

FLORA OF PRESIDENCY  
OF BOMBAY

Vol. I.

by

T. COOK

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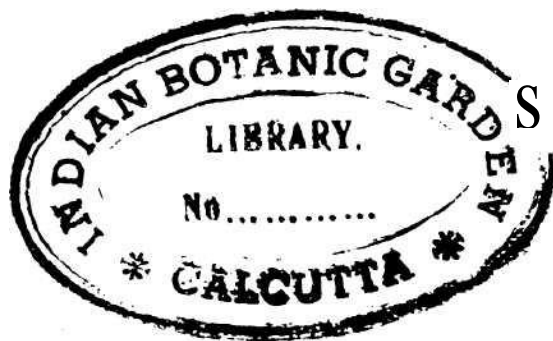
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F O R A

30 M AY

REFERENDE

ments and forming a short tube, usually 5 (rarely 10, in a double row), imbricate in bud. Stamens numerous, in 1 or several rows, rarely in 5 or more bundles ; filaments filiform or ligulate, united at the base; anthers oval and short. Hypogynous scales large, cushion-like and fleshy, or wanting. Ovary inferior or half-inferior, 5-2-celled, the cells usually with 2-4, rarely a single ovule, suspended from the summit of the axils; style filiform, with a simple or lobed stigma. Fruit a more or less succulent drupe crowned by the calyx-limb, containing a single 5- or fewer-celled nut. Embryo straight or curved.—Trees or shrubs, with alternate simple leaves often drying yellow. Flowers usually small, in short axillary racemes, spikes or clusters, rarely solitary. Bracts minute, often scale-like.

fc Ovary 3-celled. Drupes oblong or elliptical, 3-celled.

Embryo straight. Glabrous; flowers sessile, in compound

puberulous spikes; drupes

terete ..... S. lucida.

Young shoots more or less pubescent; flowers shortly pedicelled, in simple or branched villous-tomentose racemes; drupes terete . S. racemosa.

Young shoots more or less rusty-pubescent; flowers sessile or nearly so, in simple tomentose spikes; drupes sulcate-ribbed . 8.

sulcata. Glabrous; petioles and rib beneath sparingly hairy; racemes quite glabrous, slender; drupes terete . . . . .

S. leiostachya.

Hf, % Ovary 2- rarely 3-celled. Drupes ovoid with a contracted apex, or turbinate, by abortion usually 1-seeded; the mass of the endocarp often protruding inwards so as to cause the seed turning more or less horse-shoe-shaped, Embryo curved. O Flowers sessile, in simple or compound spikes; stamens in 2 or more series.

Young shoots, spikes and leaves beneath more or less rusty-pubescent or tomentose; drupes turbinate, ribbed . . . . . 8. Javanica.

Glabrous; drupes turbinate, torulose-ribbed; spikes glabrous . S. spicata.

Glabrous ; drupes ovoid-turbinate, terete; spikes glabrous . 8. polycarpa. O O Flowers pedicelled, in simple or compound racemes ; stamens in 2. or more series.

Glabrous; drupes ovoid-turbinate, terete ; racemes compound,

minutely appressed-pubescent, robust . . . . . » . S. pedicellata. Glabrous; leaves caudate-acuminate; drupes ovoid-turbinate, terete; racemes simple, slender, pubescent . . . . . S. caudata.

O O O Flowers white, pedicelled, in racemes or poor panicles.

Stamens collected in 5 bundles. Racemes appressed-pubescent, forming slender panicles at the end

of the young pubescent branchlets ; pedicels long, filiform . 8. cratcogoides.

Racemes short, shortly tomentose; pedicels very short and thick . S. leucantha.

\* Ovary 3-celled; drupes oblong or elliptical, 3-celled; embryo straight.

**1. S. lucida**, Wall.—An evergreen small stunted tree, all parts quite glabrous; leaves lanceolate to elliptically lanceolate, on a 4-6 lin. long petiole, 3-4 in. long, shortly acuminate, almost entire, or more or less serrulate, coriaceous, shining above, glabrous, laxly



veined and minutely net-veined between the nerves; flowers umill but much larger than *m S. spicata*, yellow, sessile, forming short puberulous, compound spikes in the axils of the leaver • *hJ I i* bractlets 3 under each flower ovate, ciliate, some feute tlyx like; calyx glabrous, 5-lobed, the lobes rather short rotund^ blunt, minutely ciliate; petals nearly IX 1<sub>in.</sub> j Song aW blunt; stamens numerous, in several rows, free to the *h<sub>a</sub>«J* <sup>osz</sup> glabrous, 3 celled; drupes elliptical, about leimng "£ smooth, containing a hard, bon^, 3-celled nut; embryo straiio-ht

' a^,000to7,000ft.

,20-J+^T+1^Sa'i?iBrand\_ F<f f 300\_A^ergreen tree (M—^5+(0+1—li), the young shoots more or less pubescent-leaves oblong and obovate-lanceolate to lanceolate, taperinc in a 3 4 1m. long strong, often pubescent petiole, 3-6 in. long,° bluntish acuminate or apiculate, more or less serrulate, coriaceous, glabrous or appressed-pubescent on the midrib beneath, in drying taS ye owish, the nerves strong, the veination lax; flowfrs smalf yellowish, on short, strong, villous pedicels forming a s mple or branched villous-tomentose strong raceme in the axils of thekaves and shorter than them- bract at the base of the pedicel ovate to obovate, about a line long, villous-pubescent, the 2 bractlets much. ovate acute or nearly blunt; petals nearly 3 lin. lone rotate ov,-if blunt; stamens nearly as long as the netals nnJ!?' T,

sp^sa  
zsthxSSB\$

OTCS^ftS)^^^ i Martaban  
Feb.-IVsS.=Metam La?PArgyll t h  
S ^ and compP-t- U-d for furniture. tree

le<sup>TM</sup> shrub (?), the buds glabrous; leaves elbtiSII <sup>d<sub>1</sub>ark<sub>-</sub>c<sub>9</sub>lon<sup>TM</sup>d</sup> stiff hairs, the leaf-a sparingly hairy ^olt^CTT^," <sup>o<sup>W</sup>o^!</sup>-ceolate, on serrate, almost chartaceous ,, {.-.;?,' n> ^n§> ruminant, repand-midrib and nerves spS; appS ^ beneath on the strong or drying brownish/the &ffiS"SdS; r<sup>TM</sup>in small, on slender l-U li<sub>n</sub> lono- o-lXm, r ! ?<sup>1</sup>CUOUS^

sohtary in the a.ls of

bracts about **a line long**, lanceolate, acute, quite glabrous; bractlets almost conform, but minute; calyx smooth, the lobes ovate, blunt, about  $\frac{1}{2}$  lin. long; corolla rotate, the lobes ovate-oblong, blunt, about 1<sup>^</sup> lin. long; stamens numerous, unequal, inserted at the base of the very short tube; berries ovoid-oblong, terete, smooth, 4 lin. long, crowned by the rather conspicuous calyx-limb.

4. **S. sulcata**, Kz.—An evergreen small often stunted tree, 15-25 ft. high, the young shoots covered with a rusty-coloured or tawny appressed pubescence; leaves lanceolate to elliptically lanceolate, acute at the base, on a strong petiole 3-4 lin. long, acuminate, more or less crenate-serrulate or entire, thick chartaceous, 5-7 in. long, more or less glossy above, and when old also beneath, glabrous, the nerves strong, the net-veination conspicuous and not very lax; flowers small, yellow, almost sessile, in short, simple, rusty-tomentose axillary racemes; bracts and bractlets almost equal, obovate-lanceolate, acute, appressed-pubescent, nearly a line long; calyx densely appressed-pubescent, the lobes about a line long, ovate-lanceolate, rather blunt; petals 2 lin. long, ovate-oblong, blunt; stamens numerous, unequal, inserted at the base; drupes elliptically oblong, on  $\frac{1}{2}$  lin. long tomentose peduncles, about 4-5 lin. long, sulcate, almost glabrous, when fully ripe bluish black, crowned by the calyx-limb, containing a sulcate, hard, bony, 3-celled nut; embryo straight.

Var. 1, **glabrior**: leaves more coriaceous, quite glabrous, shining above; drupes larger and glabrous.

Var. 2, **pubescens**: leaves narrower and longer acuminate, less glossy & almost opaque, pubescent on the midrib beneath; the young shoots rusty villous-tomentose; drupes (unripe) pubescent.

HAB.—Frequent in the drier hill forests of Martaban, at 3,000 to 6,000 ft. elevation; var. 2: Upper Tenasserim, at 4,000 ft. elevation.—Fr. March.—1.—SS.=Metam.

# # *Ovary 2- rarely 3-celled; drupes ovoid, contracted at the apex, or turbinate, usually 1 seeded; embryo curved.*

5. **S. Javanica**, Kz.—An evergreen small tree, all softer parts more or less covered with a soft rusty-coloured pubescence; leaves from lanceolate to elliptically and oblong-lanceolate, usually at both ends acuminate, on a thick, densely rusty-tomentose petiole  $\frac{1}{2}$  in. long, more or less acuminate, 5-8 in. long, serrulate, rigidly pergamaceous, smooth and more or less opaque above, beneath more or less softly pubescent from short rusty-coloured hairs, the nerves rather crowded and more or less parallel, the net-veination rather faint; flowers white, sessile, rather small, forming shorter or longer, robust, densely tawny- or rusty-villous tomentose, **branched**

or rarely simple racemes in the axils of the leaves and shorter than them; bract and bractlets calyx-like, broadly ovate, rather acute, densely rusty-pubescent, about a line long, the bract a little longer; calyx deeply 5-lobed, rusty-pubescent, the lobes oblong, about a line long; corolla rotate, the lobes ovate-oblong, acute; stamens numerous, the inner series shorter, inserted at the base of the short tube; drupes ovoid, nearly 3 lin. long, appressed-pubescent, glabrescent, sulcate-ribbed, crowned by the large calyx-limb, containing a 1-seeded nut; embryo curved.

HAB.—Tenasserim.

6. **S. spicata**, Roxb.; Bedd. Sylv. Madr. 149; Brand. For. FL 300.—An evergreen middling-sized tree, all parts quite glabrous; leaves from lanceolate to oblong and almost obovate-lanceolate, tapering in a 4-6 lin. long petiole, 3-5 in. long, acuminate, crenate-toothed or almost entire, coriaceous, glabrous, shining above, in a dried state more or less yellowish, the venation between the nerves conspicuous, but thin and lax; flowers yellowish, small, almost sessile, forming more or less branched glabrous spikes in the axils of the leaves and shorter than them; bract and bractlets rotundate, concave and ciliate, calyx-like; calyx glabrous, 5-parted, the lobes broadly oblong, blunt, smooth, about a line long; petals oblong, nearly a line long; stamens numerous, long-exserted, in apparently a single row and free to the base; ovary 3-celled, glabrous; drupes the size of a pea, turbinate, torulose-ribbed, olive-coloured, containing a conformly-shaped thick and hard 1-seeded nut; embryo curved.

HAB.—Tenasserim, apparently frequent.—Fl. Aug.

7. **S. polycarpa**, Wall.—An evergreen small stunted tree, all parts quite glabrous; leaves lanceolate to obovate-lanceolate, on a 4-6 lin. long petiole, 2-5 in. long, more or less acuminate, obsolete crenate-serrulate, coriaceous, glabrous, almost opaque, in drying turning yellowish, beneath almost glaucous-green, the venation between the nerves thin and lax and almost without net-venation; flowers small, yellow, sessile or nearly so, forming glabrous, simple, or at the base branched spikes in the axils of the leaves and shorter than them; bract and bractlets conform, the former at the base of the very short pedicel or forming with the bractlets a calyx-like involucre, broadly ovate, somewhat acute; calyx glabrous, the lobes very short and broad, rounded; petals about a line long, blunt; stamens numerous, unequal, the filaments free to their insertion; ovary glabrous, 2-celled (?); drupes ovoid-turbinate, terete, the size of a small pea, smooth, crowned by the broad calyx-limb, containing a pergamaceous, thin, 1-seeded nut.

HAB.—Not unfrequent in the drier hill forests of Martaban and Tenasserim, at 4,000 to 5,000 ft. elevation.—Fl. Feb.-Aug.—1.—SS.=Metani.

8. *S. pedicellata*, Kz.—An evergreen tree (30—40 +10—15 + 3—4), the young shoots very slender and sparingly appressed silk-hairy; bark about 2 lin. thick, brownish grey, obsoletely fissured; cut greenish; leaves elliptically lanceolate to lanceolate, tapering in a slender, glabrous petiole 4-5 lin. long, 4-5 in. long, almost caudate-acuminate, obsoletely crenate-serrulate, thin pergamaceous, glabrous, opaque, the nerves and the lax venation thin and little conspicuous; racemes slender, compound, and forming poor, almost sessile, minutely appressed, pubescent panicles in the axils of the leaves and above the scars of the fallen ones; bractlets hardly  $\frac{1}{2}$  lin. long, ovate, acute, glabrous, deciduous; pedicels usually 2 lin. long, minutely appressed-pubescent; unripe berries ovoid, 3-4 lin. long, terete and smooth, crowned by the calyx-limb, containing a pergamaceous 1-seeded nut; calyx-lobes in fruit broadly ovate, blunt, about  $\frac{1}{2}$  lin. long, glabrous.

HAB.—Rather rare in the tropical forests of Martaban, east of Tounghoo.—Fr. Apr.—s.—SS.=Metam.

REMARKS.—Wood very pale brown, rather light, close-grained, soft.

9. *S. caudata*, Wall.—An evergreen tree, all parts glabrous or nearly so; leaves lanceolate to ovate-lanceolate, on a 3-4 lin. long petiole, acute at the base, 2-4 in. long, long and caudate-acuminate, crenate-serrulate, thin-coriaceous, in a dried state more or less yellowish, quite glabrous, more or less opaque, the nerves and the lax net-venation thin; flowers small, yellow, on slender 2 to nearly 3 lin. long puberulous pedicels, forming short, slender, pubescent racemes in the axils of the leaves and shorter than them; bracts and bractlets obovate-lanceolate, pubescent, very deciduous; calyx glabrous, the lobes about  $\frac{1}{2}$  lin. long, ovate-lanceolate; corolla

rotate, the lobes about 3 times longer than the calyx-lobes, oblong, blunt; stamens numerous, unequal, inserted at the base of the very short corolla-tube; drupes ovoid, narrowed at the top, the size of a pea, smooth and glossy, crowned by the broad calyx-limb, containing a pergamaceous 2-celled but only 1-seeded nut; embryo curved.

HAB.—Upper Tenasserim; Chittagong.—Fr. Apr.

10. *S. cratsegoides*, D. Don.; Brand. For. Pl. 299.—An evergreen (?) small stunted tree, the young shoots more or less appressed-pubescent; leaves obovate-oblong to oblong, on a 2-3 lin. long, thin, sparingly hairy petiole, obtuse at the base, 1-2  $\frac{1}{2}$  in.

long, shortly acuminate or acute, rather sharply serrulate, chartaceous, glabrous (or the midrib beneath pubescent), turning yellowish in drying, rather opaque, the nerves and the lax vernation in adult

leaves rattier conspicuous and strong; flowers rather small, yellow-ish, then white, fragrant, on 1-2 lin. long pedicels, forming short appressed-pubescent racemes in the axils of the younger leaves and towards the end of the young branchlets, usually collected into terminal leafy or leafless panicles; bracts and bractlets linear, very deciduous; calyx glabrous or nearly so, the limb broad, deeply 5-lobed, the lobes broadly oblong, blunt, ciliate,  $\frac{1}{2}$  a lin. long; corolla rotate, the lobes oblong, blunt, nearly 2 lin. long; stamens numerous, collected in 5 bundles adnate to the base of the very short corolla-tube; drupes the size of a pepper-kernel, obliquely ovoid, containing a thin, 2-celled, but only 1-seeded nut; embryo curved.

HAB.—Martaban hills east of Tounghoo.

11. *S. leucantha*, Kz.—*Tha-le*.—An evergreen tree (20 — 25 -4- (?) 4-1—1), all parts glabrous; leaves oblong- to elliptically-lanceolate, a little unequal at the base, on a slender 2-3 lin. long petiole, 3-4 in. long, shortly and bluntish acuminate, crenulate-toothed, chartaceous, glabrous; flowers white, fragrant, jointed on the very short (hardly  $\frac{1}{2}$  lin. long), thick, greyish tomentose pedicels, forming short tomentose racemes in the axils of the leaves; bracts ovate, pubescent outside, deciduous; calyx quite glabrous, or the ovate blunt ciliolate about 2 lin. long lobes a little pubescent outside; petals obovate-oblong, twice as long as the calyx-lobes; stamens glabrous, unequal, in 5 bundles, each inserted at the base of the corolla-lobes \ ovary and the long style sparingly hairy.

HAB.—Frequent in the swamp forests of the Lrawaddi plains.—Fl. Jan.—s.—SS.=All.

### JASMINEJS.

Flowers regular, hermaphrodite or unisexual. Calyx free, usually small, 4- or 5- rarely more-toothed or -lobed, or rarely truncate and entire. Corolla with a longer or shorter tube, 4- or 5- rarely more -lobed, or divided to the base into 4 petals, rarely 2-petalled or wanting altogether. Stamens 2, rarely 4, adhering to the base of the corolla; filaments usually short; anthers 2-celled, the cells opening in longitudinal slits. Ovary 2-celled, the cells with 2, rarely 1 or 3 ovules, in the young state attached laterally, but becoming pendulous or ascending according to the growth of the ovary. Fruit succulent or capsular, entire or 2-lobed, 2-celled or reduced to a single cell and seed. Seeds with or without albumen. Embryo straight.—Trees or shrubs, often climbing, very rarely herbs, with opposite or very rarely alternate, simple, or pinnate leaves. Flowers in axillary or terminal panicles, sometimes reduced to short racemes or clusters.

About 24 species of this family grow in Burma, most of which are climbers. The timber of several species is durable and close-grained. The genuine oil of jasmine is obtained from *Jasminum officinale* and *J. grandiflorwn*. The common olive (*Olea Uuropaa*) yields the well-known olive-oil. Manna excretes from the bark of several species of *Fraxinus*. The corollas of *Nyctanl/ies* are used as an orange dye. Many of the *Jasmines* scent the air, especially during night, with their delicious perfume.

- J|C *Stamens 2 only*. O Corolla-lhnb 5-12-lobed, usually twisted-imbricate in bud.
  - Ovules erect.
  - X Fruit a fleshy 1- or 2-lobed drupe. Corolla twisted in bud; albumen none; usually climbers • *Jasminum*,
  - X X Fruit a dry compressed capsule.
- Corolla twisted in bud; albumen none; erect trees
  - Nyctanthes*. O O Corolla 4-lobed, rarely 6-8-cleft or wanting, with or without a tube; ovules pendulous. X Fruit a dry 2-valved capsule; corolla-lobes twisted in bud. Ovary 2-celled, the cells 4-ovuled; seeds winged; albumen none; trees, with usually pinnate leaves ..... *Schrebera*.
  - X X Fruit a drupe or berry; corolla valvate or nearly so in bud f Ovules solitary; ovary 2-celled; a climber, with sharply 4-cornered stems ..... *Myxopyrum*.
  - f f Ovules 2 in each cell; ovary 2-celled; erect trees or shrubs.
- Albumen none ..... • *Chionanthus*.
- Seeds albuminous; flowers in axillary or terminal panicles ..... *Olea*,
- %: 5jc *Stamens 4, alternating with the 4 petals*. Corolla without tube; ovules erect; climber ..... *Azima*.

### JASMINUM, L.

Corolla-tube cylindrical, the limb spreading, 5-8-lobed, imbricate-twisted in bud. Stamens 2, included. Ovary entire or notched, 2-celled, the cells with a solitary or rarely 2 or 3 ovules attached laterally, but becoming erect as the ovary enlarges; styles terminal or in the notch, very shortly 2-lobed. Berry almost to the base 2-lobed or one of the lobes abortive. Seeds usually solitary in each lobe, erect. Albumen none. Cotyledons thick and fleshy, radicle scarcely prominent.—Shrubs, usually climbing, with opposite or rarely alternate leaves either 1-foliolate or pinnately 3-foliolate or pinnate. Flowers in axillary or terminal trichotomous panicles or rarely almost solitary or clustered. Bracts often very small, rarely large and often discoloured.

- 5fc *Leaves pinnate or pinnately 3-foliolate, rarely the one or other 1-foliolate*. Glabrous ; leaves unpaired-pinnate; calyx-lobes subulate, about 3-4 lin. long ..... *J- grandiflorum*.
- 5jc ijc *Leaves \foliolate, with a jointed petiole*.

X Bracts minute or very short and filiform, rarely wanting  
altogether. + Calyx-lobes short or the calyx  
almost truncate.

f Flowers in corymbs.

(ilabrous; pedicels 2-5 lin. long; calyx 5-cornered, almost truncate *J. extensum*.  
Pubescent; flowers sessile; calyx-teeth as long as the calyx-tube . *J. decussatum*.  
ft Flowers in poor axillary racemes; pedicels £-1 in.

long; calyx-teeth distinct. § Corolla-lobes blunt, glabrous. Nerves  
conspicuous on both sides, usually with a gland in the axils;

corolla-lobes usually 8, rarely 5-7 ..... *J- subglandulo-*  
*sum.* Nerves

thin and obsolete, without glands ; corolla-lobes usually 5 . «7. *attenuatum*.

§ § Corolla-lobes acuminate. Glabrous; leaves

more or less narrow, very long acuminate;

corolla-lobes 9-12 . . . . . *J laurifolium*.

-f- -f- Calyx-lobes longer than the calyx-tube, subulate.

Small shrub, almost erect; branchlets puberulous; leaves penni-  
nerved . . . . . \*?• *sambao*.

Twining, glabrous; leaves 3-nerved . . . . . ♦

«/. *anastomosans*.

X X Bracts leafy, conspicuous, shorter or longer than the  
*calyx*.

+ Bracts longer than the calyx, leafy, white, discoloured.

More or less pubescent, especially the branchlets; corolla-tube  
about 4 in. long or longer . . . . .

. «/. *Rottlerianum*.

Glabrous when adult, with a tuft of hairs in the nerve-axils  
beneath; corolla-tube about an in. long..... *J. coarclatum*.

•\—|— Bracts shorter than the calyx; calyx-lobes subulate ;

pedicels 1-2 lin. long. More or less pubescent; corolla and  
calyx-lobes each 6-9, the latter

4-5 lin. long, pubescent. . . . .

. *J. hirsutum*. Glabrous or puberulous ; corolla-and calyx-lobes each 6-7> the latter  
only a line long, more or less pubescent . . . . . *J.*  
*scandens*.

\* *Leaves pinnate or ^innately 3-foliolate*.

1- *J. grandiflorum*, L.—*Mgat-lay*.—An evergreen  
scandent

shrub, all parts glabrous; leaves unpaired-pinnate, on a short peti-  
ole ; leaflets in 3 to 1 pair with an odd one (the upper pair often  
confluent with the terminal leaflet), on very short petiolules or  
sessile, more or less rhomboid-ovate, unequal at the base ±-\ in  
long, blunt or acute, membranous, glabrous; flowers white\* often  
reddish outside, on slender pedicels, forming a poor  
coiymbose

glabrous panicle m the axils of the leaves; calyx glabrous, 5-lobed,  
he lobes subulate, about 3 lm, long; corolla-tube slender, \ in

fetS  
-litary/ovoid,

HAB.—Burma (according to Dr. Mason). ♦

♦ *Leaves \-foliolate*.

: r ^f^' Wall-TAn evergreen scandent snrub  
with r slightly 4-gonous branchlets, all parts glabrous;



leaves

lanceolate to ovate-lanceolate, on a 8-4 lin. long, slender petiole jointed at the apex, acute or acuminate at the base, 2-3 in. long, bluntish acuminate with a mucro, entire, membranous, glabrous, penninerved; flowers small, white, on 2-5 lin. long at the middle 2-bracted pedicels, forming a glabrous brachiate shorter- or longer-peduncled poor corymb in the axils of the upper leaves and at the end of the branchlets; calyx glabrous, bell-shaped, about a line long, 5-cornered with the angles produced into as many minute teeth; corolla-tube § in. long, slender, the limb about £ that length, usually 6-lobed, the lobes lanceolate, acute; berry-lobes globular-ovoid, the size of a small pea, blackish, glossy.  
HAB.—Ava.—Fl. Fr. Nov.

3. **J. decussatum**, Wall.—An evergreen scandent shrub, all parts densely pubescent; leaves ovate- to oblong-lanceolate, on a 2-3 lin. long, villous petiole jointed at the base, rounded at the base, 2-3 in. long, acuminate, membranous, entire, penninerved, on both sides softly (beneath often villously) pubescent; flowers small, white, sessile or nearly so, forming a longer or shorter peduncled small corymb-like pubescent panicle in the axils of the leaves and at the end of the branchlets; bracts linear, acuminate, pubescent; calyx pubescent, small, 6-toothed, the teeth linear-lanceolate, about as long or shorter or somewhat longer than the calyx-tube; corolla-tube about 4 in. long, the lobes linear-lanceolate, acute, about half as long as the tube; berry-lobes solitary or paired, ovoid-oblong, nearly ^ an in. long, fleshy, smooth, bluish black.

HAB.—Not unfrequent in the tropical forests, from Martaban down to Upper Tenasserim, up to 3,000 ft. elevation.—Fl. Febr.; Fr. March.—SS.=Metam.

4. **J. subglandulosum**, Kz.—An evergreen shrub, with scandent terete branches, all parts glabrous; leaves oblong to obovate-oblong, rounded at the somewhat narrowed base, 4-5 in. long, shortly acuminate, entire, thin-coriaceous, glossy, glabrous, the nerves on both sides (especially beneath) conspicuous, and usually with a gland in their axils; flowers white, on ^-1 in. long, slender pedicels thickened upwards, forming a peduncled, very lax, glabrous, nude raceme in the axils of the leaves; bractlets minute, subulate; calyx glabrous, the teeth broad, very short, blunt; corolla-tube £-■§ in. long, the limb half as long, 6-8- (usually 8) -lobed, the lobes obovate-oblong, blunt; berry-lobes ovoid-oblong, diverg-ins?.

HAB.—Not unfrequent in the tropical forests of the southern slopes of the Pegu Yomah above Rangoon; also Tenasserim.—Fl. Dec—s.—SS.=Lat. p.

5. **J. attenuatum**, Wall.—An evergreen scandent shrub,  
all  
parts glabrous; leaves oblong to oblong-lanceolate, obtuse at the  
base, on a strong petiole 1-2 in. long, 4-6 in. long, bluntish acu-

minate, entire, coriaceous, glabrous, the nerves thin and inconspicuous, without glands in the axils ; flowers white, on \ in. long strong pedicels, forming a peduncled, glabrous, naked, lax raceme in the axils of the leaves ; bractlets linear-subulate, small ; calyx glabrous, the teeth very short, acute ; corolla-tube about \- \ in. long, the limb nearly as long, usually 5-lobed, the lobes linear-oblong, blunt; berry-lobes ovoid, very diverging.

HAB.—Not unfrequent in the damp hill forests of the Martaban Bills, at 5,000 to 7,000 ft. elevation.—Fl. Fr. March.—s.—SS.=Metam.

6. **J. laurifolium**, Roxb.—An evergreen scandent shrub, up to 8 ft. high, with terete branchlets, all parts quite glabrous ; leaves linear to linear-lanceolate, rounded or acute at the base, on a 2 lin. long petiole jointed at the middle, 2-5 in. long-, bristly acuminato,

entire, glabrous, thinly coriaceous, the lateral nerves thin and uniting from the base into a more or less distinct intramarginal nerve and without any net-veination between them ; flowers middling-sized, white, often reddish outside, on about an inch long, slender, glabrous pedicels, arising by 2-5 at the end of the branchlets or from the axils of the upper leaves, or forming 3-flowered peduncled racemes ; calyx glabrous, the tube about a line long, 6-12-lobed, the lobes long or short, linear-subulate ; corolla-tube about f in. long, the limb about as long, 9-12-lobed, the lobes linear-lanceolate, acuminate ; berry-lobes 2 or 1, ovoid-oblong, about \ in. long, <sup>sa</sup>PP<sup>v</sup>> glossy, blackish.

Var. 1, **laurifolium proper**: calyx-lobes much longer than the calyx-tube, up to 4 lin. long.

Var. 2, **brachylobum** : calyx-lobes as long or a little longer than the calyx-tube, more or less recurved.

HAB.—Var. 2 : frequent in the tropical forests from Martaban down to Tenasserim.—Fl. Feb.-Apr.; Fr. Apr.-May.—s.—SS.=Metam.

7. **J. anastomosans**, Wall.—An evergreen scandent shrub, 3-5 ft. high, with terete branchlets, all parts glabrous ; leaves ovate to ovate-oblong on a 2-3 lin. long petiole jointed at the middle, rounded or obtuse at the base, 1-3 in. long, acuminate, entire, chartaceous, glabrous, 3-nerved from the base, the lateral nerves all anastomosing, veined and obsoletely and laxly net-veined between ; flowers white, on very short bracteoid hardly a line long pedicels, solitary or by pairs from the axils of the leaves or forming very short 3- or 4-flowered axillary clusters ; calyx glabrous, 6-cleft, the lobes linear-subulate, up to 4 lin. long; corolla-tube about f in. long, the limb usually 7-cleft, the linear lobes almost as W as the tube.

Vit B>"";FMqifl tin;theti.OpACal forents Of the eastern sloP<\* of the Pegu Wah and Martaban down to Tenasserini.—Fl. March-Apr.—s.—SS.=Metam.

8. **J. sambac**, Ait.; Brand. For. Fl. 2>\\.—*Sa-pai* or *ma-lee*.—An evergreen small shrub, erect, or the terete branches somewhat scandent, the young shoots shortly pubescent; leaves oblong to ovate, on a curved, jointed petiole 1-2 lin. long, more or less rounded or almost cordate at the base, 2-3 in. long, bluntish or shortly apiculate with a mucro, entire, thin-chartaceous, while young herbaceous with a tuft of hairs in the axils of the nerves, penninerved; flowers middling-sized, fragrant, white, often reddish outside, on 1-2 lin. long slightly pubescent pedicels, forming a terminal, poor, short, slightly puberulous raceme; bracts and bractlets subulate-filiform, often deciduous; calyx puberulous or glabrous or nearly so, about 8-cleft, the lobes puberulous, subulate, somewhat longer than the calyx-tube; corolla-limb about an inch in diameter, with as many oblong to elliptical, acute or blunt lobes as there are calyx-lobes, the tube about as long as the calyx-lobes; berry-lobes 2 or 1, globular-ovoid, shorter than the calyx-lobes, black, sappy.

HAB.—Apparently not wild in Burma, but frequently cultivated by natives and often met with in neglected lands and deserted toungyas.—Fl. March-Apr.

X x *Bracts conspicuous, leafy, shorter or longer than the calyx,*

9. **J. Rottlerianum**, Wall.—An evergreen scandent shrub, the terete branchlets densely tawny pubescent; leaves oblong to ovate-lanceolate, on a tawny-villous 2-3 lin. long petiole jointed at the middle, rounded or almost cordate at the base, 3-5 in. long, shortly acuminate, entire, chartaceous, while young on both sides shortly and softly puberulous, and the nerves pubescent, adult turning more or less glabrous above, penninerved; flowers white, almost sessile, in terminal bracted puberulous or pubescent short-peduncled corymbs at the end of the branchlets; bracts ovate to ovate-lanceolate, acuminate, puberulous, white; calyx pubescent, 5-7-cleft, the lobes subulate, about 3 lin. long, pubescent; corolla-tube more than £ in. long, the limb \- \ the length of the tube, 5-7-lobed, the lobes obovate-lanceolate to ovate, acute.

HAB.—Not unfrequent in the tropical forests along the eastern slopes of the u Yomah.—Fl. Apr.-s.-SS.=SiS.

10- **J. coarctatum**, Roxb.—An evergreen, large, scandent shrub, the young terete branches sparingly pubescent; leaves oblong to oblong-lanceolate, obtuse or acute at the base, on a 3-4 lin. long puberulous petiole jointed at the middle, 5-6 in. long, shortly acuminate, entire, thin-chartaceous, glossy on both sides, with a tuft of hairs in the nerve-axils beneath, penninerved; flowers white, on very short puberulous pedicels or almost sessile, forming a longer

or shorter peduncled bracted puberulous corymb at the end of the branches and in the axils of the upper leaves ; bracts leafy, ovate-lanceolate to linear-lanceolate, acuminate, slightly puberulous, white ;

calyx more or less pubescent, usually 8-lobed, the lobes linear-subulate, somewhat longer than the tube ; corolla-tube slender, nearly an inch long, the limb 8-lobed, the lobes linear-oblong, about 4 lin. long.

HAB.—Frequent in the tropical forests along the eastern slopes of the Pegu Yomah and the Martaban hills east of Tounghoo; also Clnttagong.—\* 1. Apr.-May.—s.—SS.=SiS. Metam.

**11. *J. hirsutum*, Willd.; Brand. For. Fl. 312.**—An evergreen scandent shrub, the terete branchlets densely tawny-pubescent; leaves ovate to cordate-ovate, on a 2-3 lin. long tawny-pubescent petiole jointed at the base, rounded or cordate at the base, 1-2| in. long, shortly acuminate to blunt with a mucro, entire, chartaceous, especially while young pubescent or puberulous beneath, often turning more or less glabrescent except on the nerves beneath ; flowers white, middling-sized, on short up to a line long pubescent pedicels, forming almost sessile or shortly peduncled, tawny-pubescent, leafy-bracted, abbreviate racemes at the end of the branchlets or on young axillary shoots; bracts leafy, lanceolate, shorter than the calyx; calyx pubescent, 6-9-cleft, the lobes subulate\*, pubescent, 4-5 lin. long; corolla-tube longer or nearly twice as long as the calyx-lobes, the limb of the length of the tube, 6-9-lobed, the lobes linear-oblong, acuminate.

HAB.—Ava; Pegu.—Fl. Jan.

**12. *J. scandens*, Vhl.—*Tcm-sa-pai*.**—An evergreen, large, scandent shrub ascending up to 40 and 50 ft. high with cylindrical trunk as thick as a man's arm, very variable in its indumentum, the terete branchlets almost glabrous to densely tawny-pubescent; bark about a line thick, rather even, but rough, longitudinally corky-cracked; cut dry, pale-coloured; leaves from ovate-lanceolate to lanceolate and ovate, on a 3 to 4 lin. long pubescent or glabrous petiole jointed below the middle, more or less rounded or almost cordate at the base, 2-3 in. long, acuminate, entire, chartaceous, more or less glabrous or slightly puberulous or pubescent on the nerves, penninerved; flowers white, on thick puberulous pedicels less than a line long, forming short-peduncled pubescent or puberulous usually 3-flowered corymbs in the axils of the leaves or the corymbs augmented by two lateral 1-or 2-flowered peduncles or collected in a spurious panicle at the end of the branchlets • bracts or rather floral leaves 2 only at the base of the inflorescence' calyx about a line long, more or less pubescent, the teeth linear, of the length of the calyx-tube; corolla-tube about 4 an in. long or longer, the limb more than half the length of the tube, 6- or 7<sup>^</sup> lobed, the lobes oblong to linear, rather blunt or acute; berry-lobes ovoid, the size of a pea, smooth, blackish.

Var. **1, scandens proper:** all parts, especially the branchlets and leaves, more glabrous.

Var. **2, lsetum** (/ . **te\*w»**, Wall.) : the branchlets, the nerves, and sometimes the under-surface of the leaves, pubescent.

HAB.—Frequent in the tropical and open forests all over Burma from Arracan, Pegu, and Martaban down to Tenasserim. — Fl. Dec.-Feb; Fr. Apr.-May.—s:l.—SS.= oo.

REMAEKS.—Wood light brown.

### NYCTANTHES, Juss.

Calyx tubular, entire, or obscurely 5-6-toothed. Corolla salver-shaped, the tube terete; limb 5-7-lobed, sinistrorsely twisted in bud. Anthers 2, sessile at the throat of the corolla. Ovary 2-celled, compressed, with a solitary erect ovule in each cell; style filiform, with a capitate stigma. Capsule compressed-obovate, notched, 2-celled and opening in 2 valves. Albumen none.—Trees or shrubs, with rough, simple, opposite leaves. Flowers in small terminal corymbs.

**1. N. arbor tristis, L.;** Bedd. Sylv. Madr., t. 240; Brand. For. Fl. 314.—*Hseit-bee-loo*.—A large shrub, often growing out into a small tree of 15 to 20 ft. in height, all parts more or less roughish pubescent, the branchlets 4-cornered; leaves ovate to oblong-ovate, rounded to acute at the 3- or 5-nerved base, on a 1-3 lin. long scabrous petiole, 2-4 in. long, acuminate, entire or often produced into several acute lobes, chartaceous, very scabrous above, less so beneath; flowers rather small, very fragrant, opening during night, sessile, each supported by 2 broadly ovate bracts almost concealing the calyx, by threes in peduncled small corymbs often arranged into a brachiate compound one at the end of the branchlets; corolla white, with an orange tube; capsule rigidly coriaceous, obovate, compressed, truncate or notched with a mucro, strongly longitudinally-veined, about 1 in. long, glabrous.

#HAB.—Bare in the low forests of Pegu above Rangoon; also Ava; Tenasserim.—Fl. Fr. C.S.~l.-SS.=CaS. Lat.

### SCHREBERA, Roxb.

Calyx tubular-bell-shaped, very shortly 5-8-toothed, sometimes almost 2-lipped, with the lobes 2- and 3-lobed. Corolla salver-shaped, naked or pilose at the throat, the limb 6-8-cleft, twisted<sup>111</sup> bud. Stamens 2, inserted in the tube or at the throat of the corolla; filaments short; anthers 2-celled. Ovary 2-celled, with 4 pendulous ovules in each cell; style filiform with a thick shortly 2-lobed or 2-cleft stigma. Capsule woody or coriaceous,



opening

into 2 valves bearing the septa in the middle. Seeds compressed, at the apex extended in a wing. Albumen none or very scanty. Embryo straight with a blunt superior radicle and leafy large cotyledons.—Trees, with unpaired-pinnate or 1-foliolate leaves. Flowers in terminal corymb-like panicles.

1. Sch. swietenioides, Roxb.; Bedd. Sylv. Madr., t. 248; Brand. For. Fl. W\$.—*Thit-hswe-lwe*.—& tree (40—60 + 10—30 + 3—5), shedding leaves in H.S., all parts glabrous; bark about \ an in. thick, grey, rough, peeling off in small irregular flakes ; cut pale-coloured; leaves unpaired-pinnate, the petiole compressed half-terete; leaflets opposite or nearly so, in 2 or 3 pairs with an odd one, ovate to oblong, often unequal at the base and tapering in a 2-4 lin. long petiole, 2-5 in. long, bluntish acuminate, entire, chartaceous, glabrous, impressed net-veined between the thin curved nerves; flowers yellowish green, turning brownish, appearing with the young leaves, on 1-2 lin. long pedicels, arranged in peduncled corymbs forming a glabrous peduncled panicle at the end of the branchlets ; calyx glabrous or rarely puberulous; corolla glabrous, naked at the throat, the tube about 3 lin. long, the lobes obovate, truncate; capsules woody, obovate pear-shaped, 1|-2 in. long, rounded at the apex, the valves with usually 4 large spongy seeds winged at the apex.

HAB.—Not unfrequent in the mixed forests all over Pegu and Martaban.—Fl. Apr.; Fr. January.—1.—SS.=SiS. All.

REMARKS.—Wood grey or brown, very close-grained, heavy, hard and durable. Supposed not to warp or bend.

### OLEA, Tournef.

Calyx short, bell-shaped, 4-toothed or rarely truncate. Corolla more or less funnel-shaped or spreading, the tube shorter or longer, the limb 4-parted, rarely the corolla wanting. Stamens 2, inserted in the corolla-tube if present, or hypogynous in the absence of the corolla. Ovary 2-celled, the cells with 2 ovules suspended from the top of the septa; style short, at the summit 2-cleft or almost capitate. Drupe berry-like, with an oily pericarp enclosing a long putamen often 2- or by abortion 1-seeded. Embryo erect, with leafy cotyledons. Albumen fleshy or horny.—Trees or shrubs, with opposite simple leaves. Flowers small, in axillary or terminal racemes, corymbs or panicles.

*if. Corolla almost rotate, the limb spreading. Inflorescence axillary or at the same time terminal. O Petals only a line or thereabouts long. Leaves rigidly coriaceous, the nerves impressed; panicles puber-*  
 T<sup>lou</sup>«..... *O. dentata.*  
 leaves thin-coriaceous, the nerves prominent; panicles glabrous . *O. dioica.*

O O Petals about 3 lin. long.

Leaves without veins between the nerves.....0. *terniflora*.

\* \* *Corolla funnel-shaped, with a longer or shorter tube.*

*Panicles all terminal, glabrous or pubescent . . . . . O. robusta.*

1. **O. dentata**, Wall.—An evergreen tree (40—60+ (?) +3—4), all parts glabrous or the young shoots puberulous; bark rough, brownish grey, about ½ in. thick; cut brownish; leaves elliptically oblong to oblong and lanceolate, acuminate at the base, on a 3-4 lin. long petiole usually red-coloured, 3-6 in. long, long but bluntish acuminate, more or less serrate-toothed to almost entire, rigidly coriaceous, smooth and glossy, the nerves and veins impressed

beneath; flowers small, yellowish white, both sexes with corolla, dioecious, the males on short but slender puberulous pedicels forming branched, puberulous, cymose panicles, the females sessile or nearly so, by 3 or more, forming a brachiate, poor, puberulous panicle in the axils of the leaves; bractlets minute; petals about a line long; drupes ovoid, the size of a small pea, glabrous.

HAB.—Frequent in the drier hill forests and the hill Eng forests of Martaban and Upper Tenasserim, at 2,000 to 3,000 ft. elevation; also in the tropical forests above Rangoon.—Fl. June-Jan.; Fr. Apr.-May.—1.—SS.=Metam. Lat. p.

REMARKS.—Wood white or pale brown, turning dark brown, very heavy, rather coarse-fibrous, but close-grained.

2. **O. dioica**, Roxb.; Bedd. Sylv. Madr. 153.—A pretty large tree with ash-coloured bark, all parts glabrous; leaves oblong to oblong-lanceolate, acuminate at the base, on a 3 to 4 lin. long petiole, 3-5 in. long, shortly acuminate, remotely and sharply

serrate, coriaceous, glabrous, the lateral nerves prominent beneath; flowers small, greenish white, dioecious, both sexes pedicelled, the males forming ample glabrous cymose panicles, the females somewhat larger and with (according to Roxburgh also without) corolla, in short racemes forming a simple brachiate long-peduncled glabrous panicle in the axils of the leaves or opposite to them; petals about a line long; drupes nearly globular, the size of a large pea, bluish black, with a 1-seeded putamen.

HAB.—Hills of Chittagong.—Fl. March-Apr.; Fr. July.

3. **O. terniflora**, Kz.—An evergreen tree (30—40 + 10—20 + 3—4), all parts quite glabrous; bark about ½ in. thick, dark grey, roughish and finely-cracked; cut greenish brown; leaves oblong to obovate-oblong, acute at the base, on a 3-4 lin. long thick petiole, 3-5 in. long, shortly and bluntish acuminate, entire, coriaceous, glaucous-green, glabrous, the nerves beneath tolerably distinct without distinct veins between them; flowers small, white, sessile, usually by 3 or rarely more in a cluster or occasionally

solitary and interruptly spiked, forming brachiate, short, stiff, minutely-pubescent panicles arising laterally or collected at the end of the branchlets; calyx pubescent inside, tho teeth short and

rotundate; petals linear-subulate, about 3 lin. long; drupes ovoid  
 oblong, nearly \* m-long, smooth, bluish black. \* <<>> Pegu Fr.  
 Jan.-s.-SS^MetamTsiS TenasSerun' als0 Cluttagong.-Fl. Dec.-Jan ;

rather h<^> close-grained, of an Unequal

M^25.nffdi^Ercr T> Bedd s^\_ parts glabrous or the you<sup>TM</sup> 12TA\everZTME\* far^e tre\_e, all  
 ovate-lanceolate, acuminated l^X pubeSCent; lfve s\_ 0^0^ to  
 petiole 2-3 in In<sup>TM</sup> ■ he base' on a slender 2-3 lin.  
 minal often ^1^11<sup>TM</sup>^" ^ ^I' forming a ter" panicle; calyx  
 obscure v Su 'o" S or almOst tomeil tose shaped / drupes eHiSly  
 ntl " \* ' pemstent^ coroll a funnel-glabrous, bldsh black  
 ^' Somewhat curved' 3"4 lin\_ ^g,

^ =  
 Sc Tar\_ 2: Ava^UpperTena^serim.-

EEMAES.—Wood hard, durable.

### CHIONANTHUS, L.

peZded from the iLm^ ^j£, ^l \*TM of o7les sus"  
 notched stigma. Drupe more or lSs fl^W^ T? Short with a  
 bony putamen. Albumen none Embt\_ ^ th^ ^ g l" ^ ^  
 cotyledons, the radicle superior ver^ llh f P^lan^ ^nvex  
 shrul,, with opposite sim^T I<sup>TM</sup> I' F W^  
 panicles, very rarely reduced to sessile cluster

##

(leaves

^WJrfl^i»ra~ - the upper side  
 Panicles rather small, with minute bracts; nerves prominent \* •k' Palemh^icus.  
 both sides; drupes \* in. long prominent on  
 lon\*)^ o o No Visible Veids between' then erves (leaves 6-10 in. ChmacroPh<sup>11</sup>TM.

Panicle minutely puberulous; petals linear .

• Ch. montanus.

14. **D. flavicans**, Hiern.—An evergreen small tree, or large shrub 8-10 ft. high, the very young shoots slightly pubescent; leaves elliptically to oblong^lanceolate and oblong, often a little oblique, on hardly a line k:ig petiole, 2-3 in. long, bluntish acuminate, thin-coriaceous, entire, smooth, the nerves faint without net-veination; flowers rather i&c^e, usually 4-merous, white, usually solitary or by 2, rarely more/- on short, tawny-pubescent, large-bracted peduncles or almost s&ssile in the axils of the leaves; bracts obovate-lanceolate, densely appressed-pubescent, acute, 3-4 lin. long; calyx appressed tawny-pubescent, more or less glabrescent, 4- (rarely 5-) -cleft, the lobes ovate, acuminate, unequal, 2 of them larger and nearly 3 lin. long; corolla in bud 4-gonous, ^ an inch long, the tube 4-cornered, inflated, as long as the calyx, pubescent at the narrowed neck, the lobes glabrous, as long as the tube; stamens 12-20, inserted by twos in two rows at the base of the corolla-tube, the inner row half as long, in the females fewer and inserted higher up in the tube; filaments rather short; anthers ovate, acuminate; ovary in the males absent, in the females 4-angular-ovate, glabrous, terminating in an erect 2-lobed style; berries oblong, about § in. long, blunt, up to 4-seeded, supported by the somewhat enlarged appressed calyx.

HAB.—Tenasserim.

15. **D. undulata**, Wall.—An evergreen large tree, all parts glabrous, or the very young branchlets f ugaceously tawny-pubescent ; leaves oblong to elliptical, on a £-£ in. long petiole, 4-6 in. long, apiculate, entire, chartaceous, while very young covered beneath with very f ugaceous tawny or rusty-coloured hairs, soon quite glabrous and shining, the net-veination very lax and thin; flowers yellow, 4-merous, sessile, the males forming very short, bracted, densely tawny-pubescent, axillary racemes, the females solitary or rarely by 2-3 and almost sessile amongst the bracts in the axils of the leaves; bracts ovate, acute, densely villous; calyx tawny-pubescent, 4-cleft, the lobes as long as the tube, oblong, somewhat acute ; corolla tawny-pubescent outside, the tube a little longer than the calyx, ovoid-urceolate, the lobes rotundate, about a line long; stamens in the males 16, by pairs, inserted at the very base of the corolla-tube, the inner ones smaller; anthers linear-oblong, acute, rusty-pilose at the base; filaments very short; ovary hirsute, in the males rudimentary ; berries globular, about an inch in diameter, covered with rusty-coloured appressed hairs, resting on the spreading densely pubescent calyx and supported by a very thick, hardly a line long, few-bracted peduncle; albumen homogeneous.

.—In the tropical forests of Martaban, Tenasserim, and 11 u> Amlainans.

—\*1. Apr.-May ; Fr. Oct.-FeL.—s.—SS.=Metam.

**16 D. sapotoides, Kz.**—An evergreen tree (40—50 + 15—25  
 l- [ ' yoUn , g f oots Covered with a fugaceous rusty-coloured thin  
 pubescence; bark smooth, greenish dark-grey; leaves elliptically  
 oblong or elliptical, obtuse «ft the base, on a glabrescent thxck  
 petiole hardly J an in. long, 6-8 in. long, shortly and bluntish  
 acuminate, entire, coriaceous, the net-veination very lax, faint and  
 impressed; flowers 4-merous, yellowish white, resembling those of *D*  
*tapoia*, almost sessile, clustered on a very thick, short, axillary  
 peduncle; calyx rusty-pubescent outside, the lobes ovate-lanceolate,  
 with the margins reflexed and at the base auricle-like reroute, nearly  
 3 lm long, acuminate; corolla-tube urceolate, <sup>as hng as the</sup>  
<sup>calyx, somewhat rusty-pubescent out-</sup> tube A \*stamens 14m10

anthers ovate-lanceolate acuminate,  
 68 ot            ^ ^ ^            the  
    style

of the eastern slopes of the Pegu

<sup>hrL ^Tfft Roxb — An</sup> evergreen middling-sized tree,  
 glabrous, the leaf-buds appressed tawny-pubescent; leaves  
 lanceo-    ^ Ti on a 2.3 lm> , long petiole > 3.5 in. long S> atMTM" W o. r ;  
 nlt            <?TM<\*ous, glabrous, the nerves impressed above, beneath  
 apuleulate! prominent and the net-veination between rather dense flowers  
 rather small 4-merous, yellowish white, sessile, the males in poor  
 dense axillary clusters, the females solitary; calyx bell-shaped,  
 densely rusty- or tawny-tomentose, the lobes oblong, acute • corolla  
 outside silky-pubescent, the tube short and almost  
 ovate-urceolate, about twice as long as the calyx-lobes, the lobes  
 oblone-somewhat acute, about a line long; stamens singly, about  
 16 in sserted on the torus, in the females reduced in number to  
 8-lo' anrl inserted at the base of the corolla-tube; filaments short;  
 anthers linear, mucronate; ovary in females densely  
 tawny-pubescent 8 celled; styles short, as many as cells; berries  
 ovoid-oblong, shortlv and densely tawny-pubescent, about an inch  
 long, supported by the enlarged tawny-pubescent calyx and a few  
 rotundate bracts. HAB.—Upper Tenasserim.—Pl. March.

**18 D. pyrrhocarpa, Miq.**—An evergreen tree (50 fin +  
 + 6—8), glabrous, the leaf-buds appressed tawny « I ^u—TM +  
 g      py                      g      nd eEicallvSw  
 3-5 lin. long petiole! 4-6 in! hog1 \*^7 fi! \$ ^u \* \*T

oblong to elliptically obW - ' ? ? • • - - tawny-Pubescent; lea



st strong and conspicuous; flowers whitish, 4-merous the females  
solitary, on very short tawny-tomentose peduncles? calyx  
S!

oblong bell-shaped, about 3 lin. long, the lobes rounded and very short; corolla shortly saucer-shaped, tawny-tomentose, the tube somewhat longer than the *Myx*; ample, but hardly widened, the lobes about 2 lin. long, ovate > acute; stamens in males about 16, inserted on the torus, unequal ^filaments short; anthers linear, acuminate; ovary densely tawny-pubescent, in the males rudimentary; berries (unripe) depressed-globose, the size of a large cherry, densely and shortly rusty-tomentose, supported by the enlarged reddish tomentose 4- or 5-lobed calyx, the lobes of which appear ovate, bluntish acuminate and very coriaceous.

(?) Var. 2, **Andamanica**: leaves oblong to linear-oblong, the lateral nerves faint and numerous.

HAB.—Var. 2: rather rare in the tropical forests of the Andanians.—Fl. May.—B.—SS.=Metam. SiS.

19. **D. variegata**, Kz.—A tree (60—70 + 30—40 + 4—6), shedding leaves in H.S., all parts quite glabrous; bark about 2-3 lin. thick, roughish, blackish; cut red; leaves elliptically oblong or oblong, sometimes somewhat unequal at the base, on a thick 2-4 lin. long petiole, 5-8 in. long, acute to acuminate, entire, chartaceous or thin-coriaceous, glabrous, the nerves and the lax net-veination beneath prominent and conspicuous, in a dried state remaining green-coloured; flowers small, yellow, 4-merous, in bud about 4-5 lin. long, elongate, on very short bracteolate pedicels, by 3 or a few in short-peduncled, minutely puberulous, bracted cymes in the axils of the leaves, or arranged along the young often leafless shoots in a sort of spurious raceme; bracts broad, rather acute, puberulous; calyx puberulous, deeply 4-cleft, the lobes broadly oblong, blunt, about 2 lin. long; corolla-tube urceolate, a little longer than the calyx-lobes, the lobes ovate, acute, as long as the tube; stamens in the males about 16, unequal, inserted at the base of the corolla-tube; filaments short; anthers linear, cordate at the base, acuminate, glabrous; females and fruits unknown.

—Not unfrequent in the moister upper mixed and the tropical forests of Pegu and Martaban, up to 1,000 ft. elevation.—Fl. Apr.—1.—SS.=SiS. *Metam.*

REMAEKS.—Sapwood white, turning greyish, heavy, fibrous, but close-grained, soft.

20. **D. stricta**, Roxb.—A large tree, the trunk perfectly straight, the younger parts all softly pubescent; leaves ovate-lanceolate to ovate, on a 1-2 lin. long petiole, 1-2½ in. long, acuminate, membranous or almost chartaceous, along the midrib above and beneath all over pubescent, glossy above; flowers small, 4-merous, white, sessile, the males forming very small, few-flowered, appressed tawny-pubescent, bracted spikes, the females solitary on a very short 2-bracted peduncle or almost sessile in the axils of the leaves;

## 2. SILENE,

**tal or perennial** herbs, frequently viscous **in the upper parts**. Flowers solitary **or** eymose, **often** forming unilateral **or** terminal panicles. Calyx more or **tess inflated**, ovoid, eampanulate, **clavate** tubular, **5-toofehed** or **5-fid**, **generally 10-** (more rarely **20-** **o** nerved, 5 of the **n<** **dicating** the line of demarcation between the **ils**. Petals *o*; claw narrow; limb entire, 2-lid or rarely laeiuiate, .iKiiitly with 2 scales at the base. **Stamens** 10, Torus **ekmga** into a more or less stalked gynophore. Ovary 1-celled or septate at **the very base; ovules numerous?** styles usually .3 (rarely a). Capsule **dehiscing** at the apex by 6 (rarely 3) short- valves. Seeds **reniform**, laterally compressed, **tubercled**, with the hilura on the inner margin ; embryo **peripheric**, forming a semicircle or a complete circle. ....I Europe, N. and S. Africa, N. America, c.xtratropical **Asia; species** about 250.

**I. Silene noctiflora, Linn. Sp. PL (1758) p. 4J!>.** **Stem en** 1-2 ft. high, viscous-pubescent in the upper part, usually dichotomously **branched**. **Leaves:** the lower obovate-obiong; the upper narrowly lanceolate. Flowers ;, **in**, long, few, **in a** dichotomous cyme. (. ' ■ ■ hairy and viscous, cylindrie, **inflated, truncate at the base; teeth** long, **subulate**, half as long as **the** tube, **eliate**, the points diverging before the flower opens; nerves very broad, green on a whitish us branous **ground**. Petals white, tinged **with** rose **within** and with yellow **the** outside. **Styles 3.** **Gynophore** about. £ the length of the capsule. Capsules .f-1 in. long, **ovoid-conical**. Seeds globose-renifi convex **on the back, tubercled**. **Not inFl. B.I.; Boiss. Fl. Orient.** p. 583 ; Woodr. in Journ. Bomb. **Nat.** v. 11 (1897) p. 124 ; *Byrne\** Hot. v. 2, p. 66', t. 209.—Flowers ; Dec-**Jan.**

A weed of cultivation whi:<sup>Nb</sup> ((*ids Wo&drovi, I, e.*) is to be Hi'?' with in e« .t: ground about Poona.—DISTRIB, *Europe, Siberia, W. A - i* /as §

## 3. CERASTIUM, Linn.

103<sup>ft</sup>

**Herbs, usually pubescent or hirsute.** Leaves usually smaP\*\*  
|%'%  
or **pblo** :rely subulate. **Flowers** white, in terminal dic-<sup>!!</sup>  
**cymes.** **Sepals 5** (rarely 4). Petals as many  
(rarely 0)  
notched at **the a** **ora** entire. **Sfcameua 10, rarely 5**  
**Ovary 1-celled; ovules many; styles 5,** opposite the **sepals**  
**or 3).** Capsule eylindri **ic-ovoid**, often incurved, de  
**the** apex by twice as man ; here ar **bshoi<sup>l</sup>**  
or more mrely **recurved.** Seeds nu rown, **globos<**  
**sompresed, granulate or t a berci e d.** — Di STB IB. A :  
**!ions ; -** about 4

**I. Cerastium glomeratum, Thuill. Fhr, Par. ed. 2(1\*'**  
**Annual, 6-12 in. high,** the whole plant clothed with g[,;t. V  
simple **hairs.** Leaves **sessile** or nearly so, \-l by |-| in., 'V  
lower leaves **obovate-spathulate;** the upper elliptic-ova

acute, **becoming** gradually **smaller** upwards. **Flowers whit** }  
**in**, across, in corymbose **cymes**, which are at first capita\* open  
and **spreading** ; **pedicels** as long as the calyx, al

orbateotis. less than long; sepals hairy, lanceolate, very acute, their margins membranous. Petals about equal to tin -> a little lon:

third of the way down, more than twice as long as the sepals; Seeds yellowish-brown, minute, roundish-void, fuberculate. Sytne, Bng. Bot. v. 2, p. 82, t. 22L *Oerastium ium*, var. *glornentta*, Edgew, & Hook. f. in Fl. B. I. v. 1. p. 228 ; , Trim. M. Ceyl. v. 1, p. 85. *Oerastium i*, Woodr- in Journ. Bomb. Nat. v. 11 (1897) p. 124.—Flowers: Sept.

The only locality in the Bombay Presidency from which the plant has been introduced.—Bisri [hout the world,

#### 4. STELLARIA, Linn.

Annual or perennial herbs, usually diffusely branched. Flowers white, in terminal (rarely axillary), paniculate cymes, rarely subsolitary. Sepals 6 (very rarely 4). Petals as many, 2-partite or 2-fld, or 0. Stamens 10 (sometimes fewer), hypogynous or perigynous.

Disk annular or sometimes divided into prominent glands between the 8 stamens. Ovary 1-celled; ovules many (rarely 3); styles 3 (rarely 2-5).

Capsule short, globose, ovoid or oblong, splitting to below the middle into as many simple or 2-fid valves as there are styles. Seeds more or less laterally compressed, tubercled, granulate or nearly smooth; embryo annular.—DISTUB. All temperate and cold regions; ies 70.

**Stellaria media**, *Cynll Charm. O...* m. (1784) p. 36. A very annual; stems 3-20 in. long, much branched, procumbent, with fine hairs down one side. Leaves 1/2-1 in. long, usually glabrous; long-petioled ovate.; the upper sessile, elliptic or lanceolate.

White, numerous, in terminal dichotomous cymes; pedicels

Sepals lanceolate, subobtuse, hairy or glandular, margins I than the sepals or 0. Stamens 10, or often

lies ovoid, longer than the sepals. Seeds brown, acutely FL 8. 1. v. 1. p\*230; Boiss. I:1. Orient, v. 1, p. 707; 3yme, [y. 2, p. 93, t. 229 ; Woodr. in Journ. Bomb. Nat, v. 11 (1897) ! lict. Econ. Prod. v. (I, part 3, p. 358.

**Chickweed.** Has been found at Mabablesbwar (fide W\* introduced,

al glands. Ovary 1-celled;

#### >. ARENARIA, Linn.

perennial, often tufted herbs. Flowers white, very rarely terminal paniculate or capitate cymes, rarely axillary and subsolitary, sepals 5. Petals 5 (rarely 0), entire or slightly notched. (rarely 5 or 8), inserted on the disk. Disk annular or of

ovules many (rarely few);

tubular/ \*\*\$£% < hort, rarely exceed ils, with as many  
acute, y& \*k%oid valves as thei^e are styles ! or turgid",  
JP "tuberclcd ; embryo annular.—DJSTIIIU. All temperate and  
"•necies ISO,

**I. *Arenaria neelgherrensis*, Wight ,  
(1834) p.**

*Prodr,*

Annual; stems **procumbent, elongate, much-branched**; with an **alternate** line of **leaves on one side**. Leaves sessile, distant, **obovate or elliptic, mucronate, glabrous, dotted with whitish points**. **Flowers in terminal, few-flowered cymes or solitary axillary; pedicels long, slender, viscidly pubescent; bracts leafy.**

**Sepals**

**Ovate, very acute, with a strong dorsal hair} margins branous. Petals usually longer than the sepals. Styles usually 2 or 4. Capsules ovoid, about equalling compressed, transversely striate, Fl. B, I, v, 1, p. 239 ; Dalz. & Qi! p. 15 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 124.— Flowers: Feb.**

**Southern districts of the Presidency; not common. KANAKA : Yacotnbi N. Kanara), Woodrow, S.M. COVKTBT : Belgaam and Dharwar, pakeli if Cribsi**

**6, SPERGULA, Linn.**

Annual herbs, **with** forked or fascicled branches. Leaves opposite, often **with** abbreviated **leaf-buds** in their axils whence the foliage appears whorled; stipules **small, scarious. Flower** white, in **peduncled, paniced cymes**. Sepals 5. Petals 5? entire. Stamens 10 (rarely 5). Ovary 1-celled; ovules **many ; styles 5**, opposite the petals. Capsule 5-valved ; valves entire, opposite the suture. Seeds black, **compressed, margined or winged**; embryo annular.—DISTMB. Weeds of cultivation in temperate regions ; species 2 or 3.

1. ***Spergula arvensis*, Linn. Sp. Pl (1753) p. 440. Ar 6-18 in. high, pubescent or glandular; stems geniculate, branched the root. Leaves in false whorls, 14 in. long, linear-subulate terete, grooved beneath, rather fleshy. Flowers white, in terminal, sub umbelate cymes; pedicels slender, spreading. Sepals ovate, obtuse, slightly shorter than the petals, with membranous margins. Capsules longer than the sepals, 3-valved. Seeds tubercled, narrow 1 v margined. El. B. I, v. 1, p. 243 ; j-Orient, v. 1, p. 731 ; Syme, Eng. Bot. v. 2, p. 126, t; 253 ; Journ. Bomb. Nat. v. 11 (1897) p. 125; AVatt. Diet, Econ, B part 3, p. 320.**

**SIKD : Kirthar mountains, Woodrow.—DISTRICT, A weed of cultivation in temperate regions.**

**7. POLYCARPON, Linn.**

Diffuse or dichotomously branched glabrous or pubescent. Leaves flat, opposite or whorled ; stipules scarious. **Flowers** small, in crowded, **much-branched, terminal, bracteate** scarious. **Sepals 5, keeled, entire. Petals 5, small, entire notched. Stamens 3-5. Ovary 1-celled ; ovules many ; 1-3-fid. Capsule 3-valved, Seeds ovoid, not winged.—Dist. temperate and warm regions of both hemispheres ; species 0.**

1. ***Polycarpon Lefebvianum*, Benth. § Boob. l., Gen. PM p. 153, in note (Loeflingii) ; Edgew. § Hook. f. in Ft. A perennial herb; branches more or less pubescent!**

numerous, spreading from a centre, diffi  
ascendin

prostrate or

/ i 0.., 'j:;ji; ■  
usua j^

■ ■ are or ob

Flowers small, us numerous,  
!, either terminal or in the forks of the  
pubescent; bracts ovate, acut<

iip. Sepn<sup>1</sup>

fhe back,

'T than !he ". trun-

I ai the tules very thin, membranous, enclosed In  
idric, rough, pale brown. Trim. 7; Woodr. in Journ.

Bomb. Nat. v. 11. (1897) p. 125.

■ : ■ ■

iftbleshwar, I ! S. M.

COUNTRY :

, 11) i i > fCA.VAHA; VTaguli, j?&< \$\*eJ

### 8. POltYCARP^GA, Lamk.

or perennial herbs, usually erect. Leaves linear or  
rarely

n appearing whorled by the preseneii ■ ondar\$ axiHary

stipules scftrioiiB. Flowers in lax or contracted or capitate

cymes, often showy from the white, rosy or purple, sea nous sepals,  
rKmSjor rarely herbaceous and scarioua at (he margins only.

R< (ire. 2-toothed or with the margin ■. Stamens

5,

I ■ ignynous or subbvp ^uSj or cohering urith fche petals into  
a ring or tube. Ovary 1-celled ; ovules many; style e long at e; 3~gr oo ved,

3-fid or 3-denfate, Capsule 3-valved. Seeds obovoid or compressed ;  
curved, rarely almost straight.—DiSTiun, Io tropical or warm,

M ica] eonnh'fes ; upecies 24.

Rives lineiir..... 1 p<■.,

'Xycarp sea corymb osa, lam. Tab, Encyc. et Method, v. 2

|2d. An erect, annual herb, 6-1S in. high, sometimes woody

Botomously branched ; branches slender terete, the young ones

nt, |ii-n: in. long, oarrow-Jinear, mucronate;

lolate, very acute, L-nerved- Flowers Dumerous, small, in

jjch-branchfd, terminal cymes, forming flat-topped heads;

3^ -C" ' ibescent ; bra in. long, silvery white, brjstle-

pals la y acute, scarious, silvery-white or

^|.tcb the petals and capsule. Petals less than J

;K. Capsules very small, shinitg, brown. Fl, B. I.

wit 5; U'iirht. Icon. b. 712; Dak. & Gibs. p. 16; Trim. ]■!. (-evl.

in br';.. | Woodr. in Journ. Bomb. Nat. v. II (1897) p. 125; Watt,

f(>rm 11 \*i Prod. v. 6, part I, p. 314.—Flowers: Oct.-Ja11.

ni ore u S' '\$ ro ugh ■ Presideii i sy. Ko» KA»: /J.'h < // a ^ < ■.

cular T/ fwmr, Woodrow I-, Kohput, Coefe I S. M. : .

■ , J\_f i ^Dli!ir»'ui\*, Woodrow. Sam: Jemadar fca Landa, near Rurachi

corolla-1-  
tubular  
acute,  
A smaller plant, very much branched from a woody  
es hoary-tomentose. Flowers smaller, orange or brownish  
I. v. 1, p. 245; Wight, Ill. v. 2, t. 110. Polycarpæa

(1897) p .

COUNTRV : Badami, Woodrow', Cooke'.



2. *Polycarpaea spicata*, *Wight\* ex Arnott in Ann. Nat. Hist.* ser. I, v. 3 (1839) p. 91. A small slender glabrous herb, 2-4 in. high; branches numerous from the root, terete, filiform. Lea glaucous, ]-1 in. long, petioled, obovate-spathulate, very much attenuated at the base, mucronate; radical leaves rosulate; caulic 1-3 whorls between the root and the apex; stip acute, prolonged to a fine point. Flowers in fascicled spikes; the apex of the peduncles; peduncles filiform, 1 or more in a whorl; [bracts scarious. Sepals scarious, lanceolate, white, with colored, broad, herbaceous midrib. Petals very small, oblong, Q: about \ as long as sepals, Seeds smooth, shining, brown, 1/16". I. v. t, p, 246; Boiss. Fl. Orient, x. 1, p. 738; Woodr. in Journ. I Nat. v. 11 (1807) p. 125; Oliver, PI. Trop. Air. \* 1. p. 146.—Flowers: Nov.-Feb.

India and Kathiawar (Ghijai common. GUJAEAT: 3fangrol and Porbandar (Kathiawar coast), *Woodrowl* SISD: seashore, Karachi, *TalzeU* Tata district, *WboSrotol*; Landbi, near Karachi, *Cooke!*—DISTRIB, Abyssinia, Arabia. Egi

### OBBER XVJi. PORTULACACE^.

Herbs, rarely undershrubs, usually glabrous and more or less succulent. Leaves opposite or alternate, entire\*often fleshy; stipules scarious or lacerate, sometimes changed into hairs or 0. Inflorescence various, usually terminal; flowers regular, hermaphrodite. Sepals fewer than the petals, usually ~. free or adnate to the ovary at the base, entire\* imbricate. Petals 4-5, rarely more, hypogynous or perigynous. fr>fc, connate at the base, imbricate., entire, fugacious. Stamens 4-10 inserted with the petals and often adnate to them at the base; filaments filiform; anthers 2-celled, cells parallel, dehiscing longitudinally. " free or semi-inferior. 1-celled; ovules 2-many on basal funiculus central column, amphitropous; style 2-5-lu.l. branches longit,k stigmatose. Capsule membranous or crustaceous, circumscissile dehiscing by as many valves as there are styles. Seeds many or compressed; embryo curved round mealy albumen.—DISTRIB. American; genera 15; species 125.

Ovary half-adnate ..... 1. POR^  
Ovary free..... 2. TAL\_

#### 1. **PORTULAOA**, Linn. Diffuse or

ascending, fleshy herbs. Leaves alternate or SHIK<sup>u</sup>

stipules scarious or reduced to fascicles of hairs or scales (*nod / day's*) at the nodes, 0 or 1. Flowers terminal, solitary or clustered—rounded by a whorl of leaves, Sepals 2, united at the base and adnate to the ovary, the free part above deciduous. Petals 4-or a little united at the base, inserted on the top of the calyx just where it becomes free from the ovary. Slat<sup>11</sup> numerous, inserted at the base of the petals; filaments filiform. Ovary ovoid, semi-inferior, 1-celled; ovules numerous, deeply 3-8-fid. Capsule membranous, semi-inferior^; circumscissile. Seeds numerous, eojnpreaapH v^p

and often granule )ryo peripheries—I) i ss R I B. Chiefly  
tropical

..... 1, I', ofara  
..... 2, P, WiohtitHKi,

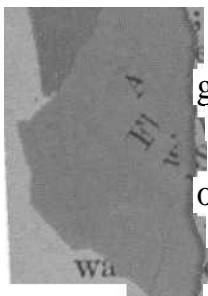
I ea wood?

1. **Portulaca oleracea**, Z/m#. *Sp. Pl.* (1753) p. 445, AD annual succulent prostrate herb; stems 0-12 in, long, reddish, swollen at lljt, uite glabrous. Leaves fleshy, subsessile, |~3 in. long, sutopposite, cuneiform, rounded and truncate at tie apex, spangled uJien fresh with glistening dots, margins reddish; stipules (oi: nodal appendages) 0, Flowers few together, in sessile ininal heads. Sepals unequal, obtuse. Petals 5, obovate, yet low. Stamens 8-12, Style 3-8- (often 5~) partite. Capsules ovoid, cir-

Seeds numerous, black, concentrically striate and granulate. j'l. B.I.Y. 1, 'p. 246; Grab. Cat. j Dalz. & Gibs. p. 15; Boiss. Fl. Orient, v. 1, p. 757; Sprague & HI. Gen, IT. Amer. v. 1. t 99; Trim. Fl. Ceyl. v. I, p. 80; Woodr. in Joura. Bomb. Nat. v. 11 (1897) p. 125; Watt, Diet. Econ. Prod, v. 0, part 1, p.,829.—Flowers; Oct.-Dec. *The Purslane*, *Ymiy. Ghol.*

VM1)i Very common throughout the Presidency from Sind to Kanara, as a weed in . and cultivated ground. The leaves are used Hindus, A full account of <ris a potherb by the native^ eds ae ;i doi ■ remedy by l Hid fl l f hi ;iy be found in Watt's Diet-. Econ. Pi'ud.

**SPortulaca Waghtiana**, *Wall Cat.* (1828) 6845. A small branched prostrate herb, 2-4 in.; stems stout. isting of a ||r of short, angled, g us, easily separable joints about ^in. aves alternate. —■/ in. long, ovate, scute, fleshy, easily de- stipules (or nodal appendages) in a whorl of iO out H, seurious, , very acute, persistent, silvery-white, aa long as and alm< g the leaves. Flowers terminal, sessile, solitary, surrounded olue.ro of ileshy leaves and J r of thread-like silvery opals broadly oblong-ellipfie. row it the apex, membranous. longer than llie sepals, united to them at the base and corning :bem and the lid of the capsule. Stamens 8 : anthers yellow. to j its length. Heeds numerous, reniform, brown, granulate. v. 1, p. 247; W. & A. Prodi<sup>1</sup>, p. 35G; Trim. form iii s 11. Ceyl. v. 1, foodr, in Journ. Bomb. Nat. v. J1 (1897) p. 125.—Flowers :



ir, puwnd in the southern districts of the Presidency. 8, M. C.-I-STIU-; Batlami, lit to ix<sup>idrow:</sup> > Ij0II(t1' Woodnm| Belgaum, WocdrvM-1) run. Ceylon, corolla-tuitulaca quadrifida, *Linn, Mant*, (1707) p. 73. A small tubular aniuaj as filiform, glabrous, rooting at the nodes. Leaves greiesby, ,; \ in. long, ovate, acute; stipules (or nodal appen-3g of

**Bl**very hairs ; **peti**<>**les** s!iort. Mowers **terminal**, soJitary, .surrounded **by**  
**silvery** hairs and **an involucre** of 4 leaves! . **rounded** at the apex.  
Petals 4, yellow, **oblong\*** - **slendei'**, **4-fid to** near the middle. Capsules

CEJE.

XVII. POB.TTTLAOA.CEJE.

or pendulous branch.

**jonieal.** Seeds **minutely** tubercled. **Fl. B. I.**, v. 1, p. 81', Dalz. & Gibs. p. 15; **Wight** t. 111. v. 2, t. 109; **Bois** 31's **Fl. B. I.** v. 1, p. 757; **Trim. FL Ceyl.** v. 1, p. 90; **Woodr. in Journ. Bot. Soc. Lond.** v. 11 (1897) p. 125: **Watt. Diet. Boon.** Prod, v, 6, part; 1, p. 125.

**Flowers : Nov.**

A common weed. **DBC< WT: PI** ,. ! 8.&C,I **Badami**, CW/r!; \*'ni  
**Dharwar, W>** **Padshapur**, **STKD: Kara** \*

**4. Portulaca tuberosa**, #<>#&. **HortBrng.** (1814) p. 91. A perennial succulent herb; root thick, fusiform; branches **numerous**, prostrate, glabrous, 2-4 in. long. Leaves alternate, 1-2 in. long, fleshy, linear-oblong, obtuse or acute; **stipules** (or nodal appendages) a ring of long brownish hair\*, flowers terminal, solitary, sessile, surrounded by a ring of brownish hairs and an involucre of 6-8 long leaves. Petals 5, yellow. Stamens 20 or more. Style filiform, 5-cleft at the apex.

Capsules uvoid. with a short conical top, smooth, and polished. Seeds black, granulate. **Fl. B. I.** v. 1, p. 247; **W & A. Prodr.** p. 356; **Trim. Fl. Ceyl.** v. 1, p. 90; **Boiss. Fl. Orient.** v. 1, p. 757; **Woodr. in Journ. Bomb. Nat.** v. II (1807) p. 125; **Watt, Diet\* Ecoa.** Prod. v. 6, part 1, p. 331.—Flowers: Aug. **VJBEK. Janyli-fjdjar**,

Snrp: **Jemadarita** Landu, near **Karachi, Stocks** !; **Malir**, river-bunks (near Karachi), **Wood-row**,—**Dfsth** (u. Ceylon).

**5. Portulaca suffruticosa**, **Wight, in Wall. Oat.** (1828) 0842. **Suffruticose**, about 1 ft. high; root woody, much divided; branches **numerous**, short, terete, glabrous, ascending. Leaves alternate, 1-2 in. long, terete, or elliptic in section, acute; stipules (or nodal appendages) a few, short, brownish hairs. Flowers large, sessile, surrounded

ring of brownish hairs and an involucre of 0-8 leaves. Stamens \* **cjiver** 16. Seeds minute, black, tubercled. **Fl. B. I.** v. 1, p. 247; **W & A. Prodr.** p. 356; **Trim. Fl. Ceyl.** v. 1, p. 90; **Woodr. in Journ. Nat.** v. II (1897) p. 125.—Flowers: Nov.

A rare plant **GUJARAT: Ahuiedabad, Woodrow**,—**BISTBIB, Ceylon.** §

## 2. **talinum**, Adans.

£S

Succulent glabrous herbs or shrubs. Leaves alternate or subopposite; stipules 0. Flowers terminal, racemed or paniced, rarely 3 Sepals 2, herbaceous, ovate, deciduous or rarely subsistent. at^'bivK^ hypogynous. Stamens 5-many, hypogynous or adhering to the petals. Ovary free; ovules many; sigmoid or 3-farrows \* - ; P. Cap. Fibrous or ovoid, papery or thinly crustaceous, 2-3-valved. Seeds subglobose or reniform; strophilate; testa shining; embryo peripheric.—**DISTEIB. Tropical** and warm regions of the world: species 11, chiefly **American**.

**1. Talinum cuneifolium**, **Wald. Sjp. Pl.** v. 2 (1709) p. 864 & glabrous shrub, attaining a height of several feet, with erect rod-like branches. Leaves 1-2 by 1 in., fleshy, obovate, attenuated into the petiole, entire or emarginate. i) y ■ v; ' - Jys. Ait **Flowers** terminal panicles. **Feb.-M** 11 ^;

'><-»':>ni<. **Sepals**

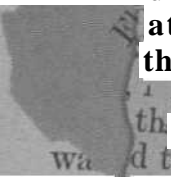
L> and shining 3-fid. < ise, glabrous, about  
 tropical | p...a\_ g, snifonn, compressed, concentrically strii  
 247; Oliver, Fl. Trop. p. f~>0: Woodr. in  
 Bomb! Nat. v. "H (1897) p, 125. "'■ W. &  
 A.  
 p. 356 : Dalz. & Gibs. Suppl. p. 39.—Flow< v.  
 irts in th : Singhad, ^ ; Purandhar,  
 •ica. "

EB A V i i l . TAMABICACE2E.

Shrubs or small trees. Lea> small, often scale-like, quite  
 ihy ; stipules 0. Flowers terminal or axillary, solitary.  
 or arranged in spit-ate- or paniculate racemes, regular, usually herma  
 phrodite. Sepals 5, rarely 4, connate at the base, much  
 imbricate.  
 ?; many as the sepals, inserted beneath a disk, imbricate, free or  
 nnited at the base into a tube. Disk hypogynous or slightly  
 perigynous,  
 landular, erenate or angled, obsolete. Stamens  
 5-many,  
 A ou the disc, free or variously united at the base; anthers  
 £}-celled, versatile, usually apiculate. Ovary free, 1-celled or  
 imperfectly  
 Septate; placentas &-6 ; ovules 2-many on each placenta, anatropous;  
 be ventral ; tnicropyle inferior; styles 3-5. Capsule dehiscent, with  
 many valves as there are styles^ Seeds plumed or winged,  
 albuminous or not; embryo straight; cotyledons flat; radicle inferior,  
 trt.—DISTBIB. Temperate and warm regions oE the N. hemisphere  
 \'- iu S. Africa, often iu maritime or sandy places ; genera 5 ; species  
 I It 40.

1. TAMARIX, Linn.

ir small trees. Leaves minute, scale-like, amplexicaul or ng.  
 Flowers white or rosy, spicate or densely racemose. Sepals Bwly 6).  
 free. Petals inserted beneath a glandular-crenaie, angled or slightly  
 connal s at the base. Stamens 5-10 t|ffor 11-12), inserted on the  
 disk, free, or scarcely connate at into a ring. Ovary  
 attenuated at the apex; ovules many; (rarely 2-5), short,  
 thick ; placentas very short, basal. Cap-'Clved. Seeds  
 many, small, glabrous, produced at the apex plume, the  
 axis of £ which La setiforra atid feathered with ; albumen 0/  
 embryo ovoid-oblong.— DISTSIB. S. Europe, in b^ v,,t  
 Central and tropical Asia, usually near the coast; species



Stamens T>.

- plo tal, in racemose paniclea ..... i. T. gallica.
- Flowers l-scxvial, in close cylmdrical Bpikea ..... 2. T. dioica,
- iuol, in usually interrupted spikes ..... '6. !' ar-
- 10.
- <;;uKls of Uic disk aepa llamenta; axis of plume
- acute, ■ ..... 4- T.ericoides
- .,, n(>' the disk passing into the bases of the EUamente;

o "^^^luBaa tiort ..... 5. J\ *strkta*,  
■ *surround*  
obl ! V<sup>I1</sup>; (is' .- *PI* (1753) p. 270; *vxa. inc*

A shrub or small tree, **with** slender erect or **pendulous** branches,  
 Leaves  $1\frac{1}{2}$  in. long, subulate-acute from a **triangular semi-amplexical**  
**base**, at first imbricate, **^litt** or **wards distant**. **Flowers**  
**hermaphrodite**;  
**numerous, crowded, in** slender **lateral** and terminal **panicle** spike  
**raa pedicels short**; bracts very acute, immediately **beneath**  
 flowers. Sepals 5, much shorter **than** the petals,  
**triangular-ovate**  
**margins** minutely denticulate. Petals oblong, rounded **and**  
 often  
 notched at the top, pink. **Disk 5-lobed**; lobes entire or nearly  
 so.  
 Stamens 5, inserted at **the margins** of the middle of the lobes **of** the  
 disk. **Ovary bottle-shaped**, trigonous, truncate at top; **styles**  
 connate to **the** ovary. Capsules about  $\frac{1}{2}$  in. long, conical,  
**somewhat**  
 trigonous, **tapering**, pale **pink**, glabrous. Seeds **with a** plume of **white**  
 hairs. Fl. B. I. v. 1, p. 218. *Tamarix gallica*, W. & A. Prodr. p.  
 40 ;  
 Grab. Cat. p. 11 ; Trim. FL Ceyl v. 1, p. 91 ; **Talb.** Trees/Bomb. p. 14 ;  
 Woodr. in Journ. Bomb. Nat., v. 11 (1897) p. 12-3; Watt, Diet. Econ. **£J**  
 v. 6, part 3, p. 411.—Flowers: Dec-Mar. *Vmx, Jhw : Lai.*  
 Abundant on the banks of the **Indus** throughout **Sind**. **SIKP; W**  
*Cooke'*

2. *Tamarix dioica*, *JRosoh. ffort. Beng.* (1814) p. 22. **A**  
 small  
 dioecious tree **with a** short trunk; branches **spreading with** **at**  
 extremities. Leaves sheathing, **glabrous**, obliquely **trist**  
**acuminate**. Flowers  $\frac{1}{2}$  in. in diam., in dense **peduncled spikes**,  $1\frac{1}{2}$   
 in.  
**long**, forming drooping, **terminal** panicles; peduncles about **equalling**  
**the spikes**; bracts lanceolate, acuminate, **with** membranous  
 margins,  
 persistent. Sepals about half **as long as** the petals, elliptic-obovate  
 and  
**with a strong** midrib, margins membranous. Petals **elliptic-oblong**,  
**pink**.  
 Stamens 5, inserted in the notches of the minute 5-lobed **disk** (in *the*  
 female **flowers** reduced to short filaments usually **without**  
**anther**).  
 filaments **ligulate**. Styles  $\frac{1}{2}$  as long as the ovary; **stigmas** **connate**  
 truncate. Fl. B. I. v. 1, p. 249; Orak. Cat. p. 11'; Boiss. *Kl. ty* v.  
 v. 1, p. 777 ; **Talb.** Trees, Bomb. p. 14 ; Woodr., **in Journ. Bo'** v.  
 v. 13 (1897) p. 125; "Watt, Diet. Econ. Prod. v. 6, part 3, p. 411"  
**Flowers:** Nov. **YEKST. Jhdu; Ldl Jkdu ; Oaz.** **W**

Beds of rivers **throughout the Presidency, common**, in **the**  
 the Indus. Beds of **Kcmkan and Deccan rivers**, in **the**  
 b.:n; lvs of the **Nerbudda**, **Woodrowl** **SIND:**  
 istan, Assam, Birraa.

3. *Tamarix articulata*, *Vahl, Symb.* v. 2 (1791) p. 48.  
 shrub or small tree, reaching 20 ft. high ; **the** slender **ultimate** branch  
**hoary with a** saline efflorescence from **the impressed**, punctate **leaves**;  
 Leaves reduced to a short **sheath**, **the free** **to** a small **tri-**  
 tooth. Flowers hermaphrodite, in slender, usually interrupted spike  
 bracts sheathing, acute, shorter than the **flowers**. **Sepals 5,**

**broadly elliptic**, much **shorter** than the **petals**, entire or minutely toothed. **P** < **oblong**, conniving at the top. Stamens 5 ; **filaments** filiform, inserted **in alternate** notches of the **10-lobed** disk. **Capsules** trigonous, rounded at tip ; styles 3, about half the length of the ovary ; stigmas ovoid. Fl. <sup>^</sup> v. i, p. *M*); Oliver, FL Trop. AIV. y. **1**, p. **151**; **Boiss. FL Orient**, v. ! <sup>v</sup> Talb. Trees, Bomb. p. 14 ; Watt, Diet. **Econ.** Prodr, >, ■'-

Upper and **middle Sind eastwards.**  
**Algeria, \*T-M** 9 **Airiea**  
 s of taiji-

Siv- r<sup>c10</sup>^f

ST<sup>18</sup>,



**Tamarix ericoides, Botil.**

*Sehr.*

v, I shrub with dark crad irk, .!.

minute, scale-like, ovate-1 : pun^giate. Flowers

handsome, \ in. in diam. in terminal Licels very short; bracts mem-  
1011

white -ed, slightly unequal, the sepals, with minutely ily long and short, not ex-  
ie petals ; glands of the disk separating the filaments. Styles  
3, short, dilated at the apea ellipsoid. Capsules dull yellowish-  
Planie of the seeds with a very long axis, feathered with dirty  
white hairs. Ft B, I. v. 1, p. 249; Niedenau, in Eugl. & Prantt  
art 6, fig. 134, o-Q; Talb. Trees. Bomb. p. 14 ; Woodr.  
m Joura. Bomb. Nat. v. II (1897) p. 125; Walt, Did.: Eeon. Prod,  
V. 6, part S, p. 411 IMekaunu erieoides, W. & A. Prodr. p. 40;  
Grab.  
Cat. p. I ; Dalz. & Gibs. p. L4; 0 in Jaeqaem. Voy. Bot. p. 58,

'.' : ^ov.-Jiin. Vsmr. Jhdu: Sarub;  
KddsUrni.

Eonkan and ], ■  
of the] aimernear

< - KANAKA. K&la naddi, near Sulgeri (H. Eanara), r<^-/! Six,, - Owfe

."), Tamarix stricta, J5oi>s. />iVf:/, ser, 2 (1860) Ease. 2, p. i37.

Glaucous, glabrous. .Leaves closely sheathing, very narrow, shortly and abruptly mucronulate. Flowers subsessile, in slender, paniced spikes or racemes; bracts broadly triangular-ovate, eucullate, acuminate, shorter tn the flowers. Sepals obloog-obovate, rounded and minutely denticulate. Petals oblong-elliptic, obtuse, minutely toothed at the apex, a Hh longer than fcli tls. Stamens 10. Disk 10-lobed, the lobes  
^^^ig into the slightly dilated bases oi: the f Mam eats. Stigmas 3, sub-  
n i is short, conical, dull white. Fl. B. I. v. 1, p,

XIX.

quatic or t ba or undershms. Le  
"ftorled, entire or serrate; stipules twin. Flowers  
w3fi?, reguiar, axillary.solifcary or \*■ ■ gtjs us many,  
hypogynous, imbr jmber to the p ersatile, 2-celied, the  
ina<sub>r</sub>y i)als> ovuly<sup>s</sup> ^merous, on the inner ani  
the celk horizontal or Bubascendmg, anat^pous; raphe iS  
O  
tbe cells, distinct from tWhl -  
p.ul^tiidl  
^ ^ ^ ' ^

^ Cnp.ul^epticidal:

^ o ^  
more or

le,^ifZs  
^;;,

d; **mphe** on **the** concave side; testa

**Style**

**i'h'**(t<sup>01'</sup> v<sup>ery</sup> thitl; **embryo conform to**

rt lhft\_>i' **im.~Distiim3:hrough-**

1. **BERGIA**, Linn.

Herbs or **undershrubs**, erect, decumbent or diffusely branched, often pubescent. **Leaves** opposi rate or sometimes entire. Flowers small, **axillary**, solitary or **cymoselj? fascicled**, usually 5-merous. Sepals acute with an **herbaceous** midrib, the margins usually membranous. Ovary ovoid. Capsule subcrustaeons, **septicidal**,—**DisiaiB**. "Warm countries **throughout** the world ; species about 14.

- Terrestrial woody plant; stamens 10 ..... 1. *B. odorata*.
- Semi-aquatic **plants**.
- Stamena 5 ..... 2. *B. tunmannioides*.
- Stamens 10 ..... y. J>\ cagu nsis,

1. *Bergia odorata*, *Edgew. in Journ. Asiai. Soe. Beng.* v. 7 (1S38) p. 765. Shrubby, **6-24 in.**, **decumbent** or spreading, glandular-pubescent; the bark deciduous iu **cinnamon-colored** flakes. Leaves **sessile**, often fascicled **in** the axils. /,, < in. **long**, from **oblotig-lanceolate** to elliptic, **obtuse**, **crenafce-serrate**, **hispid** and often **glandular on both side?**, often **with** re volute margins ; stipules **linear**. **Flowers** solitary or **in** axillary fascicles of **2 to 6 or 8**; **pedicels** about as long as **the sepals**. Sepals ovate, **acute**, hairv **without** and on the margins. Petals obovate-oblong, **entire**. **Stamens 10**, **alternately** shorter or nearly equal; filaments dilated below. **Ovary** ovoid, silicate, narrowed **into the styles**; styles 5, one **half** the length of the ovary. Capsules 5-ceiled. Seeds minute, nnumerous, slightly curved, dark brown, shining. Pl. B, I. v. 1, p. 251; \\'oodr, in Journ. Bomb. Nat. v. 11 (1897) p. 125. *Bergia ceslivosa*, Woodr. in Journ. Bomb. Nat. v. 11 (1807) p. 125. *Elatine odorata*, Dalz. & Gibs. p. 14. *Bergia suffmticosa*, Fenzl, in Benks. Bot. Gesel. liegens. v. 8 (1841) p. 183; Boiss.' Fl. Orient, v. 1, p. 783 ; Oliver, FL Trop. Afr. v. i, p. 153 ; Niedenzu, in Eugl. & Prantl, PHauzenf. v " part 6, iig. 130, A-J.—Flowers: Oct.-Nov. ( The leaves vary much in size ; while usually **J^j** in. long, they/ sionally reach nearly 1 in. I have noticed these large leaves m spe from Baroda as also iu some from Senegal.

**g**

Common iii Gujarat and Sind. GITJAIHAT ; Surat, *Dalzcell*\\ Baroda, J Porbandar, *Cooke* \ SrKi>: Sibt, *Woodrow*; Jemadar fca Lancia, near Karachi" Hyderabad, *Coohe I*—**BISTKIB**. Trop. Africa, **Persia**, Egypt.

2. *Bergia ammannioides*, *Boxb. HoH. Beng.* (1814) p. 34. **6-15 in.** high, erect, often with many **decumbent branches** from tf,<sup>1"</sup> stem and branches glandular, pubescent. Leaves j—

ceolate or emptic, acute, tapering to a long base or into the peti sharply serrulate, thinly hispid or glabrescent ; stipules subulat Flowers minute, crowded in dense axillary fascicles, sessile, celled.

**Sepals 5**, **linear-lanceolafce**, wry acute, with ciliate, margins. **Petals 5**, very **thin**, elliptic- **acute**. Ovary **si4o**; **suleate** ; styles 5, short. Capsules sul o, the margins of tc\* ± j incurved. Seeds numerous, minute, ovoid, polished. **FJur p. 251 ; Dalz, & Gibs. p. 14; Boiss. FJ. Orient, v. ^ ,o'-> ' Fl. Trop. Air. v. 1. p. )o2 (exclud. citation) ; Won-<sup>1</sup> > Nat, v. 11 (1.897) p. 125. *Elatine ammannoid#* Grah. Cat. p. 12.—**Floweff,^** ..**

On (I.

\. **Bergia capensis** *itiss.* (1773) p. 241. \ glabrous  
 h the ;!  
 uit herb, |-1 ft. in., elliptic-lancei  
 joints, f^eaves l : siipules  
 l-lf i ■ sessile or subs\* pub 5, few or  
 Libobtuse la aciimin s  
 p 5, broad,  
 .jig. Stamens 10, Capsules globos  
 ; i; 11 f ■. Styles short. Seeds minute, cy I i adric, stigtJ y c u rved an  
 d  
 reraely ru n. *Bergia vertieillata*, Willd, Sp.  
 1\*1,

(1799) v. 2, p. 770; I'!. B. I. v. 1, p; 252; Bah. & Gibs. p. 14 ; Oliver,  
 Fl. Trop. AiV. v. L, p. 152; Woodr. in Journ. Bomb. IS'at. v. 1.3 (1807)  
 p. 125, *Wlutine verticillata*, W. & A. Prodr. p. 41; Gnih. Cat. p. 32.  
*Bergia aqiwtica*, Roxb. Corom. PI. v. 2, p, 22, t.  
 •Fhnvoi's : Get i-12: Boiaa. Fl, Orient,

t:iti]<H and in

inr.iv-jj: I nkan aiul Deccan. ECOKKAK ; Dasgj  
 :".- -Disi BIB, 3?rop, Africa, I

OBDEB XX. HYPEKICACE^.

Elerbs or shrubs, rar es opposite (rarely verticillate),  
 oil- Ldular-dotted, ■■ hed, exstipulate. Flowers  
 henna-  
 phrodite, regular, solitary or cymose, terminal (rarely axillary). Sepals  
 and petals 5 (mre!\ abricate. Sfcameoa usually indefinite,  
 usually in bundles of 3 or 5, rarely free or all connate; ant hers versatile.  
 Ovary of 3-5 ea 1- or •"> 5-eelled; ovules few or numerous on  
 parietal or arileplac ; raphe lateral or ior; styles  
 as many as the carpels, filiform, free or rarely united. Fruit capsular  
 or baccate. Seeda straig]11 or variously curved, exari 1 late; embryoq  
 straight urved.—UISTBIB. Temperate and warm regions; species 210.

1. HYPERICUM, Linn.

:,il or shrubs. Leaves usually sessile. Flow  
 litary, oymose or paniculate. Sepals 5. 5, not hairy  
 Stamens free or connate at i e into 3-8 bun tiles.

Ovary  
 with 3-5 more or less p] rietal pla or inJper-  
 c perfectly 3-6»ceI] distinct

tiii e< I). Capsule septicidai or deh i s e ing at the placent as ; s  
 adhering to the axis or the margins of the mlves. Seeds not  
 embryo straight (rarely curved), oblong or cylindric ; cotyledons  
 s;han the radicle, sometimes very short.—DISTEUS. In temperate  
 am "i'hietly ol: the N. hemisphere, and in mountains in the  
 tropics ;

cells i  
%hvx:

;• -'cum mysorensis, Wall. Cat. (1828) i808  
(B ■ a^h-branched, glabrous shrub, 4-8 ft. high ; very  
young oblong; V".an^'d' leaves numerous, decussate,  
1-11 by

y^mnuvr ^-jir, , , ■ n ■ -----

nnffiiis's original name (!. capen-  
1 that the -' ot a

|—| **in.**, **oblong-lanceolate**, acute, entire, **glabrous**, with **pellucid** stria?, **tapering** to an **araplexicaul base** with very small auricles. **Flowers bright golden-yellow**, 2-2-| in. across, in **terminal 1-3-flowered** cymes; pedicels short. Sepals J, in. long, oblong-ovate, acute persistent. Petals I-1- in. long, elliptic-oblong, very oblique, **fcvvice** as long as the stamens. Staoiens very numerous, in 5 groups, spreading. Ovary 5-lobed, tapering into 5 Jui.g. persistent^ styles ; ovules numerous on 5 axile placentas ; styles longer than the ovary. Capsules \ in. long; valves 5, with long beaks. Seeds cylindrical. EL B. I. v. I, p. **253** ; Trim. **Fl.** Ceyl. v. 1, p. 93. *Norysea mysorensis*, Wight. Icon. t. 56,—Flowers all the year.

On hills in the **Koakan**; rare, **KoifK v s : Stocks!**

**2. Hypericura japonicum, Thunb. Ft. Jap.** (1784) p. **295**, t. 31. An annual herb, erect or **procumbent**; stein **6-12** in. long, 4-angled, **dichotomously** branched **above**. Leaves £~| by \-~fe **in.**, **amplexicaul**; elliptic or ovate, obtuse at both ends, pellucido-punctate. **Flowers** £-| **in.** across in elongate diehotomous cymes; pedicels | **in.** long; bracts linear-lanceolate. Sepals lanceolate, acute, entire, persistent, pellueido-punctate at the margin. Petals **yellow**, as long as the **sepals**; persistent. **Stamens** not very **numerous**; **filaments slightly connate** at the base. Ovary 1.-celled, with 3 parietal placentas ; styles 3 (rarely 4), one third the length of the ovary. Capsules ovoid, **equalling** the persistent sepals, 3-valved. Seeds oblong, ribbed. Fl. B. I. v. 1. p. ^50 ; Trim. **Fl.** Ceyl. v. 1. p. 93.—"Flowers all the year.

Rare. S. M.. **OOHTEX : Caatlerock, G-ammie.**—DISTRIB, Japan, China, **Java**, Australia, New Zealand.

**OBDBB XXI. GrUTTIFER^.**

\*allj  
siuo

Trees or shrubs, abounding **in** yellow or greenish juiee.  
See

opposite, coriaceous or membranous, **often** decussate, rarely *jswd* usually exstipulate. Flowers axillary or terminal, **solitary**, J.<sup>T</sup>J subracemose or paucled, **regular, dicecious**, polygamous or henna; **Sepals 2-6, imbricate.** Petals 2-6 (**rarely** more or <)), 1 ^ usual in much imbricate or contorted. **R I i n e F U w F a s : S f e a**

y ^  
**indefinite**, hypogynous; iilaments free or rarely **connate, monacf^o?** or in as many bundles as there are petals; anthers various.  
**FLOWBES:** Staurinodes various. Ovary **2-many-** or (rarely) ovules **1-many**, axile or erect from the base oE the cavity ; stj, \_

many as the cells of the ovary, free or connate, sometimes peltate.]  
 sessile, **subsessile** or with a more or less elongate style. **Fru<sup>na</sup>**  
 baccate, indurated, with a fleshy or pulpy pericarp, **Seeja<sup>^</sup>**  
 albumen 0 ; embryo with a large radicle (*tigeUus*) with small G],  
 cotyledons, or of thick consolidated or free cotyledons and \ ;■.  
 inferior radicle.—**DISTIB**, Throughout the tropics, chiefly in  
 and Asia, rare in Africa ; species 250.

Stigma sessile or subsessile; embryo of a solid tigellus with min<sup>ll/1</sup>UKsr \* ■  
 cotyledons or 0. -OicvJ

-«STJ

**Uaiyx** of 4 or 5 sepals..... iA<sup>r</sup>

Calyx closed in bud, fcstJgjjF'VijkV\* 'alye9 ....

; OAHOPHTW,OK 3. 4. MasPA.

1. GARCINIA, Lii

with yellow juice. J- tsually coriaceous. Flowers
gatnous, solitary, fascicled or panieled, axilStry or terminal. Sepals
.-. Petals 4-5, imb J'IAMVKRS ; Stamens many, free or
or -1-lobed mass, or tetradelphous around a risdi-
tmentar tasile or on short filaments, 2-eeiled, dehiscing
y 4-celled, or peltate and dehiscing by a circular
imsctss). 'VTMALI: or tuniytxninoium FIXJWERS: Stauimodes
variously united. Ovary 2-12-celled; ovule solit;= ■■{;

laterally affixed ; stigma sessile o roadly peltate, entire or
[itely iobsd, smooth or tuhereled. Berry with a coriaceous rind. a
pulpy aril j embryo a solid homogeneous mass (thjdhis) without
obvious cotyledons.—DISTIUB. Tropics of the Old World; 50,

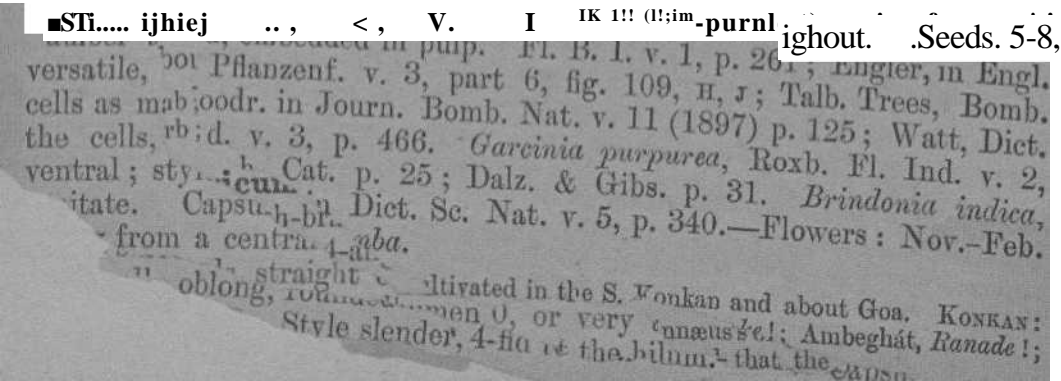
Fruit exceeding 1 in. in tlianj.
Frail, globose, noi I..... I, /, ; :-
Pruit tffoid, 7- -S-grooved ..... 2, G, Catntwgia.

Fruit no i'i di-itN.
y, slightly 4'ldbed ..... y, G. M&relfa.
Howors . ■■■IS
Pru yclli.iw ..... 4, <}, Xam
l.-'fiiit small, green ..... g, (,)

Garcinia indica, Choins. in DC. Ptochr. v. I (1824) p. 561. A

JJ"2ii \* L(:avA -i-;!; 5)J vl \ iQ/s lvtl mi |i:i young, oblougJanceolate,
;it ..■ uis wfith entire, repand margins ; petiole n. long, Flowers
i^rved> or terminal, solitary or in sj>reading fascicles ; pedicels gradually
d upwards, 1 ■.! in. Jn :-like, deciduou- als
ttd fchich ami laller, oblong-ovate;
1 vrr ger oboVate-orbicular. P< tals L thick, a KttJ ; -r than the
'MALE FLOW a i in axillary and terminal ■

ea, the
'TK<sup>101</sup> (bf the tei'tninaf fascicled carried oi
} I > ^amente : 11^1111. P101
d, solitary or 2 ; 1 1 ^ ! ' : PIO efl uot peduncled.
tuHjgg jH :j bundles, arranged crosswise each bundl
inod i



a~^ Sberoua, on a short column ; an no u.^.;



Bombay G!< ■ ': ravines at Khandaln  
 foreai ear YeJlapur (-N, Kan  
 The fruit is eaten and used lor mating syrup. A COM  
 named I ■ ised for bealtng chaps and

■own in the soul i  
 theBatnagii unnwirde of 13,000 ti  
 ouldtivalion. It wss Ichno<sup>1</sup> ■ ■ llie jiau  
 hence the IIOB 5 to i4 bj llioiiar?, A considembi  
 n by (!;• ill account of the modi  
 the seeds; will be found in Witt's Die! of Economic Product  
 pp. 467-470.

2. *Garcinia Cambogia, Besrous. in Lamfo Encyc. v. 3*  
 (17

p. 701. A moderate-sized (ree with round bead, drooping  
 branches^  
 and rough, dark-brown bark ; young sbouts glabrous. Leaves 2~h  
 b)

^-2 in., elliptic-lanceolate, acute or slightly acuminate, glabrous^ nerves  
 oblique ; petioJ | in. long, stout. MAIJB FLOWERS in the axils  
 of

fallen leaves, 3 or 4 together; pedicels thickened upwards, variable in  
 leng'h. I^epals thick and fleshy, with membranous margins;  
 outer sepals \ in. long, shorter than the'inner, orbicular; inner  
 elliptic-oblong. Petals more than twice as long as the sepals,  
 obovate-oblon concave, with narrowly membranous margins.

Stamens numerous on a gh or 1; t.fi ick andropho re, monadelphbus, forming  
 a globular head. J^E\i ■ or HBBMAPH. FLOWBJia larger than the male, in  
 terminal and axilla]

cicles of t-3. Sepals and petals as in the male. Stamihodea LO  
 unequal, in a ring round fche ovary, free or connate at the ba.se.

