, pedicels $\frac{1}{2}$ –1 in. rusty-tomentose. *Isonandra grandis*, *Thwaites Enum. Pl. Zeyl.* 176. *Bassia grandis*, *Bedd. Fl. Sylv. t.* 254.

CEYLON; alt. 6000 feet, *Walker, &c.*

A huge tree. Leaves 10 by $4\frac{1}{4}$ in., base cuneate, glabrous; petiole $\frac{3}{4}$ in. Pedicels

densely clustered, sometimes near the end of the branches, more often distant therefrom. *Calyx-lobes* $\frac{1}{4}$ – $\frac{1}{2}$ in., ovate, subacute, rusty-tomentose. *Corolla* $\frac{3}{4}$ in., white. *Stamens* 12, filaments as long as the anthers; anthers apiculate, extrorse. *Ovary* 6-celled. *Berry* 1– $1\frac{1}{2}$ in., ovoid, black. *Seeds* used for oil.

VAR. parvifolia; leaves 2 by 1 in., pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in.—There are numerous examples intermediate between this and *D. grandis* type.

3. *D. rubiginosa*, Benth. in Gen. Pl. ii. 658; leaves obovate-oblong obtuse rusty-tomentose beneath, pedicels $\frac{3}{4}$ –1 in. rusty-tomentose. *Isonandra rubiginosa*, *Thwaites Enum.* 177. *Bassia rubiginosa*, *Bedd. For. Man.* 141.

CEYLON; up to 4000 ft., Saffragam district and Hinidoon Corle, *Thwaites*.

A huge tree. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ – $1\frac{3}{4}$ in., base cuneate, very coriaceous, ultimately nearly glabrous; petiole $\frac{1}{2}$ in. *Pedicels* 6–10 together, stout, subterminal or lateral. *Calyx-lobes* $\frac{1}{2}$ in. and upwards, ovate, subacute. *Stamens* 12; filaments shorter than the apiculate anthers. *Ovary* 6-celled. *Berry* ovoid.—Flowers rather larger than in the two foregoing species.

4. *D. canaliculata*, Benth. in Gen. Pl. ii. 658; leaves oblong shortly cuneate at both ends, pedicels 1 in. hardly crowded sparingly fulvous-tomentose. *Isonandra canaliculata*, *Thwaites Enum.* 177. *Bassia canaliculata*, *Bedd. For. Man.* 141.

CEYLON; Caltura district, *Thwaites*, *Gen. Walker*.

A medium-sized tree. *Leaves* 10 by $4\frac{1}{2}$ in. to $2\frac{1}{2}$ by $1\frac{1}{2}$ in., glabrous, midrib channelled above or nearly plane; petiole $\frac{3}{4}$ –2 in. *Pedicels* 2–4 together, lateral or terminal, less crowded than in the three foregoing species. *Calyx-lobes* $\frac{1}{2}$ in., broad-triangular. *Ovary* 6-celled. *Berry* ellipsoid.—The channelling of the midrib of the leaf above, characteristic of *Thwaites'* large specimens, entirely disappears in some of the small examples.

5. *D. pauciflora*, Benth. in Gen. Pl. ii. 658; leaves narrowly elliptic obtusely acuminate, pedicels 0– $\frac{1}{2}$ in. rusty-tomentose. *Isonandra pauciflora*, *Thwaites Enum. Pl. Zeyl.* 177. *Bassia pauciflora*, *Bedd. For. Man.* 141.

CEYLON; near Ratnapoora, at no great elevation, *Thwaites*.

A medium-sized tree. *Leaves* 7 by $2\frac{1}{2}$ in., base cuneate, glabrous, primary nerves distinctly inarching; petiole $\frac{3}{4}$ in. *Calyx-lobes* $\frac{1}{2}$ – $\frac{1}{3}$ in., elliptic, rusty-tomentose. *Corolla* $\frac{1}{2}$ in. *Ovary* 3–4-celled. *Berry* oblong.

6. *D. lævifolia*, Benth. in Gen. Pl. ii. 658; leaves narrowly obovate-oblong obtuse or subacute, pedicels $\frac{3}{4}$ in. closely pilose. *Isonandra lævifolia*, *Thwaites Enum.* 177. *Bassia lævifolia*, *Bedd. For. Man.* 141.

CEYLON; Saffragam district and Reigam Corle, at no great elevation, *Thwaites*.

A medium-sized tree; branchlets adpressedly pilose. *Leaves* $4\frac{3}{4}$ by $1\frac{1}{2}$ in., base cuneate, glabrous, very smooth beneath from the primary nerves not being elevated, secondary nerves slender but very distinct; petiole $\frac{1}{4}$ in. *Fascicles* 4–6-fld.; axillary or 1–2 near the ends of the branches. *Calyx-lobes* $\frac{1}{2}$ in., ovate, acute, closely pilose. *Anther-tips* pilose (*Thwaites*). *Ovary* 6-celled. *Berries* oblong, acute.

7. *D. lanceolata*, Benth. in Gen. Pl. ii. 658; young leaves and shoots rusty-tomentose, leaves lanceolate narrowed at both ends tip very obtuse, pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. obscurely tomentose. *Isonandra lanceolata*, *Thwaites Enum.* 442, not of *Wight*. *Bassia lanceolata*, *Bedd. For. Man.* 141.

CEYLON; Caltura, *Thwaites*.

A middle-sized tree. *Leaves* $4\frac{1}{2}$ by $1\frac{1}{2}$ in., coriaceous, densely closely silky-tomentose beneath when young, glabrescent when mature, nerves obscure; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. *Pedicels* 3–6 together. *Calyx-lobes* $\frac{1}{2}$ in. or rather more, ovate, subacute, obscurely tomentose.

** *Species of Malabar.*

8. **D. elliptica**, *Benth. in Gen. Pl.* ii. 658; leaves elliptic or somewhat obovate subobtuse glabrous, pedicels $1\frac{1}{2}$ in. minutely tomentose, stamens 12–18 (usually 14–17). *Bassia elliptica*, *Dalz. in Hook. Kew Journ.* iii. 36; *Dalz. & Gibs. Bomb. Fl.* 139; *Bedd. Fl. Sylv.* t. 43. *Bassia* sp., *Miq. Pl. Hohenack.* n. 397. *Isonandra acuminata*, *Drury Useful Pl. Ind.* 260, not of *Gardner*.

BOMBAY and CANARA; *Dalzell*. MANGALORE; *Hohenacker*. CANARA; *Stocks*. WESTERN GHATS, up to 4000 ft.; common, *Beddome*.

A tree, 100 ft., trunk often straight, unbranched to a great height; branchlets and shoots minutely adpressedly pilose. *Leaves* 4 by 2 in., obtuse or with a short obtuse triangular point, base cuneate; petiole $\frac{3}{4}$ in. *Pedicels* 4–8 together, axillary or terminal. *Calyx-lobes* $\frac{1}{2}$ in., ovate, subacute, minutely adpressed-pilose. *Corolla* $\frac{1}{2}$ in., segments fulvous-silky on the back. *Filaments* short, hairy; anthers narrow-lanceolate, acute, sometimes tips hairy. *Ovary* 6-celled. *Berry* $1\frac{1}{2}$ in., ellipsoid.—Indian Gutta-percha.

*** *Species of East Bengal and the Malay Peninsula.*

9. **D. polyantha**, *Benth. in Gen. Pl.* ii. 658; leaves obovate-oblong subobtuse closely silky-tomentose beneath or mature nearly glabrous, pedicels $1\frac{1}{2}$ in., filaments hairy hardly as long as the anthers. *Bassia polyantha*, *Wall. Cat.* 4166; *A. DC. Prodr.* viii. 198. *Sideroxylon regium*, *Wall. Cat.* 4156, partly. *Isonandra polyantha*, *Kurz For. Fl.* ii. 119, and in *Journ. As. Soc.* 1877, pt. ii. 230.

SILHET; *Wallich, H. f. & T.* CACHAR; *Keenan*. CHITTAGONG; *H. f. & T.* PEGU; *Wallich*. AERACAN; *Kurz*.

A tree, 30–40 ft. *Leaves* $5\frac{1}{2}$ by $2\frac{1}{4}$ in., base cuneate, silvery or rich brown glossy beneath; petiole $\frac{1}{2}$ – $1\frac{1}{4}$ in. *Pedicels* in lax clusters towards the ends of the branches, tomentose. *Calyx-lobes* $\frac{1}{2}$ – $\frac{3}{4}$ in., ovate, hardly acute. *Corolla* nearly $\frac{1}{2}$ in., cream-coloured. *Stamens* 12, sometimes more. *Berry* $1\frac{1}{2}$ in., obovoid, scaly brown, 1-seeded.—Yields good gutta-percha in large quantity (*Kurz*). Flowers eaten (*Keenan*).

10. **D. obovata**, *Clarke*; leaves obovate-oblong glaucescent glabrous beneath secondary nerves obscure, pedicels $\frac{1}{2}$ in. densely clustered, filaments glabrous at least as long as the anthers. *Isonandra obovata*, *Griff. Notul.* iv. 293; *Kurz For. Fl.* ii. 120, and in *Journ. As. Soc.* ii. 230. *Bassia*? *hypoleuca*, *Miq. Fl. Ind. Bat. Suppl.* 582 (*vide Kurz*).

MALACCA; *Griffith* (*Kew Distrib.* n. 3606), *Maingay* (n. 985, 996). SINGAPORE; *T. Anderson*.

A tree; branches thick, leaves clustered towards their extremities; shoots rusty-tomentose. *Leaves* $8\frac{3}{4}$ by 3–4 in., obtuse or very shortly acute, base cuneate, primary nerves 12 on each side, much raised beneath; petiole $\frac{3}{4}$ in. *Clusters* densely covering the branches below the terminal leaves. *Calyx-lobes* $\frac{1}{2}$ – $\frac{3}{4}$ in., ovate, subobtuse. *Corolla* $\frac{1}{2}$ in., nearly glabrous without, segments narrow acute. *Stamens* 12. *Berries* $\frac{3}{4}$ in. diam., globose.—*Kurz* says that there is another species collected in Martaban by Falconer closely allied to this. The imperfect specimen collected by Falconer at Moulmein appears identical.

11. **D. Helfer**, *Clarke*; leaves obovate-lanceolate obtuse glabrous secondary nerves distinct, pedicels $\frac{1}{2}$ in. densely clustered.

TENASSERIM; *Helfer* (*Kew Distrib.* n. 3616). TAVOY; *Packman*.

Closely allied to *D. obovata*; and is perhaps *Helfer's* Tenasserim plant referred to *D. obovata* by *Kurz*; but the nervation of the leaves is different. *Leaves* $8\frac{3}{4}$ by 3 in., base cuneate, primary nerves 8–9 on each side, $\frac{1}{4}$ –1 in. apart, inarching not conspicuously parallel.—*Corolla* not seen.

12. **D. Maingayi**, Clarke; leaves large obovate pilose beneath, pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. densely clustered rusty hirsute, filaments glabrous.

MALACCA; *Maingay* (n. 996–2).

Branchlets thick, rusty-villous. *Leaves* $9\frac{1}{2}$ by 6 in., obtuse, base cuneate, primary nerves 13 on each side, carried parallel almost to the margin, secondary distinct; petiole nearly 2 in. *Pedicels* densely clustered along the branches below the terminal leaves. *Calyx-lobes* $\frac{1}{2}$ in., ovate, obtuse, rusty hirsute. *Corolla* $\frac{1}{2}$ – $\frac{1}{4}$ in., nearly glabrous without, lobes ovate acute. *Stamens* 12; filaments about as long as the anthers. *Fruit* not seen.—Nearly allied to *D. obovata*, but the corolla is much shorter with wider lobes, and the indumentum is more spreading.

13. **D. hexandra**, Clarke; leaves elliptic-oblong suddenly narrowed at both ends glabrous, pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. clustered axillary, filaments pilose hardly so long as the anthers. *Isonandra hexandra*, Griff. *Notul.* iv. 292. *Payena Griffithii*, Kurz *For. Fl.* ii. 121, and in *Journ. As. Soc.* 1877, pt. ii. 230?.

MALACCA; Griffith (Kew Distrib. n. 3609), *Maingay* (n. 984).

Shoots closely rusty-tomentose. *Leaves* 6 by $2\frac{1}{2}$ in. (generally much smaller), very shortly obtusely acuminate or subobtuse, much less cuneate at the base than in the 3 foregoing species, primary nerves 9–10 on each side, secondary not prominent; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in. *Calyx-lobes* $\frac{1}{2}$ in., ovate, minutely closely tomentose. *Corolla* $\frac{1}{2}$ – $\frac{1}{4}$ in.; lobes elliptic, acute, nearly glabrous without. *Berry* $\frac{1}{2}$ in. diam., globose, 1-seeded. *Seed* exalbuminous.—Kurz says his *Payena Griffithii* was *Hexameria*, Griff., a name unpublished either as a genus or section by Griffith. Kurz's diagnosis is so short that placing his plant here is a mere guess.

14. **D. rubens**, Clarke; leaves obovate-oblong obtuse glabrous, pedicels $\frac{1}{4}$ in. axillary minutely tomentose, filaments and corolla-tube within glabrous.

MALACCA; *Maingay* (n. 995).

Shoots minutely closely rusty-tomentose. *Leaves* 4 by $1\frac{1}{2}$ in., base cuneate, drying red, primary nerves not prominent; petiole $\frac{1}{2}$ in. *Calyx-lobes* $\frac{1}{2}$ in., ovate, subacute, minutely closely tomentose. *Corolla* $\frac{1}{2}$ in. or more, lobes 6, oblong, obtuse. *Stamens* 12; filaments all short, subequal; anthers oblong, acute, mucronate. *Berry* not ripe, promises to be $\frac{1}{2}$ in. diam.—Not very closely allied to any of the preceding species.

15. **D. Gutta**, Benth. in *Gen. Pl.* ii. 658. leaves obovate-oblong very shortly obtusely acuminate coriaceous, pedicels $\frac{1}{2}$ in. in axillary clusters, filaments glabrous longer than the anthers. *Isonandra Gutta*, Hook. *Lond. Journ. Bot.* vi. 464, t. 16; *Miq. Fl. Ind. Bat.* ii. 1038, t. 36; *Benth. & Trim. Med. Pl.* t. 167.

MALACCA and SINGAPORE; Lobb, *Maingay*.—DISTRIB. Sumatra.

A tree, 40 ft.; shoots minutely rusty-tomentose. *Leaves* $4\frac{1}{2}$ by 2 in. (sometimes much longer), base cuneate, densely closely rusty-tomentose beneath, ultimately glabrescent, primary nerves 24–30 on each side, not prominent; petiole $\frac{1}{2}$ in. *Calyx-lobes* $\frac{1}{2}$ in., ovate, obtuse, rusty-tomentose. *Corolla* $\frac{1}{2}$ in.; lobes 6, elliptic obtuse. *Stamens* 12. *Ovary* 6-celled. *Berry* $\frac{2}{3}$ in., ovoid, 2–1-seeded.—Easily distinguished from all the preceding species by the numerous primary nerves of the leaf.—*Gutta-percha*.

6. **BASSIA**, Linn.

Trees. *Leaves* petioled, coriaceous, silky or tomentose beneath when young; stipules caducous. *Pedicels* axillary, fascicled, among the subterminal tufts of leaves, or in the axils of fallen leaves. *Calyx-segments* 4, 2-seriate, 2 outer valvate enclosing the inner (except in *B. butyracea*). *Corolla-tube* at least twice as many as the corolla-lobes, 12–40 (usually 16–20) in bud. *Stamens* lanceolate, acute, connective often mucronate or excurrent. *Ovary* villous, 4–12-

(usually 6-8-) celled; style linear. *Berry* globose or oblong-ellipsoid, 1-3- (rarely 4-5-) seeded. *Seeds* ellipsoid, hilum long, sometimes large; albumen 0; radicle very small; cotyledons hemi-ellipsoid, fleshy.—*DISTRIB.* Species 30; in India, Malaya and Polynesia.

* Calyx-lobes 4, the 2 outer subvalvate including the others.

† *Species of the Deccan Peninsula and Ceylon* (*B. latifolia*, extending northwards to Kumaon).

1. ***B. latifolia***, *Roxb. Cor. Pl.* 20, t. 19, and *Fl. Ind.* ii. 526; leaves elliptic or oblong-elliptic shortly acuminate, calyx rusty-tomentose, anthers 20-30 3-seriate subsessile. *Wall. Cat.* 4163; *A. DC. Prodr.* viii. 198; *Dalz. & Gibs. Bomb. Fl.* 139; *Bedd. Fl. Sylv.* t. 41; *Brand For. Fl.* 289. *B. villosa*, *Wall. Cat.* 4165.—Mahwah or Madhuca, *C. Hamilton in As. Research.* i. 300-308, with fig.

Throughout CENTRAL INDIA; alt. 1-4000 ft., abundant; from West Bengal to the Western Ghats; also wild in the KUMAON Terai.—*DISTRIB.* Ava.

A tree, 50 ft., with a large head, the leaves clustered at the ends of the branches; all the young parts densely rusty-woolly. *Leaves* 5 by 3 in., varying in size, and from round-obovate to broad-lanceolate, acute, base cuneate, densely woolly beneath when young, in age glabrescent, primary nerves 12 on each side, subparallel, $\frac{1}{4}$ - $\frac{1}{2}$ in. apart, secondary very prominent, glabrous or obscurely pubescent; petiole 1-1 $\frac{1}{2}$ in.; stipules linear, caducous. *Pedicels* 1-1 $\frac{1}{2}$ in., woolly, in dense clusters near the ends of the branches. *Calyx-lobes* $\frac{1}{4}$ - $\frac{1}{2}$ in., ovate, subacute, densely rusty-tomentose; nearly always 4, rarely 5; the two outer segments always subvalvate and enclosing the others. *Corolla* $\frac{3}{4}$ in., yellowish white, tube fleshy; lobes 7-14 (usually 8-9), short, erect. *Stamens* usually 24-26; anthers hairy, acuminate. *Berry* 1-2 in., ovoid, 1-4-seeded.—The corollas, collected and dried, form an important article of food both for men and animals in Central India, and yield by distillation a coarse spirit. The seeds yield an inferior oil, largely eaten by the tribes. Moa-tree, of the English denizens.

2. ***B. longifolia***, *Linn. Mant.* 563; leaves lanceolate narrowed at both ends glabrous distinctly nerved, anthers 16 2-seriate subsessile tips 3-toothed, young fruit globose densely hirsute. *Gaertn. Fruct.* t. 104; *Lamk. Ill.* t. 398; *Wall. Cat.* 4162; *Roxb. Fl. Ind.* ii. 523; *A. DC. Prodr.* viii. 197; *Wight Ill.* t. 147; *Dalz. & Gibs. Bomb. Fl.* 139; *Thwaites Enum.* 175; *Bedd. Fl. Sylv.* t. 42.

MALABAR; from Canara southwards, and CEYLON; common.

A tree, 50 ft.; leaves clustered towards the ends of the branches; all the young parts rusty-tomentose. *Leaves* 4-5 by 1 $\frac{1}{2}$ in., mature glabrescent, primary nerves 12 on each side, distinct, secondary distinct; petiole 1-1 $\frac{1}{2}$ in.; stipules linear. *Pedicels* 1-2 in., tomentose, in dense clusters near the ends of the branches. *Calyx-lobes* $\frac{1}{4}$ - $\frac{1}{2}$ in., ovate, subacute. *Corolla* $\frac{3}{4}$ in.; lobes usually 6, scarcely one-third the length of the tube. *Filaments* hairy; anthers 3-toothed at the apex (*A. DC.*), the short mucronation of the connective between the tips of the two cells giving this appearance more strongly than is indicated in any of the figures. *Berry* 1-1 $\frac{1}{2}$ in. diam., globose, ultimately nearly glabrous, 1-2-seeded or (*vide* Roxburgh) sometimes 3-4-seeded.—The figure of Gaertner shows the fruit 5-seeded, which may be an error; *A. DC.* doubts this figure, while he expresses no doubt about Lamarek's (*Ill.* t. 398) which is copied from it. This species has been much confounded with the next, but the young fruit is widely different.

3. ***B. malabarica***, *Bedd. For. Man.* 140; branchlets glabrous, leaves lanceolate or oblong obtuse or scarcely acute glabrescent distinctly nerved, stamens 16 in 2 series subsessile connective excurrent lanceolate-linear, young fruit oblong-lanceolate glabrous.

SOUTH CANARA, MALABAR, and the ANAMALLAYS; up to 4000 ft., abundant, *Beddome*.



A middle-sized tree. *Leaves* scattered, 10 by $2\frac{1}{2}$ in., tapering at both ends, or 3 by $1\frac{1}{2}$ in., subobtusate at both ends, primary nerves 15-25 on each side, secondary distinct; petiole $\frac{1}{4}$ - $\frac{3}{4}$ in. *Flowers* in axillary clusters near to or distant from the ends of the branches, closely resembling those of *B. longifolia*. *Filaments* short, hairy; connective much produced. *Berry* 1 by $\frac{1}{2}$ in., often oblique, scarcely obtuse when ripe; 1-seeded in all the examples.—The leaves vary greatly in size and shape if there be not two species here included; perhaps it should be united with *B. nerifolia* and *Moonii*.

4. *B. Moonii*, *Bedd. For. Man.* 140; branchlets rusty-villous, leaves oblong-lanceolate obtusely acuminate glabrescent distinctly nerved. *Dasyaulus Moonii*, *Thwaites Enum.* 176.

CEYLON; Caltura, *Moon*; Ratnapoora, *Thwaites*.

Does not appear to differ from *B. malabarica*, except by rusty villous shoots.—*Seeds* sparingly albuminous (*Thwaites*).

5. *B. nerifolia*, *Moon. Cat. Pl. Ceyl.* 36; branchlets glabrous, leaves very narrowly oblong coriaceous nerves obscure, anthers 16 2-seriate subsessile connective excurrent lanceolate-linear, young fruit oblong-lanceolate glabrous. *Bedd. For. Man.* 140, and *Fl. Sylv.* t. 254. *Dasyaulus nerifolius*, *Thwaites Enum.* 175.

CEYLON; common, *Thwaites*.

Leaves $4\frac{1}{2}$ by $\frac{3}{4}$ in. in *Thwaites*' typical example, broader and obtuser in others. Except by the texture of the leaves this seems undistinguishable from *B. malabarica*. *Beddome's* analysis does not show the anthers acute enough.

6. *B. fulva*, *Bedd. For. Man.* 140; leaves elliptic or obovate subobtusate at both ends densely rusty-woolly on the nerves beneath when mature, inflorescence and calyx of *B. malabarica*. *Dasyaulus fulvus*, *Thwaites Enum.* 176.

CEYLON; Pasdoon Corle, *Thwaites*.

A medium-sized tree. *Leaves* 6 by $3\frac{3}{4}$ in., coriaceous, somewhat rugose, primary nerves 10-12 on each side, strongly elevated; petiole $\frac{1}{2}$ in., densely rusty-woolly. Inner 2 calyx-segments densely rusty-woolly. *Corolla* not seen. *Ovary* 6-celled (*Thwaites*). *Fruit* not seen.

7. *B. microphylla*, *Hook. Ic. Pl.* t. 74; leaves small obovate or oblong obtuse glabrous, fascicles axillary few-fl., anthers 12 2-seriate subsessile acuminate. *Bedd. For. Man.* 140. *B. parvifolia*, *A. DC. Prodr.* viii. 198. *Dasyaulus microphyllus*, *Thwaites Enum.* 175.

CEYLON; *Gen. Walker*; near Galle, *Gardner*.

Branchlets glabrous; shoots rusty-villous. *Leaves* 1- $1\frac{1}{2}$ by $\frac{3}{4}$ in., coriaceous, nerves slender; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{2}$ in., nearly glabrous, solitary or few together. *Calyx-lobes* $\frac{1}{2}$ in., ovate, subobtusate: 2 entirely within, villous. *Corolla* $\frac{1}{2}$ in., cleft to the middle; lobes 6 (rarely 5) obtuse. *Filaments* hairy.

†† *Species of the Malay Peninsula and Andamans.*

8. *B. argentea*, *De Vriese Pl. Reinw.* 62; leaves elliptic rhomboid at both ends silky beneath, fascicles axillary many-fl., flowers small. *Miq. Fl. Ind. Bat.* ii. 1041.

MALACCA; Maingay.—DISTRIB. Malayan Archipelago?

A large tree. *Leaves* 7 by $2\frac{3}{4}$ in., primary nerves 15 on each side, parallel, strongly raised beneath, secondary obscured by close shining silk; petiole $\frac{1}{4}$ - $\frac{1}{2}$ in. *Pedicels* as long as the petioles, 4-10 together in the axils of persistent leaves. *Calyx-segments* $\frac{1}{2}$ in., ovate, obtuse, closely tomentose. *Anthers* acute, hairy on all sides.—Maingay's specimens named *argentea* are too imperfect for analysis; they agree with *De Vriese's*

diagnosis. In the absence of fruit it is uncertain whether either may not be a *Payena*.

9. **B. Lobbii**, *Clarke*; leaves elliptic acutely cuneate at both ends glabrous distinctly reticulated, pedicels $1\frac{1}{4}$ in. with the calyx-lobes closely cinereous-tomentose.

MOULMEIN; banks of the Attran, *Lobb*.

Shoots grey-tomentose. Leaves $2\frac{1}{2}$ by $1\frac{1}{4}$ in., submembranous, primary and secondary nerves distinct; petiole $\frac{1}{2}$ in. Pedicels from the terminal tufts of leaves. Calyx-lobes $\frac{1}{4}$ in., elliptic-oblong. Corolla 10-12-lobed. Stamens about 18; filaments short; anthers lanceolate, mucronate. Ovary 8-celled.—Possibly a *Payena*, but the long calyx-lobes and habit suggest *Bassia*.

10. **B. Mottleyana**, *De Vriese in Miq. Journ.* 1861, 257; leaves long-petioled broadly elliptic abruptly shortly acuminate at both ends glabrous, fascicles very numerous axillary-dense-fld.

MALACCA; *Griffith* (Kew Distrib. n. 3608).—DISTRIB. BORNEO.

Leaves 5 by $2\frac{1}{4}$ in., coriaceous, primary nerves numerous not prominent nor very oblique; petiole $\frac{3}{4}$ - $1\frac{1}{2}$ in. Pedicels $\frac{1}{2}$ - $\frac{3}{4}$ in.; fascicles in the axils of persistent leaves and clothing the branches below the leaves. Calyx-lobes $\frac{1}{8}$ - $\frac{1}{5}$ in., ovate, scarcely acute, sparingly tomentose, Corolla 8-10-lobed. Stamens 16-18; anthers subsessile, lanceolate, acute. Ovary 6-8-celled. Fruit not seen.

11. **B. cuneata**, *Blume Bijl.* 675; leaves obovate obtuse or emarginate coriaceous glabrous, seeds exalbuminous. *Miq. Fl. Ind. Bat.* ii. 1041.

MALACCA; *Maingay*.—DISTRIB. JAVA.

Leaves $4\frac{1}{2}$ by $2\frac{1}{2}$ in., attenuated at the base, primary nerves slender, not very oblique; petiole $\frac{3}{4}$ in. Flowers not seen. Berry $\frac{3}{4}$ -1 in. diam., globose, 1-3-seeded. Seeds $\frac{1}{4}$ - $\frac{3}{4}$ in., ovoid, shining-chestnut; hilum elliptic, oblique, covering one-third the surface; radicle exceedingly small, cotyledons hemi-ellipsoidal fleshy.—*Maingay's* examples (in ripe fruit) are here referred to *Blume's B. cuneata* merely from his short description of that plant in flower. Whether *B. obovata*, *Forst.*, from Tanna, differs is doubtful. *Maingay's* cuneate-emarginate leaved plant has been supposed to be the fruiting state of *B. Mottleyana*; the two appear closely allied.

12. **B. caloneura**, *Kurz Andaman Rep.* 141; leaves large elliptic-oblong base rounded or obtuse, fruit $1\frac{1}{4}$ by 1 in. rusty 2-seeded. *Isonandra*? *caloneura*, *Kurz For. Fl.* ii. 119, and in *Journ. As. Soc.* 1877, pt. ii. 229. *I. calophylla*, *Kurz in Journ. As. Soc.* 1871 pt. 69, and 1873 pt. ii. 88, not of *Teyssm. & Binn.* *Dichopsis*? *caloneura*, *Hook. f. in Gen. Pl.* ii. 658.

SOUTH ANDAMAN; frequent, *Kurz*.

A tree, 60 ft.; shoots minutely rusty-silky. Leaves $8\frac{1}{2}$ by $2\frac{3}{4}$ in., acute, mature glabrous; petiole $\frac{1}{2}$ in. A very obscure plant. *Kurz* describes the calyx (*Journ. As. Soc.* 1873, and *For. Flor.*) as 6-lobed, and the seed (*Journ. As. Soc.* 1877) as exalbuminous; but he never saw the flower. He elsewhere describes the calyx as 4-lobed, and he has finally put the plant into an albuminous genus.—Our specimen has no flower, and the solitary fruit has no calyx and is unfit for analysis; as, however, it altogether resembles that of a *Bassia*, and is quite unlike that of an *Isonandra*, we retain the plant in the former genus.

** Calyx-lobes 5, much imbricated, not or obscurely 2-seriate.

13. **B. butyracea**, *Roeb. in As. Research.* viii. 499-502, with fig., and *Fl. Ind.* ii. 527; leaves obovate or obovate-oblong, stamens 30-40, filaments glabrous as long as the anthers. *Wall. Cat.* 4164; *Don Prodr.* 146; *A. DC. Prodr.* viii. 198?; *Brand. For. Fl.* 290, t. 35.

SUBTROPICAL HIMALAYA; alt. 1-5000 ft.; from Kumaon to Bhotan, frequent.

A tree, attaining 70 ft. Leaves 13 by 6 in. (or smaller), crowded near the ends of

the branches, subobtusely, base rhomboid, tomentose when young, mature glabrous or flocculose beneath, primary nerves 16 on each side; petiole $1\frac{1}{4}$ in.; stipules $\frac{1}{2}$ in., ovate-lanceolate, caducous. *Pedicels* 1 in., very many, crowded among the subterminal leaves, tomentose. *Calyx-lobes* $\frac{1}{2}$ in., ovate, subsimilar, rusty-villous. *Corolla* $\frac{3}{4}$ in.; lobes 8-10, spreading. *Anthers* exserted, linear-lanceolate. *Ovary* 7-9-celled. *Berry* 1 by $\frac{3}{4}$ in., 1-3-seeded.—A. DC. says the calyx is 4-lobed, whence it must be very doubtful whether he had the true plant.

7. *PAYENA*, A. DC.

As *Bassia*, but the seeds albuminous. *Corolla* deeply lobed, and flowers in the axils of scattered leaves.—DISTRIB. Species 8-10?, in the Malay Peninsula and islands.

As the fruit is only known in the first described species, the four others may prove to be *Bassias*.

1. *P. Maingayi*, Clarke; leaves large oblong acuminate, flowers large, filaments and anthers glabrous, connective produced narrow-lanceolate. *Ceratophorus* sp., *Maingay* ms. *Chrysophyllum*? *molle*, Wall. Cat. 4161?.

MALACCA; *Maingay*. ? Penang; *Wallich*.

Branchlets rusty-tomentose. *Leaves* 9 by $2\frac{1}{2}$ in., parallel-sided, abruptly acuminate, base cuneate, shining brown-silky beneath, ultimately glabrescent, primary nerves 24 on each side, not prominent nor very oblique; petiole 1 in. *Pedicels* $\frac{3}{4}$ in., 2-6 together, clothing the branches and in the axils of persistent leaves, minutely silky. *Calyx-lobes* $\frac{1}{2}$ in., ovate, subacute, closely silky. *Corolla* $\frac{1}{2}$ in., divided nearly to the base; segments 10, lanceolate, distinctly 2-seriate. *Stamens* 16-20. *Ovary* 6-8-celled. *Berry* $1\frac{1}{2}$ by $\frac{3}{4}$ in., 1-seeded. *Seed* brown, shining, albuminous; hilum very large.—*Wallich's C. molle* consists of a branchlet with leaves only, from Penang.—Abounds in gutta-percha (*Maingay*).

2. *P. malaccensis*, Clarke; leaves large obovate or obovate-oblong conspicuously nerved, filaments and anthers with long fulvous hairs, connective produced linear-cuspidate. *Keratophorus* *Wightii*, *Maingay* ms., not of Hassk.

MALACCA; *Griffith* (Kew Distrib. n. 3610), *Maingay*.

Branchlets nearly glabrous. *Leaves* 12 by $6\frac{1}{2}$ in., subobtusely, base cuneate, ultimately glabrous, primary nerves 15-20 on each side, curving upwards; petiole $1\frac{1}{2}$ in. *Pedicels* $\frac{3}{4}$ in., closely silky; in numerous axillary fascicles. *Calyx-lobes* 2 outer $\frac{1}{2}$ in., subquadrate, obscurely silky, much overlapping, 2 inner longer, subacute, densely villous. *Corolla* $\frac{1}{2}$ in., divided nearly to the base; lobes 10, narrow-lanceolate, sub-2-seriate. *Stamens* 16-20; filaments short. *Fruit* not seen.

3. *P. lucida*, A. DC. *Prodr.* viii. 197; leaves elliptic acuminate primary nerves somewhat oblique to the midrib, filaments and anthers glabrous, connective excurrent tip glabrous. *Kurz For. Fl.* ii. 121, and in *Journ. As Soc.* 1877, pt. ii. 230. *Mimusops lucida*, Wall. Cat. 4147; *G. Don Gen. Syst.* iv. 35 (wrongly described, not of *Poir.*).

PENANG; *Wallich*. SINGAPORE; *Lobb*.

Branchlets and shoots rusty-tomentose. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., tapering at both ends, glabrous and somewhat shiny beneath, nerves not prominent; petiole $\frac{1}{2}$ in. *Pedicels* clustered in the axils of persistent leaves, $\frac{1}{2}$ -1 in., slender, minutely silky. *Calyx-lobes* $\frac{1}{2}$ in., obtuse, obscurely silky. *Corolla* $\frac{1}{2}$ in., deeply divided; lobes 8, oblong, obtuse. *Stamens* 16; filaments short. *Ovary* 8-celled.—*Bassia sericea* (Blume Bijdr. 674) is perhaps the same species, but has the primary nerves closer, the pedicels rather shorter. *Miquel* admits *Bassia sericea*, Blume, as a species, and also *Payena*?

sericea, Miq., which, from the authentic example, is seen to be quite different, though probably a true *Bassia*.

VAR. *Wightii*; leaves larger very coriaceous gradually or abruptly shorter acuminate, pedicels stouter, sepals larger rusty-tomentose. *Isonandra polyandra*, *Wight Ic.* t. 1589. *Keratophorus Wightii*, *Hassk. in Retz.* 101.—Malacca; *Griffith* (Kew Distrib. n. 3605), *Maingay*.—This is perhaps specifically distinct from *P. lucida*; and of this there are two forms having the flowers alike but leaves somewhat differing, viz. (1) *Wight Ic.* t. 1589, leaves $6\frac{1}{4}$ by $2\frac{3}{4}$ in. obovate-oblong suddenly shortly acuminate; (2) *Griffith n.* 3605, leaves 5 by $1\frac{1}{4}$ in. oblong-lanceolate long-acuminate. *Griffith* and *Maingay* have each collected both forms, and have each kept them apart as being distinct species.

4. ***P. paralleloneura***, *Kurz in Journ. As. Soc.* 1871, pt. ii. 70, and *For. Fl.* ii. 121; leaves narrowly elliptic-acuminate, primary nerves nearly horizontal, filaments and anthers glabrous, connective excurrent tipped with fulvous hairs.

MERGUI; Helfer (Kew Distrib. n. 3611).

Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., base broadly rhomboid, primary nerves very slender; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{2}$ – $\frac{3}{4}$ in.—This seems exceedingly near *P. lucida* and *Bassia sericea*, Blume.

8. **MIMUSOPS**, Linn.

Trees. *Leaves* elliptic or obovate, coriaceous; primary nerves numerous, spreading, slender or obscure. *Pedicels* clustered or solitary, axillary. *Calyx-segments* 6–8, 2-seriate, outer series valvate in bud, including the inner imbricated series. *Corolla-tube* short, lobes 18–24, 2–3-seriate. *Stamens* 6–8 (in *M. littoralis* 12–16), inserted near the base of the corolla, opposite its interior series of lobes; filaments short; anthers lanceolate, connective excurrent; staminodes as many as the stamens, entire serrate or lobed. *Ovary* hairy, 6–8-celled. *Fruit* globose, 6–1-seeded; endocarp crustaceous. *Seeds* compressed, ellipsoid; albumen fleshy; cotyledons flat, often nearly as wide as the seed.—**DISTRIB.** Species 30; in the tropics of both hemispheres.

1. ***M. Elengi***, Linn.; *Roxb. Cor. Pl.* i. 15, t. 14, and *Fl. Ind.* ii. 236; leaves elliptic shortly acuminate, stamens 8, berry 1-seeded. *Gaertn. Fruct.* i. 198, t. 42; *Lamk. Ill.* t. 300; *Wall. Cat.* 4146; *A. DC. Prodr.* viii. 202; *Grah. Cat. Bomb. Pl.* 106; *Dalz. & Gibs. Bomb. Fl.* 140; *Wight Ic.* t. 1586; *Bedd. Fl. Sylv.* t. 40; *Kurz in Journ. As. Soc.* 1877, pt. ii. 231, and *For. Fl.* 123.—*Rheede Hort. Mal.* i. t. 20. *Rumph. Herb. Amb.* ii. t. 63.

DECCAN and MALAY PENINSULAS; common. In North India frequently cultivated. **DISTRIB.** Cultivated in the Tropics.

A tree, 50 ft. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{4}$ in., base rhomboid, glabrous, nerves slender numerous nearly horizontal; petiole $\frac{1}{2}$ in. *Pedicels* $\frac{1}{2}$ – $\frac{3}{4}$ in., rusty-tomentose. *Calyx-lobes* 8, $\frac{1}{2}$ in., elliptic, acute, rusty-tomentose. *Corolla-lobes* 16–20, narrow-lanceolate, white. *Staminodes* 8, pilose, acute, serrate or subentire. *Berry* $\frac{3}{4}$ –1 in., ovoid, 1- (rarely 2-) seeded, yellow.

2. ***M. Roxburghiana***, *Wight Ic.* t. 1588; leaves broadly elliptic very obtuse at both ends, stamens 6 (rarely 7), berry 6–3-seeded. *Bedd. For. Man.* 143; *Brand. For. Fl.* 293.

SHEVAGHERRY and AYAMALLAY HILLS; Wight.

A large tree. *Leaves* 3 by $1\frac{1}{4}$ in., coriaceous, glabrous, nerves very slender; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. *Pedicels* 2–4 together, 1 in., nearly glabrous, near the ends of the branches. *Calyx-lobes* 6, $\frac{1}{2}$ in., triangular-lanceolate, mealy-tomentose. *Corolla* nearly as of *M. Elengi*, but segments rather fewer. *Staminodes* 6 (rarely 7), lanceolate serrate. *Berry* $\frac{1}{2}$ in. diam., depressed-globose, shining.—Flowers as large as, and like those of *M. Elengi*; but the calyx is only 6-lobed. There are no specimens at

Kew except the very complete set collected by Wight; but Col. Beddome says the tree is common in the Nilgherry and Anamallay forests.

3. *M. hexandra*, Roxb. *Cor. Pl.* i. 16, t. 15, and *Fl. Ind.* ii. 238; leaves elliptic-obovate obtuse or emarginate, stamens 6 (occasionally 7-8), berry 1- (sometimes 2-) seeded. *Wall. Cat.* 4148, A, B; *A. DC. Prodr.* viii. 204; *Grah. Cat. Bomb. Pl.* 106; *Dalz. & Gibs. Bomb. Fl.* 140; *Bedd. For. Man.* 142. *M. indica*, *A. DC. l.c.* 205; *Wight Ic.* t. 1587; *Brand. For. Fl.* 291. *M. Kauki*, *Wall. Cat.* 4149, A, C, not of Linn.

DECCAN PENINSULA and CEYLON, common; extending north to Gujerat, Banda and the Circars. Cultivated in North-west India.

A large tree. *Leaves* 3-4 by $1\frac{1}{2}$ -2 in., base cuneate or rhomboid, coriaceous, nerves obscure; petiole $\frac{1}{3}$ - $\frac{1}{2}$ in. *Pedicels* $\frac{1}{4}$ - $\frac{1}{2}$ in., 2-5 together, nearly glabrous; clusters subterminal, and along the branches, often dense. *Calyx-lobes* 6, $\frac{1}{8}$ - $\frac{1}{6}$ in., elliptic, subacute, obscurely tomentose or nearly glabrous. *Corolla* $\frac{1}{4}$ in. long, white. *Staminodes* 6-8, serrate or lobed. *Berry* $\frac{1}{2}$ by $\frac{1}{4}$ in., wider when 2-seeded.—The staminodes are rather more lobed in the well-developed examples.

4. *M. Kauki*, Linn. *Sp. Pl.* 497; leaves long-petioled obovate-elliptic silky-white beneath, stamens 6-8, berry usually 4-3-seeded. *Wall. Cat.* 4149, E, upper half; *A. DC. Prodr.* viii. 203; *Miq. Fl. Ind. Bat.* ii. 1042; *Grah. Cat. Bomb. Pl.* 106. *M. balota*, *Blume Bijl.* 673. *M. dissecta*, *Br. Prodr.* 531, in obs.; *Hook. Bot. Mag.* t. 3157; *A. DC. l.c.* 204. *M. Hookeri*, *A. DC. l.c.* M. Browniana, *Benth. Fl. Austral.* iv. 285.—*Rumph. Herb. Amb.* iii. t. 8.

BIRMA, at Amherst; *Wallich*. MALACCA; *Griffith*.—DISTRIB. Malaya, Tropical Australia.

A large tree. *Leaves* 4 by 2 in., obtuse or scarcely acute, base cuneate, nerves obscure; petiole 1- $1\frac{1}{2}$ in. *Pedicels* 1 in., densely clustered near the ends of the branches, cinnamomeous-tomentose. *Calyx-lobes* 6, $\frac{1}{4}$ in., ovate, subacute, brown-tomentose. *Corolla* $\frac{1}{2}$ in. long, lobes narrow, acute. *Staminodes* 6-8, serrate or lobed. *Berry* $\frac{1}{4}$ -1 in. diam., globose, smooth.—Among the secondary sheets of *Wall. Cat.* 4148 are *Achras Sapota* and *Sideroxylon ferrugineum*. The great difficulty that has been raised over *M. Kauki*, Linn., has been due to two causes: (1) Wallich identified his Amherst plant, the true *M. Kauki*, with Roxburgh's Deccan *M. hexandra*; (2) botanists, not looking to the fruit, and perhaps not having it always to look at, have betaken themselves to the degree of notching of the staminodes for diagnostic characters.

ANOMALOUS SPECIES.

5. *M. LITTORALIS*, Kurz *For. Fl.* ii. 123, and in *Journ. As. Soc.* 1876, pt. ii. 138; leaves large elliptic or obovate glabrous beneath, fruit 1- $1\frac{1}{2}$ in. diam. 6-5-seeded. *M. indica*, Kurz *Andaman Rep.* 42, and in *Journ. As. Soc.* 1871, pt. ii. 70, not of *A. DC.*

ANDAMAN ISLANDS; Kurz, *Helper* (Kew Distrib. n. 3613). NICOBARS; Kurz.

A tree, 50-80 ft.; all parts quite glabrous. *Leaves* $7\frac{1}{2}$ by $3\frac{3}{4}$ in., not acute, base cuneate, coriaceous; petiole $\frac{1}{2}$ in. *Pedicels* 1 in., clustered towards the ends of the branches, 1 in each axil.—The Kew specimens have no flowers, but represent a large species allied to *M. Kauki*. Kurz describes the calyx as 6-8-lobed, and the fertile stamens as 12-16, with as many staminodes; indicative perhaps of a new genus.—*Andaman Bullet-wood*.

ORDER XC. EBENACEÆ. (By C. B. Clarke.)

Trees or shrubs. *Leaves* alternate, rarely subopposite, exstipulate, entire, usually coriaceous. *Flowers* usually dioecious, regular, axillary, subsessile or in short cymes, usually bracteate: pedicels articulated under the flower. *Calyx*



inferior, gamosepalous, in fruit often accrescent. *Corolla* gamopetalous, often hairy without. *Stamens* as many or 2-3 times as many as the corolla-lobes, hypogynous, free or filaments paired or variously united; anthers narrow, dehiscing longitudinally; staminodes in the female flower resembling stamens or 0. *Ovary* superior, sessile; styles 2-8; cells as many or twice as many as the styles, imperfectly septate; ovules twice as many as the styles, attached to the interior angle of the cells, pendulous, anatropous. *Fruit* coriaceous or fleshy, indehiscent, several- or few-seeded. *Seeds* pendulous, usually oblong, longitudinally 2-3-furrowed, testa thin, albumen copious equable or ruminate; embryo axile, radicle superior.—Species 250, in the tropics of the whole world; a few species in South Africa and North America.

Flowers often 3-merous. Ovary 3- or 6-celled 1. MABA.

Flowers mostly 4-5-merous. Ovary 4-5- or 8-10-celled 2. DIOSPYROS.

1. MABA, J. R. & G. Forst.

Trees or shrubs. *Leaves* alternate, entire. *Flowers* dioecious (monœcious in *M. Maingayi*), axillary, short-pedicelled or in small dense cymes; usually 3-merous, rarely 4-5-merous. *Calyx* 3-5-partite or 3-5-fid, rarely subtruncate, often cupuliform and enlarged in fruit. *Corolla-tube* usually longer than the calyx, lobes 3, twisted to the right-hand. *Male flowers*: stamens 3-22; filaments distinct, paired or otherwise united; anthers oblong; ovary rudimentary. *Female flowers*: staminodes 0-12; ovary 3-celled, or 6-celled, or 3-celled with imperfect dissepiments between the ovules; 6-ovulate. *Fruit* ellipsoid or globose, glabrous or hairy, 1-6-celled, 1-6-seeded. *Albumen* not ruminate (where known) in any of the Indian species except *M. Maingayi*.—DISTRIB. Species 60, in the tropics of both hemispheres and frequent in Australia and Polynesia.

SECT. I. *Ferreola* (Hiern in Trans. Camb. Phil. Soc. xii. 107). *Calyx-lobes* not much imbricated. *Ovary* densely hairy.

* *Fruiting calyx* small, 3-partite, patent or reflexed.

1. *M. acuminata*, Hiern in Trans. Camb. Phil. Soc. xii. 112; leaves elliptic much acuminate, stamens 4-5, fruit $\frac{1}{2}$ in. diam. tomentose. *Macreightia acuminata*, Thwaites Enum. 424; Bedd. For. Man. 147.

CEYLON; Hinidoon Pattoo, Thwaites.

A medium-sized tree; branchlets fulvo-sericeous, soon glabrescent. *Leaves* 3 by 1-1 $\frac{1}{2}$ in., thinly coriaceous, soon glabrescent; base rhomboid or almost rounded; petiole $\frac{1}{2}$ in. *Male fl.*: calyx $\frac{1}{2}$ in.; corolla-tube $\frac{1}{4}$ in.; rudiment of ovary oblong, acute, pilose.

2. *M. oblongifolia*, Hiern in Trans. Camb. Phil. Soc. xii. 112; leaves oblong or elliptic acuminate, stamens about 12, fruit $\frac{3}{4}$ -1 in. diam. brown tomentose almost hirsute. *Macreightia oblongifolia*, Thwaites Enum. 183; Bedd. Fl. Sylb. (Anal. Gen.) t. 21, fig. 1, and For. Man. 147, not of Kurz.

CEYLON; Galle and Ratnapoora, Thwaites.

A small tree; branchlets patently fulvous-hairy, at length glabrescent. *Leaves* 6 by 2 $\frac{1}{2}$ in., base rounded, subcoriaceous, patently fulvous hairy on the nerves beneath, ultimately glabrous; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Male fl.* crowded, sessile; calyx $\frac{1}{4}$ in., shortly 3-lobed; corolla-tube $\frac{1}{2}$ in., limb 3-fid; stamens glabrous; rudiment of ovary minute, pilose. *Female fl.* solitary, subsessile; calyx $\frac{1}{4}$ in., divided nearly to the base; corolla-limb 3-fid; stamens 0; ovary 3-celled, style divided into 3 glabrous stigmas. *Fruit* 3-6-seeded. *Seeds* $\frac{1}{2}$ by $\frac{1}{2}$ in., black, albumen equable.

3. **M. ovalifolia**, *Hiern in Trans. Camb. Phil. Soc.* xii. 113; leaves elliptic or subovate narrowed to a scarcely-acute apex, stamens 13-16. *Macreightia ovalifolia*, *Thwaites Enum.* 424; *Bedd. For. Man.* 147.

CEYLON; Hinidoon Pattoo, *Thwaites*.

A medium-sized tree; branchlets patently fulvous-hairy soon glabrescent. *Leaves* 3 by $1\frac{1}{2}$ in., base rhomboid or nearly rounded, subcoriaceous, fulvous-hairy beneath when young, soon glabrescent; petiole $\frac{3}{8}$ – $\frac{1}{2}$ in. *Male fl.* crowded, sessile; calyx $\frac{1}{8}$ in., shortly acutely 3-lobed; corolla-tube $\frac{1}{8}$ in.; limb 4-fid (in one example at least); stamens glabrous; ovary-rudiment minute. *Female* not known.

** *Fruiting calyx cupuliform at the base, often enlarged.*

4. **M. nigrescens**, *Dalz. in Dalz. & Gibs. Bomb. Fl.* 142; branchlets patently fulvous-hairy, leaves lanceolate scarcely acute, male fl. subsessile in short cymes, fruits ellipsoid when young with fulvous hairs upwards. *Hiern in Trans. Camb. Phil. Soc.* xii. 115.

WESTERN GHATS, from the Concan to Mysore; *Dalzell, Ritchie, &c.*

A tree, 15 to 35 ft. (Ritchie); young branches almost shaggy. *Leaves* 2 by $\frac{3}{4}$ in., narrowed at both ends, fulvous-hairy on the midrib beneath and margins, soon glabrescent; primary nerves indistinct, secondary prominently finely reticulated; petiole $\frac{1}{8}$ in. *Male fl.* 1-5 together, 3-4-merous; calyx $\frac{1}{8}$ in., lobes short triangular; corolla $\frac{1}{8}$ in., tube campanulate; stamens 9 or (in 4-merous flowers) 6-4, glabrous; rudiment of the ovary hairy. *Female fl.* 1-2 together, 3-merous; stamens 0; ovary 3-celled. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in.; calyx (in fruit) $\frac{1}{8}$ in. diam., shortly cupuliform.

5. **M. buxifolia**, *Pers. Syn.* ii. 606; branchlets soon glabrous, leaves elliptic or obovate obtuse, flowers 1-3 together subsessile in very short cymes, fruits globose or ellipsoid soon glabrous. *Wight Ic.* t. 763; *A. DC. Prodr.* viii. 240; *Thwaites Enum.* 183; *Hiern in Trans. Camb. Phil. Soc.* xii. 116; *Bedd. Fl. Sylb. (Anal. Gen.)* t. 19, fig. 4, and *For. Man.* 148, partly; *Kurz in Journ. As. Soc.* 1877, pt. ii. 232, and *For. Fl.* ii. 139. *M. littorea*, *Br. Prodr.* 527. *M. Cumingiana*, *madagascariensis*, *guineensis* and *Smeathmanni*, *A. DC. l.c.* 241. *M. neilgherrensis*, *Wight Ill.* t. 148, bis E. *M. Ebenus*, *Wight Ic.* tt. 1228-9, not of *Spreng.* *Maha?*, *Wall. Cat.* 7461. *Ferreola buxifolia*, *Roxb. Cor. Pl.* i. 35, t. 45, and *Fl. Ind.* iii. 790.

SOUTH DECCAN PENINSULA with CEYLON, common. MALAY PENINSULA; from PEGU to MALACCA, frequent.—DISTRIB. Malay Islds. to N. Australia and the Philippines. Tropical Africa with Madagascar.

A bush, or in the hills a small tree. *Leaves* (very variable) $\frac{1}{4}$ –1 in., narrowed at the base, soon glabrescent; primary nerves indistinct, secondary finely reticulated; petiole $\frac{1}{12}$ in. *Flowers* 3-merous; calyx $\frac{1}{10}$ in., campanulate, lobes short triangular; corolla campanulate, lobes oblong. *Male fl.*: stamens 6-12, glabrous; ovary-rudiment hairy. *Female fl.*: stamens 0; ovary 3-celled; style 3-lobed at the apex. *Fruit* $\frac{1}{2}$ in., 1-seeded; calyx in fruit cupuliform (often very shortly); albumen equable.

VAR. *Ebenus*, *Thwaites* l. c.; leaves $2\frac{1}{4}$ by $1\frac{1}{2}$ in. elliptic rounded at both ends.—*M. Ebenus*, *sp. Wight*, comes about half-way between this and the next var.

Var. *angustifolia*, *Thwaites* l. c.; leaves 3 by $\frac{3}{4}$ in. narrowly cuneate at both ends.—Except in the glabrate branches this is nearly the same as *M. nigrescens*.

6. **M. andamanica**, *Kurz in Journ. As. Soc.* 1876, pt. ii. 138, and *For. Fl.* ii. 140; leaves large oblong patently hairy on the midrib beneath, female fl. axillary solitary subsessile, berry ellipsoid more than an inch long. *Macreightia oblongifolia*, *Kurz Andam. Rep.* 11, not of *Thwaites*. *M. andamanica*, *Kurz Andam. Rep.* ed. ii. 42.—See *Hiern in Trans. Camb. Phil. Soc.* xii. 124.

ANDAMAN ISLANDS; in the upper forests frequent, *Kurz*. NICOBARS; *Kurz*.

A shrub, 3-5 ft.; branchlets hairy. *Leaves* 8 by $2\frac{3}{4}$ in., abruptly subobtusely



A monoecious tree (*Moringa*); branchlets furfuraceous or subtomentose, soon glabrous. Leaves 4 by 2½ in., obtuse, base cuneate, coriaceous; petiole ½ in. Male fl.: calyx 4-partite; corolla-limb 4-partite, stamens 22 (*Moringa*). Female fl.: pedicels ¾–1 in., densely rusty-woolly; calyx ½ in., wide-campanulate, rusty-woolly, lobes short; corolla tube ½ in., glabrous below suddenly dilated upwards, lobes ½ in., narrow; style short, tip 3-lobed; ovary narrowly-oblong, glabrous, cells 3, 2-ovulate. Fruits 1½–2 by 1 in., ellipsoid, 3–1-celled, cells 1–0-seeded; calyx-tube in fruit solid, cylindric, ½ by ½ in.; lobes in fruit horizontal, ½ in. diam., round, imbricate. Seed 1 by ½ in., cylindric; albumen strongly ruminated.—The flowers are not in a good state for examination, and the ovaries may perhaps not prove always 3-celled; but Hiern's dissections show conclusively that each cell contains two oblong erect ovules.



2. DIOSPYROS, Linn.

Trees or (rarely) shrubs. *Leaves* alternate, or (in Sect. *Meloniā*) sometimes subopposite, entire. *Flowers* dioecious, very rarely polygamous, axillary and short-pedicelled or in small cymes, sometimes (the females often) solitary; 4-5-merous, very rarely 3-merous. *Calyx* lobed, often deeply (in Sect. *Ebenus* truncate), in the female often larger than in the male, often accrescent and plicate or auriculate in fruit. *Corolla* tubular, salvershaped or campanulate, shortly or deeply lobed, lobes twisted to the right. *Male flowers*: stamens 4-64, often 16; filaments distinct, paired or otherwise united; anthers linear, rarely short; ovary rudimentary. *Female flowers*: staminodes 0-16; ovary 4-5-celled, or 8-10-celled, or 4-5-celled with imperfect dissepiments between the ovules; cells 1- (rarely 2-) ovuled; styles (or stigmas) 1-4. *Fruit* globose, ellipsoid, or ovoid-conic, often supported by the much enlarged, sometimes woody, calyx; flesh often pulpose or viscid. *Seeds* oblong, usually compressed, albumen equable or (in Sect. *Meloniā*) ruminated.—Species 153, in the tropics of the whole world; a few in South Africa and North America.

SECT. I. **Gunisanthus** (Genus *A. DC. Prodr.* viii. 219). *Leaves* alternate, (adult) fulvous-pilose at least on the nerves beneath. *Inflorescence* male in loose or short racemose few-flowered cymes, females subsolitary axillary. *Flowers* 4- (rarely 4-5-) merous. *Calyx* divided nearly to the base, nearly similar in the male and female flowers, little accrescent (where known) in fruit. *Corolla* narrowly tubular in the bud, cinereous-pilose or glabrate without when expanded; lobes elliptic. *Stamens* glabrous, 12-16 (or ex Hiern sometimes in *D. apiculata* 6-7 only). *Ovary* (where known) 4-celled; cells 1-ovuled. *Albumen* (only known in *D. apiculata*) equable.

1. ***D. pruriens***, Dalz. in Hook. *Kew Journ.* iv. 110; leaves elliptic base obtuse or cordate, male fl. long-pedicelled in small cymes, corolla fulvous-tomentose without. Dalz. & Gibs. *Bomb. Fl.* 141; *Bedd. Ic. Pl. Ind. Or.* t. 129, and *For. Man.* 144; Hiern in *Trans. Camb. Phil. Soc.* xii. 185, not of Thwaites.

BOMBAY; Dalzell, Ritchie. BARABOODUN HILLS; Law.

Shoots fulvous-pilose; branchlets persistently villous. *Leaves* 3 by $1\frac{1}{4}$ in., tip cuneate obtuse, base abruptly narrowed often cordate, fulvous-pilose especially on the nerves beneath, ultimately glabrescent above, chartaceous scarcely coriaceous; primary nerves oblique, secondary not prominent; petiole $\frac{1}{8}$ - $\frac{1}{4}$ in. *Male fl.*: peduncles $0-\frac{1}{2}$ in., 1-5-flowered; bracts small ovate, glabrous within, caducous; pedicels $0-\frac{1}{2}$ in.; calyx nearly 4-partite, lobes $\frac{1}{4}$ in., oblong, hairy; corolla $\frac{1}{2}-\frac{3}{4}$ in., salvershaped, tube rather longer than the calyx, lobes $\frac{1}{4}-\frac{1}{2}$ in. oblong; stamens 13-14, glabrous. *Female fl.* solitary; peduncles $\frac{1}{2}$ in.; calyx and corolla nearly as in the males; ovary 4-celled, 4-ovuled. *Fruit* $\frac{3}{8}$ -1 in., ovoid-conical, densely clothed with fulvous stinging hairs; fruiting calyx scarcely enlarged.

2. ***D. apiculata***, Hiern in *Trans. Camb. Phil. Soc.* xii. 186; leaves elliptic acuminate base obtuse or cordate, male fl. in short cymes, corolla glabrous without.

PENANG; Government Hill, Maingay.

A tree, with slender stem 4 ft. high (Maingay); shoots fulvous-hirsute; branchlets persistently villous. *Leaves* $5\frac{1}{2}$ by $2\frac{1}{2}$ in., base abruptly narrowed mostly cordate, fulvous-hirsute especially on the nerves beneath, ultimately glabrescent above, chartaceous scarcely coriaceous; primary nerves very oblique, much elevated beneath, secondary not prominent; petiole $\frac{1}{16}$ - $\frac{1}{8}$ in. *Male fl.*: peduncles $0-\frac{1}{2}$ in., 1-4-flowered; bracts small, ovate, glabrous within, caducous; pedicels $0-\frac{1}{2}$ in.; calyx $\frac{1}{2}$ in., nearly 4-partite, lobes lanceolate glabrous within downwards; corolla $\frac{1}{2}-\frac{1}{2}$ in., salvershaped,

tube rather shorter than the calyx, lobes $\frac{1}{2}$ in. elliptic; stamens 12 (sometimes 6-7 ex *Hiern*), glabrous. *Female fl.* 1-3 together, subsessile. *Fruit* 1 by $\frac{1}{2}$ in., ovoid-conic, acute, with scattered fulvous hairs, ultimately nearly glabrous, calyx scarcely accrescent. *Albumen* equable.

3. **D. pilosula**, *Wall. Cat.* 4132; leaves narrowly obovate-lanceolate acuminate cuneate or rhomboid at the base, male flowers long-pedicelled in lax cymes, corolla closely silky without. *Hiern in Trans. Camb. Phil. Soc.* xii. 188. *Gunisanthus pilosulus*, *A. DC. Prodr.* viii. 220; *Kurz in Journ. As. Soc.* 1877, pt. ii. 232, and *For. Fl.* ii. 125.

KHASIA MTS.; *Wallich*. PEGU; *Brandis*. ANDAMAN ISLANDS., *Kurz*.

A small tree, attaining 25 ft. (*Kurz*); branchlets adpressedly fulvous-pilose, at length glabrescent. *Leaves* 4 by $1\frac{1}{2}$ in., base cuneate or scarcely obtuse, hairy principally on the nerves beneath, ultimately nearly glabrous except the midrib beneath, chartaceous somewhat coriaceous; primary nerves oblique, secondary not conspicuous; petiole $\frac{1}{2}$ in. *Male fl.* in lax depauperated subracemose cymes, 4-merous; bracts $\frac{1}{2}$ in., ovate, deciduous; pedicels $\frac{1}{2}$ in.; calyx-lobes $\frac{1}{2}$ in., lanceolate; corolla-tube $\frac{1}{2}$ in., slender, pilose without; lobes $\frac{1}{2}$ in.; stamens 12, glabrous. *Female fl.* solitary, calyx and corolla nearly as in the male; ovary 4-celled, cells 1-ovuled; young fruit densely rufous hirsute.

4. **D. martabanica**, *Clarke*; leaves narrowly oblong acuminate obtuse or rounded at the base, male flowers long-pedicelled in lax racemose cymes, corolla fulvous-villous without. *Gunisanthus mollis*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 88, 1877, pt. ii. 232, and *For. Fl.* ii. 126.

MARTABAN; east of Tounghoo not infrequent, *Kurz*.

A tree, attaining 30 ft.; branchlets hirsute, persistently villous. *Leaves* 6 by $\frac{1}{2}$ in., when young glabrous above, hirsute beneath with fulvous hair $\frac{1}{2}$ in. long, when mature pilose beneath, chartaceous somewhat coriaceous; primary nerves oblique, secondary not conspicuous; petiole $\frac{1}{2}$ in. *Male fl.* in lax depauperated subracemose cymes, 4-merous; bracts $\frac{1}{2}$ in., ovate, deciduous; pedicels $\frac{1}{2}$ in., calyx-lobes $\frac{1}{2}$ in., narrowly lanceolate; corolla-tube $\frac{1}{2}$ in., slender, lobes $\frac{1}{2}$ in., narrow-oblong; stamens 12-14, glabrous, anthers short-oblong, connective hardly produced. *Female fl.* unknown.—Very nearly allied to *D. pilosula* (*Kurz*).

VAR. pellucido-punctata; leaves 2 in. long. *D. vaccinioides*, var., *Hiern in Trans. Camb. Phil. Soc.* xii. 231.—Andamans; *Kurz*.—The example exhibits no flowers, one detached imperfect fruit.

5. **D. dasphylla**, *Kurz in Journ. As. Soc.* 1871, pt. ii. 71; leaves cordate-oblong acute, male flowers in short ferruginous-villous cymes, corolla-tube densely villous without, stamens about 16. *Hiern in Trans. Camb. Phil. Soc.* xii. 203; *Kurz in Journ. As. Soc.* 1877, pt. ii. 237, and *For. Fl.* ii. 138.

MARTABAN HILLS, alt. 4000 ft., *Brandis*.

Branchlets persistently fulvous-villous. *Leaves* $5\frac{1}{2}$ by $2\frac{1}{2}$ in., fulvous-pilose on the nerves beneath, chartaceous somewhat coriaceous; primary nerves oblique, secondary not conspicuous; petiole $\frac{1}{2}$ in. *Male fl.*: cymes $\frac{1}{2}$ in., 2-4-flowered; bracts $\frac{1}{2}$ in., orbicular; calyx $\frac{1}{2}$ in., deeply 4-lobed, lobes round-elliptic, ciliate-pilose; corolla-tube $\frac{1}{2}$ in., lobes $\frac{1}{2}$ in., elliptic; stamens glabrous; anther-cells narrowly oblong, connective shortly produced above them. *Female fl.* unknown.

SECT. II. **Embryopteris**. *Leaves* alternate, adult glabrous or (in *D. Kaki* and *D. montana*, var.) pubescent. *Flowers* 4- (rarely 4-6-) merous; males in small cymes or clustered subsessile (in *D. foliolosa* in rather larger more numerous-flowered cymes); females subsolitary. *Calyx* cleft to the base or half-way down (in *D. Embryopteris* and *D. Toposia* irregularly, less deeply). *Corolla* narrowly tubular in bud; glabrate or nearly so without when expanded (except in *D. Kaki*), urceolate or salvershaped. *Stamens* about 16 (in *D. Embryopteris*, *D. Kaki* and *D. assimilis* numerous), glabrous or in a



few species somewhat hairy. *Fruit* ellipsoid or subglobose. *Seeds* (where known) with equable albumen.

6. **D. montana**, Roxb. *Cor. Pl.* i. 37, t. 48 and *Fl. Ind.* ii. 538; leaves ovate or oblong pubescent or glabrous base cuneate or obtuse, male fl. in small cymes, calyx small deeply lobed, corolla urceolate glabrous without, stamens 16 glabrous. *Wall. Cat.* 4115, upper part of type sheet; *Wight Ic.* t. 1225; *A. DC. Prodr.* viii. 230; *Grah. Cat. Bomb. Pl.* 107; *Dalz. & Gibs. Bomb. Fl.* 142; *Bedd. For. Man.* 143; *Hiern in Trans. Camb. Phil. Soc.* xii. 220; *Kurz in Journ. As. Soc.* 1877, pt. ii. 235; *Brand. For. Fl.* 296. *D. cordifolia*, Roxb. *Cor. Pl.* i. 38, t. 50, and *Fl. Ind.* ii. 538; *Wall. Cat.* 4116; *A. DC. Prodr.* viii. 230; *Wight Ill.* t. 148; *Thwaites Enum.* 178; *Kurz For. Fl.* ii. 130; *Bedd. For. Man.* 143. *D. rugosula*, *Br. Prodr.* 526; *A. DC. Prodr.* viii. 229. *D. bracteata*, Roxb. *Fl. Ind.* ii. 539; *A. DC. l. c.* 239. *D. heterophylla*, *Wall. Cat.* 4188; *A. DC. l. c.* viii. 230. *D. sylvatica*, *Wall. Cat.* 4117, not of Roxb.; of *A. DC. Prodr.* viii. 231, as to var. β only. *D. punctata*, *Dcne in Nouv. Ann. Mus. d'Hist. Nat.* iii. 467; *A. DC. l. c.* 230. *D. Goindu*, *Dalz. in Hook. Kew Journ.* iv. 111; *Dalz. & Gibs. Bomb. Fl.* 141. *D. Waldemarii*, *Klotzsch in Reis. Pr. Waldem.* 101, t. 55.

From the HIMALAYA (from the Ravi eastward, *Brandis*) to CEYLON and TENASSERIM; common.—*DISTRIB.* Birma, Malay Archipelago, Trop. Australia.

A tree, often spinous; branchlets soon glabrous. *Leaves* $2\frac{1}{2}$ by 1 in., base cuneate or cordate on the same branch, thin, nerves not elevated, though both primary and reticulating nerves often distinct; petiole $\frac{1}{4}$ in. *Male fl.*: cymes $\frac{1}{4}$ – $\frac{1}{2}$ in., pubescent or glabrescent; peduncles $0\frac{1}{4}$ in.; bracts $\frac{1}{10}$ in.; calyx $\frac{1}{2}$ – $\frac{1}{10}$ in., lobes ovate; corolla $\frac{1}{4}$ in., shortly lobed. *Female flowers* solitary; peduncles $\frac{1}{4}$ – $\frac{1}{2}$ in.; calyx $\frac{1}{2}$ – $\frac{1}{4}$ in., deeply 4-fid; corolla nearly as of the male; staminodes 4–12; ovary 8-celled, cells 1-ovuled. *Fruit* $\frac{1}{2}$ – $1\frac{1}{2}$ in. diam., globose, glabrous; lobes of fruiting calyx $\frac{1}{4}$ – $\frac{1}{2}$ in., ovate, obtuse, foliaceous. *Seeds* 2–8; albumen not ruminated (*Kurz* says ruminated in the Pegu tree).—*D. cordifolia* has the female peduncles $\frac{1}{4}$ – $\frac{1}{2}$ in., the leaves and calyx subsersistently pubescent; *D. montana* has them glabrescent; *Beddome* maintains the two to be distinct species.

7. **D. Lotus**, Linn; *A. DC. Prodr.* viii. 228; leaves elliptic narrowed upwards membranous at first pubescent beneath, male fl. 2–3 together subsessile, calyx small lobed half-way down, corolla urceolate glabrous without, stamens 16 connective pilose. *Lamk. Ill.* t. 858; *Reich. Ic. Fl. Germ.* t. 1079; *Hiern in Trans. Camb. Phil. Soc.* xii. 223; *Brand. For. Fl.* 297, t. 36; *Boiss. Fl. Orient.* iv. 33.

WEST PUNJAB; Hazara, alt. 8–6000 ft., *Stewart*. WEST KASHMIR and North of PESHAWUR; not uncommon, *Brandis*.—*DISTRIB.* West Asia. Cultivated in the Mediterranean Region, also (?) in Japan and China.

Resembling *D. montana*; the leaves are larger ($6\frac{1}{2}$ by 2 in. in *Stewart's* example).—"Fruit much prized by the Afghan tribes" (*Brandis*); hence it may be questioned how far the tree is indigenous in India.

8. **D. Kaki**, Linn. *f. Suppl.* 439; leaves ovate obtuse or narrowed at both ends pubescent reticulated beneath, male flowers in small cymes, calyx lobed deeply, corolla urceolate tube short glabrate lobes tomentose without, stamens 16 pilose. *Roxb. Fl. Ind.* ii. 527; *Grah. Cat. Bomb. Pl.* 107; *Wight Ic.* t. 415; *A. DC. Prodr.* viii. 229, excl. var. γ , glabra; *Hiern in Trans. Camb. Phil. Soc.* xii. 227–230, with fig.; *Ill. Hortie.* 1871, 176, t. 78; *Kurz in Journ. As. Soc.* 1877, pt. ii. 233. *D. chinensis*, *Blume Bijdr.* 670. *D. Schi-Tse*, *Bunge Enum. Pl. Chin. Bor.* 42. *D. costata*, *Rev. Hortie.* 1870, fig. at p. 133. *D. Roxburghii*, *Rev. Hortie.* 1872, tt. 28–29. *Embryopteris Kaki*, *G. Don. Gen. Syst.* iv. 41.

KHASIA Mts.; Moosmai, Bor Pani, Nunklao, Nurtiung, *H. f. & T.*—DISTRIB. Eastern India, China and Japan, cultivated.

A small tree; branchlets subpersistently villous. *Leaves* $4\frac{1}{2}$ by 2 in., chartaceous scarcely coriaceous; primary nerves oblique, conspicuous beneath; petiole $\frac{1}{4}$ in. *Male fl.*: cymes $\frac{1}{2}$ in., about 3-flowered, pubescent; peduncles $0\frac{1}{2}$ in.; bracts $0\frac{1}{2}$ in., lanceolate-linear; pedicels hardly any; calyx $\frac{1}{4}$ in., deeply 4-lobed; corolla $\frac{1}{2}$ in. *Female fl.* solitary; peduncles $\frac{1}{2}$ in.; calyx-lobes $\frac{1}{2}$ in., ovate; corolla $\frac{1}{2}$ by $\frac{1}{4}$ in.; staminodes 8; ovary usually 8-celled; style hairy, 4-fid. *Fruit* 1-3 in. diam., globose, edible, very variable in the cultivated plant.

9. **D. Embryopteris**, *Pers. Syn.* ii. 624; leaves oblong obtuse at the base glabrous, male flowers in short cymes, corolla urceolate nearly glabrous without, stamens 24-64 pilose. *Wall. Cat.* 4123; *Bot. Reg.* t. 499; *A. DC. Prodr.* viii. 235; *Griff. Notul.* iv. 289; *Thwaites Enum.* 178; *Bedd. Fl. Sylv.* t. 69; *Hiern in Trans. Camb. Phil. Soc.* xii. 258; *Kurz in Journ. As. Soc.* 1877, pt. ii. 234, and *For. Fl.* ii. 128; *Brand. For. Fl.* 298. *D. glutinosa*, *Koen.*; *Roxb. Fl. Ind.* ii. 533; *Grah. Cat. Bomb. Pl.* 107. *Embryopteris peregrina*, *Gaertn. Fruct.* i. 145, t. 29, fig. 2. *E. glutenifera*, *Roxb. Cor. Pl.* i. 49, t. 70; *Wight Ic.* tt. 843, 844. *E. gelatinifera*, *G. Don Gen. Syst.* iv. 41. *Garcinia malabarica*, *Desrouss.*; *Lamk. Dict.* iii. 701.—*Rheede Hort. Mal.* iii. t. 41.

INDIA from the HIMALAYA (from the Jumna eastward, *Brandis*) to CEYLON and TENASSERIM, very common; abundant in Bengal.—DISTRIB. Siam, Malayan Archipelago.

A dense tree; branchlets glabrous. *Leaves* $5\frac{1}{2}$ by 2 in., obtuse or subacuminate, coriaceous; primary nerves oblique, reticulating nerves distinct, slightly elevated above; petiole $\frac{1}{4}$ by $\frac{1}{2}$ in. *Male fl.*: cymes $\frac{1}{2}$ by $\frac{3}{4}$ in., few- or many-flowered, puberulous or subtomentose; calyx $\frac{1}{4}$ in. long and broad, adpressedly cinereous silky, or in the more southern examples black silky or almost hirsute, lobes $\frac{1}{2}$ by $\frac{1}{2}$ in., triangular; corolla $\frac{1}{2}$ by $\frac{1}{2}$ in., tubular-campanulate, lobes $\frac{1}{10}$ in.; filaments short hairy, anthers linear more or less hairy. *Female fl.* 1-5 together, subsessile or cymose; resembling the male, but larger, calyx-lobes wider, subauriculate at the base; staminodes 1-12; ovary 8-celled, glabrous; styles 4, lobed at the tips. *Fruit* usually solitary, 1-2 in. diam., subglobose; glandular or rusty, usually 4-8-seeded; fruiting-calyx much accrescent, lobes $\frac{3}{4}$ in., ovate, auriculate, base cordate, nearly glabrous.

10. **D. Toposia**, *Ham. in Trans. Linn. Soc.* xv. 115; leaves oblong acuminate coriaceous glabrous, male flowers in small cymes, calyx spathaceo-valvate irregularly lobed, corolla urceolate nearly glabrous without, stamens about 32 glabrous. *A. DC. Prodr.* viii. 237; *Bedd. Ic. Pl. Ind. Or.* t. 122; *Hiern in Trans. Camb. Phil. Soc.* xii. 263; *Kurz in Journ. As. Soc.* 1877, pt. ii. 234, and *For. Fl.* ii. 128; *Bedd. For. Man.* 144. *D. racemosa*, *Roxb. Hort. Beng.* 40, and *Fl. Ind.* ii. 536; *Wight Ic.* t. 416. *D. lanceolata*, *Wall. Cat.* 4122. *Embryopteris lanceolata*, *G. Don Gen. Syst.* iv. 41.

SILHET; *Roxburgh*. CACHAR; *Keenan*. CHITTAGONG; *Kurz*. CEYLON; *Gardner*, *Thwaites*.

A large or middle-sized tree; branchlets glabrous. *Leaves* $6\frac{1}{2}$ by $2\frac{1}{4}$ in., base obtuse or almost rounded, primary nerves not so oblique as in *D. Embryopteris*, reticulated nerves very close distinct; petiole $\frac{1}{2}$ in. *Male fl.*: peduncles $\frac{1}{2}$ by $\frac{2}{3}$ in., nearly glabrous; cymes $\frac{1}{2}$ by 1 in., often 3-flowered; calyx $\frac{1}{2}$ in., lobes irregular, ovate, acute; corolla $\frac{1}{2}$ in., tubular-campanulate, shortly 4-lobed. *Female fl.* short-peduncled; acute and corolla as in the male; staminodes 12-16; ovary 4- (rarely 6-) celled; style 0, stigmas 4. *Fruit* $\frac{2}{3}$ by 1 in., ellipsoid or subglobose, villous finally glabrate, 1-4-seeded; fruiting calyx $\frac{2}{3}$ in. across; lobes patent, villous within. *Albumen* equable.

11. **D. foliolosa**, *Wall. Cat.* 4143; leaves oblong acuminate glabrous, male cymes lax, corolla urceolate glabrous without, calyx-lobes of the female



cordate ovate accrescent soon glabrous. *A. DC. Prodr.* viii. 234; *Hiern in Trans. Camb. Phil. Soc.* xii. 188. *D. calycina*, *Bedd. Fl. Sylv.* t. 68, and *Ic. Pl. Ind. Or.* t. 123.

SHEVAGHERY HILLS and COURTALLUM; *Wight*. TINNEVELLY HILLS; *Beddome*.

A middle-sized tree; branchlets soon glabrous. *Leaves* 4 by $\frac{3}{4}$ - $1\frac{1}{4}$ in., base cuneate or obtusely rhomboid, shining, coriaceous; primary nerves oblique, indistinct, reticulating nerves prominent on both surfaces; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Male fl.*: cymes 2 in., lax, soon glabrescent, pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in.; calyx $\frac{1}{10}$ in., lobed half-way down; corolla $\frac{1}{4}$ in., shortly 4-lobed; stamens 12-16, somewhat hairy. *Female fl.* solitary, peduncles $\frac{3}{4}$ -1 in.; corolla nearly as in the male; ovary 4-celled, cells 1-ovuled. *Fruit* $\frac{2}{3}$ in. diam., globose, squamose, glabrescent; fruiting calyx foliaceous, lobes $\frac{3}{4}$ in. long and broad, cordate-ovate acute.

12. *D. ovalifolia*, *Wight Ic.* t. 1227; leaves elliptic or oblong cuneate or subobtusate at both ends glabrous, flowers sessile clustered, corolla urceolate glabrous without. *Thwaites Enum.* 181; *Hiern in Trans. Camb. Phil. Soc.* xii. 237; *Bedd. For. Man.* 143.

SOUTH DECCAN PENINSULA; Coimbatore and Nilgherries, *Wight*; Anamallays and Tinnevely Hills, *Beddome*. CEYLON, alt. 2-4000 ft., *Moon*, *Thwaites*.