Ovarj globular, grebved; stigma 5-IS-rayed, tubercled. Fruit  
 iM-3 in. diam., yellow or reddish, more or Less globular, with 7-13  
 (tisnalh deep, vertical furrows, not continued to the apes which

is sm< depressed, and often mammflat< rfcarp very thick, fleshy.  
 ■ many as the grooves of the fruit, \ in. long, ovoid, <■ rounded by  
 a white tit- red aril; tesla pale-brown, veined. Fl, v. 1. p. 261 ;

Lanessan, Mem. Garcin. [Tr. Bot. (1872)] j;. 3d ; Fl. For. Coehinch.  
 t. 83, H ; Trim, Fl. Ceyl. v. 1, p. 95; Tal Bomb, J). 1 r>; Waft, Diet,  
 Bcou. Prod. v. 3, p. 404.—Flowers: .1; Upagi-tfiara.

On the Southern KOSKAS: <Sf«?As!, ZatoI; Bombej A,1  
 :: ,s: Ghata of S. Kanarain evergreen forests, Talhof.

*Garcinia Morella, Demtus. in Lamfc. HOneyc, v. :i (17<sup>v</sup> t.*  
 405, nV. 2. A middling-sized tree, with spreading bram-li\*.  
 glabrous; young branches quadrangular, .smooth. Leaves i  
 in., elliptic-obovate to ovate-lanceolate, subacute or sJio-1<sup>11</sup>^ ■  
 bluntly acmninate, narrowed at the base.; petioles .\ in. low\*-'  
 FLOWERS axillary, in fascicles of 3-5, subsessile,.or on pedice^6  
 long. Sepals 4, decussate, orbicular, concave, the outer llie<sup>""{''ms</sup>  
 Petals 4, a little larger than the sepals. Stamens 25-40, ninna<sup>11. 10</sup> ;  
 the filaments combined into a subquadrangular central columr^111,  
 at the apex, the free portion very short; anthers or-biciji<sup>1^ P'</sup>  
 dehiscing transversely. Budimentary ovary 0. FEMA<sup>T tt' ^ i r t .</sup>  
 than the in ale, soli tary, a x illary, u suallj te- Sy'' \*K. J. P  
 the male, the former persistent, the latter d<- 's-  
 30, in a ring round the ovary, connate

**smooth, 4-celled j stigma |**

in. in MH. < ase by i I lent sepals,  
 abrdus. Seeds 4; War.  
 lute dark brown. Fl. B. f. v. 1- p. 264; Bedel. v. i.  
 Fl. Ceyl. v, I, ti, '■ ■ -incl. t. 8  
 . Bomb. p. 15? Woodr. in Journ. • v. 11 (1897)  
 , 125 ■ Watt Diet. Bean. Prod. v. 3, p, 472. /W,-< ptotaa,  
 a'rah in Hook. Comp. Bot. Mag. v. 2 ■ < p. L99,1. 27.—! ?lowers:

DISTRIB.  
 ■ ■ sa fairly abi in ndia, I ' i Bengal,  
 the Western Peni tml i  
 the Western .l\; I b  
 lia as an article erf comi rted into  
 induce of >i; .vu and O< cbin-China. Watt's Dictionary of E  
 f!  
 f H  
 very fu!

4. *Garcinia Xanttochymus*, /A\*/.-./'.. £1, #• /. v. I (1874) p. 269.  
 A large tree; trunk straight, covered with dark-colored, scabious bark;  
 branches angular, spreading, 'forming a iarg bead.  
 Leaves

18 b) l' tm., 'linear-oblpjog i I Qg-lanceolate, acute or  
 uate, smooth,, shining; petioles .';-! in. long, transversely rugose.  
 M VI. H iLOW,;i;s white, I iii. in diam., in fascielea of 4-8, from the  
 fallen leaves; pedicels thickened upwards, 1-lj in. long.  
 Sepals ""») fleshy, \ \ in. long, unequal, orbicular, concave, persistent,  
 tals 5, orbicular, spreading, \ in, in diain. Stamens 15-20, in 5  
 ndles, alternating with 5 Seshy glands; anthers 2-celled. HEBMA ^K.  
 as similar to those of the male but with longfir pedicels. Ovary  
 pointed, usuall 'led.; Btigma 5-lobed, the lobes large, oblong,  
 [ing, entire. Fi ■ large as a middle-sized apple, smooth, very  
 ted at: the apex, fi How when ripe. Seeda 1-4,  
 oblong.  
 I. v. 'I, p. 269; Talb. Trees, liomb. p. 15; Woodr. in  
 Jonrn. fi p. 125 ; Watt, Diet. Ecou. Prod, 7. B,  
 p. 478. \>. Oor. Pl. v. 2, p. 51 -1. 196 ; Dal/, &  
 Gibs.

...flowers:

k

I imnja, probably planted,  
 • y i: . Daisdl Jf- Gihstot\ "Of: Konara, in etergreen fofesta, abun-  
 iioiVr ■ v(r) natives and ie . though  
 H ■

IS as; iL: J  
*Garcinia spicata*, Hook. f. in Journ. Linn. /--' < "■. v, 1-i  
 (1875)  
 middling-sized tree with straight trunk; branches angular,  
 "Leaves coriaceous, 2-4 by 1|-2^ in., broadly-elliptic or almost  
 obtuse or retuse, rarely S. Kanara. KO^KAS: Law!, Stocks!  
 eubacate, reticulately imnja, probably planted,  
 ih "Of K f t ,  
 Mar.-N ay, though

veined, **the** veins  
us **in dried** specimens; **peti** **in, long, stoutj** transversely  
. ' 1-'lowers about .{ in. in diam, in **the** axils *of* fallen leaves,**the**  
-<sup>a</sup>jerous, sometimes mixed with **the** females **in the same** fascicle,  
'uuniy **crowded in a short** spieil'onnn **raceme, the females " 2-5**  
**; pe dicels | -1 in. long. £ : 5, eery u tiequal; ciliolate,**  
**the 2** outer **1y\* thick** and **Beshy,** the 3 . Petals 5.  
**membranous, much** longer than the <sup>if</sup>>ed.  
MALE FLOWISBS; Stamens ivi 5 "SC, somewhat spatulate,,  
**fleshy**

midrophorc, carrying 8-10 anthers near the top, the free portion of I filament below the anther very Bhort; anthers didynious.

Fv,||

FLOWEBS usually fascicled. Qtaminodes in 5 trifid bundles- antb sterile, Ovary ovoid, 3-celled; stigma thick, fleshy, 3-lobed.

Fruit

green, 1-11 in. long, ovoid .globose, 1-3-seeded. Trim. Fl

Cevl,

v. 1, p. 08. ; / ovaUfoliug var. oval I. folia. Hook £ in F] B I

v. 1,p. 269 (not of Oliver): Talb. Trees, Bomb. p. 15. Xa;

'ius, Eoxb. FL Ind. v. 2, p. 632.—Flowers : M&r.-Mi

YAK, mtcrane^ Leavel larger, 3|-7 by 1|-3| in.,

elliptic-oblong

obtuse or retuse. Male flowers much larger, reaching- 'i in. in diaro! fascicled (rarely spici form). Garcin la o i 'alifoUvs, var. ma mi K th a F1 B'

I. v. 1, p. 269; Talb, Trees, Bomb. p. 15.

Xanifi^ckymm

Qxalifokiiis' 2(i9^ak.f Gib9\* R 3] . Woodl> - ^ Journ. Bomb: Nat! v. 11 (1897) p. 20.—Flowers: Dec^Fan. V«wr. //«^1 G««.

This variety » touch the more common form in the Bombay Presidency,

[t

flowers m t be cold, wh ik tjbe former flower i n the fa of season.

„nfined to

Gnats of the Jvonkaii and Kanar

Evergreen foi'c .: ". Kam a and Konlcan GMta Talbot.

### Knar

»! Woodrm. Psrghai

DECCAS: ravines atKhandaia, AILS : Gairsoppa Ghat, cotan

Pbunda Ghlt, ^7^>!

## 2. OCHROCARPOS, Thouars,

Trees. Leaves coriaceous, opposite, or teraatly whorled

Flowers

in short cymes or lateral or axillary fascicles, polygamous. Calyx closed

before (flowering, at length opening valvately into 2 sepals \* Petals 4 or mop. Stamens indefinite; filaments filiform, free or shortly ca

nate below; anthers erect, oblong, 2-celled, dehiscing longitudinag

Ovary S-celled; ovules 2 in each cell; style short, stout or 0 • sti

3-lobecL Berry 1-4-seeded. ^S; eds large, enclosed m pulp - embr

a large fleshy tigellus with the col as red need to a small m

or 0.—DISTKJB. Madagascar, West Africa; species 6.

1- Ochrocarpos longifolius, Benth. & Rook, f exW

i B I v 1 (1874) p. 270 (Ochres). A large u

te.jte or slightly 4-gonous. Leaves thickly coriaceous. 0-8 by 2 %

oblong, **obtuse of shortly** and bluntly pointed, quite **gkbrouall**.<sup>^</sup>  
slightly **repand margins** and prominent **midrib**', base rounded  
**II**

**mcorispicuoua** in fresh, but beautifully reticulate in dried spec?

**peteolea** fin. .tout. **Flowers** numerous, in **short** fasci-  
z

**tubercles from the ^as of fallen leaves ; buds globose, apiculate,** orau  
red; pedicels | - | m. **long, thickened** upward?: **bracts numerous** s

**Qlate.** **Calyx bursting into 2 valves, reflexed during flovreribg**

**4, ovate-oblong acute, thin, deciduous, white streaked&witfa red** **Staim**  
m^y sterile in the flowers. **Style short, stout; stigma broad,**

**peltate** **Fruit 1 m long, obliquely ovoid, tipped** **By the hard,**  
pointed

**Style, 1-seeded.** **Bedd. Hop. Sylvat. t. 89 ; Talb. Trees, Bomb. p. 15**

**Woodr. in Journ, Bomb. Nat. v. 11 (1897) p. 125; Watt Diet R**

**-a '**

**Prod, v 5, p. 439.** *Oal* *n imafidium^Wizht* **J v it**

**Oral, Cat. p. 27 ; Dak** lbs. p%.^iowc?s !' Feb. *M- . \**

*ourangi; Jrunaga,*

■ fiatnngiri Colta I  
law\*; Paid irdc \$  
*Oichie*, 1650! K  
Kanara), The  
flower-bad

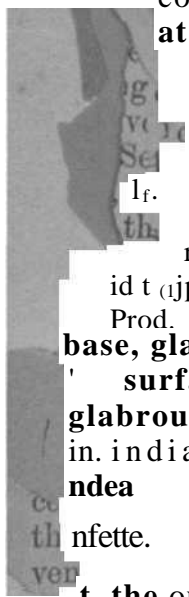
I Kanara. BCOSKAN : *Stocks*],  
Kanfr lee, abundant,  
ladgal (X.

## CAKOPHYIXUM, I mu.

polygan  
imbricate ifi .  
the base ; **filan** ; **anthi** et, ovalo or oblong, 2-celled,  
**dehij** nitudinally. Ovary 1-celled; ovule L, i style rather  
**ing; stigma peltate.** 'Drupe hidehiscent; puUunen cr :eous, Seed  
erect, ovoid or globose; testa **thin, or** thick and spongy.—DISTEIB.  
Tro-pical Asia and America; species 25,

I. **Calophyllum inophyllum, Unn, & p. PI, (1753) p. 513, A**  
**very handsome, Bmall** or middle-si/ed **glabrous** tree, with a crooked  
**trunk; Utrk smooth.** Leaves [■■; by 3-4 in., hroadly  
elliptic,  
**rounded** at the ap^x, often **emarginate**, with subrepand waved margins  
and very close lateral nerves, giving a **striate** appearance to the blade,  
**base** acute; petioles |-| in. **long, Btout, flat.** Flowers |-| in. in diam.,  
pure **white, fragrant**, in lax few-flowered racemes 4-6 in. long. Sepals  
4, ovate-orbieuJnr, concave, reflexed, ciliolate, the two outer" much the  
**Bsmaller. Petals^ oblong, obtuse**, spreading. Stamens nuuverous;  
**filaments** united into 4-6 bundles. Htvle **long<sup>1</sup>, twisted: stigmk**  
l'

«. **Calophyllum tomentosum, Wight, III v, 1 (1840) p. 128.**  
A tree, **attaining** a great height; young shoots, buds and  
**panicles**  
**clothed witB rusty tomentuin; youjag** branches **quadrangular.— Le**  
coriaceous, 3-5 by 1|-2 in., **oblong-lanceolate, acuminate, acute**  
**at the**



t?na« Zawre^culti roughout  
Sency; v- Bgij^  
d sandy of the S,  
- near bh  
feylon, E. African islands,

Australia, I ■  
rtmberis aa and an oil called *Wundi* is extracted from  
id t (ijp. For an account of the uses of the oil &c, consult Watt, Diet, Econ.  
Prod.  
**base, glabrous**, shining; **nerves** very line equally **conspicuous** on both  
**surfaces; petioles** |-| in. **long, stout, pubesent, at length**  
**glabrous.**  
in. indiatn., in terminal **panicles, and u**  
**ndea**  
nfette. **the axils of the tipper** leaves; pedicels **long, slender,**  
**tomentose.**  
**t, the outer orbicular, much B]** Q **the inner,**  
**ciliolate"**

**blong, obtuse, apreadiu ft .MH'nts unii**



Stamens  
: stigma  
3



peltate, **Fruit obliquely ovoid,  $\frac{1}{2}$  in. long, pointed, smooth.** R. B. I. v. 1, p. 274; **Wight, Icon, t, 110; Trim.FI. Ceyl. v. 1, p. 101; Talb. Trees, Bomb, p. 16; Watt, Diet. Icon. Prod. v. 2, p. 32.**

*QaUptyllum*

-'ni. **Bedd. Flor. Sylvat. t. 2, Cttlcrpkyllum an ■ Dalz.**

&

**Gtibs. p. 'i'Jt (not of Ifoxb.).—Flowers: Mar.-May. VEBK, /" ■**

Known in **W. India as the Pun or 7V/// tree,** It furnishes the / spars oP commerce, which are much used for masts.

**1/2A'}}** **Gibson (Bombay Flora, p. 32) in describing O. << folium^ tv' M the description given by Roxburgh (Fl. Ind. v. 2, p. 0<sup>1</sup> which : ot applicable to C. to\ As, however, Dalzell i Gibsc .dicate the same Locality (Nilkund <Unit) in which the tree has**

is I id by Mr. Talbot, there can be little doubt that- **O.**

**tomentomm iK ded by these botanists, and not C, anguistifolium of Roxburgh,**

**KANAK** in many of Lhc Ghat evergreen forests of N. **Kauara, Niikuad** and **Gair-Boppa Gli** common, **Talbot;** Nilkumi and AVuhvi GHuUs, ex l><

### **3. Oz phyllum Wightianum, Wall Cat. (1828) 1847. A**

middle-si zed tree, with yellowish bark; young shoots **4-gonous, glabr<** Leaves **coriaceous, 2~3| byl-l.J in>, obovate-oblong, cuneat ided** at the apex, often **emarginate, with close pervea** most prominent on the lower surface; petioles | in. long. **Flowers -I in. in diam., in raci** from the upper axil?; bracrs **small, boat-shaped, caducous; pe** slender, £ in. long. **Sepals 4, strongly veined, subeqnal, deflexed, the two outer orbicular, the two inner boat-shaped. Petals 0.**

**Stain** numerous, many-seriate; anthers large. Style flexuous; stigma **peltate with crenulate margin.** Fruit | in. long, ellipsoid, smooth, **apiculate, red when ripe:** **PI. B. I. v. 1, p. 274; Bedd. Flor. Sylvat. t. ! Talb. Trees, Bomb. p. 10; Woodr. in Journ. Bomb. Nat. v. 11 (IS p. 126; Watt, Diet. Econ. Prod. v. 2, p. 33.**

**Cal&phyllum spur' Chois. in DC. Prodr. v. 1, p. 563; Grab. Oat. p. 27; Dalz. & (> p. 32 (speurium).—Flowers: Dec. YEIIN. B6bhi| Irai,**

Western Ghats. **KONKAX : Law I, : KANAKA: plentiful in**  
; very common alow a of N. Kanara riveN, **Talbot; K&tJ**  
**B&CAMJ, 1649!; Xelkpur, TW&tf!**

### **4. MESTJA, Linn. \S**

Trees or shrubs. Leaves closely and finely penni nerved. **K> «** hermaphrodite or polygamous, axillary, solitary, largo. **Sepa^ ^ Petals 4. Stamens indefinite; filaments free or connate al th^o<sup>1</sup>. <fl base; anthers erect, oblong, 2-celled, dehiscing longitudinally. 2-celled, ovules 2 in each cell, erect; style elongate; stigma : Fruit between fleshy and subwoody, 1-celled by the absorption septum, at length dehiscing by 4 valves; valves often without. Weeds 1-4, exarillatc; testa fragile.—DISTIUB. Trop species 3.**

**1. Mesua ferrea, Linn. Sp. Pl. (1.753) p. 515. A iniddlin** glabrous tree; trunk straight, **erect;** bark smooth, as!i-coloured

branches twiggy, slender. Leaves 3-5 by 1-1½ in., oblong-lanceolate, pennate-acute or acuminate, red when young, afterwards silencing  
**above, neti** and **pruinose** beneath, rounded or acute **at the base**\* and  
very <sup>1</sup>\* inconspicuous nerves; petioles ½-1 in. long. Flowers  
**per**

i. cum-

*it* terminal,

solitary or i.n pairs, sessile;

i. S

pp than the outer. p er Petals

orbicular, cupped,  
puberulous

h P 1

chug, ooovai i., ii torn.

Stamens v&vy nume

I ! i ; > n the p <

: si igrna peltate.  
surrounded b?

pnlarfffd sepals: ■

■ ly, at length 2-valved. Seeds sfctmt-brown.

-ulai

M« B. I, v, 1, p. 277; (Iran. •, in Engl. & Prautl,  
Pflanzenf,

Bomb. p. L6j Wo

Bomb.  
P

r. 11 (1897) p. L28; Watt, Diet. Boon.

A i utiful tare  
S. Konkan ftnd X.  
Kani

. Ike':

## XXII. TEENSTECEMIACE^.

late (rarely opposite), .

owers regular, usually

ai and 1 or more together, or in terminal or

axif-

■ lary racemes (rarely panieled). Sepals *i~>* ■ slightly  
ially the la rarely 4-9),

•ften united at the base into a ring or short tube, much imbricate  
contorted. (Stamens indefinite, rar< al in number to the petals

many, hyp\* ■ ; ■ ■ ■ Free or connai ith one  
adnate to bh of the petals a with

them, ifixed or versatile, 2-celled,

(rarely tl pores. Disk 0. Ovary free

2-many in ' ; ovules

stignxaa usualli


■ numerous; placentas asile ; albumei or 0 (rarely  
■ hipp< ■ ■ ■ nu ; cotyledona^rarioTas,—

few in Africa, absent from  
ia and New Zealand; genera 32 about %

n in 3; antbi i fixed; iswinged..... 2. Gtoanosu,

ot win ..... 1. Et7RTA.

amber' 1. EURYA, Tl.unb.

di-aves usually create-serrate and glabrous. Flowers  
 eellsas >ssik or shortly pods. llary fascicles, ran  
 • bn irsisteat. Sepals 5, much imbricate. Petals 5,  
 imbri-  
 .!p Stamens 15 or less (ra i), adnate to  
 ^ie ; J f»^e Corolla \ anthers glabrous, b ifi .  
**from a**  
 11 ohiat :  
**albumen tsia and Malaya.; species**   
 2-5-) Ovary 3-(rarely  
 viomat''1 ; styles 3 (rarely

^iHB^^H

**1. Eurya japonica, Thunb, Nov. Gen. (1783) p. 6**  
 .;/, Tliw. Eni-iin. (186 U. A shrub reaching 1"  
 ng branches **glabrous, striate.** Leaves 2-4 in. long,  
 laneo

**g ,**  
**serrate, acute at the base;** petioles  
**l b**  
 axillary fascicles of 1—3, small; bracts 2, beneath th- I nail,  
**oblong, obtuse; pedicels ; >2outei**  
**mailer,**  
**ova suborbicular, ala white, ellipti**  
 oblong, about twice as long ai  
**Fruit |—| in.- oboscj tipped with fcl**  
**glabrous. PI. B. I v. 1, p. 2\* I ; Trim. Fl. Ceyl. v. 1, p. 109, I**  
*japonica*, Thunb. Fl. Japon. I . 191, fc.25; **Bedd. Flor. ,v**  
**v. 1. fc. 92; Talb. Trees, Bomb. p. 16; Watt, Diet. Eeon. Prod.**  
**p. 302,**

.Flowers all the year {T%

This plant has b tuded on the authority of -A sp  
 fi Konkan, Stocks," without any further informatio sras obtained.  
 It does not- seem to bare been found by any o

## 2. GORDONIA, Ellis.

Trees. Leaves evergreen, entire or erenate. **Flowers solitary**  
**and**  
 axillary, or crowded at the ends of the branches, often  
**subsess**  
 braetate. Sepals usually 5, **unequal**, graduating from the bract\*  
**petals.** Petals free or **slightly connate, niucn imbri**  
 larger. Stamens **indefinite**, usually **5-adelphous,** nto n v',  
 or adnate to the base of the petals. Ovary **3-5-** (rarely f5-) -  
 ovules 4-8 in each cell, **pendulous;** style **simple;**  
**fina 5-lol**  
 Capsule woody, oblong, **loeufigidalj** axis persistent. & at or c<-  
 pressed, prolonged **upwards** into an oblong wing; albumen 0 ; **em I**  
 generally straight, **oblique; cotyledons** ovate, **flat** or slightly **erun**  
 r: u.1 i < ■ 1 i s m all, s u p e i i o r. —DISTEIU. N. Am erica, tropical .  
**species** about 10. - I.

**1. Gordonia obtusa, II ' J)1459. 4falltree,**  
**2 1 by 1-3 ' in., elliptic-lane . obtuse, of :**  
**acute at the ba ;**  
 across, while ; **pedi< in. long, Bepals orbicular-oblong, silk^--**  
 side. **Petals obc •, pubescent** outside, ■ **inta-te at the^ £\**  
 styles combined to the apex; stigma **pelta 5-lobed.**  
**1-1^ in. long, oblong; valves deeply sulcate towards the apex. 3**  
 ^\*  
**terminated by a leafy wing. Fl. B. I. v. 1, p. 291; "Wight, fc\.\.0§**  
**Nilgber. v. 1, t. 20 ; Talb. Tree% Bomb. p. 17 ; Watt, Dict.Econ^ % n**

v. 3, p. 533,—Mowers : **July-Sept.**

**KOREAN:** Ohats, *Talbot*,

. \* Lf

*O&j>m* XXIII. DIPTEROCARPACM.

lieainiferous trees. **Leaves alternate**, entire or **sinuate-crenate** *U*, **penni-**  
nerved; stipules **usually small, deciduous** or **incons]** ^y-  
larger and persistent, or **caducous leaving an annular scar,** lion  
regular, hermaphrodite, **fragrant, in axillary** or terminal panic!  
usually minute or 0, rarely ' lent. **Fibwerin**«\*

XXIII. DIPTER

aulate, or very short and ally Imbricate.  
 Fruiting

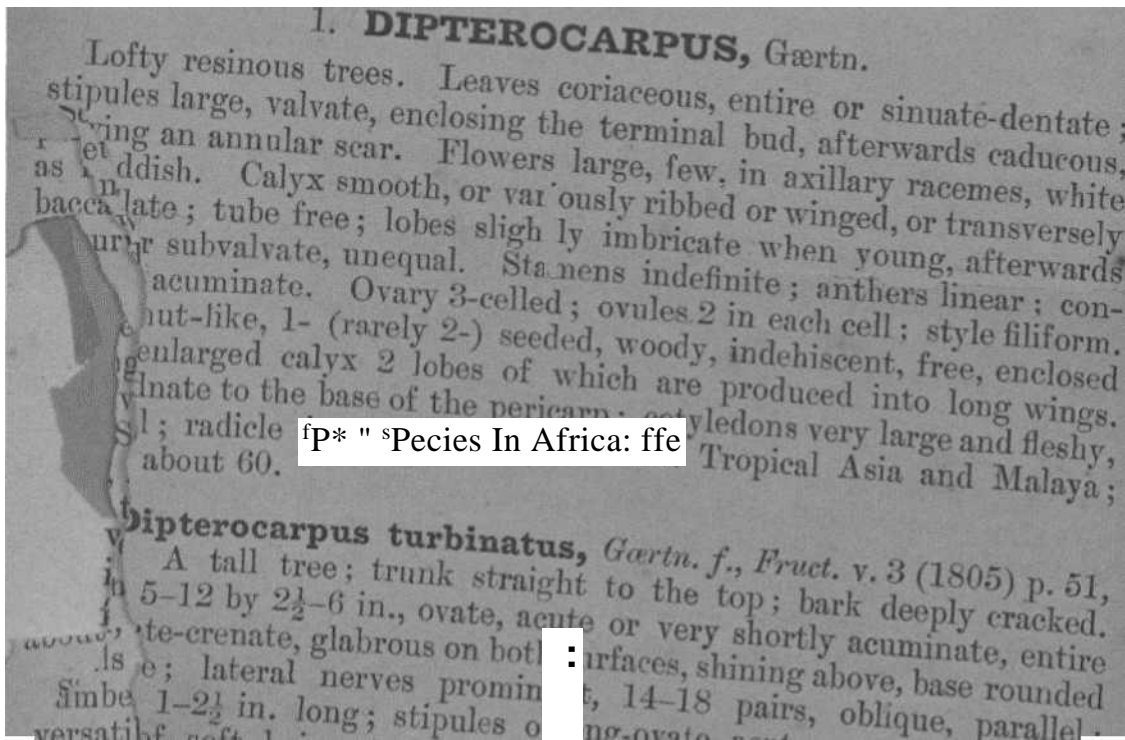
nduloua or affixed lab  
 f^ - Fruit free or S  
 a ved, I- (rarely 2-) seeded

■ 3-celled; ovules 2 |<sub>3</sub>  
 / r^'^ent- | ; micro] ^  
 \*ed ^ ^dehisceijt or

fP\* " sPecies I Afi fV • Ves o! trop  
 ; sPecioie\* about 106.

rectc,  
 lube; 2 lobe\* ouiy en-

- ..... I, DIFTEBOCABPUS.
- Calyx in fruit with ;ui obscure tube; 3 or ail the lobes enlarged ; stamens 15- matty ..... 2. SH OBEA.
- Cal)'x will) on 1 v 2 J(jbes on 1 nrged ; stamens J0-1 o ..... 3, ECOPKA.
- d iu fruit; lobes reflexed ..... 4. VATBHIA.



subglobose, pubescent. Fl. B. E. v. 1, p. 295; Roxb. Cor. s, v. 3,  
 Pit 10, t. 213; Talb. 1 Bomb, p. 17; Brandis, Enum.  
 Dip Journ. Linn. Soc. r. 31 (1895) p. 27; Waft Diet, Eoon. . ,  
 Pro< p. 161.—Flowers: Dec,-.Tan. *Yiuis. ChaMari.*

Sparing^ !ii forests of the Presidency. KGNKAN: *Stocks I I*  
 uthero *Gh&ts* of N. Kaoara, certainly indigenous, ex '*Falhai*; Gair  
 ! -DISTKXB. Pegu, Singapore and the Andamans.  
 tn Ohittagong, where the tree is abundant, it attains a height of upward;; of :  
 Eoxbarg *tad*, ? 2, *b&t* the trunk is large, enough to jfu  
 canoe capable >>'! contai a. [t produces the celebrated ■-, (or  
 oil, for a full description of m and uses of which, see Wai  
 Ecoa, Prod. I.e.

## 2. SHOKEA, Eoxb.

Resiniferous trees. Leaves entire or repanel, with parallel  
 stipules large, coriaceous and persistent, or .small and deeidu\*  
 eouspicuous. Calyx: tube very short, not ■ I In fruit, ad:.  
 the lot'us: lobes ovate-laneeolate imbricate, unequally enlarged in IV  
 wing-like (3 usually larger), closely embracing the fruit. Stame  
 many; >r oblong, rarely linear; con subulate or  
 cuspidate; valves obtuse, rarely cuspidate, equal, or with the exterior  
 valve the larger. Ovary 3-celfed; ovules 2 in each cell; style  
 usually subulate; stigma entire or 3-toothed, Capsule coriaceous, in  
 usually 1-seeded, enclosed within the base of the calyx-lobes. S  
 ovoid; cotyledons fleshy, unequal, usually enclosing the superior radicle.  
 —JJDISTRIB. Tropical Asia and Malaya; species about SO.

1. *Shorea Talura*, *Roxh Hod. Beng.* (1814) p. 93. A large  
 free; branches glabrous. Leaves 2|-4 by 1J-2 in., elliptic-ovate,  
 obtuse» often emarginate, rounded at the base, glabrous; nerves  
 12-15 pai petioles |-| in. lo Dg. Flo *wes* exeed i ng 1 in. i Ji d i am..  
 w h i IV' Qumerous panicles 2|-3| in. long from the axils of  
 fallen leKI Calyx: in flower, glabrous, small, lobes ovate, acute; in  
 fruit, 31 much more enlarged than the other 2, reaching 3 in. long,  
 by broad, the two less enlarged lobes 2| by 1| in.} all linear-oblong,\*  
 with 8-12 prominent nerves and with netted veins. Fruit n  
 obeonical, J-| in. long. PI. B. I. v, 1. \>. ''r>\; Talb. Trees, \ p.  
 18; Brattdis, Bnum. Dipter. in Journ. Linn. Soc. v. 31 (1895)1, Woodr.  
 in Journ. Bomb. Nat. v. 11 (1897) p. 126;  
 Watt, DictJ Prod., v. i>, part 2, p. f-S. W. & A.  
*Fatica la Shorea laccifera*, Bedd. Flor. Prodr. lowers: Jan  
 Sylvat. t. (i. '■ *Jalaranda*.

KAN MIX : yiroi talukaofN, Kanara, *Talb*  
 Kare. Wood-row.

apxii" (N.

;U

## 3. HOPEA, Eoxb.

Besinous I or hoary-tomentose, Leaves qii  
 joriaceous, usuall 1 and reliculately veined; stipule  
 deciduous or inconspicuous. Flowers small, io axillary and  
 terminal panicles, sessile or .shortly pedicelled; bracts, 0. Calyx : tube  
 very short, adnate to the torus; lobes short, obtuse, imbricate, often  
 with me branous margins, in fruit enlarged, the 2 largest wing-like,  
 ereek (1C|  
 othei eml) racing the Bruit. Stamens 15 (rar  
 anthers ovate or orbicular, cells obtuse, vatves equal; com<sup>1</sup>



cuspidate. Ovary 3-celled; ovules 2 in each cell; style shortly  
 ! i ulate. Pruii ii ke, i ndehi s cent, usuall y 1 - se eded, closely  
 tin the base of the calyx-lobes. Seeds ovoid; cotyledons  
 unequal, enclosing a superior radicle.—i)i<n:n;. Tropical Asia  
 sies about 15.

I. Hopea Wightiana, Wall. Cat. (1828) 6295. A large  
 tree;  
 ig branches pubescent, at length glabrous. -y 2-3 in.,  
 •©blong, obtuse or tute, glabrous, rounded at the  
 ra! nerves 7-10, oblique, curved; petioles | in. long, velvety-  
 lecund, in axillary panicles, the panicles 1-6  
 glabrous, shorter or rarely longer than the leaves ;  
 , vV-^ i. ; pedicels very short, Calyx glabrous;  
 m flowering) ovate, obtuse, the exterior larger. Petals pink,  
 nally pubescent, ciliate. Filaments LO,  
 •h alteriKi; Prying 2 ant tiers ; anthers  
 i with a long filiform a; about gth,  
 Q. long. >yoid, apieulate, glabrous, SUTI-OI i :ent  
 which are 1 into long crimson wings  
 Long-obovate, 7~9~nerved. Fl. B. 1. v. 1, p. 309;  
 ■ ■;; Brandis & OHlg, in Bngl. & Prantl, Pflanzenf.  
 6, p. 261, fig. 121, ii-M ; Talh. Trees, Bomb. p. IS; Woodr.  
 Bomb. NnL v. 11 (1897) p. 126; Brandis, Enam. Bipter.  
 ra. Linn. Soc. v, 31 (1895) p" 58 ; Watt, Diet. Econ, Prod. v. 4,

ibling the young fruit of the  
 nut, probably due to some insect, often deforms the  
 in-: 'his defQrmation as *Artocarpus*  
*lancee-*

, .le

. ISfe Prantl, Pflanzenf. i. c, which is taken from : i show the 2  
 anthers on the alternate filaments\* Vure well figured by Beddome, I.e.—  
 Flowers : .Mar, .tui:



i : the 8. *Ii*  
 \. Kanara.  
 he, 83!; evergreen fores)  
 ■  
 Woodrow ;

;. C'OUNTJIY: Loti da,

#### 4. VATERIA, Linn.

us, tomento\$e or furfuraceous. Leaves quite  
 2JH,eoriac& snninerdj reticulate) y veined; stipules sinal 1, de-  
 j\* s or inconspicu< and persistent), 1:1 owers win  
 te,  
 H Sninal panicles, • pedunolf alyx : tube very  
 ..jurt, adn; bes imbricate, scarcely enlarged in fruit.  
 mens L5 or more ; anthers I'm rior  
 cells th -t with is; con; ■  
 rarely  
 /Λ^Λ\_ ■ i cell; style  
 subulate;  
 Capsule ovoid or globo or fleshy, 1-seeded,

tved. \$'•>•{}\* thick; cptyledons thick, unequal, the  
'bed, inv< be superior radicle.—BISTBIB.

"V; 4?,<sup>ria</sup> **Sn<sup>^</sup>ica**, *Linn. Sp. Pl.* (1753) p\* 515. A large and  
very ( ^; bark whitish; young branches and inflorescence  
clothed + e pubescence. Leaves 5-8 by 2-4 in.,  
elliptic-oblong,



sliort.lv pointed **or obtuse, cordate** or rounded **at the b;i**  
**lateral i** 12-15 pairs, **very prominent beneath** ; petioles **1 in,**  
**stout,** i ■. in diam., i **irminal pani** in.  
 „ braci **cous; p**  
**divi** :- lobes **oblong-lance\***  
**on b** aot enli **rait, deflexed,** **Petals a little** :  
 than the e .bloug, i **ite. S1**  
**anthers alightlj hairy at the base, othi** irons, cells lin  
 riHctive **adaate to the apex ol' the anther, p** d into a subui  
**splitting along with the anther. Ovary pubescent; style to]**  
**than**  
**the Btamens, filiform** stigma small. Ca in.,  
**obloi** Beshy, 3-valved, the valves 1-seeded. Fl. .11 L v.  
 1,  
 p, 313; Oral). Oat. p, 22 ; Brandis & Gilg, in Eng'L & PrantL Pflanzenf.  
 v. 3, part 6, p. 271. fig, 127, i-E; Talb. Trees, Bomb. p. IS ; B\  
 Enuni. Dipfcer. in Journ. linn. Soc^ v. 31 (1895) p. 143; Woodr, in  
 Joum. Bomb. Nat. v. 11 (1897) p. 12<sup>f</sup>>; Watt, Diet Econ, Prod. v. 6,  
 part 4, p. 222.—Floy ! pr. V pa.

S- Katvii.

K<sup>r</sup> Siddapur, Su i^ts of N, Kanara no  
 commonly planted *AOIVJ*: roadsides in the -. Kaiu The  
 tree pw>du  
 isii. for uu account I u. l'rud. 1. c.

### OniEK XXIV. ANCISTROCLADACE.ffi, Planch, in "Annal.

Se. Nat, ser. 3. v. 13, p. 816.

Scan dent glabrous sh ru **ba; branches hooked.** Leaves **alte mate, sh or I**  
**petioled,** coriaceous, penni nerved and iv lieu lately **veined,** usually e **V**  
 often crowded at the ends o **branches; stipules small, decid** '  
 or 0. **Flowers regular, hermaphrodite, in axillary (or apparent!**  
 m foal) racem es or p a u id es, soon **falling off** **ulated ^**  
**base o! the Sower,** Calyx **acei** : in fruit ; tui■ short , -  
 to 11: of the ovary ; lobes 5, **unequal, imbricate. Petals 5;** \ .  
**with the sepals, unequal, contorted in aestivation, slightly conns**  
**base. Stamens 5-10,1-seriate, those alternating with tl** ”  
**longer; filaments short, dilated and connate at the base; anw<sup>3</sup>** ”  
**cing longitudinally, apiculate hv the stliirli iS^>**  
**duced connect** **muticous. Ovary ada ate to the calyx, ? ' g ^**  
 j-  
 ovule 1 in each **erect or literally afBxed : sty)**  
 a rounded or **shortly eylindric epigynous di**  
**the apex. .Fruit a 1-seeded, ini** **nut, adnate to tin.<sup>1</sup> t,**  
**calyx-tube, surttionted by the enlarged a** **calyx-lobes, mi<sub>n</sub>lX**  
**Seed Bubglobose; embryo straight, clavate; cotyledons subf^ -^i]**  
**divergent; albumen «** . **fleshy, in** closely folded brain-like  
**tions.—DISTEIB, Tropical Asia ;■ genus I; species; 10.**

### 1. ANCISTROCLADUS, Wall.

For characters\*see OEDBB.

**1. Aucistrocladus Heyneanus, Wall, Cat.**  
**(1828) 5**  
**seandent shrab, with hooked branches. Leaves deep green**  
**L]--:3 in., oblanceoiate-oblong, subacui brous, sliininp**

narrowed short tid with s  
or 0, Flow about  
equalling the calyx.  
"In, io og, u bo vat e, c\ 11 Leatefwitt Petals  
small, white, ovate-■ Fruit small,  
surmounted by~5~3 B. 1. v, 1, n. 299;  
Grah. Cat. p. 28:  
S.&P^ntI,Pfl<sub>aa</sub>zenf.v;3,pa?t6 v ■>  
IJoib. p. 17 ; Wood, inJo^Bo.,,;  
X I'towt-va; Mar. \ KI^ . A; , ^ (/i

ft??\*8nl c

w<<J Divimana (N. Jv,

forests  
of

XXV. MALVACE.5!.

rarely soft-wooded trees with t

telate hiura I ,, . " TMlt?  
tenacious i """"I "■ lobed ,, ;;  
r:lltoTMate' fluently L

^U 'rminal, solitary" cZSl<sup>t</sup>r " HW"<sup>^</sup>  
(%&) h\*f r.no<sup>TM</sup>, connatJ or C , ,  
1T/">!!L,"!"\_!aU!\_ fc<<\*<<<B

^ the stamiual-tubeTt4teri til •' more or less ad<sup>^</sup>e

<<idedat4eapet inm ,, \* , .h"<sup>^</sup> t0<sup>^</sup> bsse <sup>^</sup> the

pL.,  
!";,7 ^atty-antherifsrous bSe a<sup>t</sup>ferife<sup>^</sup> Wnta, or Into  
term<sup>1</sup> jte or sessile an 01 S01»etim.'s emitting shortly  
tas rm, cells sinuous or i 'SS!<sup>J</sup> antheps S<sup>^</sup>ose, oblong  
sistenft bursting iongitadinaUy <X p<sup>Q6ar</sup> or fna<sup>^</sup> "  
more Attached "S. whorled ros 2"imf.1<sup>^</sup>1<sup>^</sup> }f  
each<sup>^</sup> less connate; ag |fnea SS<sup>^</sup>P<sup>61</sup>! st>'<sup>1</sup>(H) distinct or  
peolar and ioS<sup>^</sup>1 <sup>^</sup>S <sup>^</sup> or Tithulate<sup>1</sup> or  
obovoid rarllfwn 8fmetimes larSe and

obovoid; ,  
Warm and tempent  
w/.<sup>^</sup><<

bn7L : "n roniform B<sup>^</sup>  
^-"y folded or cr  
S1011S; 8<<>.W; species.

s at or to the

PoJlen globose! .chiuulai/

^ Umted <sup>^</sup>to a

si litary, asoendi

the inside.

Invol. bracts 6-9, oonflale a

Ovul InvoJ. braen 3. airtiact ...

lr

Ovul ; ^

Invo

avo

TRIBE II. UEENEJE. Staminal-tube antheriferous outside, truncate or 5-toothed at the apex. Branches of the style twice as many as the carpels. Ripe carpels separating from 1 Pollen globose, echinulate.

- lavo. bracts 4, large, leafy ; ilowera densely involuorai o-capitate. f). MALACHftA.
- Invol. bracts 5 or more.
- Ripe carpels glochidiate....., ..... 7. UHBKA.
- liipe carpels 1-3-aristate or naked, not glochidiate..... 8. PAYOXIA,

TEIBB ill. HIBISCEiB. Staminal-tube anthers l'erous outside, trun-8 or 5-toothed at the apex (very rarely antherilerous). Branches of the -style as many as the cells of the ovary, Fruit capsular, loculicidaliy dehiscnt; carpels ^pfc separating. Pollen globose, echinulate,

- Braach.es of the style at length spreading ; seeds ronifortn.
- [nvol. bracts 10; ovary 10-eelled..... 9. DECASCHIOTIA.
- InnoL bracts 3, large, cordate ..... 10. SKSHX.
- Ini vary 5-eelled ..... 11. HIBJ
- Branches of the style coherent into a club-shaped mass ; seeds obovoid or angled.
- IATOL bracts 3-5, small ..... 12. THESPBSTA.
- Invol. bracts 3, large, leafy ..... 13.

TRIBE IV. (or SOTORDEB) BOMBACE-ffi. Staminal-tube divided at the apex (rarely to the base) into numerous\* 1-anfcheriferoas or 5-8, 2-co -antheriferous branches. Style entire or divided into as many very short branches as the re are cells to the ovary. Capsule loeulieidall,? dehisceni or indehiscent. Pollen smooth.

- Calyx 5-cleft,..\* ..... 14. Agar). Cool<sup>l</sup>-
- C:ilyx truncato or irregularly 3-5.-lobed. jTttns Pure
- Branches of the staminal-tube 1 -ant heriferoua ..... 15,
- Branches o uninal-ti autheriferoua ..... 16

1. ALTH^A, Linn. ?]

Herbs pubescent or villous. Leaves lobed or partite. rkm

lary, solitary or clustered, or arranged in a termi^a! rseerae. I::<sup>1</sup> bracts 6-9, connate at the base. .Sfaminal-taibc divided to the a numerous antheriferous linear filaments, <Kurv many- (more ^AJX celled; ovule 1 in each cell; styles as many as the carpels, longit%<sub>i</sub> ^ - stigmatose on the insid forming a round depressed §'\* separating from each other and iroua the short central axis.—I\£ c, ' Temperate regions of the Old World: species 132. > 313 £

1. *Althaea Imdwigii*, Linn. Mantiss. (1707) p. 98- ^, hairy annual, branched from the base. Leaves 1-1,{ h <t }> orbicular, deeply 5-7-lobed ; lobes euneate, 3-5-fid at the ape\ 2-4 in, long, slender. Flowers axillary, 3-1 together; pedice long. Jiivolucral bracts 7-9, linear, as long as the calyx, In long white and stellate hairs. Calyx-lobes \ in. long, deltoid.<sup>1</sup> £-f in. diam., whitish. Anthers round. Fruit J".| in. !"\* carpels 8-9, doubly keeled, not winged, wrinkled at tbesides, ' \* \ ' Seeds

smooth, **brown.** **Fl. B. I. v. 1, p. 319 ; E. Bak. in Journ. Bot. v 28**  
(Lond. 1890) p. **140; Woodr. in Journ. Bomb. Nat. v. J1 (189< p.**  
126. *Malwa Mahvash*, Edgew. in Hook. Journ. Bot. v. 2(1 p.  
284.—Flowers : Mar.-July.

I SIKD: St pur and  
Hyderabad, Cooke [—Di tern Asia

1786) p. 91, t. ! , !. the  
well-

known *Hi* ■ ; or> ]\_ cA  
j<sub>s</sub>  
extensively cultivate I plant in gardens  
throughout!  
Cndia. jht, with leaves 3-5 in, in diam.

cordati ■. acutely 5-7-lobed, and with very shortly-!  
raceme t-3 El. ioug, The corolla, which  
purple, or white, often (in cultivation) exceeds 4  
iu  
across. Fl. B. i. v. 1, p. 319 ( Gh-ah. Cat. p, L2 ; Dal/. & Gibs,  
Suppi p. O : Firming^)-, Man. Gard. ed. 2, p. 406 \ Woodr. Gard. in Imh  
L86; E. Bafc. in J ourn. B o i. v .28 (Loud. 1890) p, 20 7.—Flo wers :  
Jan. Mar.

2, MALVA, Linn.

Herbs hirsute or downy. Leaves angled or *h* Flowers axillary  
f>rc] tolled. Cavolucral br I (very rarely 2)  
*diMmri*. Staminal-tube divided fco the apex into numerousantheriferous  
Mamcnts. (*h*^y many- (more than 5-) celled ; ovule 1, in each cell •  
styles as many as the carpels, filiform itudinalj on the

a found *dt* ,n ripe  
■ *lpm* eachJJTM ' short; central axis, mdebiscenfc, not beaked.—  
a iobea<sup>itSjlUjL</sup> ' ate Europe and Asia, \. Africa tea 17

of the .''liiw oi  
it:eX ttsu ..... 1. *M.rotundifoh*  
tived at tl ..... % *M. sy*  
I-IIKI! ..... 3, *M.parvifiora*,

fe or sessile arottsnUfoUa, Cinn. % *PL* (1753) p. 688 \ much-  
««ou3ui u. it\*»m, ce<sup>u</sup>rp,sparingly pubescent and with some stellate hairs Leaves  
•ffiHX8i^t,l<sup>bursJ</sup> ut<sup>t</sup>li:i i borbicul up to 2-4 in  
mp raoaj aTr m< try, I . in. [ongj deflexed iu fruit  
bracta halt the Length of the calyx, 1 hairy  
Calvx

og, pvate,acute. Oorolla | in. in diam., pale purple  
gtio.19,1 pa11>l dry>; petals notched at the top, beard \  
-piiimH; ., ofive-brown; carpels 1S-16, p reticul I Q  
th

' > a tucil^e margins of the back rounded; not to Seeds brown-hlaek  
n-.'->Uo.u m J. Fl, BI, y. L, p. 320; B. Bak. in Journ. Bot. v. 2jS  
(Lone 'psjaqie^f\*' Wft. -> 1 I ; Woodr. in Journ. Bomb. Nat, v. 11 (1897)  
p, 12( •P<sup>u</sup>n . - > i ^kt\* J^ou\_ !rud\_ v\_ 5^ P- Hl.--Mowers: Jan.-Mar.  
VBK^ •; fJial'ICf<sup>5</sup> f<sup>7w</sup>^H<sup>5</sup> AAf<sup>v</sup>/j^;- deseedS are used in native meaieine



*kdia*), !■ ; id W. Asia.  
 !<sup>b</sup> O<sup>^</sup>t i t a H e ^{11} - which this  
 the iiisklc. ■  
 InToL bnulva sylvestris, var. mauritiana, *Bom. FL Orient* v  
 1 " "V>:;\_ A BPaTMa«<sup>1</sup>y P-^escent or nearly glabrate herb.' Leaves  
 Pf<sup>2</sup>! in. IB i late, 5-anguiar or shortly lobed; petioies lone.  
 ; together, some nf: them as long as the  
 leral bradv t11:t" fchealyx, CoroSall  
 » jj;. i'^T ' petals ! I. Fruit | in. i<sub>u</sub> diam.; cartels

about **10-12**, nearly **glabrous, reticulated, with 2** angular margins. **Seeds** brown-!.: PL B. L v. J, p. 32n ; E. **Bak.** in Journ. **Bot.** v. 28 (Lond. 1890) [**>. 340; K. Schum.** in **Mart.** .1-1. Bras. v. 12, **part 3, p\*265**; Watt, Diet Econ. **Prod.** v. 5, p. 141. *M. mavoriiana*^ Linn. **Sp. Pl.** p. 689 ; Grab. **Cat.** p. 12 ; Dalz. & (libs. **Suppl.** p. 6.

**BOMBAY:** (■ *mrne* !■; in garden!  
N. Africa, N, Asia,.

*Gibson.*—**DISTRIB.** Europe,

**3. Malva parviflora, Linn. Amoen. Aead. ed. 2, v. 3 (1787) p. 416;** A spreading her!), .! -U ft. high, pubescent and with some stellate hairs. Leaves 1 ~' in. in diam., rbiealar, cordate, obscurely 5-7-lobed, finely creuate 5 petioles long, up to 2 1 in. Pedicels axillary, 1 or few ither, short, rarely exceeding : ?olucral bracts short, linear, caducous, hairy at tip. Calyx in :ent, reticulately veined, glabrous; lobes ovattv mucronate. **Corolla** |-| in.-in diam., purplish or white. Fruit | in. in diam.; carpels 10, glabrous, strongly reticulated on the back, the two margins o\' the back keeled, sometimes slightly wi nged, of ten with a few minute teeth. Seeds b lae k. g 1 abro u s. Fl. 1 >. 1. v. 1. p. 321; E. **Bak.** in Journ, **Bot.** v. 28 (Lond. 1890) p. 341; K. Schum. in **Mart. Fi.** Eras. v. 12, part 3, p. 263, t. 51 ; **Woodr.** in Journ. **Bomb. Nat.** v. 11 (1897) p. 123; Watt, **Diet. Econ. Prod.** v. 5, p, 141 *M,* )ala. & **Gibs.** p. 21 (not of L i 11 a.).—Flowers: Jan .-Mar **V** *Ndrr : Qogi-Sdg.*

**DECOAN:** common about villages, *JDalzeU*; Dongergaon (near Ahmednagar), *Cooki* Jejuri, *Woodmw*) ' Siiro; Karachi, *Stocks*, 582 J; Gurapad, *Pierce* !—**DISTRIB,** Europ N, Africa, V

### 3. SID A, Liun.

**Herbs or imdershrubs, hairy and with stellate hairs. Leaves toq** stipules linear, |-4 in, long. Pedicels axillary, solitary or clr disarticulating in fruit at a constriction below the calyx. if bracts 0. Sepals5, yalvate, connate below for .J{-■■■.! their length. .f' small, yellow or white; petals connate at base and with the \* Lube. Staminal-tulx<sup>1</sup> divided at the top into numerous anth filaments. Ovary of 5-12 cells ; ovule L,in each cell, pendulou | as many as tb.9 carpels ; stigmas terminal. Fruit globose, d enclosed by the calyx; carpels separating from each other and % rg **S3** !t central axis, beaked or not. Seeds black-chestnut, smooth.—v \* — **t<sub>i6</sub>** Throughout the warmer parts of the world, most numerous in & . ^ it species about 120. 'r ^

V

**Prostrate trailing herb**..... F  
Erect or subereot herbs or underahrubs.  
*Viscoaa-ha ii\*v*..... - . 8. *ql* ri/.  
**SteUfttelyhai**^ ( % % %  
*i't'tiolea >jii'js* at the bnso ..... 3. o. SJF  
**Petioles aol Etpinj ;it** (lie ba , ""■.  
**Awij bardfy** -\ the length of the carpels.  
Flowers white; leaves downy on both skies ..... 4, 8.  
*vvers* yellow.  
Leaves lanceolate, **glabrous** on both sides ..... , -' 8. &'%\*  
Leavea obovate-ouneate, **glabrous** on the t~'''

Awns **Dear**]v as loii"; ar

**farpels.....**

1. *Si da veronicifolia*, *Lam. Encyc. v. 1 (1783) p. 5*. A perennial much-branched herb : branches prostrate or trailing, sometimes rooting, more or Lea 2 in. long, cordate, ovate, acute or ucu-

minate, serrate, sparsely clothed with stellate hairs; petioles  $\frac{3}{8}$ – $\frac{7}{8}$  in. long. Pedicels  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long, slender, axillary, solitary or twin, jointed a little above the middle. Calyx  $\frac{1}{4}$  in. long, 5-angled, hairy; lobes

triangular, acute or acuminate. Corolla pale-yellow, slightly exceeding the c; tly %. Car pel- iooth, not reticulated, muti co us or with a a i rial 1 slightly 2-lipped beak-, not cuspidate. S own. glabrous. K. Schum.

ras. v. 12, part 3, ]). 319; E. Bak. in *Journ. Bot.* v. 30

2) p. 293. S. Cav. Diss, p. 277; *Fl. B. I.* v. 1,

lz. & (lib. p. 17; *Trim. Fl. Ceyl. v. 1, p. HI*; *Wbodr. in Mart. Bras. v. 12, part 3, ]). 319*; E. Bak. in *Journ. Bot.* v. 30

ond. 1892) p. 293. S C Di p. 322/ *Dalz. & (lib*

•founi. **Bomb.** part 2, p. 681.—Flowers: Oct.-N

Commoncfarou

*Law !; Karanja, on sea sand, Stock and Baroda, Cookel S. M*

*Cookei .SIM>: widelj, W< i, In trop*

,,, KOKSAB:  
 \Jadluwi (Dan^s)  
 .^, ^]?:: Londa and Bath  
 "ions of

2. *Sida glutinosa*, *CV/\*-. piss. 1 (1785) p. 16, t. 2, iig. 8*. Suberect, more hairy than !ta and glutiaoufl-hairy. Pedicels axillary'

veral crowded fcogetl arly all les^ than | in. long. Carpels o-()'

tooth, grej-puberulous, not reticulated j beak consisting of 2 rounded' jr ovate lobes, rather longer than as in X, *icifolia*, but not bicuspidate.

*Dfcherwi \ veronicifolia. K. Schum. in Mart. Bras. v. 12 part 8\**

310; E. fi;ik. in *Journ. Bot. v. 30 (Lond. 1892) p. 293 8 mmor. W. & A. Prod. p. 59; [! . B. [-. v. 1, p. 322 ; Trim, Fl.*

*Cey] V 1*

»°t2; *Woodr. in Joura. Bomb. Nat. v. LI (1897) p, 126.--Elowers I -Jan.*

^widely, *Wo*  
 .1. Beilgaum\_ A  
 micros.

KANAKA: D<  
 Widely spread throughout liif tropics of

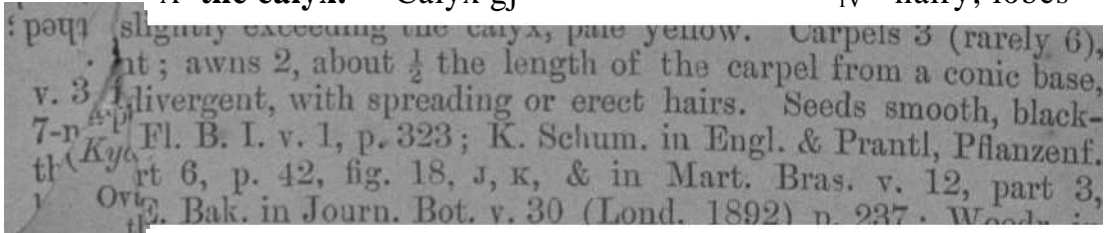
apixwsa, imm. % PZ. (1753) p. 68& A suberect branched sai^s .\*^ey from minute stellate hairs. Leaves up to 13 in. Long, elliptic snojuopbtuse or cuneal narrowed at the top

-l^uitwt^fc triangular, not acuminate, ultimately glabrate above gre\

..... "rt~ petioles J-l ia. long, with often I 3 smal] recurved spines

; ; M, . Nat. v. 1! (1897) p. 126; *Watt, Diet. Econ. Prod v 6 S86. & a&a, Linn. 8p. Pl. ed. 2, p. 960 ; Dalz. & Gibs n 17 I\*O t N*

**Jthe petiole. Pedicels 0~", f tn, totogf, flustered or solitary, jointed**  
**-A- the calyx. Calyx gj** <sub>iv</sub> hairy; lobes



**triangular**

**p** , **p** ; alz. &  
Gibs n

**f"! Ankleshwar (near Bro^jh), Cookel: TJOQIM**  
**^n< "'':' \*<<\*■ ! -J><<Tam. Tropical**  
**idiSta§**

4. *Sida grewioides*, *CfuiU.*, *Perr. et A, Ilich. Fl. St negamb, v.*

1

*f* 1830) p. 71. A branched undershrub<sup>11</sup>, grey-toimntose with stellate hairs. Leaves ,',-K in. *h* oblong, sometimes obovate, obtuse, crenate, downy" on but) sides *j* peti in, long. Pedicels 1~2 toother, 0-4 in. loag, jointed close under alyx. Calyx (in flower) much as in 8 *spinosa*, in fruit somewhat enlarged, sometimes exc< ;t. in diam., th( bi'oad. Corolla a little longer than the calyx, whi nearly glabrous, hoary, strong reticulated; a 2, linear, small, oardlj >{ f ho carpei, Seeds black, smooth, sometimes with near the hilum, Tl. B. I. v. 1, p. 323; E. Bak. in Journ. Bot, v, 30 ( Load. L892) p. 238 ; Woodr. in Journ. Bomb. Nat. v. II (1897) p. 120.—Flowers: ^S Dei

common, *Dalzeil*, li; Kara . . . . ■ ■ . RIB.  
ODropical Africa.

5. *Sida acuta*, *J?wrm. Fl lad. (1768) p. 147*. Shrubby, much-branched : branches slender, terete, minutely stellately hairy. Leaves 1-2| in. long, lanceolate, with rounded base, sharply serrate, glabrous on both sides ; pel ■--] in. long, shorter than the stipules, Pe 1-2 in each axil, shorter or longer than the petiole, jointed abouttbe middle. Calyx \ \ in. long; lobes triangular,,acute. Corolla nearly twice as long ie calyx, yellow. Fruit -1-J- in, in diam.; carpels

5-9, puberulous, not pubescent, strongly reticlated, toothed on the dorsal margins; awns if, nearly linear, about \ the length of the carpel, Seeds smooth, black. *Grah. Gat. p. 10 ; Wight, Ic. t. '95; Pate. & Giby. p. 17; K, Sebum, in Mart. Bras. v. 12, part 3, p. 325; E. Bak. in Journ. Bot. v. 30 (Lond. 1892) p. 238. 8. carpinifolia, Linn. f.. Supp<sup>1</sup> (1781) p. 807; Fl. B. I. v. 1, p. 323; Woodr. in Journ. "Bomb. X v. 11 (1897) p. 126; Watt, Diet. Econ, Prod. v. 6, parti?, p. 67!. Flo WOTS ; Nov.—Dec. VEEN, *Bdlax Jangali-nnetki^ lMhdn~ctjihna,>&i\$-**

C&KKAK: caramon, *Law!*; Bombay, *Cap* ∴ *Valzet f Gil*  
Marmagao, *Woodnnn*. Di: Poona, ECirkee, I . \*  
S. M. COITNTRY : Belgaum, *Bit* 1627! B. En tropical and SVL \*  
regions of both fa

(>. *Sida rhombifoliaj* var. *retusa*. *Masters, in Fl, ILL v. 1'*  
p. 324.—Shrub by, erect; branches mini ttely stella t elj ha i ry. ) ^ o  
on the middle of the stein obovate or truncate, sometime fc\*'  
euneate at base, often coarsely toothed at top, |-1^ in. long, darfc^ p\*  
and glabmus aboVe, more or less tomentdse beneath ; petioles very }■&  
\* fl in. or less. Pedicels axillary and crowded towards tin  
branches^ jointed above the middle, longer or shorter than the petir  
(al yx angular; bbes triangular, a e ute. Coroll a yellow, more than twit  
as long as the calyx. Carpels &-10, reticulated, with 2 .short  
awns.-, smooth, black, K. Schurn. in Mart. FL Bras. v. 12,  
part 3, ]>. 339; E. Bak. in Journ. Bot, v. 30 (Lond. 1892) p.  
239; W Diet. Econ. Prod. v. 6, part 2, p. 682. *S. i-ctvm*, Linn.  
Sp. PL ed. 2, p. 961; Grab. Cat. p. L6j Dak. & Gibs. p.  
17.—Flowers: Oct.-Dec. VeR\ *Bithi : J.t.,ii,n)-)i,xI'h;* ; ..|/l-lidla.

A common iveed. EOHKAN: " very comni.  
(Fortugnese territory), *Cooke!* P ! GOJASAI  
S. if. Cooxuiiv : Belgaum, i?i/?cj4ie, 621; Dh\$!\*war, *Cooke)*

7. *Sida cordifolia*, Ztwn. *Sp. Pl.* n75  
softly hairy and with 'much silicate hairs  
in long, cordate

abrid ; awns 2  
nearl\* V . ' f^els, linear, retrorse  
1 ' mafgms» ^ - ^ K. Hal,  
in  
lea not entire; petiole  
Few together ■ obtuse or  
middle! I ■ itary  
seeding the *cupyl*  
strongly reticulated cili; or  
a ^ bid Corolla slightly  
w the  
"?' mdmm>., carpels 7-10,  
tll(- (wo dorsal mar  
fl 7 1 " < ' ' f ^ ^ l li

■ Diffnra, Tropic;!  
. *Sifekie*,

1 na } . ; 4. KYBIA, Koxb. x  
1 na.vees with stellate hairs

4. Apt length loculicidally dehiscent  
Eathespi-ellipsoid, brown. black. ~ I)IST3,;71  
long JL "y ! in each cell  
- ' in India.  
acu>Ay<sup>dia</sup> calycina, i^j n^ R j "( ' ? ' ' p' 51 ; w  
ns / (1810) p. 1\$, t. 215 A' tn'p j  
P^  
>rved, cordate, usually 3-7-lobed' lob^ft^6 U! ' lon^ palmately -  
longest, glabrous above, ^tonSS^feafr' t th « ^obl ion-  
Paniclea man ered (Wh ? A beneath; petioles U2 in  
- ton^ I oShfete' lo! uvil^ to^ « i.  
»• toy tafarfti Corolla white r r ^7 "T?d'ac^nt  
rii; olWi clawed, with a tuft f 'i "  
eTM^ nate ^e of law Staminal tube og m.  
hairy^at the hi ybranch\* n^ 8ule of ^ " 'nal, :lt^ peltal  
2-3-celled; om\ 1

than in the carpellate flo<sup>S</sup> P<sup>^</sup> V flJ\*?«n\*« l<sup>^</sup>g<>r in |e ri»  
of a verj smal) ^ "'<sub>ov</sub> ^ e ^cnlieidaJly fj.^lved  
..... 1:~'% donate. &^iwl^ '



Fi. B I. v. i, p. P;ib. & Gibs, p. 24; Talb. Erees, Bomb. p. 20; Woodr. in Journ. Bomb. Nat v. U (1897) p. 128. —Plowers: Aug.- Pec. VEEN". r:/h-|

Cxijfv/: DB( ■ i-hi ■ ■'. IVON ■ iboli GJnf, ■ at> Gbiite, ( : North Kauara

5. ABVTXI\*ON, Tournef.

'rv: tbs. Leave\* [ate, ovate, to<or  
'slightly  
Ir ,, ] ■■■■■ lary (uppermost running into  
raceme in •'■ L-flowered (in A. ramosum oft  
flowered), join n\*the flower. Flowers yellow. Involueral bra  
Stami tube divided at the top info in ;, antheri fila-  
ments. \*;u'! styles as many its the carpel?, long; stigmas  
capitate, liipe carpels separating from the short centra] axis,  
rouode  
on the back, ■ truncate, pointed, apiculate or with a  
short  
oblique or hovl inuero, 3-5-seeded. renifornj, dark brown.  
—DISTHIU. Jn all warm regions ; species 170.

- Cforpels 5.  
Staminal-tubo very short, ..... „..... 1. A. polyandi |  
Staminal-tul ■ ;labfous..... 2. A. Eanadei.  
Carpelf? more tsually 1.-  
Carpels pointed or with a distinct nmicro.  
Carpels ^-| in. long,  
CurpeJs bairy, ultimately glabrate, shining ..... 3. . ^s  
Carpels densely jiaii'y, ultimately shaggy ..... 4, .  
arpels£~\$ in. long ..... 5. A, I  
Carpels obtuse, without & m\|  
Corolla '2 in. in  
Fruit globose, densely illous..... 0. J. mutie  
i'Yiutx-..... 7. A. . ens. \*  
Corolla f in. in diam. .... 8, A. cHmm,  
Osrpelfl 8-10.  
Carpels J in. long; fruit short, eylindric.  
Oarpols beaked ..... 9. A. ramos]u£|  
! ly beaked, truncate..... 10. A. fructict] &  
: a. long; fruit droid ..... i'< ' ^

.1. Abntilon polyandrum, Wight ei Am, Prodr. (1834)  
Au erect undershrub, A iu Leaves up to 9 by 7 in., roui  
pvato ■ tqthed, tomentose ir..^ o ^ %-  
iv(..ity; petioles 3 ■! in. long. Racemes terg ^4  
8-15 in. long; pedicels I-2, 1, in. long, joinfced near the flower; -.^ P\* ^ <<|'  
(at the base of the pedi I in. long, lanceolate, toothed. <■ ' / ^  
lobes |-| in. long, lanceolate, tomentose. Corolla Li in, in dj\$  
orange-yellow, purple-veined near the base. Sfcaminal-tube J^ery sbr  
densely 11 airy ; ilaments long, free aimgst to the very base. 'Carpels  
acuminate, mucronate, a liti).<sup>1</sup> longer than the calyx. smooth^j?  
brown. PI. B. 1. y. I, p. 325 (excluding syn. Schlecht); Grah, Cat. 'STK!B,  
p. 15; Dalz. & Gribs. p. 17: E, Bat. in Journ. Bot. v. 31 (Lond. 1803)  
j); 270; Woodr. in Journ. Bomb. Nat. v. U (1897) p. l'2<i; Wat^Dioi  
Econ. Prod. v. I, p. 17. — Flov -.Tan. FEES'. Maddn B  
rnn, (}. Don. Gen. Syst. v. 1 (1831) p. ^"O^j^..;  
dently t print for Abu polyanthum and was not!. >

*Sida polyantha*, **Sehlecht**, a remote **speci**

Very common on the GhAta. KOKKAK: *Stock\*' Law'.*\*, Par, &7</,£m; w. Ghats  
\*iawyi ! s- M- Cowiir: Belgaum, /7?v-/<>, 60!~DISTRIB. S.  
Java. Africa

2. *Abutilon Ranadei*, Wx *Stapf, in Km Bull.* (1894) n  
</>

^n underahrub, ;h, densely and tnii-u!,lv steHately tonsentose!  
Leav;\_S Q1J u> ' bv 6 in.,-cordate, ovate, acuminate, distantly tooth  
petioles stout, 2- ! in. long. Mhucj-s axillary, solitar  
iri. long, jointed near the flower. Calvxl-lin lnr»». kL  
bbes ovate-laneeoiate, scute, a the lube." Petals iii,Tj ;n  
long, orange-yellow, purple-veined at base. Stammal-tube liii.W  
glabrooB; filaments exceedingly short. Carpels 5, acuminate,  
mucr?-  
oate, ; In. long, densely shortly hairy all over. Seeds laree duakv *hhu I*  
furfuraceous.lc Woodr. in Journ. Bomb. ^v *Wimlv VM.*  
—Flowers: Jan. 'F- " u

A rare plant, named after S. B, Bi ormanvvoM ' en  
**at the College of Science, Poona, who** . 7 v vi-  
ghat, on the I iri and Kdhkpnr Boad, *Eanaitm* jj ? TM

3 *Abutilon indicum*, flfo^ //, w. 5Wt T< , (lg27) ,,  
atescent, minutely hoarv-tonientns\* i,,,,... n)) i(.

Sower<sup>1-J</sup> »^eyl. v.1, p. 145 ; B. Bak. in Jonrn. Bot, v31 O,ond. 1893

\*r ost of the year, VEEK \fudm- i> i; ■ TI I '  
P^ nAAHimnfi »« , ^m»i ..... \* \*ffftW< !ll{^ 8eedg 'tre used in

XT/ ' .PS \ abumlntl .long the roaddes.  
\* s v STEY: Bfelgaum. 5/^ w ■ 631 i "»m.ean»gar, *Cwke!*  
e|3J rk:: Lwda. near Karachi^

; 7 more^omentose than *A. indium*. Calyx (fensey clothed  
wS ^/woolly hairs, Flowers 2 in. m diam., orange-veUow  
rZ i  
nnude. shaggy on the back when ripe. Need, 4oo on  
P %*indicum*. F1.B. J. r.1,p.326; Grah V-M Vi" iV • o h/'nvisc

Econ. Prod, y. 1, p. 15. \* // 14; Uatt> DW\*.

BOMBAY: Capf. ffjkw!; in gardens,Boiahay G nI have only seen one  
specimen iVom Bombay mavkal M a bore, in Herb. K\*w.

'-o n*Abutilon bidentatum*, A *Itiel*, wi AI -\* ,->

Carpels about 20, J-J in. '

%

9. *Abutilon ramosum*, *Guilt*, /', *A, Rich., FL Senegambh.* v. 1 (1830) p. 68. Shrubby, erect, 4-5 Ft. high, with ash-colored bark, minutely hairy. Leaves 2-5 in. in . *oanh* .  
 tril' subulate, . . . . .  
 Pedicels

requently divided into - branches near the top, jointed the calyx. Calyx .{-.' in. long, divided to the middle, MI; [lobes ovate, euspidati Corolla jj in. in diam. short, cylindric; carpels 8- 10, glutinous-pubescent, .' in! Ion tuncronate. Seeds dull, furfuraceous-dotted. K L M . 1 v i p. 328; E. Bak. in Journ. Bot, v. 31 (Lond. 1893) p. fe; Woodr'in Journ. 1; Sfat. v. I! (1897) p. 127. A. Dalz k ("ribs p. ! : Dec.

RAT: fj"l\* ■ Sf! Six,.: Karachi,

.^*Abutilon fruticosum*, *Quill, Perr. ,i A. Eieh;*, *FLSmegamb.*

u" Ion q' deeP^y cordate, ovate-oblong, acute or obtuse often r<7!:. ^te, some tir . bthed; petioles .^1 in. Jong.

Pedicel" n, LOQg, axillary, scattered, slender, jointed near the top. Calyx :, divided more than half way down; lobes ovate acute or S^TTS Cor^fla^tm. in diam., yellow. Fruit i in. lo^cyHnlic *Tt* (Ome] truncate, not beaked. Seeds small brown dotted wit^minute \*hite hooked hairs. Fl. B. ! , i ! "

I. nntiv 1 i, s; !, i; E. Bak. in Journ. Bot. v, k\Und. p.214; Woodr. in Journ. Bomb. Nat. v. 11 (1S97) n 127

Jemaa« S\_ ^Hia, near Karachi, **flfec^ 371!**; Malir, near

V- \ ;^*Abutilon cornutam*, *T. Coolce.* Erect 2ft 1, mi Diet. ^Leaves orbicular, 2|-3 in. in diam Jv V^- : ^ y^Hwm^ ^We- fir in.] dy pub, .: .: ., " ' V,^1 :. ^fn\ [n\* ^

Verj above t) (;t v\^- ! ,' ton&' sif"(l(^r, B^ expanding in the evening. Carpels 8 loSaly^W H? rno»te, with strong mucro. Seeds brown furfnr, (; " ^yaictem, DaUell MS. in Herb. Kew. dotted

^ap: ' : Kiarachi VT p(vl. Pl lol; w

c1e lol low mg is grown as an oraamentel plant in/l ;B , aens throughout the Presidency:— common in *Abutilon striatuni*, Dicks, in Dindl. Bot *Re& nf&Q\ |r n*

A slender erect branching shrub, glabrous ew hfti \* p> i9\_ ong-petioled, broadly oval,, 3- or obsoTe4lv^ffi! ^?S' urinate" o r subcuspidate, irregularly coarsely sermt^ V

-*invovw* Lnear, obhuoeolate, acumi ¥\*  
""v  
 axillary, large, rosy with white s&afes S /<sup>^</sup>P<sup>^</sup>nt.  
 U> ^rh Fl U W T.J- -r> .- » . HflJ^> IMz.  
 & Gibs. Sn<rv1

**ovat.**

part 'f>, p. 426; Firm. Man. Gard. Fml. ed. 3, p. -113. *Abittihn pictum*,  
 '■ walp, Rep. T.1, p« 324. #«2a yf/Yta. Gill, in Hook. Hot. Misc. v.  
 p. 154. Cultivated i

6. MALACHRA, Linn.

Hispid herbs. Leaves often angled\* or iobed; Flowers yellow of  
 whitish, iu dense li^ad-; with foliaceous ihvolucral bracts. Sepals •">,  
 united into a tube bekn middle. Staminal-tube short, truncate  
 or  
 5-toothed at the apex; filaments numerous. Ovary 5-celled; cells 1  
 ■■■  
 ovuled; styles l(i : apitate. Ripe carpels separating from  
 the  
 axis, imloliis' >th. Seedsreniform, ascending.—DISCTIB,  
 Warmer regions of America; species 5 6, of which I  
 or2h,avebecom©naturaliz in Asia and Africa. The following is one  
 of these:—

1, *Malachra capitata*, Linn, Syst ed. 12, v. 2 (176' p. 8  
 A coarsely hispid annual. Leaves 2 3 in. long, cordat\* mi  
 orbicular more or ! bed or angled, to orate and entire; petioles  
 1|—2 in. long, jointed below the blade; stipules |~jjj in. long, simple,  
 linear or often 2—3-branched, the branclies connate at or near the very  
 base, flat at base, above filiform. Pedi 2 in. long; several  
 of  
 different lengths arranged on a very short stoui axillary peduncle, each  
 pedicel carrying a 4-leaved involucre, 3 of the leaves of which are  
 equal, the fourth smaller and attached higher up than the others.  
 Involucral leaves with stiff bristles mi the, margins and on the nerves  
 beneath, variously lobed and toothed, with a white spot at the base and  
 with 2 opposite ciliate appendages, each | in. long, on the short  
 stalk  
 below the blade. Flowers subseisile, 46 within the involucre, yellow  
 Calyx membranous; lobes ovate, acute, prominently margined., \y  
 midrib produced into,, a long bristly point. Carpels 5, rounded ( n n h i  
 back, wedge-shaped on the ■■ side, white when ripe.  
 brown veins. Seeds smooth, brown-black. Fl. B. i. v. !.  
 Woodr. injourn. Bomb. Nat. v. 1! (1897) p. 127; Watt, Diet. \*gm %'  
 Prod, v/5, p. 109. *M. rotundifolia*, Schrank, Pl. Rar. Hort. r % S'  
 t. 56; Grab. Cat. p. 13; Dal/. & Gibs. Suppl. p. 9.—Flowers:  
 Dee. VBEW. *Rdn-bhendi*; *Fdn-bhendi*. ' -o^ %  
 \ ery eomiao in waste places in the island of Bombay and, illy, in the n. <y eJ  
 low-lying tract known as the Byculla Plats. The pbml ooiupletely m9 / tr.,,5 ^  
 x  
 I bed and a weed in many p -aHam (Gat. f., 't-t •  
 iO  
 states thai if was i 1 from Brazil into Bombay by Nil ;i fibre-j\*.\* J£ "  
 A  
 The plant prodi | lib re, but the expectation of its being used in Bq . >2  
 ibstitute for Jute ■ been realized. Fora full accou 7  
 Econ. Prod. I.e.

7. URENA, Linn.

Herbaceous **tomentose** perennials. Leaves **usually** angled or lobed. Flowers **clustered, sessile or** shortly petaloid, (**involucral bracts 5**, **connate** at **the base, adnate to the tube of the calyx, ultimate** ;ii).  
Sepals 5, connate into a cup-shaped **calyx**. **V** **connate** below, united to the *staminal* tube. **Staminal-tube bearing short subsessile** anthers below the **truncate or 5-toothed** **n<sup>o</sup>-celled** cells **L-ovuled**: branches of the style



#### 4. CA3MSJERA, Juss.

Climbing shrubs, sometimes spiny. Leaves alternate, entire, pinnately-nerved. Flowers in short axillary spikes, hermaphrodite, ino-  
ohlamy(Icon. Perianth tubular or urceolate, regular, 4-5-lobed.

^Stamens as many as the Lobes of the perianth and opposite to them; filaments glabrous, free, or attached between the thick fleshy lobes of

-A  
the disk of anthers small, oblong, adnate, 2-celled, dehiscing longitudinally.

Ovary superior, ovoid-conical, glabrous? ovule pendulous from a short placenta; style cylindrical; stigma capitate,

>  
5-lobed. Fruit superior, drupaceous, surrounded at the base by the perianth 5-lobed; endocarp thin; endocarp bony. Seed solitary,

erect, roundish; embryo in the upper part of fleshy albumen; radicle superior; cotyledons sometimes 3, very long, plano-convex,—DISTEIB. Tropical Asia and Australia; species 4.

1. *Cansjera Rheedii*, J. F. Gmel, Linn. Syst. J. Vat. ed. 13, v. 2 (1791) p. 2yO. A climbing shrub, sometimes spiny; young branches yellowish-green, pubescent. Leaves 1Y>~BJ by §-l in., thinly coriaceous, oblong-lanceolate or ovate, glabrous on both surfaces, base narrowed or rounded, often slightly inequilateral; main nerves 3-5 pairs, curved, ascending; petioles -Ay-^ in. long. Flowers ^ in. long, in the axillary spikes ^-1 m. long, one or two spikes from an axil; bracts minute, linear-lanceolate, one at the base of each flower. Perianth pubescent externally, urceolate, 4-5-toothed, the apices of the teeth recurved. Fruit about 1/2 in. long, ovoid or ellipsoid, orange-red surmounted by the remains of the style, glabrous. Fl. B. I. v. 1, p. 582 j Bedd. For. Man. in Flor. Sylvat, p. clxxix, t. 20, fig. 6; Trim. Fl. Ceyl. v. 1, p. 209; Talb. Trees, Bomb. p. 45; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270.—Flowers: Nov.-Dec.

KORC : Law f; Elephants, Graham j Sahefte, Grafuim. IJECCAN; valley of the Koina, Vooke! 8. M. GOPNTBY: Pirva Ghat (Belgaut districts), Sitchie!; hills east of Bdgftum, Ritchie, 02fi! KAN-ARA: on the Ghats in evergreen moist forest, Talbot Yelkpur, Woodrow.—DISTRIB. Throughout India; Indian Archipelago, Hongkong, N. Australia.

#### 5. GOMPHANDRA, Wall

Shrubs or trees. Leaves alternate, entire, penninerved (rarely, 5-nerved at the base). Flowers small, polygamio-dioecious, cymose. Calyx cup-shaped, minutely 4-5-toothed. Petals 4 or 5, inserted on a short hypogynous disk, more or less connate into a corolla, free at the apex, valvate, often absent in the female flowers. Stamens 4 or 5 hypogynous, alternate with the petals; filaments fleshy, flattened\* usually with a small tuft of gland-tipped hairs at the top "on the back" hollowed in front; anthers small, pendulous from the apices of the filaments, 2-lobed, dehiscing longitudinally. MALI; FLOWERS with rudimentary ovary sunk in the fleshy disk \ stigma minute. FEMALE FLOWERS with long cylindrical 1-celled ovary and large discoid stigma; ovules 2, collateral, pendulous from the apex, the funicle dilated. Fruit elongate drupe-like, surmounted by the remains of the stigma;

pericarp smutted. thin; endocarp leathery. Seed solitary,  
pendulous; alb<sup>g</sup>Q **rarely** bipartite; embryo minute.—DISTBIB.  
Tropical Asia; spr T<sup>r</sup> *move*

Stamens usually '  
\_nt i > 1 •

**BB**

#### 4. CANSJERA, Juss.

Climbing shrubs, sometimes spiny. Leaves alternate, entire, penni-nerved. Mowers in short axillary spikes, hermaphrodite, mono-chlamydeous. Perianth tubular or urceolate, regular, 4-5-lobed. Stamens as many as the lobes of the perianth and opposite to them; ufilaments glabrous, free, or attached between the thick fleshy lobes of lthe disk; anthers small, oblong, adnate, 2-celled, dehiscing longitudinally. Ovary superior, ovoid-conical, glabrous; ovule solitary, vpendulous from a short placenta; style cylindric; stigma capitate, 1-lobed. Fruit superior, drupaceous, surrounded at the base by the marcescent perianth; mesocarp thin; endocarp bony. Seed solitary, erect, roundish; embryo in the upper part of fleshy albumen; radicle superior; cotyledons sometimes 3, very long, plano-convex.—DISTRIB. Tropical Asia and Australia; species 4.

1. *Cansjera Rheedii*, *J. F. Omel. Linn. Syst. Nat. ed. 13, v. 2* (1791) p. 280. A climbing shrub, sometimes spiny; young branches yellowish-green, pubescent. Leaves 1|-3| by §-1§ in., thinly coriaceous, oblong-lanceolate or ovate, glabrous on both surfaces, base narrowed or rounded, often slightly inequilateral; main nerves 3-5 pairs, curved, ascending; petioles -jV~8 \*n\* l<sup>ong</sup>\* Flowers τ\j- in. long, in pubescent axillary spikes ■\*—1 in. long, one or two spikes from an axil; bracts minute, linear-lanceolate, one at the base of each flower. Perianth pubescent externally, urceolate, 4-5-toothed, the apices of tb .teeth recurved. Fruit about \ in. long, ovoid or ellipsoid, orange-r' surmounted by the remains of the style, glabrous. Fl. B. I. v. 1, p. 582; Bedd. For. Man. 'in Flor. Sylvat. p. clxxix, t. 26, fig. 6; Trim. Fl. Ceyl. v. 1, p. 259; Talb. Trees, Bomb. p. 45; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270.—Flowers: Nov.-Dec.

KONKAN: *Law* !; Elephanta, *Graham*; Salsette, *Graham*. LECCAN: valley of thf Koina, *Cookel* S. M. COUNTRY: Parva Ghat (Belgaum districts), *liitchie* !; hills eas of Belgaum, *Ritchie*, 926! KANARA: on the Ghats in evergreen moist forests, *Talbot* Yellapur, *Woodrow*.—DISTRIB. Throughout India; Indian Archipelago, Hongkong, N. Australia.

#### 5. GOMPHANDRA, Wall.

Shrubs or trees. Leaves alternate, entire, penninerved (rarely 3-nerved at the base). Flowers small, polygamo-dioecious, cymose. Calyx cup-shaped, minutely 4-5-toothed. Petals 4 or 5, inserted on a short hypogynous disk, more or less connate into a corolla, free at the apex, valvate, often absent in the female flowers. Stamens 4 or 5 hypogynous, alternate with the petals; filaments fleshy, flattened, 'usually with a small tuft of gland-tipped hairs at the top on the back', hollowed in front; anthers small, pendulous from the apices of the filaments, 2-lobed, dehiscing longitudinally. MALE FLOWERS with rudimentary ovary sunk in the fleshy disk; stigma minute. FEMALE FLOWERS with long cylindric 1-celled ovary and large discoid stigma; ovules 2, collateral, pendulous from the apex, the funicle dilated. Fruit elongate! drupe-like, surmounted by the remains of the stigma; pericarp smarted, thin; endocarp leathery. Seed solitary, pendulous; alb<sup>g</sup> rarely bipartite; embryo minute.—DISTRIB. Tropical Asia; sgr<sup>^</sup> ^<sub>r</sub> m0YQ

Stamens usually

KONKAN : high hills, *Dalzell I, Law I*; Campuli, *Woodrow I* DECCAN : Dahili, near Poona, *Woodrow!* KANAKA : common in the evergreen forests of the Ghats of W. Kanara, from Ainshi southwards, *Talbot*; Falls of Gairsoppa, *Talbot* —DISTRIB. India (W. Peninsula); Ceylon, Malacca.

3. ***Olax nana***, *Wall. Cat.* (1828) 6783. A low undershrub, branches from a woody rootstock, - twiggy. Leaves subsessile, 1-2| by ^-| in., oblong-lanceolate, obtuse, glabrous, base usually acute; midrib strong. Flowers \-f-\$ in. long, white, solitary, axillary; pedicels slender, \-^ in. long. Calyx free, minute, cup-shaped, truncate or obscurely lobed. Petals 3, oblong-obovate, rounded at the apex, the tip inflexed, cohering about half way up but readily separable. Stamens 3, one in the centre of each petal, a little more than half the length of the petal and adnate to it about half way up; anthers yellow. Stam modes 6, one at each edge of each petal and a little shorter than it. Ovary ovoid; style shorter than the stamens. Fruit globose, | in. long, apiculate, deep yellow when ripe, nearly covered by the accrescent, calyx, 1-seeded. *El. B. I. v. 1, p. 576*; *Woodr. in Journ. Bomb. Nat. v. 11* (1897) p. 270; *Watt, Diet. Econ. Prod. v. 5, p. 479*.

GUJARAT: Rajkot (Kathiawar), *C. Macnaghten!* —DISTRIB. India (W. Himalaya, Punjab, Nepal).

### 3. **STROMBOSIA**, Blinnie.

Trees or shrubs, usually glabrous. Leaves alternate, coriaceous, quite entire. Flowers small, in axillary cymes, regular, hermaphrodite. Calyx : a shallow cup, more or less 5-lobed. Petals 5, free, hairy within, valvate. Stamens 5, opposite the petals and adnate ^to them; anthers 2-celled. Staminodes 0. Ovary inferior or superior, more or less imperfectly 4-5-celled, surrounded by a lobed disk; ovules 4-5, pendulous from a central placenta. Fruit drupaceous; stone crustaceous. Seed pendulous; embryo minute, within fleshy albumen.—DISTRIB. Species 6, one in Tropical Africa, the others Tropical Asiatic.

1. ***Strombosia ceylanica***, *Gard. in Calc. Journ. Nat. Hist. v. 6* (1846) p. 350. A large tree with greyish bark. Leaves coriaceous, 3|-6g by 1§-2| in., oblong-lanceolate, shortly acuminate, acute or obtuse, glabrous, base inequilateral, usually acute; petioles | in. long, glabrous. Flowers subsessile, crowded in heads on axillary scaly tubercles. Calyx minute; lobes very short, suborbicular. Petals longer than the calyx, linear-oblong, acute, externally glabrous, hairy within, recurved at the apex. Filaments opposite the petals and adnate to them throughout their whole length, the anthers appearing as if sessile in the centre of the petals about one-third the way below their apex. Disk large, fleshy. Ovary inferior, adnate to the calyx-tube, 5-celled. Fruit pyriform when young, more or less globose when old, apiculate, rugose, deep purple, tuberculate when ripe. *EL B. I. v. 1, p. 579*; *Trim. ¥. Ceyl. v. 1, p. 257*; *Talb. Trees, Bomb. p. 45*; *Woodr. in Journ. Bomb. Nat. v. 11* (1897) p. 270. *Sphcerocarya leprosa*, *Dalz. in Hook. Kew Journ. v. 3* (1851) p. 34; *Dalz. & Gibs. p. 223*.—Flowers : Dec.

KONKAN : *Law!*; in the Wari Country, *Dalzell \$ Gibson*; Konkan Ghats, *Talbot*. KANARA: *Dahell!*; Poteli (N. Kanara), *Woodrow*; N. Kanara Ghats, *Talbot*.—DISTRIB. India (W. Peninsula); Oeylon.

the edges of the petals and attached to their bases, rarely opposite their centres; anthers adnate to the filaments, oblong, 2-celled, dehiscing longitudinally. Staminodes 5-6, bind, usually opposite the petals. Ovary free, more or less 3-celled below, 1-celled above, usually surrounded by a cup-shaped hypogynous disk; ovules 3, linear, pendulous from the apex of a central placenta; style simple; stigma 3-lobed. Drupe ~~lobose~~ or oblong, more or less covered by the accrescent calyx; stone crustaceous, 1-celled, 1-seeded. Seed spuriously erect, albuminous; embryo minute in the apex of fleshy albumen; radicle superior.—**DISTRIB.** Chiefly in the Tropics of the Old World, a few in Australia; species 25-30.

Climbing shrubs.

- |   |                          |
|---|--------------------------|
| Armed; drupe firm in .....                | 1. <i>O. scandens</i> .  |
| Unarmed; drupe juicy in .....             | 2. <i>O. Wightiana</i> . |
| A low undershrub; pedicels solitary ..... | 3. <i>O. noua</i> .      |

1. **Olix scandens**, *lioxb. Cor. Pl.* v. 2 (1798) p. 2, 1. 102. A climbing, much-branched shrub, armed with slightly curved stout prickles on the old wood; branches terete, more or less pubescent. Leaves 2-3 by 1-11 in., elliptic or oblong-elliptic, usually obtuse, glabrous above, glabrous or pubescent beneath, entire, base rounded or subacute; petioles  $\pm \frac{1}{2}$  in. long, pubescent. Flowers white, fragrant, about  $\frac{1}{2}$  in. long, in axillary racemes which are shorter than the leaves; buds oblong, somewhat clavate; pedicels short, pubescent; bracts ovate-oblong, as long as the pedicels, pubescent, ciliate, caducous. Calyx cup-shaped, truncate, ciliate. Petals linear, acute, more or less connate. Stamens about half as long as the petals. Ovary ovoid, glabrous; style about half as long as the petals; stigma 3-lobed. Drupes globose,  $\frac{1}{2}$  in. in diam., apiculate, covered, except the top, by the accrescent calyx. *Fl. B. I.* v. 1, p. 575; *Grah. Cat.* p. 22; *Trim. Fl. Ceyl.* v. 1, p. 256; Engler, in *Engl. & Prantl, Pflanzenf.* v. 3, part 1, p. 240, fig. 153; *Talb. Trees, Bomb.* p. 44; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 270; *Watt, Diet. Econ. Prod.* v. 5, p. 479.—Flowers: Feb.

Along the Ghats, *Graham*. **DEI CAN:** Khandala, *Woodrow, Graham*. **KANAKA:** Nilkund (N. Kanara), *Woodrow*.—**DISTRIB.** Throughout Tropical India and Birina; ^Ceylon.

2. **Olix Wightiana**, *Wall. Cat.* (1828) 6779. A large much-branched unarmed scandent shrub or \*small tree; young parts glabrous. Leaves 3-5 by 1-2 in., oblong-elliptic, acuminate, subacute or obtuse, glabrous and shining, entire, base acute or rounded; petioles  $\frac{1}{2}$  in. long. Flowers about  $\frac{1}{2}$  in. long, white, in axillary solitary or clustered racemes about 1 in. long; buds clavate; pedicels puberulous or subglabrous • bracts minute/much shorter than the pedicels, caducous. Calyx externally puberulous, truncate or obscurely lobed. Petals long, oblong or subglobose, covered, except at the top, by the accrescent calyx. *P* & *Gibs.* p. 27; *Trim. Fl. Ceyl.* v. 1, (1897) p. 270.—Flowers: Dec.-Feb. *Woodr. in Journ. Bomb. Nat.* v. 11

puberulous on the outside near the apex, linear, acute. Stamens 3, each inserted at the edge of a petal and about half its length. Staminodes 5, opposite the petals and nearly as long as them. Ovary ovoid, glabrous ; style a little shorter than the petals; stigma deeply 3-lobed. Drupes 1 in.

less adnate to the calyx-tube and disk. Seed pendulous; albumen fleshy, entire or lobed, rarely wanting; radicle superior; cotyledons leafy, flat or folded, rarely fleshy.—DISTRIB. Tropics of both hemispheres; genera about 45; species about 220.

Stamens 10; calyx not accrescent .....	1. XZMRNIA.
Stamens 3; calyx accrescent .....	2. OLAX.
Stamens usually 5 (rarely 4).	
Stamens opposite the petals or the lobes of the calyx when petals are absent.	
Stamens 5; ovary 3-5-celled .....	3. STROMBOSIA.
Stamens 4-5; ovary 1-celled; petals 0 .....	4. CANSJKRA.
Stamens 5, alternate with the petals.	
Trees or erect shrubs.	
Petals glabrous within.	
Petals connate .....	f>.
GOMPIANDRA.	
Petals free .....	6. APODYTES.
Petals villous within .....	7. MAPIMA.
A climbing shrub .....	8.
SARCOSTIQMA.	

### 1. XIMENIA, Linn.

Shrubs or low trees; branches spiny. Leaves alternate, quite entire. Flowers rather large, racemose, usually hermaphrodite. Calyx small, 4-5-toothed or -lobed, not altered in fruit. Petals 4-5, hypogynous, valvate, hairy within. Stamens twice as many as the petals, hypogynous; anthers innate, linear, erect. Staminodes 0. Ovary superior, 3-4-celled; ovule solitary in each cell, pendulous, anatropous; style columnar; stigma simple. Drupe ovoid, 1-celled; stone solitary.—DISTRIB. Throughout the Tropics of both hemispheres; species 4-5.

1. *Ximenia americana*, Linn. *Sj>. PL* (1753) p. 1193. A small much-branched spiny shrub; young parts glabrous; branches often ending in a spine. Leaves coriaceous, 1-2 by  $\frac{1}{2}$  in., elliptic, obtuse at both ends, the apex sometimes emarginate; petioles scarcely  $\frac{1}{2}$  in. long. Flowers white, fragrant, bisexual or sometimes polygamous,  $\frac{1}{2}$  in. long, in short racemes which are axillary or on the ends of lateral twigs; buds oblong, subacute; pedicels short; bracts minute, subulate. Calyx small, glabrous, deeply divided; lobes 5, ovate, acute, ultimately reflexed. Petals much longer than the calyx,  $\frac{7}{8}$  in. long, equalling the stamens in length, linear-oblong, acute, shaggy inside. Ovary glabrous, ovoid-conical, longitudinally sulcate, rugose. Fruit ovoid or ellipsoid,  $\frac{1}{2}$  in. long, deep orange when ripe; pericarp pulpy; endocarp 1-celled, 1-seeded. *Fl. B. I. v. 1, p. 574; Trim. Fl. Ceyl. v. 1, p. 255; Talb. Trees, Bomb. p. 44; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269; Watt, Diet. Econ. Prod. v. 6, part 4, p. 319.*—Flowers: Jan.-Feb.

S. M. COUNTRY: Kedur, near Badami, *Woodrowl*; north-east of Belgaum, *Ritkie* 994!—DISTRIB. India (E. & W. Peninsulas); Malaya, Tropical Africa, America.

### 2. OLAX, Linn.

Trees or shrubs often scandent, sometimes armed. Leaves alternate. Flowers small, in axillary simple or branched racemes. Calyx minute, cup-shaped, truncate or obscurely toothed, much enlarged in fruit, enclosing the drupe, but free. Petals 4-6, hypogynous, free or more or



less coherent, valvate.  
opposit

Staraens (fertile) usually 3, generally

Seeds pendulous, hilum broad ; testa membranous; albumen 0; embryo large; cotyledons thick; radicle small, superior.—DISTEIB. Tropics of the Old and New World ; genera 3 ; species about 40.

### 1. CHAILLETIA, DC.

Flowers polygamo-monoecious. Sepals 5, unequal, united at the base or above it, obtuse. Petals 5, 2-fid. Stamens 5, sometimes slightly adnate at the base to the petals. Disk of 5 quadrate scales placed opposite the petals. Ovary 2-3-celled.—DISTEIB. Tropical Asia, Africa and especially America; species about 30.

1. **Chailletia sumatrana**, *Miq. Fl. Ind. Bat. Suppl.* (1860) p. 328. A bush or small tree. Leaves 2-4 by 1-1 f in., elliptic or oblong-elliptic, acuminate, entire, glabrous, base acute ; petioles  $yV \sim 8^{*n*}$   $^{\wedge}E >$  stipules pubescent. Flowers small, in axillary or extra-axillary clusters. Sepals  $y^{\wedge}$  in. long, elliptic-oblong, obtuse, densely pubescent. Petals as long as the sepals or a little longer, linear-oblong, deeply notched at the apex. Connective of anthers broad. Ovary (in the female flowers only) downy ; styles 2, recurved. Fruit transversely oblong or ob-cordate, didymous, compressed, covered with soft greyish down ; epicarp coriaceous, 2-valved, dehiscing along the edge ; stone thin, hard, rugose, covered by a soft scarlet mesocarp. Trim. El. Ceyl. v. 1, p. 254. *Chailletia gelonioides*, Bedd. For. Man. in Flor. Sylvat. (1871) p. lix, t. 0, fig. 1: Fl. B. I. v. 1 (1875) p. 570; Talb. Trees, Bomb. p. 43; "Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269; Watt, Diet. Econ. Prod. v. 2, p. 263. *Moacurra gelonioides*, Eoxb. Fl. Ind. v. 2, p. 69; Dalz. & Gibs. p. 52,—Flowers : Apr. -June.

KONKAN: *Stocks I*; edge of the Ghats in lat.  $16^{\circ}$ , *Dalzell* S. M. COUNTRY: Ramghat, *Ritchie*, *Irt55!*, plentiful, *Dalzell* cf *Gibson*. KANARA : very common in N. Kanara near the Falls of Gairsoppa, *Tcdbot*.—DISTRIB. India widely; Ceylon, Sumatra.

### ORDER XXXYIII. OLACACE<sup>^</sup>

Trees or shrubs, erect, scandent or twining. Leaves alternate (rarely opposite), simple or lobed, exstipulate. Inflorescence cymose or racemose (rarely capitate), terminal, axillary or extra-axillary ; flowers usually small, regular, hermaphrodite, polygamo-dioecious or dioecious. Calyx 4-5-toothed, sometimes accrescent, free or adherent to the fruit, valvate or imbricate. Petals 3-6, valvate or imbricate, free or more or less coherent. Stamens 3-15, inserted with the petals and more or less adnate to them, all antheriferous or rarely some without anthers • filaments free or rarely monadelphous ; anthers erect, 2-celled, dehiscing longitudinally. Disk hypogynous or perigynous, cup-shaped or 0. Ovary free or half-inferior, 1-celled or imperfectly 2-3-5-celled (from the dissepiments not reaching the apex of the cavity); ovules 1-5 pendulous from the apex of a minute free central placenta, or from the side or apex of the ovarian cavity, the funicle (or ? placenta) often dilated into a thickened process above the ovule; style simple or 0 • stigmas 1 (rarely 2), entire or lobed. Fruit drupaceous or dry,

in-eiiiscent, 1- (rarely 2-) celled, 1- (rarely 2-) seeded, free or more  
or

Disk thick, 10-lobed, pubescent. Stamens 10, inserted in the sinuses at the base of the disk ; filaments subulate, the alternate somewhat longer; anthers cordate, apiculate, versatile. Ovary immersed in the disk, pubescent, depressed, 3-lobed, 3-celled; ovules about 8 in each cell, attached to the axis, ascending; style short; stigma obscurely 3-lobed. Capsule oblong, coriaceous, 3-celled, loculicidally 3-valved. Seeds compressed, exalbuminous, margins angular, winged above; cotyledons plano-convex.—DIBTRIB. India and Ceylon ; species 1.

1. **Chloroxylon Swietenia**, *DC. Prodr.* v. 1 (1824) p. 625. A tree 30-40 ft. high ; bark corky, rough, deeply furrowed, yellowish. Leaves 6-9 in. long, abruptly-pinnate : leaflets subopposite or alternate, 10-20 pairs, f-lj by -J--<sup>1</sup> in., oblong, obtuse, glabrous, glaucous, very inequilateral, the upper of the leaflet larger than the lower and rounded, the lower side *&te* at the base ; petiolules yV~J \*<sup>n</sup>- 1<sup>on</sup>»\* Flowers in branched m -flowered terminal and axillary panicles shorter than the leaves ; 1 is globose ; bracts minute, caducous. Calyx pubescent, deeply divide\* , lobes ovate. Petals j<sup>3</sup>^ in. long, ovate, acute, sagittate at the b< >e, abruptly and shortly clawed, externally pubescent. Disk fleshy, pubescent. Stamens inserted between the lobes of the disk, shorter than the petals. Ovary immersed in the disk, 3-lobed, pubescent. Capsules oblong, acute, glabrous. Seeds |—pg- in. long (including the membranous, somewhat falcate wing), y-g- in. broad. *Yl B. I.* v. 1, p. 569 ; *Grab. Cat.* p. 32 ; *Dalz. & Gibs.* p. 39 ; *Engler, in Engl. & Pränfl, Pnanzenf.* v. 3, part 4, p. 171, fig. 99, A-H (under *Rutacee*) ; *DC. Monogr. Phan.* v. 1, p. 748 ; *Trim. Fl. Ceyl.* v. 1, p. 253 ; *Talb. Trees, Bomb.* p. 43 ; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 269 ; *Watt, Diet. Econ. Prod.* v. 2, p. 270.—Flowers: Mar .-Apr. *VHalda ; Jtillu.*

KONKAN: *Law I, Stocks], Dahell, Woodrowl* S. M. COUNTRY: abundant in the dry deciduous forests of the Dharwar and Belgaum districts, *Talbot*; Falls of Gokak, *Graham, Woodrow*; hills N. of Belgaum, *Ritchie*, 104!—DISTRIB. India ^ vV. Peninsula); Ceylon.

The Indian Satinwood tree. The wood is hard and durable, beautifully mottled and excellent for the manufacture of furniture, for which purpose it is much used in Ceylon. See *Watt, Diet. Econ. Prod.* 1. c.

## ORDER XXXVII. CHAILLETIACE^].

Small trees or shrubs: Leaves alternate, quite entire; stipules 2, deciduous. Flowers small, unisexual or polygamous, in corymbose cymes. Sepals 5, free or connate, imbricate. Petals 5, free, sub-perigynous, notched or 2-fid, with often an inflexed lamina which is adnate to the face of the petal. Stamens 5, subperigynous, all or some only fertile, free or adnate to the corolla ; anthers oblong; connective often thickened at the back. Disk of 5 glands or scales or a 5-glandular or lobed cup. Ovary free, 2-3-celled ; ovules anatropous, in pairs from the top of each cell, pendulous; styles 1-3, free or more or less connate; stigmas simple or capitate. Drupe pubescent or hispid, transversely oblong or didymous, compressed ; epicarp entire or splitting and disclosing the putamen ; putamen 1-3-celled, the cells 1-seeded.

Prodr. p. 123; Roem. Synop. fasc. 1, p. 135; DC. Monogr. Phan. v. 1, p. 727; Trim. Fl. Ceyl. v. 1, p. 252. *C. Nimmoaii*, Grab, in Wight, 111. v" ]t p. 148; Dalz. & Gibs. p. 38.

KONIUN: *Woodrowl, Talhot*; Tungar hill, *Graham*; jungles at Bohe, *Dalzell* \$ *Gibson*. KANARA: N. Kanara, *Talbot*.—DISTRIB. India (W. Peninsula); Oeylon.

### 15. CEDRELA, Linn.

Tall trees with colored wood. Leaves pinnate; leaflets numerous, usually quite entire. Flowers hermaphrodite, small, in terminal and subterminal panicles. Calyx short, 5-partite. Petals 5, suberect, free, imbricate. Stamens 4-6, free, inserted at the top of the disk, sometimes alternating-with staminodes; filaments subulate; anthers broadly oblong, versatile. Ovary sessile on the top of the disk, ovoid, 5-celled, the cells opposite the petals; ovules 8-12, biseriate, pendulous; stigma discoid. Capsule coriaceous, 5-celled septitragally; valves 2-lamellate. Heeds pendulous, compressed, imbricate, winged; albumen thin, fleshy; cotyledons flat, subfoliaceous; radicle short, superior.—DISTRIB. Tropical Asia, Australia, America; species about 16.

1. **Cedrela Toona**, *lioxh. ex Eottl. \$ Willd. in Ges. Naturf. Fr. Nette Schr.* v. 4 (18U3) p. 198. A tall tree reaching 60 ft.; branches numerous, forming a shady head. Leaves abruptly-pinnate, 12-18 in. long or more; leaflets opposite or alternate, 4-15 pairs, 2-6 by f-2] in., lanceolate or ovate-lanceolate, acuminate, entire or slightly undulate, glabrous, base inequilateral, the upper side usually larger rounded, the lower smaller acute; petiolules |<sup>-</sup> in. long. Flowers white, honey-scented, in large drooping terminal more or less pubescent panicles nearly as long as the leaves; buds ovoid or oblong; pedicels short, slender. Calyx divided nearly to the base; lobes orbicular-ovate, ciliate. Petals £ in. long, broadly elliptic, obscurely veined, ciliate, keeled at the base inside. Stamens 5, each inserted on one of the orange-colored hairy lobes of the disk; staminodes 0; filaments subulate; anthers oblong, cordate, rounded and apiculate at the apex. Ovary hairy, ovoid or subglobose; stigma *fa* in. in diam. Capsules oblong, |1 in. long. Seeds with a membranous wing at each end, about | in. Ions: including the wings. FL B. I. v. 1, p. 568; Grab. Cat, p. 24(5); Dalz. & Gibs. p. 38; DC. Monogr. Phan. v. 1, p. 745; Talb. Trees, Bomb. p. 43; Woodr. in Journ. Bomb. Nat. v. 11 (1 f-07) p. 269; Watt, Diet. Econ. Prod. v. 2, p. 233.—Flowers: Jan. VEEN. *Mahd-nim*; *Kudak*; *Tuni*.

KONKAN: road to Matheran, *Kanitkar!*, *Cooke!*; Rambag, Matheran, *H. M. lliardwood*. DECCAN: ravines at Khandala, *Graham, Woodrow*; Panchgani, *Woudrow* Kliandala, *Dalzell # Gibson*. KANARA: abundant in the forests of N. Kanara' immense t'ees common at Yellapur, *Talbot*.—DISTRIB. India (Central and Southern and Birma); Java, Australia.

The tree is known as the *Toon*, the *Indian Mahogany* tree and the *Moulmein Cedar*. The wood is valuable for furniture, the flowers yield a dye and the bark has some repute in native medicine. See Watt, Diet. Econ. Prod. 1. c.

### 16. CHLOROXYLON, DC.

A lofty tree; wood yellow, hard. Leaves abruptly-pinnate; leaflets numerous, very oblique, entire. Flowers small, in axillary and terminal pubescent panicles. Calyx short, 5-partite. Petals 5, clawed,

imbricate.

**14 CHUKRASSIA**, Adr. Juss. Mem. Mus. Par. v. 19  
(1830)

p. 251.

CHICKRASSIA, Wight & Arn. Prodr. p. 122 ; Hook. f. & Benth.  
Gen. Plant.

A tree. Leaves abruptly-pinnate; leaflets alternate or opposite. Flowers hermaphrodite, rather large, in terminal panicles, 4-5-merous. Calyx short, dentate. Petals oblong, free, erect, contorted. Staminal-tube cylindric, its mouth with 10 short blunt teeth ; anthers 10, erect, inserted within the teeth, entirely exerted. Disk obsolete. Ovary shortly stalked, cylindric, 3-5-celled ; ovules numerous, 2-seriate ; style short, stout; stigma discoid. Capsule woody, 1-5-(usually 3-) celled, 3-5-valved. Seeds numerous, winged below, exalbuminous ; cotyledons orbicular, inequilateral.—DISTRIB. India, Ceylon; species 1.

The name originally given to this genus by Adr. Juss. (Mem. Mus. Par. v. 19 [1830] p. 21) was *Chukrassia*, derived from the Bengali name of a tree of the genus which Roxburgh (Hort. Beng. [1&14] p. 33) gave as *Chukrasi*. Subsequent to the publication of the name as *Chukrassia* by Adr. Juss., Roxburgh (Fl. Ind. [1832] p. 319) corrected the Bengali name to *Chickrassee*, and Wight and Arnott (Prodr. [1834] p. 122) adopted the spelling *Chickrassia*, \*as agreeing better with the more recent vernacular synonym given by Roxburgh. This mode of spelling the name of the genus has been adopted in the \* Genera Plantarum ' of Hooker and Bentham and in Fl. B. I. v. 1, p. 568. Continental and other foreign botanists are however reverting to the original mode of spelling the name (*e. g.* J.C. Monogr. Phan. and Harms in Engl. & Prantl, Pflanzenf.), and, as there can be no question as to its correctness, the spelling of the name as *Chukrassia* and not *Chickrassia* is certain to be ultimately adopted universally.—The change has therefore been made above.

1. **Chukrassia tabularis**, Adr. Juss. in Mem. Mus. Par. v. 19 (1830) p. 251, t. 22, fig. 27. A tall tree; young branches lenticellate, glabrous. Leaves abruptly-pinnate, 12-18 in. long; leaflets 5-8 pairs, 2-5 by 1-21 in. (the upper leaflets often larger than the lower), ovate or ovate-oblong, acute or acuminate, glabrous above, more or less velvety beneath, base inequilateral, the upper side the larger and usually rounded, the lower side usually acute; petiolules  $\frac{1}{2}$  in. long. Flowers in terminal panicles which are shorter than the leaves, the branches of the panicles spreading, many-flowered; buds oblong. Calyx pubescent outside, obtusely 5-toothed. Petals dirty-white, fl. in. long by  $\frac{1}{2}$  in. broad, linear-oblong, spatulate. Staminal-tube cylindric, glabrous. Ovary hairy, attenuated into the style; stigma 4-lobed, just appearing above the apex of the staminal-tube. Capsules ovoid or obovoid,  $\frac{1}{2}$  in. long, by about  $\frac{1}{4}$  in. in diam. Seeds winged,  $\frac{1}{2}$  by  $\frac{1}{4}$  in. (including the wing). 11. B. I. v. 1, p. 568; Grab. Cat. p. 32 ; Harms, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 271, fig. 152, S-T ; DC. Monogr. Phan. v. 1, p. 726 ; Talb. Trees, Bomb. p. 43; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269 ; Watt, Diet, Econ. Prod. v. 2, p. 268.—Flowers: Feb.-Apr. VEEN. *Ldl-devddr* ; *Dalmaria*.

KONKAN : *Law!*, *Stocks !*; Matheran, *H. M. Birdwood*. DECCAN : Hewra botanical garden, *Dalzell!* KANAKA : evergreen forests of N. Kanara, *Talbot*; Yellapur, *Woodrow*.—DISTRIB. India (W. Peninsula).

VAK. *velutina*, King, in Journ. As. Soc. Beng. v. 64 (1895) p. 88. Leaflets 1 omentose or pubescent on both surfaces. Panicles tomentose. Petals puberulous on the outside. Capsules often 4-valved. Trim. Fl. Ceyl. v. 1, p. 252 ; Talb. Trees, Bomb. p. 43. *C. velutina* fsp.), Wight &

Am.



p. 565; Grab. Cat. p. 31 ; Dalz. & Gibs. p. 38; DO. Monogr. Phan. v. 1, p. 713; Talb. Trees, Bomb. p. 42; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269.—Flowers : Feb.-Mar. VEEN. *Limbdra*.

KONKAN : *Stocks!*; common all along the Ghats, *Dalzell & Gibson*. DECCAN : Khandala, *Graham, Woodrow* ; P&rgbat, *Graham*. KANARA: common along the banks of rivers and in evergreen forests in N. Kanara, *Talbot*; Kasarli, *Bitchie*, 1190!; Yacombi, *Woodrow!*—1)ISTBIB. Throughout India generally.

### 13. SOYMIDA, Adr. Juss.

A lofty tree with bitter bark and hard wood. Leaves abruptly-pinnate ; leaflets opposite, obtuse, entire. Flowers hermaphrodite, in axillary and terminal panicles. Sepals 5, short, imbricate. Petals 5, spreading, clawed, contorted. Staminal-tube short, cup-shaped, 10-lobed, lobes 2-dentate; anthers inserted between the teeth. Disk conspicuous. Ovary ovoid, 5-celled; ovules many in each cell, biseriate, pendulous; style short; stigma thick, discoid, 5-angled. Capsule woody, 5-celled, septifragally 5-valved, the valves consisting of 2 plates separating from the 5-winged axis. Seeds pendulous from the top of the axis, imbricate in two series, compressed, winged at both ends; cotyledons foliaceous, 2-auricled at the base; radicle very short, superior.—DISTEIB. One species, endemic in India.

1. *Soymida febrifuga*, Adr. Juss. Mem. Mus. Par. v. 19 (1830) p. 251, t. 22, fig. 26. A tall tree. Leaves 9-18 in. long, crowded towards the ends of the branches; leaflets 3-6 pairs, opposite, 2-4| by 1-2| in., elliptic or oblong, obtuse, glabrous, penninerved, the nerves numerous and conspicuous beneath, base rounded, inequilateral, the lower side generally extending further down the petiolule than the upper; petiolules 3-4 in. long. Flowers in large terminal or axillary divaricately branched panicles often equalling the leaves, the branches of the panicle alternate; pedicels very short; bracts minute, triangular, acute. Sepals 5, rotund, the margins membranous, slightly lacerate. Petals 5, obovate, 1 in. long, clawed, often notched at the apex. Staminal-tube about half as long as the petals, slightly urceolate; anthers attached by the middle of the back. Ovary glabrous; stigma large, discoid,  $\frac{1}{8}$  in. in diam., 5-lobed, the lobes radiating to the centre. Capsules 1-2½ in. long, obovoid, 5-celled, 5-valved. Seeds winged. Bot. B. I. v. 1, p. 567; Dalz. & Gibs. p. 38; Bedd. Flor. Sylvat. t. 8; T)C JN<sup>on0</sup>Sr\* i>nan- v- 1> P- 722; Harms, in Engl. & Prantl, Pflanzenf. v. 4 Jrt 4, p. 271, fig. 152, K-M ; Talb. Trees, Bomb. p. 42; Woodr. fii^Ufrn. Bomb. Nat. v. 11 (1897) p. 269; Watt, Diet. Econ. Prod, v. 6, part 3, p. 318. *Sivietenia febrifuga*, Koxb. Hort. Beng. p. 33; Cor. PL v. 1, p. 18, t. 17; Grah. Cat. p. 32.—Flowers: Mar. VERN! *lluhi* ; *lluhi*.

KONKAN : *Stocks!*; Tana districts, *Woodrow*. DECCAN : Khandesh and Jowar jungles, *Dalzell & Gibson*. GUJARAT: *Graham*. S. M. COUNTRY : in dry forests and on stony hills, *Talbot*.

The bark of the tree has been recommended as a substitute for Peruvian bark. The

heart wood is heavy and close-grained and well adapted for ornamental furniture. See Watt, Diet. Econ. Prod. 1. c.

both surfaces, shining above, paler beneath (the lateral leaflets opposite, very shortly-petiololed, the terminal with a longer petiolule), base sub-acute. Flowers yellowish-white, in corymbosely-branched axillary or terminal panicles about equalling the leaves; buds globose; peduncles long, pubescent; bracts minute, triangular, caducous. Calyx small, pubescent outside; lobes ovate, acute. Petals  $\frac{1}{2}$  in. long, ovate-oblong, acute, glabrous or puberulous outside, imbricate. Staminal-tube half as long as the petals, hairy inside, equally 10-cleft for about two-thirds of its length, the divisions 2-toothed at the apex; anthers 10, acuminate, slightly hairy, inserted between the teeth and exceeding them. Disk large, annular. Ovary sunk in the disk; stigma 2-dentate. Berry  $\frac{1}{8}$  in. long, ovoid, oblong or subglobose, bright orange-yellow when ripe, finely tomentose, minutely apiculate. Seed usually solitary, completely enveloped in a white juicy aril. PI. B. I. v. 1, p. 564; DC. Monogr. Phan. v. 1, p. 634; Trim. Fl. Ceyl. v. 1, p. 250; Talb. Trees, Bomb. p. 41; Woodr. in Journ. Bomb. Nat. v. II (1897) p. 269; Watt, Diet. Econ. Prod. v. 6, part 4, p. 299.—Flowers: Nov. YERN. *Walsura*; *Walursi*.

F. M. COUNTRY t Ramghat, plentiful, *Dalzell* \ KANARA: evergreen forests of N. Kanara, common in the Devimana Ghat forests, *Talbot*.—DISTRIB. India (VV. Peninsula); Ceylon.

The bark of the tree is used for poisoning fish; hence the specific name.

## 12. HEYNEA, Eoxb.

Trees, rarely shrubs. Leaves imparipinnate; leaflets opposite, petiole-uled, entire. Flowers small, hermaphrodite, in axillary and terminal corymbosely-branched long-peduncled panicles. Calyx 4-5-fid, imbricate. Petals 4-5, free, oblong, suberect, subimbricate, much longer than the calyx. Staminal-tube deeply 8-10-n'd, the lobes linear, 2-toothed at the apex, bearing the anthers between the linear teeth. Disk annular, fleshy. Ovary sunk in the disk, 2-3-celled, narrowing into the style; ovules 2 in each cell; style as long as or longer than the ovary; stigma discoid, 2-3-dentate. Fruit capsular, 1-celled, 2-valved, 1-seeded. Seeds exalbuminous, with a thin white aril; cotyledons hemispheric; radicle superior.—DISTRIB. India, Malaya; species 3.

1. *Heynea trijuga*, *Roxb. Hort. Bencj.* (1814) p. 33. A small tree reaching 30 ft. Leaves 6-15 in. long: common petiole with a thickened base; rachis slender, glabrous; leaflets 2-6 pairs and an odd one,  $\frac{1}{2}$  by 1-2 in., ovate-oblong or oblong-lanceolate, acuminate,

glabrous above, glaucous and pubescent or glabrous beneath, base rounded or acute; petiolules  $\frac{1}{8}$ – $\frac{7}{8}$  in. long, the terminal ones the longer. Flowers about  $\frac{1}{4}$  in. long, white, in corymbosely-branched panicles nearly as long as the leaves; peduncles very long, slender, glabrous; bracts linear-lanceolate, caducous. Calyx with a few scattered hairs on the outside; lobes ovate, subacute. Petals much longer than the calyx with a thickened midrib and membranous finely ciliolate margins. Staminal-tube shorter than the petals, split for about two-thirds of its length, the lobes linear, 2-dentate, slightly hairy outside, densely so within; anthers between the teeth of the lobes, about equal to them in length or a little longer, slightly mucronate. Ovary glabrous; style slightly obconical; stigma 2-dentate, with a thickened ring at the base. Capsules  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, ovoid or subglobose. Fl. B. I. v.



(immature) obovoid. Fl B. I. v. 1, p. 560; DC. Monogr. Phan. v 1,

### 10. CARAPA, Aubl.

Glabrous littoral trees. Leaves impari- or abruptly-pinnate • leaflets opposite, entire. Flowers hermaphrodite, in fa/ LillarJ c\_vmoS e panicles. Calyx 4-5-fid or -partite. Petals 4-5, free reflexed Mammal-tube urceolate-globose, 8-10-dentate, the teeth entire or bC partite; anthers 8-10 alternate with the teeth of the sta.niual-tube Disk iieshy, cup-shaped, adherent to the base of the ovary. Orary 4-5 ribbed or sulcate^ -5-celled ; ovules 2-8 in each cell; style Ihort stigma discoid. Innt capsular, subglobose, large, 6-12-seeded^ l fleshy dehiscing by i valves. Seeds exarillate, large, thick

3-4 by li-lai m., oblong-obovato or elliptic, obtuse or

large, discoid. Fruit the size of^ an orale 3 4

S f z I : ^a.rie rar» it v-^v-  
Tal. Trees, Bomb. p. 42 ; Watt, Diet. Econ Prod" xT J\{ P

nd Ce<sub>ylon</sub>,

### 11. WALSURA, Eosb.

Trees. Leaves 1-6-foliolate; leaflets usually opposite entire  
l lowers small, hermaphrodite, in axillary and terminal Z n panicles. Calyx short, 5-tid or 5-partite, 15\* JS'^ imbricate or subvalvate. Stamens 10 or 8 ;' mamentslinear o tree or connate into a tube ; anthers terminal, or inserted in at the apex of the filament. Disk'usually annular £ 2-3-celled, sunk in the disk; ovules 2 in each S L

1. *Walsura piscidia*, Boccb. Eort. Beng. (1814) D «O A tree ;  
young parts glabrous. Leaves 3-foliolate • leaflpts' «,,K • SmaU 2-3^  
by 1-1-1 in., oblong-elliptic, obtuse, AiT^SKS

i- i in. long. MALE FLOWERS about  $\frac{1}{2}$  in. long, in axillary lax branched sparingly lepidote panicles about equalling the leaves ; peduncles long ; pedicels short. Calyx lepidote outside, 3-lobed ; lobes rounded, ciliolate. Petals 3, longer than the calyx, broadly elliptic, concave, glabrous, linnal-tube scarcely shorter than the\* petals, obovoid, irregularly nu obtusely 5-7-toothed ; anthers 6, attached half way up the tube. Rudimentary ovary stalked, ovoid-oblong, truncate, obscurely grooved. FEMALE or HERMAPHRODITE FLOWERS a little larger than the male, in few-flowered supra-axillary racemes about 2 in. long. Calyx, petals and staminal-tube as in the male. Ovary lepidote, ovate, 3-angled, 3-celled ; stigma sessile, large, 3-lobed. Emit depressed, globular, 2-5 in. in diam., dehiscent by 3 valves; pericarp coriaceous. Seeds 3, rounded, trigonous, with an orange-colored aril. Fl. B. I. v. 1, p. 560 ; Dalz. & Gibs. p. 37 ; DC. Monogr. Phan. v. 1, p. 583; Talb. Trees, Bomb, p. 41 ; King, in Journ. As. Soc. Beng. v. 64 (1895) p. 55 ; Watt, Diet. Econ. Prod. v. 1, p. 224.

S. M. COUNTRY : Parva Ghat (Belgaum Collectorate), *Balzell & Gibson*.—DISTIUB. India, Lower Bengal and the Andamans.

3. **Amoora Lawii**, *Hiern*, in *Book. f. Fl. B. I.* (1875) v. 1, p. 561. A moderate-sized tree; young branches lepidote with yellowish-brown scales, at length glabrous. Leaves imparipinnate, 6-9 in. long ; common petiole short; leaflets 1-2 pairs and an odd one, opposite or sub-alternate,  $2\frac{1}{2}$ -4 by 1-11 in., elliptic or oblong-lanceolate, acuminate, glabrous, base rounded or acute, subequilateral; petiolules  $\frac{1}{2}$ -g in. long. Elowers white, in axillary much-branched panicles clothed with yellowish-brown scales. Calyx lepidote, truncate, more or less obscurely 4-toothed. Petals usually 4, glabrous, g in. long, broadly elliptic-oblong. Staminal-tube subentire at the apex, glabrous outside, slightly ribbed inside ; anthers 8 (rarely 7); long, triangular-oblong, attached near the base of the staminal-tube, the tips just level with its apex. Ovary conical, 3-celled, lepidote; style almost 0 : stigma 3-toothed. Fruit buff-coloured, pyriform, densely lepidote, 1 in. long. El. B. I. v. 1, p. 561; Talb. Trees, Bomb. p. 41; DC. Monogr. Phan. v. 1, p. 585. *Epicharis exarillata*, *Kimmo*, in *Grah. Cat.* p. 31. *Nemeda Nimnwnii*, Dalz. in Dalz. & Gibs. p. 37.—Elowers : Dec-Jan. VERN. *Burumb*.

KONKAN : *Stocks !, Law \, Dalzell*; hills about Nagotna, *Ch^aham*; Karjat, *Woodrow!*; Amboli Ghat, *Kanithar!* DECCAN : Khandala, *Graham* ; Parghat, *Graham*. IVANARA. : throughout the evergreen forests of N. Ivanara; very common in the Ainslii Ghat forests, *Talhot*.—DISTRIB. India (W. Peninsula).

4. **Amoora canarana**, *Biem*, in *Hook. f. Fl. B. I.* v. 1 (1875) p. 560. A tree ; young parts, inflorescence and calyx lepidote. Leaves abruptly pinnate, 6-15 in. long; leaflets 4-6 pairs, subalternate, 3-7 by 1 $\frac{1}{2}$ -2-J in., oblong, acute or acuminate, glabrous above, lepidote beneath, narrowed at the base ; petiolules  $\frac{1}{2}$  in. long. Elowers small, in dense di-viiricately-branched panicles much shorter than the leaves ; buds globose; pedicels short. Calyx obtusely 3-5-toothed, lepidote outside. Petals 3-4, orbicular, glabrous, j\ in. long. Staminal-tube obovoid, glabrous, truncate or very faintly and obscurely toothed at the apex, the mouth open ; anthers 6, sessile, attached near the mouth of the tube, the tips just exerted. Ovary lepidote; style 0; stigma 3-toothed. Fruit

gamo-dioecious, small, the male in axillary panicles, the female usually in spikes or racemes. Calyx 3-5-partite or -fid. Petals 3-5, thick, concave, free or rarely slightly united at the base, imbricate or rarely valvate. Staminal-tube a little shorter than the petals, subglobose or campanulate, obsoletely 6-10-crenate; anthers 6-10, included, sessile or subsessile. Disk obsolete. Ovary sessile, depressed, 3-5-celled; ovules 1-2 in each cell; style 0 or short or elongate; stigma entire or toothed. Capsule subglobose, coriaceous or woody, 3-4-celled; cells 1-seeded, loculicidally 3-5-valved. Seeds in a fleshy aril, with ventral hilum; cotyledons often conferruinate; radicle superior.—DISTHIB. Tropical and Subtropical Asia, Polynesia and Australia; species about 25.

Leaves imparipinnate.

Petals 3; anthers 6.

Seeds with a scarlet aril ..... 1. *A. Ruhituka*.

Seeds with an orange-colored aril ..... 2. *A. cucullata*.

Petals 4; anthers 8 ..... 3. *A. Lawii*.

Leaves abruptly-pinnate ..... «..... 4. *A. canarana*.

1. **Amoora Rohituka**, *Wiyla Sf Am. Prodr.* (1834) p. 119.

An

evergreen tree 30-60 ft. high; young parts finely silky. Leaves

large,

imparipinnate, 1-2 ft. long; leaflets opposite, 4-8 pairs and an odd one, 3-9 by 1-4 in., elliptic-oblong or oblong-lanceolate, acuminate, glabrous on both surfaces, very inequilateral, obtuse or acute at the base; petiolules  $\frac{1}{2}$  in. long. MALE FLOWERS numerous, erect,  $\frac{1}{2}$  in\*, long, sub-

globular, in solitary axillary panicles more than half as long as the leaves, the branches of the panicle about 3 in. long spreading at right angles or slightly drooping; bracts beneath each flower small, scale-like; pedicels short. Calyx glabrous, 5-partite; lobes orbicular, ciliate. Petals

3,

orbicular, concave, thick, glabrous, much larger than the calyx-lobes.

Staminal-tube nearly as long as the petals, subglobular, with a small opening at the apex; anthers 6, subsessile, elliptic-oblong, attached near the base of the tube, the tips just exerted. FEMALE or HERMAPHRODITE

FLOWERS larger than the male, in axillary or supra-axillary solitary spikes much shorter than the leaves. Calyx and petals as in the male,

the anthers narrower. Ovary hairy, globular or ellipsoid;

stigma

3-lobed. Fruit 1-11 in. in diam., globular, yellow when ripe;

pericarp

coriaceous, smooth, 3-celled, opening by 3 valves. Seed oblong

with

a scarlet aril. Fl. B. I. v. 1, p. 559; Trim. Fl. Ceyl. v. 1, p. 249;

DC.

Monogr. Phan. v. 1, p. 581; Talb. Trees, Bomb. p. 41; Woodr. in

Journ. Bomb. Nat. v. 11 (1897) p. 269; King, in Journ. As. Soc. Beng.

v. 64 (1895) p. 53; Watt, Diet. Econ. Prod. v. 1, p. 224.

*Amoora*

*maerophylla*, Nimmo, in Grab. Cat. p. 31. *Aphauamixis*

*Rohituka*,

Pierre, Fl. For. Cochinch. t. 344; Harms, in Engl. & Prantl, Pflanzenf.

v. 3, part 4, p. 292, fig. 162, Q.—Flowers: July.

KONKAN: *Law* !, *Stocks* I; S. Konkan Ghats, *Talbot*. DECCAN: Khandala, *Graham* - planted in gardens, *Woodrow*. KANAKA: abundant in the forests of Yellapur (N

Kanara), *Talbot*.—DISTRIB. India (W. Peninsula, Assam, Oude): Ceylon, Malava',  
Philippines.

2. ***Amoora cucullata***, *Roxb. Cor. Pl.* v. 3 (1819) p. 5±, t. 258.  
A tree 30-40 ft. high. Leaves imparipinnate, 12-15 in. long:  
leaflets  
2-4 pairs and an odd one, opposite or subopposite, 3-7 by 1<sup>^-</sup>2<sup>^</sup> in.  
oblong-elliptic, subfalcate, subacute, glabrous on both surfaces,  
\ase  
rounded very inequilateral except that of the terminal leaflet; petiolules



broadly elliptic-oblong, rounded at the apex, glabrous. Staminal-tube urceolate-globose, shorter than the petals, truncate, the mouth open, obscurely 5-lobed; anthers 5, concealed in the tube, inserted below its mouth. Ovary small, stellately lepidote; style half as long as the staminal-tube; stigma small, broadly ovoid. Berry  $\pm$ — $\frac{1}{2}$  in. long, pyri-form or subglobose, velvety-tomentose, buff-colored, usually 1-seeded. Seeds ellipsoid. King, in Journ. Asiat. Soc. Beng. v. 64 (1895) p. 67; Harms, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 299, fig. 163, *G. Aglaia EoxburgJiiana*, Hiern, in Hook. f. Fl. B. I. v. 1, p. 555 (*not* of Miquel); DC. Monogr. Phan. v. 1, p. 604; Trim. Fl. Ceyl. v. 1, p. 246; Talb. Trees, Bomb. p. 40; Watt, Diet. Econ. Prod. v. 1, p. 145.—Flowers: Nov.-Dec.

KONKAN: *Stocks* !, *Law*! S. M. COUNTRY : Eamghat, *Ritchie*, 1H58! KAXARA : Kumpta, *Talbot*, 2955 !; Falls of Gairsoppa, *Talbot*, 2673 !; Karwar (near the coast), *Talbot*, 499!; evergreen forests of N. Kanara, from Ainshi southwards, *Talbot*.—DISTKIB. India (W\*. Peninsula and Birma); Singapore, Ceylon, Java, Sumatra.

### 8. LANSITJM, Eumph.

Trees or shrubs. Leaves imparipinnate. Inflorescence axillary; flowers small, dioecious, the male usually in lax branching panicles, the female spicate or racemose. Sepals 5, rounded, imbricate. Petals 5, rounded, connivent, imbricate. Staminal-tube globose, mouth crenulate; anthers 10, subacute, usually in 2 rows, the shorter one included, the longer semi-exserted. Disk inconspicuous. Ovary globose, 3-5-celled; ovules 1-2 in each cell, attached to the axis; style very short, thick; stigma truncate, 3-5-lobed. Berry 3-5-celled, corky or fleshy. Seeds solitary or twin, collateral, oblong, exalbuminous, embedded in a pulpy aril; hilum ventral; cotyledons transverse; radicle superior.—DISTKIB. India, Malaya; species 4-6.

1. **Lansium anamallayanum**, *Bedd. in Trans. Linn. Soc.* v. 25 (1860) p. 212. A moderate-sized tree. Leaves imparipinnate, 6-9 in. long; leaflets 3-5, alternate, 3-6 by 1<sup>^</sup>—2<sup>^</sup> in., elliptic-lanceolate, acuminate, glabrous on both surfaces, base acute, subequilateral; petiolules <sup>^</sup>—<sub>|</sub> in. long, blowers in panicles, spikes or racemes shorter than the leaves, 2-3-fasciculate, the hermaphrodite flowers sessile; buds globose. Calyx rugose outside; lobes orbicular, ciliate. Petals <sup>^</sup> in. long, elliptic-obovate, veined. Staminal-tube irregularly crenate, striate inside; anthers 2-seriate, the upper row slightly exserted. Ovary densely hairy, 3-lobed, 3-celled; ovules usually 2 (sometimes 1 *Beddome*) in each cell; style very short; stigma large, 3-lobed. Fruit oblong, size of a grape, 2-celled, 2-seeded. FL B. I. v. 1, p. 558; *Bedd. Flor. Sylvat.* t.131; DC. Monogr. Phan. v. 1, p. 597; Talb. Trees, Bomb. p. 40; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269.—Flowers: Apr.-May. VEEN. *Telya*.

KANARA: abundant on the S. Ghats of N. Kanara in evergreen forests, *Talbot* Hulical, *Wuodrow* !—DISTKIB. India (W. Peninsula).

### 9. AMOORA, Eoxb.

Trees, often tall; young parts sometimes lepidote. Leaves usually imparipinnate; leaflets few- or multi-jngate, entire. Flowers poly-

Khandala, *Woodrow*; *Phimda*. Gh&t, *Ritchie*, 675 ! KANARA: common near the Falls of Gairsoppa, *Talbot*.—DISTRIB. India (W. Peninsula, Assam and Khasia hills); Ceylon, the Andamans.

**2. *Dysoxylum malabaricum*, *Bedd. ex Hiem, in Iloojc^f. Fl. B. I. v. 1* (1875) p. 548.** A very large tree ; young shoots slightly puberulous. Leaves up to 18 in. long, abruptly-pinnate; rhachis angular; leaflets alternate or subopposite, 4-5 pairs, 4-9 in. long, pale green, elliptic-oblong, acuminate, entire, puberulous when young; lateral nerves 12-20 pairs, prominent beneath ; petiolules \- \ in. long. Flowers \ in. long, in axillary racemiform panicles shorter than the leaves; buds oblong; pedicels £ in. long. Calyx short, finely pubescent outside, deeply 4-lobed ; lobes ovate, acute. Petals 4, linear-oblong, subacute, imbricate. Staminal-tube urceolate, with 8 deep emarginate crenatures, contracted about § of the way up ; anthers 8, alternate with the crenatures, included. Disk cupular, truncate, subentire or irregularly toothed, not concealing the ovary, pubescent within. Ovary densely pubescent, tapering into the style, 4-celled ; ovules 2 in each cell; stigma capitate, 4-lobed. Fruit 2 in. in diam., pyriform, verrucose, bright yellow when ripe, 3-4-seeded. Seeds bluntly trigonous ; testa reddish brown; cotyledons green. *Fl. B. I. v. 1*, p. 548. *Dysoxylum glandidosuni*\*, *Talb. Trees, Bomb. p. 39.*—Flowers : Feb.

KANAKA : evergreen forests of N. Kanara, *Talbot*, 228!—DISTRIB. India (W. Peninsula).

## 7. AGLAIA, *Lour.*

Trees or shrubs, glabrous, lepidote, or stellately-pubescent. Leaves alternate, pinnate; leaflets opposite, often oblique at the base, quite entire. Flowers polygyno-dioecious, minute, in axillary branching panicles. Calyx 5-toothed or 5-partite, imbricate. Petals 5, free, or more or less connate at the base, imbricate. Sfcaminal-tube urceolate or subglobose, 5-toothed or quite entire at the apex ; anthers usually 5, or 4 or 10, included or half exerted, erect. Disk inconspicuous. Ovary 1-2- (rarely 3-) celled, short: ovules 1-2 in each cell; style thick, very short or 0 ; stigma scarcely broader than the style, 1-3-toothed. Berry 1- or few-deeded ; pericarp coriaceous. Seeds with a fleshy integument.—DISTRIB. Tropical and subtropical Asi.i and Polynesia; rare in temperate climates ; species more than 50.

**1. *Aglaia odoratissima*, *Blume, Bijdr.* (1825) p. 171.** A tree reaching 40 ft. high; young branches, petiolules and inflorescence covered with minute brown deciduous scales. Leaves 3-7 in. long imparipinnate; leaflets opposite, usually 5 (rarely 3 or 7), thinly coriaceous, 2-4-^ by 1-2 in., elliptic-oblong or obovate, usually shortly acuminate, upper surface glabrous, the lower and especially the nerves more or less lepidote, base cuneate ; petiolules ^-|- in. long (those of the terminal leaflets the longest). Flowers globular, in axillary or supra-axillary pyramidally-branched elongate lepidote panicles 3-8 in. lonp. Calyx appressedly lepidote-puhescent outside; lobes 5, short, rounded, ciliolate. Petals yellow, ^ in. long, much longer than the calyx, unequal,

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\* The glands in the axils of the lateral nerves noted by Mr. Talbot (*l. c.*) appear to be the work of insects.

Cultivated throughout the Presidency and self-pi an ted, but nowhere really wild ; common about villages. KONKAN : *Stocks* ! DECCAN : Poona, *Covke* !; Hubli, *Hohe/i-hackcr*, 765!—DISTRIB. Cultivated throughout India and in many hot climates.

The well-known *Nim* or *Margosa* tree. Its valuable properties attracted the notice of the Mohammedans on their arrival in India and it was named by them *Azad-claracht-i-hindi* from its resemblance to the Persian lilac (*Melia Azedarach*). For a full description of the valuable products of the tree, consult Watt, Diet. Econ. Prod. 1. c.

## 6. DYSOXYLUM, Blume.

Glabrous often foetid trees. Leaves large, alternate (rarely opposite), impari- or abruptly-pinnate; leaflets usually quite entire, oblique at the base. Flowers hermaphrodite, in axillary or supra-axillary lax panicles. Calyx short, 4-5-iiid or -partite, imbricate, caducous. Petals 4-5, valvate or slightly imbricate, free or connate below with the staminal-tube (never with the ovary). Stamens united into a tube which is a little shorter than the petals and usually laciniate or crenate; anthers 8-10, inserted beneath the apex of the stamioal-tube, glabrous, iucluded or half exerted. Disk tubular, crenulate or entire at the mouth, glabrous or ciliate, usually sheathing and exceeding the ovary. Ovary free, 3-5-celled, attenuated into a style much longer than the ovary; ovules 1-2 in each cell, superposed or collateral; stigma discoid. Capsule thickly coriaceous, globose or pyriform, 1-5-celled, loculicidally 2-5-valved; cells 1-2-see.ded. Seeds exarillate (rarely arillate); cotyledons thick, plumule often hirsute; albumen 0.—DISTRIB. Malaya, Australia, New Zealand, Polynesia ; species 85.

Leaves imparipinnate; calyx nearly half as long as the flower, lobes obscure .....	1. <i>D. binectariferum</i> .
Leaves abruptly-pinnate; calyx short, lobes acute .....	2. <i>D. malaharicum</i> .

**1. *Dysoxylum binectariferum*, HooJc.f. ex Bedel, in Trans. Linn. Soc. v. 25 (1866) p. 212.** A tree 30 ft. high or more; young parts finely puberulous. Leaves imparipinnate, pale, 6-10 in. long; rhachis angular; leaflets 5-9, alternate, 4-7 by 1<sup>^</sup>-3 in., oblong-elliptic, acuminate, glabrous on both surfaces, entire or obscurely and distantly toothed, base acute often inequilateral; nerves about 14 pairs, prominent beneath ; petiolules l~J- in. long. Flowers § in. long, in axillary or supra-axillary subglabrous panicles which are shorter than the leaves; pedicels short, articulated. Calyx cupular, nearly half as long as the flower, coriaceous, truncate, entire or obscurely lobed, glabrous. Petals 4, greenish-yellow, valvate except at the apex, tomentose outside. Staminal-tube cylindric, toothed, glabrous; anthers 8, included. Disk surrounding and twice as long as the ovary, irregularly 8-toothed, the teeth again dentate. Ovary ribbed, villous, attenuated into the style, 4-celled; ovules 2 in each cell; stigma hemispheric, truncate. Capsules 2~2| in. long, obovoid or subglobose, grooved, glabrous, orange-colored when ripe, 4-celled, 4-seeded. Seeds large, nearly 1 in. long, purplish-brown, shining. Fl. B. I. v. 1, p. 546; DC. Monogr. Phan. v. 1, p. 493; Trim. FL Ceyl. v. 1, p. 247; Talb. Trees, Bomb. p. 39 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269; Watt, Diet. Econ. Prod. v. 3, p. 199. *Epicharis exarilluta*, Arn. ex W. & A. Prodr. p. 120 {not of Nimmo) ; Dalz. & Gibs. p. 37. *Guarea binectarifera*, Eoxb. Hort. Beng. p. 28; Grah. Cat. p. 31.—Elowers : Aug.-Sept. VERN. *Yerindi*. KONKAN: near Vingorla, *Dalzd* \$ *Gibson*. DECCAN: Lanoli Grove, *Graham*;

petiolules very short, slender. Elowers small, white, in axillary corymbose panicles which are shorter than the leaves ; peduncles long, slender; pedicels short. Calyx, pubescent outside, 5-toothed; teeth short, triangular. Petals 9 in. long, membranous, oblong, acute, pubescent outside. Stamens a little shorter than the petals; filaments hairy inside, the teeth sharp and as long as the anthers. Ovary glabrous ; style short; stigma capitate, shortly 5-lobed. Berry 1—j in. in diam., globose, 5-lobed, scarlet. Seeds angular. El. B. I. v. 1, p. 545 ; Harms, in Engl. & Prantl, Pflanzsnf. v. 3, part 4, p. 281, fig. 158, A-D ; Trim. El. Ceyl. v. 1, p. 245 ; Talb. Trees., Bomb. p. 39; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269. *Mallea Rothii*, A. Juss. in Mem. Mus. Par. v. 19 (1830) p. 222, t. 13, fig. 6 ; Grab. Cat. p. 31 ; Dalz. & Gibs. p. 37.—Elowers : Sept. YERN. *Gudmei*.

KONKAN : *Stoc/csl* DECCAN : abundant on the Kartriz Ghat near Poona, *Graham*; Kadakvasla near Poona, *Cooke!*; Khandala, *Woodrow*. S. M. COUNTRY : Belgaum hills, *Ritchie*, 110!—DISTRIB. India (W. Peninsula); Ceylon, Java.

5. **AZADIRACHTA**, A. Juss. Mem. Mel. (1830) p. 68, t. 2, n. 5;  
C. De Candolle, in DC. Monogr. Phan. v. 1, p. 459, t. 6, fig. 10.

Trees. Leaves alternate, imparipinnate; leaflets serrate. Elowers hermaphrodite, in axillary panicles. Calyx 5-partite. Petals 5, much exceeding the calyx, free, imbricate. Staminal-tube a little shorter than the petals, laciniate at the apex; anthers within the tube at its apex, sessile, opposite to the lacinise. Disk 0. Ovary 3-celled, the cells opposite the petals; ovules 2 in each cell, collateral; style much exceeding the ovary ; stigma shortly cylindrical, 3-toothed. Drupe 1-seeded; endocarp woody. Seed exalbuminous, ellipsoid; cotyledons very thick and fleshy, acutely 2-lobed at the base; radicle exerted from the cotyledons, superior.—DISTRIB. India, Ceylon, Java ; species 1.

1. **Azadirachta indica**, A. Juss. in Mem. Mus. Par. v. 19 (1830) p. 221. A large tree 40-50 ft. high, with a straight trunk. Leaves simply pinnate, 8-15 in. long, crowded near the ends of the branches; leaflets 9-12, subopposite, 1-3 by 1/2-1 in., obliquely lanceolate, sometimes falcate, acuminate, serrate, glabrous on both surfaces, base inequilateral, acute; petiolules very short. Elowers white, fragrant, in branched glabrous panicles shorter than the leaves; bracts minute, lanceolate, caducous. Calyx puberulous outside, divided almost to the base ; lobes rotund-ovate, minutely ciliolate. Petals 1 in. long, obovate-oblong, faintly puberulous outside, ciliolate. Staminal-tube glabrous, a little shorter than the petals, obconic, the lacinige truncate and toothed at the apex ; anthers 10, opposite the lacinise and a little shorter than them, apiculate. Disk 0. Ovary glabrous, 3t-celled, the cells opposite to the petals ; ovules 2 in each cell, collateral; stigma 3-toothed, included in the tube. Drupes the shape of an olive, 1/2 in. long, glabrous, 1-seeded. Grah. Cat. p. 30; Dalz. & Gibs. p. 36; Trim. El. Ceyl. v. 1, p. 244 ; DC. Monogr. Phan. v. 1, p. 459, t. 6, fig. 10 ; Harms, in Engl! & Prantl, Pflanzenf. v. 3, part 4, p. 287, fig. 160, M-S. *Melia Azadirachta*, Linn. Sp. Pl. p. 385 ; El. B. I. v. 1, p. 544 ; Talb. Trees, Bomb p. 38 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269 ; Watt, Diet. Econ. Prod. v. 5, p. 211.—Elowers : Mar.-May. VERN. *Mm*.

**2. *Melia composita*, Willd. *Sp. PI* (1709) v. 2, p. 559.** A tall handsome tree; young branches densely clothed with stellate pubescence, ultimately smooth. Leaves bi- sometimes tri-pinnate, 9-30 in. long\*; ultimate leaflets 5-11, opposite, 1-3 by 1-1½ in. (the terminal the largest), from ovate-lanceolate to ovate-rotund, acute or acuminate, entire or crenulate, thinly stellately pubescent on both surfaces when young, at length glabrous, base acute or rounded, more or less oblique; main nerves 7-8 pairs; petiolules ½-1 in. long. Flowers greenish-white, 1 in. long, fragrant, in stellately pubescent many-flowered branched panicles shorter than the leaves; peduncles long; pedicels short. Calyx stellately tomentose outside, deeply divided; lobes ovate, erect, ciliate. Petals 5-6 in. long, linear-spathulate, concave, pubescent outside, pubescent within, ciliate. Staminal-tube scarcely 1 in. long, slightly expanded at the mouth, 10-toothed (the teeth bifid), silky puberulous on both surfaces; anthers exerted, pubescent, longer than the teeth. Ovary glabrous, 5-celled; style a little longer than the staminal-tube, overtopped by the apiculate anthers; stigma cylindrical, 5-toothed, teeth erect. • Drupes ovoid or ellipsoid, 1-1½ in. long, smooth, yellowish. Seed 1 in each cell, smooth, pointed. *Grab. Cat.* p. 30; *Dalz. & Gibs.* p. 36; *Bedd. Flor. Sylvat.* t. 12; *Brandis, For. EL* p. 69; *King, in Journ. As. Soc. Beng.* v. 64, p. 18. *Melia dubia*, Hiern (*not of Cav.*), *El. B. I.* v. 1, p. 545; *DC. Monogr. Phan.* v. 3, p. 453; *Watt, Diet. Econ. Prod.* v. 5, p. 223 (excluding from all three the syn. *M. superba*, Eoxb.); *Talb. Trees, Bomb.* p. 39; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 269. *Melia robusta*, Eoxb. *Hort. Beng.* p. 33.—Flowers: Mar. VERN. *Kadu-khajur*; *Kdla-Jchajur*.

I have followed Sir G. King in the separation of this species from *M. dubia*, Cav., with which it had been united by Mr. Hiern, *Fl. B. I. I. c.* The reasons given by Sir G. King (*I. c.*) for its separation appear quite conclusive.

KONKAN: hilly parts of the Konkan, *Graham*. DECCAN: Malshiras, Purandar taluka, *Kanit&arl*; Parghat, *Dahell* <\$f Gibson. S. M. COUNTRY: on the Gatparba river, *Ritchie*, 1021! KANARA: common on the Supa Ghats, *Talbot*; Harihar and Yacombi, *Woodrow*.—DISTRIB. India generally; Australia, Angola.

#### 4. CIPADESSA, Blume.

Shrubs or small trees. Leaves alternate or subopposite, imparipinnate or 3-foliolate; leaflets entire or coarsely serrate. Flowers hermaphrodite, in axillary panicles. Calyx 5-toothed. Petals 5, valvate. Stamens 5-10; filaments united below into a short tube, free above, 2-toothed at the apex, antheriferous between the teeth; anthers short. Disk cupular, adnate to the base of the staminal-tube. Ovary 5-celled; ovules 2 in each cell, collateral; style short; stigma capitate. Fruit baccate, subfleshy, 5-ribbed, 5-celled; cells 1-2-seeded. Seeds angled; albumen fleshy; embryo curved; cotyledons oblong; radicle superior.—DISTRIB. India, Java; species 4.

1. *Cipadessa fruticosa*, *Blume, Bijdr.* (1825) p. 162. A small much-branched shrub; young parts silky. Leaves imparipinnate, 4-9 in. long; leaflets 3-6 pairs and an odd one, opposite, 1-2 by ½-1 in., elliptic-lanceolate, acute at both ends, very coarsely serrate, rarely subentire, glabrous except the nerves which are more or less hairy;

truncate at both ends. Fl. B. I. v. 1, p. 542; Grab. Cat. p. 30 ; Dalz. & Gibs. p. 36 ; Harms, in Engl. & Prantl, Pflanzanf. v. 3, part 4, p. 281, fig. 158, G-II; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 269; Watt, Diet. Econ. Prod. v. 5, p. 342.—Flowers: Nov.-Dec. *VEH*\ *Kdjmr-bhendi*.

KONKAN : *Dalzell*!; east of Panwelh rare, *Nimmo* ex *Graham*; plentiful on the skies of nalas near Vingorla, *Dahell* & *Gibson*; Sawantwari, *Kanitkar*!; Vingorla, *Kanitkar* I KANARA : *Thomson* !; Karwur, *Wood raw* !—DISTRIB. India (W. Peninsula); Angola (a pubescent form).

### 3. MELIA, Linn.

Trees or shrubs. Leaves alternate, simply or 2-3-pinnate with an odd one, the young ones often stellately tomentose; leaflets toothed, serrate or entire. Flowers hermaphrodite, elongate, in large many-flowered axillary much-branched panicles. Calyx 5-6-partite, imbricate. Petals 5-G, free, much exceeding the calyx. Staminal-tube a little shorter than the petals, lacinate, the mouth dilated; anthers 10, within the staminal-tube- at its apex, sessile between its lacinae, erect. Disk annular. Ovary 5-8-celled; cells opposite the sepals ; ovules 2 in each cell, superposed; style cylindrical, much exceeding the ovary ; stigma capitate. Drupe subfleshy; endocarp woody; cells 1-seeded. Seeds pendulous, elliptic; testa crustaceous ; albumen fleshy or scanty ; cotyledons foliaceous; radicle terete, superior.—DISTRIB. Tropical Asia and Australia ; species about 12.

Flowers lilac ; anthers nearly equalling the teeth of the purple staminal-tube.....	1. <i>M. Azedarach</i> .
Flowers white; anthers exceeding the teeth of the white staminal-tube .....	2. <i>M+composita</i> .

1. **Melia Azedarach**, Linn. *SJJ. PL* (1753) p. 384. A tree reaching 40 ft. Leaves impari- bi- (or sometimes tri-) pinnate, 9-18 in. long; pinnae opposite or alternate ; ultimate leaflets 3-11, opposite or nearly so, 1-2 by 1-1 in., ovate or lanceolate, acuminate, obtusely serrate, sometimes lobed, glabrous on both surfaces, slightly inequilateral at the base; petiolules short, slender. Flowers fragrant, lilac, in long-peduncled, axillary panicles which are shorter than the leaves and glabrous or sparsely puberulous ; pedicels slender. Calyx pubescent outside, divided nearly to the base; lobes ovate-oblong acute, ciliolate. Petals 1 in. long, oblong-lanceolate. Staminal-tube purple, 1/2 in. long, glabrous, slightly ribbed outside, faintly pubescent within, acutely 20-toothed; anthers sessile, glabrous, apiculate, 1 between each pair of teeth. Ovary glabrous. 5-celled. Drupe ellipsoid-globose, 4-seeded. Fl. B. I. v. 1, p. 544; Grab. Cat. p. 30; Harms, in Engl. & Prantl/Pflanzenf. v. 3, part 4, p. 287, fig. 1G0, A-L ; Boiss. Fl. Orient, v. 1, p. 954; Talb. Trees, Bomb. p. 39 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 2G9 ; Watt, Diet. Econ. Prod. v. 5, pi 221. *Melia sempervirens*, Sw. Prodr! Veg. p. 67 ; Dalz. & Gibs. Suppl. p. 15.—Flowers : Apr.-May. VERN. *Btdcdn-nimb* ; *Balcdyan*.

Cultivated throughout the Presidency; common about villages in the Konkan and Deccan. The tree is known to Anglo-Indians as the *Persian lilac* the *bead-tree* or *bastard cedar* and has some medicinal value. See Watt, Diet. Econ. Prod. 1 c \_  
DISTRIB. India (Sub-Himalayas); Persia, China.

The only specimen in Herb. Jvew.. marked *T. virens* in Dalzell's handwriting, is without flowers, but the leaves and capsules are unmistakably those of *T. villosa*. Graham (Cat. Bomb. Pits. I.e.) gives as the habitat of *T. virens*, Khandala and the bottom of Parghat, where it is, he states, abundant, flowering in April and May. I have myself collected specimens on the hills not far from Parghat in the month of May in full flower, but these were all *Turritea villosa*, and were, as Graham describes, destitute of leaves when the flowers appeared. There can be, little doubt that both Graham and Dalzell have mistaken *T. villosa* for *T. virens*. Neither author mentions *T. villosa* at all, while *T. virens* has not, as far as I am aware, been found by any botanical collector. It seems more than doubtful therefore if *T. virens* really occurs in the Bombay Presidency.

There are but 2 authentic specimens of the species in existence, one in the Linnean Herbarium in the Linnean Society, and the other in the British Museum, both of which I have seen. Kcenig the collector states that they were found on heaps of scoriae from extinct volcanoes in the East Indies, but gives no precise locality.

2. **Turritea villosa**, Benn. *PL Jav. Ear.* (1840) p. 182. A large shrub. Leaves membranous, appearing after the flowers, 2-4 by 1<sup>^</sup>-2-j (when mature), ellipt-<sub>j</sub> or ovate, acuminate, entire, softly villous when young, becoming more or less glabrous when old, base acute or rounded; petioles \- \ in. long, pubescent. Flowers axillary, 1<sup>^</sup>-2 in. long, solitary or in fascicles of 2-6, or in short-peduncled umbels; buds clavate. Calyx campanulate, pubescent outside, o-toothed; teeth triangular. Petals yellow, linear-spathulate. Stamininal-tube reaching 1 in. in length, glabrous; teeth very short; anthers longer than the teeth of the stamininal-tube. Ovary 5-celled; style long, far-exserted; stigma large, ovoid. Capsule subglobose, about \ in. in diam., glabrous. El. B. I. v. 1, p. 542; Wight, *Icon. t.* 1593; Talb. *Trees, Bomb.* p. 38; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 268, -r-Flowers: Apr.-June.

KONKAN: *Law I*; Ghats in S. Konkan, *Capt. Geburnel*; near Pen, *Woodrow*. DECCAN: Mahableshwar hills, *Ralph*, 213!; Koina Valley, below Mahableshwar, *Cooke*! KANARA: moist forests of the Supa subdivision of N. Kanara, *TaJhot*.—DISTRIB. India (Anainallay hills); Java.

## 2. NAREGAMIA, W. & A.

A glabrous branching undershrub. Leaves alternate, 3-foliolate. Flowers axillary, solitary. Calyx 5-tid, deciduous, imbricate. Petals 5, elongate-spathulate, free, contorted. Staminal-tube elongate, cylindric, inflated at the apex; anthers 10, appendaged at the apex. Disk annular. Ovary ovoid, 3-celled; ovules 2 in each cell, collateral, pendulous; style filiform; stigma capitate. Capsule ovoid-globose, 3-lobed, 3-celled, loculicidally 3-valved; valves separating from the 3-winged axis, cells 2-seeded. Seeds pendulous, curved, truncate at both ends, with a short double membrane along the side next the axis; albumen fleshy; cotyledons foliaceous.—DISTRIB. India; Angola (*W. Tropical Africa*).

1. **Naregamia alata**, *Wight Sf Am. Prodr.* (1834) p. 117. Suffruticose, about 1 ft. high. Leaves 3-foliolate, 1-3 in. long (including the winged petiole); petiole | -1 \ in. long; leaflets | -2 in. long, sessile (the terminal slightly the largest), cuneate-obovate, sometimes obtusely lobed, entire, glabrous. Flowers 1-1<sup>^</sup> in. long, longer than the pedicels, white, axillary, solitary. Calyx hairy outside; lobes oblong-lanceolate. Petals linear-spathulate. Capsule somewhat membranous, 3-lobed, 3-valved, valves orbicular. Seeds muriculate, chestnut-brown, terete, curved,

- Seeds exalbuminous ; cotyledons thick.
- Flowers and staminal-tube oblong ; style long.
- Disk 0; petals 5 ..... 5. AZADIRACHTA.
- Disk large, usually sheathing the ovary;  
petals 4 ..... 6. DYSOXYLUM.
- Flowers and staminal-tube globose or turbinate ;  
style short or obsolete.
- Anthers included in the staminal-tube  
or the tips only exerted. Fruit baccate.
- Anthers 5; seeds exarillate ..... 7. AGLAIA.
- Anthers 10, in 2 series ; seeds aril-  
late..... 8.
- LANSIUM.
- Fruit capsular.
- Seeds arillate ..... 9. AMOOHIA.
- Seeds exarillate ..... 10. CARAPA.
- Anthers wholly exerted from the  
staminal-tube.
- Fruit baccate, indehiscent..... 11. WALSTURIA.
- Fruit capsular, loculicidal ..... 12. HEYNEA.
- Seeds winged.
- Filaments united into a tube.
- Staminal-tube cup-shaped; disk conspicuous..... 13. SOYMIIDA.
- Staminal-tube cylindrical; disk 0 ..... 14. CIUKRASSIA.
- Filaments distinct.
- Stamens 4-6 ..... 15. CEDRELA.
- Stamens 10..... 1(3. CILOXYLON.

### 1. TURRIEA, Linn.

Trees or shrubs. Leaves alternate, petioled, entire or obtusely lobed. Flowers in axillary clusters or short racemes, bracteate. Calyx 5-4-toothed or -partite. Petals 5-4, elongate, free, contorted. Staminal-tube cylindrical, toothed at the apex; anthers 10 or 8, short, included or exerted, inserted just within the mouth, alternating with the teeth. Disk annular or obsolete. Ovary 5 (or more) -celled ; ovules 2 in each cell, superposed ; style filiform, thickened at the apex ; stigma discoid or capitate. Capsule 4 (or more) -celled, cells 1-2-seeded, 5- or many-valved; valves woody or coriaceous, separating from the winged axis. Seeds oblong, with a broad ventral hilum, the margins sometimes winged ; albumen fleshy ; embryo curved ; cotyledons foliaceous ; radicle terete.— **DISTRIB.** Tropical Asia and Tropical and South Africa ; species about 23.

- Teeth of staminal-tube subulate; anthers shorter than the teeth;  
style just exerted ..... 1. *T. virens*.
- Teeth of staminal-tube short; anthers longer than the teeth; style  
far-exserted ..... 2. *T.*  
*villosa*.

**1. Turraea virens, Linn. Mantiss. alt. (1771) p. 237.** A shrub 3-4 ft. high. Leaves coriaceous, alternate, elliptic-lanceolate, sub-acuminate, emarginate, quite entire, glabrous, paler beneath; petioles very short. Flowers in axillary or lateral clusters, yellow ; bracts small, linear, villous. Calyx small, shortly 5-fid, persistent, sericeo-villous. Petals lanceolate or spatulate. Staminal-tube about 1 in. long, with 10 lanceolate teeth ; anthers alternate with the teeth and shorter than them ; style just exerted. Ovary 5-celled. Capsule 1 in. long hairy



VI. B. I. v. 1, p. 541.

J'

Dalzell & Gibson (Bomb. Fl. p. 36) state that the plant is " common on the Ghats."

**1. *Canarium s trie turn*, Boxb. Hort. Beng. (1814) p. 49.** A large tree; young branches and leaves beneath densely rufous-tomentose. Leaves coriaceous, shining and glabrous above, reaching 2 feet {*Beddome*, Flor. Sylvat. 1. c. says 4 feet) in length; leaflets 3-7 pairs and an odd one, 4-8 by 1f-3| in., ovate-oblong or ovate, to ovate-lanceolate, acuminate, opposite or alternate, finely serrate, with 10-15 pairs of lateral nerves very prominent beneath; petiolules  $y^{\wedge}-3$  in\*  $\wedge_{on}S\ll$  Mowers in short-branched axillary panicles snorter than the leaves; pedicels very short. Calyx usually 3-lobed, cupular, rusty tomentose outside; tube J in. long; lobes triangular,  $-J_T$  in. long. Petals  $\setminus$  in. long by  $T^{\wedge}$  in. broad, oblong-obovate, slightly hairy on the outside towards the rounded apex. Ovary ovoid, attenuated into a style as long as the ovary, glabrous, rudimentary in the male flowers. Drupes  $1^{\wedge}-2$  in. long, ellipsoid or ovoid, tapering at both ends; stone hard, bony. El. B. I. v. 1, p. 534; Dalz. & Gibs. p. 52; Engler, in DC. Monogr. Phan. v. 4, p. 118; Bedd. Flor. Sylvat. t. 128; Talb. Trees, Bomb. p. 37; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268; Watt, Diet. Econ. Prod. v. 2, p. 96.—Flowers: Feb.-Apr. VEBN. *llaldhwp*.

KONKAN: *Law* !, *Dalzell*, 1679 !; Mira hills near Pen, *Dalzell* & *Gibson*; Mathenin, near the Chauki, *H. M. Birdwood*. KANARA: *Law*!; Ainshi Ghat (N. Kanara), common, *Talbot*.—DISTRIB. India (W. Peninsula).

The tree is known as " *the black dammar tree* " and yields a brilliant resin. For particulars as to its uses, consult Watt, Diet. Econ. Prod. 1. c.

## ORDER XXXVI. MELIACEiE.

Trees or shrubs. Leaves alternate, exstipulate, usually pinnate; leaves or leaflets usually entire. Flowers regular, usually hermaphrodite, in terminal or axillary panicles. Calyx usually small, 4-5-lobed or -partite, imbricate, rarely valvate. Petals 4-5 (rarely 3-7), sometimes free and contorted or imbricate, sometimes connate or adnate to the staminal-tube and valvate. Stamens 4-10, generally 8-10 (very rarely more), inserted with the petals outside of the base of a hypogynous disk; filaments united by their margins into a more or less complete tube which is entire, toothed or variously laciniate, rarely free; anthers introrse or versatile, erect, usually sessile on the staminal-tube, included or exserted, 2-celled, dehiscing longitudinally; connective sometimes produced. Disk various, usually annular, or tubular and sheathing, free or adnate to the ovary or staminal-tube, or 0. Ovary usually free, 2-5-celled; ovules 1-2 (rarely more) in each cell, collateral or superposed; raphe ventral, micropyle superior; style simple; stigma disciform or capitate. Fruit capsular, baccate or drupaceous. Seeds exalbuminous or with fleshy albumen, winged or not; embryo flat; hilum usually ventral; cotyledons fleshy.—DISTRIB. Frequent in the warm regions of Asia and America, rarer in Africa; genera 37; species about 300.

Seeds not winged; filaments united into a tube.

Seeds albuminous; cotyledons foliaceous.

- |  |               |
|--|---------------|
| Leaves simple.....                       | 1. TURIUEA.   |
| Leaves compound.                         |               |
| Common petiole winged .....              | 2. NAREGAMIA. |
| Common petiole not winged.               |               |
| Flowers elongate; fruit drupaceous ..... | 3. MELIA.     |
| Flowers globose; fruit baccate .....     | 4. CIPADESSA. |

the alternate ones not reaching to the apex, 2-valved, the valves semi-bifid. *Balsamodendron pubescens*, Stocks, in Journ. As. Soc. Bomb. v. 2 (1848) p. 395, t. 26 ; Hook. Kew Journ. Bot. v. 1 (1849) p. 264, t. 9 ; Aitch. Pb. & Sind PL p. 30 ; El. B. I. v. 1, p. 529 ; Boiss. PI. Orient. v. 2, p. 2 ; Talb. Trees, Bomb. p. 37 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268 ; Watt, Diet. Econ. Prod. v. 1, p. 369.—Elovers : Mar.-Apr. VERI\*. *Bayi*.

*Protium pubescens*, W. & A. Prodr. (1834) p. 176, having been transferred to the genus *Commiphora* becomes *Commiphora pubescens* by right of priority, and *Balsamodendron* (now *Commiphora*) *pubescens* of Stocks (1848) has been called *Commiphora Stocksiana* by Engler.

SIND : hills and rocky places, *Stocks*, 439 !—DISTRIB. Beluchistan.

3. **Commiphora Berryi**, Engl. in DC. Monogr. Phan. v. 4 (1883) p. 17. A much-branched small tree or bush ; branches spiny, the lateral ones ending in sharp spines. Leaves 3-foliolate ; petioles slender ; leaflets obovate, sessile, the terminal  $\wedge$ -| in. long, twice as large as the lateral ones, all entire or the upper part obsolete crenate, glabrous, cuneate at the base. Elovers small, about 3 in. long, subsessile, solitary or fascicled. Calyx campanulate ; teeth 3-4, short, triangular. Petals 3-4, twice as long as the calyx, with a recurved apex which terminates in an incurved tip. Stamens 6-8, alternately long and short, those of the male flowers longer than those of the female or hermaphrodite flowers. Disk small, 6-8-crenate. Drupes oblong, apiculate. *Balsamodendron Berryi*, Arn. in Ann. Nat. Hist. v. 3 (1839) p. 86 ; PI. B. I. v. 1, p. 529 ; Bedd. Elor. Sylvat. t. 126 ; Trim. El. Ceyl. v. 1, p. 237 ; Talb. Trees, Bomb. p. 37 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268 ; Watt, Diet. Econ. Prod. v. 1, p. 366. *Balsamodendron gileadense*, Gran. Cat. p. 43 (*not* of Kunth).—Elovers : Eeb:-Mar.

Cultivated, but not apparently wild, in the Bombay Presidency. Graham (*I. c.*) says that it was introduced into Bombay in 1837 by Mr. Watson from Mecca. It is abundant in the dry jungles to the east of the Nilghiris (*Beddome*) and is largely used for hedges throughout the Madras Presidency.

#### 4. CANARIUM, Linn.

Tall balsamiferous trees. Leaves large, alternate, distant, impari-pinnate (rarely 1-3-foliolate) ; leaflets usually petioluled, often very unequal, the lowest rotund, remote from the base, or sessile at the base of the leaf and stipuliform. Elovers hermaphrodite or polygamous, in axillary branched panicles. Calyx cupular or urceolate, 3- (rarely 5-) lobed or -fid, valvate, persistent. Petals 3-5, thick, usually longer than the calyx, valvate or slightly imbricate. Disk annular, entire or lobed. Stamens 6-10, inserted outside the disk or at the base of the disk • filaments free or connate at the base with one another and with the disk. Ovary ovoid (rudimentary in the male flowers), 3- (rarely 2-4-) celled ; ovules 2 in each cell ; style short or equalling the ovary in length ; stigma capitate, 2-4-lobed. Drupe ovoid or ellipsoid, often trigonous  $\wedge$  v\ ith a 1-3-celled, 1-3-seeded stone. Seed conform to the cell ; testa membranous ; cotyledons sometimes partite, contortuplicate ; radicle short, straight, superior.—DISTRIB. Tropical Asia, Africa, Malaya ; species about 70.

inparipinnate ; leaflets sessile or shortly petioluled, small, crenate or serrate, rarely entire. Flowers polygamous, small, fascicled, shortly pedicelled. Calyx cupular, urceolate or tabular, 4 (rarely 5-6)-toothed or -lobed, persistent. Petals 4 (rarely 5-6), inserted on the margin of a more or less concave disk, oblong, erect, spreading or reflexed at the apex, valvate. or induplicato-valvate. Stamens 8-10, inserted on the margin of the disk, the alternate usually longer, rarely equal; filaments dilated at the base ; anthers ovate. Disk cupular. Ovary ovoid, sessile, 3- rarely 2-4-celled ; ovules 2 in each cell; style short; stigma obtusely 3-4-lobed. Drupe ovoid or subglobose; epicarp 2--6-valved ; pyrenes crustaceous or woody, connate into a compound pyrene, one cell seed-bearing, the rest barren.—DISTIUB. Africa ; species 35.

- Calyx-lobes equalling the tube ..... 1. *C. Mukul*.  
 Calyx-lobes shorter than the tube.  
 Unarmed; stamens equal ..... 2. *C. Stocksiana*.  
 Armed ; stamens alternately long and short ..... 3. *C. Berryi*.

1. **Commiphora Mukul**, *Engl. in 1)0. Monogr. Phan.* v. 4 (1883) p. 12. Shrubby, 4-6 feet high; young parts glandular-pubescent; branches knotty and crooked, divaricate, usually ending in a sharp spine. Leaves 1 -3-foliolate; leaflets subsessile (the terminal up to 5 in.), rhomboid-ovate, serrate-toothed in the upper part (the tapering base entire), smooth, and shining, the lateral leaflets when present less than half the size of the terminal ones. Flowers in fascicles of 2-3 ; pedicels very short. Calyx campanulate, glandular-hairy; lobes 4-5, triangular, as long as the tube. Petals brownish-red, broadly linear, nearly thrice the length of the calyx, reflexed at the apex. Stamens 8-10, alternately long and short, half the length of the petals. Disk 8-10-lobed, the alternate sinuses deeper and in these are inserted the shorter stamens. Ovary oblong-ovoid, attenuated into the style. Drupes red when ripe, 1-3 in. in diam., ovoid, acute; epicarp 4-valved; pyrenes ovate, acute, readily splitting into 2. *Bahimodenclron Mu7eitel*, Hook., ex Stocks, in Hook\*. *Kew Journ. Bot.* v. 1 (1849) p. 259, t. 8; *PL B. I.* v. 1, p. 529; *Boiss. Fl. Orient*, v. 2, p. 3; *Talb. Trees, Bomb.* p. 37 ; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 268; *Watt, Diet. Econ. Prod.* v. 1, p. 366. *Bahamodendron lloxburghii*, Stocks, in *Journ. As. Soc. Bomb.* v. 2 (1848) p. 391 (*not* of Arnott); *Dalz. & Gibs. Suppl.* p. 19 ; *Aitch. Pb. & Sind Pl.* p. 30.—Flowers: Mar.-Apr. VERN. *Giigcti*

Dry regions of Sind and Khandesh. DECCAN : Pert, 30 miles north of Poona, *Woodrowl, Dalzell & Gibson*; between Salher and Abowna (Khandesh), *Dalzell & Gibson*. SIND: hills in Sind, *Stocks*, 440!

The gum-resin known as *Gugal* or *Indian Bdellium* is obtained from the tree. It is extensively used in native medicine. See *Watt, Diet. Econ. Prod.* 1. c.—DISTKIB. India (Rajputana); Beluchistan, Arabia.

2. **Commiphora Stocksiana**, *Engl in DC. Monogr.* v. 4 (1883)

p. 17. An unarmed shrub, much resembling *C. Mukul* in general habit; branches not tipped with a spine; young shoots and leaves rusty-pubescent. Leaves 2-3 pairs with an odd one; leaflets entire, the terminal obovate, petioluled, the lateral subsessile, usually oblong-obovate. Flowers fascicled, 1-3 together, subsessile. Calyx urceolate; teeth short. Petals red or white, obovate, acute, spreading at the apex, not reflexed. Stamens equal in height. Disk equally toothed. Drupes red, subglobose, shortly pointed, marked by 4 conspicuous white sutures,

nearly so, rounded at the apex. *Boswellia glaber*, Koxb. Hort. Bong, p. 90 ; Grah. Cat. p. 42.

Padshapur (Belgaum districts), *Ritchie*, 1009!—DISTRIB. N.W. India.

## 2. GARUGA, Eoxb.

Trees more or less tomentose. Leaves crowded towards the 'ends of the branches, alternate, imparipinnate; leaflets opposite, stibsessile, serrate. Flowers in dense panicles, polygamous. Calyx campanulate, 5-fid, valvate. Petals 5, inserted on the tube of the calyx, induplicato-valvate. Disk thin with a crenate margin, lining the calyx-tube. Stamens 10, equal, free, inserted in the tube of the calyx at the margin of the disk. Ovary ovoid, sessile, 4-5-celled, attenuated into an erect style ; ovules 2 in each cell; stigma capitate, 4-5-lobed. Drupe without valves, globose, fleshy, containing 1-5 bony rugose pyrenes. Seed conform to the cell; testa membranous; cotyledons thin, contor-tuplicate; radicle short, superior.—DISTRIB. Tropical Asia, America, and Australia ; species 8-10.

1. *Garuga pinnata*, *Eoxb. Hort. Bencj.* (1814) p. 33; *Cor. Pl.* v. 3, p. 5, t. 208. A tree sometimes reaching 50 ft. in height; bark furrowed, the outer layers peeling oil in Hakes. Leaves 6-18 in. long, deciduous in the cold season; leaflets 6-10 pairs and an odd one, opposite or nearly so, subsessile, sometimes 6 in. long, lanceolate or ovate-lanceolate, usually acuminate, oblique, crenate, pubescent when young, at length glabrous. Flowers yellow, in much-branched axillary tomentose panicles, several together at the ends of the branches ; bracts deciduous. Calyx  $\frac{1}{2}$  in. long, campanulate, cleft a little less than half way down, densely tomentose outside; lobes ovate-oblong, subobtuse. Petals 1 in. long, linear-oblong, tomentose outside, sparsely pubescent within, attached to the tube of the calyx beneath the margin of the disk, tip thickened, inflexed. Disk thin, lining the calyx-tube, crenate. Stamens inserted on the tube of the calyx at the margin of the disk between the crenatures ; filaments slightly hairy. Style long, stout, hairy; stigma capitate, 5-lobed. Drupes black, tieshy, size of a gooseberry, edible ; pyrenes 1-3 (commonly 2), bony, rugose. Seed with a membranous wing. Fl. B. I. v. 1, p. 528 ; *Grab. Cat.* p. 43; *Talb. Trees, Bomb.* p. 37 ; *Engler, in Engl. & Prantl, Pflanzenf.* v. 3, part 4, p. 257, ifig. 150; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 268; *Watt, Diet. Econ. Prod.* v. 3, p. 483.—Flowers : Eeb.-Mar. VERN. *Kdlcatl.*

KONKAN : *Law!*; hilly parts of the Konkan, *Graham*; Bombay, *Capt. Geburne!* ; Mathoran Ghat, *H. M. Birdwood.* DECCAN : Ganesh Khind (Poona), *Woodrow!*; Deccan hills, *Woodrow.* S. M. COUNTRY : Belgaum, *Ritchie*, 101 (>) KANAKA: Honore, *Hohenhac/cer*, 726! GUJARAT: hills, *Woodrow.*—DISTRIB. Throughout India; Malaya, Philippines.

The drupo is eaten raw, pickled or cooked, and the young shoots and leaves aro used as fodder, especially for elephants. See *Watt, Diet. Econ. Prod.* 1. c.

3. **COMMIPHORA**, *Jacquin, Hort. Sehcenbr.* v. 2 (1797) p. \$6, t. 249.

(BALSAMODENDRON, *Kunth.*)

Balsamiferous trees or shrubs ; branches often spinescent. Leaves membranous, 3-foliolate, sometimes with very small lateral leaflets, or

at the base or margin of the disk, equal or unequal: filaments free, rarely connate at the base; staminodes 0; anthers usually versatile, 2-celled. Ovary free, 2-5- (rarely 1-) celled, usually attenuated into a short style; ovules 2 (very rarely 1) in each cell, axile, usually pendulous, rarely ascending; micropyle superior; raphe ventral; stigma undivided or 2-5-lobed. Fruit drupaceous, usually indehiscent, containing 2-5 pyrenes, or rarely pseudo-capsular and dehiscent. Seeds pendulous; testa membranous; albumen 0.—DISTMB. Tropics of both hemispheres; genera 18; species about 160.

Drupe dehiscent; pyrenes separating .....	1. BOSWELLIA.
Drupe indehiscent; pyrenes not separating.	
Calyx 5-fid; disk lining the calyx-tube .....	2. GAUGA.
Calyx 4-toothed; disk cupular .....	3. COMMIPHORA.
Calyx usually 3-fid; disk annular .....	4. CANARIUM.

### 1. BOSWELLIA, Eoxb.

Trees usually with papery bark. Leaves alternate, crowded at the ends of the branches, deciduous, imparipinnate; leaflets opposite, usually serrate. Flowers hermaphrodite, small, white, in axillary racemes or panicles. Calyx small, 5-toothed, persistent. Petals 5, narrowed at the base, imbricate. Disk annular, crenate: Stamens 10, alternately long and short, inserted at the base of the disk. Ovary sessile, 3-celled; ovules 2 in each cell, pendulous; style short; stigma 3-lobed. Drupe trigonous, 3-valved, valves separating from the pyrenes; pyrenes bony, 1-seeded, finally separating from the trigonous axis. Seeds compressed, pendulous; cotyledons contortuplicate, multifid; radicle superior.—DISTRIB. India; Tropical Africa; species about 6.

1. *Boswellia serrata*, Eoxb. ex Coleb. *As. Res.* v. 9 (1807) p. 379, t. 5. A deciduous middle-sized tree; bark ash-colored, peeling off in thin flakes; young shoots and leaves pubescent. Leaves 8-15 in. long; leaflets opposite, 1-2 by 1 in., sessile, 8-15 pairs and an odd one (the pair at the base of the leaf often much smaller than the others), variable in shape, ovate or ovate-lanceolate, usually inequilateral and obtuse, crenate-serrate, more or less pubescent, base acute, rounded, or somewhat truncate. Flowers in axillary racemes, shorter than the leaves. Calyx pubescent outside; lobes broadly triangular-ovate. Petals 5 in. long, ovate, pubescent outside, tips inflexed. Stamens inserted at the base of an annular crenate disk; anthers slightly pubescent. Ovary surrounded by the disk; style grooved. Drupe trigonous; pyrenes heart-shaped; cotyledons trifid. Fl. B. I. v. 1, p. 528; Talb. *Trees, Bomb.* p. 36; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 268; Watt, *Diet. Econ. Prod.* v. 1, p. 515. *Boswellia tjiurifera*, Eoxb. ex Fleming, in *Asiat. Ees.* v. 11, p. 158; Grah. *Cat.* p. 42.—Flowers: Feb.-Apr. VERN. *Sdlai*; *Sdlphali*.

KONKAN: *Stocks!*, Nimmo ex Graham. DECCAN: Satpudas of the Khandesh district, Talbot; hills in the Deccan, widely, Woodrow; Kartriz and Kamatki Ghats on the road to Mahableshwar, H. M. Birdwood; hill-sides, Poona districts, Woodrow; Pal jungles, Khandesh district, Kanitkarl S. M. COUNTRY: hill of Shendur in the Chichuri taluka, Belgaum Collectorate, Law ex Graham.—DISTRIB. Throughout India.

VAE. *glabra*, Hook, f. Fl. B. I. ? c. Glabrous; leaflets entire or

stipules lanceolate, £-g in. long. Flowers 3-6, in axillary umbels; peduncles 2-3 in. long, with 2 lanceolate bracts *li* in. long at the base; pedicels 1-1| in. long, slender, jointed below the middle; bracts below the pedicels |j in. long, lanceolate. Sepals **f** in. long, coriaceous, elliptic-oblong. Petals upwards of 1 in. long by | in. broad, obovate, with a very short narrow claw, tender. Stamens indefinite; filaments short; anthers elongate. Styles connate throughout their entire length, shortly 4-divided at the apex. Drupes reticulately rugose, £-| in. long, ellipsoid. Fl. B. I. v. 1, p. 524; Woodr. in Jo urn. Bomb. Nat. v. 1L (1897) p. 268. *Ochna nana*, Buch.-Hara. in Wall. Cat\* 3761; Dalz. & Gibs. p. 46.

KONKAN : *Dalzell* § *Gibso*?i.—DISTRIB. India (at the foot of the Himalayas, Pegu).

## 2. GOMPHIA, Schreb.

Glabrous trees or shrubs. Leaves alternate, simple, coriaceous, shining, narrowly serrate, many-nerved; stipules 2. Flowers yellow, in axillary or terminal bracteate racemes; pedicels jointed near the base. Sepals 5, usually colored. Petals 5, imbricate. Disk thick, lobed. Stamens 10, inserted at the base of the disk; filaments short; anthers opening by terminal pores. Ovary 5-6-lobed; lobes 1-celled; ovule solitary in each cell; styles connate; stigma simple. Drupes 5 or fewer, seated on the enlarged disk., Seed erect; testa membranous; cotyledons fleshy, plano-convex; radicle very short.—DISTRIB. ChieHy Tropical American, a few species in Africa, fewer in Asia; species about 80.

1. **Gomphia angustifolia**, *Vahl, Symb.* v. 2 (1791) p. 49. A small much-branched tree; young parts glabrous. Leaves 3-6 by 1-2 in., distichous, oblong-lanceolate, acute, finely serrate, glabrous, closely reticulately veined, base acute; petioles very short; stipules deciduous. Flowers in pyramidal terminal and axillary panicles; buds globose; pedicels slender, jointed near the base. Sepals ^ in. long, elliptic. Petals \ in. long, obovate, shortly clawed. Stamens 10; filaments short; anthers rugose. Ovary glabrous, 4-5-lobed; lobes obovoid; style much exceeding the stamens. Drupes 5 or fewer, ^-§ in. indiam., usually obovoid, smooth, reticulately veined, surrounded by the persistent sepals. Fl. B. I. v. 1, p. 525; *Grah. Cat.* p. 38; *Trim. Fl. Ceyl.* v. 1, p. 235; *Talb. Trees, Bomb.* p. 36; *Watt, Diet. Econ. Prod.* v.'3, p. 533.

KONKAN : on the Ghats of the S. Konkan, *Talbot*; S. Konkan, *Nimmo* ex *Graham*.—DISTRIB. S. India; Singapore, Ceylon, Philippines.

## ORDER XXXV. BURSERACE^S.

Balsamiferous trees or shrubs. Leaves alternate (very rarely opposite), 3- (rarely 1-) foliolate or imparipinnate, without or rarely with stipules. Flowers hermaphrodite or polygamous, usually small, racemose or paniced. Calyx 3-5-fid or -partite, imbricate or valvate. Petals 3-5, free or rarely connate, deciduous, imbricate or valvate. Disk annular or cupular, rarely inconspicuous, free or adnate to the calyx-tube. Stamens as many or twice as many as the petals, inserted



after flowering, sometimes 0. Stamens inserted at the base of or on the disk, 4, 5, 8, 10 or indefinite ; filaments usually short, persistent; anthers linear, dehiscing longitudinally or by terminal pores. Ovary short and 2-10-lobed, or terete, elongate and 1-10-celled ; placentas anile or parietal; ovules 1-2 in each cell or indefinite, ascending or rarely pendulous; raphe ventral; micropyle superior; style simple, subulate, acute, straight or incurved ; stigma simple, terminal. Emit indehiscent, drupaceous or baccate, compound, each drupe or pyrene 1-4-seeded, or capsular and 1-5-celled with septicidal dehiscence.—DISTRIB, Tropical regions of the world, very many in America; genera 12; species about 150.

Stamens indefinite.....	1. OCHNA.
Stamens 10 .....	2. G-OMPHIA.

### 1. OCHNA, Linn.

Glabrous trees or shrubs. Leaves alternate, usually serrate, shining, many-nerved; stipules 2. Flowers yellow, in panicles or umbels, springing from a scaly bud beneath the last year's leaves, bracteate. Sepals 5, imbricate, persistent, colored. Petals 5-12, deciduous, imbricate. Disk thick, lobed. Stamens indefinite, inserted at the base of the disk, shorter than the petals ; anthers dehiscing longitudinally, deciduous. Ovary 1-celled, deeply 3-10-lobed; lobes obtuse ; ovule solitary in each cell, axile; styles connate or sometimes free at the apex -y stigmas simple or capitate. Drupes 3-10, seated on the enlarged disk. Seed erect, oblong; testa membranous; cotyledons thick, plano-convex; radicle minute.—DISTRIB. Tropical Asia and Africa; species 25.

A small tree ; flowers in short racemes .....	1. <i>O. squarrosa</i> .
A low undershrub; flowers in long-peduncled umbels.....	2. <i>O. pumila</i> .

1. **Ochna squarrosa**, *Linn. Sj. Pl.* ed. 2 (1762) p. 731. A shrub or small tree. Leaves 2-5 in. long, oblong-lanceolate, elliptic or obovate,

usually acute, finely serrulate, quite glabrous, base narrowed into a short petiole : stipules lanceolate, ^-| in. long. Flowers fragrant, in umbel late panicles on the old wood, or sometimes on short leafless branchlets; pedicels jointed. Sepals coriaceous, ^-| in. long, elliptic-oblong, with close parallel veins, petals 5-12, a little longer than the sepals.

Stamens indefinite, deciduous; filaments very short; anthers long,

linear. Styles completely combined, longer than the stamens.

Fruit

of 3-6 drupes, | in. long, oblong-ovoid, sessile, black, surrounded by the persistent calyx. Fl. B. I. v. 1, p. 523; Grab. Cat. p. 37; Dalz. &

Gibs. Suppl. p. 17; Trim. Fl. Cevl. v. 1, p. 233; Talb. Trees, Bomb, p. 36 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268; Watt, Diet. Econ. Prod. v. 5, p. 439.—Flowers: Feb.-April. VEEN.

*Kanak-champa*.

KONKAN : *Law!*; S. Konkan, on hills near the sea, *Talbot*: Parel road, Bombay, planted. *Graham*: DECCAN : gardens about Poona, *Cookel*, *Woodrowl* S. M.

COUN-THY: Castlorock, *Woodrow*. KANAKA: *Dal-ell* \, *Stocks* !; near Karwar, *Talbot*, 116!; Cliandawar, *Ritchie*, 1667 !—DISTRIB. India (E. & W. Peninsulas, Birina); Ceylon.

2. **Ochna pumila**, *Buch.-Ham. ex I.* *Don, Prodr. FL Nep.* (1825) p. 224. A low undershrub about 2 ft. high. Leaves 4-6| by 1<sup>^</sup>-2 in., oblanceolate, spinous-serrate, glabrous, base acute; petioles short;

Cat. p. 37; Engler, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 211, fig. 120; Trim. Fl. Ceyl. v. 1, p. 231; Talb. Trees, Bomb. p. 35; Watt, Diet. Econ. Prod. v. 6, part 2, p. 451.

KONKAN : throughout the S. Konkan jungle, *Nimmo ex Graham*; jungles near Goa, *Dr. Lush*; along river-banks, *Talbot*.—DISTRIB. India (W. Peninsula); Ceylon. The tree furnishes the *Niepa* bark of commerce.—See Watt, Diet. Econ. Prod. 1. c.

### 3. BALANITES, Delile.

Spiny shrubs or trees. Leaves alternate, 2-foliolate; leaflets coriaceous, entire. Flowers greenish, in axillary cymes, fragrant. Sepals 5, concave, imbricate. Petals 5, oblong, spreading, glabrous or villous, imbricate. Stamens 10, inserted in the furrows at the base of the disk; filaments naked, filiform, subulate; anthers inserted at the back. Disk thick, depressed-conic or pulvinate, 10-grooved, hollowed at the apex. Ovary globose, half-immersed in the disk, villous, 5-celled; ovule solitary in each cell, linear, pendulous below the apex of the cell; style short, subulate, terete or 5-furrowed; stigmas 1 or 5, simple, minute. Drupe fleshy, oily; putamen bony, 5-angled, 1-celled, 1-seeded. Seed pendulous, ovoid; testa subfibrous; albumen 0, embryo green, ovoid; cotyledons thick, oblong, plano-convex, sometimes corrugated or 2-lobed; radicle superior.—DISTRIB. Northern and Tropical Africa, Tropical and Western Asia; species 2.

1. **Balanites Roxburghii**, *Planch, in Ann. 8c. Nat. ser. 4, v. 2* (1854) p. 258. A small tree rarely reaching 30 ft. high; young parts pubescent or tomentose; branches yellowish-green, glabrous or pubescent; spines 1-1½ in. long, axillary, straight, strong, very sharp. Leaves 2-foliolate; petioles ½ in. long; leaflets elliptic or obovate, obtuse or subacute, sometimes slightly mucronate, base usually acute; petiolules very short. Flowers small, greenish-white, fragrant, in axillary few- or many-flowered short-peduncled cymes or fascicles. Sepals ovate, ½ in. long, pubescent outside, silky within. Petals oblong-obovate, glabrous outside, silky villous within, very little longer than the sepals. Filaments subulate, glabrous; anthers attached at the back. Disk cupular, with a 10-lobed glandular margin. Ovary silky-villous; style short, conical. Drupes large, ovoid, woody, angular, 1-2 in. long, 5-grooved. Fl. B. I. v. 1, p. 522; Talb. Trees, Bomb. p. 35; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268; Watt, Diet. Econ. Prod. v. 1, p. 363.—Flowers: Mar.-May. VERN. *Hingu*; *Hinganhet*.

Engler & Prantl (Pflanzenf. v. 3, part 4, p. 355, fig. 189) unite this with *B. cvgyptiaca*, Delile, a species growing in N. and Tropical Africa which is distinguished from *B. Roxburghii* by its glabrous petals.

KONKAN: Bombay, *Capt. Geburne* DECCAN: widely, *Woodrow*; Ahmednagar, *Cookel*, *Woodrow* S. M. COUNTRY: Dharwar, *Cookel*, *Woodrow* GUJARAT: Ahmed-abad, *Cookel*—DISTRIB. Drier parts of India.

### ORDER XXXIV. OCHNACEÆ.

Trees or shrubs with watery juice. Leaves alternate, glabrous, simple (very rarely pinnate), coriaceous, stipulate. Flowers hermaphrodite, usually paniculate, rarely solitary. Sepals 4-5, free, imbricate. Petals 4-12 (usually 5), free, deciduous, spreading, imbricate. Disk

enlarged

o2

p. 37 ; Dalz. & Gibs. p. 46 ; Pierre, Flor. For. Cochinch. t. 295, A ; Talb. Trees, Bomb. p. 35 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 2(58; Watt, Diet. Econ. Prod. v. 1, p. 148.—Mowers: Jan.-Mar. VERN. *Mahdrufc.*

KONKAN : 'Dalzell, Stocks! DECCAN : Gibson, Woodrow. GUJARAT : English burial-ground, Surat. *Geburne*; common about Broach and Baroda, *Dr. Lush.*—DISTKIB. India (N.W. Prov., W. Peninsula, Behar); Queensland (var. *iiriberhijiora*).

2. ***Ailanthus malabarica*, DC. Prod. v. 2 (1825) p. 89.** A large tree. Leaves very large, 1<sup>^</sup>-2 ft. long, crowded, spreading, glabrous ; leaflets 8-10 pairs, 3-6 by 1<sup>^</sup>-2<sup>^</sup> in., alternate or subopposite, ovate-oblong or oblong-lanceolate, tapering, acute or acuminate, entire, glabrous, glaucous beneath, unequal-sided at the base, the upper side the larger and rounded, the lower smaller and acute ; petiolules <sup>^</sup>-f in. long. Flowers white (the bisexual rather larger than the male), in lax axillary panicles ; pedicels short. Calyx-lobes triangular, acute. Petals about <sup>^</sup> in. long, oblong-lanceolate. Stamens longer than the petals; filaments filiform, much longer than the anthers. Samara 2-2\ by §-f in., linear-oblong, rounded at both ends, reddish-brown, not or very rarely twisted. *Y.* B. I. v. 1, p. 518 ; Grab. Cat.p. 37 ; Dalz. & dibs, p. 46; Trim. Fl. Ceyl. v. 1, p. 230 ; Talb. Trees, Bomb. p. 35 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 208.—Mowers : Feb.-Mar.

KONKAN: *Stocks I, Law I, Gibson, Dahell* ; Nagotna, *Dalzd I f Gibson, Woodrow.* DECCAN: Pant Sachiv's country at Udliar, Rani&liwnr, *Dalzell § Gibson.* KANAKA : N. Kanara, in evergreen forests, *Talhot\ Kumpla-Sirsi Tvoad, Woodrow.*—DISTRIB. India (W. Peninsula); Ceylon, Cocbinchina.

## 2. SAMADERA, Gsertn.

Small glabrous trees. Leaves alternate, simple, short-petioled, oblong, coriaceous, shining. Flowers hermaphrodite, few, in axillary and terminal umbels. Calyx small, 3-5-partite, glandular at the base outside, imbricate. Petals 3-5, coriaceous, much longer than the calyx, imbricate. Disk large. Stamens 6-10, with small basilar scales, included. Carpels 4-5, distinct, free ; ovule solitary, pendulous ; styles free at the base, more or less united above; stigmas acute. Drupes 1-5, large, dry, compressed, rigid, winged. Seed solitary; testa membranous ; cotyledons plano-convex, fleshy ; radicle very short.—DiSTitiB. Tropical Asia and Madagascar; species 3.

1. ***Samadera indica*, Gcertn. Fruct. v. 2 (1791) p. 352, t. 156.** A small tree 30-35 It. high, with stout Dranches. Leaves large, sometimes reaching 10 by 3<sup>^</sup> in., elliptic-oblong, usually shortly acuminate, entire, reticulately veined, glabrous, shining, base rounded rarefy sub-acute : petioles J-| in. long, stout. Flowers in few- or many-flowered umbels; peduncles axillary, glabrous, often longer than the leaves ; pedicels |-| in. long, glabrous, red. Calyx small, glabrous, persistent; lobes broad, thick, ciliate. Petals |-1 in. long, oblong, obtuse. Stamens twice as many as the petals and slightly shorter than them; filaments long, with a hairy scale at the base. Ovary shortly stalked, glabrous, usually 4-celled : style glabrous, a little longer than the stamens, llpe carpels 2-2<sup>^</sup>, in. long, nearly semicircular, much compressed, smooth, reticulate. Seed large. PI. B. I. v. 1, p. 519 ;

Grah.

ORDER XXXIXI. SIMARUBACE<sup>^</sup>].

Trees or vshrubs, usually with bitter irark. Leaves usually alternate, pinnate, rarely simple; stipules 0, or deciduous. Inflorescence mostly axillary, paniculate or racemose, rarely spicate; flowers regular, usually small, diclinous or polygamous, rarely hermaphrodite. Calyx 3-5-lobed or-partite. Petals 3-5, very rarely 0, imbricate or valvate. Disk annular, cupular, or elongated into a gynophore, rarely 0. Stamens inserted at the base of the disk, equal in number to the petals or twice as many; filaments free, naked, often with a scale at the base; anthers oblong, usually introrse, 2-celled, dehiscing longitudinally! Ovary often deeply 2-5-lobed, 1-6-celled; ovules usually solitary (rarely many) in each cell; raphe ventral; micropyle superior; styles 2-5, free at the base and apex or at the base only, or connate by the usually capitellate stigmas. Fruit drupaceous or capsular or sometimes samaroid. Seeds usually solitary, pendulous; testa membranous; albumen copious, fleshy, scanty or 0; embryo straight or curved; cotyledons usually plano-convex or flat, rarely contorted or rugose; radicle superior.—DISTRIB. Tropical and warm regions j species about 120.

Ovary deeply divided.

- |   |               |
|---|---------------|
| Leaves pinnate; fruit samaroid .....          | 1. AILANTHUS. |
| Leaves simple; fruit drupaceous, winged ..... | 2. SAMADERA.  |
| Ovary entire; leaves 2-foliolale .....        | 3. BALANITES. |

## 1. AILANTHUS, Desf.

Lofty trees. Leaves alternate, pinnate; leaflets alternate or sub-opposite. Flowers in terminal or axillary branched panicles, small; pedicels bracteate. Calyx short, 5-fid; lobes equal, imbricate. Petals 5, spreading, induplicato-valvate. Disk 10-lobed. Stamens 10 in the male, 2-3 in the hermaphrodite and 0 in the female flowers, inserted at the base of the disk; filaments very short or filiform, without scales. Ovary 2-5-partite (rudimentary in the male flowers); ovule 1 in each cell, semianatropous; styles connate. Samaras 1-5, large, membranous, linear-oblong, veined, 1-seeded in the middle. Seed compressed; testa membranous; albumen scanty, adhering to the testa; cotyledons flat, foliaceous, suborbicular.—DISTRIB. India, Australia, China; species 3-4.

- |   |                           |
|---|---------------------------|
| Leaflets coarsely toothed; filaments shorter than the anthers . | 1. <i>A. excelsa</i> .    |
| Leaflets entire; filaments longer than the anthers.....         | 2. <i>A. malaharica</i> . |

**1. *Ailanthus excelsa*, Jloxb. Cor. PI. v. 1 (1795) p. 24, t. 23.** A tree 60-80 ft. high. Leaves\* unequally or equally pinnate, usually 8-12 in. but sometimes reaching 2-3 ft. long, the younger tomentose, the older more or less so or glabrous; leaflets 8-14 pairs,, alternate or subopposite, very variable in shapp, 4-6 in. long, coarsely and irregularly toothed or sublobate, very unequal at the base; petiolules f-2 in. long. Flowers iu large lax often much-branched panicles; pedicels long, slender. t Calyx-lobes ovate-triangular. Petals | in. long, ovate-lanceolate, glabrous, reflexed. Filaments glabrous, about half as long as the anthers. Samara H-2| in. long by §-| in. broad, lanceolate, acute at both ends, reddish-brown, twisted near the base, many-nerved, the nerves reticulate above the seed, otherwise nearly parallel. Seed solitary in the centre of the samara. FJ. *B.I.* v. 1, p. 518; Grah. Cat.

I v. 1, p. 516; Grab. Cat. p. 24; Dalz. & Gibs. p. 30; Bedd. Flor. Sylvat. t. 121; Trim. Fl. Ceyl. v. 1, p. 228; -#Engler, in Eng. & Prantl, Pflanzenf. v. 3, part 4, p. 193, fig. 112; Talb. Trees, Bomb. p. 34; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268; "Watt, Diet, Econ. Prod. v. 3, p. 324.—Flowers: Mar. YEIIN. *Kavath*.

The Elephant- or Wood-apple; often cultivated. KONKAN: *Stocks I, Cajff. Geburnel*; in gardens, Bombay, *Graham*. DECCAN: cultivated, *Jacquemont*, 984 !; Ahmednagar, *Graham*; gardens, Poona, *Coofce I* KANARA: *Plalyal, Ritchie*, 1G431 GUJARAT: *Da hell cf Gibson*; valley of the Tapti, common, *Graham*.—DISTRIB. Java, Ceylon.

## 16. JEGLE, Corr.

Spinous trees. Leaves 3- (rarely 5-) foliolate; leaflets membranous, subcrenulate, pellucido-punctate. Flowers hermaphrodite, rather large, white, in axillary panicles. Calyx small, - 4-5-lobed, deciduous. Petals 4-5, oblong, spreading, imbricate. Stamens numerous; filaments short, subulate; anthers elongate, erect. Disk inconspicuous. Ovary ovoid, attenuated into the style; cells 8-20 peripheral; ovules numerous, 2-seriate; style short; stigma capitata or fusiform, deciduous. Berry globose or ovoid, 8-15-celled; cells many-seeded; rind woody. Seeds numerous, oblong, compressed, in an aromatic pulp; testa woolly and mucous.—DISTRIB. Java and tropical Africa; species 2-3.

1. **JEGLE Marmelos**, *Corr. in Trans, Linn. Soc. v. 5* (1800) p. 223. A small tree, armed with strong straight sharp spines §-1 in. long. Leaves 3- (rarely 5-) foliolate; petioles puberulous, 1-11 in. long; leaflets lanceolate or elliptic-lanceolate, 1-3 by f-1<sup>^</sup> in., glabrous, the lateral leaflets subsessile, the terminal leaflet long-petioluled. Flowers bisexual, greenish-white, scented; buds globose; -pedicels pubescent. Calyx flat, pubescent, 4-lobed; lobes rounded, sometimes obscure, ciliolate. Petals 4, much imbricate, *i* in. long, free, oblong, coriaceous. Stamens numerous, sometimes 50 or more; filaments subulate, glabrous, free or sometimes 2 or 3 of them more or less united or subfascicled; anthers linear-oblong, apiculate. Ovary 11-celled, glabrous, ovoid-oblong, faintly ribbed, seated on an elevated disk; cells many-ovuled; ovules biseriate. Fruit 2-5 in. in diam., globose; rind grey or yellowish; pulp sweet, thick, orange-colored. Fl. B. I. v. 1, p. 516; Grab. Cat. p. 24; Dalz. & Gibs. p. 31; Engler, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 194, fig. 113; Talb. Trees, Bomb. p. 34; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 268; Watt, Diet. Econ. Prod. v. 1, p. 117.—Flowers: Apr.-May. VERN. *Bel*.

Cultivated in many places and found wild occasionally in the Deccan. Ko. N: *Stocks!*, *Law!*; Bomhay, *Capt. Geburne I Elephanta, Graham*. DECCAN: WI .in many parts, ex *Dalzell & Gibson*; widely planted, *Woodrow*; about temples in the Deccan, *Graham*. S. M. COUNTRY: Gatpraba river N. of Belgaum, *Bitchie*, 994!

The *Bad* tree, known commonly as the *Bengal Quince*. Many parts of the tree possess highly valuable medicinal properties, and the dried unripe fruit has been long used as a remedy for diarrhœa and dysentery. See *Wat!*, Diet. Econ. Prod. 1. c.



The *Bitter* or *Seville* Orange (var. 2, *Birjaradia*, Fl. B. I. 1. c.) does not appear to\*be largely cultivated in India.—It is grown sparingly on the hills about Panchgani and used for making marmalade.

A full description of the several species and varieties of *Citrus* grown in India may be found in Watt's Dictionary of Economic Products of India, vol. 2, pp. 333-358. Woodrow (Gardening in India, p. 202 *et sea.*) gives a concise account of the mode of growing, budding and pruning the orange.

3. **Citrus decumana**, *Murr. Syst.* ed. 13 (1774) p. 530. • A tree 30-40 ft. high ; young shoots pubescent. Leaflets large, 6-9 in. long, ovate-oblong, frequently emarginate, pubescent beneath; petioles broadly winged. Flowers large, white. Stamens 16-24. Fruit large, pale yellow, globose or pyriform ; rind thick ; pulp varying in color from crimson to pale pink or yellow ; vesicles distinct. Fl. B. I. v. 1, p. 516 ; Grab. Cat. p. 25 ; Dalz. & Gibs. Suppl. p. 12 ; Brandis, For. Fl. p. 55 ; Talb. Trees, Bomb. p. 34; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 2G8 ; Watt, Diet. Econ. Prod. v. 2, p. 348.—VEHN. *Papanas*.

The *Pummelo*, or *Shaddock* of the W. Indies, a native of the Malayan and Polynesian Islands, largely cultivated in the Presidency and arriving at great perfection along the coast of Kanara and the Konkan.

Dr. Bonavia (Cultivated Oranges and Lemons of India and Ceylon, p. 167) says " The best pummelos I have ever seen are the thin-skinned red pummelos of Bombay. All the -other varieties of pummelo I have seen in India and Ceylon are not to be compared with this and hardly worth propagating to any extent."

## 15. FERONIA, Corr.

A spinous tree. Leaves alternate, imparipinnate ; petioles simple or winged; leaflets opposite, subsessile. Flowers white, in lax racemes or panicles, polygamous. Calyx small, flat, 5-toothed, deciduous. Petals 5 (rarely 4-6), spreading, imbricate. Stamens 10-12 (some of them often imperfect); filaments dilated," villous in front and on the margins, subulate at the apex; anthers linear-oblong. Disk short. Ovary oblong, 5-6- at length 1-celled; ovules many, crowded, in many series, on 5-6 at length parietal placentas ; style 0 ; stigma oblong, fusiform, deciduous. Berry globose, 1-celled, many-seeded, filled with pulp ; rind woody. Seeds oblong, compressed; cotyledons thick, fleshy.—DISTRIB. Tropical India and Java ; species 1.

1. **Feronia Elephantum**, *Corr. in Trans. Linn. Soc.* v. 5 (1800) p. 225. A moderate-sized tree with straight sharp strong spines i-ll in. long. Leaves smelling of aniseed, alternate, imparipinnate; petiole and rhachis flat, often narrowly winged ; leaflets 3-9, opposite, 1-2 by «-l in., cuneate or obovate, tip often crenulate. Flowers small | numerous, dull red, in lateral or terminal pubescent panicles, male and female flowers'often in the same panicle. Calyx small, 5-6-lobed • lobes triangular. Petals 5-6, free, elliptic-oblong, 1 in. long, spreading' or deflexed. Stamens 10-12, 1-seriate; filaments equal, subulate, densely hairy at the base within; anthers large, linear-oblong. Ovary glabrous, sessile. Fruit 2-2| in. in diam., globose, hard; pericarp woody, rough, grey-colored. Seeds embedded in an edible pulp. Fl. H#

sweet, not aromatic. Fl. B. I. v. 1, p. 515 : Brandis, For. Fl. p. 52. *Citrus Limetta*, Kisso; Dal/. & Gibs. Suppl. p. 13.—VERN. *Mitha limhv*. Widely cultivated.

2. **Citrus Aurantium**, Linn. *Sp- ^*. (1753) p. 782. A tree, rarely a shrub ; young shoots glabrous, greenish-white. Leaves 1-folio-late • leaflets 3-6 in. long, elliptic or ovate, obtuse, acute or acuminate; petioles naked or winged, the wing often obovate and nearly as large as the blade. flowers bisexual, pure white. Stamens 20-30. Fruit globose, generally oblate, not mammillate, usually orange-colored; rind loose or adherent; pulp sweet, yellow, rarely red. Fl. B. I. v. 1, p. 515; G-rah. Cat. p. 20; Dalz. & Gibs. Suppl. p. 12; Talb. Trees, Bomb. p. 34 ; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (1897) p. 268 ; Watt, JL>ict. Econ. Prod. v. 2, p. 335.—VERN. *Ndriwji*.

The sweet and bitter orange; widely cultivated. Of the former (*C. aurantium* proper, Fl. B. I. 1. c.) many kinds are cultivated in India, one of the best of which is probably that known as the " Cintra " Orange, the name of which was supposed wto denote its Portuguese origin. Dr. Bonavia is of opinion that the term is a corruption of a Sanskrit name *Santara*, and has nothiug to do with the Portuguese town Cintra.

This orange is cultivated in many places in the Bombay Presidency (<?. (*j*. about Poona), but Nagpur in the Central Provinces is the great source of supply for the Bombay market. The tree is capable of producing 2 crops of fruit annually, but as such excessive production would naturally result in deterioration, the Xagpur orange-growers, by allowing one plantation to rest while the other is bearing, obtain a yield of fruit at two different seasons, from two distinct plots.

The fruit of the Cintra Orange weighs from 7 to 10 ounces, has a smooth loose skin in one variety, tight in another, with pulp of a deep orange color and excellent flavor.

The *Lddu* Orange of the Deccan comes next to the " Cintra " among the cultivated oranges of the Presidency. The fruit weighs 7 to 8 ounces, but the color of its skin is not attractive. Woodrow (Gardening in India) mentions a remarkable malformation which occurs in many of the fruits, viz., that at the stigmatic end, enclosed within the skin, a small completely formed orange, as large as a marble, with 5 or 7 carpels, may often be found. The tree grows to a large size. Woodrow mentions one in Sir A. Sassoon's garden (Garden Reach, Poona) which, planted 20 years previously, had covered an area of 400 scjuare feet.

The *Mandarin* Orange (*JAl Lddu* of the Deccan) produces a handsome fruit, which is in season from November to January. The appearance of the fruit is attractive, but in flavor the pulp is inferior to that of the *Lddu*.

A variety of the *Mozambique* Orange, named *KJidguzi*, is also grown in the Deccan. The fruit attains a large size, sometimes weighing as much as 13 ounces. The skin is tight and the endocarp so strong that the

uit can only be sucked ( *Woodroiv*).

An orange, called in the vernacular *Resemi-ndringi*, is cultivated about Poona. It produces a small fruit weighing about 3 ounces, with very little juice and a great number of seeds (about 20). It is a very poor orange and hardly worth cultivating.

many-celled ; ovules 4-8 in each cell, 2-seriate; style deciduous ; stigma capitate. Berry globose or oblong, fleshy, many-celled; septa membranous; cells few-seeded, filled with horizontal or fusiform cellules replete with juice. Seeds horizontal or pendulous; testa coriaceous or membranous; embryos sometimes 2 or more in one seed; cotyledons plano-convex, often unequal; radicle small, superior.—DISTRIB. Tropical Asia, 5 species ; Australia, 2 species.

Young shoots and leaves glabrous; transverse vesicles of pulp concrete.

Young shoots purple ; petals tinged with red ; flowers often unisexual; fruit often mammillate at the apex... 1. *C. medica*.

Young shoots greenish-white; petals white; flowers bisexual ; fruit not mammillate ..... 2. *C. Aurantium*.

Young shoots and underside of leaves pubescent; transverse vesicles of pulp distinct ..... 3. *C. deumana*.

1. **Citrus medica**, *Linn. Sp. Pl.* (1753) p. 782. A shrub or small tree flowering and fruiting almost the whole year; young shoots glabrous, purple. Leaves 1-foliolate ; petioles naked or winged; leaflets 3-6 in. long, elliptic-ovate or ovate-lanceolate, usually obtuse, crenate-serrate, base acute. Flowers white, usually tinged with red, small or medium sized, often unisexual, 5-10\* in a raceme. Stamens 20-40. Fruit globose or oblong, often mammillate at the apex, usually yellow when ripe ; rind thick or thin. *El. B. I. v. 1*, p. 514 ; *Brandis, For. Fl. p. 51*; *Talb. Trees, Bomb. p. 33*; *Woodr. in Journ. Bomb. Nat. v. 11 (1807) p. 267* ; *Watt, Diet. Econ. Prod. v. 2, p. 349*.

Cultivated throughout the Presidency; said to be wild on the Western Ghats. *Graham* (*Cat. Bo. Pl.* p. 25) mentions the occurrence of a plant called by the natives *Malmiga*, apparently wild near Tar and on the level part of the Rotunda Ghat (below Muhableshtar), which, however, *Dalzell* cf- *Gibson* (*Bo. Fl. Suppl. p. 13*) failed to find. *Mr. Nairne* (*Flowering Plants of W. India, p. 48*) mentions that he had himself found the plant on the Parpoli Ghat (Wari Country).

The varieties of *Citrus medica* cultivated in the Bombay Presidency are the following :—

VAR. 1. *Citrus medica* proper. The Citron. Fruit large, oblong, obovoid or somewhat irregularly shaped ; mammilla obtuse; rind thick, very aromatic; pulp scanty, subacid. *Fl. B. I. v. 1*, p. 514; *Brandis, For. Fl. p. 52*. *Citrus medica*, *Linn.*; *Dalz. & Gibs. Suppl. p. 13*.—VERN. *Mdhlungi*.