A middle-sized tree; branchlets glabrous. *Leaves* 5 by $2\frac{1}{4}$ in., coriaceous, nerves ultimately distinct; petiole $\frac{1}{4}$ in. *Male fl.* 3-6 together, clusters minutely pilose; calyx $\frac{1}{10}$ in., wide-campanulate, lobes $\frac{1}{16}$ in., deltoid, hairy on both sides; corolla $\frac{1}{2}$ - $\frac{3}{4}$ in., tubular-campanulate, lobes 4-5 less than half the length of the corolla, ovate; stamens 13-20, glabrous. *Female fl.* 2-6 together, resembling the males but rather broader; staminodes 0-7; ovary hairy 4-6 celled (2-celled, *vide Wight*); style 2-3-lobed. *Fruits* 1-3 together, $\frac{3}{8}$ in. diam., subsessile, globose, glabrate, usually 1-seeded; lobes of the fruiting calyx $\frac{1}{8}$ by $\frac{1}{2}$ in., reflexed, thick, ferruginous-tomentose on both sides. *Albumen* equable.

13. *D. nigricans*, *Wall. Cat.* 6351; leaves elliptic-lanceolate acuminate glabrous, male flowers subsessile, calyx-lobes small ovate, corolla tubular nearly glabrous without. *A. DC. Prodr.* viii. 239; *Hiern in Trans. Camb. Phil. Soc.* xii. 207; *Bedd. For. Man.* 144.

KHASIA MTS.; *H. f. & T. SILHET*; *Wallich.*

A tree, attaining 50 ft.; branchlets subsersistently grey-pubescent. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{4}$ in., base broad-cuneate, often turning black in drying, chartaceous hardly coriaceous; primary nerves slender, indistinct, oblique, reticulating nerves distinct; petiole $\frac{5}{8}$ in. *Male fl.* 3-6 together; calyx-tube very short, lobes 4, $\frac{1}{2}$ in., sparsely pilose; corolla $\frac{1}{2}$ in., deeply lobed. *Female fl.* unknown. *Fruit* solitary, subsessile $\frac{3}{4}$ by $\frac{1}{2}$ in., ellipsoid, glabrous, 4-celled; fruiting calyx divided nearly to the base, blackish; lobes $\frac{1}{4}$ by $\frac{1}{2}$ in., ovate or elliptic, foliaceous, nearly flat and glabrous.

14. *D. variegata*, *Kurz in Journ. As. Soc.* 1871, pt. ii. 73; leaves large broadly oblong acute glabrous, male flowers in very short sparingly pubescent cymes, corolla salver-shaped nearly glabrous without. *Hiern in Trans. Camb. Phil. Soc.* xii. 203; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 137.

ASSAM; *Jenkins*. PEGU and MARTABAN; alt. 0-1000 ft., not infrequent, *Kurz*.

A tree, attaining 70 ft. (*Kurz*); glabrous. *Leaves* $7\frac{1}{2}$ by $2\frac{1}{2}$ - $3\frac{1}{2}$ in., base cuneate or subobtusate, coriaceous; primary nerves oblique strong, reticulating nerves distinct; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Male fl.*: cymes 3-8-flowered, crowded; calyx $\frac{1}{2}$ in., 4-lobed more than half-way down, lobes elliptic minutely pubescent; corolla-tube $\frac{1}{4}$ in., narrowed upwards, lobes $1\frac{1}{4}$ in., ovate, subacute, patent; stamens about 16, anthers glabrous.—In an Assam fruiting example (n. 275 *Herb. Kew*); peduncle $\frac{1}{2}$ in.; fruit solitary $\frac{3}{4}$ in. diam., globose, ferruginous-villous; calyx-lobes 4, $\frac{3}{4}$ by $\frac{1}{2}$ in., auriculate, ferruginous-pubescent within. This was matched with *Kurz's* male examples of *D. variegata* by the leaves, apparently correctly by *Hiern*, who nevertheless hesitated to

describe the fruit of *D. variegata* from it.—Griffith's Assam examples, referred to by *Hiern* l. c. 223, were finally referred to *D. variegata*, with which the leaves exactly agree; the examples exhibit only leaves and dense panicles 4-6 in. diam. of abortive buds: these are doubtful.

15. **D. Ebenum**, *Koenig*; *A. DC. Prodr.* viii. 234; leaves elliptic obtuse or obtusely cuneate at both ends coriaceous reticulating nervation hexagonal prominent, male fl. in short-peduncled cymes, corolla tubular glabrous without not clavate in the bud, stamens about 16. *Roxb. Hort. Beng.* 40, and *Fl. Ind.* ii. 529; *Wall. Cat.* 4120; *Wight Ic.* t. 188; *Grah. Cat. Bomb. Pl.* 108; *Bedd. Fl. Sylv.* t. 65; *Hiern in Trans. Camb. Phil. Soc.* xii. 208, partly. *D. Ebenaster*, *Roxb. Fl. Ind.* ii. 529, not of *Retz*.

SOUTH DECCAN PENINSULA; fide *Beddome*. ASSAM; *Griffith* (an culta?). CEYLON; alt. 2-5000 ft., frequent.—DISTRIB. Malaya (*Hiern*).

A large tree; branchlets glabrous. Leaves 4 by $1\frac{1}{2}$ in., coriaceous; primary nerves oblique; petiole $\frac{1}{8}$ - $\frac{1}{4}$ in. Male fl. 3-12 together, almost fascicled on peduncles 0- $\frac{1}{2}$ in.; calyx $\frac{1}{2}$ in., funnel-shaped, nearly glabrous, lobes 4, not reaching half-way down, rounded, glabrous or ciliate-pubescent on the margins; corolla-buds $\frac{1}{2}$ in., narrower upwards, lobed half-way down; filaments minutely pilose, anthers linear glabrous, connective long produced. Female fl. solitary, very shortly peduncled; calyx larger than in the male; style 1, stigmas 4; ovary 8-celled. Fruit $\frac{3}{4}$ in. diam., globose, glabrous or adpressedly pubescent; fruiting calyx a subhemispheric wooden cup fitting the base of the fruit; below its margin without spread the 4 ovate calyx-lobes.—No specimens seen from Bengal except cultivated. Thwaites sends a variety in which the primary nerves of the leaves are more distant and very oblique.

16. **D. assimilis**, *Bedd. in Madras For. Rep.* 1866-7, 20, t. 1; leaves broadly oblong acuminate glabrous thin reticulating nervation rhomboidal conspicuous, male fl. in short-peduncled cymes, calyx pubescent, corolla tubular glabrous without not clavate in bud, stamens 24-32. *D. nigricans*, *Dalz. in Hook. Kew Journ.* iv. 110; *Dalz. & Gibs. Bomb. Fl.* 141, not of *Wall. nor of Bedd.* *D. Ebenum*, *Hiern in Trans. Camb. Phil. Soc.* xii. 208, partly.

MALABAR; Concan and Canara, *Dalzell*; South Canara, *Beddome*.

Leaves more parallel-sided than in *D. Ebenum*, much thinner in texture, drying black. Calyx more pubescent, lobed more than half-way down. Filaments glabrous, anthers linear, connective hardly produced. The examples are all male, but the tree seems closely allied to *D. Ebenum* (*Beddome*), with which *Hiern* unites it.

17. **D. clavigera**, *Clarke*; leaves elliptic obtusely rhomboid at both ends glabrous coriaceous reticulated nervation obscure, male fl. in small dense cymes, corolla tubular glabrous without clavate in the bud, stamens about 16 glabrous. *D. Ebenum*, *Hiern in Trans. Camb. Phil. Soc.* xii. 208, partly.

MALACCA; *Griffith* (*Kew Distrib.* n. 3635), *Maingay* (n. 971).

Whole plant glabrous, except the minutely ciliate-pilose margin of the calyx. Leaves $2\frac{3}{4}$ by $1\frac{1}{2}$ in. (much larger occur), drying red; petiole $\frac{1}{2}$ in. Male fl. 3-16 together in very small subsessile cymes; calyx $\frac{1}{2}$ in., divided deeply; lobes 4, obtuse; corolla (in the bud) $\frac{1}{2}$ in., glabrous, the upper portion containing the lobes much thicker than the tube; anthers oblong, connective very shortly produced. Female fl. and fruit unknown.

SECT. III. **Brachyanthos**. Leaves alternate. Flowers small, 4- (rarely 3- or 5-) merous; males in very small cymes (or in *D. microphylla* almost fascicled), females solitary or (in *D. Kurzii*) in very small cymes. Calyx nearly 4-partite, larger in the female, accrescent in fruit. Corolla subglobose in the male bud, when expanded urceolate small, glabrate (in *D. Kurzii* cinereous-tomentose). Stamens 12-24, glabrous or slightly hairy; anther dehiscing at

first by short slits laterally near the apex of the cells. *Albumen* ruminated or equable.

18. *D. sylvatica*, *Rarb. Cor. Pl.* i. 37, t. 47, and *Fl. Ind.* ii. 537; leaves elliptic or oblong narrowed at both ends nearly glabrous secondary nervation indistinct, male fl. in small cymes, corolla short urceolate glabrate without, female solitary. *A. DC. Prodr.* viii. 231, excl. var. β ; *Thwaites Enum.* 178; *Bedd. Ic. Pl. Ind. Or. t.* 121, and *For. Man.* 143; *Hiern in Trans. Camb. Phil. Soc.* xii. 161, not of *Wall.*

DECCAN PENINSULA from the CIRCARS and BOMBAY to CEYLON.

A medium-sized tree. *Leaves* $4\frac{1}{2}$ by 2 in., minutely pubescent beneath or glabrous, drying black; petiole $\frac{1}{2}$ in. *Male fl.* in cymes $\frac{1}{2}$ -1 in. long; calyx-lobes $\frac{1}{16}$ in., rounded, minutely hairy; corolla $\frac{1}{10}$ in., lobed half way down; stamens 13-22, glabrous or sparsely pilose; anthers ovate, dehiscent by a short slit near their apex, connective produced lanceolate. *Female fl.* on peduncles $\frac{1}{2}$ - $\frac{3}{4}$ in., 4-3-merous; calyx-lobes $\frac{1}{2}$ in., ovate-oblong; corolla $\frac{1}{2}$ - $\frac{3}{4}$ in.; staminodes 4; ovary 6-8-celled; styles 3, bifid. *Fruit* $\frac{1}{2}$ in. diam., globose, nearly glabrous; fruiting calyx accrescent, lobes spreading, foliaceous, glabrous, nearly flat, striate. *Seeds* 2-8, albumen ruminated.

19. *D. chretiolides*, *Wall. Cat.* 4187; leaves large elliptic base obtuse nearly glabrous reticulating nervation prominent, male fl. in small cymes, corolla urceolate glabrate without, females solitary. *A. DC. Prodr.* viii. 231; *Hiern in Trans. Camb. Phil. Soc.* xii. 162; *Kurz in Journ. As. Soc.* 1877, pt. ii. 234, and *For. Fl.* ii. 129.

Throughout BRITISH BIRMA, frequent.—DISTRIB. Ava.

A tree, attaining 70 ft. *Leaves* attaining 11 by $6\frac{1}{2}$ in., base rounded or rarely rhomboidal, nearly glabrous when very young, pale (brown when dried) beneath; petiole $\frac{3}{8}$ in. *Flowers* nearly as in *D. sylvatica*, the males rather larger; anthers ovate-lanceolate, similar to those of *D. sylvatica*, and similarly dehiscent by a lateral slit from the apex of the cell, which is in this species produced more than half-way down the cell. *Fruit* 1-1 $\frac{1}{2}$ in. diam., globose, smooth.

20. *D. Kurzii*, *Hiern in Trans. Camb. Phil. Soc.* xii. 162; leaves elliptic shortly acuminate glabrous, primary nerves slender distinct very close, female fl. 2-3 together in short-peduncled cymes, corolla-lobes cinereous-tomentose on both sides. *Kurz in Journ. As. Soc.* 1877, pt. ii. 235, and *For. Fl.* ii. 231.

ANDAMAN ISLDS.; frequent, *Kurz.* NICOBARS; *Kamorta, Kurz.*

A tree, attaining 60 ft. (*Kurz*); branchlets pubescent. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate, drying black, midrib depressed above; petiole $\frac{3}{8}$ - $\frac{1}{2}$ in. *Male fl.* unknown. *Female fl.* 4-merous; peduncles $\frac{1}{10}$ - $\frac{1}{8}$ in., pubescent, bracts small, linear, deciduous; calyx $\frac{1}{16}$ in., lobes deep, elliptic glabrous or nearly so; corolla $\frac{1}{2}$ - $\frac{3}{4}$ in., short-campanulate, lobes deep, oblong-ovate; staminodes 4 glabrous; ovary glabrous except at the apex, 4-celled, cells 1-ovuled; styles 2, erect, slender, hairy, long, base connate. *Berries* globular, size of a small cherry, smooth, 4-celled, 4-seeded; albumen equable. *Kurz* says that the style is simple thick.

21. *D. microphylla*, *Bedd. Ic. Pl. Ind. Or. t.* 218, and *For. Man.* 145; leaves small ovate-oblong cuneate at both ends glabrescent except the midrib beneath, flowers axillary subsessile, calyx-lobes ovate. *D. buxifolia*, *Hiern in Trans. Camb. Phil. Soc.* xii. 218. *D. vaccinioides*, *Wall. Cat.* 4180, as to *Penang and Singapore examples*; *Hiern l. c.* 230, as to all the *Malay examples, not of Lindl.* *Leucoxyllum buxifolium*, *Blume Bijl.* 1169; *Choisy Mém. Ternstr.* p. 43, t. 2.

CANARA, MYSORE, BABABOODUN and ANAMALLAY HILLS; *Gibson, Beddome, &c. MALACA; Mainy, n.* 966, *Griffith* (Kew Distrib. n. 3643), *Walker, &c. PENANG and SINGAPORE, Wallich.*—DISTRIB. JAVA, BORNEO.

A large tree; branchlets in the Malay glabrescent, in the Malabar subsessile hirsute. *Leaves* $1\frac{1}{2}$ by $\frac{1}{2}$ - $\frac{3}{4}$ in., glabrous above, coriaceous, nerves obscure; petiole $\frac{1}{16}$

in. *Male fl.* 1-3 together in a most minute cyme; calyx $\frac{1}{16}$ in., 4-lobed; lobed half-way down, tube glabrate without lobes densely fulvous-pilose near their margins; stamens 16 (in the Indian examples). *Female fl.* solitary; calyx and corolla nearly as of the male; ovary 4-celled, pubescent, cells 1-ovuled; style short, bipartite. *Fruit* $\frac{1}{2}$ - $\frac{3}{4}$ by $\frac{1}{2}$ - $\frac{1}{3}$ in., short-cylindric, glabrous 1- (rarely 2-) seeded. *Seeds* with albumen not ruminate. The anthers are exceedingly short, dehiscing at first by a lozenge-shaped opening from the summit, but even at that time a groove is produced from this opening nearly to the base of the cell. *D. vaccinioides* differs in its very narrow calyx-segments.

22. **D. Chloroxylon**, Roxb. *Cor. Pl.* i. 38, t. 49, and *Fl. Ind.* ii. 538; leaves elliptic or obovate-oblong hairy beneath, male fl. subsessile fascicled, calyx small, lobes 4 deep ovate, corolla small urceolate nearly glabrous without. *Wall. Cat.* 4118; *A. DC. Prodr.* viii. 230; *Dalz. & Gibs. Bomb. Fl.* 140; *Hiern in Trans. Camb. Phil. Soc.* xii. 233; *Brand. For. Fl.* 297. *D. tomentosa*, *Lamk. Encyc.* v. 436, not of Roxb. *D. capitulata*, *Wight Ic.* tt. 1224, 1588 bis.

DECCAN PENINSULA from SURAT and ORISSA southwards; frequent.

A middle-sized tree; branches sometimes spinous. *Leaves* $1\frac{3}{4}$ by 1 in., usually narrowed upwards or acute, base cuneate or obtuse, nerves not prominent; petiole $\frac{1}{8}$ in. *Male fl.* 4-10 together, 4-merous; calyx $\frac{1}{10}$ in., lobes ovate, glabrous within; corolla $\frac{1}{2}$ in.; stamens 16, glabrous; anthers opening by small subapical slits, subsequently extending nearly to their base. *Female fl.* solitary, sessile; calyx and corolla as in the male but rather larger; staminodes 7-9; ovary glabrous, styles 4 glabrous. *Fruit* $\frac{1}{2}$ in. diam., globose, glabrous, 2-3-seeded; fruiting calyx $\frac{1}{2}$ in. diam., nearly flat.—Wight says that his *D. capitulata* differed by having the produced connective bipartite, but this does not appear to be so in Wight's own Herbarium specimens. As to *D. glauca*, Rottler (*A. DC. Prodr.* viii. 238), reduced here doubtfully by Hiern, it is so imperfectly characterised that it may have been *D. montana* or some totally remote species.

SECT. IV. **Ebenus** (Hiern in *Trans. Camb. Phil. Soc.* xii. 146). *Leaves* alternate, adult glabrous. *Flowers* mostly 4-merous; males in very small cymes or fascicled; females 1-3, sessile. *Calyx* obscurely lobed or nearly entire. *Corolla* narrowly tubular in the bud, fulvous-tomentose without. *Stamens* glabrous. *Albumen* equable.

23. **D. oocarpa**, *Thwaites Enum.* 180; leaves ovate obtusely acuminate glabrous primary nerves oblique secondary little elevated, male fl. fascicled, corolla tubular tomentose without, female calyx subtruncate. *Hiern in Trans. Camb. Phil. Soc.* xii. 171.

MALABAR HILLS; *Law. CONCAN*; *Dalzell. CEYLON*; *Thwaites*.

A middle-sized tree. *Leaves* 4 by $1\frac{1}{2}$ in., base broadly rhomboid; petiole $\frac{1}{2}$ - $\frac{1}{3}$ in. *Male fl.*: cymes small, 3-7-flowered; calyx $\frac{1}{8}$ in., cylindric, silky; corolla $\frac{1}{2}$ in., 3-4-lobed; stamens 9-12, glabrous. *Female fl.* 1-3 together, subsessile, similar to and scarcely larger than the male; ovary 6-8-celled. *Fruit* 1 by $\frac{3}{4}$ in., ellipsoid, young narrowly cylindric; fruiting-calyx short funnel-shaped, mouth $\frac{1}{4}$ in. (or more) wide, entire.—Hiern follows Thwaites in reducing here *D. Arnottiana*, Miq.; but Miquel's authentic specimen at Kew is *D. Candolleana*.

24. **D. quæsite**, *Thwaites Enum.* 179; leaves elliptic abruptly acuminate glabrous primary nerves numerous nearly horizontal reticulating nerves conspicuous, male cymes small, corolla tubular minutely closely hairy without. *Bedd. Ic. Pl. Ind. Or.* t. 128 (*nervation bad*), and *For. Man.* 145; *Hiern in Trans. Camb. Phil. Soc.* xii. 174.

CEYLON; Saffragam, and between Ratnapoora and Galle, *Thwaites*.

A huge tree. *Leaves* 7 by $3\frac{1}{2}$ in., base broadly rhomboid; petiole $\frac{1}{2}$ in. *Male fl.*: cymes small, 3-9-flowered, pilose; calyx $\frac{1}{4}$ in., tubular, pubescent, obscurely 4-5-lobed;

corolla $\frac{1}{2}$ in., 4-5-lobed; stamens about 16. *Female fl.* solitary, short-peduncled; corolla shortly 5-lobed. *Fruit* 2 in. diam., globose, glabrous; fruiting calyx $1\frac{1}{2}$ in. wide, lobes large cordate, reflexed at the sides and base.—Beddome's figure as to the outline of the larger leaves agrees with Thwaites' specimens, but the venation shown in the smaller leaves is particularly unlike them.

SECT. V. *Noltia* (Hiern in Trans. Camb. Phil. Soc. xii. 146, character much widened). *Leaves* alternate, adult glabrous (in *D. stricta* and *D. flavicans* somewhat pubescent). *Flowers* 4- or 5-merous; male fascicled, female sessile or shortly peduncled, solitary or fascicled. *Calyx* distinctly lobed. *Corolla* ovoid-tubular in the bud, densely fulvous- or rufous-tomentose without. *Albumen* (where known) equable.

* *Stamens* 4-5, *fruit* ovoid-conic.

25. *D. attenuata*, Thwaites Enum. 182; leaves oblong acuminate base cuneate glabrous nervation conspicuous above, male fl. sessile clustered, corolla tubular ferruginous-tomentose without, stamens 4-5, fruit ovoid acuminate glabrous. *Bedd. Ic. Pl. Ind. Or.* t. 139, and *For. Man.* 146; *Hiern in Trans. Camb. Phil. Soc.* xii. 182.

CEYLON; Pasdoon Corle, Thwaites.

A middle-sized tree. *Leaves* $3\frac{1}{2}$ by 1 in., coriaceous; primary nerves indistinct, distant, nearly horizontal, secondary fine; petiole $\frac{1}{4}$ in. *Male fl.* 3-10 together; calyx $\frac{1}{10}$ in., deeply lobed, hairy on both sides; corolla $1\frac{1}{2}$ in., slender; anthers glabrous. *Female fl.* solitary, subsessile; calyx $\frac{1}{4}$ in., nearly 4-5-partite; stamens 4-5; ovary 4-celled, cells 1-ovulea. *Fruit* $1\frac{1}{4}$ by $\frac{1}{2}$ in., very sharply acuminate, 2-3-seeded; calyx-segments in fruit narrow-oblong, foliaceous, $\frac{1}{4}$ in. long.

26. *D. acuta*, Thwaites Enum. 182; leaves oblong-lanceolate acuminate base obtuse or almost rounded glabrous reticulation obscure above, male fl. sessile clustered, corolla tubular densely fulvous-villous without, stamens 4-5, fruit ovoid acuminate. *Hiern in Trans. Camb. Phil. Soc.* xii. 182; *Bedd. For. Man.* 146.

CEYLON; Pasdoon Corle, Thwaites.

A middle-sized tree. *Leaves* 9 by $2\frac{1}{2}$ in., broadest near the base, very thick coriaceous; primary nerves nearly horizontal, reticulation usually altogether obscure, sometimes subconspicuous beneath; petiole $\frac{3}{8}$ in. *Male fl.* 5-20 together; calyx $\frac{1}{2}$ in., lobed more than half-way down, very hairy; corolla $\frac{1}{2}$ in.; stamens glabrous. *Female fl.* sessile, 1-4 together; calyx $\frac{1}{2}$ in. or more, lobed nearly to the base, lobes lanceolate, margins little reflexed; ovary 4-6-celled. *Fruit* $1\frac{1}{2}$ in. long, 2-3-seeded.

** *Stamens* 12-20, *fruit* ellipsoid obtuse.

27. *D. Gardneri*, Thwaites Enum. 181; leaves elliptic-lanceolate glabrous. nerves not prominent, male fl. sessile clustered, corolla salvershaped fulvous-tomentose without, calyx-lobes in the female flower very short. *Bedd. Ic. Pl. Ind. Or.* t. 132, and *For. Man.* 146; *Hiern in Trans. Camb. Phil. Soc.* xii. 214. *Patonia Walkerii*, Wight Ill. i. p. 19.

CEYLON; alt. 2000 ft., Walker, Gardner, &c.

A middle-sized tree; young shoots soon glabrous. *Leaves* $6\frac{1}{2}$ by $2\frac{1}{2}$ in., base rhomboid or obtuse, shining above, midrib strongly elevated beneath; petiole $\frac{1}{4}$ in. *Male fl.*: calyx $\frac{1}{2}$ in., lobed half-way down, silky; corolla-tube $\frac{1}{2}$ in., narrowed upwards, lobes $\frac{1}{2}$ in. elliptic acute; stamens 12-16, filaments short, anthers lanceolate linear, connective pilose on the back, hardly produced. *Female fl.* solitary, subsessile; calyx-tube $\frac{1}{2}$ in., campanulate, lobes broad-triangular, hardly $\frac{1}{16}$ in. long. *Fruit* nearly 1 in. diam., depressed globose, glabrate; fruiting-calyx cupuliform, thickened, $1\frac{1}{4}$ in. diam., lobes very short triangular.

28. **D. lanceafolia**, Roxb. *Cat. Pl. Fl. Ind.* (1813), and *Fl. Ind.* ii. 537; leaves oblong or lanceolate acuminate glabrous coriaceous, male fl. sessile clustered, corolla salvershaped fulvous-tomentose without, calyx-lobes in the female flower ovate with reflexed margins. *A. DC. Prodr.* viii. 232; *Hiern. in Trans. Camb. Phil. Soc.* xii. 213; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 136. *D. multiflora*, *Wall. Cat.* 4144; *A. DC. l.c.* 231. *D. amena*, *Wall. Cat.* 4139; *A. DC. l.c.* 231.

SILHET; Roxburgh. KHASIA MTS.; Terrya Ghat, *H. f. & T.*; Mahadeo, *Griffith. Cachar*; *H. f. & T.*, Keenan. MOULMEIN; *Falconer* (fide *Kurz*).

A pretty large tree; branchlets soon glabrous. *Leaves* $6\frac{1}{2}$ by 2 in., base rhomboid or subobtusate, coriaceous; midrib deeply impressed from above, much elevated below; primary nerves oblique, secondary not prominent. *Male fl.*: calyx $\frac{1}{2}$ in., lobes 4, ovate, ferruginous sericeous; corolla in *D. lanceafolia* $\frac{1}{2}$ in., in *D. multiflora* $\frac{1}{2}$ in., narrowed upwards, lobes $\frac{1}{2}$ in.; stamens about 16, filaments minutely pilose; anthers linear, glabrous or slightly pilose at the base. *Female fl.* solitary, subsessile; calyx $\frac{1}{2}$ by $\frac{1}{2}$ in., lobes cordate-ovate densely fulvous tomentose, margins recurved even before the corolla is expanded; corolla nearly as of the male; ovary 8-celled, hairy. *Fruit* 1 by $\frac{3}{4}$ in., ovoid or subglobose ferruginous-villous; fruiting calyx 1 in. diam., with thickened tube and spreading lobes.

VAR. *amena*, *Wall. Cat.* 4139 (sp.); leaves oblong-lanceolate widest very near the base, calyx-lobes in the female smaller without recurved margins. *A. DC. Prodr.* viii. 231.—Khasia; *Wallich*.—Referred here by *Hiern*, but the material is very scanty (not showing either the male inflorescence or fruit); and the leaves and female calyx appear more like those of *D. undulata*, *Wall. var. macrophylla*.

29. **D. sapotoides**, *Kurz*; *Hiern in Trans. Camb. Phil. Soc.* xii. 206; leaves large obovate-oblong shortly acuminate glabrate, male fl. sessile clustered, calyx-lobes broad reflex-margined, corolla salvershaped, tube fulvous-pilose without, lobes glabrate. *Kurz in Journ. As. Soc.* 1877, pt. ii. 236; *For. Fl.* ii. 136.

BRITISH BIRMA; eastern slopes of the Pegu Yomah, frequent, *Kurz*.

A tree, attaining 50 ft. (*Kurz*); branchlets soon glabrous. *Leaves* 11 by $3\frac{1}{2}$ in., base cuneate or subobtusate, coriaceous, midrib beneath obscurely silky otherwise ultimately glabrous; primary nerves oblique, secondary not conspicuous; petiole $\frac{1}{2}$ in. *Male fl.* densely clustered, bracts $\frac{1}{2}$ in., ovate; calyx $\frac{1}{2}$ in., openly campanulate, deeply lobed, fulvous-silky; corolla-buds $\frac{1}{2}$ in., tube densely fulvous-silky at least on the 4 angles; stamens 15–16, glabrous. *Female fl.* (from *Kurz*'s description) nearly as of the male; staminodes 12; ovary glabrous, style tolerably long, 4-cleft.—Resembles *D. flavicans* but has much larger leaves; the specimens do not exhibit the long bracts conspicuous in *D. flavicans*, nor does *Kurz* notice that such ever occur.

30. **D. flavicans**, *Hiern in Trans. Camb. Phil. Soc.* xii. 205; leaves elliptic acuminate to an obtuse apex glabrescent, male fl. clustered subsessile, calyx-lobes broad reflex-margined, corolla salvershaped fulvous-pilose without, sometimes glabrate towards the apex, female flowers 1–3 together on $\frac{1}{2}$ in. ferruginous-villous pedicels. *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 135. *Guatteria* ? *flavicans*, *Wall. Cat.* 7295.—Ebenacea sp. 2, *Griff. Notul.* iv. 291.

MERGUI and TAVOY; *Griffith*. TENASSERIM; *Helper*. MALACCA; *Griffith* (*Main-gay*, n. 972, *male specimens only*).

A small tree; branches soon glabrescent. *Leaves* $5\frac{1}{2}$ by 2 in., base rhomboid or subobtusate, midrib beneath obscurely pubescent, otherwise at length glabrous, coriaceous, when dried yellowish-green above, cinnamonaceous-brown beneath; primary nerves distant, oblique, secondary obscure; petiole $\frac{1}{2}$ in. *Male fl.*; pedicels $\frac{1}{10}$ in.; bracts $\frac{1}{2}$ in., oblong; calyx $\frac{1}{2}$ in. long and broad, lobes ovate acute ferruginous-pubescent auriculate; corolla nearly $\frac{1}{2}$ in., slender, lobed half-way down; stamens 14–20, glabrous. *Female fl.*: bracts as of the male; calyx as of the male, slightly

larger, $\frac{1}{2}$ in. long and broad, with a distinct tube; corolla as of the male. *Fruit* $\frac{3}{4}$ by $\frac{1}{2}$ in., oblong cylindric, glabrescent; fruiting calyx very slightly enlarged.—Female flowers and fruit here are described from Griffith's examples; but by Hiern from Maingay's n. 972 female (see next species).

31. **D. decipiens**, Clarke; leaves elliptic acuminate glabrous, female flowers sessile solitary, calyx 4-partite, lobes foliaceous margins hardly reflexed little hairy, corolla salvershaped tube 4-gonal densely fulvous-silky. *D. flavicans*, Hiern in *Trans. Camb. Phil. Soc.* xii. 205, as to the female plant partly.

MALACCA; Maingay (n. 972, female only).

Closely resembling *D. flavicans* female, and taken as part of it by Hiern. *Female calyx* (shortly after flowering); lobes $\frac{1}{2}$ in. and upwards, ovate acute, with scattered fulvous hairs or nearly glabrous, tube 0 or obscure. *Fruit* 1 in., cylindric, glabrous; fruiting calyx unchanged.—This does not show the bracts conspicuous in every example of *D. flavicans*. Helfer's n. 3640, from Tenasserim, a very poor specimen with young male buds, might be the male of *D. decipiens*, or *D. flavicans* as proposed doubtfully by Hiern. Helfer's n. 423, doubtfully referred here by Hiern l. c., has totally different leaves and is quite distinct, may be *D. lucida*, Wall.

32. **D. stricta**, Roxb. *Hort. Beng.* 40, and *Fl. Ind.* ii. 539; leaves elliptic-lanceolate acuminate sparsely pilose beneath, male fl. subsessile in small clusters, corolla salvershaped tomentose without, fruit ellipsoid glabrous narrowed at the base. *Wall. Cat.* 4121; *A. DC. Prodr.* viii. 232; *Hiern in Trans. Camb. Phil. Soc.* xii. 201; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 137, as to descript. only.

EAST BENGAL; Silhet and Comilla, Roxburgh (*Hort. Calc.*); (Griffith, Kew Distrib. n. 3624).

A tall slender conical tree with straight trunk (Roxburgh); branchlets soon glabrous. *Leaves* 3 by $1\frac{1}{4}$ in., base obtuse, ultimately glabrous above except the midrib, coriaceous; primary nerves oblique not prominent, secondary obscure; petiole $\frac{1}{2}$ in. *Male fl.* 3-6 together; bracts $\frac{1}{16}$ in., numerous, ovate; calyx $\frac{1}{16}$ in., deeply lobed, lobes ovate apiculate; corolla-tube $\frac{1}{2}$ in., narrowed upwards, lobes 4, $\frac{1}{2}$ in., ovate; stamens 14-16, glabrous. *Female fl.* unknown. *Fruit* $1\frac{1}{2}$ by $\frac{1}{2}$ -1 in., solitary; peduncle $\frac{1}{2}$ in.; fruiting-calyx small, lobes $\frac{1}{2}$ in. long and broad, ovate.

SECT. VI. **Melonia** (Hiern in *Trans. Camb. Phil. Soc.* xii. 146, in chief part). *Leaves* alternate or subopposite. *Flowers* 4-5-merous; male cymose or fascicled, female solitary or fascicled. *Calyx* deeply lobed or tubular-campanulate, often much larger dissimilar in the female. *Corolla* in the bud ovoid-tubular, densely fulvous- or rufous-sericeous without *Albumen* ruminated (where known).

* *Leaves when mature more or less hairy beneath, male flowers distinctly cymose with tubular-campanulate calyx.*

33. **D. Tupru**, Buch-Ham. *Journ.* i. 183, and in *Trans. Linn. Soc.* xv. 112, not of Hiern; leaves (not large) elliptic obtuse at both ends reticulating nerves raised on the upper surface, male fl. cymose, calyx short-cylindric, corolla yellow-woolly without, female solitary short-peduncled with 4-5-gonal calyx. *D. rubiginosa*, Roth *Nov. Sp.* 385; *A. DC. Prodr.* viii. 239. *D. exsculpta*, Dalz. & Gibs. *Bomb. Fl.* 142, *syn. excl. not of Ham.* *D. melanoxylon*, Hiern in *Trans. Camb. Phil. Soc.* xii. 159, in great part.

WEST DECCAN PENINSULA; from the Concan to Mysore, Hamilton, &c. JUBBULPORE; Griffith.

A small tree; branchlets woolly. *Leaves* $3\frac{1}{2}$ by 2 in. (rarely so large even when mature), alternate and subopposite, base mostly rounded or subcordate, or if obtusely

cuneate not decurrent on the petiole; fulvous woolly when young, ultimately glabrescent above, coriaceous; secondary nerves slender; petiole $\frac{1}{4}$ in. *Male fl.*: cymes $\frac{1}{2}$ – $1\frac{1}{2}$ in., fulvous-hairy; calyx-tube $\frac{1}{8}$ in., terete; teeth $\frac{1}{2}$ in., triangular; corolla $\frac{1}{2}$ in., very woolly without; stamens 12; filaments and anther-cells glabrous, connective fulvous-pilose behind, scarcely produced. *Female fl.*: pedicels $\frac{1}{10}$ in.; calyx (at flower time) $\frac{1}{2}$ by $\frac{1}{4}$ in., lobed nearly to the base; lobes broad ovate with recurved margin; corolla $\frac{1}{2}$ in.; styles 2–3, bifid at the apex. *Berry* $\frac{3}{4}$ in. diam., globose, smooth; often 4-seeded.—Hamilton says that the calyx of the male (in *D. Tupru*) is like that of the female; but this must have been a slip, as his authentic specimen in the British Museum shows.

34. **D. tomentosa**, Roxb. *Hort. Beng.* 40, and *Fl. Ind.* ii. 532; leaves large ovate from a rounded base reticulated nerves impressed on the upper surface, male fl. cymose, calyx funnel-shaped, corolla ferruginous-lanate without, female solitary short-peduncled with 4–5-gonal calyx. *Wight Ic.* tt. 182, 183, not of Poir. *D. exsculpta*, Ham. in *Trans. Linn. Soc.* xv. 110; *A. DC. Prodr.* viii. 223, not of Dalz. nor of Bedd. *D. insculpta*, Ham. l. c. 112; *A. DC. l. c.* *D. Roylei*, *A. DC. l. c.* 239.

BENGAL; Roxburgh, Hamilton. BEHAR; H. f. & T. CHOTA NAGPORE; Clarke. BUNDELKUND; Edgeworth. OUDH; R. Thompson.

A small, crooked tree. *Leaves* alternate and opposite, 8 by 5 in., sometimes 13 in., commonly broad-ovate, rarely ovate acute, young very hairy, mature glabrous above hairy beneath, base cordate or rounded (rarely obtusely cuneate), ultimately glabrescent on both surfaces, very coriaceous; secondary nerves impressed as broad furrows, giving the leaf a wrinkled and thickened aspect; petiole $\frac{1}{4}$ in. *Flowers* nearly as in *D. Tupru*, but rather larger; calyx of the male widened at the mouth, teeth ovate often $\frac{1}{10}$ – $\frac{1}{8}$ in.; stamens about 16, filaments glabrous, connective fulvous-pilose on the back, shortly produced. *Berry* as of *D. Tupru*, but rather larger.

35 **D. melanoxyton**, Roxb. *Cor. Pl.* 36, t. 46, and *Fl. Ind.* iii. 530; leaves elliptic narrowed at both ends reticulating nerves raised on the upper surface, male fl. cymose, calyx short cylindric, corolla yellow-lanate without, female solitary short-peduncled with 4–5-gonal calyx. *A. DC. Prodr.* viii. 224; *Hiern in Trans. Camb. Phil. Soc.* xii. 159, partly; *Brand. For. Fl.* 294, partly, not of Blume. *D. Wightiana*, Wall. *Cat.* 4406; *A. DC. l. c.* 223; *Bedd. Fl. Sylv.* t. 67. *D. dubia*, Wall. *Cat.* 4407; *A. DC. l. c.* 223; *Wight Ic.* t. 1223.

DECCAN PENINSULA AND CEYLON; frequent.

A tree, attaining sometimes 60–80 ft., or a shrub. *Leaves* 4 by $1\frac{1}{2}$ in., alternate or rarely subopposite, base nearly always narrowed, or if broad yet with a narrow decurrence on the petiole. Otherwise as *D. tomentosa*.

Var. Beddomei; calyx of the female (as of the male) tubular terete with small teeth. *D. exsculpta*, *Bedd. Fl. Sylv.* t. 66, not of Ham.—Not seen. If the figure of the female calyx is incorrect, this tree will be *D. melanoxyton*, Roxb. type (not *D. tomentosa* as Hiern doubtfully suggests).

36. **D. Packmanni**, Clarke; all young parts ferruginous-woolly, leaves elliptic-oblong acute, male fl. pedicelled by threes on short peduncles 5-merous, stamens 16 paired, anthers oblong-lanceolate fulvous-pilose, connective not produced.

TAVOY; Packmann (from Herb. Wight).

Branchlets slender, densely ferruginous-woolly, finally glabrate. *Leaves* $2\frac{1}{2}$ by $\frac{3}{4}$ in., alternate, base obtuse, ferruginous-woolly on both surfaces, ultimately nearly glabrous except the midrib beneath; primary nerves slender, reticulating nerves close distinct; petiole $\frac{1}{2}$ in. *Male fl.*: peduncles $\frac{1}{4}$ in., pedicels $\frac{1}{10}$ – $\frac{1}{8}$ in.; calyx $\frac{1}{2}$ by $\frac{1}{4}$ in., shortly campanulate, lobed half-way down; lobes ovate, ferruginous-villous on both sides; corolla $\frac{1}{4}$ in. shortly campanulate, deeply lobed, densely ferruginous-villous without; filaments glabrous below, fulvous-pilose upwards, anther-cells and connec-

live with fulvous hairs. *Female fl.* not seen.—Not taken up by Hiern, who has merely noted on the sheet "cfr. *D. melanoxylon*, Roxb.;" it is near *D. Trepur*, Ham the leaves more acute, more finely reticulated.

37. **D. burmanica**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 73; leaves oblong obtusely cuneate at both ends mature reticulated above by the impressed nerves, male fl. in small peduncled cymes, corolla fulvous-tomentose without, stamens 12-16 glabrous. *Hiern in Trans. Camb. Phil. Soc.* xii. 166; *Kurz in Journ. As. Soc.* 1877, pt. ii. 235, and *For. Fl.* ii. 133.

PROME, PEGU and MARTABAN; *McLelland, Kurz.*—DISTRIB. Ava.

A tree, attaining 60 ft. (*Kurz*); all the young parts fulvous-pubescent. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., alternate, hairy on both sides, ultimately nearly glabrous except near the midrib beneath, coriaceous; primary nerves oblique, indistinct; petiole $\frac{1}{8}$ – $\frac{1}{6}$ in. *Male fl.*: peduncle $\frac{1}{4}$ – $\frac{1}{2}$ in., cymes 3-8-flowered; calyx $\frac{1}{8}$ – $\frac{1}{6}$ in., lobed less than half-way down; corolla $\frac{1}{4}$ – $\frac{1}{3}$ in.; anthers linear. *Female fl.*: solitary, peduncles $\frac{1}{4}$ – $\frac{1}{2}$ in.; calyx nearly $\frac{1}{4}$ in., lobes broadly cordate-ovate with recurved margins; staminodes 8. *Fruit* 1-1 $\frac{1}{2}$ in. diam., globose, glabrous, 2-4-seeded. *Albumen* ruminated.

** *Leaves when mature glabrescent beneath, drying reddish or brownish, male flowers fascicled with deeply-lobed calyx.*

38. **D. insignis**, *Thwaites Enum.* 180; leaves often subopposite large ovate or oblong glabrous, male fl. clustered subsessile, corolla-buds narrower upwards, stamens 14-20. *Bedd. Ic. Pl. Ind. Or.* t. 130, and *For. Man.* 145; *Hiern in Trans. Camb. Phil. Soc.* xii. 157.

ANAMALLAYS; alt. 2-3000 ft., *Beddome*. CEYLON; alt. 2000 ft., *Thwaites*.

A very large tree. *Leaves* subopposite and alternate, 13 by 6 in., or 8 by $3\frac{1}{2}$ in., acuminate, base rounded or cuneate, coriaceous; secondary nerves strong, tertiary manifest; petiole $\frac{1}{4}$ in. *Male fl.* 4-merous; calyx $\frac{1}{8}$ – $\frac{1}{6}$ in., campanulate, shortly 4-fid, minutely pubescent; corolla $\frac{1}{2}$ in., tubular, tomentose, silky without, lobes short; filaments and anthers glabrous or with very few scattered hairs, unequal. *Female fl.* 1-3 together, axillary, subsessile; ovary 8-celled. *Fruit* $1\frac{1}{2}$ in. diam., globose, smooth; calyx accrescent, tube forming a woody shallow cup $1\frac{1}{4}$ in. wide. *Seeds* $\frac{3}{4}$ by $\frac{1}{2}$ – $\frac{1}{3}$ in.; albumen ruminated.

39. **D. oppositifolia**, *Thwaites Enum.* 181; leaves often subopposite elliptic shortly obtusely acuminate glabrous, male flowers subsessile few together, corolla-buds broader upwards, stamens about 8. *Bedd. Ic. Pl. Ind. Or.* t. 131, and *For. Man.* 146; *Hiern in Trans. Camb. Phil. Soc.* xii. 157.

CEYLON; Hinidoon Corle, alt. 1000 ft., *Thwaites*.

A middle-sized tree. *Leaves* 4 by 2 in., broadly rhomboid or almost rounded, coriaceous; secondary nerves obscure, tertiary indistinguishable; petiole $\frac{1}{10}$ – $\frac{1}{8}$ in. *Male fl.*: calyx $\frac{1}{12}$ in., nearly glabrous, acutely 4-lobed half-way down; corolla $\frac{1}{2}$ in., ferruginous-villous without, lobed one-third the way down; filaments very unequal. *Female fl.* (and fruit) unknown.

40. **D. hirsuta**, *Linn. f. Suppl.* 440; leaves elliptic or oblong abruptly acuminate coriaceous young hirsute beneath with short basifixed hairs, male fl. densely fascicled, corolla tubular ferruginous-tomentose without, stamens 5 glabrous, fruit rufous-tomentose 6-10-seeded. *A. DC. Prodr.* viii. 223; *Thwaites Enum.* 181; *Bedd. Ic. Pl. Ind. Or.* t. 137, and *For. Man.* 146; *Hiern in Trans. Camb. Phil. Soc.* xii. 163, partly, excl. syn. *D. lucida*.

CEYLON; Saffragam and Galle, *Thwaites*.

A middle-sized tree; branchlets and inflorescence ferruginous-tomentose. *Leaves* $1\frac{1}{2}$ by $1\frac{1}{2}$ –2 in., alternate, base broadly rhomboid or almost rounded, ultimately nearly glabrous, coriaceous; nervation very obscure; petiole $\frac{1}{2}$ in. *Male fl.*: calyx $\frac{1}{10}$ in., terete, 5-fid half-way down; corolla $\frac{1}{4}$ in. *Female fl.* 1-3 together, subsessile; calyx

$\frac{1}{4}$ in., broad, deeply 5-lobed; corolla $\frac{1}{4}$ – $\frac{1}{2}$ in.; staminodes 5; ovary usually 10-celled. Fruit 1 by $\frac{3}{4}$ in., ellipsoid; calyx densely ferruginous-silky within.

41. **D. Candolleana**, *Wight Ic. tt.* 1221–2; leaves oblong shortly cuneate at both ends coriaceous glabrescent, male fl. densely fascicled, corolla tubular yellow-tomentose without, stamens 10 glabrous, fruit glabrous usually 5–4-seeded. *Dalz. & Gibs. Bomb. Fl.* 142; *Bedd. For. Man.* 144, not of *Thwaites*. *D. hirsuta*, *Hiern in Trans. Camb. Phil. Soc.* xii. 164, partly. *D. Arnotiana*, *Miq. in Pl. Hohenack.* n. 562. *D. canarica*, *Bedd. Ic. Pl. Ind. Or.* t. 134, and *For. Man.* 145. *D. oligandra*, *Bedd. Rep. Forests Madras*, 1867, 68.

DECCAN PENINSULA; from the Concan to Quilon and Courtallum, common.

Closely resembling *D. hirsuta*. Leaves 4–7 in., young with closely adpressed fulvous hairs adfixed by their middle beneath, usually early glabrescent, without the acuminate apex of *D. hirsuta*. Male fl. rather larger; calyx $\frac{1}{2}$ in.; corolla $\frac{1}{2}$ in.; stamens in 5 pairs, filaments of each pair attached one in front of the other at the base. Female fl. rather larger than in *D. hirsuta*, 1–3 together or sometimes 6–10; staminodes 5, or 10 in the form *D. canarica*, *Bedd.*

42. **D. nilagirica**, *Bedd. Ic. Pl. Ind. Or.* t. 136, and *For. Man.* 144; leaves oblong narrowed at both ends, young densely rufous-tomentose beneath, male fl. densely fascicled, corolla tubular tomentose without, stamens 16, filaments hairy.

NILGHERRIES; Sispara Ghat, *Beddome*.

Female fl. 1–2 together; staminodes 8 in one series; ovary 8-celled; fruit globose, depressed, size of a small greengage.—Not seen; appears allied to *D. Candolleana* as *Beddome* states, rather than to *D. lucida* as suggested by *Hiern*.

43. **D. Moonii**, *Thwaites Enum.* 182; leaves large oblong coriaceous glabrescent, male fl. densely fascicled, corolla tubular densely rufous-villous without, stamens 5–8 glabrous, female calyx wide-tubular, fruit glabrate 6–10-seeded. *Bedd. Ic. Pl. Ind. Or.* t. 138, and *For. Man.* 146. *D. hirsuta*, *Hiern in Trans. Camb. Phil. Soc.* xii. 164, partly.

CEYLON; Caltura, *Moon*; Pasdoon Corle, *Thwaites*.

Leaves 11 by $3\frac{1}{4}$ in., base broad or rounded, primary nerves numerous sub-horizontal obscure. Male fl. nearly as of *D. hirsuta*. Female fl.: calyx-tube at flower time $\frac{1}{2}$ in. long and broad, slightly wider upwards, lobes hardly so long as the tube. Fruit $1\frac{1}{4}$ in. diam., globose.—Closely allied to *D. hirsuta*, the young leaves being similarly hairy beneath. The female calyx however differs strikingly.

44. **D. Thwaitesii**, *Bedd. Ic. Pl. Ind. Or.* t. 135, and *For. Man.* 144; leaves lanceolate acuminate coriaceous glabrescent, flowers fascicled, corolla intensely rufous-tomentose without, stamens 10–12 connective fulvous-pilose its whole length, fruit rufous-tomentose usually 4-seeded. *D. Candolleana*, *Thwaites Enum.* 181, not of *Wight*. *D. hirsuta*, *Hiern in Trans. Camb. Phil. Soc.* xii. 164, partly.

CEYLON; Saffragam and Hinidoon Corle, *Thwaites*.

Resembling *D. hirsuta* in the shape and texture of the leaves and in the fruit. Young leaves intensely red-tomentose, soon glabrescent. Male fl.: calyx $\frac{1}{2}$ in., lobes $\frac{1}{2}$ in., triangular; hairs on the connective numerous, short, extending to the shortly-produced apex (the two long cilia depicted by *Beddome* are not found in *Thwaites'* authentic examples). Fruit $\frac{3}{4}$ in. diam., subglobose.

*** Leaves alternate, early glabrous, drying blackish, male flowers distinctly cymose with shortly-lobed calyx, fruiting calyx strongly plicate.

45. **D. affinis**, *Thwaites Enum.* 179; leaves oblong narrowed at both ends early glabrescent reticulatating nerves prominent, male cymes peduncled, calyx



with hairs fixed by their middle soon glabrescent, corolla tubular fulvous-tomentose without, stamens 8-9. *Bedd. Ic. Pl. Ind. Or.* t. 127, and *For. Man.* 145; *Hiern in Trans. Camb. Phil. Soc.* xii. 169, partly.

TINNEVELLY HILLS; *Beddome*. CEYLON; between Kandy and Badulla, *Thwaites*.

A middle-sized tree; branchlets glabrous except the tips. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., apex obtuse, when very young with scattered hairs fixed by their middle; petiole $\frac{1}{2}$ in. *Male fl.*: peduncles $\frac{1}{2}$ in., 5-10-flowered, soon glabrate; calyx $\frac{1}{2}$ in., campanulate-tubular, distinctly veined, teeth minute; stamens nearly glabrous, anthers linear, connective fulvous-pilose below on the back, apex shortly produced. *Female fl.* solitary on peduncles $\frac{1}{2}$ in.; calyx $\frac{1}{2}$ by $\frac{1}{2}$ in., early glabrescent; corolla $\frac{1}{2}$ in., tubular, narrowed at the mouth, lobes broad ovate mucronate, nearly glabrous within. *Fruit* 1 in. diam., globose, glabrous, usually 4-seeded. *Albumen* ruminated (*Thwaites*).

46. *D. crumenata*, *Thwaites Enum.* 179; leaves elliptic obtuse at both ends early glabrous reticulating nerves prominent, male cymes small, calyx subtomentose with basifixed hairs, corolla tubular fulvous-hirsute without, stamens about 12. *Bedd. Ic. Pl. Ind. Or.* t. 126, and *For. Man.* 145; *Hiern in Trans. Camb. Phil. Soc.* xii. 169.

CEYLON; Central Province, alt. 2-4000 ft., *Thwaites*.

A large tree. *Leaves* $2\frac{1}{2}$ by $1\frac{1}{2}$ in.; but in another example 3 by $\frac{3}{4}$ in. resembling those of *D. affinis*; this example is in ripe fruit and may be *D. affinis* mixed in the mounting perhaps. *Female fl.*: peduncles and calyces somewhat persistently subtomentose with basifixed hairs; corolla-tube $\frac{1}{2}$ in., lobes broad, rounded, plicate, auriculate, densely tomentose within. Otherwise in all respects as *D. affinis*, of which further material may prove this a variety.

47. *D. opaca*, *Clarke*; leaves elliptic cuneate at both ends primary nerves thin oblique secondary obscure, male cymes very small, calyx densely sericeous with basifixed hairs, corolla short-tubular tomentose without, stamens about 16. *D. affinis*, *Hiern in Trans. Camb. Phil. Soc.* xii. 169, partly, not of *Thwaites*.

CEYLON; *Thwaites*.

Branchlets terete; bark very smooth. *Leaves* 3 by 1 in., subobtuse, very opaque, minutely pilose with basifixed hairs, when young soon glabrous; petiole $\frac{1}{2}$ in. *Male fl.*: cymes almost reduced to fascicles; calyx $\frac{1}{2}$ in., teeth small; corolla $\frac{1}{2}$ in., very deeply lobed; stamens glabrous, anthers lanceolate.—*Hiern* has widened the diagnosis of *D. affinis*, so as to include in it this solitary male example of *Thwaites*, which differs in too many points; the texture nervation and indumentum of the leaves, the very deeply-lobed male corolla and number of stamens. It may not belong to this section of the genus.

SECT. VII. *Argophyllum*. *Leaves* alternate, usually large, glabrous above, shining, coriaceous. *Flowers* 4-5-merous; males in small cymes, females solitary or few together, scarcely pedicellate. *Calyx* deeply lobed, often dissimilar in the female. *Corolla* in the bud ovoid-tubular, densely fulvous- or rufous-sericeous without. *Stamens* usually 16 (12-20). *Albumen* (where known) equable.

48. *D. oleifolia*, *Wall. Cat.* 4128; leaves oblong obtusely acuminate, nerves above obscure, male cymes small few-fld., calyx glabrous without densely fulvo-tomentose within, corolla widely tubular fulvous-tomentose without. *A. DC. Prodr.* viii. 239; *Kurz in Journ. As. Soc.* 1871, pt. ii. 72, 1877, pt. ii. 235, and *For. Fl.* ii. 132; *Hiern in Trans. Camb. Phil. Soc.* xii. 204.

AMHERST; *Wallich*. PEGU; *Brandis*. MARTABAN and TENASSERIM; frequent, *Kurz*.—DISTRIB. JAVA.

A tree, attaining 60 ft. (*Kurz*); branchlets soon glabrous. *Leaves* $6\frac{1}{2}$ by 2 in., opaque, coriaceous, nerves beneath very closely but obscurely reticulate; petiole $\frac{1}{2}$ in.

Male fl. about 3 together, in very small cymes, 4-merous; calyx $\frac{1}{4}$ in., lobes wide acute; corolla-tube $\frac{1}{4}$ in. and upwards, lobes short round; stamens 20. *Female fl.* solitary, on very short peduncles (*Kurz*). *Fruit* $\frac{3}{8}$ in. diam., globose, fulvous-pubescent; fruiting-calyx $\frac{1}{4}$ in., 4-fid, in one case 3-fid, tomentose within; lobes ovate-deltoid.

49. *D. undulata*, *Wall. Cat.* 4136; leaves broadly oblong cuneate at the base glabrous, nerves strongly elevated beneath, male flowers in very short densely ferruginous cymes, corolla tubular densely ferruginous without, stamens about 16 nearly glabrous except the connective. *A. DC. Prodr.* viii. 233; *Hiern in Trans. Camb. Phil. Soc.* xii. 216, partly; *Kurz in Journ. As. Soc.* 1877, pt. ii. 23, and *For. Fl.* ii. 135, partly.

AMHERST; *Wallich. Mergui; Griffith. MALACCA; Griffith* (*Kew Distrib.* n. 3636).

A large tree (*Kurz*); branchlets soon glabrous. *Leaves* 8 by $2\frac{1}{2}$ – $3\frac{1}{2}$ in., shortly acuminate or acute, coriaceous, nerves somewhat impressed above; petiole $\frac{1}{2}$ in. *Male fl.*: cymes less than $\frac{1}{4}$ in.; bracts $\frac{1}{10}$ in., triangular; calyx nearly $\frac{1}{8}$ in. long and broad, lobes 4, short, broad-triangular; corolla $\frac{1}{2}$ in., lobed half-way down; filaments nearly glabrous, anthers linear, connective villous with fulvous ascending hairs, hardly produced above the anther. *Female fl.* solitary, shortly peduncled; calyx soon obpyramidal enlarged, teeth broadly triangular, incurved over the young fruit, margins of the lobes not reflexed. *Fruit* $1\frac{1}{4}$ by $\frac{3}{4}$ –1 in., apex remarkably truncate, fulvous-villous; fruiting calyx much thickened, woody, not plicate nor reflexed.—Much of the material referred to this species by *Hiern* is *D. lucida*, *Wall.*

VAR. *macrophylla*, *Wall. Cat.* 4141 (sp.), not of *Blume*; leaves 14 by $4\frac{1}{4}$ in. much acuminate, nerves of the upper surface not impressed.—*Tavoy; Wallich, Packman. Mergui; Griffith* (*Kew Distrib.* n. 3629)—*Fruit* not seen; *fide Hiern* larger than that of *D. undulata*, typ.; but it may be feared than *Hiern* attributed to *D. undulata* the much smaller globose fruit of *D. lucida* (marked by him *D. undulata*), and supposed the large truncate fruits to belong to *D. macrophylla*.

50. *D. pachyphylla*, *Clarke*; leaves elliptic or oblong coriaceous glabrous base rounded, male fl. in small ferruginous-villous cymes, corolla tubular rusty-tomentose beneath, stamens about 12 nearly glabrous except the connective. *D. undulata*, var. *macrophylla*, *Hiern in Trans. Camb. Phil. Soc.* xii. 215 (*neither D. undulata nor D. macrophylla, Wall.*).

MALACCA; *Maingay* (n. 974).

Branchlets thick, soon glabrous. *Leaves* 7 by $2\frac{1}{4}$ in., acute, midrib much elevated beneath, other nerves inconspicuous, very smooth shining above; petiole $\frac{1}{4}$ in. *Male fl.*: cymes $\frac{1}{4}$ –1 in., often compound; bracts $\frac{1}{10}$ in. ovate; calyx $\frac{3}{8}$ – $\frac{1}{2}$ by $\frac{1}{8}$ in., lobed half-way down, lobes 4 oblong; corolla $\frac{1}{2}$ in., tube narrowed upwards, lobes hardly $\frac{1}{8}$ in., small oblong; stamens nearly as of *D. undulata*. *Female fl.* not seen.—*Alldie* no doubt to *D. undulata*, but the corolla differs much, neither do the leaves agree.

51. *D. lucida*, *Wall. Cat.* 4127: leaves oblong narrowed at both ends coriaceous glabrous, male fl. sessile fascicled, corolla tubular yellow-tomentose without, stamens 12–14, anthers and connectives glabrous filaments densely pilose. *A. DC. Prodr.* viii. 233. *D. undulata*, *Hiern in Trans. Camb. Phil. Soc.* xii. 215, partly, not of *Wall.* *Diospyros* sp., *Griff. Notul.* iv. 288.

SINGAPORE; *Wallich. MALACCA; Griffith* (*Kew Distrib.* n. 3637, n. 3619, not *Heffer* under same *Distrib.* n.); *Maingay* (nn. 970, 973, 977).

Leaves 4 by $1\frac{1}{2}$ in., soon glabrescent, primary nerves not numerous nor prominent, reticulating nerves beneath little elevated; petiole $\frac{3}{8}$ – $\frac{1}{2}$ in. *Male fl.*: calyx $\frac{1}{2}$ in. lobed half-way down; corolla nearly $\frac{1}{2}$ in., lobed scarcely half-way down, buds narrower upwards. *Female fl.* 1–2 together, subsessile; calyx $\frac{1}{2}$ by $\frac{1}{4}$ in., divided nearly to the base, lobes broad-ovate with recurved margins; corolla nearly $\frac{1}{2}$ in. *Fruit* $\frac{3}{8}$ in. diam., globose, umbonate at the apex, hairy nearly till ripe, 4–6-seeded. *Albumen* equable.

52. **D. Helferi**, *Clarke*; leaves oblong obtuse apiculate base acute glabrescent reticulating nerves prominent, female fl. 1-3 together sessile, calyx-lobes deep with reflexed margins, corolla rufous-hirsute without. *D. Moonii?*, *Hiern in Trans. Camb. Phil. Soc.* xii. 164.

TENASSERIM (or Andamans); *Helfer*, n. 3632.—DISTRIB. Cambodia.

Branchlets rufous-tomentose. *Leaves* 6 by $2\frac{1}{2}$ in., broadly oblong, parallel-sided, tip shortly cuneate, base broad, shortly suddenly attenuate, narrowed into the petiole, ferruginous-pilose beneath when young; primary nerves numerous, subhorizontal, much reticulated; petiole $\frac{1}{2}$ in. *Male fl.* unknown. *Female fl.* usually 3 together sessile on thick peduncles scarcely $\frac{1}{20}$ in. long; calyx nearly $\frac{1}{2}$ in., almost 5-partite, lobes ovate-oblong; corolla nearly $\frac{1}{2}$ in. *Fruit* (imperfectly ripe) $\frac{3}{4}$ by $\frac{1}{2}$ in., ellipsoid, glabrous; fruiting calyx much enlarged, plicate, with much-reflexed margins auriculated at the sinus.—Affinity doubtful, but cannot be *D. Moonii*; the prominently reticulated nerves of the leaves and the female calyx differ.

53. **D. argentea**, *Griff.* *Notul.* iv. 288; leaves large oblong acute glistening silky beneath, male fl. in stout dense cymes, stamens hairy, fruit solitary hairy. *Hiern in Trans. Camb. Phil. Soc.* xii. 262.

MALACCA; *Griffith* (Kew Distrib. n. 3625), *Maingay* (n. 968).

Branchlets stout, with subsistent yellowish hair. *Leaves* 10 by $2\frac{1}{2}$ -3 in., base rounded, glabrous above, densely villous with fulvous or white soft hairs beneath, at length glabrate; nerves obscure, midrib impressed above; petiole $\frac{1}{2}$ in. *Male fl.*: cymes $\frac{1}{2}$ in., 3-10-flowered; bracts $\frac{1}{2}$ in., ovate; calyx $\frac{1}{2}$ in., deeply 4-lobed, villous; corolla $\frac{1}{2}$ in., tubular, lobed half-way down, very villous without; stamens 22-24. *Female fl.* solitary, peduncles $\frac{1}{2}$ in.; calyx $\frac{1}{2}$ in., campanulate, lobes ovate; corolla $\frac{3}{4}$ in.; staminodes 4-5; ovary 4-celled, 8-ovuled, densely hairy; styles 4, hairy, erect. *Fruit* $2\frac{1}{2}$ by $1\frac{1}{2}$ in., ellipsoid, 8-celled; fruiting calyx greatly enlarged, lobes $1\frac{1}{2}$ in., oblong, densely softly villous. *Seeds* 6-8, $1\frac{1}{2}$ by $\frac{1}{2}$ in., albumen horny.—*D. discolor*, Willd. (A. DC. Prodr. viii. 235), a Philippine species, greatly resembles *D. argentea*, but has glabrous stamens; it is in the collections of Wallich and Maingay, but is supposed only cultivated in India.

SECT. VIII. **Horsfieldia**: as Sect. VII., except that the female flowers are distinctly (though often shortly) cymose.

54. **D. oblonga**, *Wall.* *Cat.* 4124; leaves large oblong acuminate glabrous, female flowers crowded in very short cymes 5-merous tomentose with black hairs intermixed. *A. DC. Prodr.* viii. 243; *Hiern in Trans. Camb. Phil. Soc.* xii. 243.

PENANG; *Wallich*. SINGAPORE; *Maingay* (n. 967).

Branchlets stout, glabrous. *Leaves* $7\frac{1}{2}$ by $2\frac{3}{4}$ in., base obtuse or almost rounded, coriaceous; primary nerves numerous, nearly horizontal, reticulating nerves inconspicuous; petiole $\frac{1}{2}$ in. *Male fl.* not known. *Female fl.* 1-5 together; calyx $\frac{1}{2}$ in., deeply lobed, lobes ovate-oblong, auriculate, subplicate; corolla $\frac{1}{2}$ in., densely hairy without, deeply lobed; staminodes 5; ovary 10-celled, ferruginous-hairy. *Fruit* $\frac{3}{4}$ in. diam., globose, glabrate; calyx $\frac{3}{4}$ in. across, lobes auriculate. *Albumen* horny, not ruminated.

55. **D. ramiflora**, *Roxb. Hort. Beng.* 40, and *Fl. Ind.* ii. 535; leaves large broadly oblong acute glabrous, male fl. in short cymes, female in many-flowered compound much larger cymes. *Wall. Cat.* 4119; *Wight Ic.* t. 189; *A. DC. Prodr.* viii. 233.

EAST BENGAL; Tipperah, *Roxburgh*; Khasia Mts., *Wallich*.

A large tree; branchlets glabrous. *Leaves* $7\frac{1}{2}$ by $3-3\frac{1}{2}$ in., base cuneate or obtuse, nerves not prominent; petiole $\frac{1}{2}$ in. *Male fl.* subfasciculate in $\frac{1}{2}$ in. rusty cymes; calyx $\frac{1}{2}$ by $\frac{1}{2}$ in., sublobular, campanulate, lobed nearly halfway down; lobes 5, oblong, subobtusate; corolla $\frac{1}{2}$ in., tubular, lobed less than halfway down, densely villous without; stamens 16, glabrous, anthers linear, connective hardly produced. *Female*

♂: cymes $\frac{1}{2}$ –2 in., often on the old branches; calyx $\frac{1}{4}$ – $\frac{1}{2}$ by $\frac{1}{2}$ in.; corolla $\frac{1}{2}$ by $\frac{1}{2}$ in., as of the male, but larger; stamens 8–12; ovary hairy, 8–12-celled, stigmas 4–8. **Fruit** 2–3 in. diam., globular, nearly glabrous; fruiting calyx $\frac{1}{2}$ in. across.

56. D. densiflora, *Wall. Cat.* 4140; leaves large elliptic or oblong obtuse or scarcely acuminate glabrous, male fl. numerous in somewhat large cymes, calyx 4-lobed nearly to the base lobes with reflexed margins, corolla tubular fulvous-tomentose without, stamens 15–16 glabrous. *A. DC. Prodr.* viii. 233; *Hiern in Trans. Camb. Phil. Soc.* xii. 171; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 134.

MOULMEIN and AMHERST; Wallich. ARRACAN, MARTABAN and TENASSERIM; rare, Kurz.

Leaves $7\frac{1}{2}$ by $2\frac{1}{2}$ – $3\frac{1}{2}$ in., base obtusely cuneate; primary nerves wide apart, much arched, slightly elevated above, reticulated nervation distinct on both surfaces; petiole $\frac{1}{2}$ in. **Male fl.**: cymes 1–2 in. diam., minutely rusty-pubescent; bracts $\frac{1}{2}$ in., ovate; pedicels $0\frac{1}{2}$ in.; calyx-lobes $\frac{1}{2}$ by $\frac{1}{2}$ in.; corolla $\frac{1}{2}$ in., narrowly cylindric; anthers and connective glabrous. **Female fl.**: cymes $\frac{3}{4}$ – $1\frac{1}{2}$ in., 12–20-flowered; calyx-lobes $\frac{1}{2}$ by $\frac{1}{2}$ in. **Fruit** $\frac{3}{4}$ in. diam., globose, ultimately glabrescent; pedicels in fruit $\frac{1}{2}$ – $\frac{3}{4}$ in. **Albumen** ruminated (*Hiern*), but the affinity of this species seems to be with *D. undulata*.

57. D. Horsfieldii, *Hiern in Trans. Camb. Phil. Soc.* xii. 193; leaves large ovate-oblong or elliptic-oblong glabrous strongly reticulate beneath, male fl. in compound cymes, calyx-lobes ovate with reflexed margins, corolla urceolate ferruginous-hispid without, female fl. in large cymes. *D. frutescens*, *Hassk. Pl. Jav. Rar.* 467, not of *Blume*.

Malacca; Griffith (Kew Distrib. n. 3620).—DISTRIB. Java.

Branchlets soon glabrous. **Leaves** $9\frac{1}{2}$ by $2\frac{1}{2}$ – $4\frac{1}{2}$ in., shortly acuminate, base rounded or obtuse, nerves (primary and secondary) impressed above very strongly raised beneath; petiole $\frac{1}{2}$ in. **Male flowers**: cymes about 1 in., few-flowered; calyx $\frac{1}{2}$ in., deeply 4-lobed, fuliginous-hispid; corolla $\frac{1}{2}$ in., urceolate, fuliginous-hispid without, lobes 4 ovate; stamens 14–16, filaments hairy, anthers glabrous. **Female fl.**: cymes 1–4 in.; bracts $\frac{1}{2}$ in., elliptic; calyx nearly as in the male; corolla $\frac{1}{2}$ in., very deeply 4–5-lobed; stamens 12; ovary 8-celled, cells 1-ovuled. **Fruit** $\frac{3}{4}$ in. diam., globose, fuliginous hairy, ultimately glabrescent; lobes of the fruiting calyx $\frac{1}{2}$ in., margins strongly reflexed, auriculate.

58. D. paniculata, *Dalz. in Hook. Kew Journ.* iv. 109; leaves broad-oblong obtusely cuneate at both ends glabrous, male fl. paniced, calyx-lobes foliaceous ovate, corolla tubular black-velvety without, female flowers solitary or few together. *Dalz. & Gibs. Bomb. Fl.* 141; *Bedd. Ic. Pl. Ind. Or.* t. 125, and *For. Man.* 144; *Hiern in Trans. Camb. Phil. Soc.* xii. 190.

DECCAN PENINSULA; in the Ghauts, Wight; Concan, Dalzell; Canara, Ritchie; Anamallays, Beddome.

A large tree; nearly glabrous except the flowers. **Leaves** $6\frac{1}{2}$ by 2 in., mature strongly closely reticulate on both surfaces; petiole $\frac{1}{2}$ in. **Male fl.**: cymes 1– $1\frac{1}{2}$ in., sparingly pilose, pedicels $0\frac{1}{2}$ in., bracts ovate caducous; calyx 5-lobed nearly to the base, lobes $\frac{1}{2}$ – $\frac{1}{2}$ in., pubescent without and within; corolla $\frac{1}{2}$ in. (or rather more) lobed half-way down; stamens 20, glabrous. **Female fl.** solitary or in 2–5-flowered cymes, peduncled; bracts ovate, caducous; ovary 4-celled, cells 1-ovuled. **Fruit** 1 by $\frac{3}{4}$ in., ellipsoid, ferruginous-hirsute; fruit-calyx 5-lobed, enlarged, nearly glabrous; lobes $\frac{1}{2}$ – $\frac{3}{4}$ in. long and broad, plicate, auricled.

59. D. Brandisiana, *Kurz in Journ. As. Soc.* 1871, pt. ii. 72; leaves lanceolate or oblong acuminate base cuneate or subobtuse sparsely pilose or ultimately nearly glabrous, male fl. in very short cymes, corolla tubular minutely closely pilose, stamens about 16, female fl. in many-flowered cymes. *Hiern in*



Trans. Camb. Phil. Soc. xii. 184; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 138.

UPPER TENASSERIM; *Brandis*.—DISTRIB. Upper Birma.

A tree; branchlets pubescent. *Leaves* $8\frac{1}{2}$ by $2\frac{1}{4}$ in., or wider (*Kurz*); primary nerves much raised beneath, oblique, secondary conspicuous, undulate; petiole $\frac{1}{4}$ in. *Male fl.*: cymes $0\frac{1}{2}$ in., densely fascicled, on the old wood or in the axils of the leaves; calyx $\frac{1}{2}$ in., divided more than half-way down, rusty villous; corolla $\frac{1}{2}$ in., narrowly tubular, lobes short obtuse; filaments densely pilose, anthers and connective glabrous. *Female fl.*: cymes 1 in., rusty pubescent; bracts $\frac{1}{10}$ in., lanceolate; pedicels $\frac{1}{2}\frac{1}{2}$ in.; calyx and corolla nearly as in the male but rather larger; staminodes 5-8; ovary ovoid-conic, hairy, style hairy, stigmas 6-8 glabrous; cells 6-10, 1-ovuled, septa at flowering time complete.

VERY IMPERFECTLY KNOWN SPECIES.

D. CHARTACEA, *Wall. Cat.* 4135, partly; glabrous, leaves ovate-lanceolate or narrowly lanceolate acuminate, male fl. sessile in small clusters 4-merous, calyx elongate cylindric lobes ovate ciliate, corolla short lobes obtuse, stamens 16-20 in pairs, anthers hairy. *A. DC. Prodr.* viii. 232; *Hiern in Trans. Camb. Phil. Soc.* xii. 230; *Kurz in Journ. As. Soc.* 1877, pt. ii. 234, and *For. Fl.* ii. 129.—Martaban and Upper Tenasserim; not uncommon, *Kurz*.—DISTRIB. Birma.

Wallich has two sheets of this; the type is a male in very young bud with small narrow leaves; the duplicate sheet is a male with medium large young flowers and broad-almost ovate-lanceolate leaves. It is very doubtful whether the two belong to the same species. *Hiern* has described the flowers from the duplicate sheet, while he says the leaves are 2-9 $\frac{1}{2}$ by $\frac{1}{2}$ -3 in. elongate lanceolate, which seems intended to cover both sheets of Wallich. *Kurz* finds *Hiern's* plant "not uncommon" in British Birma, but says the leaves are 4-5 in. long, ovate-oblong to oblong and oblong-lanceolate; so that his plant can hardly be referred to the species of Wallich's type sheet in which the leaves are uniformly small and narrow, running from $2\frac{1}{2}$ by $\frac{1}{2}$ in. to $3\frac{1}{2}$ by $\frac{3}{4}$ in.

D. ELEGANS, *Clarke*; leaves oblong acutely caudate fulvous-pilose on the nerves beneath, male cymes small on $\frac{1}{4}$ in. peduncles, corolla with a few scattered hairs without or glabrate, calyx 3-partite.

KHASIA MTS.; Nunklow, alt. 3500 ft., *Clarke*.

A small tree; branches persistently fulvous-hirsute. *Leaves* $5\frac{1}{2}$ by $1\frac{1}{2}$ in., obtuse at the base; primary nerves oblique; petiole $\frac{1}{2}$ in. *Male fl.* (exceedingly young) about 12 short-pedicelled in each cyme; cyme sometimes $1\frac{1}{2}$ in. compound; female unknown.—Supposed allied to *D. microphylla*, but may be a *Maba*.

VAR. *Hookeri*; shrubby, leaves less finely acuminate. *D. stricta*, *Hiern in Trans. Camb. Phil. Soc.* xii. 201, partly, not of *Roxburgh*.—Chittagong, Seetakoond; *H. f. & T.*—This differs from *D. stricta* in the hirsute branches and peduncled male cymes.

D. GRATA, *Wall. Cat.* 4142; leaves alternate oblong narrowed at both ends obtuse glabrous, female flowers solitary subsessile, ovary fulvous-hispid, fruit globose subglabrous, fruiting calyx 5-fid pentagonal pubescent on both sides. *A. DC. Prodr.* viii. 232; *Hiern in Trans. Camb. Phil. Soc.* xii. 264.—Nipal; *Wallich*.

Hiern thinks *Wallich's* fragmentary example may be *D. lanceifolia*, *Roxb.*

D. ORIXENSIS, *Wight*; *Hiern in Trans. Camb. Phil. Soc.* xii. 264; leaves alternate elliptic shortly obtusely acuminate base obtuse hairy at least on the midrib beneath, fruits solitary axillary subglobose, fruiting calyx deeply 4-fid hairy without.—*Courtallum*; *Wight*.—This looks like the female of *D. stricta*, *Roxb.* Why *Wight* named a *Courtallum* species *orixensis* does not appear. *Hiern* says that *D. orixensis* of *Klein* and *Willd.* (*A. DC.* viii. 230) is probably *D. montana*, *Roxb.*, with which also *Beddome* agrees (*For. Man.* 143); but the short description of *Willd.* appears to fit *Wight's* examples of *D. orixensis* very well.

D. PYRHOCARPA, *Miq. Fl. Ind. Bat. Suppl.* 250, 583; shoots pubescent soon glabrescent, leaves elliptic-oblong shortly acuminate coriaceous densely reticulated, flowers solitary short-peduncled rufous-tomentose, berries size of a cherry depressed-globose rufous-orange-tomentose. *Hiern in Trans. Camb. Phil. Soc.* xii. 266; *Kurz in Journ. As. Soc.* 1877, pt. ii. 236, and *For. Fl.* ii. 136.—West Sumatra.

VAR. andamanica, Kurz; leaves oblong to narrow-oblong, lateral nerves faint and numerous, reticulation more lax.—Andamans; *Kurz*.—Not seen, and for the present exceedingly obscure; for Kurz l. c. adds "the Andaman tree, I have little doubt, is a different species" (i.e. from the Sumatran), "but the material is too incomplete for description."

D. ROYLEI, Wall. *Cat.* 4134; *A. DC. Prodr.* viii. 239.—There is no specimen of this in Wallich's herbarium.

D. VENOSA, Wall. *Cat.* 4126; leaves alternate elliptic shortly acuminate glabrous, female flowers in subsessile clusters 1-3 together, bracts $\frac{1}{2}$ in. ovate. *Anonaceæ?*, *Hiern in Trans. Camb. Phil. Soc.* xii. 271.—Penang; *Wallich*.

The single fruiting calyx (not perhaps the normal form) on Wallich's specimen is 3-lobed, but the young fruit in it is globose, undivided, and can hardly be *Anonaceæ*. The specimen might be *D. undulata* or some closely allied species.

ORDER XCI. STYRACEÆ. (By C. B. Clarke.)

Trees or shrubs. *Leaves* alternate, exstipulate. *Flowers* hermaphrodite (in the Indian species), in axillary and terminal simple or compound racemes or spikes, sometimes solitary, white, rarely rose; bracts small. *Calyx* campanulate, superior or inferior, limb 5-4-toothed or truncate, persistent. *Petals* 5-4, free or united into a short (rarely long) tube, imbricate (in the Indian species). *Stamens* adnate to the petals, 8-10 or very many; filaments free or connate; anthers round or linear, dehiscing laterally. *Ovary* inferior or superior, 2-5-celled, or (by the early separation of the septa) 1-celled; style filiform; stigma small or capitate; ovules 1 or few on the inner angle of each cell, pendulous or erect. *Fruit* drupaceous, 1-seeded, less often 2-3-seeded. *Seeds* albuminous; embryo straight or curved.—Species 220, in the warmer regions of Asia, Australia and America; not known in Africa.

Stamens many, in several series 1. SYMPLOCOS.
 Stamens 10, in 1 series 2. STYRAX.

1. SYMPLOCOS, Linn.

Trees or shrubs; often drying yellow. *Leaves* alternate, toothed or entire. *Racemes* or *spikes* axillary, simple or compound, sometimes reduced to a single flower; bracts usually solitary at the base of each pedicel, caducous; bracteoles 3-1, small, at the base of the flower. *Flowers* white (in *S. rosea*, rose), hermaphrodite (in the Indian species). *Calyx-tube* adnate; lobes 5, small, imbricate. *Petals* (in the Indian species) 5, imbricate, free or obscurely connate, more rarely connate into a tube. *Stamens* numerous, in several series, adnate to the corolla-tube, usually throughout its length, and in a few species in a tube beyond it; anthers shortly-oblong, dehiscing longitudinally. *Ovary* inferior (in the Indian species), 3-, rarely 2- or 4-celled; style filiform, stigma small capitate sub-3-lobed; ovules 2, pendulous from the inner angle of each cell. *Drupe* ellipsoid, endocarp usually woody, 1-3-seeded. *Seeds* oblong, straight or less often curved; embryo terete, axile, straight or curved.—*DISTRIB.* Species 160, in the tropics of Asia, Australia and America.

SUBGENUS I. HOPEA (Species 1 to 59). *Petals* free or connate only at the very base, spreading; buds subglobose. *Filaments* slender, more or less united to the corolla, not forming a tube distinct from the corolla. *Embryo* straight, or curved.—The curvembryose species constitute the section *Palura*, not adopted here, the embryo being unknown in many species.

SECT. 1. Racemes or spikes (at least some of them) compound. (See also 12. *S. racemosa* var., and 51. *S. angustata*). Species 1 to 11.

* *Embryo curved (in several not known).*

1. ***S. cratægoides***, *Ham. ms.*; *Don Prodr.* 145; leaves broadly elliptic closely sharply serrulate towards the acuminate apex, cyme elongate compound subpanicled, disc glabrous. *A. DC. Prodr.* viii. 258; *Brand. For. Fl.* 299; *Kurz For. Fl.* ii. 147, and in *Journ. As. Soc.* 1877, pt. ii. 239. *S. paniculata*, *Wall. Cat.* 4429. *Lhodra cratægoides*, *Dene in Jacq. Voy. Bot.* 103, t. 110.—*Griff. Itin. Notes* 163, n. 839.

HIMALAYA; alt. 2-8000 ft.; from Kashmir to Bhotan; common. KHASIA; alt. 3-5000 ft.; common. MARTABAN; Nattoung Hills (*Kurz*).—DISTRIB. Japan.

A tree, 40 ft., or shrub. *Leaves* $2\frac{1}{2}$ by $1-1\frac{1}{2}$ in., varying from lanceolate acuminate to broadly obovate-elliptic subobtusate, teeth sometimes nearly obsolete, usually softly pilose beneath, at least on the midrib, sometimes glabrous; reticulating nerves prominent beneath; petiole $\frac{1}{2}$ in. *Panicles* 1-5 in., hairy, glabrescent or glabrous; lateral branches distinct, cymosely many-flowered, or with few longer-pedicelled flowers; bracts small, linear, caducous. *Calyx-tube* obconic, glabrous, or sparsely pilose or densely hirsute; teeth small obtuse, or lanceolate subacute, glabrous ciliate or pilose. *Corolla* $\frac{1}{2}-\frac{3}{8}$ in. *Stamens* 20-60. *Fruit* $\frac{1}{2}-\frac{3}{8}$ in., obliquely ovoid or obovoid, calyx-rim small, very much narrower than the fruit.—Most variable: the typical North-west form (described by Brandis) has a glabrous calyx-tube with short obtuse teeth; while Griffith's n. 806 (from Khasia) has densely hairy calyx-tube and long calyx-teeth. The fruits vary so greatly in form and size that Thomson (erroneously) regarded some as insect-injured.

2. ***S. spicata***, *Roxb. Hort. Beng.* 40, and *Fl. Ind.* ii. 541; leaves broadly lanceolate acute serrulate glabrous, flowers sessile in long-branched spikes, disc glabrous. *Wall. Cat.* 4417; *Brand. For. Fl.* 300; *Kurz For. Fl.* ii. 146, and in *Journ. As. Soc.* 1877, pt. ii. 239. *S. polycarpa*, *Wall. Cat.* 4423; *A. DC. Prodr.* viii. 255; *Kurz U. c.* S. Loha, *Don Prodr.* 144; *A. DC. l. c.* *S. racemosa*, *Wall. Cat.* 4418, in part, not of *Roxb.*

NORTH and EAST INDIA; near the base of the hills, alt. 0-4000 ft.; from Kumaon to Bhotan, Assam and Martaban; common.—DISTRIB. China, Japan, Australia?

A small tree. *Leaves* 5 by 2 in., base cuneate; nerves distant, not prominent beneath, parallel; petiole $\frac{1}{2}$ in. *Spikes* 2-4 in., often tripartite below, sometimes panicled, glabrous or obscurely rusty-pubescent; flowers all closely sessile, the depressed ovary and short calyx-tube embraced by the 3 persistent small ovate obtuse bracteoles. *Calyx-lobes* $\frac{5}{16}$ in., round, glabrous or slightly pubescent. *Petals* $\frac{1}{2}$ in. *Stamens* about 40. *Fruit* $\frac{1}{2}$ in. diam., subsymmetric, ribbed (or smooth), globose, surmounted by a very short cylindric tube; calyx-rim as wide as the tube.—Wallich's *S. polycarpa* only differs in the larger leaves; *Kurz* separates it by the smooth, not ribbed fruit; but the fruit is distinctly ribbed in Wallich's *polycarpa*. The whole of this series of *S. spicata* type is readily distinguished by the long branches of the spike, with small distant flowers and very depressed ovaries.

VAR. *laurina*, *Wall. Cat.* 4416 (sp.); spikes shorter fulvous subtomentose or hirsute, flowers rather larger densely crowded, ovary less depressed. *S. spicata*, *A. DC. Prodr.* viii. 254; *Wight Ill.* t. 150; *Thwaites Enum.* 154; *Bedd. For. Man.* 149. *S. flavida* and *S. Loha*, *Miq. in Pl. Hohenack.* p. 1053, 1054. *Myrtus laurina*, *Retz Obs.* iv. 26. *Eugenia laurina*, *Willd. Sp. Pl.* ii. 967. *Bobua laurina*, *DC. Prodr.* iii. 24. *Hopea spicata*, *Dalz. & Gibs. Bomb. Fl.* 140.—W. side of the Deccan Peninsula and Ceylon; alt. 2-7000 ft., very common.—(*Burm. Thes. Zeyl.* t. 62.)

VAR. *attenuata*, *Wall. Cat.* 4426 (sp.); leaves long-attenuate at the base, spikes shorter tripartite or simple, fruits smaller often only $\frac{1}{2}$ in. *A. DC. Prodr.* viii. 256.—Khasia; alt. 3-6000 ft., common, Hills of British Birma, *Kurz*.

VAR. *malasica*; leaves less coriaceous, secondary nerves prominent, flowers less closely sessile, ovary not depressed, calyx-lobes oblong prominent above the bracteoles.—Malay Peninsula, common; *Maingay*, n. 957, &c.—This is not exactly *S. Stawellii*, *F. Muell. Fragm. Phyt. Austr.* v. 60, which has the flowers more distinctly pedicelled, and is more like the Ceylon *S. laurina*.

3. *S. oxyphylla*, Wall. Cat. 4430; leaves oblong-lanceolate acuminate serrulate glabrous, racemes compound, flowers small mostly pedicelled. *A. DC. Prodr.* viii. 256. *S. pedicellata*, Kurz in *Journ. As. Soc.* 1873, pt. ii. 89, and *For. Fl.* ii. 147.

KHASIA; Wallich; Cherra, alt. 4000 ft., H. f. & T. ASSAM; Masters. PEGU; rather rare, Kurz.

A small tree; branchlets glabrous. Leaves 5 by $1\frac{1}{2}$ in., subcaudate, base attenuate; nerves distant, not prominent beneath, parallel; petiole $\frac{1}{4}$ in. Panicles $1\frac{1}{2}$ –2 in. diam., many-fld., puberulous, finally glabrous; bracts small, caducous. Calyx nearly glabrous; teeth $\frac{1}{10}$ in., round. Corolla $\frac{1}{2}$ in. Fruit $\frac{1}{4}$ in., ovoid, narrowed upwards into a cylindric beak, often 3-seeded, scarcely ribbed; fruiting calyx as wide as the beak.—*S. xanthophylla*, Jungh. & De Vriese; *Miq. Fl. Ind. Bat.* i. pt. ii. 468, has pedicelled flowers, but the fruits are small, and it resembles *S. spicata* var. *attenuata* rather than *S. oxyphylla*.

4. *S. fasciculata*, Zoll. Syst. Verz. 136; leaves oblong-lanceolate minutely pilose on the midrib beneath or glabrous very short-petioled, cymes compound very small, flowers small mostly pedicelled. *Miq. Fl. Ind. Bat.* i. pt. ii. 467. *Dicalyx tinctorius*, Blume Bijl. 1116.

MALACCA; Griffith (Kew Distrib. n. 3665), Maingay (n. 958). SINGAPORE; Murton.—DISTRIB. Java, Borneo.

A large tree (Maingay); branchlets ashy-pubescent. Leaves $3\frac{1}{2}$ by $1\frac{1}{4}$ in., obtusely acuminate, base obtusely rhomboid, entire or obscurely crenate-serrate; thinly chartaceous, nerves distant, not prominent beneath, parallel; petiole $\frac{1}{2}$ in. Cymes scarcely $\frac{3}{4}$ in. diam., ashy-pubescent; bracts minute. Calyx-teeth $\frac{1}{10}$ in., ovate-oblong, grey-pubescent. Corolla $\frac{1}{2}$ in. Stamens 25. Disc glabrous; style glabrous (in the Malacca examples), sparsely villous in the Javan. Fruit $\frac{1}{2}$ in., obliquely ovoid, narrowed to a cylindric beak; embryo not seen (fruit imperfectly ripe), probably curved.

5. *S. oligandra*, Bedd. Ic. Pl. Ind. Or. t. 272; leaves oblong cuneate at both ends subentire glabrous, cymes scarcely $\frac{1}{2}$ in. compound minutely hairy, disc closely shortly hairy.

TRAVANCORE GHATS; Beddome.

A tree (Beddome); branchlets glabrous. Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., coriaceous; nerves 9–10 on each side, very slightly impressed; petiole $\frac{1}{4}$ in. Cymes 3–6-fld.; bracts minute, deciduous. Calyx-tube $\frac{1}{12}$ in., glabrous; teeth $\frac{1}{24}$ in., closely adpressedly pilose. Petals $\frac{1}{10}$ in. Stamens 12–14, in pairs. Ovary 3-celled. Fruit unknown.

6. *S. ferruginea*, Roxb. Hort. Beng. 40, and *Fl. Ind.* ii. 542; leaves broad-lanceolate rusty-villous on the nerves beneath, nerves numerous strong parallel, spikes compound rusty-villous. Wall. Cat. 4412; *A. DC. Prodr.* viii. 257. *S. mollis*, Wall. Cat. 4433; *G. Don Gen. Syst.* iv. 3. *S. Verhuelli*, Jungh. & De Vriese; *Miq. Fl. Ind. Bat.* i. pt. ii. 467. *S. polystachya*, Zoll. & Mor. Verz. 43, not of Wall. *S. lachnobotrya* and *Horsfieldiana*, *Miq. Fl. Ind. Bat. Suppl.* 475. *S. javanica*, Kurz in *Journ. As. Soc.* 1877, pt. ii. 239 (syn. *S. rubiginosa* excl.), and *For. Fl.* ii. 145. *Dicalyx javanicus*, Blume Bijl. 1117.

KHASIA; Wallich; Mikir Hills, Simons. MALAY PENINSULA; from Mergui to Malacca, common.—DISTRIB. Malay Archipelago.

A small tree; branchlets subsersistently rusty-villous. Leaves $6\frac{1}{2}$ by $2\frac{1}{2}$ in., acuminate, base cuneate, often broader above the middle, serrulate or subentire, mature villous beneath or glabrescent, coriaceous, shining, smooth with scarcely impressed nerves above; nerves 10–15 on each side, strongly raised beneath, quite parallel, carried $\frac{2}{3}$ (or more) the way to the margin before inarching; petiole $\frac{1}{2}$ in. Panicles 2–5 in., very compound and villous, branches long; flowers sessile, bracteoles concealing the short calyx-tube. Calyx-teeth $\frac{1}{12}$ in., ovate, villous. Corolla $\frac{1}{2}$ in. Stamens 40. Ovary depressed, disc glabrous. Fruit $\frac{1}{2}$ in., depressed-globose, ribbed; beak hardly any besides the enlarged glabrescent calyx-teeth.

VAR. *polystachya*, Wall. Cat. 4428 (sp.); leaves beneath glabrous or adpressedly pilose on the midrib only. A. DC. Prodr. viii. 254.—Gurwhal, alt. 5500 ft., *Strachey* & *Winterbottom*. Kumaon; alt. 4500 ft., *Madden*. Darjeeling; alt. 5,000 ft., *Gamble*. Khasia; alt. 3–4000 ft., *Wallich*, *Clarke*.—This may be specifically separable, for when the midrib beneath is hairy, the indumentum is widely different from that of *S. ferruginea*. Brandis thinks (*For. Fl.* 300) this species too near *S. spicata*; the nervation of the leaves differs widely.

** *Embryo straight* (in several not known).

7. *S. adenophylla*, Wall. Cat. 4427; leaves narrowly lanceolate or broadly elliptic obtusely acuminate subentire glabrous, racemes compound minutely rusty-pubescent, disc glabrous. A. DC. Prodr. viii. 257. *S. iteophylla*, *Miq. Fl. Ind. Bat. Suppl.* 476.

PENANG; *Wallich*. SINGAPORE and MALACCA; *Wallich*, *Griffith*, *Maingay*.—DISTRIB. JAVA, BORNEO.

Branchlets glabrous. *Leaves* 3 by $\frac{2}{3}$ in., or $3\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate or attenuate, coriaceous; nerves distant, not prominent; petiole $\frac{1}{2}$ in. *Racemes* 1–2 in., tripartite, lax; pedicels $0\frac{1}{2}$ in.; bracteoles minute, subobsolete. *Calyx-tube* glabrous or minutely rusty; teeth $\frac{1}{10}$ in., oblong. *Corolla-lobes* $\frac{1}{2}$ in. *Stamens* 40. *Fruit* $\frac{1}{2}$ by $\frac{1}{2}$ in., terete, ellipsoid, smooth, tip obtuse; calyx-teeth closely incurved, inconspicuous.—*Wallich* doubted whether his broad-leaved examples from Singapore (var. *virgata*, Wall.) might not be specifically distinct from his narrow-leaved ones from Penang; but two extreme forms of leaf occur on one branch.

8. *S. celastrifolia*, *Griff. ms.*; leaves elliptic-oblong cuneate at both ends crenate glabrous, racemes laxly paniced minutely rusty-villous, disc glabrous.

MALACCA; *Griffith* (Kew Distrib. n. 3651).—DISTRIB. BORNEO.

Branchlets glabrous. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ – $1\frac{3}{4}$ in., very shortly obtusely acuminate, base cuneate or subobtusely, strongly crenate, thickly chartaceous, when dried dull-green above, pale-yellow beneath; nerves not prominent; petiole $\frac{1}{2}$ in. *Racemes* 2–3 in., branches long lax; pedicels $\frac{1}{10}$ in.; bracteoles subobsolete. *Calyx-tube* nearly glabrous, teeth $\frac{1}{10}$ in., elliptic, glabrous. *Corolla* $\frac{1}{2}$ – $\frac{3}{4}$ in. *Stamens* 40. *Fruit* more than $\frac{1}{2}$ in., ovoid-ellipsoid, smooth; calyx-rim as wide as the upper part of the fruit, teeth erect. *Embryo straight*.

9. *S. phyllocalyx*, *Clarke*; leaves oblong acuminate serrulate glabrous, spikes very short sparingly compound minutely pilose, calyx-teeth green round, disc glabrous. *Symplocos* sp. n. 812, *Griff. Itin. Notes*, 158. *Symplocos* sp. n. 54, *Herb. Ind. Or. H. f. & T.* *Symplocos* sp. (Ohandan), *Gamble Darjeeling List*, 54. *Laurinea* ? n. 660, *Griff. Itin. Notes*, 141.

SIKKIM; alt. 8–12,000 ft., *J. D. H.*, &c., frequent. BHOTAN; *Griffith*.

A small tree or shrub, almost wholly glabrous. *Leaves* 4 by $1\frac{1}{2}$ in., base cuneate or attenuate, coriaceous, shining; midrib elevated above, broad; nerves numerous, often 14 on each side, slender but distinct above; petiole $\frac{1}{2}$ in. *Spikes* often shorter than the petioles, bracts glabrous when young; bracteoles $\frac{1}{2}$ in., ovate. *Calyx-teeth* $\frac{1}{8}$ in., glabrous or microscopically ciliate on the margins. *Corolla* $\frac{1}{2}$ in. *Stamens* 40–50. *Disc* shortly hairy; style often sparsely hairy. *Fruit* nearly $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid, crowned by the unaltered calyx-teeth. *Embryo straight*.—Furnishes a dye exported into Tibet (*Hook. Himal. Journ.* ii. 41).

10. *S. theaeifolia*, *Ham. ms.*; *Don Prodr.* 145; leaves oblong acuminate obscurely serrulate glabrous, spikes very short compound minutely pubescent, disc densely hairy. *S. lucida*, *Wall. Cat.* 4414; A. DC. Prodr. viii. 255; *Kurz in Journ. As. Soc.* 1877, pt. ii. 298, and *For. Fl.* ii. 143, not of *Sieb. & Zucc.* *S. racemosa*, *Wall. Cat.* 4418; A. DC. l. c., partly; *Brand. For. Fl.* 300, not of *Roxb.*

HIMALAYA; from Nipal to Bhotan, alt. 5-8000 ft., very common. KHASIA; alt. 4-6000 ft., common. MARTABAN; alt. 5-7000 ft., not unfrequent. *Kurz*.

An erect tree, often 50 ft.; branchlets glabrous. *Leaves* $4\frac{1}{2}$ by $1\frac{3}{8}$ in., base cuneate or obtuse, coriaceous; nerves numerous, indistinct, not parallel; petiole $\frac{1}{2}$ in. *Panicles* $\frac{1}{2}$ -1 in., dense, often tripartite from the base, branches stout; bracts $\frac{1}{10}$ in. broad, obtuse; bracteoles $\frac{1}{16}$ in., broad, obtuse. *Calyx-tube* nearly glabrous, teeth $\frac{1}{16}$ in., broad, obtuse, glabrous, minutely ciliate. *Corolla* $\frac{1}{2}$ - $\frac{3}{8}$ in. *Stamens* 20-25. *Disc* densely covered with long white hairs. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid, smooth, tip obtuse, calyx-teeth incurved inconspicuous. *Embryo* straight.—There has been much confusion respecting this very distinct species. Wallich has, under No. 4418, three plants named *S. racemosa*, Roxb., none of which are right, except letter C, upon which De Candolle (in whose Herbarium the specimen is) founded his *S. nervosa*.

11. *S. kurgensis*, Clarke; leaves oblong acuminate scabrous-villous beneath, panicles rufous-hirsute, flowers subsessile, calyx-tube glabrous, teeth closely silky. *Symplocos*, n. 31, *Herb. Ind. Or. Hk. f. & T. S.*, *spicatae affinis*, *Bedd. For. Man.* 152.

Mts. of Kure, common, G. Thomson; *Beddome*.

Branchlets thick, soon glabrescent except the tips. *Leaves* $5\frac{1}{2}$ by 2 in., base rounded or subcordate when mature, sub-denticulate, villous and glandular-scabrid beneath, coriaceous; nerves 10 on each side, thick, much elevated beneath; petiole $\frac{1}{4}$ in., rusty-villous. *Panicles* 2-3 in.; bracts $\frac{1}{4}$ in., ovate, densely hairy. *Calyx-lobes* $\frac{1}{10}$ in., ovate. *Petals* $\frac{1}{2}$ in. *Stamens* 50. *Disc* and style glabrous. *Fruit* nearly $\frac{1}{2}$ by $\frac{1}{4}$ in., cylindric, smooth; calyx-rim as broad as the fruit, teeth patent. *Embryo* straight.—This differs from *S. Hohenackeri*, n. 37, in the rounded base of the leaves, which are glandular-scabrous beneath, and in the compound spikes.

SECT. 2. Racemes or spikes undivided (in *S. racemosa* var. divided). *Embryo* straight. Species 12 to 59.

* *Species of the Himalaya and Khasia Mts.*

12. *S. racemosa*, Roxb. *Hort. Beng.* 40, and *Fl. Ind.* ii. 539; leaves oblong cuneate at both ends obscurely crenate, midrib glabrous or pilose beneath, racemes hairy half as long as the leaves, disc glabrous. *Kurz in Journ. As. Soc.* 1877, pt. ii. 238, and *For. Fl.* ii. 144, not of *A. DC.* *S. Hamiltoniana*, Wall. *Cat.* 4420; *A. DC. Prodr.* viii. 254; *Brand. For. Fl.* 301. *S. rigida*, Wall. *Cat.* 4422, type sheet. *S. nervosa*, *A. DC. l.c.* 256, not of *Wight*. *S. propinqua*, *Hance in Seem. Journ. Bot.* 1868, 329.—*Symplocos* n. 52, *Herb. Ind. Or. H. f. & T.*

Throughout NORTH-EAST INDIA, alt. 0-2500 ft., common from the Terai of Kumaon to Assam and Pegu; common throughout Chota Nagpore.—DISTRIB. Birma, China.

A small tree, or more frequently a shrub; branchlets soon glabrous. *Leaves* 5 by $1\frac{1}{2}$ in. (sometimes almost orbicular leaves) obtuse, coriaceous; nerves distant, not conspicuous; petiole $\frac{1}{2}$ in. *Racemes* 2-4 in.; bracts $\frac{1}{2}$ in., ovate, hairy, deciduous; lower pedicels often distant, $\frac{1}{10}$ - $\frac{1}{8}$ in.; bracteoles $\frac{1}{12}$ in., ovate. *Calyx-tube* usually glabrous, lobes $\frac{1}{10}$ in., ovate, minutely pubescent. *Corolla* $\frac{1}{2}$ in. *Stamens* sometimes 115. *Fruit* nearly $\frac{1}{2}$ by $\frac{1}{4}$ in., subcylindric, smooth; calyx-rim nearly as wide as the fruit, with erect teeth. *Embryo* straight.—*S. rigida*, Wall. type, differs by some of the racemes terminating in a leafy branch, so that the pedicels appear solitary from the old wood bearing the fruits.—*Kurz* must be mistaken in thinking that this was *S. racemosa* of *A. DC.*, who describes his plant as having racemes about as long as the petioles and the ovary pilose at the summit. *A. DC.*'s plant was therefore, as he states, *S. racemosa*, Wall. = *S. theaefolia*, Don. *Kurz* also refers the Kew Distrib. n. 3660 to *S. spicata*, whereas that number is *S. racemosa*, Roxb.

VAR. *khasiana*; flowers sessile in dense clusters on the spike. *Symplocos*, n. 1275, *Griff. Ibin. Notes*, 87.—Khasia; Nongkreem (alt. 4500 ft., perhaps), *Griffith*.

VAR. composita, Kurz in Journ. As. Soc. 1877, pt. ii. 238; flowers clustered in small cymes subterminal on the elongate branches, stamens about 40. *S. rigida*, Wall. Cat. 4422 partly.—Moulmein; Wallich. Darjeeling Terai; frequent, C. B. Clarke.

13. *S. glomerata*, King; Gamble, *Darjeeling List* 54; leaves elongate-lanceolate acuminate gland-serrate glabrous, petioles glandular, flowers and fruits fascicled axillary, disc glabrous. *Symplocos*, n. 900, *Griff. Itin. Notes*, 177. *Symplocos*, n. 55, *Herb. Ind. Or. Hk. f. & T. Incerta*, n. 448, *Griff. Itin. Notes*, 125.

SIKKIM and BHOTAN, alt. 1-8000 ft., frequent; *Griffith, J. D. H., &c. KHASIA*, alt. 2-5500 ft.; *H. f. & T., Simons*.

A shrub; or a tree 10 ft. high (*J. D. H.*); nearly wholly glabrous. Leaves 6 by $1\frac{1}{2}$ in., base cuneate, coriaceous; midrib impressed above, nerves distant, conspicuous beneath; petiole $\frac{1}{4}$ in. Bracts and bracteoles ovate, somewhat woolly, but obscured by the densely fascicled flowers. Calyx-tube nearly glabrous; lobes $\frac{2}{10}$ in., broad, rounded. Corolla nearly $\frac{1}{2}$ in. Stamens 25. Fruit $\frac{1}{4}$ - $\frac{1}{3}$ by $\frac{1}{8}$ - $\frac{1}{6}$ in., subcylindric, smooth; calyx-rim nearly as wide as the fruit, teeth erect. Embryo straight.

14. *S. ramosissima*, Wall. Cat. 4425; leaves oblong lanceolate acuminate membranous serrulate glabrous, racemes numerous scattered few-flowered minutely pubescent longer than the petioles, disc glabrous. *A. DC. Prodr.* viii. 257; *Brand. For. Fl.* 299.

TEMPERATE HIMALAYA, alt. 4-8000 ft.; from Gurwhal to Bhotan, common KHASIA; alt. 4000 ft., *H. f. & T.*

A shrub, or tree 30-40 ft.; branchlets glabrous. Leaves 4 by $1\frac{1}{2}$ in. (occasionally much larger), base cuneate; nerves somewhat distant, slender, distinct beneath; petiole $\frac{1}{4}$ in. Racemes $\frac{1}{2}$ -1 in., 1-6-flowered, often from lower leafless axils; bracts deciduous; pedicels $0-\frac{1}{8}$ in.; bracteoles $\frac{1}{16}$ in., ovate, pubescent, adpressed to the calyx-tube. Calyx-teeth $\frac{1}{20}$ in., ovate. Corolla $\frac{1}{8}$ - $\frac{1}{6}$ in. Stamens 20. Fruit more than $\frac{1}{4}$ in. long, ellipsoid (accompanying subglobose fruits are probably insect-punctured); calyx-rim narrower than the fruits. Embryo straight.—In Kew Distrib. n. 3667 (Panukka, in Bhotan, *Griffith*) many of the branches have the racemes reduced to solitary flowers.

15. *S. caudata*, Wall. Cat. 4113; leaves lanceolate caudate subentire glabrous, racemes lax hairy much longer than the petioles, calyx-tube obconic glabrous, disc glabrous. *A. DC. Prodr.* viii. 256. *S. prunifolia*, Sieb. & Zucc. *Pl. Jap. Fam. Nat.* ii. 9; *Miq. in Ann. Mus. Lugd. Bat.* iii. 101. *S. Swinhoeana*, Hance in *Ann. Sc. Nat. Ser. 4*, xv. 226.

SIKKIM; Darjeeling, Gamble. KHASIA (alt. 3000 ft.); Wallich, &c. CHITTAGONG; Seetakoond, *H. f. & T.*—DISTRIB. China, Japan.

Attains sometimes 15 ft., usually a shrub. Leaves 3 by $\frac{3}{4}$ in., base cuneate, stoutly chartaceous; nerves distinct, distant, not easily separable from the secondary; petiole $\frac{1}{8}$ in. Racemes 1- $1\frac{1}{2}$ in., sparingly pilose or fulvous-subhirsute; bracts and bracteoles inconspicuous; pedicels $0-\frac{1}{8}$ in. Calyx-tube $\frac{1}{16}$ in., teeth nearly as long, ovate, subacute. Corolla $\frac{1}{4}$ in. Stamens 25. Fruit (unripe) $\frac{1}{2}$ in., ovoid-cylindric, shining, smooth, crowned by the patent somewhat-enlarged calyx-teeth.—From the form of the unripe fruit, the embryo is presumed to be curved.

16. *S. lancifolia*, Sieb. & Zucc. *Fl. Jap. Fam. Nat.* ii. 9; leaves lanceolate acuminate crenate-serrulate glabrous, spikes slender fulvous-pubescent, disc glabrous. *Miq. in Ann. Mus. Lugd. Bat.* iii. 101. *S. leptostachya*, Sieb. & Zucc. l. c. *S. microcarpa*, Bth. in *Hook. Kew Journ.* iv. 303.

ASSAM; Patkoye Mts., alt. 2500 ft., *Griffith* (Kew Distrib. n. 3659).—Japan. Hongkong.

A shrub or small tree; branchlets nearly glabrous. Leaves $3\frac{1}{2}$ by 1 in., base

cuneate or rhomboid, subcoriaceous; nerves distant, not conspicuous; petiole $\frac{1}{2}$ in. Spikes $\frac{1}{2}$ – $1\frac{1}{2}$ in., subracemose; flowers small, the minute pedicels and calyx-tube enveloped by persistent fulvous-villous imbricated bracteoles. *Calyx-segments* $\frac{1}{16}$ in., ovate. *Corolla* $\frac{1}{16}$ in. *Stamens* 15–25. *Ovary* 3-celled. *Fruit* $\frac{1}{2}$ in. diam., cuboid-globose; calyx-rim less than one quarter the width of the fruit. *Embryo* curved.—The simple spikes are in one example sometimes changed into dense panicles of abortive flowers with numerous bracteoles.

VAR. *fulvipes*; midrib of the leaves beneath fulvous-pilose, spikes villous. *S. microcarpa*, var.?, *Btk. Fl. Hongk.* 212. *Symplocos*, n. 657, *Griff. Itin. Notes*, 41. *Symplocos*, n. 50, *Herb. Ind. Or. Hk. f. & T.*—Khasia; Cherra, *Griffith* (Kew Distrib. n. 3648); Borpani, *H. f. & T. Assam*; *Masters*.

17. ***S. Hookeri***, Clarke; leaves large obovate-oblong acute minutely toothed glabrous, nerves parallel much elevated beneath, racemes stout minutely rusty. *Symplocos*, n. 49, *Herb. Ind. Or. Hk. f. & T.*

KHASIA; Nunklow, *H. f. & T.*

Branches thick, glabrous. *Leaves* 12 by $4\frac{1}{2}$ in., base cuneate, thickly chartaceous; midrib and nerves impressed on the upper surface; petiole $1\frac{1}{2}$ in. *Flowers* not seen. *Racemes* (in fruit) from thick branchlets, 2–3 in., simple; pedicels $\frac{1}{2}$ in., distant. *Fruit* $\frac{1}{2}$ by $\frac{1}{2}$ in., elongate ellipsoid, smooth. *Embryo* straight.—From the leaves this appears allied to *S. rubiginosa*, Wall., which has much smaller fruits.

18. ***S. macrophylla***, Wall. *Cat.* 4431; leaves large elliptic acute from a rounded base minutely toothed hirsute beneath, spikes 2 in. stout densely rusty-villous.

KHASIA MTS.; *De Silva*.

Branchlet stout, rusty-hirsute. *Leaves* 8 by $3\frac{1}{2}$ in., base obtuse or subcordate, thickly coriaceous, rugose from the deeply impressed nerves; nerves 11 on each side, strongly elevated beneath, secondary distinct; petiole $\frac{1}{2}$ in., densely hirsute. *Bracts* and bracteoles subsimilar, $\frac{1}{2}$ in., ovate, very hairy. *Calyx-tube* $\frac{1}{16}$ in., glabrescent; teeth $\frac{1}{16}$ in., ovate, closely hairy. *Petals* $\frac{1}{2}$ in., elliptic. *Fruit* not seen.

19. ***S. dryophila***, Clarke; leaves narrowly obovate-lanceolate shortly cuspidate subentire glabrous, racemes long lax sparsely fulvous-hirsute, disc glabrous. *Symplocos*, n. 53, *Herb. Ind. Or. Hk. f. & T.*

EASTERN NIPAL AND SIKKIM, alt. 8–10,000 ft.; in oak forests, *J. D. H.*; Simonbong, alt. 9000 ft., *Gamble*.

A tree (*Gamble*); branchlets glabrous. *Leaves* 6 by $1\frac{1}{2}$ in., base cuneate, densely villous beneath when young, soon glabrous, coriaceous; nerves many, slender, midrib impressed above; petiole $\frac{1}{2}$ in. *Racemes* $3\frac{1}{2}$ in.; bracts caducous, outermost orbicular glabrous, inner oblong villous; pedicels $\frac{1}{2}$ – $\frac{1}{4}$ in., bracteoles obsolete. *Calyx-tube* $\frac{1}{16}$ in., nearly glabrous; teeth $\frac{1}{16}$ in., ovate. *Corolla* $\frac{1}{2}$ in. *Fruit* $\frac{1}{2}$ in. diam., subglobose, smooth; calyx-rim much narrower than the fruit. *Embryo* curved.

20. ***S. grandiflora***, Wall. *Cat.* 4421; leaves lanceolate subentire glabrous, nerves much elevated beneath, racemes elongate lax nearly glabrous, disc glabrous. *A. DC. Prodr.* viii. 257.

KHASIA MTS.; *De Silva*, *Griffith*. ASSAM; *Griffith*.

Branchlets glabrous. *Leaves* 5 by $1\frac{1}{2}$ in., base cuneate or subobtusate, thickly chartaceous; midrib impressed, nerves subparallel, secondary distinct beneath; petiole $\frac{1}{2}$ – $\frac{1}{4}$ in. *Racemes* 2– $3\frac{1}{2}$ in.; bracts caducous; pedicels many, 0– $\frac{1}{2}$ in., glabrous or nearly so; bracteoles $\frac{1}{16}$ in., lanceolate, subciliate. *Calyx-tube* $\frac{1}{16}$ in., obconic, glabrous; teeth $\frac{1}{16}$ in., ovate. *Corolla* $\frac{1}{2}$ – $\frac{1}{4}$ in. *Stamens* 80. *Fruit* $\frac{1}{2}$ by $\frac{1}{2}$ in., subcylindric, smooth; calyx-rim little narrower than the fruit. *Embryo* probably straight.

21. ***S. Sumuntia***, Ham. ms.; *Don Prodr.* 144; leaves oblong-lanceolate acuminate crenulate glabrous coriaceous, racemes $1\frac{1}{2}$ in. hirsute, calyx-teeth

nearly glabrous, fruit ovoid-cylindric. *S. racemosa*, Wall. Cat. 4418, B and lower half A. *Symplocos*, n. 888, Griff. *Itin. Notes*, 173.

HIMALAYA, alt. 3-7000 ft.; from Nipal to Bhotan, frequent; Hamilton, &c. KHASIA; Borpani, Simons.

A small tree; branchlets glabrous. Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate; midrib impressed, nerves 11 pairs, sub-parallel, impressed slightly above; petiole $\frac{1}{2}$ in. Bracts and bracteoles villous, caducous; pedicels $0-\frac{1}{2}$ in., hirsute. Calyx-tube glabrous or nearly so. Petals $\frac{3}{8}-\frac{1}{2}$ in. Stamens 35-40, 5-adelphous. Disc glabrous. Fruit $\frac{1}{2}$ by $\frac{1}{2}$ in., smooth, calyx-rim as wide as the upper part of the fruit. Embryo straight.—Described from Hamilton's type: the fruit from Sikkim examples of J. D. H.—A narrow-leaved var. ? of *S. decora*, Hance (in Trimen Journ. Bot. 1874, 368), from Ningpo, hardly differs but by the slightly longer flowers.

VAR. *floribunda*, Wall. Cat. 4419 (sp.); flowers spiked, i.e. pedicels 0 or most obscure. *S. Sumuntia*, A. DC. Prodr. viii. 255. *Symplocos*, n. 739, Griff. *Itin. Notes*, 150.—Nipal to Bhotan, Assam and Khasia.—Hamilton also collected this, and did not suppose it identical with his *S. Sumuntia*.

22. *S. pyrifolia*, Wall. Cat. 4415; leaves elliptic-lanceolate acuminate minutely toothed glabrous rigid, racemes $1\frac{1}{2}$ in. glabrous or sparsely hairy, calyx-teeth densely silky, fruit cylindric-ellipsoid. A. DC. Prodr. viii. 256.

NIPAL; Wallich. SIKKIM; alt. 7000 ft., J. D. H. BHOTAN; Griffith. KHASIA; alt. 2-6000 ft., very common.

Closely resembling *S. Sumuntia*: the leaves are stiff and crisp rather than coriaceous, the petioles rather longer. Hamilton named this *S. salicifolia* or Lodh of the Bengalees, considering it a var. of *S. racemosa*, Roxb. Don hence took the specific name *S. Loha*, his description of which refers to *S. spicata*.

** *Species of the Malay Peninsula* (see also 12. *S. racemosa*).

23. *S. ophirensis*, Clarke; leaves elliptic-cuneate obtuse subentire glabrous, petiole very short, racemes very short closely silky. *Symplocos*, 42, Herb. Ind. Or. H. f. & T.

MALACCA; Mt. Ophir summit, Griffith (Kew Distrib. n. 3650), Lobb.

Branches glabrous. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate, stiffly chartaceous; nerves distant, reticulations close, prominent beneath; petiole $\frac{1}{10}-\frac{1}{8}$ in. Racemes $\frac{1}{2}$ in., dense; bracts and bracteoles inconspicuous; pedicels $0-\frac{1}{16}$ in. Calyx-tube $\frac{1}{16}$ in. closely fulvous-silky, teeth $\frac{1}{16}$ in., ovate, fulvous-pilose. Petals $\frac{1}{2}$ in. Stamens 40. Disc nearly glabrous. Fruit $\frac{1}{2}$ by $\frac{1}{2}$ in., ovoid-cylindric, smooth; calyx-rim as wide as the upper part of the fruit. Embryo straight.

24. *S. leucantha*, Kurz in Journ. As. Soc. 1873, pt. ii. 89, and For. Fl. ii. 148; leaves oblong or ovate acute crenate glabrous, racemes hardly 1 in. hirsute, calyx nearly glabrous, teeth prominent.

PEGU; Irrawaddi swamp-forests, Kurz; Moulmein, Parish.

A tree 20-25 ft. (Kurz); branchlets glabrous. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in. (in Kurz's examples), much wider in those of Parish, base cuneate or obtuse, thinly chartaceous with slender conspicuous nerves; primary nerves distant, only 1 or 2 pairs from the upper half of the midrib. Pedicels $0-\frac{1}{8}$ in., hairy; bracteoles $\frac{1}{2}$ in., elliptic, hairy, deciduous. Calyx-tube $\frac{1}{16}$ in., teeth $\frac{1}{16}$ in., ovate, nearly glabrous. Corolla $\frac{1}{2}$ in. Stamens 40. Disc glabrous. Fruit unknown.

25. *S. sulcata*, Kurz in Journ. As. Soc. 1871, pt. ii. 65, and For. Fl. ii. 145; leaves oblong acuminate subentire coriaceous glabrous, racemes 1 in. rusty-tomentose, fruit ellipsoid longitudinally furrowed.

MARTABAN and UPPER TENASSERIM, alt. 3-6000 ft.; in the drier hill-forests, frequent, Kurz. MOULMEIN; Lobb.

A tree 20-25 ft. (Kurz); branches glabrous. Leaves $4\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate or

rhomboid, often unequal sided; midrib and nerves strongly raised beneath, nerves 13 pairs sub-parallel; petiole $\frac{1}{4}$ in. *Pedicels* $0\frac{1}{12}$ in.; bracts and bracteoles sub-similar, $\frac{1}{12}$ in., obovate-oblong, pubescent. *Calyx-tube* nearly glabrous; lobes $\frac{1}{12}$ in., ovate-lanceolate, subobtuse, pubescent. *Petals* $\frac{1}{8}$ in. *Stamens* numerous. *Fruit* $\frac{1}{8}$ by $\frac{1}{6}$ in., rusty, calyx-rim much narrower than the fruit, teeth accrescent. *Embryo* straight.

26. **S. leiostachya**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 89; leaves oblong acuminate serrulate fulvous-pilose on the midrib and primary nerves beneath, racemes numerous 2-4 in. very narrow nearly glabrous many-flowered. *S. leiostachya*, *Kurz in Journ. As. Soc.* 1877, pt. ii. 239, and *For. Fl.* ii. 144 (as to flowers only).

TENASSERIM; *Helper* (Kew Distrib. n. 3656).

A large tree (*Helper*). *Leaves* $4\frac{1}{2}$ by 1 in., base obtuse or rounded, coriaceous; midrib and nerves impressed above, prominent beneath; petiole $\frac{1}{2}$ in. *Racemes* axillary, and 10-15 crowded at the ends of the branchlets, 20-40-flowered, when young densely spicate; pedicels later sometimes attaining $\frac{1}{4}$ in.; bracteoles $\frac{1}{12}$ in., ovate, glabrous. *Calyx-tube* $\frac{1}{4}$ in., teeth $\frac{1}{16}$ in., ovate, glabrous. *Petals* $\frac{1}{2}$ in. *Stamens* 40. small. *Fruit* not known.—Kurz mistook the fruit of a Nicobar *Symplocos* (*S. Nicobarica*) for that of this species.

27. **S. nicobarica**, *Clarke*; leaves broadly oblong shortly acuminate serrulate coriaceous nearly glabrous, fruiting racemes 2-3 in. nearly glabrous, fruits ovoid-conic. *S. leiostachya*, *Kurz For. Fl.* ii. 144, partly.

NICOBARS; *Kamorta*, *Kurz*.

Young branchlets fulvous-hirsute. *Leaves* 5 by $1\frac{1}{4}$ in., base rhomboid, obscurely fulvous-pilose on the midrib beneath; nerves prominently raised beneath, not quite parallel; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Racemes* stout; lower pedicels $\frac{1}{2}$ in. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in., smooth; calyx-rim as wide as the upper part of the fruit, teeth erect. *Embryo* straight.—Flowers not known. From the fruit this appears to be allied to *S. racemosa*, Roxb.

28. **S. cerasifolia**, *Wall. Cat.* 4434; leaves oblong acute at both ends crenate pilose on the midrib beneath, spikes $1\frac{1}{2}$ in. villous, calyx-teeth large, fruit ellipsoid large. *A. DC. Prodr.* viii. 257.

PENANG; *Wallich. MALACCA*; *Maingay* (Kew Distrib. n. 962).

Branchlets glabrescent. *Leaves* $5\frac{1}{2}$ by $1\frac{1}{2}$ in., coriaceous; nerves very oblique, distant, obscure above, elevated beneath; petiole $\frac{1}{2}$ in. *Spikes* solitary, axillary and crowded, subterminal; bracts $\frac{1}{4}$ in., ovate, very hairy; pedicels 0; bracteoles caducous. *Calyx-tube* $\frac{1}{16}$ in., subglabrous; teeth $\frac{1}{16}$ in., ovate, subacute, pilose. *Petals* $\frac{1}{8}$ in. *Stamens* 30. *Disc* and lower part of style with a few hairs. *Fruit* 1 by $\frac{1}{2}$ in., smooth; calyx-rim $\frac{1}{2}$ in. broad. *Embryo* straight.

29. **S. rubiginosa**, *Wall. Cat.* 4432; leaves large obovate-oblong acute, nerves parallel much raised beneath, spikes 2 in. silky-villous, fruit ellipsoid small. *A. DC. Prodr.* viii. 257.

PENANG; *Wallich. MALAY PENINSULA*; *Griffith* (Kew Distrib. n. 3652). *MALACCA*; *Maingay* (Kew Distrib. n. 955).

Branchlets rusty-hirsute. *Leaves* $10\frac{1}{2}$ by $4\frac{1}{2}$ in., cuneate at the base, minutely toothed, rubiginous-villous on the nerves beneath or ultimately glabrous, coriaceous; secondary nerves transverse, subparallel, not strongly reticulated; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Spikes* axillary, subremote; bracts and bracteoles subsimilar, $\frac{1}{6}$ - $\frac{1}{4}$ in., ovate, densely villous. *Calyx* sessile, closely silky-villous, tube $\frac{1}{16}$ in.; lobes $\frac{1}{16}$ in., elliptic, subacute. *Petals* $\frac{1}{2}$ in. *Stamens* 30. *Disc* and style glabrous. *Fruit* $\frac{1}{3}$ by $\frac{1}{4}$ in., smooth; calyx-rim $\frac{1}{2}$ in. wide, teeth erect. *Embryo* straight.

30. **S. crassipes**, *Clarke*; leaves large elliptic-lanceolate subentire glabrous short-petioled, racemes $\frac{1}{2}$ in. rusty-villous.



MALACCA; Mount Ophir, *Maingay* (Kew Distrib. n. 960).

Branchlet glabrous. *Leaves* $6\frac{1}{2}$ by 3 in., base rounded subcordate or obtusely rhomboid, stoutly chartaceous; nerves distinct, distant, irregular, not at all parallel; petiole $\frac{3}{8}$ in., very thick. *Raceme* 4-flowered, axillary; pedicels hardly $\frac{1}{12}$ in.; bracteoles 3, $\frac{1}{10}$ in., ovate, rufous-villous. *Calyx* rufous-villous, tube $\frac{1}{10}$ in.; teeth $\frac{1}{12}$ in., ovate. *Petals* $\frac{1}{2}$ in. *Stamens* 30. *Ovary* 3-celled; disc minutely fulvous-pilose. *Fruit* unknown.

31. **S. rigida**, *Clarke* (not of *Wall.*); leaves large lanceolate narrowed at both ends subentire coriaceous glabrous, spikes 2 in. pubescent. *Doxomma rigidum*, *Miers* in *Trans. Linn. Soc. ser. ii. Bot. i. 104.* *Barringtonia rigida*, *Clarke* in *Hook. f. Fl. Brit. Ind. ii. 510.*

MALACCA; *Maingay* (Kew Distrib. n. 767, 965).

A large tree (*Maingay*); branchlets glabrous. *Leaves* 12 by $3\frac{1}{2}$ in., early glabrate; nerves 13 pairs, much elevated beneath, subparallel; petiole $1-1\frac{1}{4}$ in. *Spikes* approximated among the penultimate leaves of the branch, erect, ultimately thick rigid; bracts and bracteoles similar, $\frac{1}{2}$ in., ovate, densely grey hairy without. *Calyx-tube* $\frac{1}{10}$ in., glabrescent; teeth $\frac{1}{10}$ in., ovate, densely grey hairy. *Petals* $\frac{1}{2}$ in. *Stamens* 60. *Disc* glabrous. *Fruit* (imperfectly ripe) nearly 1 by $\frac{1}{2}$ in., oblong-ellipsoid; calyx-rim $\frac{1}{8}$ in. wide, teeth erect.—There may still be a doubt whether *Doxomma rigidum* (*Maingay*, n. 767) is the fruiting state of *Symplocos* sp. (*Maingay*, n. 965) in good flower; the petioles are longer, the fruiting spike extraordinarily thickened; but it is the fruit either of *Maingay*, n. 965, or some closely allied species.

*** *Species of the Deccan Peninsula* (see also 12. *S. racemosa*).

32. **S. monantha**, *Wight* *Ic. t. 1236*; leaves lanceolate acute or acuminate at both ends glabrous, flowers solitary axillary sessile or very shortly pedicelled. *Bedd. For. Man. 150.*

SHEVAGHERY HILLS; *Wight*. TINNEVELLY Mts.; *Beddome*.

A leafy, very ramous shrub (*Wight*); branchlets soon glabrate. *Leaves* $1\frac{1}{2}$ by $\frac{2}{3}$ in., base cuneate or subobtusely, subentire or minutely toothed, nerves inconspicuous; petiole $\frac{1}{8}$ in. *Peduncles* $0-\frac{1}{10}$ in.; bracteoles small, sometimes numerous. *Calyx-tube* $\frac{1}{20}$ in., minutely tomentose, teeth $\frac{1}{20}$ in., elliptic. *Petals* $\frac{1}{2}$ in., or more. *Stamens* 40. *Disc* minutely hairy. *Fruit* not seen.

33. **S. anamallayana**, *Bedd. Ic. Pl. Ind. Or. t. 116*, and *For. Man. 150*; leaves broadly elliptic subobtusely glabrous, flowers solitary peduncled. *S. uniflora*, *Bedd. in Trans. Linn. Soc. xxv. 219*, not of *Benth.*

ANAMALLAYS, alt. 5-6000 ft.; *Beddome*.

A small tree (*Beddome*); glabrous or the margins of the calyx-lobes minutely pubescent. *Leaves* $1\frac{1}{2}$ by 1 in., base obtuse or rounded, serrulate, rigidly chartaceous; nerves distant, secondary distinctly reticulated; petiole $\frac{1}{8}$ in. *Peduncles* $\frac{1}{4}-\frac{1}{2}$ in., slender, solitary (or, ex *Beddome*, sometimes 2-3 together) in axils; bracts 0; bracteoles $\frac{1}{2}$ in., lanceolate, caducous, at the base of the calyx-tube. *Calyx-tube* $\frac{1}{16}$ in.; teeth $\frac{1}{24}$ in., triangular. *Petals* $\frac{1}{6}$ in. *Stamens* 40. *Disc* glabrous. *Fruit* not seen.

34. **S. microphylla**, *Wight* *Ic. t. 1232*; leaves elliptic obtuse or scarcely acute serrulate almost glabrous, spikes very short dense fulvous-villous, disc and style pilose. *Bedd. For. Man. 150.*

NILGHERRIES; *Gardner*; *Avalanche*, *Wight*.

A ramous bush, 6 ft. high (*Wight*); branchlets rufous-villous. *Leaves* attaining $2\frac{1}{2}$ by $1\frac{1}{2}$ in. (in *Wight*'s examples), obtuse at the base, rigidly coriaceous, adpressedly fulvous pilose on the midrib beneath or glabrate; primary nerves 8 pairs, strong, reticulations distinct; petiole $\frac{1}{4}$ in. *Spikes* $\frac{1}{4}-\frac{3}{4}$ in.; bracts $\frac{1}{2}$ in., ovate, fulvous-villous. *Calyx* nearly glabrous, tube $\frac{1}{10}$ in., lobes $\frac{1}{12}$ in., ovate. *Petals* $\frac{1}{8}-\frac{1}{2}$ in. *Stamens* 50. *Style* sparsely fulvous-pilose; disc shortly closely pilose. *Fruit* not known.

35. **S. macrocarpa**, *Wight ms.*; leaves oblong narrowed at both ends glabrous, spikes short dense rusty-pubescent, calyx-tube pubescent, fruit large long-ellipsoid.

SOUTH DECCAN PENINSULA; Courtallum, *Wight, herb*, nn. 467, 469.

Branchlets stout, rusty. *Leaves* attaining 8 by $2\frac{1}{2}$ in., slightly crenulate, chartaceous; primary nerves 9 pairs, conspicuous but not thick, secondary nerves distinct beneath; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. *Spikes* $\frac{1}{2}$ – $1\frac{1}{2}$ in., stout; bracts $\frac{1}{2}$ in., spatulate obovate, rusty-pubescent; flowers crowded. *Calyx-tube* $\frac{1}{10}$ in., teeth more than $\frac{1}{2}$ in., lanceolate. *Petals* $\frac{1}{2}$ in. *Stamens* 40. *Disc* and style glabrous or nearly so. *Fruit* $1\frac{1}{2}$ by $\frac{3}{4}$ in., smooth, round; calyx-rim $\frac{1}{2}$ in., broad, teeth patent.—Examples in young fruit may be distinguished from *S. Beddomei* by the short stout spikes, and the shorter petioles.

36. **S. Gardneriana**, *Wight Ic. t.* 1231; leaves elliptic cuneate at both ends villous beneath, nerves numerous strong subparallel, calyx-tube densely hairy, fruits hairy. *Bedd. Fl. Sylv. t.* 237.

SOUTH MALABAR MTS., alt. 4–7500 ft.; Nilgherries, Travancore, Anamallays, &c., frequent.

A small tree; branchlets thick, villous. *Leaves* $4\frac{1}{2}$ by 2 in., slightly crenulate, coriaceous; nerves 10 pairs; petiole $\frac{1}{2}$ in., stout, rusty-villous. *Spikes* 2 in., stout fulvous-villous; bracts $\frac{1}{2}$ – $\frac{3}{4}$ in., ovate, densely villous, caducous; flowers sessile or the lower pedicels attaining $\frac{1}{2}$ in. *Calyx-tube* $\frac{1}{12}$ in., teeth $\frac{1}{2}$ in., oblong, densely silky. *Petals* $\frac{1}{2}$ – $\frac{3}{4}$ in., round. *Stamens* 50. *Disc* shortly densely villous. *Fruit* $\frac{3}{4}$ – 1 in., cylindric, densely villous; calyx-rim $\frac{1}{2}$ in. wide, teeth patent.—Easily distinguished by the very hairy fruit. *Beddome's* figure represents the fruit of *Gardneriana*, but the leaves of a plant since sent to Kew as a new species. This latter has leaves more rounded at the base and more acute bracts than *S. Gardneriana*.

37. **S. Hohenackeri**, *Clarke*; leaves elliptic cuneate at both ends villous beneath, nerves numerous strong subparallel, calyx-tube glabrous. *Eriobotryæ* vel *Photiniæ* affinis, *Miq. in Pl. Hohenack. n.* 456.

Mercara in CANARA, *Hohenacker*.

Hohenacker's example (in flower) resembles *S. Gardneriana* in every point but the conspicuously glabrous calyx-tube, the calyx-teeth being densely silky. It has hence been supposed a simple-spiked var. of *S. kurgensis*, n. 11; but it so closely resembles *S. Gardneriana* that further material may show it a mere variety thereof.

38. **S. Beddomei**, *Clarke*; leaves elliptic or oblong narrowed at both ends gland-serrulate glabrous, spikes long fulvous-villous, calyx-tube glabrous teeth sparsely pilose, fruit ovoid. *S. reticulata*, *Grah. Cat. Bomb. Pl.* 104. *Symplocos* sp., *Herb. Wight*, n. 62. *Hopea racemosa*, *Dalz. & Gibs. Bomb. Fl.* 140.

WESTERN GHATS; from the Concan to Kurg, frequent.

Perhaps only a variety of *S. racemosa*; but the leaves are less coriaceous, the nerves more numerous (9 pairs), more distinct, the crenatures stronger, the inflorescence spicate, scarcely racemose; but the greatest difference is in the fruit, which is ovoid, $\frac{1}{2}$ by $\frac{1}{2}$ in. (that of *S. racemosa* is much narrower, not wider towards the base).

VAR. glabrata; flowering spikes nearly glabrous, fruit subcylindric. *Symplocos*, n. 32, *Herb. Ind. Or. Hk. f. & T.—Kurg*; *G. Thomson*.—Leaves glabrous from the bud; calyx-teeth glabrous; lower pedicels in fruit attaining $\frac{1}{2}$ in.; fruits $\frac{1}{2}$ – $\frac{3}{4}$ by $\frac{1}{2}$ in.

VAR. flagellaris; spikes in young fruit $5\frac{1}{2}$ in. long slender wavy, otherwise as var. *glabrata*.—Bombay Presidency; *Dalzell*.

39. **S. foliosa**, *Wight Ic. t.* 1234; leaves elliptic or oblong serrulate from the base glabrous, spikes fulvous-villous, calyx-tube glabrous. *S. nervosa*, *Wight Ic. t.* 1235; *Bedd. For. Man.* 149, not of *A. DC.*

NILGHERRIES, alt. 5-7500 ft.; *Wight, Gardner, Hohenacker* common about Ootacamund, *Beddome*.

A large tree (*Beddome*); branchlets soon glabrate. *Leaves* $8\frac{1}{2}$ by $1\frac{1}{2}$ - $1\frac{1}{2}$ in., acuminate or shortly acute, base cuneate or obtuse; serratures regular, close; nerves 9 pairs, prominent beneath; petiole $\frac{1}{2}$ in. *Spikes* 1- $1\frac{1}{2}$ in.; bracts caducous. *Calyx-tube* $\frac{1}{12}$ in., teeth $\frac{1}{10}$ in., oblong, glabrous or sparsely pilose. *Petals* $\frac{1}{8}$ in. *Stamens* 40. *Disc* and style glabrous. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in., broadly cylindric, smooth; calyx-rim scarcely $\frac{1}{2}$ in. wide.—Distinguished from all other Indian species by the leaves being serrulate from the very base. The examples marked by *Wight S. nervosa* are identical with those marked by him *S. foliosa*, as *Beddome* divined; but *Wight's S. nervosa* is not *DeCandolle's* (as *Beddome* presumed), and the name *S. nervosa* has been so misapplied that the undisputed one of *S. foliosa* is adopted here for this well-marked species.

40. *S. rosea*, *Bedd. in Trans. Linn. Soc. xxv. 219*; leaves elliptic-oblong sharply acuminate serrate glabrous, racemes 1-3 in. very hairy as is the calyx, flowers rose-coloured, fruit puberulous. *Bedd. Ic. Pl. Ind. Or. t. 115, and For. Man. 150.*

ANAMALLAYS, alt. 2-4000 ft., *Beddome*.

A large shrub; young branches petioles and inflorescence hairy. *Leaves* 5-6 by $1\frac{1}{2}$ - $2\frac{1}{2}$ in.; petiole $\frac{1}{2}$ in. *Bracts* deciduous. *Calyx-lobes* acute, half as long as the corolla. *Fruit* $\frac{1}{2}$ in., oblong.—Description copied from *Beddome*.

VAR. *glabrior*; calyx-tube glabrous, fruit glabrous. *S. racemosa*, *Herb. Wight, not of Roxb.*—Courtallum and Cochin; *Wight*.—*Leaves* obovate-lanceolate, chartaceous; nerves 6-7 pairs, slender, distinct not parallel. *Pedicels* (in fruit) $\frac{1}{8}$ in. *Calyx-rim* (in fruit) nearly $\frac{1}{2}$ in., wide (as wide as the summit of the fruit). *Wight's* examples fit *Beddome's* picture so well, that this is probably not even a variety.

41. *S. acuminata*, *Bedd. Ic. Pl. Ind. Or. t. 117, and For. Man. 150*; leaves obovate-lanceolate acuminate glabrous, racemes slender few-flowered slightly hairy, calyx glabrous, flowers $\frac{1}{2}$ in. diam.

MALABAR; Wynaad, very common on the Brumagherries, alt. 6000 ft., and on the Tirrioot Peak, *Beddome*.

A small tree, or large shrub; young shoots, peduncles and bracts minutely hairy, otherwise quite glabrous. *Leaves* 4 by $1\frac{1}{2}$ - $1\frac{1}{2}$ in., base attenuated, subentire. *Racemes* 1-2 in.; pedicels 0- $\frac{1}{10}$ in. *Calyx-lobes* rounded or subacute, half as long as the corolla.—Not seen; description taken from *Beddome*.

42. *S. pulchra*, *Wight Ic. t. 1230 (not good)*; leaves oblong acuminate brown-hirsute on both surfaces, racemes 1-2 in., flowers 1-4 large. *Bedd. For. Man. 149.*

NILGHERRIES; Sispara Ghat, alt. 3-4000 ft., *Gardner, Wight, Beddome*.

A shrub; branches densely fulvous-hirsute. *Leaves* $4\frac{1}{2}$ by $1\frac{1}{2}$ in., base rounded, denticulate, chartaceous; nerves 7 pairs, distinct, very oblique; petiole $\frac{1}{10}$ - $\frac{1}{8}$ in. *Peduncles* patently rufous-hirsute; pedicels 0- $\frac{1}{8}$ in.; bracteoles $\frac{1}{8}$ - $\frac{1}{4}$ in., linear, hirsute. *Calyx-tube* $\frac{1}{10}$ in., sparsely pilose; teeth $\frac{1}{10}$ in., ovate, glabrescent. *Petals* $\frac{1}{4}$ - $\frac{1}{2}$ in., elliptic. *Stamens* 50-60. *Disc* densely pilose.—*Wight's* figure omits the thick, long, spreading brown hairs of the branches, leaves, and peduncles; it is hence very likely to mislead.

43. *S. obtusa*, *Wall. Cat. 4424*; glabrous, leaves obovate-elliptic obtuse subentire coriaceous, spikes 1-4 in., flowers large. *A. DC. Prodr. viii. 255*; *Wight Ic. t. 1233, and Ill. t. 151 b.*; *Thwaites Enum. 185*; *Bedd. For. Man. 149.*

SOUTH MALABAR; Nilgherries and Anamallays, alt. 5-8000 ft., common. CEYLON; alt. 5-8000 ft., frequent.

A tree. *Leaves* $1\frac{1}{2}$ by $\frac{1}{2}$ in., or larger (attaining 7 by $3\frac{1}{2}$ in. in some Ceylon varieties),



base attenuated, margin often reflexed; nerves distant, irregular, distinct beneath; petiole long, often $\frac{1}{2}$ in. in the small-leaved varieties. *Bracts* caducous; pedicels 0, or (rarely) $\frac{1}{10}$ in. *Calyx-tube* $\frac{1}{10}$ in., teeth $\frac{1}{12}$ in., round, prominent. *Petals* $\frac{1}{2}$ in. *Stamens* 50–60. *Disc* glabrous. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in., ovoid-cylindric, smooth; calyx-rim $\frac{1}{2}$ in., broad, teeth prominent.—The varieties enumerated by Thwaites do not differ much from the type, but vary greatly as to the size of the leaves.

*** *Species of Ceylon* (see also n. 43. *S. obtusa*).

44. *S. læta*, Thwaites Enum. 184; glabrous, leaves elliptic-lanceolate acute at both ends, spikes 1–2½ in. *Bedd. For. Man.* 151.

CEYLON; elevated parts of the Central Province, Thwaites.

A tree. *Leaves* 2 by $\frac{3}{4}$ in., minutely toothed. *Spikes* often peduncled; bracts small, caducous; bracteoles 0; lower pedicels 0, rarely 0– $\frac{1}{10}$ in. *Calyx-lobes* $\frac{1}{10}$ in., round. *Petals* $\frac{1}{2}$ – $\frac{1}{3}$ in. *Stamens* 30. *Fruit* more than $\frac{1}{4}$ in., ellipsoid.—Otherwise resembling *S. obtusa*, from which it differs in its acute leaves and smaller flowers.

VAR. *pedicellata*; pedicels longer, attaining sometimes $\frac{1}{2}$ in.—Ceylon; Thwaites, n. 165.

45. *S. bractealis*, Thwaites Enum. 185; glabrous, leaves elliptic-oblong scarcely acute, spikes 1–2 in., bracts ovate glabrous ciliate, bracteoles large persistent. *Bedd. For. Man.* 151.

CEYLON; elevated parts of the Central Province, Walker, Thwaites.

A tree. *Leaves* 2 by 1 in., base obtuse or subacute, closely minutely serrulate, coriaceous; nerves 6 pairs, prominent beneath, secondary distinct; petiole $\frac{1}{2}$ in. Rhachis of the *spike* glabrous or sparingly fulvous-pilose. *Bracts* $\frac{1}{2}$ in. and upwards; bracteoles $\frac{1}{2}$ in., sometimes persistent under the ripe fruit. *Calyx-tube* $\frac{1}{16}$ in., lobes $\frac{1}{12}$ in., round. *Petals* $\frac{1}{5}$ in., obovate. *Stamens* 60. *Disc* glabrous. *Fruit* $\frac{1}{3}$ by $\frac{1}{2}$ in., ellipsoid, narrowed at both ends.

VAR. *revoluta*, Wight & Gardner; leaves exceedingly coriaceous, margins revolute.—Ceylon.

46. *S. versicolor*, Clarke; glabrous, leaves oblong acuminate at both ends subentire chartaceous, spikes 1–2 in., bracts and bracteoles small glabrous ciliate. *S. rufescens*, Thwaites Enum. 184; *Bedd. For. Man.* 150, not of H. B. K.

CEYLON; Ambagamowa District, Thwaites.

Branchlets when young glabrous; reddish when dried. *Leaves* 4 by 1½ in., drying with red blotches; nerves distant, indistinct; petiole $\frac{1}{2}$ in. *Spikes* glabrous; bracts $\frac{1}{2}$ in., ovate, deciduous; bracteoles $\frac{1}{16}$ in., oblong, more ciliate, subpersistent. *Calyx-tube* $\frac{1}{10}$ in., glabrous, teeth $\frac{1}{16}$ in., scarcely ciliate on the margin. *Petals* $\frac{1}{2}$ in. *Fruit* unknown. Probably allied to the two preceding rather than to *S. spicata* as Thwaites supposed.

47. *S. acuta*, Thwaites Enum. 186; leaves elliptic-lanceolate acuminate subentire glabrescent except the nerves beneath, racemes small villous, calyx glabrous with rounded lobes. *Bedd. For. Man.* 151.

CEYLON; Saffragam District, alt. 2000 ft., Thwaites (C.P. 2681, partly).

A tree; young branches fulvous-villous at the tips. *Leaves* 3½ by 1½ in., base cuneate or subobtusate, adpressedly fulvous-pilose on the nerves beneath, coriaceous; nerves 8 pairs, obscure above, strongly raised beneath; petiole $\frac{1}{2}$ in. *Racemes* $\frac{1}{2}$ –1 in.; bracts $\frac{1}{2}$ in., ovate, fulvous-pilose, deciduous; pedicels $\frac{1}{10}$ in.; bracteoles $\frac{1}{16}$ in., lanceolate, ciliate. *Calyx-tube* $\frac{1}{24}$ in., teeth $\frac{1}{10}$ in., scarcely pubescent on the margins. *Petals* $\frac{1}{2}$ in. *Fruit* unknown; that described by Thwaites belongs to *S. cuneata* (mixed with C.P. 2681)

48. *S. cuneata*, Thwaites Enum. 186; leaves elongate-lanceolate at-

tenuate at both ends subentire glabrous except the nerves beneath, racemes small villous, calyx densely silky with oblong lobes.

CEYLON; Moon; Pasdoon Corle at no great elevation, *Thwaites* (C.P. 2920 and part 2681).

A tree; branchlets fulvous-villous. *Leaves* $5\frac{1}{2}$ by $1\frac{1}{4}$ in., adpressedly fulvous-pilose on the nerves beneath, coriaceous; nerves 8 pairs, obscure above, strongly raised beneath; petiole $\frac{1}{4}$ in. *Racemes* 1 in.; bracts $\frac{1}{2}$ in., ovate, deciduous; pedicels $\frac{1}{12}$ in.; bracteoles $\frac{1}{12}$ in., ovate. *Calyx-tube* $\frac{1}{10}$ in., teeth $\frac{1}{8}$ in. *Corolla* not seen. *Disc* and style glabrous. *Fruit* $\frac{1}{2}$ by $\frac{1}{8}$ in., long-cylindric, softly villous; calyx-rim as wide as the upper part of the fruit; teeth enlarged, $\frac{1}{8}$ - $\frac{1}{6}$ in. long, lanceolate.

49. **S. hispidula**, *Thwaites Enum.* 186; leaves oblong-elliptic acuminate hispid beneath, racemes 1-4 in., bracts ovate hispid, calyx-tube and fruit softly hairy. *Bedd. For. Man.* 151. *S. subcordata*, *Wight ms.*

CEYLON; alt. 3-5000 ft., *Wight, Walker, Thwaites.*

A tree; branchlets with patent, fulvous, bristly hairs. *Leaves* $3\frac{1}{2}$ by 2 in., from cuneate-oblong acuminate to cordate-orbicular shortly acute, obscurely crenate, fulvous-hirsute or glabrate above, patently hispid at least on the nerves beneath; nerves 7 pairs; petiole $\frac{1}{10}$ - $\frac{1}{4}$ in., usually short. *Racemes* lax, irregular; bracts $\frac{1}{2}$ in., hispid; pedicels $0\frac{1}{8}$ (rarely $\frac{1}{4}$) in.; bracteoles $\frac{1}{8}$ in., subacute, hispid. *Calyx-tube* $\frac{1}{10}$ in., lobes $\frac{1}{10}$ in., ovate, obtuse, glabrescent upwards. *Petals* $\frac{1}{4}$ in., round. *Stamens* 50. *Disc* hairy. *Fruit* $\frac{1}{3}$ - $\frac{1}{2}$ by $\frac{1}{8}$ in., cylindric; calyx-rim as wide as the fruit, teeth enlarged, lanceolate, suberect.—Readily separated from the neighbouring Ceylon species by the hairy fruit; but may be only a form of *S. pulchra*.

50. **S. jucunda**, *Thwaites Enum.* 186; leaves cordate-oblong attenuate subentire rufous-hirsute beneath, racemes $1\frac{1}{2}$ in. rufous-hirsute, bracts linear rufous-hirsute, calyx-tube and fruit pilose. *Bedd. For. Man.* 151.

CEYLON; Deltotte and Saffragam, alt. 3-4000 ft., *Thwaites.*

A tree; branchlets densely patently rufous-hirsute. *Leaves* $3\frac{1}{4}$ by $1\frac{1}{4}$ in., tapering from near the base, chartaceous, glabrous above; primary nerves 9 on each side the midrib, springing nearly at right angles therefrom; petiole $\frac{1}{8}$ - $\frac{1}{6}$ in. *Fruit* $\frac{1}{2}$ in., cylindric (*Thwaites*).—Nearly allied to *S. hispidula*, *Thwaites*, but differs in the nervation of the leaves and the linear bracts.

51. **S. angustata**, *Clarke*; leaves small oblong-lanceolate acuminate entire adpressedly fulvous-pilose on the nerves beneath, racemes $1-2\frac{1}{2}$ in. fulvous-pilose very slender, calyx glabrous. *S. elegans* var. *angustata*, *Thwaites Enum.* 186, partly.

CEYLON; Newera Ellia, *Macrae*; Jatagama, *Thwaites* (C.P. 78).

Branchlets adpressedly shortly rufous-pilose. *Leaves* 2 by $\frac{3}{4}$ in., acute, base obtuse or rounded, glabrous except the nerves beneath, coriaceous; nervation irregular, not prominent; petiole $\frac{1}{8}$ - $\frac{1}{6}$ in. *Racemes* sometimes slightly compound; bracts $\frac{1}{16}$ in.; pedicels $0\frac{1}{8}$ in.; bracteoles $\frac{1}{16}$ in., hairy, persistent. *Calyx-tube* $\frac{1}{16}$ in., teeth $\frac{1}{16}$ in., round. *Petals* $\frac{1}{4}$ in. *Fruit* $\frac{1}{3}$ by $\frac{1}{8}$ in., ovoid-cylindric smooth; calyx-rim nearly as wide as the upper part of the fruit, teeth somewhat enlarged, suberect.

52. **S. latiflora**, *Clarke*; leaves oblong acuminate serrulate hispid on the nerves beneath, racemes $\frac{1}{2}$ -1 $\frac{1}{2}$ in. villous bracteate, calyx-tube glabrous, flowers large. *S. hirsuta*, *Wight & Gardn. in Thwaites Enum.* 185, excl. var. β ; not of *A. DC.*

CEYLON; alt. 5-8000 ft., *Walker, Gardner, Thwaites.*

A tree; branchlets fulvous-hispid. *Leaves* $3\frac{1}{4}$ by 1 in., base obtuse or rounded, serrulate nearly to the base, chartaceous; nerves 7 pairs, irregular; petiole $\frac{1}{4}$ in. *Bracts* $\frac{1}{8}$ in., ovate, villous; pedicels $0\frac{1}{10}$ in.; bracteoles $\frac{1}{10}$ in., ovate, villous. *Calyx-tube* $\frac{1}{12}$ in., teeth $\frac{1}{10}$ in., round. *Petals* $\frac{1}{2}$ in., round. *Stamens* 80-100. *Disc* and

style glabrous. *Fruit* $\frac{1}{4}$ by $\frac{1}{8}$ in., ellipsoid, smooth; calyx-rim scarcely $\frac{1}{10}$ in., broad; lobes $\frac{1}{8}$ in., patent.

53. *S. minor*, *Clarke*; leaves small elliptic subobtusely serrulate hispid on the nerves beneath, racemes $\frac{1}{2}$ – $1\frac{1}{2}$ in. patently fulvous-hirsute, calyx-tube glabrous. *S. hirsuta*, *Thwaites Enum.* 185, var. β minor, mostly. *S. elegans*, *Thwaites l. c.*, var. β , partly.

CEYLON; *Macrae*, *Walker*, *Gardner*, *Thwaites* (C.P. 273, 155).

Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in., obtuse or very suddenly acute, base rounded, coriaceous, margin recurved, nervation strong beneath. *Bracts* caducous. *Fruit* $\frac{1}{4}$ by $\frac{1}{8}$ in., cylindric smooth; calyx-rim as wide as the top of the fruit.—Allied to *S. latiflora*, and treated as a variety of it by *Thwaites*, but there are no examples intermediate between the two forms.

VAR. *eugenioides*, *Champ. ms.*; branchlets adpressedly fulvous-pilose at the tips only, leaves very small glabrous or nearly so, racemes scarcely $\frac{1}{2}$ in. long 1–2 (rarely 4-) flowered nearly glabrous.—Ceylon, *Walker*; Horton Plains, *Champion*.

VAR. *glabrescens*, *Thwaites ms.*; branchlets early glabrous, leaves coriaceous, racemes short few-flowered densely fulvous-villous.—Ceylon; Central Provinces, alt. 6000 ft., *Thwaites*.—Resembles *S. microphylla*. Placed with *S. minor* by *Thwaites*, but differs in the glabrousness of the leaves, and dense fulvous hairy spikes.

54. *S. elegans*, *Thwaites Enum.* 185, var. α only; leaves broadly elliptic acutely acuminate adpressed rufous-hirsute on the midrib beneath, racemes $\frac{1}{2}$ – $1\frac{1}{2}$ in. slender rufous-hairy, calyx glabrous. *Bedd. For. Man.* 151.

CEYLON; alt. 5–7000 ft., *Champion*, *Thwaites*.

Possibly a var. of *S. latiflora*, *Clarke*. *Leaves* 2 by 1 in., base rounded, slightly crenate-serrate. *Racemes* more slender, bracts narrower, flowers smaller than in *S. latiflora*.

55. *S. hebantha*, *Thwaites ms.*; leaves elliptic acuminate subentire glabrescent, spikes 1–3 in. densely villous, calyx-tube glabrous teeth silky.

CEYLON; *Songalla*, *Thwaites* (C.P. 3918).

Branchlets villous. *Leaves* $3\frac{1}{2}$ by 2 in., base rounded, coriaceous, sparsely pilose on the nerves beneath; nerves 7 pairs, conspicuous beneath, sub-parallel; petiole $\frac{3}{8}$ in. *Spikes* stout, dense; bracts more than $\frac{1}{4}$ in., ovate, densely hairy.—This may be a Ceylon form of *S. Beddomei*; but differs in the leaves rounded at the base, less crenate.

56. *S. cordifolia*, *Thwaites Enum.* 187; leaves large cordate elliptic nearly sessile glabrous, spikes stout densely villous crowded near the ends of the branches, calyx-tube glabrous teeth villous. *Bedd. For. Man.* 151.

CEYLON; alt. 6–7000 ft., *Macrae*, &c.

A tree; branchlets thick. *Leaves* 6 by $2\frac{3}{4}$ in. (sometimes much larger), scarcely acute, rounded or attenuate at the base but always cordate at the petiole, minutely denticulate, coriaceous; nerves 13 pairs, distinct beneath; petiole $0\frac{1}{8}$ in. *Spikes* 2–4 in., often 8–12 quasi-fasciculate at the ends of the branches; bracts $\frac{1}{4}$ – $\frac{1}{2}$ in., ovate, villous. *Calyx-tube* $\frac{1}{10}$ in., teeth $\frac{1}{8}$ in. *Petals* $\frac{1}{4}$ in., elliptic. *Stamens* 60. *Disc* hairy. *Fruit* $\frac{1}{4}$ by $\frac{1}{4}$ in., cylindric; calyx-teeth enlarged, triangular, densely hairy.

57. *S. apicalis*, *Thwaites Enum.* 187; leaves large obovate-lanceolate acuminate glabrous, spikes 1–2 in. hirsute, calyx-tube hairy. *Bedd. For. Man.* 151.

CEYLON; *Moon*; Reigam Corle and between Ratnapoora and Galle at no great elevation, *Thwaites*.

Subarboreal (*Thwaites*); branchlets hairy, afterwards nearly glabrous. *Leaves* clustered at the end of the branchlets or the lower sometimes whorled, 13 by 5 in.,



base attenuated, sometimes very shortly cordate at the petiole, nearly entire, stoutly chartaceous; nerves 13 pairs, prominent beneath; petiole $\frac{1}{10}$ – $\frac{1}{8}$ in. Bracts $\frac{1}{2}$ in., ovate, black-hirsute, subsistent. Fruit more than $\frac{1}{2}$ by $\frac{1}{2}$ in., cylindric, villous finally glabrescent; calyx-rim as wide as the fruit, teeth $\frac{1}{2}$ in., triangular, acute, suberect, villous.

58. *S. marginalis*, Thwaites Enum. 187; leaves elliptic acute coriaceous densely ferruginous-hirsute on the nerves beneath, spikes 3–6 in. densely ferruginous-hirsute, calyx-tube and young fruit densely ferruginous-hirsute. Bedd. For. Man. 151.

CEYLON; Ambagamowa District, Thwaites.

A tree; branchlets stout, densely ferruginous-hirsute. Leaves 6 by 3 in., base obtuse or rounded, subentire, rugose, glabrous above; nerves 13 pairs, very prominent and thick beneath; petioles $\frac{1}{4}$ – $\frac{1}{3}$ in. Spikes very stout; bracts deciduous. Disc villous. Fruits (half-ripe) $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid; calyx-teeth $\frac{1}{2}$ in., elliptic.

59. *S. coronata*, Thwaites Enum. 187; leaves large oblong or elliptic narrowed at both ends serrulate fulvous-villous on the nerves beneath, spikes 1–3 in. fulvous-villous, calyx-tube and young fruit softly villous. Bedd. For. Man. 152.

CEYLON; alt. 2–4000 ft., Macrae, &c.

A tree. Leaves attaining 12 by $3\frac{1}{2}$ in., attenuate downwards but shortly cordate at the petiole, closely but minutely serrulate, coriaceous; nerves 13 pairs, much elevated beneath, reticulations very prominent beneath; petiole $\frac{1}{8}$ – $\frac{1}{4}$ in. Spikes dense with flowers nearly to their base; bracts $\frac{1}{2}$ in., ovate, villous, subsistent. Calyx-tube $\frac{1}{10}$ in.; teeth $\frac{1}{10}$ in., oblong, densely silky. Petals $\frac{1}{2}$ in., appear to have been red or purple. Stamens 50. Fruit (half-ripe) $\frac{1}{2}$ by $\frac{1}{4}$ in., ovoid, hairy; calyx-teeth $\frac{1}{2}$ in., suberect.

VAR. *obovata*; leaf 7 by $4\frac{3}{4}$ in. broadly obovate.—Ceylon.

SUBGENUS II. *Ciponima* (including CORDYLOBLASTE). Petals distinctly connate, tube often elongate; flower-buds obovate-oblong or clavate. Filaments adnate to the corolla throughout the tube, and often produced as a free tube. Calyx-tube produced much above the ovary, free, with short lobes.

60. *S. pendula*, Wight Ic. t. 1237; glabrous, leaves elliptic subentire, peduncles $\frac{1}{2}$ – $\frac{3}{4}$ in. 1-flowered pendulous in bud, corolla-tube $\frac{1}{2}$ in. Bedd. For. Man. 152.

MALABAR AND TRAVANCORE MTS.; alt. 4–6000 ft., common, Wight, Beddome.

A tree. Leaves $2\frac{1}{2}$ by 1 in., obtuse, base cuneate, coriaceous; nerves irregular, distinct beneath; petiole $\frac{1}{2}$ in. Peduncles solitary or 1–3 together; bracteoles $\frac{1}{4}$ in., minutely ciliate. Calyx-tube $\frac{1}{2}$ in., lobes scarcely $\frac{1}{4}$ in. Corolla in bud $\frac{1}{2}$ in. Stamens 40–60; no free staminal tube. Disc and style glabrous. Fruit not seen.

61. *S. pauciflora*, Wight ms.; nearly glabrous, leaves elliptic subentire, peduncles $\frac{1}{4}$ – $\frac{3}{4}$ in. 1-flowered always erect, corolla-tube $\frac{1}{2}$ in. *S. pendula*, Thwaites Enum. 184.

CEYLON; Wight, &c.; alt. 5–8000 ft., abundant, Thwaites.

Perhaps only a Ceylon form of *S. pendula* as Thwaites supposes, but the peduncles are always much longer and slenderer, at no time pendulous, often several-flowered with very long pedicels, not rarely rusty-pubescent. Fruit (unripe) $\frac{1}{2}$ by $\frac{1}{2}$ in., cylindric, curved.

62. *S. sessilis*, Clarke; glabrous, leaves obovate-oblong obtuse subentire, flowers solitary sessile or subsessile erect, corolla-tube $\frac{1}{2}$ in.

TRAVANCORE MTS., Beddome.

Differs from *S. pendula* in the erect, smaller flowers; from *S. pauciflora* in the

want of peduncles; considered a var. of *S. pendula* by Beddome (*For. Man.* 152), but ranked as a species by Benth. (*Gen. Pl.* ii. 669).