VAR. 2. *Limorium*. The Lemon. Petiole margined or winged. Fruit ovoid, yellow, mammillate; rind thin ; pulp abundant, very acid. *Fl. B. I. v. 1*, p. 515 ; *Brandis, For. Fl. p. 52*. *Citrus Limonium*, *Eisso*, in *Ann. Mus. Par. v. 20*, p. 201; *Grah. Cat. p. 25* ; *Dalz. & Gibs. Suppl. p. 13*.

VAR. 3. *acida*. The Sour Lime of India, Leaflets elliptic-oblong. Bacemes short; flowers small; petals usually 4. Fruit usually small, globose or ovoid; rind thick or thin ; pulp pale, very acid. *Fl. B. I. v. 1*, p. 515 ; *Brandis, For. Fl. p. 52*. ? *Citrus Bergamia*, *Dalz. & Gibs. Suppl. p. 13*.—VERN. *Limbu*. Very widely cultivated.

VAR. 4. *Limetta*. The Sweet Lime of India. Fruit globose, 3-5 in in diam.; rind thin, smooth, adhering to the pulp; juice abundant

has been frequently mistaken for *A. monophylla* and ticketed as such by collectors. In a recent communication from Mr. Gammie of the College of Science at Poona, that gentleman informed me. that there was not, when he wrote, a single specimen of *A. monophylla* in the College Herbarium, all the specimens there preserved being specimens of *A. racemosa*, though some had been erroneously labelled as *A. monophylla*. *A. racemosa* is tolerably abundant at Mahableshwar and Matheran, but I have seen no specimen of *A. monophylla* from either locality.

**3. *Atalantia ceylanica*, Oliver, in Journ. Linn. Soc. v. 5 (1861), Suppl. 2, p. 25.** A much-branched shrub, usually armed with sharp

stout spines—1 in. long ; bark smooth ; young parts glabrous.

Leaves

1-foliolate; petioles  $\frac{1}{2}$  in. long; leaflets very variable, coriaceous, 1-4 in. long, ovate-oblong, elliptic-oblong or ovate-lanceolate, rounded at the apex or with an emarginate or 2-lobed tip (rarely obtusely acuminate), entire, glabrous. Flowers crowded in short finely pubescent

corymbose

or racemose cymes much shorter than the leaves; bracts minute;

pedicels short. Calyx 4-lobed; lobes shallow, rounded, ciliate, sometimes

obscure. Petals 4 (rarely 3 or 5),  $\frac{1}{2}$  in. long, elliptic-oblong, obtuse,

slightly concave, glandular. Stamens 8, the alternate ones longer;

filaments flat, free, or 2 to 3 of them more or less combined; anthers cordate. Disk annular, subcupular. Ovary sunk in the disk,

2-celled;

ovules 2 in each cell, collateral; style short, stout; stigma clavate.

Berry  $\frac{1}{2}$  in. in diam., globose or ovoid, 2-4-seeded. Fl. B. I. v.

1, p. 512; Trim. Fl. Ceyl. v. 1, p. 227; Talb. Trees, Bomb. p. 33.

DECCAN: Phunda Ghat, *Ritchie I*

This species has been included on the authority of a single imperfect specimen in Herb. Kew. marked "Phoondah Ghat, *Ritchie*"; it does not seem to have been found by any other collector.—DISTRIB. Ceylon.

**4. *Atalantia missionis*, Oliver, in Journ. Linn. Soc. v. 5 (1861), pp. 2, p. 25.** A small much-branched tree, armed with long sharp

spines which are solitary or in pairs; branchlets smooth, often angled. Leaves 1-foliolate; petioles  $\frac{1}{2}$  in. long; leaflets thick and coriaceous, 2-3 by 1-1  $\frac{1}{2}$  in., broadly oblong-obovate or elliptic, obtuse or rounded, entire or crenulate, undulate, glabrous, glaucous when dry, base acute; nerves and veins obscure. Flowers small, white, in glabrous racemes 1-2 in. long. Calyx usually 4- (rarely 5-) lobed; lobes ovate-triangular. Petals 5, lanceolate-oblong. Stamens 8, equal; filaments free, broader and flattened near the base; anthers narrow-linear. Ovary seated on a gynophore, 4-5-celled ; ovules 2 in each cell; style stout, thickened upwards. Berry 1 in. in diam., globose, with a thick rind, 4-5-celled; cells 1-2-seeded. Seeds globose, embedded in glutinous mucilage. Fl. B. I. v. 1, p. 513; Bedd. For. Man. in Fl. Sylvat, p. xlvi; Talb. Trees, Bomb. p. 33 ; Watt, Diet. Econ. Prod. v. 1, p. 349.

KANAKA : N. Kanara in evergreen forests, near Karwar, ex *Talbot*.

#### 14. **CITRUS**, Linn.

Trees or shrubs, usually spinous. Leaves 1-foliolate ; petiole often winged; leaflets entire or crenulate, coriaceous, persistent. Flowers white or pinkish, sweet-scented, solitary, fascicled or in small cymes. Calyx cupular or urceolate, 3-5-fid. Petals 4-8, linear-oblong, thick, imbricate. Stamens 20-60 ; filaments variously connate, compressed at the base; anthers oblong. Disk large, cupular or annular. Ovary

Stamens usually combined into a tube.

Oalyx irregularly split to the base ; cymes contracted ..... 1. *A. monophylla*.

Calyx regularly or subregularly lobed ; cymes long, racemose. 2. *A. racemosa*.

Stamens noj, combined into a tube.

Ovary sunk in the annular disk ; anthers cordate ..... 3. *A. ccylanica*.

Ovary stipitate; anthers linear-oblong ..... 4. *A. missionis*.

**1. *Atalantia monophylla*, DC. *Prod.* v. 1 (1824) p. 535.** A shrub or small tree with numerous rigid branches, the older ones armed with short sharp axillary spines. Leaves 1-foliolate; petioles  $\frac{1}{2}$  in. long, with 1 or 2 stipulavy scales at the base; leaflet coriaceous, 1-3 by  $\frac{1}{2}$ -1-in., ovate-oblong or elliptic, obtuse, emarginate, bright green, entira, glabrous, reticulately veined. Flowers crowded in axillary fascicles or in racemose much-contracted cymes; buds oblong or. slightly clavate; pedicels  $\frac{1}{2}$ - $\frac{1}{4}$  in. long; bracts minute. Calyx, at the time ot: flowering or after it, irregularly split at the base. Petals white,  $\frac{1}{2}$  in. long, cuneate-obovate, rounded or subacute, clawed, adnate to the staminal-tube. Stamens 8 ; filaments united into a tube almost throughout their entire length; anthers small, elliptic, inserted on the triangular teeth of the staminal-tube. Disk inconspicuous. Ovary conical, gradually sloping into the style, 3-5-celled; style long, cylindric, equalling the staminal-tube. Berry  $\frac{1}{2}$  !obular, very like a lime, about as large as a nutmeg, usually 4-celled ; cells 1-seeded. El. B. I. v. 1, p. 511; Grah. Cat. p. 23 ; Dalz. & Gibs. p. 28 ; Bedd. For. Man. in Elor. Sylvat. p. xlvi, et Anal. Gen. t. 7, fig. 5 ; Engler, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 191, fig. Ill, C-D; Trim. El. Ceyl. v. 1, p. 226; Talb. Trees, Bomb. p. 33; "Watt, Diet. Econ. Prod. v. 1, p. 349. *Atalantia floribunda*, Wight, Icon, t. 1611.

KONKAN : on the Ghats, ex *Dalzell* & *Gibson*, and ex *Graham*. KANAKA : moist forests of N. Kanara, ex *Talbot*. S. M. COUNTRY: Belgaum Ghats, ex *Talbot*.—DISTJMH. Ceylon.

**2. *Atalantia racemosa*, Wight \$• *Am. Prodr.* (1834) p. 91.** A shrub or small tree; spines strong and sharp, sometimes absent. Leaves, 1-ffoliolate ; leaflet 2-4 by 1—1<sup>^</sup> in., elliptic, rounded'at the ape?;, emargi-tnate, entire or cremilate, glabrous, reticulately veined, base acute; petioles 5 in. long. Flowers in axillary racemose cymes ; pedicels short; bracts minute, subulate. Calyx usually 4- sometimes 3-5-lobed ; lobes rounded, or subacute, ciliolate. Petals white, ^ in. long, broadly elliptic or obovate, very concave in bud, not adnate to the staminal-tube, glandular. Stamens 8; filaments usually united into a tube throughout nearly their entire length, sometimes united at the base only when they are linear and flattened; anthers large, cordate, attached at the back near the base on the triangular teeth of the staminal-tube or the triaugular apex of -the filaments. . Disk cupular. Ovary ovoid, oblong, or obovoid; style short, stout, somewhat clavate. Berry globular, J in. in diatn. EL B. I. v. 1,-p. 612; Bedd. For. Man. in Elor. Sylvat. p. xlvi; Trim. El. Ceyl. v. 1, p. 226; Talb. Trees, Bomb. p. 33. *Atalantia monophylla*, Woodr. in Jourii. Bomb. Nat. v. 11 (1897) p. 267. *Sclerostylis atalantioides*, W. & A. in Wight, Icon. t. 71 (in textu 8. *parviflora*) ; Dalz. & Gibs. p. 29.— Elowers : Nov.-Dec. VBRK. *Makad-limbu* ; *Rdn-limbu*.

KONKAN: *Lawl*, *Stocks I*, *Dalzell*, *Capt. Geburne* \\ *Amboli* Ghat, *Woodrow* %DBCCAN: *Khandala*, *Cookel*; *Raighar*, *Bahell!*; *Par*, *Dalzell*— DisTRirf. Ceylon. Much more common than the preceding species, which is rare. *Atalantia*

*racemosa*

KONKAX: *Stocks*], *Dakclll*; the Ghats, common, *Dahcll* \$ *Gibson*. KANAKA: in moist, evergreen forests, *Talbot*; Mundele, *Ritchie*, 1G47 !; Divimana Ghat, *Woodrow*! —DISTIUB. Java, Ceylon.

## 12. PARAMIGNYA, Wight.

Erect or climbing shrubs, unarmed or with axillary spines. Leaves 1-foliolate (the articulation often obscure), subcoriaceous, persistent. Flowers rather large, axillary, solitary or fascicled. Calyx cupular or small and 4-5-lobed. Petals 4-5, free, imbricate or very rarely indupli-cato-valvate. Stamens 8-10, free, equal or subequal; filaments linear; anthers linear-oblong. Disk thick, columnar. - Ovary 3-5-celled; ovules 1 or 2, obliquely superposed in each cell; style elongate, continuous with the ovary, finally deciduous; stigma capitate. Berry ovoid or subglobose, often contracted at the base, 1-5-seeded; rind thick. Seeds large, oblong, compressed; testa membranous; cotyledons fleshy, equal.—1)ISTRIB. Tropical India; species 4.

1. *Paramignya monophylla*, *Wiyllit*, III. v. 1 (1840) p. 100. A climbing evergreen shrub, the older branches armed with sharp recurved axillary spines <sup>^</sup>-| in. long. Leaves numerous, 1-foliolate, gland-dotted; petioles <sup>^</sup>-<sup>^</sup> in. long, usually twisted; leaflets 2-4 by 1-2| in., ovate-oblong, acute, obtuse or acuminate, entire or nearly so, glabrous, base rounded often oblique. Mowers white; pedicels axillary, 1-3 together, pubescent. Calyx softly woolly; lobes 5, shallow, rounded. Petals 5, linear-oblong, ;j in. long, recurved. Filaments flat, linear, hairy, suddenly tapering beneath the anthers. Ovary haii-y, 3-5-celled; style long, stout, the lower part hairy. Berry obovoid or ellipsoid, 1, in. long, smooth. Seeds numerous, large, compressed. Fl. B. I. v. 1, p. 510; Grab. Cat. p. 25; Dalz. & Gibs, p. 30; Bngler, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 191, fig. Ill, A-B; Trim. Fl. Ceyl. v. 1, p. 224; Talb. Trees, Bomb. p. 33; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267; Watt, Diet. Econ. Prod. v. 6, part 1, p. 110.—Flowers: JNov.-Jan.

KONKAN: *Law* !; Ghats, *Stocks* I; Amboli Ghat, *Kanitkar* \; 23 miles west of Ratn; giri, *Woodrow* I; jungles at Viridi and throughout the S. Konkan as far as the Savil\* river, *Dahcll* cf *Gibson*. DECCAN: Phunda Ghat, *Ritchie*, \*JD3 !; Pargln'it, *Dahcll* c] , *Gibson*. S. M. COUNTRY: Eamghat, *Ritchie*, 91)3! KANAKA: evergreen forests of IS'. Kanara, *Talbot*) Ohandawar (N. Kanara), *Woodrow* !—DISTIUB. Ceylon.

## 13. ATALANTIA, Corr.

Shrubs or small trees, spinous or unarmed. Leaves alternate, 1-1'oliolate, coriaceous, persistent; stipule-like scales which belong to undeveloped leaf-buds are often present at the base of the petioles and spines. Flowers in axillary (rarely terminal) fascicles, racemes or panicles, rarely solitary. Calyx 3-5-lobed, or -partite, sometimes irregularly split. Petals 3-5, free or adnate to the stamens and united with them into a tube, imbricate. Stamens 6-8 (rarely 15-20), free or irregularly connate into a tube, subequal or the alternate shorter; anthers ovate-oblong or with a cordate base (linear-oblong in *A. missionis*). Ovary 2-4- (rarely 3-5-) celled; ovules ] or 2, collateral; style at length deciduous; stigma capitate. Berry large, subglobose, 1-5-celled, 1-5-seeded. Seeds oblong :- cotyledons fleshy, plano-convex.—DISTIUB. Tropical Asia and China, 1 in Australia; species 10.



oblong Ovary oblong, 4-5-celled; ovules 1-2 in each cell; style short, thick, °at length deciduous ; stigma obtuse or capitate. Berry globose, 1-4-celled, 1-4-seeded. Seeds imbedded in mucilage ; cotyledons fleshy.  
\_PiSTiiiB. Tropical Asia; species 2-3.

**1. *Limonia acidissima*, Linn. #p. *Pl.* ed. 2 (1762) p. 554,** A spinous glabrous shrub or small tree; spines sharp, | -1 in. long. Leaves pinnate, 1-4 in. long; petiole and rhachis jointed, the former narrowly, the latter very broadly winged; leaflets 2-4 pairs, 1-2 by i-1 in., trapezoid-ovate, obtuse, rarely acute, notched at the tip, crenu-fate, glabrous, base cuneate; joints of rhachis obovate-oblong, crenulate. Flowers in umbelliform, often leafy racemes ; peduncles 2-3 together from the axils of fallen leaves ; pedicels slender. Calyx small, glandular; lobes 4, broadly-ovate, acute. Petals 4, glandular, | in. long, elliptic-oblong. Stamens 8, free, subequal; filaments linear-subulate. Disk stipitiform. Ovary papillose, 4-celled; style stout. Berry | in. in diam., globose, 1-4-seeded, very acid. El. B. I. v. 1, p. 507; Grrah. Cat. p. 23; Dak. & Gibs. p. 29; Bedd. For. Man. in Flor. Sylvat. p. xlv; Talb. Trees, Bomb. p. 32; Watt, Diet. Econ. Prod. v. 4, p. 641.—Mowers : Apr.-May.

S. M. COUNTRY : Falls of Gokak, *Balzell & Gibson, Graham*; hills at Padshapur, *Graham*.

### 11. LUVUNGA, Ham.

Scandent glabrous shrubs, usually armed with axillary spines. Leaves 3-foliolate; leaflets coriaceous, quite entire. Flowers in axillary, fascicled or paniced racemes. Calyx cupular, entire or obscurely 4-6-lobed. Petals 4-5, free, thick, oblong or lanceolate, imbricate. Stamens 8-10, equal or subequal; filaments linear-subulate, free or connate below ; anthers linear or linear-oblong. Disk elevated, annular or cupular. Ovary 2-4-celled ; ovules 2 in each cell, superposed ; style short, continuous, stout, at length deciduous ; stigma capitate. Berry large, ellipsoid, with a thick rind, 1-3-seeded. Seeds large, ovoid; testa membranous, nerved ; cotyledons equal, oblong, fleshy.—DISTEIB. Tropical Asia; species about 4.

**1. *Luvunga eleutherandra*, Dalz. in *Kew Journ. Bot.* v. 2 (1850) p. 258.** Shrubby, scandent, with long, flexuose branches armed with sharp axillary somewhat deflexed or scarcely curved spines | -1 in. long. Leaves large, 3-foliolate ; petiole 1-3 in. long; leaflets nearly equal, 2-5 by 1-2± in., coriaceous, elliptic-oblong or obovate, shortly acuminate, entire, glabrous, base usually acute; petiolules short. Flowers in axillary glabrous racemes or panicles shorter than the petioles. Calyx cupular, truncate, entire or obscurely lobed, glandular. Petals | in. long, thick, glandular, elliptic-oblong, subacute. Stamens 8, shorter than the petals; filaments all free, longer than the style. Ovary 3.-celled, glandular; style short, stout. Berry | -1 in. long, ellipsoid, pitted. Fl. B. I. v. 1, p. 509; Dalz. & G-ibs. p. 30; Engler, in Engl. & Prantl, *Pflanzenf.* v. 3, part 4, p. 189, j^g. 109, M-E ; Trim. Fl. Ceyl. v. 1, p. 224 ; Talb. Trees, Bomb. p. 32 ; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 267.—Flowers: Jan.

Fl B. I. v. 1, p. 506 ; Dalz. & Gibs. p. 30 ; Bedd. For. Man. in Flor. Sylvat. p. xlv, et Anal. Gen. t. 7, fig. 3 ; Trim. Fl. Ceyl. v. 1, p. 222 ; Talb. Trees, Bomb. p. 32; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p# 267.—Flowers : Feb.

KONKAN : *Stocks* I S. M. COUNTRY : Ratnghat, *Ritchie*, 1644 !; Chorla Ghat, *Dalzell Sf Gibson*. KANARA : *Stocks*!; Hatkumba (N. Kanara), *Ritchie*, 1644!; Ghats of N. Kanara in evergreen forests, *Talbot*.—DISTRIB. Moluccas, Ceylon.

*Clausena Wampi*, Oliver (*CooJcia jmnctata*, Sonnerat), a native probably of China, is often grown in gardens. Its fruit is about as large as a marble and is used for tarts and preserves. *Grali, Cat*, p. 24 ; *Dalz. Sf Gibs. Suppl.* p. 12.

### 9. TRIPHASIA, Lour.

A spiny shrub. Leaves alternate, 3-foliolate; leaflets ovate, obtuse, usually crenate, the lateral smaller. Flowers solitary or in 2-3-flowered cymes, axillary, white, odorous. Calyx 3-lobed. Petals 3, free, imbricate. Stamens 6, free, subequal; filaments subulate, dilated at the base; anthers linear. \* Disk fleshy, annular or stipitiform. Ovary seated on the disk, ovoid, 3-celled, narrowed into the style; ovule 1 in each cell; style slender, at length deciduous; stigma obtuse or capitate and 3-lobed. Berry small, ovoid, 1-3-celled, 1-3-seeded. Seeds oblong, immersed in mucilage; testa coriaceous; cotyledons plano-convex, often unequal and lobed.—DISTRIB. A native of China, cultivated in the tropics; species 1.

1. **Triphasia Aurantiola**, *Lour. FL Cochinch.* v. 1 (1790) p. 153. A spinous straggling shrub; branches terete; spines axillary, straight, slender. Leaves 3-foliolate; leaflets, thick and soft, f-1| by |-g in. (the terminal leaflet much the largest, the lateral ones more rounded and oblique), ovate-elliptic, tip rounded, notched, crenulate, closely gland-dotted, glabrous, base cuneate; petiolules short. Flowers fragrant, solitary or in 2-3-flowered peduncled cymes; • pedicels very short. Calyx 3-lobed; lobes broadly ovate or suborbicular, ciliate. Petals 3, linear-oblong, rounded at the tip, \ in. long, white. Fruit ellipsoid, \ in. long, fleshy, apiculate, gland-dotted. *Triphasia trifoliata*, DC. Prod. v. 1 (1824) p. 536; Fl. B. I. v. 1, p. 507; Grah. Cat. p. 23; Dalz. & Gibs. Suppl. p. 12; Talb. Trees, Bomb. p. 32; Aoodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267; Watt, Diet. Econ. Prod. v. 6, part 4, p. 88.—VERN. *Chin-Jce-limbu*.

A native probably of China, grown in gardens throughout India. The fruit is used in preserves and pickles, being a common ingredient in Chinese preserved fruits.

Graham is in error in stating that the plant is a native of the S. Konkan. Dalzell and Gibson (Suppl. to Bo. Fl. p. 12) correct a similar error.

### 10. LIMONIA, Linn.

Shrubs or small trees, often spiny. Leaves alternate, 3-foliolate or imparipinnate; petiole winged; leaflets opposite or alternate. Flowers paniculate, racemose or fascicled. Calyx 4-5-lobed or -partite; lobes equal. Petals 4-5, imbricate. Disk annular or stipitiform. Stamens 8-10, free, subequal; filaments subulate; anthers cordate or linear-

105! KANAKA : *Ritchie!*; common in the Supa district of N. Kanara, *Talbot*.—DISTRIB. Ceylon.

The leaves under the name of *Karripdk* are used to flavor curries, and the leaves, bark, and root are employed in native medicine. See Watt, Diet. Econ. Prod. 1. c.

### 8. CLAUSENA, Burm.

Trees or shrubs, unarmed. Leaves imparipinnate, usually deciduous ; leaflets membranous. Flowers small, in terminal or axillary cymes, panicles or lax racemes. Calyx 4-5-lobed or -partite. Petals 4-5, free, usually tender, elliptic or rotund, imbricate. Stamens 8-10, free, the alternate a little shorter; filaments dilated in the middle or below the middle, subulate at the apex ; anthers short. Disk stipitiform. Ovary 4-5- (rarely 2-3-) celled, stalked ; ovules 2 in each cell, collateral or superposed ; style usually distinct, at length deciduous ; stigma obtuse, entire or 2-5-lobed. Berry ovoid, oblong or globose, 2-5-celled. Seeds oblong ; testa membranous; cotyledons equal, plano-convex.—DISTRIB. Chiefly tropical Asia, a few in tropical Africa and Australia ; species 14.

Flowers in terminal panicles, usually 5-merous; ovules collateral..... —	1.	<i>C. indica</i> .
Flowers in axillary racemes, usually 4-merous; ovules superposed.....	2.	<i>C. Wildenowii</i> .

**1. Clausena indica**, *Oliver, in Journ. Linn. Soc. v. 5 (1861), Suppl. 2, p. 36.* A shrub or small tree. Leaves 4-10 in. long ; petioles slender, terete, glabrous; leaflets 7-13, alternate, 1<sup>^</sup>-3 by |-1<sup>^</sup>in., ovate-oblong or lanceolate, obtusely acuminate, acute or rounded, notched at the tip, crenulate, glabrous, shining, base very oblique; petiolules -i- in. long. Flowers small, in terminal corymbosely branched peduncled panicles ; pedicels short. Sepals ovate, acute? ciliolate. Petals white, elliptic, ~ in. long. Ovary 2-5-celled, glabrous, papillose ; ovules 2 in each cell, collateral. Emit nearly globular, \ in. in diam., salmon- or cream-colored; pulp abundant, edible. Fl. B. L v. 1, p. 505 ; Bedd. For. Man. in Flor. Sylvat. p. xlv; Trim. Fl. Ceyl. v. 1, p. 221 ; Engler, in Engl. & Prantl, Pflanz. v. 3, part 4, p. 187, fig. 108/L-O; Talb. Trees, Bomb. p. 32 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267 ; Watt, Diet. Econ. Prod. v. 2, p. 358. *Pipiostylis indica*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 33, t. 2 ; Dalz. k Gibs. p. 29.—Flowers: Apr.-May.

S. M. COUNTRY: *Etirva Ghat, Dalzdl\* KANAKA : common in the evergreen forests on the Ghats of N. Kanara from Ainshi southwards, *Talbot*.—DISTRIB. Ceylon.

**2. Clausena Wildenowii**, *Wight & Am. Prodr. (1834) p. 96.* A large shrub ; young parts more or less pubescent. Leaves 6-16 in. long; rhachis slender, terete; leaflets 5-15, membranous, distant, 2-4 by f-1f in., ovate-oblong or ovate-lanceolate, acute, obtuse or acuminate, more or less emarginate, crenulate, finely reticulately veined and gland-dotted, glabrous, base very oblique ; petiolules -i- in. long, pubescent. Flowers fragrant, in slender racemes 3-10 in. long, from the axils of the young leaves and shorter than them. Sepals ovate, acute, ciliate. Petals white, \ in. long, ovate, concave, reticulately veined. Filaments dilated at the base. Ovary 4-angled or grooved, cylindrical, 4-celled ; ovules 2 in each cell, superposed ; style short; stigma 4-lobed.

Fruit size of a- large pea, ovoid, smooth, greenish-white, 1-2-seeded.

Berry small, 1-2-celled, oblong or ovoid, 1-2-seeded. Seeds with a woolly or glabrous testa; cotyledons equal.—DISTRIB. Tropical Asia; species about 5.

Flowers few; leaflets 3-7..... 1. *M. exotica*.  
Flowers numerous; leaflets 11-25 ..... 2. *M. Koenigii*.

1. **Murraya exotica**, Linn, *Mantiss.* v. 2 (1771) p. 563 (*Murrcea*); VAR, 2, *Fl. B. I.* v. 1, p. 503. A small evergreen tree; bark smooth, yellowish-white; branches slender. Leaves imparipinnate, 4-7 in. long; petioles glabrous; leaflets 3-7, alternate, 1-3 by 1-1-1/2 in. (the terminal leaflet the largest), ovate-elliptic, obovate or rhomboid, usually acuminate with a notched tip, entire, glabrous and shining, base acute, oblique; petiolules 1/2-1/3 in. long. Flowers very fragrant, campanulate, solitary or in terminal and axillary corymbs. Sepals small, glandular, oblong, obtuse. Petals white, 1/2 in. long, oblong-lanceolate, subobtusely, erect at the base, the upper half spreading. Filaments flat, linear, tapering beneath the anther. Ovary 2-celled. Berry 1/2-1/3 in. in diam., oblong or ovoid, pointed, smooth, 1-celled, 2-seeded, red when ripe. Grab. Cat. p. 24; Bedd. For. Man. in *Flor. Sylvat.* p. xlv, et Anal. Gen. t. 7, fig. 2; Trim. Fl. Ceyl. v. 1, p. 219\*; Engler, in *Engl. & Prantl, Pflanzeuf.* v. 3, part 4, p. 187, fig. 103, A-G; Talb. Trees, Bomb, p. 31; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 267; Watt, *Diet. Econ. Prod.* v. 5, p. 288. *Murraya paniculata*, Jack, in *Mai. Misc.* v. 1, p. 31; Dalz. & Gibs. p. 29.—Flowers: June-Oct. VEEN. *Kunti; Ohula-juti*.

Pretty common on the higher Ghats; frequently grown in gardens throughout the Presidency. KONKAN: *Stocks I*; G-sits, *Talhot*; Rohe, *Dalzell & Gibson*. DECCAN: *Xliandala, Woodrow.*; Mahableswar and Matheran, *H. M. Birdwood*; Lanoli, *Kanitkarl S. M.* COUNTRY: Raunghat, *Ritchie*, 89! KANARA: Kala naddi, *Ritchie*, 80!; Gluits of N. Kanara, *Talhot*.—DISTRIB. China, Australia and the Pacific Islands, Ceylon.

2. **Murraya Koenigii**, Spreng. *Syst. Veg.* v. 2 (1825) p. 315. A small tree with dark grey bark. Leaves imparipinnate, up to 12 in. long; petioles terete, pubescent; leaflets 11-25, alternate, 1-2 by 1-1/2 in., obliquely ovate or somewhat rhomboid, acuminate, obtuse or acute, tip usually notched (the lower leaflets often suborbicular or obovate, much smaller than the upper), irregularly crenate-dentate, glabrous or nearly so above, pubescent beneath, sprinkled with black dots; petiolules very short. Flowers white, in much-branched terminal peduncled corymbose cymes; peduncles and pedicels pubescent. Calyx pubescent; lobes sub-acute, triangular. Petals 1/2 in. long, linear-oblong, rounded at the apex, gland-dotted. Filaments dilated at the base. Ovary 2-celled;

ovules

solitary (rarely 2), in each cell. Fruit ovoid or subglobose,  $\frac{1}{2}$  in.

in

diam., apiculate, rough with glands, black, 2-seeded. Fl. B. I. v.

1,

p. 503 ; Bedd. For. Man. in Flor. Sylvat. p. xliv ; Trim. *FL*

Ceyl.

v. 1, p. 220; Talb. Trees, Bomb. p. 31; Woodr. in Journ. Bomb. Nat.

v. 11 (1897) p. 267 ; Watt, Diet. Econ. Prod. v. 5, p. 288.

*Bergera*

*Koemgii*, Linn. Mantiss. p. 563; Grah. Cat, p. 24; Dalz. & Gibs. p. 29.

—Flowers: Feb.-Apr. VERN. *Kadhi-nim*.

Common all along the line of the Ghats. KONKAN : *Law I, Stocks* !; on the Ghats, common, *Dalzell & Gibson*. DECCAN: Mahabaleshwar, common, *Cooker*; hills near Poona, *Woodrow*! S. M. COUNTRY : Hill of Backur, 5 miles west of Eelgaum, *Ritchie*,

g. 104 ; Talb. Trees, Bomb. p. 31 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267. *Cyminosma pedunculata*, DC. Prod. v. 1, p. 722; Dalz. & Gibs. Suppl. p. 17. *Clausena simplieifolia*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 180 ; Dalz. & Gibs. p. 30.—Mowers : Aug.-Sept.

KONKAN : *Law* !, *Stocks* ! KANAKA : *Dcdzell*!; Godhuli (N. Kanara), *Talbot ex Woodrow*, 1. c.; Karwar, *Talbot*!, *Woodrow*.—DISTRIB. Sumatra, Java, Oochinchina.

## 6. GLYCOSMIS, Con.

Unarmed trees or shrubs. Leaves 1-foliolate or imparipinnate; leaflets usually alternate. Flowers small, in axillary, rarely terminal panicles. Calyx 5-partite ; lobes broad, imbricate. Petals 4-5, imbricate. [Stamens 8-10, free, inserted round a disk; filaments subulate, dilated below; anthers small, often furnished with a dorsal or apical gland. Ovary seated on the disk, 2-5-celled; ovule solitary in each cell, pendulous. Berry pulpy or somewhat dry, 1-3-seeded. Seeds oblong; testa membranous ; cotyledons equal; radicle very short.—DISTRIB. Tropical Asia and Australia ; species 5.

1. **Glycosmis pentaphylla**, *Corr. in Ann. Mas. Hist. Nat. v. 6* (1805) p. 386. An erect shrub or small tree. Leaves 3-5- (rarely 1-) foliolate; leaflets 2-8 by f-2| in., subsessile, alternate and subopposite, polymorphous, usually oblong-lanceolate, obtuse, acute or acuminate, entire or obscurely creulate, glabrous, base acute. Flowers small, less than | in. across, crowded in small clusters in erect axillary panicles 1-4 in. long ; pedicels very short; bracts beneath the calyx triangular. Calyx small; lobes ovate-orbicular, margins membranous, ciliolate, with a gland on the outside of each lobe a little below its apex. Petals imbricate, white, very broadly obovate or suborbicular, the margins membranous! Filaments flattened; anthers with a gland at the apex and sometimes with another smaller gland at the back of the anther. Ovary on a short thick disk, covered all over, as is the style, with mammillate glands ; style as wide as the ovary in bud. Berry globose, ^ in. in diam., apiculate, .smooth^ pinkish-white or cream-colored. Fl. B. I. v. 1, p. 499 ; Grab. Cat. p. 23; Dalz. & Gibs. p. 29; Bedd. For. Man. in Flor; Sylvat. p. xliii, et Anal. Gen. t. 6 ; Trim. Fl. Ceyl. v. 1, p. 217 ; Talb. Trees, Bomb. p. 31 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897); p. 267 ; Watt, Diet. Econ. Prod. v. 3, p. 512.

Common throughout the moist evergreen forests of the Konkan and N. Kanara. KONKAN: *Law*!, *Stocks*!; Wada, *Woodrow* I; jungles in the Konkan, *Balzell* & *Gibson*. DECCAN : Khandala, *Woodrow*. KANAUA : Kala naddi, *Ritchie*, 87 ! S. M. COUNTRY: Oastlerock, *Woodrow*!; Belgaum Ghats, *Ritchie*, 87 I—DISTIUB. Malaya, China, Borneo, Australia, Ceylon.

## 7. MURRAYA, Linn.

Shrubs or small trees, unarmed. Leaves pinnate; leaflets alternate, petioluled, cuneate or oblique at the base. Flowers solitary, axillary, or in terminal corymbs or axillary cymes. Calyx 5-fid or 5-partite. Petals 5, free, imbricate. Stamens 10, free, the alternate shorter; filaments linear-subulate ; anthers small, short. Disk stipitit'orm. Ovary seated on the disk, 2-5-celled, narrowed into the style ; ovules 1-2 in each cell,

superposed or collateral; style elongate, at length deciduous ; stigma capitate.



KONKAN: *Lawl, Stocks I, Dalzell*; S. Konkan, *Graham*. DECCAN : Khamlala, *Dalzell & Gibson*; Mahableshwar, *Choke!*, *H. M. Birdwood*. S. M. COUNTRY : Bamghat, *Ritchie*, 91 ! KANARA : plentiful, *Dalzell & Gibson*; Sirsi (N. Kanara)," *Talbof*, 338 !—PISTRIB. Sumatra, Java, China, the Philippines, Ceylon.

A valuable medicinal plant, the root-bark especially possessing high therapeutic properties. See Watt, *Diet. Econ. Prod.* 1. c.

**2. *Toddalia bilocularis*, Wight & Am. Prod.** (1834) p. 149. A handsome, middle-sized tree with dark green foliage, unarmed. Leaves 3-foliolate ; petioles 1-3 in. long, terete, glabrous; leaflets 3-7 in. by 1-3 in., elliptic-lanceolate, bluntly acuminate, notched at the tip, entire, glabrous, base acute; lateral nerves numerous, parallel and uniting into one that is parallel to and close to the margin; petiolules 1/2 in. long. Flowers terminal and from the upper axils. Calyx cupular. Petals usually 2 (sometimes 3), orbicular-oblong. Stigma large, peltate. Fruit as large as a small cherry, 2-celled. Fl. B. I. v. 1, p. 497 ; Dalz. & Gibs. p. 46; Bedd. For. Man. in Flor. Sylvat. p. xliii, et Icon, t. 167; Talb. Trees, Bomb. p. 31. *Dipetcdum biloculare*, Dalz. in Kew Journ. Bot. y. 2 (1850) p. 38.

A very rare plant, of which but few specimens have been available for examination. KANAKA : *Balzell & Gibson*.

## 5. ACRONYCHIA, Forst.

Trees. Leaves opposite or alternate, very rarely 3-foliolate ; leaflets large, quite entire, pellucido-punctate. Flowers in axillary and terminal corymbs, polygamous. Calyx short, 4-lobed, imbricate, sometimes enlarged after flowering. Petals 4, much longer than the calyx, spreading or revolute, valvate. Disk thick, 8-gonous, tomentose or pubescent. Stamens 8, inserted beneath the disk; filaments subulate, the alternate longer. Ovary inserted in the hollowed apex of the disk, pubescent or tomentose, 4-celled ; ovules 2 in each cell, superposed ; style terminal, short or long; stigma 4-grooved. Fruit 4-celled, the cells 1-2-seeded, or drupaceous with a coriaceous or bony putamen, or capsular and loculicidally 4-valved. Seeds usually exserted and dependent from a slender funicle; testa black; albumen copious ; embryo straight; cotyledons oblong, flat.—DISTRIB. Tropical Asia, Australia and the Pacific Islands ; species 15.

**1. *Acronychia laurifolia*, Blume, Cat. Gew. Buitenz.** (1823) p. 63 ; *Bijdr.* p. 245. A small tree with pale smooth bark; young twigs glabrous. Leaves 1-foliolate ; leaflets 3-5 by 1-2 in., oblong-lanceolate or somewhat obovate, usually shortly and obtusely acuminate, entire, glabrous and shining above, base acute ; petioles 1/2 in. long. Flowers fragrant, in paniculately corymbose cymes; buds linear-oblong; peduncles long, straight, terete; pedicels glabrous. Calyx small; lobes broadly ovate, ciliolate. Petals 1/2 in. long, yellowish-white, strap-shaped, cucullate, inflexed at the apex, hairy at the base inside. Stamens shorter than the petals ; filaments dilated and hairy at the base; anthers versatile. Disk 8-ribbed, softly pubescent towards the apex". Ovary conical, softly hairy ; style shorter than the stamens. Capsules 1/2-1 in. in diam., sub-globose, 3-5-celled, glabrous, rough with immersed glands, more or less lobed, tip angled or grooved. Fl. B. I. v. 1, p. 498 ; Trim. Fl. Ceyl. v. 1, p. 216; Engler, in Engl. & Prantl, *Pflanzenf.* v. 3, part 4, p. 180,

opposite, angled ; bracts minute, caducous; peduncles very long, sometimes prickly. Calyx-lobes minute, triangular. Petals 4, elliptic, 1/2 in. long, yellow, valvate. Ripe carpels 1/4 in. in diam., spherical, rugose. Seeds globose, bluish-black, smooth, shining. Fl. B. I. v. 1, p. 495; Grah. Cat. p. 36; Dalz. & Gibs. p. 45; Bedd. For. Man. in Flor. Sylvat. p. xli, et Anal. Gen. t. 6; Talb. Trees, Bomb. p. 30; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267; "Watt, Diet. Econ. Prod. v. 6, part 4, p. 325.—Mowers : July-Oct. VERN. *Ti&al*; *Ghir-plial*; *KoJcli*.

KOSKAN: Vingorla, *Dalzelli*; Waral (Ratnagiri districts), *Woodrow*, Banda in the Wari country, *Dalzell*. DECCAN; Khandala, *Graham*-, *KhndesU*, *Graham*', Par village, *Graham*. S. M. COUNTRY: Parva Ghat (Belgaum districts), *Ritchie*, 1187! KANARA; Ivarwar, *Talhot*; throughout N. Kanara in moist, evergreen forests, *Talbot*.

The unripe carpels are gratefully aromatic and have the flavor of orange peel. The seeds taste exactly like black pepper. Both are employed in Southern India as condiments. The essential oil obtained from the fruit is used medicinally. See Watt, Diet. Econ. Prod. 1. c.

#### 4. TODDAUA, Juss.

Subscandent or sarmentose shrubs, usually prickly. Leaves alternate, 1-3-foliolate; leaflets sessile. Flowers small, in axillary or terminal cymes or panicles, unisexual. Calyx short, 2-5-toothed -lobed or-partite. Petals 2-5, imbricate or valvate. Disk inconspicuous or slightly elongate: MALE FLOWERS: Stamens 2-4-5 (or 8, the alternate ones opposite the petals, short and imperfect), inserted at the base of the disk; filaments subulate or filiform. Ovary rudimentary, simple or 4-partite. FEMALE FLOWERS: Ovary ovoid, oblong or globose, sessile or inserted on a short torus, 2-7- (very rarely 1-) celled; ovules 2 in each cell, superposed or collateral; style short or 0; stigma capitate. Fruit pisiform, sub-globose or lobed, coriaceous or fleshy, punctate, 2-7-celled -r cells 1-(rarely 2-) seeded. Seeds angled, reniform; testa coriaceous; cotyledons oblong or linear.—DISTRIB. Tropical and subtropical Asia, Africa and Australia; species about 8.

- |  |                            |
|--|----------------------------|
| Prickly shrub; fruit 3-7-celled; petals 5..... | 1. <i>T. aculeata</i>      |
| Unarmed tree; fruit 2-celled; petals 2-3.....  | 2. <i>T. hilocularis</i> . |

1. **Toddalia aculeata**, *Pers. Syn. v. 1 (1805) p. 249.* A large sarmentose shrub, usually armed with sharp curved or straight prickles (sometimes unarmed). Leaves 3-foliolate; leaflets coriaceous, sessile, 1^HH" by f-la i^n-> lanceolate-oblong or obovate, usually with a long blunt acumen, notched at the apex, crenulate or subentire, glabrous, many-nerved, the midrib often prickly, base acute. Flowers white, -jUA-in. across, in axillary cymes. Calyx small, glandular; lobes triangular. Petals 5, oblong, thickened at the apex, imbricate. MALE FLOWERS: Petals shorter than the stamens; buds globose. Ovary (rudimentary) cylindrical-oblong, grooved, seated on a lobed disk. FEMALE FLOWERS: Petals longer than in the male; buds oblong. Stigma sessile, 5-7-lobed. Fruit globose, size of a large pea, 3-5-grooved, orange-colored, pitted on the rind, 3-7-celled. Seed solitary in each cell, smooth, reniform, rounded on the back. Fl. B. I. v. 1, p. 497; Grah. Cat. p. 37 (*Toddalia*); Dalz. & Gibs. p. 46; Trim. Fl. Ceyl. v. 1, p. 215; Engler, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 176, fig. 101', A-K; Talb. Trees, Bomb. p. 31; "Woodr. in Journ. Bomb. Nat. v. 11 (1897) 5. 267; Watt, Diet. Econ. Prod. v. 6, part 4, p. 67. *Limonia oligandra*, Dak. in Kew Journ. Bot. v. 2 (1850) p. 258; Dalz. & Gibs, p. 28.—Flowers: JSept.-Dec. VEEN. *Jangli-Jcdli-mircJii*.

Tolerably abundant along the line of the Ghats. KONKAN : *Stocks* !, *Law* !  
 Parghát, *Graham*; Mahabeshwar, *Cooke* !, *Woodrow* !, *H. M. Woodrow* !; ravines at  
 Khandala, *Graham*. S. M. COUNTRY : Ramghát, *Ritchie*, 200 ! KANARA : throughout  
 the Gháts of N. Kanara in moist situations; forests near Yellapur, N. Kanara, *Talbot*.  
 — DiSTuiB. Sumatra, Java, Oeylon.

### 3. ZANTHOXYLUM, Linn.

Shrubs or trees, often armed. Leaves alternate, 3-foliolate or pinnate; leaflets opposite or alternate, entire or crenate, often oblique, pellucido-punctate. Flowers polygamous, small, in axillary or terminal, usually paniculate cymes. Calyx 3-8-fid, imbricate, rarely 0.. Petals 3-5, rarely 0. MALE FLOWERS : Disk inconspicuous. Stamens 3-5, hypo-gynous. Ovary rudimentary. FEMALE FLOWERS: Stamens 0 or squami-form. Disk very short. Carpels 1-5, oblique, 1-celled ; ovules 2 in each cell, usually collateral; styles sublateral, short or long, free or connate above ; stigmas capitate. Fruit of 1-5 globose coriaceous or fleshy 1-seeded carpels dehiscent ventrally ; endocarp horny, separating or not. Seeds globose or oblong, often hanging out of the carpel; hilum broad; testa bony or crustaceous, blue or black, shining; albumen fleshy; embryo straight or curved ; cotyledons flat; radicle very short. —DISTIB. Throughout the tropical and warm regions of the world; species 80.

Leaves 3-foliolate ; branches of the cyme alternate..... 1. *Z. ovalifolium*.  
 Leaves 5-many-foliolate; branches of the cyme opposite..... L\ *Z. Rhetsa*.

#### 1. *Zanthoxylum ovalifolium*, *Wight, III.* v. 1 (1840) p. 109.

A shrub about (5 ft. high, glabrous, armed with short straight or slightly curved prickles from thickened bases. Leaves 3-foliolate; petioles  $\frac{1}{2}$ -1 in. long ; leaflets coriaceous, 3-4 by 1-Jr-lf in., elliptic-oblong or obovate, bluntly acuminate, tip rounded, emarginate, glabrous on both surfaces, obscurely crenate, base acute; petiolules  $\frac{1}{2}$  in. long. Flowers  $\frac{1}{2}$  in. across, in dense paniculate cymes with alternate branches ; peduncles and pedicels glabrous, the latter very short. Calyx small; lobes minute, fleshy, triangular. Petals  $\frac{1}{2}$  in. long, ovate, obtuse, valvate. Ripe carpels solitary, spherical, size of a pea, slightly pitted, glabrous. Seed globose, smooth, shining, black. Fl. B. I. v. 1, p. 492; Eedd. For. Man. in Flor. Sylvat. p. xlii, et Anal. Gen. t. 6, fig. 3; Talb. Trees, Bomb. p. 30; "Woodr. in Journ. Bomb. Sat. v. 11 (1897) p. 267; Watt, Diet. Econ. Prod. v. 6, part 4, p. 325.—Flowers : Nov.-Dec.

Bare; the only specimens I have seen have been collected in Ivanara. KANARA : *Hohenhacker*, 7(>3 a !, *Stocks* !, *Woodrow* !; Yacombi, *Woodrow* !—DISTRIB. Singapore.

#### 2. *Zanthoxylum Rhetsa*, *DC.* *Prod.* v. 1 (1824) p. 728.—A

middle-sized tree, covered all over (even occasionally the petioles and peduncles) with sharp curved or straight prickles, those from the old wood with a solid conical base; bark corky, deeply cracked; branches numerous, spreading. Leaves crowded at the ends of the branches, equally or unequally pinnate, 12-20 in. long; leaflets 8-20 pairs, 3-5 by 1/2-1 in., opposite, ovate-oblong or oblong-lanceolate, caudate-acuminate, entire, glabrous, the upper side of each leaflet rounded at the base, the lower side narrowed into the costa; nerves 10-12 on the upper side, 2 fewer on the lower; petiolules very short. Flowers in large, terminal paniculate cymes often more than 12 in. broad, the branches

p. 17; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267.—VEEN. *Satdp.*

Cultivated for its medicinal properties in gardens throughout India. Below the Ghats it is largely grown, "being much used by the Konkan people as a fumigation in infant catarrh" (Dalzell & Gibson). Consult Watt, Dictionary of Economic Products of India, v. 6, part 1, p. 593.—DISTRIBUTION. Westward to the Canary Islands.

2. **Ruta tuberculata**, *Forslc. Fl. Jfigypt.-Arab.* (1775) p. 86. Stem erect or ascending, terete, branched, woody, minutely glandular, glaucous, glabrous. Leaves 1 in. long, linear-oblong or somewhat spatulate, obtuse or subacute, pustular and pubescent, base narrowed into the petiole. Cymes dichotomously branched; flowers 1 in. across, the central one of each cyme sessile, the others shortly pedicelled. Sepals small, broadly elliptic, about 1/2 in. long. Petals 1/2 in. long, yellow, elliptic-oblong, obtuse, concave, entire, glabrous. Filaments dilated and hairy at the base. Capsules 5-lobed, 5-celled, tubercled, often with 2 seeds in each cell. Fl. B. I. v. 1, p. 485; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267; Watt, Diet. Econ. Prod. v. 6, part 1, p. 594. *Hajrtophyllum tuberculatum*, Boiss. Fl. Orient, v. 1, p. 939.—Flowers: Dec.

SIND: Bdbgta hills, *Vicary!*; Sibi, *Cooke!*, *Woodrow!*—DISTRIBUTION. Egypt and Algeria.

## 2. EVODIA, Forst.

Trees or shrubs, unarmed. Leaves opposite, simple or 1-3-foliolate or imparipinnate; leaflets pellucido-punctate, quite entire. Flowers small, in axillary paniculate cymes, unisexual. Sepals 4-5, imbricate. Petals 4-5, sessile, valvate or slightly imbricate. Disk 4-5-lobed. Stamens 4-5, inserted at the base of the disk; filaments subulate; anthers oblong. Ovary deeply 4-lobed, 4-celled; ovules 2 in each cell, collateral or superposed; style basilar. Fruit of 4 coriaceous 2-valved 1-seeded cocci; endocarp horny, elastically separable, 2-lobed. Seeds oblong; testa bony or crustaceous, shining; hilum faint; albumen fleshy; embryo straight; cotyledons ovate.—DISTRIBUTION. Tropical Asia, Malaya, the Mascarene and Pacific Islands and Australia; species 22.

1. **Evodia Roxburghiana**, *Bentji. FL Honglc.* (1861) p. 59. A small soft-wooded tree, about 30 ft. high; bark corky; branches opposite. Leaves 3-foliolate; petioles 1-4 in. long, terete, glabrous; leaflets 2-5 by 1-2 in., oblong, acuminate, closely pellucid-dotted, with slightly repand margins, glabrous on both surfaces, shining above, base narrowed, the lobes sometimes unequal; petiolules 1/2 in. long. Flowers dioecious, small, in dense axillary bracteate cymes; pedicels short, more or less glandular-pubescent; bracts minute, broadly ovate acute. Sepals minute, broadly elliptic or suborbicular. Petals white, 1/2 in. long, ovate, acute, reflexed. MALE FLOWERS: Stamens 4; filaments glabrous; anthers elliptic. Disk pulvinate, pubescent. FEMALE FLOWERS: Ovary pubescent; style short, thick; stigma 4-lobed. Staminodes 4, with small barren anthers. Cocci the size of a peppercorn, 2-valved. Seeds black, globose, polished, shining. Fl. B. I. v. 1, p. 487; Trim. Fl. Ceyl. v. 1, p. 214; Talb. Trees, Bomb. p. 30 • Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 267; Watt, Diet. Econ. Prod. v. 3, p. 305. *Xanthoceylon triphyllum*, Wight, Icon. t. 204 'Grah. Cat. p. 36; Dalz. & Gibs. p. 45.—Flowers: May.

the greatest, number occur in S. Afri i and Australia; genera 82; species about 650.

Ovary deeply 2-5-lobed ; fruit capsular or 3-5-coccous.

Herbs, sometimes shrubby at the base; flowers hermaphrodite. 1. EUTA.

Shrubs or trees ; flowers polygamous.

Leaves opposite ..... 2. EVODIA.

Loaves alternate ..... 3.

ZANTHOXYLUM.

Ovary entire or slightly 2-5-lobed; fruit drupaceous or baccate, usually indehiscent.

Flowers polygamous ; seeds albuminous.

Stamens 2-5 ..... 4. TODDALIA.

Stamens 8 ..... 5. ACRONYCHIA.

Flowers hermaphrodite; seeds exalbuminous.

Ovules solitary or twin in each cell.

Unarmed.

Style very short, persistent .... »..... 6. GLYCOSMIS.

Style jointed on the top of the ovary, deciduous ; leaves pinnate.

Filaments not dilated at the base ..... 7. MURRAYA.

Filaments dilated at the base ..... 8. CLAUSENA.

Armed; leaves 3-8-foliolate.

Stamens 6; calyx 3-lobed ..... 9. TITIPITASIA.

Stamens 8 or 10.

Calyx 4-5-lobed ..... 10. LIMONIA.

Calyx cupular, obscurely lobed ..... 11. LUVUNGA.

Unarmed or armed ; leaves 1-foliolate.

Anthers linear-oblong ; disk elongate ..... 12. PARAMIGNYA.

Anthers ovate or condate (except in *A. missionis*); disk cupular ..... 13. ATALANTIA.

Ovules many in each cell.

Stamens 20-60 ; leaves 1-foliolate ..... 14. CITRUS.

Stamens 10-12 ; leaves pinnate ..... 15. FERONIA.

Stamens 30-60 ; leaves 3-foliolate ..... : ..... 16. J£

### 1. RUTA, Linn.

Strong-smelling glanduloso-punctate herbs, often shrubby below. Leaves alternate. Flowers numerous, in terminal corymbs, cymes or panicles, greenish or yellow. Calyx short, 4-5-lobed or -partite, persistent. Petals 4-5, concave, often toothed or ciliate, imbricate. DM thick, urceolate, 8-10-glandular or 8-10-foveolate. Stamens 8-10, inserted round the base of the disk, the alternate shorter; filaments dilated at the base. Ovary sessile, deeply 3-5-lobed, 3-5-celled ; ovules pendulous from the axis of the cells ; style central, stigmatose at the apex. Capsule 4-5-lobed ; lobes indehiscent or dehiscing at the apex, many-seeded. Seeds angled ; testa pitted; albumen fleshy ; embryo slightly curved ; cotyledons sometimes 2-partite.— **DISTRIB.** Chiefly Mediterranean, Testern and Central Asian ; species about 40.

•"el» lowers 4-merous; filaments glabrous ..... 1. 7?. *gmvolens*.

V^wers 5-merous; filaments pilose ..... 2. *R.*

*tuberculata*.

the ap<sup>el</sup>uta 6<sup>r</sup>? <veolens 5 Linn. *Sp- Pl-* (1753) p. 383, *TAR. angust-* /

"ook. f. in *EL B. L* v. 1, p. 485. Leaves petioled, decompound;

giveniJthe <sup>cuneate</sup>>. spatulate-oblong or linear-oblong. Flowers in

Bottler's *HerY* <sup>sP</sup>re<sup>ad</sup>ing corymbs; pedicels longer than the capsule;

^olate. Sepals triangular, acute. Petals oblong-obovate,

lo. ImpaVpuptly clawed. Capsules obtuse, shortly pedicelled.

v. 2 (1824) p. ^ *graveolens*, Grab. Cat, p. 36; Dak. & Gibs.  
Suppl. Seeds

pubescent and tomentose. Leaves 1-2 in. long, elliptic-lanceolate or obovate, serrate, glabrous or with a few hairs above, more or less hairy on the nerves beneath, base narrowed into a petiole, which is sometimes slightly glandular. Flowers rose-colored, 1 in. across, axillary, fascicled; pedicels short, scabrid. Sepals small, linear-lanceolate, hairy. Standard somewhat rhomboidal, hairy outside, produced into a long hairy beak. Wings with long oblong-obovate terminal, and small rounded lateral lobes. Lip boat-shaped, acuminate, hairy. Spin- (t. Capsules 1 in. long, ellipsoid, mucronate, vilions. Seeds globose, minutely tubercled, dark brown. Fl. B.I. v. L, p. 454; Date. & Gibs. p. 44; *lk > dd*. Ic i. L44. Very rare, KONKAK : *8t(k ka ';*; S. Konkan, *Dalzell & Gibson*,

16. *Impatiens pulcherrima*, Dalz. in *Book. New Journ. lnt*, v. 2 (1850) p, 37. Si em erect, 1|—2 ft, high, glabrous, simple or branched. Leaves alternate, membranous. 3-5 by 1|-2 in., elliptic-oblong, acuminate, glabrous or with a few scattered hairs above, glabrous and :ous beneath, crenate-serrate, the areolures setose petioles 1-1/2 in- long, the upper part often with stipitate glands. Flowers violet-purple, 1|-2 in. across : pedicels 2-3 in. long, 2-3 together, curved in fruit. Sepals small, lanceolate. Standard orbicular; notched, spurred and keeled at the back. Wings broad, the terminal lobes obovate, the lateral lobes large, oblong-elliptic. Lip short, deeply boat-shaped, mucronate. Spur long, curved. Capsules f: in. long, very turgid in the middle, at first puberulous, at length glabrous, i ly beaked.

Weeds  
subglobose, rugose. Fl, B. 1. v. 1, p. 458; Palz. & Gibs. p. 44 • A Woodr. in *Jourri. Bomb. Nat.* v. 11 (1897) p. 266.—Flowers: Sept.-Oct.

In the Flora of British India 1. c. the sepal- : ihed as bifid. In all the specimens I have examined, I have found the sepals entire at the apex.

Esther rare. KONKAN- : shady jungle\* in the V- rtry, *Dabell % Gibson* ; road from Wadi to Poladpur, *Woodrow ! D» TAX* ; Fitzgerald GMt below Mthableahwar\* *Cookel S, M, Coi'-vrRY: Londa, Woodrow.*

A very handsome plant which has been successfully grown at Kew  
froi  
stippled by Dalzell, There is an excellent figure in tl 1 Magazine \*  
t. 4615.

## OBDEB XXXH. RXJTACE.ffi.

Trees or shrubs, rarely herbs, abounding in pellucid glands filled with essential oil Leaves exstipulate. Mowers regular, usually herma-  
phrodite, in axillary or terminal cymes or panicles, never spiked. Caly of 4-5 small lobes or sepals. Petals 4-5, hypogynous, valvate or un-  
cate. Stain a us 4-5 or 5 or 10, rarely more I *Eoh \ • fi l« «i*  
usually free, hypogynous ; anthers 2-celled, inliur.se. Disk withite  
stamens, crenate or tobed, sometimes large and long. Ovary of 4iife'  
or connate carpels ; ovules usually 2 in each cell ■ styles as'raan  
fil<sub>2</sub>-carpels, free or variously united; stigmas terminal, entire  
IKALB Trait, a capsule, berry or drupe, or of 1-4 capsular cocci.  
Sesbletely solitary in the cells ; testa various, often crustaceoua  
aJze of a albumen fleshy or 0 ; embryo straight or curved ; radicle  
alw\*X B. l

D Throughout the warm and temperate regions ° - p. BO'  
\* f.f "L' J  
9 \* L- Tifnti



12. **Impatiens latifolia**, *Linn. Sp. PL* (1753) p. 937. A  
 robust  
 branched glabrous annual, 2-3 ft. high : branches alternate.  
 Leaves  
 membranous, 2-5 by 1-2 in., alternate, subopposite or subverticillate,  
 often crowded at the ends of the branches, ovate-lanceolate, acuminate,  
 crenate-serrate (the crenatures often setose), glabrous or  
 pubescent  
 above, glabrous beneath, base cuneate ; petioles 1-2 in. long, glabrous.  
 Flowers 1-1-g- in. across, rose-purple or violet, in axillary fascicles  
 :  
 pedicels very slender, usually recurved in fruit. Sepals ovate,  
 cuspidate.  
 Standard broad, 2-lobed, winged and spurred behind. Wings  
 2-lobed.  
 Lip greenish-white or reddish, boat-shaped, acuminate. Spur  
 green,  
 long, slender, straight or incurved. Capsules ellipsoid, turgid. Fl. B.  
 I.  
 v. 1, p. 450 ; *Grab. Cat.* p. 34 ; *Dalz. & Gibs.* p. 44.

Common on the Konkan hills. KONKAN : *Stocks !, Law !, Dalzell & Gibson.*

13. **Impatiens lucida**, *Ueyne, in Wall Cat.* (1828)  
 4738. A  
 slender glabrous annual, 4-8 in. high. Leaves subopposite or  
 whorled,  
 1J-4 by 1-2 in., ovate or ovate-lanceolate, acuminate, crenate-serrate  
 (the crenatures sometimes setose), glabrous or with a few scattered hairs  
 above, paler beneath, base cuneate ; petioles 1/2 in. long, very slender,  
 glabrous. Flowers small, 1/2 in. across, solitary or fascicled.  
 Sepals  
 small, ovate, acute. Standard orbicular-oblong, horned and keeled  
 at  
 the back. Wings with broad (nearly orbicular) terminal lobes  
 and  
 scarcely any lateral ones. Spur very long, 3 or 4 times as long as  
 the  
 flower, slender, incurved. Capsules 1/2 in. long, ellipsoid, turgid in  
 the  
 middle, attenuated at both ends, glabrous. Fl. B. I. v. 1, p. 451.

KONKAN : *Stocks !*

14. **Impatiens Balsamina**, *Linn. PI.* (1753) p. 938. . Annual,  
 erect, 1-3 ft. high; stem glabrous or pubescent, slightly  
 branched.  
 Leaves alternate, up to 6 in. long, lanceolate, acuminate, deeply serrate,  
 glabrous, decurrent into a glandular petiole. Flowers  
 rose-colored,  
 showy ; pedicels 1-3, axillary, slender, pubescent, shorter than the leaves.  
 Sepals minute, ovate. Standard small, orbicular, retuse, horned.  
 Wings  
 broad, the lateral lobes rounded, the terminal sessile, very large.  
 Lip

small, boat-shaped, mucronate. Spur short or long, incurved.

Capsules

tomentose. Seeds reticulate. Fl. B. I. v. 1, p. 453; Trim. Fl.

Ceyl.

v. 1, p. 203; Watt, Diet. Econ. Prod. v. 4, p. 334.

VAR. 1. *coccinea*. Leaves very deeply serrate. Flowers medium-sized. Spur long and slender. /. *Balsamina*, Dalz. & Gibs. p. 44; Grab. Cat. p. 34; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (1897) p. 266 ; /. *cornuta*, Linn. This is the common form in the Bombay Presidency.

Western Ghats widely, *Woodrow*; Parva Ghat, *Ritchie*, 123!; hills north of Belgaum, *Ritchie I*; Konkan: *Dafceltl*, *Stocks I*

VAB. 2. *brevicalcarata*, T. Cooke. Leaves reaching 6 in. long, narrow-lanceolate. Flowers smaller. Standard winged at the back, horned at the apex. Spur very short, stout, incurved.

This variety occurs at Mahableshwar and does not agree with any of the varieties given in the Flora of British India. It agrees with a specimen in Herb. Kew. from Bottler's Herbarium, marked /. *cornuHk* from Samulcott.

**15. *Impatiens scabriuscula*, Heync, in *Roccb. FL Ind.* {ed. Carey) v. 2 (1824) p. 464. Low, erect, 4-10 in. high, usually much-branched,**

glabrous. Leaves sessile or nearly so, 1-1 by 1-1 in., smaller upwards, oblong or ovate, obtuse or acute, distantly spinous-toothed or subserrate upper surface scabrid, the lower glabrous and paler, base rounded or cuneate, the upper leaves sometimes cordate ; stipules 0. Flowers a few across ; pedicels equalling the leaves, dettixed in fruit and with a line of pubescence. Sepals linear-lanceolate. Standard orbicular, cuspidate Wings with very broad obovate subsessile terminal, and small lateral ellipsoid acute at base. Capsules 5 in. long, p. J T Wool? in 'Jo^rn'Bomb^1^: v. U^mt'^^^^

v ' a < f-J- \* Thorns, in Journ. Zinn. See. > erect' branched, 10-18 in. high. Leaves

te»i»J one. Lip b»,t.s,hapk »lba , «,M iS.

wfth,d ^V<fttoJW««! « « \*. D v . : Purandhar, Woo<lro\_wU

Mahableshwar

at once

11. **Impatiens tomentosa**, Heyne, in Wall. Cat. (1828) 475]

Stem erect, not much branched, the upper part more or less

with rufescent hairs. Leaves 1-1 by 1-1 in., smaller upwards, the uppermost sometimes serrate, more or less hispid or tomentose beneath, the nerves often clothed with rufous hairs petioles short, more or less rufous-hairy pedicels solitary, rufous-hairy, deflexed in fruit. Sepals ciliate. Standard orbicular-oblong, slightly keeled with a small ovate acute lateral terminal one. Lip saccate, acuminate, hair,

hooked or 0. Capsules i in. long tu.4 d in Ll ' i<< pur short' stout'  
ends. EL B. I. v/1, p. 49 ; Dal!'. ST& p 43Tell "' , ^'^ ?\* both  
•iwimo).—Flowers : Sept. P' (exclud\_ syn. /. nWno.  
DECCAN : Fhunda Gbat, Dcdzett \$ Gibson

very minute spur. Capsules § in. long, ellipsoid, shortly pointed, turgid in the middle. Seeds few, subglobose, black, shining. El. B. I. v. 1, p. 447 ; Dalz. & Gibs. p. 43; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.—Flowers : Aug.-Oct. VEKN\ *Terda*.

A very variable plant whose different forms are numerous.

The following varieties are given by Sir J. Hooker in the El. B. I.

(I. e.) :-

VAE. *inconspicua* proper, of which the plate 970 in Wight's Icones is taken as the type.

Stem 4-8 in. high, somewhat robust, branched. Leaves ovate or ovate-lanceolate, petioled, strongly serrate. Pedicels usually short. Spur 0.

VAK. 2. *pusilla*. Smaller. Lower leaves more or less petioled, lanceolate, serrate; the upper longer, narrow, sessile, remotely serrate. /. *pusilla*, Heyne, in Wall. Cat. 4745.

VAR. 3. *Jilifonnis*. Slender, much-branched. Leaves sessile, very long, slender, remotely serrate, the lower sometimes petioled and lanceolate. Flowers few. *I. jiliformis*, W. & A. Prod. p. 140; Grab. Cat. p. 34.

Khandala, Graham.

VAR. 4. *ramosissima*. Ilobust, much-branched. Leaves short, sessile, oblong, obtuse or subacute, subcordate or rounded at the base. Flowers reddish-purple. Standard keeled, with a row of hairs along the keel and with a short greenish horn. Wings tinged with darker purple at the base. Lip veined within. Spur minute. *J. ramosissima*, Dalz. in Hook. Kew Journ. Bot, v. 3, p. 230.

This variety is very common throughout the Presidency. It is abundant on many of the Konkan and Deccan hills during September and October. KONKAN: *Law!*, *Stocks!*

### 8. *Impatiens oppositifolia*, Linn. #p. PL (1753) p. 937.

Erect,

1-1-^ ft. high, glabrous, flaccid. Leaves 1-3 in. long, opposite,

sessile or the lower petioled, linear or linear-lanceolate, oblong or obovate, obtuse or acute, remotely spinous-serrate, glabrous or with a few short hairs above, pale beneath; stipules, small, subulate.

Mowers

about 1 in. across, purple or purple with an orange tinge; pedicels elongate, slender, quite glabrous, axillary, solitary or 2-3 together.-

Sepals linear, with a callous point. Standard orbicular. Wings with a>

broadly obovate clawed terminal lobe and a small falcate lateral one. Lip somewhat conical. Spur short, stout, usually curved like a hook.'

Capsules T<sup>5</sup>F--i- in. long, ellipsoid, attenuated at both ends. Seeds subglobose, glabrous, black, shining. FJ. B. 1. v. 1, p. 448; Grah. Cat.

p. 34; Trim. Fl. Ceyl. v. 1, p. 202 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.

Very common in the Konkans. KONKAN: *Stocks I*, *Dalzclll*; Vingorla, *Dalzdll*

Ghat road, Wadi to Poladpur, *Woodrow* ! DECCAN : Parghat, *Dalzell*! S. M. COUNTRY :  
Belgaum hills to the North, *Ritchie*, 120 ! KANAKA: Tinai (N. Kanara), *Talbot*;  
Halyal (N. Kanara), *Talbot*!

**9. Impatiens Lawii**, *Book. f. Sf Thorns, in Journ. Linn. Soc. v.*  
4  
(1860) p. 122. Erect, much-branched, 8-12 in. high; stem  
stout,

Icon. t. 751 ; Dalz. & Gibs. p. 42 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.—"Flowers : Aug.-Jan.

The only specific distinction between this species and *I. acaidis* seems to be in the wings, which are tripartite in *I. rivalis* and bipartite in *I. acaidis*. The specimens of Stocks from the Konkan (*var.* 2, Fl. B. I.) have very large leaves, attenuated and somewhat oblique at the base, with very long petioles.

KONKAN: *Storfisl* S. M. COUNTRY : Kainghat, *Dakell*

5. ***Impatiens chinensis***, *Linn. Sp. Pl.* (1753) p. 937. Stem 4-20 in. high, erect, angled, from a rooting prostrate base, glabrous. Leaves all opposite, subsessile, 1-4 in. long, the breadth very variable, linear-oblong or obovate, sharply seriate, the serratures usually terminating in a stiff bristle, the upper surface more or less hairy, the lower silvery-grey, glabrous, base rounded or subcordate; petioles usually almost 0, or, if present, short and broad; stipules linear-lanceolate, recurved. Flowers 1 in. across, rose-purple or white ; pedicels slender, axillary, solitary or fascicled, shorter or longer than the leaves, deflexed in fruit. Sepals 3 in. long, linear-acute, with a callous point. Standard orbicular, acuminate or horned. Wings semi-obovate, auricled at the base. Spur long, slender, incurved. Capsules 1-1.5 in. long, ellipsoid, tapering at both ends, turgid in the middle. Seeds numerous, shortly oblong, smooth, black, shining. Fl. B. I. v. 1, p. 444; Dalz. & Gibs, p. 42; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266. *Impatiens fasciculata*, Lam. Encyc. v. 1, p. 363; Wight, Icon. t. 748.

KONKAN : *JDatell* & *Gibson*. KANAKA: Sampkband, Yacombi (N. Kanara), *Woodrow*.

6. ***Impatiens Kleinii***, *Wight & Am. Prodr.* (1834) p. 140. A slender branched annual, 6-15 in. high. Leaves all opposite, usually petioled, 1-1.5 by 0.5-1 in., elliptic, lanceolate or obovate, acute or obtuse, distantly serrulate, more or less hairy on the veins above, glabrous and glaucous beneath; base narrowed into a short petiole; stipules 0, or of 2 small kinds. Flowers very small, 0.5 in. across, violet-purple ; pedicels 0.5 in. long, axillary, filiform, solitary or twin, deflexed in fruit, glabrous. Sepals 1 in. long, linear, acute. Standard small, orbicular-oblong, horned. Wings with long claws, broadly obovate, almost entire. Spur slender, usually longer than the flower, "straight or curved. Capsules narrow, 1 in. long, fusiform. Seeds few, globose, black, shining. Fl. B. I. v. 1, p. 445; Grah. Cat. p. 34; Dalz. & Gibs. p. 43 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.

Common in the rains. KONKAN: *Stocks I*; Miradonger, *Dcdzell* S. M. COUNTRY • Castlerock, *Cooke*! KANAKA : Sampkhand (N. Kanara), *Woodrow*!

7. ***Impatiens inconspicua***, *Benth. in Wall. Cat.* (1828) 4741. A small plant, 4-12 in. high, much-branched from the base. Leaves variable, the lower usually petioled, the upper sessile or nearly so, 1-4 in. long, ovate, oblong or linear, serrate, glabrous or pubescent above, pale beneath, base rounded or acute ; stipules setaceous or 0. Flowers pink, small; pedicels with a line of pubescence, axillary solitary or twin, very slender, shorter than the leaves. Sepals linear-subulate. Wings with a broad rhomboid-obovate terminal lobe and a small linear lateral one. Lip saccate, acuminate, not spurred or with a

short teeth on the margins ; nerves flabellate, conspicuous beneath; petioles 1-2 in. long. Flowers  $\frac{1}{2}$  in. in diam., 6-15 in each raceme ; racemes 1-4 in. long; bracts broadly ovate, obtuse or acute ; pedicels slender,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Sepals obliquely ovate. Standard short, broader than long. Wings 3-lobed, the lobes subequal or the inner the smaller. Spur rather shorter than the flower,  $\frac{1}{2}$  in. long, incurved, clavate, rounded at the apex. Capsules  $\frac{1}{2}$  in. long, ellipsoid. Seeds minute, granulate. Fl. B. I. v. 1, p. 442; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266. *Impatiens scapiflora*, W. & A. Prodr. p. 137 ; Wight, Icon. t. 967; Grab. Cat. p. 34 (not of Heyne). KONKAN : Western dialects, *De Crcspigny* ex Woodrow ; S. Konkan, *Graham*.

**2. *Impatiens Stocksii*, Hoolc. f. Sf Thorns, in Journ. Linn. Soc.**  
v. 4 (1860) p. 119. A small glabrous plant scarcely reaching 5 in. high. E/Ootstock tuberous, perennial. Leaves  $\frac{1}{2}$ -1 in. in diam., orbicular-oblong or broadly ovate, crenate, usually with a small tooth between the crenatures; petioles  $\frac{1}{2}$ -1 in. long. Flowers few, 3-6 together; racemes 1-1 $\frac{1}{2}$  in. long ; bracts small, ovate, acute ; pedicels  $\frac{1}{2}$  in. long, rather stout for the size of the plant. Sepals  $\frac{1}{2}$  in. long, ovate, obtuse. Standard somewhat rhomboidal, as broad as long. Wings with 3 obtuse lobes, the lower the longest. Spur 0. Capsules  $\frac{1}{2}$  in. long, ellipsoid. Seeds minute, linear-oblong. Fl. B. I. v. 1, p. 442 ; Dalz. & Gibs, p. 42; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.

KONKAN: *Stocks I*; mountains of the Konkan, *Woodrow*. KANAKA: *Law I*

**3. *Impatiens acaulis*, Am. in Hook. Comp. Bot. Mag. v. 1 (1835) p. 325.** Rootstock tuberous, perennial; scape 3-12 in. high. Leaves all radical, variable in size and shape,  $\frac{1}{2}$ -5 in. in diam., suborbicular, ovate or oblong, obtuse or subacute, glabrous, subentire or crenate, often with irregular short teeth, base subcordate or rounded, truncate or subacute; petioles 1-2 in. long. Flowers pink, 1-1 $\frac{1}{2}$  in. across, in racemes 1-4 in. long; bracts ovate; pedicels  $\frac{1}{2}$  in. long. Sepals ovate, obtuse. Standard short, obovate, concave, broader upwards. Wings 2-partite, the terminal lobe the largest. Spur long, very slender, curved. Capsules  $\frac{1}{2}$  in. long, ellipsoid, acute at both ends. Fl. B. I. v. 1, p. 443; Dalz. & Gibs, p. 42; Trim. Fl. Ceyl. v. 1, p. 201 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266. *Impatiens scapiflora*, Hook, in Bot. Mag. v. 64 (1837) t. 3587 {not of Heyne}.—Flowers : Sept.-JNTov.



A very beautiful plant found on wet rocks on many of the Konkan and Deccan hills. It is very common at Maliabeshwar, often out of reach on the summit of rocks over which water trickles. It may be found in similar places at Khandala.

KONKAN : mountains of the Konkan, *Stokes!* ; the Ghats, *Dalzell & Gibson!*; Matheran, *H. M. Birdwood.* DECCAN : Mahabeshwar, *Cooke!*; Khandala, *Woodrow!*; Lanoli, *Woodrow!*; Fitzgerald Ghat, below Mahabeshwar, *Cooke!*, *H. M. Birdwood.*

\. ***Impatiens rivalis***, *Wight, in Madr. Journ.* v. 5 (1837) p. 13, t. 8. Rootstock tuberous ; scape 6-18 in. high. Leaves very variable in form and pubescence, 2-7 in. long, ovate-oblong or elliptic, glabrous or more or less hairy above, irregularly, sometimes obscurely, crenate-serrate with distant short stout teeth, base cordate, rounded or acute; petioles reaching 7 in. long. Flowers as in the preceding species ; bracts ovate. Standard broader than long, vaulted. Wings 3-partite. Spur very long, curved. Capsules as in *I. acaulis*. *Fl. B. I.* v. 1, p. 444 ; *Wight,*

Watt, Diet. Econ. Prod. v. 1, p. 359.—Mowers: Mar.-May.  
*Bilhnbi*.

Cultivated throughout the plains of India. The fruit is very acid when green, and is made into pickles, &c. See Watt, Diet. Econ. Prod. 1. c.

### 6. IMPATIENS, Linn.

Annual or perennial herbs, rarely shrubby at the base, usually glabrous. Leaves simple, variously arranged, exstipulate or with stipular glands at the base of the petiole. Flowers irregular, often handsome, axillary, solitary or in racemes (less commonly in scapes), resupinate. Sepals 3 (very rarely 5), colored, imbricate; 2 anterior when present minute; 2 lateral small, flat, usually green; posterior (*lip*) (anterior in flower owing to inversion of the flower) large, petaloid, usually produced into a hollow spur. Petals 3 (or 5); anterior (*standard*) (posterior in flower, outer in bud) erect; lateral (*wings*) 2-lobed or composed of 2 united together. Stamens 5; filaments short, broad; anthers cohering. Disk 0. Ovary oblong, 5-celled; ovules many in each cell, 1-seriate; stigma sessile, 5-toothed. Capsule short or long, loculicidally dehiscent; valve 5, elastically springing away from a placentiferous axis. Seeds smooth or tubercled, glabrous or hairy; albumen 0; embryo straight.—DiStitiB. A genus of about 135 species, the greater number natives of the mountains of tropical Asia and Africa; rare in temperate Europe, N. America, N. Asia and S. Africa.

- Scapigerous; rootstock tuberous, perennial; flowers racemed.  
Spur shorter than the flower or 0.  
Spur clavate, obtuse ..... 1. *I. Beddomei*.  
SpurO ..... 2. *I. Stoclesii*.  
Spur longer than the flower.  
Wings 2-partite ..... 3. *I. acaulis*.  
Wings 3-partite ..... 4. *I. rivalis*.  
Annual; leaves all opposite or the upper (rarely all) whorled in threes (never alternate).  
Spur as long as, or longer than the flower; leaves all opposite.  
Flowers  $\frac{1}{2}$  in. across; wings auricled at the base... 5. *I. chinensis*.  
Mowers  $\frac{1}{2}$  in. across; wings with long claws ..... 6. *I. Kleinii*.  
Spur shorter than the flower or 0.  
Flowers purple or rosy.  
Pedicels with a line of pubescence.  
Lip saccate; leaves reaching 4 in..... 7. *I. inconspicua*.  
Lip boat-shaped; leaves not exceeding 1 in. ... 9. *I. Lawii*.  
Pedicels glabrous..... 8. *I. oppositifolia*.  
Pedicels rufous-hairy all over ..... 11. *I. tomentosa*.  
Flowers yellow ..... 10. *I. Dalzellii*.  
Annual; leaves subopposite and whorled.  
Tall, 2-3 ft. high; flowers 1-1 $\frac{1}{2}$  in. across ..... 12. *I. latifolia*.  
Short, 4-8 in. high; flowers  $\frac{1}{2}$  in. across..... 13. *I. lucida*.  
Mostly annual; leaves alternate, usually distant.  
Spur long.  
Capsule tomentose ..... 14. *I. Balsamina*.  
Capsule glabrous ..... 16. *I. pulcherrima*.  
SpurO; capsule villous ..... 15. *I. scqbricscula*.

1. *Impatiens Beddomei*, *Ifoolcf. in Fh B. 7. v. 1, p. 442*.  
Root-stock tuberous, perennial; scape about 1 ft. high. Leaves 1 $\frac{1}{2}$ -3 in. in diam., all radical, fleshy, orbicular and reniform, cordate, with distant

beneath the pedicels. Sepals lanceolate, acute, with parallel nerves. Corolla much exceeding the sepals ; lobes rounded, spreading. Style nearly glabrous. Capsules ellipsoid, apiculate, slightly exceeding the sepals ; cells few-seeded. Seeds ovoid, transversely striate. Fl. B. I. v. 1, p. 436 ; Dalz. & Gibs. p. 42; Eeiche, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 16, fig. 14, G ; Trim. Fl. Ceyl. v. 1, p. 197 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266.—Flowers : Oct.-Jan.

A common weed in the Konkan during the rains. KONKAN : Sion, near Bombay, *Woodrow* !; Neral, *Woodrow* ! DECCAN : Poona, *Cooke*!, *Woodrow* ! GUJARAT : Baroda, *Woodrow*, KANAKA: *Talbot*—DISTRIBUTION. Tropical Asia, Africa and America.

## 5. AVERRHOA, Linn.

Trees. Leaves alternate, imparipinnate, exstipulate. Flowers regular, small, in short panicles. Sepals 5, imbricate. Petals 5, hypogynous, contorted. Glands 0. Stamens 10, very shortly connate at the base into a ring, all perfect or 5 without anthers. Ovary 5-lobed, 5-celled; ovules numerous; styles 5, distinct; stigmas capitate. Berry oblong, indehiscent. Seeds naked or arillate ; albumen fleshy, scanty ; embryo straight.—DISTRIBUTION. Probably natives of the New World; species 3 or 4, of which the following are cultivated in many hot countries.

- |   |                        |
|---|------------------------|
| I, leaflets 5-11 ; fruit with sharp angles ; seeds arillate ..... | 1. <i>A. Carambola</i> |
| Leaflets 11-35; fruit with obtuse angles; seeds exarillate .....  | 2. <i>A. Bilimbi</i> . |

1. **Averrhoa Carambola**, Linn. *Sp. PL* (1753) p. 428. A small tree with close drooping, branches. Leaves alternate; leaflets 5-11, irritable to the touch, 1½-2½ by ¾-1½ in., ovate-oblong, acuminate, entire, glabrous or pubescent above, glaucous and glabrous beneath, base oblique, acute; petiolules short, stout, pubescent. Flowers in short racemes chiefly axillary or sometimes springing from the bark. Sepals 5-6 in. long, glabrous. Petals more than twice as long as the sepals, oblong-obovate, variegated white and purple. Stamens 10, of which 5 are shorter and without anthers, or sometimes 1 or 2 of these longer\* and antheriferous; filaments dilated at the base. Fruit oblong, acutely angled, yellow. Seeds arillate. Fl. B. I. v. 1, p. 439 ; Dalz. & Gibs. Suppl. p. 16 ; Bedd. For. Man. in «Fl. Sylvat. p. xxxix ; Eeiche, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 16, fig. 14, n, and p. 22, fig. 20 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266; Talb. Trees, Bomb, p. 29; Watt, Diet. Econ. Prod. v. 1, p. 359.—Flowers : May-Aug. V. *Kamaranga*.

Cultivated in many parts of India for its fruit which is eaten. See Watt, Diet Econ. Prod. 1. c.

2. **Averrhoa Bilimbi**, Linn. *JSJJ. PL* (1753) p. 428. A small tree, 15 to 20 ft. high. Leaflets 11-35, entire, 1½-2½ by ¾-1½ in., oblong, more or less pubescent on both surfaces, base usually rounded, somewhat oblique; petiolules 1-1½ in. long, pubescent. Flowers from the trunk and branches; panicles villous. Sepals 5 in. long, ovate-lanceolate, acute, pubescent. Petals oblong-spathulate, more than twice as long as the sepals. Fruit oblong, obtusely lobed. Seeds exarillate. Fl. B. I. v. 1, p. 439; Dalz. & Gibs. Suppl. p. 16; Bedd. Flor. Sylvat. t. 117 ; Eeiche, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 22, fig. 19 ; Talb. Trees, Bomb. p. 29; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266;

### 3. OXALIS, Linn.

Acid herbs, rarely shrubby. Leaves radical or cauline, alternate, digitately or pinnately 3-foliolate. Flowers on axillary, 1- or more-flowered peduncles, regular, yellow, rosy or white. Sepals 5, imbricate. Petals 5, hypogynous, contorted. Disk without glands. Stamens 10, free or united at the base, all antheriferous. Ovary 5-lobed, 5-celled; ovules 1-many in each cell; styles 5, distinct; stigmas terminal, capitate, 2-fid or lacinate. Capsule dehiscent loculicidally; valves persistent to the axis. Seeds with an outer fleshy coat bursting elastically; testa crustaceous; albumen fleshy; embryo straight.—*DISTRIB.* Largely distributed in S. Africa and S. America; a few species in temperate and tropical regions; species more than 200.

1. ***Oxalis corniculata***, Linn. *Sp. Pl.* (1753) p. 435. A small procumbent herb; stems rooting, pubescent with appressed hairs. Leaves palmately 3-foliolate; petioles  $li-Si$  in. long, very slender, pubescent; stipules small, oblong, adnate to the petiole; leaflets  $|-1$  in. long, obovate, cuneate at the base, subsessile, glabrous or with a few appressed hairs and with ciliate margins. Flowers axillary, subumbellate; peduncles solitary, up to  $3^{\wedge}$ in. long, deflexed in fruit, pubescent; bracts beneath the pedicels lanceolate, hairy. Sepals  $|-fV$  in. long, oblong, obtuse, appressedly hairy outside. Petals yellow, oblong, rounded at the apex, emarginate, twice as long as the sepals. Stigma papillose. Capsules  $\pounds$  in. long, linear-oblong, 5-angled, shortly beaked, tomentose. Seeds numerous, broadly ovoid, acute, transversely striate, brown. Fl. B. I. v. 1, p. 436; Grah. Cat. p. 35; Dalz. & Gibs. p. 42; Wight, Icon. t. 18: Boiss. El. Orient, v. 1, p. 866; Trim. Fl. Ceyl. v. 1, p. 196; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266; Watt, Diet. Econ. Prod. v. 5, p. 658.—Flowers: Oct.-May.  $Y^{EEN}$ -*AmbusL*

Common everywhere; a troublesome weed in gardens.—*DISTRIB.* Cosmopolitan.

### 4. BIOPHYTUM, DC.

Annual or perennial herbs. Leaves crowded at the ends of the stem and branches, abruptly pinnate; leaflets opposite, oblique. Flowers dimorphic, in small umbels; peduncles terminal. Sepals 5, imbricate, lanceolate, acuminate. Petals 5, yellow, connate into a salver-shaped corolla. Stamens 10, distinct; filaments free, the 5 inner longer. Ovary 5-celled; styles 5; stigmas notched at the apex or 2-fid. Capsule ovoid or oblong or subglobose, dehiscent loculicidally into 5 spreading valves. Seeds as in *Oxalis*.—*DISTRIB.* Tropical Asia, Africa and America; species about 20.

1. ***Biophytum sensitivum***, DC. *Prod.* v. 1(1824) p. 690. Annual; stem erect, from 1-10 in. long, stout or slender, glabrous or hairy. Leaves sensitive, crowded into a rosette on the top of the stem 1-1—3 in. long; petiole short; rachis slender, glabrous or hairy; leaflets opposite,  $|$  in. long, 6-15 pairs (the terminal pair the largest, the pairs becoming smaller downwards), oblong, obliquely rounded and apiculate at the apex, subsessile, glabrous, paler beneath. Flowers dimorphic,  $j$  in. across, yellow; peduncles many, of various lengths up to 4 in. long, slender, pubescent or glabrous; pedicels many; bracts lanceolate, small, crowded

2.

**Monsonia heliotropioides, Sow\*.** *Fl. Orient.*  
 p. 897. A an ■ with a woody rootstock. Leaves chi  
 radical, ■ 1!> ■ in., variable in shape, ovate, obtuse or rhomb  
 ly villbus ■ white hairs on both sui sharply denticuluar, or  
 base cordate, rounded or cuneate; petioles up 2^ in. long, clot or  
 with long white hairs fitetipules -subulate, hairy. I "lowers in umbels, t  
 id  
 the summit of a very long scape which sometimes reaches 8 in, k^  
 Vt\

distantly clothed with white hairs: bracts beneath ul'  
 lanceolate; slender, slightly hairy. Sepals ■■',. i A

ptic-oblong, abruptly mucronate, becoming enlarged and obo\ a  
 in fruit, I outside, the margins membranous. Petals ■  
 obova ■

■ than the sepals. Filai ■ ■ itly ciliate. Carpels stipitate; 0  
 sely hairy at the base, obliquely truncate, with 2-3 grooves or'  
 wrinkles beneath the apex; beak up to 3| in. long, slightly downy  
 outside, clothed with silky hairs within. Fl. B. I. v. 1, p. 428;  
 Woodr. in Jo urn. Bomb. Nat. v. 11 (1897) p. 268.—Mo were : Aug.

Ea i ■ . . . ■ : 1. 51 oiks fron) K a cach i. W' o  
 Westwards to Egj odroto.—D ES

2. EROD] j the node \*K e

Herbs, rarely undershrubs ; Flowers reg u tar or i rregular; m. ath.  
 branch Seed

usually pinnately divided, axillary, umbel] the apex, rarely 1-flowered. s  
 very

ils 5, hypo Sepals 5, imbrica us, imbricate, with alternating glands. Stamens & oth;  
 alternating \i: . lodes. Ovary 5-lobed, 5-celled, beaked, thit •» jrle edon

running into . lodes. Ovary 5-lobed, 5-celled, beaked, thit •» jrle s  
 ovules 2 in each C€ with 5 Longitudinally stigmatose branche, ^f, 1, 3-Io  
 L-seeded, sepai more or less superposed. Lobes of the capsu.,) bed.

elastically from \ ; ■ septifragally i'roni the axis, the beaks rolling u \ Fl.  
 bo the apex, hairy on the in tier surface, eac

with usually 2 pits at the top below the beak. Seeds exalbuminous"1: B. I.  
 embryo incumbent on the jnduplicate or fiexuoua radicle.—DISTKIB-0 v- 1,  
 OhieHy in temperate regions in the N. hemisphere of the Old World ■ m\_

1. *Erodiunx cicutarium, Vilf.rlt.* *IJort. Ken'*, ed. I, v. p.  
 (1789) p. 414. An annual herb ; branches short or long, som 434;  
 ^im , Bois

reaching 2 ft. and upwards, more or less clothed with white hairc ' s.  
 ves oblong, piunatisect ; segments 7-11 pairs, sessile, not decurrent, Bl.

ovate-oblong or obovate, deeply incisb-dentate; stipules Bcarious, ovate-^ Ori  
 lanceolate, acute. Pedunelvs many-flowered; pedieelis hoary ; nt,  
 bracts j v. 1,

small, scariouB, ovate. Sepals oblong-lanceolate, shortly p.  
 inucromvte,' 890

hair}' outside. Petals obovate, unequal, as long as, or longer than ;  
 the the Woo

sepals, purple, often spotted. Filaments glabrous, without dr.  
 teeth. in

Beak 5-6 times as long as the i pits with a concentric Jou  
 fold' rn.  
 Bom

b. **Nat.** v. **11** (1897) p. **266**.—**Mowers : Feb.-Dec.**

v.1°

A very **rare** plant, occurring in **Sind**. It is abundant near **Quetta**, which is  
not,  
**however** ~~however~~, within the **limits** of the Bombay **Presidency**.

JJo

**SIND:** **Tata** district, **Woodrow!**—**DISTRIB.** **Throughout Europe** and  
**H. Asia. temperate**

---

.rll,a>> alternate with the <b>peta</b>	ao.
Perfect stamens 15 .....	j.
Ac ].'(■' ■■ aminodeso .....	£
<b>dimtjlsndsO; leaves compound,</b>	
£[o\ve Herbs; fruit oapsular.	
p Leftves 3-foliolate .....	∴
↑ 'A:li Leaves abruptly pinnate .....	4.
irtie * Trees; leaves piniiate .....	5.
ovul'lowew irregular ; leaves simple ; sepals usually colored .....	U. IML'ATJJ OA.

cap''

I'<sup>1</sup>

## 1. MONSONIA, Linn,

els

**D** Herbs or Emdershrubs. Leaves **alternate** or opposite, fcc  
**ajijided.** Flowers **regular j** pod: **Hilary, braci** >ut the  
**middle, 1\*flowered** or **umbellately m**

Petals 5, **hypogynous**, imbriio

PiStatuens .15, ail **aatheri**

↑  
 / a ring and **higher up ini**

amena bppo

1 each **sepal.** **Ovi**

^bearing o **linear** branches \=,

<sup>a</sup>PP each cell, **super]**

J^ptifnigally from i:

bails rol]

<sup>b</sup>TM **om** the **base"** to the ape-.

**within.** Seeds **exalbuminous,**

<sup>ol</sup>)a(liele **mcumbent on wsn** Volutely folded cotyledons.—DISTJ:

rica

<sup>i</sup>find tropical Asia.: species about 12.

**jolitary;** petals longer than the sep;ils ..... [ . .1/.

■ I **arabeUed;** petals ■ than the sepals .....

|y I. *Monsonia senegalensis*, *Guilt*, tj-

v. 1

pJl'1830)p. 131.—A **diffuse annual** herb, 3-1-J: in. **high, woody** at, and  
 .ivarleately-branched from the base, **clothed** with viscid **glandular bairs.**

**Lieaves** |-1| **u, oyate, acute or subobtuse, ihu** e, dli-stautiy

Jl[j t ooth ed, glab n i u.s a bo v e or

**i and OD**

• **margins,** base cord:\*

% :ofi]y **hairy ; stipu** ■ **subulafc**

ft4eachi **in. long, .-**

[■xlitt:liexf3cl **near the Sower** or at the **bn**

**ts 2, sul**

Jatiseri **the peduncle one fourth ■**

**lird of the way up fro in**

ae0a **tptio-oblong, awned, ;**

**.iewhat obovate**

**in**

^TJruit, ■ **in. long (excluding the aw**

**c hairs, the** ^i; ^ **membranous ; awn** about; ,-. - \u

**in. long, obovate.** Filaments **broad and I!**

[pitate, obconical, **clothed with stiS haij**

**brQneate, with**

pocket-like depressions or wrinkles h

; **beak 3 in. JOJl^,**

imely downy outside and with Jo

**f hairs on the Lni**

**Fl.**

■ **B. L v. 1, p. 4^7; Dalz, & Gibs. p. 41; Boiss. Fl. Orient, v.**

**p. 898; VWoodr. in Jpurn. Bomb. Nat. v. 11 (1897) p. 266. Gerani**

**Lawianum, Nirnmo, in (xrah. Car. (flyleaf).—Flowers : Aug.**

Th roughout **th& dry districts** oif the **Presi**

**amou. D**

**Ganesb Khisd,**

\*>ergi

I **Indapuraud N.**

**Don-**

**I Gibson. GUJAEAT: Baikar neap Deesa, \$tock\$**

**SISD:**

**.. ap'Kbed,**

**pjKaracM, S**

**-DrsTiuss. Belnebbtan, Arabia, Seaegs abia.**

**Laada,**

xxx ZIGOPHTLI vci\$ 5 Woodr. in Jmirn. Bomb.

1. *Fagonia cretica*, linn. *Sp. PI* (17<sup>^</sup>!; HaU  
 ereci undershrub, more or less glanduli  
 Leav< Foliola-  
 in length, from . . . i : in. I i ■<sup>nn.</sup> it<sup>l</sup>. i i \* .i-  
 erf  
 Iterrate, not glandular,\* ll»  
 e (when the 1 Flowers  
 solitary orf^r  
 middle the or with vly short petiolul.es4-«>, narrow, often <  
 j. pedicels sl< in. long, Se;tent.  
 Petals 4~5y<sup>1</sup>.;  
 ovate, a i. Petals twice as ! is Mie sepals, s: Stamens  
 12-15,  
 long. Ovary hairy; style tapering. Fruit glandular-pubnt<sup>nera</sup> 5 Blaments  
 at The I tyramidai" towards the apex, deeply 5-parti<sup>e</sup>ep<sup>^</sup> 2-3-lobed,  
 axis •• smooth. Fa ■'■ funicles from  
 PI. p. 3 88. ¥J.' Orient 'lbove tui middle.  
 Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266\* W\*nd dehiscing wirr  
 Prod. v. riff, Koth, Nov. Sp3« Seeds angled t.  
 Cat. p. 35: Dak. & Si 45.—Flowers: ( )et;"^'ed.—DISTUITJ.  
 Qfa s of the Mediter-  
 uoai tbe Deccan; ■ nraon m smd. JJECCAS: Ualseci -,  
 ooke!

ome reptile ha native rtiedieine. i^oe Wstt, Diet. Econ, Prod, I. c<sup>u</sup>

-3 in.  
 1 ml  
 sute

## OEBBE XXXI. GERANIACE^).

grain iiMds ; Bijapur, i Woodrawi StNo: ' te.  
 Herbs, undershrubs, rarely trees, often glandularly pubescent. Leave" X\*  
 opposite or alternate, rarely entire, often 2<sup>J</sup>Stipulate. Flowers herm; ' , .{-.  
 phrodite, regular or irregular, solitary, umbelled, cymose or r'aceiuose -. ^jt  
 [uncles usually axillary. Sepals -5, rarely fewer, free or united to fcb"  
 .],  
 middle, usually imbricate, the us sometimes spurred, persister  
 or rarely (Vf<- Petals as many as the sepals or fewer (1  
 suppression) or »us or subperigynous, variously imbric I  
 rarely cor. Torui ty expanded into a disk, with 5 glanc<sup>^</sup>""  
 irrinating with I glandular, raised in the centre, rare<sup>1</sup>  
 flat. Stamens as ma as many (rarely thrice aa many) as t Ecoo...  
 sepj no or dilated or conna i a ring; anih  
 versatile, 2-celled, cells parallel, dehiscing longitudinally. OVJ  
 2-) lobed, 3-5-celled, Carpels united with she axis as Par as t'  
 insertion o ovules, proloi hove into a styliferous beak or in ft '  
 styles which Mirror I; stigmas capitate, linear or ligi «  
 late; ovules 1-2 or tnanv in each cell, anatropous, pendulous: r;inh'.,- A  
 ventral. Fruit eapsular, 3-5-lobed; lobes 1-seeded, often separating j o  
 from the axis, septicial or loculicial, randy berried. Heeds pendulous , H  
 horizontal or ascending, usually exarillate; lest a membranous, rarely . ?<sup>ou</sup>  
 subcrue albumen scanty or 0, rarely thick and fleshy\*: embry< .->  
 : or curved; cotyledons flat, plano-convex or variously folded,  
 foli or thick, rarely fleshy ; radicle short, straight, looking towardt j . J  
 the nilum, or longer, inflexed or usually incumbent on the cotylei . ! ^\*  
 \_l).is'nnii. Tempe] >tropical regions of both  
 hemispheres'ii<sup>1</sup>



genera 20; sp

a3  
g&n  
indigeno

(commonly called *Geranium*)are cultivated  
' bloom extremely well. The genus i^ not

■

e n.

„ []; ' ;"t **crastaceous**; albumen scanty;  
**cotyledons**

**glands 0**; leaves com pom • chiefly of the Cnpr and Australia; species  
**flowe Herbs; fru**

'4 til T „ 'jindnc ..... L. Zsvm/plex,  
 liw i .i r@eg ; leaves pmr

**ovuHowew irregular ;£ simpleXj /,;,,,. Mantiss, v. 1 (1767) p. 68..**

, ai ery m uch - bra u the d **procum** ben t herb; bran eh es  
 I^1 , **Btriate**, glabrous. Leaves **small, sofosessile**, eylindric,  
 l/\* Herbs or ate<sup>r</sup> o ^ ^ use > **fleshy; stipules lanceolate, acute. Flowe**  
 • **iivided** Fl ' ^ ova \* '(1' **cucullate** at the apex. Petals yellow,  
**spathulate, middle \* 1>fin** ■ ''l s ^ il ^ ' ^ i i i n 8 l - 8 scale **bipartite**, hyaline,  
 the segments **P e \* ais \* 5 j . y** **turbinate, glabrous, ribbed**; style **tapering**.  
 Capsules

**PStamens'jD r<sup>08e'</sup> Beparatillg into 5 compr\* ded cocci.**  
 f J.J.J.,, 3 **uj llong, attenuated** at both ends. **B. I. v. 1,**  
**je j P 11. Orient, v. 1. p. 912; "Woodr. in .fourn. Bomb.**

**Nat.**  
 ^bearing 5 line?' ~ (J0 ; Watt < Dict< E con< Pro:l v" 6' ^:irt 4' ^ m \_ \_ ~  
 app each !;IHK VjEEIf 7  
 "p i . i f p ■■■■. ■. ! !"; ' reic Sind, The i ds. SINE: So^fe !. Stocks !;  
**brau rage, Vi <clu, t'o>" DIS^HIB. Arabia, tropical Africa,**  
**ob^tern Asui.**

:d k **Zygophyllum coccinetim, JW<>>. ,S)\*. PI. (1753') p. 8BO.**  
 ^ 'ifi'ruticose ; **braiacKes woody, striate** and **papillose**, hoary at first  
**with ^,1 white powdery tomentum, at length glabrous, 1.**

**powdery**; petioles stout, **fleshy, grooved, Io]**  
 ^ **ipules triangular, scario<a** ; leaflets oblong, **eylindric or seinicylindric,**  
 ^ **Tbtuse, minutely powdery.** Flowers solitary, white or ;ith  
**fellow. Sepals i!esh? e, the margins mem bran** Petals  
**pathulate, spreading, longer than the sepals, undulate on the margin.**  
**taminal-scale ovate-lanceolate, entire or ta \. Ovary**  
 " **labrous or velvety. Capsules | in. long, o . 5-ribbed,**  
**K> runcate at the base and the apex; cocci 3 -1. Seeds**  
 small,

<sup>Ij</sup> **luvoid, acute, tubereled, compressed. Fl, B. I. v, L, p. 425; Boisa, Fl.**  
**V<][rrient. v. 1, p. 915.**

o **JasRare. SIND : on hills,**

qpft 5. **PAGONIA, Linu.**  
 b J Branching herbs woody at **the base, erect** or prostrate.  
**Leaves 0** Opposite, 1-3-foliolate, ■ the leaflets quite entire, **mucronate;**  
**stipu St'ten spiny.** Flowers **solitary from among the t s, rosy**  
**or violet, jrarely** yellow. **Sepals 5, deciduous, imbricate.**  
 Petals 5, **cla . caducous, imbricate. Disk short, inconspicuous.**  
**Stamens 10, inserted on the disk; filaments finform, naked; anthers**  
 shortly oblong. **Ovary**  
**sile, 5-gonous, 5-celled, narrowed into a 6-gonous subulate si**  
**ovules 2. near the base of the cell, collateral, pendulous from ascending**  
**funicles; stigma simple. Fruit 5-gonous, of. 5 Useeded cocci |v|**  
 ; ilehisce along **fche ventral sature** and separate from a **hbruj irp,**

seeds **erect, compressed** broadly **oblong** testa **mucilaginous**; albumen  
pale; cotyledons broad,  $\frac{1}{2}$  U, ovate,—**DISTRIB.** Widely  
dispersed **throughout the Mediterranean** and the **Eastern regions**,  
rarer **in** **Spain**, California and Chili; **species 2** or **3**, well-defined.

L, p. 424; Boiss. Fl. Orient, v. I, p. 916; Woodr. in Journ. Bomb Nat. v. 11 (1897) p. 206.—Flowers: Oct.

Sis»: rare; Bind bills, DakeM, 1300.; Hala nwge Heart,i ■  
odrowVisTRis, K. and S.Africa, ArtAnL «'.\*■>

### 3. PEGANUM, Linn.

**Branching perennial-rooted** herbs. Leaves alternate, not **glandular** " entire or irregularly multifid; sttpu\ea IUH. PW, wUtervTrf or

subtermihal i<'a f- opposed pedicels, white. Sepals 4-6, narrow, of tun and

Eottaceoua ami pimatvfid, open in aestivation, persistent. Petals 4 r», 17

subequa], imbricate. Disk annular or cup-hUn^cd. Stamen\* L2 is,

inserted at the base of **the disk**, some without anthers:

**filaments**

**dilated** below; anthers linear. Ovary **globose, deeply** 2-3-lobed,

**2-3-celled** : ovules many in each cell, suspended by short funicles from the **central** angle; styles basal, twisted, **2-3-keeled** above the middle.

**the keels** stigmatose. Fruit globose, 3-4-celled, dry and dehiscent **veitr** 3 valves, **or baccate** and **indehiscent**; cells many-seeded. Seeds angled «. testa spongy, **scrobiculate** : **albumen fleshy**; embryo curved.—DISTKIB.

Species I, of which **1** is **widely** dispersed on the shores of the Mediteranean and tropical Asia, the others natives of Central Asia and

Mexico. j

1. **Peganum Harmala**, Unn. Sp. Pl. (1753) p. 44.4. A bush,<sup>1"</sup> 1-3 ft. high, **dichotomously and corymbosely** branched. Leaves 2-3 in.<sup>00"</sup> **long, multifid, the segments** narrow, linear, acute. Flowers |—**1 in.M>j** across, solitary, sessile **or pedicelled**. Sepals narrow, linear, acute,\*)\* **usually exceeding** the petals. Petals white, elliptit-oblong. Capsules<sup>10</sup> -| in. **in diam.**, deeply lobed, veined, glabrous. FJ. B, IT v. 1, p. 486 (*under Rutaceee*); Grab.. Cat. p. 35 ; Dalz. & Gibs. p. 45 f-**Boiss. Fl.** Orient, v. 1, p. 917; Woodr. in Journ. Bomb. Nat. v. **13}** (1897) p. 267; **Watt**, Diet. Econ. Prod. v. 6, part 1, p. 124.—Flowers J-Oct.-Dec. VERK. *flu filial*.

Common in the drier parts of ilic Presidency. KOSKAN: *Lawl* DKCCAN: Indapur\* (Pooua Colleetorate), *JMzdl*, if- *Gih-<m*; Eijapur, *Coo&el*, *Wbodrcvt\**. SIND: *Sioc&gi* Hyderabad, *IVoodrowl*—DISTEIB. Soongaria, Arabia, N. Africa and westward to Hungary and Spain.

The plant is of considerable repute in native medicine. See Wntt, Diet. Eco: Prod. 1. c.

### 4. ZYGOPHYLLUM, Linn.

**Small** shrubs or prostrate herbs; branches terete, often spinescent. Leaves opposite, 1-2-foliolate; leaflets usually fleshy; stipules i<sup>j</sup>, **often** spiny. Flowers from among the stipules, white or yellow, usually marked **with** a red or purple spot at the base. Calyx 4-5-partire, persistent or deciduous, **imbricate**. Petals 4-5, clawed, imbricate and **contorted**. Disk fleshy, angular, cup-shaped or concave. Stamens 8-10, inserted at the base of the disk, longer than the petals; filaments filiform, with a scale at **the base** within ; antliers oblong. Ovary sessile on **the disk, 4-5-gonous**, 4-5- (rarely 2-3-) celled, attenuated into **an angled** style ; stigma minute ; ovules **2-many** in each cell, superposed ;

**raphe** free or adnate. Fruit **capsular**, 4-5-gonous or **4-6-winged**,  
Uilehiscent or sepficidally dehiscent into 5 cocci, or loculicidalh  
•i-valved, the endocarp sometimes separating. Seeds 1 or  
more ir

Sp. PL p. 387; Grah. Cat. p. 35.—Flowers throughout the year. VEEN. *GoJcru*; *Sardtd*.