63. **S. Henscheli**, Benth. in *Gen. Pl.* ii. 669; leaves elliptic-oblong narrowed at both ends subentire ultimately nearly glabrous, racemes small ashy silky, corolla-tube $\frac{1}{2}$ – $\frac{1}{4}$ in. subglabrous. *Cordyloblaste Henscheli*, Moritz in *Bot. Zeit.* 1848, 606.

MALACCA; Mt. Ophir, Griffith (Kew Distrib. n. 3644), Lobb.

Branchlets sparsely pilose. *Leaves* 4 by $1\frac{1}{2}$ in., sometimes obscurely pubescent beneath, coriaceous; nerves irregular, indistinct; petiole $\frac{1}{4}$ in. *Racemes* $\frac{1}{4}$ – $\frac{1}{2}$ in. diam., 1–5-flowered; bracts minute; pedicels $0\frac{1}{2}$ in. *Calyx-tube* $\frac{1}{2}$ in., grey-silky, lobes scarcely $\frac{1}{4}$ in. *Corolla* in bud $\frac{1}{2}$ by $\frac{1}{2}$ in. *Stamens* 40–60; staminal tube $\frac{1}{10}$ in., free. *Disc* villous; style $\frac{1}{2}$ – $\frac{1}{3}$ in., glabrous, stigma large capitate. *Fruit* not seen.

VAR. *hirtistylis*; flowers rather larger, style hirsute.—Mt. Ophir; Maingay (n. 2586, herb. prop.).

64. **S. Maingayi**, Benth. in *Gen. Pl.* ii. 669; leaves elliptic narrowed at both ends sparsely pubescent beneath, racemes dense ferruginous hairy, corolla-tube 1 in. silkily white-tomentose without.

MALACCA; Maingay (Kew Distrib. n. 961).

Branchlets stout, rusty-hirsute. *Leaves* $4\frac{1}{2}$ by 2 in., subentire, coriaceous; nerves irregular, indistinct; petiole $\frac{1}{4}$ in. *Racemes* 1 in., stout; bracts $\frac{1}{2}$ in., ovate, ferruginous-hairy; pedicels $0\frac{1}{2}$ in.; bracteoles minute. *Calyx-tube* $\frac{1}{2}$ in., hairy, teeth $\frac{1}{10}$ in. *Corolla-tube* narrow, glabrous within; lobes $\frac{1}{2}$ in., elliptic. *Stamens* 40–60, staminal tube $\frac{1}{2}$ in., free, dividing into 20 ligulate lobes. *Disc* and style hairy. *Ovary* 3–5-celled with 1 pendulous ovule in each cell (Maingay). *Fruit* $1\frac{3}{4}$ by $1\frac{1}{4}$ in., obovoid, obtuse, glabrescent; endocarp very thick, woody; calyx-rim $\frac{1}{2}$ in. wide, less than one-tenth the width of the upper part of the fruit.

2. STYRAX, Linn.

Trees and shrubs. *Leaves* elliptic-lanceolate. *Flowers* in lax little-divided axillary and terminal racemes, or subsolitary axillary; bracts inconspicuous. *Calyx* campanulate, free or slightly adnate to the base of the ovary, truncate or 5-toothed. *Corolla-tube* short, lobes 5, elliptic-oblong, imbricate (in the Indian species). *Stamens* 10, 1-seriate at the summit of the corolla-tube, filaments short; anthers large, linear. *Ovary* nearly free, at first 3-celled, later often 1-celled; style subulate, stigma capitate; ovules few in each cell. *Fruit* globose or ellipsoid, seated on the cupuliform or patelliform calyx, toughly chartaceous (in the Indian species), breaking up irregularly. *Seeds* rarely 2 (many in *S. polysperma*), erect, testa chartaceous or indurated, albumen plentiful fleshy; embryo straight, cotyledons broad.—Species 60, in the warmer regions of Eastern Asia and America.

S. Finlaysonianum, Wall. Cat. 4403, A. DC. Prodr. viii. 261, with subentire nearly glabrous leaves (*S. odoratissimum*, Champ. in Hook. Kew. Journ. iv. 304) was collected probably in Cambodia, and is not known as an Indian plant.

1. **S. serrulatum**, Roxb. *Fl. Ind.* ii. 415; leaves elliptic acuminate serrulate glabrous or with scattered stellate hairs beneath, pedicels and calyx closely white-tomentose, corolla $\frac{1}{2}$ in., style glabrous. *Wall. Cat.* 4402; *A. DC. Prodr.* viii. 267; *Hk. f. in Bot. Mag.* t. 5950, *syn. excl.*; *Kurz in Journ. As. Soc.* 1877, pt. ii. 237, and *For. Fl.* ii. 142. *S. Porterianum*, Wall. Cat. 4401; *A. DC. l.c.* *S. floribundum*, Griff. *Notul.* iv. 287.

EASTERN INDIA; alt. 3–7000 ft., frequent; from Nipal and Bhotan to Pegu and Penang.

A tree, sometimes 40 ft. high, or more often a shrub; young branches stellately pubescent. Leaves 3 by $1\frac{1}{2}$ in., often widest at or above the middle, base acute or rounded on the same branch, glabrous, rarely setulose above, stellately pubescent and soon glabrate beneath, chartaceous, prominently reticulate; petiole $\frac{1}{2}$ in. Peduncles axillary solitary, 2-3-fasciculate, or in small racemes, or (by the suppression of the leaves) subpaniculately racemed 3-5 in. long at the ends of the branchlets; pedicels $\frac{1}{2}$ in. Calyx (at flower time) $\frac{1}{2}$ in. broad, minutely 5-toothed or truncate. Corolla-lobes elliptic, subacute, tomentose without, white. Filaments hairy, attached $\frac{1}{2}$ in. above the corolla-base. Fruit $\frac{1}{2}$ by $\frac{1}{3}$ in., ellipsoid, white- or fulvous-tomentose; splitting up irregularly, calyx in fruit enlarged cupuliform $\frac{1}{2}$ in. wide embracing the lower quarter of the fruit.

VAR. *agrestis*; calyx-tube brown-hirsute with spreading hairs. *Cyrta agrestis*, Ham. in Wall. Cat. 4402.—Sikkim, Bhotan and Assam.

VAR. *virgatum*; leaves tapering acuminate usually widest below the middle, flowering-calyx $\frac{1}{2}$ in. wide, corolla $\frac{1}{2}$ in., segments wider. *S. virgatum*, Wall. Cat. 4400; A. DC. Prodr. viii. 267; Kurz in Journ. As. Soc. 1877, pt. ii. 237, and For. Fl. ii. 142. *S. grandiflorum*, Griff. Notul. iv. 267, and Ic. Pl. Asiat. t. 423.—From Sikkim and Bhotan to Pegu. Distrib. South China, Japan.—*S. japonicum*, Sieb. & Zucc. Fl. Jap. i. 53, t. 23, united with this in Bot. Mag. t. 5950, somewhat differs in the glabrescent calyx and pinkish flowers.

2. **S. Hookeri**, Clarke; leaves elliptic acuminate serrulate setulose on the nerves above with scattered stellate hairs beneath, pedicels and calyx loosely fulvous-tomentose, corolla $\frac{1}{2}$ in., style densely stellate-pubescent. *Styrax* sp., Gamble Darjeeling List, 54.

SIKKIM and BHOTAN; alt. 6-7000 ft., frequent, Hook. f., &c.

Perhaps only an extreme form of *S. serrulatum*, var. *virgatum*, but the flowers are much larger sometimes 1 in. long; the calyx at flower-time is more than $\frac{1}{2}$ in. broad, lax. Fruit as of *S. serrulatum*.

3. **S. ? crotonoides**, Clarke; leaves broad-oblong shortly acuminate at both ends subentire coriaceous stellately pubescent beneath, fruit $\frac{3}{4}$ by $\frac{2}{3}$ ellipsoid indehiscent supported by a woody cupuliform calyx. *Crotoni affinis* sp., Wall Cat. 7848.

SINGAPORE; Wallich.

Branches rusty-stellate-pubescent. Leaves 5 by $2\frac{1}{4}$ in., glabrous above, almost tomentose, with very close rusty-stellate hairs beneath; nerves 9 pairs, prominent beneath; petiole $\frac{1}{2}$ in. Fruits with hard white tomentum (ripe but broken up and the seeds gone).—This agrees, as to leaves and fruit, closely with *S. suberifolium* (Hk. & Arn. Bot. Beechey Voy. 196, t. 40), but has much larger leaves and fruits.

4. **S. Benzoin**, Dryand. in Phil. Trans. 1787, 308, t. 12; leaves elliptic acuminate subentire closely stellately tomentose beneath, pedicels and calyx closely white-tomentose, corolla $\frac{1}{2}$ in., style glabrous. Blume Bijl. 671; Roxb. Fl. Ind. ii. 416; A. DC. Prodr. viii. 261; Benth. & Trim. Med. Pl. iii. t. 169.

MALACCA; Griffith, Maingay.—DISTRIB. Malaya.

A small tree, resembling *S. serrulatum* in the inflorescence and flowers. Fruit $\frac{1}{2}$ in. diam., globose, densely white tomentose.

5. **S. rugosum**, Kurz in Journ. As. Soc. 1871, pt. ii. 51, and For. Fl. ii. 141; leaves elliptic acuminate serrulate densely stellately white-tomentose beneath, pedicels and calyx roughly tomentose, corolla $\frac{1}{2}$ in., style stellately tomentose at base.

MARTABAN; alt. 4-6000 ft., Brandis.

A tree; branchlets floccosely rusty-tomentose. Leaves 3 by $1\frac{1}{4}$ in., base obtuse, stellately pubescent or finally glabrous above, coriaceous, reticulate beneath; petiole $\frac{1}{2}$ in. Flowers axillary, and quasi-racemed towards the ends of the branches, pen-

dulous; peduncle $\frac{1}{10}$ in.; bracteoles linear, sometimes $\frac{1}{4}$ in. *Calyx* rusty floccose-tomentose, subspathaceous, irregularly lobed and often serrate. *Corolla* closely tomentose without. *Filaments* villous. *Fruit* not seen.

6. **S. polysperma**, Clarke; leaves broadly oblong acute obscurely crenate glabrous, corymbs many-flowered scabrous, corolla $\frac{1}{4}$ – $\frac{1}{3}$ in., fruit 5–6-seeded.

KHASIA Mts.; Griffith; Mahadeo, alt. 3000 ft., H. f. & T.

Branches glabrous. *Leaves* 6 by $2\frac{1}{4}$ in., base cuneate or rhomboid; petiole $\frac{1}{2}$ in. *Corymbs* subterminal, repeatedly dichotomous, flowers nearly sessile. *Corolla* densely tomentose without. *Style* obscurely 3-lobed. *Fruit* $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid, subacute, imperfectly 3-celled; cells 2–1-seeded; testa stoutly chartaceous.—A most remarkable plant; the glabrous leaves and compound dichotomous inflorescence have caused fruiting examples to be referred to *Cordia*. The fruit is altogether unlike that of any other *Styrax*, and may indicate a new genus.

ORDER XCII. OLEACEÆ. (By C. B. Clarke.)

Trees, or scandent or erect shrubs, unarmed. *Leaves* opposite (in a few *Jasminums* alternate), simple 3-foliolate or pinnate, entire or toothed; stipules 0. *Inflorescence* mostly in trichotomous cymes or panicles, terminal or axillary, rarely fascicled or racemose. *Flowers* hermaphrodite often dimorphous, sometimes polygamous or dioecious, regular. *Calyx* small, truncate or 4- (sometimes 5–9-) lobed, rarely 0. *Corolla* monopetalous, rarely 4–9-petalous or 0, tube long or short, imbricate or valvate in bud. *Stamens* 2 (in Indian species), inserted on the corolla, or (in the polypetalous or apetalous genera) hypogynous, filaments usually short; anthers dehiscing usually on the margin or subextorsely. *Ovary* free, 2-celled; style short or long, stigma simple or 2-lobed; ovules 1–2 (rarely 3–4) in each cell, attached to the inner angle near the apex or base. *Fruit* a loculicidal capsule, or indehiscent, or a berry or drupe. *Seeds* solitary (or 2) in each cell, erect or pendulous; testa thin or bony, albumen fleshy horny or 0; embryo straight, radicle superior or inferior.—DISTRIB. Species 280, in the tropical and temperate regions.

A shrub, collected by Helfer in Tenasserim or the Andamans (Kew Distrib. n. 3694) is supposed to belong to this Order; the imperfect specimens are here described.

Branches round; wood loose, soft; bark white, smooth. *Leaves* opposite, 10 by $3\frac{1}{2}$ in., cuneate at both ends, entire, softly hairy on the nerves beneath, coriaceous, whitened beneath, primary nerves 12 on each side the midrib, prominently inarching; petiole $\frac{1}{4}$ in., hairy, very turgid. *Panicles* 1 in., axillary, reduced almost to racemes, minutely pubescent; bracts 0 or minute; pedicels hardly any. *Ovary* (in young fruit) superior, 2-celled; cells 2-ovuled?.

TRIBE I. **Jasminææ**. *Corolla-lobes* much imbricate. *Seeds* erect; albumen 0; radicle inferior.

Scandent shrubs; fruit baccate 1. JASMINUM.
 Erect small tree; capsule bipartite 2. NYCTANTHES.

TRIBE II. **Syringææ**. *Fruit* dry, loculicidal. *Seeds* pendulous, winged, radicle superior.

Corolla-lobes imbricate; fruit woody, pyriform 3. SCHREBERA.
Corolla-lobes valvate; fruit small, cylindric 4. SYRINGA.

TRIBE III. **Fraxinææ**. *Fruit* samaroid. *Petals* valvate or 0.

Trees; leaves pinnate 5. FRAXINUS.



Jasminum.]

XCH. OLEACEÆ. (C. B. Clarke.)

TRIBE IV. **Oleineæ**. Fruit a drupe or berry. Corolla small. Radicle superior (except *Myxoperyum*).

* Corolla-lobes imbricate; seeds albuminous.

Flowers fascicled or in very short racemes 6. OSMANTHUS.

** Corolla-lobes valvate or petals distinct in pairs or 0.

Petals in pairs or distinct or very shortly united into a tube, inflorescence axillary 7. LINOCIERA.

Corolla tubular or 0, inflorescence axillary except in *O. glandulifera* 8. OLEA.

Panicles terminal 9. LIGUSTRUM.

Large scandent shrubs, leaves 3-nerved 10. MYXOPERYUM.

1. JASMINUM, Linn.

Shrubs, scandent or erect. Leaves opposite or alternate, simple 3-foliate or unequally pinnate; petiole nearly always articulated. Cymes 3- or 2-chotomous, simple or flowers rarely solitary; bracts linear and small, or ovate, sometimes petaloid. Calyx 4-9-fid, tube funnel-shaped rarely subcylindric, teeth linear long or short or 0. Corolla salver-shaped, white pink or yellow, tube narrow, lobes 4-10, patent, imbricate in bud. Stamens 2, included in the corolla-tube, filaments very short; anther oblong, connective usually shortly produced and triangular. Ovary 2-celled; style cylindric, stigmas 2 linear, long or short or subcombined; ovules 2 in each cell, near the base. Berry didymous, or often, by suppression, simple; carpels globose ellipsoid or elongate. Seed in each carpel 1, rarely 2, erect, exalbuminous; radicle inferior.—DISTRIB. Species 90, in the tropics or warm temperate parts of the Old World.

* Leaves all simple.

† Calyx pubescent. (The series proceeds from the species with long to those with short calyx-teeth.)

The species are generally dimorphic, having a long- and a short-styled form: Wight founded two species on this solitary character out of *J. auriculatum*. It has not been found practicable to use characters drawn from the style and stigma in the discrimination of the species.

1. **J. Sambac**, Ait. Hort. Kew. i. 8; leaves short-petioled ovate nearly glabrous, cymes lax few-flowered, bracts small, calyx-teeth subulate. Bot. Reg. t. 1; Bot. Mag. t. 1785; Wall. Cat. 2868; DC. Prodr. viii. 301; Wight Ic. t. 704; Dalz. & Gibs. Bomb. Fl. 137; Brand. For. Fl. 311; Kurz For. Fl. ii. 153, in Journ. As. Soc. 1877, pt. ii. 242. J. fragrans, Salisb. Prodr. 12. J. undulatum, Willd. Sp. Pl. i. 36, not of Ker. J. Sambac, Roxb. Hort. Beng. 2, Fl. Ind. ed. Carey & Wall. i. 87. J. quinqueflorum, Heyne; Wall. Cat. 2878; DC. l. c. 302. J. pubescens, Wall. Cat. 2880, not of Willd. Nyctanthes Sambac and undulatum, Linn. Sp. Pl. 8. Mogorium Sambac, Lamk. Dict. iv. 210, Fl. t. 6, fig. 1. M. undulatum, Lamk. Dict. iv. 212.—Rheede Hort. Mal. vi. tt. 50, 51, 55. Burm. Thes. Zeyl. t. 58, fig. 2. Mallica, Asphota and Sup-tula, Jones in As. Research. iv. 245.

BENGAL to CEYLON and BURMA; alt. 0-2000 ft., common.—DISTRIB. Much cultivated throughout India, and in the tropics of both hemispheres.

Scandent; branchlets pubescent. Leaves opposite or sometimes ternate, thinly membranous, varying from 1 to 5 in., sometimes on the same bush, acute or obtuse, base cuneate or rounded, nerves beneath pubescent or glabrous, primary often tufted in the axils beneath, secondary nerves distinct; petiole $\frac{1}{2}$ in. Cymes about 3-flowered



suberect subulate calyx-teeth.
VAR. 1. *Sambac proper*; corolla-tube not twice the length of the calyx.

2. **J. undulatum**, Ker in Bot. Reg. t. 436, not of Willd.; leaves short-

SIKKIM, BHOTAN and KHASIA, alt. 1-5000 ft., common; Griffith, H. f. & T., &c.—
 TRIB. South China to Hongkong.

3. **J. pubescens**, Willd. *Sp. Pl.* i. 37; hairy, leaves ovate acute, cymes dense often hardly exceeding the uppermost leaves, calyx-teeth $\frac{1}{2}$ – $\frac{3}{4}$ in. subulate densely villous. Roxb. *Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 90; *Don Prodr.* 105; *DC. Prodr.* viii. 302; *Dalz. & Gibs. Bomb. Fl.* 138. *J. hirsutum*, Willd. l. c. 36; *Smith Exot. Bot.* ii. 117, t. 118; *Bot. Reg.* t. 15; *Bot. Mag.* t. 1991; *Wall. Cat.* 2852; *Wight Ic.* t. 702; *Brand. For. Fl.* 312; *Kurz For. Fl.* ii. 154, and in *Journ. As. Soc.* 1877, pt. ii. 242. *J. multiflorum*, *Roth Nov. Sp.* 6 (?); *Andr. Bot. Rep.* t. 496; *DC. l. c.* 303. *J. congestum*, *Wall. Cat.* 2874; *DC. l. c.* 314. *J. bracteatum* (by error *fractiatum*), *Wight Ic.* t. 1248; *Dalz. & Gibs. Bomb. Fl.* 138. *Nyctanthes pubescens*, *Retz Obs.* v. 9. *N. multiflora*, *Burm. Fl. Ind.* 5, t. 3, fig. 1. *Mogorium pubescens*, *Lamk. Dict.* iv. 213.

INDIA, from the HIMALAYA to CEYLON and TENASSERIM, alt. 0-3000 ft., common.—
DISTRIB. Birma, China.

DISTRIB. Birma, China.
Scandent; branchlets, pedicels and calyx densely fulvous-villous. *Calyx-teeth* with patent yellow hairs erect or curved in fruit. Otherwise as in *J. undulatum*, Ker, which has more acuminate, less hairy leaves.—*Nyctanthus hirsuta*, Linn. Sp. Pl. 8 is generally taken for this and the name *hirsutum* preferred, but Linnaeus founded his plant on *Rhede Hort. Mal.* vi. t. 48, which is not *J. pubescens*. *Rhede Hort. Mal.* vi. t. 54 is usually quoted for *J. pubescens*, but from the shape of the leaves it seems more likely to be *J. Rotterlianum* or *J. Thwaitesii*. The name *J. multiflorum*, Roth, has been much disputed: Roth says he took it from Heyne, but Heyne's original plant with the ticket descriptive of *J. multiflorum*, in his handwriting, is preserved in Herb. Wight, and is *J. Rotterlianum*. This however could not have been

the plant described by Roth, as he says the bracts were linear. The example of *J. multiflorum* in Herb. Roxb. is *J. pubescens*.

VAR. *bracteata*, Roxb. Hort. Beng. 3, Fl. Ind. ed. Carey & Wall. i. 92 (sp.); leaves somewhat bifarious, bracts linear small, calyx-teeth $\frac{1}{4}$ in., corolla-tube $\frac{1}{4}$ in. Wall. Cat. 2867; DC. Prodr. viii. 305.—Penang; *Wallich*.—DISTRIB. Sumatra.—This was supposed allied to or a var. of *J. bifarium*, from which it does not much differ but by the longer calyx-teeth. The corolla-tube, which is figured as very short in Roxburgh's drawing, is $\frac{3}{4}$ in. in some of Wallich's specimens.

4. *J. coarctatum*, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 91; leaves elliptic acute nearly glabrous, petioles jointed, flower-heads solitary or subpaniculate, bracts prominent white ovate-lanceolate, calyx-teeth linear hairy. DC. Prodr. viii. 308; *Kurz For. Fl. ii. 153*, and in *Journ. As. Soc. 1877*, pt. ii. 242. *J. reticulatum*, Wall. Cat. 2869; DC. l.c. 303.—*Jasminum*, n. 34, *Herb. Ind. Or. Hk. f. & T.*

From ASSAM to PEGR, alt. 0-3000 ft., frequent; *Wallich, Griffith, &c.*

Scandent; branchlets hairy. Leaves $4\frac{1}{2}$ by 2 in., usually acuminate, base obtuse or rounded, midrib above pilose or glabrous, often tufted in the axils of the nerves beneath, membranous, secondary nervation somewhat prominent; petiole $\frac{1}{2}$ in. Cymes dense, many-flowered, rusty-pubescent; bracts $\frac{1}{2}$ -1 in., petaloid, acuminate, often ciliate or pilose. Flowers white. Calyx-teeth $\frac{1}{2}$ in. Corolla-tube 1-1 $\frac{1}{2}$ in.; lobes $\frac{1}{2}$ in., oblong, acute. Carpels $\frac{1}{2}$ by $\frac{1}{2}$ in., and upwards.

5. *J. Rottlerianum*, Wall. Cat. 2865; leaves elliptic acute softly hairy on both surfaces or glabrate, petioles jointed, flower-heads solitary or subpaniculate, bracts prominent white ovate-lanceolate, calyx-teeth linear hairy. DC. Prodr. viii. 305; *Wight Ic. t. 1249*; *Dalz. & Gibs. Bomb. Fl. 138*. *J. hirsutum*, Wall. Cat. 2852, C. *J. bracteatum*, *Heyne in Herb., not of Roth*. *J. pubescens* and *hirsutum*, *Miq. in Herb. Hohenack. not of Willd.*

Mts. of the DECCAN PENINSULA; from the Concan to Travancore, alt. 2-5000 ft., frequent; *Heyne, &c.*

Scandent; branchlets, inflorescence and bracts villous. Leaves often subcordate at the base, adult very villous. Corolla-tube 1 in., and more in *Wight's* examples. Fruit-carpels $\frac{1}{2}$ by $\frac{1}{2}$ in.—This type form looks, from its hairiness, very distinct from *J. coarctatum*.

VAR. *glabrior*; adult leaves glabrous or nearly so, inflorescence shortly pubescent, corolla-tube $\frac{3}{4}$ in. slender.—Travancore; *Wight*.—This is referred by *Wallich* to *J. Rottlerianum*, and there are examples intermediate in hairiness; but it is very difficult to say how it differs from *J. coarctatum*, except that the flowers are rather smaller. *Kurz (For. Fl. ii. 153*, and in *Journ. As. Soc. 1877*, pt. ii. 242) has a *J. Rottlerianum* from Pegu, with adult leaves nearly glabrous, and the corolla-tube only $\frac{1}{2}$ in. long; this plant cannot therefore resemble very closely the typical *J. Rottlerianum*, which has a tube 1-1 $\frac{1}{2}$ in.; but possibly *J. coarctatum* and *Rottlerianum* should be united.

VAR. *Thwaitesii*; leaves oblong acuminate nearly glabrous, corolla-tube 1-1 $\frac{1}{2}$ in., carpels $\frac{1}{2}$ in. diam. globose. *J. rigidum*, *Thwaites Enum. 190*, not of *Zenk.*—Ceylon; *Thwaites*, C. P. n. 1809. *Nilgherries*, alt. 4-7000 ft., frequent, *Clarke*.—Branchlets terete, pubescent. Leaves sometimes cordate at the base. Bracts several, ovate-lanceolate, whitish. Calyx-teeth $\frac{1}{2}$ in., linear.—This is a very difficult plant as may be guessed from *Thwaites* referring his specimen (though much twining) to *J. rigidum*. It does not differ much from *J. Rottlerianum*, var. *glabrior* (of which the fruit has not been seen): its small fruit is very unlike that of *J. coarctatum*.

6. *J. Griffithii*, Clarke; leaves large oblong-elliptic acuminate pilose beneath, heads dense many-flowered, bracts linear small or the uppermost leaves whitened, calyx-teeth long subulate patently fulvous-pilose.

MALACCA; *Griffith (Kew Distrib. n. 3704)* and *Maingay (n. 998)*.

Scandent; branchlets patently fulvous-villous. Leaves 6 $\frac{1}{2}$ by 2 $\frac{1}{2}$ in., base obtuse or

cordate, coriaceous; nerves impressed above, much raised and fulvous-villous beneath, strongly tufted in their axils, prominently inarching, secondary obscure; petiole $\frac{1}{2}$ in. Inflorescence fulvous-pilose, subbracteate, but the upper leaves (even $3\frac{1}{2}$ in. long) whitened. Calyx-teeth $\frac{1}{2}$ in. Corolla-tube $\frac{3}{4}$ in., slender; lobes $\frac{1}{4}$ in., elliptic, acute. Fruit not seen.

7. **J. Maingayi**, Clarke; leaves long-petioled elliptic-lanceolate glabrous, flower-heads dense pubescent, bracts small linear or 1-2 ovate-lanceolate, calyx-teeth long linear pubescent.

PENANG; *Maingay* (Kew Distrib. n. 1000).

Scandent; branchlets pilose. Leaves 5 by 2 in., acute, base obtusely rhomboid, coriaceous; nerves 6-8 pairs, conspicuous, very oblique, not inarched, secondary obscure; petiole $\frac{3}{8}$ - $\frac{1}{2}$ in. Cymes paniced, sometimes more compound and lax; pedicels $\frac{1}{10}$ - $\frac{1}{8}$ in.; bracts mostly linear, $\frac{1}{4}$ - $\frac{1}{2}$ in., a few foliaceous bracts $\frac{3}{4}$ in. long occur. Calyx-tube $\frac{1}{2}$ in., campanulate; teeth $\frac{1}{4}$ - $\frac{1}{2}$ in. Corolla-tube $\frac{3}{4}$ in.; lobes $\frac{1}{2}$ in., elliptic, acute. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

8. **J. malabaricum**, Wight Ic. t. 1250; leaves subcordate ovate suddenly acuminate nearly glabrous, cymes compound hairy, calyx-teeth long linear hairy, corolla-tube elongate. J. glabellum, Wall. Cat. 2857, partly.

DECCAN PENINSULA; on the Ghats, from the Concan southwards, common, Wight, &c.

Scandent; branchlets pubescent. Leaves $4\frac{1}{2}$ by 3 in., broadest near the base, membranous; nerves 9 pairs, distinct beneath, lower patent; petiole often 1 in. Cymes compound, trichotomous, not dense, many- (often 40-50-) flowered, branches ascending; bracts $\frac{1}{4}$ - $\frac{1}{2}$ in., subulate; pedicels $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{4}$ in., subulate, acute. Corolla-tube $\frac{1}{2}$ - $\frac{3}{4}$ in.; lobes $\frac{1}{2}$ in., oblong, very acute. Fruit not seen.—Wight first named this plant *J. cuspidatum*, but abandoned the name on finding that Roth had applied it to a very different species. Wight's figure does not show the very acute petals, which are conspicuous in his examples.

VAR. *Lawii*; leaves ovate-lanceolate gradually acuminate, corolla-lobes nearly 1 in. long very narrow.—Concan; *Law*?.—These specimens have been referred to *J. erectiflorum* which has glabrous cymes and calyx-teeth, and a less compound inflorescence.

9. **J. arborescens**, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 94; arborescent, leaves subcordate or ovate acute, finally glabrous, cymes trichotomous hairy, calyx-teeth short linear subclavate pubescent divaricated, basal sinus wide, corolla-lobes not much shorter (often longer) than the tube. Wall. Cat. 2856; Wight Ic. t. 699; DC. Prodr. viii. 303; Brand. For. Fl. 311. J. montanum, Roem. Nov. Sp. 5; DC. l. c. 308. J. arboreum, Roem. et Sch. Mant. i. 90.

TROPICAL NORTH-WEST HIMALAYA; Terai of Oudh and Kumaon; frequent. DECCAN PENINSULA, from Rajmahl to Ceylon; in the hot lower hills, alt. 500-3000 ft., common.

A large shrub or scrubby tree; branchlets hairy. Leaves 4 by $2\frac{1}{2}$ in., shortly acuminate, widest near the base, subcordate or the upper ovate or elliptic, young hairy and often tomentose on both surfaces; nerves distinct beneath, lower divaricate; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. Cymes usually 12-20-flowered, not dense; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{4}$ in. Calyx-teeth $\frac{1}{10}$ - $\frac{1}{8}$ in., their narrowest part one-third of the way up. Corolla-tube $\frac{1}{2}$ in.; lobes $\frac{3}{4}$ in., lanceolate, acute. Carpels (generally solitary) $\frac{1}{2}$ by $\frac{1}{4}$ - $\frac{1}{2}$ in., unsymmetric, ellipsoid, black.

VAR. *latifolia*, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 93 (sp.); scandent. Wall. Cat. 2855; DC. Prodr. viii. 308; Wight Ic. t. 703; Dalz & Gibs. Bomb. Fl. 138; Brand. For. Fl. 311.—Base of the Himalaya, from Kumaon to Bengal.

VAR. *montana*, Roth Nov. Sp. 5 (sp.); leaves elliptic cuneate scarcely rounded at

the base, calyx minutely pubescent. *DC. Prodr.* viii. 308. *J. punctatum*, *Wall. Cat.* 2877; *DC. l. c.* 303.—*J. glabellum*, *Wall. Cat.* 2857, partly.—Deccan Peninsula; Patna.

10. ***J. Roxburghianum***, *Wall. Cat.* 2870; leaves elliptic-oblong softly hairy, cymes trichotomous very hairy, calyx-teeth minute narrowly triangular villous, corolla-lobes usually as long as the tube. *DC. Prodr.* viii. 314.

MALABAR GHATS, *Ritchie*; Bababoodun Hills, *Law*.

Perhaps a var. of *J. arborescens*, but much more hairy, and with shorter calyx-teeth. Leaves not acuminate, sometimes obtuse, base broadly cuneate or scarcely rounded, mature softly hairy on both surfaces. Cyme somewhat lax, many-flowered. Calyx densely fulvous-villous teeth $\frac{1}{20}$ – $\frac{1}{10}$ in. Corolla and fruit as in *J. arborescens*.

11. ***J. syringæfolium***, *Wall. Cat.* 2861; leaves ovate-lanceolate acuminate glabrous, cymes lax trichotomous minutely pubescent, calyx-teeth short linear erect pubescent, corolla-lobes shorter than the tube. *DC. Prodr.* viii. 306.

TENASSERIM, Amherst and Tavoy; *Wallich, Packman*. ASSAM; *Griffith*.

Scandent; branchlets glabrescent. Leaves 4 by $1\frac{1}{2}$ in., broadly cuneate or the lower leaves rounded at the base, coriaceous; nerves 3–5 pairs, prominent beneath; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in., mostly pubescent. Cymes terminal and axillary, 12–20-flowered; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{8}$ – $\frac{1}{6}$ in. Calyx-teeth $\frac{1}{16}$ – $\frac{1}{12}$ in. Corolla-tube $\frac{2}{3}$ in.; lobes scarcely $\frac{1}{2}$ in., narrow, acute. Fruit-carpels $\frac{2}{3}$ by $\frac{1}{2}$ in., unsymmetric, ellipsoid.—*Kurz (Journ. As. Soc. 1877, pt. ii. 242)* refers this species to *J. scandens*, which has the cymes much denser, the calyx-teeth divaricate, the corolla-tube shorter.

12. ***J. bifarium***, *Wall. Cat.* 2866; leaves oblong acuminate minutely pubescent or glabrous, cymes subcapitate, calyx-teeth short linear erect pubescent, corolla-tube longer than its lobes. *DC. Prodr.* viii. 306. *J. bracteatum*, *Wall. Cat.* 2867. *J. nummularoides*, *Blume Mus. Lugd. Bat. i.* 275.

PENANG; *Wallich, Maingay*.—DISTRIB. Malaya to Borneo.

Scandent; branchlets hairy or nearly glabrous. Leaves 2 by $\frac{3}{4}$ in. (sometimes much larger), bifarious, base truncate; nerves 5 pairs, often pubescent, secondary obscure; petiole $\frac{1}{2}$ in. Cymes 6–12-flowered, usually subsessile between the two uppermost leaves; bracts $\frac{1}{2}$ in., linear; pedicels $0\frac{1}{2}$ in. Calyx-teeth $\frac{1}{16}$ – $\frac{1}{10}$ in. Corolla-tube $\frac{2}{3}$ in.; lobes scarcely $\frac{1}{2}$ in., elliptic, acute. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

VAR. *glabra*; leaves larger elliptic rhomboid or rounded at the base glabrous often drying reddish not bifarious, calyx-teeth $\frac{1}{8}$ – $\frac{1}{6}$ in. *J. Lessertianum*, *DC. Prodr.* viii. 304 *ex descr.*—Malacca and Singapore, frequent; *Wallich, Walker, &c.*—DISTRIB. Malaya.—This is one of Horsfield's plants, and believed to be *J. glabrum*, *Horsf.*; *Blume Bijdr.* 679: but whether *J. glabrum*, *Willd.*, is doubtful.

13. ***J. scandens***, *Vahl Symb.* iii. 2; leaves ovate-lanceolate glabrous or nearly so, cymes subcapitate pubescent, calyx-teeth short linear pubescent divaricate or recurved in flower, corolla-tube scarcely $\frac{1}{2}$ in. *Roxb. Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 88; *Wall. Cat.* 2850; *DC. Prodr.* viii. 306; *Kurz For. Fl.* ii. 155, and in *Journ. As. Soc.* 1877, pt. ii. 242, *syn. excl.* *J. lætum*, *Wull. Cat.* 2859; *DC. l. c.* 306. *Nyctanthes scandens*, *Retz Obs.* v. 9.

BENGAL AND PEGU, in the plains, common; and in the adjacent lower hills of SIKKIM, ASSAM, KHASIA, CACHAR and CHITTAGONG.

Scandent; branchlets pubescent. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., acuminate, base rounded, pubescent on the nerves beneath or glabrous, coriaceous; nerves few, remote; petiole $\frac{1}{4}$ in. Cymes dense, often on short axillary branches; bracts $\frac{1}{2}$ in., linear, but the cyme frequently subsessile between the two uppermost leaves; pedicels $0\frac{1}{10}$ in. Flowers white, often tinged pink, very fragrant. Calyx-teeth $\frac{1}{16}$ – $\frac{1}{8}$ in. Corolla-tube shorter than in the preceding species and somewhat broader; teeth $\frac{1}{4}$ – $\frac{1}{2}$ in., oblong, acute. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

14. **J. decussatum**, Wall. Cat. 2860; leaves ovate-lanceolate hairy, flowers in clusters upon compound trichotomous villous cymes, calyx-teeth short linear recurved villous, corolla-tube about $\frac{1}{4}$ in. DC. Prodr. viii. 306; Kurz For. Fl. ii. 151, and in Journ. As. Soc. 1877, pt. ii. 241.

PEGU and TENASSERIM, frequent: Wallich, Griffith, &c.

Scandent; branchlets villous. Leaves 4 by $1\frac{1}{2}$ in., acuminate, base obtuse, mature hairy at least beneath, coriaceous; nerves few, remote; petiole $\frac{1}{4}$ in. Cymes terminal compound, and on short-lateral branches; bracts $\frac{1}{2}$ in., linear; pedicels 0 or $0-\frac{1}{2}$ in. Calyx-teeth $\frac{1}{10}$ in. Corolla smaller than in any of the preceding species; lobes $\frac{1}{4}$ in., narrowly lanceolate. Carpel $\frac{1}{4}$ by $\frac{1}{4}$ in., ellipsoid.

†† Calyx glabrous (the series proceeds from the species with long to those with short calyx-teeth).

15. **J. cordifolium**, Wall. Cat. 2858; leaves cordate-lanceolate acuminate glabrous, cymes crowded many-flowered, calyx-teeth subulate, corolla-tube nearly 1 in. G. Don Gen. Syst. iv. 60; DC. Prodr. viii. 304. J. erectiflorum, DC. Prodr. viii. 308; Wight Ic. t. 1251.

NILGHERRIES; Gardner, Wight; Canoor, alt. 6000 ft., Clarke.

Scandent, glabrous. Leaves 4 by $1\frac{1}{2}$ in., coriaceous; nerves 7 pairs, the lowest divaricate, secondary obscure; petiole $\frac{1}{2}-\frac{3}{4}$ in. Cymes often 20-flowered, shortly repeatedly trichotomous; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{2}-\frac{1}{3}$ in. Corolla-lobes $\frac{3}{4}$ in., elliptic, acute. Carpels nearly $\frac{1}{2}$ by $\frac{1}{2}$ in., ellipsoid.—G. Don says the leaves are 3-nerved, the cymes pubescent, which will not apply to the present (nor to any Nilgherry) species; Wight has noted in his Herb. that *J. erectiflorum*, A. DC., is *J. cordifolium*, Wall.

16. **J. anastomosans**, Wall. Cat. 2863; leaves elliptic-lanceolate acuminate glabrous imperfectly 3-nerved, cymes 1-5-flowered axillary, calyx-teeth long linear, corolla-lobes very long narrow. DC. Prodr. viii. 305; Kurz For. Fl. ii. 152, and in Journ. As. Soc. 1877, pt. ii. 242. J. stenopetalum, Lindl. in Bot. Reg. t. 918, in adnot.; DC. l.c. 304; Blume Mus. Bot. i. 272. J. trinerve, Roxb. Hort. Beng. 3, and Ic. Ined. in Herb. Kew., and Fl. Ind. ed. Carey & Wall. i. 91; Wall. Cat. 2848 A, chiefly, not of Vahl. J. laurifolium, Wall. Cat. 2847 A, chiefly, not of Roxb.—*Jasminum* sp. n. 32, Herb. Ind. Or. H. f. & T.

BHOTAN; Dalimkote, Gamble. KHASIA; Griffith. CACHAR; Keenan. SILHET; Chattuck, H. f. & T. PEGU; Wallich, &c., frequent.

Scandent, glabrous. Leaves 4 by $1\frac{1}{2}$ in., very acute, base obtuse sometimes cordate, membranous; lowest pair of nerves strong, carried along the margin, upper slender, distinct, resembling the secondary; petiole $\frac{1}{4}$ in. Cymes slender, on short lateral branches sometimes leafy, but more frequently altogether axillary; bracts $\frac{1}{4}$ in., linear; pedicels $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{2}-\frac{3}{4}$ in. Corolla-tube $\frac{3}{4}$ in., lobes 7-10, often 1 in. Carpels $\frac{1}{2}$ by $\frac{1}{2}$ in., ellipsoid; calyx-teeth in fruit often thickened, divaricate, stellate.

VAR. *silhetensis*, Blume Mus. Bot. i. 271 (sp.); corolla-lobes a little shorter than the tube. J. trinerve, Wall. Cat. 2848, chiefly.—Silhet.—*J. trinerve*, Vahl, is defined as having the corolla-lobes only half as long as the tube; but, after all the labours of Blume, it may be a question whether the Indian plant is other than a form of it, as Roxburgh considered.

17. **J. subtriplinerve**, Blume Mus. Bot. i. 272; leaves elliptic-lanceolate acuminate glabrous 3-nerved, cymes 1-7-flowered axillary and terminal, calyx-teeth linear, corolla-lobes oblong acute shorter than the tube. J. trinerve, Wall. Cat. 2848, partly.

SIKKIM, ASSAM, KHASIA, SILHET, CACHAR, alt. 0-4000 ft., frequent; Wallich, Griffith, H. f. & T., &c.

Closely allied to *J. anastomosans*. Leaves coriaceous, distinctly 3-nerved, the basal primary pair of nerves often carried near the margin nearly to the tip of the



leaf, other nerves obscure. Flowers usually 3, sometimes all solitary and terminal. Sometimes in compound many-flowered cymes; pedicels not exceeding $\frac{1}{2}$ in., by which the species is known from all forms of *J. laurifolium*. Calyx-teeth $\frac{1}{4}$ in., shorter than in *J. anastomosans*, glabrous in the Sikkim examples, minutely scabrid-pubescent in the Khasian. Corolla-tube $\frac{3}{4}$ in., lobes $\frac{3}{8}$ by $\frac{1}{4}$ in.

18. **J. nobile**, Clarke; leaves ovate-lanceolate acuminate, cymes few-flowered lax, corolla very large, calyx-teeth linear acute.—*Jasminum*, n. 26, *Herb. Ind. Or. H. f. & T.*

MOULMEIN; Thoungyeen, alt. 5000 ft., Lobb; Donnatonug, alt. 4000 ft., Parish.

Scandent, glabrous. Leaves $3\frac{1}{4}$ by $1\frac{1}{4}$ in., base obtuse or almost rounded, coriaceous, obscurely 3-nerved; petiole $\frac{1}{2}$ in. Cymes terminal and on shortened axillary branches, peduncled or sub-sessile, 3-5-flowered; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in., thickened. Calyx-teeth $\frac{1}{4}$ in. Corolla-tube 1 in., lobes $1\frac{1}{4}$ by $\frac{1}{4}$ – $\frac{1}{2}$ in., oblong acute. Fruit not seen.

19. **J. laurifolium**, Roxb. *Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 91; leaves oblong or narrow-elliptic acuminate 3-nerved, cymes few-flowered lax, calyx-teeth linear long, corolla-lobes long narrow. *Wall. Cat.* 2847, partly; *DC. Prodr.* viii. 303; *Kurz For. Fl.* ii. 152, and in *Journ. As. Soc.* 1877, pt. ii. 241. *J. angustifolium*, Ker in *Bot. Reg.* t. 521, not of Vahl.

KHASIA MTS., *De Silva, H. f. & T.* (cultivated in Ceylon, Kumaon, Mauritius, &c.). Scandent, glabrous. Leaves $2\frac{1}{2}$ by $\frac{3}{4}$ in., base obtuse or rounded, coriaceous, definitely 3-nerved in the cultivated examples, more membranous and anastomosing nerves more distinct in the native; petiole $\frac{1}{2}$ in. in the wild, $\frac{1}{4}$ in. in the cultivated plant. Cymes 3-5-flowered, terminal or long-peduncled and axillary; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in., not much thickened. Calyx-teeth $\frac{1}{4}$ in. Corolla-tube $\frac{3}{4}$ in., lobes $\frac{3}{4}$ by $\frac{1}{2}$ in. Fruit not seen.—Ker, whose figure of this species is excellent, nevertheless says he could not distinguish it from *J. angustifolium* (by which Ker meant *J. sessiliflorum*); it has 3-nerved leaves, the corolla-lobes much longer.

VAR. *brachyloba*, Kurz l. c.; calyx-teeth $\frac{1}{10}$ – $\frac{1}{8}$ in.—Birma; Griffith (Kew Distrib. n. 3712); Martaban and Tenasserim Hills, frequent (Kurz).

VAR. *sublinearis*; leaves 5 by $\frac{1}{2}$ in., calyx-teeth $\frac{1}{2}$ in.—Tavoy; Helfer (Kew Distrib. n. 3710).

20. **J. adenophyllum**, Wall. *Cat.* 2876; leaves elliptic-oblong acuminate penninerved, cymes lax few-flowered, calyx-teeth very long linear. *DC. Prodr.* viii. 314.

KHASIA MTS.; *De Silva*.

Scandent, glabrous. Leaves 5 by $1\frac{1}{2}$ in., base cuneate; primary nerves 8 pairs, subequally distant, the lowest short; petiole $\frac{1}{2}$ in., not (or very obscurely) jointed. Peduncles 1-flowered (in the scanty examples); bracts obsolete; pedicels 1 in. Calyx-teeth $\frac{1}{2}$ in., and upwards. Corolla and fruit not seen.—The imperfect examples represent a species, apparently closely allied to *J. laurifolium*, but the nervation of the leaves is altogether different.

21. **J. sessiliflorum**, Vahl *Enum.* i. 29; leaves small ovate, cymes few-flowered, pedicels short, calyx-teeth linear long, corolla medium-sized tube hardly so long as the narrow lobes. *DC. Prodr.* viii. 307. *J. angustifolium*, Wall. *Cat.* 2873, partly, not of Vahl.

MADRAS; Nundidroog, Chingleput, Rottler, &c. CEYLON; Thwaites.

Scandent, ramous; branchlets often minutely pubescent. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in. (those of the shortened flowering lateral branchlets hardly half so large), shortly acute or subobtuse, base obtuse or almost rounded, glabrous; nerves few, obscure; petiole $\frac{1}{8}$ – $\frac{1}{6}$ in. Cymes usually 3- or 1-flowered, sessile; pedicels 0– $\frac{1}{8}$ in. Calyx-teeth $\frac{1}{2}$ in., glabrous or obscurely scabrid-pubescent. Corolla-tube $\frac{1}{2}$ in., lobes $\frac{3}{8}$ – $\frac{1}{2}$ by $\frac{1}{10}$ in., acute. Fruit not seen.

22. **J. angustifolium**, *Vahl Enum.* i. 29; leaves small ovate, cymes few-flowered, pedicels long, calyx-teeth linear short, corolla largeish lobes lanceolate. *Roxb. Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 95; *Wall. Cat.* 2873, partly; *Wight Ic.* t. 698; *DC. Prodr.* viii. 303. *J. vimineum*, *Willd. Sp. Pl.* i. 36. *J. triflorum*, *Pers. Syn.* i. 7. *Nyctanthes angustifolia*, *Linn. Sp. Pl.* 8. *N. viminea*, *Retz Obs.* v. 9. *N. triflora*, *Burm. Fl. Ind.* 4, t. 2. *Mogorium vimineum*, *Lamk. Dict.* iv. 213. *M. triflorum*, *Lamk. Ill.* 23, t. 6, fig. 2.—*Rheede, Hort. Mal.* vi. t. 53.

DECCAN PENINSULA and CEYLON; in the lower hills, frequent.

Scandent, ramous; branchlets minutely pubescent or almost villous. Leaves $1\frac{1}{2}$ by $\frac{1}{2}$ in. (those of the lateral branchlets half as large), acute, base obtuse or almost rounded, glabrous; nerves few, obscure; petiole $\frac{1}{2}$ in. Cymes usually 3-1-flowered; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. Calyx-teeth $\frac{1}{2}$, rarely $\frac{1}{4}$ in., glabrous or very nearly so. Corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ in.; lobes $\frac{2}{3}$ by $\frac{1}{3}$ in. Carpels $\frac{1}{3}$ by $\frac{1}{4}$ in., unsymmetric, ellipsoid.—In the habit and leaves this species closely resembles *J. sessiliflorum*, with which it has been mixed from the days of Rottler.

23. **J. Ritchiei**, *Clarke*; leaves ovate or elliptic shortly acuminate glabrous, cymes few-flowered lax, pedicels long, calyx-teeth linear short, fruit-carpels large globose.

WESTERN GHATS and CEYLON, in the hills frequently collected; Nilgherries, *Wight, Gardner*; Bababoodun Hills, *Law*; Belgaum, *Ritchie*, &c.

Scandent, ramous, glabrous or nearly so. Leaves attaining $4\frac{1}{2}$ by $1\frac{1}{4}$ in., base broadly cuneate; nerves 5-6 pairs, prominent, often tufted in the axils; petiole $\frac{1}{2}$ in. Cymes very lax, often subpaniculate, 3-9-flowered; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ –1 in. Calyx-tube campanulate, often somewhat ribbed; teeth $\frac{1}{2}$ in. and upwards, linear or shortly oblong, sometimes minutely ciliate-scabrid. Corolla-tube $\frac{3}{4}$ in., lobes $\frac{3}{4}$ in., narrow. Carpels $\frac{1}{2}$ in., very accurately spherical.—Named *J. angustifolium* by *Wight* and *Ritchie*, from which in flower it does not differ much but by the larger leaves; the fruits are unusual.

VAR. *purpurea*, *Heyne* in *Herb. Rottler* (sp.); leaves more obtuse sometimes roundish.—Bababoodun Hills, *Rottler*. Ceylon, *Wight*.

24. **J. Wightii**, *Clarke*; glabrous, leaves oblong-lanceolate long-acuminate, cymes trichotomously compound lax, calyx-teeth shortly linear, corolla-tube $\frac{1}{2}$ in. lobes $\frac{3}{4}$ in.

Bolimpatty near COIMBATORE; *Wight*, n. 1762.

Branches flexuose. Leaves $3\frac{1}{2}$ by $\frac{3}{4}$ in., or some more ovate, attenuate into the petiole, penninerved; nerves obscure; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. Cymes terminal; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ – $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{2}$ in. Corolla-lobes $\frac{1}{2}$ – $\frac{1}{2}$ in. wide, acute. Fruit not seen.—The leaves are punctate beneath, the cyme somewhat divaricated, the calyx-teeth separated by a very wide sinus. It may be allied to *J. arborescens* var. *montana*, but it is very glabrous.

25. **J. rigidum**, *Zenker Pl. Ind.* 5, t. 6; glabrous, leaves ovate or elliptic shining, cymes few-flowered dense sessile, calyx-teeth linear rigid erect, corolla-tube elongate longer than the lobes. *DC. Prodr.* viii. 305; *Wight Ic.* t. 1247; *Thwaites Enum.* 190, in part. *J. myrtophyllum*, *Zenker Pl. Ind.* 6, t. 7; *DC. l.c.* 304. *J. ligustrifolium*, *Wall.*; *Bojer Hort. Maurit.* 204; *DC. l.c.* 305, not of *Lamk.* *J. cuspidatum*, *Rottler*; *Spreng. Syst.* i. 30; *Wall. Cat.* 2872. *J. Perrottetianum*, *DC. l.c.* 304, ex descr. *J. triflorum*, *Heyne* in *Herb. Rottler*, not of *Pers.*

DECCAN PENINSULA and CEYLON, alt. 5000 ft.; common.

A rigid, dense, shrub, hardly scandent. Leaves 2 by $\frac{3}{4}$ in., upper acute at both ends, not acuminate, lower ovate, coriaceous; nerves reticulating, slender but often subprominent on the upper surface; petiole $\frac{1}{2}$ in. Cymes 3-1-flowered; pedicels 0– $\frac{1}{2}$



in. *Calyx-teeth* $\frac{1}{2}$ in. *Corolla-tube* 1 in.; lobes $\frac{2}{3}$ by $\frac{1}{2}$ in., oblong, acute. *Fruit* not seen.

VAR. tetraphis, Wight & Gardn. in Calc. Journ. Nat. Hist. vi. 55 (sp.); subscandent, leaves larger, cymes with more flowers.—Nilgherries; *Gardner*, &c.—Leaves puberulo-punctate beneath. May this be *J. Perottetianum*, *A. DC. Prodr.* viii. 304?

26. **J. trichotomum**, *Heyne*; *Roth. Nov. Sp.* 6; leaves ovate-lanceolate glabrous or minutely rusty-pubescent beneath, cymes trichotomous compound lax glabrous or nearly so, calyx-teeth minute triangular-subulate, corolla smallish. *Wall. Cat.* 2879; *DC. Prodr.* viii. 308. *J. intermedium* and *J. Gardnerianum*, *Wight in Herb.*

MADRAS; Rayacottah, *Heyne*; Nilgherries, *Gardner*, *Wight*.

Scandent, ramous; branchlets glabrous. *Leaves* $2\frac{1}{4}$ by 1 in., not acuminate, base broadly cuneate or almost rounded; nerves 7 pairs, secondary obscure; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Cymes* terminal, often paniculate, divaricate; bracts $\frac{1}{2}$ – $\frac{3}{4}$ in., lanceolate; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in. *Calyx* glabrous, teeth in Heyne's type example 0– $\frac{1}{25}$ in., rarely attaining $\frac{1}{16}$ in. *Corolla-tube* $\frac{1}{2}$ in.; lobes $\frac{1}{2}$ in., narrow acute. *Carpels* $\frac{1}{4}$ in., ellipsoid, black.—Allied to *J. arborescens* (var. *montana*), as noted by Heyne on the original plant of *Rottler*. *Roth's* description does not agree well with this type, and has puzzled all authors.

27. **J. latipetalum**, *Clarke*; glabrous, leaves narrow-lanceolate coriaceous, cymes few-flowered lax, calyx-teeth minute lanceolate, corolla large lobes $\frac{1}{2}$ – $\frac{3}{4}$ in. broad.

MOULMEIN; Thoung-gyeen, alt. 5000 ft., *Lobb*.

Scandent. *Leaves* 5 by $\frac{3}{4}$ in., elongate, acuminate, base obtuse, almost rounded, very thick; nerves 20 pairs, horizontal, obscure; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in., not (or very obscurely) jointed. *Cymes* 1–5-flowered, terminal; bracts $\frac{1}{2}$ in., lanceolate; pedicels $\frac{1}{2}$ in. *Calyx-teeth* $\frac{1}{20}$ in. *Corolla-tube* 1– $1\frac{1}{4}$ in., slender; lobes $\frac{3}{4}$ in., obovate-oblong, obtuse. *Fruit* not seen.

28. **J. attenuatum**, *Roxb. Hort. Beng.* 3; glabrous, leaves oblong acuminate, cymes lax slender, calyx subhemispheric teeth minute, corolla-tube $\frac{3}{4}$ – $\frac{1}{2}$ in. *Wall. Cat.* 2864; *DC. Prodr.* viii. 309; *Kurz For. Fl.* ii. 151, and in *Journ. As. Soc.* 1877, pt. ii. 241.

KHASIA Mts. and adjacent part of *ASSAM*, alt. 500–4000 ft., frequent; *Wallich*, *Griffith*, *H. f. & T.*, &c. *MARTABAN*, alt. 5–7000 ft. (*Kurz*).

Scandent. *Leaves* $6\frac{1}{2}$ by 2 in., base cuneate or subobtusely, membranous; nerves 12 pairs, obscure; petiole $\frac{1}{2}$ in. *Cymes* axillary and terminal, slender; bracts $\frac{1}{2}$ in., lanceolate; pedicels $\frac{1}{2}$ – $\frac{3}{4}$ in., slender. *Calyx-teeth* $\frac{1}{20}$ in. *Corolla* bright-red, pink or white; lobes $\frac{1}{2}$ in., lanceolate, acute. *Fruit-carpels* $\frac{1}{2}$ by $\frac{1}{2}$ in., ellipsoid.

29. **J. glandulosum**, *Wall. Cat.* 2849; glabrous, leaves elliptic acuminate, cymes slender lax few-flowered, calyx-tube cylindric-campanulate teeth minute, corolla-tube 1– $1\frac{1}{4}$ in. slender lobes $\frac{3}{4}$ –1 in. linear. *DC. Prodr.* viii. 304; *Royle Ill.* 268; *Brand For. Fl.* 312. *J. nepalense*, *Spreng. cura post.* 12; *DC. l. c.* 308. *J. dichotomum*, *Don Prodr.* 105, not of *Vahl*. *J. Hamiltonii*, *G. Don Gen. Syst.* iv. 67. *J. laurifolium*, *Gamble Darjeeling List*, 55, not of *Roxb.*

SUBTROPICAL HIMALAYA, alt. 2–6000 ft., from Kumaon to Bhotan; frequent. *KHASIA Mts.*, alt. 2–4000 ft., frequent.

Scandent. *Leaves* 3 by $1\frac{1}{2}$ in., base obtuse or rounded; nerves 7 pairs, distinct, often tufted in the axils beneath, inarching; petiole $\frac{1}{2}$ in. *Cymes* axillary and terminal, 1–3-flowered; bracts $\frac{1}{10}$ in., linear; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in., slender. *Calyx-tube* $\frac{1}{2}$ by $\frac{1}{10}$ in., lobes $\frac{1}{20}$ in. *Corolla* white, scarcely yellow while fading; lobes $\frac{1}{15}$ – $\frac{1}{8}$ in. broad. *Carpels* $\frac{3}{4}$ by $\frac{1}{2}$ in., elongate ellipsoid.—This has been confounded with the Australian *J. simplicifolium* (*Benth. Fl. Austral.* iv. 296), which has a much shorter calyx-tube,

a less slender corolla, and fruit carpels not half as long; and is only known in cultivation in India.

30. ***J. subglandulosum***, Kurz in *Trimen Journ. Bot.* 1875, p. 329, and *For. Fl.* ii. 151; glabrous, leaves large obovate-oblong shortly acuminate, racemes axillary very lax, calyx broad teeth very short, corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ in., lobes half as long obovate-oblong blunt.

SOUTH ANDAMAN; Kurz. PEGU and TENASSERIM, in the tropical forests not infrequent (Kurz).

Scandent. Leaves 7 by $2\frac{3}{4}$ in., base obtusely cuneate, membranous; nerves 10 pairs, secondary distinct. Flowers white; bracts minute, subulate. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.—Description chiefly from Kurz, as his example is very imperfect; the inflorescence appears strictly cymose, as in the two preceding species; there is nothing in the material or description to show that it differs from *J. attenuatum* but in the somewhat larger leaves.

31. ***J. smilacifolium***, Griff. ms.; glabrous, leaves large ovate acute coriaceous 3-nerved, cymes axillary and terminal stout compound, calyx-teeth short thick triangular, flowers and fruits large.

MALACCA; Griffith (Kew Distrib. n. 3698), *Maingay*.

A large climber. Leaves 7 by $3\frac{3}{4}$ in., base obtuse or almost cordate, very thick, secondary nerves thin distinct; petiole $\frac{3}{4}$ in. Cymes 5–20-flowered, not lax; bracts $\frac{1}{10}$ in., lanceolate; pedicels $\frac{1}{4}$ – $\frac{1}{2}$ in. Calyx-teeth $\frac{1}{10}$ in. Corolla white tinged with pink, tube $\frac{3}{4}$ –1 in., lobes $\frac{3}{4}$ by $\frac{1}{2}$ in., acute. Carpels 1 by $\frac{1}{2}$ – $\frac{3}{4}$ in.; pedicels often greatly enlarged, $\frac{1}{2}$ in. diam. below the fruit.—This has been supposed a var. merely of *J. crassifolium*, Blume, which however has smaller obscurely 3-nerved leaves, and the cymes much slenderer, with pedicels often $\frac{3}{4}$ in.

** Leaves (some of them) compound: in *J. auriculatum* and *brevilobum* often in appearance simple, the lateral leaflets being only occasionally present and then exceedingly small. (The series proceeds from the less- to the more-compound-leaved species.)

32. ***J. auriculatum***, Vahl *Symb.* iii. 1; leaves mostly simple ovate some 3-foliolate the lateral leaflets mere auricles, cymes compound many-flowered, corolla-tube $\frac{1}{4}$ – $\frac{1}{2}$ in. Roxb. *Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 96; Wall. *Cat.* 2854; *Bot. Reg. t.* 264; *DC. Prodr.* viii. 309, *syn. excl.*; *Wight Ic.* t. 700. *J. affine* and *ovalifolium*, *Wight Ic.* tt. 1255, 1256.

DECCAN PENINSULA and CEYLON, common (cultivated in Scinde, North-west India, Bengal, Siam and Mauritius).

Scandent; pubescent or villous, sometimes nearly glabrous. Leaves (when simple and the terminal leaflets) 1 by $\frac{3}{4}$ in., shortly acute or hardly acuminate, base obtuse or rounded, ash-pubescent sometimes glabrescent; nerves few, lowest oblique; lateral leaflets when present rarely exceeding $\frac{1}{2}$ in. diam. Cymes terminal, paniculate, grey-pubescent; bracts $\frac{1}{2}$ in., linear; pedicels $0\frac{1}{5}$ – $\frac{1}{4}$ in. Calyx-teeth minute, narrowly oblong. Corolla-lobes $\frac{1}{4}$ in., elliptic. Carpels $\frac{1}{2}$ in. diam., globose, black.—The *J. mauritianum*, Bojer, reduced to *J. auriculatum* by Baker (*Fl. Maurit.* 220) has the leaves subequally 3-foliolate, the corolla-tube nearly 1 in. *J. affine*, Wight, with the style half as long as corolla-tube, and *J. ovatifolium*, Wight, with the stigmas exserted, are dimorphic forms.

33. ***J. brevilobum***, A. DC. *Prodr.* viii. 307; leaves mostly simple ovate, some 3-foliolate the lateral leaflets mere auricles, cymes sessile subcapitate, corolla-tube $\frac{2}{3}$ –1 in. *J. nilagiricum*, *Pl. Hohenack.* n. 1007.

Mts. of the DECCAN PENINSULA; Nilgherries, Pulneys, &c., alt. 3–6000 ft., frequent; *Gardner, Wight, &c.*

Resembling *J. auriculatum*; usually villous or subtomentose, sometimes only



sparingly pubescent. Terminal leaflets often cordate; the lowest primary nerves divaricate. Cymes terminal, 3-10-flowered, dense. Flowers altogether larger than in *J. auriculatum*; lobes often $\frac{1}{2}$ by $\frac{1}{2}$ in. Carpels larger, $\frac{1}{4}$ in. diam. and upwards.

34. **J. flexile**, Vahl Symb. iii. 1; glabrous, leaves opposite nearly all 3-foliolate, leaflets elliptic or ovate acute coriaceous distinctly nerved, cymes lax axillary and terminal upper elongate paniculate longer than the leaves, corolla-tube $\frac{2}{3}$ -1 in. Wall. Cat. 2881; DC. Prodr. viii. 310; Wight Ic. t. 1253.—Burm. Thes. Zeyl. t. 58, fig. 1.

DECCAN PENINSULA AND CEYLON, in the lower hills, frequent.

Scandent. Terminal leaflet $4\frac{1}{2}$ by $1\frac{1}{2}$ -2 in., base rounded or obtuse; primary nerves 6 pairs, inarching. Panicles 4-8 in. long, or the lower short few-flowered, branches opposite alternate or whorled; bracts $\frac{1}{2}$ in., linear; pedicels $\frac{1}{2}$ - $\frac{1}{3}$ in. Calyx-teeth minute. Corolla white, lobes $\frac{1}{2}$ by $\frac{1}{2}$ in., acute or obtuse. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.—Heyne named three examples of this in Herb. Rottler: *J. acuminatum*, *J. azoricum* and *J. travancorense*. The Timor *J. parviflorum*, Decne., is said to have much smaller flowers, but it must be very nearly allied.

VAR. *ovata*, Wall. Cat. 2882 (sp.), chiefly, leaflets obtusely cuneate at the base, axillary cymes short few-flowered, pedicels $\frac{1}{2}$ in. *J. attenuatum*, Wall. Cat. 2864, B, not of Roxb.—Khasia; Wallich.—This is possibly a var. of *J. lanceolaria*, Roxb.; it has leaves distinctly nerved, the flowers rather smaller.

VAR. *Hookeriana*; terminal leaflet 4 by $2\frac{1}{2}$ in. membranous, corolla large with broad lobes.—Jasminum n. 41, Herb. Ind. Or. H. f. & T.—Khasia; Hook. f. & T.—This seems exactly half-way between *J. flexile* and *J. caudatum*, having the broad leaflets of the former, the membranous texture and flowers of the latter.

35. **J. caudatum**, Wall. Cat. 2884; glabrous, leaves opposite nearly all 3-foliolate, leaflets lanceolate or ovate-lanceolate caudate-acuminate membranous distinctly nerved, cymes lax, corolla-tube $\frac{3}{4}$ -1 $\frac{1}{4}$ in. Lindl. in Bot. Reg. 1842, t. 26; DC. Prodr. viii. 310. *J. ovatum*, Wall. Cat. 2882, in part.

KHASIA, alt. 0-4000 ft., frequent; Wallich, H. f. & T., &c. MISHMEE; Griffith.

Only distinguishable from *J. flexile*, var. *Hookeriana*, by the narrower more caudate leaves. The cyme is usually slenderer, the corolla longer, the tube attaining $1\frac{1}{4}$ in., the lobes $\frac{3}{4}$ by $\frac{1}{2}$ in.

36. **J. lanceolaria**, Roxb. Fl. Ind. ed. Carey & Wall. i. 97; glabrous, leaves opposite nearly all trifoliolate, leaflets elliptic shortly acuminate very thick, nerves obscure, cymes compound rigid thick-branched, corolla-tube 1 in. DC. Prodr. viii. 310. *J. lanceifolium*, Roxb. Hort. Beng. 3?

KHASIA and JAINTIA MTS., alt. 3-5000 ft., frequent; Griffith, H. f. & T., &c.

A large climber. Leaflets 4 by $1\frac{1}{2}$ in., acute, base obtusely cuneate. Cymes compound, trichotomous; bracts $\frac{1}{2}$ in., linear; pedicels 0- $\frac{1}{2}$ in., thick, still thicker in fruit. Calyx-teeth minute. Corolla large, white; lobes attaining $\frac{3}{4}$ by $\frac{1}{2}$ in. Carpels $\frac{1}{2}$ - $\frac{1}{2}$ in. diam., subglobose.—Easily recognised by the very thick leaflets and stout cymes. This has been identified by Benth. (Fl. Hongk. 216) with *J. paniculatum*, Roxb., a Chinese plant, which has the corolla far smaller (tube $\frac{1}{2}$ in., lobes $\frac{1}{4}$ in.), the cyme less stout, the leaflets obtuse.

37. **J. heterophyllum**, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 99; leaves alternate simple and 3-foliolate, leaflets ovate-lanceolate glabrous, cymes very compound minutely pilose, corolla yellow tube $\frac{1}{4}$ - $\frac{1}{2}$ in. Wall. Cat. 2883; Don Prodr. 106; Wall. Pl. As. Rar. iii. 47, t. 275; DC. Prodr. viii. 312; Loud. Arb. 655, t. 1274.

NIPAL; Wallich, Scully. MISHMEE; Griffith.

Scandent. Leaves 5 by $2\frac{1}{2}$ in. (lateral leaflets, when present, smaller), base rounded or cordate, somewhat coriaceous, nerves irregular but distinct beneath. Cymes mostly terminal, 10-30-flowered, branches alternate; bracts $\frac{1}{2}$ in., linear; pedicels 0- $\frac{1}{2}$ in.

Calyx small, minutely pubescent, teeth minute. *Corolla-lobes* $\frac{1}{4}$ in., elliptic, acute. *Carpels* $\frac{1}{3}$ by $\frac{1}{4}$ in., ellipsoid.

38. ***J. calophyllum***, Wall. Cat. 2889; leaves opposite and alternate subequally 3-foliolate, leaflets broadly ovate glabrous, cymes compound trichotomous minutely pubescent, corolla-tube $\frac{3}{4}$ in. DC. Prodr. viii. 310; J. courtallense, Wight Ic. t. 1252.

SOUTH DECCAN PENINSULA; Nilgherries, Wight, Foulkes; Courtallum, Wight.

Scandent. Leaflets 2 by $1\frac{1}{2}$ in., obtuse or shortly acute, base rounded truncate or subcordate, membranous, shining, nerves slender. Cymes 10-50-flowered, branches alternate and opposite; bracts minute; pedicels $0-\frac{1}{2}$ in. Calyx nearly glabrous, subtruncate. Corolla-lobes $\frac{1}{4}-\frac{1}{2}$ in., elliptic, obtuse. Carpels $\frac{1}{2}$ in., ellipsoid.

39. ***J. dispernum***, Wall. Cat. 2886, and in Roxb. Fl. Ind. ed. Carey & Wall. i. 99, and Pl. As. Rar. iii. 46, t. 274; leaves opposite 3-5-foliolate, leaflets cordate-lanceolate glabrous sub-3-nerved, cymes somewhat dense puberulous or pubescent running into terminal panicles, corolla-tube $\frac{1}{2}$ in. Don Prodr. 106; DC. Prodr. viii. 310; Brand. For. Fl. 312.

TEMPERATE HIMALAYA; alt. 2-8000 ft., from Kashmir to Bhotan, common. KHASIA MTS., alt. 3-6500 ft., common.

Scandent. Terminal leaflet $3\frac{1}{2}$ by $1\frac{1}{2}$ in., acuminate, coriaceous; lateral leaflets 1 or often 2 pairs, smaller. Cymes when axillary 10-20-flowered; upper leaves often gradually reduced to bracts $\frac{1}{2}$ in. long, whence arises a terminal elongate panicle 60-100-flowered; proper bracts $\frac{1}{10}$ in.; pedicels $0-\frac{1}{2}$ in. Calyx glabrous or minutely puberulous, teeth $\frac{1}{15}$ in., short-triangular. Corolla white; lobes $\frac{1}{4}-\frac{1}{2}$ in., broadly elliptic. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

40. ***J. humile***, Linn.; DC. Prodr. viii. 313; glabrous or puberulous, leaves alternate 3-foliolate or pinnate, leaflets rhomboid oblong coriaceous, cymes somewhat dense, calyx-teeth very short, corolla yellow tube $\frac{1}{2}-\frac{3}{4}$ in. Bot. Reg. t. 350. J. chrysanthemum, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 98. J. revolutum, Sims in Bot. Mag. t. 1731; Bot. Reg. t. 178; Don Prodr. 106; Wall. Cat. 2887; Lodd. Bot. Cab. t. 966; DC. l. c. 312; Wight Ic. t. 1258; Loud. Arb. 655, t. 1275; Brand. For. Fl. 313; Boiss. Fl. Orient. iv. 42. J. bignoniaceum, Wall. Cat. 2888; DC. l. c. 313. J. Wallichianum, Lindl. in Bot. Reg. t. 1409. J. inodorum, Jacquem.; Dene. in Jacq. Voy. Bot. 139, t. 143; DC. l. c. 312.—Jasminum, n. 3, Hardwicke in As. Research. vi. 349.

SUBTROPICAL HIMALAYA, alt. 2-5000 ft., from Kashmir to Nipal, common. BHOTAN; Griffith. SOUTH INDIA AND CEYLON, alt. 2-6000 ft., common.—DISTRIB. Cabul (cultivated widely).

An erect rigid, ramous shrub. Leaflets 2 by $\frac{3}{4}-1$ in., or $\frac{1}{2}$ by $\frac{1}{4}$ in., very variable in size, usually smaller when more numerous, acute or obtuse at both ends; nerves inconspicuous. Cymes 10-20-flowered; bracts minute; pedicels $\frac{1}{4}-\frac{1}{2}$ in. Calyx glabrous or nearly so; teeth $\frac{1}{16}$ in., triangular-oblong. Corolla-lobes $\frac{1}{3}$ by $\frac{1}{2}$ in. Carpels $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

41. ***J. pubigerum***, Don Prodr. 106; softly densely villous, leaves alternate 3-7-foliolate, leaflets ovate or oblong, cymes dense, calyx-teeth $\frac{1}{20}-\frac{1}{10}$ in. densely villous, corolla-tube $\frac{3}{4}$ in. DC. Prodr. viii. 312, excl. var. β .

NORTH-WEST INDIA; Royle.

An erect shrub, in habit closely resembling *J. humile* and perhaps a var. thereof, but there are no examples intermediate in hairiness. Branches dense, villous. Leaflets $1\frac{1}{2}-2$ in., from suborbicular to oblong, closely villous on both surfaces. Cyme nearly sessile, 15-flowered, very villous. Calyx-teeth linear, short but much longer than in *J. humile*.—Perhaps a garden plant.

42. **J. officinale**, Linn.; *DC. Prodr.* viii. 313; glabrous or nearly so, leaves opposite pinnate, leaflets rhomboid-oblong acute, calyx-teeth linear long, corolla white tube $\frac{2}{3}$ in. *Bot. Mag.* t. 31; *Brand. For. Fl.* 313; *Boiss. Fl. Orient.* iv. 43.

KASHMIR; alt. 3-9000 ft., frequent.—DISTRIB. Cabul, Persia (often cultivated in India, China, Europe, &c.).

* Branches very long, weak, requiring support, hardly scandent. *Cymes* terminal, 1-10-flowered, often leafy; bracts $\frac{1}{2}$ in., linear; pedicels 0- $\frac{1}{4}$ in. *Calyx-teeth* $\frac{1}{2}$ - $\frac{3}{4}$ in., sometimes as long as the corolla-tube, sometimes (in the same plant) not half so long. *Corolla-lobes* $\frac{1}{2}$ by $\frac{1}{4}$ in. *Carpels* $\frac{1}{2}$ by $\frac{1}{4}$ in., ellipsoid.

43. **J. grandiflorum**, Linn.; *DC. Prodr.* viii. 313; glabrous or nearly so, leaves opposite pinnate, leaflets rhomboid-oblong, calyx-teeth linear long, corolla white tube $\frac{2}{3}$ in. *Roxb. Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 98; *Bot. Reg.* t. 91; *Wall. Cat.* 2885; *Wight Ic.* t. 1257; *Brand. For. Fl.* 313; *Kurz For. Fl.* ii. 150, and in *Journ. As. Soc.* 1877, pt. ii. 242. *J. aureum*, *Don Prodr.* 106; *DC. l. c.* 314 p.—*Rheede Hort. Mal.* vi. t. 52.

SUBTROPICAL NORTH-WEST HIMALAYA, alt. 2-5000 ft.; frequent, wild (fide *Brandis*; elsewhere in India often cultivated).

Branches subpendent, angular, hardly requiring support. *Calyx-teeth* about $\frac{1}{4}$ in., rarely half as long as the corolla-tube. *Corolla-lobes* attaining $\frac{1}{2}$ in.—Otherwise hardly distinguishable from *J. officinale*.

EXCLUDED SPECIES (not British Indian).

J. EXTENSUM, *Wall. Cat.* 2862; *DC. Prodr.* viii. 308; *Kurz For. Fl.* ii. 150.—Birma.

J. LIGUSTRIFOLIUM, *Wall. ms.*; *Bejer Hort. Maurit.* 204, *DC. Prodr.* viii. 305.—Birma, beyond the British frontier.

J. TUBIFLORUM, *Roxb. Cat. Pl.* (1813), *Fl. Ind. ed. Carey & Wall.* i. 96.—This is supposed to be the origin of *J. SOLENANTHUM*, *DC. Prodr.* viii. 306, founded on a specimen cultivated in the Mauritius. Malay Islds.

J. ORLONGUM, *Burm. Fl. Ind.* 6, t. 3, fig. 2; *DC. Prodr.* viii. 312.—Java.

2. **NYCTANTHES**, Linn. in part.

A small tree. *Leaves* opposite, ovate. *Flowers* in small, sessile, bracteate heads disposed in terminal trichotomous cymes. *Calyx* ovoid-cylindric, subtruncate, finally split or deciduous. *Corolla* salvershaped; tube cylindric, yellow; lobes 4-8, imbricated in bud, patent, white. *Anthers* 2, subsessile near the top of the corolla-tube. *Ovary* 2-celled; style cylindric, very shortly bifid; ovule 1 in each cell, erect, basal. *Capsule* orbicular, compressed parallel to the partition, ripe separating into 2 subdiscoid carpels. *Seed* erect, orbicular, flattened, testa thin, albumen 0; cotyledons flat, radicle inferior.

N. Arbor-tristis, Linn.; *Roxb. Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 85; *Wall. Cat.* 2846; *Bot. Reg.* t. 399; *Lamk. Ill.* t. 6; *DC. Prodr.* viii. 314; *Bot. Mag.* t. 4900; *Bedd. Fl. Sylv.* t. 240; *Eichler in Mart. Bras.* vi. pt. i. 317, t. 84, fig. 3; *Brand. For. Fl.* 314; *Kurz For. Fl.* ii. 155, and in *Journ. As. Soc.* 1877, pt. ii. 240. *Parilium Arbor-tristis*, *Gaertn. Fruct.* i. 234, t. 51. *Scabrita scabra*, Linn.; *Vahl Symb.* ii. 28; *Gaertn. Fruct.* ii. 265, t. 138. *S. triflora*, Linn. *Mant.* i. 37.—*Rheede Hort. Mal.* i. t. 21 *Sephalica*, *Jones in As. Research.* iv. 244.

CENTRAL INDIA, alt. 1-3000 ft., common, to Bundelkund and Burdwan; reappearing in the Oudh and North-west Terai (cultivated throughout India, and in both hemispheres).

Erect, 30 ft., but often forming coppice, scabrid-pilose. *Leaves* $4\frac{1}{2}$ by $2\frac{1}{2}$ in., acute, base rounded or cuneate; petiole $\frac{1}{2}$ in., not articulated. *Flowers* 3-7 in each head, sweet-scented; bracts $\frac{1}{4}$ - $\frac{1}{2}$ in., elliptic. *Calyx* $\frac{1}{2}$ in. *Corolla-tube* $\frac{1}{4}$ - $\frac{1}{2}$ in.; lobes $\frac{1}{4}$ - $\frac{1}{2}$ in., elliptic. *Capsule* $\frac{1}{4}$ in. long and broad by $\frac{1}{8}$ in. thick.

3. SCHREBERA, Roxb.

A tree. *Leaves* opposite, unequally pinnate. *Flowers* in terminal 2-3-chotomous compound cymes; bracts small. *Calyx* tubular-campanulate, irregularly 4-7-lobed. *Corolla* salvershaped; tube cylindric; lobes imbricate in the bud, 4-7, patent. *Stamens* 2, near the top of the corolla-tube; filaments short. *Ovary* 2-celled; style cylindric, shortly 2-lobed; ovules 3-4 in each cell, pendulous from its apex. *Capsule* obovoid, 2-celled, loculicidally 2-valved, woody. *Seeds* pendulous, winged, albumen 0; cotyledons plano-convex or contorted, radicle superior.—DISTRIB. Species 4; 1 Indian, 3 African.

S. swietenoides, Roxb. *Cor. Fl.* ii. t. 101, and *Fl. Ind. ed. Carey & Wall.* i. 109; minutely pubescent or glabrous, leaves 5-7-foliolate, cymes many-flowered, capsule 2 in. pearshaped. *Wight Ill.* t. 162; *Trattin. Arch.* i. 29, with plate; *DC. Prodr.* viii. 675; *Bedd. Fl. Sylv.* t. 248; *Brand. For. Fl.* 305; *Kurz For. Fl.* ii. 156, and in *Journ. As. Soc.* 1877, pt. ii. 243.

TROPICAL HIMALAYA; Kumaon Terai. DECCAN PENINSULA, alt. 1-4000 ft. PEGU; widely diffused, but not abundant.

A tree, 40-50 ft. *Leaflets* 4 by 2 in., ovate, acute, mature glabrous; petiolules $\frac{1}{8}$ in. *Cyme* often 100-flowered; bracts $\frac{1}{2}$ in., linear, or obsolete; pedicels 0- $\frac{1}{2}$ in. *Calyx* $\frac{1}{2}$ in., irregularly 5-lobed, somewhat 2-lipped or subtruncate, minutely pilose or glabrescent. *Corolla* white with brown marks; tube $\frac{1}{4}$ - $\frac{1}{2}$ in.; lobes $\frac{1}{2}$ - $\frac{1}{4}$ in., elliptic. *Anthers* subexserted. *Capsule* 2 by $1\frac{1}{2}$ in., obovoid, obtuse, very woody. *Seeds* usually 3-4 in each cell; cotyledons contorted.

VAR. *pubescens*, Kurz in *Flora*, 1872, p. 398 (sp.); leaves pubescent, cyme villous.—Jubbulpore; *Kurz*.—A variety of *S. swietenoides* according to Kurz himself in *Journ. As. Soc.* 1877, pt. ii. 243, who says that the capsules are much smaller.

4. SYRINGA, Linn.

Shrubs. *Leaves* opposite, simple or (in cultivation) pinnate. *Panicles* terminal; bracts small or 0. *Calyx* small, campanulate, irregularly toothed or subtruncate, persistent. *Corolla* salvershaped; tube narrow-cylindric; lobes 4, patent, elliptic, induplicate-valvate in bud. *Stamens* 2, near the top of the corolla-tube; filaments short; anthers oblong, laterally dehiscent. *Ovary* 2-celled; style cylindric, included, 2-partite or subsimple; ovules 2 in each cell, pendulous from its apex. *Capsule* oblong, subterete, loculicidally 2-valved. *Seeds* pendulous, compressed, winged, albuminous; cotyledons flat; radicle superior.—DISTRIB. Species 6 (or 11 ex Dene.), from Eastern Europe to Japan.

1. **S. persica**, Linn.; *DC. Prodr.* viii. 283; leaves 1 in. ovate-lanceolate or lanceolate glabrous, flowers numerous scarcely fasciated. *Bot. Mag.* t. 486; *Wall. Cat.* 2832; *Brand. For. Fl.* 306; *Rev. Hort.* 1878, p. 571-2, with fig.; *Dene. in Nouv. Arch. Mus.* 2, ii. 42; *Boiss. Fl. Orient.* iv. 38.

WEST KASHMIR; alt. 8000 ft., possibly wild; frequently cultivated in India.—DISTRIB. Persia.

A glabrous shrub. *Leaves* acute, rarely obtuse, sometimes pinnatifid or sub-pinnate, base cuneate; petiole $\frac{1}{2}$ in. *Panicles* compound, glabrous; bracts from $\frac{1}{2}$ in. lanceolate to $\frac{1}{2}$ in. linear, usually inconspicuous; pedicels $\frac{1}{10}$ - $\frac{1}{5}$ in. *Calyx* $\frac{1}{2}$ in., teeth short, triangular. *Corolla* lilac or white; tube $\frac{1}{4}$ in., lobes $\frac{1}{2}$ in. *Capsule* $\frac{1}{2}$ - $\frac{1}{2}$ by $\frac{1}{8}$ in., terete, 4-ribbed.—Persian Lilac.

2. **S. Emodi**, Wall. Cat. 2831; leaves 2-5 in, elliptic or ovate glabrous whitened beneath, panicles dense, flowers often fascicled. Royle Ill. 267, t. 65, fig. 2; DC. Prodr. viii. 283; Bot. Reg. 31 (1845), t. 6; Brand. For. Fl. 306; Decne. in Nouv. Arch. Mus. 2, ii. 40.

SUBALPINE HIMALAYA, alt. 9-12,000 ft., from Kashmir to Kumaon, frequent; Wallich, Falconer, &c.

A large shrub. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., acute at both ends, secondary nerves prominently reticulating beneath; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. Panicles dense-flowered; bracts lanceolate, deciduous, usually inconspicuous; pedicels often 0, sometimes $\frac{1}{8}$ in. Calyx $\frac{1}{2}$ in., subtruncate, minutely pubescent or nearly glabrous. Corolla purplish or white; tube $\frac{1}{4}$ in.; lobes $\frac{1}{2}$ in. Capsule $\frac{1}{2}$ - $\frac{3}{4}$ in., terete, 2-grooved, acute.

5. FRAXINUS, Linn.

Trees. Leaves opposite, unequally pinnate. Inflorescence terminal or on shortened axillary buds falsely axillary. Flowers small, polygamous or dioecious, paniced, racemose or subfascicled; bracts caducous. Calyx small, 4-toothed, or 0. Petals 0, or 2-4, free or connate in pairs at the base, narrow-oblong, induplicate-valvate in bud. Stamens 2, attached near the base of the petals or subhypogynous, filaments short or long. Ovary 2-celled; style short or long, bifid; ovules in each cell 2, pendulous from its apex. Capsule samaroid, compressed contrary to the partition, produced into a wing, 1-seeded, indehiscent. Seed pendulous, oblong; albumen fleshy; cotyledons flat, radicle superior.—DISTRIB. Species 30, in the north temperate regions of both hemispheres.

SECT. I. **Ornus**. Petals 2-4. Flowers paniced, mostly hermaphrodite.

1. **F. floribunda**, Wall. Cat. 2836, and in Roxb. Fl. Ind. ed. Carey & Wall. i. 150, and Pl. As. Rar. iii. 47, t. 277; leaflets elliptic-lanceolate serrate membranous, secondary nerves reticulated, samaras 1-1 $\frac{1}{2}$ in. very narrow obtuse or emarginate. Don Prodr. 106; DC. Prodr. viii. 275; Brand. For. Fl. 302, t. 37. F. urophylla, Wall. Cat. 2835; DC. l. c. Ornus floribunda, Dietr. Sp. Pl. i. 249; Loud. Arb. 653, t. 1270. O. urophylla, G. Don Gen. Syst. iv. 57.

TEMPERATE AND SUBALPINE HIMALAYA, alt. 5-11,000 ft., from Kashmir to Bhotan; Wallich, Griffith, &c. KHASIA MTS., alt. 4-5000 ft.; De Silva, H. f. & T.

A large tree. Leaflets 3-4 pairs, 4 by $1\frac{1}{2}$ in., acutely acuminate, serratures close shallow (in the Khasian F. urophylla more distant and coarse), glabrous, when young pilose on the nerves beneath; petiolules $\frac{1}{4}$ in. Pedicels $\frac{1}{2}$ in., in tufts on the branches of the panicle. Calyx $\frac{1}{10}$ - $\frac{1}{8}$ in.; teeth acutely triangular in the typical Kumaon plant, hardly any in the East Himalayan. Corolla-lobes $\frac{1}{2}$ - $\frac{1}{4}$ in., linear-oblong. Filaments $\frac{1}{12}$ in. Style short; stigma long, deciduous. Samara $\frac{1}{2}$ in. wide upwards, narrowed to the width of the seed at base.—F. retusa, Champ. (according to Benth. Fl. Hongk. 214), differs in the retuse samara and the subtruncate calyx; but, if these characteristics are specific, the East Himalayan and Khasian examples must be referred to F. retusa. The Hongkong retusa differs however in the smaller samara, which when fully ripe is less than 1 in. The flowers appear to grow larger westward; in Wallich's type example of F. floribunda the petals are fully $\frac{1}{2}$ in.

2. **F. Griffithii**, Clarke; leaflets elliptic obtusely acuminate entire coriaceous, secondary nerves obscure, samaras 1 in. very narrow obtuse or emarginate.

MISHMEE; "summit of a high mountain," Griffith (Kew Distrib. n. 3677).

Griffith's example is in ripe fruit, and is perhaps a var. of F. floribunda, but differs more from it and from F. retusa than these do from each other. The leaflets are very thick, acuminate, rostrate, rounded and sometimes widened at the tip.

SECT. II. **Fraxinaster**. *Petals* 0. *Flowers* polygamous or dioecious. *Pedicels* in fruit racemed or subfascicled.

3. **F. excelsior**, *Linn.*; *DC. Prodr.* viii. 276; leaflets 2-5 pairs all sessile or nearly so, calyx in all the flowers obsolete, pedicels in fruit racemed. *Engl. Bot.* t. 1692; *Lamk. Ill.* t. 858, fig. 1; *Brand. For. Fl.* 303; *Boiss. Fl. Orient.* iv. 39. *F. heterophylla*, *Vahl Enum.* i. 53 (and several others). *F. Moorcroftiana*, *Wall. Cat.* 2834; *DC. l. c.* 275, not of *Brandis*. *Ornus Moorcroftiana*, *G. Don Gen. Syst.* iv. 57.

TEMPERATE WEST HIMALAYA and WESTERN TIBET, alt. 4-9000 ft.; Ladak; *Moorcroft*; Kashmir, frequent; *Jacquemont*; Jamu and Kishtwar, *T. Thomson*.—DISTRIB. From the Caucasus westwards to Britain.

A large tree. *Leaflets* 4 by $1\frac{1}{2}$ in., elliptic, acuminate, serrate sessile or very nearly so, midrib beneath glabrous or minutely pubescent. *Flowers* in short racemes, fascicled near the tips of the branches, appearing before the leaves; male and hermaphrodite alike without perianth. *Filaments* very short. *Racemes* in fruit 1-6 in., pendulous; pedicels $\frac{1}{2}$ in.; samaras $1\frac{2}{3}$ by $\frac{1}{4}-\frac{1}{3}$ in., narrowed gradually to both the obtuse ends.—In the absence of flowers *Brandis* hesitates about identifying this with *F. excelsior*, but the tree is plentiful in Kashmir hills and exactly like the common Ash.

4. **F. xanthoxyloides**, *Wall. Cat.* 2833; leaflets 3-5 pairs lowest petiolulate, calyx 0 in the male flowers small in the hermaphrodite, pedicels in fruit in very short racemes or subfascicled. *DC. Prodr.* viii. 275; *Brand. For. Fl.* 304; *Boiss. Fl. Orient.* iv. 41. *F. Moorcroftiana*, *Brand. For. Fl.* 304, not of *Wall.* *Ornus xanthoxyloides*, *G. Don Gen. Syst.* iv. 57.

TEMPERATE HIMALAYA; from Kashmir to Kumaon, alt. 3-9000 ft., abundant in places (*Brandis*).—DISTRIB. Cabul and Beloochistan.

A tree 25 ft., or more often a shrub. *Leaflets* 2 by $\frac{3}{4}$ in., hardly acuminate, crenulate-serrate, glabrous, or often slightly hairy near the base of the midrib beneath; lowest petiolules usually $\frac{1}{2}$ in., distinct, sometimes subobsolete. *Flowers* appearing before the leaves in dense heads, brown from the woolly bracts. *Filaments* short; anthers oblong. *Racemes* in fruit $\frac{1}{2}$ in., or the pedicels $\frac{1}{4}$ in., appearing fascicled. *Calyx* in fruit often $\frac{1}{16}$ in., obtuse, striated lengthwise or not. *Fruit* $1\frac{1}{2}$ by $1\frac{1}{4}$ in.—The Cabul examples of *Griffith* have the samara $\frac{1}{3}$ (sometimes very nearly $\frac{1}{2}$) in. broad. *F. dimorpha*, *Coss & Dur.*, from Algiers, does not appear to differ except in all the leaflets being sessile or very nearly so.

6. OSMANTHUS, *Lour.*

Evergreen shrubs or trees, glabrous. *Leaves* opposite, entire or serrate. *Flowers* axillary and terminal, fascicled or in very short racemes; hermaphrodite or polygamous. *Calyx* 4-toothed or -lobed. *Corolla-tube* short or long; lobes 4, elliptic, obtuse, imbricated. *Stamens* 2, subsessile on the corolla-tube. *Ovary* 2-celled; style short or cylindric, 2-lobed or subentire; ovules 2 in each cell, pendulous from its apex. *Drupe* ovoid or globose; endocarp bony or crustaceous. *Seeds* pendulous, usually solitary, albumen fleshy; radicle superior.—DISTRIB. Species 8, extending from the N.W. Himalaya through China and Japan to Western N. America.

The character of this genus is here considerably widened from that of *Gen. Pl.* (ii. 677), to include *O. suavis*, *King*.

1. **O. fragrans**, *Lour. Fl. Cochinch.* i. 29; leaves lanceolate acuminate, calyx minute, corolla less than $\frac{1}{2}$ in. tube very short. *DC. Prodr.* viii. 291. *Olea fragrans*, *Thunb. Fl. Jap.* 18, t. 2; *Roxb. Hort. Beng.* 3, and *Fl. Ind. ed.*

Osmanthus.] *Carey & Wall.* i. 104; *Wall. Cat.* 2810; *Bot. Mag.* t. 1552; *Blume Mus. Bot.* i. 316; *Brand. For. Fl.* 309. *O. acuminata*, *Wall. Cat.* 2809; *DC. l.c.* 285.

TEMPERATE HIMALAYA, alt. 4-7000 ft., from Gurwhal to Sikkim; *Wallich, H. f. & T.*, &c. KHASIA MTS.; *Griffith, Lobb.* (According to Brandis only planted in Gurwhal and Kumaon).—DISTRIB. China, Japan, cultivated.

A small tree or a shrub. *Leaves* 7 by 2 in., entire in the wild plants, often serrated in the cultivated, coriaceous; petiole $\frac{2}{3}$ in. *Pedicels* $\frac{1}{4}$ – $\frac{3}{4}$ in., densely fascicled, often in the upper axils, rarely terminal. *Calyx* less than $\frac{1}{30}$ in., 4-toothed. *Corolla* divided nearly to the base; lobes oblong. *Drupe* $\frac{3}{4}$ by $\frac{1}{2}$ in., ellipsoid.—The fruit is only known from the Kumaon tree (a cultivated plant, ex *Brandis*). The cultivated *O. fragrans* is not known to produce fruit elsewhere.

2. *O. suavis*, *King in Herb. Calc.*; leaves lanceolate acute, calyx $\frac{1}{8}$ – $\frac{1}{6}$ in. deeply 4-lobed, corolla-tube $\frac{3}{4}$ – $\frac{1}{4}$ in. *Olea* sp., *Griff. Itin. Notes*, 156, n. 785.

SUBALPINE HIMALAYA; Sikkim and East Nipal, alt. 9-10,000 ft., Tonglo and Kalapookree, *J. D. H., King*; Bhotan *Griffith*.

A bush, 12 ft., or a small tree (*King*). *Leaves* $3\frac{1}{4}$ by 1 in., acute, base cuneate, minutely crenate-serrate, coriaceous; petiole $\frac{1}{2}$ in. *Pedicels* 0– $\frac{1}{4}$ in., in dense axillary and terminal fascicles. *Flowers* polygamous. *Calyx-lobes* oblong, obtuse, microscopically pubescent. *Corolla-tube* $\frac{1}{2}$ in. and upwards (both in the male and hermaphrodite flowers) in *King's* specimens; in *Griffith's* varying from $\frac{1}{10}$ to $\frac{1}{2}$ in. (in flowers male or nearly male); corolla-lobes $\frac{1}{2}$ in., strongly imbricated in the bud. *Anthers* subsessile near the top of the tube, elliptic, acute. *Style* $\frac{1}{2}$ in., tip bifid. *Drupe* $\frac{1}{4}$ – $\frac{1}{2}$ by $\frac{1}{4}$ – $\frac{1}{2}$ in., ellipsoid; endocarp thin, crustaceous. *Albumen* copious, fleshy.—*Griffith* made a long MS. note on this species: it does not agree well with *Osmanthus* to which *King* refers it, but there appears no other place for it unless a new genus.

7. LINOCIERA, Swartz.

Shrubs or trees. *Leaves* opposite, entire. *Flowers* in axillary (rarely terminal) panicles or cymes, often in small terminal fascicles; bracts at the divisions small. *Calyx* small, 4-fid. *Petals* 4, long or short, nearly free, or cohering by pairs, or very shortly connate, induplicate-valvate in bud. *Stamens* 2; filaments short; anthers elliptic, dehiscing on the margin. *Ovary* 2-celled; style short, stigma obscurely bifid or entire; ovules 2 in each cell, pendulous from its apex. *Drupe* ellipsoid (rarely globose); endocarp bony or crustaceous. *Seed* usually solitary, pendulous, testa thin, albumen fleshy plentiful or 0; radicle superior.—DISTRIB. Species 40, in the tropics of both hemispheres.

Olea only differs by having the corolla more distinctly tubular. Many authors place the albuminous species in *Olea*, and the exalbuminous in *Linociera*; but the albumen is unknown in so many species that this arrangement is inconvenient, while it throws into different genera the very long-petaled species closely allied in every point except the albumen.

SECT. I. Eulinociera. Seeds albuminous (Petals elongate).

1. *L. malabarica*, *Wall. Cat.* 2828; leaves broadly oblong hardly acuminate, flowers in small clusters, calyx-lobes grey-pilose, petal $\frac{1}{4}$ in. linear-lanceolate connected in pairs, ovary pilose. *DC. Prodr.* viii. 297; *Wight Ic.* t. 1246; *Dalz. & Gibs. Bomb. Fl.* 159. *Chionanthus malabarica*, *Bedd. For. Man.* 154, and *Fl. Sylv.* t. 239, fig. in corner.

DECCAN PENINSULA; from the Concan, *Dalzell*, to Courtallum, *Wight*; frequent.

A small tree. *Leaves* 4 by $1\frac{1}{2}$ in., subobtusely or very suddenly narrowed to an obtuse apex, base cuneate, glabrous, coriaceous, nerves obscure; petiole $\frac{1}{2}$ in. *Peduncles* short, axillary, fascicled, numerous, grey-pilose, sparingly paniced; bracts $\frac{1}{30}$ in., ovate, grey-pilose. *Calyx-lobes* $\frac{1}{24}$ in., ovate, grey-pilose on the back.

Petals white. *Style* shortly bifid. *Drupe* $\frac{1}{2}$ by $\frac{1}{2}$ in., ellipsoid; endocarp thin, crustaceous. *Testa* thin, albumen plentiful.

2. ***L. Wightii***, *Clarke*; leaves elliptic acuminate or rostrate, flowers in small clusters, calyx-lobes glabrous on the back ciliate, petals $\frac{1}{2}$ in. linear-lanceolate connected in pairs often for one-third their length, ovary glabrous. *Olea linocieroides*, *Wight* *l.c.* t. 1241; *Bedd. For. Man.* 152.

DECCAN PENINSULA; Courtallum; *Wight*. Tinnevely Ghauts, alt. 1-3000 ft., *Beddome*.

A small tree. *Leaves* 4 by $1\frac{1}{2}$ in., base obtusely cuneate, coriaceous, nerves obscure or somewhat plainly inarching; petiole $\frac{1}{2}$ in. *Peduncles* short, axillary, clustered, glabrous, sparingly panicled; bracts $\frac{1}{10}$ in., ovate, glabrous. *Calyx-lobes* $\frac{1}{4}$ in., ovate. *Drupe* $\frac{1}{2}$ by $\frac{1}{2}$ in., ellipsoid; endocarp thin, crustaceous. *Testa* thin, albumen plentiful.—Hardly differs from *L. malabarica*, but by the points specified in the diagnosis. *Wight's Herbarium* contains the ripe fruit, which is as depicted by him.

SECT. II. ***Geranthus***. *Seeds* exalbuminous. (Several species, in which the seed is not known may prove to be *Oleas*.)

3. ***L. purpurea***, *Vahl Enum.* i. 47; leaves obovate-oblong obtuse coriaceous, panicles very small closely pubescent, petals 4 subequal $\frac{1}{10}$ in., drupe $\frac{1}{2}$ in. ellipsoid. *Wall. Cat.* 2829; *DC. Prodr.* viii. 297. *Chionanthus zeylanica*, *Linn.*; *Thwaites Enum.* 188; *Roxb. Fl. Ind. ed. Carey & Wall.* i. 107; *Bedd. For. Man.* 154. *Thouinia nutans*, *Linn. f. Suppl.* 89.

CEYLON; common in the hotter parts of the island.

A small tree; branchlets minutely pubescent. *Leaves* $2\frac{1}{2}$ by 1 in., tip very obtuse or rounded, base attenuate, nerves slightly impressed beneath distinctly inarching; petiole $\frac{1}{2}$ in. *Panicle* $\frac{1}{2}$ -1 in., somewhat dense, grey-pubescent; lower bracts $\frac{1}{2}$ in., lanceolate, upper $\frac{1}{10}$ in., ovate. *Calyx* very small. *Ovary* glabrous.

VAR. dichotoma, *Wall. Cat.* 2825 (sp.); leaves elliptic or oblong subacute at both ends very coriaceous nerves less distinct, panicles 1-4 in. lax nearly glabrous, petals $\frac{1}{2}$ in. *DC. Prodr.* viii. 297.—Ceylon.

4. ***L. albidiflora***, *Thwaites Enum.* 189; leaves elliptic shortly suddenly rostrate coriaceous, panicles small nearly glabrous, petals 4 subequal $\frac{1}{2}$ - $\frac{1}{4}$ in. and upwards, drupe $\frac{1}{2}$ - $\frac{3}{4}$ in. *Chionanthus axillaris*, *R. Br. Prodr.* 523?.

CEYLON; alt. 1-3000 ft., abundant, *Thwaites*.—DISTRIB. Australia.

A small tree; nearly glabrous. *Leaves* $2\frac{1}{2}$ by $1\frac{1}{2}$ in.; nerves beneath slightly impressed, distinctly inarching. *Panicles* $\frac{1}{2}$ -1 in.; bracts $\frac{1}{10}$ in., ovate, minutely ciliate-pubescent. *Calyx* $\frac{1}{10}$ in., glabrous; lobes minutely ciliate-pubescent. *Petals* pale yellow (*Thwaites*). *Ovary* glabrous.—This seems hardly specifically distinct from *L. purpurea* if in that species we include the larger flowered *L. dichotoma*. *Beddome (For. Man.* 154) reduces it with confidence to *L. malabarica*; but (apart from the presence of albumen) *L. malabarica* has the flowers in small capitate clusters at the extremities of peduncles much longer than the heads themselves. The example communicated from Australia by F. Mueller appears identical with the Ceylon specimens; F. Mueller is very probably right in supposing it to have been *Chionanthus axillaris*, *R. Br.*, but the diagnosis of Brown is very short.

VAR. rostrata, *Thwaites Enum.* Pl. Zeyl. 189 (sp.); fruit 1 by $\frac{1}{2}$ in.—Ceylon; Hinidoon Corle, *Thwaites*.—Except in the somewhat larger fruit, *Thwaites' examples* of this appear identical with his *L. albidiflora*.

5. ***L. leprocarpa***, *Thwaites Enum.* 189; leaves oblong acuminate coriaceous, panicles small minutely glandulose-pilose, drupe ovoid large. *Chionanthus leprocarpa*, *Bedd. For. Man.* 154.

CEYLON; Central Province, alt. 3-4000 ft., rather rare, *Thwaites*.

Appears closely allied to *L. purpurea*. *Leaves* $5\frac{1}{2}$ by $1\frac{1}{2}$ in., base narrowly cuneate,

Linociera.]

very thick; nerves beneath somewhat obscure, inarching. *Fruit* 1 by $\frac{3}{4}$ in., rough, blotched, fide *Thwaites*, but when dry does not differ in this respect from the neighbouring species.—*Thwaites*'s example is not in flower; nor does *Thwaites* explicitly state that the seed is exalbuminous.

VAR. *courtallensis*; leaves elliptic-oblong subacute hardly acuminate drying reddish. *Chionanthus courtallensis*, *Bedd. For. Man.* 154.—*Courtallum*, *Wight*. Tinnevely Ghats; *Beddome*.—A good-sized tree (*Beddome*), glabrous. *Leaves* $7\frac{1}{2}$ by $2\frac{1}{2}$ in., nerves beneath subobscurely inarched. *Panicles* $\frac{1}{2}$ –1 in., usually reduced to 3–5 subsimple racemes fascicled in each axil, glabrous. *Petals* scarcely $\frac{1}{2}$ in. *Drupe* unknown.—The flowers of this have been in the Herbarium matched with the fruit of *L. leprocarpa*; the identification must be uncertain until further material is received.

6. *L. intermedia*, *Wight Ic.* t. 1245; glabrous, leaves elliptic-oblong acute at both ends secondary nerves prominent, panicles compound somewhat dense, petals $\frac{1}{2}$ in. narrowly oblong, drupe $\frac{3}{4}$ by $\frac{1}{2}$ in. *Chionanthus intermedia*, *Bedd. Fl. Sylv.* t. 239.

NILGHERRIES, alt. 1–6000 ft.; *Wight, Hohenacker, &c.* **ANAMALLAYS**; alt. 5000 ft., *Beddome*.

A large tree, *Beddome*, more often small. *Leaves* $6\frac{1}{2}$ by $2\frac{1}{2}$ in., chartaceous; nerves 10 pairs, reticulations many prominent; petiole $\frac{1}{2}$ –1 in. *Panicle* 2–5 in.; branches compressed; bracts $\frac{5}{16}$ in., ovate; pedicels often hardly any. *Calyx* $\frac{1}{16}$ in., lobes ovate glabrous. *Petals* 4, shortly united at the base, obscurely disposed in pairs. *Ovary* glabrous.—*Chionanthus picrophloia*, *F. Muell. Fragm.* iii. 139, t. 24, does not appear to differ; the inflorescence in the picture is subcapitate, but in the specimens is densely paniculate, as in *L. intermedia*.

VAR. *Roxburghii*; panicles smaller, drupes scarcely $\frac{1}{2}$ in., seed exalbuminous. *Olea paniculata*, *Roxb. Catal. Pl.* (1813), and in *Fl. Ind. ed. Carey & Wall.* i. 104. *O. Roxburghii*, *Spreng. Syst.* i. 34; *Wight Ic.* t. 735, not of *Wall.* *O. Roxburghiana*, *Reem. et Sch. Mant.* i. 77; *DC. Prodr.* viii. 286; *Dalz. & Gibb. Bomb. Fl.* 159; *Bedd. For. Man.* 153.—Orissa and Circars, *Roxburgh*. Chota Nagpore, alt. 2–5000 ft.; *J. D. H., &c.* Western Ghats; *Dalzell, Beddome, &c.*—Sumbulpore; *Griffith*. Siwaliks; *Edgeworth*. At 4500 ft. alt. this is a gnarled tree 25 ft. high. The examples of *Griffith* and *Edgeworth* have narrower (obovate-lanceolate) leaves. *Linociera*? oblonga, *Wall. Cat.* 2843, from Ava, appears the same, but the example consists of very young fruits and leaves only.

7. *L. pauciflora*, *Clarke*; glabrous, leaves large elliptic-oblong somewhat acuminate coriaceous, panicles very small. *Olea pauciflora*, *Wall. Cat.* 2812, letter a only; *DC. Prodr.* viii. 288, partly.

PENANG; *Wallich*.

Leaves $7\frac{1}{2}$ by $2\frac{1}{2}$ in., shortly obtusely acuminate, base cuneate; nerves 11 pairs, subprominent beneath, secondary nerves obscure; petiole $\frac{1}{2}$ in. *Panicles* reduced to subsimple erect spikes 1 in. *Flowers* in bud, seem likely to be small. *Drupe* not seen.—This could hardly be distinguished from *L. leprocarpa*, var. *courtallensis*, but by the subsolitary racemes. If, however, as *Wallich* supposed, the next variety is really its young fruit, it must be altogether different.

VAR. *evolutior*; nerves more distinct, petioles 1– $1\frac{1}{4}$ in., panicles in young fruit 2–6 in. compound lax, branches stout angular, pedicels thickened. *L. pauciflora*, *Wall. Cat.* 2812, b only.—Penang; *Wallich*. Tenasserim or Andamans, *Helfer*.—The seeds are immature but probably exalbuminous.

VAR. *palembanica*; leaves as of *L. pauciflora*, *Wall.* a, panicles 2–5 in. compound, petals $\frac{1}{10}$ in. elliptic-oblong, fruits not seen. *Chionanthus palembanica*, *Miq. Fl. Ind. Bat. Suppl.* 558; *Kurz For. Fl.* ii. 159, and in *Journ. As. Soc.* 1877, pt. ii. 243.—Andamans; *Kurz, Helfer*.—*Kurz* says the drupe is 1– $1\frac{1}{4}$ in., ovoid to oblong. In one branch of *Helfer*'s the petioles vary from $\frac{1}{4}$ to $\frac{3}{4}$ in. The upper bracts are sometimes $\frac{1}{2}$ in., subfoliaceous, both in *Miquel*'s and *Helfer*'s examples.

8. *L. terniflora*, Wall. Cat. 2845; leaves oblong acuminate coriaceous, nerves inarching distinct on both surfaces, flowers in small heads in small pubescent panicles, petals $\frac{3}{4}$ in. united in pairs, ovary pilose. DC. Prodr. viii. 297. *Olea terniflora*, Kurz For. Fl. ii. 157, and in Journ. As. Soc. 1877, pt. ii. 244.

BIRMA; on the Saluen, Wallich; Pegu—Yomah, Kurz.

Innovations fulvous-pilose. Leaves $6\frac{1}{2}$ by 2 in., sometimes more elliptic, glaucous-green, narrowed at both ends, apex obtuse; nerves 8 pairs, impressed above; petiole $\frac{1}{5}$ in. Panicles 1-3 in., divaricate with few heads, grey-pubescent; heads often 3-flowered. Calyx $\frac{3}{16}$ in.; lobes broad, patent, thin, ciliate-pubescent. Petals united about one-third their length. Ovary minutely pilose; style twice as long as the ovary, pilose below. Drupe $\frac{1}{4}$ by $\frac{1}{4}$ in.; seed exalbuminous in Kurz's own example, who nevertheless removes the species to *Olea*.—Setting aside the albumen, the species appears closely allied to *Linociera malabarica*.

VAR. *acuminata*, Wall. Cat. 2844 (sp.); primary nerves obscure somewhat impressed beneath not prominently inarched, petals united in pairs for half their length, ovary densely pilose, style much shorter than the ovary. DC. Prodr. viii. 298. *Linociera* sp. n. 6, Herb. Ind. Or. H. f. & T.—Birma; on the Saluen, Wallich; Moulmein; Griffith (Kew Distrib. n. 3689); Chittagong; H. f. & T.

9. *L. insignis*, Clarke; leaves large obovate-lanceolate, panicles compound pubescent, petals 4 nearly free oblong-linear. *Chionanthus insignis*. Miq. Fl. Ind. Bat. Suppl. 559. *Ch. montanus*, Kurz For. Fl. ii. 159, and in Journ. As. Soc. 1877, pt. ii. 243, not of Blume.

TENASSERIM, Helfer (Kew Distrib. n. 3688); Martaban, alt. 1-2000 ft., rather rare, Kurz.—DISTRIB. Sumatra.

A small tree (Kurz); innovations ashy-pubescent. Leaves $9\frac{1}{2}$ by $2\frac{1}{2}$ in., shortly acuminate, base attenuated, glabrous; nerves 12 pairs, prominent beneath, secondary obscure; petiole $1\frac{1}{4}$ in. Panicles 2-4 in., ashy-pubescent; bracts $\frac{1}{2}$ in., linear, some $\frac{3}{4}$ in., subfoliaceous, often added; pedicels often hardly any. Calyx $\frac{1}{10}$ in., pubescent; lobes deep, almost acute. Petals $\frac{1}{2}$ in., oblong, margins much incurved. Ovary microscopically pilose; style as long as the ovary, terminated by 2 short lobes. Drupe 1 in. (Kurz); the fruit in the examples seen is very imperfectly ripe, but seems likely to be larger.—*Chionanthus macrocarpa*, Blume (Mus. Bot. i. 319), has drupes $1\frac{1}{2}$ by $\frac{3}{4}$ in. and obtuse petals, but the leaves and inflorescence are exceedingly like the present plant. Kurz supposes the Tenasserim plant to be *Chionanthus montana*, Blume (altered to *Ch. monticola* in Mus. Bot. i. 317), but the plentiful examples communicated show this to be a totally different species with much smaller leaves and very small glabrous panicles.

10. *L. minutiflora*, Clarke; leaves obovate-oblong subacute, panicles compound, calyx nearly glabrous, petals $\frac{1}{2}$ in. free narrowly oblong. *Chionanthus minutiflora*, Kurz For. Fl. ii. 159, and in Journ. As. Soc. 1877, pt. ii. 243.

MARTABAN HILLS; east of Tounghoo, Brandis.

Leaves $4\frac{1}{2}$ by $1\frac{1}{4}$ in., base cuneate, coriaceous; nerves few, slender, prominent beneath, secondary obscure; petiole $\frac{1}{4}$ in. Panicles 3-4 in., minutely ashy-pubescent, branches in flower long slender; bracts $\frac{1}{16}$ in., linear; pedicels hardly any. Calyx $\frac{1}{16}$ in.; lobes ovate, glabrous or puberulous. Ovary glabrous; style very short. Drupe not seen.—The examples from Kurz's herbarium are very imperfect; they appear closely allied to *L. laxiflora*, Blume (common in Malaya), which has, however, a very pubescent calyx.

11. *L. macrophylla*, Wall. Cat. 2826; leaves large long-petioled oblong acute distinctly nerved, panicles compound dense less than one-third as long as the leaves glabrous, pedicels $0-\frac{1}{2}$ in., petals $\frac{1}{2}$ in. nearly free oblong, drupe $\frac{3}{4}$ by $\frac{1}{2}$ in. DC. Prodr. viii. 297. *Chionanthus macrophylla*, Kurz For. Fl. ii. 159, and in Journ. As. Soc. 1877, pt. ii. 243.

SILHET; *Wallich*. ASSAM; *Griffith, Jenkins*. KHASIA; *Griffith*.

A small tree; glabrous or nearly so. Leaves 8 by 2½ in. (sometimes 9½ by 4 in.), acute at both ends, chartaceous, often punctate on the upper surface; nerves 10–13 pairs, secondary distinct; petiole 1–1½ in. Panicles 1–1½ in. in the type specimens, 1–4 in. in cultivated ones; bracts minute. Calyx glabrous. Petals obtuse, margins little incurved. Ovary glabrous; style short. Fruit elongate ellipsoid, on greatly thickened pedicels; endocarp crustaceous; testa thin; albumen 0.

VAR. *attenuata*; panicle more lax, in fruit slenderer with pedicels less thickened. *L. tenuiflora*, *Wall. Cat.* 2827; *DC. Prodr.* viii. 298. *Olea attenuata*, *Wall. Cat.* 2839; *DC. l. c.* 286. *Chionanthus ramiflora*, *Roxb. Hort. Beng.* 3, and *Fl. Ind. Carey & Wall.* i. 106; *Benth. Fl. Austral.* iv. 301. *Phillyrea ramiflora*, *Roxb. Ic. Ined.*—Pegu and Tenasserim; *Wallich, Griffith*. Andamans; *Kurz*.—DISTRIB. Ava, Malaya, Tropical Australia.—This has been placed as a variety of *L. intermedia*, Wight, and it does not greatly differ but by the smaller flowers and the much slenderer panicle.—*L. ramiflora*, *Wall. Cat.* 2824 (*DC. l. c.* 297), cultivated specimen, is remarkable for the intricately divaricately ramosus panicle, the pedicels being nearly all ½ to ¾ in. The whole series only differs in the development of the panicle, and (slightly) in the size of the flowers; and perhaps *L. intermedia*, *macrophylla* and *ramiflora* (with their varieties) form but one species, extending over Southern and Eastern India, Malaya and Australia.

SPECIES NOT SEEN.

L. COTINIFOLIA, *Vahl*; *DC. Prodr.* viii. 297; is founded on *Pluk. Alm. t.* 241, fig. 4, which represents a Ceylon shrub with leaves very villous beneath and 5-merous flowers, and is therefore not of the genus.

L. ? LORANTHIFOLIA, *Wall. Cat.* 2842, from Amherst, has only twigs and a few leaves which resemble those of *Salvadora persica*.

L. MUELLERI, *Van Heurck Pl. Nov.* 124, collected by Griffith near Malacca, is perhaps *Bouea microphylla*, *Griff.*; *J. D. Hook. Fl. Brit. Ind.* ii. 21. (It has 4 stamens).

CHIONANTHUS ? GHIERI, *Gaertn.*; *DC. Prodr.* viii. 295; from Ceylon, of which the leaves and flowers are unknown, remains obscure.

NOTELÆA POSTA, *Don Prodr.* 107; leaves opposite elliptic-oblong acuminate, peduncles axillary drooping clustered 1-flowered, calyx-teeth equal, stigma capitate.

NIPAL; *Narainhetty, Hamilton* (fide *Don*). Probably a *Linociera*.

Leaves 4–5 by 1½–2 in. Petals 4, ovate united at the base in pairs by the filaments. Drupe with subchartaceous endocarp.—Copied from *Don*.

8. *OLEA*, *Linn.*

Trees or shrubs. Leaves opposite, entire or toothed. Flowers small, hermaphrodite dioecious or polygamous, in axillary or terminal panicles; bracts minute. Calyx small, 4-toothed or 5-lobed. Corolla-tube short; lobes 4, induplicate-valvate, or 0. Stamens 2, on the corolla-tube or subhypogynous, filaments short; anthers oblong. Ovary 2-celled; style short, stigma ovate or shortly 2-lobed; ovules 2 in each cell, subpendulous or attached laterally to the septum. Drupe ellipsoid or subglobose, endocarp bony or crustaceous, usually 1-seeded. Seed pendulous, albumen fleshy; radicle superior.—DISTRIB. Species 35 in the Old World, from the North Temperate Zone to South Africa and New Zealand.

1. *O. cuspidata*, *Wall. Cat.* 2817; leaves oblong, nerves beneath entirely obscured by felted ferruginous scales, panicles short axillary, flowers bisexual corollid, ovary glabrous, drupe ½ in. ellipsoid. *DC. Prodr.* viii. 285; *Brand. For. Fl.* 307, t. 38; *Boiss. Fl. Orient.* iv. 56. *O. ferruginea*, *Royle Ill.* 257, t. 65, fig. 1.

NORTH WEST HIMALAYA and KASHMIR, alt. 2–6000 ft., frequent. DISTRIB. Cabul, Beloochistan.

A tree, 30 ft., glabrous, not spinous. *Leaves* $2\frac{1}{2}$ by $\frac{3}{4}$ in., narrowed at both ends, usually obtuse or subacute, sometimes cuspidate, very coriaceous; midrib prominent beneath, scales of the lower surface circular peltate closely toothed; petiole $\frac{1}{2}$ in. *Panicles* 1-2 in., minutely scaly; flowers perfect, but many with reduced ovary are functionally male. *Calyx* $\frac{1}{10}$ in., subtruncate, glabrous. *Corolla* deeply divided; lobes $\frac{1}{10}$ in., elliptic, obtuse. *Endocarp* bony.—This was supposed a var. of the Wild Olive by Dr. Stewart; Brandis says it differs by the more lax inflorescence, the upper surface of the leaves glossy, not dull grey, the lower surface reddish instead of white, smaller fruit, the absence of spines, and a more distinctly marked heartwood. The cuspidation of the leaves, distinct in Wallich's specimen, and relied on by Boissier as a diagnostic mark, proves variable in the Indian plant.

2. *O. glandulifera*, Wall. *Cat.* 2811; leaves rhomboid-lanceolate entire, nerve-axils glandular, secondary nerves distinctly reticulating, panicles mostly terminal glabrous or nearly so, flowers bisexual corolloid, ovary glabrous or nearly so, drupe $\frac{1}{2}$ in. ovoid. *DC. Prodr.* viii. 285; *Wight Ic.* t. 1238; *Bedd. Fl. Sylv.* t. 238; *Brand. For. Fl.* 309, excl. *syn.*

NORTH-WEST HIMALAYA, alt. 2-6000 ft., from Kashmir to Nipal. Mts. of SOUTH INDIA; *Wight, Beddome, &c.*

A tree, 20-60 ft.; glabrous or nearly so. *Leaves* 4 by 2 in., acuminate, base cuneate, margin undulate; petiole $\frac{3}{4}$ in. *Panicles* nearly always terminal, some smaller in the penultimate axils sometimes added, 2-5 in. diam., broad, compound; pedicels $0\frac{1}{2}$ in. *Calyx* minute, 4-lobed, glabrous or obscurely pubescent on the margin. *Corolla* deeply divided, lobes $\frac{1}{2}$ in., elliptic, obtuse. *Anthers* broad, large. *Ovary* glabrous or (fide *Wight*) minutely hairy. *Endocarp* bony.

3. *O. dioica*, Roxb. *Hort. Beng.* 3, and *Fl. Ind. ed. Carey & Wall.* i. 105; leaves elliptic-lanceolate toothed or entire coriaceous, secondary nerves obscure, panicles axillary glabrous, flowers dioecious males with corolla females without, ovary glabrous or with hard tomentum, drupe $\frac{1}{2}$ in. ellipsoid often subacute. *Wall. Cat.* 2814; *Wight Ill.* t. 151; *DC. Prodr.* viii. 286; *Dalz. & Gibs. Bomb. Fl.* 159; *Bedd. For. Man.* 154; *Kurz For. Fl.* ii. 157, and in *Journ. As. Soc.* 1877, pt. ii. 244. *O. Wightiana*, Wall. *Cat.* 2815. *O. Heyneana*, Wall. *Cat.* 2823; *DC. Prodr.* viii. 288.

In the lower hills, from ASSAM and BENGAL throughout the DECCAN PENINSULA; common. CHITTAGONG HILLS; *Roxburgh.*

A tree 30-60 ft.; glabrous. *Leaves* $5\frac{1}{2}$ by $2\frac{1}{2}$ in., base cuneate; nerves 10 pairs, elevated beneath; petiole $\frac{1}{2}$ in. *Panicles* 2-6 in., very compound, shining (female usually smaller); pedicels $0\frac{1}{2}$ in. *Calyx* minute; lobes ovate, glabrous or margin obscurely pubescent. *Corolla* of the males deeply lobed; lobes $\frac{1}{10}$ in., elliptic, obtuse; of the females wanting in the examples seen (*Kurz* says present). *Endocarp* crustaceous.—*O. Wightiana*, Wall., is a form from Assam with large leaves but shorter subglobose drupes; in the typical *O. dioica* the drupes are often subacute.

4. *O. maritima*, Wall. *Cat.* 2813; branchlets hairy, leaves elliptic-lanceolate entire or toothed coriaceous, secondary nerves obscure, panicles axillary hairy, flowers dioecious, drupe $\frac{1}{2}$ in. globose. *G. Don Gen. Syst.* iv. 49; *DC. Prodr.* viii. 288. *Pachyderma javanicum*, Blume *Bijd.* 682. *Stereoderma javanicum*, Blume; *DC. l. c.* 290. *Tetrapilus brachiatus*, Lour. *Fl. Cochinch.* 611. *Notelaea Zollingeriana*, Teijs. & Binn. *Cat. Hort. Bog.* 122.

MALACCA and SINGAPORE; Wallich, Griffith, &c., frequent.—DISTRIB. Malaya, Cochinchina.

A small tree. *Leaves* $3\frac{1}{2}$ by $1\frac{1}{2}$ in., base cuneate, glabrous; petiole $\frac{1}{2}$ in. *Panicles* 1-4 in., compound; bracts minute or a few $\frac{1}{2}$ - $\frac{3}{4}$ in. narrow lanceolate, caducous; pedicels $0\frac{1}{2}$ in. *Calyx* minute; lobes ovate, pubescent. *Corolla* (in the males) $\frac{1}{2}$ - $\frac{1}{10}$ in., divided deeply; lobes elliptic, obtuse; of females not seen. *Endocarp* somewhat bony.—Without fruit, this greatly resembles *Olea dioica*, but the branchlets



and panicles have many minute soft spreading hairs. Wight supposed it to be *Olea microcarpa*, Vahl (i.e. *Phillyrea indica*, *Lour. Fl. Cochinch.* 19), but Loureiro says his plant had terminal inflorescence, so that it should more probably be one of the globose-fruited *Ligustrums* allied to (or identical with) a Khasia or Chinese species.

5. *O. dentata*, Wall. Cat. 2840; branchlets hairy, leaves oblong-lanceolate toothed or entire coriaceous, secondary nerves obscure, panicles axillary large hairy, flowers dioecious, corolla in both sexes campanulate shortly 4-fid. *DC. Prodr.* viii. 286; *Kurz For. Fl.* ii. 157, and in *Journ. As. Soc.* 1877, pt. ii. 245.

BRITISH BIRMA; *Griffith and Helfer* (Kew Distrib. n. 3690), *Parish*, &c.; Martaban and Tenasserim, alt. 2-3000 ft., frequent (*Kurz*).

A tree, 40-60 ft. (*Kurz*). Leaves 5 by $1\frac{1}{4}$ in., base cuneate or subobtusely, glabrous or sometimes hairy beneath; nerves slender, often subimpressed beneath; petiole $\frac{1}{4}$ in. Panicles (both male and female) 3-6 in., brachiate; bracts small, linear or $\frac{1}{2}$ - $\frac{3}{4}$ in., very narrow, hairy; pedicels $0-\frac{1}{16}$ in., with flowers in threes. Calyx minute; lobes ovate, pubescent. Corolla $\frac{1}{2}$ - $\frac{1}{3}$ in., almost tubular-campanulate, subequally 4-lobed. Ovary glabrous; style 0; stigma subtruncate. Drupe not seen.—This plant has been mixed with *O. maritima*, from which it hardly differs but by the campanulate shortly-divided corolla, and with *Linociera ternifolia*, in which the corolla is nearly divided into 2 bifid petals and the panicle much smaller.

VAR. *salicifolia*, Wall. Cat. 2821 (sp.); panicles much less hairy, pedicels $\frac{1}{2}$ - $\frac{1}{3}$ in. subumbelled, corolla $\frac{1}{4}$ in., drupes $\frac{1}{2}$ by $\frac{1}{4}$ in. narrow ellipsoid, endocarp bony, seed albuminous. *DC. Prodr.* viii. 286.—Khasia; *Wallich*, *Griffith*; at the Bor-pani, *H. f. & T.*—This is placed with *O. dentata* by *Kurz*, the leaves are remarkably similar, and one of *Griffith's* Mergui examples in flower seems nearer the Khasia *O. salicifolia* than the Birma *O. dentata*; but the seeds of *O. dentata* remain unknown, and may prove to be exalbuminous, when the species will stand near *Linociera terniflora*.

6. *O. Gamblei*, Clarke; leaves oblong acuminate entire coriaceous, panicles axillary obscurely pubescent, flowers dioecious both males and females without corolla, drupes $\frac{3}{4}$ by $\frac{1}{2}$ in.

TROPICAL SIKKIM HIMALAYA; *J. D. H.*; near Punkabari, *Gamble*.

Nearly glabrous. Leaves $4\frac{1}{2}$ by $\frac{1}{2}$ in., parallel-sided, long acuminate, base cuneate; nerves obscure; petiole $\frac{1}{4}$ in. Panicles $2\frac{1}{2}$ in., brachiate; bracts minute; pedicels $0-\frac{1}{8}$ in. Calyx less than $\frac{1}{30}$ in., subtruncate. ciliate. Anthers subsessile, oblong, large. Ovary glabrous; style short, stigma short bifid. Fruit sometimes nearly 1 by $\frac{1}{2}$ in.; endocarp bony. Seed albuminous.—One or two hermaphrodite flowers (without corolla) are seen at the base of the female panicles. The New Zealand *O. apetalae* has broader less acuminate leaves and shorter, far less compound, subracemose panicles.

7. *O. polygama*, *Wight Ic.* tt. 1239, 1240; glabrous, leaves broadly elliptic suddenly shortly acuminate coriaceous, secondary nerves obscure, panicles axillary, flowers male and hermaphrodite all petaline. *Bedd. For. Man.* 154. *O. Gardneri*, *Thwaites Enum.* 188; *Bedd. For. Man.* 154.

NILGHERRIES; *Sispara*, *Gardner*, *Wight*. CEYLON; alt. 7000 ft., *Walker*, *Thwaites*.

A small tree. Leaves $2\frac{1}{2}$ by $1\frac{1}{4}$ in., obtuse, mucronate, base cuneate; nerves 8 pairs, subimpressed beneath; petiole $\frac{1}{4}$ in. Panicles 1-2 $\frac{1}{2}$ in.; male on one tree, female-hermaphrodite on another; bracts inconspicuous; pedicels $\frac{1}{16}$ - $\frac{1}{8}$ in., subumbelled. Flowers as of *O. dioica*. Drupe not seen.—This differs from *O. dioica* slightly; the leaves dry reddish with subcurved margins, the nerves are not elevated beneath the panicles are smaller; it looks like a high-level, somewhat stunted *O. dioica*.

9. **LIGUSTRUM**, Linn.

Shrubs or trees; branchlets often lenticellate. Leaves opposite, entire, glabrous when mature, except in *L. nepalense*, var. *vestita*. Panicles terminal, sometimes with foliaceous bracts in the lower part, flowers white or nearly so. Calyx small, truncate or shortly 4-toothed. Corolla funnelshaped, tube long or short; lobes 4, induplicate-valvate. Stamens 2, on the corolla-tube, filaments short; anthers oblong or rounded. Ovary 2-celled; style longish, stigma sub-clavate oblong hardly 2-fid. Drupe 1-3-seeded; endocarp chartaceous or thin. Albumen fleshy; radicle superior.—DISTRIB. Species 25, from Europe throughout Asia to Australia.

* Drupe longer than broad.

1. **L. robustum**, Blume Mus. Bot. i. 313; branches very lenticellate, leaves elliptic narrowed at both ends, nerves slender irregular, panicle large hairy, corolla-tube as long as the calyx, drupe $\frac{1}{4}$ by $\frac{1}{2}$ in. Dcne. in Nouv. Arch. Mus. 2, ii. 29, not of Brand. or Bedd. *L. pubescens*, Wall. Cat. 2841; Pl. As. Rar. iii. 44; DC. Prodr. viii. 294. *L. punctatum*, Griff. Notul. iv. 741. *Phillyrea robusta*, Roxb. Hort. Beng. 3, and Fl. Ind. ed. Carey & Wall. i. 101. *Olea robusta*, Wall. Cat. 2822; Kurz For. Fl. ii. 158, and in Journ. As. Soc. 1877, pt. ii. 244. *Visiania robusta*, DC. l. c. 289; Deless. Ic. Sel. v. t. 44. *V. sumatrana*, Miq. Fl. Ind. Bat. ii. 549.

EAST BENGAL PLAIN; Silhet, Dacca, Chittagong, &c.; abundant near the base of the hills. Pegu; Kurz.—DISTRIB. Birma, Malaya.

A tree, attaining 60 ft.; usually a large shrub. Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., membranous; nerves somewhat distant, difficult to count from their irregularities and interposed scarcely less distinct other nerves; petiole $\frac{1}{2}$ in. Panicles often 12 by 10 in., pubescent or almost villous; bracts 0; bracteoles $\frac{1}{30}$ in., linear; pedicels (in flower) $0\frac{1}{2}$ in., the flowers all scattered not clustered. Corolla small, white. Style long, or (fide Griffith) hardly any (is the species dimorphic?). Drupe cylindric, often curved and more or less glaucous.—Many of the species that follow are difficult to separate from this; and, when it is said that this East Bengal plains plant is not *L. robustum* of Brandis, all that is intended is that the long-fruited Silhet species (Roxburgh's type) has not been sent from the North-west Himalaya. Dr. Brandis may very probably be right in thinking plants he has seen there to be not specifically distinct.

VAR. *khasiana*; panicle smaller denser, pedicels in flower 0, drupe $\frac{1}{4}$ — $\frac{1}{2}$ by $\frac{1}{2}$ — $\frac{1}{3}$ in. very glaucous. *Ligustrum* sp. n. 5, Herb. Ind. Or. H. f. & T. *Olea*, n. 445, Griff. Notul. iv. 29.—Khasia, alt. 4000 ft.; Griffith, H. f. & T., &c.—A stunted small tree, perhaps a high-level form of the plains' *L. robustum*, but appears more distinct than species admitted by authors. In Griffith's examples the fruiting panicle in *L. robustum* type is diffuse with scattered fruit, in var. *khasiana* it is close erect rigid with erect fruits and 4-angled lenticellate branches; the fruits are scarcely more than half the size of those of *L. robustum*. But the series *Ligustrum*, n. 5, H. f. & T., includes an example gathered at Chela (alt. 1000 ft.) which is intermediate in character.

2. **L. Walkeri**, Dcne. in Nouv. Arch. Mus. 2, ii. 27; branches lenticellate, leaves elliptic acuminate, nerves slender irregular, panicle large compound minutely pubescent, corolla-tube hardly as long as the calyx, drupe $\frac{1}{4}$ by $\frac{1}{2}$ in. *L. ceylanicum*, Dcne. in Nouv. Arch. Mus. 2, ii. 30. *L. robustum*, Thwaites Enum. 188.

CEYLON; ascending to 5000 ft., frequent; Walker, Thwaites (n. 475, 494, &c.). NILGHERIES; Herb. Ind. Or. H. f. & T., n. 5, partly.

Very near *L. robustum*, and perhaps only the Ceylon form of it as Thwaites considered; the drupes, however, are very much shorter, broader, and somewhat obovoid, the panicle is more obscurely pubescent, the leaves rather more coriaceous. Decaisne



refers the Nilgherry portion of *Ligustrum*, n. 5, *H. f. & T.*, to his *L. confusum*, which is certainly erroneous; it is either *L. Walkeri* or closely allied thereto.

VAR. *tubiflora*; corolla-tube twice as long as the calyx. *Olea Roxburghii*, *Wall. Cat.* 2816 B only.—Deccan Peninsula; Belgaum, *Dr. Ritchie*; Herb. Heyne, *Wallich*.—Corolla-tube much slenderer than in *L. neilgherrense*, *Wight*; anthers exsert.—These are very doubtful plants; *Ritchie*'s has a bracteate panicle, and subovate leaves, but the drupe is as of *L. Walkeri*.

3. *L. Roxburghii*, Clarke; branches lenticellate, leaves ovate-lanceolate acuminate coriaceous, panicle stout pubescent, flowers clustered, corolla-tube broad as long as the calyx, drupe $\frac{1}{2}$ by $\frac{1}{2}$ in. *L. Candolleianum*, *Blume Mus. Bot.* i. 315, not of *Dcne.* *L. robustum*, *Bedd. For. Man.* 154, not of *Blume*. *L. compactum*, *Dcne. in Nouv. Arch. Mus.* 2, ii. 23, not of *H. f. & T.* *Olea Roxburghii*, *Wall. Cat.* 2816, not of *Spreng. nor of Wight*. *Visiania robusta*, *Wight Ic. t.* 1242. *Phillyrea terminalis*, *Herb. Roxb.*

Mts. of the DECCAN PENINSULA, alt. 4-7000 ft., very common.

A small tree. *Leaves* $3\frac{1}{2}$ by $\frac{1}{2}$ in., base obtuse; nerves 8 pairs, slender but well-defined and somewhat regular; petiole $\frac{1}{2}$ in. *Panicles* often 8 by 6 in., brachiate; bracts lanceolate, foliaceous or 0; pedicels hardly any, clusters of flowers often somewhat whorled. *Corolla* $\frac{1}{2}$ in., much larger than in *L. robustum*; tube sometimes considerably exceeding the calyx.—*Blume* finds his species on *Wall. Cat.* 2816 E, which he (by error) supposes to have come from Nipal. *Dcaisne* has not included *Wight*'s icon, t. 1242, in his monograph; but he has named the specimens belonging to that picture, *L. compactum*, perhaps because of the distinct regular nervation of the leaves, which is similar. This species has been known as "the stout Nilgherry form of *L. robustum*," but it differs as much from *L. robustum* of Silhet as does any Indian *Ligustrum*. The confusion which has enveloped this species arises from its having been named by *Wight Phillyrea paniculata*, *Roxb.*, which is = *Ligustrum lucidum*, *Aiton* = *Olea clavata*, *Don* = *O. Roxburghii*, *Spreng.* (*Wight Ic. t.* 735), a Chinese plant, cultivated both at Calcutta and in Europe, closely allied to *L. Roxburghii*, but having the panicle glabrous.

4. *L. neilgherrense*, Wight Ic. t. 1243, not of *Dcne.*; leaves ovate acute coriaceous, panicle dense, branches glabrous lenticellate, corolla-tube twice as long as the calyx, drupe $\frac{1}{2}$ by $\frac{1}{2}$ in. *L. Candolleianum*, *Dcne. in Nouv. Arch. Mus.* 2, ii. 28, not of *Blume*. *Olea Roxburghii*, *Wall. Cat.* 2816, E only.

Mts. of the DECCAN PENINSULA, frequent; Dindygul, Nilgherries, Bababoodun Hills, &c.

United (very probably correctly) with *L. Roxburghii* by *Beddome*; it differs in the larger flowers (corolla-tube $\frac{1}{2}$ in.) and in the glabrous panicle, the branches of which are quadrangular lenticellate in fruit, instead of round and hairy as in *L. Roxburghii*. The leaves also are not acuminate, often subobtus, sometimes orbicular ($2\frac{1}{2}$ by 2 in.).—*Dcaisne* has marked a typical example of this from Herb. *Wight* (flower and fruit) *L. compactum*; the Kumaon *L. compactum* has a shorter corolla-tube with reflexed lobes more closely-nerved acuter leaves, and a very different-looking less rigid fruit-panicle with compressed flexuose branches.

VAR. *obovata*, *Dcne. in Nouv. Arch. Mus.* 2, ii. '22; leaves subobtus, corolla rather shorter.—Mts. of the Deccan Peninsula.—Cannot be satisfactorily distinguished from *L. neilgherrense*.

5. *L. Perrottetii*, A. DC. in DC. Prodr. viii. 294; branches rarely lenticellate, leaves smallish elliptic acute at both ends, panicles thyrsoid minutely pubescent, corolla-tube nearly twice the calyx, drupe $\frac{1}{2}$ by $\frac{1}{2}$ in. *Wight Ic. t.* 1244; *Bedd. For. Man.* 153, and *Anal. Gen. t.* 19, fig. 5; *Dcne. in Nouv. Arch. Mus.* 2, ii. 32.

Mts. of the DECCAN PENINSULA, frequent; Nilgherries, Pulneys, *Wight*, *Gardner*, &c.



Leaves 2 by $\frac{3}{4}$ in., coriaceous; nerves 7 pairs, oblique to the midrib, slender or obscure. *Panicles* 3 by $1\frac{1}{2}$ in., rigid; branches in fruit 4-angled, stout.—This differs little from *L. Roxburghii* but by the non-lenticellate branches and smaller leaves, and is placed under *L. Roxburghii* by Beddome.

6. ***L. Decaisnei***, *Clarke*; branches lenticellate, leaves small elliptic acute at both ends, panicles small obscurely pubescent, corolla small tube scarcely as long as the calyx. *L. neilgherrense*, *Dcne. in Nouv. Arch. Mus.* 2, ii. 32, not of *Wight*. *Ligustrum* sp. n. 3, *Herb. Ind. Or. H. f. & T.*

NILGHERRIES.

Leaves $1\frac{1}{2}$ by $\frac{3}{4}$ in. *Panicles* 2 by $1\frac{1}{2}$ in.—This appears as though a form of *L. Walkeri* with smaller leaves and panicles, but is founded on a plant once collected, the fruit unknown.

VAR. *microphylla*, *Wight* in *Herb. (sp.)*; leaves $2\frac{1}{4}$ by $\frac{3}{4}$ in. lanceolate, panicles glabrous, berry $\frac{1}{4}$ by $\frac{1}{8}$ in.—South Deccan; Shevagherry Hills and Courtallum, *Wight*.—*L. microphyllum*, *Bedd. For. Man.* 154, from Coorg, is described with small leaves and pubescent panicle-branches, and is therefore perhaps nearer *L. Decaisnei* type. *L. Walkeri* only differs in its large diffuse panicles.

7. ***L. compactum***, *H. f. & T.*; *Brand. For. Fl.* 310; glabrous, leaves elliptic-lanceolate, nerves 12–20 pairs subdistinct, panicle pyramidal compound, corolla-tube as long as the calyx, fruit nearly $\frac{1}{2}$ by $\frac{1}{8}$ in. *Dcne. in Nouv. Arch. Mus.* 2, ii. 23 (as to the Kumaon examples). *Olea compacta*, *Wall. Cat.* 2819. *DC. Prodr.* viii. 287.

TEMPERATE HIMALAYA, alt. 5000 ft.; Kumaon, *Wallich*, *Thomson*, *Strachey & Winterbottom*.

Branches sparingly (or not) lenticellate. *Leaves* 4 by $1\frac{1}{2}$ in., acute, base cuneate or rounded, coriaceous; petiole $\frac{1}{4}$ in. *Panicles* 4 in. long and broad; bracts 0; bracteoles minute; flowers clustered, subsessile. *Corolla-tube* very short; lobes reflexed, or sometimes corolla-tube considerably exceeding the calyx. *Panicle* dense with fruit; branches compressed, flexuose. *Drupe* often curved.

8. ***L. Massalongianum***, *Vis. Pl. Nov. Orto Padova*, 27, t. 4; leaves linear-lanceolate, panicles small dense very hairy, corolla-tube narrow twice as long as the calyx, drupe $\frac{1}{4}$ by $\frac{1}{8}$ in. *Dcne. in Nouv. Arch. Mus.* 2, ii. 19. *Olea robusta*, γ . *angustifolia*, *Wall. Cat.* 2822. *Ligustrum* n. 8, *Herb. Ind. Or. H. f. & T.*

KHASIA; alt. 3–5000 ft., *Wallich*, *H. f. & T.*, &c.

A small shrub; branchlets lenticellate, densely leafy. *Leaves* 3 by $\frac{1}{2}$ in., tapering at each end, coriaceous; nerves few, distant; petiole $\frac{1}{8}$ in. *Panicles* 1–2 in.; bracts $\frac{1}{2}$ in., linear, caducous; bracteoles inconspicuous; flowers clustered, subsessile, small. *Berry* glaucous, exceedingly like that of *L. robustum*, var. *khasiana*, of which this may be a narrow-leaved form.

VAR. *Lindleyi*; leaves 1 in. lanceolate, corolla-tube hardly longer than the calyx, style short, drupe $\frac{1}{4}$ in. broad. *L. robustum*, *Wall. Cat.* 2822, γ only. *Olea Lindleyi*, *Wall. Cat.* 6305; *DC. Prodr.* viii. 288. *Ligustrum* sp., n. 1175, *Griff. Itin. Notes*, 81.—Khasia, alt. 3–4000 ft.; *Griffith*, *H. f. & T.*, &c.—Perrottet's Nilgherry plant referred here by Decaisne was perhaps *L. Decaisnei*, var. *microphylla*.

** *Drupe* globose.

9. ***L. confusum***, *Dcne. in Nouv. Arch. Mus.* 2, ii. 24; branches lenticellate, leaves elliptic-lanceolate, panicles pubescent bractless, flowers clustered subsessile, corolla-tube as long as the calyx, berry $\frac{1}{2}$ in. diam. *L. robustum*, *Wall. Cat.* 2822, β only. *Ligustrum* sp., nn. 1247, 408, 1247, *Griff. Itin. Notes*, pp. 86, 123, 157. *Ligustrum* n. 9, *Herb. Ind. Or. H. f. & T.*



SIKKIM; Lachen and Lachoong, *J. D. H.*; Kulhait, alt. 5000 ft., *Clarke*. BHOTAN; alt. 5500 ft., *Griffith*. KHASIA, alt. 3-5000 ft., common, *Griffith*, *H. f. & T.*, &c.

A small tree; sometimes 40 ft. in Sikkim. *Leaves* $3\frac{1}{2}$ by $\frac{3}{4}$ in., usually obtuse or rounded at the base, coriaceous; nerves slender or distinct; petiole $\frac{1}{4}$ in. *Panicles* 1-5 in.; bracts 0 or linear, caducous; bracteoles minute. *Corolla* $\frac{1}{2}$ in., wider than in *L. robustum*.—This previous to Decaisne's memoir, was confounded with *L. robustum* which (except as to the fruit) it greatly resembles. In flower it differs from the Bengal typical *L. robustum* in the more obtusely-based leaves, the sessile crowded flowers, and the broader corolla. It only differs from *L. spicatum* in the absence of persistent leaflike bracts in the panicle. Simons' specimen is named *L. compactum* by Decaisne, but it has a pubescent panicle, and the leaves do not show the prominent numerous nerves characteristic of *L. compactum*.

VAR. macrocarpa; berry $\frac{1}{2}$ in. diam. and upwards. Khasia; Nunklao, alt. 4000 ft., *Clarke*.

10. *L. nepalense*, *Wall. Cat.* 2830, and in *Roxb. Fl. Ind. ed. Carey & Wall.* i. 150, and *Pl. As. Rar.* iii. 44, t. 270; branches lenticellate, leaves elliptic-lanceolate, panicles large pubescent, bracts leaflike coriaceous persistent, flowers clustered sessile, corolla-tube as long as the calyx, drupe $\frac{1}{5}$ in. diam. *DC. Prodr.* viii. 294, excl. var. β ; *Dcne. in Nouv. Arch. Mus.* 2, ii. 26. *L. spicatum*, *Ham.*; *Don Prodr.* 107; *Loud. Arb. Brit.* 630, t. 1220. *L. bracteolatum*, *Don Prodr.* 107; *DC. l.c.*; *Brand. For. Fl.* 310; *Dcne. l.c.* 34. *L. Wallichii*, *Blume Mus. Bot.* i. 315; *Dcne. l.c.* 29. '*L. parviflorum*, *Visiani*; *Dcne. in Nouv. Arch. Mus.* 2, ii. 26. *L. kumaonense*, *Dcne. l.c.* 28. *Olea grandiflora*, *Wall. Cat.* 2820. *Visiania grandiflora*, *DC. l.c.* 289.

TEMPERATE HIMALAYA, alt. 4-7000 ft.; Gurwhal to Nipal, frequent.

Only separable from *L. confusum* by the bracts interspersed among the panicle branches being petiolate, often $1\frac{1}{2}$ by $\frac{1}{2}$ in., coriaceous, persistent. The type examples of *L. nepalense* and *grandiflorum* in herb. Wallich, and of *L. kumaonense* in herb. Strach. & Winterb. all exhibit these bracts, which are not seen in the Khasian *L. confusum*.—*L. nepalense*, β var. *glabra* (*Bot. Mag. t.* 2921), is *L. lucidum*, and received from the Calcutta garden, it is not an Indian plant.

VAR. vestita, *Wall. Cat.* 6304 (sp.); leaves villous beneath. *DC. Prodr.* viii. 294. --Nipal.

11. *L. Myrsinites*, *Dcne. in Nouv. Arch. Mus.* 2, ii. 33; leaves small elliptic, racemes small few-flowered nearly glabrous, drupe scarcely $\frac{1}{8}$ in. diam. *L. Uva-ursi*, *Dcne. l.c.* 34. *Ligustrum* n. 10, *Herb. Ind. Or. H. f. & T.*

KHASIA, alt. 4-5000 ft.; Mairung, *Griffith* (*Kew Distrib. n.* 3683); Mafiong, Moleem and Upper Kalapani, *J. D. H.*, *Simons*.

A small ramous shrub; branchlets hairy. *Leaves* $\frac{1}{2}$ - $\frac{3}{4}$ by $\frac{1}{4}$ - $\frac{1}{2}$ in., glabrous. coriaceous; nerves obscure; petiole $\frac{1}{2}$ in. *Panicles* (nearly always reduced to racemes) 3-10-flowered, less than $\frac{1}{2}$ in. diam. in flower; rachis verrucose hardly hairy; flowers sessile; in the penultimate axils are often added solitary short-pediced flowers (or raceme with foliaceous bracts in its lower part). *Corolla* $\frac{1}{2}$ in., tube a little longer than the calyx.

10. MYXOPYRUM, *Blume*.

Large scandent shrubs; branches 4-angular. *Leaves* opposite, large, coriaceous, 3-nerved, entire or toothed. *Flowers* small, yellowish, numerous in axillary and terminal trichotomous panicles; bracts minute or 0. *Calyx* acutely 4-lobed. *Corolla-tube* longer than the calyx; lobes 4, concave, oblong or spatulate, induplicate-valvate in bud. *Stamens* 2, on the corolla-tube, filaments short; anthers ovate. *Ovary* 2-celled; style hardly any, stigma 2-lobed; ovules 1-2 in each cell, attached near the base at the inner angle (anatropal, *fide*



Blume). *Fruit* 1-seeded globose, or sometimes 2-seeded obovoid; pericarp crustaceous. *Testa* thin, albumen horny; radicle inferior.—**DISTRIB.** Species 3, East Himalaya to South Madras and Malaya.

1. ***M. smilacifolium***, *Blume Mus. Bot.* i. 320; leaves ovate or oblong acute entire or toothed, fruit $\frac{1}{2}$ in. diam. *Kurz For. Fl.* ii. 160, and in *Journ. As. Soc.* 1877, pt. ii. 245. *Ligustrum laurifolium*, *Roxb. Hort. Beng.* 3. *Chionanthus* ? *smilacifolia*, *Wall. in Roxb. Fl. Ind. ed. Carey & Wall.* i. 108. *Chondrospermum smilacifolium*, *Wall. Cat.* 2837; *Wight Ill.* t. 151, b. D; *DC. Prodr.* viii. 301. *Ch. coriaceum*, *Wall. Cat.* 2838; *DC. l.c.*

SIKKIM TERAI; J. D. H. ASSAM, SILHET, CACHAR, CHITTAGONG, PEGU, PENANG. SOUTH DECCAN PENINSULA; Anamallay Mts., *Beddome*.—**DISTRIB.** Malaya, Admiralty Islands.

Nearly glabrous. *Leaves* 6–9 in., from narrow-oblong to cordate-ovate, acuminate, base cuneate or rounded, entire slightly toothed or closely serrate on the same branch; petiole $\frac{1}{2}$ in. *Panicles* 4–8 in., peduncled; branches somewhat lax in fruit. *Corolla* $\frac{1}{2}$ in.

2. ***M. nervosum***, *Blume Bijl.* 683; *Mus. Bot.* i. 320, t. 51; leaves oblong or elliptic acute entire or toothed, berries $\frac{2}{3}$ in. diam. *DC. Prodr.* viii. 290.

MALACCA; *Maingay*.—**DISTRIB.** Sumatra, Java.

Leaves 8 by $3\frac{1}{2}$ in., base cuneate or rounded, very coriaceous. *Panicles* minutely pubescent in flower, very rigid, brachiate in fruit.—*Maingay's* plant here described differs from *M. smilacifolium*, only in its very stout habit and large berries. Whether it is *Blume's M. nervosum* is uncertain, as that has no ripe fruit.

ORDER XCIII. SALVADORACEÆ. (By C. B. Clarke.)

Trees or shrubs, nearly glabrous, olive-grey, unarmed or spinous. *Leaves* opposite, entire. *Flowers* clustered or paniced, small, dioecious or polygamodimorphic. *Calyx* free, campanulate or ovoid, 3–5-fid. *Corolla* shortly campanulate or petals free, 4-merous, imbricate in bud. *Stamens* 4, on the corolla-tube or hypogynous, alternate with the corolla-segments; filaments free or connate into a tube. *Ovary* free, 1–2-, or imperfectly 4-celled; style short, stigma 2-fid or subentire; ovules 1–2 in each cell, erect from its base, anatropous. *Berry* or *drupe* mostly 1-seeded. *Seed* erect, globose, exalbuminous.—**DISTRIB.** Species 8–9, in tropical and subtropical Asia, Africa, Madagascar and Malaya.

Distinguished from the Indian species of *Oleaceæ* by their 4 stamens.

Petals free. Stamens monadelphous. Ovary 1-celled, 1-ovuled 1. DOBERA.
Corolla gamopetalous. Stamens on corolla-tube. Ovary 1-celled,
1-ovuled 2. SALVADORA.
Petals free. Stamens free. Ovary 2- (or falsely 4-) celled 3. AZIMA.

1. DOBERA, Juss.

A glabrous tree. *Leaves* opposite, entire. *Flowers* small, polygamo-dioecious, clustered on the branches of an axillary inflorescence, trichotomous in the males, subsimple in the females. *Calyx* ovoid, irregularly valvate, 3–5-toothed. *Petals* 4 (or 5), narrowly-oblong, free, imbricate. *Stamens* 4 (or 5), filaments connate into a tube; anthers lanceolate, dehiscing laterally or subextrorsely. *Scales* 4–5 outside the staminal tube, alternate with the stamens. *Ovary* 1-celled (*Bth.* &

Hk.), 4-5-celled (*Hochst.*), 2-celled (*Forsk.*); style short, stigma obtuse undivided (*Bth. & Hk.*), 2-fid (*Forsk.*); ovule solitary, erect (*Bth. & Hk.*). Fruit subglobose. Seed erect, globose, exalbuminous.

The true place of this disputed genus cannot be settled until material is received which shall decide the structure of the young ovary. The younger flowers at Kew appear all male (or functionally male); in these the imperfect style is obscurely 2-lobed, and the ovary seems 2-celled as *Forsk.* states. From *Hochstetter's* description it seems probable that he had very young fruit containing one 1-seeded cell and traces of other abortive cells. As he tried to make the order of the tree *Meliaceæ*, he may have over-counted the abortive cell.

D. Roxburghii, *Planch.* in *Ann. Sc. Nat.* 3, x. 101. *D. coriacea* and *glabra*, *A. DC. Prodr.* xvii. 31. *Tomex glabra*, *Forsk. Fl. Egypt-Arab.* 32. *Schizocalyx coriaceous*, *Hochst. in Flora*, 1844, Beil. 2. *Blackburnia oppositifolia* (error for *B. monadelpha*), *Roxb. Fl. Ind. ed. Carey & Wall.* i. 435, *fide Planch. l.c.*

BOMBAY; *Capt. Geburne*.—DISTRIB. Arabia, Abyssinia.

A fine tree (*Hochst.*). Leaves $3\frac{1}{2}$ by $1\frac{1}{2}$ in., elliptic, acute, mucronate or obovate-obtuse (on the same branch in the Indian specimen), coriaceous; petiole $\frac{1}{8}$ in. Panicles $1\frac{1}{2}$ -3 in.; bracts 0; bracteoles $\frac{2}{30}$ in., ovate, close to the calyx. Calyx $\frac{1}{10}$ in., ovate-cylindric, subspathaceous; teeth usually 5, one much broader. Petals $\frac{1}{8}$ in., white, free, 4 in the Indian plant, but placed slightly unsymmetrically, sometimes 5 in the African (*Hochst.*). Stamens 4 in the Indian specimen (sometimes 5 in the African), filaments united for two-thirds their length into a subquadrangular tube. Berry $\frac{1}{4}$ in. diam.; endocarp crustaceous.—There is no *Blackburnia oppositifolia*, *Roxb.* *Planchon* no doubt meant *B. monadelpha*, *Roxb.*, with which the description fairly agrees.

2. SALVADORA, *Linn.*

Shrubs or trees. Leaves opposite, entire. Flowers small, hermaphrodite or (mostly) functionally unisexual, racemose or spicate on the branches of terminal or axillary panicles; bracts minute. Calyx campanulate; lobes 4, imbricate. Corolla campanulate; tube with 4 small teeth (sometimes subobsolete) between the bases of the filaments; lobes 4, imbricate. Stamens 4, on the corolla, alternate with its lobes. Ovary 1-celled; style 0, stigma truncate; ovule 1, erect basal. Drupe globose, supported by the slightly enlarged calyx, and subpersistent corolla; endocarp crustaceous. Seed erect, globose, exalbuminous.—DISTRIB. Species 2; Eastern Africa, Arabia and India.

1. **S. persica**, *Linn.*; *A. DC. Prodr.* xvii. 23; glabrous, leaves ovate or oblong obtuse, panicles axillary or terminal compound, flowers pedicelled, drupes scattered. *Vahl Symb.* i. 12, t. 4; *Lamk. Ill.* t. 81; *Roxb. Cor. Pl.* i. 26, t. 28, and *Fl. Ind. ed. Carey & Wall.* i. 404; *Wall. Cat.* 1042; *Lemaout & Dene. Traité Bot.* 453, with fig.; *Dalz. & Gibs. Bomb. Fl.* 312; *Baill. in Adans.* ix. 289, t. 10, fig. 4-8; *Brand. For. Fl.* 315; *Boiss. Fl. Orient.* iv. 43. *S. Wightiana*, *Planch.*; *Thwaites Enum.* 190; *Bedd. Fl. Sylv.* t. 247. *S. indica*, *Wight Ill.* ii. 229, t. 181. *Cissus arborea*, *Forsk. Fl. Egypt-Arab.* 32. *Embelia Grossularia*, *Retz Obs.* iv. 24.

INDIA, alt. 0-1500 ft., in the drier climates; from the Punjab and Scinde to Patna; and in the Circars and North Ceylon; often planted elsewhere.—DISTRIB. Arabia, Syria, E. Africa.

A small, glaucous tree. Leaves $1\frac{3}{4}$ by $\frac{3}{4}$ in., somewhat fleshy; petiole $\frac{1}{4}$ in. Panicles 2-5 in., often very compound, numerous in the upper axils; flowers scattered. Calyx $\frac{1}{10}$ in., lobes ovate. Corolla $\frac{1}{10}$ in., almost 5-partite. Filaments short, anthers ovate. Drupe $\frac{1}{2}$ in. diam.

2. *S. oleoides*, Dcne. in Jacquem. Voy. Bot. 140, t. 144; glabrous, leaves narrowly lanceolate acute, panicles mostly reduced to axillary fascicles of short spikes, drupes clustered. *A. DC. Prodr. xvii. 28;* *Brand. For. Fl. 316, t. 39.* *S. Stocksii, Wight Ill. ii. 229, and Ic. t. 1621.* *S. indica, Royle Ill. 319.* *S. persica, T. And. in Journ. Linn. Soc. v. Suppl. i. 29.*

PUNJAB and SCINDE, in the plains; frequent.—DISTRIB. Aden.

Leaves 2 by $\frac{1}{2}$ in.; petiole $\frac{1}{8}$ in. Panicles many, axillary, mostly of sessile clustered spikes 1–1 $\frac{1}{2}$ in.; rachises after the flowers have dropped rough from the crowded scars. *Drupes* $\frac{1}{2}$ in., subsessile, often touching each other.—Closely allied to the preceding species, but well distinguished by Brandis. Wight's *S. Stocksii* is figured from a flowering example which has the panicles rather more compound than usual.

EXCLUDED SPECIES.

SALVADORA, Wall. Cat. 7530, is *Olar nana*, but there is a loose sheet without locality, date or name numbered also 7530, which is *Salvadora oleoides*.

3. *AZIMA*, Lamk.

Rambling shrubs, with axillary spines. Leaves opposite, entire Flowers small, dioecious, axillary, sessile, or on a little-branched panicle in clusters or umbels; bracts 0 or leaflike; bracteoles linear, small. Calyx campanulate, 4-fid or irregularly 2–4-lobed. Petals 4, oblong, imbricate in bud. Stamens 4, alternate with the petals, hypogynous, filaments linear; anthers ovate. Ovary 2-celled; stigma subsessile, large, 2-fid; ovules 2–1 in each cell, erect, basal. Berry globose, 2–1-seeded, endocarp membranous. Seed globose, exalbuminous.—DISTRIB. Species 3–4, in Trop. and S. Africa and Asia.