In dry and hot parts of the Presidency, a common weed. This and the next species are members of the Desert Flora,

DECCAN : *Dalzell* & *Gibson*, *Graham*, *Woodrow* ; Bijapur, *Cooke!*; Poona, *Cooke!*  
GUJARAT : *Dateell* & *Gibson*; Kathiawar, *Dateell* & *Gibson*; Deesa, *Stocks!* S. M.  
COUNTRY ; Padshapur (Belgaum districts), *liitchie*, 1(^06 ! SIND : *Woodrow* ; Jemadar  
ka Landn, near Karachi, *Stocks I*

The plant is used medicinally throughout\* India and the young leaves and stems are eaten as a potherb. See Watt, Diet. Econ. Prod. 1. c.

2. **Tribulus alatus**, *Delile*, *Flor. Mgijpt Illnstr.* (1812) p. 62. Annual; branches procumbent or ascending, densely silky-villous. Leaves as in the former species ; stipules broadly ovate, acute, hairy. Flowers  $\frac{1}{2}$  in. in diam. Sepals  $\frac{1}{8}$  in. long, ovate, acuminate, villous outside. Petals very thin, scarcely longer than the sepals, cuneate-oblong, the apex sometimes slightly dentate. Stamens 5 (or ? 10). pvary bristly with long white hairs ; style short, stout. Fruit of 5 2-seeded cocci, the cocci very hirsute, the spines confluent into toothed wings. Fl. B. I. v. 1, p.\*423 ; Boiss. Fl. Orient, v. 1, p. 902; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 266 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 78.—Flowers: Oct.-Dec. Native names *Nindo-trilcund*; *LataJc*.

In all the specimens examined by me the number of stamens was invariably 5 and not 10.

i A member of the Desert Flora growing in Sind. SIND : *Stocks!*, *Vicary !*; Sehwan, *Vooke!*, *Woodrow!*—DISTRIB. North Africa, Arabia.

## 2. SEETZENIA, Br.

A small prostrate herb, frutescent at the base, usually glabrate. Leaves opposite, stipulate, trifoliolate ; leaflets obovate, apiculate. Flowers small, axillary, solitary. Sepals 5, linear-oblong, valvate, thin curved at the apex. Petals 0. Disk small, 5-lobed. Stamens 5, ^usjalous or' f>\* disk; filaments filiform, glabrous, naked at the base ; gantn.incate at ttKse. Ovary oblong-clavate, sessile, 5-gonous, truncate, 'fleshed, acute, tubvui 1, in each cell, pendulous; styles 5, short, spreactot^y. 1. gais small, capitate. Capsule pendulous, ovoid, pentagonal, separating into 5 1-seeded cocci with a narrow succulent exocarp on the back only; endocarp crustaceous. Seeds solitary, ovoid, compressed ; testa thick with 3 skins, the outer membranous, the middle one cellular and mucilaginous, the inner coriaceous; albumen thin ; cotyledons thick.—DISTRIB. Africa ; species 1.

1. **Seetzenia orientalis**, *Dene*, in *Ann. Sc. Nat* ser. 2, v. 3 (1835) p. 281. A branching herb; stem and branches terete, articulate, somewhat swollen at the nodes, usually glabrous. Leaves glaucous; petioles JL-J in. long; stipules intrapetiolar, triangular, ciliate; leaflets fleshy, the terminal one the larger, I in. long, obovate, the lateral oblique, all with a hard, polished, horny apiculation. Flowers solitary, axillary; pedicels exceeding the leaves, |-| in. long, cernuous, often abruptly eflexed at the apex, glabrous. Fruit as in the genus. Seeds oblong, Dmpressed, somewhat pointed at the ends, smooth, brown.  
Fl. B. I.

coriaceous or crustaceous, sometimes dividing into 2-10 dehiscent or indehiscent (sometimes spiny) cocci cohering or free from the axis, or capsular and septicidally dehiscent. Seeds usually pendulous and solitary (rarely 2 or more) in each cell, oblong or linear; raphe adnate or free; testa membranous, crustaceous or thick and mucilaginous; albumen scanty (rarely 0); embryo as long as the seed, green, straight or rarely curved; cotyledons oblong or linear, thick or foliaceous; radicle short, straight, superior.—DISTRIB. Tropical and opibay^ hi pariic»f both hemispheres; rare in tropical Africa; genera 17; warm regions" OB\*\*\*. species about 100.

*	.....	1. TRIBULUS.
Seeds exalbuminous...	.....	
Seeds albuminous .....	.....	2. SEETZENIA.
Petals 0 .....	.....	
Petals 4-5. <i>fi</i> .....	.....	3. PEGANUM.
Stamens 12-1 <sup>2</sup>	.....	
Stamens 8-10.1e; stipules not spiny .....	.....	4. ZYGOFIYLLUM.
Ovules axitl; stippiies spiny .....	.....	5. FAGONIA.*
Ovules basj	.....	

### 1. TRIBULUS, Linn.

Herbs, often with silky hairs. Leaves stipulate, branching prostrate h^ernate by suppression), usually one of the pair opposite (or sometimes alU^Tuptly" pinnate. Flowers solitary, pseudo-smaller than the other, ab >pals 5, imbricate. Petals 5, spreading, axillary, white or yellow. b\ebUlar> 10-lobed. Stamens 10 (rarely 5), imbricate, fugacious. Disk ami<sup>01</sup> the longer opposite to the petals, the inserted on the base of the disk, *tr* filaments filiform, naked. Ovary 5 shorter with a small gland outside; ; ; ovules 1-5 in each cell, sessile, hirsute, 5-12-lobed, 5-12-cellecf^v^m. stigmas 5-12. Emit posed; style short, pyramidal or filiu vacillate indehiscent cocci. 5-angled, of 5-12 winged or spinous or tubes; embryo exalbuminous • Seeds obliquely pendulous; testa meinbranoLrper regions of the globe, cotyledons oval; radicle short.—DISTRIB. WanL, species about 15.

Cocci with 2 long and 2 short spines .....	% .....	L y < <i>terrestr</i> <sup>^</sup>
Cocci broadly winged .....	: uil.	2. <i>T. cdatus</i> .

#### 1. *Tribulus terrestris*, Linn. *Sp. PL* (1753) p. 387. X<sup>11</sup>^

cumbent herb; stems and branches pilose; young parts silky-villc -' Leaves opposite, abruptly pinnate, one of each pair usually smaller thr the other, sometimes wanting; stipules lanceolate, hairy; leaflets 3-v pairs, |i in. long, oblong, mucronate, sericeo-villous with appressed hairs beneath and more or less so on the upper surface, base rounded oblique petiolules^very short, pilose. Flowers axillary or leaf-opposed, solitary; pedicels -|f in. long, slender, hairy. Sepals % in. long, lanceolate, acute, hairy. Petals § in. • long, oblong-obovate; claw short, hairy. Ovary bristly; style short, stout; stigmatic lobes longer than the diameter of the style. Fruit globose, consisting of (usually) 5 hairy or nearly glabrous, often muriculate, woody cocci, each with 2 pairs of hard sharp spines, one pair longer than the other. Seeds several in each coccus, with transverse partitions between them. Fl. B. I. v. 1, p. 423; Dalz. & Gibs. p. 45; Boiss. Fl. Orient, v. 1, p. 902; Trim. Fl. Ceyl. v. 'I, p. 194; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 2(56; Watt, Diet. Econ. Prod. v. 6, part 4, p. 78. *Tribulus lanuginosus*, Linn.

small; lobes ovate, acute. Petals thrice as long as the lobes of the calyx, oblong-elliptic, rounded at the apex. Sainara orbicular or slightly elliptic, 1-1½ in. in-diam., membranous, closely reticulately veined, glabrous, pale brown; nucleus not dorsally winged or keeled. Fl. B. I. v. 1, p. 421; Dalz. & Gibs. p. 34; Talb. 'Trees, Bomb. p. 29; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 265.—Flowers: Sept.-Nov. VEEN. *Bury el.*

Throughout the Konkan, Deccan and Kanara in moist forests. KONKAN: Stocks!; island of Salsette, *Jacquemont*, 991!; near Pen, *Dalzell & Gibson*; DECCAN: Bowdhan jungle, near Poona, *Cooke*; S. Matheran, *Woodrow*, *Ritchie*, 1½!; Londa, *Woodrow*. KANARA: Yellapur (N. Kanara), *Talhot*!

3. **Aspidopterys canarensis**, *Dah. in Boob* (1851) p. 37. A climbing shrub: branches glabrous. Leaves 3-4 by 1|-2 in., elliptic-lanceolate, glabrous when adult, sparingly clothed attached by the middle when very young, marginal hairs or subacute; petioles ½ in. long, channelled, long-pedicelled umbelliform racemes from a vertex clothed with minute rusty-tomentose bracts; glabrous. Calyx rufous-tomentose outside. Petals oblong, obtuse, 4 times as long as the lobes. Samaras 1-li in. in diam., orbicular-f-yellowish-brown, the margins entire or lobed, pale with a dorsal wing. PL B. 1. v. 1, p. 5 nucleus Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 260.—flowers: Feb.-

The Ghats of the Konkan and KANAKA: *Dalzell*; evergreen forest -Kanara; rare. KONKAN: *Stocks*!, *Dahell* fcuinta and Sirsi Road, *IFoodror* of the Supa Q-hats, N. Kanara (rare), *Talbot* ;

•; Nilkund.(N. Kanara), *Woodrow*.

## ZYGOPHYLLACEAE.

Herbs or shrubs. Leaves alternate or opposite, usually articulate. Leaves exoc&rn "oh .^ate (by suppression), stipulate, 2-3-foliolate or pinnate; ovules entire, epunctate, sometimes connate; stipules twin, persistent, sometimes spiny. Peduncles usually 1-2 in the axils of the stipules, 1-tvvered, rarely bracteate. Flowers hermaphrodite, regular or irregular, white, yellow or red, rarely blue. Sepals 5 (rarely 4), free or rarely connate at the base, imbricate (rarely valvate or open), in aestivation. Petals 5-4 rarely 0, hypogynous, free, imbricate or contorted, rarely valvate. Disk convex or depressed, rarely annular inconspicuous or 0, eglandular. Stamens as many as the petals or twice (rarely thrice) as many, inserted at the base of the disk, those opposite to the petals often connate at the base with the claw of the petals; filaments filiform, usually with a scale within at the base or the middle; anthers versatile, dehiscent



longitudinally. Ovary sessile or rarely- on a short gynophore, furrowed, angled or winged, 4-5- (rarely 2-12-) celled; cells very rarely with partial transverse septa ; ovules 2 or more (rarely 1), often filiform, pendulous or ascending; raphe ventral; micropyle superior; style simple, terminal, angular or furrowed ; stigma simple, rarely discoid, or stigmas 5. Fruit various (never baccate),

Seed solitary, globose. Fl. B. t. v. "1, p. 418; Grab. Cat. p. 28; Trim. r.; 'J., , it v. L, p. L93; Niedenzu, in Engl. & Pranth Pflanzenf, v. 3, part 4\* p. 46, Bg. 38, p. 49, Kg. 39, D; Talb. Trees, Bomb. p. 28 : Woodr. in Jo»rn. Bomb, \.-ir. v. U (1897) p. 265; Watt, Diet. Econ.

I, v. I, p. 2^2. *Heptaye Mi* -. Dalz. A Gibs. p. 33.—Flowers : Jan.-Mar. \^T EBH". *Madhtivndlati* II

Grows abundantli on tlie Wester) . KOSKAS : ! . *Law I, Woodrow.*

Bon ■ DECCAS: Panehgani, //, .V./; ■■■■ ' IC \ s Kalauaddi, *Bitckie*, L001!—DISTEIB, China, Jara, [ey]

2. **ASPIDOPTERYS**, A. Juss. v

Scandent shrubs. Leaves quite entire, petioled, eglandular, ex-."j si i pulate. Panicl< s axillary or terminal, simple or compound ; peduncles, bracteate ; pedicels usually slender. Flowers white or yellow, inodorous^ Calyx short, ^partite, eglandular. Petals clawed, entire. Stamens **10,v!** all :i ; filaments filiform, distinct or connate at the base; anthers^ ,g y , ^ ged : stylos 3, glabrous ; stigmas rapjtate. Fruit of 1-3 -samaras i

ovate, glabrous. Ovary 3-lobed, the lobes flattened at the back,the - win

g y g g pj surrounded by a seutiform, ovate or orbicular, membranous wing, some-M times shortly crested in the middle. Wong, subl cotyledons. ^ light, equal; radicle short.—DISTIIIU. Tropical Asia ; species 15.

- v Nil lly wing\* 0  
 ibfousbeneatli ..... 1. *A. Boxbu* ! ■.i  
 laves cordate, clothed with white beneath ..... '2. *A. corda* ^  
 Nucleus dorsally winged ..... 3. *A. oanarensis*.

1. **Aapidopterys Roxburghiana**, A. Jws. in *Ann. Sc. Not.* ser. i<sup>J</sup>. v. 13 (1840) p. 207. A climbing shrub; branches slender; youngf\* parts glabrous or tomentose. Leaves 3-4 by 1^2 it)., ovate-elliptic, minate, entire, glabrous on both sarfaces except on the midrib which is more or less pubescent, base rounded; petioles :{-4<in. long, '6 rusty-puBescent. Flowers small, \ in. across, in dense terminal andJS

axillary rusty-tomentose panicles; bracts lanceolate, pubescent. Calyx\*<sup>1</sup> persisteni ; ] - obtuse, tomentose. Petals obovate, concave, <sup>w</sup> white. Stamens \'->; filaments connate at the base, the exterior "'iorte-^ ^ Ovary pilose; styles slightly longer than the stamens. Samaiminously^s oblong, 1-2 by |-| in., membranous, glabrouSi yellowish-brown ;liori.—.u^ not winged or keeled. FL E, I. v. 1, p. 420; Dalz. & Q-ibs. [rr Niedenzu, in Engl. & Prantl, Pflanzenf. v. 3, part 4, p. 46, iig. . . '\$\$ Talb. Trees, Bomb. p. 29; Woodr. in Journ. Bomb. Nat, <sup>DU^B^</sup> (1807) p. 265; *Hircta indica*, Eoxb. JIort. Beng. p. 90; Grah. <sup>u ul:l L;></sup> p. 28.—Flowers: Dec. <sup>U> aE no</sup>

u

Forests of the Western Ghats; not common. KOKKAM: *Dakett* & *Gibson*; other forests, *Talbot*. DKCTAX; hills near Satara, *Woodrow*; JKhandala, *Dalsdale* & *CHS*\* -'''/ es 1!au  
Khandala Gh&t (

2. **Aspidopterys cordata**, *A. Juss. in Ann. Sc. Nat. ser, 2, v. 1-* (1840) p. 267, A slender climber; young parts tomentose. *Leate-*  
*O*  
4-7 in. in diam., orbicular or broadly ovate, abruptly terminated *ban*  
*Id*  
broad acuminate **tip**, glabrous or nearly so above, white-tomentose  
beneath, base cordate; petioles 1-1½ in. long, rusty --pubescent. *Mowe*\*-  
;] in. across, in tomentose panicles; bracts subulate or 0. Calyx

**10-celled, with usually 2 or 3 suvd-. PI. B. I. v. 1, p. 413; Dalz. & Gibs. p. 17; Trim. FI. Ceyl. v. 1, p. 1S9 ; Beiche, in ] g Praiiti, Pflanzenf. v. 3, part 4, p. 33, fig. 29 ; Talb. Trees Bomb Watt, Diet. Eeon. Prod. v. 4. p. 302.—Flowers: Aug.**

Rare. KONKAH : Law !, Stocks !; between MaVwun and Vjngoria, DalseU ! KANAI cka !—DISTRIB. Ceylon.

**OoDiu XXIX. MALPHIGIACE.S].**

Trees or shrubs, often climbing. **Leaves (in the Indian genera)** <= opposite, entire ; glands often present on the petiole or the bottom of J.the blade or margin of the leaf; stipules small or 0. **Inflorescence** 'axillary and **terminal**; flowers hermaphrodite, regular or irregular; pedicels articulated, **bracteate**. Calyx usually **5-partite**; segments

(imbricate, very rarely vulva! e. 1 or n sever all) -d with a **gllarge** gland, rarely **eglandular** (A<sub>n</sub>, \*, >. p, fa i iger than the **biCalyx, usually equal, fimbriate or dentate, clawed or not, Disii incon-** atspicuoii -ually **10, hypogynous or subperigynous** oi **3 or mor** <r than the others ; filaments free or conna **lobase; a short, 2-celled. O^** ovules solitary in each **scell; styles U3, straight or eircinate; -** terminal or sublateral oinconspicuous. **Fruit (in the Indian genera) of o** ire winded **p samaras. Seeds eialbuminona ;** hi oY curved ■ radicle 3 superior. — **DisiiB.** Throughout Brazil and Guiana, less widely in v, tropical **America, Aiirica and Asia; species about 600.**

u ■ nirel.v 2; calycine gland large ..... i n, ,  
V Styles.,; calyemegland0..... 2 UpiDOPTERTf  
h

**1. HIPTAGE, Giern.**

**h Scandent shrubs. Lea.** coriaceous, **entire, petioled,** ^ eglanduiar, **exstipulate.** |lw **terminal** and **axillary, sometimes** compound ; peduncles erect, br. h with the > **2-Bracteate pedicek.** RoWera white, **fragrant, the fifth petal discolored**

Calyx **5-partite, with 1 large gland partly adna** Petals **Ilfe<sup>d6</sup>. lin?o%ua1, si|k?- 3** t0, declini **one much** c-->usite or um the ot'ers/ **Blaments ednnate at the very base. Ovary l<sup>ex</sup>%** --'> loht's **annendiculate.** styles 1-2. **filiform at fil**

**f/etime>/tf{\t!:** T^ samarasl  
>ered, m & \*' ^fi ?ubS<sup>lobo</sup>?e > cotyledons unequal, thick, curved.-^  
hite YiF<sup>3'</sup> J-^opical Asia; species 4.

Igmnaie **kiptage Madafclota, Ga-rU. Fruet. v. 2 (17Ql)v** m , -

rahlL gB U"oOdy m^TMf\*\*.<TMl>H. s^uh; yonng

parts'silky!

-a \aU'.ives coriaceous, 4-t bv lf-3 in., jelliptic-oblongs at-inrim n. TM V  
**glands**, glabrous, **strongly nerved beneath, base Sute''** 1^

■Jna»y»ng, silky-pubescent. Flow f in. **across**, f]

often <e[y **tomentose racemes** about as **long** as the **leaves** ■ hLaf\_c i'  
teliformj/x persistent, densely pube Id?- toS ow£? Jj?060^

**pnthersth** a large oblong gland at the **base outside**. **Petals** a i ''

**shor**e sepals, **orbicular**, clawed, fringed **on the margin, the upn "ed.roader**  
than the rest Carpels with a **central wing** het\ il TM lateral,

the inner wing 1-1 -L ifl. lon. the 2 **lateral wings** | i.n.^

simpj

Econ. Prod. v. (3, part 1, p. 427. *Reinwardtia trigyna*, Dalz. & Gibs, p. 16. *Linum trigynum*, Koxb. in As. Res. v. 6, p. 357 ; Grab. Cat. p# 34.—Flowers : Jan. VEEN. *Abai*.

Widely planted in gardens, but found wild in a few localities.—Dalzell notes that it occurs wild on Miradonger, near Pen in the Konkan, where it has also been found by Woodrow. I have found it in the Deccan on the banks of the Koina river below Mahableshwar far removed from any habitation.

The dimorphism of the sexual organs of *Reinwardtia trigyna* has been treated of by Alefeld in Botan. Zeit. (1803; p. 282. Sir Henry Collett in 1884 made a careful and exhaustive examination of upwards of 100 fresh specimens from the hills below S i l and the subjoined table gives the forms which he has been able to differentiate in Herb. Kew.).

A. Long-styled forms.

Stamens in 2 rows, 3 of the stamens being distinctly longer than the other 2.

(a) Styles 3 ; stamens about half as long as the styles.

(b) Styles 4, three long and one short, the latter equalling the longer stamens.

(c) Styles 5, three long and two short, the 2 shorter equalling respectively the long and short stamens.

B. Short-styled forms.

Stamens in 2 rows, three being distinctly longer than the other two.

(a) Styles 3, equalling in length the 2 shorter stamens. (>) Styles 3, standing below the 2 shorter stamens.

(c) Styles 7, standing below the 2 shorter stamens.

(d) An abnormal form with all 5 stamens of slightly, unequal lengths ; the 3 styles on a level with the shortest stamen.

C. All the styles and stamens of the same length.

Sir H. Collett's observations make it evident that the species *R. tetragyna* can scarcely be maintained as a separate one, a fact long since suspected by Hooker (Fl. B. I. v. 1, p. 412 under *R. tetragyna*).

### 3. HUGONIA, Linn.

Scandent shrubs, often tomentose. Leaves alternate, pinninerved, stipulate. Inflorescence various ; flowers yellow, the 2 lowest peduncles of each branch converted into spiral hooks. Sepals 5. Petals 5, hypogynous, contorted, fugacious. Stamens 10, connate at the base into a short tube, with glandular swellings between the petals. Ovary 5-celled; ovules 2 collateral in each cell; styles 5, filiform, stigmatose at the apex. Drupe globose, fleshy or baccate. Seeds compressed, albuminous; embryo straight or slightly curved ; cotyledons flat; radicle short.—t

D Tropical Asia and Africa; species 6.

**1. Hugonia Mystax, Linn. Sp. Pl. (1753) p. 675.** A rambling\* scandent shrub; branches yellow-tomentose, with short horizontal branchlets, leafless below and provided near the ends with a pair of circinate hooks. Leaves 1-2 by 1-1 in., elliptic-obovate, obtuse or subacute, entire, reticulately veined, the veins conspicuous on both surfaces, glabrous, base tapering; petioles 1/2 in. long, hairy ; stipules lanceolate-subulate. Flowers at the extremities of the short branchlets

1-1<sup>^</sup> in. across, terminal and in the upper axils; pedicels short, 1-flowered, clothed with soft yellow hairs. Sepals  $\frac{1}{2}$  in. long, ovate-lanceolate, acute, fulvous-pubescent. Petals many times longer than the sepals, thin, ovate-oblong, acute or truncate. Styles longer than the stamens; stigmas capitate. Drupes about  $\frac{1}{2}$  in. in diam., globose, surrounded by the persistent sepals; pulp scanty; stone bony, grooved,

smooth, dark brown, shining. Fl. B. I. v. 1, p. 410; Grah. Cat. p. 34; Dalz. & Gibs. Suppl. p. 16; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 265; Watt, Dict. Econ. Prod. v. 5, p. 2.—Flowers: Feb.—Mar. VERN.

P

*Alsi; Javas.*

The well-known flax-plant. Native country unknown, but supposed to have originally been introduced from Egypt, where it was in use in the time of the Pharaohs. It is grown in India for the oil procurable from the seeds, not for the fibre. For a full account of the plant and its uses, consult Watt, Diet. Econ. Prod. 1. c.—DISTRIB. All regions where flax is cultivated for oil or fibre.

**2. *Linum mysorense*, Heyne, in Wall. Cat. (J828) 1507.** Annual, 18 in. high, glabrous; stem erect, slender, striate, leafy. Leaves sessile, 1—1½ in. long, oblong-elliptic or obovate, mucronate, tapering at the base, 3-nerved. Flowers ½ in. across, on short pedicels, solitary, collectively forming a corymbose terminal panicle made up of unilateral cymes. Sepals ½ in. long, elliptic-lanceolate, pointed, glabrous, 3-nerved. Petals yellow, about twice as long as the sepals, obovate, rounded at the apex, acute at the base. Filaments dilated and connate below. Ovary; glabrous; styles slightly connate at the base. Capsules globose, apiculate,

surrounded by the persistent sepals. Seeds 10, elliptic, compressed,

smooth. Fl. B. I. v. 1, p. 411; Grah. Cat, p. 33; Dalz. & Gibs. p. 16

; Trim. Fl. -Ceyl. v. 1, p. 188; Woodr. in Journ. Bomb. Nat. v. 11

(1897) p. 265; Watt, Diet. Econ. Prod. v. 5, p. 1.—Flowers: Oct.—Dec. VERN. *Undri.*

Very common on the Konkan and Deccan hills; abundant at Mahablesliwar. DECCAN: hills at Par, *Dafcell!*; Kbandala, *Graham!*; Kolhapur, *Woodrow!*; Maha-lesliwar, *Cooke!*—DISTRIB. Ceylon.

## 2. REINWARDTIA, Dumort.

Undershrubs. Leaves alternate, membranous, usually serrate, pinnately-nerved; stipules minute, caducous. Flowers large, yellow or white, in very short fasciculate axillary racemes or in dense corymbs at the ends of the branches; pedicels bracteate. Sepals 5, entire. Petals 5, contorted, fugacious. Stamens 5, connate at the base, hypogynous, with as many interposed setiform staminal nodes. Glands 2-3, adnate to the staminal-tube. Ovary 3-5-celled, cells 2-locellate; ovule 1 in each locellus; Styles 3-4 (rarely 5 or 7), filiform, stigmatose at the apex. Capsule globose, splitting into 6-8 valves; valves 1-seeded. Seeds reniform; albumen thin; embryo straight.—DISTRIB. Endemic; species 1 or 2.

**1. *Reinwardtia trigyna*, Planch, in Hook. Lond. Journ. Bot. v. 7 (1848) p. 522.** An undershrub, 2-3 ft. high; branches terete, with longitudinally wrinkled bark, glabrous. Leaves 2-4 by 1-1½ in., elliptic-lanceolate, acute, distantly serrate, decurrent into a short petiole, glabrous, mucronate; stipules minute, subulate, caducous. Flowers yellow, handsome, 1-1½ in. across. Sepals 1-g in. long, oblong-lanceolate, very acute. Petals obovate, cuneate. Stamens 5, dimorphic, long stamens and short styles and short stamens and long



styles occurring in different flowers • pollen grains of the short stamens larger than those of the long ones! Styles normally 3, free or connate at the base, sometimes 4, 5 or 7 of different lengths; stigmas of the long styles larger than those of the short ones. Capsules globose, shorter than the sepals. El. B < I. v. 1 p. 412; Woodr. in Journ. Bomb\*. Nat. v. 11 (1897) p. 265 ; Watt, Diet

## ORDEB XXVIII.

Herbs or shrubs, rarely trees, usually glabrous. Leaves usually alternate, simple, entire, rarely crenate-serrate ; stipules lateral or intra-petiole or 0. Inflorescence various, normally racemose. Flowers regular, hermaphrodite. Sepals 5 (rarely 4), free or connate at the base, imbricate. Petals as many as the sepals, hypogynous or rarely slightly *V*igynous, imbricate, often contorted, usually fugacious, blue, yellow white, rarely rosy. Stamens as many as the petals with as many interposed staminodes, or twice (rarely thrice) as many, united at the base into a ring or a short hypogynous or slightly perigynous tube ; filaments filiform, inserted on the apex or a little below the apex of the tube, within or without; anthers versatile, 2-celled, dehiscent longitudinally ; glands 5, entire or didymous, usually adnate to the staminal-tube or obsolete. Ovary free, entire, 3-5-celled; ovules 1-2 in each cell, inserted beneath the apex of the inner angle, pendulous, anatropous ; raphe ventral ; micropyle superior; styles 3-5, free or more or less connate; stigmas terminal. Fruit capsular, septicidally splitting into as many (or by the presence of false dissepiments), double as many valves as there are cells to the ovary, leaving no axis, less commonly a drupe. Seeds in each valve or pyrene 1-2, usually compressed ; testa sometimes expanded into a membranous wing; albumen fleshy or 0 ; embryo almost as long as the seed, straight or rarely incurved ; cotyledons flat or plano-convex, usually ovate or elliptic; radicle superior.—DISTRIBUTION. Throughout the world; genera 14; species about 135.

Herbs .....	1. LINUM.
An erect undershrub.....	2. REINWARDTIA.
A scandent shrub, with hooked woody tendrils .....	3. HUGOXIA.

## 1. LINUM, Linn.

Herbs sometimes suffrutescent, usually glabrous. Leaves generally alternate, narrow, entire, 1-many-nerved ; stipules 0 or glanduliform. Inflorescence various. Sepals 5, entire. Petals 5, contorted, fugacious. Stamens 5, connate at the base, hypogynous, alternate with the petals, often alternating with minute or setiform staminodes ; glands & small, adnate to the staminal-tube outside, opposite to the petals. Ovary 5-celled, the cells imperfectly septate, 2-seeded, or with a perfect, fissile septum, 10-valved, 1-seeded. Seeds compressed; albumen scanty embryo straight.—DISTRIBUTION. Temperate and warm regions ; species 80.

Flowers large, 1 in. in diam., blue .....	1. <i>L. usitatissimum</i> .
Flowers small, 1/2 in. in diam., yellow .....	2. <i>L. myosotis</i> .

1; **Linum usitatissimum**, Linn. *Sp. PL* (1753) p. 277. Annual, 2-4 ft. high ; stems solitary or few, corymbosely branched; branches ascending towards the apex. Leaves up to 1 1/2 in. long, linear-lanceolate, attenuated at both ends, acute at the apex. Flowers about 1 in. across, in corymbose panicles. Sepals : the two outer elliptic, acuminate, with entire membranous margins; the three inner broader, acuminate, with ciliate margins, all strongly 3-nerved, the middle nerve alone reaching the apex. Petals blue, slightly crenate. Capsules mucronate, the edge of the dissepiments in the interior glabrous. Seeds compressed, ellipsoid,

numerous, in rusty-pubescent racemes 2-4 in. long; buds ovoid, acute; pedicels up to 1 in. long. Sepals  $J-J^{\wedge}$  in. long, oblong-lanceolate or linear-oblong, acute, fulvous-pubescent without and  $v^{\circ}$ ;  $K^a$  a few  $h^{\circ}$  within. Petals a little longer than the sepals, wedge-shaped, hairy at the base inside, silky villous outside, lacinate one third of the way down. Stamens 40-50; filaments  $T^{\wedge}$  in. long; anthers slender, linear, each with an erect awn  $^{\wedge}$  in. long, which is often slightly curved, or twisted. Ovary conical, silky-villous, 2-celled; style silky near the base, rapidly tapering from base to apex. Drupes  $1^{\wedge}-2$  in.; stone compressed, tubercled on the flattened sides and with a thickened margin. Fl. B. I., V. 1, p. 404; K. Schum. in Engl. & Prantl, Pflanzenf. v. 3, p. 6, p.  $f^{\circ}$  fig. 1, A, B; Talb. Trees, Bomb. p. 27; Woodr. in Journ. Bom. JW<sup>^</sup>G. v. 11 (1897) p. 265; Watt, Diet. Econ. Prod. v. 3, p. 206. *Monocera Uthercidata*, W. & A. Prodr. p. 83; Wight, Icon. t. 62; Dalz. & Tibs, p. 27.—Flowers: Jan. VERJ<sup>S</sup> *lludralc*,  
<sup>1</sup> In Wight's Icon. t. 62, the style is incorrectly copied from Roxburgh's drawing.—It is shown as terete, glabrous, while it should have been shown as tapering, silky.

Southern Ghats from Belgaum southwards ex Talbot. KANAKA: *Stucksl, Hohen-hacker*, 531!—DISTRIB. Malaya.

5. **Elaeocarpus aristatus**, *Roxb. Hort. Beng.* (1814) p. 42; *Fl. Ind.* v. 2, p. 91. A tree. Leaves 8-11 by 3-4 in., obovate-cuneate, obtuse, acute or somewhat acuminate, more or less irregularly crenate-serrate, glabrous on both surfaces, base acute (rarely rounded); petioles 1 in. long, usually glabrous. Flowers numerous; buds long, elliptic-lanceolate, pointed. Sepals  $T^{\circ}$  in. long, pubescent. Petals cuneate, a little longer than the sepals, hairy at the base within, silky-villous without, somewhat more deeply and more finely divided at the apex than in the last species. Stamens 40-50; awn erect; filaments glabrous, short. Ovary 2-celled, silky-villous, conical; style tapering from a conical base, the basal portion silky. Fruit of the size and shape of an olive; stone oblong, pointed at both ends, somewhat rugose (not tuberculate), 1- or (rarely) 2-celled. Fl. B. I. v. 1, p. 405; Talb. Trees, Bomb. p. 27.

*Monocera Roxburghii*, Wight, Icon. t. 63.—Flowers: Apr.

Bare. KOKAN: *Stocks I*; Talkat Ghat, *Dalzell*

6. **Elaeocarpus Munroii**, *Mast, in Hook. f. Fl. B. I.* v. 1, p. 407. A tree. Leaves 2i-4 by 15-2 in., crowded towards the ends of the branches, ovate-lanceolate, acuminate, crenate-serrate, glabrous on both surfaces, base rounded, acute or subcordate; petioles  $1-1\frac{1}{2}$  in. long, glabrous. Flowers numerous in racemes which are usually shorter than the leaves; buds ellipsoid; pedicels  $\frac{1}{4}-\frac{1}{2}$  in. long. Sepals  $\frac{5}{16}$  in. long, narrow-lanceolate, acute, pubescent without. Petals a little longer than the sepals, oblong, silky on both surfaces, lacinate about one third of the way down; segments 10-12. Ovary 2-celled, silky-puberulous; style straight, tapering, longer than the stamens, the basal half silky-puberulous. Drupe size of a small olive, yellowish, edible; stone 1-celled. Fl. B. I. v. 1, p. 407; Talb. Trees, Bomb. p. 27. *Monocera I Munroii*, Wight, Icon. t. 952.—Flowers: Sept.-Oct.

This plant has been included on the authority of a specimen in Herb. Kew. marked  
" Konkan, *Stocks!* "



4. *Elaeocarpus tuberculatus*, *Fl. Ind.* v. 2, p. 594. (1814) p. 93;  
*Fl. Ind.* v. 2, p. 594. A large tree. Leaves *obovate-cuneate*, *obtusely crenate-dentate* or *subentire*, strongly *pinnately*-nerved, glabrous *above*, *fulvous-pubescent* on the nerves beneath, *base* usually *rounded*; *petioles* 1 in. long, more or less hairy. Flowers *ver*}

numerous fructs into filiform appendages, glabrous, base rounded; pedicels 1-1½ in. long, slender, hairy; stipules lanceolate, acicular. linear-oblong, in leaf-opposed cymes; buds obovoid, apiculate; bracts within, peduncles almost 0; pedicels 2-3, very short. Sepals ½ in. the base ar-oblanceolate, apiculate. Petals spatulate, a little longer than the Stamens Capsules ½-1 in. long, erect, stout, cylindrical, truncate, 6-angled an erect (angles winged); valves 3-4, slightly septate or without parti-Ovary 'beak 3-fid, the tips stellately spreading or recurved. Seeds tapesate, dark brown. Fl. B. I. v. 1, p. 398; Grab. Cat. p. 20; Dalz. & tubs. p. 25; Trim. Fl. Ceyl. v. 1, p. 183; A Woodr. in Journ. Bomb. Nat. V. 11 (1897) p. 265; Watt, Diet. Econ. Prod. v. 2, p. 534.—Flowers in Sept.

A common weed. XONKAN: Law!, Stocks!; Bombay, Capt. Geburne I; Parel (Bombay), Woodrow!; Neral (below Matheran), Woodrow! GUJARAT: Goclra, Qjooke! SIND: Jemadar ka Landa (near Karachi), Stocks!—DISTRIB. Ceylon.

## 5. ELJEOCARPUS, Linn.

Trees. Leaves simple, entire or serrate. Flowers in racemes, rarely polygamous. Sepals 4-5, valvate (rarely imbricate), distinct. Petals as many as the sepals, lacinate, lobed or rarely entire, inserted round the base of a thickened glandular torus. Stamens numerous (rarely 8-12), inserted on the torus between the glands; anthers linear, dehiscent by a transverse valve at the apex. Ovary 2-5-celled; ovules 2 in each cell; style subulate, entire. Drupe with a single bony tuberculate stone, 3-5- or (by suppression) 1-celled; cells 1-seeded. Seeds pendulous; testa crustaceous or bony: albumen fleshy; cotyledons broad, flat or undulate.—DISTRIB. Tropical Asia, islands of the Pacific and Australia; species about 50.

Anthers not terminated by an awn.

Drupe 5-celled ..... 1. *E. Ganitrus*.

Drupe 1-3-celled.

Anthers bearded; filaments short, straight ..... 2. *E. serratus*.

Anthers rarely bearded; filaments long, twice bent ..... 3. *E. oblongus*.

Anthers terminated by a long awn.

Leaves obovate.

Stone much tubercled ..... 4. *E. tidwrculatus*.

Stone rugose, not tubercled ..... 5. *E. arts tat us*.

Leaves ovate-lanceolate ..... 6. *E. Munroii*.

1. **Elaeocarpus Ganitrus**, Roxb. Hort. Bencj. (1814) p. 42. A tree. Leaves 4-6 by 1-1½ in., oblong-lanceolate, acute or acuminate (rarely obtuse), obscurely and irregularly crenate-serrate or subentire, decurrent into the petiole, glabrous; petioles ½-¾ in. long. Racemes 2-3 in. long, from the old wood; buds ovoid-conical, pointed; pedicels ½ in. long. Sepals ½ in. long, oblong, acuminate, pubescent outside. Petals ½-¾ in. long, oblong, lacinate about half way down, ciliate. Stamens about 40, in groups opposite each petal; filaments very short; anthers linear, one valve tipped at the apex with a small tuft of glistening hairs. Ovary pilose, 5-celled; style longer than the stamens. Drupes ½-1 in. in diam., globose or somewhat obovoid, purple; stone tubercled, 5-celled, 5-seeded. Fl. B. I. v. 1, p. 400; Grab. Cat. p. 22; Dalz. & Gibs. p. 27; Talb. Trees, Bomb. p. 27; Woodr. in Journ. Bomb. Nat. v. 11 (1897)

ao

XXV II. Til

%xq«t«[«<3, glabrous. Leaves | L-| by ; -.. in., elliptic-oblong, f<3 .tp&Hq uaje, the lower serratures not (or rarely) produced into .»-;<Y\""}] !-'!;f;].\_i(^, glabrous, ded or cuneate; petioles very bulate. short (aim ' lie), leaf-opposed cymes; buds obovoid apiculate; 1 tracts long, lanceolate: peduncle\* 2-5-flowered. Sepals ^ in. long, linear, apiculate. Petals oblong-obovate. Capsules^ in, long, shortly beaked, , cylindric, pul I sd; valves slightly septate between the I. E. I. V. 1, p. 'WS; 1 Dak. & Gibs. p. 24; Trim. FL Ceyl. v. 1, p. L83; Woodr.\*in Journ «p Boll■■■ i ! (189^)^ p. 265; W:\i\\ Tolerably common in the hotter parte of fhe Presideaoy. Diet. Econ, Prod. v. ■ke\ CrVJAitAT; IVuttd.'run-; Surat, Flowers:

Do . . . isiss. BdhuphalK. V

DaccAs: Poona, Wood-\*- ; ofcell.— OISTBIB. Tropica '3[ Africa, Aastn ■lun.

5. Corchorus Antichorus, Baemch. Norn. ed. 3 (1797) p. 158.'\* (nnial, 6-9 in., prostrate, aaueh-bran< ■■■■ base; branebes.o bed, imbricate, woody. Leaves ', roundish, usually<sub>3B</sub> wrinkled, glabrous, irregularly crenate-serrate, tbe - notv<sub>Y</sub> I, base rounded or c ; petio a, long, very^ slender; stipules subulate. .Flov. . on leaf buds obovoid, apiculate; bracts la te-subulate; pedu pedicels -oblong, apiculate. Petals\* longer than the loyate. Capsule lu. long, cylindrie. beaked, i curved upwards, 4-valved; valve . it at all. septate between the seeds. Seeds trigonous, black. Fl. H. I. v. 1"8 p. 398; Boiss. FL Orient., v. I '>: Woodr, in Joaro. Bomb. Xat)^ v. ! 1 (1897) p. 265; Watt, Did t. Prod. v. 2. p. 535. I vd^ ;nro, Hort. Agrensis, A pp. p. 35 j Dak. & G-ibs. p, 25.—<sup>10</sup> I ■■ ; Sept-Ocfc. VsBir. Muclhiri, ^

amoti m dry and hot districts ; i member of the Indian desert flora. DEOCAS I\* I . Bajkot (Kathiawar t; Gogo^

A%haaisfan, Arab

6. Corchorus trxdens, Linn, Mantiss., App. (.1.771) p, 566, Annual 1-2 it. high; branches glabrous. Leaves li—<H- hy 4—1 in., linear-oblong or lanceolate, creni , the lower serratures on each sideO usually prolonged into filiform appendages, glabrous ov more or (es^o pubescent; petiolei les subulate, [an. long. Mow 1~4 tog bovoid, apiculate.



Sepals | in. iong.o  
 Hnear-oblong, apieulate. Petals obovate-oblong, slightly longer than  
 the sepals. Capsules 1-1 j.. in. long, slender, glabrous, terminating *m*)  
 3 stellately spreading or deflexed points, 3-valved; valves  
 without  
 PaTS truncate at both ends, black. FL B. I. v. 1,  
 p. 398 ;  
 Woodr. in Joura. Bomb. Nat, v. II (1897) p. 265; Watt, Diet. Econ.  
 Prod. v. 2, p. 544.

**Slim:** ; .. '& I—DISTRIB, Troptcal Africa and Australia.

7. *Corchorus acutatigulus*, *La m. Encye. y. 2* (1786) p<sub>r</sub>  
 104  
 Annual, much-branehed j branc t. Leave  
 ^■-t>h<sup>l'</sup>. . ovate, acute, serrate, the lower serratures on each si(

p. 246; Dak. & Gibs. p. 25;  
in Journ. Bomb, Nat v if  
/i v. 2, p. Sk-Mo^\*-^  
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## Corcl^orus trilocularis /

'g-lanceolate, a  
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ill sf' HI short cymes; buds ovoid !  
P°\*JTM\* subulate; peduL w^etavefy  
snort, pubescent. SeDala '!' in

tfegl;\_1 t wiili a short erect beak faa<sub>i</sub>ry J!  
pma, jscabrous when old 3-4-<sub>an</sub>cr]^ Q I ^'J<sup>1''1^</sup> \*''th stifi

,roft Witions between A.ISK' & fctS<sup>1TM3</sup> " , TM'Ves wi» "» ■

-b;»nl | 8 15; \V««I, in Mili ,p. 397; Qrah. Cat. p. 20 !),) ,• r ,  
. I as peon. Prodr. v. 2, 'TM''oi) Is' bla\*. R. B V

p. Cell DECCAS: j a p Pd 2  
simj 4.

## Corchorus

faseicularis, TM»ai. 6-18 m.  
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Diet. Econ. Prod. v. 6, parb 4, p. 374.—Flowers : May-July.

VERN\ *Guti*.

KONKA\* : *Law!*, *Stocks!*; the Ghats pretty common, *Graham*; Matheran near G-arbat Point, *O. Macnagkten* Hart Point, *H. M. Birdwood*. DBCCAN: Bowdhan, near Poona, *Cooke!*, *Woodrow!*; Lanoli, *Woodrow!* S. M. COUNTRY : near Belgaiun, *Ritchie!* KANARA : in moist forests growing to a tree, a straggling shrub in drier parts of the Presidency, *Talbot!*; Kala naddi, *Ritchie*, 138!—DISTRIB. India (N.W. Prov., Oude, Eajputana, W. Peninsula); Ceylon.

6. **Zizyphus horrida**, *Roth, Nov. PL Sp.* (1821) p. 159. A

shrub

with sender divaricate branches. Leaves  $\frac{1}{2}$  by  $\frac{1}{2}$  in.,

broadly

elliptic or suborbicular, often mucronate, crenate, glabrous ;

petioles

$\frac{1}{2}$ - $\frac{1}{2}$  in. long ; stipular prickles from broad triangular bases, twin, one straight and the other hooked,  $\frac{1}{2}$ - $\frac{1}{2}$  in. long, glabrous, shining, hard and sharp. Flowers in dense much-branched pubescent cymes; peduncles stout,  $\frac{1}{2}$  in. long; pedicels shorter than the peduncles. Calyx pubescent outside; lobes ovate, acuminate, keeled about half way down.

Petals

broadly obovate with a very long claw. Disk 5-angled, not

pitted.

Styles 3, distinct or nearly so. Fruit  $\frac{1}{2}$ - $\frac{1}{2}$  in. in diam., globose,

woody,

3-celled, 3-seeded. Fl. B. I. v. 1, p. 63G; Talb. Trees, Bomb. p. 52.

KONKAN : *Stocks!*

I have seen only one Bombay specimen which is in Herb. Kew. marked as abjve, without more precise information as to locality.—DISTRIB. India (W. Peninsula).

7. **Zizyphus rugosa**, *Lamlc. Encyc.* v. 3 (1789) p. 319. A

large

straggling armed shrub sometimes climbing ; young branches

clothed

with fulvous tomentum. Leaves 2-5 in. long, broadly

elliptic, -shortly

acuminate, denticulate, glabrous above, fulvous-tomentose beneath, base oblique, often cordate; petioles  $\frac{1}{2}$ - $\frac{1}{2}$  in. long, tomentose; prickles from a broad base, solitary, short, recurved, tomentose except the tips.

Flowers in long-peduncled tomentose cymes arranged along

usually

leafless spmous branches forming a panicle (the cymes sometimes turned to one side); buds globose and as well as the peduncles and pedicels densely tomentose. Calyx pubescent outside ; lobes ovate acute,

the

keel on the inner face reduced to a line. Petals 0. Disk

5-lobed..

Ovary 2-celled. Styles 2, connate below the middle. Drupe  $\frac{1}{2}$ - $\frac{1}{2}$  in.

in

diam., globose or pyriform, white when ripe; stone thin,

1-celled,

1-seeded. Fl. B. I. v. 1, p. 636; G-rah. Cat. p. 39; Dalz. &

Gibs,

p. 49; Trim. Fl. Ceyl. v. 1, p. 282; Talb. Trees, Bomb. p. 52; Woodr.

in Journ. Bomb. Nat. v. 11 (1897) p. 271 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 372.—Flowers : Dec.-Feb. VERN. *Turan*.

Very common throughout the Ghats of the Presidency. KONKAN : *Stocks!*; Konkati, and Ghats, *Ritchie*, 135! ; Bombay, *Capt. Geburne!* DECCAN : Mahableshtar, *Cooke!*;

Khandala, *Woodrow!*; Ganesh Khind (Poona), *Woodrow!*; Igatpuri, *Kanitkar!* KANARA : N. Kanara Gháts, *Talbot*. SIND : Hyderabad, *Cooke!* The fruit is eaten largely by the hill tribes in April and May. Dalzell & Gibson (*l. c.*) consider it palatable, but I have always thought it mawkish.—DISTRIB. India generally; Ceylon.

### 3. RHAMNUS, Linn.

Shrubs or trees. Leaves alternate (rarely subopposite), petioled, nenninerved; stipules small, deciduous. Flowers hermaphrodite or polygamous, axillary, racemose or cymose, the cymes fasciculate. Calyx 4-5-fid; tube urceolate; lobes keeled within. Petals 4-5 or 0, inserted on the edge of the disk. Disk lining the calyx-tube, the margin thin.

it 2

Stamens 4-5; filaments very short. Ovary free, ovoid, 3-4-celled, attenuated into a 3-4-fid style ; stigmas obtuse, papillose. Fruit a berry-like drupe, oblong or globose, girt at the base by the small calyx-tube ; pyrenes 2-4, dehiscent or indehiscent, 1-seeded. Seeds obovoid; testa membranous or crustaceous; albumen fleshy; cotyledons flat, recurved at the margins ; radicle short.—DISTRIB. Warm and temperate regions of both hemispheres; species about 60.

1. **Rhamnus Wightii**, *Wight & Am. Prodr.* (1834) p. 164. A large glabrous, unarmed shrub. Leaves alternate (rarely a few sub-opposite), 2-4 by 1-1.5 in., ovate-oblong, acuminate, finely serrate, glabrous, base rounded or subacute; petioles 1/2-1 in. long, puberulous. Flowers in axillary fascicles, or in fascicles along an elongate, axillary rachis; pedicels shorter than the petioles. Calyx pubescent outside, cleft about half way down ; lobes triangular, keeled on the inner face. Petals minute, lanceolate, flat. Stamens 5. Ovary 3- or 4-celled; styles 3 or 4, connate half way up. Berry 1/2 in. in diam., globose, supported by the persistent calyx and tipped with the remains of the styles, smooth, reddish-purple when ripe. *Fl. B. I. v. 1*, p. 639; *Dalzell & Gibs.* p. 50; *Trim. Fl. Ceyl. v. 1*, p. 283; *Talb. Trees, Bomb.* p. 52 ; *Watt, Diet. Econ. Prod. v. 6*, part 1, p. 442.—VERN. *Bagt-roda*.

Rare. Found only on the highest hills of the Northern Ghats (*Dalzell & Gibson*). There is one specimen in Herb. Kew. from Dalzell (!) from Hewra botanical garden, but no specimen from a plant truly wild. Mr. Woodrow informs me that he has searched for the plant himself and sent collectors to search for it, but has failed to find it.—DISTRIB. India (W. Peninsula) ; Ceylon.

*Ulliamnus triqueter*, *Laws*, in *Hook. f. Fl. B. I. v. 1* (1875) p. 639, has been found by N. B. Eanade, late herbarium-keeper in the College of Science, Poona, on the hill fort of \*Kori about 12 miles S. of Lanoli. It has also been found at the hill fort of Purandhar about 25 miles from Poona. The plant is a native of the Western Himalaya and the Salt range in the Panjab, and has not been found wild in Western or Southern India. It seems highly probable that the ancestors of the plants in the two Peccan hill forts were introduced, perhaps as medicinal plants. Mr. Woodrow informs me that they were abundant on the highest parts of the walls of the Kori fort.

#### 4. SCUTIA, Commers.

Glabrous shrubs, spinous or unarmed ; branches often angular. Leaves opposite or subopposite, coriaceous, penninerved. Flowers hermaphrodite, in axillary fascicles, or subumbellate. Calyx 5-fid; tube hemispheric or turbinate ; lobes ovate, acute, thickened at the apex. Petals 5, clawed, erect, flat or cucullate. Disk filling the calyx-tube, the margin free, undulate. Stamens 5, as long as the petals, free. Ovary ovoid or globose, immersed in the disk, free, 2-4-celled, narrowed into a short 2-3-fid style ; stigmas obtuse, papillose. Fruit obovoid or subglobose, dry or slightly fleshy, girt at the base by the persistent calyx-tube ; pyrenes 2-4, crustaceous, angular or compressed. Seeds compressed; testa membranous ; albumen 0 or thin.—DISTRIB. Asia, Africa and Tropical America ; species 8.

1. **Scutia indica**, *Brongn. in Ann. Sc. Nat. ser. 1*, v. 10 (1827) p. 363. A straggling shrub, sometimes scandent; branches often decussate, armed

with recurved prickles. Leaves subopposite, subbifarious, |-1| in. long, orbicular, elliptic or obovate, entire, glabrous, dark green and shining above; petioles -J- in. long; stipules subulate. Prickles hooked, usually inserted a little higher up than the petiole and a little to one side of it. Flowers small, in axillary umbels which are as long as, or sometimes slightly longer than, the petioles; peduncles and pedicels glabrous. Calyx glabrous; lobes ovate, acute, keeled below the thickened apex. Petals deeply bifid, clawed, as long as the stamens. Stamens inserted on the mouth of the calyx-tube and enclosed by the petals. Fruit \ in. in diam., globose, smooth; pyrenes crustaceous, compressed. Fl. B. I. v. 1, p. 640; Grah. Cat. p. 39; Dalz. & Gibs. p. 50; Trim. ?1. Ceyl. v. 1, p. 284; Talb. Trees, Bomb. p. 53; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271.—Flowers: Feb.-Apr. VERN. *ChimaU*

Very common on the higher Ghats; abundant at Mahableshwar, where it is known as the "wait-a-bit" thorn. Ko IAN: *Stocks I, Law I, Dalzell*, 80! DECCAN: Phunda

80

Ghat, *Bitkie, -j*!; Mahableshwar, *H. M. Birdwood, Cooke!, Woodrow!*

KANARA:

*Ritchie*, 80!; Supa Ghats of N. Kanara, *Talbot*.—DISTRIB. India (W. Peninsula); Mauritius.

## 5. SAGERETIA, Brongn.

Shrubs unarmed or spinous; branches often decussate. Leaves sub-opposite; stipules minute, deciduous. Flowers hermaphrodite, very small, fascicled along terminal or axillary leafless paniculate branches. Calyx 5-fid; tube hemispheric or urceolate; lobes ovate, acute, keeled within. Petals 5, clawed, cucullate. Stamens 5, equalling the petals or nearly so. Disk cupular, filling the calyx-tube, the margin free, 5-lobed. Ovary ovoid, sunk in the disk, free, 3-celled; style short, 3-furrowed; stigmas 3, capitate or obtuse. Fruit globose, coriaceous, indehiscent; pyrenes 3. Seeds oblong; albumen thin; cotyledons flat.—DISTRIB. Central and E. Asia, Java and the warmer parts of N. America; species about 11.

1. **Sageretia oppositifolia**, *Brongn. Ann. 8c. Nat. ser. 1, v. 10* (1827) p. 360. A shrub or small tree; branches slender, spinous, tomentose when young. Leaves li-4 by |-1| in., ovate-oblong, acute or acuminate, serrate, clothed beneath when young with a dense woolly tomentum, base rounded or cordate; petioles | in. long. Flowers in sessile clusters along the branches of terminal and axillary tomentose panicles; buds globose; bracts ovate, acute. Calyx pubescent outside; lobes triangular, thickened at the apex, keeled on the inner face. Petals obovate, clawed, longer than the stamens, keeled on the back. Disk in the form of a deep cup with free margin. Fruit obovoid, \ in. long, not lobed, black when ripe, edible. Fl. B. I. v. 1, p. 641; Brandis, For. FL p. 95; Talb. Trees, Bomb. p. 53.

KONKAN: *Stocks I* and, ex *Brandis* 1. c. There is only one specimen in Herb Kew. from Bombay marked "konkan, *Stocks*."—DISTRIB. Throughout the greater part of India; Java.

## 6. COLUBRINA, Rich.

Erect or sarmentose shrubs. Leaves alternate; stipules small, deciduous. Flowers axillary, cymose or paniculate. Calyx 5-fid; tube hemispheric. Petals 5, inserted below the disk, clawed,

cucullate.

Stamens 5, enclosed within the petals ; filaments filiform. Disk thick, filling the calyx-tube, annular, 5-angled or 5-10-lobed. Ovary sunk in the disk and confluent with it, subglobose, 3-celled, attenuated into a 3-fid or 3-partite style;- stigmas obtuse, papillose. Fruit subglobose, girt below the middle by the tube of the calyx, 3-celled; cells 1-seeded, tardily dehiscent. Seeds obovoid, compressed, 3-gonous ; albumen thin, fleshy ; cotyledons orbicular.—DISTRIB. Chiefly in the Tropical and warmer parts of N. America ; species about 10.

1. **Colubrina asiatica**, *Brongn. in Ann. 8c > Nat. ser. 1, v. 10* (1827) p. 369. A glabrous much-branched unarmed shrub. Leaves membranous, 1<sup>^</sup>—3 by 1-2<sup>^</sup> in., broadly ovate, acute or acuminate, crenate-serrate or subentire, glabrous, rounded or subcordate at the base; petioles §-§ in. long. Flowers yellowish, in small axillary shortly peduncled pubescent cymes which are shorter than the petioles. Calyx-lobes broadly and acutely triangular, keeled on the inner face, scarcely thickened at the apex. Petals as long as the calyx, enveloping the stamens and longer than them, broadly obovate or orbicular, cucullate, the claw short and very slender. Ovary 3-celled ; style 3-fid. Capsule globose, quite smooth, § in. in diam. Seeds chocolate-brown, rounded on the back, angled on the ventral side, slightly emarginate at the base, smooth. Fl. B. I. v. 1, p. 642 ; Grah. Cat. p. 39; Dalz. & Gibs. p. 50 ; Trim. Fl. CeyL v. 1, p. 285 ; Talb. Trees, Bomb. p. 53.—VERN. *Guti*.

KONKAN : Ghats of the Kontan, *Talbot*; Elephanta, *Dalzell & Gibson, Graham*; near the sea at Ratnagiri, *Stocks I, Dalzell!*—DISTRIB. India (E. & W. Peninsulas); Java, Borneo, Australia, S.E. Africa, Oeylon.

## 7. **GOUANIA**, Linn.

Unarmed climbing shrubs, cirrhiferous. Leaves alternate, petiolate ; stipules oblong, deciduous. Flowers polygamous, small, in axillary or terminal spikes or racemes ; rhachis often cirrhose. Calyx superior, 5-fid : tube short, obconic; lobes 5. Petals 5, inserted below the margin of the disk, cucullate. Stamens 5, enclosed within the petals; anthers dehiscent longitudinally. Disk glabrous or pilose, epigynous and filling the calyx-tube, 5-gonous, or produced into 5 horns. Ovary sunk in the disk, 3-celled ; style 3-partite or 3-fid; stigmas minute. Fruit coriaceous, inferior, crowned by the persistent limb of the calyx, 3-winged or boldly 3-angled. Seeds plano-convex, obovate; albumen scanty.—DISTRIB. Chiefly Tropical American; species about 50.

1. **Gouania microcarpa**, *DC. Prodr. v. 2* (1825) p. 40. A shrub climbing by circinate axillary or sometimes extra-axillary tendrils. Leaves 2-4 by 1-2<sup>^</sup>- in., ovate or elliptic, acute or acuminate, entire, glabrous, penninerved, rounded or subcordate at the base ; secondary nerves 4-6 pairs, the pairs near the base often opposite ; petioles | in. long. Flowers in distant pubescent eluste\*\*, on the long branches of spicate terminal and axillary panicles. Calyx pubescent outside ; lobes triangular, thickened at the apex, keeled on the inner face. Petals spathulate, clawed, truncate or slightly emarginate at the tip. Disk pubescent, the angles truncate. Fruit \ in. long by | in. broad, pubescent at first, afterwards glabrous and polished, \uth 3 large lobe6



(scarcely wings) which are rounded at top and bottom. Fl. B. I. v. 1, p. 643; Trim. PL Ceyl. y. 1, p. 286; Talb. Trees, Bomb. p. 53. *G. leptostachya*, Dalz. & Gibs. p. 50; Talb. Trees, Bomb. p. 53 (*not* of DC)—Flowers : Nov.-Dec.

KONKAN : *Stocks* !; Wari, *Dalzell*, Iti84!; Banda, *Dalzell* & *Gibson*. S. M. COUNTRY : Ramghat, *Ritchie*, 1684 ! KANARA : very common on the N. Kanara Ghats, *Talbot*; Divirmana (N. Kauara), *Woodrow* !; Supa, *Ritchie*, 1684 !; Kumpta, *Cooke*!—DISTRIB. India (W. Peninsula); Ceylon, Java.

## ORDER XLII. VITACEI<sup>E</sup>, Lindl.

(*AMPELIDE<sup>E</sup>*, Endl.; Hook. f. & Benth. Gen. PI.)

Small trees or shrubs which are usually climbers (except *Leea*) ; juice copious, watery; stems and branches nodose. Leaves alternate (the lower sometimes opposite), simple or digitately or pedately 3-11-foliolate, rarely pinnate. Flowers regular, hermaphrodite (rarely unisexual), usually small, generally greenish, in cymes, racemes, panicles or thyrsi usually opposite the leaves ; peduncles often transformed into simple or compound tendrils. Calyx small, entire, or 4-5-toothed or -lobed. Petals 4-5, free or variously cohering, valvate, usually caducous. Stamens 4-5, opposite to the petals, inserted at the base of the disk or between its lobes; filaments subulate. Anthers free or connate, short, 2-celled, introrse. Disk between the stamens and ovary, various in form, free or connate with the petals and stamens or the ovary, urceolate, annular or widely expanded, rarely entirely confluent with the ovary. Ovary usually sunk in the disk, 2-6-celled ; ovules 1-2 in each cell, ascending, anatropous; raphe ventral; style short, conical, subulate, or 0; stigma capitate or discoid, sublobate. Fruit baccate, often watery, 1-6-celled ; cells 1-2-seeded. Seeds erect, rugulose ; testa bony; embryo short, at the base of cartilaginous (often ruminant) albumen ; cotyledons oval; radicle inferior.—DISTRIB. Throughout the tropical and temperate regions of the whole world ; genera 3; species about 375.

- |  |           |
|--|-----------|
| Shrubs, usually scandent and cirrhose ; stamens distinct, free; ovary 2-celled ..... | 1. VITIS. |
| Erect shrubs, ecirrhose; stamens connate with the disk; ovary 3-6-celled.....        | 2. LEEA.  |

### 1. VITIS, Linn.

Shrubs usually cirrhose, sarmentose, often climbing to a great height, very rarely erect. Leaves simple or compound (very rarely 2-pinnate). Flowers small, sometimes polygamous, umbellate, cymose, paniculate, racemose or spicate; peduncles leaf-opposed (very rarely axillary), usually towards the ends of the branches. Calyx short, entire or 4-5-toothed or -lobed. Petals 4-5, free or calyptately cohering at the apex. Disk various or obsolete. Stamens 4-5, inserted below the margin of the disk • anthers free. Ovary 2-celled (sometimes imperfectly), very rarely 3-4-celled ; ovules 2 in each cell; style 0 or short. Berry ovoid or globose, 1-2-celled; cells 1-2-seeded.—DISTRIB. Chiefly Tropical and Subtropical; not common in Tropical America ; species about 320.

- Leaves simple. Flowers  
4-merous.
- An erect shrub; tendrils 0 ..... 1. *V. Woodrown.*  
Scandent shrubs; tendrils leaf-opposed.  
Leaves quite glabrous.  
Stems terete or obscurely angled.  
Leaves pale green.  
Stems woody below .....; ..... 2. *V. pallida.*  
Stems weak, trailing ..... 3. *V. repens.*  
Leaves blotched with white above, bright red  
beneath ..... 4. *V. discolor.*  
Stems and branches acutely angled or winged..... 5. *V. quadrangularis.*
- Leaves pubescent or tomentose beneath.  
Leaves ovate.  
Leaves subtomentose beneath ; flowers green ... 6. *V.*  
*giyantea.* Leaves when young densely tomentose beneath;  
flowers pink ..... 7. *V. repanda.*  
Leaves with orange-red pubescence beneath;  
flowers greenish-yellow ..... 8. *V. adnata.*  
Leaves 3-5-lobed, grey tomentose beneath ..... & *V. Linncsi.*
- Flowers 5-merous; peduncles cirrhiferous.  
Leaves 3-5-lobed, floccose on both sides; flowers scarlet. 10. *V. tomentosa.*  
Leaves ovate, glabrous above ; flowers greenish-purple. 11. *V. indica.*  
Leaves 3-7-lobed, at length glabrous ; flowers reddish-  
brown ..... 12. *V. latifolia.*
- Leaves 3-foliolate (sometimes simple in *V. liheedei*).  
Flowers 4-merous.  
Leaflets sessile or subsessile.  
Berry black, smooth, 1-seeded ; leaflets subsessile ... 13. *V. Itheedei.*  
Berry scarlet, hispid, 1-seeded; leaflets quite sessile. 14. *V. setosa.*  
Leaflets stalked.  
Berry black, smooth, 2-4-seeded ..... 15. *V. trifolia.*  
Berry yellow, afterwards turning red, smooth,  
1-seeded ..... 16. *V. canarensis.*  
Flowers 5-merous ..... 17. *V. araneosa.*
- Leaves digitate, usually 5-foliolate ; flowers 4-merous.  
Stipules small, cordate ; berry black ..... 18. *V. elongata.*  
Stipules large, ear-shaped ; berry red ..... 19. *V. auriculata.*
- Leaves usually pedate (sometimes 3-foliolate in *V. lanceo-*  
*laria*). Flowers  
bisexual.  
Leaves 5-7-foliolate ; stems glabrous ..... 20. *V. tenuifolia.*  
Leaves 7-11-foliolate; stems pubescent or hairy ..... 21. *V. pedata.*  
Flowers dioecious..... 22. *V. lanceolaria.*

**1. *Vitis Woodrowii*, Stapf, MS.** An erect shrub 5-6 ft. high; trunk 3-4 in. thick at the base ; bark rough, grey; lower branches 2-3 ft. long, annual, ecirrhose, slightly tomentose at\* the apex. Leaves up to 9 in. long and broad, pale green, cordate-ovate or cordate-rotund (with a broad sinus), usually shortly (rarely obscurely) 3-lobed, acute or acuminate, repand-crenate (the crenatures recurved), at first sparingly tomentose, at length glabrate, rather firm, palmi-nerved ; petioles nearly equalling the blade, more or less tomentose when young; stipules triangular-ovate, reddish, caducous. Flowers tetramerous, in compound umbels ; peduncles 1 in. or afterwards 2 in. long ; primary rays usually 4, about  $\frac{1}{2}$  in. long at time of flowering, afterwards up to 1 in. long; pedicels at time of flowering  $\frac{1}{2}$  in., afterwards  $\frac{1}{2}$  in. long, thick, straight. Calyx saucer-shaped; limb membranous, truncate or very obscurely lobed. Petals 4, calyptrately deciduous, hooded and thickened at the apex. Disk 4-lobed, Style short, stout, conical. Berry obovoid-globose,

about \ in. in diatn. Seed solitary. ? *Cissus vitiginea*, Dalz. & (Jibs.

p. 40 {not of Koxb.); Cfos«\* -----, Grab. Cat. p. 33 (n. 244),—Flowers': June. VEEN. *Gimul*.

"**Very** closely- allied to *V. pallida*, W. & A., from which it differs in the absence of tendrils, an erect thick trunk and larger leaves which are almost invariably **3-lobed**. The root contains **starch-granules** in abundance, of variable form, also raphides which are pointed at one end and 2-3-furcate **at** the other ( *Woodrow*).

KOWKAN : Bombay, *Capt. Geburne* ! D HCC AN : common in the Poona districts, *Woodrow* !; a roadic'ie bu.-li, *Nairne*; Bowdhan forest near Poona, *Woodrow*!—DISTIUB. Apparently endemic in the Bombay Presidency.

**2. Vitis pallida**, *Wight \$ Am. Prodr.* (1834) p. 125. A climbing

sbrub; steins woody below, terete or nearly so; tendrils simple.

Leaves 3-0 in. in diara., pale green, cordate (with a wide sinus), ovate or orbicular, shortly acuminate, glabrous, the margins with **shallow** distant glandular incurved serratures; petioles 2-5 in. long; stipules mem

branous, broadly oblong, obtuse, caducous. Flowers in compound

umbellate cymes; peduncle 1-2 in. long, thick and fleshy.

Calyx

saucer-shaped, the margins membranous. Petals 4, calyptrately deciduous but free at the **apex**, triangular-ovate. Style rather long,

slender. Disk 4-lobed. Berry 1- (rarely 2-) seeded, size of a pea,

pyriform or subglobose, mucronate, supported on an incurved pedicel.

Fl. B, I. v. 1, p. 647; Trim. Fl. **Ceyl. v. 1, p. 291**; **Talb. Trees, Bomb, p. 55**; *Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271.*

*Cissus*

**pallida**, *Planch, in DC. Monogr. Phan. v. 5, part 2, p. 477.*—Flowers : June-July.

Rare in the Bombay Presidency. S. M. COUNTRY: Padshaptir, *Ritchie*; near Dharwar, *Talbot*. \*&\*

**3. Vitis repens**, *Wight \$ Am. Prodr.* (1834) p. 125.

P'\$^j&

quite glabrous; branches subterete when **fresh**, angled ^ 3,-^ rJ ; young shoots glaucous ; tendrils weak, leaf-opposed, forked. -vves membranous, pale green, 3-0 by 1-3\ in., broadly ovate, acui nate, glabrous, **the** margins undulate and **distinctly** spinous-toothed, base deeply cordate ; main nerves about 4 pairs, the lower pair branching

; p ^ g p

pound umbellate cymes ; buds conical; peduncles leaf-opposed, solitary or rarely fascicled, 1-2-^ in. long ; pedicels slender. Calyx

truncate. Petals 4, triangular-ovate, subacute,  $\frac{1}{10}$  in. long, free. Berry subglobose or pyriform,  $\frac{1}{8}$ - $\frac{1}{8}$  in. in diam., usually 1-seeded. Fl. B. I. v. 1, p. 646; **Talb. Trees, Bomb. p. 55**; *Woodr. in Journ. Bomb. Nat. 11 (1897) p. 271.* *V. glauca*, W. & A. *Prodr. p. 126.* *Cissus repens*.

outwards ; petioles 1-2} in. long; stipules rounded. Flowers in com-

v.

Lam. Encyc. V. 1, p. 31; Dalz. & Gibs. p. 39 ; Planch, in DC. Monogr. Phan. T. 5, part 2, p. 504. *Cissus cordata* Koxb. Fl. Ind. v. 1, p, 407 ; Grab. Cat. p. 32.—Flowers: Feb.-Mar.

I have followed Planchon (*l. c.*) in uniting this species with *V. glauca*. Although Lawson (Fl. B. I. 1. c.) makes *Cissus cordata* Koxb. a synonym of both *V. repens* and *V. glauca*, he still retains these as separate species.

KONKAN: Dalzell & Gibson, Graham, Talbot. S. M. COUNTRY: Belgaum, Bitchie, 114! KANARA: in evergreen forests, not common; Gbata near Supa, Talbot, 20! Jsilkimd (N. Kanara), Woodrow.—DISTRIB. India (E, Tropical Himalaya, Chittagoug, W. Peninsula); Java, Amboyna.

4. **Vitis discolor**, Dalz. in Hook. Kew Journ. Bot. v. 2 (1850) p. 39. Scandent; stem woody at the base only; young shoots and branches more or less 5-6-angled, deep red; tendrils leaf-opposed, forked. Leaves 3-5 by 1½-2½ in., ovate-oblong, acuminate, usually irregularly blotched with white above, deep red and shining beneath, remotely bristle-serrate, glabrous, base more or less oblique, cordate, truncate or rounded, sometimes cuneate; main nerves 5-7 pairs; petioles red, those of the lower leaves reaching 2 in., those of the upper leaves about 1 in. long or less; stipules ovate-oblong, rounded at the apex. Flowers 4-merous, in umbellate cymes on umbellately arranged branches; buds oblong; peduncles leaf-opposed, slender, short or long, and as well as the pedicels deep red. Calyx glandular, fleshy, truncate. Petals red outside, glabrous, 1½ in. long, thickened at the apex. Disk 4-lobed. Style long, glabrous. Fruit subglobose or pyriform, about 1 in. long, red when ripe. Seed solitary. Fl. B. I. v. 1, p. 647; Talb. Trees, Bomb. p. 55; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 253. *Cissus discolor*, Blume, Bijdr. p. 181; Dalz. & Gibs. p. 40; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 496.—Flowers: Aug.-Oct. VEEN. *Telitsaijel*.

A very handsome plant, often grown in gardens in India and in conservatories in England. According to Watt (*l. c.*) depth of color and breadth of leaf are obtained when the plant is grown in shade.

KONKAN: *Law* Stocks I, *Dalzell* Talbot \ W. Ghats, *Woodrow* DBCCAN: below Mahableshwar near Wada bungalow, *Cooke* KANAKA: moist forests of N. Kanara, *Yellapur*, *Talbot*—DISTRIB. Throughout India, Java.

5. **Vitis quadrangularis**, Wall. Cat. (1828) 5992. Stems leafless when old, very long, fleshy, glabrous, much contracted at the nodes, quadrangular, the angles of the young branches winged; tendrils long, slender, simple. Leaves 1-2 in. long, broadly ovate or reniform, sometimes 3-7-lobed, denticulate, glabrous, cordate, rounded, truncate or cuneate at the base; petioles ½ in. long; stipules small, broadly ovate, obtuse. Flowers in shortly peduncled cymes with spreading umbellate branches. Calyx cup-shaped, truncate or very obscurely lobed. Petals 4, ovate-oblong, acute, ½ in. long, hooded at the apex. Disk erect, 4-lobed. Style short, stout. Berry obovoid or globose, scarcely ½ in. long, apiculate, red when ripe, 1- (very rarely 2-) seeded. Fl. B. I. v. 1, p. 645; Trim. Fl. Ceyl. v. 1, p. 289; Talb. Trees, Bomb. p. 54; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Wight, Icon. t. 51; Watt, Diet. Econ. Prod. v. 6, part 4, p. 256. *Cissus quadrangularis* Linn. Mantiss. p. 39; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 509; Grab. Cat. p. 33; Dalz. & Gibs. p. 39. *Cissus edulis*, Dalz. in Hook. Kew Journ. Bot. v. 9 (1857) p. 248; Dalz. & Gibs. p. 40.—Flowers: July. VEEN. *Chaudhri*; *Kdndvel*; *Harsankar*.

Throughout the driest districts of the Presidency, *Talbot*. KONKAN: in gardens Bombay, *Graham*. GUJARAT: in hedges, *Dalzell* & *Gibson*; *Ehavnagar* (Kathiawar), *Woodrow*.

The succulent stems are eaten in curries when young. *Graham* says that the Arabs when suffering from affections of the spine, make beds of them. See Watt. Diet. Econ. Prod. 1. c.—DISTRIB. Throughout India; Java, E. Africa, Malaya, Ceylon.

6. **Vitis gigantea**, Bedd. in Trans. Linn. Soc. v. 25 (1866) p. 212. An enormous climber; trunk 4-5 in. in diam.; bark corky; branches

terete, glabrous; tendrils bifid. Leaves 6-8 by 5-6 in., exactly cordate with a deep sinus, long-acuminate and mucronate, glabrous above, sub-tomentose beneath, bristle-crenate, 5-nerved from the base, much reticulate; petioles 2-5 in. long; stipules glandular. Flowers minute, green, cymose; peduncles shorter than the petioles; branches of the cymes 3-5, umbellate or bearing 2-3 umbellate branches\* at the apex. Fruit not seen. El. B. I. v. 1, p. 648. *Cissus gigantea*, Planch, in DO. Monogr. Phan. v. 5, part 2, p. 622.—Flowers: Aug.

There is but one specimen in Herb. Kew. communicated by Mr. Talbot.—It is without fruit. KANAKA: Karwar, Talbot, 229!, Woodrow.

7. **Vitis repanda**, Wight & Am. Prodr. (1834) p. 125. Scandent; branches terete, covered with appressed rufous tomentum when young, at length more or less glabrate; tendrils forked or 0. Leaves 3-7

by 2-6 in. (the lower sometimes opposite), broadly ovate, cordate, acuminate, coarsely crenate-dentate, inciso-serrate or sublobed, often repand,

densely tomentose when young, particularly on the underside, at length glabrous above; petioles 1-3 in. long; stipules oblong, rounded at the apex. Peduncles leaf-opposed, solitary or sometimes 1-4, each

bearing 1-4 compound umbellately branched cymes; buds oblong-globose, hairy at the tips. Calyx truncate, hairy outside. Petals 4, pink, triangular-

oblong, 1/2 in. long, free or scarcely cohering at the apex.

Berry

pyriform, mucronate, 1-seeded. Seed obovoid, smooth. El. B. I. v. 1,

p. 648 (exclud. syn. *Cissus vitiginea*, L.); Trim. El. Ceyl. v. 1, p. 292; Talb. Trees, Bomb. p. 55; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271. *Cissus repanda*, Vahl, Symb. v. 3, p. 18; Grah. Cat. p. 32

;

Dalz. & Gibs. p. 39; Planch, in DC. Monogr. Phan. v. 5, part 2,

p. 474.—Flowers: Mar.-Apr. VERK. Qendal.

Common throughout the Presidency on the border of the heavy rainfall zone, Talbot. KONKAN: Law!, Stocks!; Malabar Hill, Bombay, Graham; Elephanta Island, Graham. DECCAN: Bowdhan Forest near Poona, Woodrow!—DISTRIBUTION. Throughout India; Ceylon.

8. **Vitis adnata**, Wall. Cat. (1828) 5998. Scandent; stems and inflorescence clothed with orange-red pubescence, at length glabrate; tendrils forked. Leaves 3-5 by 2-3 in., broadly ovate, abruptly and

shortly acuminate or cuspidate, bristle-serrate, densely clothed with

orange-red pubescence beneath, pubescent (at length glabrate) above, main nerves 4-5 pairs, prominent beneath; petioles 1-3 in. long, pubescent; stipules suborbicular, hairy, caducous. Flowers greenish-yellow, in

much-branched peduncled compound umbellate cymes; buds oblong;

fruiting pedicels more or less recurved. Calyx truncate or obscurely lobed. Petals 4, sometimes cohering at the apex and calyptrately deciduous. Berry  $\frac{1}{2}$  in. in diam., obovoid or subglobose, glabrous, apiculate, 1- (rarely 2-) seeded, black when ripe. Seeds with angular pits on the surface. Fl.B. I. v. 1, p. 649 ; Trim. Fl. Ceyl. v. 1, p. 290 ; Talb. Trees, Bomb. p. 55 ; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (1897) p. 271 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 251. *Cissus adnata*, Koxb. Fl. Ind. v. 1, p. 405; Wight, Icon. t. 144; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 494.—Flowers : Dec. Roxburgh (*I. c.*) says that the stipules are adnate, but I have not found them so, nor has Planchon (Monogr. 1. c). In Roxburgh's figure

(Icon. 1787), which has been copied by Wight (Icon, 144), the stipules are shown with a deep green centre, which cannot be distinguished in dried specimens.

KONKAN: *Stocks I* DECCAN : Bowdhan near Poona, *Woodrow, Bhiva* KANAKA: *Lawl*; moist forests near Goond (N. Kana»a), *Talbot*.—*DismiB*. Throughout India; Java, Borneo, Philippines, Ceylon.

9. **Vitis Linnsei**, *Wall Cat.* (1828) 5987. Scandent, clothed with short grey or fulvous pubescence; branches terete; tendrils stout, simple, woody, pubescent near the base, glabrous upwards. Leaves 2-5| by 1f-5 in., rotund-ovate, cordate or truncate at the base, shallowly or deeply palmately 3-5-lobed, sharply and irregularly dentate, softly glandular-pubescent and grey beneath (generally like the leaves of *Malva*) ; petioles |-1§ in. long, pubescent; stipules membranous, ovate, obtuse, pubescent outside, blowers 4-merous, in pedunculate cymes of 5-6 unequal branches; pedicels umbellate, slender, pubescent; buds oblong or subglobose, pubescent. Calyx truncate, pubescent outside. Petals ±\$—<i\ in. long, pubescent outside, oblong,\* hooded, often calvp-trately deciduous, usually free at the apex. Disk fleshy, 4-lobed. Style as long as the ovary. Berry § in. long, pyriform, blue and with a glaucous bloom on the surface, drooping, apiculate, 1-seeded. Seed obovoid, rugulose. Fl. B. I. v. 1, p. 649; Trim. Fl. Ceyl. v. 1, p. 291 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 255. *Cissus vitiginea*, Linn. Sp. Pl. p. 117 ; Planch, in DC. Monogr. Phan. v. 5, pa-rt 2, p. 472.—Flowers : Aug.

There can be no doubt that this plant is the true *Cissus vitiginea* of Linnaeus, the original type of his genus *Cissus*. Linnseus (Flor. Zeyl. [1747] p. 24) describes the leaves as subrotund, obsoletely pentagonal (as of *Malva*), tomentose, and the berry as blue, descriptions which are quite characteristic, that which compares the leaves to those of *Malva* especially so. In Amoen. Acad. ed. 1, v. 1 (1749) p. .390, Linnaeus amplifies the description, and in Sp. PL (1753) p. 117 he gives the name *C. vitiginea* to the plant which he again describes therein.

DECCAN : near Wadi Station, *Gt. I. P. Railway, Cookel* S. M. COUNTRY: Badami, *Woodrow!* —DISTRIBUTION. India (W. Peninsula); Ceylon.

10. **Vitis tomentosa**, *Heyne, in Both, Nov. PI Sp.* (1821) p. 157. Scandent; stems stout, covered with a dense reddish or white detergent tomentum ; tendrils long, forked, woody. Leaves 4-8 in. long, as broad as, or sometimes broader than long, palmately 3-5-angled, -lobed or -partite, closely serrate-dentate, floccose with whitish cobwebby wool, base cordate with a wide sinus, less commonly truncate.; petioles 1|-3in. long; stipules short, truncate. Flowers 5-merous, scarlet, small, sessile, in shortly peduncled compact densely woolly cymes 1-2 in. long, at the ends of stiff leaf-opposed peduncles ; peduncles bearing a long 1-3-forked tendril below the cyme ; buds broadly oblong, truncate, arane-ously woolly. Calyx thin, membranous, woolly outside, covering over the petals in bud, 5-lobed; lobes short, triangular. Petals 5, ovate-oblong, not cohering at the apex, glabrous. Ovary conical, 10-furrowed at the apex ; style 0 ; stigma foveolate. Berry subglobose, ^ in. in diam., 2-3-seeded. Seeds ovoid-oblong, coarsely and irregularly rugose. VI. B. I. v. 1, p. 650 ; Trim. Fl. Ceyl. v. 1, p. 288; Talb. Trees, Bomb, p. 55; Watt, Diet. Econ. Prod. v. 6, part 4, p. 258. *Ampelocissus tomentosa*, Planch, in Journ. Vigne Amer. (Dec. 1884) p. 375 & in



DC. Monogr. Phan. -v. 5, part 2, p. 376.—Flowers: Mar.

*YERX. Shend-vel.*

S. M. COUNTRY : common in the forests of the Dharwar districts along the banks of streams and rivers, *Talbot*; Belgaum, *Ritchie*, 116! KANAKA: dry Forests on the N. Kanara border, *Talbot*) Mandgod (N. Kanara), *Talbot*, 144!—DISTRIB. India (W. Peninsula); Ceylon.

11. **Vitis indica**, *Linn. Sp. Pl.* (1753) p. 202. Scandent; stems stout, hollow, cylindrical, more or less floccose-woolly, striate; tendrils simple, 6 in. long or more, floccose-woolly. Leaves 4-9 by 3-8 in., broadly ovate, deeply cordate with a narrow sinus and rounded lobes, acute or acuminate, coarsely glandular-dentate, glabrous at length above, tufous- or grey-tomentose on the nerves beneath; nerves 6-8 pairs, prominent beneath, the two lower pairs much branched on the lower side; petioles 3 in. long, densely floccose-woolly. Flowers 5-merous, greenish-purple, almost hidden in a reddish woolly tomentum, nearly sessile, in dense clusters on the thick branches of a racemose or paniculate cyme 2-3 in. long; buds oblong-obovoid, flattened at the top; peduncles 2-7 in. long, usually bearing a simple tendril below the cyme. Calyx small, truncate. Petals oblong,  $y^1$  in. long. Ovary grooved; stigma foveolate. Berry  $\frac{1}{2}$  in. long, ovoid-oblong, smooth, purple.

G-rah. Cat. p. 33; Dalz. & Gibs. p. 41; Trim. El. Ceyl. v. 1, p. 288; Talb. Trees, Bomb. p. 55; King, in Journ. As. Soc. Beng. v. 65 (1897) p. 112. *Vitis eriodada*, W. & A. Prodr. p. 130; Laws, in El. B. I. v. 1, p. 651; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271.

*Schembra*

*Valli*, Hheede, Hort. Mai. v. 7, p. 11, t. 6. *Ampelocissus eriodada* (?), Planch, in DC. Monogr. Phan. v. 5, part 2, p. 380.-

KONKAN : *Graham*; evergreen forests, *Talbot*. KANARA : Kadgal, *Woodrow*; evergreen forests, *Talbot*.—DISTRIB. India (W. Peninsula); Ceylon.

12. **Vitis latifolia**, *Roxb. Hort. Beng.* (1814) p. 18. An extensive

climber; stems weak, finely striate, glabrous; tendrils forked.

Leaves

4-7 in. long, as broad as long, orbicular, cordate, 3-7-angled or -lobed (sometimes palmately), sharp! and irregularly toothed, reticulately

veined, tomentose beneath when young, at length glabrous; main nerves 5-7 pairs, the lowest pair almost horizontal, branched on the  $t^1$  *ver* side;

petioles  $2\frac{1}{2}$ -4 in. long. Flowers small, 5-merous, deep reddish-brown,

in compact thyrsoïd cymes; buds ovoid-oblong, glabrous; peduncles

bearing a slender forked tendril below the cyme. Calyx small, truncate.

Petals  $y^1$  in. long, oblong, not cohering at the apex. Style 0; stigma foveolate. Berry edible,  $\frac{1}{2}$  in. long, globose, glabrous, usually

2-

(rarely 3-) seeded, black. Seeds ellipsoid,  $\frac{1}{3}$  in. long, rounded and transversely grooved on the back, flattened on, and with a raised ridge in the middle of the face, smooth, polished. El. B. I. v. 1, p. 652; Talb.

Trees, Bomb. p. 55; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271.  
*Cissus latifolia*, Vahl, Symb. v. 3, p. 18 ; G-rah. Cat. p. 32 ; Dalz. & Gibs.  
p. 39. *Ampelocissus latifolia*, Planch, in Journ. Vigne Amer.

(*Dec.*

1884) p. 374 & in DC. Monogr. Phan. v. 5, part 2, p. 370.—Elovers :  
June-Aug. VEBN. *Kadena*.

KONKAN : common, *Dalzell* & *Gibson*; Malabar Hill (Bombay), *Graham*; W. Ghats,  
*Kanitkar* !, *Woodrow*!; Eatnagiri, *Nairne*. DECCAN : Bowdhan near Poona, *Woodrow* I  
KANARA : moist forests near the coast; common near Karwar and on the N. Kanara  
Ghats, *Talbot*. GUJARAT: Godra, *Cooke*!—DISTRIB. India (N.W. Prov., Assam,  
W. Peninsula).

13. **Vitis Rheedei**, *TVI&M Sf Am, Prodr.* p. stem stout, cylindrical or tetrag 127. Quite glabrous; anous. Leaves variable, usually 3-foliolate (with very shortly stalked car sessile leaflets), sometimes 3-partite or 3-lobed or simple (often all < 3 kinds of leaves on one and the same plant); leaflets or segments unequal, the middle one lanceolate, the lateral ones very obliquely ovate or oblong, all acuminate or acute, bristle-serrate, glabrous on fyoth sides ; petioles 1-2 in. long ; stipules ovate-orbicular. Flowers 4-<sup>c</sup>merous, in subumbellate divaricate cymes which are usually shorter tzhan the petioles, numerous near the end of the branch and the last cyjme terminating it; pedicels short. Calyx saucer-shaped, subtruncate. Petals 4, free. Style long. Berry § in. long, obovoid, 1-seeded, blacky. Seed J-T<sup>3</sup>-g- in. in diam., girt with a ring round the middle, smooth, »yellowish-white. Fl. B. I. v. 1, p. 653 ; Trim. Fl. Ceyl. v. 1, p. 293 ; ^Tal. Trees, Bomb. p. oo. *Cissus trilobata*, Lara. Encyc. v. 1, p. 31 ; Gra[h. Cat, p. 33 ; Dalz. & Gibs. p. 39 ; Planch, in DC. Monogr. Phan. v. 5, j oart 2, p. 503.

KONKAN : ex *Dalzell \$ Gibson* 1. ec.—DISTRIB. India (W. Peninsula); Ceylon.

14. **Vitis setosa**, *Wall\**. *Cat.* (1828) 6009. Whole plant clothed with scattered glandular brisf ;ly hairs ; stem herbaceous, prostrate, weak, succulent, striate and sulcate; tendrils leaf-opposed, forked, long. Leaves succulent, sessile, i\*-foliolate (the lower sometimes simple); ■leaflets sub fleshy, 2-3 by Ig-'j2 in., shortly petioluled (the petiolule of the terminal leaflet the longest), elliptic or obovate-oblong, obtuse, irregularly bristle-toothed or laciniate, glabrous or nearly so above, glandular-hispid on the nerves beneath, pa r,le green ; stipules broadly ovate, acute. Flowers T^ in. long,' contracted in the middle, arranged in leaf-opposed or apparently terminal dichot oralous or trichotomous lax divaricate glandular cymes ; peduncles 1^ -3^ in. long, glandular-hispid; pedicels'short. Calyx cup-shaped, subtruncate. Petals hooded at the apex, ultimately reflexed. Style subulate. Iperry |-T\ in. in diam., ovoid, glandular-hispid, scarlet. Fl. B. I. v<sub>Jr</sub> 1, p. 654; Trim. Fl. Ceyl. v. 1, p. 296; Talb. Trees, Bomb. p. 55; A^Voodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271 ; Watt, Diet. Econ. ' ■ Prod. v. 6, part 4,'p. 257. *Cissus setosa*, Eoxb. Fl. Ind. v. 1, p. 41 0 ; Dalz. & Gibs. p. 41 ; Planch, in DC. Monogr. Phan. v. 5, part 2, ^p. 608. VERN. *Khdjagolicha-vel* Planchon is, I think, in ei Tor in calling the cymes axillary.

DECCAN : *Woodrow!*; Alandi, \* near Poona, *Bhiva!*; Poona districts, *Cooke !*; about Junnar, *Dalzell # Gibson.* tel\$. JVX. COUNTRY : Kuput hills of Dharwar in dry rocky situations, *Talbot.*— DISTRIB. Ind<sub>o</sub>Ija (W. Peninsula); Ceylon.

Every part of the plant is acrid ^j. It has some repute in native medicine, being used to promote suppuration and ass i<sub>st</sub> in the extraction of Guinea-worms.—See Watt, Diet. Econ. Prod. 1. c.

15. **Vitis trifolia**, *Lim^i. Sp. PI.* (1753) p. 203. Scandent; stems herbaceous or woody at the.ct base only, compressed, densely pubescent when young; tendrils shi.'pjrt, slender, usually branched. Leaves 3-foliolate ; common petioleejy\* f-lf in. long; leaflets thick, 1|-2| by |-1| (the middle one the largest n), rotund-ovate, ovate-lanceolate or obovate,

acute or obtuse, crenate-s; serrate or subinciso-dentate, more or less  
pubescent on both surfaces; main nerves 5-6 pairs; petiolules of the lateral leaflets 1-1.5 in. long, those of the terminal leaflets twice as long; stipules small, ovate, acute, Flowers in branched divaricate pubescent

long-peduncled cymes ; buds globose ; pedicels about £ in. long. Calyx pubescent outside, funnel-shaped, truncate or obscurely 4-lobed. Petals 4, oblong, rounded at the apex, -fa<sup>m</sup>- 1<sup>ong</sup>> hooded, pubescent outside. Disk cup-shaped with a plicate margin. Style conical. Berry turbinate, fleshy, ^-| in. long, 2-4-seeded. Seeds triangular, rounded and rugose on the back, cuneate on the face. King, in Journ. As. Soc. Beng. v. 65 (1897) p. 402. *Vitis carnosa*, Wall. Cat. 6018 ; Laws, in Fl. B. I. v. 1, p. 654 (*exclud. syn. Cissus auriculata, Roxb.*) ; Trim. Fl. Ceyl. v. 1, p. 294; Talb. Trees, Bomb. p. 56; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 252. *Cissus carnosa*, Lam. Encyc. v. 1, p. 31; Roxb. Fl. Ind. v. 1, p. 409 ; Grah. Cat. p. 33; Dalz. & Gibs. p. 40; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 570.—Flowers : Aug. 'VERN. A'mbat-vel.

There is no doubt as to the identity of this plant with *Vitis trifolia*, Linn. That Linnaeus included under the genus *Vitis* a plant with 4-merous flowers is easily accounted for by the fact that he never saw the plant. There is no specimen in the Linnean Herbarium in the Linnean Society, and Linnaeus merely copied a portion of the very meagre description given by Eay, Hist. Pl. v. 3 (1704) lib. 28, p. 68, who calls the plant *Vitis pearmedoorica*, a synonym quoted by Linnaeus. Kay, however, merely quotes Pettiver, who first described the plant in Phil. Trans, v. 22 (1700-1701) p. 707. I have personally examined Pettiver's actual specimens which are in the British Museum. Eheede (Hort. Mai. v. 7, t. 9) gives a good figure of the plant.

KONKAN: Ghats, *Talbot*. DECCAN: widely, *Woodrow*; Bhadgaon near Poona, *Bhiva*!; below Mahableshwar, *Cooke*!; hills near Bowdhan (Poona district), *Wood-row* ! S. M. COUNTRY : Badami, *Woodrow* ! ; common in the Dharwar district bordering on N. Kanara, *Talbot*. KANARA : Ghats of N. Kanara, *Talbot*.—DISTRIB. Throughout India; Ceylon, Malacca.

16. ***Vitis canarensis***, *Dalz. in Hook. Kew Journ. Bot.* v. 3 (1851) p. 123. Whole plant except the inflorescence at length

glabrous;

branches terete, striate. Leaves 3-foliolate, long-petioled ; leaflets 3-4

by 1<sup>^</sup>-2£ in., elliptic-obovate or lanceolate, suddenly and shortly acuminate, pubescent on both surfaces, at length glabrous, distantly serrate, reticulately veined, base inequilateral, somewhat cuneate ; petiolules of the lower leaflets \ in. long, those of the terminal leaflets twice as long. Flowers in axillary or leaf-opposed puberulous cymes ; peduncles shorter than the petioles. Calyx small, truncate or obscurely lobed. Petals 4,

oblong, subacute, hooded at the apex, JV<sup>n</sup>TV<sup>\*n</sup>- 1<sup>oDS</sup>> faintly puberulous outside. Style short; stigma acute. Berry -f<sup>^</sup> in. in diam., globose,

almost smooth, yellow, afterwards turning red, dry, 1-seeded.

Seeds

| in. long, ellipsoid or subglobose, smooth, speckled and faintly transversely striate. Fl. B. I. v. 1, p. 655 ; Talb. Trees, Bomb. p. 56.

*Cissus canarensis*, Planch, in DC. Monogr. Phan. v. 5, part 2, p. 620.—Flowers : Apr.

KANARA : Supa Ghats of N. Kanara in evergreen forests, common, *Talbot*; Kanara, *Dalzelli*; Ainshi (N. Kanara), *Talbot*, 2700!—DISTRIB. Apparently endemic.

17. **Vitis araneosa**, *Laws, in Hook.f. Fl B. I. v. 1 (1875) p. 657.*  
Scandent, the whole plant covered with floccose down which is deciduous  
except on the underside of the leaves ; tendrils foliate. Leaves  
3-foliate  
late, ultimately glabrous above, clothed beneath with persistent floccose

down, the common petiole 1-2| in. long; terminal leaflets 3-5 by 1<sup>^</sup>-2 in., elliptic or lanceolate, acute, crenate-serrate, attenuated or rounded and nearly equilateral at the base, on petiolules' about | -£ in. long; lateral leaflets scarcely smaller, very inequilateral at the base (the lower side much the larger and rounded, the upper side smaller and acute), on petiolules about \ as long as those of the terminal leaflets. Flowers 5-merous, in leaf-opposed small umbellate cymes ; peduncles reaching 3 in. long, bearing a forked tendril below the cyme ; pedicels very short. Calyx small, membranous, 5-lobed or truncate. Petals 5, oblong, rounded at the apex, ^ i<sup>n</sup>« l<sup>o</sup>ng- Ovary ribbed at the apex ; style short, stout; stigma foveolate. Berry globose, size of a pea, 1-4-seeded. Seeds ellipsoid, \ by£ in., rugose, pointed at one end, longitudinally grooved on the back and with a deep circular depression on the face. Talb. Trees, Bomb. p. 56; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 405 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 252. *Cissus araneosus*, Dalz. & Gibs. p. 41.—Flowers: Sept.

Rare. DECCAN : highest Ghats west of Junnar, *Dalzell & Gibson*.

This plant has been included on the authority of Dalzell and Gibson (Bomb. Fl. p. 41), who give its habitat as the highest Ghats west of Junnar. I have seen no specimens from the Bombay Presidency, those in Herb. Kew. being from the Pulncy Hill 3 *ex* Herb. Wight.—DISTRIB. India (W. Peninsula).

18. **Vitis elongata**, *Wall. Cat.* (1828) 6016. A large glabrous climber; stems very long, somewhat compressed, succulent, smooth, branching only near the top; tendrils long, simple, leaf-opposed. Leaves digitately usually 5- (less commonly 3-) foliolate, the common petiole 2-4 in. long, sulcate; stipules small, cordate; leaflets 4-6 by 1-2 in., oblong-lanceolate or elliptic-lanceolate, acuminate, serrate, narrowed into a very short petiolule. Flowers greenish-purple, 4-merous, in di- or di-trichotomous leaf-opposed cymes, the ultimate branches short, umbellate. Calyx membranous, cup-shaped, truncate. Petals 4, oblong, subacute, yV~8 ^n\* l<sup>o</sup>ng- Disk 4-lobed. Ovary ovoid; style slender; stigma simple. Berry about the size of a cherry, ellipsoid, 1-seeded, black when ripe. Seed f in. long, ellipsoid, pointed at one end, rugose on the back and with a large elliptic pit on the face. Fl. B. I. v. 1, p. 658; Talb. Trees, Bomb. p. 56 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 272. *Cissus elongata*, Eoxb. Fl. Ind. v. 1, p. 411 ; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 621.—Flowers: May-Oct.

KONKAN : *Law* ! DECCAN : Lanoli, *Dalzell I*; Khandala, *Bhiva* !; Panchgani, *Coo/ce* !; Mahableshwar, *Cooke*! KANARA : in the forests on the coast near Karwar, *Talbot*; Sirsi-Kumpta road, *Woodrow*!— DISTRIB. India (Sikkim Himalaya, Bengal, Silhet, Coromandel).

19. **Vitis auriculata**, *Wall. Cat.* (1828) 6031. An extensive climber; branches succulent; young parts softly pubescent; tendrils leaf-opposed, 2-3-cleft. Leaves 5-foliolate, common petioles 3-6 in. long, stipules large, ear-shaped; leaflets membranous, 2-6 by 1-4 in. obovate or rhomboidal, acute or shortly acuminate, serrate, glabrous above, more or less pubescent beneath; petiolules | -1| in. long, those of the terminal leaflet nearly twice as long as those of the lateral ones. Flowers 4-merous, small, in much-branched divaricate cymes longer than the petioles; peduncles weak, striate, pubescent; pedicels very short. Calyx membranous, truncate, pubescent outside. Petals 4, oblong, obtuse, hooded at the apex, pubescent outside. Fruit the size

a cherry, **globose**, smooth, shining, red when ripe, 1-seeded. **Seed** ellipsoid or subg **■. concave on the face**. **Fl. B. I. v. 1, p. 8** **Talb. Trees, Bomb. p. fjfi; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 272. Oissus aurucidata, Roxb. Fl. Ind. (ed. Carey) v. 1 (1820) p. 430; DC. Prodr. v. I, p. 682; Orail. Cat. p. 240; Dal\*. & Gibs. p. 40j Wight, Iron. t. 145; Planch, in DC. Monogr. Phan. v. 5, part 2, p. 565.**—Flowers; Mar.-June. **VLJIX. Kali-vet; 'Jamjli-hujorm.**

**KONKAN:** on rocks by the seashore, Bombay. **WoodrW; Vingorla, Datzefl \$ Gibson-BSCCA N : Sindewadi, top of Kartria Q-h'&t\*(Poc») & districts, Wbodr\*w!** **S. M. OOUKRTI :** about Dharwar, **Law ex Graham;** Belgaura and **Dharwar** districts, **Talfot.**—**DISTKIB.** Throughout **India,**

**20. Vitis teimifolia, Wight \$ Am. Prodr. (1834) p, 129.** Scandent; stems slender, striate, glabrous; **tendrils** leaf-opposed, slender, **usually forked.** **Leaves compound, petioled, the petioles 1-3 in.** long;

«aflets 5-7, **1-3 by £-2 in.** long, the lateral **pedately** arranged, the **-minal** leaflet slightly larger and **with a longer petiolule** than the **■ral** ones, all lanceolate, acuminate, mucronate, euneate at **the base, IJlowly repand-serrate, glabrous.** **Flowers bisexual, 4-merpus, in axillary dichotomously branched lax divaricate cymes.** **Calyx i'uih shaped,** truncate. **Petals 4, ovate-oblong, obtuse, hooded at the apex.** buV A <sup>in\*</sup> \*ong\* <sup>-^ ^ ^-lobed.</sup> **Style short, conical.** **Berry** |**-| in.** long, **fcurbmate-globose,** cream-colored when ripe, 1-4-seeded. **Seeds** T\ in. j£ long, pointed, euneate **on the face** and with a **prominent** longitudinal midrib down the centre of the rounded b'iek, transversely **rugose** at each side of the midrib. **Fl. B. I. v. 1, p. 660; Trim. Ft Ceyl. v. 1, p. 295; Talb. Trees, Bomb. p. 50; Woodr. in Journ. Bomb. Nat. v. 1 1 (1897) p. 272. Oissus Unuifolia, Heyne; in Wall. Cat. 0022; Planch, , in DC, Monogr. v. 5, part 2, p. 503.**—Flowers : May-Aug.

**KAKABA:** moist forests of the N, Kanara Ghats froui Ainahi southwards, **Talbot; Gudehalli near Karwar, Woodrow.**—**DISTRIB.** Iuditi generally; Gliiia, Japan.

**21. Vitis pedata, VaJd, ex Wall. Cat, (1828) 6027.**  
**Scandent,**

softly pubescent, sometimes hairy, rarely glabrate; tendrils long, slender, forked. Leaves 7-11-foliolate, the la<sup>^</sup>.ral leaflets **pedately** arranged; common petiole? 2-3 **in. long, hairy or glabrate;** leaflets 2-5 by 1-2] i?i., oblong-lan ex, olate, **acuminate, serrate,** pubescent or glabrous, **often** oblique at- the base; **petioluleS** variable **in** length, those **of** the terminal leaflets usually much longer than those of the lateral ones. Flowers bisexual, white, in axillary divaricate shortly pedunculate corymbose cymes. Calyx shallow, 4-lobed; lobes **triangular. Petals 4 (rarely o),** triangular, **calyprately deciduous,** cohering at **the apex.** Disk large, cup-shaped, exceeding the ovary. **Berry** about the size ot\* a pea, sub-globose or often **4-lobed, 2-4-seeded, cream-colored** when ripe. **Seeds** hemispheric, smooth, with a deep **circular** pit closed by a **thin membrane** **on** the Jat lower face. **PI. B. L v. 1, p. 661; Trim. Fl. Ceyl. v. 1, p. 295; Xnlb. Trees, Bomb. p. 56; Watt, Diet. Econ. Prod. v. 6, part 4, "p. 25b\*. Cissus pedata, Lamk. En eye. v. 1, p. 31; Grab. Cat. p. 33 j Dalz. & Gibs. p. 40; Planch, in DC, Monogr. Phan. v. 5, part 2, p. 558.**

**KOHKAX :** *Stocks<sup>l</sup>, Dahell, Graham, Talbof,* **KAMBA:** not common,



***Talbot*; Shirolu (N. Kanara), *Talbot*, J2687 J—DKTWB, India generalHy; Malaya, Cejloa.**

**22. *Vitis lanceolaria*, Wall. Ca\***. (1828) 6013. Scandent, glabrous except the inflorescence; stem woody; branches with lenticellate bark; tendrils long, slender, simple. Leaves 3- or 5-foliolate (in the latter case the leaflets pedately arranged); petioles 1-2 in. long; leaflets stalked, 3-5 by 1-2 in., oblong-lanceolate, irregularly serrate, glabrous. Flowers 4-merous, dioecious, axillary; male cymes paniculate, longer than the petiole; female cymes denser, corymbose, shorter than the petiole; branches of the inflorescence pubescent. Calyx funnel-shaped, truncate at the apex. Petals ovate-oblong, obtuse, hooded at the apex,  $y^1$  in. long. Stigma large, 4-lobed. Berry about  $\frac{1}{2}$  in. in diam., globose, 2-4-seeded, cream-colored when ripe. Seeds ellipsoid, obtusely angular on the face, rounded and with a single deep groove on the back, smooth. Fl. B. I. v. 1, p. 660; Trim. Fl. Ceyl. v. 1, p. 296; Talb. Trees, Bomb, p. 56; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 272. *Cissus lanceolaria*, Eoxb. Hort. Beng. p. 11; Grab. Cat. p. 33. *Cissus muriata*, Dalz. & Gibs. p. 40. *Tetrastigma lanceolarium*, Planch. in DC. Monogr. Phan. v. 5, part 2, p. 423.—Flowers: Dec-Mar. VEKN. *Razor-Ucha-yel*.

KONKAN: *Graham*; Matheran, *Woodrow*. KANARA: plentiful, *Dalzell* & *Gibson*; N. Kanara Ghats in evergreen forests, *Talbot*.—DISTRIB. India (Assam, E. & W. Peninsulas); Ceylon.

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*Vitis vinifera*, Linn. The grape vine (YERN. *Angur*) is cultivated in several parts of the Presidency. The moist climate of the Konkan is not suitable for vine-growing, but in parts of the Deccan, e. g. Ahmed-nagar, and especially Nasik, grapes of fairly good quality are grown for the Bombay market. The vines are usually trained on live posts cut from *Erythrina indica*, a tree known in the vernacular as the *Pdngara*.

The vine is largely cultivated in Sind, the climate of which province seems highly favorable to its growth. *Woodrow* (*Gardening in India*) speaks in terms of high approbation of the system of growing the vine at Hyderabad which was introduced by Mr. Strachan.

For an exhaustive account of the culture of the vine in India consult *Watt's Diet. Econ. Prod.* v. 6, part 4, pp. 258-296. *Woodrow* (*Gardening in India*, ed. 5 (1889) pp. 218-230) gives a full account of the mode of culture adored in the Bombay Presidency.

## 2. LEEA, Linn.

Small trees, shrubs or herbs; branches usually striate or sulcate. Leaves alternate, usually large, simple or 1-2-3-pinnate; petioles often dilated at the base; stipules sheathing. Peduncles leaf-opposed or sub-terminal. Tendrils 0. Inflorescence corymbosely cymose. Flowers small, red, yellow, white or green. Calyx 5-toothed. Petals 5, connate at the base and adhering to the staminal tube, revolute. Stamens united at the base into a 5-lobed tube; filaments inserted between the lobes of the tube, inflexed; anthers either free and exerted or connate and enclosed in the tube. Ovary inserted on the disk, 3-8-celled; ovules 1-2 in each cell, erect; style short; stigma thickened. Emit 3-8-celled, baccate, usually succulent, depressed-globular and lobed. Pyrenes wedge-shaped. Seed compressed.—DISTRIB. Tropical Asia, Africa, a few species in Australia; species about 50.

Leaves simple .....	1. <i>L. macrophylla</i> .
Leaves usually simply pinnate.	
Main nerves of leaflets close ; bracts subpersistent.	
Stems with crisp wings .....	2. <i>L. crispa</i> .
Stems without crisp wings .....	3. <i>L. aspera</i> .
Main nerves of leaflets not close; bracts caducous .....	4. <i>L. latifolia</i> .
Leaves 2-3-pinnate.	
Leaves glabrous .....	5. <i>L. sambucina</i> .
Leaves hairy beneath.	
Lobes of staminal-tube entire .....	6. <i>L. robusta</i> .
Lobes of staminal-tube notched.	
Leaves with scattered glandular discs beneath .....	7. <i>L. cequata</i> .
Leaves without glandular discs .....	8. <i>L. setuligera</i> .

**1. *Leea macrophylla*, Roxb. ex Homem. Hort. Hafn. v. 1 (1813) p. 231.** Herbaceous, erect, 1-3 ft. high ; root tuberous, perennial, red.

Leaves simple, broadly ovate, cordate, acute, or acuminate, coarsely serrate or sublobed, nearly as broad as long, the lower leaves up to 2 ft., the upper 6-9 in. long, dark green and glabrous above, cano-pubescent beneath ; main nerves opposite, 8-10 pairs, very prominent; petioles 2-5 in. long, deeply striate, glabrous. Flowers white, in terminal much-branched puberulous corymbose cymes often 1 ft. long ; buds oblong ; peduncles deeply grooved ; pedicels short. Calyx divided about 1/2 of the way down ; lobes triangular-ovate, tipped with a small hard point. Petals oblong. Staminal-tube deeply divided ; lobes oblong, entire or emarginate ; anthers laterally united in bud. Berry 1/2 in. in diam., black, 3-6-celled, depressed-globose, usually 3-6-lobed. *FL B. I.*

v. 1, p. 664 (excluding syn. *L. latifolia*), *G-rah. Cat.* p. 247; *Dalz. & Gibs.* p. 41 ; *Wight, Icon.* t. 1154 ; *C. B. Clarke, in Trim. Journ. Bot.* (1881) p. 137 ; *Talb. Trees, Bomb.* p. 57 ; *Woodr. in Journ. Bomb. Nat.* v. 11 (3897) p. 272; *Watt, Diet. Econ. Prod.* v. 4, p. 617.—Flowers: July-Sept. *VERN. Dinda.*

KONKAN : -*Nimmo* ex *Graham*; *Neral, Woodrow!*; *W. Ghats, Woodrow.* DECCAN : *Singhad* near *Poona, Bhiva!* KANAKA : common in the forests near *Yellapur* (*N. Kanara, Talbot.*

The root is employed in native medicine, being used for the cure of Guinea-worm. See *Watt, Diet. Econ. Prod.* 1. c.—*DISTRIB.* Throughout the hotter parts of India.

**2. *Leea crispa*, Linn, *Mantiss.* v. 1 (1767) p. 124.** An erect shrub, 4-8 ft. high; stems somewhat woody, jointed, swollen above the joints, and together with the tranches, peduncles, and petioles, furnished with 6-8 short crisp wings. Leaves usually simply pinnate (the lower pair of leaflets rarely with one (or both?) of the pair compound); leaflets oblong, very parallel-sided, 4-7 by 1-3 in., acute or shortly acuminate, sharply serrate, glabrous above, pubescent on the nerves and veins beneath, usually rounded at the base ; main nerves 12-20 pairs, pro

minent, parallel, nearly straight, one running into each serrature; veins transverse, nearly parallel, close, conspicuous beneath ; petiolules of the lateral leaflets  $\frac{1}{8}$  in. long, those of the terminal much longer.

Flowers greenish-white, in small terminal slightly pubescent cymes ; bracts subpersistent, linear-subulate,  $\frac{1}{2}$  in. long; bracteoles  $\frac{1}{2}$  in. long, lanceolate. Calyx shortly divided; lobes triangular, gland-tipped.

Petals oblong. Lobes of the staminal-tube linear-oblong, bifid ; anthers

not united in bud. Style grooved. Berry  $\frac{1}{2}$  in. in diam., depressed-

globular, usually 2-6 (or more) -lobed, black when ripe. Fl. B. I. v. 1,

s  $\frac{1}{2}$

p. 6G5 ; C. B. Clarke, in Trim. Journ. Bot. (1881) p. 135 ; Talb. Trees, Bomb. p. 57 ; Watt, Diet. Econ. Prod. v. 4, p. 616.—Flowers : Aug.

KONKAN : from the sea-level upwards in moist forests, *Talbot* KANARA : Karwar, *Talbot*—DISTRIB. India (W. Trop. Himalaya, Oude, W. Peninsula).

3. **Leea aspera**, *Edgew. in Trans. Linn. Soc.* v. 20 (1841) p. 36 (*not* of Wall.). A shrub 6-10 ft. high; stems terete, not crisply winged. Leaves usually simply pinnate (one or both the leaflets of the lowest pair sometimes compound); leaflets 5-7, elliptic, not parallel-sided, 5-8 by 2|-4 in., more or less acuminate, glabrous or with short stiff hairs above, finely pubescent beneath, irregularly serrate, cordate at the base; main nerves 12-18 pairs carried nearly to the margin, then curved and bifurcate so that the crenatures of the margin are often nearly twice as many as the nerves; petiolules |-| 'in. long, those of the terminal leaflets twice as long as those of the lateral ones. Flowers white, in much-branched trichotomous pubescent cymes, which are shorter than the leaves ; bracts linear-subulate, -J--| in. long, subsistent. Calyx shallowly lobed; lobes gland-tipped and with membranous margins. Petals ovate-oblong, subacute. Staminal-tube divided about \ way down ; lobes bifid, sloping towards the apex ; anthers not united in bud. Berry size of a pea, depressed-globular, often 2-6-lobed, smooth, black when ripe. Fl. B. I. v. 1, p. "65; C. B. Clarke, in Trim. Journ. Bot. (1881) p. 136 ; Talb. Trees, Bomb. p. 57; "Woodr. in Journ. Bomb. Nat, v. 11 (1897) p. 272; Watt, Diet. Econ. Prod. v. 4, p. 616.—Flowers: July-Aug.

KONKAN : *Law* !; Bombay, *Capt. Geburve*! DFXCAN : Khandala, *Coolce* !; Karli, *Woodrow* ! Karli hills near Poona, *Kamtkar* ! KANARA : throughout N. Kanara in moist forests, *Talbot*; Karwar, *Talbot*, *Woodrow*!—DISTRIB. India (W. Tropical Himalaya, Oude, W. Peninsula).

4. **Leea latifolia**, *Wall. Cat.* 1828, 6821. A shrub ; young branches rusty-puberulous. Leaves simply pinnate ; leaflets 3-5, elliptic-oblong, 9-12 by 6-11 in., subacute or obtuse, distantly serrate, glabrous above, mealy-white pubescent beneath, base cordate; main nerves opposite, 8-10 pairs ; veins transverse and distinct; petiolules of terminal leaflets |-1 in. long, the upper pair of lateral leaflets sessile or nearly so, the lower pair (when present) shortly stalked. Flowers in long-peduncled pubescent umbellate cymes ; bracts caducous. Calyx pubescent outside ; lobes short, triangular, with membranous margins. Petals oblong. Lobes of the staminal-tube notched ; anthers united in bud. Style angled and ribbed ; stigma concave. Berry size of a pea, depressed-globular, usually 2-6-lobed. C. B. Clarke, in Trim. Journ. Bot. (1881) p. 138 ; King, in Journ. As. Soc. Beng. v. 65 (1897) p. 410. *L. coriacea*, *Laws*, in Fl. B. I. v. 1, p. ^o; Talb. Trees, Bomb. p. 57. *L. cinerea*, *Laws*, in Fl. B. I. v. 1, p. 665.

There is but. one specimen (in fruit only) from Bombay in Herb. Kew. labelled "Konkan, *Slocks* " !—DISTRIB. India (W. Peninsula); Malaya.

5. **Leea sambucina**, *Willd. Sp. PL* v. 1 (1797) p. 1177. A shrub 4-10 ft. high; branches numerous, straight, tough, the young ones green, Vabrous. Leaves 15-20 in. long, 2- (rarely 3-) pinnate; leaflets 3-8 |y li-3<sup>J</sup> in., oblong or elliptic-oblong, acuminate, coarsely and irregularly ferrate, 'glabrous, base acute or cuneate; main nerves 7-12 pairs,

prominent beneath, arched ; petiolules of the lateral leaflets  $\frac{1}{2}$  in. long, those of the terminal much longer. Flowers white, in large branched corymbose cymes; bracts inconspicuous, caducous. -Calyx shortly divided ; lobes subacute or rounded and with membranous margins. Lobes of the staminal-tube rounded at the apex, notched; anthers united in bud. Berry  $\frac{1}{2}$  in., depressed-globular, often 2-6-lobed, smooth, shining, purple-black. *El. B. I. v. 1, p. 666* (excluding some synonyms); C. B. Clarke, in *Trim. Journ. Bot.* (1881) p. 139; Talb. *Trees, Bomb.* p. 57 ; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 272 ; Watt, *Diet. Econ. Prod.* v. 4, p. 618. *L. Staphijlea*, Eoxb. *Hort. Beng.* p. 18; *Grah. Cat.* p. 33; *Dalz. & Gibs.* p. 41; *Trim. Fl. Ceyl.* v. 1, p. 297.—Flowers: July-Oct. VERN. *Knrlcani; Dinda*.

Where there is a heavy rainfall short aerial roots are developed abundantly from the branches (*Talbot 1. c*).

Widely distributed throughout the Presidency. KONKAN : *Stocks!*, *Law !* ; W. Gh;il s, *Woodrow*; Konkan and Ghat jungles, common, *Dalzclll*; Salsette, *Graham*; Matherun, *Conkel*, *H. M. Birdwood*. DECCAN: *Khandula, Cookel*; Lanoli, *Woodrow* || *Kartriz* Gluit near Poona, *Kantikarl*; *Knrl*, *Woodrow!*; Mahableshwar, *Cookel*, *H. M. Birdwood*.—DISTRIB. Throughout India ; Malay islands\*, Ceylon.

6. ***Leea robusta***, *Eoxb. Hort. Beng.* (1814) p. 18. A shrub 5-6 ft. high; young branches rusty-pubescent. Leaves simply pinnate to

tripinnate; rhachis and petioles angled, not winged'; leaflets 3-9 by 1-3j in. (the terminal leaflets very much larger than the lateral ones, acute *rp* the base while the lateral leaflets are rounded), oblong or elliptic-oblong, acuminate, irregularly serrate, sparsely strigose above, pubescent and with the nerves sparsely strigose beneath ; main nerves 8-12 pairs, ascending ; petiolules of the terminal leaflets often reaching 2 in., those of the lateral leaflets  $\frac{1}{2}$  in. long. Flowers greenish-white in long-peduncled much-branched compound cymes; bracts caducous.. Calyx divided about  $\frac{1}{2}$  of the way down. Lobes of the staminal-tube

rounded or truncate, not bifid at the apex ; anthers slightly united in

bud. Berry  $\frac{1}{2}$  in., depressed-globular, black when ripe; pyrenes 6-4.

C. B. Clarke, in *Trim. Journ. Bot.* (1881) p. 164 ; King, in *Journ. As. Soc. Beng.* v. 65 (1897) p. 4L7 ; Talb. *Trees, Bomb.* p. 57. *L. difusa*,

*Laws*, in *Fl. B. I. v. 1, p. 667*.—Flowers : Aug.

Kr <sup>T</sup>KAN: Mira Donger near Pen, *Dahelll* KANARA : Ghats of N. Kanara and sea-level near Kadra, *Talhot*.—DISTRIB. India (Nipal, Khasia mountains, Andamans); Malaya.

7. ***Leea aequata***, *Linn. Mantiss.* v. 1 (1767) p. 124. A shrub

4-10 ft. high ; young shoots more or less pubescent. Leaves 2-pinnate (the upper often simply pinnate or rarely simple); rhachis angled but hardly winged, pubescent; petioles not dilated at the base; leaflets 3-7 by 1-11 in., oblong or ovate-oblong, acuminate, irregularly serrate, more or less hairy on both surfaces, covered beneath with numerous flat

circular discs; main nerves 7-12 pairs, ascending, curved; petioles of the lateral leaflets  $\frac{1}{2}$ - $\frac{1}{3}$  in., those of the terminal reaching 1 in. long.

Flowers white, very shortly pedicelled, in short compact pubescent cymes ;  
bracts large, broadly ovate, obtuse, caducous. Calyx pubescent  
and  
sparsely covered with glandular discs outside, cleft about \ the way down; •  
lobes ovate, subacute. Lobes of the staminal tube oblong, bifid ; anthers  
united in bud. Berry \ in. in diam., depressed-globular, usually 2-6-

lobed, black when ripe. C. B. Clarke, in *Trim. Journ. Bot.* (1881) p. 163; King in *Journ. As. Soc. Beng.* v. 65 (1897) p. 418. *L. hirta*, Koxb. ex Hornetn. *Hort. Hafn.* v. 1, p. 231; Laws, in *Fl. B. I.* .v. 1, p. 668; Talb. *Trees, Bomb.* p. 57; Watt, *Diet. Econ. Prod.* v. 4, p. 617.—1 lowers in the rains (*Talboi*).

The circular discs on the underside of the leaves furnish an excellent specific character. They are found on no other Indian *Leea* and are always present in this species.

KANARA: evergreen forests near Karwar, *Talbot* 1. c— DISTRIB. India (Sikkiin Himalaya, Assam, East Bengal, Siihet, the Andamans).

8. ***Leea setuligera***, C. B. Clarke, in *Trim, Journ. Bot.* (1881) p. 105. Leaves compound, 2-3-pinnate; leaflets elliptic or elliptic-lanceolate, acuminate, sharply and closely serrate, clothed with stiff bristles between the nerves above, bristly on the nerves beneath, base rounded or sub-acute; main nerves about 7-12 pairs; petiolules of lateral leaflets 0-g in. long. Flowers in small compact umbellate cymes; bracts linear-subulate, caducous; peduncles 1-1f in. long; pedicels very short. Lobes of the staminal-tube bifid; anthers united in bud. Fruit not seen.

The flowers are, as far as it is possible to judge from a dried specimen, red.

There is but one specimen in Herb. Kew. labelled "Konkan, *Stocks*" (!) which matches with no other specimen of *Leea* in the Herbarium.

### OEDER XLIII. SAPINDACEJE.

Trees or shrubs, rarely climbing herbs. Leaves alternate (rarely opposite), generally compound; stipules caducous or 0. Flowers usually polygamo-dioecious, often irregular. Calyx usually ^-5-lobed or 4-5-sepalous; lobes or sepals often unequal, imbricate or rarely valvate. Petals 4-5 or 0, free, equal or unequal, often bearded or squamate at the base within. Disk annular or unilateral, rarely wanting in the male flowers. Stamens 5-10 (usually 8), inserted inside the disk at the base of the ovary, or outside, or on the disk, sometimes unilateral; filaments often pubescent, usually free; anthers 2-celled, basifixed or versatile. Ovary centric or excentric, entire, lobed or partite nearly to the base, 1-4-celled; ovule 1 (rarely 2 or more) in each cell, affixed to the axis of the ovary, ascending; style simple or divided, usually terminal; stigma usually simple. Fruit capsular or indehiscent, entire or lobed, sometimes winged. Seeds globose or compressed, arillate or naked, usually exalbuminous; embryo usually thick, sometimes plicate or spirally convolute.—DISTRIB. Throughout the world, especially in the Tropics; genera 73; species 500-800.

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*Erioglossum edule*, Blume, *Bijdr.* p. 229, a tree which occurs in the Sikkim Himalaya, Assam, Birma, the Indian Archipelago, and North-western Australia, has been planted in the Girgaum Woods, Bombay, but is certainly not indigenous. It has sweet-scented flowers in paniced racemes, and the wood is useful, strong, and durable, chocolate-colored in the centre.

*Blighia sapida*, Konig, in *Kon. & Sims, Ann. Bot.* v. 2, p. 571, the *Akee* tree of Jamaica, a native of Africa and the West Indies, has been planted in Parel and Dapuri gardens and in Lanoli Wood. It has abruptly-pinnate leaves, 3 or 4 pairs of pale-green glabrous leaflets, small white flowers and a bright-red pear-like /nut. about



4 inches long, which is edible, but (*vide* Dalzell & Gibson) can only be eaten fried and is insipid (see Dalz. & Gibs. Suppl. p. 13).

*Filicium decipiens*, Thwaites, Enum. p. 408, a very ornamental tree, rather slow of growth, with bright-green fern-like leaves, narrow leaflets and a winged rhaohis, has been grown at Poona from seeds procured from the botanical gardens at Peradeniya, Ceylon (see Woodrow, Gardening in India, ed. 5, p. 232).

Leaves alternate, exstipulate ; seeds exalbuminous.

Stamens inserted within the disk.

Flowers irregular; disk unilateral.

Herbs ; fruit an inflated capsule ..... 1. GARDIOSPERMUM.

Trees or shrubs; fruit indehiscent.

Leaves pinnate ..... 2. HEMIGYROSA.

Leaves 1-3-foliolate ..... 3. ALLOPHYLUS.

Flowers regular; disk annular.

Fruit not inflated, indehiscent; flowers small.

Fruit not breaking up into cocci; petals 0. 4. SCILEICIBRA.

Fruit of 1-3 indehiscent cocci.

Sepals free, much imbricate ..... 5. SAIMNDUS.

Sepals connate, valvate or nearly so . 6. NEPIHMUM.

Fruit an inflated capsule; flowers large ..... 7. HARPULMA.

Stamens inserted outside the disk; fruit 3-winged .... 8. DODON.EA.

Leaves opposite, stipulate; seeds albuminous ..... 9. TUKPINIA.

## 1. CARDIOSPERMUM, Linn.

Climbing tendril-bearing herbs with wiry stems. Leaves alternate, exstipulate, 2-ternate; leaflets coarsely crenate or serrate. Flowers irregular, polygamo-dicecious, in axillary racemes or corymbs, the common peduncle 2-cirrhose. Sepals 4, much imbricate, the 2 exterior small. Petals 4, arranged in pairs, the two upper furnished with a large scale below the base of each, the 2 lower smaller, distant, each furnished with a small crested scale. Disk unilateral, undulate, of 2 glands opposite the lower petals. Stamens 8, excentric; filaments unequal, free or connate at the base. Ovary sessile or subsessile, 3-celled; ovule solitary, ascending; style short, 3-fid. Capsule membranous, trigonous, 3-celled, 3-valved, inflated, loculicidal. Seeds globose, usually arillate at the base ; testa crustaceous ; cotyledons large, transversely conduplicate.—DISTRIB. Chiefly in Tropical America and Africa; species about 30.

Capsules winged at the angles ..... 1. *C. Halicacabum*.

Capsules not winged at the angles ..... 2. *C. canescens*.

1. **Cardiospermum Halicacabum**, Linn. *Sp. PL* (1753) p. 366. Annual and perennial ; branches slender, striate, pubescent or glabrous. Leaves deltoid, 2-ternate ; petioles f-1<sup>^</sup> in. long; ultimate segments of the leaves lanceolate, glabrous or sparsely pubescent, inciso-serrate, very acute at the apex and narrowed at the base. Flowers white, J-<sup>^</sup> in. long, in few-flowered umbellate cymes; peduncles slender, stiff, axillary, l|-4 in. long, provided beneath the cyme with 2 opposite usually circinate tendrils; pedicels very slender, |-| in. long. Outer sepals rounded, obovate, usually with a few scattered hairs on the back just below the apical margin ; inner sepals larger than the outer, rounded, membranous. Petals rounded at the apex. Style very short. Capsules shortly stalked, subglobose or more commonly depressed-pyriform, trigonous, truncate at top, winged at the angles, bladderly, veined. Seeds globose, £-\ in. in diam., smooth, black, with a small white heart-shaped aril. Fl. B. I. v. 1, p. 670; Qrah. Cat. p. 28; Dalz. & Gibs. p. 34; A.iMi. Ph. & Sind PI. p. 34; Trim. Fl. Ceyl. v. 1, p. 299; Radlk. in

Engl. & Prantl, *Pflanzenf.* v. 3, part 5, p. 308, fig. 159, A-c; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 272; Watt, *Diet. Econ. Prod.*, v. 2, p. 155.—Flowers: Dee. YERN. *Tjovati*; *Kapal-jjhodi*.

Known as the *Heart-pea* or *Balloon-vine*. Common in hedges throughout the Presidency, *Graham, Dahell Sf Gibson*. DECCAN: hills, *Woodrow*; Poona, *Baqjil, Cooke!*, *Jacquemont*, 443! SIND: *Stocks*.

The root, leaves and seeds are extensively employed in native medicine. See Watt, *Diet. Econ. Prod.* 1. c.—DISTRIB. Most warm countries.

2. **Cardiospermum canescens**, *Wall. Fl. As. Bar.* v. 1 (1830) p. 14. Scandent; stem shrubby, deeply 5-furrowed, more or less pubescent. Leaves 2-ternate, pubescent on both sides; ultimate segments smaller than in the preceding species and blunter, the terminal segment mucronate or cuspidate. Flowers larger than in the preceding species, §-§ in. long, in long-peduncled umbellate cymes. Tendrils as in *C. Halicacabum*; Capsules 1-1½ in. long, inflated, subglobose, 3-angled, not winged. Seeds as in the preceding species. *Fl. B. I.* v. 1, p. 670; *Wight, Icon.* t. 74. *C. Corindum*, *Trim. FL Ceyl.* v. 1, p. 300.

I have seen only one specimen from Bombay in *Herb. Kew.* marked "Konkan, *Stocks I*"—DISTRIB. India (Birma, W. Peninsula); Ceylon, Abyssinia.

## 2. HEMIGYROSA, Blume.

Trees. Leaves alternate, exstipulate, pinnate, pale; leaflets opposite or nearly so, 2-3 pairs, petioluled, entire, coriaceous, oblong, reticulately veined. Flowers polygamo-monocious, irregular, in axillary many-flowered paniculately arranged spicate racemes. Sepals 5, unequal, erect, concave, the 2 outer smaller. Petals 4-5, unequal (the 5th often deficient or scale-like), erect, clawed, with a jagged hooded scale near the base. Disk pulvinate, unilateral. Stamens usually 8, unequal, unilateral; filaments pilose; anthers not or scarcely exerted. Ovary excentric, turbinately trigonous, 3-celled; ovule solitary in each cell; stigma trigonous, obtuse. Fruit indehiscent, thickly coriaceous, fleshy or woody, trigonous or globose, velvety or tomentose, 3-celled, the cells hirsute within. Seeds oblong, exarillate; testa coriaceous; cotyledons fleshy, equal.—DISTRIB. Tropical Asia; species 3-4.

1. **Hemigyrosa canescens**, *Thwaites, Enum.* (1858) p. 56 & p. 408. A middle-sized tree with a crooked trunk of considerable girth; bark ash-colored. Leaves variable in length; rachis smooth; leaflets 2-3 pairs, opposite or subopposite, oblong-lanceolate, obtuse, acute or emarginate, 3-5 by 1-1½ in., entire, glabrous, shining, ashy green; petiolules ½-1 in. long. Flowers about ½-1 in. long, in simple or panic-led velvety-pubescent racemes which are axillary or scattered over the branches; bracts minute, triangular. Sepals unequal, the 2 outer ovate-orbicular, ciliate, the 3 inner larger, orbicular, concave, with ciliate or laciniate margins. Petals white, oblong-spathulate, shortly clawed, slightly laciniate; scale about ½ as long as the petal, hairy at the base, 2-lobed at the apex, the lobes laciniate. Stamens slightly longer than the petals; filaments hairy. Fruit ½-1 in. in diam., subglobose or trigonous, velvety-tomentose, apiculate, yellow. *Fl. B. I.* v. 1, p. 671; *Bedd. Flor. Sylvat.* t. 151; *Trim. Fl. Ceyl.* v. 1, p. 301; *Talb. Trees, Bomb.* p. 58; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 272; *Watt, Diet. Econ. Prod.*

v. 4, p. 221. *Gupania canescens*, Pers. Syri. v. 1 (1805) p. 413; Grab. Cat. p. 2<sup>J</sup>; Dalz. & Gibs. p. 35.—Flowers : Feb.-May. VERN. *Karpa* ; *Lokhundi*.

KONKAN: Parel, *Wbodrow*; Matheran, *Kamtkarl*, *H. M. Birdwood*. BECCAN : Palasdari, *Woodtow* \\ Bimashankar, *Gibson*; Khandala, *Grahim*. S. M. COUNTRY : Itamkat, *Dalzcell* § *Gibson*.—*DISTMB*. India (Birma, Madras, W. Peninsula); Ceylon.

### 3. ALLOPHYLUS, Linn.

Shrubs or small trees, ecirrrose. Leaves alternate, exstipulate, 1-3-foliolate ; leaflets usually large, entire or serrate. Racemes simple or laxly paniculate, axillary. Flowers irregular, small, polygamo-dioecious. Sepals 4, in opposite pairs, cucullate, membranous, widely imbricate, the 2 outer smaller. Petals 4 (the place of the 5th vacant), usually small, naked inside or with a shaggy scale above the claw. Disk unilateral, lobed or swollen into 4 glands opposite the petals, very rarely obsolete. Stamens excentric or scarcely centric, included or shortly exerted. Ovary usually 2-celled; ovule 1 in each cell, ascending from its base. Fruit indehiscent, usually 1-2-lobed; lobes sub<sup>^</sup>lobose, fleshy or dry. Seeds erect, usually with a very short fleshy aril; embryo curved; cotyledons plicate.—*DISTRIB*. Chiefly Tropical America; less frequent in Tropical and S. Africa, the Pacific Islands and Australia; species about 80.

1. **Allophylus Cobbe**, *Blume, Rumph.* v. 3 (1847) p. 131. A small tree, or a shrub often climbing to a considerable height. Leaves 3-foliolate, 3-5 | by lf-2- | in., alternate, crowded at the extremities of the branchlets, drooping ; common petioles 2-2<sup>^</sup>- in. long, ferrugineo-pubescent; leaflets ovate or elliptic, acute or acuminate, sharply and distantly serrate-dentate, more or less hairy or pubescent on both surfaces, the terminal leaflet usually acute at the base, the lateral leaflets usually rounded and more or less oblique; petiolules of the lateral leaflets  $\sim$ <sup>^</sup> in., those of the terminal leaflets sometimes reaching 1 in. long. Flowers small, white, shortly pedicelled, in fascicles along the branches of spicate axillary 2-4-branched racemes. Sepals glabrous. Petals cuneate, with a fringed scale above the claw. Stamens 8. Ovary 2-lobed, hairy. Fruit globose, smooth, size of a pea, red when ripe. *El. B. I.* v. 1, p. 673 ; *Trim. Fl. Ceyl.* v. 1, p. 303; *Talb. Trees, Bomb.* p. 58 ; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 272; *Watt, Diet. Econ. Prod.* v. 1, p. 175. *Schmidelia Kobbe*, *Lamk. Tab.* v. 2, p. 443, t. 312, f. 2. 8. *Cobbe*, *DC. Prodr.* v. 1, p. 610; *Grah. Cat.* p. 29. *Gardiospermum Schmidelia* & *Gardiospermum villosa*, *Dalz. & Gibs.* p. 34.—Flowers : May-Aug. YERIST. *Tipan*.

KONKAN : Mira hills near Pen, *Dalzcell* cf *Gibson*. DECCAN : Lanoli, *Woodrow*, *Kanitkar*! Mahableshwar, very common, *Cooke* !, *H. M. Birdwood*. KANAKA : in moist forests and along the banks of rivers and streams in N. Kanara, usually a scandent shrub, *Talbot*.—*DISTRIB*. India (Assam, Siihet, Birma, E. & W. Peninsulas); Ceylon, Malaya, N. Australia.

### 4. SCHLEICHERA, Willd.

Trees. Leaves alternate, exstipulate, pinnate; leaflets opposite or alternate. Flowers regular, polygamo-dioecious, small, fascicled on slender simple racemes or panicles; pedicels slender. Calyx small, 4-6-iiid;

lobes valvate or obscurely imbricate. Petals 0. Disk complete, with waved margin. Stamens 5-8 inserted within the disk ; filaments more or less pubescent. Ovary 3-4-celled, attenuated into a rigid style ; ovule 1 in each cell, erect; stigma 3-4-lobed. Fruit dry, suberustaceous, indehiscent, ovoid, cuspidate with the style, 1-3-celled. Seeds with a fleshy aril, erect; embryo conduplicate ; cotyledons connate, unequal.—DISTRIB. Tropical Asia and the Philippines ; species 2.

**1. *Schleichera trijuga*, Willd. *Sp. PL* v. 4 (1805) p. 1096.** A large tree 40-60 ft. high, with smooth grey bark. Leaves abruptly pinnate; petioles and rhachis terete, pubescent; leaflets 2-4 pairs (the leaflets of the lowest pair 2-3<sup>^</sup> by 1-2| in., those of the terminal pair 4-9 by 1-J-4 in.) opposite or nearly so, usually very obtuse (rarely shortly acuminate), entire, glabrous, base rounded or tapering; lateral nerves 12-20 pairs with reticulate veins between; petiolules very short, articulated with the rhachis. Flowers white or yellowish, fascicled, on interrupted often branched racemes which are axillary or below the leaves, often several on short branchlets. Calyx-lobes acute. Fruit size of a small plum, pointed, often echinate with stout rather blunt prickles. Seeds 1 or 2, enclosed in a pulpy edible, aril which has a pleasant acid taste; testa smooth brown. *FL B. I.* v. 1, p. 681 ; *Grah. Cat.* p. 29; *Dalz. & Gibs.* p. 35; *Trim. Fl. Ceyl.* v. 1, p. 304; *Talb. Trees, Bomb.* p. 59 ; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 272; *Watt, Diet. Econ. Prod.* v. 6, part 2, p. 487. *Sapinclus trifoliata*, Linn. *Sp. Pl.* (1753) p. 367.—Flowers : Feb.-May. VEEN. *Kosimb.*

KONKAN : *Stocks!*; Bombay, *Law!*; Kanheri forests and Salsette, *Graham* ; Thana districts, *CooJce!*; Matheran Ghat, *H. M. Birdwood.* DECCAN : Khandala, *Woodrow.* KANARA : Mandgod (N. Kanara), *Talbot*, 364!; Sirsi, *Woodrow*; Kala naddi (below fall), *Ritchie*, 1657!—DISTRIB. Throughout India; Oeylon, Java, Timor.

The tree is sometimes known as the *Lac tree*, the lac which is produced on it beLig the most highly prized quality. The wood is hard and durable and the oil obtained from the seeds has been employed for the cure of itch. See *Watt, Diet. Econ. Prod.* 1. c.

## 5. **SAPINDUS**, Tournef. ex Linn.

Trees or shrubs. Leaves alternate, exstipulate, simple, 1-foliolate or abruptly pinnate ; leaflets usually entire. Flowers polygamous, regular, in terminal or axillary racemes or panicles. Sepals 4-5, in 2 series, much imbricate. Petals 4-5, naked or with scales above the claw. Disk complete, annular or fleshy, usually lobed. Stamens usually 8-10, inserted within the disk ; filaments free, usually pilose ; anthers versatile. Ovary entire or 2-4-lobed, 2-4-celled ; ovule 1 in each cell; style terminal; stigma 2-4-lobed. Fruit fleshy or coriaceous, 1-2 (rarely 3-4-) coccous, the cocci oblong or globose, indehiscent. Seeds usually globose, usually exarillate ; testa crustaceous or membranous ; cotyledons thick; radicle short.—DISTRIB. Tropical regions of the world; species about 40.

**1. *Sapindus laurifolius*, Vahl, *Symb.* v. 3 (1794) p. 54.** A handsome tree. Leaves abruptly-pinnate; leaflets subopposite, 2-3 pairs 3-7 by 1-4 in., lanceolate or elliptic-lanceolate, acute or acuminate, entire, glabrous above, more or less pubescent beneath, base acute; main nerves about 8-12 pairs ; petioles g in. long, pubescent. Flowers

dingy white, in terminal rusty-pubescent panicles, the males numerous/ the bisexual flowers few. Sepals 5, rotund-ovate, ciliolate, fulvous-pubescent outside, glabrous **within**,  $\frac{1}{2}$  in. long. Petals 4-5, shortly-clawed, narrower than the sepals, **lanceolate**, villous outside and more or less so within, usually furnished with 2 villous scales attached at each side of the petal about half way up. Disk concave with a fleshy hirsute margin. Stamens 8 ; filaments villous; anthers oblong, apicu-late. **Ovary** densely hairy. Fruit fleshy, 2-(usually 3-) lobed, clothed with fulvous hairs when young, glabrous and wrinkled **when** ripe, with 1 seed in each lobe. Seeds blackish, smooth, about the size of a large pea, very hard. **Grab. Cat.** p. 29 ; **Dak. & Gibs.** p. 34 ; **Brandis**, For. Flor. p. 106 ; **Trim. PI. Ceyl.** v. 1, p. 306. *S. trifolius*, El. B. I. v. 1, p. 682, **in part** (*not* of Linn.); **Talb. Trees, Bomb.** p. 59; **Woodr.**, in **Journ. Bomb. Nat.** v. 11 (1897) p. 272 ; **Watt**, **Diet. Econ. Prod.** v. 6, part 2, p. 468.—Flowers : Oct.-Dec. **VEEN. Ritka.**

Generally to be met with about villages in the Konkan, *Graham*, KONKAN : *Stocks!*, *Daheh!* ; Rainbdg (Matheran), *H. M. Birdwood*. S. M. COUNTRY : Ram-ghiU, *Ritchie*, 1000!; Londa, *Bhiva!* KASAH.A : Kala naddi, *Ritchie*, 1000!; indigenous on the Ghits of N. Kanara in evergreen forests, *Tutbot*,—DISTKIB. Cultivated in Bengal and in IS. & W. India.

*VAE. emarginatus*. Leaflets ovate-oblong or obovate-oblong, glabrous above, softly tomentose beneath, rounded or emarginate at the apex. *Sajpindus emarginatus* (sp.), Vahl, **Symb.** v. 3 (1794) p. 54; **Wight & Am. Prodr.** p. **III**; **Gran. Cat.** p. 2U ; **Dalz. & Gibs.** p. 35; **BedclFlor. Sylvat.** t. 154 ; **Trim. FL Ceyl.** v. 1, p. 307. *S. trifolius*, Hiem, in **Hook. f. PI. B. I.** v. 1, p. 682, **in part** (*not* of Linn.) j **Watt**, **Diet. Econ. Prod.** v. 6, part 2, p. 468.

Found in the same localities as the preceding.

The berries of both trees are used as a substitute for soap ; hence the name *Soap-mU* tree which is given to them by Anglo-Indians- The fruit is also employed in native medicine, while the wood is hard and useful for many purposes'. See **Watt**, **Diet. Econ. Prod.** 1. c.

## 6. NEPHELIUM, Linn.

Trees or shrubs. Leaves alternate, **exstipulate**, pinnate; leaflets subopposite, entire (rarely serrate). **Flowers** numerous, regular, small, polygyno-dioecious, **m** terminal and axillary racemes or panicles. Calyx small, 4-6-lobed; usually cupular; lobes short, valvate or slightly imbricate in bud. Petals 4-6 or 0, villous, rarely with 2 scales. Disk annular or swollen, glabrous or pubescent. Stamens 6-8, inserted within the disk, **long-exserted**; filaments filiform, usually pubescent. Ovary pubescent, often verrucose, 2-3-lobed ; lobes 1-celled, 1-ovulate ; style **2-3-fid** or -partite, the lobes recurved. **Fruit** 1-3-coccos, indehiscent, globose or ovoid, echinate, tubercled or smooth. Seeds ellipsoid or globose, exalbuminous, covered with a pulpy aril; cotyledons fleshy but not plicate.—DISXBIB. Chiefly Malayan ; species about 20.

1. **Nephelium Longana**, *Camb. in Mem. Mus. Par.* v. " \* ^ (1829) p. 30. A tree 30-40 ft. high ; bark smooth, flaking off in s' ?s; young parts clothed with rufous stellate pubescence. Leaflets 2-5 pairs, long, equally or unequally pinnate ; rachis rusty-puberulous when young, afterwards glabrous; leaflets 2-5 pairs, reddish when young,

coriaceous, 2i-8 by 1-2 in., oblong or ovate-lanceolate, more or less oblique, shortly acuminate, glabrous and reticulately veined, base cuneate; main nerves 10-15 pairs, prominent beneath; petiolules ^-| in. long. Elowers small, white, in clusters on the branches of terminal and axillary large much-branched puberulous panicles ; pedicels short, pubescent. Calyx 5-6-lobed; lobes obtuse, densely pubescent. Petals 5-6, linear-spathulate, pubescent, about as long as the calyx. Disk pubescent. Stamens 6-10, included in the female, exserted in the male flowers ; filaments hairy at the base. Ovary 2-3-lobed ; style long ; stigmas 2, recurved. Eruit supported on the persistent calyx, edible when young, globose, reddish, tubercled. Seed solitary, enveloped in a fleshy pale subacid aril, black, shining. El. B. I. v. 1, p. 688; Grab. Cat. p. 29 ; Dalz. & G-ibs. p. 35; Trim, Fl. Ceyl. v. 1, p. aO9; Talb. Trees, Bomb. p. 59 ; Woodr. in Journ. Bomb. Nat. v. 11 (1817) p. 272; Watt, Diet. Econ. Prod. v. 5, p. 348.—Elowers : Feb.-Apr. VERN. *Umb*; *Vumb*,

KONKAN : *Law!*, *Stocks!*; evergreen forests of Kcmkan Ghats, *Talhot*. DECCAN : Mahableshwar, *Cooke!*; Koina valley, *H. M. Birdwood*; Par in a ravine near which there is a forest chiefly of *Vumh* trees, ex *Graham* 1. c. S. M. COUNTRY : Ilamghat, *Dalzell* & *Gibson*. KANAKA: *Jlitchic*, 1656.'; evergreen forests of N. Xanara Ghats, *Talhot*; Ainshi (N. Kanara), *Tulbot*, 952 !—DISTRIB. India (E.Bengal, W. Peninsula); Ceylon, Often cultivated in tropical countries.

The fruit is about the size of a cherry and the pulpy aril is eaten. See Watt, Diet. Econ. Prod. 1. c.

*Nephelium Lit-chi*, Camb., the *Litchi* introduced from S. China has been occasionally, though rarely, cultivated in Bombay. See Watt, Diet. Econ. Prod. v. 5, p. 346.

## 7. HARPULLIA, Eoxb.

Erect trees. Leaves alternate, exstipulate, pinnate ; leaflets alternate, entire. Elowers regular, dioecious or polygamous, racemose or paniculate, pedicelled. Sepals 4-5, erect, equal. Petals 4-5, linear-obovate, sometimes clawed, but without either glands or scales. Disk obscure. Stamens 5-8, elongate, centric. Ovary oblong, 2-lobed, 2-celled ; ovules 2 in each cell; stjle usually elongate; stigma linear, usually more or less twisted. Capsule coriaceous, inflated, 2-lobed, 2-celled, loculicidally 2-valved, cells 1-2<sub>r</sub>seeded. Seeds subglobose, exalbuminous, usually arilla'e; embryo thick.—DISTRIB. Tropical Asia, Australia and Madagascar ; species about 6.

1. *Harpullia imbricata*, *Thwaites*, *Ennm.* (1858) p. 56. A large tree with an erect straight trunk ; young parts finely fulvous-pubescent. Leaves inparipinnate; rhachiscylindric, 6-10 in. long, pubescent; leaflets 4-5 pairs, opposite or alternate, 3-6 by 1-2 in., oblong-lanceolate, obtusely acuminate, entire, glabrous and shining, bright light green, thin ; main nerves 8-12 pairs; petiolules ^-| in, long. Elowers § in. long, in lax drooping axillary panicles; pedicels long, slender, puberulous. Sepals 5, free, oblong, obtuse, fulvous-pubescent, subpersistent. Petals much exceeding the sepals, spatulate, veined, and with a long claw which is Pubescent within. Stamens in bisexual flowers shorter than the petals ae- male flowers exserted beyond them. Ovary ovoid, hairy; tyle 3 or 4 tJj&^s as long as the ovary, much exserted; stigma oblong,

usually more or less spirally twisted. Capsules inflated, broadly reniform, compressed, broader than long, about 1 by H-4f, bright orange, ultimately glabrous, tipped with the long persistent style. Seeds ovoid, black, smooth, with a small disciform aril. Trim. Fl. Ceyl. v. 1, p. 311; Bedd. Flor. Sylvat. t. 158. // *cupanioides*\*, Hieni, in Hook. f. Fl. B. 1. v. 1, p. 692 (*not* of Roxb.); Talb. Trees, Bomb. p. 59; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 272. *Streptostiyma viridiflonim*, Thwaites, in Kew Journ. Bot. v. 6<sup>r</sup> (1854) p. 298, t. 9.—Flowers: Nov.-Jan.

There is no doubt that this plant is perfectly distinct from // *cupani-oides* of Roxburgh.

Roxburgh, Fl. Ind. (1824) p. 442, describes *H. cupanioides*, a native of Chittagong, as having a somewhat 2-lobed ovary, a short style, a 2-lobed stigma with reflexed lobes, a semi-oval seed, of which the inner side is straight, with a deep orange aril covering the whole seed. The Bombay plant agrees exactly with the description given by Thwaites (Kew Journ. Bot. I.e.) and Trimen (Fl. Ceyl. 1. c.) and with the plate (t. 158) given by Beddoine. The aril of the Bombay plant is small and disciform, the seed is ovoid, black, the style is long and the stigma oblong and spirally twisted.

KONKAN: *Stocks!*, *Law I* KANAKA: in the evergreen forests of N. Kanara; very common in the forests near Goond, *Talbot*.—DISTRIB. India (Chittagong, Birma, S. Andamans, W. Peninsula); Ceylon, Sumatra, Borneo, Java.

## 8. DODONiEA, Linn.

Shrubs, rarely trees, often viscous. Leaves alternate, exstipulate, simple or abruptly-pinnate. Flowers unisexual or polygamo-dioecious in axillary or terminal racemes, corymbs or panicles, inconspicuous. Sepals 2-5, imbricate or valvate. Petals 0. Disk obsolete in the male, small in the female flowers. Stamens 5-10 (usually 8), inserted on the outer side of the disk; filaments very short; anthers linear-oblong, obtusely 4-gonous. Ovary sessile, 3-6-gonous, 3-6-celled; "ovules 2 in each cell, collateral or superposed. Capsule membranous or coriaceous, 2-6-gonous, septieidally 2-6-valved, valves winged at the back, cells 1-2-seeded. Seeds lenticular or subglobose, compressed, exalbuminous, exarillate; funicle thickened; testa crustaceous or coriaceous; embryo spirally convolute.—DISTRIB. Chiefly Australian; species about 60,

1. ***Dodonaea viscosa*, Linn. Mantiss. v. 2 (1771) p. 149.** A shrub, rarely a small tree, with erect twiggy branches often angled; young parts scurfy-puberilous. Leaves subsessile, simple, more or less viscid with a yellowish resinous exudation, lg-4 by  $\frac{1}{2}$  in. (the breadth very variable), oblanceolate, subacute or shortly apiculate, glabrous, shining, tapering much towards the base. Flowers greenish-yellow, small, in short few-flowered axillary spreading cymes; pedicels slender, nodding. Sepals oblong,  $\frac{1}{2}$  in. long, about equalling the stamens. Anthers oblong-linear, very large. Ovary pilose; style long. Capsules membranous, compressed,  $\frac{1}{2}$  in. long and slightly broader, with a wide marginal wing notched at the hood and apex, viscid, orange-brown. Seeds black. Fl. B. I. v. 1, p. 697; Trim. Fl. Ceyl. v. 1, p. 312; Talb. Trees, Bomb., p. 60; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 272; Watt, Diet Econ. Prod. v. 3, p. 172. *D. Burmanniana*, DC. Prodr. v. ], p. 616; Grab. Cat. p. 30; Dalz. & Gibs. p. 36; Aitch. Pb. & Sind PI. p. 34.

Linn. f. Suppl. Pi. p. 218.-Flowers : Jov. Vimr#

residency, chiefly in dry open situations. KONKAK • <?/, / , r  
 Ghat, Graham, 8. M COUNTRY • "RJI« • 2? N' t Stocks' \* Law I  
 Cocks; Dharwar, WW^ : very oomm^r^dft^nilft^  
 east of Belgaum, Graham, Dalzell & Gibson. SIND : Stocks 571^^ k / , north and  
 The specimens from Sind are usually very narrow Wv^ T! India, Ceylon and  
 in most warm countries narrow-leaved--DisTRiB. Throughout

9- TURPINIA, Vent.

Glabrous trees or shrubs with tpi-Pte  
 stipulate, usually imparipinnate ; leafle^opSSfte^ern^ m^o^ with  
 coriaceous stipules. Flowers white 3<<,ii^se^rrulate> sometimes in terminal  
 and aiillarv paS vvsIn ' ?gulf' hel'm^aphrodite, imbricate  
 persistent PS? 5 TJ ?Pf ! bran<<hes Calyx 5fid

in terminal and aiillarv paS vvsIn ? g f ' hel'm^aphrodite,  
 imbricate, persistent. PeS? 5 ,PTJ ?Pf ! bran<<hes. Calyx 5-fid OR  
 lobed. Stamens 5, S^rfffi ^ raised' senate filaments  
 flattened. OvaryTesSe 3liJ\* \*n\ between the l^bes 5 mauyand then  
 2-seriate, ascend nR' anat—' f / o^les few Or TMY shgmas subcapitate.  
 p -u^it sub "lohoZ. fTv S 7'f 3' United or f'ee; 8-celled; cells^ few- or  
 manySS ' ^^^fleshy or coriaceous

1. Turpinia pomifera, DC. Prodr. v. 2 (1825) : q A, large  
 young parts glabrous. Leaves 6-15 in }m~ : A, large  
 tree;  
 imparipinnate ; rbachis glabrous rtiD±Tt^Slte.st lpulate' usua%  
 caducous; leaflets 39 i ^ i ^ a r' tri TM 8 ^

imparipinnate ; rbachis glabrous rtiD±Tt^e;st lpulate' usua%  
 caducous; leaflets 3-9, opposite 2^8 hi i S -^^ ar' tri TM 8 ^,  
 shortly acuminate, finely serrate^glabrous U~l TM" oblong-lanceolate  
 pairs, distant, ascending; petiolules ol\*Z 1 t T ^ ?^ain "ves 5-6  
 the terminal ones up to 2 in loni. ,Kn li f 1<?aflets H >., of  
 Flowers numerous, near the' enfr of the fc^'^^ulate? dduco'us.  
 terminal panicles shorter than th a U brancl'es' in lax axillary and  
 lobes oblong, obtuse, cUiat toj^i?^ ^ t^ Ca^"  
 exceeding the calyx ciliate <<f<< T ' oblong obtuse, slightly  
 little shorter; fill'men ^JSS TM & \* T^8 the ^ << •  
 furrowed, tapering into a slut style t (?T^dly oVoid' S labro TM.  
 black, i-1 in.indiam. pSrc fleshv 4 S^lobos e, smooth, purplish-  
 brown. Pl. B. I. v. 1, p 698 ^Trim VI' r f\* ^ shining' dark  
**Bomb^p. 60; WoodrYn ^K^IVso^ JfV''**  
 Diet. Econ. Prod. v. 6, part 4, n 203 7>> << 7 C </ P^2'2; Watt,  
 Dalz. & Gibs. p. 47—Flowers f Jan tl\*aZww<<. Wall. Cat. 4277;



KONKAN: *Lawl, Stocks', he Cremionv ex WnnJ<sup>TM</sup>,*  
S. M. COUNTRY : Parva Ghat, *Dateellf<sub>Glb2</sub> £t?" e<sup>TM</sup>S<sup>TM</sup>\* \*>r<<b,*  
*Talhot.*  
DISTMB. India generally; C<sup>lon</sup>, Tunwi<sup>^</sup> China e<sup>Ter</sup>g<sup>^</sup>n forests, 7a/40<.\_

#### ORDER XLIV. SABIACEJE.

TPST" I? <sup>^f\*</sup> o\_r C<sup>limbing</sup> Shrubs' S<sup>labrous</sup> or with simple hairs Leaves  
alternate, simple or compound, exstipulate. Floweraheraa'  
phrodite or polygamous, usually panicled. Caljx 4-5-partite, mbricTe"

Petals 4-5, imbricate. Disk usually small, annular. Stamens 4-5, opposite the petals, inserted at the base of or on the disk, free or coherent with the petals, all perfect or 2 only perfect and 3 without anthers ; filaments clavate, flattened or subulate; anthers didymous, the cells separated by a thick connective and bursting transversely by a deciduous cap. Ovary sessile, 2-3-celled, compressed or 2~3-lobed ; ovules 1-2 in each cell; styles 2-3, free or connate or 0; stigmas punctiform. Ripe carpels 1-2, dry or fleshy, indehiscent. Seeds compressed or globose, basilar; hilum broad ; testa membranous or coriaceous; albumen 0 ; cotyledons often contorted ; radicle deflexed.—DISTBIB. Tropical and subtropical regions chiefly of the IN", hemisphere; genera 4 ; species about 35.

### 1. MELIOSMA, Blume.

Trees or shrubs, usually pubescent. Leaves alternate, simple or imparipinnate ; leaflets subopposite, the terminal one rarely wanting. Flowers small, hermaphrodite, in branched terminal, or terminal and axillary panicles ; bracts caducous. Bracteoles and sepals 5-9, persistent, forming an uninterrupted whorl round the petals. Petals 5 : 3 large nearly orbicular, valvate ; 2 smaller, interior, placed behind the fertile stamens, either membranous and nearly free, or reduced to a bifid scale adnate to the filament. Stamens 5: 2 fertile, opposite the smaller petals, the filaments short, flattened incurved, expanded at the top into a cup which bears 2 globose cells that burst transversely, springing back elastically; 3 deformed, broad, opposite the larger petals, 2-fid, with 2 empty cells together forming a cup over the pistil. Disk cupular or annular with 2-5 simple or dentate teeth. Ovary sessile, 2- (rarely 3-) celled, contracted into a simple or 2-partite style; ovules 2 in each cell; stigma simple. Drupe small, oblique, subglobose; stone crustaceous, 1-celled, with usually a basilar rounded projection over which the seed is curved. Seeds globose; testa membranous; cotyledons con-duplicate ; radicle incurved.—DISTBIB. Tropical Asia, Malaya, a few in IS. America ; species about 32.

1. **Meliosma Wightii**, *Planch, ex Brand. For. Fl.* (1874) p. 116. A small tree; branches, petioles and panicles clothed with ferruginous pubescence. Leaves 3|7 by 1|-2| in., coriaceous, oblong-elliptic or lanceolate, acute or acuminate, usually entire, glabrous above except on the nerves, prominently reticulately veined and more or less pubescent beneath; petioles about \ in. long. Flowers small, in rigid pyramidal rufous-hairy panicles. Sepals and bracteoles about 7-9, all suborbicular, ciliate, the outer ones pubescent outside. Petals membranous, the 3 larger ones rounded, obtuse, the 2 smaller bifid. Ovary flask-shaped, glabrous. Drupes \-| in. in diam., nearly globular, supported on the persistent sepals. *Fl. B. I.* v. 2, p. 4; *Trim. Fl. Ceyl.* v. 1, p. 314; *Talb. Trees, Bomb.* p. 60. *Millingtonia punyens*, Wight, *Icon.* t. 964.

KONKAN: *Dalzell!*

I have seen only one specimen from Bombay which was collected by Dalzell. The plant appears to be tolerably common on the Nilgherries.—DISTKIB. India (W. Peninsula); Ceylon.

ORDER XLV. ANACARDIACE<sup>^</sup>].

Trees or shrubs usually with oleo-resinous often acrid juice. Leaves alternate, simple or compound, exstipulate. Flowers small, regular, 1-sexual, polygamous, or 2-sexual, usually paniced. Calyx 3-5-partit, sometimes accrescent. Disk flat, cupular or annular, entire or lobed, rarely obsolete. (Stamens equal in number to the petals, rarely more, inserted under (rarely on) the disk ; filaments usually subulate ; anthers 2-celled, basi- or dorsi-fixed. Ovary superior (half inferior in *Holi-c/arna*), 1- or 2-6-celled, rudimentary or 2-3-fid in the male (of 5-6 carpels in *Buclianania*); ovule solitary in each cell, pendulous from the top or side of the cell or from an ascending basal funiele. Eruit superior (except in *Holigarna*), usually a 1-5-celled, 1-5-seeded drupe; stone sometimes dehiscent. Seed exalbuminous; embryo straight or curved; cotyledons plano-convex; radicle short.—DISTMB. Chiefly tropical; genera *bb* ; species about 450.

- Ovary 1-celled or if 2-celled with 1 cell early suppressed.  
 Ovules pendulous from a basal funicle.  
 Leaves pinnate or 3-foliolate (sometimes simple in *R. Cotinns*) ..... 1. R-irs.  
 Leaves simple.  
 Flowers polygamous.  
 Stamens 1-5; fruit a fleshy drupe ..... 2. MANGIFERA.  
 Stamens 8-10; fruit a reniform nut ..... 3. AXACARDIUM.  
 Flowers hermaphrodite; stamens 10; fruit a drupe ..... 4. BUCHANANIA.  
 Ovules pendulous from the top or above the middle of the cell.  
 Leaves pinnate.  
 Petals valvate ; style 1 ..... 5. SOLENOCARPUS.  
 Petals imbricate; styles 3-4 ..... 6. OIUNA.  
 Leaves simple.  
 Stamens 5-6; -styles 3.  
 Petals imbricate ; drupe superior ..... 7. SEMBICARPUS.  
 Petals valvate; drupe inferior ..... 8. HOLIGARNA.  
 Stamens 4; style 1 ..... 9. NOTHOPELON.  
 Ovary 4-5-celled ; leaves pinnate ..... \* ..... 10. SPONDIAS.

## 1. RHUS, Linn.

Trees or shrubs often with acrid juice. Leaves alternate, 3-foliolate or imparipinnate (simple in *H. Cotinus*). Flowers small, in terminal and axillary panicles, polygamous. Calyx small, 4-6-partite, persistent; segments subequal. Petals 4-6, equal, spreading, imbricate. Stamens 4, 5, 6 or 10, inserted at the base of the disk, free ; filaments subulate-; anthers short, imperfect in the female flower. Ovary sessile, ovoid or globose, 1-celled ; ovule pendulous from a basal funiele; styles 3, free or connate, short or long; stigmas simple or capitate. Drupe small, dry, compressed; stone coriaceous, crustaceous or bony. Seed pendulous from the funiele ; testa membranous ; cotyledons flattish ; radicle hooked, short, superior.—DISTRIB. Chiefly in warm extratropical regions of both hemispheres ; species about 120.

1. *Rhus mysurensis*, *ffeyne*, ex *Wight & Am. Prodr.* (1834) p. 172. A shrub or small tree; branches woody, often spiny, the younger pubescent. Leaves 3-foliolate : leaflets obovate, cuneate, sinuate-toothed or sublobed,

**with a Few soatteivd haira above, softly pubaseent beneath; terminal leaflet or shortly p itiolilled, much larger than the lateral onos, reaching 1 J J. in. long; lateral leaflets sessile, sometimes very small.**

c

**Flowers in terminal and axiilarjr bi I pubescent panicles; pedicels**

short; **bracts miiiate, linear^pubeaceat.** Calyx **pubescent outside, inuchi shortiT than the petals; lobes ovate. Petala ,I, in. Song, oblong, sub-aeute, glabrous.** Disk **5-lobed, the lobes often notched. Drupes | -£ in. in diam., subgiobose, brown, glabrous, shining. EJngler, in DO. Monogv, Plmn. v. 4, p. 420. Ehtts nt/soremis, Jlook. L in Fl. B. I, v, 2, p. 9; Aiteh. Pb. & Sind PL p. 35; Talb. Trees, Bomb, p. 01; Woodr. in Joarn. Bomb. Nat. v. 11 (1897) p. 272; Watt, Diet. ikon. Prod. v. (>, part I, p. 497.—Mowers: June, VEHN". Amani.**

Ajr: Oii.-it bef,ive«n Wai and Wath&r, Cooke\\ hills ite;ir Poona,

Wtyvh-om'^

Oliattamnghi iiiJ! near Poona, A' | s. A! C HTSTRV: ootiimon in tha Dharwa?

■ J'. ^rsi>: on the hilis, 1753—DISTRIB. Indiagenerallj.

Q-Ffthani states th il thebari Is used for tanning, and in Rtjputana, where the sbrnb is enm-non, it is l&rgely employed for this purposo aud is said I : fine brown vahr to leather. —See Watt; Diet. Eeon. Prod. I. c,

## 2. MANGIFERA, Linn.

**T roes. TJ oa ves alternate, petiuled, aim pie, entire, co r i aeoo us. Fl o wers small, polygamous, in terminal panicles. Calyx -4-5-part ire ; segaients imbricate, decidaous. Petals 4—>, free or adnate to the disk, imbricate; nerves thickened, sometimes ending in excrescences. ► Stamens 1-5, inserted just within the di.sk or on it, 1 usually more perfect and much longer than the others, the others with imperfect or smaller anthers, or reduced to teeth, or absent. Ovary sessile, [-celled, oblique; ovule pendulous, funicle basal or inserted on fche side of the coll above its base (rarely horizontal). Drupe large, fleshy ; stone compressed, fibrous. Seed large, compressed; testa papery; cotyledons plano-convex, often unequal and lobed.—DISTRIB. Tropical Asia, chiefly Malaya ; species about 30.**

**1. Mangifera indica, Linn. 8p. PI. (1753) p. 200. A**  
largo

spreading evergreen tree reaching **50 ft., in height, all parta** glabrous except the inflorescence. Leaves **crowded at the ends of the branches,** coriaceous, 5-10 by JI—3 in., **oblong, or oblong-lanceolate,** acute, **acuminate or subobtuse,** .shining, entire, **the margins often undulate,** base **narrowed ;** petioles |~^ in. long. Flowers **monoecious, jj in. long, with a somewhat disagreeable** odor, arranged in large many-flowered pubescent panicles longer than the leaves ; pedicels **short, thick; braeteoles ovate,** small. Sepals ovate, concave, **pubescent** outside, shorter than the petals. Petals oblong, **subaeute, reiiexed, glabrous, with JJ strong orange-colored ridges on the inner face. Disk fleshy, 5-lobed. Stamen 1 ; filament subulate; anther purple. Ovary glabrous. Drupes large, He.shy, obliquely pynforin or subovoid, subcompressed, 3—8 in. long; stone compressed, fibrous\*** very hard, Fl. B. I. v. 2, p. L3; GJ-;!I, Cat p. 41 ; Dalz. & Gibs, p. 51 ; Talb. Trees, Bomb. p. 01 ; Woodr. in Joura. Bomb. Nat. v. 11 (1807) p. 273; Engler, in DO. Monogr. v, 4, p, 198 ; W'att, Diet. Eeoiu Prod. v. 5, jp. 146.—Flowers : Jan.-Feb. VEHN A'nib.

I The well-known *Mango* tree, cultivated throughout India and the Tropics generally. It is said to be wild in the Western Peninsula from *Khap* southwards, but in this tree as widely cultivated as is the Mango, the fruit of each largely by the *Jackfruit* and ■

it is difficult to determine in what localities the tree may be considered truly wild. It is planted everywhere throughout the Presidency, and its dense shady foliage renders it valuable as a roadside tree as well as for planting near main roads in *topes*, whose shade at-midday is valuable to wayfarers and their cattle. The fruit varies much in quality, in some cases being graphically described as a mixture of tow with turpentine, while in the case of some of the more highly cultivated trees the fruit is very delicious. #

Bombay has been long celebrated for its cultivated mangoes, of which those grown in the island of Bombay are undoubtedly the best, perhaps from the care bestowed on their cultivation. Most of the mangoes grown throughout the country are raised from seedlings, with the result that the quality of the fruit is extremely variable. To secure good fruit, grafting is essential, and was apparently introduced into Bombay by the Portuguese, to propagate the valuable kinds known as the *Mnzagon* (Bombay) and Goa mangoes. Of the Bombay mangoes, the best kinds are those known as the *Aphoos* (probably a native corruption of the Portuguese name *Alphonse*) and the *Pirie*. The fruit of both weighs on an average about 8 ounces, that of the *Aphoos* is greenish-yellow on the unexposed, red on the exposed side, without any stigmatic point or beak. The flavor of the fruit is indescribably delicious and it commands the highest price in the market. The *Pirie* mango has less of a yellowish tinge on the unexposed side than the *Aphoos*, the exposed side being red, and the fruit is furnished with a distinct beak. The ripe fruit does not keep as well as that of the *Aphoos* and the flavor is not quite so good, so that its market price is lower. The midrib of the leaves and the branches of the inflorescence of the best variety of the *Aphoos* are of a rich rosy color, while the corresponding parts of the *Pirie* are white or greenish-white. Woodrow ('Gardening in India,' edition 5 [1889] pp. 69-72 & pp. 240-260) gives a full description of the best modes of growing and grafting the mango, as well as a list of the most celebrated trees in the Bombay Presidency and the localities in which they are to be found. Watt, Diet. Econ. Prod. v. 5, pp. 146-15(), also gives valuable information.

### 3. ANACARDIUM, Eottb.

Shrubs or trees. Leaves alternate, petiolod, simple, coriaceous, quite entire. Flowers polygamous, in terminal bracteate panicles. Calyx 5-partite, deciduous, erect, imbricate. Disk filling the base of the calyx, erect. Stamens 8-10, all or some fertile; filaments connate and adnate to the disk. Ovary obovoid or obcordate; ovule 1, ascending from a very short lateral funicle. Nut reniform, seated on a large pyriform fleshy body, formed of the enlarged disk and top of the peduncle; pericarp cellular and full of oil. Seed reniform, ascending; testa membranous, adherent; cotyledons semi-lunar; radicle short, hooked.—DiSTiiiB. Tropical America; species 6, of which 1, the followiug, has been naturalized in Asia.

1. **Anacardium occidentale**, Linn. *Sp. Pl.* (1753) p. 383. A small tree with a short thick crooked trunk; branches terete, glabrous. Leaves coriaceous, 4-6 by 2<sup>^</sup>-3 in., obovate or elliptic, rounded at the apex, glabrous, finely reticulately veined, base cuneate; main nerves 10-12 pairs, prominent beneath; petioles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Panicles terminal, longer than the leaves, the branches cymose; peduncles lengthening with age; bract i-f in. long, ovate, very acute, nerved, puberulous outside. Sepals  $\frac{1}{2}$  in. long, lanceolate, puberulous outside. Petals  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, linear-lanceolate, deflexed from the middle, minutely puberulous outside. Stamens about 9, one longer than the others, the longer one exerted beyond the recurved petals. Ovary about  $\frac{1}{2}$  in. long, glabrescent, attenuated into a subulate style  $\frac{1}{2}$  in. long. Fruit reniform, 1 in. long, its pedicel large, fleshy, dark-colored. El. B. I. v 2 p. 20; Grah. Cat. p. 40; Dalz. & Gibs. Suppl. p. 18; Talb. Trees, Bomb. p. 61; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273;

Engler, in DC. Monogr. Phan. v. 4, p. 219 : Watt, Diet. Econ. Prod. v. 1, p. 232.—Flowers : Jau.-Mar. VERX. *Kdjn* ; *Hijuli-hadam* ; *Gem* 1)(*ivv*).

The *Cashew-met* tree, a native of Tropical America, naturalized and cultivated in India, especially near the coast. KONKAN : *Stocks* \; Malabar and Parel hills (Bombay), *Graham* ; Salsette, common, *Graham*; Southern Koukan, *Dalzell* § *Gibson* ; Kitnagiri, *Coo/eel*, *Kanitkarl*; Vingorla, *Ritchie*, 142!; Wari Country, *Dalzell* § *Gibson*. S. M. COUNTRY : Dharwar, *Talbot*.

The nuts are eaten 7\*oasted and are much esteemed. The plant is also used in native medicine. See Watt, Diet. Econ. Prod. 1. c.

The fruit is very curious, the nut appearing to be outside it, an error into which Graham and Dalzell & Gibson have fallen. What is regarded by them as the fruit is, however, the enlarged pedicel and disk on which the nut is seated.

#### 4. **BUCHANANIA**, Spreng. in Schrader, Journ. v. 4 (1801) p. 234.

Trees. Leaves alternate, petioled, simple, coriaceous, quite entire. Flowers hermaphrodite, small, white, in terminal and axillary branched panicles. Calyx short, obtusely 3-5-toothed or -lobed, persistent, imbricate. Petals 4-5, oblong, imbricate, at length recurved. Disk orbicular, 5-crenate. Stamens 8-10, free, inserted at the base of the disk. Carpels 5-6, free, seated in the cavity of the disk, one fertile, the others imperfect; ovule 1, pendulous from a basal funicle; style short; stigma truncate. Drupe small, scantily fleshy ; s\*one crustaceous or bony, 2-valved. Seed gibbous, acute at one end ; cotyledons thick ; radicle superior.—DISTRIB. Tropical Asia, Australia and the Pacific Islands ; species about 25.

Leaves broadly oblong, more or less, villous beneath ; panicles pilose.....

1. *B. Lanzas*.

Leaves narrowly oblong, glabrous beneath ; panicles glabrous .

2. *B. anyudifolia*.

1. **Buchanania Lanzas**, Spreng. in Schrader, Journ. v. 4 (1801) p. 234. A tree 40-50 ft. high, with straight trunk; young branches clothed with silky hairs. Leaves thickly coriaceous, 5-10 by 2½-5 in., broadly oblong, obtuse, sometimes emarginate, glabrescent above, more or less villous beneath, reticulately veined, the nerves and veins impressed on the upper surface, base rounded ; main nerves 10-20 pairs ; petioles ½ in. long. Flowers small, sessile, greenish white, in terminal and axillary pyramidal ferrugineo-pilose panicles which are shorter than the leaves; bracts small, caducous. Calyx-lobes short, broadly ovate, ciliate. Petals ½ in. long, ovate-oblong, subacute. Disk fleshy. Stamens 10, a little shorter than the petals; filaments flattened; anthers about as long as the filaments. Ovaries : 1 perfect, conical, villous, the other 4 reduced to cylindrical filaments. Drupes obliquely lentiform, ½ in. in the long diameter, black ; stone hard, 2-valved. *Buchanania laUfolia*, Roxb. Hort. Beng. (1814) p. 32 ; Hook. f. Fl. B. 1. v. 2. p. 23 ; Grab. Cat. p. 41; Dalz. & Gibs. p. 52; Bedd. Flor. Sylvat. t. 165; Talb. Trees, Bomb. p. 62; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273; Engler, in DC. Monogr. Phan. v. 4, p. 182 ; Watt, Diet. Econ. Prod. v. 1, p. 544.—Flowers : Jan.-Mar. VEEN. *Char* ; *Piyal*.

The specific name *Lanzas* is derived from the native Birmese name, and was given to the plant by Sprengel in 1800-1801. The name is therefore prior to that given by Roxburgh (1814), and though not as

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characteristic as *Koxhurglvs* name (*latifolia*), must necessarily be adopted. See note under *B. anfstistifolia*, the next species.

KONKAN: *Stocks* \ Bombay, *Lambert* \; Wari, *Cookel*; Baitsi (Wari Country), *Dahell* & *Gihson*. BECCAN : \*Knrtriz Ghat (near Poona), *Woodrow!*; Singhad hill, *Woodrow!* GUJARAT: Barria jungles east of Buroda, *Gibson*; Dangs, *Woodrow*. S. M. COUNTRY: Belgaum, *Law*\, *Ritchie*, 1010!—DISTRIB. Hot and drier parts of

The fruit is eaten and an oil is extracted from the kernels. See Watt, Diet. Eeon. Prod. 1. c.

2. ***Buchanania angustifolia***, *Itoxb. lfort. Beng.* (1814) p. 32; *Fl. bid.* v. 2 (1832) p. 38(3. A glabrous tree. Leaves thinly coriaceous, 3-6 by 1<sup>^</sup>-2 in., linear-oblong, elliptic or elliptic-lanceolate, obtuse or rounded, very often emarginate, quite glabrous, reticulate-veined, the nerves and veins slightly prominent on the upper surface, base rounded or acute; main nerves 12-15 pairs; petioles |1| in. long, slender. Flowers in glabrous branched panicles about equalling the leaves; . pedicels ■<sup>^</sup>-j<sup>^</sup>-1<sup>^</sup>-in. long. Calyx-lobes semiorbicular. Petals y<sup>^</sup> in. long, oblong. Fertile ovary pilose. Drupes | in. in diam., obliquely globose,\* slightly compressed.' VI B. I. v. 2, p. 23; *Grab. Cat.* p. 41; *Wight, Icon.* t. 101; *Tiin. Fl. Ceyl.* v. 1, p. 316; *Talb. Trees, Bomb.* p. 112; *Engler, in DC. Monogr. Phan.* v. 4, p. 184.

This tree has been included on the authority of *Graham* (1. c.), who gives the Ajanta jungles as its habitat. It has not apparently been found in the Bombay Presidency by any other collector. *Dahell* & *Gibson* do not include the plant in their Bombay Flora, and *Talbot* (1. c.) merely quotes *Graham*. There are no specimens in *Hrb. Kew.* from the Bombay Presidency. *Wight's* specimens and those in *Herb. Rottl.* are from Southern India. *Roxburgh* states (1. c.) that it is a native of the south end of India. On the other hand, *Blithie* (9350 in *Herb. Kew.*!) has found the plant in the Ghanda district of the Central Provinces.—DISTRIB. India from the Central Provinces southward.

JMc—*Stuedel, Norn.* v. 1, p. 253, and, following him, *Daydon Jackson*, in 'Index Kewensis,' give *B. Lanzan*, *Spreng.* in *Schrader, Journ.* v. 4 (1801), as a synonym for *B. angustifolia*.—The plant to which the name *B. Lanzan* was given by *Sprengel* was first described by *Buchanan* in *Asiat. Res.* v. 5 (1798) p. 123, but was not named in that publication. *Sprengel*, two years later, named the plant *B. Lanzan* from the native Burmese name communicated by *Buchanan*, and at the same time founded the genus *Buchanania* (1800-1801). *Roxburgh* (*Hort. Beng.* [1814] p. 32) no doubt in ignorance of *Sprengel's* work which had appeared in a journal printed in *Gottingen* in 1801, gave the same name to the genus. That the plant described by *Buchanan* could not possibly have been *B. angustifolia* of *Roxburgh* is evident from the fact that *B. angustifolia* is not a native of Birma, but is confined to S. India, whereas, from *Buchanan's* notes, it is clear that the plant described by him was abundant on the mountainous districts of Upper Birma and that its seeds were widely distributed commercially and used for the same purposes as almonds. Moreover, *Roxburgh* (*Fl. Ind.* v. 2, p. 385) makes it quite clear that the *B. Lanzan* of *Sprengel* was the same plant that he described as *B. latifolia*. *Roxburgh* quotes *Buchanan* in *Asiat. Res.* (1. v.) as the original author, and gives the native name of the plant as *Larmzon*, which is doubtless a misprint for *Launzan*. See remarks under the preceding species.

## 5. SOLENOCARPUS, Wight & Am.

A tree. Leaves alternate, crowded towards the ends of the branches, imparipinnate; leaflets opposite, glabrous, serrulate. Flowers hermaphrodite, small, in terminal branched panicles. Calyx minute, 5-toothed, imbricate, deciduous. Petals 5, spreading, valvate. Disk broad, annular. Stamens 10, inserted at the base of the disk. Ovary free, sessile, 1-celled; ovule 1, pendulous from the top of the style.



ctavate; stigma obliquely truncate. Drupe small, obliquely ob-  
 01 truncate, compressed; pericarp cellular, full of oil; stone bony.  
 Seed linear, compressed; cotyledons linear, plano-convex; radicle very  
 short, thick, superior.—DISTBLB. Peninsular India; species.

1. *Solenocarpus indica*, *Wijket Sf Am, Prodr.* (1834) p. 171. A  
 tree. Leaves imparipinnate; rhachis slender, angled; leaflets senile  
 (except the terminal one, which has a ^petiolule about | in. long), 2-3.J  
 by |~lj in., oblong, acuminate, .slightly crenate, glabrous on both  
 surfaces, pale beneath, IKISC oblique, flic upper .side of the Leaflet shorter  
 than the tower and suddenly contracted at the base; main nerves \* 10  
 pairs, faint'. Flowers white, in raab-branched panicles, the branches  
 puberulous, angled; pedicel\* solitary or 2 ?> together, short. Calyx-  
 lobes scarcely .ji in. long, deltoid. Petals oblong-lanceolate, aboui /, in.  
 Jong and about ^ in. broad. Di'upes ] in. long, pi -1. ir'i. B,  
 1.  
 v. 2. p. \*1"; **Bedd, Flop. Syvat. t. 2,\*3**; **Bngler, in DO. Mouogr. Phan. v. 4,**  
**p. 250**; **Talb. Trees, Bomb. p. 62.**—blowers : *J;w.*

Rare in the Bombay Presidency. *Dalzett* in Herb. KVw. tvilhotti loo»lity ! KONKAH ;  
*Stocks*!. *K \su<\* -. in tiio evergreen forests of the l'eHaptr [akika in N. K&tioro, r.irt<,  
*TaUwt.* - DISTHJB. As the genU3,

## 6. ODINA, Eoxb.

Trees with stout **Soft branches**. Leaves few at. fche ends of the  
 branches, alternate, usually imparipinnate, deciduous; leaflets opposite,  
 quite.on tire. **Flowers small, monoecious or dioecious, Easctled, shortly**  
**pedicelled, in simple and panieled terminal fascicled racemes**. Calyx  
 4-5-iohed, persistent; lobes rounded, imbricate. **Disk annular, crenate.**  
**MALE FI^OWEBS: Sta 3 10 inserted below the disk. Ovary**  
**4-5-**  
**partite. YXM&JMFLOWIEBS : Ovary sessile, oblong, 1-celled j ovule 1 in**  
 each cell, **pendulous** from near its apex by a long **funicle**, often **abortive**  
 in 3 of the ceils; **styles £ \, stout; stigmas simple or capiteiate.**  
 Drupe small, compressed, **pbloag, subreniforai**, crowned by the **distant**  
 styles; **stone hard. Seed compressed; embryo curved; cotyledons flat,**  
**fleshy; radicle superior.**—DISTIIB. Africa and Tropical Asia; species  
 about 13,

1. *Odina Woodier, JRoxb, ffort. Beng.* (1814) p. 29; *Odina*  
*Wodier, Eoxb. Fl, Ind. v. 2* (1832) p. 293. A large tree 40 -50 ft. high;  
 trunk thick; bark **ash-colored, smooth, exfoliating**; young parts more or  
 hss stellately puhendous. Leaves crowded about **tlie ends oi' the branches,**  
**10-18 in. long**; leaflets **membranous!**, **green above, brown beneath (when**  
**dry), 3-5 pairs and an odd one, 3-6 by 1-2 in., ovate-oblong,**  
**acuminate,** glabrous, shining, tinged with **pink** when young, base  
 acute or rounded, often oblique; main nerves 6-8 pairs; **petiolules** of  
 the lateral leaflets 0 ^ in. long, those of the **terminal leaflets much longer.**  
**Flowers purplish, appearing when the tree is bare pf leaves, crowded in**  
**cymose fascicles, the uiale racemes compound, Hie female simple; pedicels**  
 very short, fulvous-pubescent; bracts ovate, **acute,** pubescent outside,  
 ci'iiate. Calyx-lobes about X- in. long, ovate-orbicular, **ciliate.** Petals  
 4, **ovate-oblong,** acute, £-4 in. long. Stamens in the male flowers  
 equalling the petals. **Ovary in tire female i&hl in the male**  
**rudimentary, 4-lobed. JDrupes renifbrra,**

## S. k

*Wooarviiu,* L.)J4H, iJiLim ^ W t't-teru <uici Southern GLats).

compressed, red. PI. B. I. v. 2, p. 29 ; Grab. Cat. p. 42 ; Dalz. & Gibs. p. 51 ; Bedd. Flor. Sylvat. t. 123 ; Engler, in DC. Monogr. Pban v 4 p. 267 ; Trim, PL Ceyl. v. 1, p. 318 ; Talb. Trees, Bomb. p. 62 ; Woodr'. in Journ. Bomb. Nat. v. 11 (1897) p. 273 ; Watt, Diet. Econ. Prod, v. 5, p. 445.—Flowers : Feb.-May. VEEN. *Shimti; Moya*.

Common throughout the Presidency in deciduous forests. KONKAN : *Law! Stocks!* • Malabar hill and Elephanta (Bombay), *Graham*. DECCAN : Khandala, *Bhiva!* • Bowdhan near Poona, *Woodrow*. GUJARAT : Eajkot, *Woodrow*. KANARA : Kala naddi, *Bitchie*, 140!—DISTRIB. India; Ceylon.

Often planted as a roadside tree, especially in the Madras Presidency, a purpose for which it is by no means suitable, as it is bare of leaves in the hot weather when shade is required. It grows very readily from cuttings, which is perhaps the reason of its being so often planted. The tree exudes a gum which is not of much value and the bark is employed in native medicine. See Watt, Diet. Econ. Prod. 1. c.

## 7. SEMECARPUS, Linn. f.

Trees. Leaves alternate, simple, quite entire, coriaceous. Flowers small, polygamous or dioecious, in terminal (rarely axillary) panicles. Calyx 5-6-fid; segments deciduous. Petals 5-6, imbricate. Disk broad, annular. Stamens 5-6, inserted at the base of the disk imperfect in the female flowers. Ovary very rudimentary or 0 in the male flowers ; in the female superior, 1-celled ; ovule pendulous from the apex of the cell, funicle short; styles 3; stigmas subclavate. Drupe fleshy, oblong, subglobose or reniform, oblique, seated on a fleshy receptacle formed of the thickened disk and calyx-base; pericarp charged with acrid resin. Seed pendulous ; testa coriaceous, the inner coat somewhat fleshy; embryo thick; cotyledons plano-convex; radicle superior.—DISTRIB. Tropical Asia and Australia; species about 38.

1. **Semecarpus Anacardium**, Linn. f. *Suppl.* (1781) p 182 A moderate-sized tree. Leaves 7-24 by 4-12 in., obovate-oblong, rounded at the apex, coriaceous, glabrous above, ashy grey or buff and more or less pubescent beneath and with cartilaginous margins, base rounded cordate or cuneate, sometimes shortly auricled; main nerves 15-25 pairs making a large angle with the costa, sometimes nearly horizontal prominent on both surfaces ; petioles 1-1½ in. long. Flowers greenish-white, subsessile, fascicled in pubescent panicles which are equal to or shorter than the leaves, the female panicles shorter than the male • pedicels short; bracts lanceolate, pilose. Calyx-segments about 1/2 in' long, pilose outside. Petals 1 in. long by 1/2 in. broad, ovate, acute' Ovary in the male flowers rudimentary, hairy ; in the female subglobose' densely pilose, crowned with the 3 styles. Drupes 1 in. long, obliquely ovoid or oblong, smooth and shining black when ripe, seated on a fleshy receptacle or hypocarp about 1/2 in. long, smooth and yellow when ripe Fl. B. I. v. 2, p. 30 ; Grah. Cat, p. 41 ; Dalz. & Gibs, p 52 • Bedd Flor. Sylvat. t. 163; Engler, in DC. Monogr. Phan. v. 4 p 478 & in Engl. & Prantl, Pflanzenf. v. 3, part 5, p. 175, fig. 110, H-N • Talb Trees, Bomb. p. 62 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p 273 " Watt, Diet. Econ. Prod. v. 6, part 2, p. 498.—Flowers: May-July, VERF *Bibba; Bhildvd*.

Throughout the Presidency in dry forests. KONKAN: common, *Dalzell & Gibson Low I Stocks I, Graham;* Wan Country. *Dalzell & Gibson*. DECCAN: common\* *Dalzell & Gibson;* Singhad, *Woodrow*. S. M. COUNTRY: JBelgaum, *Ritchie* 1014 i

GUJARAT: *Graham*. KANAKA: K;ila naddi, *Ritchie*, ^^ !— DJSTKIH. India; E. Archipelago, N. Australia.

The tree is known to Anglo-Indians as the *marking-nut* tree, the juice of the perienrp being used for marking cotton cloths. An acrid viscid juice is extracted from it which is used in making a kind of vaniish, while the fleshy receptacles on which the drupes rest are roasted and eaten. See Watt, Diet. Econ. Prod. I.e.

VAB. *cuneifolia*, DC. Prodr. v. 2, p. 62. Leaves cuneate at the base, often tomentose beneath. *S. cuneifolia* (sp.), lloxb. Fi. Ind. v. 2, p. 8(5; Grah. Cat. p. 41.—Flowers: Dec. VERN. *Bibu*.

*Dalzcell*, without locality, in Herb. Kew.! PECCAN : Lanoli Grove, Khnndala and jungles about Par, *Graham*.-\*—DISTHIB. Tropical Himalaya, Khasia mountains and Behar.

This is included on the authority of Graham (*I. c*).

### 8. HOLIGARNA, Ham.

Lofty trees. Leaves alternate, simple, quite entire, coriaceous ; petiole furnished with 2 or 4 spur-like deciduous appendages. Flowers small, crowded, in axillary and terminal racemes or panicles. Calyx superior ; tube cup-shaped ; teeth 5, imbricate. Petals 5, densely villous in front, cohering at the base and with the edge of the disk, persistent, valvate. Disk lining the calyx-tube, obscure in the female flowers. Stamens 5, inserted at the edge of the disk, coherent at the base w<sup>r</sup>ith the petals ; filaments subulate, glabrous ; anthers small, subglobose. Ovary in the male flowers 0, in the female flowers inferior, 1-celled; ovule pendulous from near the top of the cell; styles 3-5, terminal; stigmas capitate or clavate. Drupe inferior, subcompressed, oblong or ovoid, resinous, acrid; stone coriaceous. Seed parietal; testa membranous; embryo thick ; cotyledons plano-convex ; radicle minute, next the hiluin.—DISTIUU. Throughout India ; species 5 or 6.

Leaves quite glabrous beneath ; drupe almost entirely included in the torus .....	1.	<i>H.</i>
<i>Arnoitiana</i> .		
Leaves rusty-pubescent beneath ; drupe \-^ exserted from the torus .....	2.	<i>H.</i>
<i>Grahamii</i> .		

1. **Holigarna Arnottiana**, *Hodk.f. in Ft. B. I. v. 2* (1876) p. 36. A tall tree ; branches densely leafy at the apex. Leaves 6-12 by 2-4 in., obovate or oblmceolate, clecurrent into the petiole, acute or rounded at the apex, glabrous on both surfaces, paler beneath; main nerves 12-20 pairs, prominent on both surfaces, nearly straight, making a large angle with the costa ; petioles | -1 in. long, with 2 petiolar spurs or tubercles at the top, which are early deciduous. Flowers minute, crowded, in rufous-tomentose panicles which are shorter or longer than the leaves. Calyx-teeth very short. Petals y<sup>1</sup>^ in. long, oblong, acute. Drupes reaching 1 in. long, obliquely ovoid, rounded at the top, quite glabrous, long-pedicelled, almost entirely included in the torus. Talb. Trees, Bomb, p. 63 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273 ; Engler, in DC. Monogr. Phan. v. 4, p. 497 ; Watt, Diet. Econ. Prod. v. 4, p. 259. *Holigarna longifolia*, W. & A. Prodr. p. 169 (*not of Eoxb.*); Grah. Cat. p. 4i ; Dalz. & Gibs. p. 51.—Flowers: Jan.-Feb. VERN. *Huli/erl*

Common in the evergreen forests of the Konkan and N. Kanara. *Dalzcell* in Herb. Kew. without any locality! KONKAN: *Stocks I*; hilly and wooded parts, *Graham*. S. M. COUNTRY : *Woodrow* ! KANAKA : Nilkund (N. Kanara), *Talbot*!; Divimana, *Voodrow*.—DISTRIB. India (Western and Southern Gbats).

2. **Holigarna Grahamii**, *Ilooh f. in FL B. I. v. 2* (JS7G) p. 37. A tree 20-30 ft. high ; young branches ferrugineo-tomentose. Leaves 12-16 by 4-6 in., rigidly coriaceous, oblanceolate, triangular above the middle, acute or acuminate, glabrous and shining above, ferrugineo-pubescent beneath, base cuneate ; main nerves 20-30 pairs, prominent and pilose beneath ; petioles  $\frac{1}{2}$ - $\frac{5}{8}$  in. long, stout, with 1 or 2 spurs on each side  $\frac{1}{2}$  in. long. Flowers in rusty-tomentose terminal panicles, <sup>4-3</sup> clustered, the male panicle about 1 ft. long, the female shorter. Calyx cup-shaped; lobes minute. Petals  $\tau^{\wedge}$  in. long,  $-fa$  in. broad. Drupes about 4- in. long, enclosed in the cup-shaped torus, except one-sixth or one-fourth of the upper part which is exserted. El. B. I. v. 2, p. 37; Talb. Trees, Bomb. p. 63 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273 ; Engler, in DC. Monogr. Phan. v. 4, p. 499 ; Watt, Diet. Econ. Prod. v. 4, p. 260. *Semecarpus Grahamii*, Wight, Icon. t. 235 : Dalz. & Gibs. p. 52.

KONKAN : *Law* !, *Storks* \; Mira hills near Pen, *Dalzell* <\$• *Gibson*. DECCAN : Khndala, *Woodrow*. S. M. COUNTRY : Ramghat, *liitchie*, 1077! KANARA: common on the N. Kanara Ghats from Ainshi southwards, *Talbot*.—DISTRIB. India (W. Peninsula).

## 9. NOTHOPEGIA, Blume.

Trees. Leaves alternate or opposite, coriaceous, quite entire. Elowers small, bracteate, polygamous, in short axillary racemes. Calyx small, 4-5-lobed, persistent. Petals 4-5, spreading, imbricate. Disk annular, 4-5-lobed. Stamens 4-5, inserted on the margin of the disk; filaments free, pilose. Ovary free, sessile, ovoid, 1-celled ; ovule 1, pendulous from near the top of the cell; style short. Drupe depressed-globose, striate, apiculate with the style, seated on the slightly thickened torus. Seed pendulous; testa membranous ; cotyledons thick, plano-convex ; radicle very short, sublateral.—DISTRIB. India (W. Peninsula); species 3.

1. **Nothopegia Colebrookiana**, *Blume, Mus. Bot v. 1* (1849) p. 203. A small tree about 15 ft. high, with acrid milky juice. . Leaves 3-8| by 14-25 in., elliptic-oblong, acute or acuminate (rarely subobtuse), glabrous and shining above, pale beneath, base decurrent into the petiole ; main nerves 15-20 pairs ; petioles  $\wedge$ -| in. long. Elowers small, white ; the female sessile or nearly so, in more or less tomentose-pubescent racemes which are much shorter than the leaves, solitary and fascicled ; the male racemes much longer and more branched than the female. Calyx-lobes 4, about  $\frac{3}{4}$  in. long. Petals 4, hairy on the back, linear-oblong, obtuse,  $\wedge$  in. long and about  $\frac{1}{2}$  in. broad, with recurved tips. Stamens 4. Drupes seated on the slightly enlarged torus, the shape of a fig, about  $\frac{1}{2}$  in. long, longitudinally striate, purple ; pulp copious, edible. PL B. I. v. 1, p. 40; Trim. Fl. Ceyl. v. 1, p. 325; Talb. Trees, Bomb. p. 63; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273; Engler, in DC. Monogr. Phan. v. 4, p. 467, & in Engl. & Prantl, Pflanzenf. v. 3, part 5, p. 175, fig. 110, A-D ; Watt, Diet. Econ. Prod. v. 5, p. 430. *Glycyarrhiza racemosa*, Dalz. in Kew Journ. Bot. v. 2 (1850) p. 39; Dalz. & GHbs. p. 51 (exclud. svn.).—Flowers: Jan.-Mar. VEEN. *A'mberi*.

KONKAN : *Stocks* !, *Law* !; Baitsi (Wari Country), *Ritchie*, 422! Ghat, *liitchie*, 422 ! S. M. COUNTRY : Kamgi.at, *JXitcme*, Szz I AANARA : evergreen forests of N. Kanara Ghats, common, *Talbot*; Divimana Ghat, *Woodrow*!; Sampkhand (N Kanara), *Woodrow* !—DISTRIB. India (W. Peninsula); Ceylon.

**10. SPONDIAS, Linn.**

Deciduous glabrous trees. Leaves usually crowded at the ends of the branches, alternate, imparipinnate ; leaflets subopposite, usually caudate-acuminate. Flowers small, shortly pedicelled, polygamous, in terminal spreading panicles. Calyx small, deciduous, 4-5-fid; lobes slightly imbricate. Petals 4-5, spreading, subvalvate. Disk cup-shaped, broad, eremite. Stamens 8-10, inserted beneath the disk. Ovary sessile, free, 4-5-celled ; ovule 1 in each cell, pendulous ; styles 4-5, conniving above. Drupe fleshy; stone hard, thick, 1-5-celled, the cells erect or diverging and opening by canals through the top of the stone. Seed pendulous ; testa membranous; embryo straight; cotyledons elongate, plano-convex ; radicle short, superior.—DISTHIB. Tropical regions ; species about 8.

- Panicle 12-15 in. long; stone fough ..... 1. *S. mangifera*.  
 Panicle 6-8 in. long ; stone smooth ..... 2. *S. acummata*.

**1. *Spondias mangifera*, Willd. Sp. PI v. 2 (1799) p. 751.**

A

glabrous tree 30-35 ft. high ; trunk straight; bark smooth, ash-colored ; branches nearly horizontal. Leaves 12-18 in. long, the common petioles slender, terete, smooth, striate ; leaflets 3-5 pairs and a terminal one, 3-7 by 1|-3 in. oblong or elliptic-oblong, acuminate, quite entire, more or less oblique; main nerves numerous, horizontal, straight, joined by a strong intramarginal one; petiolules 4—<sup>^</sup> in. long. Flowers 1- or 2-sexual, sessile, numerous, pinkish-green, in sparingly-branched glabrous terminal panicles 10-15 in. long. Calyx-teeth minute, triangular. Petals <sup>-y\$-^</sup> in. long, ovate-oblong, acufce. Disk 10-crenate. Stamens 10, about half as long as the petals. Drupes ovoid, yellow, about 1| in. long; stone woody, hard, rough with irregular furrows and cavities, fibrous outside. Seeds usually 1, more rarely 2 or 3. Fl. B. I. v. 2, p. 42; Grah. Cat. p. 42 ; Dalz. & Gibs. Suppl. p. 19; Trim. Fl. Ceyl. v. 1, p. 327; Talb. Trees, Bomb. p. 63; Engler, in DC. Monogr. Phan. v. 4, p. 248, & in Engl. & Prantl, Pflanzenf. v\* 3, part 5, p. 149, fig. 97, B-D ; Watt, Diet. Econ. Prod. v. 6, part 3, p. 338.—Flowers : Feb.-Apr. VEEN. A'mbddd.

Often planted throughout the Presidency. KONKAN : *Stocks* \; Girgaum and Mahim woods (Bombay), probably planted, *Graham*. GUJARAT : widely planted, *Woodrow*. S. M. COUNTRY : Ramghat *Ritchie*, 1008 ! ; Belgaum (planted), *Ritchie*, 1008 ! KANARA : Usheli jungles, *Ruchie*, 1008 !—DISTKIB. Throughout tropical Asia.

The ripe fruit is eaten, but is not very palatable, having an astringent terebinthaceous taste. It is known to Anglo-Indians as the *hog-plum*. It is not, however, the *hog-plum* of the W. Indies, which is *Spondias dulcis*, Willd.

**2. *Spondias aciiminata*, Roxb. Hort. Beng. (1814) p. 34.**

An

elegant middle-sized tree with a dense crown ; trunk perfectly straight; bark smooth, olive-grey; branches spreading in all directions, from erecto-patent above to divaricate below. Leaflets 5-8 pairs,

subopposite,  
elliptic, caudate-acuminate, entire, obscurely crenulate, polished. Panicles  
6-8 in. long. Drupes ovoid, yellow when ripe, the size of a pullet's  
egg;  
stone smooth, fibrous outside. Fl. B. I. v. 2, p. 42 ; Eoxb.  $\cancel{L}$  Ind. v.  
2,  
p. 451; Grah. Cat. p. 42 ; Talb. Trees, Bomb. p. 63; Watt, Diet. Econ.  
Prod. v. 6, part 3, p. 338.

KONKAN : hills near Kanheri, *Graham*, 1. c. KANARA : *Talhot*.

The existence of the plant in the Bombay Presidency is somewhat doubtful. I have  
seen one *imperfect* specimen from the hills near Kanheri which does not appear to  
differ from *S. mangifera*. Engler, in DC. Monogr. Phan. v. 4, p. 249, considers the  
species a doubtful one. The specimen in Herb. Kew. are very imperfect.

### ORDER XLYI. MORINGACE.E.

Unarmed trees with soft wood. Leaves alternate, 2-3-pinnate, the pinnae and pinnules imparipinnate, opposite; leaflets opposite, quite entire, obovate, caducous, and, as well as the pinnae and pinnules, with glands at the base; stipules 0. Flowers large, white, or white streaked with red, hermaphrodite, irregular, in axillary panicles. Calyx cup-shaped, 5-cleft; segments unequal, petaloid, deciduous from above the base, imbricate. Petals 5, unequal, the upper smaller, the lateral ascending, the anterior the larger. Disk lining the calyx-tube. Stamens inserted on the edge of the disk, declinate, 5 perfect opposite the petals alternating with 5 (or 7) which are reduced to antherless filaments; anthers dorsifixed, 1-celled. Ovary stipitate; ovules numerous, in 2 series, on parietal placentas; style slender, tubular; stigma perforated. Capsule elongate, beaked, 3-6-angled, 1-celled, loculicidally 3-valved. Seeds many, in pits of the valves; testa corky, winged or not; albumen 0; embryo straight; cotyledons plano-convex; radicle very short, superior; plumule many-leaved.—DISTRIB. W. Asia and N. Africa.

A Natural Order of doubtful affinity, containing 1 genus (*Moringa*) and 3 species.

#### 1. MORINGA, Lamk.

##### Character of the Order.

Leaves usually 3-pinnate; leaflets $\frac{1}{2}$ to $\frac{3}{4}$ in. long, nerves obscure; flowers white .....	1. <i>M. pterygosperma</i> .
Leaves usually 2-pinnate; leaflets $\frac{1}{2}$ to 1 in. long, nerves distinct; flowers yellow, streaked with red .....	2. <i>M. concanensis</i> .

#### 1. *Moringa pterygosperma*, Gcertn. *Fruct.* v. 2 (1791) p. 314.

A small or middle-sized tree; bark corky; wood soft; root pungent; young parts tomentose. Leaves usually 3-pinnate, sometimes 1½ ft. long; rhachis slender, thickened and articulated at the base; pinnae and pinnules opposite, deciduous, their rhachides very slender, articulated and with a gland at the articulations; ultimate leaflets  $\frac{1}{2}$  to 1 in., the lateral elliptic, the terminal obovate and slightly larger than the lateral ones; nerves obscure; petiolules of the lateral leaflets  $\frac{1}{2}$  to  $\frac{3}{4}$  in., those of the terminal  $\frac{1}{2}$  to 1 in. long. Flowers white, in large puberulous panicles. Calyx-lobes linear-lanceolate reflexed, puberulous outside. Petals spatulate, veined. Stamens 5 fertile, alternating with 5-7 antherless ones; filaments villous at the base. Ovary oblong, villous; style cylindrical. Pods reaching 18 in. long, 9-ribbed. Seeds 3-angled, the angles winged. Fl. B. I. v. 2, p. 45; Grab. Cat. p. 43; Dak. & Gibs. p. 311; Ait. Pb. & Sind PL p. 36; Bedd. Flor. Sylvat. t. 80; Talb. Trees, Bomb. p. 64; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 273; Watt, Diet. Econ. Prod. v. 5, p. 276.—Flowers: Jan.-Apr. VEBK. *Shevga*.

The *horseradish* tree or *drumstick* tree of Anglo-Indians. It is found wild in the forests of the Western Himalaya and Oudh, but is cultivated throughout India and in other tropical countries. The scraped root furnishes an excellent substitute for watercress while the long immature pods are used in making what is known to the Indians as drumstick-curry. Several parts of the tree are used in native medicine. Europeans as well as the natives extract an oil from the seeds. The oil is highly valued by watchmakers and generally as a lubricant for fine machinery, while perfumers hold it

in high esteem from the property it possesses of absorbing and retaining fugitive odors. It seems surprising that a greater trade is not done in this oil considering the number of trees that are planted throughout India.—Consult Watt, Diet. Econ. Trod. 1. c.

**2. *Moringa concanensis*, Nimmo, in Gralt. Cat. Bo. Pl. (1839)** p. 43. A tree\* glabrous except the young parts and the inflorescence. Leaves 2- (very rarely 3-) pinnate, reaching 1½ ft. long; primary pairs 5-6, distant, 4-8 in. long, the primary rhachis thickened at the base and as well as the secondary articulated, and with a gland at the articulations; leaflets 4-6 pairs and an odd one, broadly elliptic or sub-orbicular, obtuse at both ends, often retuse at the apex, of variable size,

thinly pubescent panicles reaching 1½ ft. long; pedicel ½-¾ in. long, articulated with the flower; bracts minute, caducous. Calyx thinly tomentose, about ½ in. long; segments white, oblong, reflexed. Petals yellow, veined with red, oblong or oblong-spathulate, the lower about ½ in. long. Stamens 5 fertile and 4-5 staminodes; filaments hairy at the base. Capsules straight, acutely triquetrous, slightly constricted between the seeds, 1-1½ ft. long; valves hard, ¾ in. broad. Seeds white or pale yellow, 3-angled, ½-¾ in. long, 3-winged; wings very thin, hyaline. Fl. B. I. v. 2, p. 45; Dalz. & Gibs, p. 311; Talb. Trees, Bomb. p. 64; Hook. Icon. Plant, ser. 4, v. 6 (1899) t. 2596; Watt, Diet. Econ. Prod. v. 5, p. 275.—Flowers: Oct.-Dec. YERN. *Mhua* (in Sind).

A somewhat rare plant. KOXKAN: *Law I, Dalzell, Capt. Gcburnel*; jungles near Pen, *Dalzell* SIND: *Stocks, 584 !, Dalzell, 58!*; Sind hills, *Balzell!*—DISTRIB. India (Rajputana); Beluchistan.

## ORDER XLYII. CONNARACEÆ.

Trees or shrubs erect or scandent. Leaves alternate, exstipulate, 1-3-lobed or imparipinnate; leaflets quite entire. Flowers usually hermaphrodite, racemose or paniculate, regular or subregular. Calyx 5-lobed or -partite, usually persistent, imbricate or valvate. Petals 5, usually narrow, free or slightly cohering, very rarely valvate. Stamens perigynous or hypogynous, sometimes declinate, 5 or 10, those opposite the petals usually shorter and often imperfect; filaments filiform, often connate at the base. Disk 0 or small, annular or incomplete. Carpels 5, rarely 1-3 or 6-7, globose-ovoid, hirsute, 1-celled; ovules 2, collateral, ascending, orthotropous; styles subulate or filiform; stigmas capitellate, simple or 2-lobed. Fruit usually of 1 (rarely 2-3), sessile or stalked 1- (rarely 2-) seeded follicles. Seed\* erect, often arillate; testa thick, sometimes arilliform below the middle, the aril various; cotyledons fleshy in the exalbuminous, leafy in the albuminous seeds; radicle superior, rarely ventral.—DISTRIB. Tropics; genera 14; species about 140.

Calyx enlarged after flowering; follicles sessile .....	1. EOUREA.
Calyx not enlarged after flowering; follicles stipitate .....	2.

CONNARUS.

### 1. ROUREA, Aubl.

Trees or shrubs sometimes scandent. Leaves imparipinnate; leaflets opposite or alternate. Flowers small, numerous, in axillary panicles; pedicels usually slender. Sepals 5, broadly ovate or



orbicular,

imbricate, enlarged and clasping the base of the ripe follicle. Petals 5, usually linear-oblong. Stamens 10 ; filaments connate at the base. Ovaries 5, of which 4 are usually imperfect; styles slender. Follicle sessile, curved. Seed erect, arillate, exalbuminous.—DISTRIB. Species about 52, all tropical.

1. **Rourea santaloides**, *Wight & Am. Prodr.* (1834) p. 144. A climbing or sarmentose shrub; branches slender. Leaflets 2-4 pairs and a terminal one, 1|-3J by f-li in., coriaceous, elliptic or lanceolate, caudate-acuminate, shining above, prominently reticulately veined beneath, base rounded, less commonly acute ; petioles g-i in. long. Flowers small, in glabrous racemose panicles, several of which spring from leaf-axils ; pedicels short, slender ; bracts minute. Sepals y<sup>1</sup>^ in. long, broadly ovate" or suborbicular, more or less minutely ciliolate. Petals f\r in. long, spatulate-oblong. Ovaries ovoid, glabrous ; styles shorter than the stamens; stigmas 2-Jobed. Follicles f in. long, conical-ovoid, tapering to a point, falcately curved, chestnut-brown, finely striate, supported on the enlarged calyx, dehiscing ventrally. Seeds about | in. long, ovoid-oblong, arillate. Fl. B. I. v. 2, p. 47 ; Dak. & Gibs. p. 53; Trim. Fl: Ceyl. v. 2, p. 1 ; Gilg, in Engl. & Prantl, Pflanzenf. v. 3, part 3, p. 63, &g. 34, F-H ; Talb. Trees, Bomb. p. 64 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420; Watt, Diet, Econ. Prod. v. 6, part 1, p. 570.—Flowers : Oct. VEIIN. *Vardhdrd.*

KONKAN : *Stocks!*; Wari Country, *Dalzell & Gibson*; Miradonger near Pen, *Ka-nitkar!*, *Woodrow.*, S. M. COUNTRY : Belgaum districts, *Cook!*; Ramghat, *Ritchie*, 126!; Castlerock, *Cvokel*, *Woodrow!* KANAKA: Yellapur, *Woodrow!* abundant 'on the hills near Karwar, *Talbot.*—DISTRIB. India (Konkan to Travancore).

Mr. Talbot reports a variety with eiliate sepals and small follicles at Ainshi Ghat (N. Kanara). I have generally found the sepals of the species above described to be, if not ciliate, at all events almost invariably minutely ciliolate. I have examined specimens from the Konkan, Castlerock, Belgaum districts, and Ramghat, with the above result.—I have not seen any specimens of the variety noted by Mr. Talbot.

## 2. **CONNARUS**, Linn.

Trees or shrubs often scandent. Leaves imparipinnate; leaflets usually 5, quite entire. Flowers small, in axillary and terminal branched panicles. Sepals 5, not enlarged after flowering, imbricate, embracing the pedicel of the fruit. Petals 5, linear or ligulate, slightly-dilated upwards. Stamens 10, those opposite the sepals long, with perfect anthers, those opposite the petals shorter and sometimes anther-less. Ovaries 5, densely pubescent, 4 usually imperfect or obsolete, the fifth with a slender style ; stigma capitellate. Follicle oblique, stipitate, inflated, glabrous or pubescent within. Seed arillate ; testa shining ; albumen 0; cotyledons amygdaloid.—DISTRIB. Species about 80, all tropical.'