1. *A. tetracantha*, Lamk. Dict. i. 343, and Ill. t. 807; rigid, leaves elliptic acute, flowers axillary clustered, calyx minutely hairy, berries sessile. *Wight & Gardn. in Calc. Journ. Nat. Hist. vi. 49–55, t. 1;* *Wight Ill. ii. t. 152;* *Dalz. & Gibs. Bomb. Fl. 143.* *Monetia barlerioides, L'Hérit. Stirp. Nov. i. t. 1;* *Gaertn. Fruct. t. 225;* *Roxb. Fl. Ind. iii. 765;* *Wall. Cat. 7492.* *Fagonia montana, Miq. in Pl. Hohenack. n. 761.*

DECCAN PENINSULA and CEYLON; "one of the commonest shrubs of Coromandel, growing in all situations;" *Roxburgh, &c.*—DISTRIB. S. and Subtrop. Africa and Madagascar.

Glabrous, or branchlets hairy. Leaves 1 $\frac{1}{2}$ by $\frac{3}{4}$ in., mucronate or spinescent, base cuneate, glabrous, rigid; petiole $\frac{1}{2}$ in.; spines $\frac{1}{4}$ – $\frac{3}{4}$ in., 1–2 in each axil. Flowers in axillary clusters scarcely $\frac{1}{2}$ in. diam.; upper leaves often reduced or obsolete, so that the branches end in naked spikes on which the flowers are whorled. Calyx $\frac{1}{10}$ in. Petals $\frac{1}{2}$ in. Ovary 2-celled; cells 2-ovulate, or (ex Wight & Gardner) more often 1-ovulate. Berry $\frac{1}{4}$ in. diam., usually 1-seeded.

2. *A. sarmentosa*, Benth. in Gen. Pl. ii. 681; rambling, leaves ovate obtuse mucronate, flowers paniced, calyx glabrous, berries pedicelled. *Actegeton sarmentosa, Blume Bijl. 1143;* *A. DC. Prodr. xvii. 30.* *Monetia Brunoniana, Wall. Cat. 7493.* *M. laxa, Planch. in Ann. Sc. Nat. 3, x. 191.* *M. sarmentosa, Baill. in Adams. ix. 289, t. 10, fig. 1–3.* *Salvadora Madurensis, Dcne. in Jacquem Voy. Bot. 140.*

PROME; Kurz (n. 3036).—DISTRIB. Birma, Malaya, Philippines.

Branchlets glabrous. Leaves 2 $\frac{1}{2}$ by 1 $\frac{1}{2}$ in., broadly ovate, base obtuse, rigid, glabrous; petiole $\frac{1}{8}$ in.; axillary spines $\frac{1}{4}$ in., 2 in each axil. Panicles axillary, in fruit 1–3 in.; bracts minute; pedicels in fruit 0– $\frac{1}{8}$ in. Flowers as of *A. tetracantha*. Ovary imperfectly 4-celled, 4-ovuled. Berry $\frac{1}{4}$ in. diam.

ORDER XCIV. **APOCYNACEÆ.** (By J. D. Hooker.)

Erect or twining shrubs, rarely herbs or trees. *Leaves* opposite or whorled (scattered in *Cerbera* and *Plumeria*), quite entire, exstipulate. *Flowers* in terminal or axillary cymes, hermaphrodite, regular. *Calyx* inferior; lobes 5, rarely 4, imbricate, often glandular within at the base. *Corolla* rotate or salver-shaped; lobes 5, rarely 4, spreading, contorted and often twisted in bud, very rarely valvate. *Stamens* 5, rarely 4, on the tube throat or mouth of the corolla, filaments usually short; anthers oblong linear or sagittate, conniving, connective sometimes adhering to the stigma; cells 2, dehiscing lengthwise, sometimes produced downwards into an empty spur; pollen granular. *Disk* annular, cupular or lobed, or of glands, or 0, sometimes concealing the ovary. *Ovary* 1-celled with 2-parietal placentas, or 2-celled with axile placentas, or of 2 distinct or partially connate carpels; style simple or divided at the base only; top thickened; stigma 2-fid, acute or obtuse. *Ovules* in each cell 2, or few or many and 2- ∞ -seriate, rarely solitary. *Fruit* a dry or fleshy drupe, berry, or samara, or of 2 drupes, berries or follicles. *Seeds* various, often winged, or with a terminal pencil of long silky hairs (*Coma*); albumen hard fleshy, or scanty or 0; embryo straight, cotyledons flat, concave, convolute or contorted, radicle usually superior.—**DISTRIB.** Species about 900, chiefly tropical.

TRIBE I. *Carisseæ*. *Anthers* included, free from the stigma; cells rounded at the base. *Ovary* of 2 wholly combined carpels, 1-2-celled. *Fruit* large, usually fleshy or pulpy within. *Seeds* without wing or pencil of hairs. *Corolla-lobes* overlapping to the left in all.

* *Ovary* 1-celled, with parietal ovules.

- | | |
|---|------------------|
| Fruit indehiscent. Albumen 0 | 1. WILLOUGHBEIA. |
| Fruit 2-valved. Albumen horny | 2. CHILOCARPUS. |

** *Ovary* 2-celled, with axile ovules.

- | | |
|---|----------------|
| Flowers 4-merous. Erect shrubs. Seeds exalbuminous | 3. LEUCONOTIS. |
| Climbing shrubs. Corolla-mouth with lobed scales | 4. MELODINUS. |
| Climbing slender unarmed shrub. Corolla-mouth naked | 5. WINCHIA. |
| Erect or stout climbing armed shrubs | 6. CARISSA. |

TRIBE II. *Plumeriæ*. *Anthers* included, free from the stigma, cells rounded at the base. *Ovary* of 2 distinct carpels united by the style. *Fruit* various. *Seeds* peltate. *Corolla-lobes* overlapping to the left except in *Ochrosia*.

SUBTRIBE 1. *Rauwolfiæ*. *Calyx* eglandular within. *Carpels* 1-2, rarely 4-6-ovuled. *Fruit* of 2 1-seeded drupes or berries, rarely moniliform (of superposed drupes).

- | | |
|--|---------------|
| Leaves usually whorled. Disc present. Albumen even | 7. RAUWOLFIA. |
| Leaves usually whorled. Disc 0. Albumen ruminate | 8. ALYXIA. |
| Leaves opposite. Disc 0. Albumen smooth | 9. HUNTERIA. |

SUBTRIBE 2. *Cerberæ*. *Calyx* glandular within. *Carpels* 2-, rarely 4-ovuled; ovules on opposite sides of a thick placenta. *Drupe*s or berries 1-seeded, or 2-seeded, the seeds separated by the enlarged placenta.

- | | |
|--|---------------|
| Leaves scattered, alternate. Corolla funnel-shaped | 10. CERBERA. |
| Leaves opposite. Corolla salver-shaped, lobes overlapping to the right | 11. OCHROSIA. |
| Leaves opposite. Corolla salver-shaped | 12. KOPSIA. |

SUBTRIBE 3. **Euplumeriææ**. *Calyx* glandular within. *Carpels* 6-∞-ovuled. *Fruit* (in the Indian genera) of 2 follicles.

* *Ovules* 2-seriate.

- Disc annular or obscure. Seeds winged. Leafless shrub . . . 13. RHAZYA.
Disc of 2 scales. Seeds truncate at both ends . . . 14. VINCA.

** *Ovules* ∞-seriate.

- Erect trees. Leaves scattered, alternate. Seeds winged . . . 14*. PLUMERIA.
A climber. Leaves opposite or whorled. Seeds winged . . . 15. ELLERTONIA.
Erect trees or shrubs. Leaves whorled. Seeds comose.
Style distinct . . . 16. ALSTONIA.
Erect trees. Leaves whorled. Seeds winged. Style 0 . . . 17. DYERA.
Erect trees. Leaves opposite. Seeds comose. Style short . . . 18. HOLARRHENA.

SUBTRIBE 4. **Tabernæmontanææ**. *Calyx* glandular within. *Carpels* ∞-ovuled. *Fruit* fleshy or coriaceous, dehiscent or not.

- Erect trees or shrubs . . . 19. TABERNÆMONTANA.

TRIBE III. **Echitideæ**. *Anthers* included or exserted, conniving in a cone around the top of the style and adherent to it by a point on the connective; cells produced downwards into a subulate empty spur. *Ovary* of 2 distinct carpels united by the style. *Fruit* of 2 follicles. *Seeds* comose at one or both ends.—Exceptions, see *Parsonsia*.

SUBTRIBE 1. **Parsonsiææ**. *Corolla* rotate or salver-shaped, throat naked, except *Wrightia*. *Anthers* more or less exserted.

- Corolla*-lobes valvate. *Carpels* connate in flower . . . 20. PARSONSIA.
Corolla rotate, mouth naked. Connective thickened at the back . . . 21. VALLARIS.
Corolla salver-shaped, mouth naked . . . 22. POTTSIA.
Corolla rotate or salver-shaped, mouth with scales . . . 23. WRIGHTIA.

SUBTRIBE 2. **Neriææ**. *Corolla*-throat broad, with 5-10 scales. *Anthers* included.

- Shrubby, erect. Leaves whorled. *Corolla*-lobes short. Follicles erect . . . 24. NERIUM.
Shrubby or twining. Leaves opposite. *Corolla*-lobes long or tailed. Follicles spreading . . . 25. STROPHANTHUS.
Herbaceous. Leaves opposite. *Corolla*-lobes short. Follicles slender . . . 26. APOCYNUM.

SUBTRIBE 3. **Euechitideæ**. *Corolla* various, mouth naked. *Anthers* included.

* *Corolla*-lobes valvate, overlapping to the left.

- Flowers small or minute. *Corolla* urceolate, lobes valvate . . . 27. URCEOLA.
Flowers small. *Corolla* subcampanulate, lobes overlapping . . . 28. PARAMERIA.

** *Corolla*-lobes overlapping to the right.

a. *Corolla* very large.

- Immense climbers, *corolla* bell- or funnel-shaped . . . 29. BEAUMONTIA.
Lofty climbers. *Corolla* salver-shaped . . . 30. CHONEMORPHA.

β. *Corolla* minute, urceolate, lobes very short.

- Ovary* exserted from the disc. Seeds beaked . . . 31. ECDYSANTHERA.



γ. *Corolla small or medium-sized, salver-shaped, lobes nearly straight or slightly twisted to the left in bud.*

Ovary hidden in the disc. Seeds slender 32. *BAISSEA*.

Ovary hidden or not in the disc. Seeds ovate or oblong . . . 33. *AGANOSMA*.

δ. *Corolla small, salver-shaped, lobes sharply twisted to the left in bud, tips not deflected.*

Ovary hidden in the disc. Seeds slender 34. *EPIGYNUM*.

Ovary exerted from the disc. Seeds beaked 35. *REYNCHODIA*.

Ovary exerted from the disc. Seeds not beaked 36. *TRACHELOSPERMUM*.

Ovary hidden in the disc. Seeds ovate, beaked 37. *ANODENDRON*.

ε. *Corolla small, salver-shaped, lobes sharply twisted to the left in bud, with the tips deflected.*

Seeds ovate, beaked 38. *ICHNOCARPUS*.

Seeds ovate, not beaked 39. *MICRECHITES*.

TRIBE I. **CARISSEÆ.**

1. **WILLOUGHBEIA**, Roxb.

Glabrous shrubs, often climbing by the peduncles becoming tendrils. *Leaves* opposite, petiole short. *Flowers* in axillary cymes. *Calyx* short, 5-lobed. *Corolla* salver-shaped, tube nearly glabrous within, mouth naked or with fleshy glands alternating with the lobes; lobes overlapping to the left, nearly straight in bud. *Stamens* included in the tube, and filaments very short; anthers ovate or lanceolate, cells rounded at the base. *Disc* 0. *Ovary* 1-celled; style short, top obconic or urceolate, stigma curved or columnar; ovules many, ∞-seriate on 2 parietal placentas. *Berry* large, globose or ovoid, many-seeded, pericarp hard. *Seeds* imbedded in pulp, ellipsoid, albumen 0; cotyledon thick, plano-convex.—**DISTRIB.** Species 8-10, Malayan and East Asiatic.—All supposed to yield Caoutchouc.

The species with glands on the corolla-mouth may form a different genus. I have seen no tendrils on these.

* *Mouth of corolla naked.*

1. **W. coriacea**, Wall. *Cat.* 1620, and *Pl. As. Rar.* iii. 45; glabrous, leaves elliptic or elliptic-lanceolate subacute or obtusely acuminate thickly coriaceous very shining above, base acute, nerves 8-14 pairs strong arched interspaces not reticulated, corolla-lobes linear-oblong longer than the globose tube. *A. DC. Prodr.* viii. 321.

SINGAPORE; Wallich, Lobb. MALACCA; Griffith, Maingay (Kew Distrib. 1048).

Branches stout, bark black; tendrils slender, branched. *Leaves* 4-5 by 1-2½ in., drying greenish above and red beneath, very smooth, secondary nerves very faint; petiole stout, ¼-½ in. *Flowers* densely crowded, sessile in sessile cymes, ½ in. long; bracts persistent. *Calyx* very thick, subhemispheric; lobes short, rounded, ciliate. *Corolla* thickly coriaceous, lobes twice as long as the tube. *Ovary* broad, acute; style short, top obovoid, stigma conical. *Seeds* ¼ in. long.

2. **W. edulis**, Roxb. *Cor. Pl.* iii. t. 280, and *Fl. Ind.* ii. 57; glabrous, leaves oblong or obovate-oblong obtusely acuminate or caudate thinly coriaceous, base acute, nerves many pairs nearly straight ascending interspaces reticulated, corolla-lobes linear-oblong longer than the subcylindric tube. *Wall. Cat.* 1618,

and *Pl. As. Rar.* iii. 45; *A. DC. Prodr.* viii. 321; *Kurz For. Fl.* ii. 165. *W. martabanica*, *Wall. Cat.* 1619, and *Pl. As. Rar.* iii. 45, t. 272; *A. DC. l.c.*; *Kurz l.c.* *Hunteria?*, *Wall. Cat.* 9066. *Pacourea* *Gudara*, *Herb. Ham.*; *Wall. Cat.* 4465.

ASSAM; at Gualpara, *Hamilton*. SILHET; *De Silva*. CACHAR; *Keenan*. CHITTAGONG; *Roxburgh, &c.* PEGU; *McClelland*. MARTABAN; *Wallich*. MALACCA; *Griffith*.—DISTRIB. Borneo.

"An immense climber; tendrils long, branched; bark $\frac{1}{2}$ in. thick" (*Roxburgh*). *Leaves* 4-7 by $1\frac{1}{2}$ -2 $\frac{1}{2}$ in., greenish or brown when dry and polished above, paler beneath, margins waved; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* shortly stoutly peduncled, few-fld.; bracts rounded, deciduous; pedicels very short. *Calyx* thick, subglobose; lobes short, rounded, ciliolate. *Corolla-tube* $\frac{1}{2}$ in., inflated in the middle, lobes three times as long. *Anthers* subsagittate; filaments short. *Ovary* ovoid, acute; style very short, stigma conical. *Berry* "size of a lemon, subovoid, rind thick smooth friable. *Seeds* many in soft pulp mixed with cottony fibres, size of a garden bean; outer coat fleshy, inner thin friable," *Roxb.*—Yields much caoutchouc. Fruit edible. *Kurz*, who keeps *W. edulis* distinct from *W. martabanica*, gives no other characters than "berry ovate smooth" in the former, and "berry globular wrinkled in the latter."—Assuming the usual variety in the size and form of such fruits in *Apocynaceæ*, and attributing the wrinkles to age, nothing is left whereby to distinguish these plants, of which the specimens in *Wallich's Herbarium* are identical.

3. *W. ceylanica*, *Thwaites Enum.* 191; glabrous, leaves elliptic obtusely acuminate base acute margins waved nerves very many pairs horizontal interspaces reticulated, cymes sessile or peduncled, corolla-lobes linear-oblong much longer than the tube. *Beddome For. Fl., Anal. Gen.* xx. fig. 4. *Chilocarpus ceylanicus*, *Wight Ic.* t. 1288. *Winchia cirrhifera*, *Gardner ms.*

CEYLON; in forests ascending to 4000 ft., *Gardner, &c.*

A climbing shrub with long branched tendrils, bark of branches black. *Leaves* 3-4 by $1\frac{1}{2}$ -2 in., very coriaceous, when dry very dark brown and polished above, light red-brown beneath; nerves straight, with a recurrent one from the intramarginal between every pair of primaries; petiole $\frac{1}{2}$ in. *Cymes* usually peduncled, few or many-fld.; bracts ovate, obtuse; pedicels short. *Calyx* small, lobes short rounded, ciliolate. *Corolla-tube* very short, lobes three times as long. *Anthers* lanceolate, filaments nearly as long, very broad and fleshy at the base. *Ovary* very broad, depressed-flagon-shaped; style rather slender, stigma elongate, obpyriform. *Fruit* "4-5 in. diam., spherical or subpyriform, fleshy, yellow-red. *Seeds* $\frac{3}{4}$ by $\frac{1}{2}$ in., oblong, compressed, testa membranous, cotyledons fleshy, reddish," *Thwaites*.

4. *W. firma*, *Blume Mus. Bot.* i. 154; glabrous, leaves elliptic or elliptic-lanceolate very coriaceous shining above obtusely acuminate base acute, nerves 10-15 pairs nearly straight interspaces hardly reticulated, cymes sessile dense-flowered, corolla-lobes linear-oblong longer than the inflated tube, berry pyriform. *Miquel Fl. Ind. Bat.* ii. 390. *W. Burbidgei*, *Dyer in Kew Gard. Rep.* 1880, 44, 46.

SINGAPORE; jungles near the Botanical Gardens, *H. Murton*.—DISTRIB. Sumatra, Borneo.

A large climber; branches stout, obtusely angled, bark smooth. *Leaves* very variable, 3-6 by 1-3 in., very coriaceous, usually dark brown and polished above, or on both surfaces when dry; midrib very stout beneath; nerves slender but prominent, reticulations very indistinct. *Flowers* about $\frac{1}{2}$ in. long. *Calyx-lobes* ovate, obtuse, obscurely ciliate. *Corolla-tube* inflated in the middle; lobes narrow. *Anthers* ovate, acute, filaments short. *Ovary* ovoid, acute; style short. *Fruit* in Bornean specimens as large and of the form of a good sized pear, 4 inches long, orange-yellow, pericarp thick. *Seeds* 1 in. long.—There may be more than one species under this name. The Javan specimens referred to it by *Miquel* have much fewer nerves in the

leaf. Burbidge has made in Borneo excellent drawings of the whole plant in flower and fruit. In both Singapore and Borneo it is said to yield the "Gutta Singarip."

5. **W. grandiflora**, *Dyer in Herb. Kew.*; quite glabrous, leaves elliptic or orbicular tip and base rounded very thickly coriaceous pale, nerves 4-7 pairs very strong arching interspaces with distant reticulations, cymes densely many-fld., corolla-lobes very large oblong much longer than the slender tube.

MALACCA; *Maingay* (Kew Distrib. 1047).—DISTRIB. Borneo.

A very stout climber, with woody tendrils, branches as thick as a goose-quill. Leaves 3-5 by 3-3½ in., very pale yellowish-red and rather shining above when dry, beneath cinnamon coloured and soft to the touch, with midrib and nerves very distinct but not prominent; petiole stout, ½-1 in. Cymes very dense-fld.; flowers shortly and stoutly pedicelled. Calyx broad, lobes rounded. Corolla nearly 1 in. long before expansion, tube ½ in., very slender, swollen towards the base, lobes ¾-1 in. long, tip rounded. Anthers lanceolate, base cordate, filaments slender. Ovary minute, broadly conical; style very short, base conical, top urn-shaped; stigma slender, as long as the style.

6. **W. tenuiflora**, *Dyer in Herb. Kew.*; shoots and cymes pubescent, leaves elliptic-oblong or oblanceolate obtusely acuminate base acute, nerves 20-30 pairs very slender nearly horizontal interspaces nerveless, petiole slender.

MALACCA; *Maingay* (Kew Distrib. 1049).

Branches with black bark. Leaves 3-4 by 1-1½ in., thinly coriaceous, dark brown and hardly shining above when dry, pale brighter brown beneath but without reticulations between the nerves, margins flat; petiole ¼-¾ in. Cymes numerous, rusty puberulous, subsessile, dense-flowered; bracts small, rounded. Calyx-lobes rounded. Corolla-tube ½ in. long, slender, hairy within, globose near the base just above the calyx; lobes narrowly linear-oblong, obtuse. Anthers cordate-lanceolate, filaments short slender. Ovary hemispheric, top almost truncate; style very short, stigma large, elongate conic. Fruit 4 in. long, "pyriform, abounding in caoutchouc; pericarp thick, leathery. Seeds many, naked, cotyledons pink fleshy" (*Maingay*).

** Mouth of the corolla with tubercles or scales. (Tendrils not seen.)

7. **W. oblonga**, *Dyer in Herb. Kew.*; branches very stout, leaves elliptic obtuse or suddenly obtusely contracted at the tip opaque above, base acute, nerves 10-15 pairs arched interspaces reticulated, cymes sessile dense-fld.. corolla-lobes linear-oblong longer than the rather long tube, berry oblong.

MALACCA; *Maingay* (Kew Distrib. 1089).

A long flexuose shrub (*Maingay*). Branches woody, obtusely angled, rough, with close-set small lenticels, bark pale. Leaves 3-6 by 1½-3 in., base usually rounded, thickly coriaceous; when dry dark brown and opaque on both surfaces; petiole stout. ½ in. Cymes very small, sessile, pedicels very short. Calyx-lobes short, oblong, strongly ciliate. Corolla-tube ½ in., rather slender, inflated in the middle, lobes twice as long, with glands or tubercles at the sinus. Berry many-seeded, pericarp leathery. Seeds 2-seriate, imbedded in firm pulp; cotyledons large, fleshy (*Maingay*).—Abounds in tenacious milky juice.

8. **W. flavescens**, *Dyer in Herb. Kew.*; quite glabrous, leaves elliptic obtusely acuminate base subacute or rounded, nerves numerous nearly horizontal very slender interspaces reticulated, cymes sessile many-fld., corolla-tube very short, tubercles at the mouth small lobulate. *Chilocarpus flavescens*, *Kew Gard. Report*, 1880, 47.

SINGAPORE; in jungles near the Botanic Gardens, *H. Murton*. "A large climber; stem 8 in. diam." (*Murton*).

Branches stout, smooth, divaricate, somewhat compressed, nodes swollen, bark brown. Leaves 3-4 by 1½-2½ in., thickly coriaceous, dirty brown and opaque above when dry, brighter and paler yellowish-brown beneath, nerves very distinct though slender;



petiole $\frac{1}{4}$ – $\frac{1}{2}$ in., stout. *Cymes* numerous, 1 in. diam., branches divaricate; bracts very minute; flowers pedicelled, 4–5-merous. *Calyx* small, lobes broadly ovate. *Corolla-tube* inflated, quite glabrous within; lobes slightly falcate, forming an oblong bud narrower than the tube, which they nearly equal in length. *Anthers* shortly ovate, twice as long as the filaments. *Ovary* distinctly 1-celled with parietal many-ovuled placentas. *Fruit* unknown.

DOUBTFUL SPECIES.

9. *W. RUFESCENS*, Dyer in *Herb. Kew.*; leaves elliptic or elliptic-oblong or -lanceolate, obtuse, very coriaceous, shining above, red-brown when dry beneath, nerves 16–20 pairs very slender, slightly arched, interspaces reticulated.

MALACCA, Maingay (Kew Distrib. 1092).

Branches divaricate, thickened at the nodes, bark black; tendrils not seen. *Leaves* $2\frac{1}{2}$ –3 by 1–1 $\frac{1}{4}$ in., dirty brown above, bright-brown beneath; petiole $\frac{1}{4}$ in. *Fruit* (unripe) globose, nearly 2 in. diam.

2. **CHILOCARPUS**, Blume.

Milky sarmentose shrubs. *Leaves* opposite, nerves horizontal close. *Flowers* small, in axillary cymes. *Calyx* short, 5-lobed, eglandular. *Corolla-tube* cylindrical, throat naked; lobes 5, broad, overlapping to the left, twisted to the right. *Stamens* at or below the middle of the tube; anthers lanceolate, acute, cells rounded at the base. *Disc* 0. *Ovary* 1-celled, placentas 2 parietal; style short, stigma ovoid or conical, tip obscurely 2-toothed; ovules many, 2-seriate on each placenta. *Berry* fleshy, at length 2-valved. *Seeds* imbedded in pulp, or in a granular substance, compressed or thick, grooved or excavated at the hilum, albumen copious, horny, equable or ruminant; cotyledons flat, radicle elongate. —DISTRIB. Species 8, Malayan and Australian.

* *Pedicels bracteate at the base only; flowers very small, in lax panicked cymes; tube of corolla inflated in the middle* (fruit unknown).

1. **C. atro-viridis**, Blume *Mus. Bot.* i. 153; glabrous, leaves oblong obtusely caudate, nerves very numerous nearly horizontal straight slender. *Miguel Fl. Ind. Bat.* ii. 393. *C. malabaricus*, Beddome *Ic. Pl. Ind. Or.* t. 175. *Hunteria*? *atro-viridis*, Wall. *Cat.* 1614; *A. DC. Prodr.* viii. 351. *Winchia atro-viridis*, Kurz *For. Fl.* ii. 170.

MALAYAN PENINSULA; Tavoy, Gomez; Mergui, Griffith, Parish. MALABAR; Beddome.

Branches slender; bark smooth, sparsely lenticellate. *Leaves* $3\frac{1}{2}$ –6 by $1\frac{1}{2}$ –2 in., thinly coriaceous, base acute, green and opaque when dry above, paler green beneath, minutely dotted and with a recurrent nerve from the marginal one between every pair of primaries; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in., slender. *Cymes* 2–4 in., on slender pedicels; branches trichotomous, spreading, slender; flowers pedicelled, 3-nate or subumbellate; bracts minute. *Calyx-lobes* rounded, with white margins. *Corolla* $\frac{1}{2}$ in. long, tube inflated in the middle, glabrous externally, pubescent at the mouth and base of the stamens within; lobes short, falcate, broadly notched on one side, inflexed and forming a globose bud. *Anthers* subsessile, oblong. *Ovary* acute. *Fruit* unknown.—The *C. denudatus*, Blume, of Java, may prove to be the same as this.

** *Pedicels with many imbricate bracts; flowers very small; fruits capsular.*

2. **C. enervis**, Hook. f.; leaves oblong or elliptic-lanceolate obtuse or obtusely apiculate narrowed into a slender petiole nerveless, fruit 4 in. ellipsoid narrowed to an obtuse point base contracted into a short stipes, pericarp very thick.

MALACCA; Maingay (Kew Distrib. 1044).

Scandent; branches stout, smooth, swollen at the nodes. *Leaves* 3 by 1–1 $\frac{1}{2}$ in.,



very thickly coriaceous, brown and opaque above when dry, brighter brown beneath, midrib stout; petiole $\frac{1}{4}$ in. *Flowers* unknown. *Fruit* on a very stout woody pedicel with remains of minute persistent bracts in spiral series, bright orange coloured; pericarp very thick, dehiscent, pulp coarsely granular. *Seeds* very numerous, irregularly broadly oblong, ends rounded, hilum excavated, testa smooth, albumen solid horny.

3. **C. decipiens**, Hook. f.; glabrous, leaves elliptic-oblong or -ovate obtusely acuminate, base acute, nerves very numerous slender nearly horizontal, fruit linear-oblong cylindric rounded at both ends, pericarp woody.

MALACCA; *Maingay* (Kew Distrib. 1060 and 1043, *C. atro-viridis*).

Leaves $3-3\frac{1}{2}$ by $1-1\frac{1}{2}$, hardly shining above and greenish when dry, beneath pale brown minutely dotted; nerves very slender but prominent on both surfaces; petiole $\frac{1}{4}$ in. *Cymes* rather slender, dichotomously branched; flowers not seen. *Fruit* $1\frac{1}{2}-2\frac{1}{4}$ by $\frac{1}{2}-\frac{2}{3}$ in., on a stout pedicel bearing numerous minute bracts in spirals. *Seeds* large, "albumen horny, dull white; cotyledons blood-red, fleshy, convolute" (*Maingay*).—The foliage resembles *C. atro-viridis*, but there are no recurrent nerves between the primaries.

*** *Pedicels bracteate at the base only; flowers long; tube of corolla inflated towards the base.*

4. **C. Maingayi**, Dyer in *Herb. Kew.*; glabrous, leaves elliptic-oblong obtuse base acute, nerves numerous slightly arched strong beneath, cymes long very stout, pedicels subverticillately branched.

MALACCA; *Maingay* (Kew Distrib. 1046).

A climber; branches stout, smooth, shining, swollen at the nodes. *Leaves* $3-4$ by $1-2$ in., coriaceous, opaque, dull yellowish green when dry on both surfaces; nerves $20-30$ pairs, with a recurrent one from the intramarginal between each pair; petiole $\frac{1}{2}$ in., very stout. *Cymes* elongate, erect; peduncles very stout, $1-3$ in., bearing superposed pairs of very short branches, the crowded flowers of which give them a somewhat whorled appearance; flowers $\frac{3}{4}$ in. long, sessile or stoutly pedicelled. *Calyx-lobes* rounded, short. *Corolla-tube* very slender, with a ring of hairs below the anthers within; lobes inflexed and forming an ovoid bud much broader than the tube, when expanded $\frac{1}{2}$ in. long, ovate-lanceolate, narrowed into long points. *Anthers* small, ovate, longer than the slender filament. *Ovary* acute, "1-celled with 4 parietal placentas," *Maingay*. *Fruit* "spherical and obtusely conoid, coriaceous, fleshy, capsular, orange-yellow. *Seeds* very many, immersed in angular bright yellow masses (pulp), mixed with delicate arachnoid fibres, subquadrate, curved on one surface, deeply channelled on the other; testa cartilaginous, bright brown; albumen horny; embryo axile; cotyledons semi-oval, flat, white" (*Maingay*).

3. **LEUCONOTIS**, Jack.

Erect milky evergreen shrubs. *Leaves* opposite, nerves distant. *Flowers* in peduncled axillary cymes, 4-merous. *Calyx* 4-lobed or -partite, eglandular or minutely glandular within. *Corolla* salver-shaped, tube dilated in the middle, throat naked; lobes 4, short, overlapping to the left. *Stamens* 4, in the middle of the tube, included, anthers linear, cells rounded at the base. *Disc* 0. *Ovary* 2-celled; style short, top thickened, stigma 2-toothed; ovules 2, laterally affixed in each cell. *Berry* ovoid or globose. *Seeds* 1-3, imbedded in pulp, ovoid-oblong, testa membranous, albumen 0; cotyledons thick, fleshy, inner faces irregular, radicle short superior.—DISTRIB. Species 6, Malayan (not Javan).

* *Calyx* 4-partite, segments long linear.

1. **L. eugenifolius**, A. DC. *Prodr.* iii. 3: 1; shoots petioles and nerves

beneath rusty-puberulous, leaves opaque above oblong obtusely caudate base obtuse, nerves 8-10 pairs united by a strong intramarginal one, cymes few-fld. *Miquel Fl. Ind. Bat.* ii. 398. *L. cuspidatus*, *Blume Mus. Bot.* i. 112; *Miquel l. c.* 398. *Melodinus*? *eugenifolius*, *Wall. Cat.* 1616.

PENANG; *Wallich*.—DISTRIB. Sumatra, Borneo.

Branches strict, obscurely angled, bark smooth. *Leaves* 3-4 by $1\frac{1}{4}$ - $1\frac{1}{2}$ in., tip $\frac{1}{2}$ in. long, very narrow, pale or dark greenish-brown when dry above, beneath much paler yellow-brown and minutely dotted and with strong horizontal nerves; petiole slender, $\frac{1}{3}$ - $\frac{1}{2}$ in. *Cymes* erect; peduncle 1 in.; bracts linear; pedicels short; flowers erect, nearly $\frac{1}{2}$ in. long. *Sepals* very narrow, erect, deciduous in fruit. *Corolla* coriaceous, tube as long or half as long again as the calyx, pubescent within; lobes short, puberulous on both surfaces. *Anthers* sessile, elongate-lanceolate. *Ovary* deeply grooved, narrowed into the grooved style, stigma oblong, 2-fid. *Fruit* "the size of a gooseberry," *Don*.

** *Calyx* 4-lobed, lobes short rounded.

2. ***L. Griffithii***, *Hook. f.*; glabrous, leaves elliptic obtusely acuminate shining above base rounded or subacute, nerves 5-7 pairs very faint, cymes shortly stoutly peduncled glabrous, flowers densely crowded sessile or shortly pedicelled.

MALACCA; *Griffith, Maingay* (Kew Distrib. 1051, *L. anceps*?). ? SINGAPORE; *T. Anderson*.

Branches obscurely angled, lenticellate. *Leaves* 3-5 by $1\frac{1}{2}$ -2 in., thickly coriaceous, pale brown when dry, beneath paler still and very opaque chocolate-brown, and minutely dotted or not, intramarginal nerve very faint; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* erect, peduncle shorter and stouter than the petiole; branches very short, thick and crowded; bracts small, broad; flowers $\frac{1}{2}$ in. long. *Calyx* small, lobes rounded. *Corolla* thickly coriaceous, tube cylindric, glabrous within and without; lobes short, rounded forming an ovoid bud broader than the tube. *Anthers* sessile, narrowly lanceolate, acuminate. *Fruit* $1\frac{1}{2}$ in. long, broadly ellipsoid. *Seeds* $\frac{1}{2}$ in. long, oblong, compressed, smooth.—Very near *L. anceps*, *Jack*, but which has long-peduncled puberulous cymes with long-pedicelled flowers. *Anderson's* Singapore specimens have the leaves opaque above, and broader, but the flowers appear to be identical.

3. ***L. Maingayi***, *Dyer in Herb. Kew.*; quite glabrous, leaves oblong abruptly obtusely acuminate shining above, nerves 6-10 pairs slender arched, base acute or rounded, cymes very shortly and very stoutly peduncled glabrous few-flowered, flowers sessile or stoutly pedicelled.

SINGAPORE; *Maingay* (Kew Distrib. 935).

Characters very much those of *L. Griffithii*, but a much stouter plant; leaves coriaceous but very dark brown, with stronger nerves beneath and longer petioles, 1- $1\frac{1}{2}$ in. long; peduncle of cymes $\frac{1}{4}$ - $\frac{1}{2}$ in., and $\frac{1}{6}$ - $\frac{1}{4}$ in. diam.; calyx much larger, as broad as the peduncle of the cyme; bracts triangular, thickly coriaceous.

4. **MELODINUS**, *Forst.*

Evergreen, erect or climbing shrubs. *Leaves* opposite. *Cymes* terminal and axillary, flowers rarely 4-merous, white or pale pink. *Calyx* 5-partite, eglandular within. *Corolla* salver-shaped, mouth with thick cleft or lobed scales; lobes overlapping to the left. *Anthers* included, subsessile, lanceolate, cells rounded at the base. *Disc* 0. *Ovary* 2-celled, acute; style short, stigma thick 2-fid; ovules many in each cell. *Berry* globose, pericarp coriaceous or hard. *Seeds* many, imbedded in pulp, albumen fleshy; cotyledons thin, radicle short.—DISTRIB. About 15 species, East Asiatic, Malayan, Australian and Pacific.



* *Flowers in terminal paniced cymes. Corolla-lobes oblong or rounded, quite entire.*

1. **M. monogynus**, Roxb. *Fl. Ind.* ii. 56; leaves oblong or oblong-lanceolate acute or obtuse base acute or rounded, corolla-tube $\frac{1}{2}$ – $\frac{3}{4}$ in., lobes as long oblong. *A. DC. Prodr.* viii. 329; *Wall. Cat.* 1603; *Wight Ic.* t. 394; *Bot. Reg.* t. 834; *Bot. Mag.* t. 2527. *Echaltium piscidium*, *Wight Ic.* t. 242, *excl. fig. of fruit.* *Nerium piscidium*, *Roxb. Fl. Ind.* ii. 7, *excl. descr. of fruit.*

SIKKIM HIMALAYA; at Bartning, alt. 4500 ft. (leaves only), *Clarke*. ASSAM, SILHET and the KHASIA MTS., common, ascending to 4000 ft. *PENANG*; *Maingay*.

A tall milky climber, branches smooth. *Leaves* 5–6 by $1\frac{1}{2}$ –2 in., pale brown when dry and shining above, nerves many but not close, very slender, arching; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Panicles* puberulous, sometimes 12 in. long, brachiate, drooping; flowers usually 3-nate, nearly white, fragrant; pedicels long or short; bracts caducous. *Calyx-segments* $\frac{1}{2}$ in., broad, ciliate. *Corolla-tube* villous or bearded within, lobes obtuse. *Fruit* globose, obscurely 4-angled, size and colour of an orange; pericarp coriaceous. *Seeds* numerous. Roxburgh erred in describing the scales of the corolla as being undivided.

2. **M. khasianus**, *Hook. f.*; leaves linear-lanceolate acuminate at both ends membranous, cymes short few-fl., corolla-tube $\frac{1}{2}$ in., lobes rounded.

KHASIA MTS.; Moflong wood, &c., alt. 5–7000 ft., *Griffith, J. D. H. & T. T.*

A smaller plant in all its parts than *M. monogynus*, with leaves $2\frac{1}{2}$ –5 by 1 – $1\frac{1}{4}$ in., and more membranous, very much smaller flowers with a short corolla-tube and rounded lobes, and with the fruit only $1\frac{1}{2}$ in. diam.

** *Flowers small in axillary cymes or fascicles. Corolla-lobes very obliquely 2-lobed or 2-fid at the tip.*

3. **M. orientalis**, *Blume Bijl.* 1026, and *Mus. Bot.* i. 155, fig. 411; quite glabrous, leaves oblong or elliptic-oblong obtusely acuminate base acute, nerves very numerous nearly horizontal very slender, cymes shortly peduncled few-fl., corolla $\frac{1}{2}$ in. lobes short obliquely ovate bicuspidate, scales closing the mouth very thick fleshy lobulate. *Miquel Fl. Ind. Bat.* ii. 395, t. 34; *A. DC. Prodr.* viii. 330; *Kurz in Journ. As. Soc.* 1877, ii. 250, in note. *Hunteria?* cuspidata, *Wall. Cat.* 1609; *A. DC. l.c.* 350. *Alyxia?* cuspidata, *Wall. Herb. Chilocarpus cuspidatus*, *Benth. in Gen. Pl.* ii. 698 (under *Hunteria*).

PENANG; *Wallich, Phillips, Maingay* (*Kew Distrib.* 1043/2, *Chilocarpus suaveolens*).—*DISTRIB.* Java, Sumatra.

Branches smooth, rather slender, bark very dark. *Leaves* 4–5 by $1\frac{1}{2}$ –2 in., thinly coriaceous, greenish brown and shining above when dry, pale yellowish green beneath, margins a little undulate; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Cymes* with very short stout peduncles; flowers crowded; bracts rounded, persistent. *Calyx* small, lobes rounded. *Corolla* very thickly coriaceous, tube swollen in the middle, lobes forming a globose bud; lobes shorter than the tube. *Fruit* "large, yellow" (*Maingay*).

4. **M. ? micranthus**, *Hook. f.*; quite glabrous, leaves elliptic-lanceolate obtusely acuminate base acute nerves remote very slender, cymes subsessile many-flowered, corolla $\frac{1}{2}$ – $\frac{3}{4}$ in. long, lobes short unequally obtusely 2-lobed, scales closing the mouth 2-lobed.

MALACCA; *Maingay* (*Kew Distrib.* 1090).

Branches smooth rather slender; bark black. *Leaves* 3–6 by 1 – $1\frac{1}{4}$ in., coriaceous, dark brown and shining when dry above, paler bright brown beneath, margins somewhat undulate; petiole $\frac{1}{2}$ in. *Fascicles* of flowers $\frac{1}{2}$ – $\frac{3}{4}$ in. diam.; bracts broad, short, deciduous. *Calyx* very small, lobes rounded. *Corolla* coriaceous, tube much swollen in the middle; lobes short, forming a globose bud, obliquely 2-fid, sinus broad,

longer lobule ciliate or toothed at the tip. *Anthers* narrowly lanceolate, acuminate. *Fruit* unknown.—Maingay observes that this resembles a *Melodinus*.

5. WINCHIA, A. DC.

A slender twining evergreen shrub. *Leaves* 3 in a whorl. *Flowers* small, in terminal panicle cymes. *Calyx* small, 5-lobed, eglandular within. *Corolla* salver-shaped, tube nearly cylindric; lobes rounded, velvety, overlapping to the left; throat villous. *Anthers* above the middle of the tube, included, subsessile, cells rounded at the base, dehiscing almost throughout their length. *Disc* 0. *Ovary* short, 2-celled, top rounded glabrous; style short, stigma with a calyp-triform base; ovules in several series, placentas on the septum. *Fruit* not seen.

W. calophylla, A. DC. *Prodr.* viii. 326; *Kurz For. Fl.* ii. 170; *Deless- Ic. Sel.* v. t. 46. *Alyxia*? *calophylla*, Wall. *Cat.* 1607. *A. glaucescens*, G. *Don Gen. Syst.* iv. 97 (descript. incorrect).

MARTABAN; Wallich.

Leaves 2-4 in., oblong-lanceolate, obtusely caudate, acuminate, base acute, very shining above and dark olive brown when dry, pale beneath, margins waved, coriaceous; nerves very numerous, close and horizontal; petiole slender, $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* glabrous, rounded, shortly peduncled, 1-2 in. diam.; bracts minute; pedicels short. *Calyx* campanulate, lobes rounded, ciliate. *Corolla-tube* $\frac{1}{2}$ - $\frac{1}{4}$ in., four times longer than the calyx, inflated below the top; lobes short, white with velvety hairs.

6. CARISSA, Linn.

Spinous, densely branched, usually erect shrubs. *Leaves* opposite, small, coriaceous. *Flowers* in terminal and axillary peduncled 3-chotomous cymes. *Calyx* 5-partite, glandular within or not, segments acute. *Corolla-tube* cylindric, throat naked, lobes overlapping to the right (in the Indian species). *Stamens* at the top of the tube, included; anthers lanceolate, cells rounded at the base. *Disc* 0. *Ovary* 2-celled; style filiform, stigma fusiform or columnar, minutely 2-fid; ovules 1-4 in each cell, rarely more. *Berry* ellipsoid or globose, 2- (or by abortion 1-) celled. *Seeds* usually 2, peltately attached to the septum, albumen fleshy, cotyledons ovate.—DISTRIB. Species about 20, African, Asiatic and Australian.

The Indian species of this genus are very difficult of definition, and are probably reducible to one or two very variable plants. The tickets of Wallich's specimens in Herb. Linn. Soc. have been, I fear, much misplaced.

* *Spines straight.*

1. **C. Carandas**, Linn.; A. DC. *Prodr.* viii. 332; shrubby or arborescent, quite glabrous except the puberulous cymes, leaves $1\frac{1}{2}$ -3 in. oblong rounded broadly ovate or obovate shining above, tip rounded or obtuse, nerves numerous, corolla $\frac{3}{4}$ -1 in. long, ovary 4- or 8-ovuled, berry $\frac{1}{2}$ -1 in. ellipsoid 4- or more-seeded. Wall. *Cat.* 1677, partly; Roxb. *Cor. Pl.* i. 55, t. 77, and *Fl. Ind.* i. 687, and ed. Wall. & Carey ii. 523; Wight *Ic.* t. 426, and in Hook. *Comp. Bot. Mag.* i. 276, t. 12; Lamk. *Ill.* t. 118, fig. 1; Lodd. *Bot. Cab.* t. 663; Brand. *For. Fl.* 320; Gibs. *Cat. Bomb. Pl.* 116; Dalz. & Gibs. *Bomb. Fl.* 143; Kurz *For. Fl.* ii. 169; Beddome *Fl. Sylv.* 156, t. 19, fig. 6. *C. congesta*, Wight *Ic.* t. 1289.

Throughout the drier sandy or rocky soils of INDIA, native or cultivated; from the Punjab to Ceylon, Birma and Malacca.—DISTRIB. JAVA, TIMOR.

A large shrub or small gnarled tree with many dichotomous, rigid, spreading

branches; axils and nodes with 2 simple or forked thorns, sometimes 1-2 in. long. *Leaves* subsessile, $1\frac{1}{2}$ -3 by $1-1\frac{1}{2}$ in., rather thinly coriaceous, base rounded or retuse, tip rarely mucronate. *Cymes* terminal, peduncle stout, $\frac{1}{4}$ -1 in.; bracts minute; flowers crowded, white or pale rose-coloured, odorous. *Calyx-segments* subulate-lanceolate, acute, puberulous and ciliate. *Corolla-tube* $\frac{3}{4}$ in., glabrous or puberulous with swollen throat and lobes pubescent, lobes lanceolate, acute, about half as long as the tube. *Ovary-cells* 4-ovuled, *Drupe* $\frac{1}{2}$ -1 in. long, ellipsoid, red then black, polished, 4- or more-seeded.

VAR. congesta, Beddome Fl. Sylv. Anal. Gen. 156; ovarian cells 2-ovuled. *Kurz* in Journ. As. Soc. 1877, ii. 250. *C. congesta*, *Wight Ic.* t. 1289.—Mt. Aboo, *Stocks*; Kurg, the Wynad and Birma.

2. ***C. spinarum***, *A. DC. Prodr.* viii. 332; suberect, shrubby, glabrous or branches cymes and leaves beneath finely puberulous, leaves $\frac{1}{2}$ -1 $\frac{1}{2}$ in. elliptic ovate or rounded acute mucronate or apiculate rarely obtuse many or few-nerved shining above, corolla $\frac{1}{2}$ in. long, ovary 4-ovuled, berry $\frac{1}{4}$ in. subglobose. *C. diffusa*, *Roxb. Fl. Ind.* i. 689, and *ed. Wall. & Carey*, ii. 524; *A. DC. l. c.*; *Wight Ic.* t. 427; *Wall. Cat.* 1678, partly; *Brand. For. Fl.* 321; *Kurz For. Fl.* ii. 169; *Beddome Fl. Sylv.* t. 157.

Drier parts of INDIA; from the Punjab Himalaya, which it ascends to 6000 ft. in Murree, to Ceylon and Birma.

Probably a state of *C. Carandas* as suggested by Brandis, than which it is a smaller plant with shorter and more slender spines, more acute leaves and a smaller berry.

VAR. hirsuta; more pubescent. *C. hirsuta*, *Roth Nov. Sp.* 128; *A. DC. Prodr.* viii. 333; *Kurz For. Fl.* ii. 169; *Dalz. & Gibs. Bomb. Fl.* 143. *C. villosa*, *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 525; *Grah. Cat. Bomb. Pl.* 116. *Wight Ic.* t. 437. Not uncommon.

3. ***C. paucinervia***, *A. DC. Prodr.* viii. 333; suberect, shrubby, glabrous except the puberulous petioles and cymes, leaves 1-1 $\frac{1}{2}$ in., elliptic-oblong or -lanceolate acute at both ends very coriaceous not shining, nerves 2-3 pairs very oblique, corolla $\frac{1}{2}$ - $\frac{3}{4}$ in., berry $\frac{1}{2}$ in. ellipsoid. *Wight Ic.* t. 1290. *C. diffusa*, *Wall. Cat.* 1678, in part. *C. Carandas*, var. *paucinervia*, *Beddome Fl. Sylv. Anal. Gen.* 156; *Kurz in Journ. As. Soc.* 1877, ii. 250.

LOWER BENGAL; Monghir, *Hamilton in Herb. Wall.* NILGHERY MTS.; at the Kaitia Falls, *Wight*, &c. ? *C. salicina*, *Lamk.*; *A. DC. l. c.*

A small ramous shrub, with the habit of *C. diffusa*, and probably, as Beddome conjectures, a variety of that species, but very distinct in appearance, more densely leafy, the leaves less shining than in its congeners and yellower when dry. *Peduncles* very short, 3-5-fid. *Corolla-lobes* very narrow.—I suspect a mistake as to the Monghir locality and that Wallich's specimens are mislabelled.

** *Spines decurved.*

4. ***C. macrophylla***, *Wall. Cat.* 1679; shrubby, erect; quite glabrous except the puberulous cymes, leaves 2-4 in. ovate or elliptic-ovate acute or acuminate many-nerved, cymes sessile, corolla 1 in., berry $\frac{3}{4}$ -1 in. ellipsoid. *A. DC. Prodr.* viii. 332. *C. inermis*, *Vahl Symb.* iii. 43; *A. DC. l. c.* 335. *C. lanceolata*, *Dalz. in Dalz. & Gibs. Bomb. Fl.* 143. *C. Dalzellii*, *Beddome For. Fl. Anal. Gen.* 157. *C. mitis*, *Heyne mss.*

DECCAN PENINSULA; Kurg, *Heyne*; the Concan, at Ramghat, *Dalzell*; Courtallum, *Roth, Wight*.

A large shrub, thorns very strong, curved, 1-1 $\frac{1}{2}$ in., and branches dark brown. *Leaves* shortly petioled, drying dark brown. *Flowers* as in *C. Carandas*, but lobes of corolla longer and narrower. *Calyx-lobes* longer and more slender, almost filiform in the Courtallum specimens, which have smaller leaves.—I cannot doubt this being



Vahl's *C. inermis*, described by him from a spineless branch, which justifies the abandonment of his name *inermis*.

5. *C. suavissima*, *Beddome mss.*; climbing, quite glabrous, leaves 2-3 in. broadly ovate acute or acuminate many-nerved, cymes sessile, corolla 1 in. long, berry 2 in. long.

DECCAN PENINSULA; mountains of the Madura district, *Beddome*.

This closely resembles *C. macrophylla*; but differs in the slender climbing habit, very small spines, broader paler leaves, the perfectly glabrous flowers and large berries. Col. *Beddome* describes it as a lofty climber with milky and most delicious fruit.

TRIBE II. PLUMERIEÆ.

7. *RAUWOLFIA*, *Linn.*

Glabrous (the Indian) shrubs. *Leaves* 3-4-nately whorled, rarely opposite; nerves slender, remotely arched, axils glandular. *Peduncles* alternating with the terminal leaves, becoming lateral. *Calyx* 5-fid or -partite, eglandular within. *Corolla* salver-shaped, tube cylindric, mouth constricted, throat usually hairy within; lobes broad, overlapping to the left. *Stamens* included at or above the middle of the tube; anthers small, acute, cells rounded at the base. *Disc* large, cup-shaped or annular. *Carpels* 2, distinct or connate; style filiform, stigma broad calyptriform at the base, tip 2-fid; ovules 2, collateral in each carpel. *Ripe carpels* drupaceous, distinct or connate, usually 1-seeded. *Seeds* ovoid, albumen fleshy; cotyledons flat.—*DISTRIB.* Species about 40, chiefly tropical American.

* *Corolla-tube* slender, inflated a little above the middle.

1. *R. serpentina*, *Benth. in Gen. Pl.* ii. 697; leaves elliptic-lanceolate or obovate acute or acuminate, nerves 8-12 pairs, cymes long-peduncled rounded rarely racemose fruiting erect, sepals short lanceolate, corolla-tube long slender shortly globosely inflated above the middle, drupes $\frac{1}{2}$ in. broadly obliquely ovoid. *Kurz For. Fl.* ii. 17. *Ophioxylon serpentinum*, *Linn.*; *A. DC. Prodr.* viii. 342; *Bot. Mag. t.* 784; *Jones in As. Research.* iv. 308; *Roxb. Fl. Ind.* i. 694, and ed. *Carey & Wall.* ii. 530; *Wight Ic. t.* 849; *Grah. Cat. Bomb. Pl.* 116; *Dalz. & Gibs. Bomb. Fl.* 144; *Bedd. For. Fl. Anal. Gen.* 156; *Miq. Fl. Ind. Bat.* ii. 404. *O. trifoliatum*, *Gaertn. Fruct.* ii. 129, t. 109, fig. 2; *Miquel l. c.* *O. obversum*, *Miquel l. c.* 405. *Tabernæmontana cylindracea*, *Wall. Cat.* 4451.—*Rheede Hort. Mal. t.* 47; *Burm. Fl. Zeyl. t.* 64.

TROPICAL HIMALAYA and plains near the foot of the hills from Sirkind, *Edgeworth*, and Moradabad, *Thomson*, and in Sikkim. The KHASIA Mts., ascending to 4000 ft.; ASSAM, PEGU, TENASSERIM, and in the DECCAN PENINSULA, along the Ghats to TRAVANCORE and CEYLON.—*DISTRIB.* JAVA.

A small shrub, 6-18 in., rarely 2-3 ft. high, bark white, rarely lenticellate. *Leaves* 3-7 by $1\frac{1}{2}$ -2 $\frac{1}{2}$ in., green when dry, very pale beneath, narrowed into a short petiole. *Cymes* 1-2 in. diam., many-flowered; peduncle 2-5 in., stout, branches and pedicels red; bracts obsolete; pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in.; flowers white or pinkish, nearly 1 in. long. *Calyx* small. *Corolla-tube* often curved; lobes not one-quarter the length of the tube, margins undulate; throat hairy. *Drupes* black, endocarp slightly rugose.

2. *R. peguana*, *Hook. f.*; leaves oblong or oblong-lanceolate acuminate, cymes sessile branched from the base branches divaricate, calyx-lobes ovate acute, corolla-tube slender inflated in the middle.

PEGU; *Kurz*.

Branches rather slender, not lenticellate. *Leaves* opposite and three in a whorl,

3-5 by $1\frac{1}{2}$ - $1\frac{3}{4}$ in., very membranous; nerves 7-10 pairs, very faint. *Cymes* with the main branches an inch long widely divaricating from the base, some decurved; flowers pedicelled, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. *Calyx* very small, many times shorter than the corolla-tube. *Corolla-lobes* very small. *Fruit* not seen.—This is closely allied to *R. serpentina*, differing in the inflorescence, smaller flowers, and calyx.

** *Corolla-tube broad, inflated at the top.*

3. *R. densiflora*, *Benth. in Gen. Pl.* ii. 697; leaves obovate or oblanceolate acuminate, nerves 8-16 pairs, cymes short- or long-peduncled or corymbose erect or spreading in fruit, sepals elongate subulate-lanceolate half the length of the broadly tubular corolla-tube which is inflated at the top, drupes $\frac{1}{2}$ - $\frac{1}{4}$ in. obliquely ellipsoid. *Ophioxylon neilgherrense*, *Wight Ic.* t. 1292; *Dalz. & Gibs. Bomb. Fl.* 144. *O. ceylanicum*, *Wight Ic.* t. 1291. *O. macrocarpum*, *Wight l. c.* iv. part 2, 1. *O. densiflorum*, *Thwaites Enum.* 191; *Beddome For. Fl. Anal. Gen.* 156, t. 20, fig. 2. *Tabernæmontana densiflora*, *Wall. in Bot. Reg.* t. 1273; *A. DC. Prodr.* viii. 373. *T. parviflora*, *Herb. Heyne in Wall. Cat.* 4453.

KHASIA Mts.; alt. 1-4000 ft. *J. D. H. & T. T.* DECCAN PENINSULA, on the Western Ghats; from the Concan southwards, alt. about 6000 ft. CEYLON, ascending to 6000 ft.

A larger shrub than *R. serpentina*; branches copiously lenticellate. *Leaves* often 4 in a whorl, very variable in size, 4-10 by 2-3 in., and number and stoutness of nerves. *Cymes* often numerous, dichotomously branched, branches and pedicels erect; flowers rose-red or white, $\frac{1}{2}$ in. long. *Calyx-lobes* $\frac{1}{2}$ - $\frac{1}{4}$ in. *Corolla-lobes* rounded, nearly as long as the tube. *Drupe* very rugose.

VAR. ? *macrophylla*; leaves broader 8-10 by $2\frac{1}{4}$ - $3\frac{1}{2}$ in. very membranous, cymes very short branched from the base, flowers not seen, fruit as in the type. *Tabernæmontana subcapitata*?, *Herb. Ind. Or. H. f. & T.*—Khasia Mts., alt. 2000 ft., at Nowgong.

4. *R. microcarpa*, *Hook. f.*; leaves small oblanceolate acuminate, nerves 8-10 pairs, cymes short branched from the base, drupes ovoid $\frac{1}{4}$ in. long. *Tabernæmontana microcarpa*, *Wall. Cat.* 1581.

BIRMA; Taongdong (road to Ween-dow), *Wallich*.

The specimens are most wretched, consisting of two fragments of branches with 3 or 4 broken leaves and a fruiting cyme from which the solitary drupe (much eaten by insects) is detached.

5. *R. decurva*, *Hook. f.*; leaves small oblanceolate acuminate, cymes shortly peduncled decurved few-flowered, calyx-lobes lanceolate half as long as the broad corolla-tube which is inflated at the top, drupes $\frac{1}{4}$ in.

DECCAN PENINSULA; Canara and the Concan, Poonah, *Storks*; Mundeel, *Ritchie*.

A shrub, 6 ft.; branches stout, dichotomous, lenticellate, leafy at the tips only. *Leaves* 4 in a whorl, in crowded whorls, $1-1\frac{1}{2}$ by $\frac{1}{2}$ - $\frac{3}{4}$ in., drying brownish-green. *Cymes* short, peduncle $\frac{1}{2}$ -1 in., 2-6-flowered, sometimes branched from the base; flowers $\frac{1}{2}$ in. long, white to pink. *Calyx-lobes* lanceolate, half the length of the corolla-tube. *Corolla-lobes* rounded, almost as long as the tube.—This may be a state of *R. densiflora*, but if so it is a very singular one, easily distinguished by the small leaves crowded at the tips of the woody branches, the decurved peduncles, and small flowers.

6. *R. micrantha*, *Hook. f.*; leaves elliptic-lanceolate or oblanceolate acuminate, cymes with long slender erect peduncles few-fl., calyx-lobes triangular-ovate, corolla very small tube slightly swollen at the top, lobes small, drupes $\frac{1}{2}$ in. obliquely ovate acute. *Ophioxylon micranthum*, *Wight mss.*

MALABAR; *Wight*.

Branches rather slender, with minute lenticels. *Leaves* opposite and 3 in a whorl,



3-5 by 1-2 in., very membranous, drying yellowish green, narrowed into an often slender petiole; nerves 10-12 pairs, very slender. *Peduncle* $1\frac{1}{2}$ -2 in., branches few, slender, short, divaricate; bracts minute, subulate; flowers $\frac{1}{2}$ in. *Calyx-lobes* about one-quarter the length of the corolla-tube. *Corolla* membranous, tube broad, lobes (unexpanded) very small. *Drupes* connate to the middle.

7. **R. Beddomei**, *Hook. f.*; leaves oblanceolate acuminate, cymes with very long slender horizontal peduncles, branches few divaricate, flowers racemed, calyx-lobes triangular-ovate, corolla small, tube slightly swollen at the top, lobes small, drupe $\frac{1}{2}$ in. gibbously ovate acuminate. *Tabernaemontana verticillata*; *Beddome For. Fl. Anal. Gen. xx. fig. 3.*

TRAVANCORE; *Beddome.*

Branches very slender; bark ciliate, minutely lenticellate. *Leaves* 3-6 by $1\frac{1}{2}$ -1 $\frac{3}{4}$ in., very membranous; nerves 15-20 pairs, very slender, spreading, nearly straight. *Peduncle* 3-5 in.; horizontal or decurved; branches 1-2 in., divaricate, very slender, forked, the long arms bearing racemes of flowers $\frac{1}{2}$ in. long, like those of *R. micrantha*. *Drupe* solitary, much flattened.—Allied to *R. micrantha*, differing in the leaves with more numerous straighter nerves, the very long peduncles and racemose flowers and large drupes.

DOUBTFUL SPECIES.

OPHIOXYLON BELGAUMENSE, *Wight Ic. iv. part ii. 2* (under *O. neilgherrense*); shrubby, erect, leaves elliptic-oblong obtuse or acuminate, corymbs long-peduncled compact many-fld., flowers on rather long pedicels, calyx 5-cleft, lobes dilated broad imbricating somewhat truncate, corolla-tube long slender, lobes forming a round capiculum in bud, stamens about the middle of the tube.—Belgaum, *Lav.* I find no specimen of this in Wight's Herbarium; but for the calyx it seems identical with *R. serpentina*.

R. PULAPARIA, *Roxb.*; *Smith in Rees's Cyclop. xxix.*; *A. DC. Prodr. viii. 341*; leaves 3 in a whorl, 3-4 by $1-1\frac{1}{2}$ in. elliptic-lanceolate subacute, nerves very numerous nearly horizontal, cymes terminal, peduncle curved stout $\frac{1}{2}$ in., pedicels and bracts downy, calyx-lobes small ovate acute downy, corolla-tube many times longer than the calyx swollen at the top glabrous, lobes short rounded.—A Calcutta garden plant, probably the W. Indian *R. nitida*, L. I have made up the description from Roxburgh's coloured figure and Smith's description, having no specimen.

8. **ALYXIA**, *Br.*

Shrubs. *Leaves* 3-4-nately whorled, rarely opposite, nerves faint. *Flowers* small, in axillary or subterminal cymes. *Calyx* short, 5-partite, eglandular within. *Corolla* salver-shaped, tube cylindric, throat naked; lobes overlapping to the left. *Stamens* at or above the middle of the tube; anthers lanceolate, base of cells rounded. *Disc* 0, or obscure. *Carpels* of ovary 2, distinct; style filiform, top oblong, urceolate or capitate, tip pointed or shortly 2-fid; ovules 2-6, 2-seriate in each carpel. *Fruit* of 1-2 drupes or berries, 1-seeded or with 2-4 1-seeded joints. *Seeds* ovoid or oblong, grooved or excavated ventrally, albumen horny, ruminate; cotyledons thin, radicle superior.—DISTRIB. Species about 30, tropical Asiatic, Malayan, Australian and Polynesian.

1. **A. gracilis**, *Benth. in Gen. Pl. ii. 697*; glabrous, twining, leaves opposite and 3 in a whorl elliptic oblong or lanceolate obtusely caudate, nerves very many faint horizontal, flowers small in long peduncled very slender branched panicles. *Hunteria* ? *gracilis*, *Wall. Cat. 1613*; *A. DC. Prodr. viii. 350.*

SIKKIM HIMALAYA; in the Terai, alt. 1-2000 ft., *J. D. H. KHASIA Mts.*, alt. 2-4000 ft., *De Silva, H. f. & T.*

Branches slender; bark pale, often warted. *Leaves* 3-6 by $1-1\frac{1}{2}$ in., shining above, green when dry, paler beneath, base acute; petiole $\frac{1}{2}$ - $\frac{1}{3}$ in. *Cymes* 2-4 in., branches spreading, very slender; bracts small, ovate, acute. *Calyx-lobes* $\frac{1}{16}$ in.,



ovate, acute. *Corolla-tube* about twice as long as the calyx; lobes oblong, obtuse, as long as the tube. *Ripe carpels* $\frac{3}{4}$ in. long, stoutly stipitate, ellipsoid, obtuse, smooth. —Habit of a *Chilocarpus*.

2. **A. coriacea**, Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 541, and Cat. 9065; bark red-brown, leaves opposite very coriaceous obovate obtuse shining above nerves ascending, cymes very short and shortly peduncled, bracts and calyx-lobes obtuse. *Hunteria*? *coriacea*, Wall. Cat. 1610.

PENANG; Wallich, Porter.

Branches very stout. *Leaves* 2–4 by 1–1 $\frac{1}{2}$ in., narrowed into the petiole, yellow-brown when dry, nerves raised in the upper surface, beneath opaque dull yellow with the nerves very faint; petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. *Cymes* $\frac{1}{2}$ in., few fld., bracts very small. *Flowers* $\frac{1}{2}$ in. long. *Calyx* very coriaceous, lobes $\frac{1}{16}$ in., acute, ciliate. *Corolla-tube* inflated in the middle, constricted at the mouth, with 5 2-lobed glands, lobes small, oblong falcate. *Fruit* not seen.

3. **A. lucida**, Wall. in Roxb. Fl. Ind. ed. Wall. & Carey, ii. 540; bark red-brown, cymes and shoots pubescent, leaves opposite or 3–4 in a whorl obovate obtuse or acute very pubescent shining above and almost so beneath, nerves nearly horizontal, cymes very short and shortly peduncled, corolla $\frac{1}{2}$ in. long. *A. Gynopogon*, Wall. Cat. 1605.

SINGAPORE; Wallich. MALACCA (cultivated); Maingay.

Branches very stout, young 4-angled. *Leaves* 3–4 by 1–1 $\frac{1}{2}$ in., pale, hard and thick when dry, narrowed into a very short petiole; nerves hardly raised on either surface. *Cymes* $\frac{1}{2}$ in. long, on thick peduncles, rarely longer than the petioles; bracts oblong, pubescent; flowers yellow, fragrant. *Calyx* deeply 5-cleft, segments acute. *Corolla-tube* $\frac{1}{2}$ in., pubescent within; lobes as long, oblong. *Ovary* villous. *Ripe carpels* $\frac{1}{2}$ in. long, broadly elliptic, smooth, stipitate.

4. **A. pilosa**, Miquel Fl. Ind. Bat. ii. 408; branches leaves beneath and cymes softly pubescent or tomentose, leaves 3–4 in a whorl elliptic-lanceolate very coriaceous shining above, nerves very many horizontal, cymes shortly peduncled, flowers villous.

MALACCA; Mt. Ophir (Herb. Hook.).—DISTRIB. Sumatra, Borneo.

Branches stout; bark pale. *Leaves* 3–5 by 1–1 $\frac{1}{2}$ in., drying green, narrowed into short stout petioles $\frac{1}{4}$ in., midrib stout beneath; nerves very close, faint on both surfaces. *Peduncle* equalling or shortly exceeding the petiole, very stout, bracts small; flowers subsessile, crowded, $\frac{1}{2}$ in. long. *Calyx-segments* ovate-lanceolate, obtuse, erect, one-fourth shorter than the corolla. *Corolla-tube* coriaceous, narrowly campanulate above, hairy within and without, lobes very short, rounded, glabrous within. *Fruit* not seen.—I am a little doubtful about the Malacca locality of this plant, that given above is in Sir W. Hooker's handwriting on the sheet; that on a specimen, evidently of the same collecting, in Bentham's Herbarium, is marked, "Penang, Hooker, 1857."

5. **A. pumila**, Hook. f.; dwarf, glabrous, leaves opposite or 3 in a whorl elliptic-lanceolate obtusely acuminate very coriaceous shining above, nerves very many horizontal, cymes subsessile few-fld.

MALACCA; Mt. Ophir, Lobb, Maingay (Kew Distrib. 1053).

A small slender shrub (apparently scandent, Maingay); branches slender, young 4-angled with granulate red bark. *Leaves* 1–2 by $\frac{1}{2}$ – $\frac{3}{4}$ in., drying greenish, narrowed into slender petioles, $\frac{1}{4}$ in., midrib prominent beneath, nerves very close and faint on both surfaces. *Cymes* 3–6-fld.; peduncle very short; bracts minute; flowers shortly pedicelled, quite glabrous, $\frac{1}{2}$ in. long. *Calyx-segments* small, ovate-lanceolate, thick, subacute. *Corolla-tube* inflated below the constricted mouth, throat villous within; lobes small, rounded. *Fruit* $\frac{1}{2}$ in. long, between globose and ellipsoid, apiculate, pedicel slender.



6. ***A. odorata***, *Wall. Cat.* 1606; bark red, leaves opposite and 3 in a whorl, elliptic or obovate obtuse or obtusely acuminate shining above with numerous raised nearly horizontal nerves, ripe carpels fleshy. *A. DC. Prodr.* viii. 347; *Miquel Fl. Ind. Bat.* ii. 408.

TENASSERIM; between Chappedong and Amherst, *Wallich*.

Leaves 3-5 by $1\frac{1}{2}$ -2 in., narrowed into the very short petiole, yellow when dry; nerves almost imperceptible beneath. *Flowers* not seen. *Ripe carpels* $\frac{3}{4}$ in. long, stipitate, ellipsoid.—This differs from *A. stellata* in the coriaceous foliage and larger carpels. A piece of the old wood in Wallich's Herbarium is covered with smooth scaling very dark-brown bark. *Kurz (in Journ. As. Soc. 1877, ii. 251)* refers this to *A. stellata*, but the fruit is very much larger than that of his own description of the latter species.

7. ***A. stellata***, *Roem. & Sch. Syst.* iv. 439; quite glabrous, bark very white quite glabrous, leaves 3-4 in a whorl elliptic-lanceolate or oblong or obovate obtuse or obtusely acuminate shining above, nerves numerous very slender nearly horizontal, cymes shortly peduncled nodding paniced, corolla-tube $\frac{1}{2}$ in. long. *Roxb. Fl. Ind.* i. 699, and *ed. Wall. & Carey*, ii. 539. *A. DC. Prodr.* viii. 346; *Wall. Cat.* 1604. *Gynopogon stellatum*, *Labill. Sert. Austr.-Caled.* 30, t. 34; *Kurz For. Fl.* ii. 176.

TENASSERIM and the ANDAMAN ISLANDS; *Kurz*. PENANG; *Wallich*.—DISTRIB. Malay Archipelago, Pacific Islds.

A shrub; branches slender, smooth. *Leaves* 2-5 by $1-1\frac{1}{2}$ in., thinly coriaceous, green when dry, pale beneath, narrowed into a petiole $\frac{1}{4}$ in. long. *Cymes* short but effuse; bracts short, ovate; flowers very shortly pedicelled, pure white. *Calyx* deeply 5-lobed, lobes acute. *Corolla-tube* cylindric, slender, lobes short, rounded. *Ripe carpels* ellipsoid, stipitate, "size of a cherry," *Roxb.*, or "of a small pea," *Kurz*, yellowish, sometimes with a second superposed.—I am not convinced of the identity of this with the original species of New Caledonia, which has more obovate leaves.

8. ***A. fascicularis***, *Benth. in Gen. Pl.* ii. 698 (under *Hunteria*); bark pale warted, leaves opposite or 3 in a whorl elliptic-oblong or -lanceolate obtusely caudate shining above with numerous parallel very slender raised nerves, cymes very shortly peduncled decurved dense-fld. glabrous or puberulous, corolla-tube $\frac{1}{2}$ in. long. *Hunteria*? *fascicularis*, *Wall. Cat.* 1612; *A. DC. Prodr.* viii. 350.

KHASIA MTS.; *De Silva*; Churra, alt. 4000 ft., *H. f. & T.*

A woody climber, branches slender or stout. *Leaves* 3 $3\frac{1}{2}$ by $1-1\frac{1}{2}$ in., coriaceous, green or pale brown when dry; nerves very faint beneath; petiole distinct, $\frac{1}{4}$ in. *Cymes* $\frac{3}{4}$ -1 in. long, dense-fld.; flowers racemose, very shortly peduncled; bracts acute. *Calyx-lobes* ovate, acute. *Corolla-lobes* small, rounded. *Fruit* not seen.—The short corolla at once distinguishes this from *A. stellata*.

9. ***A. ceylanica***, *Wight Ic.* t. 1293; glabrous, branches slender, leaves opposite or 3 in a whorl broadly elliptic obtusely caudate membranous not shining, nerves distant arched, flowers solitary or 2-3-nate long pedicelled, carpels often moniliform. *Thwaites Enum.* 191; *Beddome For. Fl.* 158, t. 20, fig. 5.

CEYLON; Ambagamowa district, alt. 1-2000 ft., *Walker, &c.*

Shrubby, erect?; branches dichotomous, 4-angled. *Leaves* 2-3 by $1-1\frac{1}{2}$ in., drying green, base narrowed into a short slender petiole, midrib slender; nerves 8-10 pairs, extremely faint and slender. *Pedicels* $\frac{1}{2}$ in., straight, slender. *Calyx-lobes* lanceolate, acute, many times shorter than the corolla. *Corolla* yellowish, tube $\frac{1}{2}$ in., very slender, funnel-shaped above, glabrous without, villous within; lobes lanceolate, acuminate, half the length of the tube. *Carpels* fleshy, scarlet, sometimes of one dimidiate-oblong compressed pedicelled 1-seeded segment, $\frac{1}{2}$ - $\frac{3}{4}$ in. long, some-



Algeria.]

times of 2-4 similar superimposed ones.—Very dissimilar from the other species, if indeed congeneric.

DOUBTFUL SPECIES.

GYNOPOGON BREVIFLORUM, *Kurz For. Fl.* ii. 177; glabrous throughout, scandent. leaves 2-3 in. opposite or in whorls of 3 oblong lanceolate to lanceolate obtusely caudate base acuminate thinly coriaceous, nerves parallel obsolete, petiole 2-3 in. (? lines), cymes axillary and terminal short sessile, trichotomous, pedicels glabrous; very short, flowers small; calyx-lobes lanceolate acuminate, corolla-tube $\frac{1}{2}$ in. lobes shorter, drupes ellipsoid pointed glabrous, pedicel slender.—Upper Tenasserim and Martaban, in tropical forest, alt. 2000 ft.—The above description is condensed from Kurz's. I have seen no specimens.

9. **HUNTERIA**, Roxb.

Glabrous trees. *Leaves* opposite, coriaceous, shining, nerves very slender. *Flowers* small in terminal axillary or subterminal cymes. *Calyx* small, 5-lobed, eglandular. *Corolla* salver-shaped, tube cylindric, throat annulate, lobes overlapping to the left. *Stamens* above the middle of the tube; anthers oblong-lanceolate, cells rounded at the base. *Disc* 0. *Carpels* 2, distinct; style filiform, top thickened, stigma shortly 2-fid; ovules 2-4 in each carpel. *Fruit* of 2 ovoid or oblong, oblique or recurved fleshy berries, 1-seeded or 2-celled by the intruded placenta, and 2-seeded, not pulpy within. *Seeds* ovoid or oblong, albumen fleshy; cotyledons thin, radicle straight.—**DISTRIB.** 3 Indian species.

H. corymbosa, *Roxb. Fl. Ind.* i. 695, and *ed. Carey & Wall.* ii. 53; leaves lanceolate or oblong-lanceolate obtuse or obtusely caudate shining above, cymes short terminal and axillary. *A. DC. Prodr.* viii. 360; *Wight Ic.* t. 428. *H. zeylanica*, *Gard. Thwaites Enum.* 191; *Bedd. For. Fl.* ii. t. 265. *H. ? lanceolata*, *Wall. Cat.* 1611; *A. DC. l. c.* *A. Roxburghiana*, *Wight Ic.* t. 1294; *Thwaites Enum.* 192; *Bedd. l. c. Anal. Gen.* 158. *Cameraria zeylanica*, *Retz. Obs.* iv. 24; *A. DC. l. c.* 389. *Gynopogon lanceolatum*, *Kurz For. Fl.* ii. 177. *Tubernæmontana salicifolia*, *Wall. Cat.* 1680. *T. parviflora*, *Herb. Heyne.*

DECCAN PENINSULA: Coromandel coast, *Roxburgh*, &c.; Tinnevely Ghats, *Beddome*; Courtallum, *Heyne*, &c. **TAVOY:** *Wallich*, *Roxburgh*. **PENANG:** *Wallich*, *Phillips*. **CEYLON:** *König*, &c.

A tree; branches slender, smooth. *Leaves* very variable, 4-6. by $\frac{3}{4}$ -2 in., very coriaceous, narrowed into the petiole, pale yellow-brown when dry; nerves very numerous, slender, spreading, with close intermediate reticulations; tip sometimes $\frac{1}{2}$ in. long; petiole $\frac{1}{4}$ - $\frac{3}{4}$ in. *Cymes* shortly peduncled, shortly corymbosely branched; bracts minute: flowers pedicelled, white. *Calyx-lobes* ovate, acute. *Corolla-tube* $\frac{1}{2}$ in., limb about $\frac{1}{2}$ in. diam.; lobes short, obliquely ovate-oblong. *Ripe carpels* size of a cherry, globose, pedicelled, pulpy, orange-coloured, 2-seeded.—Some Deccan specimens, figured by *Wight* as *H. Roxburghiana*, and which includes *Wallich's. Tubernæmontana salicifolia*, have very narrow leaves.

10. **CERBERA**, Linn.

Small glabrous trees. *Leaves* alternate, long, nerves slender horizontal and parallel. *Flowers* large, white or red, in terminal cymes. *Calyx* 5-partite, eglandular, segments long. *Corolla* funnel-shaped, tube short, throat ribbed or with pubescent scales; lobes broad, overlapping to the left. *Stamens* included; anthers lanceolate, apiculate, cells rounded at the base. *Disc* 0. *Carpels* 2, distinct; style filiform, top dilated, stigma 2-lobed; ovules 4 in each carpel, on the faces of a thick placenta. *Fruit* of 1 (rarely 2) globose ovoid or ellipsoid 1-2-seeded carpels; pericarp very thick, fibrous and woody. *Seeds*

broad, compressed, peltately attached to the placenta, albumen 0; cotyledon thin, radicle very short.—DISTRIB. 4 maritime species, Madagascar, tropical Asia, and the Pacific.

C. Odollam, Gaertn. *Fruct.* ii. 193, t. 124; leaves lanceolate or oblanceolate or linear-obovate acute or abruptly acuminate narrowed into the stout petiole. *A. DC. Prodr.* viii. 353; *Wight Ic.* t. 441; *Roxb. Fl. Ind.* i. 692, and in *ed. Carey & Wall.* ii. 527; *Grah. Cat. Bomb. Pl.* 116; *Brand. For. Fl.* 322; *Kurz For. Fl.* ii. 171; *Bedd. For. Fl. Anal. Gen.* 157. *C. Manghu*, *Lin.* partly; *Wall. Cat.* 1582, in *Roxb. Fl. Ind. ed. Wall. & Carey*, ii. 529; *Bot. Mag.* t. 1845. *C. lactaria*, *Ham.*; *A. DC. l. c.* *C. laurifolia*, *Lodd. Bot. Cab.* t. 989. *Tanghinia Odollam*, *lactaria* and *laurifolia*, *G. Don Gen. Syst.* iv. 98.—*Rheede Hort. Mal.* i. t. 39.

Salt swamps, or on the coasts of INDIA and CEYLON.—DISTRIB. Malay Archipelago, China, Australia, Pacific Islds.

A small tree or large shrub, branches very thick. *Leaves* 3-8 by 1-2 in., leathery, black when dry, shining above, nerves very slender; petiole stout, $\frac{3}{8}$ -1 $\frac{1}{2}$ in. *Cymes* large; peduncle 2-6 in., stout, branches corymbose; bracts ovate, deciduous; flowers white, shortly pedicelled. *Calyx-lobes* $\frac{3}{8}$ -1 in., lanceolate, acuminate, revolute. *Corolla-tube* $\frac{1}{2}$ in., mouth red, limb 1-3 in. diam., lobes falcately triangular-obovate, acute. *Ripe carpel* ovoid, 2-4 in. long.—Omitted in Dalzell & Gibs. *Bomb. Flora*, but stated by Graham to be native of the South Concan.

11. OCHROSIA, Juss.

Trees. *Leaves* whorled, rarely opposite or scattered; nerves very numerous, slender, spreading. *Cymes* terminal, at length lateral, peduncled. *Calyx* 5-partite, eglandular, segments obtuse. *Corolla* salver-shaped, tube cylindric, throat naked, lobes overlapping to the right. *Stamens* above the middle of the tube, included; anthers lanceolate, cells rounded at the base. *Disc* 0, or obscure. *Carpels* 2, distinct; style filiform, top oblong, stigma 2-fid; ovules 2-6, 2-seriate in each carpel on each side of a prominent placenta. *Fruit* of 2 (rarely 1) spreading drupes; endocarp hard, thick, usually dorsally compressed and ventrally grooved. *Seeds* solitary, or 2 separated by the placenta, flattened, albumen 0 (or fleshy?); cotyledons large, flat; radicle short, superior.—DISTRIB. Species 12, Mascarene Islands, Malay Archipelago, Australia and the Pacific.