A branched shrub; follicles not striate nor shining, contracted into the stalk .....

1- C.

*monocarpus.*

A. climbin^ shrub; follicles chestnut-brown, strongly striate, shortly narrowed into the stalk .....

2. *C. Wicjhtii.*

A small tree • follicles dark brown, striate, cordate at the base...

3. *C. Ritchei.*

1 **Connarus monocarpus**, *Linn. Sp. Pl.* (1753) p. 675. A much-branched shrub. Leaflets 1 or 2 pairs with a terminal one, 3-4 by 1|-\\ in glabrous, shining, elliptic or elliptic-lanceolate, obtusely atuni-

perigynous or subhypogynous ; filaments free or variously combined; anthers 2-celled. Ovary free, with 1 or more ovules on\* the ventral suture ; style simple, cylindrical, often declinate. Fruit a legume more rarely follicular or indehiscent or breaking up into 1-seeded joints, very rarely fleshy and drupe-like. Seed usually exalbuminous ; cotyledons foliaceous or amygdaloid with a straight or indexed acuminate radicle.—  
DISTRIB. The second largest Natural Order of flowering plants. Of the three Suborders into which it has been subdivided, the first is distributed throughout the globe, the second and third confined to tropical and warm regions ; genera about 400 ; species 6000 or 7000.

### SUBORDER J. PAPILIONACEÆ.

Herbs, shrubs or trees. Leaves alternate, digitate or pinnate, rarely 1-foliolate or simple, often terminating in tendrils. Flowers irregular (rarely subregular), hermaphrodite. Calyx gamosepalous, 5-toothed or -lobed or the upper lobes more or less connate, or bilabiate, the 2 upper lobes opposed to the 3 lower, rarely closed *in bud* and spatheaceous. Corolla papilionaceous ; petals 5, free or adnate to the staminal tube, the posterior (standard) outside in bud, the 2 lateral (wings) intermediate, the 2 lower inside and usually cohering by their lower margins (keel). Stamens 10, diadelphous, monadelphous or free. Ovary free. Embryo with an inflexed radicle. Cotyledons accumbent.

TRIBE I. **GENISTEJE.** Herbs or shrubs. . Leaves simple or digitately 3- or 4-foliolate. Stamens monadelphous. Pod dehiscent, not jointed.

- |   |                  |
|---|------------------|
| Anthers uniform ; keel-petals scarcely cohering ..... | 1. ROTIIIA.      |
| Anthers dimorphous; keel-petals firmly cohering.      |                  |
| Keel obtuse.  |                  |
| Calyx 2-lipped.....                                   | 2. ARGYROLOBIUM. |
| ■ Calyx 5-toothed.....                                | 3. LOTONONIS.    |
| Keel beaked.  |                  |
| Pod flattened; .....                                  | 4. HEYLAXDIA.    |
| Pod turgid 1.....                                     | 5. CROTALARIA.   |

TRIBE II. **TRIFOLIUM/LLZE.** Herbs. Leaves pinnately 3-foliolate, the veins of the leaflets usually excurrent into teeth ; stipules usually adnate to the petiole. Stamens diadelphous; filaments usually dilated at the apex. Pod usually dehiscent, *not* jointed.

- |  |                |
|--|----------------|
| Pod elongate, straight or recurved.....            | 6. TRIGONELLA. |
| Pod short, globose or ovoid .....                  | 7. MELILOTUS.  |
| Pod spirally falcate, circinate or cochleate ..... | 8. MEDICAGO.   |

TRIBE III. **LOTUS/E.** Herbs. Leaves pinnately 5-foliolate; leaflets entire. Stamens diadelphous ; filaments all or the alternate ones dilated at the apex. Pod dehiscent, not jointed.

- |  |           |
|--|-----------|
| Lowest pair of leaflets stipule-like ..... | 9. LOTUS. |
|--|-----------|

TRIBE IV. **GALEGRÆJE.** Herbs or shrubs. Leaves pinnate, usually many- (rarely 3-1-) foliolate ; petiole not cirrhiferous. Stamens usually diadelphous ; filaments filiform at the apex. Pod not jointed, usually dehiscent, but if indehiscent, usually small, 1-2-seeded, or membranous-inflated.

nafe, rounded or acute at the base ; nerves 3-5 pairs ; petiolules of the lateral leaflets | in., those of the terminal leaflets longer. Flowers about \ in. long, crowded, in erect pyramidal densely pubescent terminal panicles; pedicels short, stout, articulated with the flower. Sepals ovate-oblong, subacute, densely pubescent. Petals much longer than the calyx, linear-oblong, more or less pubescent outside. Follicles glabrous within, at first bright scarlet, afterwards dark brown outside, 1^2| in. long, fusiform, slightly falcate, tapering into a narrow stalk surrounded at t^1 >ase by the persistent (non-acrescent) calyx, smooth, not striate nc -rung. Seeds 1 in. long, ovoid, slightly compressed, surrounded a' oase by a large pulpy yellow aril; testa black, shining. *Fi. B. I. v. < . 50 ; Dalz. & Gibs. p. 53 ; Grab. Cat. p. 35 ; Trim. 11. Cevl. v. 2, p. 2; Talb. Trees, Bomb. p. 65; Woodr. in Journ. Bomb. JS^rat. v. 11 (1897) p. 420; Watt, Diet. Econ. Prod. v. 2, p. 517. Connarus pinnatus, Lamk. Encyc. v. 2, p. 95 ; Grah. Cat. p. 35.—Flowers : Feb. VEHN. 'Sundar.*

KOXXAN: *Stocks 1; S. Konkan, Nimmo ex Graham; Southern Ghats, Dalzcll \$ Gibson; Goa jungles, Graham.* KANAKA : Ghat forests of N. Kanara, *Talbot.*—DISTK-IB. India (from the Konkan to Travancore); Ceylon.

**2. Connarus Wightii, Hook. /.** *in Fl. B. I. v. 2 (1876) p. 51.* An extensive climber. Leaflets 3-3i by I5-I5 in., elliptic-ovate, obtusely pointed, coriaceous, hardly shining, reticulately veined, glabrous ; nerves 5-6 pairs, arched, slender. Follicles 1| by f in., compressed, bright red, afterwards chestnut-brown, strongly striate on the faces, narrowly keeled at the sutures, slightly pointed at the apex, base shortly narrowed into the stalk, quiiie glabrous within. Seeds obovoid-oblong, compressed, arillate at the base ; testa black, shining. *Talb. Trees, Bomb. p. 65; Woodr. in Journ. Bomb. Nat. v. 11 (1897).p. 420.—Flowers: Feb.*

KONKAN : Amboli Ghat, *Kanitkar ! S. M. COUNTRY : Castlej-ock, Woodrow!, Cooler!* KANAKA: Potelli (N. Kanara), *Talbot, 2733!; Karwar, Talb/S>^i\i- IV-----" T" \.* (Western Peninsula). *(ti\* b»s^iri8TEiB. India*

**3. Connarus Ritchei, Hook. f. in Fl B. A** nm ...  
A small tree (?). Leaflets 3-4 by U-1| in., elliptic  $Y' Z \setminus J$   $If' \circ$ , acuminate, finely reticulated, quite gllbrous.  $Flc^3 > nceolat9$ , obtusely rusty-pubescent panicles. Sepals ovate-oblong.  $Pe^{^rs} \ll m/ ; o''g? m$  long as the sepals. Follicles | by i in, turgidly oblc^tals \*hou \ ^T^ top, cordate at the base, as broad from suture to sut<sup>n</sup>S' rounclecl at the brown, striate. *Talb. Trees, Bomb. p. 65.—Mowers*  $lurf as aCrOSSJ$  dark  $< Apr.$

A rare plant. S. M. COUNTRY : Ramghat, *Ritchie, 931 ! KAN.* Suna Ghats of N. Kanara, *Talbot.*—DISTRIB. India (W. Peninsula<sup>ARA : Law ! > SiocAs ! 5</sup> 4a).

### ORDER XLVIII. LEGUMINOS^J.I

Herbs, shrubs or trees. Leaves alternate (very N ^ , opposite) usually stipulate, compound (rarely simple); leaflets S(^me times stipel-late. Flowers usually irregular and hermaphrodite. Se^als 5 co^^ed or free, often unequal, sometimes combined into 2 lips. p^ta]s 5 (rare]v fewer), usually irregular and imbricate in SUBORDERS 1 a>nj 2 reeuhr and valvate in 3. Stamens normally 10 (rarely fewer) or. J

Authors apiculate ; hairs reduced.

- Stamens monadelphous ..... 10. CYAMOPSIS.
- Stamens diadelphous ..... H- INDIGOFEKA.

Anthers muticous ; hairs basifixed.

Pod 1-seeded, indehiscent.

- Herbaceous plant (the Bombay species) ..... 12. PSORALEA.

Pod few- or many-seeded, tardily dehiscent.

Filaments not dilated.

- A climbing shrub (the Bombay species) ..... 13. MILLETTIA.

Filaments dilated ; pod 6-8-seeded.

- An erect shrub ..... 14. MUNDULEA.

Pod many-seeded, soon dehiscent.

Flowers generally in leaf-opposed racemes; pods

- flattened, continuous or scarcely septate ..... 15. TEPHROSIA.

Flowers in axillary racemes.

- Pod very long, distinctly septate ..... 16. SESBANIA.

Pod short, not transversely septate, often longi-

- tudinally 2-celled..... 17. ASTRAGALUS.

TRIBE V. **HEDYSAREAE**. Herbs or shrubs sometimes twining or scandent. Leaves impari- or less commonly abruptly-pinnate (rarely simple) ; petiole not cirrhiferous. Stamens diadelphous or monadelphous. Pod jointed if more than 1-seeded.

Leaflets exstipellate.

Stamens monadelphous; anthers uniform.

- Leaflets 1-3 ..... 18. TAVERNIERA.

- Leaflets 4 ..... 19. GEISSASPIS.

Stamens diadelphous (9 and 1); anthers uniform.

- Spiny shrub with simple leaves ..... 20. ALIAGI.

Stamens monadelphous ; anthers dimorphous.

- Joints of pod 2-6, echinate; calyx-tube short..... 21. ZORNIA.

- Joints of pod 1-2, rugose ; calyx-tube long ..... 22. STYLOSANTHES.

Stamens in 2 bundles of 5 each ; anthers uniform.

- Pod twisted, enclosed in the calyx ..... 23. SMITHIA.

- Pod straight, exerted from the calyx ..... 24. JESCIYNOMKNIK

Leaflets stipellate.

Stamens diadelphous (9 and 1); anthers uniform.

- Seed solitary ; pod boat-shaped ..... 25. "EVVTOTTq

^alr

Seeds many ; pod not distinctly jointed.

Pod turgid .....

Pod flat..... L) -Windrow I;

Holgi,

Seeds 2 or more ; pod distinctly jointed.

Kium Hitchie, 1727

!—

Joints of pod folded on one another ..... F

Joints of pod not folded on one another.

Joints of pod turgid .....

Joints of pod flattened. £vh.

A tree ; racemes fascicled from the old

wood.....; stipules

free.

Herbs shrubs ; racemes simple or? Calyx

2-lipped,

pair. v.dd from the year's shoots..... k 2 teeth forming

TRIBE VI. **VICIEAE**. Herbs (except *Abrus*) low or climbing standard usually abruptly-pinnate; petiole ending in a tendril downward - back rarely in an odd leaflet); stipules usually foliaceous! dimorphous, peltate. Stamens diadelphous (the tenth suppressed inferiorly); uniform. Pod dehiscent, not jointed. 8ly or villous,

Shrubs with the tenth stamen absent ..... 32

Herbs with diadelphous stamens (9 and 1)..... 33.

TRIBE VII. **PHASEOLEAE**. Climbing or prostrate v. 1 (1842)

erect or shrubby, very rarely trees.  
reaching

Leaves pirmately 3-fc^oot,

d silky hairs.

**u**

■\ \_ or 5-7-foKolate). Brads 2, opposite, persistent, sttpnUir ov caducous.. Stamens monadelphous or diadelphous. Pod dehiscent, not jointed. Loaves not gland-dotted : Leaflets Btipellate. Style beardless.

Nodes of raceme not tumid; petals about equal in Length.

, Statmens diadelphous; stipules and Bracts conspicuous, persistent,

Style fuKcfftin; e&lyx-teeth distinct ..... 34. SHVTERM.

Style flattened upwards; calyx truncate ... 3,">, DCMASIA.

Stamfeng uonadelphous \ stipules and bracts minute, caducous.

Anthers viniform, all fertile ..... 3fi. Gh/fCtKE.

Alternate anthers sterile,..., ..... 37. TKRAMSUS.

Xatlo? of raceme more or lest\* tumid.

Petals very unequal.

Climbing nhrnbs ..... 38. Md i \.

Armed trees ..... , ..... 39, EKYTHRIKA.

Petals equal.

Stamens rUadelphoua,

Herbs.

i\v() upper calyx-teeth not fused into out! ..... 40, GIIONA.

Two upper Cftlyx-teeth fused into one....., ..... 41. GALATTIA,

Sbrube or trees.

Flowers small, paniced ..... 42, SPATHOLOBUS.

Plowera large, racemose ..... 43. BUTEA.

Stamens ruonadelphoia

Upper lip of calyx projecting..... 44. CANAVALIA.

Dpperlip ol<sup>1</sup> C;!VK m»L proj«y;titig..... 45. PCERABIA,

Style 1 larded below Hie stigma.

Stamens dta(lal)ous. Stigma oblique.

Keel spiral ..... > ..... 46. PHASEOMJS.

Keol not spiral, ..... 47. ^ to

Stigma terminal.

b>...x\_ -is very nneqcal in length ..... 48. OMTOI

l-k f«. louff<sup>1</sup> IV'taU equal in la^th..... 49. Doucuos.

... \ T \*' la-J;ed fceneatli; Btipellse often abortive: nodes pvate-ianceoJate, | yp,

in the axils of mof«.\*

yellow or red, sear <sup>move</sup>

longer t\-\ar\ +hn r»'''th deep linfs between the seeds; seeds

-p i J, t- \* \* /with faint liaee between tne swds ; seeds

-oom D, J\ at", y, 11 ftb a smiiu Btropriole ..... i..... 51. PIMJAKH,

A rerv rare plant, r<sup>2</sup>-

mocks, 698!; 8elnvt.y<sup>x"treln</sup> wscre&cenfc ..... ;>2. CftiSTA.

A b l n i u , Egypt, B^?x-teeth not accrescent.

Leaves pinnate; pod compressed ..... 53.

i Leaves digitate; pod turgid ..... 54.

Trees or shrubs. Leaves iraparipin-

A prostrate } mially exstipellate. Stameus nionadelphous or diadel-  
soKtary, Calyxv usually uniform. Pod longer than the calyx,  
continuous,

lower much deep\*

orbicular j vt ingstly alternate,

the back, narrow<sup>llla^</sup> whitish or reddish ..... 55, DALBEEGIA.

slit above: antb/arS<sup>e'</sup> yellow ..... m' £Ta\*o < \*\*Pes-

innexed above ( ai\_mOst wwndy. not winged ..... 57, PorraAatA.

1-2-seeded —X thia winged down on© or both sides

TRIBE IX. SOPHOREJE. Trees or shrubs (rarely herbs). Leaves imparipinnate. Stamens free or very slightly connate at the base. Pod not jointed, indehiscent or 2-valved.

Pod moniliform ..... 59. SOPHORA.

### 1. ROTHIA, Pers.

Annual diffuse herbs. Leaves digitately 3-foliolate. Flowers numerous, minute, axillary, solitary or in very short racemes. Calyx-tube turbinate; calyx-lobes as long, % the tube, the two upper broader and arched. Corolla scarcely exerted; petals nearly equal, narrow, clawed, those of the keel very slightly cohering. Stamens monadelphous, the staminal-tube split at the top; anthers uniform, minute. Ovary sessile, linear; ovules numerous; style short, straight, filiform; stigma capitate. Pod linear, slender, nearly straight, compressed, many-seeded, continuous within, dehiscing by the upper suture.—DISTRIB. Species 2, of which one is a native of Tropical Asia, the other of India and N. Australia.

1. **Rothia trifoliata**, Rrs. Syn. PL v. 2 (1807) p. 302 & p. 309. A much-branched hairy prostrate herb growing in sandy soil; stem slightly woody at the base. Leaflets somewhat fleshy, 1-2 in. long, oblong-lanceolate or oblanceolate, obtuse or acute, mucronate, clothed with silky hairs; petioles shorter than the leaves; stipules elliptic-oblong, acute, sometimes slightly falcate, hairy, 1/2 in. long; petiolules very short. Flowers on very short pedicels, solitary or 2-4 together, in very short axillary racemes. Calyx silky-hairy, 1/2 in. long; segments lanceolate, very acute. Corolla yellow, fugacious; standard clawed, pink. Pods 1-2 in. long, silky, narrow-linear, flattened, straight or nearly so, pointed by the style. Seeds numerous, 2 or more. El. B. I. v. 2, p. 103; Trim. El. Ceyl. v. 2, p. 7; Woodr. in Fourc. Bomb. Nat. v. 11 (1897) p. 420; Watt, Diet. Econ. Prod. v. 1, Flowers: Aug.-Oct.

BECCAM: Bijapur, Woodrow!; Burlmnpur (S. M. Railway) S. M. COUNTRY: Badami, Cookel, Wood-row; Bel---

DISTRIB. India and Ceylon in sandy soil, N. Australia.

y 2. *C. filipes*.

—1 3. *C. prostrata*\*

### 2. ARGYROLOBIUM, Eckl. & Zucc. 4. *a vesta*\*

Herbs or shrubs. Leaves digitately 3-foliolate. 5. *C. Socksii*. Flowers in terminal or leaf-opposed racemes or umbels. 6. *C. bifaria*. deeply divided; teeth 5, distinct (in the Indian species, the upper, and the lower lip. Corolla scarcely exserted suborbicular; wings oblong. Keel-petals broad, joined, to the obtuse incurved tip. Stamens monadelphous; ant. 1. *C. mysorensis*. Ovary linear, sessile; ovules numerous; style curved gradually to the stigma terminal, often oblique. Pod linear, compressed, continuous within or septate between the seeds, subterete. *C. pu&iila*. Species 40-50, chiefly South-African.

1. **Argyrobium roseum**, Jaub. & Spach. Illus. p. 116. A small diffuse annual; stems many from the base, 6 in. long, very slender, terete, clothed with short appressed hairs. *C. chinensis*



Leaves 3-foliolate; petiole 1/2 in. long, silky; stipules minute, triangular, acute, persistent. Leaflets 1/2 by 1/4 in., broadly obovate-cuneate, occasionally reflexed (the lateral leaflets more or less oblique), silky on both sides with appressed hairs; petiolules very short. Peduncles reaching 1-2 in. long, very slender, 1-4-flowered. **Calyx** pubescent outside; upper lip shorter than the lower; teeth all triangular, acute. Corolla rose-colored or purplish; standard longer than the upper lip of the calyx. Pods 1/2 in. long by 1/8 in. broad, silky-pubescent. Seeds 10-15. *EL B. I. Y. 2*, p. 64; *Ait. Pb. & Sind PL* p. 38. *A. Kotsehyi*, *Botss. Diag. ser. 1*, fasc. 6, p. 32.

A very rare plant, **SIND**: *Stocks*<sup>1</sup>; Boogta hilk, *Vicar if isx Aitchison* (**I.e. DISTBIB.** India (N.W. Provinces); **Beluebistaa**, Persia.

### 3. LOTONONIS, DC.

**Herbs, rarely shrubs.** Leaves digitately 3-foliolate; stipules connate or free. **Flowers** in terminal or leaf-opposed racemes or umbels. **Calyx**-tube narrow, turbinate, the 4 upper teeth more or less connate, the lower 2 deeper and narrower than the others. Corolla slightly exserted; standard oblong; wings shorter and narrower; keel longer, suddenly incurved at the tip, its petals firmly united along the back. **Stamens** united in a tube slit along the top; anthers dimorphous. Ovary sessile or scarcely stalked; ovules many; style abruptly incurved at the base; stigma terminal, often oblique. Pod linear, usually compressed, but in the species below turgid.—**DISTBIB.** Chiefly inhabitants of S. Africa; **Species** about 60. ....

1. **Lotononius** *leobordea*, *Benth. in Land, Journ. Bot.* v. 2 (1843) p. 607. A diffuse much-branched herb; stem less than 6 in.

long, clothed as is the rest of the plant with fulvous silky hairs.

#### Leaves

3-lobed—what fleshy; petioles as long as the leaves. Leaflets subsessile, .. oblong or oblanceolate, sometimes mucronate; stipules 1/2 in. long, hairy. **Flowers** in subsessile clusters of 1-5,

1. **Crotalaria** [part of the leaves. Calyx 1/2 in. long. Corolla pale

undershrub; branched exserted. Pods linear-oblong, turgid, scarcely

with appressed calyx, 4-8-seeded. *El. B. I. v. 2*, p. 64; *Aitch. Pb.* &

sessile, 1/2 by 1/4 in. long, hairy. *Fl. Trop. Afr.* v. 2, p. 5; *A. Woodr. in Journ.* at the apex, part (1897) p. 40.

terminal raceme? *Smn*: sullirated land between the **plaba** and the **Eobill** pass, hairy. **Segments** 4, *Woodr.*—*Qi&rtuB.* India (**Panjab**), Arabisi, i'erm, Syria, standard veined **tuchistan**, longer than the in *Hook. Loidi* 4 **HBYLANDIA, DC.**

**Pb. & Sind PL**

*Bomb. Nat.* v/\*erb« leaves simple, entire, flowers small, axillary, p 595,—paw *feP&Q* turbinate, the 2 upper lobes slightly connate, the lower cleft. Corolla much exserted; standard large, sub-*D(rf~dl# Swa^kovate-oblQBg*, much smaller; keel-petals joined along the **Landa**, near **d** into an incurved beak. Stamens all united in a tube **Afghanistan**, Behurs dimorphous. Ovary sessile; ovules 2; style

abruptly - h e ovary ; stigma terminal. Pod small, oblong, **flat**,  
**2. Crotalaria** \*"*r<sub>n</sub>demk*- in India and Ceylon ; species 1.  
j\ 475. A **prostrate** herb ,

1. **Heylandia latebrosa**, DC. *Mem. Leg.* (1825) p. 201. A. prostrate much-branched herb; branches sometimes reaching 20 in. long, slender, wiry, clothed with long hairs. Leaves numerous, simple, 1/2-1 in., subsessile, ovate, subacute, hairy on both surfaces, obliquely cordate at the base. Flowers in the axils of most of the leaves, solitary, subsessile. Calyx-segments acute. Corolla yellow, much exerted, 1/2 in. long. Pods silky, 1/2 in. long, surrounded at the base by the persistent calyx and tipped by the style, smooth or slightly hairy, flattened, pale brown. Fl. B. I. v. 2, p. 65 ; Grab, Cat. p. 4± ; Dalz. & Gibs. p. 54 ; Aitch. Pb. & Sind PL p. m ; Trim. Fl. Ceyl. v. 2, p. 8 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.—Flowers : Feb. to June. VERN. *Godhadi*.

Very common, especially throughout the Deccan; abundant at Poona.—DISTRIBUTION. Throughout Tropical India and Ceylon.

### 5. CROTALARIA, Linn.

Herbs or shrubs. Leaves simple or 3-foliolate, rarely impari pinnate, with or without stipules. Flowers in terminal or leaf-opposed racemes, usually yellow, often showy. Calyx-tube short; teeth linear or lanceolate, subequal or shortly connate into 2 lips. Corolla equalling or exceeding the calyx; standard orbicular (rarely ovate), shortly clawed; wings obovate or oblong, shorter than the standard ; keel broad, equalling the wings, its petals joined down the back, much incurved, distinctly beaked. Stamens monadelphous; anthers dimorphous. Ovary sessile (rarely stalked), usually many- (rarely 2-) ovulate ; style long, abruptly incurved at the base, more or less bearded upwards ; stigma minute, oblique. Pod sessile or stalked, straight, linear-oblong, turgid or inflated, continuous within, usually many-seeded.—DISTRIBUTION. Tropical and subtropical regions of the globe; species about 300.

- Leaves simple.

A rigid copiously stiffly-branched undershrub with small  
 exstipulate deciduous leaves; pod slightly longer than  
 the calyx, pubescent .....<sup>^</sup>Vk ' ' I ^  
 Diffuse herbs ; stems prostrate or ascending; racemes axillary, leaves ;  
 lateral, few-flowered. 'i in. long, densely  
 Stipules 0. 1,1; standard broadly  
 Corolla exerted ..... d, glabrous. Seeds  
 Corolla not exerted. yi rv>v] 9  
 Q  
 Bracts minute, subulate .....<sup>^</sup>l ■ ^' ••\* > P'\*\*\* >  
 Bracts leafy, lanceolate..... Watt, J. J. Leon.  
 Stipules present.  
 Leaves linear-oblong ; wings of corolla yellow .....<sup>^</sup>wap ftii:fc\_e -j Q.>O\_r  
 Leaves rotund-ovate -, wings of corolla purple ..... UUB ' Drier '• f~ f  
 Diffuse annuals or low shrubs with slender branches; racemes  
 all terminal or a few also lateral. \ ' . \*■<sup>c</sup> °  
 5  
 Pod distinctly exerted; racemes lax. ,, O/IQ\*7/?\ /\*~  
 Stipules present. f J ^7^ P' \* > < •  
 Branches terete ; pods glabrous ..... US and branches  
 Branches triquetrous; pods hairy ..... ^irm, subsessile,  
 Stipules 0.  
 acute, densely  
 Plant exceeding 1 ft in height..... rounded w ua<sup>l</sup>  
 Plant less than 6 in. high ..... I  
 Pod included or scarcely exerted. ^recl , racemes ;  
 Racemes capitate. ong, persistent,  
 Stipules 0. i; bracteoles 2  
 Upper teeth of calyx connate ..... ^a"iv'ja/shae<sup>(yV</sup> -\_\_ ^  
 Upper teeth of calyx long, lanceolate. .£ o.c.oo<sup>J'</sup>  
<sup>4</sup> Leaves much longer than broad --ute 5 the <<\* lovva<sup>r</sup>  
 h

- Leaves nearly as broad as lung, shaggy beneath. 13. *C. priestkyoidea*.
- Stipules present ..... 14. *C dubia*.
- Racemes las.
- StipuL s 0 ; upper .tenth of calyx connate ..... 15. *C. tin ijotia*.
- StipuluVs inimiie, subulate; upper teeth of calyx  
oblanceolate ..... 16. *C.cahjchm*.
- Erect herbs or shrubs ; racemes usually terminal;  
pod glabrous, much longer than the calyx.
- Stipules 0 ..... 17. *C.lutescens*.
- Stipules and bracts subulate ..... 18. *C. retuna*,
- Stipules and bracts foliacsoua ..... 19. *O. seriam*,
- Erect scrubs; leaves usually large, uoi deciduous; flowers in  
terminal or terminal and lateral racemes ; pod silky or

angled.

- Stipules fultaceous; corolla blue and white ..... 20. ('. *verrycosa*.
- Si ipules 0 or minute; corolla yellow ..... 21, *C leptostachya*.

Branches terete.

- Stipules ^-lunate; wings of corolla often pale blue  
in the upper part ..... 2\*2. *C. Hetpieana*.
- Siipules0 or minute; wings of corolla yellow ..... 23. *V. jnnve.it*.

Erect shrubs; pods silky or velvety ; fiowera pameled.

- Pod iO-12-seetled ..... 24. *C, faad-urensi&*
- Pod 2 seeded ....' ..... 25. *C.fulva*.
- Pod 1 -seeded ..... 20. *C.*

Leaves trjjfoliolate.

Perennial herbs or imdershrubs.

X'oil 2-seeded.

- Oalyx-teeth exceedirtg the tube; porl sub^lobosf. .... 27.C . g
- Calyx-teetb equalling the tube ; pod subquadrangular... 28, *C, Noioniu* Tod
- many-seeded. Stip ■ l'it-

**Bructs largp, OTat@; p. -seeded..... 20. ('. or-Leritit.**

**Bracts Uiimite, s<taceou<; pod 20 30-seeded..... 30. C.striaia.**

**Etipulea 0. Pod with a stalk f I in- long..... 31. C. labwmifolia.**

Leaves usually ■"- but varying from 3- to 7\*oliolate ;  
pocl glabrous, ;i()~40-seeded.

■■! amniil ; **Btiv>ule» linear - lanceolate : bracts**

-..... W\*^

*C.qi oUa*

bluish-purple : wh

purple. Keel wit'Burhia, *Ham, in Wall. Cat. (1828) 5386*. A low  
Walked, much infls Shea numerous, stiff, close, entaBgl^i, striate, h<Mtry  
first pubescent, be>b< . Leaves few, meompicuousV^<<ci4&ous,  
sub-

Pi. B. I. v. 2, p^ in., oblong, asually rouuded, sometimes mucronate  
Icon, t. 30; W<fe-greeni silky; stipules 0. tFlowenj 6—12, in elongate  
Mowers: Aug.-O; pedicels very short, bibracteolate. Calyx X in.  
long,

S, M. CtovKTRY:fl&nceolate, acute; Corolla slightly exserted, yellow;  
*Woodrov?!—BISTBI S:* ;htly bearded at the top. Pods  
scarcely

(8, H. Cmmtrv),

(8, H. Cmmtrv), , JounK v g (lg4% \ p < 4/4 . Jfof^ & (:i1) ,, 54  
 the purple wings o-  
 rp. 37; 1 alb. Trees, Bomb. p. b < ; AVoodr. in Journ,  
**7. Crotala!- H (1897) p. 420; Watt, Diet, Econ, Prod.**  
 v. 2, erect herb 1-2 vs : Dec.-Feb, YEHN. Ghrup-L  
 1 A^ spreading he desert Flora. GUJAHAT: Ahmedabad, A !;  
 Cambay,  
 Ittl-<-^g(\ a^ |^y SINO: Cooked Stocks, 37.); Mirpur-Khas, Woodrow;  
 Jemadar  
 India; Afghanistan, Reju Karachi, Biocetel; Shikarpur, Cool-e\~l)is,i&m. ^W.  
 The meagurenae alxyj i;ii| , - .; L Fi. B. I. v. 2, p. 66 ;  
 Benth.

b

, Baft, i« ifeflfe lon^ . /OIH^ . Y. 2 (1843)  
 • stems 6-15 in. long, many from a woody

root, very slender, terete, clothed with spreading deciduous silky hairs. Leaves 1-2 by 1-2 in., ovate-oblong, obtuse or acute, mucronulate, prominently veined, subsessile, clothed with scattered silky hairs, obliquely cordate at the base; stipules 0. Flowers distant, in leaf-opposed or extra-axillary 2-flowered racemes, which are much longer than the leaves; peduncles and pedicels very slender, the latter 1/2 in. long; bracts 1/2 in. long, linear-lanceolate, hairy, persistent. Calyx 1/2 in. long, hairy; teeth long, lanceolate. Corolla yellow, exserted; standard erect, orbicular, veined, 1/2 in. broad. Pods 1/2 in. long, shortly stalked, glabrous. Seeds 8-10. Fl. B. I. v. 2, p. 66; Dalz. & Gibs. p. 56; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.—Flowers: Oct.-Dec.

*Mgeworthii* : Gh. it between Wai and Wathar, *Cook*!; Pliunda Ghat, *Ritchie*, *b'd* Mahableshwar, *Cook* I; Dongergaon, near Ahniediagar, *Cook*! KANAKA: *Mrs. Vard*! near Honore, *Hohenhacker*, 731! —DISTRIB. India (W. side of the W. Peninsula).

VAR. *trichopliora*. Smaller and coarser clothed with silky yellow-brown hairs. Leaves 1-2 in. long. Peduncles 1-2-flowered. Corolla scarcely exserted. *Benth. ex Baker in Fl. B. I. v. 2, p. 67 (sp.)*.

Except the hairiness and somewhat larger leaves, I find nothing to separate this from *C. Jilipes*, of which I think it should be considered a variety.

KONKAN: *Stocks* I

3. ***Crotalaria prostrata***, *Ro. & Schum. Flort. Beng. (1814) p. 54.* Annual, 6-15 in. high; branches many, ascending, slender, clothed with silky yellowish hairs. Leaves subsessile, 1-2 by 1/2 in., oblong or obovate, rounded at the apex, clothed on both surfaces with silky yellowish or yellowish-brown hairs, paler beneath, usually oblique or subcordate at the base; stipules 0. Flowers small, 2-4-flowered racemes; peduncles slender, hairy, long. Bracts and bracteoles minute, subulate. Calyx 1/2 in. long, hairy; segments linear. Corolla yellow, not exserted. Pods 1/2-3/4 in. long, inflated, linear.

12-15, highly polished. *El. B. I. v. 2, p. 67; Trim. L. Journ. Bomb. Nat. v. 11 (1897) p. 420; 1 Prod. v. 2, p. 613.—Flowers: Oct.-Nov.*

*Stocks*, without locality! S. M. COUNTRY: Halyal, near Dhail

oblong-cylindric. KANAKA: Kala naddi, *Ritchie*, 1023!; Yellapur, *Talbot*.—DISTRIB. India; Ceylon, Java.

4. ***Crotalaria vestita***, *Balcer, in Hook. f. Fl. h. I. Journ. p. 12-13.* An erect usually much-branched herb 9-24 in. high; slender, terete, clothed with long silky hairs. Leaves 1-2 by 1/2 in., oblong or obovate, obtuse or sinuate, base usually cordate. Flowers in densely branched racemes, 4-5-flowered. Calyx 1/2 in. long, hairy; segments linear. Corolla yellow, not exserted. Pods 1/2-3/4 in. long, inflated, linear. *Stocks*, without locality! S. M. COUNTRY: Halyal, near Dhail. KANAKA: Kala naddi, *Ritchie*, 1023!; Yellapur, *Talbot*.—DISTRIB. India; Ceylon, Java. *punctata*, *Grab!*

peduncles much longer than the leaves; bracts 1/2 in. long, persistent, leafy, lanceolate, 1/2 in. long; pedicels shorter than the calyx; bracteoles 2 beneath the calyx, 1/2 in. long, linear, very hairy. Calyx shaggy, 1/2 in. long; the 2 upper segments lanceolate, acute; the 3 lower linear.

Corolla not exerted; standard suborbicular-oblong, veined; wings linear-oblong, rounded at the tip. Pods oblong, turgid, glabrous, |-J in. long, subsessile. Seeds 15-20. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.

*Stocks* and *Dalzell*, without localities! DKCCAN: Khandala, *Bhival*; Maha-bleshwar, *Cookel*—DISTUIB. Apparently endemic in Bombay.

**5. *Crotalaria Stocksii*, Benih. ex Baker, in *IfooJc.f. Pl. B. I.* v. 2 (1876) p. 67.** A much-branched annual 1-1 ½ ft. high; stems and branches pale, slender, terete, glabrous. Leaves f-1<sup>^</sup> by 1<sup>^</sup>/<sub>2</sub> in., sub-sessile, linear-oblong, tip rounded, tomentose on both surfaces, equally narrowed at both sides at the base; stipules minute, subulate, deciduous. Flowers very small, yellow; pedicels filiform, 2 or 3 times as long as the leaves, solitary, leaf-opposed, with 2 subulate bracts about -fa ID. long below the flower and with 2 small subulate bracteoles beneath the calyx. Calyx fa in. long, pubescent outside; segments very acute. Corolla slightly exerted; standard obovate-oblong. Pods sessile, 4~1 in. long, lineal-oblong, glabrous, finally black. Seeds 12-16, reni-form, compressed. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.

Rare. KONKAN: *Stocks* \; Jauibalpada, Colaba district, *Kanitkar*! -DISTRIB. Tenasserim and the Andamans.

**6. *Crotalaria bifaria*, Linn. f. *Svpph* (1781) p. 322.** A much-branched herb; branches terete, more or less pubescent. Leaves |-1<sup>^</sup> by |-1 in., rotund-ovate or a few of the upper oblong, rounded at the apex, mucronulate, more or less hairy on both surfaces, oblique or rounded at the base; petioles j<sup>1^</sup>in.long; stipules gin. long, lanceolate, reflexed. Racemes 1-2-flowered; peduncles stout, usually exceeding

<sup>^j</sup> bTuTsh-purple |g<sup>s</sup> i~§<sup>'</sup> m- ^on^ oblong, rounded at the tip, bluish-purple. Kee<sup>^1</sup> a ^ori1? beak, veined with purple. Pods shortly stalked much<sup>a^ec^</sup> I~H<sup>"1#</sup> ^onS» usually mottled with purple, at first pubescent<sup>>om^an</sup>£ nearly glabrous before splitting. Seeds 10-12. Y\ B. I. v. • 69 5 Grah. Cat. p. 45; Dalz. & Gibs. p. 55; AVight, Icon. t. 30<sup>3o</sup>dr- in Journ. Bomb. Nat. v. 11 (1897) p. 420.—• Flowers: ^

the leaves; bracts 2, about J- in. below the calyx, foliaceous, persistent, lanceolate or ovate-lanceolate, -|—| in. long. Calyx reaching | in. long, hairy outside; Segments linear-lanceolate, very acute. Corolla slightly exerted ^jstandg&d<sup>orkioiilar</sup>, reaching | in. long, yellow, veined with

§ ^ bl dd h i

S. M. Cou Rawgmt, *Law ex Graham, Dalzell § Gibson*; Badami, *Cookel, Woodrow*! \_ ?B\* I<sup>d</sup>ia (W. Peninsula).

The meas<sup>nt8</sup> have been taken from a well-grown spec'nnen from Badami (S. M. Coun<sup>v^lere</sup> the plant is tolerably abundant.—The flowers are handsome, the purple vOtttrasting<sup>wen</sup> with the yellow standard.

**7. *Crc<sup>r\*a</sup> »iysorensis*, Both, *Nov. PL Fp.* (1821) p. 338.** An erect



herbft\* ^S> wltm numerous ascending branches clothed with ^ IA. ,, spre} hairs. Leaves subsessile, 1—2| by j|-| in., linear-oblong, nK^~\*,i \*/oth ends, apiculate, clothed (especially beneath) with long spreading silky hairs ; stipules linear-lanolate, \-1 in. long, persistent. } lowers yellow, in lax erect terminal 6-9-flowered racemes; bracts foliaceous, lanceolate, hairy; bracteoles beneath the calyx ^ in. long, lanceolate, hairy. Calyx ^-| in. long, the upper segments lanceolate,

the lower linear, all clothed with long spreading hairs. Corolla exerted; standard ovate, acute; wings narrow-oblong, rounded at the tip. Pods 1 in. long, scarcely stalked, truncate at the apex, much inflated, glabrous when ripe, pale brown. Seeds 20-30. Fl. B. I. v. 2, p. 70; Trim. El. Ceyl. v. 2, p. 12; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.—Flowers: Oct.

KONKAN: *Stocks!* DECCAN: Poona, *Woodrow!*; Jsasik hills, *Dalzell!*; Wada Ghat below Alaliabfshwar, *Cooke!*; Dongergaon near Ahmednagar, *Cooke!* GUJARAT: Dakor, *Kanitkar I*—DISTRIB. Throughout India; Ceylon.

8. ***Crotalaria triquetra***, *Dah. in Hook. Kew Journ. Bot.* v. 2 (1850) p. 34. Suffruticose, 12-20 in. high, branched from the base; branches acutely triquetrous, glabrous or with a few scattered spreading hairs. Leaves sessile, 1-1½ by ½-¾ in., elliptic-oblong, glabrous above, glabrous or with a few scattered hairs beneath, rounded or sub-cordate at the base; stipules small, ovate, acute, reflex. Flowers pale yellow, in long very lax 2-3-flowered terminal and lateral racemes 6 or 7 times as long as the leaves; pedicels about as long as the calyx; bracts ovate, acute; bracteoles beneath the calyx minute, setaceous. Calyx ½ in. long; segments subequal, triangular, acute, silky. Corolla slightly exerted; standard broadly ovate, subacute, with a tuft of hairs at the back below the apex; wings oblong, rounded at the tip. Pods ¾-1 in. long, oblong, cylindrical, with appressed silky hairs. Seeds 15-20. Fl. B. I. v. 2, p. 71; Dalz. & Gibs. p. 56; Trim. Fl. Ceyl. v. 2, p. 12; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.—Flowers: Oct. VERN. *Ghāti*.

KONKAN: *Law!*, *Stocks!*, *Dalzell!*; Malwan, *Dalzell* <J- *Gibson\** Vingorla, *Woodrow*. DECCAN: Poona, *Woodrow*, 191!, also 235!; Mahableshwar, *Cooke I*—DISTRIB. India (Rajputana to Tinnevely).

9. ***Crotalaria albida***, *Heyne, ex Roth, Nov. Pl. Sp.* (1821) p. 333. A much-branched undershrub 1-2 ft. high; branches slender, terete, more or less silky-pubescent. Leaves 1-2 by 1½-2 linear-oblong, oblanceolate, obtuse, apiculate, pellucido-punctate, very or less silky-pubescent (especially beneath), base acute; petioles ½-1 long; stipules 0. Flowers in terminal (rarely lateral) 6-20-flowered racemes, 2-5 in. long; pedicels ½-1 in. long; bracts and bracteoles linear. Calyx ½ in. (finally 1 in.) long; teeth long, the 3 lower linear, acuminate, the 2 upper broader, sometimes subobtuse. Corolla 1 in. long, pale yellow; standard suborbicular, with a few hairs on the back; wings obovate-oblong. Pods glabrous, sessile, 1 in. long, oblong-cylindrical. Seeds 6-12. Fl. B. I. v. 2, p. 71; Trim. Fl. Ceyl. v. 2, p. 12; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420. *Crotalaria punctata*, Grah. in Wall. Cat. 5401. *Crotalaria epunctata* Dalz. in Hook. Kew Journ. v. 3 (1851) p. 210; Dalz. & Gibs. p. 56.—Flowers: Dec.-Feb.

KONKAN: *Stocks I*, *Law I*; Ratnagiri, *Kanitkar!* DECCAN: Fitzgerald Ghat below Mahableshwar, *Cooke!* KANARA: near Honore, *Ho hen hacker*, 731!; N. Kanara, *Talbot*, 119! GUJARAT: *Kanitkar!*—DISTRIB. Throughout the plains of India; Malaya, Ceylon, China, Philippines.

I have examined a large number of specimens from Bombay, but have not found the leaves of any of them to be epunctate. In a specimen in Herb Kew. labelled *C. epunctata* in Dalzell's own handwriting, the leaves are pellucid-dotted.—It sometimes happens, when the leaves are densely pubescent, that the dots are not readily distinguishable, but careful examination will reveal them. I have not therefore

retained the var. *epunctata*.

**10. *Crotalaria pusilla*, ffeyne, ex Both, Kov. PL SJK (1821).p. 335.**  
A much-branched leafy herb 2-5 in. high ; branches ascending, clothed with appressed brownish silky hairs. Leaves \-| by  $\tau V''TV^m-i^{su\wedge}$  sessile, linear-oblong, densely silky, obtuse or subacute, narrowed at the base ; stipules 0. Racemes terminal and lateral, numerous,  $\wedge$ -1 in. long, 3-10-flowered ; pedicels short; bracts minute, lanceolate. Calyx hairy

species

Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420.—Flowers : Sept.-Oct.

KONKAN : Bombay, *Capt. Gehurne* ! DECCAN : near Wadi Junction, G. I. P. Railway, *Vaidya* \ S. M. COUNTRY: Dharwar, *Woodrow*; Iadami, *Woodrow*!; Paclshapur, *Richie*, 1171 !—DISTRIB. From the Bombay Presidency southwards.

**11. *Crotalaria nana*, Barm. Fl. hid. (1768) p. 156, t. 48, fig. 2.**  
Annual, 9-18 in. high, sometimes erect and without branches, sometimes branched from the base or from above the base; stem and branches clothed with long spreading hairs. Leaves f-2 by J-| in., subsessile, closely and  $\wedge$  minutely pellucido-punctate, oblong or oblanceolate, subacute, apiculate, 'silky-hairy on both surfaces, base subcuneate ; stipules 0. Flowers small, usually in crowded capitate or quasiumbellate terminal racemes, sometimes a few solitary or 2-3 together in some of the upper leaf-axils ; pedicels short, hairy ; bracts and bracteoles small, linear-subulate, very hairy. Calyx densely hairy outside, the 2 upper teeth connate for nearly their entire length very shortly divided at the apex, the 3 lower teeth triangular, acute. Corolla not exerted ; standard oblong, rounded, with a tuft of hairs at the back below the apex. Pods \ in. long, globose-ovoid, glabrous, black when ripe, scarcely exceeding the calyx. Seeds 6-10. *Yl B. I. v. 2, p. 71 ; Dalz. & Gibs.*

p. *o(J ; Trim. Fl. Ceyl. v. 2, p. 13 ; Woodr. in Journ. Bomb. Nat.*

v, 11 (1897) p. 420. *Crotalaria umbellata*, Wight, in Wall. Cat. 5383;

*Grah. Cat. p. 45 V't>alz. & Gibs. p. 56.*—Flowers: Sept.-Oct.

KONKAN: *Stocks I*; Yingorla and Mai wan, *Dcdzell & Gibson*. DECCAN: Maha-bleshwar, *Cookel, Woodrow* ! S-. M.COUNTRY : RamgMt, *Law ex Graham*.—DISTRIB. India (W. Peninsula); Ceylon.

**12. *Crotalaria chinensis*, Linn. Syst. ed. 10 (1759) p. 1158.**

Annual, 1-2 ft. high, usually much-branched ; stems and branches clothed with long spreading brown silky hairs. Leaves subsessile, 1-21 by 5-f in., oblong or oblanceolate, rounded at the base and apex", pellucido-punctate, apiculate, more or less silky-hairy ; stipules 0.

Flowers in terminal capitate racemes, 3-6 in a head ;

bracts and  
bracteoles linear persistent. Calyx  $\frac{1}{2}$  in. long, densely hairy ;  
lower  
teeth linear, the upper lanceolate. Corolla pale yellow, not exerted  
;  
standard orbicul\* r-oblong, subacute, with a dense tuft of long hairs at  
the back below the apex. Pods sessile, as long as the calyx,  
glabrous.  
Seeds 15-20. *Fl B. I. v. 2, p. 73; Benth. in Hook. Lond.*  
*Journ.*  
v. 2 (1843) p. 566 (*not* of Eoxb.).—Flowers : Oct.

Rare. KONKAN: *Stocks\**; Severndroog taluka, *Stocks!* — DISTRIB.  
Throughout India ; Sumatra, China, Philippines.

13. **Crotalaria priestleyoides**, Baker, in *Ifook. l. Fl. B, L v. 2* (1870) p. 74. A low undershrub; branches ascending, densely clothed with spreading brown silky hairs. Leaves nearly as broad as long, subsessile,  $\frac{1}{2}$  by  $\frac{1}{2}$  in., broadly obovate or oblanceolate, mucronate, the upper surface sparsely clothed with long hairs, the lower shaggy, base rounded or acute; stipules 0. Flowers 4-8, in dense terminal heads; bracts  $\frac{1}{2}$  in. long, lanceolate, acuminate, persistent, shaggy outside, glabrous or nearly so within. Calyx shaggy; lower teeth linear, acute, the upper lanceolate and  $\frac{1}{2}$  in. broad. Corolla as long as the calyx; standard  $\frac{1}{2}$  by  $\frac{1}{2}$  in., obovate-oblong, rounded at the apex and with a small tuft of hairs at the back. Pods sessile,  $\frac{1}{2}$  in. long, dark brown, glabrous, smooth and polished. Seeds 10-16, chestnut-brown, smooth, polished.

Rare. KONKAN: *Law I, Slocks*  $\frac{1}{2}$  *I) ah ell I*—DISTRIB. India, Ananiallay hills (*Bcddoaie*).

14. **Crotalaria dubia**, *Grah. in Wall. Cat.* (1828) 5404. Annual, 1-2 ft. high, simple or branched; stems and branches silky with appressed hairs. Leaves membranous, 2-3 by 1-1-J- in., obovate, subacute, mucronate, more or less silky above, densely so beneath, base cuneate; main nerves 6-9 pairs, prominent on the under surface, hairy; petioles  $\frac{1}{2}$  in. long; stipules minute, setaceous. Flowers 12-20 in dense, silky-villous, usually oblong terminal heads, sometimes reaching 2 in. long, with often a leaf: just below the head; bracts and bracteoles obovate-lanceolate, acute, about  $\frac{1}{2}$  in. long, hairy on both surfaces. Calyx densely fulvous-silky outside, glabrous within; segments all long, acuminate, the 2 upper slightly broader and less deeply divided than the 3 lower. Corolla as long as the calyx; standard broadly oblong, emarginate, with 2 or 3 long hairs at the back near the apex. Pods sessile, as long as the calyx, glabrous?,  $\frac{1}{2}$  in. long, oblong. Seeds 6-?, pale brown, polished. *Fl. E. I. v. 2*, p. 73; *Benth. in. Hook. Loud. Journ.* v. 2 (1843) p. 568.—Flowers: Nov.-Dec.

p            he Bombay Presidency.      KONKAN: *SfocAA9^^ARk* : common  
 on  
 the banks of the Kala nadili near Lalguli, Yellapur talu&a, *Talbot*, 120!—DISTRIB.  
 India (W. Peninsula, Chiltugong, Tenasserim).      \*

**15. *Crotalaria linifolia*\*** *Linn. f. Suppl.* (17&1) p. 322.  
 Suffruti-cose, 9-20 in. high, usually much-branched; branches terete,  
 clothed with appressed silky hairs. Leaves 1-2' by :j-4 in.,  
 oblanceolate or oblong, rounded at the apex, apiculate, densely siuky  
 with appressed hairs beneath, more or less hairy above, base subcui\care;  
 petioles very short, silky ; stipules 0. Flowers in terminal elongate  
 silky 6-20-flowered racemes reaching 1 ft. long; pedicels -^gin.  
 long; bracts and bracteoles subulate. Calyx densely silky ; the 2 upper  
 segments connate except at the very apex, forming a broadly ovate  
 upper lip \ by -i- in., the 3 lower segments triangular, acuminate. Corolla  
 scarcely longer than the calyx ; standard oblong, rounded, truncate or  
 sometimes slightly emarginate, with a very few minute hairs at the back  
 below the apex. Pods ovoid-oblong, sessile, as long as the calyx,  
 obliquely truncate at the apex, glabrous, black when ripe. Seeds 4-10.  
 Fl. B. I. v. 2, p. 72; Grah. Cat, p. 45 ; Dalz. & Gibs. p. 56 ; Trim. Fl.  
 Ceyl. v. 2, p. 13 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420. *C.*  
*sepalifera* Grah. in *Wall. Cat.* 5420.      Flowers: Sent

A rare plant in the Bombay Presidency.      KONKAN: *SfocA'A9^^ARk* : common  
 on

bk      f      h      Kl              dli                      L l i Yll      l

I have examined many living specimens in which there were only 4 seeds. •

KONKAN : *Stocks* ! DECCAN : Poona, *Cooke* !, *Woodrow* !; Khed, *Kanitkar* !; Khan-dala, *Graham*. GUJARAT : Surat, *Dalzell* & *Gibson*.—DISTRIB. E. tropical regions.

**16. *Crotalaria calycina*, Schrank; PI Bar. Monac. (1819) t, 12.**  
An erect herb 1-2 ft. high ; stem simple or branched, densely clothed with appressed silky hairs. Leaves variable, dimorphous, in one form narrow-linear, acute, reaching 5-6 in. long, in the other and more common form lanceolate, acute or subobtusely, 1—3<sup>^</sup> by |g in., mucronate, glabrous or nearly so above, more or less silky with appressed hairs beneath, base acute; petioles J<sup>^</sup>—J<sup>^</sup>in. long ; stipules minute, subulate, hairy. Flowers large, in terminal 2-12-flowered racemes ; pedicels stout, 5 in. long, deflexed in fruit; bracts and bracteoles large, foliaceous, lanceolate, very acute, shaggy with long hair. Calyx |1 in. long, densely clothed with long fulvous persistent hairs ; lower teeth lanceolate, acuminate, the upper obovate-oblong, |§ in. wide. Corolla pale yellow, shorter than the calyx; standard obovate-oblong, rounded at the apex and with a small tuft of long hairs at the back. Pods sessile, shorter than the calyx, glabrous, dark brown. Seeds 20-30. Fl. B. I. v. 2, p. 72; Trim. El.

Ceyl. v. 2, p. 14; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420. *O. anthylloides*, Don, Prodr. p. 241; Grah. Cat. p. 44 ; Dalz. & Gibs. p. 54 (not of Lamk.).—Flowers : Oct.

Pretty common in the rains, *Graham*. KONKAN : *Stocks* I; S. Konknu, *Duhe* U. & *Gibson*. DECCAN: Poona, *Woodrow* I; Soos, Poona Collectorate, *flhival*—DISTRIB. E. tropical regions, Tropical Africa.

**17. *Crotalaria lutescens*, Dalz. in Hook. Kav Journ. v. 2 (1850) p. 34.** Annual, erect, 1-3 ft. high, sparingly branched; branches terete or obscurely angled, striate, glabrous. Leaves membranous, pale, subsessile, variable, in one form\* reaching 8 in. long by ^-\ in. in breadth, linear, in another 3-5 by |j|j in., elliptic-lanceolate, all acute (rarely rounded) at the apex, apiculate, glabrous except the young leaves; stipules 0. Flowers distant, in long slender lax 6-15-flowered racemes ; pedicels ^ in. long, slender; bracts and bracteoles small, subulate, persistent. Calyx glabrous outside, about i in. long; upper teeth connate at the base only, the 3 lower teeth connate for about half their length, all linear, very acute. Corolla yellow, twice as long as the calyx ; standard 1 in. long, conspicuously veined, ovate-oblong, acute, reflexed in flowering; keel with a hairy line on its back. Pods quite glabrous, cylindrical, oblong, 1-1| in. long. Seeds numerous.—Fl. B. I. v. 2, p. 74; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420. *C. peduncularis*, Dalz. & Gibs. p. 55 (not of Graham).—Flowers : Aug.-Oct.

KONKAN: *Law*, *Stocks* > *Dalzell*; Vingorla, *Dalzell* cf- *Gibson*; Malvan, *fuhell*. S. M. COUNTRY : Castlerock, abundant, *Cooke* ! KANARA : on the Ghats near the Yena



temple (N. Kanara), *Talbot*, 280!—DISTRIB. Apparently endemic.

18. ***Crotalaria retusa***, *Linn. Sp. Pl.* (1753) p. 715. A robust undershrub 2-4 ft. high; branches striate, glabrous or appressedly pubescent. Leaves 1<sup>1</sup>-3-i by f-g in., oblanceolate-oblong, obtuse or retuse, sometimes mucronate, rarely subacute, glabrous above, silky-pubescent beneath, base cuneate ; petioles very short ; stipules subulate. Flowers numerous, large and showy, in erect terminal racemes 6-12 in. long;

pedicels ]—<sup>^</sup> in. long ; bracts .subulate, 1 at the base o( each pedicel and 2 miuh smaller about halt' way up. Calyx §-■£■ in. long, glabrous or nearly so outside ; tube cam pan u I ate; upper teeth ovate, acute, divaricate, connate near the base only, the 8 lower teeth much narrower, triangular, acuminate, connate about half the way up. Corolla much exserte 1, about 1 in. long, yellow with a purple tinge; standard subor.bicular, conspicuously veined, with a strong rib down the middle of the back. Pods 1-1-J- in. long, stalked, linear-oblong, slightly broader upwards. Seeds 15-20. F\ . B. I. v. 2, p. 75 (*exclud. sijn!* Dalz. & Gibs.); Bofc. Mag. t. 2561; Trim. PL Ceyl. v. 2, p. 15 ; Watt, Diet. Econ. Prod. v. 2, p. 613. *C. Leschenaultii*, Grah. Cat. p. 44; Dalz. & Gibs. p. 54; Woodlr. in Journ. Bomb. Nat, v. 11 (1897; p. 420.—Flowers : Sept.-Nov. VEKN. *Dingala*,

KONKAN: *Law I, Stocks I, Capt. Geburnel* DECCAN: Mahableshwar, *CookeU Wood-row !*; Khandala, *JWoodrowl S. M.* COUNTRY: Rainghat, *Jtitchie*, 150!—DISTRIB. India generally; Ceylon, Cliina, Malaya, N. Australia, Tropical Africa.

Very common at Mahableshwar, where it has been erroneously referred to *C. Leschn-aultii*, DC. *Crotalaria Leschenaultii* [DC. Prodr. v. 2, p. 125 ; Benth. in Hook. Lond. Journ. v. 2 (1843) p. 481 ; Wight & Am. Prodr. p. 186 : *C. lupimjflora*, Grab, in Wall. Cat. 5407] has foliaceous ovate bracts, by which it may be readily distinguished from *C. retusa*. *C. Leschenaultii* seems to be a rare plant, confined apparently to the Nilghiris. There are only 2 specimens in Herb. Kew., one from Wight's Herbarium and the other from Mcl\or's (n. 80). There is every reason to believe that it is not a Bombay plant at P<sup>11</sup>. It has not t)3en found in that Presidency by Law, Stocks or Ritchie or by ni'.^e recent collectors. Ritchie's specimen (n. 150) from Ratnghat mentioned by Baker in Fl. B. I. v. 2, p. 76, is *C. retusa*. What *C. retusa* of Graham (Cat. p. 45) is, whitfh he says grows in compounds on the Esplanade in Bombay and flowers in the cold season, or what *C. retusa* of Dalzell & Gibson (Bo. Fl. p. 55) is, which is said to be common in sandy soil in company with *C. verrucosa* and to flower in February and March, when all the Bombay Crotalarias are practically out of bloom, I can form no idea.

19. **Crotalaria sericea**, Retz. *Obs.* fasc. 5 (1789) p. 26. A

short

undershrub 3-4 ft. high ; branches stout, striate, subglabrous. Leaves 2-6 in. long, very variable in breadth, oblong-lanceolate, acute or sub-acute, mucronate, glabrous above, finely silky b<sup>421</sup>ath, base cuneate ; petioles y<sup>1^</sup> in. long; stipules large, leafy, persistent. Flowers in elongate terminal 20-50-flowered racemes 10-A2 in. long; pedicels longer than the calyx, with 1 large foliaceous ovalte-acute bract at the base of each pedicel and a pair of minute subulate tracts on each pedicel below the middle. Calyx ^ in. long, almost gUbrous outside ; tube campanulate, half as long as the teeth ; upper tec\th large, triangular, acute, about \ in. broad at the base, the 3 lower teeth smaller and less deeply cut than the upper, linear-lanceolate, acute. Corolla yellow with a purplish tinge; standard broadly ovate, with a strong midrib afc the back. Pods glabrous, linear-oblong, stalked, 1-2 in. long. Seeds 20-30. PL B. I. v. 2, p. 75 ; Grah. Cat. p. 45; Dalz. & Gibs. p. oo; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 420; Watt, Diet. Econ. Prod. v. 2, p. 614.—Flowers : Oct.-Dec.

KONKAN: *Law I Stocks I*; Bombay, in pasture grounds, *Dafcell \$ Gibson, Graham*, KANARA: Gund (N. Kanara), *Woodrow*.—DISTRIB. Throughout India generally; Malaya, Andamans.

20. **Crotalaria verrucosa**, Linn. £/? . *PI.* (1753) p. 715. A much-branched herb 2-3 ft. high; branches acutely angled, at first puberulous,

afterwards glabrescent. Leaves 2-6 by 1<sup>^</sup>-3 in., ovate-rhomboid or ovate-deltoid, obtuse or occasionally acute at the apex, tapering to the base, subglabrous above, more or less downy and paler beneath; nerves, prominent; petioles  $\tau V''i$  <sup>1D</sup>- 5 stipules large, foliaceous, semilunate, persistent, flowers in terminal or lateral 12-20-flowered racemes 6-8 in. long; pedicels  $f^{\wedge}$  in. long; bracts at the base of the pedicels linear-lanceolate,  $J$  in. long, those on the pedicels much smaller, subulate. Calyx membranous, 4 in. long, faintly pubescent; tube short, campanulate; teeth subequal, triangular, acute. Corolla  $\frac{3}{4}$  in. long, exserted, bluish-purple and white, rarely entirely white. Pods densely villous when young, softly pubescent when ripe, 1-1 $\frac{1}{2}$  in. long, oblong-cylindric, stalked. Seeds 10-15, yellow,  $\frac{1}{5}$  in. long, polished. Fl. B. I. v. 2, p. 77; *Grah. Cat.* 55; *Trim. Fl. Ceyl.* v. 2, p. 15; p. 40; *JUalz. cc Uibs.* p. Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 420; *Watt, Diet. Econ. Prod.* v. 2, p. 614.—flowers: Oct.-Nov.

KONKAN: *Law*!, *Stocks*!; Vingorla, *Woodrow*; near Goa, *Cooke*! DECCAN: Sholapur districts, *Law ex Graham*.—DISTRIB. Tropical India; Ceylon, China, Tropical Africa, Mauritius, Tropical America.

**21. *Crotalaria leptostachya*, Benth. in Hook. Lond. Journ. Bot. v. 2 (1843) p. 562.** A stiff erect shrub; stems and branches

tetra-

gonous, fulvous-pubescent at the angles. Leaves membranous, 3|-5i

by

|-1 in., oblong-lanceolate or linear-oblong, acute, apiculate (sometimes very narrow in proportion to their length), thinly clothed on both sides with fulvous appressed silky hairs, base usually rounded; nerves numerous, conspicuous, fulvous-hairy; petioles very short; stipules minute,

deciduous. Flowers in elongate many-flowered racemes 6-12 in. long

;

pedicels short, fulvous-hairy; bracts small, subulate, hairy. Calyx  $\wedge$  in.

long, clothed with fulvous silky glistening hairs on the outside;

tube

very short; teeth long, triangular, acute, the 2 upper divaricate, slightly broader and a little more deeply cleft than the 3 lower ones.

Corolla

yellow, no-exserted  $\nabla$  standard suborbicular, glabrous on the back.

Pods

densely fulvous-silky.  $g-f$  in. long. Seeds 4-6. *XL B. I. v. 2,* p.

78;

Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 420.—flowers: Oct.

KONKAN: *Stocks*!, *Law*! DECCAN: Ambenala Ghat, *Kanitkar*!; Khandala, *Cooke*!, *Woodrow*. KANAKA: *Yelapur, Talbot*, 80!—DISTRIB. Apparently endemic in Bombay.

**22. *Crotalaria Heyneana*, Griseb. in Wall. Cat. (1828) 5414.**

A sparingly-branched undershrub 1-2 ft. high; branches slender, terete, the young ones pubescent. Leaves membranous, subsessile, 3-5

by

11-2 in., elliptic-lanceolate, very acute (sometimes acuminate), mucronate, glabrous above, sparsely and minutely puberulous beneath, base

acute ; nerves slender, conspicuous ; petioles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, pubescent; stipules small, semilunate, reflexed. Flowers in terminal and lateral many-flowered racemes; pedicels  $\frac{1}{2}$  in. long; bracts linear-subulate, those beneath the pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, those on the pedicels smaller. Calyx  $\frac{1}{2}$  in. long, pubescent outside ; tube campanulate; segments long, linear-lanceolate, very acute, the 2 upper slightly broader and more deeply cut than the lower. Corolla about  $\frac{1}{2}$  in. long; standard erect, suborbicular, pale yellow or nearly white, with blue streaks at the base; wings usually pale blue in the upper part. Pods  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, linear-oblong, broader towards the apex, softly pubescent. Seeds 10-12,

yellow. Fl. B. I. v. 2, p. 78 ; Benth. in Hook. Loud. Journ. v. 2 (1845) p. 560; Bor. Mag. t. 5074.—Flowers: Nov.-Jan.

Rare. KANAKA : Kadgal (N. Kanara), *Woodrowl* ; Lalguli, near Yellapur, *Talbot*, 33 ! and 223 ! — DISTRIB. India (Kanara to Travanoore).

. 23. **Crotalaria juncea**, *Linn. Sp. PI* (1753) p. 714. Annu<sup>1</sup>, 2-8 fr. high : branches numerous, ascending, slender, terete, striate, silky-pubescent. Leaves 1-4 by |j in., linear or oblong, obtuse or subacute, apiculate, clothed on both sides with appressed silky shining hairs, base usually acute ; petioles ^V~IV in. long ; stipules 0 or very minute. Flowers large, in erect terminal and lateral 12-20-flowered racemes oft \*n reaching 1 ft. long ; pedicels ^-J- in. long, pubescent ; bracts minute, linear-subulate ; bracteoles 2 beneath the calyx, rainu'e, linear-subulate. Calyx f in. long, clothed with fulvous hairs; teeth linear-lanceolate, very deep. Corolla bright yellow, slightly exerted ; standard ovate-oblong, subacute. Pods 1-1^ in. long, sessile, clothed with short fulvous silky hair. Seeds 10-15. Fl. B. I. v. 2, p. 79.

Doubtfully wild, but often found as an escape from cultivation. The ]:lant is cultivated throughout India, extensively so in the Bombay Presidency, for the sake of its fibre, which furnishes the *Sunn Hemp* of commerce and which is largely exported from Bombay. Consult Watt, Diet. Econ. Prod. v. 2, p. 595, where will be found an exhaustive description of the mode of cultivation of the plant and of the extraction and uses of its fibre.^-DisTiiiB. Malay islands, Australia.

24. **Crotalaria madurensis**, *Wvjht, hi Wall. Cat.* (1828) 5370. A much-branched erect undershrub; branches terete, clothed with short yellowish-brown silky hairs. Leaves 1^-3| by 1-2 in., ovate-oblong,

obtuse (rarely subacute), mucronate or not, closely covered with shining yellowish-brown silky hairs, base usually rounded; m -liii nerves numerous, conspicuous; petioles ^ in. long, densely silky; stjpules 0.

Flowers

often largt<sup>f</sup> and showy, more than twice as long as tti/e calyx, in panicled racemes; bracts and bracteoles -j^~f\ in. long, ovate-lanceolate, acute or acuminate. Calyx |-§ in. long, densely silky, c^j>ly bilabiate ;-tAlta

short; the 2 upper teeth triangular-acute, divar^owL scarcely connate at the very base; the 3 lower about half as broald as the upper, linear-lanceolate, very acute, connate for about one-third of their length.

Corolla yellow, exerted; standard orbicular, sliglity mucronate, silky on the back ; wings often rugose or presenting a honey combed appearance on the upper side near the base. Pods IVI-J- in. long, shortly

stalked, sparsely hairy, turgid. Seeds 10-12. 11. B. I. v. 2, p. 79 ;

Benth.- in Hook. Lond. Journ. v. 2 (1843) p. 563 *i* Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.—Flowers : Dec.

Very rare in the Bombay Presidency. KANARA : Kurapta-TSirsi road, *Woodrow*.—DISTRIB. India (Nilghiri and Madura Uills).

25. **Crotalaria fulva**, *Roxb. FL Ind.* v. 3 (1832) p. 266. An erect

much-branched uiuWshrub 3-5 ft. high ; branches densely clothed with short brown silky hairs. Leaves 2i-4 by |-1 in., oblong or

oblanceolate,  
obtuse or subacute, often apiculate, clothed on both sides with yellowish-  
brown shining silky hairs, base cuneate; petioles  $y^{n^1}$  long, silky-hairy;  
stipules 0 or minute. Flowers numerous, in paniced racemes; bract  
1  
beneath the pedicel, ovate, acute or acuminate, hairy, reflexed ; bracteoles  
2 beneath the calyx, similar, but a little smaller, all persistent.  
Calyx

\ £ iii. long, silky-hairy ; teeth lanceolate, about equally cleft, the 2 upper oblong, broader than the 3 lower lanceolate ones. Corolla | -1 in. long, exerted ; standard elliptic, acute, silky on the back. Pods included, clothed with appressed silky yellowish-brown hairs. Seeds 2, light brown, polished. FL\* B. I. v. 2, p. 80 ; Grab. Cat. p. 44 ; Dalz. & Gibs, p. 54; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.—1 lowers: Feb.

XONKAN: *Law I; Dahell*, without locality! S. M. COUNTRY: Ramghat, *Dalzett* & *Gibson*, common, *Graham*. KANAKA: Kumpta-Sirsi road, *Woodrowl*—DISTRIB. India (W. Peninsula); Java, Sumatra, Seychelles and Mauritius.

26. **Crotalaria ramosissima**, *Eoccb. FL Intl.* v. 3 (1832) p. 208. A very much-branched woody herb scarcely reaching 1 ft. high ; branches densely clothed with silky hairs. Leaves -1—1 by £-fV \*n-> crowded, subsessile, linear or oblanceolate, usually obtuse, apiculate, densely silky-hairy on both surfaces, base cuneate ; stipules 0. Flowers in paniced racemes ; bracts lanceolate, recurved. Calyx \ in. long, hairy outside ; teeth linear, acute, the margins reflexed. Corolla \$ in. long ; standard pointed, silky on the back. Pods sessile, § in. long, oblong, densely silky. Seed 1, brownish-black, polished. Fl. B. I. v. 2, p. 80 ; Grah. Cat\* p. 44 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Oliver, Flor. Trop. Afr. v. 2, p. 26.—Flowers: Dec.

Rare. S. M. COUNTRY : Badaini, *Cooke!*, *Woodrow !*—DISTRIB. India (W. Peninsula); Tropical Africa.

27. **Crotalaria medicaginea**, *Lamlc Encyc. Method*, v. 2 (178G) p. 201. A perennial herb scarcely reaching 1 ft.; rootstock woody, branched ; stems and branches numerous, diffuse, filiform, terete, sparsely clothed with appressed hairs. Leaves 3-foliolate; common petioles linear-subulate. Leaflets | -| by T V ~ & ■ in., oblanceolate! rounded, apicu"Ste, glabrous, more or less silky beneath ; petiolules distinct, veij \*"\*»£\*- s<sup>l</sup>. Flowers in terminal and leaf-opposed 2-6-flowered racemes; peduncle- <sup>1</sup>toriger tfc an the leaves, filiform; bracts minute, linear-subula e.

g p g ^ ^ Seeds 2 ^ R J ^  
Ceyl. v. ^ p. i» , y<sub>M</sub>, *Diet. Econ. Prod.* v. 2, p. 613.  
• T lenthH"ui and the va<sup>iens of the true G. TM</sup> *medicaginea* from Bombay. The var. *negheta* /wi<sup>^</sup>  
• Mnltva Afelh<sup>^</sup> - *lit. var. nans* is occasionally met with.—DISTRIB. Tropical India : te> Ion,  
Mala)a, ^g<sup>n</sup><<nistan) china> Au8t14alia/

VAR. 1. *neglect* ^ ^ in pL B L y ^ ^ gL Brancheg mope ^^^ ing than m  
tne n ^ Leaflets largeFj retuse or roundf,d? apiculate or not. Encemes b-y-llowc,^^  
*a neglecta* (sp.)? ^Vight & A.rn. *Prod.* p. 192.

*a ji* \_ ^ ^ long, silky outside with appressed hairs ; teeth triangular, <sup>acTMV</sup>, exceeding the campanulate tube, all about equally long, the <sup>t^o^</sup>f^i& little broader. Corolla yellow, twice as long as !^iCa<sup>i</sup>inJu^h<sup>n</sup>silkv sJlk^ o? th e b^ckj Pods obliquely subglobose, i in.

YAB. 2. *luxur* <sup>n</sup> Baker <sup>^</sup> in FL <sup>^</sup> <sup>^</sup> v <sup>^</sup> p< 81> A much gtouter  
and stronger pi <sub>n</sub> <sup>2\_3</sup> f <sup>^</sup> fa. h Leaflets j usual] retus fl  
terminal leaflet <sup>^</sup> <sup>^</sup> <sup>^</sup> petio]es up <sup>^</sup> . <sup>^</sup> <sup>^</sup> <sup>^</sup> <sup>^</sup> <sup>^</sup>



6-12-flowered. *C. lu. vuriens* (sp.), Benth. in Hook. Lond. Journ. v. 2 (1843) p. 578.

KONKAN : *Stoc/csl*; Salsette, *Jacquemont*, 718! DECCAN : near Talegaon, Poona districts, *Bhiva*!

28. **Crotalaria Notonii**, *Wight 4' Am, Prodr.* p. 192. Suffruticose, erect; branches divaricate, more or less silky. Leaves approximated ; petioles slightly shorter than the leaves; stipules  $\wedge$ - $\wedge$  in. long, linear, acute, persistent. Leaflets  $|$ - $|$  by  $|$ - $|$  in., obovate-cuneate, rounded, truncate or retuse at the apex, apiculate or not; petiolules  $\wedge$  in. long, pubescent. Flowers 12-20, close, in terminal or leaf-opposed racemes 2-3 in. long; pedicels  $\wedge$ -g in. long, pubescent; bracts g- $\wedge$ - in. long, linear, acute, persistent. Calyx  $|$ - $|$  in. long, sparsely silky; teeth lanceolate, acute, equalling the tube. Corolla more than twice as long as the calyx, yellow; keel with a very long beak. Pods  $|$  ii. long, sub-quadrangular, thinly silky. Fl. B. I. v. 2, p. 82 ; Wight, Icon. t. 752.

*C. rostratu*, Wight & Arn. Prodr. p. 191 ; Dalz. & Gibs. p. 57.

Rare. GUJARAT : sandy soil at Domas near Surat, also in Kathiawar, ex *Dalzell & Gibson*, 1. c.—DISTRIB. India (Nilghiri and Pulney hills).

29. **Crotalaria orixensis**, *Willd. in Ges. Naturf. Fr. Neue Schr.* v. 4 (1803) p. 217. Perennial, herbaceous, diffuse; stems slender, copiously branched, 1-1 $|$  ft. long, sparingly clothed with spreading brownish hairs. Leaves glabrous above, clothed with appressed hairs beneath; petioles g- $|$  in. long, hairy; stipules £ in. long, foliaceous, lanceolate, persistent. Leaflets  $|$ - $|$  by  $\wedge$  in., obovate-oblong, obtuse; petiolules very short. Flowers small, in very lax lateral or terminal 3-12-flowered racemes ; pedicels  $\wedge$  in. long, filiform ; bracts large, foliaceous, ovate, acute, deflexed. Calyx  $\wedge$ - $\wedge$  in. long, silky outside ; teeth lanceolate, acute. Corolla scarcely exerted, yellow. Pods  $\wedge$ - $|$  in. long, glabrous, with a stalk as long as the calyx. Seeds 8-10. Fl. B. I. v. 2, p. 83 ; Dalz. & Gibs. p. 57 ; Oliver, Fl. Trop. Afr. v. 2, p. 27 : Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.—Flowers : Sept.-Oct. VEHN. *Anaabel*; *Jensru*.

KONKAN : *Stocks*! DECCAN : Poona, *Col. Sykes* !, *Woodrow* !; Ghat between Wat IK; and Wai, *Cooke* \ S. M. COUNTRY: Dbarwar, *Cooke*!—DISTRIB. India (W. Peninsu), Tropical Africa.

30. **Crotalaria striata**, *DC. Prodr.* v. 2 (1825) p. 131. Suffruti-

,e, 2-3 ft. high; stem stout, more or less striate; branches pube-

puberulous, the very young ones silky. Leaves membranous; petioles 1-3 in. long, stout, slightly pubescent; stipules minute, deciduous or 0. Leaflets 2-3 by 1-1½ in., elliptic, obtuse or acute, sometimes emarginate, glabrous above, minutely puberulous and glaucous, beneath. Flowers numerous, in erect terminal and lateral elongate spicate 20-50-flowered racemes which sometimes reach 1 ft. long; pedicels very short; bracts setaceous, minute. Calyx ½ in. long, slightly pubescent outside; teeth as long as the tube, lanceolate. Corolla dull yellow, veined with purple, twice as long as the calyx. Pods 1-2 in. long, much deflexed, oblong, cylindrical, glabrous, shortly stalked. Seeds 20-30, dark brown. Fl. B. I. v. 2, p. 84; Oliver, Fl. Trop. Afr. v. 2, p. 38; Trim. Fl. Ceyl. v. 2, p. 18; Wood", in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Eton. Prod. v. 2, p. 614.—Flowers: Nov.

DECOAN: Poona, *Woodrow!* ; Ganesh Khind, *Wood-row!*— DiSTRiii. Throughout India; Ceylon, Malaya, Tropical America and Africa.

**31. *Crotalaria laburnifolia*, Linn. Sp. PL (1753) p. 715.** An erect shrub 2-4 ft. high ; branches slender, terete, glabrous." Leaves 3-foliolate; petioles 1½-2| in. long; stipules 0. Leaflets membranous, 1-11 by f-li in., elliptic-oblong, acute or subacute at both ends ; petioles -r<sup>^</sup>-g in! long. Flowers in terminal and lateral few-flowered lax racemes ^-1 ft. long ; pedicels about ^ in. long; bracts minute, deciduous. Calyx ij—^ in. long, glabrous, turbinate ; teeth lanceolate, as long as the tube. Corolla 1 in. long, much exserted, yellow, glabrous ; keel broad, with a long incurved beak. Pods cylindrical, li-2 in. long, glabrous, with a very long stalk |—1 in. long, much exceeding that of any other species. Seeds 20-30. Fl. B. I. v. 2, p. 84 ; Dalz. & Gibs. p. 57; Trim. Fl. Ceyl. v. 2, p. 19 ; Watt, Diet. Econ. Prod. v. 2, p. 613.

SOUTHERN KONKAN: *Nimmo ex Dalzell & Gibson*. This has been included on the authority of Dalzell and Gibson (Bo. Fl. p. 57), who cite Nimmo as above.

It has not apparently been found by any other Bombay collector, and there are no specimens from Bombay in Herb. Kew. Woodrow does not include the plant in his list published in Journ. Bomb. Nat. —DISTRIB. India (W. Peninsula); Ceylon, Malaya, Philippines.

**32. *Crotalaria quinquefolia*, Linn. Sp. Pl. (1753) p. 716.** An erect annual 1-3 ft. high; stem and branches pale, furrowed, glabrous or the young ones more or less thinly silky. Leaves 5- (rarely 3-) foliolate ; petioles variable in length, from |3 in., channelled, glabrous or sparsely pubescent; stipules linear-lanceolate, acute, subsistent. Leaflets subsessile, usually narrow-linear, 1-4| by J-i in. (rarely oblanceolate or elliptic-oblong when they are shorter and broader), obtuse or subacute, glabrous above, pale beneath, base acute. Flowers in lax usually terminal 10-20-flowered racemes reaching 8 in. long ; pedicels J-g in. long; bracts J-| in. long, foliaceous, lanceolate, very acute, persistent. Calyx campanulate, \ in. long, glabrous or nearly so ; teeth triangular, acute, as long as the tube. Corolla glabrous, twice as long as the calyx. • Pods li-2 by |-1 in., oblong, glabrous, slightly tapering at the base. Seeds 30-40. Fl. B. I. v. 1, p. 84; Grab. Cat. p. 45; Dalz. & Gibs. p. 57 ; Trim. Fl. Ceyl. v. 2, p. 19.

KONKAN : margins of rice-fields in Salsette, *Graham, Dalzell & Gibson*; Wari Country, *Stocks!*—DISTRIB. India (W. Peninsula, Birina); Ceylon, Malaya, Philippines.

## 6. TRIGONELLA, Linn.

Annual herbs. Leaves pinnately 3-foliolate, toothed ; stipules adnate to the petiole. Flowers lemon-yellow, in axillary racemes. Calyx-tube campanulate ; teeth distant, subequal. Petals free from the staminal-tube ; standard obovate or oblong; wings oblong; keel

shorter than the wings, obtuse. Stamens diadelphous ; filaments not dilated ; anthers uniform. Ovary sessile or shortly stalked; o-vules usually many; style glabrous ; stigma terminal. Pod linear or linear oblong, compressed or subterete (not spiral), usually exserted, continuous within. Seeds few or many.—DISTRIB. Europe, Asia, INT. and S. Africa, with 1 species in Australia ; species about 50.

1. **Trigonella occulta**, *Del'rfc, Fl. -Eyyjtt. Mustr.* (1812) p. 71.

A low densely cespitose diffuse annual; stems not more than a few inches long, pale, glabrous or with *iv* few scattered silky hairs. Leaves pinnately 3-foliolate; petioles J-ff in. long, striate, silky-hairy when young; stipules J in. long, leafy, deeply lancinate-toothed, strongly nerved. Leaflets  $\wedge_{6\sim}$  in. long, oblanceolate-cuneate, sharply toothed, g r o u s above, sparsely silky beneath; nerve g, p lateral petiolules short, the terminal ones  $\tau V^{\text{TV}^{\text{n*}}}$   $l^{\text{on}\%}$ \* Flowers 2-4 together, in sessile axillary clusters. Calyx  $\wedge$  in. long, membranous, hairy; teeth longer than the tube, subulate. Corolla scarcely exerted; standard obovate-obfong; wings oblanceolate. Pods membranous, slightly l th th l b l l l i i d t l i d l subglabrous above, sparsely silky beneath; nerves strong, conspicuous; l t e l t i l l h t h t i l V V l F l e s 24

FL Orient, v. 2, p. 84; Aitch. Pb. & Sind PL p. 38; Woodr. in Joura. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet, Econ. Prod. v. 6, part 4, p. 88.—Flowers: Jan.

Very rare except in Sind. DECCAN: Lauoli, *IVoodrow*. SIND: *Stocks!*—DISTRIB. India (Upper Gangetic plain); Egypt, Nubia.

7. **MELILOTUS**, Juss.

Annual or biennial herbs. Leaves pinnately 3-foliolate; stipules adnate to the petiole; leaflets toothed. Flowers small, yellow or white, in slender or abbreviated axillary racemes; bracts minute or 0; bracteoles 0. Calyx short; teeth subequal. Corolla free from the stain inal-tube, deciduous\*, standard obovate or oblong, contracted at the base, sub-sessile; wings obtuse; keel shorter than the wings, obtuse. Stamens diadelphous; filaments not dilated; anthers uniform. Ovary sessile or stalked; ovules few; style filiform, incurved; stigma terminal. Pod subglobose or ovoid, longer than the calyx indehiscent or tardily dehiscent. Seeds 1 or few.—DISTRIB. Temperate and subtropical regions of the Old World; species 10 or 12.

1. **Melilotus indica**, *All. FL .Pedei^x.* 1 (1785) p. 308. An erect annual herb, 1-H ft. high; steinfand branches pale, slightly striate, glabrous or nearly so. Leaves 3-foholate; petioles  $|-1|$  in. long, very slender; stipules  $\wedge$  in. long, lanceolate, very acute, adnate to the petiole. Leaflets  $i-\S$  by  $f^{\sim}\S$  in., toothea, oblanceolate or obovate-cuneate (sometimes a few casually linear-oblong), rounded, truncate, or retuse at the apex, glabrous or with a few scattered hnirs on both sides; petiolules of the lateral leaflets very short, those of the terminal leaflets  $iV\sim T i^{11*}$   $l^{\text{ou}g}$ « Flowers small, in slender spicate close racemes; pedicels short, deflexed; bracts subulate. Calyx  $\wedge\sim rV^{\wedge n\#}$   $\wedge or)E$  5 teeth triangular. Corolla twice the calyx. Pods ellipsoid, compressed, tapering at both ends, reticulato-venose, glabrous. Seed 1, oblong-ellipsoid, compressed,  $y^{1\wedge}$  in. long, brown. *Melilotus parviflom*, Desf. EL Atlant. v. 2 (1800) p. 192; Fl. B. I. v. 2, p. 89; Grah. Cat, p. 46; Dalz. & Gibs. Suppl. p. 21; Boiss. Fl. Orient, v. 2, p. 108; Watt, Diet. Econ. Prod. v. r>. p. 225.—Flowers: Jan. VEEN. *Vdnmetliilcd*; *Rdn-methi*.

In pasture grounds, *Graham, Dakctt\$ Gibson*. DECCAN: *Yoona, IVoodrov*. SIND: *IVoodrowl, Cooke!* ^-DISTRIB. India (tropical zone); Europe, S. Persia, Afghanistan, and introduced in many otheL\* regions.



s. **MEDICAGO**, Linn.

Herbs, rarely shrubs. Leaves pinnately 3-foliolate; stipules adnate to the petiole; leaflets, toothed. Calyx-tube campanulate; teeth 5, sub-equal. Corolla free from the staminal-tube ; standard obovate or oblong, contracted at the base, subsessile ; wings oblong ; keel shorter than the wings, obtuse. Stamens diadelphous ? filaments not dilated at the apex; anthers uniform. Ovary sessile, usually many-ovulate; style subulate, glabrous ; stigma oblique. Pod spirally twisted (rarely falcate), reticulate-ly veined, scarcely dehiscent.—DISTMB. Europe, W. Asia, N. Africa; species about 40.

- |  |                            |
|--|----------------------------|
| Pod unarmed, 1-seeded.....   | 1. <i>M. lupulina</i> ..   |
| Pod armed, many-seeded.  |                            |
| Pod covered with spines on the exterior faces as well as on the margins..... | 2. <i>M. laciniata</i> .   |
| Pod covered with spines on the margins but not on the exterior faces .....   | o. <i>M. deniicidata</i> . |

1. **Medicago lupulina**, Linn. *Sp. Pl.* (1753) p. 779. Annual or biennial, more or less pubescent; stem 1 ft. or more, finely downy, grooved. Leaves 3-foliolate ; petioles  $\frac{1}{2}$  in. long, slender, more or less pubescent; stipules subentire or subdentate at the base, lanceolate and acuminate at the apex. Leaflets  $\frac{1}{2}$  in. long, nearly as broad as long, obovate-cuneate, faintly inciso-crenate, slightly retuse and apiculate with a triangular tooth at the apex. Flowers 10-20, in dense spicate axillary racemes ; peduncles  $\frac{1}{2}$  in. long, filiform ; pedicels  $\frac{1}{2}$  in. long in fruit; bracts minute, subulate. Calyx  $\frac{1}{2}$  in. long, hairy outside; teeth linear-lanceolate, very acute. Corolla scarcely longer than the calyx. Pods indehiscent, unarmed,  $\frac{1}{2}$  in. long, glabrous or pubescent, subglobose, arcuately reticulato-venose, black when ripe. Seed 1, ovoid-oblong,  $\frac{1}{4}$  in. long, yellowish-brown, smooth. Fl. B. 1. v. 2, p. 90; Boiss. *Fl. Orient*, v. 2, p. 105; Woodr. in *Journ. Bomb. Nat.* v. 11 (1897) p. 421 : Aitch., *Diet. Econ. Prod.* v. 5, p. 190.—Flowers: Mar.

SIND : Sehwan, *Kauitkar* !, Woodrow.—DISTMB. India (N.W.) ; Orient, Mediterranean, Abyssinia, Afghanistan.

2. **Medicago laciniata**, AIL *Fl. Pedem.* v. 1 (1785) p. 116. Annual; stems glabrous, slender, reaching 1 ft. long. Leaves 3-foliolate ; petioles  $\frac{1}{2}$  in. long, slender ; stipules lacinate. Leaflets  $\frac{1}{2}$  in. long, obovate-cuneate, truncate or retuse, sharply dentate or sometimes pinnatifid. Peduncles  $\frac{1}{2}$  in. long, produced into an awn, 2-flowered ; pedicels  $\frac{1}{2}$  in. long; bracts minute, subulate. Calyx  $\frac{1}{2}$  in. long, campanulate, faintly pubescent or glabrous outside ; teeth about as long as the tube, triangular, acute. Corolla exerted. Pod globose, of 4-5 spirals, which are armed with long sharp close spines on the margins as well as on the exterior faces. Seeds usually 8-10, about  $\frac{1}{4}$  in. long. Fl. B. 1. v. 2, p. 90; Aitch. *Pb. & Sind PL* p. 39; Boiss. *Fl. Orient* v. 2, p. 104.

SIND: *Stocks*, fide *Aitchisou*, *Pb. & Sind PL* p. 9.

This plant has been included on the authority of Aitchison (l. c.), who gives it in his list as having been found in Sind by Stocks.—I have seen no specimens from Sind. —IH-nMT'. Tmlia /Tan.jnh and Salt range; Beluchistan, Egypt. Abyssinia.

**3. *Medicago denticulata*, Willd. Sp. PL v. :i (1600) p. 1414.** Annual. Leaves 3-foliolate; petioles 4—1\$ in. long ; stipules lacinate. Leaflets i-| by §-£ in., obovate-cuneate, slightly toothed, somewhat deeply emarginate, ~mucronate. Peduncles \-h in. long, closely 2-6-flowered, awned ; pedicels short. Calyx ^ in. long, glabrous or nearly so outside; teeth lanceolate, slightly shorter than the tube. Corolla twice as long as the calyx. Pods of 2-4 spirals, with spiny margins, the outer face retieulato-venose, -i—| in. across, not spiny. Seeds about 4-8. Fl. B. I. v. 2, p. 90 ; Boiss. El. Orient, v. 2, p. 102; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Econ. Prod. v. 5, p. 199.

SIND: Blmbak, *Cookel*; Sehwan, *JWoodrow*.—DISTRIB. India (tropical zone of tlw North-west); Orient, Abyssinia, Europe, Japan, China, Siberia.

*Medicar/o saliva*, Linn., *Lucerne*, is commonly grown throughout the Bombay Presidency, and indeed throughout the greater part of India, as fodder. The flowers are usually purple and the pod forms a double spiral.—VERX. *Vila^qluU* ; *Lcisan-c/hds*. See Watt, Diet. Econ. Prod, v. 5, p. 199.

1). **LOTUS**, Linn.

Herbs. Leaves usually 5- (sometimes 3-) foliolate, the lowest pair of leaflets arising from the base of the petioles like stipules ; stipules minute, tuberculiform or 0. Flowers axillary, umbellate or rarely solitary ; bracts 3-foliolate, usually stalked. Calyx-lobes subequal or the lowest longest, very rarely more or less connate into 2 lips. Corolla free from the staminal-tube ; standard obovate, suborbicular or ovate-acuminate, contracted at the base into a claw; wings obovate ; keel incurved, beaked. Stamens diadelphous ; alternate filaments dilated at the apex ; anthers uniform. Ovary sessile, many-ovulate : style inflexed above the ovary; stigma terminal or lateral. Pod linear, turoid, dehiscent, septate (very rarely continuous) between the seeds.—DISTRIB. Europe, temperate Asia, N. & S. Africa, X. & S.W. America and Australia ; species about 50.

Flowers peduneled; corolla twice as long as the calyx..... 1. *L.*

*eorniculatus*.

Flowers sessile ; corolla scarcely exceeding the calyx ..... 2. *L. GarcinL*

1. **Lotus eorniculatus**, var. **minor**, *Baicer*, in *Hook. f. Fl. B. I.* v. 2 (1876) p. 91. A perennial herb; rootstock short, caespitously branched ; stems decumbent, 2-6 in. long, glabrous or slightly pubescent. Leaves 5-foliolate, somewhat fleshy, -J—§ by -^pa \*n\*> sess;e> obovate or oblong, subacute, the lower pair of leaflets stipule-like and distant from the other three. Flowers solitary, on a long slender peduncle, each flower subtended by a 3-foliolate leaf or bract. Calyx \ in. long, glabrous or faintlv pubescent; teeth equal, linear-subulate from a triangular base, equalling the tube. Corolla twice as long as the calyx. Pods f-1 in. long, cylindric, straight. Seeds 20-30. Aitch. Pb. & Sind PL p. 39 ; Woodr.' in Journ. Bomb. !N<sup>T</sup>at. v. 11 (1897) p. 421.—Flowers: Jan.-Mar.

SIND: *Stocks*, 680 !, *B/wlal*, *Wood row*.

The variety with solitary flowers seems to be confined to Sind.



**2. Lotus Garcini, DC. Prodr. v. 2 (1825) p. 212.** Suffruticose, reaching scarcely 1 ft. high; branches many from a little above the base, covered with short grey silky hairs. Leaves 3- or 5-foliolate; leaflets  $\frac{1}{2}$  to 1 in. long, sessile (3 when the stipule-like pair is absent or 5 when that pair is present), fleshy, pale, obovate-cuneate, obtuse or retuse, clothed on both sides with grey hairs. Flowers sessile, axillary, solitary. Calyx  $\frac{1}{2}$  in. long, clothed with long white hairs; teeth linear or linear-lanceolate, twice as long as the tube. Corolla a little longer than the calyx; standard orbicular, clawed. Pods  $\frac{1}{2}$  in. long, 1½ times as long as the calyx, glabrous or pubescent, linear, straight, compressed, black when ripe. Seeds about 6. PL B. I. v. 2, p. 91; Aitch. Pb. & Sind Pl. p. 40; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421. *Lotus StocJcsii*, Boiss. PL Orient, v. 2, p. 174.—Flowers: Nov-Dec.

GUJARAT: Porbandar, *Cookel, Woodrow*. SIND: *Vicary, Stocks*, 563!; sandy ground near the sea, *JDahell*, 22!; Jemadar ka Landa (near Karachi), *Stocks* !—DISTRIB. Through Persia to Nubia.

## 10. CYAMOPSIS, DC.

Erect herbs with appressed medifixed hairs. Leaves imparipinnate; stipules small, setaceous; leaflets usually 3 (rarely many), exstipellate. Flowers small, purplish, in axillary racemes. Calyx oblique; teeth unequal, the lowest the longest. Corolla caducous; standard obovate, sessile; wings oblong, free from the keel; keel erect, subincurved, obtuse. Stamens monadelphous; anthers uniform, apiculate. Ovary sessile, many-ovulate; style incurved at the apex; stigma capitate. Pod linear, subtetragonous, acuminate, 2-valved, septate between the seeds. Seeds square, compressed.—DISTRIB. Species 2, one Indian, the other Arabian and Tropical African.

1. **Cyamopsis psoralioides, DC. Prodr. v. 2 (1825) p. 216.** An erect annual, 2-3 ft. high, more or less clothed with appressed medifixed greyish hairs; stem grooved. Leaves 3-foliolate; petioles 1-1½ in. long, sparsely hairy; stipules  $\frac{1}{2}$  in. long, linear-subulate, persistent. Leaflets  $\frac{1}{2}$  to 1 in. long, elliptic, acute, sharply dentate (the teeth usually ending in a weak spine), clothed on both sides with appressed medifixed hairs, base acute; main nerves prominent; petiolules of the lateral leaflets  $\frac{1}{2}$  in., those of the terminal one  $\frac{1}{2}$  in. long. Flowers small, purplish, in axillary 6-30-flowered close racemes; peduncles and pedicels short, hairy; bracts linear-subulate, persistent,  $\frac{1}{2}$  in. long. Calyx hairy outside,  $\frac{1}{2}$  in. long to the extremity of the longest tooth; teeth very unequal, the 2 lowest the longest, linear-subulate, the 3 upper shorter, triangular-acute. Corolla slightly longer than the calyx; standard orbicular, shortly clawed. Pods thick, fleshy, subtetragonal,  $\frac{1}{2}$  in. long, slightly pubescent. Seeds 5 or 6, square, slightly compressed. FL B. I. v. 2, p. 92; Grah. Cat. p. 46; Dalz. & Gibs. Suppl. p. 21 • Wight, Icon. t. 248; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421 • Watt, Diet. Econ. Prod. v. 2, p. 673.—Flowering time depends on the time of planting. VEEN. *Gavdri; MatJci*,

Cultivated in many parts of India from the Himalayas to Java Comorin. It is grown as a vegetable for human consumption, the cooked pods being used as food or as food for cattle when the grain is used as dry, and the whole plant as "Teen fodder Consult Watt, Diet. Econ. Prod. 1. c.—DISTRIB. Afghanistan.

## 11. INDIGOFERA, Linn.

Herbs, shrubs or undershrubs often silvery-canescens, more or less densely clothed with appressed neditixed hairs (sometimes mixed with tomentum and laxer hairs). Leaves imparipinnate or simple; stipules usually small, setaceous, very shortly adnate to the petiole; leaflets quite entire, sometimes stipellate. Flowers in axillary racemes or spikes, each flower pedicelled or sessile in the axil of a caducous bract; bracteoles 0. Calyx minute; teeth subequal or the lowest longest. Corolla usually rosy or purple ; standard ovate or orbicular, sessile or clawed, often persistent for a long time; wings oblong, slightly adherent to the keel, caducous ; keel erect, obtuse or acuminate, spurred on each side near the base, Caducous. Stamens diadelphous; anthers uniform, apiculate. Ovary sessile or subsessile, usually many-ovulate; style glabrous; stigma capitate, often penicillate. Pod septate between the seeds, usually linear-cylindric (rarely oblong or globose), turgid, rarely flattish (in *Lechinata* sickle-shaped).—DISTRIB. Throughout the warmer regions of both hemispheres, abundant in Southern and Tropical Africa; species 250-300.

Leaves simple.

Pod 1-seeded.

Pod sickle-shaped, spiny ..... 1. /. *echinam*.

Pod globose, not spiny ..... 2. /. *linifolia*.

Pod 2 (or more) -seeded.

Pod 2-seeded ; leaves ovate, cordate ..... 3. /. *cordifolia*.

Pod 4-6-seeded ; leaves oblong, not cordate ..... 4. /. *DalzcUn*.

Leaves imparipinnate. Flowers in axillary sessile or silort-peduncled heads.

Leaves 3-foliolate; pod 1-2-seeded ..... •"» /. *glandulosa*.

Leaves 5-11-foliolate.

Pod 3-4-seeded ..... 0. /. *trigonelloides*.

Pod 2-seeded ..... 7. *I.cnneaphylla*.

Flowers solitary.

Herbaceous ; steins prostrate ..... 8. /. *uniflora*.

Shrubby ; stems erect, rigid ..... \!) /. *aspalathoide\**.

Flowers in axillary racemes.

Pod quite flat and papery ..... 1C. /. *anabaptista*.

Pod not flat and not papery.

Leaflets alternate.

Leaves argenteo-canescens; pod curved ..... 11. /. *paucifolia*.

Leaves not argenteo-canescens ; pod straight ..... 12. *Lnendecaphyllo*.

Leaflets opposite.

Leaflets 3-5.

Leaflets 3; racemes G-12-flowered.

Terminal leaflet sessile ..... 13. /. *trifoliaia*.

Terminal leaflet stalked ..... 14. /. *trica*.

Lower leaflets 3, tho middle and upper leaflets 5;

racemes 12-20-flowered ..... 15. /. *artieulata*.

Leaflets 5.

Pod deflexed ..... 16. /. *marginnlata*.

Pod not deflexed ..... 17. *I. glabra*.

Leaflets 7, 9 or 11 (sometimes 13 in /. *thwtoria*).

Racemes few-flowered.

Racemes 3-6-flowered ; seeds 8-12 ; pod toru-

lose; hairs of stem not gland-tipped ..... 18. /. *tenuifolia*.

Racemes many-flowered.

Racemes 6-12-flowered.

Hairs of stem gland-tipped.

Seeds 10-12 ; pod faintly torulose ..... 19. /. *viscosa*.

- 11 hairs of stem not gland-tipped.  
 Seeds 3-8; pod straight, not torulose ... ~o. *I. a.*, #<', <u-«.  
 Seeds 15-20; pod recurved at the tip ... 21. *I. purriflora*.  
 Racemes more than 12-flowered. Pod cylindrical.  
 Pod thinly hairy, torulose ..... 22. *I. Hotter*.  
 Pod glabrous, not torulose ..... 23. *I. t'wctnrift*  
 Pod 4-gonous.  
 Pod densely pubescent, not torulose, de-  
 flexed ..." ..... 24. *I. hirsuta*.  
 Pod thinly hairy, torulose, not deflexed ... 25. *I. constricta*.  
 Leaflets 13-21.  
 Standard and keel-petals hairy outside ..... 26. *I. Wightii*.  
 Standard and keel-petals glabrous ..... 27. *I. pulchella*.

**1. *Indigofera echinata*, Wilkl. Sp. PI v. 3 (1800) p. 1222.** A diffuse annual; stems many, spreading from the base, 1-2 ft. long, 2-edged, glabrous or nearly so. Leaves simple, 1 by 1/2 in., ovate, very obtuse and usually apiculate at the apex, with a few scattered hairs on both sides; petioles 1/4-1/2 in. long; stipules 1/2 in. long, linear-subulate. Flowers in axillary 10-flowered racemes; peduncles 1/2-1 in. long. Calyx hairy, 1/2 in. long; teeth lanceolate, acute, many times longer than the tube. Corolla pink, slightly longer than the calyx.

Pods 1/2 in. long, semilunate, compressed, beaked with the persistent style, furnished with several rows of divaricate hooked bristles along the ventral suture. Seed 1. Fl. B. I. v. 2, p. 92: Dalz. & Gibs, p. 57:

Trim. Fl. Ceyl. v. 2, p. 21; Wight, Icon. t. 316; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.—Flowers: Aug.-Dec.

Dalzell characterises the plant as "very common," but I have not found it so. My experience is that it is rare. JVON'KAN • *T.mr* • 9//W<|—DISTHIB. India (W. Peninsula); Ceylon, Guinea.

**2. *Indigofera linifolia*, Uetz. Obs. Bot. fasc. 4 (1786) p. 29 & fuse. 6 (1791) t. 2.** Annual; stems numerous, much-branched, 6-18 in. long, somewhat 2-edged, silvery-white with appressed hairs.

Leaves

numerous, simple 1/2 by 1/2-1/3 in. linear, acute at both ends, mucronate, silvery on both surfaces with appressed hairs; petioles 0-1/2 in. long; stipules minute, setaceous. Flowers 6-12, in dense sessile or very shortly peduncled axillary racemes. Calyx 1/2 in. long, very deeply cut, clothed with silvery hairs; teeth linear-subulate, many times longer than the tube. Corolla bright red, 2-3 times as long as the calyx. Pod 1/2-1 in. long, globose, apiculate, glistening-white with appressed silky hairs. Seed 1. Fl. B. I. v. 2, p. 92; Grab. Cat. p. 46; Dalz. &

Gibs. p. 58; Wight, Icon. t. 313; Trim. Fl. Ceyl. v. 2, p. 22; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Wait, Diet. Econ. Prod. v. 4, p. 886.—Flowers: July-Oct. VEEN. *Pandarplalli*.

KONKAN: Oorun, *Stocks*! DECCAN: Poona, *Cooke*!; Ahmednagar, *Coo/cc*! S. M. COUNTRY: Belgaum, *Ritchie*, 640!—DISTHIB. Throughout India; Ceylon, Afghanistan, Abyssinia, N. Australia.

YAK. *Campbellii*, Wight. Leaves ovate-elliptic, subacute, or obovate, obtuse,  $\frac{1}{2}$  to  $\frac{3}{4}$  in.

DECCAN: Poona, Woodrow, 317!; Ahmednagar, Cooke\ GUJARAT: Ankleshwar. Kanitkar!

***o. Indigofera cordifolia***, *lh<sub>t</sub>,<sup>^</sup> <.«.■ lioth. Sov. PL 8<sub>2</sub>\*. (1821) p. 357. A diffuse copiously branched annual, usually more or less clothed with long white hairs ; stems 3-9 in. long, the young ones pubescent, the older nearly glabrous. Leaves simple, | - | by i - | in., subsessile, broadly ovate-cordate, subobtuse, mucronate, hairy on both sides, very densely so beneath ; stipules minute, setaceous. Flowers in dense subsessile 4-8-flowered heads. Calyx g in. long, hairy outside; tube very short; teeth linear, acute, very hairy. Corolla bright red, not exerted ; standard spathulate. Pods cylindrical, oblong, straight, | in. long (including the straight beak), densely pubescent. Seeds 2, yellow. VI B. I. v. 2, p. 93; Dalz. & Gibs. p. 58 ; Aitch. Pb. & Sind PL p. 40 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421 ; Watt, Diet, Econ. Prod. v. 4, p; 385.—Flowers: Aug.-Dec. VERN\ *Godadi; Beclilca*.*

Common. KOXKAN : *Law !, Stocks !*; Oorun, *Stocks !* DECCA.V : Poona, *Woodrow !, Cooke !* S. M. COUNTRY : Padshapur, *fiitchir, lf>02 !*; Ridmi, *Cooke !* SIND : *Wood row, Karachi, Stocks]*—DISTRIB. Throughout India: Afghanistan. Boluchistan. X. Australia.

**4. *Indigofera Dalzellii*, T. Cool-e.** Perennial, more or less silvery-canescens; stems many from a woody root, prostrate, ascending at the apex, flexuous, acutely triquetrous. Leaves simple, subsessile, £ - | by *jjr-'§* in., elliptic-oblong, subacute. mucronate, glabrous above, hairy beneath, base acute ; stipules subulate from a triangular base, persistent. Flowers in axillary 12-20-flowered racemes w hich are 3 to 4 times as long as the leaves ; rhachis acutely triquetrous, glabrous; pedicels deflexed in fruit; bracts minute, ovate, acuminate. Calyx j<sup>1^</sup>-<sup>^</sup>-in. long; tube scarcely any ; teeth triangular, very acute. Corolla purple, twice as long as the calyx ; standard orbicular, hairy on the back. Pods 2~I b.V "nT ""' \**j<sup>ieai</sup>\**> 4-gonous. beaked, glabrous, shortly 4-winged. Seeds 4-6. *Indiqofem triquetra*, Dalz. in Hook. Kew Journ. v. 2 (1850) p. 30; VI B. I. v.'2, p. 93; Dalz. & Gibs. p. 58; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421 .—Flowers : July-Sept.