O. borbonica, Gmel.; *A. DC. Prodr.* viii. 356; glabrous, leaves in whorls of 3-4 obovate narrowed into the petiole polished above, tip rounded. *Thwaites Enum.* 192. *O. salubris*, *Blume Mus. Bot.* i. 158; *Kurz For. Fl.* ii. 172. *Cerbera parviflora*, *Wall. Cat.* 1584. *C. salutaris*, *Lour.*; *Blume Bijl.* 1033.

Tidal forests of the ANDAMAN ISLDS., *Kurz*, of SINGAPORE, *Wallich*, and CEYLON.—DISTRIB. Java, Seychelle and Mascarene Islds.

An evergreen tree, 20 ft. high, branches very stout. *Leaves* 6-16 by 2-6 in., coriaceous, yellow when dry, nerves nearly straight; petiole $\frac{3}{8}$ -2 in. *Cymes* stoutly peduncled, branches short, thick, corymbose; lower bracts sometimes leafy; flowers white, shortly thickly pedicelled. *Calyx-lobes* very coriaceous, ovate. *Corolla-tube* $\frac{1}{2}$ in., limb $\frac{1}{2}$ in. diam. *Ripe carpels* "ellipsoid-oblong, about 2 in. long" (*Kurz*).—I have seen no fruit, and have refrained from quoting synonyms, the specimens of the genus, being difficult to procure, are insufficient for complete identification; but I suspect that this species extends under various names from the Mauritius to Australia and the Fiji Islands.

12. **KOPSIA**, *Blume*.

Glabrous trees or shrubs. *Leaves* opposite, narrowed into very short petioles. *Flowers* in terminal cymes. *Calyx* small, 5-partite, segments with glandular tips, eglandular within. *Corolla* salver-shaped, tube very slender, throat hairy, lobes overlapping to the right. *Stamens* near the top of the tube, included; anthers acute, cells rounded at the base. *Disc* of 2 glands alternating with the carpels. *Carpels* 2, distinct; style filiform, thickened at the top, stigma short; ovules 2 on each carpel, 1 on either side of a thick placenta. *Fruit* of 2 obovoid or obliquely quadrate coriaceous or rather fleshy carpels, each 1-celled and -seeded or 2-celled by the intruded placenta and 2-seeded. *Seeds* oblong, albumen 0; cotyledons not thick.—**DISTRIB.** Species 4, Malayan.

1. **K. fruticosa**, *A. DC. Prodr.* viii. 352; leaves elliptic or elliptic-lanceolate obtusely caudate shining above, nerves 10–13 pairs, cymes subsessile, bracts ovate acute, corolla-tube inflated at the top. *Bot. Mag.* t. 4220. Calpicarpium Roxburghii, *G. Don Gen. Syst.* iv. 100; *Wight Ic.* t. 431; *Kurz For. Fl.* ii. 178. *Cerbera fruticosa*, *Ker, Bot. Reg. t.* 391; *Roxb. Fl. Ind.* i. 691, and *ed. Wall. & Carey*, ii. 526; *Wall. Cat.* 1583.

PEGU, MARTABAN and TENASSERIM; *Wallich, &c.*, often planted.—**DISTRIB.** Java, Borneo.

A large evergreen shrub. *Leaves* 4–8 by $1\frac{1}{2}$ –3 in., thinly coriaceous, green when dry, shining above, paler beneath; nerves slightly arched, reticulations distinct. *Cymes* short, nearly flat-topped; peduncle very short, stout; branches short, thick; bracts $\frac{1}{12}$ in. *Calyx-segments* $\frac{1}{12}$ in., ovate. *Corolla* pink, tube $1\frac{1}{2}$ in., limb $1\frac{1}{2}$ –2 in. diam., mouth red. *Ovary* villous. *Ripe carpels* usually solitary, 1-seeded, urn-shaped, $\frac{1}{2}$ –1 in. long, obliquely truncate, pubescent, veined; pericarp thin, greenish purple.

2. **K. macrophylla**, *Hook. f.*; leaves oblong obovate or elliptic-oblong obtusely caudate opaque above, nerves 18–20 pairs, cymes subsessile, bracts imbricate boat-shaped obtuse, corolla-tube inflated in the middle.

SINGAPORE; *Lobb*.

Leaves 5–9 by 2–3 in., thinly coriaceous, green above, paler beneath; nerves as in *K. fruticosa*; petiole hardly any. *Cyme* with a short stout peduncle and a few thick branches 1 in. long, clothed with small broad bracts. *Calyx-lobes* rounded. *Corolla-tube* 1 in., very slender, limb $1\frac{1}{2}$ in. diam., lobes obovate. *Fruit* not seen.—This resembles *K. fruticosa*, but differs conspicuously in the long opaque leaves, shorter petioles, imbricate bracts, and corolla-tube with the stamens in the middle.—I have seen only one specimen.

3. **K. pauciflora**, *Hook. f.*; leaves elliptic or elliptic-lanceolate obtusely caudate shining above, nerves 6–8 pairs, cymes sessile reduced to a very short simple rachis, bracts ovate obtuse, corolla-tube inflated at the top.

MALACCA; Mt. Ophir, *Maingay* (Kew Distrib. 1056).

Leaves yellow-green when dry, 4–6 by $1\frac{1}{2}$ –2 $\frac{1}{2}$ in., firmly but thinly coriaceous, yellow beneath; petiole $\frac{1}{2}$ in. *Cyme-rachis* $\frac{1}{4}$ – $\frac{1}{2}$ in. long, quite sessile, loosely clothed with bracts. *Calyx-lobes* broad, obtuse. *Corolla-tube* $1\frac{1}{2}$ –2 in., very slender; lobes 1 in., linear-oblong, longer and narrower than in the two preceding species. *Fruit* not seen.—This is referred by *Maingay* (mss.) to *Blume's K. flavida* of New Guinea, which is described as having intensely green leaves and cymose flowers.

13. **RHAZZA**, *Dcne*

Glabrous erect shrubs. *Leaves* alternate, thick, nerves obscure. *Flowers* in dense terminal cymes, corymbs or thyrsi. *Calyx* short, 5-partite, eglandular.

Corolla salver-shaped, tube cylindric, with reflexed hairs beneath the stamens within, throat constricted hairy; lobes 5, short, broad, overlapping to the left. *Stamens* above the middle of the tube, included; anthers lanceolate, cells rounded at the base. *Disc* annular or obscure. *Carpels* 2, distinct; style filiform, top broad thickened, stigma sometimes furnished with a reflexed membrane, top 2-globose; ovules many, 2-seriate in each carpel. *Follicles* 2, erect, slender. *Seeds* many, subterete or angled and compressed, truncate or winged above and below, albumen fleshy ruminant; cotyledons oblong, thick, radicle superior.—*DISTRIB.* 2 species, Arabian and Indian.

R. stricta, *Decaisne in Ann. Nat. Sc. ser. 2*, iv. 81, and in *Jacquem. Voy. Bot. t. 111*; leaves elliptic-lanceolate acute coriaceous, corolla-lobes ovate mucronate. *A. DC. Prodr. viii. 386*; *Brandis For. Fl. 322*; *Boiss. Fl. Orient. iv. 47*.—*Apocyn. Wall. Cat. 7478*.

SCINDE; *Stocks*; in the Trans-Indian territory, common; Salt-range, *Fleming*; Peshawur, *Stewart*.—*DISTRIB.* Afghanistan, Beluchistan, Arabia.

A small glabrous very stout erect sparingly branched leafy shrub. *Leaves* 3-4 by $\frac{1}{2}$ - $\frac{3}{4}$ in., yellowish and leathery when dry, sessile. *Flowers* in short axillary, stoutly branched cymes, shortly and stoutly pedicelled; bracts subulate, persistent. *Calyx-lobes* acute. *Corolla* white, tube $\frac{1}{2}$ in., upper half inflated. *Follicles* erect, parallel, 2-3 by $\frac{1}{2}$ in., slightly compressed, thinly coriaceous. *Seeds* $\frac{1}{2}$ in. long, angularly compressed, shortly winged.—There is no specimen of this on the sheet in Wallich's Herbarium to which his ticket, No. 7478, is attached, but the note on that ticket is "*Apocyn. (ex Royleo in ejus Herbar. adsunt specim. et icon. pict.) viminea, subaphylla, Doab Hindostanie, 1825*," leaves no doubt as to the plant meant; added to which the icon alluded to, made by Royle's artists, is in the Kew collection of drawings.

14. **VINCA**, *Linn.*

Erect or procumbent herbs or shrubs. *Leaves* opposite. *Flowers* solitary, axillary. *Calyx* 5-partite, eglandular, segments narrow. *Corolla* salver-shaped; tube cylindric, with usually reflexed hairs below the stamens; throat constricted, hairy or thickened; lobes broad, overlapping to the left. *Stamens* above the middle of the tube, included; anthers various. *Disc* of 2 large glands. *Carpels* 2, distinct; style filiform, top thick, stigma annulate viscid sometimes with a reflected membrane, tip minute penicillate; ovules 6 or more, 2-seriate in each carpel. *Follicles* 2, slender, erect or spreading. *Seeds* subcylindric, truncate at both ends, hilum lateral, albumen fleshy; cotyledons ovate, radicle long superior.—*DISTRIB.* About 10 species, European, Indian, American, and Madagascarian.

V. ROSEA, *Linn.* (*V. Gulielmi Waldemarii*, *Klotzsch in Reise Pr. Waldem. Bot. t. 70*); a West Indian plant, is much cultivated about pagodas, &c.; it has obovate leaves and rosy flowers $1\frac{1}{2}$ -2 in. diam.

V. pusilla, *Murr. in Act. Goett. 1772, 66, t. 2, fig. 1*; annual, erect, glabrous, branched from the base, leaves lanceolate acuminate, flowers very small subsessile, sepals filiform. *A. DC. Prodr. viii. 382*; *Dalz. & Gibs. Bomb. Fl. 144*. *V. parviflora*, *Retz Obs. ii. n. 33*; *Roxb. Fl. Ind. ii. 1*. *Catharanthus roseus*, *G. Don Gen. Syst. iv. 95*.—*Rheede Hort. Mal. ix. t. 33*.

WESTERN HIMALAYA; Garwhal, alt. 2000 ft., *Str. & Winterb.*; *UPPER GANGETIC PLAIN*, *Royle, &c.* Throughout the *DECCAN*, common.

An erect, pale-green annual, 1-2 ft. high; stem and branches acutely 4-angled. *Leaves* $1\frac{1}{2}$ -2 $\frac{1}{2}$ by $\frac{1}{2}$ - $\frac{3}{4}$ in., membranous, acuminate, margins minutely scabrid, stipular glands subulate; petiole $\frac{1}{2}$ in. or less, slender. *Flowers* $\frac{1}{2}$ in. long, on short pedicels, white. *Corolla* mouth narrow, hairy; throat glabrous, thickened. *Follicles* 2-3 in., very slender, diverging, straight, membranous. *Seeds* $\frac{1}{10}$ in., linear-oblong, cylindric, rounded at both ends; testa black, many-ribbed, ribs rough.

14. **PLUMERIA**, Linn.

Erect trees; branches very thick. *Leaves* scattered, elongate, nerves numerous, horizontal. *Flowers* large, in terminal 2-3-chotomous cymes; bracts many, broad, deciduous. *Calyx* small, 5-fid, eglandular within; lobes broad, obtuse. *Corolla* salver-shaped, throat naked, lobes overlapping to the left, rarely to the right. *Stamens* near the base of the tube; anthers obtuse, cells rounded at the base. *Disc* 0, or lining the calyx-tube. *Carpels* 2, distinct; style short, stigma 2-lobed; ovules ∞ -seriate in each cell. *Follicles* linear-oblong or ellipsoid. *Seeds* oblong or lanceolate, plano-convex, winged, albumen fleshy, thin; cotyledons oblong or ovate-cordate.—**DISTRIB.** About 40 species, all natives of tropical America.

P. acutifolia, *Poiret*; leaves oblong acute at both ends. *A. DC. Prodr.* viii. 392; *Wall. Cat.* 1636; *Wight Ic.* t. 471; *Brand. For. Fl.* 323; *Kurz For. Fl.* ii. 179; *P. acuminata*, *Roxb. Fl. Ind.* ii. 20; *Bot. Reg.* t. 114; *Bot. Mag.* t. 3952.

Cultivated and naturalised in many parts of INDIA.

A small tree with crooked trunk and rough bark; branches swollen and leafy at the tips. *Leaves* 8-12 in.; petiole 1-1½ in., 1-glandular at the top. *Flowers* many, fragrant, pink externally, white within. *Follicles* about 5 in. long, cylindric.

15. **ELLERTONIA**, *Wight*.

Glabrous climbing shrubs. *Leaves* opposite or 3-4-nately whorled, coriaceous. *Flowers* slender, in subterminal cymes. *Calyx* small, deeply 5-fid, eglandular. *Corolla* salver-shaped, tube cylindric; throat constricted, naked; lobes 5, narrow, overlapping to the left. *Stamens* in the middle of the tube, filaments ciliate; anthers lanceolate, cells obtuse at the base. *Disc* 0. *Carpels* 2, distinct; style filiform, top ovoid or oblong, stigma linear, 2-fid; ovules many in each carpel, 2- ∞ -seriate. *Follicles* 2, linear or narrowly linear-oblong, terete, spreading. *Seeds* 2-seriate, oblong, flattened, peltately attached, winged above and below, albumen scanty; cotyledons thin, radicle superior. Species 2, an Indian and ? a Madagascarian.

E. Rheedii, *Wight Ic.* t. 1295.—*Rheede Hort. Mal.* ix. t. 14.

MALABAR and the CONCAN; at Quilon, *Wight*; Wurree country, *Stocks, Gibson*.

Branches twining, slender, terete, *Leaves* 3-5 by 1-2 in., elliptic or oblong, obtusely acuminate, of a peculiar blue-gray hue beneath when dry, coriaceous; nerves 10-12 pairs, very slender, spreading; petiole ¼ in. *Cymes* clustered, few-fld., 1-2 in. long, 2-3-chotomously branched; bracts subulate, persistent; pedicels short. *Sepals* ovate, acuminate. *Corolla-tube* ½ in., very slender, inflated in the middle; lobes lanceolate, acuminate. *Ovary* elongate; style slender, stigmas long. *Follicles* 2-4 by ½ in., horizontally divaricate, sessile, straight or slightly curved, acute, coriaceous, inner coat separable. *Seeds* 1½ in., disc elliptic, wings quite straight, tips rounded.

16. **ALSTONIA**, *Br.*

Trees or erect shrubs. *Leaves* 3-4-nately whorled, rarely opposite. *Flowers* in subterminal corymbose cymes. *Calyx* short, 5-lobed or -partite. *Corolla* salver-shaped, tube cylindric; throat naked, annulate or with reflexed hairs; lobes overlapping to the right or left. *Stamens* near the top of the tube, included; anthers subacute. *Disc* annular, lobed or truncate or 0. *Carpels* 2 distinct; style filiform, top ovoid or oblong, stigma minute or 2-toothed; ovules many, ∞ -seriate in each carpel. *Follicles* 2, linear, slender. *Seeds* oblong or linear, flattened, peltately attached, often ciliate, albumen scanty; cotyledons oblong, flat, radicle superior.—**DISTRIB.** Species about 30, tropical Asiatic, Malayan, Australian, and Polynesian.

SECT. I. **Pala.** *Leaves* with close parallel nervation, usually obtuse. *Corolla-lobes* overlapping to the left.

1. **A. scholaris**, *Brown in Mem. Wern. Soc. i. 75*; leaves 4-7 in a whorl obovate or elliptic-oblong white beneath, base acute, tip obtuse rounded or obtusely acuminate, cymes peduncled or sessile capitate, flowers pubescent, follicles very long and slender. *A. DC. Prodr. viii. 408*; *Wight Ic. t. 422*; *Gräh. Cat. Bomb. Pl. 115*; *Dalz. & Gibs. Bomb. Fl. 145*; *Brand. For. Fl. 325*; *Kurz For. Fl. ii. 183*; *Beddome For. Fl. 325, t. 242*; *Wall. Cat. 1644*. *Echites scholaris*, *Linn. Mant. 55*. *E. Pala*, *Ham. ex Spreng. Syst. i. 633*; *A. DC. l. c. 477*.—*Rheede Hort. Mal. i. t. 45*.

Drier forests of INDIA; in the tropical region of the WESTERN HIMALAYA from the JUMNA eastwards to ASSAM, and southwards to CEYLON, SINGAPORE and PENANG.—DISTRIB. Malay Archipelago, tropical Australia and Africa.

An evergreen tree 40-60 ft., "at times 80-90" (*Brandis*); trunk tall, base often buttressed; branches whorled; juice milky bitter. *Leaves* 4-8 by 1-2½ in., very coriaceous, whitish beneath; nerves 30-60 pairs, horizontal, joining an intramarginal one; petiole stout, ¼-½ in. *Cymes* umbellately branched; peduncle 1-3 in., rarely 0, very stout; branches numerous, stout; flowers subcapitate, greenish-white. *Corolla* ½-¾ in. diam., throat villous, lobes rounded. *Disc* 0. *Ovary* hirsute. *Follicles* 1-2 ft., pendulous in clusters, only ½ in. diam., terete. *Seeds* ½ in. long, slender.

2. **A. spathulata**, *Blume Bijl. 1037*; quite glabrous, leaves 3-5 in a whorl obovate-cuneate tip rounded concolorous beneath, cymes peduncled and pedicelled flowers quite glabrous.—*A. DC. Prodr. viii. 410*; *Miquel Fl. Ind. Bat. ii. 437*. *A. cuneata*, *Wall. Cat. 1645 (habitat wrong)*.

MALACCA; in marshes, *Griffith, Maingay* (Kew Distrib. 1068).—DISTRIB. JAVA, Borneo.

Leaves 1½-4 in., very coriaceous, brown on both surfaces when dry, shining above, opaque beneath; nerves 20-30 pairs, horizontal; petiole very short. *Cymes* small, umbellately branched; bracts short. *Calyx-lobes* orbicular. *Corolla-tube* ½ in., lobes elliptic, throat villous. *Disc* small. *Ovary* glabrous. *Follicles* 5-7 in. long, slender.

SECT. II. **Blaberopus.** *Leaves* with close parallel nerves, membranous, acute or acuminate. *Corolla-lobes* overlapping to the left. *Disc* of 2 ligulate glands alternating with the carpels. *Follicles* 3-6 in., broadest in the middle.

3. **A. venenatus**, *Brown in Mem. Wern. Soc. i. 75*; quite glabrous, leaves 4-6 in a whorl narrowly lanceolate finely acuminate, follicles stipitate and long-beaked. *Wall. Cat. 1647*; *Lodd. Bot. Cab. t. 186*; *Wight Ic. t. 436*; *Dalz. & Gibs. Bomb. Fl. Suppl. 52*; *Beddome For. Fl. Anal. Gen. 160*. *Blaberopus venenatus*, *A. DC. Prodr. viii. 411*. *Echites venenata*, *Roxb. Ic.*

DECCAN PENINSULA, NILGHERY HILLS; alt. 3-4500 ft., Courtallum, Dindygul on high hills.

A shrub 6-8 ft. *Leaves* 4-8 by ½-1½ in., narrowed into a slender short petiole, midrib stout, nerves very slender and close. *Cymes* subumbellate, the flowers often racemose on the branches. *Calyx* very small, lobes triangular-ovate, acute. *Corolla-tube* 1 in., very slender, swollen at the top, limb ¾-1 in. diam.; lobes oblong, obtuse. *Ovary* ovoid; style slender, top barrel-shaped, stigma 2-fid. *Follicles* 4-5 by ½ in., sword-shaped, coriaceous, smooth, narrowed into a stalk ¾-1 in. long, and into a straight beak as long. *Seeds* more than ½ in. long, linear-oblong, flat, hairs short.—Fig. 6 of Wight's plate represents the pod of *A. nerifolia*.

4. **A. nerifolia**, *Don Prodr. 131*; branchlets and leaves beneath pubescent, leaves opposite or 3-4 in a whorl narrowly lanceolate finely acuminate, follicles sessile beaked. *Wall. Cat. 1646*. *Blaberopus nerifolius*, *A. DC. Prodr. viii. 411*. *B. Sebuisii*, *Van Huerck & Muell. Arg. in Plant. Nov. Herb. Van Heurck, fasc. ii. 188*.



TROPICAL HIMALAYA; Nipal, *Wallich*, near the Sikkim frontier, on dry rocks, J. D. H. BHOTAN; *Griffith*.

Very similar to *A. venenata*, but the leaves are more coriaceous, always more or less pubescent beneath, and much fewer in a whorl, with usually long (sometimes $\frac{1}{2}$ in.) subulate interpetiolar glands; the foliicles are longer (4-7 in.), more slender, straighter, and sessile; the seeds are smaller and narrower.—*B. Sebusii*, Van H. & Muell. Argan., is founded on Griffith's Bhotan specimen, in which the leaves and flowers are those of *A. nerifolia*, but the pods, which are separate, belong to *A. venenata*.

SECT. III. **Dissuraspermum.** *Leaves* with distant nerves. *Corolla*-lobes overlapping to the right. *Disc* annular. *Follicles* long, slender, cylindric.

5. ***A. macrophylla***, *Wall. Cat.* 1848; leaves 6-12 in. oblanceolate or elliptic-lanceolate obtusely acuminate pubescent or glabrous beneath, nerves 16-20 pairs, cymes numerous large terminal sessile or peduncled with slender spreading many-flowered branches, corolla-tube glabrous throat villous. *A. DC. Prodr.* viii. 409. *A. costata*, *Wall. Cat.* 1849, not of *Br.*

PENANG; *Wallich, Maingay* (Kew Distrib. 1066/2, 1070/2).—DISTRIB. Java, Timor, Philippine Islds.

Leaves thinly coriaceous, $2\frac{1}{2}$ -3 in. broad, shining above, rather paler beneath; nerves spreading, about $\frac{1}{2}$ in. apart; base narrowed into a stout petiole $\frac{3}{4}$ -1 in. long. *Cymes* copious, lax, pubescent; bracts 0; flowers small. *Calyx* campanulate, lobes short obtuse. *Corolla-tube* $\frac{1}{2}$ in., mouth contracted; lobes rounded, pubescent, thick. *Disc* annular. *Ovary* ovoid, acute, glabrous. *Follicles* very numerous, slender, pendulous, 12-18 by $\frac{1}{4}$ in., terete, membranous. *Seeds* slender, $\frac{1}{4}$ in. long.

6. ***A. angustifolia***, *Wall. Cat.* 1850; leaves glabrous obovate or oblanceolate obtusely acuminate or obtuse, nerves 10-15 pairs, cymes numerous branched densely pubescent many-flowered, peduncle and branches stout, calyx urceolate lobes very short, corolla-tube densely pubescent throat villous. *A. DC. Prodr.* viii. 409.

SINGAPORE; *Wallich, T. Anderson.* MALACCA and PENANG; *Griffith, Maingay* (Kew Distrib. 1066, 1067, 1070, 1070/1, 1070/2).

A tall tree (*Maingay*), leaves much smaller and more coriaceous than *A. macrophylla*, always quite glabrous, with fewer nerves and longer petioles ($\frac{3}{4}$ -1 in.) and with denser more pubescent cymes and flowers. Penang specimens have very broad leaves, 6-7 by 3 in.

SPECIES OF DOUBTFUL POSITION.

7. ***A. Kurzii***, *Hook. f.*; a tree 80-100 ft., quite glabrous; leaves whorled, 4-7 in. long, oblong to obovate-oblong, tip retuse or rounded, base acute or obtuse, coriaceous, glaucous beneath; nerves parallel, numerous, slender; flowers small, white, densely cymulose; pedicels short and stout; cymelets shortly peduncled, whorled, forming a long peduncled, glabrous axillary panicle; foliicles linear. *A. spectabilis*, *Kurz For. Fl.* ii. 183, not of *Brown*.—Forests of the Andaman Islds., *Kurz*.

This is obviously not *Brown's A. spectabilis*, which is probably closely allied to *A. macrophylla*. In *Journ. As. Soc.* 1877, ii. 254, *Kurz* says of this, "hardly specifically distinguishable from *A. scholaris*."

8. ***A. GRANDIFOLIA***, *Miquel Fl. Ind. Bat. Suppl.* 555; leaves 5-7 in a whorl, unequal, 12-16 by 4-5 in., narrowly obovate or oblanceolate, obtusely apiculate, glaucous beneath, midrib stout, nerves 20 pairs strong; petiole very stout, 2 in.—Singapore, *T. Anderson*.—Of this I have seen only two leaves, which precisely agree with *Miquel's* from Sumatra.

17. **DYERA**, *Hook. f.*

Glabrous trees. *Leaves* whorled, petioled. *Flowers* small, in terminal and axillary umbellately branched cymes. *Calyx* hemispheric, shortly 5-lobed, eglandular within. *Corolla* salver-shaped, tube short; lobes overlapping to

the left. *Stamens* 5, in the middle of the tube, included, filaments very short; anthers oblong, obtuse, upper half empty fleshy, base obtusely 2-lobed. *Disc* annular, obscure. *Ovary* short, broadly conic, obtuse, top pubescent, 2-celled, cells many-ovuled; style 0, stigma 2-cleft, minute, sessile, pyriform, lobes appressed. *Follicles* very large long thick, straight, cylindric, obtuse, connate at the base, reflexed, furfuraceous. *Seeds* (unripe) flattened, winged.—Species 3, Malayan.

1. *D. costulata*, Hook. f.; leaves rounded at the base, cymes shortly peduncled, corolla-lobes about as long as the tube. *Alstonia* ? *costulata*, *Miquel Fl. Ind. Bat. Suppl.* 556.

MALACCA; Griffith, *Maingay* (Kew Distrib. 1097).—DISTRIB. Sumatra.

A tree; branches very stout. *Leaves* 6-8 in a whorl, 2-4 by $1\frac{1}{2}$ -3 in., broadly elliptic or oblong, rounded at both ends, hard and coriaceous, shining above, glaucous beneath; nerves 12-16 pairs, strong, nearly straight, almost horizontal or ascending, reticulations prominent above; petiole $\frac{1}{2}$ -1 in. *Cymes* numerous, twice umbellately branched, glabrous; peduncles 2-3 in.; pedicels short; flowers very small. *Calyx-lobes* rounded, coriaceous. *Corolla-tube* $\frac{1}{10}$ in. long, glabrous, lobes linear-oblong. *Follicles* 9-12 by $1-1\frac{1}{2}$ in., "covered with minute crenated ferruginous squamulae" (*Maingay*).—A most remarkable plant, evidently allied to *Alstonia*, though from the seeds being imperfectly known, its exact affinity cannot be stated. The huge follicles are borne on a woody peduncle nearly $\frac{1}{2}$ in. diam., their bases are entirely connate, and though quite straight they are sharply deflexed, when ripe they gape wide, and the inner shining parchment-like coat becomes irregularly torn, forming a fringe to the coriaceous outer. An allied species from Borneo, collected by Low, Lobb, and Beccari, has longer leaves (6-9 by 1-2 in.) with the base narrowed into the petiole and numerous (20-30) pairs of nerves.—All the species are said to yield gutta Jelatang.

2. *D. laxiflora*, Hook f.; leaves narrowed to the rounded or subacute base, cymes long peduncled, corolla-lobes four times as long as the tube.

SINGAPORE; Murton, *Cantley*.

Closely allied to *D. costulata*, but with much larger leaves, sometimes 8 in long, petioles $1\frac{1}{2}$ -2 in. *Peduncles* of cyme very slender, 3-5 in., pedicels $\frac{1}{4}$ - $\frac{1}{2}$ in. *Corolla-lobes* linear, $\frac{1}{2}$ in. long.

18. *HOLARRHENA*, Br.

Trees or shrubs. *Leaves* opposite, membranous. *Flowers* white, in terminal or subaxillary many-flowered corymbose cymes. *Calyx* 5-lobed or -partite, usually glandular within, lobes small. *Corolla* salver-shaped, tube slender cylindric, throat contracted naked; lobes oblong, overlapping to the left. *Stamens* near the base of the tube; anthers oblong-lanceolate, mucronate, cells rounded at the base. *Disc* 0. *Carpels* 2, distinct; style short, filiform, stigma oblong-fusiform, top entire or 2-toothed; ovules many in each carpel. *Follicles* 2, elongate, spreading and incurved, terete. *Seeds* linear or oblong, compressed, concave, tipped with a deciduous coma; funicle in the concavity, albumen scanty; cotyledons broad, complicate, radicle short, superior.—DISTRIB. Species 7 or 8, tropical Asiatic and African.

1. *H. antidysenterica*, Wall. *Cat.* 1672; glabrous pubescent or tomentose, leaves shortly petioled elliptic oblong ovate or ovate-oblong obtusely acuminate. *A. DC. Prodr.* viii. 413; *Brand. For. Fl.* 326, t. 40; *Bedd. Fl. Sylv. Anal. Gen.* xx. fig. 6; *Kurz For. Fl.* ii. 182; *Dalz. & Gills. Bomb. Fl.* 145; *Beddome For. Fl. Anal. Gen.* 160, t. 20, fig. 6. *H. Codaga*, *G. Don Gen. Syst.* iv. 78; *A. DC. l.c.*; *Kurz For. Fl.* ii. 183; *Wight Ic.* 1297. *H. pubescens*, Wall. *Cat.* 1673; *A. DC. l.c.* *H. malaccensis*, *Wight Ic.* t. 1298. *Pl. Chites antidysenterica*, *Roxb.* *Wrightia antidysenterica*, *Grah. Cat. Bomb. Pl.* 114, excl. some syns. *Chonemorpha* ? *antidysenterica*, *G. Don l.c.*; *Wight Ic.* t.



439. ? *H. villosa*, *Ait. et Loud. in Steud. Nomencl.—Rheede Hort. Mal. i. t. 47.*

TROPICAL HIMALAYA; ascending to 3500 ft., from the Chenab westwards, and throughout the drier forests of INDIA to TRAVANCORE and MALACCA.

A small deciduous tree, bark pale. *Leaves* 6–12 by $1\frac{1}{2}$ –5 in., base obtuse rounded or acute; nerves 10–14 pairs, strong, arched; petiole 0– $\frac{1}{4}$ in. *Cymes* 3–6 in. diam., corymbose, sessile, terminal; bracts small, ciliate; pedicels slender. *Flowers* inodorous, white, 1–2 in. diam., puberulous. *Sepals* acuminate. *Corolla-tube* very slender, $\frac{1}{4}$ – $\frac{1}{2}$ in.; lobes as long, oblong, tip round. *Follicles* 8–16 by $\frac{1}{4}$ in., very slender, parallel, terete, coriaceous, obscurely torulose, usually with small long white spots. *Seeds* $\frac{1}{2}$ in., narrowly linear-oblong, glabrous, coma 2 in., brown.

2. *H. mitis*, *Br. in Mem. Wern. Soc. i. 62*; glabrous, leaves lanceolate or linear-lanceolate obtuse. *A. DC. Prodr. viii. 413*; *Thwaites Enum. 194*; *Beddome For. Fl. Anal. Gen. 161.*

CEYLON; not uncommon up to 1500 ft.

A medium-sized tree (*Thwaites*). *Leaves* 3–5 by $\frac{1}{2}$ –1 in., shining above, paler beneath, nerves about 10 pairs; petiole $\frac{1}{4}$ in. *Cymes* axillary and terminal, many-fld. *Corolla-lobes* narrowly linear. *Follicles* upwards of a foot long.—A specimen of this is in the Wallichian Herbarium without name or number, ticketed as from Herb. Finlayson; probably erroneously, as Finlayson collected only in Siam.

19. TABERNÆMONTANA, Linn.

Trees or shrubs. *Leaves* opposite. *Flowers* white in axillary terminal cymes. *Calyx* 5-lobed or partite, glandular within, rarely eglandular. *Corolla* salver-shaped, tube cylindric, usually slender, inflated in the middle or top; lobes overlapping to the left. *Stamens* at or above the middle of the tube, filaments short or 0; anthers sagittate or base obtuse, acuminate. *Disc* 0. *Carpels* 2, distinct; style short or long, top urceolate ovoid or clavate, stigma short or long 2-lobed; ovules usually many, and ∞ -seriate in each carpel. *Fruit* of 2 ovoid or oblong or reniform, smooth or ribbed 1-many-seeded, dry or fleshy follicles. *Seeds* buried in pulp, ovoid-oblong, subterete or compressed, grooved down one face, smooth striate or rugose, albumen fleshy equable or ruminate; cotyledons ovate, radicle short or long.—**DISTRIB.** About 110 species in all tropical regions.

* *Calyx* 5-lobed to the middle, lobes obtuse, eglandular or with glands on their inner faces at the base. *Corolla-lobes* globose in bud.

+ *Branches stout*; *leaves large coriaceous*; *peduncles and pedicels very stout*. *Calyx large*. *Corolla-tube cylindric, stout*.

1. *T. dichotoma*, *Roxb. Hort. Beng. 20*, and *Fl. Ind. ii. 21*; glabrous, leaves coriaceous oblong or obovate or linear-oblong tip rounded, base acute, nerves horizontal, petiole stout, cymes long-peduncled few-fld. *A. DC. Prodr. viii. 366*; *Wight Ic. t. 433*; *Wall. Cat. 1570*; *Thwaites Enum. 192*; *Bot. Reg. 1841, t. 53*. *Cerbera dichotoma*, *Lodd. Bot. Cab. t. 1516*. *C. Manghas*, *Linn., partly (Thwaites)*. *Tanghinia dichotoma*, *G. Don Hort. Brit. ed. 3, 461*.—*Burm. Thes. Zeyl. t. 70, fig. 1.*

DECCAN PENINSULA; common in the Western Ghats, *Beddome*. CEYLON; very common in the warmer parts of the island (*Thwaites*).

A small tree; branches very stout, woody, cylindric; buds resinous. *Leaves* 4–8 by 1–2 in., pale yellow-brown when dry, midrib very stout, nerves 16–22 pairs; petiole $\frac{1}{4}$ – $\frac{3}{4}$ in., base semiamplexicaul. *Peduncle* 2–5 in., bracts 0. *Calyx* hemispheric, very thick, lobes semicircular. *Flowers* scarcely fragrant. *Corolla* white, tube $\frac{3}{4}$ –1 in., yellow, cylindric, swollen at the very base, limb white, 2–3 in. diam., mouth contracted; lobes broadly oblong, falcate, obtuse. *Anthers* half-way down the tube.



Follicles usually solitary, 4-5 by 1-2 in., recurved, oblong, narrowed at both ends, dorsally concave, ventrally 2-ribbed, orange-yellow. *Seeds* many, $\frac{3}{4}$ in. long, buried in scarlet pulp.—Though mentioned by Roxburgh and Beddome as a Malabar plant, I have seen no specimen from continental India. It is remarkable as being the only Ceylon species of this common Indian and tropical genus. The *T. dichotoma*? of Gibson's Catalogue of Bombay Plants is probably *T. Heyneana*.

2. ***T. Heyneana*, Wall. in Bot. Reg. under t. 1273, and Cat. 1573;** glabrous, leaves linear-oblong or -lanceolate obtusely acuminate, base acute, nerves 12-16 pairs arched, cymes peduncled many-fl. *A. DC. Prodr.* viii. 376. *T. intercedens*, Van Heurck & Mull. Arg. *Plant. Nov. Herb. Van Heurck*, 166. *T. recurva*, *Herb. Hohenack*, 1847, not of Roxb.

WESTERN GHATS; from the Concan, southwards, common.

Branches very stout, with pale smooth bark, grooved when dry. *Leaves* 3-8 by 1-2½ in., coriaceous, dark brown and shining above when dry, paler beneath, midrib and nerves beneath stout; petiole $\frac{1}{2}$ - $\frac{1}{2}$ in., base dilated. *Peduncle* 1-2 in.; pedicels $\frac{3}{4}$ -1 in.; bracts obsolete. *Calyx* very coriaceous; lobes hardly ovate, obtuse. *Corolla-tube* 1 in., cylindric, stout, swollen at the top, limb 1 in. diam.; lobes globose in bud, falcately oblong, obtuse, crisped. *Ovary* very short; style filiform, top conic, stigma forked. *Follicles* very variable, $\frac{1}{2}$ -1 in. long, sessile, slightly recurved, shortly sausage-shaped, not keeled or ribbed, beaked or not. *Seeds* 2 or more, $\frac{1}{2}$ in. long.

3. ***T. corymbosa*, Roxb. Fl. Ind. ii. 25;** glabrous, leaves elliptic-oblong or lanceolate or oblanceolate obtuse or obtusely acuminate, nerves 10-16 pairs very spreading, cymes peduncled many-fl. *A. DC. Prodr.* viii. 376; *Wall. Cat.* 1772, and *Bot. Reg. under t. 1273*.

PENANG; *Wallich, Phillips*. SINGAPORE, *Anderson, Murton*.—DISTRIB. Java.

Very similar to *T. Heyneana*, but with smaller and more crowded flowers on slenderer pedicels, more obtuse leaves with straighter nerves. *Branches* stout; bark pale, smooth, grooved when dry. *Leaves* 3-7 by 1½-2½ in. (in one specimen of Wallich's 12 by 4 in.), coriaceous, opaque, greenish or brown above when dry, pale beneath; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* shortly peduncled, much branched; bracts obsolete; pedicels $\frac{1}{2}$ in. *Calyx* very coriaceous, lobes rounded. *Corolla-tube* $\frac{1}{2}$ in., cylindric, swollen at the top; lobes falcately oblong, globose in bud. *Ovary* elongate-conical; style stout, stigma fusiform. *Follicles* not seen.—This is certainly very near *T. javanica*, Miquel, but differs in the longer pedicels, suppression of bracts, and in the corolla-tube being dilated not in the middle, but at the top, as also in the stigma not being 2-fid; the latter character is however a very deceptive one, as the tearing away of the stigma from the anthers often mutilates it. *T. sphaerocarpa* of Java is another close ally.

4. ***T. hirta*, Hook. f.;** cymes pubescent, leaves elliptic-ovate or -oblong long acuminate, nerves 10-15 pairs arched, cymes peduncled many-fl.

MALACCA; *Maingay*.

Leaves 4-8 in., coriaceous, almost caudate, base acute; petiole $\frac{1}{2}$ - $\frac{1}{2}$ in. *Cymes* almost hirsute, with short close-set spreading hairs, peduncle branches and pedicels stout. *Calyx* coriaceous, sometimes 7-lobed, lobes semicircular, eglandular. *Corolla* glabrous, tube $\frac{1}{2}$ in., stout, cylindric; lobes short, globose in bud. *Ovary* elongate; style slender, top urn-shaped, stigma small fusiform. *Follicles* strongly recurved, 1-1½ by $\frac{1}{2}$ - $\frac{3}{4}$ in., terete, not ribbed keeled or beaked. *Seeds* $\frac{1}{2}$ in., few or many.—The specimens are very indifferent of this very distinct species.

†† *Branches* rather slender; leaves membranous; calyx small; corolla-tube slender.

5. ***T. coronaria*, Br. in Hort. Kew. ed. 2, ii. 72;** glabrous, leaves in each pair unequal elliptic-oblong obovate or oblanceolate obtusely acuminate or caudate, peduncles solitary or in pairs in the forks of the branches dichotomous 1-8-fl., corolla-tube swollen below the middle, follicles recurved. *A. DC.*



Prodr. viii. 373; *Roxb. Fl. Ind.* ii. 23; *Wall. Cat.* 1568; *Wight Ic.* t. 477; *Brand. For. Fl.* 322; *Dalz. & Gibs. Bomb. Fl.* 144; *Bedd. For. Fl. Anal. Gen.* 159; *Lodd. Bot. Cab.* t. 406. *T. divaricata*, *Bhume Bijl.* 1626; *Kurz For. Fl.* ii. 174. *Nerium divaricatum*, *Linn. Sp. Pl.* 306. *N. coronarium*, *Jacq. Coll.* i. 138, t. 52; *Bot. Mag.* t. 1861.—*Jasminum zeylanicum*, &c., *Burm. Fl. Ind.* t. 39.

Cultivated throughout INDIA; from the N.W. Himalaya in Kumaon, eastwards and southwards.—Native country unknown.

A shrub, 6–8 ft., much dichotomously branched, bark pale. *Leaves*, the larger 4–6 by 1–1½ in., glossy, rather coriaceous, green when dry, pale beneath, margins waved, nerves 6–8 pairs, narrowed into a petiole ¼–½ in., axils of petioles glandular. *Peduncles* 1–2 in., pedicels slender; bracts 0 or minute. *Flowers* pure white, often double, fragrant. *Calyx-lobes* broadly ovate, acute. *Corolla-tube* ½–1 in., glabrous, dilated slightly below the middle, limb 1–1½ in. diam.; lobes obliquely ovate, obtuse, margins curled; mouth with 5 glands. *Anthers* inserted below the middle of the tube. *Ovary* glabrous. *Follicles* 1–3 in., spreading and recurved, sessile or contracted into a sort of stalk at the base, turgidly oblong, beaked or not, 3-ribbed. *Seeds* 3–6, oblong, striated; aril red, fleshy.

6. ***T. graciliflora***, *Wall. Cat.* 1576, and in *Bot. Reg.* under t. 1273; glabrous, leaves oblong-lanceolate obtusely acuminate or caudate, nerves 11–16 pairs, cymes very long-peduncled, bracts obsolete, corolla-tube 1 in. very slender, lobes narrow, follicles ½ in. turgid 1–2-seeded. *Kurz For. Fl.* ii. 175. *T. Colignonæ*, *Van Heurck & Muell. Pl. Nov. Van Heurck*, 170.

MARTABAN and MOULMEIN; *Wallich, Griffith.*

Branches with pale bark. *Leaves* 4–7 by 1–2 in., membranous, narrowed into a slender petiole ¼–½ in. *Peduncle* sometimes equalling the leaves; branches of a slender, divaricate, pedicels short. *Calyx* very small; lobes rounded, ciliolate. *Corolla-tube* dilated above the middle, twice as long as the lobes. *Ovary* of two very slender carpels; style filiform, tip obconic, stigma forked. *Follicles* turgid, smooth, with a short upcurved beak or 0. *Seeds* ½ in.

7. ***T. subcapitata***, *Wall. Cat.* 1579, and in *Bot. Reg.* under t. 1273; leaves elliptic-oblong or lanceolate obtusely acuminate or caudate, nerves 8–12 pairs, cymes shortly peduncled small many-fld., bracts obsolete, corolla-tube ⅓ in., lobes small rounded, throat villous. *A. DC. Prodr.* viii. 373.

TAVOY; *Gomez. PEGU and TENASSERIM (Kurz). MERGUI; Griffith.*

An evergreen shrub. *Leaves* 4–7 by 1½–3 in., very membranous, midrib and nerves slender; petiole slender, ¼–⅔ in. *Peduncle* 1–1½ in.; branches crowded, dichotomous, very short. *Calyx* small; lobes broadly ovate, obtuse. *Flowers* white. *Corolla* rather funnel-shaped above, lobes about half as long as the tube. *Ovary* ovoid, acute; style filiform, tip clavate, stigma fusiform. *Follicles* “obliquely oblong, about ⅔ in. long, narrowed into a thick long stalk and compressed into a sterile truncate appendage, terminating in a falcate point; glabrous, 1–2 seeded,” *Kurz*.

8. ***T. peduncularis***, *Wall. Cat.* 1575, and in *Bot. Reg.* under t. 1273; glabrous, leaves oblong-lanceolate obtusely caudate-acuminate, nerves 12–20 pairs spreading, peduncles very long and slender, cyme-branches divaricate, pedicels capillary, corolla-tube ½ in. curved limb small, follicles ½ in. stipitate 1-seeded. *A. DC. Prodr.* viii. 376.

PENANG; *Porter, Maingay (Kew Distrib. 1060/2).*

A small shrub. *Leaves* 4–6 by 1½–2½ in., membranous, nerves close, tips usually very long, base acute; petiole slender, ¼–⅓ in. *Peduncle* 4–5 in., wiry; branches few, filiform, widely divaricate. *Calyx* small, lobes rounded. *Corolla-lobes* very small, mouth glabrous. *Ovary* of two long narrow carpels; style filiform, top clavate, stigma 2-fld. *Follicles* turgid, obtusely beaked, not ribbed.

** *Calyx* 5-partite, segments eglandular or glandular at the base.

† *Calyx-segments* broad, foliaceous, deciduous.

9. **T. crisa**, Roxb. *Hort. Beng.* 20, and *Fl. Ind.* ii. 24; glabrous, leaves elliptic or elliptic-oblong or -obovate obtusely acuminate margins wrinkled, cymes long-peduncled, bracts minute, sepals rounded subacute. *A. DC. Prodr.* viii. 371, excl. syn. *Rheede & Linnaeus*; *Wall. Cat.* 4450; *Wight Ic.* t. 470; *Bedd. For. Fl. Anal. Gen.* 159. *T. alternifolia*, Roxb. *Fl. Ind.* ii. 24; *Kurz For. Fl.* ii. 174, not of *Linnaeus*.

ANDAMAN ISLANDS; frequent along the coast, *Kurz*.

Habit and foliage of *T. coronaria*, but leaves often much larger, sometimes 10 by 5 in., with more numerous and more spreading nerves; petiole very short. *Cymes* many-fld.; peduncle 1-4 in.; pedicels long, $\frac{1}{2}$ -1 in. *Sepals* $\frac{1}{2}$ in. diam., obtuse or apiculate, sometimes cordate. *Corolla-tube* very slender, $\frac{1}{2}$ - $\frac{3}{4}$ in., swollen at the top; limb 1 in. diam., lobes obovate, margins crisped, ovoid and acute in bud. *Ovary* ovoid, narrowed into the slender style, which is elongate, urceolate at the top, with a 2-fid stigma. *Follicles* "1 in., sessile, acute, recurved, ventrally 3-keeled, 3-6-seeded" (*Roxburgh*).—This species, which differs from all others in the remarkable calyx, has long been in confusion, and though cultivated in India from a very early period, it was only quite lately that its native country was known. This is the Andaman Islands. *Beddome* indeed says that it is common in the Western Ghats; but I have seen no specimens and suspect some error. *Roxburgh* accurately describes it, but strangely confounded it with *T. alternifolia* of *Linnaeus* (*Sp. Pl.* 211). Under the latter plant (*Fl. Ind.* ii. 25) he quotes *Linnaeus*' and *Rheede's Curata pala*, and says "the leaves being in this opposite, made me change the Linnaean specific name *alternifolia* for *crisa*, on account of its curled petals." A glance at *Rheede's figure of Curata pala*, upon which *Linnaeus* founded his *T. alternifolia*, shows that it has nothing to do with this, but is probably *T. coronaria*. *Kurz*, also neglecting to refer to *Rheede*, restores the Linnaean name of *alternifolia*, and does not even refer to *Roxburgh's crisa*, though his description perfectly agrees with that author's. Lastly, *Linnaeus* and *Roxburgh* are both wrong in the citation of *Rheede for Curata pala*—it is part i. t. 47 (*Linnaeus* say 45, and *Roxburgh* 46).

†† *Calyx-segments* narrow, acute or acuminate, persistent.

10. **T. recurva**, Roxb. *Hort. Beng.* 20, and *Fl. Ind.* ii. 26; glabrous, leaves elliptic-oblong obtusely acuminate subcaudate, cymes short-peduncled recurved few- or many-fld., bracts subulate persistent, sepals very unequal lanceolate ciliolate, corolla-tube slender swollen above, follicles turgid many-seeded. *A. DC. Prodr.* viii. 371; *Wall. Cat.* 1569, and in *Bot. Reg. under t.* 1273; *Wight Ic.* t. 476; *Kurz For. Fl.* ii. 174. *T. gratissima*, *Lindl. in. Trans. Hort. Soc. vii.* pt. i. 55, and *Bot. Reg. t.* 1084.

CHITTAGONG; *Roxburgh*; Flagstaff Hill, *J. D. H. & T. T. PEGU* and *TENASSERIM* (*Kurz*).

A small shrub; bark smooth. *Leaves* 2-6 by 1-2 $\frac{1}{2}$ in., membranous; nerves 6-8 pairs, slender, arched; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* with stout peduncle $\frac{1}{2}$ -1 in., branches stout; bracts rather persistent; flowers drooping, fragrant. *Sepals* $\frac{1}{2}$ - $\frac{3}{4}$ in. *Corolla-tube* $\frac{3}{4}$ in.; limb 1-1 $\frac{1}{2}$ in. diam., lobes falcately obovate, forming an ovoid acute bud. *Ovary* elongate, narrowed into the filiform style with oblong tip and forked stigma. *Follicles* $\frac{1}{2}$ -2 in., sessile, hardly recurved, very turgid, terete, not keeled.

11. **T. rostrata**, *Wall. Cat.* 1578, and in *Bot. Reg. under t.* 1273; glabrous, leaves elliptic-oblong or -lanceolate obtusely acuminate pale beneath, cymes short-peduncled, bracts persistent, sepals ovate acute, corolla-tube swollen in the middle, follicles sessile lanceolate long-beaked acutely keeled few-seeded. *A. DC. Prodr.* viii. 371; *Kurz For. Fl.* ii. 174.

AVA; banks of the Irawaddy, *Wallich*.

Shrubby, bark smooth. *Leaves* 3-6 by 1 $\frac{1}{2}$ -2 in., membranous; nerves 7-10 pairs,



slender. Cymes few-fl., peduncle $\frac{1}{4}$ –1 in., bracts small, pedicels very short. Sepals small, $\frac{1}{10}$ in. Corolla-tube 1 in., very slender, lobes falcately linear-oblong. Filaments slender. Ovary narrowed into a style much shorter than the tube, stigma large, 2-partite. Follicles $\frac{1}{2}$ –1 by $\frac{1}{8}$ – $\frac{1}{2}$ in., 2–4-seeded, beak straight or upcurved.

12. **T. calycina**, Wall. Cat. 1577, and in Bot. Reg. under t. 1273; glabrous, leaves elliptic-lanceolate obtusely acuminate, cymes short-peduncled, bracts subulate persistent, sepals linear-lanceolate acuminate very unequal, corolla-tube swollen above, ovary very short. Kurz For. Fl. ii. 173.

TENASSERIM; Gomez.

Foliage similar to that of *T. rostrata*, but petioles rather longer; pedicels very short indeed; bracts sometimes linear-oblong and almost leafy in texture; sepals very much longer, one-third as long as the corolla-tube, which is very slender, $\frac{2}{3}$ in. long and swollen at the top; ovary not elongate, but almost hemispheric.—I have seen but one specimen.

13. **T. malaccensis**, Hook. f.; glabrous, leaves elliptic-obovate or lanceolate obtusely acuminate or caudate, cymes sessile or shortly peduncled few-fl., pedicels slender, bracts 0, sepals unequal subulate-lanceolate acuminate, corolla-tube slender inflated at the top, lobes narrow, follicles turgid recurved beaked 3-keeled few- or many-seeded.

MALACCA; Griffith, Maingay (Kew Distrib. 1061, 1062).

A small shrub. Branches slender, very smooth. Leaves in flowering specimens 3–4 by 1–1 $\frac{1}{4}$ in., very membranous, in the fruiting specimens shorter and broader in proportion sometimes nearly orbicular; nerves very slender, 6–8 pairs; petiole $\frac{1}{4}$ in. Cymes very slender and few- or many-flowered, pedicels $\frac{1}{4}$ –1 in.; flowers small. Corolla-tube $\frac{2}{3}$ in., lobes about as long, crumpled. Ovary short, top rounded; style long, filiform. Follicles $\frac{3}{4}$ –1 $\frac{1}{2}$ in., more or less recurved.

14. **T. membranifolia**, Kurz For. Fl. ii. 175; glabrous, leaves elliptic-lanceolate caudate-acuminate very membranous, not paler beneath, cymes subsessile, bracts obsolete, sepals very small subulate, corolla-tube very slender inflated below the middle, lobes linear-lanceolate much shorter than the tube.

MARTABAN; forests east of Tounghoo, Kurz.

An evergreen shrub, 3–4 ft. (Kurz). Leaves 3–5 by 1–1 $\frac{1}{4}$ in., tips very long, curved, nerves 7–8 pairs, very slender. Cymes short, many-flowered; pedicels long or short. Sepals subequal. Corolla-tube $\frac{3}{4}$ in., lobes linear-lanceolate, acute, half as long as the tube or less, forming very long narrow buds. Ovary ovoid, acute; style filiform, top elongate-clavate, truncate, stigma slender. Follicles not seen.

DOUBTFUL AND EXCLUDED SPECIES.

T. FINLAYSONIANA, Wall. Cat. 4452, without flower or fruit, is probably a native of Siam, and is indeterminate.

T. INDICA, Willd. Herb. in Steudel Nomenclator, cannot be determined without a reference to Willdenow's herbarium.

T. MACROCARPA, Jack., is a native of Sumatra; and *T. MONOCARPA*, Steudel Nomenclator, is obviously a misprint for the same.

T. PERSICARIEFOLIA, Willd., Roxb. Fl. Ind. ii. 27, is a Mauritian plant.

T. OPHIORHIZOIDES, Kurz For. Fl. ii. 175; a glabrous shrub, 2–4 ft., leaves 3–5 in. obovate-oblong to broadly lanceolate shortly acuminate sessile or tapering into a petiole of 2–3 lines membranous pale beneath, cymes 2–3 rarely more in the forks of the upper branches, subsessile or shortly peduncled few-fl., pedicels 1–1 $\frac{1}{2}$ lines, bracts and bractlets minute deciduous, calyx 5-cleft very short, segments hardly 1 line lanceolate acute, corolla-tube about 4 lines rather thick, apex inflated, lobes hardly half as long as the tube.—Hill forests of Martaban, alt. 3–5000 ft. frequent.—I have seen no specimen.

T. WALLICHIANA, Steudel Nomenclator (*T. parvifolia*, Roxb. Fl. Ind. ii. 25; Wight Ic. t. 393, by error pauciflora in letterpress), is a native of Sumatra.

20. **PARSONSIA**, Br.

Twining shrubs. *Leaves* opposite. *Flowers* small, white, in terminal or axillary dichotomous cymes or thyrsi. *Calyx* 5-partite, glandular within or naked, or with 5 scales. *Corolla* salver-shaped, tube short, cylindric or globose, throat naked; lobes overlapping to the right. *Stamens* inserted in the tube, filaments often twisted; anthers half-exserted, acute, conniving over and adhering to the stigma, cells spurred and empty below. *Disc* of 5 lobes or scales. *Ovary* 2-celled; style filiform, top dilated, truncate, stigma columnar or elongate-conical, cells many-ovuled. *Fruit* cylindric, carpels at length separating from the two placentas. *Seeds* linear or oblong, tip narrowed and penicillate, albumen scanty; cotyledons linear-oblong, flat, radicle superior.—**DISTRIB.** 12 species of tropical Asia, Australia and New Zealand.

P. spiralis, Wall. Cat. 1631; quite glabrous, leaves ovate oblong or oblong-lanceolate base acute rarely rounded or cordate, cymes axillary corymbose. *A. DC. Prodr.* viii. 402; *Kurz For. Fl.* ii. 180. *P. oblonga*, Wall. Cat. 1632; *A. DC. l.c.* *P. pauciflora* and *P. acuminata*, Wall. Cat. 1633, 1634. *Helygia javanica*, Blume Bijl. 1043. *Heligme javanica*, *A. DC. l.c.* 425. *H. Rheedei*, Wight Ic. t. 1303; Dalz. & Gibs. Bomb. Fl. 146. *H. spiralis*, Thwaites Enum. 193. *Spirostemon spiralis*, Griff. Notul. iv. 80, t. 411, fig. 1. *Aganosma concanensis*, Hook. Ic. Pl. t. 841.

SILHET; Wallich. PEGU, TENASSERIM, MALACCA, SINGAPORE and PENANG. WESTERN GHATS; from the Concan southwards. CEYLON, ascending to 3000 ft.—**DISTRIB.** Malay Archipelago, China.

An evergreen twiner. *Leaves* 3-7 by $1\frac{1}{2}$ - $3\frac{1}{2}$ in., coriaceous, pale when dry; nerves 6-8 pairs, arched; petiole $\frac{1}{2}$ -1 in. *Cymes* 2-3 in. diam.; peduncle stout, half as long as the leaves; bracts small. *Sepals* ovate, very thick, obtuse, equalling the corollatube. *Corolla* $\frac{1}{2}$ in. diam., coriaceous; lobes linear-oblong, obtuse. *Fruits* 7 by $\frac{3}{4}$ in., or shorter, elongate, linear-lanceolate, acuminate, quite cylindric, at length separating into 2 coriaceous follicles. *Seeds* $\frac{3}{4}$ in., slender, glabrous; coma as long.

TRIBE III. **ECHITIDÆ.**21. **VALLARIS**, Burm.

Twining shrubs. *Leaves* opposite, minutely dotted. *Flowers* white, in subaxillary or axillary or supra-axillary dichotomous cymes, or fascicled. *Calyx* 5-partite, glandular or not within, segments narrow. *Corolla* salver-shaped, tube short, throat naked; lobes broad, overlapping to the right. *Stamens* at the top of the tube, filaments very short clavate; anthers exserted, conniving in a cone adherent to the stigma, connective with a large dorsal gland, cells with rigid basal spurs. *Disc* various. *Carpels* 2, at first connate, many-ovuled; style filiform, pubescent, stigma thick obscurely annulate. *Fruit* oblong, acuminate, carpels at length separating. *Seeds* 2-seriate, ovate, acuminate or beaked, compressed, tip comose, albumen scanty; cotyledons flat thin, radicle superior.—**DISTRIB.** Species 5 or 6, tropical Asiatic and Malayan.

* *Flowers* cymose. *Twining shrubs.*

1. **V. Heynei**, Spreng. Syst. i. 635; leaves elliptic or oblong or linear-oblong acuminate pellucid-dotted, cymes pubescent. *A. DC. Prodr.* viii. 400; Dalz. & Gibs. Bomb. Fl. 144. *V. dichotoma*, Wall. Cat. 1621; Griff. Notul. iv. 77; *A. DC. l.c.*; Thwaites Enum. 192; Brand. For. Fl. 327; Kurz For. Fl. ii. 181; Wight Ic. t. 438. *Echites dichotoma*, Roxb. Fl. Ind. ii. 19. *Peltanthera solanacea*, Roth Nov. Sp. 132.



TROPICAL HIMALAYA; Nipal, Wallich; Kumaon, ascending to 5000 ft., Edgeworth. DECCAN PENINSULA, from the Concan southwards. SILHET, BIRMA, CEYLON. (Commonly cultivated in India).

A tall climbing shrub, bark pale; the axils of the petioles glandular. Leaves $1\frac{1}{2}$ –4 by $\frac{3}{4}$ –1 $\frac{1}{2}$ in., glabrous or pubescent, petiole $\frac{1}{2}$ – $\frac{3}{4}$ in. Cymes 3–10-fl., sessile or peduncled, dichotomous, much shorter than the leaves, sometimes racemose with a twining rachis; peduncles and pedicels slender, the latter often decurved; flowers pure white, $\frac{2}{3}$ in. diam., fragrant. Sepals ovate-oblong, obtuse, equalling the short corolla-tube. Corolla-limb spreading. Disc ciliate. Filaments linear, villous; anthers woolly. Style pubescent. Follicles 6 by 2 in., straight, tapering from a rounded base to a stiff point, "splitting into 4 valves when dry" (Roxb.); pericarp thick, fibrous. Seeds 1 in., ovate, beaked, with a tuft of hairs at the hilum; coma very long.—I have seen no seeds; Kurz states that the follicles are always solitary.

2. *V. Pergularia*, Burm. Fl. Ind. 81; leaves large broadly elliptic or obovate or rounded abruptly shortly acute membranous, cymes glabrous or puberulous.—A. DC. Prodr. viii. 399; Wight Ic. t. 429; Hook. Ic. Pl. t. 153 (*V. Pergularia* by error). *V. ovalis*, Miquel Fl. Ind. Bat. ii. 427. *Pergularia glabra*, Linn. Mant. 53. *Emericia Pergularia*, Roem. & Sch. Syst. iv. 401. *Echites hircosa*, Roxb. Fl. Ind. ii. 18.—Rumph Amb. v. 51, t. 29, fig. 2.

BENGAL; scarce, Roxburgh. MALACCA; cultivated, Maingay. CEYLON (*Thwaites*).—DISTRIB. Java, Malay Islands, Timor.

A climbing shrub; bark pale; axils of the petioles glandular. Leaves 4–7 by 3–4 in., glabrous or puberulous beneath; petiole 1–1 $\frac{1}{2}$ in. Cymes much more lax-flowered and glabrous than in *V. Heynei*. Flowers with a disagreeable goat-like smell. Sepals ovate-lanceolate, acute.—Thwaites doubts this being distinct from *P. Heynei*, which makes me doubt his having the true plant in Ceylon. Miquel's *V. ovalis* is undoubtedly the same species, as an examination of Horsfield's specimens, on which it was founded, proves. I doubt the species being British Indian. I have seen no native specimens, and Roxburgh's habitat of Bengal is not confirmed.

** *Flowers fascicled. Shrubs not twining.*

3. *V. Maingayi*, Hook. f.; branches stout, bark black, leaves very coriaceous elliptic-lanceolate obtusely acuminate shining above, nerves 5–6 pairs, corolla $\frac{1}{2}$ in. diam., lobes obliquely ovate obtuse puberulous, mouth contracted puberulous.

MALACCA; Maingay (Kew Distrib. 1084).

A large tree (*Maingay*). Branches curving, bark closely ringed with cracks. Leaves 3–4 $\frac{1}{2}$ by 1–1 $\frac{1}{2}$ in., tapering at both ends, very dark brown above, pale brown beneath, nerves strong but not prominent, black when dry; petiole very short, black. Flowers 4–8 in a small peduncled fascicle; pedicels very unequal, $\frac{1}{4}$ – $\frac{1}{2}$ in., rather stout. Sepals broadly ovate, 2 outer eglandular, 3 inner with 5 glands in all (*Maingay*). Corolla-tube much longer than the sepals, $\frac{1}{2}$ in. long, swollen in the middle, mouth much contracted, hairy within; lobes not much twisted in bud, but strongly overlapping. Anthers half-exserted, with a large subcordate gland at the base behind, villous opposite to it in front. Disc of broad rounded glabrous glands. Ovary hairy towards the tip; style slender, top slightly dilated. Fruit unknown.

4. *V. lancifolia*, Hook. f.; branches slender, bark pale, leaves narrowly lanceolate acuminate, nerves very numerous close and slender, corolla $\frac{1}{4}$ in. diam., lobes obliquely foliate obtuse, mouth broad villous.

MALACCA; Maingay (Kew Distrib. 1102).

A much branched woody shrub, apparently erect and not twining; branches tubercled with lenticels, twigs smooth. Leaves 2–3 by $\frac{1}{4}$ – $\frac{1}{2}$ in., narrowed at both ends, much so to the very slender points, pale brown, rather membranous; petiole slender, $\frac{1}{4}$ – $\frac{1}{2}$ in. Flowers 3–5 on a very short axillary peduncle; pedicels very slender, $\frac{1}{4}$ in., with minute bracts at the base. Sepals triangular, very small, ciliate, minutely

glandular at the base (*Maingay*). *Corolla-tube* funnel-shaped, $\frac{1}{2}$ in. long, limb $\frac{1}{4}$ in. diam., lobes inflexed at the tip in bud. *Anthers* half-exserted, with a narrow lanceolate gland on the back.

DOUBTFUL SPECIES.

V. ASSAMICA, *Griff. Notul.* iv. 77; this agrees fairly well with the character of *V. Heynei*, but I find no specimens of this species in Griffith's herbarium from Assam. His habitat is woods at Bishenath.

V. ? ANCEPS, *Wall. Cat.* 1622; *A. DC. Prodr.* viii. 400 (*without description*); from Tavoy. This is not a *Vallis*, but is in too imperfect a state for determination. *Kurz* (*Journ. As. Soc.* 1877, ii. 254) says that it seems hardly referable to *Apocynæ*.

22. **POTTSIA**, *Hook. et Arn.*

An evergreen climber. *Leaves* opposite, nerves distant. *Flowers* in lax terminal and axillary paniced cymes. *Calyx* small, 5-partite, glandular within. *Corolla* salver-shaped, tube cylindric; throat constricted, naked; lobes overlapping to the right. *Stamens* at the top of the tube, filaments hairy; anthers exserted, sagittate, conniving over and adhering to the stigma, cells with basal empty spurs. *Disc* deeply 5-fid, lobes lanceolate, much longer than the ovary. *Carpels* 2, distinct, villous, many-ovuled, included in the disc; style slender, thickened in the middle and top, stigma conical. *Follicles* elongate, slender, beaded. *Seeds* linear, elongate, coma deciduous, albumen copious; cotyledons linear, flat, radicle superior.—*DISTRIB.* Species 2 or 3, Eastern Asiatic and Malayan.

P. cantonensis, *Hook. & Arn. Bot. Beech. Voy.* 199, t. 43; *Benth. Fl. Hongk.* 222; *Kurz For. Fl.* ii. 190. *P. Hookeriana*, *Wight Ic.* t. 1306 bis. *P. ovata*, *A. DC. Prodr.* viii. 442. *Parsonsia ovata*, *Wall. Cat.* 1630. *Teysmannia laxiflora* and *Hookeriana*, *Miquel Fl. Ind. Bat.* ii. 455, 456, and *Parapottsia*, *Addenda*, 1080. *Vallis laxiflora*, *Blume Bijl.* 1043. *Euthodon paniculata*, *Griff. Notul.* iv. 84; *Ic. Pl. Asiat.* t. 458, fig. 2.

SILHET; *De Silva*. ASSAM; *Jenkins*. CACHAR; *Keenan*, TENASSERIM; *Kurz*. MALACCA; *Maingay*.—*DISTRIB.* Java, S. China.

Branches slender, smooth, cylindric; twigs puberulous. *Leaves* 3-4 by $1\frac{1}{2}$ -2 in., elliptic-ovate or ovate, acuminate, base rounded or subcordate, nerves 4-6 pairs; petiole slender, $1-1\frac{1}{2}$ in. *Cymes* drooping, long-peduncled, very many-fld.; branches slender, ultimate with racemose flowers; pedicels slender, $\frac{1}{2}$ in.; bracts minute, ovate. *Sepals* broadly ovate, obtuse. *Corolla* $\frac{1}{4}$ - $\frac{1}{2}$ in., glabrous, rose-coloured, tube broad obtusely angled, lobes short ovate. *Follicles* 1 ft., flexuous, smooth, thinly coriaceous. *Seeds* 1 in., very slender, glabrous, coma as long.—Griffith in his generic character of *Euthodon* describes the throat of the corolla as without scales; in the specific he mentions 5 glands in the sinus of the lobes; these I do not find in his specimens.

23. **WRIGHTIA**, *Br.*

Shrubs or small trees, with often slender cord-like branches. *Leaves* opposite. *Flowers* red, white or yellow, in terminal or subaxillary sessile cymes. *Calyx* short, 5-partite, with glands or scales inside. *Corolla* salver-shaped, tube cylindric, usually short, throat with 1-2 series of usually fimbriate scales; lobes overlapping to the left. *Stamens* at the top of the tube, filaments short dilated; anthers exserted, sagittate, conniving around and adhering to the stigma, cells spurred at the base. *Disc* 0. *Carpels* 2, free or connate, many-ovuled; style filiform, stigma ovoid with usually a toothed basal ring. *Follicles* linear, erect, connate or distinct. *Seeds* linear, compressed, tip narrowed naked, base with a deciduous coma, albumen scanty or 0; cotyledons broad, convolute, radicle



short, superior.—DISTRIB. Species about 12, tropical African, Asiatic and Australian.

W. religiosa, Benth. in *Gen. Pl.* ii. 713 (Echites religiosa, *Teijsm. & Binnend. Hort. Bogor.* 126); cultivated at Malacca (*Herb. Maingay*), is a native of Siam. It is a small tree with elliptic leaves $\frac{1}{2}$ – $1\frac{1}{2}$ in. long, capillary peduncles and pedicels, and small flowers without coronal scales.

* *Calyx-segments half the length of the short corolla-tube or shorter.*

1. *W. tinctoria*, Br. in *Mem. Wern. Soc.* i. 73; glabrous, leaves elliptic-ovate or lanceolate or obovate-oblong obtusely acuminate or caudate, coronal scales fimbriate. *A. DC. Prodr.* viii. 406; *Wall. Cat.* 1625; *Wight Ic.* t. 444; *Dalz. & Gibs. Bomb. Fl.* 145; *Brand. For. Fl.* 324; *Grah. Cat. Bomb. Pl.* 114; *Kurz For. Fl.* ii. 193; *Bedd. Fl. Sylv.* t. 241; *Bot. Reg.* t. 933. *Nerium tinctorium*, *Roxb. Hort. Beng.* 19, and *Fl. Ind.* ii. 4.

CENTRAL INDIA and throughout the WESTERN PENINSULA. *BIIRMA* (*Kurz*).—DISTRIB. *Timor* (*Lerb. Mus. Paris*).

A small tree, twigs glabrous or puberulous. Leaves 3–5 by $1\frac{1}{2}$ in.; nerves 6–12 pairs, faint till the leaves are old, then strong beneath; base acute or rounded; petiole very short. Cymes sometimes 5 in. diam., with slender spreading dichotomous branches; bracts minute; flowers white, $\frac{1}{2}$ – $\frac{3}{4}$ in. diam. Sepals ovate, obtuse. Corolla-lobes linear-oblong, scales linear scattered. Stamens large. Follicles 6–18 in. or more, cylindric, slender, smooth, tips adhering. Seeds $\frac{3}{4}$ in., glabrous except for the coma, linear.—Foliage very variable. I have seen no Birmese specimen. The *Timor* plant is undoubtedly the same.

VAR. *Rothii*; branches and leaves beneath puberulous. *W. Rothii*, *G. Don Gen. Syst.* iv. 86; *A. DC. Prodr.* viii. 406; *Wight Ic.* t. 1319. *W. tinctoria*, *Roth Nov. Pl. Sp.* 121.—Deccan Peninsula.

2. *W. angustifolia*, *Thwaites Enum.* 193; glabrous, leaves lanceolate obtuse, coronal scales ligulate tips lacerate. *Beddome For. Fl. Anal. Gen.* 160.

CEYLON; Dambool and Trincomalee, *Gardner*.

A small tree; branches slender. Leaves $1\frac{1}{2}$ –4 by $\frac{1}{2}$ – $\frac{3}{4}$ in., almost black when dry, nerves 6–12 pairs; petiole very short. Cymes and flowers as in *W. tinctoria*, but the coronal scales very different, as long as the anthers, and laciniate at the tip only. Fruit unknown.

3. *W. tomentosa*, *Roem. & Schultes Syst.* iv. 414; densely tomentose, leaves elliptic caudate-acuminate, base acute, cymes many-flowered, corolla-lobes linear-oblong, coronal scales short obtuse entire or lobulate. *A. DC. Prodr.* viii. 404; *Wall. Cat.* 1628; *Wight Ic.* t. 443, and *Ill.* ii. t. 154; *Dalz. & Gibs. Bomb. Fl.* 145; *Brand. For. Fl.* 323; *Grah. Cat. Bomb. Pl.* 114; *Beddome For. Fl., Anal. Gen.* 159. *W. mollissima*, *Wall. Cat.* 1627; *Pl. Rar.* ii. t. 126; *Kurz For. Fl.* ii. 192. *W. Wallichii*, *A. DC. l. c.* 405; *Dalz. & Gibs. l. c.*; *Kurz l. c.*; *Wight Ic.* t. 1296; *Beddome l. c.* 160. *W. Coraia*, *Wall. Cat. under* 1615; *A. DC. Prodr.* viii. 407. *W. Hamiltoniana*, *Wall. Cat.* 4461. *Hunteria eugenifolia*, *Wall. Cat.* 1615. *Nerium tomentosum*, *Roxb. Fl. Ind.* ii. 6. *N. Coraia*, *Hb. Ham.* N.? *tinctorium*, *Hb. Ham.*—*Rheede Hort. Mal.* ix. t. 3, 4.

TROPICAL INDIA; from the Indus eastwards and southwards to Ceylon, Birma and Penang, ascending to 2000 ft. in the Himalaya, and to 4000 in the Nilgherries.

A small usually crooked deciduous-leaved tree, bark corky. Leaves 3–6 by $1\frac{1}{2}$ – $2\frac{1}{2}$ in., often tomentose on both surfaces, dark brown when dry, nerves 10–14 pairs; petiole $\frac{1}{2}$ in. Cymes peduncled, corymbose, many-fl'd.; flowers 1 in. diam., yellowish with orange coronal scales. Sepals half as long as the corolla-tube, rounded. Corolla-lobes linear- or obovate-oblong, coronal scales very variable. Anthers white. Follicles 6–12 by $\frac{1}{2}$ in., connate into a cylinder, with a deep groove on each side till maturity, rough with tubercles. Seeds slender, $\frac{1}{2}$ – $\frac{3}{4}$ in., coma pure white.—There is



some obscurity about the colour of the flower of this species, possibly indicating different species, or a change during life. In Thwaites' figure of the Ceylon plant they are in one pale yellowish-red, in another of the same cymes a deep blue purple. In a drawing of Royle's they are nearly pure white, in another they are all pale rosy; in Wight's Illustrations (of *W. mollissima*) they are a dingy pale reddish. Brandis, who remarks on this subject and on the various accounts of the scent of the flowers, suggests that they may change colour after expansion.

4. *W. coccinea*, Sims, *Bot. Mag.* t. 2696; glabrous or pubescent, leaves elliptic or elliptic-lanceolate obtusely caudate-acuminate base acute, cymes few-fl., corolla-lobes rounded, coronal scales large broad rounded undivided. *A. DC. Prodr.* viii. 407; *Wall. Cat.* 1626; *Grah. Cat. Bomb. Pl.* 114; *Kurz For. Fl.* 193; *Lodd. Bot. Cab.* t. 894; *Wight Ic.* t. 442. *Nerium coccineum*, Roxb. *Fl. Ind.* ii. 2.

SILHET; Roxburgh, *De Silva*. CHITTAGONG HILLS (*Kurz*).—DISTRIB. Philippine Islds.

A timber tree; bark of shoots white, shining. *Leaves* 3-5 by 2-2 $\frac{3}{4}$ in.; membranous, dark brown when dry, nerves 6-12 pairs; petiole very short. *Cymes* 3-4 fl.; peduncle and pedicels very short; bracts large; flowers 1 in. diam., dark red. *Sepals* rounded, $\frac{1}{2}$ in. diam., almost as long as the corolla-tube. *Corolla* thick, almost fleshy; scales crimson, obscurely crenate. *Anthers* very hairy at the back. *Follicles* "linear, as thick as the little finger, glabrous, corky-lenticellate" (*Kurz*).

5. *W. laevis*, Hook. f.; glabrous, leaves elliptic or oblong caudate-acuminate shining above; cymes few-fl., corolla-lobes oblong, coronal scales fimbriate from the base.

MALACCA; Mt. Ophir, Maingay (Kew Distrib. 1065).

Branches slender, bark pale. *Leaves* 3-5 by 1-2 in., thin in texture; nerves 4-5 pairs, arched; petiole very short. *Cymes* puberulous, peduncled, pedicels rather stout; flowers about $\frac{1}{2}$ in. diam. *Sepals* rounded, ciliate. *Corolla* rather fleshy. *Follicles* 7-8 in., very slender. *Seeds* very long, 1 $\frac{1}{2}$ in., slender, glabrous.

** *Calyx-segments much shorter than the corolla-tube*

6. *W. zeylanica*, Br. in Mem. Wern. Soc. i. 73; glabrous, leaves elliptic or elliptic-lanceolate ovate or obovate acuminate, cymes axillary and terminal, coronal scales laciniate. *A. DC. Prodr.* viii. 407; *Thwaites Enum.* 193; *Gaertn. Carp.* ii. 172, t. 117; *Wall. Cat.* 4460; *Bedd. For. Fl. Anal. Gen.* 160. *W. antidysenterica*, Br. l. c.; *A. DC. l. c.* *Nerium zeyanicum* and *antidysentericum*, Linn. *N. divaricatum*, Herb. Madr.—*Burm. Fl. Zeyl.* 23, t. 12, fig. 2.

CEYLON; "common in the south of the island," Thwaites.

A small tree, branches dichotomous. *Leaves* 3-5 by 1 $\frac{1}{2}$ -2 in.; nerves 6-10 pairs; petiole very short. *Cymes* few-fl., shortly peduncled, glabrous. *Sepals* ovate, obtuse. *Corolla-tube* very slender, $\frac{3}{4}$ -1 in., limb 1-1 $\frac{1}{2}$ in. diam., white, puberulous, lobes obovate; coronal scales as long as the stamens. *Follicles* 7 in., pericarp thin. *Seeds* $\frac{3}{4}$ in. long, linear oblong.

24. *NERIUM*, Linn.

Erect glabrous shrubs. *Leaves* 3-4-nately whorled, rarely opposite, narrow, coriaceous; nerves slender, very close. *Flowers* large, in racemose cymes. *Calyx* 5-partite, glandular within, segments narrow. *Corolla* funnel-shaped, tube cylindric, throat campanulate with 5 broad toothed scales; lobes overlapping to the right. *Stamens* at the top of the tube, included, filaments short; anthers sagittate, conniving around and adhering to the stigma, tips filiform, cells with long spurs furnished with twisted hairs, appendages rigid. *Disc* 0. *Carpels* 2, distinct, many-ovuled; style filiform or thickened above the middle, stigma with a basal reflected lobed membrane surmounted by 5 tubercles, tip



subglobose. *Follicles* elongate, cylindric, straight, hard, appressed. *Seeds* oblong, villous, coma terminal caducous, albumen fleshy; cotyledons flat, thickish, radicle superior.—**DISTRIB.** Species 2 or 3, Mediterranean region, N. Asian and Japanese.

N. odorum, *Soland. in Hort. Kew.* ed. i. v. i. 297; flowers scented, appendages of the corolla cleft into 4-7 linear segments, spurs of anthers linear twice as long as the cells. *Boiss. Fl. Orient.* iv. 48; *A. DC. Prodr.* viii. 420; *Roeb. Fl. Ind.* ii. 2; *Brandis For. Fl.* 328; *Grah. Cat. Bomb. Pl.* 114; *Targ. Tozz. Rap.* 28, 29, t. 3; *Wall. Cat.* 1624; *Bot. Mag.* 1799, 2032; *Bot. Reg.* t. 74 (*fl. double*). *N. odoratum*, *Lamk. Encycl.* iii. 456. *N. latifolium* and *N. indicum*, *Mill l. c. ed.* 8.—*Rheede Hort. Mal.* ix. t. 1, 2.

WESTERN HIMALAYA; from Nipal westwards, ascending to 6500 ft. in Murree.—CENTRAL INDIA. SCIND.—**DISTRIB.** Afghanistan, Japan.

A large erect stout shrub. *Leaves* 4-6 in., linear-lanceolate, thickly coriaceous, acuminate, midrib very stout; nerves numerous, slender, horizontal; petiole very short. *Flowers* $1\frac{1}{2}$ in. diam., sweet-scented, rose white or yellow. *Sepals* subulate-lanceolate. *Follicles* 6-9 in.—Very similar to, and perhaps only a variety of the common *N. Oleander* of the Mediterranean region, which extends eastwards to Persia.

25. STROPHANTHUS, DC.

Small trees or shrubs, often climbing. *Leaves* opposite. *Flowers* usually large, in terminal cymes. *Calyx* 5-partite, glandular within. *Corolla* funnel-shaped, tube short, throat large, campanulate, with 10 free or connate scales; lobes overlapping to the right, produced into long or short tails, rarely ovate acute. *Stamens* at the top of the tube, included, filaments short; anthers ovate acute, tips filiform, conniving around and adhering to the stigma, cells spurred at the base. *Disc* 0. *Carpels* 2, distinct, many-ovuled, glabrous; style filiform, rugose, with cellular papillæ, tip dilated, stigma columnar or conical, simple or 2-fid. *Follicles* oblong or elongate, hard, spreading (parallel in *S. Jackianus*). *Seeds* compressed, fusiform, narrowed into a feathery tail, or with a sessile coma, base with a deciduous tuft of hairs.—**DISTRIB.** Species about 18, tropical Asiatic and African, and 1 S. African.

* *Lobes of the corolla exceeding the throat in length.*

1. **S. dichotomus**, DC. in *Bull. Soc. Phil.* iii. 123; glabrous, leaves elliptic-oblong or obovate obtuse acute or apiculate, cymes few-fl'd., tails of corolla-lobes 5-7 in. *A. DC. Prodr.* viii. 417; *Miquel Fl. Ind. Bat.* ii. 441. *S. scandens*, *Roem. & Sch. Syst.* iv. 412. *L. longicaudatus* and *Griffithii*, *Wight Ic.* t. 1299, 1300; *Kurz For. Fl.* ii. 191. *S. pentaphyllus*, *Griff. Notul.* iv. 78. *S. caudatus*, *Kurz in Journ. As. Soc.* 1877, ii. 257. *S. Horsfieldianus*, *Miquel Fl. Ind. Bat.* ii. 442. *Echites caudata*, *Burm. Fl. Ind.* 68, t. 26. *Nerium caudatum*, *Lamk. Dict.* *N. scandens*, *Lour. Fl. Coch.* i. 143 (*ex A. DC.*).

TENASSERIM (*Kurz*). MALACCA; *Griffith*, *Maingay*. SINGAPORE and PENANG (drawings).—**DISTRIB.** Java.

An erect shrub. *Branches* stout; bark dark, dotted with lenticels. *Leaves* 3-5½ by 2-3 in., rather coriaceous, glossy above; nerves 6-8 pairs, spreading, arching and joining far within the margin; petiole $\frac{1}{4}$ in. *Cymes* much shorter than the leaves, dichotomous. *Sepals* subulate from an ovate base. *Corolla-tube* and *throat* $\frac{3}{4}$ -1 in. long, whitish, tails purple; scales cleft to the base. *Anther-tips* very long and slender. *Follicles* not seen (as taken from a drawing, very large, divergent, 8 by 2 in., broadest at the very base where united, tapering to a broad rounded point, terete smooth green).

2. **S. Wallichii**, *A. DC. Prodr.* viii. 418; glabrous, leaves elliptic-oblong or obovate acuminate cuspidate or obtuse, cymes many-fl'd., tails of corolla-

lobes 2-3 in. *S. dichotomus*, Wall. Cat. 1641; *Wight Ic.* t. 599; *Lodd. Bot. Cab.* t. 759; *Grah. in Maund. Bot.* iii. t. 150. *S. dichotomus*, γ *coromandelianus*, *Ker in Bot. Reg.* t. 469 in obs. ? *S. caudatus*, *Kurz For. Fl.* ii. 193. *Nerium caudatum*, *Roxb. Fl. Ind.* ii. 9; *Burm. Fl. Ind.* t. 26.

KHASIA MFS., *De Silva*. CHITTAGONG; at Seetakoond, J. D. H. & T. T. (*cult.?*). CIRCARS; on the mountainous parts of the coast, *Roxburgh*. ? TENASSERIM; *Kurz*.

A climber, bark lenticellate. Leaves waved, shining, 2-3 by $1\frac{1}{2}$ -2 in., rather thin, nerves 5-6 pairs; petiole $\frac{1}{2}$ in. Cymes sometimes 6 in. diam., spreading, loosely dichotomously branched from the base; branches slender; bracts $\frac{1}{2}$ - $\frac{3}{4}$ in., narrowly lanceolate, spreading and recurved. Sepals subulate-lanceolate. Corolla-tube $\frac{1}{2}$ in., swollen at the base, pink in *Roxburgh's* drawing and *Kurz's* description, yellow with faint reddish stripes in the figures of *Maund* and *Loddiges*. Anther-tips very long and slender.

** Lobes of the corolla not or hardly exceeding the throat.

3. *S. Wightianus*, Wall. Cat. 4459; quite glabrous, leaves elliptic obtuse, cymes many-fl., tails of corolla-lobes $\frac{1}{2}$ - $\frac{1}{2}$ in. *Wight Ic.* t. 1301. *Cameraria zeylanica*, ?? *Hb. Wight* (ex Wall. l.c.).

MALABAR and TRAVANCORE; *Rottler*; near Quilon, *Wight*.

A climbing shrub, bark closely warted with lenticels. Leaves 2-3 by $1\frac{1}{2}$ in., thinly coriaceous, nerves 6-7 pairs; petiole very short. Cymes repeatedly dichotomously branched from the base, 2-3 in. high and broad, corymbiform; bracts and sepals ovate, acute. Corolla-tube $\frac{1}{2}$ - $\frac{1}{2}$ in. long; inflated at the base; lobes rather longer, gradually narrowing into the linear obtuse tail; scales very prominent. Anther-tips very long and slender. Follicles (from *Wight's* drawing) 6 by 1 in., of the shape of those of *S. dichotoma*, warted all over. Seeds with a long beak ending in a filiform longitudinally plumose bristle.

4. *S. brevicaudatus*, *Wight Ic.* t. 1302; quite glabrous, leaves elliptic or oblong finely acuminate margins crisped, corolla-lobes broadly ovate acute. *Kurz For. Fl.* ii. 191. *Cercocoma singaporiensis*, Wall. Cat. 1623. A. DC. Prodr. viii. 432.

MALACCA; *Griffith*, *Maingay*. SINGAPORE; *Lobb*. MERGUI (? *Kurz*).—DISTRIB. Borneo.

A straggling shrub, branches minutely warted. Leaves 2-4 by $1\frac{1}{2}$ in., dark brown when dry, opaque on both surfaces, nerves 6-8 pairs; petiole $\frac{1}{2}$ - $\frac{1}{2}$ in. Cymes dichotomously branched from the base; branches stout, short; bracts (often numerous and empty) and sepals broadly ovate acute. Corolla almost salver-shaped; tube $\frac{1}{2}$ in. long, limb about as broad. Filaments hairy; anthers with very slender points about equalling the cells. Style hairy. Follicles 8 by $\frac{2}{3}$ in., base broad, middle slightly turgid, then tapering to a long hard point, terete, smooth. Seeds not ripe, shortly pilose at the lower end (*Maingay*).—*Kurz* states this species is reputed to grow at *Merqui*.

5. *S. Jackianus*, Wall. Cat. 1643; leaves linear-oblong obtusely acuminate scaberulously pubescent beneath, cymes axillary very few-fl., corolla-lobes $\frac{1}{2}$ in. linear obtuse about equalling the broad subcylindric throat, seeds very slender. A. DC. Prodr. viii. 419.

PENANG; *Jack*.

Branches slender, with dark-brown bark, twigs scaberulous. Leaves 3-4 by $1\frac{1}{2}$ in., minutely scaberulous above, nerves numerous; petiole very short. Cymes very shortly peduncled, 2-3-fl.; pedicels short; flowers nodding. Sepals ovate-lanceolate, acuminate. Corolla puberulous, tube hardly any, throat more cylindric than campanulate. Follicles a foot long, very slender, parallel, cylindric, 2-partite when ripe, the segments opening flat, pericarp thinly coriaceous, polished within. Seeds $\frac{1}{2}$ in. long, narrowly fusiform, glabrous, coma white, three times as long.—I have seen



only Wallich's very mutilated flowers, shrivelled leaves, dehiscent pods and seeds, which latter entirely resemble those of a *Wrightia*.

26. *APOCYNUM*, Linn.

Erect herbs or undershrubs. *Leaves* opposite. *Cymes* terminal and lateral; flowers small. *Calyx* 5-fid, eglandular within; lobes acute. *Corolla* campanulate, 5-fid, with 5 processes between the stamens; lobes overlapping to the right. *Stamens* near the base of the corolla, included; anthers sagittate, acute, conniving and adnate to the stigma, cells with basal spurs. *Disc* fleshy, 5-lobed. *Carpels* 2, distinct, many-ovuled, half sunk in the disc, to which they are adnate by the back; style short or 0, stigma subglobose, tip 2-lobed. *Follicles* slender. *Seeds* small, oblong, with a terminal caducous coma, albumen scanty, cotyledons flat.—DISTRIB. Species 5, of the north temp. zone.

A. venetum, Linn.; *A. DC. Prodr.* viii. 400; *Boiss. Fl. Orient.* iv. 48.

WESTERN TIBET; Shayuk valley, alt. 8000 ft. (without flower or fruit), Thomson. —DISTRIB. N. Asia, from the Caucasus to China, Persia, Asia Minor, Greece, Dalmatia.

Stem and branches slender, smooth, cylindric. *Leaves* 2-3 by $\frac{1}{2}$ – $\frac{3}{4}$ in., linear-oblong or oblong-lanceolate, apiculate, entire or crenulate; nerves very slender; petiole very short. *Cymes* small, erect, subcorymbose; bracts subulate. *Flowers* erect, $\frac{1}{8}$ in. diam., purplish, puberulous. *Carpels* with pubescent tips. *Follicles* 4 in. —Though I have seen neither flower nor fruit, I cannot doubt this being the common *A. venetum*.

27. *URCEOLA*, Roxb.

Climbing shrubs. *Leaves* opposite, nerves distant. *Flowers* small, in dense corymbosely paniced cymes. *Calyx* 5-partite, eglandular within. *Corolla* urceolate or subglobose, throat naked; lobes short, valvate. *Stamens* at the base of the corolla; anthers sagittate, conniving over and adhering to the stigma, cells spurred at the base. *Disc* cupular or annular, truncate or 5-lobed. *Carpels* 2, distinct, longer than the disc, truncate, hirsute, many-ovuled; style short, top obconic; stigma subannulate, conoid. *Follicles* spreading, thick and acuminate, or elongate and contracted or not between the seeds. *Seeds* oblong or linear, compressed, villous, tip contracted bearded with long persistent brown hairs, and crowned with a long white deciduous coma, albumen scanty; cotyledons thin, radicle short.—DISTRIB. Species 7 or 8, Malayan.

SECT. I. **Urceola proper.** *Follicles* straight, even, horizontally divergent. *Calyx* longer than the corolla, 2 interior segments much smaller than the others.

1. **U. elastica**, Roxb. in *As. Res.* v. 167, with figure (excl. fruit); branches robust, leaves beneath and inflorescence finely rusty pubescent, leaves elliptic abruptly acuminate thickly coriaceous, nerves 10-12 pairs very strong, cymes very dense-fld., bracts subulate, calyx-segments lanceolate recurved, follicles cylindric. *A. DC. Prodr.* 358; *Wight Ic.* t. 473 (excl. figures and descriptions of fruit). *Tabernæmontana elastica*, Spreng. *Syst. Veg.* i. 639. ? *Vahea gummi-fera*, Poir. *Dict. Suppl.* v. 409.

MALACCA and PENANG; Roxburgh, Wallich, Griffith, Maingay (*Kew Distrib.* 1058, 1091).—DISTRIB. Sumatra.

A stout climber. *Leaves* 4-6 by 2-3 in., red-brown when dry, softly pubescent beneath, glabrous above with impressed nearly horizontal nerves; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Cymes* numerous, paniced at the ends of the branches, long-peduncled; flowers in compound corymbs, very densely packed. *Calyx* $\frac{1}{2}$ in. long, exceeding the ovoid pubescent corolla, which is glabrous within except a tuft of reflexed hairs between

the stamens. *Anthers* acuminate. *Style* oboconoid, with a small conoid stigma. *Follicles* 6 by $\frac{1}{2}$ in., quite straight, horizontal, cylindric, acuminate. *Seeds* linear, $\frac{3}{4}$ in., softly villous, coma copious, four times longer.—The fruit figured and described by Roxburgh, A. DC., and Wight as that of *U. elastica* is *Orchipeda fatida*, Blume, a plant cultivated in India. Wallich's *U. elastica* (Cat. 1617), from Penang, is an Asclepiadeous plant without flower or fruit.

2. *U. Maingayi*, Hook. f.; quite glabrous except the inflorescence, leaves elliptic abruptly acuminate thickly coriaceous, pale beneath, nerves 6–10 pairs strong, cymes finely pubescent, calyx-segments oblong obtuse recurved, follicles cylindric.

SINGAPORE, *Maingay* (Kew Distrib. 1083).

Habit and brown colour of *U. elastica*, but the leaves are quite glabrous and apparently glaucous beneath, with fewer more arched nerves not impressed above. The cymes are smaller, fewer and laxer-flowered; the calyx-segments much broader and very obtuse; the anthers and style are the same in both, but the follicles are much more slender in *A. Maingayi*.

3. *U. lucida*, Benth. in Gen. Pl. ii. 716; quite glabrous except the inflorescence, leaves elliptic abruptly acuminate shining on both surfaces, nerves 8–12 pairs, cymes lax-flid. finely pubescent, bracts subulate, calyx-segments broadly oblong, follicles short gradually acuminate from a broad base. *Chavannesia lucida*, A. DC. Prodr. viii. 444. *Echites? lucida*, Wall. Cat. 1670.

PENANG; Wallich. ?MALACCA; Griffith. RANGOON; McLelland.

Branches slender; bark nearly black, smooth. *Leaves* 3–5 in., rigidly coriaceous, red-brown when dry; nerves arched, strong beneath; petiole slender, $\frac{1}{2}$ –1 in. *Cymes* long-peduncled; peduncle and branches very slender; bracts subulate; flowers very minute, $\frac{1}{10}$ in. long. *Corolla* as in the preceding species. *Anthers* truncate. *Ovary* hairy at the tip only; style elongate with an oboconoid top surmounted by subulate stigma. *Follicles* 4 in. long, $\frac{1}{2}$ in. diam. above the narrowed base, rigid, like poignards. *Seeds* $\frac{1}{3}$ – $\frac{1}{2}$ in., linear-oblong, silky, coma 4–5 times longer.—Griffith's plant is in very young flower and may be another species; it has larger leaves with fewer and very slender nerves. The Rangoon specimens have caudate-acuminate leaves, larger bracts and hispidulous flowers. Kurz (in Journ. As. Soc. 1877, ii. 255) refers this to *U. esculenta*.

4. *U. malaccensis*, Hook. f.; quite glabrous except the inflorescence, leaves elliptic or ovate-oblong obtusely caudate-acuminate coriaceous, nerves 4–6 pairs slender, cymes shortly peduncled dense-flid., bracts puberulous oblong obtuse, calyx-segments linear-oblong obtuse recurved, "follicles elongate filiform."

MALACCA; *Maingay* (Kew Distrib. 1098, ? 1082).

Branches smooth; bark dark brown. *Leaves* 2–4 by 1–1 $\frac{1}{2}$ in., smooth on both surfaces; nerves arched, nervules obscure; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Cymes* chiefly axillary; peduncle glabrous, shorter or longer than the leaves; bracts $\frac{1}{4}$ – $\frac{1}{2}$ in., recurved, much larger than in the foregoing species; flowers hoary rather than pubescent. *Corolla* as in the preceding species. *Anthers* obtuse. *Ovaries* hirsute; style obconic, surmounted with an obpyriform stigma. *Follicles* described by Maingay as "elongate filiform divaricate. *Seeds* oval, compressed, pilose at the apex."

5. *U. esculenta*, Benth. in Gen. Plant. ii. 715; leaves elliptic caudate-acuminate coriaceous, quite glabrous, nerves 9–11 pairs strong, follicles lanceolate from a contracted peduncle-like base. Kurz For. Fl. ii. 184. *Chavannesia esculenta*, A. DC. Prodr. viii. 444; Strettell, note on Caoutchouc (Rangoon, 1874, with figure). *Echites? esculenta*, Wall. Cat. 1671. *E. lucida*, ? Don Gen. Syst. iv. 75.

MARTABAN and TAYOY; Wallich. Common all over PEGU (Kurz).



Branches and leaves quite glabrous. *Leaves* 4-6 by 2-2½ in., acute at both ends or obtuse at the base, shining above; nerves red, slightly arched. *Flowers* "minute, white; corymbs apparently short; long-peduncled, glabrous in the axils of the upper leaves, or terminal" (Kurz). *Follicles* 5 by ½ in., quite straight, pointed, narrowed into a stout stalk ½ in. long, thickly coriaceous when dry and hard. *Seeds* elliptic-lanceolate, villous, ½ in. long; coma white, four times as long.—The leaves a good deal resemble those of *U. brachysepala*, but are longer, and the nerves are more numerous. *Fruit* eatable.

SECT. II. **Dittormos.** *Follicles* flexuous, distantly torulose. *Calyx* shorter than the corolla; segments erect, subequal.

6. **U. torulosa**, Hook. f.; glabrous except the inflorescence, leaves oblong or oblong-lanceolate acuminate, nerves 6-10 pairs slender, cymes pubescent, follicles very slender swollen over the remote seeds.

MALACCA; *Maingay* (Kew Distrib. 1080, 1086).

Branches slender, smooth (in flower). *Leaves* 4-7 by 1½-2 in., red-brown when dry, thinly coriaceous. *Cymes* long-peduncled; bracts lanceolate; flowers not quite mature, ⅓ in. long. *Calyx-segments* oblong-lanceolate. *Corolla* as in the preceding section. *Anthers* subacute. *Ovary* hairy; style obconic, with a conoid stigma of the same length. *Follicles* 2-2½ ft. long, thinly coriaceous, smooth, terete, swellings ¾ in. long, often 1 in. apart, long ellipsoid. *Seeds* elliptic-lanceolate, villous, top bearded with persistent hairs; coma twice as long.—The follicles resemble those of *Parameria glandulifera*.

7. **U. brachysepala**, Hook. f.; glabrous except the puberulous flowers, leaves elliptic obtusely acuminate, nerves 6-8 pairs strong, cymes long-peduncled, peduncles and branches compressed, bracts subulate, sepals much shorter than the subglobose shortly 5-lobed corolla.

MALACCA; *Maingay* (Kew Distrib. 1079, 1080).

Branches rather stout; bark red-brown. *Leaves* 4-5 by 1½-2½ in., firmly coriaceous, red-brown when dry, nervules distinct on both surfaces. *Peduncles* 6-8 in., glabrous, red when dry, branches jointed at the nodes; branches and pedicels slender, glabrous; flowers very small, ⅙-⅓ in. long. *Calyx-segments* erect, ovate. *Corolla* pubescent, inflated; lobes obtuse, glabrous within, except a tuft of hairs between the stamens. *Anthers* subacute. *Ovary* twice as long as the disc, cylindric, hirsute; style cupular, stigma large obpyriform. *Follicles* not seen.

DOUBTFUL SPECIES.

URCEOLA?; branches and leaves glabrous; bark black when dry; leaves 2-2½ by ¾-1½ in., elliptic- or ovate-lanceolate obtusely acuminate, narrowed into the petiole, firmly coriaceous, pale brown shining above, nerves 3-4 pairs very slender ascending, follicles horizontal 6-8 by ¼ in. slightly curved cylindric from the base, narrowed at the apex, hard; seeds ½ in., very slender narrowed into a filiform process longer than the body, on which the fine pale brown hairs of the coma are placed. Probably an undescribed genus.—MALACCA; *Maingay* (Kew Distrib. 1069).

28. **PARAMERIA**, Benth.

Evergreen glabrous climbing shrubs. *Leaves* opposite, rarely 3-nately whorled. *Flowers* small, in broad lax terminal panicles. *Calyx* small, 5-fid or -partite, glandular within. *Corolla* sub-campanulate, throat broad naked, lobes obliquely obovate or obcuneate, wrinkled, overlapping to the left. *Stamens* at the base of the corolla, filaments short; anthers sagittate, acute or apiculate, conniving over and adhering to the stigma, cells spurred at the base. *Disc* of 5 connate scales. *Carpels* 2, distinct, longer than the disc, many-ovuled; style short, top obconoid, stigma conoid. *Follicles* long, slender, distantly torulose.

Seeds linear or oblong, compressed, hairy, crowned with a deciduous pencil and persistent ring of hairs, albumen scanty; cotyledons thin, radicle superior, short.—**DISTRIB.** Species 2-3, Indian and Malayan.

1. **P. glandulifera**, *Benth. in Gen. Plant.* ii. 715; glabrous except the cymes, leaves coriaceous elliptic oblong or obovate obtuse acute or acuminate shining above, nerves 5-6 pairs arching very oblique, cymes in terminal and axillary brachiate panicles. *Kurz For. Fl.* ii. 189. *Ecdysanthera glandulifera*, *A. DC. Prodr.* viii. 443; *Wight Ic. t.* 1307 (*E. Griffithii*, in text). *E. barbata*, *Mag. Fl. Ind. Bat.* ii. 451. *Echites glandulifera* and *monilifera*, *Wall. Cat.* 1660, 1659; *G. Don Gen. Syst.* iv. 75. *Parsonsia barbata*, *Bl. Bijdr.* 1042.

MARTABAN; *Wallich, Parish*; on the borders of tidal forests, *Kurz. MALACCA*; *Griffith, Maingay* (Kew Distrib. 1077, 1093). **SINGAPORE**; *Lobb. ANDAMAN ISLANDS*; *Kurz.*—**DISTRIB.** Java, Borneo, Philippine Islds., Cambodia.

Branches stout or slender. *Leaves* 3-5 by $1\frac{1}{2}$ -2 in., sometimes 3-nately whorled, smooth, nerves very slender; petiole very short, $\frac{1}{4}$ - $\frac{1}{2}$ in. Terminal panicle of *cymes* often 5-6 in. broad, pyramidal, axillary ones short; branches spreading, 3-chotomous, puberulous, pedicels short, or sometimes long and slender when the flowers are collected into globose umbellules; bracts minute; flowers $\frac{1}{4}$ in. diam. *Calyx-segments* small, ovate, one-quarter the length of the broad obtusely angled corolla-tube. *Corolla-lobes* about equalling the tube. *Anthers* acute and apiculate. *Ovary* somewhat hairy; style obconic. *Follicles* 6-12 in., very slender, flexuous, glabrous, pericarp thinly coriaceous; swellings over the seeds sometimes 1 in. apart, elliptic-lanceolate. *Seeds* $\frac{1}{2}$ in. long, oblong-lanceolate, contracted at the tip, pubescent, coma three times as long, white. The follicles resemble those of *Urceola*.—*Wight* is mistaken in describing and figuring the overlapping of the corolla-lobes as to the right. *Blume* describes the axils of the nerves of the leaf and corolla-throat as bearded in *Parsonsia barbata*, characters which I do not observe in the Indian specimens.

2. **P. polyneura**, *Hook. f.*; glabrous except the cymes, leaves membranous elliptic-oblong or elliptic obtusely acuminate, nerves 8-10 pairs arching very oblique, cymes in terminal brachiate panicles.

TENASSERIM; *Lobb. MALACCA*; *Griffith, Maingay* (Kew Distrib. 1078).

Habit of *P. glandulifera*, but leaves very membranous with numerous nerves, cymes always terminal and anthers not apiculate. *Follicles* not seen.

29. **BEAUMONTIA**, *Wall.*

Evergreen climbing trees or shrubs. *Leaves* opposite, membranous; nerves distant, arched. *Flowers* very large, white, in terminal cymes; bracts leafy. *Calyx* 5-partite, glandular or not within. *Corolla-tube* very short, throat large, bell- or funnel-shaped, naked; lobes broad, overlapping to the right. *Stamens* at the top of the tube, included in the throat; filaments thickened at the top; anthers horny, sagittate, conniving over and adhering to the stigma; cells spurred at the base. *Disc* deeply 5-lobed. *Ovary* 2-celled, cells many-ovuled; style filiform, top clavate, stigma fusiform. *Fruit* long, thick, woody, at length dividing into 2 horizontally spreading follicles. *Seeds* compressed, ovoid or oblong, top contracted, crowned with a pencil of hairs; cotyledons thin or thick, radicle short superior.—**DISTRIB.** Species 4, Indian and Malayan.

1. **B. grandiflora**, *Wall. Tent. Fl. Nep.* 15, t. 7; *Cat.* 1629; leaves glabrous or tomentose beneath, calyx-lobes 1-2 in. long, corolla between tubular and bell-shaped much shorter than the tube. *A. DC. Prodr.* viii. 404; *Kurz For. Fl.* ii. 179; *Bot. Reg.* t. 911; *Bot. Mag.* t. 3213. ? *B. longiflora*, *Lodd. Bot. Cab.* 183. *Echites grandiflora*, *Roxb. Hort. Beng.* 20, and *Fl. Ind.* ii. 14 (excl. fruit).



EASTERN HIMALAYA; from Nipal (*Wallich*) to Sikkim, ascending to 4000 ft. SILHET and CHITTAGONG.

Stem woody, very stout and climbing high. *Shoots* rusty-pubescent. *Leaves* 7-12 by 3-7 in., glabrous above, rarely tomentose beneath; obovate-oblong, abruptly acuminate; nerves 7-16 pairs, arching; petiole $\frac{1}{2}$ -1 in. *Cymes* few- or many-fl., pedicels and calyx tomentose. *Calyx-lobes* very variable, from oblong-lanceolate to obovate or oblanceolate, acuminate. *Corolla* 3-5 in. long, glabrous or pubescent; lobes 1 in. rounded, except the tip. *Anthers* $\frac{3}{4}$ in. long. *Ripe carpels* very variable in length and breadth, turgid, densely fleshy, green, with a thick hard spongy yellowish polished endocarp. *Seeds* $\frac{3}{4}$ in. long, coma twice as long.

2. **B. Jerdoniana**, *Wight* *Ic. t.* 1314, 5; leaves nearly glabrous beneath, calyx-lobes $\frac{3}{4}$ -1 in. long, corolla between broadly campanulate and funnel-shaped, lobes acuminate, follicles 10 by $1\frac{1}{2}$ in. cylindric.

DECCAN PENINSULA; on the Western Ghats from the Concan southwards, *Wight*, &c.

This so closely resembles *B. grandiflora* in all respects but the corolla, the rather smaller size of all its parts, and the form of the follicles, that I suspect it will have to be ranked as a variety.

3. **B. khasiana**, *Hook. f.*; leaves obovate or elliptic acuminate tomentose beneath, calyx-lobes $\frac{1}{2}$ in., corolla broadly campanulate, lobes equalling the tube and throat rounded not acuminate.

KHASIA MTS.; Nungklow, *Lobb*.

The general habit of this is that of *B. grandiflora*, but the old leaves are broader, 8-10 by 4-4 $\frac{1}{2}$ in., more elliptic, the peduncle and pedicels are much longer, and the flowers very short; the corolla-tube and throat are together not 2 in. long, whilst the limb is 4 in. in diameter, with quite rounded lobes. It is very near the Javanese *B. multiflora*, *Teijsm & Binn.*, which is intermediate between this and *B. Jerdoniana* all may be varieties of one, but without the fruit this cannot be determined.

30. CHONEMORPHA, *G. Don*.

Climbing stout shrubs. *Leaves* opposite, broad; nerves distant, arching. *Flowers* large, white, in lax terminal and pseudo-axillary cymes. *Calyx* 5-cleft or -partite, with a ring of glands within. *Corolla* salver-shaped, tube very short; throat long, tubular, naked; lobes broad, obliquely obtusely, overlapping to the right, twisted sharply to the left. *Stamens* at the top of the tube, filaments short, broad, villous; anthers sagittate, elongate, pungent, conniving over and adhering to the stigma, cells shortly spurred below. *Disc* thick, annular or cupular. *Carpels* 2, distinct, many-ovuled; style filiform, base cleft, top globose or hemispheric, stigma conoid or subclavate. *Follicles* long, straight, hard, parallel, 3-gonous. *Seeds* ovoid or oblong, flat, shortly beaked, coma long, albumen thin; cotyledons oblong flat, radicle short.—DISTRIB. Species 2, Indian and Malayan.

1. **C. macrophylla**, *G. Don* *Gen. Syst.* iv. 76; calyx 5-lobed. *A. DC. Prodr.* viii. 430. *Wight* *Ic. t.* 432; *Brandis* *For. Fl.* 328; *Kurz* *For. Fl.* ii. 187. ? *C. grandiflora*, *G. Don* *l. c.* *C. mollis*, *Miquel* *Fl. Ind. Bat.* ii. 444, *ex Kurz in Journ. As. Soc.* 1877, ii. 257. *Echites macrophylla*, *Roxb.* *Fl. Ind.* ii. 13; *Wall. Cat.* 1657. *E. grandis*, *Wall. Cat.* 1658; *Grah. Cat. Bomb. Pl.* 113; *Dalz. & Gibs. Bomb. Fl.* 147. ? *E. macrantha*, *Spreng. Syst.* i. 632; *A. DC. l. c.* 477. *Epichysianthus macrophyllus*, *Voigt Hort. Suburb. Calc.* 523.—*Rheede Hort. Mal.* ix. t. 5, 6.

Moist forests throughout INDIA; from Kumaon in the HIMALAYA, ascending to 4500 ft., to Travancore, Ceylon, Malacca and the Andaman Islds.—DISTRIB. Java, Sumatra.

Branches glabrous, puberulous, or pubescent, soft, stout. *Leaves* 6–18 by 5–18 in., ovate elliptic obovate or orbicular, acute or cuspidate, base acute rounded or cordate, glabrous pubescent or tomentose beneath; nerves 10–12 pairs; petiole $\frac{1}{2}$ –2 in., stout or slender. *Cymes* on long or short stout pedicels; bracts ovate, acute. *Calyx* $\frac{1}{2}$ – $\frac{3}{4}$ in., coriaceous, terete, base truncate; lobes rounded or subacute. *Corolla* white, 2–3 in. diam., lobes $\frac{1}{2}$ – $\frac{3}{4}$ in. diam.; mouth glabrous, throat with 5 villous bands within. *Stamens* $\frac{1}{2}$ in. *Follicles* 12–18 by $\frac{3}{4}$ –1 in. *Seeds* $\frac{3}{4}$ in.

2. **C. Griffithii**, Hook. f.; calyx 5-partite.

SIKKIM HIMALAYA and KHASIA MTS., alt. 2–4000 ft., Griffith, &c.

Branches often hispid. *Leaves* smaller than in *C. macrophylla*. *Flowers* quite as large, but differing so much in the calyx as to suggest its belonging to a different genus. *Fruit* unknown.

DOUBTFUL SPECIES.

C. MALABARICA, G. Don Gen. Syst. iv. 76 (excl. syn. E. Pala). Echites malabarica, Lamk. Dict. ii. 342; A. DC. Prodr. viii. 477.—Pal. Valer, Rheede Hort. Mal. ix. t. 12.

C. VESTITA, G. Don Gen. Syst. iv. 76. Echites vestita, Roem & Sch. iv. 394; A. DC. Prodr. viii. 477. E. tomentosa, Roth Nov. Sp. 137, non Vahl.—This is possibly *Wrightia tomentosa*.

31. **ECDYSANTHERA**, Hook. et Arn.

Climbing glabrous shrubs. *Leaves* opposite, acuminate, nerves distant. *Flowers* minute, in terminal trichotomous paniced cymes. *Calyx* small, 5-partite, glandular or not within. *Corolla* suburceolate, throat naked, lobes very short, obtuse, overlapping to the right. *Stamens* at the base of the corolla; anthers sagittate, conniving over and adhering to the stigma, cells spurred at the base. *Disc* annular. *Carpels* 2, distinct, longer than the disc, many-ovuled, hairy; style short, top large cupular, stigma obpyriform. *Follicles* spreading, terete, acuminate. *Seeds* few, oblong or linear, compressed, tip narrowed with a long coma and a short persistent ring of hairs, albumen scanty; cotyledons thin, radicle short superior.—DISTRIB. Species 4 or 5, Malayan and Chinese.

E. micrantha, A. DC. Prodr. viii. 442; leaves glabrous ovate-lanceolate obtusely acuminate, nerves 3–5 pairs, cymes long-peduncled glabrous or puberulous. *E. brachiata*, A. DC. Prodr. viii. 443; Kurz For. Fl. ii. 189. Echites ? micrantha and brachiata, Wall. Cat. 1667, 1668.

SIKKIM HIMALAYA (alt. 3–5000 ft.), ASSAM, SILHET, KHASIA MTS. (alt. 2–4000 ft.), CACHAR, AVA HILLS, Kurz.

A very tall climber; branches slender, pendulous, pustular, ultimate sometimes puberulous. *Leaves* 2–7 by 1–2 in., thinly coriaceous; nerves very oblique, slender; petiole $\frac{1}{4}$ – $\frac{1}{2}$ in. *Cymes* brachiate; bracts minute; flowers $\frac{1}{36}$ to $\frac{1}{12}$ in. long; pedicels slender or short. *Calyx* not half the length of the corolla, segments ovate. *Corolla* glabrous within and without, lobes falcate, spreading. *Anthers* obtuse. *Follicles* 3–4 in., $\frac{3}{4}$ in. broad near the base, horizontal, slightly incurved, narrowed from above the base to the point, thickly coriaceous with a shining crustaceous endocarp. *Seeds* $\frac{3}{4}$ in. long, elliptic-lanceolate, compressed, pubescent, bearded at the constricted tip, coma three times as long.

32. **BAISSEA**, A. DC.

Climbing shrubs. *Leaves* opposite; nerves distant, straight. *Flowers* small, in dense or lax axillary or terminal paniced or corymbose cymes. *Calyx* small, 5-partite, glandular or not within; segments obtuse. *Corolla* salver-shaped, lobes overlapping to the right, not twisted (in the Indian species). *Stamens* below the middle of the corolla; anthers sagittate, conniving over the stigma and adhering to it, cells shortly spurred at the base. *Disc* cup-shaped. *Carpels* 2, distinct, sunk in the disc, many-ovuled; style short, top cup-shaped, stigma



columnar. *Follicles* long. *Seeds* long, linear, truncate or narrowed (not beaked) at both ends, glabrous, tipped with a deciduous coma, albumen not thick; cotyledons linear, flat, radicle short.—**DISTRIB.** Species 7, a Cingalese, a Malayan, and 5 African.

1. **B. acuminata**, Benth. in *Gen. Pl.* ii. 719; leaves oblong obtusely caudate-acuminate pale beneath glabrous, cymes terminal and axillary corymbose puberulous shorter or longer than the leaves. *Oleghornia acuminata* and *cymosa*, *Wight Ic.* t. 1310, 1312; *Walp. Ann.* iii. 43; *Thwaites Enum.* 194.

CEYLON; common in the central province, alt. 3000 ft.

A slender climber. *Leaves* 3-4 by 1-1½ in., rather thin; nerves quite horizontal, very slender; petiole ½-¾ in. *Cymes* trichotomous, peduncle slender; pedicels short. *Flowers* ½ in. long. *Calyx* about half as long as the calyx-tube, glands between the sepals connate in pairs. *Corolla* glabrous or puberulous; lobes oblong or linear obtuse; tube and throat hairy within. *Follicles* 6-10 by ½ in., cylindric, smooth. *Seeds* 1½ in., slender, narrowed at both ends.—The corolla-lobes are much too short and rounded in Wight's figure.

2. **B. malaccensis**, Hook. f.; leaves oblong or elliptic obtusely caudate-acuminate pale beneath glabrous, cymes terminal and axillary paniculate glabrous longer than the leaves.

MALACCA; *Maingay* (Kew Distrib. 1094).

Very closely allied to *B. acuminata*, but more slender, leaves smaller, 2 by ¾-1½ in., more membranous, whiter beneath, cymes more paniced than corymbose; the flowers are almost identical, except that the glands are solitary between the sepals according to *Maingay's* mss. *Fruit* not seen.

33. AGANOSMA, G. Don.

Stout evergreen climbers. *Leaves* opposite. *Flowers* in terminal tomentose cymes, large or middle-sized. *Sepals* narrowly lanceolate, acuminate, with subulate glands at the base, rarely oblong ovate. *Corolla* salver-shaped, tube very short; throat long, cylindric, with bearded longitudinal bands behind the anthers; lobes lanceolate linear-oblong or broad and rounded, overlapping to the right and nearly straight in bud. *Stamens* at the base of the throat, included; anthers sagittate, rigid, conniving over the stigma and adnate to it, cells spurred at the base. *Disc* 5-lobed, cupular. *Carpels* 2, distinct, tips hirsute, rarely glabrous, many-ovuled; style short, top urn-shaped, truncate, stigma columnar. *Follicles* short or long, terete, straight or curved, linear. *Seeds* ovate or linear-oblong, flattened, glabrous, not beaked, albumen scanty; cotyledons oblong, radicle short.—**DISTRIB.** Species 5, Indian and Malayan.

The very different aestivation of the corolla requires the separation of this genus from *Ichnocarpus*.

SECT. I. **Amphineurion**, A. DC. *Sepals* ovate-oblong, acute. *Ovary* glabrous, half sunk in the disc. *Follicles* very long, cylindric.

1. **A. marginata**, G. Don *Gen. Syst.* iv. 77; glabrous or branches and leaves beneath pubescent, leaves oblong acute acuminate or caudate, nerves very strong beneath inarching within the margin, lobes lax, corolla glabrous, tube rather longer than the acute calyx-segments, lobes linear obtuse. *Wight Ic.* t. 425; A. DC. *Prodr.* viii. 433; *Kurz For. Fl.* ii. 186. *A. acuminata*, G. Don. l. c.; *Wight Ic.* t. 424; A. DC. l. c. 434. *A. macrocarpa*, A. DC. l. c. 434. *Echites marginata*, Roxb. *Fl. Ind.* ii. 15; *Wall. Cat.* 1661. *E. acuminata*, Roxb. l. c. *E. macrocarpa*, *Wall. Cat.* 1662. *E. reticulata*, *Boj. Hort. Mauritt*



211. *E. apoxys*, *Voigt Hort. Sub. Calc.* 522. ? *E. cristata*, *Roth Nov. Pl.* 135. ? *Chonemorpha cristata*, *G. Don l.c.* 76.

From SILHET and CHITTAGONG to MALACCA and SINGAPORE.—DISTRIB. JAVA, Sumatra, Philippine Islds.

A stout scandent or subscandent shrub. *Leaves* 2-4 by $\frac{3}{4}$ -1 $\frac{1}{2}$ in., coriaceous, hard, polished above, dark brown when dry; petiole $\frac{1}{2}$ in. *Cymes* chiefly axillary; peduncle slender, 1-2 in.; bracts deciduous; flowers white. *Corolla-tube* $\frac{1}{2}$ - $\frac{3}{4}$ in., slender; lobes twice as long, mouth glabrous, throat not dilated. *Ovary* glabrous. *Follicles* 6-18 by $\frac{1}{2}$ in., straight or flexuous, cylindric. *Seeds* linear-oblong.

SECT. II. *Meladenia*, *A. D.C.* *Calyx* large; lobes long, ovate or lanceolate. *Ovary* wholly included in the tubular 5-lobed disc.

2. *A. caryophyllata*, *G. Don Gen. Syst.* iv. 77; leaves ovate or elliptic acute obtuse or acuminate glabrous or tomentose beneath, nerves 3 pairs very oblique, cymes lax pubescent, sepals linear-lanceolate glandular within, corolla-lobes obliquely orbicular, ovary hairy at the tip, follicles 3-5 in.—*A. DC. Prodr.* viii. 432; *Dalz. & Gibs. Bomb. Fl.* 113; *A. Blumei*, *Wight Ic. t.* 1305, not of *A. DC.* *Echites caryophyllata*, *Wall. Cat.* 1651; *Bot. Mag. t.* 1919. ? *E. Heynei*, *Spreng. Syst.* i. 632. *E. dichotoma*, *Roth Nov. Pl.* 136. *Chonemorpha dichotoma*, *G. Don Gen. Syst.* iv. 76; *A. DC. l.c.* 477.

LOWER BENGAL; Monghir, *Hamilton*; common on rocks at Risikund, *Wallich*. DECCAN PENINSULA, *Heyne*, &c.

A large climber, stem very stout, shoots pubescent. *Leaves* 4-5 by 2-2 $\frac{1}{2}$ in., coriaceous, base rounded acute or subcordate, nerves strong beneath and all running towards the point; petiole $\frac{1}{2}$ - $\frac{3}{4}$ in. *Cymes* terminal, lax, white-tomentose; pedicels shorter than the calyx-lobes, which are hoary without. *Corolla-tube* and *throat* both cylindric, subequal; limb 1 $\frac{1}{2}$ in. diam. *Ovary* pubescent; style slender, top urceolate, stigma columnar, to the tip of which the anthers are attached. *Follicles* stout, nearly $\frac{1}{2}$ in. diam., pericarp thickly coriaceous. *Seeds* (unripe) ovate-oblong, $\frac{1}{2}$ in. long, flat.—I have retained Roxburgh's specific name for this plant, because it is that of his Herbarium, of Rottler's Herbarium, of the Botanical Magazine, of the Calcutta Botanic Gardens, and of DeCandolle's *Prodromus*; but it is not the *Echites caryophyllata* of Roxburgh's *Flora*, which is *A. calycina*, and is described as having subglobular cymes; nor of his drawing, repeated by Wight (*Ic. t.* 440), which agrees with his description and represents the leaves as having many spreading veins and ovate acute corolla-lobes and glabrous ovary. Nor have I quoted Rheede's figure (*vii. t.* 55) which is referred to as *E. caryophyllata* in the Botanical Magazine; nor Rheede's "Kemetti Valli" (*ix. t.* 14, not 135 as quoted by Roxburgh), which Roxburgh cites for his *caryophyllata*, as neither of these is a good representation of this or any other plant, and they both differ totally from Roxburgh's and the *Bot. Mag.* figure and description. Though evidently a commonly (cultivated?) plant in India, its only presumably native habitat is the Monghir one given above; its few red nerves and rounded corolla-lobes at once distinguish it from its congeners.

3. *A. gracilis*, *Hook. f.*; branches very slender, leaves elliptic oblong acuminate membranous glabrous, nerves 8-10 pairs, very slender arching, cymes terminal corymbose glabrate, peduncles and pedicels long slender, sepals 1 $\frac{1}{2}$ in. hoary eglandular, corolla-tube $\frac{3}{4}$ in., lobes 1 $\frac{1}{2}$ in. obliquely oblanceolate.

SIKKIM HIMALAYA, alt. 2-4000 ft.; *J. D. H.* KHASIA MTS., alt. 1-3000 ft.; *Lobb*.

A very beautiful and distinct species, at once distinguishable by the slender stem and branches, membranous leaves, few-flowered spreading glabrous cymes, very long sepals, and long narrow calyx-lobes.

4. *A. calycina*, *A. DC. Prodr.* viii. 432; branches stout, leaves elliptic or oblong-lanceolate acuminate glabrous, nerves 7-10 pairs arching slender, cymes terminal lax densely rusty-tomentose, peduncle and pedicels stout, sepals

$\frac{3}{4}$ –1 in. eglandular, corolla-tube $\frac{1}{2}$ in., lobes ovate acute, ovary glabrous. *Kurz For. Fl.* ii. 186. *A. Roxburghii*, *G. Don ex Wight Ic.* t. 440. *A. Wallichii*, *G. Don Gen. Syst.* iv. 77. *Echites calycina*, *Wall. Cat.* 1653. *E. caryophyllata*, *Roxburgh Fl. Ind.* ii. 11 (and drawings copied by *Wight*, t. 440).

TAVOY; *Gomez, Kurz.*

Branches pubescent. *Leaves* 3–4 in., coriaceous; petiole $\frac{1}{4}$ in. *Cymes* many-fld., tomentose. *Sepals* very narrow, rusty tomentose. *Corolla-tube* hoary, slender, cylindric, base hardly dilated, narrowed upwards to the mouth, villous within. *Ovary* quite glabrous; style elongate-clavate, truncate, stigma columnar. *Fruit* unknown.—I have under *A. caryophyllata* stated my reasons for retaining that name for the plant of Roxburgh's Herbarium, and thus avoiding an involved synonymy and the necessity of giving it a new name.

5. *A. cymosa*, *G. Don Gen. Syst.* iv. 77; glabrous or shoots and leaves beneath softly tomentose, leaves elliptic-oblong or oblong-lanceolate acute or finely acuminate, nerves 5–7 pairs, cymes dense rounded densely tomentose, sepals $\frac{1}{4}$ – $\frac{1}{2}$ in., corolla-tube $\frac{1}{8}$ – $\frac{1}{4}$ in., lobes $\frac{1}{4}$ – $\frac{1}{2}$ in. ovate acuminate, ovary hirsute.

SILHET; *Roxburgh, &c.* DECCAN PENINSULA; common from Bombay to Travancore, *Heyne, &c.*

A stout rambling climber, very variable in size and habit, of which I am unable to distinguish the following forms specifically.

VAR. 1. *cymosa proper*; shoots tawny-tomentose, leaves 4–5 by 2–2½ in. elliptic or oblong abruptly acuminate glabrous or sparsely hairy above, pubescent or tomentose beneath, nerves 7–9 pairs, sepals $\frac{1}{2}$ in., corolla-lobes $\frac{1}{4}$ in. long.—*A. cymosa*, *G. Don l.c.*; *A. DC. Prodr.* viii. 433. *Echites cymosa*, *Roxb. Fl. Ind.* ii. 16; *Wight Ic.* t. 395; *Wall. Cat.* 1654, in part.—*Silhet.*

VAR. 2. *lanceolata*; shoots tawny tomentose, leaves 4–5½ by 1–1½ in. oblong lanceolate finely acuminate margins and midrib beneath sparsely hairy, nerves 7–9 pairs, sepals $\frac{1}{2}$ in., corolla-lobes $\frac{1}{2}$ in. broad, follicles 3 by 3½ in. sessile linear-falcate, seeds ovate-lanceolate glabrous.—*Echites cymosa*, *Wall. Cat.* 1654, in part (specimens from Calcutta Botanic Gardens).

VAR. 3. *conferta*; shoots puberulous or hoary, leaves 2–3 by 1½–2 in. elliptic-oblong acute obtuse or apiculate rarely acuminate, quite glabrous on both surfaces, nerves 3–4 pairs, flowers as in var. 2. *Echites conferta*, *Wall. Cat.* 1655.—*Deccan Peninsula, Herb. Heyne.*

VAR. 4. *elegans*; shoots puberulous or glabrate, leaves 1½–2½ by ¾–1½ acute obtuse or acuminate, nerves 3–5 pairs, sepals $\frac{1}{4}$ – $\frac{1}{2}$ in., corolla-lobes $\frac{1}{8}$ – $\frac{1}{4}$ in., “follicles 5–9 by $\frac{1}{4}$ in., terete, hairy at length glabrate, seeds linear-oblong shortly beaked glabrous” (*Thwaites*). *Aganosma elegans*, *G. Don l.c.*; *A. DC. Prodr.* viii. 433; *Wight Ic.* t. 1304; *Thwaites Enum.* 194. *A. Doniana*, *Wight Ic.* t. 1306 (a small-flowered form); *Dalziel & Gibs. Bomb. Fl.* 146. *Echites elegans*, *Wall. Cat.* 1656. *E. bracteata*, *Herb. Heyne in Wall. Cat.* under 1656.—*Deccan Peninsula and Ceylon.*

DOUBTFUL SPECIES.

A. *LÆVIGATA*, *Grah. Cat. Bomb. Pl.* 113 (*Rheede Hort. Mal.* ix. t. 9); without description. *S. Concan.* Is probably *Parsonsia*.

34. EPIGYNUM, *Wight.*

Climbing shrubs. *Leaves* opposite, nerves distant, arching. *Flowers* hoary, in dense subcapitate corymbose or open paniculate cymes. *Calyx* small, 5-fld, lobes acute. *Corolla* salver-shaped, tube long, throat villous; lobes overlapping to the right, twisted to the left, or nearly erect. *Stamens* below the middle of the tube; anthers sagittate, acuminate, conniving around and hardly adhering to the stigma, cells spurred at the base. *Disc* lining the calyx-tube, fleshy, 5-lobed. *Carpels* 2, distinct, many-ovuled, dorsally adnate to the disc and surmounted by its 5 connivent lobes; style long or short, top obovate or cupular.

stigma thick. *Follicles* distinct, long, linear, terete. *Seeds* elongated, compressed (crowned with a wing or pencil of hairs?).—**DISTRIB.** Species 4 or 5, Malayan Peninsula and Borneo.

1. **E. Griffithianum**, *Wight Ic.* t. 1308; leaves elliptic acute at both ends glabrous, cymes rusty-pubescent, flowers $\frac{1}{2}$ in. long, corolla pubescent, lobes in bud slightly twisted. *Kurz For. Fl.* ii. 184. *Legouixia amabilis*, *Muell. Argan. in Van Heurck Pl. Nov.* 146.

MERGUI; Griffith, Kurz.

Branches slender, puberulous towards the tips. *Leaves* 2-3 by $\frac{3}{4}$ -1 $\frac{1}{4}$ in., membranous, brown when dry, narrowed into the short petiole. *Cymes* branched from the base or peduncled, 1-1 $\frac{1}{2}$ in. diam.; branches $\frac{1}{2}$ in.; flowers crowded; pedicels very short. *Calyx* $\frac{1}{2}$ the length of the narrow corolla-tube. *Corolla-limb* $\frac{3}{4}$ in. diam.; lobes obovate, glabrous within, throat and tube hairy within. *Fruit* not seen.

2. **E. Maingayi**, *Hook. f.*; leaves elliptic subacute and cymes softly tomentose beneath, flowers 1 in. long, corolla tomentose, lobes in bud nearly straight.

MALACCA; Maingay (Kew Distrib. 1088).

Branches slender, young tomentose. *Leaves* 3 $\frac{1}{2}$ -4 $\frac{1}{2}$ by 1 $\frac{1}{2}$ -2 in., minutely puberulous above, with yellowish tomentum beneath; petiole $\frac{1}{2}$ in., tomentose. *Cymes* shortly peduncled; flowers very shortly pedicelled, corymbose. *Calyx* $\frac{1}{2}$ the length of the corolla-tube. *Corolla-lobes* rounded, tomentose on one half of the back; tube and throat pubescent within and without. *Follicles* 6-8 by $\frac{1}{4}$ - $\frac{1}{2}$ in., slender, cylindric, flexuous, tomentose. *Seeds* not ripe.

3. ?**E. lævigatum**, *Hook. f.*; leaves elliptic-lanceolate acuminate quite glabrous, flowers $\frac{1}{2}$ in. long, corolla glabrous, lobes strongly twisted in bud. *Echites lævigata*, *Wall. Cat.* 1669.

SILHET; at Pundua? (Wallich).

Perfectly glabrous throughout; branches slender, dark brown. *Leaves* 4-5 by 1 $\frac{1}{2}$ in., thinly coriaceous, polished above; petiole $\frac{1}{2}$ in. *Flowers* in peduncled axillary trichotomous panicked cymes, rather crowded towards the ends of the long horizontal branches; bracts ovate. *Calyx-lobes* ovate-lanceolate, with a small glandular tooth in the sinus between each lobe. *Corolla-tube* $\frac{1}{2}$ in., twice as long as the calyx; lobes linear-oblong, twice as long as the tube. *Carpels* sunk in the cupular 5-lobed disc, and attached to it by their backs; style very short, stigma large. *Fruit* not seen.—A fruiting specimen of what may be this species was collected in Cachar by Keenan; the follicles are 3-4 in. by $\frac{1}{4}$ in., horizontal, terete, gradually narrowed from the base to the acute point, exactly as in *Anodendron*, but the seeds are slender and not beaked.

DOUBTFUL SPECIES.

?**E. PARVIFLORUM**, *Hook. f.*; quite glabrous, leaves 5-6 by 1 $\frac{3}{8}$ -2 in., elliptic-lanceolate, acuminate at both ends, nerves 5-6 pairs very oblique, petiole $\frac{1}{2}$ in., flowers in lax brachiate axillary and terminal cymes, peduncle branches and pedicels slender, calyx very small, corolla pale yellow, tube short, limb $\frac{1}{2}$ in. diam., lobes falcately lanceolate acuminate, stamens towards the base of the tube, ovary sunk in the 5-lobed disc, style very short, top cup-shaped, stigma conical. *Echites parviflora*, *Roxb. Fl. Ind.* ii. 20.

NORTHERN CIRCARS; Roxburgh.

I have described this from Roxburgh's drawings; it appears closely allied to *E. ? lævigatum*.

35. **RHYNCHODIA**, *Benth.*

A lofty climbing evergreen shrub. *Leaves* opposite, broad, membranous, nerves distant. *Flowers* in lax broad axillary or subterminal panicked cymes.



Calyx 5-partite or -fid, glandular within. *Corolla* salver-shaped, throat contracted, villous; lobes large, broad, obliquely obtusely, overlapping to the right, twisted to the left. *Stamens* in the middle of the tube, filaments broad short; anthers sagittate, conniving round and adhering to the stigma, cells shortly spurred below. *Disc* annular, 5-fid. *Carpels* 2, distinct, glabrous, longer than the disc, many-ovuled; style filiform, top clavate truncate, stigma columnar. *Follicles* elongate, narrow, compressed. *Seeds* ovate or oblong, compressed, beak slender, tipped by a deciduous coma.

R. Wallichii, *Benth. in Gen. Pl.* ii. 720; glabrous, leaves elliptic ovate or oblong cuspidate or caudate-acuminate, cymes dichotomous loose, peduncles and pedicels slender. *Rhynchospermum Wallichii* and *R. ellipticum*, *A. DC. Prodr.* viii. 431. *Echites rhynchosperma*, *Wall. Pl. As. Rar.* i. 43, t. 49; *Cat.* 1665. *E. elliptica*, *Wall. Cat.* 1666. *Echites verticalis*, *Herb. Ham.* *Cercomoma Wallichii*, *Miq. Fl. Ind. Bat.* ii. 445; *Kurz For. Fl.* ii. 187.

SIKKIM HIMALAYA, alt. 2500 ft.; *Treutler. SILHET; De Silva. ASSAM; Masters. CACHAR; Keenan. MARTABAN, TENASSERIM and AVA; Wallich, Kurz.*

Branches distantly tubercled. *Leaves* 5-9 by 2-4 in., base acute, rounded or rarely cordate; petiole slender, 1 in. *Cymes* 2-4 in. diam.; flowers white, fragrant; peduncle 1-3 in. *Calyx-lobes* ovate-lanceolate, half as long as the corolla-tube. *Corolla* glabrous, except round the mouth; tube $\frac{1}{2}$ in., 5-angled; limb 1 in. diam.; lobes narrowly obovate. *Follicles* 12-18 by $\frac{1}{2}$ - $\frac{3}{4}$ in., smooth. *Seeds* 1 in., beak as long as the body, hairs rather longer, white.—This genus might well form a section of *Trachelospermum*.

36. TRACHELOSPERMUM, Lemaire.

Climbing shrubs. *Leaves* opposite, nerves distant. *Flowers* white or purplish, in lax terminal or pseudo-axillary cymes. *Calyx* small, 5-partite, glandular or scaly within. *Corolla* salver-shaped, mouth constricted; lobes oblique, overlapping to the right, twisted to the left. *Stamens* above the middle of the tube, tips included or exserted, filaments short, broad; anthers conniving over and adhering to the stigma, cells spurred at the base. *Disc* annular or of oblong glands. *Carpels* 2, distinct, many-ovuled; style short, top cupular, stigma columnar. *Follicles* elongate, slender, incurved, terete. *Seeds* linear, not beaked, coma long, albumen copious; cotyledons linear, flat, radicle short.—**DISTRIB.** Species 8, East Asiatic and Malayan.

* *Cymes* in the upper axils, long-peduncled. *Corolla-tube* slender, much longer than the *calyx*.

1. **T. fragrans**, *Hook. f.*; leaves elliptic-lanceolate obtusely acuminate, cymes loosely paniced, peduncles and pedicels slender, sepals ovate or lanceolate, corolla-lobes at base and mouth pubescent, anthers included. *Ichnocarpus fragrans*, *Wall. Cat.* 1675; *A. DC. Prodr.* viii. 435; *Brand. For. Fl.* 327. *I. ? inflata*, *Herb. Ham. in Wall. l.c.* *Blaberopus lucidus*, *A. DC. l.c.* 411. *Alstonia lucida*, *Don Prodr.* 231.

TEMPERATE and SUBTROPICAL HIMALAYA; from Kumaon, ascending to 5,700 ft. to Bhotan, exclusive of Sikkim. **ASSAM**; Muku hills, *Simonds. CACHAR; Keenan.*

A tall climber, shoots and petioles sometimes pubescent. *Leaves* 3-5 by 1-1 $\frac{1}{2}$ in.; petiole $\frac{1}{2}$ - $\frac{1}{3}$ in. *Peduncles* 1-3 in., very slender, stout, angular, trichotomously branched. *Sepals* $\frac{1}{2}$ - $\frac{1}{3}$ the length of the corolla-tube. *Corolla* white, tube slender, with the throat $\frac{1}{2}$ - $\frac{1}{3}$ in.; lobes obtusely, obliquely truncate. *Disc-glands* quadrate. *Ovary* glabrous, acute. *Follicles* 4-9 by $\frac{1}{2}$ in., incurved and converging, cylindric, acuminate, narrowed at the base; pericarp thinly coriaceous, smooth, pale. *Seeds*

$\frac{3}{4}$ in. long, slender, compressed, obtuse at both ends, pale, smooth, coma as long, white.

2. **T. gracilipes**, Hook. f.; glabrous, leaves elliptic acute, cymes loosely paniced, peduncle and pedicels capillary, calyx-segments ovate or lanceolate, corolla-lobes and throat glabrous, anther-tips exserted.

KHASIA and JYNTRA MTS.; Lobb. ASSAM; Gowahatty, Simons.

Very similar to *T. fragrans*, but differing in the form of the leaf point, in the more slender cymes, and notably in the glabrous corolla and exserted anther-tips.

** Cymes short-peduncled, in numerous axils. Corolla-tube short.

3. **T. axillare**, Hook. f.; quite glabrous, leaves oblanceolate obovate or elliptic-oblong abruptly caudate-acuminate, cymes very shortly peduncled, sepals rounded, shorter than the glabrous corolla. *Rhynchospermum* 5, *Herb. Ind. Or. Hook. f. & T.*

SIKKIM HIMALAYA; alt. 4-6000 ft., J. D. H.

A stout arboreous climber. Leaves 3-5 by 1-1 $\frac{1}{2}$ in., rather coriaceous, tip $\frac{1}{2}$ in. long. Cymes 1 in. diam.; peduncle $\frac{1}{4}$ in., pedicels rather longer, stout. Sepals puberulous, half the length of the corolla-tube. Corolla dull purple; tube angular, $\frac{1}{2}$ in. long; lobes linear-oblong, nearly straight, obtuse; mouth and throat glabrous. Stamens included. Glands glabrous. Ovary pubescent; style very short, stout. Follicles 6-8 by $\frac{1}{2}$ in., curved, cylindric, tomentose. Seeds slender, $\frac{3}{4}$ in. long; coma 2 in., copious, pale brown.—Buds more obtuse and lobes less twisted to the left than in the typical species.

37. **ANODENDRON**, A. DC.

Climbing glabrous shrubs. Leaves opposite, nerves distant arched. Flowers in axillary or axillary and terminal slender paniced wide spreading cymes. Calyx 5-cleft; segments obtuse, eglandular within. Corolla salver-shaped, mouth contracted; lobes narrow, overlapping to the right, twisted to the left. Stamens below the middle of the tube; anthers sagittate, conniving round and adherent to the stigma, cells shortly spurred at the base. Disc cupular. Carpels 2, distinct, sunk in the disc, and attached to it by their backs at the base, many-ovuled; style very short, top cupular, stigma thick conic. Follicles diverging, acuminate, hard. Seeds ovoid or oblong, compressed, beaked, tipped with a long coma.—DISTRIB. Species 7, Asiatic and Malayan.

1. **A. paniculatum**, A. DC. *Prodr.* viii. 444; quite glabrous, leaves large elliptic or oblong obtusely cuspidate thinly coriaceous, nerves 12-15 pairs, calyx-lobes obtuse. Dalz. & Gibs. *Bomb. Fl.* 147; *Thwaites Enum.* 194; *Kurz For. Fl.* ii. 188; *Wight Ic.* t. 1309, fruit and seeds only. Echites paniculata, Roxb. *Fl. Ind.* ii. 17; *Wight Ic.* t. 396. E. coriacea, Wall. *Cat.* 1586. E. manubriata and polyantha, Wall. *Cat.* 1663, 1664. *Gymnema nepalense*, ? *Grah. Cat. Bomb. Pl.* 120 (ex Dalz. & Gibs.).—*Rheede Hort. Mal.* ix. t. 8.

From SILHET to MARTABAN. DECCAN PENINSULA; on the Western Ghats from the Concan southwards. CEYLON; common up to 2000 ft.—DISTRIB. Java, Timor, Philippine Islds.

An immense climber. Leaves 4-8 by 1 $\frac{1}{2}$ -3 in.; petiole $\frac{1}{2}$ in. Cymes 2-10 in. long and broad, repeatedly 3-chotomously branched; branches brachiate, filiform; flowers 3-nate; pedicels short; bracts ovate. Calyx-lobes minute. Corolla $\frac{1}{2}$ in. long, yellowish white, lobes twice as long as the tube, narrow, falcate, obtuse, throat villous. Stigma subsessile. Follicles 5-6 in., straight, narrowed from a base $\frac{3}{4}$ in. diam. to the obtuse point, terete, woody. Seeds few, 1 $\frac{1}{4}$ in. long, flat; beak long slender; coma white, 2 in. long.



2. **A. Candolleianum**, *Wight Ic. t. 1309 (excl. fruit and seeds)*; quite glabrous, leaves elliptic obtusely cuspidate thickly coriaceous, nerves 8-10 pairs, petiole 1 in., calyx-lobes acute. *Miquel Fl. Ind. Bat. ii. 455. A. rubescens, Teijsm. & Binnend. Cat. Hort. Bogor.*

MALACCA; *Capt. Wight, Maingay* (Kew Distrib. 1087).—DISTRIB. Borneo.

Very similar in inflorescence and flowers to *A. paniculatum*, but petioles longer, leaves very different in texture, sepals acute, corolla-throat nearly glabrous, style distinct, stigma smaller, follicles much thinner-walled, acute, and seeds (unripe) apparently much more slender,

3. **A. rhinosporum**, *Thwaites Enum. 195*; quite glabrous, leaves coriaceous elliptic-oblong or -lanceolate obtuse or obtusely acuminate, nerves very slender, petiole $\frac{1}{2}$ in., flowers $\frac{1}{10}$ in. long.

CAYLON; Ambagamowa and Matuvatte districts, *Thwaites*.

A much smaller and narrower-leaved plant than either of the foregoing, with a smaller panicle. *Leaves* 2-4 by $\frac{1}{2}$ -1 $\frac{1}{2}$ in.; petiole $\frac{1}{2}$ - $\frac{1}{3}$ in. *Follicles* 3-5 in. *Seeds* 1 in.

4. **A. pauciflorum**, *Hook. f.*; quite glabrous, leaves oblong or oblong-lanceolate obtusely acuminate, nerves very slender, cymes small short axillary puberulous few-fl., flower $\frac{1}{2}$ in. long.

PENANG; *Maingay* (Kew Distrib. 1101).

Branches smooth, glabrous. *Leaves* 4-5 by 1 $\frac{1}{2}$ -2 in., red-brown when dry; nerves 8-10 pairs, slightly arched, very slender; petiole $\frac{1}{2}$ in., stout. *Cymes* much shorter than the leaves; peduncle stout, $\frac{1}{2}$ -1 in.; bracts ovate, crowded; pedicels very short. *Calyx-lobes* obtuse. *Corolla* glabrous, lobes acute in bud, strongly twisted: tube about equalling the linear-lanceolate falcate obtuse lobes; throat pubescent. *Style* and stigma together pyriform, seated on the glabrous carpels. *Follicles* 4-5 by $\frac{1}{2}$ -1 in., horizontal, straight, tapering from a rounded base to the subacute points, terete, smooth, pericarp thick. *Seeds* $\frac{3}{8}$ in. long, ovoid, beaked, flat, glabrous; coma three times as long, brown.

38. ICHNOCARPUS, Br.

Climbing shrubs. *Leaves* opposite, nerves distant. *Flowers* small or minute, in long terminal and axillary paniculate cymes. *Calyx* 5-fid, glandular or not within. *Corolla* salver-shaped, throat contracted or villous; lobes narrowed to the obtuse point, overlapping to the right, upper half deflexed in bud. *Stamens* at or below the middle of the tube; anthers sagittate, conniving over and adhering to the stigma, cells spurred at the base. *Disc* free, 5-lobed. *Carpels* 2, distinct, exserted from the disc, many-ovuled, hairy; style short, top obconic, stigma columnar. *Follicles* spreading or divaricate, slender and subterete or rigid and compressed. *Seeds* narrowed at the tip, coma deciduous, albumen copious; cotyledons long, flat, radicle short, superior.—DISTRIB. Species 5 or 6, Indian, Malayan and Australian.

1. **I. frutescens**, *Br. in Hort. Kew. ed. 2, ii. 69*; glabrous or branches and leaves beneath more or less softly tomentose, leaves elliptic oblong or lanceolate acute, cymes pubescent, corolla-tube glabrous, mouth villous. *Benth. Fl. Austral. iv. 315; Wight Ic. t. 430, Wall. Cat. 1674; Brand. For. Fl. 327; Grah. Cat. Bomb. Pl. 113; Dalz. & Gibs. Bomb. Fl. 147; Kurz For. Fl. ii. 185. I. radicans, Wall. Cat. 1676. I. dasycalyx, Miquel Fl. Ind. Bat. ii. 449. I. leptodictyus, F. Muell. Fragmenta, vi. 118. Echites frutescens, Wall. Cat. 1674. Apocynum frutescens, Linn.—Lyama, Roxb. in As. Res. i. 261.—Burm. Fl. Zeyl. 23, t. 12, fig. 1.*

WESTERN HIMALAYA; Sirmore to Nepal, alt. 1–2000 ft. UPPER GANGETIC PLAIN; from Delhi to BENGAL, ASSAM, SILHET, CHITTAGONG, BURMA, the DECCAN PENINSULA and CEYLON.—DISTRIB. Java, Australia.

An extensive climber. *Leaves* very variable, 2–3 by $\frac{3}{4}$ – $1\frac{1}{2}$ in.; petiole $\frac{1}{4}$ in. *Cymes* 1–3 in., axillary and in terminal panicles, rusty-pubescent; branches short, trichotomously divided or 3-flowered; pedicels longer or shorter than the corolla. *Calyx-lobes* ovate, obtuse or subacute, eglandular. *Corolla* about $\frac{1}{4}$ in. diam., purplish, twice as long as the calyx; lobes twice as long as the tube, falcate, acuminate, mouth and margins sparingly bearded. *Disc-glands* 5, erect, slender, capitate, much longer than the hairy ovary. *Style* very short. *Follicles* 3–6 by $\frac{1}{8}$ in., very slender, cylindric, curved, acute, “sometimes moniliform as in *Ecdysanihera*,” Kurz, divergent at an acute angle; pericarp thinly coriaceous. *Seeds* $\frac{1}{2}$ in., very slender, not beaked; coma as long, scanty, white.—*I. radicans*, Wall., is the young state of the plant.

VAR. parvifolia; leaves 1– $1\frac{1}{2}$ by $\frac{1}{2}$ in. oblong or linear-oblong, cymes shorter.—Coimbatore, Wight, &c.

2. ***I. ovatifolius***, A. DC. *Prodr.* viii. 435; glabrous or branches and leaves beneath more or less tomentose, leaves orbicular elliptic-oblong or ovate obtuse acute or cuspidate, peduncle and pedicels pubescent, corolla-tube pubescent, mouth puberulous. *I. affinis*, Herb. Ind. Or. H. f. & T. Echites affinis, Roem. & Sch. *I. latifolia*, Herb. Ham. in Wall. Cat. 1652. *Springia indica*, Muell. & Van Heurck in Plant. Nov. Van Heurck, 143.

SILHET and KHASIA MTS.; alt. 1–4000 ft. MALACCA; Griffith, Maingay (Kew Distrib. 1075, 1103).—DISTRIB. Sumatra, Borneo, Celebes, Philippine Islds.

Very closely allied to *I. frutescens*, and perhaps a variety of that plant, but besides the characters indicated the leaves are much larger and broader, and the disc-glands are not capitate.—The flowers occur in a monstrous state (through insect-puncture), the corolla being enlarged below into a globose form $\frac{1}{2}$ in. diam., crowned with a rigid erect tubular beak. This state occurs in Wallich’s Herbarium, under No. 2015, from Tavoy (which number should apply to a *Dendrobium*), and it is Maingay’s 1103 (Kew Distrib.) from Malacca.

3. ***I. pubiflorus***, Hook. f.; glabrous, with rusty-tomentose cymes, leaves elliptic obtusely acuminate, cymes very shortly peduncled dense-flowered, calyx-segments oblong equalling the glabrous corolla-tube, corolla-throat pubescent, lobes linear-oblong, base gibbous.

KHASIA Mts.; Griffith (a solitary specimen).

Branch stout glabrous, bark dark brown. *Leaves* 3 by $1\frac{1}{2}$ in., rather coriaceous; petiole $\frac{1}{2}$ in. *Cymes* $\frac{1}{2}$ – $\frac{3}{4}$ in. long and broad, branched from near the base, peduncle pedicels and bracts densely tomentose; flowers $\frac{1}{2}$ in. long, corolla as broad. *Calyx* cleft to the base into linear-oblong segments. *Corolla-tube* short; lobes obliquely ovate, obtuse. *Anthers* acuminate. *Ovary* villous above, glabrous below.

39. MICROCHITES, Miquel.

Climbing shrubs. *Leaves* opposite, nerves distant. *Flowers* very small, in axillary and terminal lax thyrsoid or brachiate paniced cymes. *Calyx* small, 5-fid or -partite, glandular within, segments obtuse. *Corolla* campanulate or salver-shaped, tube short; lobes falcate, overlapping to the right, very oblique, upper half deflexed in bud. *Stamens* near the bottom of the tube, filaments short; anthers sagittate, conniving around and adhering to the stigma, cells spurred at the base. *Disc* annular or cupular, entire or lobed. *Carpels* 2, longer than the disc, distinct, many-ovuled, hirsute; style short, top turbinate or globose, stigma clavate. *Follicles* spreading or recurved, hard, subterete. *Seeds* oblong, compressed, not beaked; coma terminal, caducous.—DISTRIB. Species 4, Malayan.



1. *M. polyantha*, *Miq. Fl. Ind. Bat.* ii. 456; leaves elliptic oblong or oblong-lanceolate obtuse or obtusely acuminate glabrous, nerves numerous very slender nearly straight, cymes puberulous short axillary and in terminal racemes, flowers $\frac{1}{2}$ in. long, corolla subcampanulate glabrous. *Tabernaemontana polyantha*, *Blume Bijl.* 1029; *A. DC. Prodr.* viii. 376.

MALACCA; *Maingay* (Kew Distrib. 1081). ANDAMAN ISLANDS; *Kurz.*—DISTRIB. Java.

Branches slender, obscurely angled. *Leaves* 2-3 by 1-1 $\frac{1}{2}$ in., narrowed at both ends; nerves 10-15 pairs, with intermediate still more slender ones, very spreading, but not horizontal; petiole $\frac{1}{2}$ in. *Cymes* very shortly peduncled, about $\frac{1}{2}$ in. diam., few-fl.; bracts minute; pedicels short, stout, and calyx densely pubescent; flowers $\frac{1}{2}$ in. long. *Calyx-lobes* round. *Corolla* glabrous, subcampanulate, lobes about equaling the throat, falcately lanceolate, very oblique, mouth bearded. *Anthers* acute. *Ovary* much longer than the disc, hirsute; style short, stigma conical.

2. *M. elliptica*, *Hook. f.*; leaves elliptic- or oblong-lanceolate obtusely or acutely acuminate, nerves numerous very slender nearly straight, cymes elongate glabrate, flowers $\frac{1}{2}$ in. long, corolla salver-shaped. *Rhynchospermum* 4, *Herb. Ind. Or. H. f. & T.*

SIKKIM HIMALAYA; alt. 4-6000 ft., *J. D. H. KHASIA MTS.*; *Griffith*, alt. 3-4000 ft., *H. f. & T.*

Very similar to *M. polyantha*, but leaves narrower, 4-6 by 1-1 $\frac{3}{4}$ in., more acuminate, cymes usually longer, with distant short branches, flower larger, corolla more salver-shaped, the lobes more obliquely falcate, upper deflexed half narrow obtuse; style longer, its top more globose. *Follicles* (unripe) red, 5-6 by $\frac{1}{2}$ in., horizontal or recurved, subcylindric, broadest at the base, gradually narrowed thence to the point, pericarp hard and fleshy. *Seeds* very immature, $\frac{1}{2}$ in. long, narrowly oblong, glabrous; coma long.—The branches sometimes root copiously.

ADDENDA AND ERRATA, VOL. III., PART III.

P. 5. *Viburnum sambucinum* is a Javanese, not a Japanese plant.

P. 221. Subtribe V. CONYZEÆ. The ray-flowers are white or yellow.

P. 232. Under *D. Roylei*, for *Fullaronia* read *Fullartonia*.

P. 244. Under *E. longicaule*, for *Milkania* read *Mikania*.

P. 256. In generic character of *Microglossa*, for ligule "minute, white" read minute or small, white or lilac.

P. 237. Under *M. albescens*, line 4, after corymb insert "ligule lilac slender."

P. 260. BLUMEA. Since the printing of this genus Mr. Clarke has visited the Candolle Herbarium in Geneva, and communicated to me the following notes on such of the species described in De Candolle's *Prodromus* as appeared to him (without having the Wallichian Collection to compare) not to accord, wholly or in part, with the descriptions in this *Flora*. In respect of these discrepancies large allowance must be made for the fact that, in so critical a genus, the specimens sent by Wallich to DeCandolle do often differ considerably from those at the Linnean Society. The numbers are those of the *Prodromus*, vol. v. p. 433, &c.

3. *B. tenella*. *Prodr.* p. 433. The Timor plant is quite unlike any Indian one; the Madras one may be referable to *B. bifoliata*.

5. *B. anagallidifolia*, *Prodr.* p. 433. Is rather *B. amplexans* than *bifoliata*, the leaves being nearly entire.

11. *B. Chamissoniana*, *Prodr.* p. 434, from Luzon; and 17. *B. Leschenaultiana*, p. 435, are typical *B. Wightiana*.

ADDENDA AND ERRATA.

18. *B. lactucaefolia*, Prodr. p. 435. The Birman plant is *B. lacera*; the Luzon one *B. laciniata*.

20. *B. lacera*, var. *Wallichii*, p. 435, consists of *B. lacera*, *Wightiana*, *glomerata*, and an *Erigeron*.

28. *B. cichoriifolia*, Prodr. p. 437, and *B. crepidifolia* l. c. (*B. laciniata*, Ham. in Wall. Cat. 3084), are both *B. laciniata*.

39. *B. senecioides*, Prodr. p. 439 (*Conyza senecioides*, Ham. in Wall. Cat. 3102), is a form of *B. membranacea* resembling *B. virens*, but with more viscus bracts; it is the same as *B. hymenophylla*.

47. *B. membranacea*, Prodr. p. 440; and 51. *B. cuneifolia*, p. 441 (*Conyza cuneifolia*, Wall. Cat. 3101, from Martaban), are probably *B. lacera*.

48. *B. viscosula*, Prodr. p. 441, and *B. hispidula*, are the same as *B. paucifolia*, as is probably *B. subsimplex*, and all referable to vars. of *membranacea*.

56. *B. holoserica*, Prodr. 442, and *B. gracilis*, 443, are forms of *lacera*.

58. *B. fasciculata*, Prodr. p. 442. The Birman plant is *B. glomerata*, the Timor one quite different.

65. *B. spinellosa*, Prodr. p. 443, is a silky straggling form of *B. hieraciifolia*.

75. *B. elongata*, Prodr. p. 445, consists of *B. Clarkei*, and the large form of *lacera*?

81. *B. longifolia*, Prodr. p. 446, may be *B. myriocephala*.

P. 482. PRIMULA. All the species here for the first time described will be found together with figures of them in a paper by Dr. Watt, shortly to be published in the Journal of the Linnean Society, vol. xx. p. 1 (ined.), together with the following, which should follow 35. *P. uniflora*, p. 493.

P. WATTII, King in Herb. Calcutt.; glabrous, leaves oblong-lanceolate narrowed into the petiole obtuse lobulate or crenate softly hairy, scape slender 6-8-fld., bracts narrow or rounded, flowers capitate, calyx large lax cupular membranous irregularly incised, corolla violet, limbs broadly infundibular, lobes crenate.

SIKKIM HIMALAYA; Chola, Natong, Dr. King.

Rootstock small. Leaves 2-4 in., membranous. Heads 1-2 in. diam. Calyx $\frac{1}{2}$ in., veined. Corolla-tube $\frac{1}{4}$ in., glabrous; limb twice as long and broad. Stamens at the mouth of the tube. Ovary globose, top rounded; style very short, stigma truncate.—A very beautiful plant.

P. 495. ANDROSACE. This genus also has been illustrated by Dr. Watt for the Journal of the Linnean Society, l. c. p. 16 (ined.), where the following additional species is described: it should follow 3. *A. geraniifolia*, p. 497.

A. CROFTII, Watt in Journ. Linn. Soc. ined.; small, perennial, stoloniferous, densely rufous tomentose, leaves petioled reniform-rounded crenate or lobulate lobules 1-3-crenulate, scape stout few-fld. equalling the leaves, flowers umbellate, bracts lanceolate obtuse, pedicels short, calyx-lobes obtuse, corolla small lobes obovate retuse.

SIKKIM HIMALAYA; Singalelah, alt. 12-13,000 ft., Watt.

Whole plant clothed with (when dry) rufous hairs. Rootstock short, creeping. Leaves 1-1 $\frac{1}{2}$ in. long with the petiole; blade $\frac{1}{2}$ - $\frac{3}{4}$ in. diam., hairy on both surfaces. Flowers $\frac{1}{2}$ in. diam., apparently purple.

P. 542, line 6, after *acuminata* add Lindl.; and for 260 read 268.

P. 546, for *B. Mottleyana*, De Vriese, read *B. Motleyana*, Clarke; and add at end of specific character, *Isonandra Motleyana*, De Vriese in Miq. Journ. 1861, 257.

INDEX OF GENERA, SPECIES AND SYNONYMS.

The Synonyms and Species incidentally mentioned are printed in Italics.

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