The name */. tnqitetra* was given to a wholly different species ^a S. African plant) by E. Meyer in 1830 (Comm. p. 95), and, as Dalzell named his species in 1850, the other has priority.—I have• therefore named this */. Daheilii*.

A rare plant, apparently endemic in the Bombay Presidency. KOXKAX : *Stocks I* ; rocky hills in the Malwan district, *Dalzel § Gibson*. DECCAN : Panchgani, *Woodrow!*, *Cooke!*, *Ruoji!*

The plant is abundant, on the rocky table-land above the traveller's bungalow at Panchgani, where it grows all over, the bare rocks. Dalzell found it growing on rocks near Malwan, so that it apparently flourishes on rocky ground.

**5. *Indigofera glandulosa*, Willd. Sji. PI v. 3 (1800) p. 1227.** Annual, 9-20 in. high, much-branched ; branches long, slender, clothed with spreading hairs when young, not at all argenteo-canescens. Leaves

3-foliolate; petioles 1/2-1 in. long, slender, hairy; stipules  
setaceous,  
minute. Leaflets 1/2-1 by 1/4-1/2 in., oblanceolate, rounded or  
slightly  
retuse, apiculate, green and with a few appressed hairs above, glaucous,  
appressedly hairy and copiously nigro-punctate beneath; petiolules of  
the lateral leaflets 1/2-1/3 longer than those of the terminal leaflets longer.  
Flowers in short axillary sessile heads 1/2-3/4 in. long. Calyx 1/2-1/3  
m.  
long, hairy outside; teeth long, setaceous. Corolla 2-3 times, as  
long

«s the calyx. Pods I in. long, pubescent, angled, the angles slightly winged and often toothed. Heeds 1-2, spherical, smooth and polished, sometimes mottled. Fl. B. 1. v. 2, p. 94; Dalz. & Gibs. p. 58; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Econ. Prod. v. 4, p. 336.—Flowers : Aug.-Pec VKRX. *Barbadd.*

A common weed. KONKAN : *Stacks'*; E<sup>^</sup>phanta (Bombay), *Stacks* \ PECCAN : *Woodrow*; Poona, *Cooke* !, *Woodrow* I S. M. COUNTRY : Belgaum, *Bitckie*, 10,38 !—DISTRIB. India (W. Peninsula and Bandelkhand).

0. **Indigofera trigonelloides**, *Jaub. 6f SpacJi. Illustr.* v. 5 (1857) p. 92, t. 482. Annual, densely silvery ; stems many, cespitose, trailing, much-branched, fl-15 in. long, trigonous, clothed with appressed silvery hairs and a few spreading ones. Leaves 5-7-1'oliolate ; petioles y%-g in. long, hairy ; stipules linear, acute, hairy. Leaflets alternate, -£-§ by g-■fe in., oblanceolate or elliptic, rounded at the apex, densely clothed on both sides with silvery appressed hairs, base acute; petiolules of the lateral leaflets 0—fe in., those of the terminal leaflets ^ in. long. Flowers in dense sessile villous heads, each consisting of 12-20 sessile flowers; bract minute, ovate-lanceolate, acute, hairy. Calyx §-f\ in. long; teeth long, linear, acute, hairy. Corolla red, scarcely exerted. Pods } in. long, linear-cylindric, straight, silvery-hairy, torulose. Seeds 3-4. Fl. B. I. v. 2, p. 94 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.

Confined to Sind; a rare plant. SIND: *Cooke I, Woodrow I*; Jemadar ka Landa (near Karachi), *Stacks*] Boogta bills, *Vicaryl*; Karachi to Mugger Peer, *Perry* !—DISTRIB. India (Panjab); Afghanistan, Abyssinia, Aden.

7. **Indigofera enneaphylla**, *Linn. Mcmtiss.* v. 2 (1771) p. 571. Annual or biennial; rootsroek woody ; stems densely cespitose, 1-1 £ ft. long, trailing, prostrate but not rooting, much-branched, terete or somewhat angled, sparsely clothed with unite appressed hair. Leaves ^-| in. long, 7-9- (rarely 11-) foliolate, nearly sessile; stipules scarious, £—i-in. long, ovate, long-cuspidate. Flowers small, in sliort-peduncled 10-20-flowered spicate heads about \ in. long; pedicels almost 0; bracts scarious, y<sup>1</sup>^ in. long, ovate, acuminate, persistent. . Calyx ^-^ in. long, hairy outside; teeth long, setaceous. Corolla bright red, slightly exerted. Pods g—\ in. long, cylindric, oblong, more or less clothed with white appressed hear. 'Seeds 2, globose. M. B. I. v. 2, p. 94 ; Dalz. & Gibs. p. 58; Trim. l\ Ceyl. v. 2, p. 22; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Econ. Prod. v. 4, p. 385. /. *semi-trijuga*, Forsk. Fl. iEgypt.-Arab. p. 137 (not of Baker, in Hook. f. Fl. B. I.).—Flowers : Oct. VEIUS. *Bliuiguli.* '

KONKAN: *Stacks*] DFXCAN: Bijapnr, *Woodrow*, S. M. COUNTRY: Badami, *Woodrow I, Bhiva*! G UJARAT : Baroda, *Kanitkar*!; Surat, *Dalzd* § *Gibson*. —DISTRIB. Throughout the plains of India; Ceylon, Angola, Malay Islands, N. Australia.

8. **Indigofera uniflora**, *Buclu-Ham. ex Roxb. Hort. Beng.* (1814) 3.57 ; *Fl. Ind.* v. 3, p. 374. Perennial; stems herbaceous, very, slender,

linear, subacute and with a few appressed hairs. Flowers solitary, on long filiform pedicels which are longer than the leaves and equal in length to the pods; bracts on the pedicel a little below the flower,

minute. Calyx <sup>^</sup> in. long; teeth long, linear, acute. Corolla red, (V in. long. Pods |~i in. long, linear, straight, glabrous. Seeds 4-7, cubical, vellovvish-brown, smooth. El. B. I. v. 2, p. 94; Dalz. & Gibs, p. 58 ; Wight, Icon. t. 333 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421 .—Flowers : Oct.

A rare plant in the Bombay Presidency. S. M. COUNTRY : *Law ex DahelUf Gibson* ; Belgaum hills, *Ritchie*, 1028 ! KANAKA : *Stocks I*— DISTRIB. India (W. Peninsula and Oarnatic).

**9. Indigofera aspalathoides**, *Vahl, ex DC. Prodr.* v. 2 (1825) p. 231. A low inuch-braiihed erect undershrub; branches rigid, terete,

divaricately spreading, the young ones argenteo-canescens, the hairs soon falling off, the older one<sup>3</sup> purple and nearly glabrous. Leaves 1-5-

(often 3-) foliolate, digitate, sessile, crowded on the young branches, but soon deciduous ; stipules minute, subulate. Leaflets <sup>-^</sup>-5 in. long,

sessile, linear or oblanceolate, apiculate, rather fleshy, with a few white appressed hairs. Flowers solitary, axillary ; pedicels filiform, longer

than the leaves, but shorter than the pods. Calyx <sup>T\r</sup> in, long; teeth linear-subulate. Corolla dark pink, exserted. Pods <sup>^-§</sup> in. long, some

what turgid, straight, glabrous or with a few scattered hairs. Seeds 0-8.

Fl. B. I. v. 2, p. 94; Dalz. & Gibs. p. 58; Trim. Fl. Ceyl. v. 2, p. 23 ; "Wight, Icon. t. 332; Watt, Diet. Econ. Prod. v. 4, p. 384.

S. M. COUNTRY : near Belgaum, *Dalzell 4" Gibson*.—DISTRIB. India (plains of the Oarnatic); Ceylon.

This plant has been included on the authority of Dalzell & Gibson (Bo. Fl. 1. c). Dalzell & Q-ibsou, who describe the plant accurately, say that it is "common in the Deccan," which must, I think, be a mist.ke. I have lived in the Deccan for 25 years and have largely collected plants therein, but I have never found it, nor, as far as I know, has it been found in the Bombay Presidency by any other collectors. It does not appear in Woodrow's list in the Journal of the Bombay Natural History Society, nor are there any specimens from the Bombay Presidency in Herb. Kew.

**10. Indigofera anabaptista**, *JStued. Norn.* ed. 2 (1840) p. 805. A diffuse annual; stems 12-15 in. long; branches numerous, slender, grooved, glabrous or nearly so. Leaves 1-lg in. long; petioles |~| in.

long; stipules ■£ in. long, filiform, persistent. Leaflets 5, opposite,

*i~i* by *fV~x<sup>5</sup>*(*§*- in., oblanceolate, rounded, apiculate, clothed with white appressed hairs on both surfaces, base acute; petiolules of the lateral leaflets <sup>-^</sup> in., those of the terminal ones <sup>^</sup> in. long. Flowers in shorr-

peduiK-led 12-20-fldwered racemes, which are shorter than the leaves; pedicels short; bracts lanceolate. Calyx <sup>^</sup> in. long, densely hairy ; tube

very short; teeth long, linear-subulate. Corolla slightly exserted;

standard oblong, hairy on the back. Pods linear, quite flat, |~| in. long



by 1 in. broad, much recurved, deflexed, clothed with white appressed hairs, with a raised longitudinal ridge along the centre of each of the flattened faces and a transverse ridge between each of the seeds.

Seeds

1/2 in. in diam., discoid, pale brown. El. B. I. v. 2, p. 102 ; Woodr. in

Journ. Bomb. Nat. v. 11 (1897) p. 421.—Flowers : Aug.-Oct.

A very rare plant, confined (in India) to Sind and the Panjab. SIND : *Puran Cooke!*, *ran !*; Mulir near Karachi, *Woodrowl*—DISTRICTS. Afghanistan, Arabia.

11. **Indigofera paucifolia**, *Delile, FL d'Egypte* (1812) p. 251. A shrub 3-6 ft. high; branches numerous, stout, woody, argenteo-canescens. Leaves imparipinnate; petioles 1/2-4 in. long; stipules 1/2 in. long, lanceolate,

acuminate. Leaflets 3-5, alternate, g-1 by  $l \sim i$  in., oblanceolate or elliptic-oblong, more or less hairy above, hoary with dense fine white hairs beneath, base acute; petiolules of lateral leaflets  $\wedge$  in., those of the terminal  $\pounds$  in. long. Flowers small, in long spicate 20-50-flowered racemes reaching 4 in. long, rather close, longer than the leaves; pedicels short. Calyx  $\tau V$  in. long, silvery outside; teeth-as long as the tube, triangular, acute! Corolla red, thrice as long as the calyx; standard  $\S$  in. long, densely hairy on the back. Pods numerous, along the whole length of the rachis,  $\pounds$ -f in. long, slightly curved outwards, torulose, hoary when young with a fine appressed pubescence. Seeds 6-8, oblong, obtusely 4-gonous, truncate at one end. Fl. B. I. v. 2, p.\*97; Aitch. Pb. & Wind PL p. 41; - Trim. Fl. Ceyl. v. 2, p. 25; Talb. Trees, Bomb.  $\setminus >$ . 07; Woodr. in Journ. Bomb. Xat.' v. 11 (1897) p. 421; Watt, Diet. Econ. Prod. v. 4, p. 380.—Flowers: Sept.-Nov.

Tolerably common in Gujarat and Sindh. GUJARAT: Swat, *Dafcell* if- *Gihson*; *liuroda*, *Knnifkar* \ Dakor, *Woodrow*. SIND: *Cookel*, *Vicaryl*, *IVoodrow*, *Vuran* \; Karachi to *Mugger Peer*, *I'crn* /!—DISTRICTS Throughout the plains of India; Ceylon. IMUeliistan, Arabia, Java, Tropical Africa.

12. **Indigofera hendecaphylla**, *Jacquin, Collect*, v. 2(i 7bS) p 4' *Icon. Plant. liar.* t. 570. Herbaceous, procumbent; stems 1-2 ft. long, trailing, glabrous or with a few appressed hairs. Leaves nearly sessile, 1-2| in. long; stipules scarious-,  $\setminus -\%$  in. long, lanceolate, cuspidate. Leaflets. 5-11, alternate, i-1 by  $yg \sim i$   $\wedge^n$ -' oblanceolate, rounded, apiculate, with appressed grey hairs on both surfaces, glaucous beneath, base acute; petiolules of lateral leaflets  $-Jjj-jjr$  in., those of the terminal  $xV \sim 8$  in. long. Flowers in close many-flowered usually peduncled racemes 1-4J in. long; pedicels very short. Calyx  $\wedge$  in. long, hairy; teeth "lanceolate-subulate, very long. Corolla twice as long as the calyx. Pods numerous, imbricately deflexed,  $-J-1|$  in. long, 4-gonous, straight, pointed, not reflexed at the tip, nearly sessile, with a few appressed white hairs, not torulose. Heeds 6-10, oblong, 4-gonous, truncate at both ends. *Indigofera endecaphylla*, Bot. Eeg. t. 789; DC. Prodr. v. 2, p. 228; Fl. B. I. v. 2, p. 98; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421. / *Kleinii*, AV. & A. Prodr. p. 204; Dalz. & (Jibs. p. 00.—Flowers: Oct.-Nov.

KONKAN: *Stocks*! DECCAN: Panchgani Gluit, *Cooke I*, *Woodrow*; Ambhil Odha, *Kanitkar* \ S. M. COUNTRY: Belgaum, *Ritchie*, 1G7!, *Dalzell*  $\S$ • *Gibson*; Dliarwar, *JWc?ie*, 107! KANARA: *Stocks*]—DISTRICTS. India (W. Peninsula, Birma); Tropical AlVioa, CapeJ China.

1:5. **Indigofera trifoliata**, *Linn. Amcen. Acad.* v. 4 (1759) p. 327. Perennial, somewhat shrubby; stems much branched, 1-2 ft. long; young branches with scattered white appressed hairs, soon glabrescent. Leaves membranous, subdigitately 3-foliolate; petioles  $\setminus \pm$  in. long, slender; stipules small, setaceous. Leaflets  $-|$ -1 by  $\setminus \&$  in., oblanceolate, rounded and minutely apiculate at the apex, sparingly clothed with white appressed hairs above, more densely hairy, nigro-punctate and glaucous beneath; petiolules of the lateral leaflets  $\tau \wedge$  in. long, the terminal leaflets sessile or nearly so. Flowers small, in congested sessile, 6-12-flowered racemes, which are usually shorter than the leaves; pedicels very short. Calyx J in. long, hairy outside; teeth lanceolate-subulate, Corolla dark pink, nearly twice as long as the calyx; standard

6<sup>n</sup>«<sup>v</sup> i'u<sup>n</sup>-j oblong-obovate, densely hairy on\* the back. Pods deflexed, ½-j in. long, straight, somewhat 4-gonous, thinly hairy, with 4 narrow wings one at each side of the suture, and with a few scattered white hairs, not torulose. Seeds 0-8. Fl. B. I. v. 2, p. 96; Dalz. & Gibs, p. 59; Trim. PL Ceyl. v. 2, p. 24; Wight, Icon, t, 314; Woodr. in Journ. Bomft. Nat. v! 11 (1897) p. 421.—Flowers : Aug.-Oct.

KONKAN : *Stocks!*; Parel (Bombay), *Ranade!*, *Woodrow !*; Chiplun, *Woodrow* ; Ambeghut, *Bhiva !* DECCAN: Pooim, *Cookel* S. M. COUNTRY : -Belgaiun, *Ritchie*, 168 ! GUJARAT : Domas, *Dalzcell!*—DISTRIB. Throughout India ; Ceylon, Java, China, Philippines, N. Australia.

14. **Indigofera trita**, *Linn. f. Siqyl PI* (1781) p. 335.

An

undershrub 2-3 ft. high; branches hoary with line appressed hairs.

Leaves 3-foliolate; petioles \-^ in. long; stipules small, setaceous.

Leaflets : the lateral ones opposite, nearly sessile, *h-%* by \~*h* in.; the terminal stalked, |-1£ by |-^in., all obovate-oblong, slightly emarginate, clothed, with fine appressed grey hairs, base acute. Flowers small,

in short sessile or stalked 6-12-flowered spicate racemes, which are shorter than the leaves. Calyx ^ in. long, hairy outside : teeth

linear-

lanceolate. Corolla salmon-colored, \ in. long; standard orbicular,

hairy on the back. Pods divaricate or sometimes deflexed, rigid, straight,

4-gonous, spine-pointed, not torulose, silvery with fine appressed hairs.

Seeds 0-10, oblong, truncate at both ends. Fl. B. I. v. 2, p. U0 ;

Grab.

Cat, p. 40 5 Dalz. & Gibs. p. 00 ; Wight, Icon. tt. 315, 380; Trim. Fl.

Ceyl. v. 2, p. 25; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.—

Flowers: Feb.-Mar.

DECCAN: Poona, *Cookel*, *Woodrow I*; Talegaon (Poona (lists.), *Bhiva I* GUJARAT: Nausari, *Kanitfcarl* S. M. COUNTRY: Belganm hills, *Ritchie*, 1165!—DisTd Throughout India ; Ceylon, Tropical Africa, Malay Island?, N. Australia.

15. **Indigofera articulata**, *Gouan% Illustr. et Obs.* (1773) p. 49.

A shrub 2-3 ft. high; stem and branches argenteo-canescens, more or less angled. Leaves 1-2 in. long; petioles -i—i in. long;

stipules

minute, subulate. Leaflets 3-5, very rarely 7 (those of the lower leaved

usually 3, those of the middle and upper leaves usually 5, the terminal leaflet the largest), ^-1 by |-| in., obovate, rounded and apiculate at the apex, argenteo-canescens on both surfaces, base cuneate; petiolules of the lateral leaflets ^ in., those of the terminal ^-^ in. long.

Flowers

in short-peduncled or subsessiiie 12-20-flowered racemes shorter than the leaves ; pedicels short, slender. Calyx ■£\$ in. long, silvery-hairy ;

teeth triangular, acute, rather shorter than the tube. Corolla ^ in. long;

standard pubescent on the back. Pods  $\frac{1}{2}$  in. long, thick, turgid, recurved, shortly mucronate, silvery-canescens when young, finally glabrescent, torulose. Seeds 2-4 (commonly 3). *Indigofera argentea*.

Linn. Mantiss. p. 273; Fl. B. I. v. 2, p. 98; Aitch. Pb. & Sind Pl. p. 40; Boiss. Fl. Orient, v. 2, p. 190; Talb. Trees, Bomb. p. 67;

Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Econ. Prod. v. 4, p. 383. *I. spicata*, Forsk. Fl. Egypt-Arab, p. 138.—Flowers: Nov.-Dec. VEPN. *Karumili*.

The name *I. argentea* was given in 1708 by Burmann (Fl. Ind. p. 171) to a Persian plant and is therefore earlier than that of Linnaeus (1771). As to the plant intended by Burmann, De Candolle identifies it with *T. semitrijuga*, var. *tetrasperma*, DC, and the actual specimen in Herb.

Burm. has been seen and verified by him (Prodr. v. 2, p. 230). There is no doubt whatever that the plant described above is *I. artkulata* of Goiiian, whose description is full and accurate, while the figure by Zanoni (liar. Stirp. Hist. [1742] p. 18, t. 12), quoted by Goiiian, correctly represents it.

Chiefly confined to Sind, rare in the Deccan. DECCAN : Poona, Woodrow. SIND : Stocks, 488!, *Ptcran* !—DISTIUB. Arabia, Egypt, Abyssinia, cultivated for the indigo it produces.

**H>. Indigofera marginulata**, *Grah. in Wall. Cat.* (1828) 5407.

Suffruticose; stem and branches angled, thinly clothed with appressed grey hairs. Leaves imparipinnate; stipules setaceous, ^- in. long.

Leaflets 5, opposite, §-| by /V-f\, elliptic or oblanceolate, apiculate, sparsely clothed on both surfaces with appressed white hairs; petiolules of lateral leaflets ^ in., those of: the terminal £ in. long. Flowers in elongate lax racemes reaching 4 in. long, exceeding the leaves. Calyx £ in. long, hairy outside; teeth much longer than the tube, lanceolate-subulate. Corolla twice as long as the calyx. Pods straight, pointed, dellexed, |-1 in. long, sparsely clothed with appressed white hairs, sutures margined, valves rounded, not torulose. Seeds 5-6, oblong, obtusely 4-gonous, truncate at one end, rounded at the other. Fl. R. 1. v. 2, p/97.

Very rare. I have seen only one specimen marked KONKAN : Stocks!—DISTIUB. India (Carnatic, Dindigul hills).

17. **Indigofera glabra**, *Linn. Sf>. PL* (1753) p. 751. Annual,

1-3 ft. high; branches numerous, ascending, glabrous or with a few

vlU"\*ading deciduous eglandular hairs. Leaves f-l-j in. long; stipules

1^' in, long, lanceolate, very acute, hairy, persistent. Leaflets 5,

1 opposite, thin, j^h, by \$-§, obovate-elliptic, obtuse, apiculate, more or less appressedly hairy on both surfaces, the lateral leaflets shortly

petioluled, the terminal with a petiolule %-\ in. long. Flowers small,

yi 2-4-flowered short axillary racemes; peduncles slender; pedicels

short. Calyx T^T in. long, hairy outside; teeth subulate. Corolla red.

£ in. long. Pods |-1 in. long, straight, subcylindric or obscurely

4-gonous, glabrous, not torulose. Seeds 10-12, cubical. Trim. Fl. Ceyl.

v. 2, p. 2:\*. *I. pentaj>hyUa*, Murr. Syst. Veg. ed. 13 (1774) p. 564 (not

of Burch.); Fl. B. L v. 2, p. 95; Wight, Icon. t. 385; Woodr. in

Journ. Bomb. Nat. v. 11 (1897) p. 421.—Flowers : Oct.

A rare plant. The only specimens from the Bombay Presidency~that I have seen were collected by Woodrow at Badanri in the S. M. Country, where it seems to be fairly abundant.- -DISTIUB. Throughout India; Tropical Africa.

is. **Indigofera tenuifolia**, *lottl. ex Wvjht 6f Am. Prodr.* (1834)  
p. 200. Herbaceous, diffuse, 6-8 in. high;. branches numerous,  
spreading or ascending, slender, glabrous or more or less clothed with

I  
slightly longer. Flowers small, in short 3-G-flowered racemes usually  
longer than the leaves ; peduncles filiform ; pedicels short. Calyx 1/4- in.  
long, hairy : teeth setaceous, scarcely longer than the tube.  
Corolla

y in. long, bright red. Pods f-1 in. long, straight, linear, subcylindric or compressed, distinctly torulose. Seeds 10-12, oblong, truncate at both ends, punctate, black when ripe. Fl. B. I. v. 2, p. 95; Dalz. & Gibs. p. 58; Trim. Fl. Ceyl. v. 2, p. 24.—Flowers: Sept.-Oct,

KONKAX: *Stocks* \ S. M. COUNTRY: Padshapur, *Bitkie*, 1097!; Badarui, *Cookel*, *Woodrowl* GUJARAT: Ankleshwar near Broach, *Dalzell* <?• *Gibson*. SIND: *Bkola* \-- DISTRIB. India (W. Peninsula); Ceylon.

19. **Indigofera viscosa**, *Lamlc. Encyc. Method*, >. 3 (1789) p. 247. Annual, 1-3 ft. high; branches numerous, densely clothed with minute viscous gland-tipped hairs. Leaves f-lf in. long; petioles \ in. long, glandular-hairy; stipules %--f\ in. long, filiform. Leaflets 7-11 (usually 11), fV"§ by ^ in., opposite, obovate-elliptic, obtuse, apiculate, sparsely clothed with white appressed hairs above, more densely so beneath. Flowers small, in glandular 6-12-flowered racemes nearly as long as the leaves. Calyx -y^ in. long, hairy; teeth setaceous, about equalling the tube. Corolla pink, ^ in. long. Pods |-1 in. long, straight, sub-cylindric, faintly torulose, clothed with gland-tipped as well as with appressed white hairs. Fl. B. I. v. 2, p. 95 ; Trim. Fl. Ceyl. v. 2, p. 24; Aitch. Pb. & Sind PI. p. 41.

A rare plant in the Bombay Presidency. SIND : *Da hell I*, *Vicary* ex *Aitch*. 1. c.— D B . Springly throughout India; Ceylon.

20. **Indigofera argentea**, *Barm. Fl. hid.* (1768) p. 171 (*not of Linn.*). A low diffusely-branched argenteo-canescens undershrub reaching 2 ft. high ; branches numerous, slender, terete, silvery-canescens. Leaves g-1 in. long; petioles -f\-'§ m\* ^0U8> stipules minute, setaceous. Leaflets 7-9 (rarely 11), subsessile (except the terminal one), broadly obovate, rounded at the apex, densely clothed with long silvery appressed hairs, base cuneate. Flowers in lax 6-12-flowered peduncled racemes which are usually longer than the leaves; pedicels very short. Calyx yV in. long, canescens; teeth linear-lanceolate, us long as the tube. Corolla rather more than twice as long as the calyx; standard orbicular, i in. long, s 1 very-pubescent on the back, Pods §-7 in. long, turgid, clothed with wiute appressed hairs, shortly mucronate, not torulose. Seeds 4-6. *Indigofera semitrijugu*, uu. *tetrasperma*, DC. Prodr. v. 2, p. 230. *I. semitrijuga*, iBaker, in Hook. f. Fl. R". I. v. 2, p. 98 (*not of Forsk.*); Aitch. Pb. & Sind PI. p. 41.

The name /. *argentea* was given by Burmann in 1768, and is therefore prior to the name /. *argentea* given by Linnteus (Mantiss. [1771] p. 273) to a different plant. The plant described by Burmann has been identified by De Candolle, from -actual examination of Bunnann's .specimens, as /. *semilrijtga*, var. *tetrasperma*, DC. (See under n. 15, /. «rikuhitn preceding.) /. *semitrijuga*, Forsk., is /. *enmapliyllu*, Linn,

A rare plant. SIND : Jemadar ka Landa near Karachi, *Stocks I*; sandy soil near the sea, *Stocks*, 562!—DISTRIB. Egypt, Arabia, Abyssinia.

21. **Indigofera parviflora**, *Heyne, in Wall. Oat.* (1828) 5457.

A much-branched annual, 1-2½ ft. high ; stems and branches slender. grooved or angled, more or less argenteo-canescens. Leaves 1½-2 in. long; petioles ½-¾ in. long ; stipules minute, setaceous. Leaflets opposite, 7-9, membranous, {-I by £—| in., linear-oblong, elliptic-oblong or oblanceohite, rounded or subacute, shortly

apiculate, thinly argenteo-



petiolules of lateral leaflets about  $\frac{1}{2}$  in., those of the terminal about  $\frac{1}{2}$  in. long. Flowers in short close-sessile 12-flowered racemes shorter than the leaves; pedicels very short. Calyx  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, hairy; teeth linear-lanceolate, longer than the tube. Corolla lilac,  $\frac{1}{2}$  in. long. Pods linear,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, clothed with appressed white hairs, straight, pointed, recurved at the tip, deflexed, not torulose. Seeds 15-20, truncate at both ends. Fl. B. 1. v. 2, p. 07; W. & A. Prodr. p. 201.—Flowers: Nov.

Rare. KOXKAS: *Stocks* \ S. M. COUNTRY: Padshapur, *Ritchie*, 1 (>93 !—DISTRIB. India (W. Peninsula and Carnatic); Arabia, Tropical Africa, N. Australia.

22. **Indigofera Hauer**, *Forslc. Fl. JSyppL-Arab.* (1775) p. 137. In erect shrub about 3 ft., when cultivated reaching 5-6 ft. high; stem woody, argenteo-caescent, more or less angled, striate. Leaves 2-3 in. long; petioles  $\frac{1}{2}$  in. long; stipules minute, subulate. Leaflets 7-11, opposite,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, obovate, usually emarginate, sparingly clothed with short appressed white hairs above, not or scarcely argenteo-caescent, the lower surface pale, glabrous or nearly so; petiolules of the lateral leaflets  $\frac{1}{2}$ - $\frac{3}{4}$  in., those of the terminal  $\frac{1}{2}$  in. long. Flowers  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, in axillary subsessile racemes 1-2 in. long, usually shorter than the leaves; pedicels short, slender. Calyx  $\frac{1}{2}$  in. long; teeth triangular. Corolla reddish-yellow,  $\frac{1}{2}$  in. long; standard and keel hairy. Pods  $\frac{1}{2}$  in. long, thick, turgid, recurved, shortly mucronate, silvery-hairy when young, finally glabrescent, slightly torulose. Seeds 2-3 (usually 3). 7. *candea*, Eoxb. Fl. Ind. v. 3, p. 377; Dalz. & Gibs. p. 59; Aitch. Pb. & JSind Pl. p. 40. *. argentea*, var. *aendea*, Baker, in Hook. f. Fl. B. I. v. 2, p. 99; Watt, Diet. Econ. Prod. v. 4, p. 383.—Flowers: Nov.-Dec.

The name *. lluuer* given to this plant by Forskahl is many years earlier than *I. cwndea* given to it by Roxburgh. Steudel (Nom. Bot. & d. 2, p. 807), under the name *. Hover*, gives as a synonym *. lateritia*, Wilhl., which is *. viscosa*, Lamk. The 'Index Kewensis' also, under the name *. Hover* gives as a synonym *. lateritia*, Bertol., a native of the Cape of Good Hope. *. lateritia*, Bertol., is described in Bertol. Xcv. Coinm. Bonon. v. 2 (1830) p. 215, and figured in tab. 8, fig. 1. The description and figure show that it is very remote from *. Hauer*, Forsk.

GUJARAT: Dhej near Broach, *Dalzd!* Sixo: *Stocks* 1 Cultivated extensively in Egypt as a source of indigo (see Forsk. *I. c.*) Eoxburgh (*L c.*) says that he has extracted better indigo from it than from *. tinctoria*.—DISTRIB. India (W. Peninsula and plains of Banda); Arabia, Egypt, Abyssinia.

23. **Indigofera tinctoria**. Linn, *ty\ PL* (1753) p. 751. A shrub  $\frac{1}{2}$ -1 ft. high; branches terete or more or less angular, slightly silvery from line appressed hairs. Leaves 1-3 in. long; petioles  $\frac{1}{2}$  in. long; stipules small, subulate. Leaflets 0-13, opposite, membranous, green but drying a greyish-black,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, oblong or oblanceolate, rounded, apiculate, glabrous above or nearly so, thinly clothed with appressed hairs beneath, base acute; petiolules of lateral leaflets  $\frac{1}{2}$ - $\frac{3}{4}$  in., those of the terminal reaching  $\frac{1}{2}$  in. long. Flowers numerous, in nearly sessile lax spicate racemes 2-4 in. long. Calyx  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, hairy outside; teeth triangular, acute, as long as the tube. Corolla pink,  $\frac{1}{2}$  in. long; standard pubescent at the back. Pods  $\frac{1}{2}$ - $\frac{3}{4}$  in. long,

linear, straight or slightly curved, apiculate, thickened at the sutures, glabrous, not torulose. Seeds 8-12. Fl. B. I. v. 2, p. 99 ; Grab. Cat. p. 4G; Dalz. & Gibs. p. 59; Trim. Fl. Ceyl. v. 2, p. 26; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421 ; Walt,- Diet. Econ. Prod. v. 4, p. 387.—Flowers: Nov.-1)ec. YERX. *Nil; Quit.*

The *Indi<fo'plant*, widely cultivated in many parts of India, doubtfully wild, but found as an escape in localities not far removed from human influence. Indigo was at one time cultivated extensively in Gujarat and Sind, but its cultivation has greatly fallen off in late years.—For a full description see Watt, Diet. Eeon. Prod. 1. c.

24. **Indigofera hirsuta**, *Linn. Sp. PL* (1753) p. 751. Annual or biennial, erect, 2-4 ft. high ; stems and branches covered with soft

spreading reddish-brown hairs. Leaves 2-5 in. long; petioles \-2 in.

long; stipules *h* in. long, filiform, plumose, conspicuous. Leaflets 5-11,

opposite, membranous, 1-2 by §-1 in., elliptic-oblong or sometimes obovate, clothed on both sides with appressed hairs, glaucous beneath ; petiolules of lateral leaflets ^—*fa* in., those of the terminal sometimes reaching \ in. Jong, clothed (as is the rhachis) with spreading hairs.

Flowers in dense many-flowered peduncled racemes 2-6 in. long, longer or shorter than the leaves ; • pedicels very short. Calyx | in.

Jong,

densely hairy; teeth very long, subulate, plumose. Corolla pink,

scarcely exerted. Pods |-| in. long, imbricately deflexed, straight,

4-gonous, pointed, densely clothed with soft spreading hairs.

Seeds

(5-8, cubical. PI. B. I. v.'2, p. 98; Dalz. & Gibs. p. GO; W. & A.

Prodr. p. 204; Jacquin, *Icon. Plant. Ear. t. 569* ; Trim. *El. Ceyl. v. 2, p. 20*; Woodr. in *Journ. Bomb. Nat. v. 11* (1897) p. 421.—FJower.s

:

Aug.-Oct.

KONKAN: S. Konlian, common, *Dahell tj' Gibson; Xeral, Il'oodroc: I; Poladpur, Woodrow !; Pen, Stocks !* S. M. COUNTRY : Badami, *Bhlva !; Belgaum, Ritchie, 1026!* —DISTUIB. Throughout the plains of India ; Ceylon, Tropical Africa, Tropical Amm<>:i Java, Philippines, X. Australia.

25. **Indigofera constricta**, *Trim. Cat. Ueyl. PL* (1885) p. 2"

erect shrub 3-4 ft. high; branches divaricate, rferete or olicn-

angled, and with a few appressed hairs. Leaves about 2 inches a petioles i~| in. long,.s!ender ; stipules minute, subulate. Leaflets

7-li,

opposite, soon deciduous, dark green above, glaucous beneath, thin, f-1 by |-i in., elliptic-oblong, rounded or faintly emarginate and apiculate at the apex, sparingly clothed on both surfaces with appressed white hairs, base rounded; petiolules of lateral leaflets 4\$ in. long, those of the terminal -. in. long. Flowers numerous, in racemes about as

long

as the leaves. Calyx silky ; tube campanulate ;'teeth short,

triangular,  
acute. Pods li-2] in. long, linear, pointed, slightly curved,  
somewhat  
4-gonous, much -constricted between the seeds, sparingly silky  
with  
white appressed hairs. Seeds 8-12. Trim. Fl. Ceyl. v. 2, p. 27 ;  
Talbot.

Trees, Bomb. p. 07 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421.  
*I. flaccida*, var. *constricta*, Thw. Enum. p. 411.— Flowers-: Oct.-Nov.

A rare plant, confined to Kanara. KANAKA : common on the Nilkund Ghat, *Talbot*,  
%S)i! ; moist forests of N. Kanara, common on the Supa Ghats, *Talbot*.—DISTIIIJJ.  
Ceylon.

26. **Indigofera Wightii**, *Urah. in Wall. Cat.* (1828) 5458.

A  
small erect shrub; branches numerous, furrowed, silvery-grey  
with  
appressed hairs. Leaves li-2| in. long ; petioles .]-£ in. long;  
stipule

minute, subulate. Leaflets 13-21, opposite,  $\frac{1}{2}$  in. long, elliptic or oblanceolate, rounded and mucronate at the apex, densely clothed on both sides with persistent appressed white hairs, base acute; petiolules of the lateral leaflets  $\frac{1}{2}$  in. long, those of the terminal ones a little longer. Flowers in dense subsessile racemes, shorter than the leaves; pedicels short. Calyx  $\frac{1}{2}$  in. long, silvery outside; teeth triangular,

acute. Corolla red,  $\frac{1}{8}$ - $\frac{1}{4}$  in. long; standard broadly ovate, shortly acuminate, hairy on the back; keel-petals hairy outside. Pods 1-1 $\frac{1}{4}$  in. long, straight, cylindric, mucronate, clothed with appressed white hairs, not deflexed nor torulose. Seeds 8-12. Fl. B. I. v. 2, p. 99; Dalz. & Gibs. p. 59; Trim. Yl Ceyl. v. 2, p. 27; Talb. Trees, Bomb. p. 67.

A rare plant. KONKAN : Stocks ! S. M. COUNTRY : Belgaum, Ritchie, 166 !, Dalzell, Mucks !, Tcthol.—DISTRIB. India (W. Peninsula); Ceylon.

27. **Indigofera pulchella**, *lioxb. Hort. Benrj.* (1814) p. 57; *Fl. Inch* v. 3, p. 382. An erect ramous shrub 4-6 ft. high; branches striate, glabrous or more or less hairy. Leaves 3-6 in. long; petioles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; stipules very minute, subulate, caducous. Leaflets 13-21, opposite or a few casually alternate, 4-1 by  $\frac{1}{2}$ - $\frac{3}{4}$  in., elliptic-oblong, rounded, truncate or emarginate, apiculate, thinly clothed with short grey appressed hairs, base acute; main nerves prominent on the under surface; petiolules of the lateral leaflets  $\frac{1}{2}$ - $\frac{3}{4}$  in., those of the terminal ones  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Flowers the largest of the genus, numerous, in moderately close short-peduncled racemes shorter than the leaves; pedicels short, slender, hairy; bracts large, boat-shaped, long-cuspidate, exceeding the buds, silky-hairy, caducous. Calyx  $\frac{1}{2}$  in. long, appressedly hairy outside; teeth short, triangular. Corolla purple,  $\frac{1}{2}$  in. long; standard orbicular, as broad as long, glabrous on the back; keel-petals glabrous outside. Pods 1-1 $\frac{1}{2}$  in. long, straight, turgid, cylindric, glabrous. Seeds curie. N. B. I. v. 2, p. 101; Dalz. & Gibs. p. 60; Talb. Trees, Bomb. ud. 2.; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 421; Watt, Diet. Wilhl Prod. v. 4, p. 387. *Gihsonii*, Grab. Cat. p. 46.—Flowers: the nrtn. VEBN. >Baroli; Chimnati.

the CAN : Mahableshwar, *Cook U H. M. Birdwood, Woodrowl*; Kartriz bills, *Kanitkar* hills abou<sup>^</sup> Hewra, *Graham*. S. M. COUNTRY : Js<sup>T</sup>agarglili near Dharwar, *Kanitkar* near Hu<sup>^</sup>li, *Bohnhacker*, 774!; Belgaum, *Ritchie*, 165! KAXARA : N\*. Kaiiara iu moist forests along the ghats, *Talbot*.—DISTRIB. Throughout the bills of India.

## 12. PS OR ALE A, Linn.

Herbs or undershrubs punctate with black or pellucid glands. Leaves simple or imparipinnate, stipulate, inflorescence capitate, spicate, sub-racemose or fasciculate. Calyx-lobes 'ok anal, or the lowest the the two upper often connate. Pib M si \ t . fl i s t i n c t claws: k obtus<sup>i</sup> connate with the others, the tube. 'UPP<sup>^</sup> stan I I ^—" \ / flowering; anthers small, uniforix often closed at the commencement of

larger, the two upper often connate. Pib<sup>'^</sup>ub<sup>e</sup>M<sup>^</sup>si \ t . fl i s t i n c t claws; keel ti lihtl id ^tala all witn .  
flowering; anthers small, uniforix

terminal.

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Leaves simple

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s 3-foliolate.....r.....

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2. P. phcrrfa.

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and North America ; species ab<\* tne rr<sup>eu</sup>> ^

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•1. **Psoralea corylifolia**, *Linn. Sp. PL* (1753) p. 7G4. An erect annual 2-4 ft. high; stem and branches grooved, studded with conspicuous glands and with a few appressed and spreading white hairs. Leaves simple, li-3 by 1-2 in., broadly elliptic, inciso-dentate, rounded and mucronate at the apex, sparingly clothed with white hairs on both surfaces, closely nigro-punctate, base cuneate, rarely rounded; main nerves 5, springing from the base, and 4-6 pairs of lateral nerves higher up from the midrib; petioles |—1 in. long, hairy and gland-dotted; stipules lanceolate, persistent. Flowers close, in dense axillary solitary 10-30-flowered racemes; peduncles 1-2 in. long, hairy; pedicels very short. Calyx £-£ in. long, hairy outside; the upper teeth linear-lanceolate, the lower ovate, twice as long as the upper. Corolla bluish-purple, nearly twice as long as the calyx; standard orbicular, 1 in. long, clawed, glabrous. Pods jr in. long, ovoid-oblong, somewhat compressed, closely pitted, mucronate, black, glabrous. Seed ], smooth, adhering to the pericarp. *Fl. B. I. v. 2, p. 103*; *Grah. Cat. p. 4G*; *Dalz. & Gibs. p. CO*; *Trim. Fl. Ceyl. v. 2, p. 28*; *Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422*; *Watt, Diet. Econ. Prod. v. 6, part 1, p. 353*.—Flowers: Aug.-Dec. YEHN. *Bdvclii*.

A common weed in waste places. KONKAN: *Sfoclsl* DECCAN: *Nnsik, Woodroio.*, *VacMarl*; Kolhapur, *Cooke I S. M. COUNTKY: Belgaijin, Ititchie, 1039!*—DISTRUJ. Throughout India; Ceylon.

The seeds have some repute in native medicine as a remedy for certain skin diseases. A preparation made therefrom is stated to be valuable for restoring the hair in the j# case of broken knees in horses, and its use for this purpose is advocated in the agri-j cultural publication 'Farm and Home' of April 8th, 1891, recipe no. 2777. j'

2. **Psoralea plicata**, *Delile, FL tVEgypte* (1812) p. 2»2, t 37, fig. fely A low much-branched uundershrub 1-2 ft. high; stems whitish, teree.—striate, glabrous or nearly so, sparingly glalid-dotted. Leaves 3-fr late; petioles yV~2 in. long; stipules linear-oblong, acute, ne Leaflets oblanceolate (the lateral |-| by g-yV in., the terminal -]iivis.

jr"r\ mi-) rounded at the apex, apiculate or not, both surfaces with closely appressed hairs, gland-dotted on the lower, but no upper surface, the margins irregularly sinuate or subserrate, bai-. petiolules of the lateral leaflets 0-g-1^, those of the terminal ones reacning -fa in. long. Elowers solitary or in fascicles of 2 or 3 along

a striate axillary rhachis 2-4 in. long; pedicels short, cteflexed; bracts small, ovate, acute. Calyx accrescent in fruit, in flower J~g- in. long, silvery-hairy outside; teeth triangular, shorter than the tjube, the lowest the largest. Corolla yellow, slightly exserted. Pod\* Jin. long, ellip

soid, densely hair\ completely enclosed in the ac >ent persistent

calyx, which becomes membranous and many-nerved ed 1, adherent

to'the pericarp, smooth. *Fl. B. I. v. 2, p. 103*; , *Diet. Econ. Prod. v. 6, part 1, p. 354*.

A very rare plant. SIXD: *Stocks!*, *Woodrow I*—DISTRU. ..na (l\injab); Arabia, Egypt, Tropical Africa.

### 13. MILLETTIA, Wight & Am.

Trees or shrubs, often climbing. Leaves inparipinnate; stipules small. Leaflets often stipellate. Flowers in axillary and terminal

racemes or panicles, often fascicled, rarely scattered along the rhachis.  
Calyx-tube truncate, or with very short teeth. Corolla much exserted  
;

Y

standard broad ; keel not beaked. Stamens monadelphous or diadelphous ; filaments filiform ; anthers uniform. Ovary sessile or rarely stalked, usually girt at the base by an annular disk or by a short sheath; ovules usually few; style inflexed, terete, glabrous; stigma small, terminal. Pod linear or oblong, 1- or few-seeded, flat or turgid, coriaceous or woody, small, tardily or scarcely dehiscent.—DISTRIB. Tropics of the Old World ; species 40-50.

J. *Millettia racemosa*, *Benili. Pl. Jiuujh.* (1851-55) p. 249. A large woody climber; branches glabrous or thinly silky. Leaves reaching 1 ft. long; petioles 2-4 in. long ; stipules subulate, § in. long. Leaflets 11-15, membranous, opposite, 2-3 by 1-1<sup>^</sup> in., oblong or obovate-oblong, suddenly and obtusely acuminate, glabrous above, pale and more or less silky or glabrescent beneath, base cuneate; petiolules 1-3 in. long; stipules 1/2 in. long, filiform. Flowers close, not fascicled, in axillary and terminal silky-brown racemes 3-9 in. long shorter than the leaves; pedicels 1/2-1 in. long ; bracts conspicuous, linear-cuspidate, 1/2 in. long. Calyx 1/2 in. long, clothed with fine silky-brown hairs ; teeth very short, triangular, the two on the upper side often obsolete. Corolla yellowish-white, about twice as long as the calyx ; standard 1/2 in. long, quite glabrous, exappendiculate, shortly clawed. Ovary glabrous, shortly stalked ; ovules 6. Pods compressed between the seeds, linear, coriaceous, 4-8 in. long, 1/2 in. broad, scarcely at length dehiscent. Seeds 3-5, ovoid. Tl. B.I. v. 2, p. 105; Talk Trees, Bomb. p. 68 ; Woodr. an Journ. Bomb. Nat. v. 11 (1897) p. 422. *Millettia pallida*, Dalz. in Journ. Linn. Soc. v. 13 (1873) p. 187. *Wisteria racemosa*, Date. & Gibs, icv 61. *Wisteria pallida*, Dalz. & Gibs. p. 61.—Flowers : Apr.-May.

S<sup>1</sup>W<sup>ONKAN</sup>: *Lawl, Stocks*, *J)qisell* \ Dasgaon, *Woodrow*. GUJARAT: Dangs, rare, 12. *ell § Gibson*. S. M. COUNTRY : near Belgauni, *Dalzd § Gibson*.—

DISTRIB. India 2 • r > Central India).

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#### 14. MUNDULEA, DC.

usually sericeo-pubescent. Leaves imparipinnate ; stipules Flower? in terminal racemes; pedicels fascicled along the rachis ; bracts small; bracteoles 0. Calyx campanulate; teeth short, the 2 upper often subconnate. Corolla rosy, exerted; standard large, clawed; wings falcate-oblong ; keel incurved and obtuse at the apex. Stamens monadelphous; alternate filaments slightly dilated ; anthers uniform. Ovary sessile; ovules many; style incurved, subterete, glabrous, inflexed at the very apex ; stigma capitate. Pod subindehiscent, linear, flat, the sutures 1/2 in. thickened, reniform.— DISTRIB. Species 3, • of which 1 (the following) is ° £<sup>r</sup> habitant of Tropical Asia and S. & W. Africa, the 2 others of Madagascar.

1. *Mundulea suberosa*, *Benth. Pl. Jungh.* (1851-55) p. 248» A small tree 10-15 ft. high; bark pale, corky; branches sericeous. Leaves numerous; petioles 1/2 in. long ; stipules small. Leaflets 17-23, opposite or alternate, 1/2-1 in. by 1/2-1 in., coriaceous, oblong-lanceolate, obtuse, glabrous and bright green above, silvery-silky beneath ; petiolules of the lateral leaflets 1/2 in., those of the terminal 1/2 in. long. Flowers in close terminal racemes ; pedicels 1/2 in. long, slender. Calyx 1/2 in. long, clothed with silky hairs ; teeth short deltoid. Corolla f-g in.



long, pinkish-violet; standard silky outside. Pods 3-4 by  $f\$/l$  in., flattened, densely velvety with short golden-brown hairs, thickened at the sutures. Seeds 3-8, about  $\frac{1}{2}$  in. long, yellowish-brown. *F.* 13. I. v. 2, p. 110; Trim. Fl. Ceyl. v. 2, p. 29; Talb. Trees, Bomb. p. 68; Woodr. in. Journ. Bomb. Nat. v. '11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 5, p. 288. *Tephrosia suberosa*, DC. Prodr. v. 2, p. 249; Qrah. Cat. p. 47; Dalz. & Gibs. p. 00.—Flowers: Aug.-Oct. VERN. *Supti*.

KONKAN: *Stocks!*, *Dalzell!* DECCAN: *Gokak*, *Cooke!*, *Woodrow*. S. M. COUNTRY: *ock hills east of Belgaum*, *Graham & Gibson*; S. of Padshapur, *Ritchie*, 1173!; *ry Cooke!*, *Woodrow!*, *Talbot*.—DISTRIB. India (W. Peninsula); Ceylon, Tropical Badami, Africa, Natal. The seeds are said to be USUU-KJT poisoning fish. See Watt, Diet. Econ. Prod. 1. c.

15. TEPHROSIA, Pers.

Herbs or undershvybs. Leaves usually imparipinnate, sometimes simple, stipulate; leaflets opposite, usually numerous (rarely 1-3), parallel-veined, often silky beneath. Flowers in terminal or leaf-opposed racemes which are often leafy at the base, or solitary, or in pairs in the axils of the leaves.  $C^{\wedge}yx$ -teeth or -lobes, subequal, or the 2 upper more deeply connate, or the lower longer. Petals clawed; standard suborbicular; wings obliquely obo $V^{\wedge}e$  or oblong. Stamens diadelphous when the flower is fully open;  $aP^{*hers}$  obtuse, uniform. Ovary sessile; ovules many (rarely 2); style in  $Q^2 \wedge e.d$ , often flattened, glabrous or bearded; stigma terminal, often  $pei.ft.$   $b^{\wedge}$ .  $\wedge^{\circ}\wedge$  usually linear, flattened, many-seeded, 2-valved, continuou $\wedge$  in.  $P^l$  or obscurely septate between the seeds. Seeds sometimes with feet  $<1$  stroplnole.—DISTRIB. Tropics of both hemispheres; species abou'Musq.

- Leaves simple. ''\*
- Flowers J-2 in the axils of the leaves .....  $der^1$ . *T. \* tuts.*
- Leaves compound (sometimes a few casually simple in *T. tinctor.n-* and *T. coccinea*). Flowers in elongated racemes. Pod slightly pilose or silky. Style bearded throughout.
- Leaflets 7-13, elliptic-oblong ..... •  $2-T$  *tinctoria.*
- Leaflets 5, obovate.....  $3-T$  *coccinea.*
- Style not bearded throughout.
- Leaflets 11-21 ..... N  $4-$  *T.purpurea.*
- Leaflets 5-9 ..... A, 5. *T. AppoUinea.*
- Pod densely hairy ..... «  $6-T$  *villosa.*
- Flowers 1-2 in the axils of the leaves. »-S
- Pod much recurved ..... 7. *T. senticosa.*
- Pod nearly straight .....  $\wedge$   $i^*$  *T. pauciflora.*

1. **Tephrosia tenuis**, Wall. Cat. (1828)  $\backslash^{JS(j^{\wedge}e)}_y$  \nnual; steins slender, terete, densely caespitose, reaching 1 ft.  $\backslash o \backslash :^{\circ}Hg$ ;  $\wedge$ ches filitorin, and as well as the stems more or less clothed witli $c$  ely appressed hairs. Leaves simple, 1-1 $\wedge$ - by  $fV^{\wedge}A$   $\wedge^{n-}$   $nnear^{\wedge}$  suddenly, or gradually narrowed at the apex, long-apiculate, slightly hairy above, silky beneath, narrowed at the base; midrib prominent on the under surface; nerves obscure; petioles  $y^{\wedge}$ - $yV$  in. long; stipules  $yV \sim i$   $\wedge^{n-}$   $l^{onf?}$   $su$ bulate. Flowers solitary or 2 together in the axils of the leaves;  $pedr^{\wedge 3}$   $\backslash - \backslash$  in. long, filiform. Calyx  $y^1 \wedge$  in. long, silky; teeth lanceolate $\wedge$ bulate. Corolla A in. long, at first bluish, afterwards turning yellow (*Ritchie*);

standard long-clawed, pubescent at the back. Pods 1 by  $\pm$   $\frac{1}{2}$  in., thinly clothed with appressed hairs. Seeds 6-10. *El. B. I. v. 2, p. III; Dalz. & Gibs. p. 61; Aitch. Ph. & Sind Pl. p. 42; Woodr. in Joura. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 4, p. 15. *Macronyx strigosus*, Dalz. in Hook. Kew Journ. v. 2 (1850) p. 35.*—Flowers: Sept.-Oct.

Tolerably common. KONKAN: *Stocks*], *Dahelll*, *Capt. Gchurne*], *Woodrow*. DECCAN: Poona, along the railway line near the Bamburda crossing, abundant, *CooJce* ! S. M. COUNTRY : "Belgaum hills, *Ritchie*, 134 ! SIND : *Stocks*!; Jemadar ka Landa near Karachi, *Stocks*, 1185!—DISTRIB. India (Panjab, Birma); Laccadive.s.

The twigs are used by natives for cleaning the teeth (*Murray*). See Watt, Diet. Econ. Prod. I.e.

## 2. *Tephrosia tinctoria*, Pers. *Syn. PI v. 2 (1807) p. 329.*

A perennial undershrub 1-3 ft. high; stems and branches more or less angled, densely velvety with yellowish-brown  $\frac{1}{2}$  in. long stipules. Leaves subcoriaceous, very variable, 1-4 in. long; petioles sessile; stipules small, triangular, acuminate, hairy. Leaflets usually 7-13 (sometimes reduced to the terminal one), decreasing, in sixes towards the base of the leaf (the terminal leaflet much larger than the others and varying from 1-3 by  $\frac{1}{2}$  in.), elliptic-oblong, usually mucronate, glabrous above, more or less densely silvery-silky beneath; lateral nerves numerous, slender, conspicuous on the under surface; petiolules of lateral leaflets  $\frac{1}{2}$  in. long. Flowers in short erect densely fulvous-silky racemes; peduncles usually longer than the leaves; pedicel densely silky; bracts lanceolate, very hairy. Calyx  $\frac{1}{2}$  in. long. Petals longer than the tube, subulate from a triangular base. Corolla bright pink, about twice as long as the calyx; standard long, broadly obovate, silky-hairy on the back, the claw cuneate; keel glabrous. Style flattened, bearded throughout its entire length. Pods 2-2 $\frac{1}{2}$  by  $\frac{1}{2}$  in. linear, flattened, mucronate, slightly curved upwards at the apex, more or less clothed with soft silky hair. Seeds 8-12, distant,  $\frac{1}{2}$  in. long, ellipsoid, compressed, smooth, dark brown. *El. B. I. v. 2, p. III; Wight, Icon. t. 388; Trim. El. Ceyl. v. 2, p. 31; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 4, p. 15.*—Flowers: Oct. *VEHN. Ml; GvM,*

KONKAN : widefly-, *Woodrow*; near Poladpur, *Woodrow*! DECCAN : below Maha-bleshwar, *Cooke* ! KANARA : Yellapur, *Talbot*!—DISTRIB. India (W. Peninsula); Ceylon.

A blue dye similar to Indigo sometimes extracted from this plant in Mysore. See Watt, Diet. Econ. Prod. 1. c. and v. 4, pp. 410, 412, 451.

VAR. *intermedia*, Baker, in Hook. f. *PI. B. I. v. 2, p. 112.* Branches velvety. Leaflets 9-13, much smaller than the type, 4-5 in. broad, the terminal leaflets about equalling the lateral ones in size; nerves less prominent. Racemes not so close as in the type. *Trim. El. Ceyl. v. 2, p. 31.* *T. intermedia* (sp.), Grab, in Wall. *Cat. 5G32.*

KONKAN : Miradonger near Pen, *Stocks*!

## 3. *Tephrosia coccinea*, Wall. *Cat. (1828) 5633.* An erect branched shrub 2-3 ft. high; branches terete, flexuous, closely argenteo-canescens with soft appressed hairs. Leaves somewhat membranous, nearly sessile, 2-3 in. long; stipules scarious, lanceolate, acute, nerved,

persistent. Leaflets usually 5, opposite or casually alternate, gradually decreasing in size downwards (the terminal leaflet 1½ by 1 in.), all obovate, cuneate, rounded and mucronate at the apex, quite glabrous above, clothed with appressed silvery hairs beneath, base acute; lateral nerves very numerous, close, slender, conspicuous; petiolules of the lateral leaflets ½ in., those of the terminal ½ in. long. Flowers in erect lax racemes; peduncles much longer than the leaves, silvery-hairy; pedicels short, hairy; bracts scarious, lanceolate, very acute. Calyx ½ in. long, hairy outside; teeth subulate from a triangular base, longer than the tube. Corolla thrice as long as the calyx, bright red, handsome; standard suborbicular, hairy on the back. Style flattened, bearded throughout its entire length. Pods 2½ by 1 in., linear, flattened, mucronate, slightly curved upwards at the apex, more or less silky-hairy. Seeds 8-12. Wall. Pl. As. Ear. t. 60. *T. thictoria*, var. *coccinea*, Baker, in Hook. f. Fl. B. I. v. 2, p. 112.—Flowers: Oct.

I have adopted Dr. Prain's suggestion, founded on a recent examination of a large number of specimens (Journ. As. Soc. Beng. v. 66 (1898) p. 365), as to the propriety of recognizing this as a distinct species instead of a variety of *T. tinctoria*.

KONKAN: road from Poladpur to Maliableshwar, *Woodrow!*; Neral, *Woodrow!*—DISTRIB. India (W. Peninsula and Birtua).

4. **Tephrosia purpurea**, Pers. Syn. Pl. v. 2 (1807) p. 329. A copiously branched herbaceous perennial 1-2 ft. high; branches spreading, glabrous or sparsely pilose. Leaves 2-4 in. long; petioles 2 in. long; stipules linear-subulate, nerved, erect or sometimes reflexed. Leaflets 11-21, oblanceolate, obtuse or retuse, mucronate, ½ by 1 in. long; glabrous above, clothed with fine appressed silky hairs beneath, base cuneate; nerves close, ascending, slender, conspicuous on both surfaces; petiolules of lateral leaflets ¼-½ in. long, those of the terminal ½ in. long. Flowers in leaf-opposed lax racemes 3-5 in. long, the lower flowers of the racemes fascicled; pedicels slender; bracts subulate. Calyx ½ in. long, thinly silky; teeth triangular-subulate, as long as the tube. Corolla twice as long as the calyx; standard pubescent on the back. Style flattened, glabrescent; stigma penicillate. Pods 1½ in. long, linear, slightly curved, mucronate, at first thinly hairy, finally glabrescent. Seeds 5-6. Fl. B. I. v. 2, p. 112; Grab. Cat. p. 47; Dalz. & Gibs. p. 61; Trim. Fl. Oeyl. v. 2, p. 31; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 4, p. 14.—Flowers: Ocfc.-Jan. YEEN. *Unlidli*; *SarpunJcd*.

KONKAN: *Stocks I* DECCAN: Ahmednagar, *Cooke!* GUJARAT: Chandod, *Woodrow*; Barotla, *Woodrow!*; Deesa, *Graham* (abundant). S. M. COUNTRY: Badami, *Cooke!*; Kuput hills, *Talbot!*

The odor of the decaying plant is very offensive.

YAE. *pumila*, Baker, in Hook. f. Fl. B. I. v. 2, p. 113. Not more than 18 in. high, more diffuse, persistently finely downy, sometimes canescent. Stipules lanceolate, deflexed or not. Leaflets 9-15, smaller, densely hairy beneath. Racemes densely hairy; flowers smaller. Pods 1½ in. long, finely downy, curved. Seeds 8-10. *Tephrosia pumila*, Pers. (*sp.*) I.e. p. 330. *T. diffuse* Wight & Arn. (*sp.*) Prodr. p. 213.

GUJABAT: Ankleswar near Broach, *Bahell!* S. M. COUNTRY: Belgaum, *Ritchie!*

5. **Tephrosia Apollinea**, *Link, Enum. TTort. Berol.* v. 2 (1822) p. 252. Suffruticose, 12-18 in. high, diffusely branched from the base; branches glabrous or sparsely hairy. Leaves 1f-21 in. long; petioles <sup>a</sup>-4 in. long; stipules \-| in. long, linear-subulate, deflexed or spreading, rigid, conspicuous. Leaflets 5-r9, oblong or oblanceolate, |-11 by \-| in., emarginate, mucronate, glabrous above, more or less silky beneath. Flowers in leaf-opposed lax 6-12-flowered racemes longer than the leaves; pedicels £ in. long; bracts rigid, subulate. Calyx \ in. long, silky; teeth triangular, acute, equalling the tube. Corolla violet, about twice as long as the tube. Standard downy on the back. Style glabrous; stigma penicillate. Pods 1^11 in. long, curved upwards, mucronate, appressedly thinly hairy. Seeds 0-9. Not in Fl. B. I.; Baker, in Fl. Trop. Afr. v. 2, p. 124; Aitch. Pb. & Sind PL p. 42; Boiss. FL Orient, v. 2, p. 192.

A very rare plant in the Bombay Presidency. SIND: *Stocks* ex *Aitchison* 1. c. and fide *Baker*, in Fl. Trop. Afr. 1. c. I have seen no specimens. The plant has been included on the authority of *Aitchison*.—DISTKIB. Beluchietan, Aden, Nubia, Abyssinia, Egypt.

6. **Tephrosia villosa**, *Pers. Syn. PI* v. 2 (1807) p. 329. Perennial; branches numerous, spreading, clothed with white appressed hairs. Leaves nearly sessile, 2-3 in. long; stipules linear-lanceolate, acute, sometimes reaching § in. long, deflexed or spreading (rarely ascending). Leaflets 11-19, grey-green, ^-^ by yV~j» narrowly oblanceolate, usually emarginate and mucronate, nearly glabrous above, silky beneath, base cuneate; petiolules of lateral leaflets j<sup>1</sup> in., those of the terminal g in. long. Flowers large, few, in lax elongate racemes 6 in. or more in length, the lower flowers in distant fascicles, the lowest often in the axils of the leaves; pedicels very short; bracts linear-subulate, plumose. Calyx -^ in. long, hairy outside; teeth thrice as long as the tube, linear-subulate, densely hairy. Corolla red; standard equalling the calyx, suborbicular, silky on the back. Style flattened, glabrous; stigma penicillate. Pods 1-1^ in. long by -g—^ in. broad, persistently velvety with dense spreading fulvous hairs, very shortly mucronate, falcately curved upwards. Seeds 0-8. FL B. I. v. 2, p. 113; Trim. Fl. Ceyl. v. 2, p. 33; Woodr. Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 4, p. 15.—Flowers: July-Sept.

GUJARAT: Godra, *Cooke* ! S. M. COUNTRY: Badami, *Woodrow*; abundant in the compound of the Engineer's bungalow, *Coo/cel*—DISTKIB. Throughout the plains of India; Mauritius^ Tropical Africa.

VAR. *incana*, *Baker*, in Hook. f. FL B. I. v. 2, p. 113. Steins clothed with short spreading pubescence. Leaflets somewhat broader, sometimes reaching | in. broad. Pods more densely velvety and somewhat broader than in the type. *Tephrosia incana*, *Grah.* in Wall Cat. 5644 (*sp.*); *Wight & Arn. Prodr.* p. 212; *Grab. Cat.* p. 47.

S. M. COUNTRY: Padshapur jungles (near Belgaum), *Ritchie*, 11G7 ! GUJARAT: *Law i-x Graham*.

7. **Tephrosia senticosa**, *Pers. Syn. PI* v. 2 (1807) p. 330. A low much-branched shrub; branches divaricate, slender, terete, argenteo-eanescent. Leaves 1-11 in. long; petioles T^i in. long; stipules ^ in. long, subulate, hairy. Leaflets 1-1 L by ±-£v in., light-green and glabrous

above, argenteo-canescens with appressed hairs beneath, oblanceolate, deeply emarginate, cuneate at the base; petiolules of lateral leaflets  $\frac{1}{2}$  to  $\frac{3}{4}$  those of the terminal  $\frac{1}{2}$  in. long. Flowers usually 1-2, in the axils of the leaves; pedicels  $\frac{1}{2}$  in. long, silky-hairy. Calyx silky outside,  $\frac{1}{2}$  in. long; teeth subulate from a triangular base, a little longer than the tube. Corolla a little more than twice as long as the calyx; standard orbicular, densely hairy on the back. Ovary densely hairy; style much flattened, not bearded throughout its entire length. Pods 1-2 by  $\frac{1}{2}$  in., linear, flattened, much curved upwards, densely hairy, apiculate, the sutures not much thickened. Seeds 6-8, oblong-ellipsoid,  $\frac{1}{2}$  in. long, smooth. PL B. I. v. 2, p. 112; Dalz. & Gibs, p. 61; Trim. El. Ceyl. v. 2, p. 30; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.—Flowers: Sept.-Oct.

KONKAN: Dalzell cf Gibson. DECCAN: Wadi, Cooke!, Jeur (Sholapur districts), Woodrow.—DISTRIB. India (W. Peninsula and Birina); Ceylon.

**8. Tephrosia pauciflora**, *Grah. in Wall. Cat.* (1828) 5635. Herbaceous; stems densely caespitose, 9-20 in. long, terete, slender, clothed with spreading hairs. Leaves 2-4 in. long; petioles  $\frac{1}{2}$  in. long; stipules lanceolate-subulate. Leaflets 5-9, lanceolate-oblong or narrowly oblanceolate, rounded or sometimes subacute at the apex, often emarginate, usually apiculate,  $\frac{1}{2}$  by  $\frac{1}{2}$  in., glabrous or nearly so above, finely silky with appressed hairs beneath; petiolules of lateral leaflets  $\frac{1}{2}$  in., those of the terminal  $\frac{1}{2}$  in. long. Flowers gemmate in the leaf-axils; pedicels short. Calyx  $\frac{1}{2}$  in. long, silky with spreading hairs; teeth about equalling the tube, subulate from a triangular base. Corolla less than twice as long as the calyx; standard  $\frac{1}{2}$  in. long, sub-orbicular, densely silky on the back. Style flattened, glabrous; stigma penicillate. Pods 1-11 in. long, by  $\frac{1}{2}$  in. broad, linear, very shortly mucronate, very slightly curved, thinly silky. Seeds 6-9. \*F1. B. I. v. 2, p. 114; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.

A rare plant in the Bombay Presidency. SIND: Stocks!, Dalzell!, Puran!; Jemadar ka Landa near Karachi, Stocks, 454!—DISTRIB. India (Panjab, "Jirma"); Afghanistan.

*Tephrosia Candida*, DC. Prodr. v. 2, p. 249, a native of the Himalayas, W. Indo-China, and the Malay Archipelago, is occasionally planted in gardens. Its flowers are white or rose-colored, about 1 in. long, showy. Fl. B. I. v. 2, p. 111; Grab. Cat. p. 47; Dalz. & Gibs. Suppl. p. 25.

According to Dr. Lush (Grah. Cat. 1. c.) the plant was introduced into the botanical garden at Dapuri from Bengal.

### 1G. **SESBANIA** \*, Scop. Introd. (1777) p. 80S.

Herbs or soft-wooded trees or shrubs. Leaves abruptly pinnate; leaflets numerous, linear-oblong, obtuse, quite entire, mucronate, deciduous. Flowers in axillary lax racemes. Calyx campanulate or shallowly 2-lipped or 5-toothed. Corolla much exerted; petals  $\frac{1}{2}$  in. long claws; standard orbicular or ovate, spreading or reflexed. Keel falcate-oblong; keel obtuse and straight, or subrostrate and curved. Stamens diadelphous; anthers uniform. Ovary usually stalked, many-

\* The oldest name of the genus was "*Sesban*," which was given to it by Adanson in 1763 (Fam. v. 2, p. 327) and which was simply the Egyptian name of *S. cegyphica*.

The name *Sesbania* has, however, been universally adopted.

ovulate; style incurved, glabrous; stigma small, capitate. Pod very long and narrow, dehiscent, septate transversely between the seeds. Seeds numerous, oblong or subquadrate.—DIBTEIB. Throughout the Tropics ; species about 40.

Pod 6-10 in. long.

Unarmed ; pod twisted, torulose ..... 1. *S. agyphaca*.

Armed ; pod not twisted, not torulose ..... 2. *S. aculeata*.

Pod 2-3 in. long ..... 3. *S. procumbens*.

1. ***Sesbania segyptiaca***, *Pair. Encyc. v. 7 (1800) p. 128 (Seshan ftyyptiacus)*; *Pars. Syn. v. 2 (1807) p. 31G* ; var. ***picta***, *Prain, in Journ. As. Soc. Beng. v. GG (1808) p. 3G7*. A soft-wooded short-lived unarmed shrub 6-15 ft. high ; branches pale, terete or obscurely angled, striate, glabrous or nearly so. Leaves 2-4 in. long; petioles 1/2 in. long; stipules scarious, linear, acute, caducous. Leaflets 20-30, shortly petioled, 1/2 by 1/4 in., pale-green, linear-oblong, obtuse, faintly apiculate, glabrous. Flowers in lax slender pendulous 6-10-flowered racemes; buds straight; pedicels filiform, 1/4 in. long. Calyx 1/2 in. long, glabrous, membranous; teeth deltoid, much shorter than the tube. Corolla 1/2 in. long; standard as broad as long, mottled with purple on the outside, glabrous on the back, furnished at the base with 2 keel-like appendages which are free and falcate above, running down wing-like into the claw. Pods pendulous, 6-9 in. long, twisted, weak, slightly torulose, sharply beaked, the sutures not much thickened. Seeds 20-30. *S. picta* (sp.), *Pers. Syn. v. 2, p. 31G*. *S. aegyptiaca*, *El. B. I. v. 2, p. 114 in part (not of Pers.)*; *Grab. Cat. p. 47* ; *Dalz. & Gibs. Suppl. p. 21*; *Wight, Icon. t. 32* ; *Trim. Fl. Ceyl. v. 2, p. 34* ; *Talb. Trees, Bomb. p. 08* ; *Woodr. in Journ. Bomb. Nat. v. 11 (1807) p. 422* ; *Watt, Diet. Econ. Prod. v. 6, part 2, p. 543*. *Colutea exotica*, *Pluk. Phytogr. t. 164, f. 5*.—Flowers : Aug.-Dec. *VEIK. Sevari; Jayanti*.

*VAU. bicolor*, *Wight & Arn. Prodr. p. 214*. Standard maroon-colored or dark purple (not mottled) outside. *Prain, in Journ. As. Soc. Eng. 1. c.*

According to *Prain (l. c.)* the typical *S. segyptiaca* has uniformly yellow flowers and is a native of India. It does not, however, appear to occur in the Bombay Presidency either wild or cultivated. Both the above-named varieties are cultivated and more or less naturalized in Bombay. The wood is used to supply poles as substitutes for bamboos and furnishes excellent charcoal for gunpowder. The seeds and leaves are employed in native medicine, being considered a valuable remedy in cutaneous diseases. *Watt, Diet. Econ. Prod. 1. c.*—DISTRIB. Throughout the Tropics of the Old World.

2. ***Sesbania aculeata***, *Poir. Encyc. v. 7 (1806) p. 128 (Sesban ticalcatvs)* ; *Per\*. Syn. v. 2 (1807) p. 316*. A sparingly-branched annual or rapid growth, sometimes reaching 8 ft. or more in height; stems semiwoody ; branches and leaf-rachises more or less prickly. Leaves abruptly pinnate, sometimes reaching 1 ft. in length ; stipules membranous, acuminate, caducous. Leaflets 20-50 pairs, close, 1/2 by 1/4 in., linear-oblong, obtuse, strongly mucronate, glabrous, base acute ; petiolules very short. Flowers in lax axillary 3-6-flowered drooping racemes ; peduncles slender; pedicels 1/2 in. long, filiform. Calyx 1/2 in. long, membranous, glabrous; teeth deltoid, much shorter than the tube. Corolla 1/2 in. long, yellow, usually with red dots on the back of the

glabrous standard. Pods 6-9 in. long, not twisted, slightly falcate, beaked, not torulose. *El. B. I. v. 2, p. 114; Grab. Cat. p. 48; Dalz. & Gibs. p. 62; Trim. Fl. Ceyl. v. 2, p. 34; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 2, p. 542.*—*Elowers: Sept.-Oct. VEEN, liaia-sevari: Ghuncha.*

Very common in wet places throughout the Konkan and the Deccan.—*DISTRIB. Cosmopolitan in the Tropics of the Old World.*

3. **Sesbania procumbens**, *Wight Sf Am. Prodr. (1834) p. 215.* Annual, diffuse, more or less armed with inoffensive prickles; branches glabrous, subterete, striate. Leaves lg-2| in. long; petioles ^-| in. long; stipules ^ in. long, membranous, very acute from a triangular base. Leaflets 15-20 pairs, linear-oblong, \ by -^ in., obtuse, apiculate, glabrous, base rounded; petiolules about.^ in. long. Elowers in short 2-4-flowered racemes. Calyx ^"s m- 1<sup>ong</sup>> membranous, glabrous; teeth short, deltoid. Corolla |-^ in. long. Pods straight, erect, 2-3| in. long, not twisted, beaked, torulose. Seeds 12-20. *Fl. B. I. v. 2, p. 115; Grah. Cat. p. 48; Dalz. & Gibs. p. 62. JEschynomene pro-cumbens, Eoxb. El. Ind. v. 3, p. 337.*

Abundant in rice-fields in Bombay during the rains, *Dalzell & Gibson*; eaten by cattle, *Graham.*—*DISTRIB. India (W. Peninsula).*

*Sesbania grandiflora*, *Pers. Syn. v. 2 (1807) p. 316*, a soft-wooded tree reaching 20-30 ft. high, with large white or red flowers, is often grown about temples and villages, but is nowhere indigenous. Its flowers are 2-3 inches long and very showy. Pods often reach a foot long. *Fl. B. I. v. 2, p. 115; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422. Agati grandiflora, Desv. Journ. Bot. v. 1 (1813) p. 120; Grah. Cat, p. 48 f Dalz. & Gibs. Suppl. p. 22; Watt, Diet. Econ. Prod. v. 6, part 2, p. 544.*—*Elowers at various times. VEUN. Agastd; Hadgd.*

The tender leaves, flowers and pods are eaten. Certain parts of the tree repute in native medicine. See *Watt, Diet. Econ. Prod. 1. c.*

### 17. ASTRAGALUS, Linn.

Herbs or undershrubs. Leaves pinnate, the rhachis terminating either in a leaflet or a spine; stipules free or adnate to the petiole or united into one leaf-opposed one. Calyx tubular or companulate; teeth 5, subequal. Petals usually with rather long claws; standard erect, ovate-oblong or panduriform; wings oblong; keel equalling the wings or a little shorter, obtuse. Stamens diadelphous; anthers uniform. Ov'ary sessile or stalked, many-ovulate; style filiform, straight or incurved, not bearded; stigma small, terminal. Pod linear or oblong, usually turgid, continuous within or more or less completely longitudinally 2-celled from the introversion of the inferior suture. Seeds usually reniform.—*Chiefly throughout the N. temperate zone; species 1100-1200.*

Leaves imparipinnate.

Pod straight .....	1- ^- <i>prolixus.</i>
Pod contortuplicate .....	2. <i>A. contortuplicatm.</i>
Leaves abruptly pinnate.....	3. <i>A. Stocksii.</i>

1. **Astragalus prolixus**, *Sieb. Pl. sEgt/jpt. cccsicc. ex Bunge, Monogr. Astr. (1868-69) part 1, p. 0; part 2, p. 6.* Sterns csespitose, 3-12 in.



long, slender, terete, clothed with appressed white hairs. Leaves petioled, 1-1½ in. long, with a terminal leaflet; stipules lanceolate, hairy, free. Leaflets 11-21, elliptic-oblong, obtuse, ½-1 in. long, clothed on both sides with appressed white hairs, base rounded or subacute; petiolules very short. Flowers 6-12, sessile, in dense heads; peduncles axillary, ½-¾ in. long, appressedly hairy. Calyx  $\tau$ VTV<sup>in-</sup> 1<sup>on</sup>£» densely hairy; teeth linear-subulate, about as long as the tube. Corolla ½ in. long; standard orbicular, with a very long claw. Pods ½-¾ in. long, linear-oblong, membranous when ripe, straight, mucronate, turgid, densely silky-pubescent, nearly bilocular. Seeds 4-6, reniform, dark-brown. Fl.B. I. v. 2, p. 121; Aitch. Pb. & Sind PL p. 43; Bunge, Monogr. Astr. (1868-69) part 1, p. 9; part 2, p. 6.

A very rare plant. SIND: *Stocks* ex *Aitch.* 1. c.

I have seen no specimens from the Bombay Presidency.—DISTRIB. India (Panjab); Egypt, Arabia, Cape Verde Islands.

2. ***Astragalus contortuplicatus***, *Linn. Sp. PL* (1753) p. 758. Annual; stems numerous, 6-18 in. long, suberect or procumbent, obscurely angled, clothed with soft spreading white hairs. Leaves 2-4 in. long, imparipinnate, distinctly petioled; stipules large, broadly ovate, acute, free. Leaflets 13-17, oblanceolate, elliptic or oblong, 1-1½ in. long, densely pilose on both surfaces; petiolules short. Flowers numerous, in dense heads; peduncles axillary, much shorter than the leaves, clothed with long soft spreading hairs; bracts linear-subulate, plumose. Calyx ½-¾ in. long, densely pilose; teeth longer than the tube, linear-subulate, plumose, the 3 lower the longer. Corolla yellow, slightly exerted, deciduous; standard oblong, obcordate; wings narrow, much shorter than the standard; keel broader and longer than the wings. Pods 1 in. long, completely bilocular except at the apex, quite contortuplicate,

membranous, rugose, densely pilose. Seeds 20-30, reniform. Fl. B. I. v. 2, p. 122; Aitch. Pb. & Sind PL p. 43; Bunge, Monogr. Astr. part 1, p. 18; part 2, p. 20; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.

Bare. SIND: *Stocks*, 406!; Hyderabad, *Woodrow*.—DISTRIB. India (Panjab); E. Europe, Orient, W. Siberia.

3. ***Astragalus Stocksii***, *Bentli. ex Bunge, Monogr. Astr.* (1868-69) part 1, p. 6; part 2, p. 4. Shrubby, much-branched; branches elongate, hairy with appressed soft hairs, armed with yellow spreading spines (really the persistent rhachises of fallen leaflets), 1-1½ in. long. Leaves abruptly-pinnate, the rhachis ending in a spine, the leaves on the young shoots with a strong spiny fulvous persistent rhachis with a resting bud in its axil which develops in the second season, the leaflets deciduous, leaving scars on the spiny rhachis; leaves of the second season with slender rhachises-fascicled in the axils of the naked old ones, which then appear as spines; stipules minute, caducous. Leaflets 2-3 pairs, obovate, oblong or oblanceolate, 1-1½ by ½-¾ in., clothed with closely appressed niedifixed hairs, base usually acute; petiolules short. Flowers in lax short or elongate, 5-7-flowered racemes; bracts minute. Calyx shortly campanulate, 1-1½ in. long, hairy; teeth short, triangular. Corolla 1-1½ in. long; yellow; standard broadly obovate-oblong, retuse. Pods stalked, 1-1½ in. long, glabrous, completely bilocular, attenuated at both ends, sulcate and very convex on the dorsal, straight on the ventral side.

See Seeds 2-5. Kot in Fl. B. I. • Boiss. Fl. Orient, v. 2, p. 492 ;  
Woodr. in Journ. Bomb. IS<sup>r</sup>at. v. 11 (1897) p. 422.

SIHD : KirUinr mountains, James]

The plant had not hitherto been reported from Sind, though very common in  
bi Th i fd h Kil ti P

**Beluobistan.** The specimens found on the Kirtliar mountains were sent to Poom  
by Mr. James, Chief Cum missioned in Sind.—**DISTBIB.** Beluchietan, **Afghanistan,**

18. TAVERNIERA, DC.

uch-branched undershrubs. Leaves few, 1- or pinnafcely 3-foliolate  
; stipules scarious ; leaflets usually obovate or orbicular,  
**exstipellate,** Flowers rosy or white, in axillary lax racemes. Calyx-teeth  
suhqmil or the 2 upper more remote. Corolla mueb-exserted; standard  
broadly obovate, narrowed at the base, scarcely clawed ; wings small; keel  
about **equal** to the standard, obliquely truncate at the apex. Stamens  
mona-delphous; anthers uniform. Ovary stalked ; ovules usually 2;  
style filiform, inflexed; stigma small, terminal. Pod of 1-3 flattened  
indehis-cent densely muricated joints. Seeds reniform.—**DISTRIB.**  
India and the Orient; species 6-8.

1. **Taverniera nuxnmlaria, DC. Mem. Jgum.** (1825) p. 340, t. 52.  
A much-branched under shrub, 1-2 ft. **high** ; branches twiggy, terete,  
minutely velvety-can esent. Leaves 1-foliolate; stipules scarious,  
triangular, acute, free, united into one deciduous one which is opposite  
the leaf. Leaflets very variable in size, |1 in. across, orbicular or  
obovate, thick, glaucous, **raueronulate, much** longer than the petioiules:  
**petiolulea** ■-^i hi. long. Flowers in axillary lax 2-0-flowered racemes  
longer **thar the leaves.** Calyx /■ in. long, **finely pubescent;** teeth  
triangular, v<sup>iA</sup> a about equalling the tube, **the 2 upper larger and more**  
remote f\*i, 3 lower. **Corolla red, fern, loug;**  
\*>A-2\*, "»

longer than the keel, glaberrima, veined with dark pl...  
emarginate. Pods with 1-2 one-seeded joints; joints o<sup>ut</sup> Branch<sup>versely</sup>  
and subreticulately rugose and echinate. Fl. B. I. v<sup>adrow!</sup>; 20; Boiss.  
Fl. Orient. v. 2, p. 508; Aitch. Pb. & Sind Pl. p. 44 Prov.odr. in Journ.  
Bomb. Nat. v. 11 (1897) p. 422; Watt, Dict. Econ. Prod. v. 6, part 3,  
p. 414. *T. cuneifolia*, Arn. in Wight, Icon. t. 1055; Dalz. & Gibs. p. 67.  
*Hedysarum Gibsonii*, Grah. Cat. Bo. Pl. p. 49.—Flowers: Dec. VERN.  
*Jethmad.*

DECCAN: waste places, Dalzell & Gibson; Chattersinghi hill near Poona, Ranade! ;  
Nasik, Bhiva!; S. Deccan, Cleghorn ex Prain. GUJARAT: near Ge in Kathiawar  
(plentiful), Dalzell & Gibson. SIND: Stocks ex Aitchison.—DISTRIB: ia (Panjab);  
Afghanistan, Orient.  
The root is sweet, hence the Maratba name, which is also the nam orice.

19. GEISSASPIS, Wight & Am.

Slender dBase herbs. Leaves abruptly-pinnate;  
sri educed below\_the insertion. U£\*  
"fe.<sup>1</sup>

ers very smaUUjto\*W



**irter** than the standard. **Stamens mbnadelphous**; anthers uniform. Ovary shortly stipitate; ovules 2; **style** incurved; **stigma minute**, terminal. Pods **with 1-2** joints; joints turgid in **the** middle with a flat border, **reticulately** veined, 1-seeded, indehiscent.—DISIHB. India, Tropical Africa ; species about 5.

Flowers not more than one-third as long as **the long\***! ..... 1. *G. eristata*.  
Flowers nearly or quite a\* **long as the** short-brisUud bracts ..... 2. (\*). *tenella*.

**1. Geissaspis cristata, Wight \$ Am. Prodr. (1834) p. 218.** A **pro**  
**ven** t trailing annual, **with** densely **effispitose** terete glabrous stems £-  
2 ft. long. Leaves abruptly-pinnate; **petiol** | in. long; stipules  
searioua, lanceolate, -^ in. long, continued below i^!. rtion, spurred  
at the base, strongly nerved, eijiate. **Leaflets L obovate**, |-| by |~£ in.,  
**slightly** oblique, obtu.se, glabrous **on both** surfaces, narrowed at the base ;  
i-ves prominent beneath; peiolules **very** short. Heads of" flowers  
dense, 1 in. or more long; **peduncles axillary**; pedicels short, slender,  
curved; bracts **reniform, reaching -h in.** or **even** more in breadth,  
much imbricate, reticulatch **veined**, ciliate with stiff yellow bristles  
TV~TV ^n\* l^on' eaoQ braet about 3 times as long the single flower  
it **encloses**. Calyx membranous, glabrous, -^ in. long ; **lobea** lanceolate,  
acute. Corolla **tin. long**; standard broadly o';. glabrous, veined.  
**Pods 1-** (rarely 2-) **jointed**; joints about i in. long, **reticulately** veined,  
nearly straight on the **jipper**, much rounded (sometimes almost  
serai-circular) **on** the lower side, long-beaked and with a flat margin,  
glabrous. Seed 1 in each joint., chestnut-brown when ripe. PI. B. I. v, 2,  
p. 141; Dal/. & Crips, p. G2 ; Taubert, in **EngL & Prantl**, PflanzenP. v. 3,  
part 3, §2, **fig. 45**, is; Woodl\ in Journ. Bomb. **Nit.** v. 11 (1897) p.  
422.— Oct. V-ElfN-. *Barhi*.

js

W

**1., Si during t>9 rains**, tolerably common. **KOSKAS** : *Stocks!*, *Law I, T)alzell*  
"I iV. lala\*1 (-'^-■ ■''■ ■ "-.VVTHV: Belgauin. *Ritchie*, 181! **KAHABA**: Kaia  
\*>• 10 J p^^—DWTWB. India (W. PtatMttlaPiio»1 j Ulihr-.,

Z\ UeV, .^e, Orici. tenel:\*a, *Benth. in Flora*, v. 32 n D^>59. A  
weak **railing** ml 3-12 in, long; stems U  
**branches^ nft^** root slender, **terete**. Leaves **abruptl>-pinnate** ;  
**petiolesj ■ LTn ISSff**;

I^ 7 ' rf^> **Ari** !!!-> all **starting** almost from the **same**  
point, somewhat **oblique**; obovate, rounded o? truncate at the anex  
glabrous on but), surfaces, **base cuneate**; **aervea pr^minTnt beneaS'**  
**Flowers**; in copicms axillary race.n.s ; **bracta obliqu** I t  
"t

middle. Seed 1 in each **joiSt**, dark-brown when ripf. Fl B I v  
O  
p. 141.—Flowers : Oct. V»wr. *LaMn-barkl*

**20. ALHAGI**, Tourn. ex Adans. *Fam. v. 2 (1763) p 328*  
**Much.branched** rigid shrubs **armed with** axillary spines  
(abort

branches or peduncles). Leaves simple, quite entire<sup>^</sup>Sly  
^

stipules small. Flowers red, usually few, in axillary racemes. Calyx campanulate; teeth short, subequal. Corolla exserted; standard obovate, with a short claw; wings falcate-oblong, free; keel incurved, obtuse, about equalling the standard, and the wings. Stamens diadelphous; anthers uniform. Ovary stalked; ovules many; style filiform, incurved, glabrous; stigma small, terminal. Pod linear, jointed, somewhat thick, subterete or compressed, smooth, indehiscent, usually contracted between the seeds; joints not separating. Seed reniform.—DISTRIB. From Greece and Egypt to Soongaria and the Himalayas; species 3.

1. **Alhagi camelorum**, *Fisch. Ind. Hort GorenJc.* ed. 2 (1812) p. . A low erect shrub, armed with copious hard sharp spines reaching sometimes 1½ in. long; branches terete, striate, glabrous or nearly so. Leaves simple, coriaceous, 1-2 by ½-1 in., obovate-oblong, obtuse, apiculate, glabrous or puberulous, base cuneate; petioles very short; stipules minute, subulate. Flowers 5-8 on a spine; pedicels short, slender. Calyx glabrous, ½ in. long; teeth short, triangular. Corolla a little more than twice as long as the calyx; standard 3 in. long by 4- in. broad, obovate-oblong, auricled at the base above the claw, glabrous. Ovary glabrous. Pods 1-1½ in. long, usually falcate, more or less contracted between the seeds, glabrous. Seeds blackish-brown, smooth, polished. Bois\*s. El. Orient, v. 2, p. 559; Prain, in Journ. As. Soc. Beng. v. 66 (189S) p. 377. *Alhagi Maurorum*, Baker, in Hook. Pl. B. I. v. 2, p. 145 (*viv* Tournef.); G-rah. Cat. p. 50; Dalz. & Gibs. p. 67; Talb. Tree?, Bomb. p. 68; Woodr. in Journ. Bomb. J\^Tat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 1, p. 164.—Flowers: Mar. VERN". *Javctsa*.

I have followed Prain (*I. e.*) in naming the Indian spe^'. .> m'\

a

glabrous ovary *A. camelorum*, as distinct r ' *Mmrron..^8. yj^r*,  
a silky one. /irom 'l • A^m' willch nas

GUJARAT: common, *Graham* \*\*\_?\*' /  
S M COUNTRY\* *Graha*-\*\* ^ran *DalzM* cj *Crwson*; abundant about Broach, *Cook3 I*  
*Straciani*-seh~\*T'-•"i Lawi SIND: *Cooke*]-> *VicaryU* *Woodrowl*; Ilydembad, E""^  
-S.^'^ *KanitkarI*—DISTRIB. India (N. & N.W. Prov.); Belucliistan,  
j^ijji, AraSia.

• -xhe *camel-thorn* or *Persian manna*. plant. The freshly-cut plaits are used largely in Gujarat for making *tatties* in the hot season. The plant comes into leaf in the hot season and is n?ed as a fodder for camels; hence its name. Soir ^arts supply medicine which is considered valuable by the natives. See Wu>' 1. Prod. 1. c.

## 21. ZORNIA, Gmel. ;

Herbs. Leaves digitately 2-4-foliolate ; stipules subfoliaceous, often punctate. Leaflets usually dotted, exstipellate. Flowers in lax racemes; peduncles terminal and axillary ; bracts twin, lateral, nerved, of the same form as the stipules but larger and broader, each pair enclosing a sessile flower. " Calyx small, membranous; the 2 upper teeth connate. Corolla much exserted; standard suborbicular, clawed ; wings obliquely obovate or oblong ; keel incurved, subrostrate. Stamens inoadelphous ; anthers dimorphous. Ovary sessile ; ovules many; style filiform; stigma small, terminal. Pod jointed, compressed, the upper suture nearly straight, the lower deeply sinuate ; joints easily separable, smooth or echinate, indehiscent, flattened, 1-seeded.—DISTBTB. Species 10, all but 2 American.

1. **Zornia diphylla**, Pers. Syn. Pl. v. 2 (1807) p. 318, Annual, much-branched, 8-15 in.; branches prostrate or ascending, glabrous or puberulous. Leaves 2-foliolate ; petioles 1-2 in. long; stipules 1/2 in. long, lanceolate, acute, strongly nerved, produced below the insertion into a triangular spur. Leaflets variable in size and shape, 1-2 in. long by 1/2-1 in. wide, sessile, often unequal-sided, lanceolate, linear-lanceolate or occasionally linear, dotted with black glands beneath, glabrous, rigid. Flowers small, in 3-12-flowered spicate racemes 1-4 in. long ; peduncles slender, terete; bracts foliaceous, reaching 1/2 in. long, ovate-lanceolate, acute, ciliate, sprinkled with black dots, produced below the insertion into a triangular spur, strongly nerved from the base, completely enclosing the flower and often the entire pod. Calyx membranous, 1/2 in. long, the 2 upper teeth broad, obtuse, deeply connate, ciliate at the apex, the 2 lateral teeth smaller, deltoid, the lowest tooth the longest, lanceolate, acute, ciliate. Corolla twice as long as the calyx; standard orbicular, with a long claw.\* Pods 1-6-jointed, either quite enclosed by the bracts or exserted; joints about 1/2 in. long, compressed, indehiscent, covered with numerous, short straight fulvous spines. El. B. I. v. 2, p. 147; Benth. in Mart. PL Bras. v. 15, part 1, p. 80, t. 21-22; Taubert, in Engl. & Prantl, Pflanzenf. v. 3, part 3, p. 325, fig. 125, D (fruit); Trim. PL Ceyl. v. 2, p. 35; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 4, p. 374. *Zornia angusti-folia*, Sm.: Grah. Cat. p. 48 ; Dalz. & Gibs. p. 62.—Flowers : Aug.-Sept. VEEN. *Ldndgu*.

Tolerably common. DECCAN: Poona, Woodrow; Chattersinglii hill near Poona, *Ranacle* ! S. M. COUNTRY : Budami, Woodrow !

*Z. hirsuta* Bate- in Hook. f. PL B. I. v. 2, p. 148. Leaflets ovate. Pod 1/2 longer than 1/2 longer than in the type. Yar. *conjugata* Lam. El. Ceyl. v. 2, p. 7 *Zornia unensis* (sp.), Pers. Syn. PL v. 2 (1807) p. 318; Dalz. & Gibs., f. 12; Grab. Cat. p. 48 *Z. conjugata* (sp.), Sm. in Ees, OpWJ; d

## 22. STYLOSANTHES, Swartz.

Rigid undershrubs. Leaves pinnately 3-foliolate; stipules adnate to the base of the petiole. Leaflets exstipellate. Flowers small, in dense spikes or terminal heads. Calyx tubular ; tube filiform ; lobes membranous, the 4 upper\* connate, the lowest narrow, distinct. Petals inserted at the throat of the calyx-tube; standard orbicular; wings oblong, free ; keel incurved, obtuse, about equalling the standard. Stamens monadelphous; anthers dimorphous. Ovary sessile at the base of the calyx-tube ; ovules 2-3; style elongate, filiform, the lower part persistent ; stigma minute, terminal. Pod sessile, compressed, hooked at the apex with the persistent base of the style ; joints 1-2, reticulate or nerved. Seed compressed, ovate or lenticular.—DISTRIB. Cosmopolitan in the Tropics ; species about 15.

1. **Stylosanthes mucronata**, Willd. Sj>. PI v. 3 (1800) p. 1166. A much-branched dwarf woody perennial; branches stiff, wiry, ascending, more or less hairy. Leaves 3-foliolate ; petioles 1/2-1 in. long; stipules scarious, strongly nerved, adnate downwards to the petiole for half their length, terminating above in 2 spreading teeth... Leaflets elliptic-oblong,



f\~I ^y i^xV <sup>m</sup>-> *foe* terminal leaflet a little larger than the lateral ones, all acute and mucronate at the apex, glabrous above, silky-pubescent, strongly nerved and gland-dotted beneath, base subacute or rounded ; lateral leaflets subsessile, the terminal with a petiolule about y<sup>1</sup> in. long. Flowers small, 1 or few, sessile in the axils of leaf-like stipulate bracts and forming close terminal heads or spikes. Calyx *-fo* in. long, membranous, the upper connate lobes ciliate at the apex. Corolla twice the length of the calyx. Pods very short, concealed by the persistent bracts, tipped with the curved lower portion of the style; joints pubescent with raised veins. El. B. I. v. 2, p. 148; Trim. PI. Ceyl. v. 2, p. 36 ; Talb. Trees, Bomb. p. 69.

Common on the dry hills near Dharwar, ex *Taltot*.—DISTRIB. India (W. Peninsula) ; Ceylon, Cape, Tropical Africa, Malay Islands.

**28. SMITHIA, Ait.**

Herbs or undershrubs. Leaves impari- or abruptly-pinnate ; stipules scarious, persistent. Leaflets small, sensitive, often falcate, exstipellate. Flowers usually arranged in unilateral axillary racemes; bracts and bracteoles scarious or striate, persistent. Calyx deeply 2-lipped, the upper lip entire or emarginate, the lower entire, 3-toothed or 3-tid. Corolla exserted ; standard suborbicular, shortly clawed; wings obliquely oblong or subrostrate, about equalling the standard. Stamens in 2 bundles of 5 each ; anthers uniform. Ovary sessile or stalked ; ovules many ; style filiform, incurved ; stigma small, terminal. Pod of few or many flattened or turgid joints folded inside the calyx.—DISTRIB. Tropics of the Old World ; species 20-30.

- Calyx rigid; veins close, parallel, simple.
- Stems not bristly. Flowers yellow.
  - Flowers in short simple racemes ..... 1. *S. sensitiva*.
  - Flowers 1 or 2 in the axils of leaves which are crowded at the ends of tlK^j branches ..... 2. *8. confer(a*.
  - Flowers purnje^ ..... 3. *S. purpm-ea*.
  - Stems den^'y%r{%[j "||||'m ..... 7..... \*+•,-, ..... V... 4. *8. setidosa*.
- Calyx Membranous; veins distinctly anastomosing.
- Flowers in globose terminal heads.
  - Leaflets 9-15 pairs ..... i ..... \ 5. *S. capitata*.
  - Leaflets 3-4 pairs ..... ,6. 8. *pycnantlia*.
- Flowers in racemes.
  - Lower lip of calyx 3-lobed.
    - Leaflets 2 pairs ..... 7. *S. bigemina*.
    - Leaflets 3-4 pairs ..... 8. *8. blanda*,  
var. *racemosa*.
  - Lower lip of calyx entire.
    - Upper lip larger than the lower ..... 9. *S. hirsuta*.
    - Lower lip larger than the upper ..... 10. *8. salsuginea*.

**1. Smithia sensitiva, Ait. Hort. Kew.** \. Q .; p. 496. Annual, diffuse, much-branched ; stems 1-3 ft. long, slender, not bristly. Leaves abruptly-pinnate; rhachis £-1 in. long, bristly and ending in a long bristle; petioles short; stipules scarious, lanceolate, prolouged below the insertion into long cuspidate or lacerate auricles. Leaflets 3-10 pairs, |-| in. long, linear-oblong, obtuse, bristle-pointed, glabrous above and with strong bristles on the midrib and somewhat straight margins beneath, base rounded, somewhat unequal-sided. Elowers 2-6, in simple

racemes from the axils of the upper leaves ; peduncles *j* in. long, slender, ghbrous or with a few scattered bristles ; pedicels filiform, ascending ; bracteoles scarious, \— ^ in. long, ovate, acute, bristle-pointed. Calyx 3-3 in. long, with a few scattered bristles, rigid; veins close, parallel, simple; lips equal, entire, acute. Corolla yellow, £ in. long. Pods flattened; joints 4-6, orbicular, margined, densely papillose on the faces. Fl. B. I. v. 2, p. 148; Grab. Cat. p. 48; Dalz. & Gibs. p. 63 ; Trim. Fl. Ceyl. v. 2, p. 37 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422; Watt, Diet. Econ. Prod. v. 6, part 3, p. 255.— Flowers: Sept.-Oct. YERN. *Kavla*.

Common in Bombay towards the close of the rains, *Graham*. KONKAN : *Stocks!*, *Law* \ DECCAN: Khandala, *Cooke !*; Matberan, *Woodrow*. S. M. COUNTRY: Nagargali near Dharwar, *Cooke I*; Belgautn, *Cooke!*—DIST it in. Throughout India; An damans " and Nicobars, Tropical Africa, Madagascar, Java, China.

The leaves are used as a pot-herb, and cattle eat the plant greedily.

*YAn.flava*. General habit of *S. sensitiva* with stouter stems and larger flowers. *S. flava* (sp.), Dalz. MS. ex Prain, in Journ. As. Soc. Ben<\*. v. (W (1898) p.'378; *S. sensitiva*, var. *flare majore*, Herb. Ind. Or. Hook. f. & T. in Herb. Kew.

Except the slightly larger flowers (about \ in. long) there does not seem any distinctive character to separate this from the type, certainly none to raise it to the rank of a species.

KONKAN : *Stocks !*, *Law !* KANAKA : *Talbot ex Train 1. c.*

2. **Smithia conferta**, *Sm. in Bees, Cyclop*, v. 33 (1819) n. 2. Annual, 2-4 ft. high ; stems not bristly; branches long, virgate, straggling, smooth, with long internodes below. Leaves small, nearly sessile, abruptly-pinnate; rhachis \- \ in. long; stipules very large, scarious, lanceolate, acute, with very long acuminate or lacerate auricles. Leaflets eubsessile, 2-8 pairs, those of the stem-leaves 5-jj by.J in., those of the upper or floral leaves narrower, about *fa* in. broad, all linear-oblong, obtuse or subacute, densely bristly on the r\ ~ins and on the midrib beneath. Mowers, ?., >^\* T or 2, in the Y^^K" ^"W1VV?? leaves which »\*■\*.\* ^v . |\_dr1 p4-^ .i>solitaryuc/civ^, ^>V>.L axils or the iVp^LPF'

ure c\*w ^<<~ \*\*> Lii ends of the branches, so as to form a conge"\*J<sup>11</sup>- x, <sup>tC</sup> , pedicels very short, hairy ; bracteoles scarious, 1 in. long, elliptic-ou.' on^\* acute, with'a loijig bristle at the apex and a few long bristles at the back. Calyx -§--5 in. long, veins close, parallel; lips equal, oblong, acute, with a few long bristles at the apex and on the back. Corolla yellow, %—*fa* in. long. Pods 3-6-jointed ; joints small, turgid, papillose. Trim. Fl. Ceyl. v. 2, p. 37. *S. genuiflora*, Eoth, Nov. PL Sp. (1821) p. 352; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422. *S.-geminiflora*, var. *conferta*, Baker, in Hook. f. PL 33. I. v. 2, p. 149.—Flowers■ ■:" Nov.-Dec. The name *S. conferta* given by Smith is 2 years" prior to the name *S. (jeminiflora* ^iven by Eoth.

KOSKAN: *Stocks!*; Mahvan, *Woodrow*. S. M. COUNTRY : Belgaum, *Ritchie*, 1034! KANAKA: K<ila maddi, *Ritchie*, 1034!—DISTIUB. Throughout India; Ceylon, Java, JS<sup>T</sup>. Australia.

YAR. *geminiflora*. A somewhat more slender plant. JLeaves and calyx much less hairy. Flowers in the heads much fewer, often reduced to a single pair.

\*; *Stocks!*, *Capt. Gebunicl*

**3. *Smithia purpurea*, Hook. Bot. Mag. v. 73 (1847) t. 4283.**

Herbaceous, erect, branched, <sup>^</sup>2 ft. high ; stems and branches slender, not bristly. Leaves nearly sessile -, rhachis 1-2<sup>^</sup> in. long, slightly bristly, ending in a long bristle-point; stipules scarious, ovate-oblong, acute, prolonged below their insertion into acuminate or lacerate auricles. Leaflets 6-15 pairs, sessile, |-\$ in. long, elliptic-oblong, subacute, terminated by a very long bristle, glabrous above, with long bristles on the oblique midrib and the margins beneath, base rounded. Flowers 6-12, in copious secund racemes from the axils of the upper leaves; peduncles filiform, more or less bristly, ascending; pedicels filiform, drooping; bracteoles <sup>^</sup>J- in. long, ovate-oblong, subacute, parallel-veined, sometimes with a few bristles on the margin. Calyx 1 in. long, rigid, parallel-veined, glabrous; lips subequal, the upper obtuse, rounded, the lower acute. Corolla <sup>^</sup> in. long, p-<sup>^</sup>i- with a white spot at the base of the standard. Joints of pod i orbicular-oblong, about y<sup>1</sup><sup>^</sup> in. long, reticulato-venose, not papillose Fl. B. I. v. 2, p. 149 ; Dalz. & Gibs, p. 64; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.—Flowers \ Sept.-Dec. VERN. *Burkar*.

Not common. KONKAN : *Stocks I*; Thana, *Law I* DECCAN : Mahableshwar, *Cooke I*; Lanoli (plentiful), *Cooke!*, *Woodrow !*; Khandala, *Cooke !*—DISTRIB. Appears to be endemic in the Bombay Presidency.

**4. *Smithia setulosa*, Dalz. in Kew Journ. Bot. v 3 (1851) p. 208.**

Erect, dichotomously branched, 3-4 ft. high ; stems *i A* branches bristly with deflexed yellowish hairs. Leaves abruptly-pinnate ; rhachis 2-4 in. long, bristly, ending in a long bristle ; petioles |-| JJI. long; stipules scarious, striate, lanceolate, cuspidate, glabrous or with, a few long bristles near the apex, prolonged below their insertion into acuminate or lacerate auricles. Leaflets 4-7 pairs, subsessile, f-li by -J—\$- in., oblong, obtuse, terminated by a long bristle, somewhat unequal-sided, glabrous, ciliate. Flowers in dichotomously forked racemes forming a thyrsoid panicle, only the lowest subtended by a leaf ; peduncles terete, bristly; pedicels short, ascending; bracts -J- in. long, elliptic, subacute, striate. Calyx 1 in. long, rigid, parallel-veined, densely bristly ; upper lip obtuse, slightly recurved ; lower smaller, elliptic-lanceolate, acute. Corolla § in. long, bright yellow. Pods 10-12-jointed ; joints reticulato-venose, not papillose. Fl. B. I. v. 2, p. 149 ; Dalz. & Gibs. p. 63; Bedd. Icon, t. 243 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 432.—Flowers :  
 8ept.-)ee. }

KONKAN: *Stocks I*; W. Ghats, *Woodrow*; Mandangarh (Dapoli taluka), *Nairnc*. DECCAN : Mahableshwar (abundant), *Cooke!*, *Woodrow !* S. M. COUNTRY : Parva Ghat, *Dalzell!*; Belgauni districts, *Cooke !*—DISTRIB. India (W. Peninsula).

**5. *Smithia capitata*, Dalz. in Kew Journ. Bot, v. 3 (1851) p. 20& (not of Desv.).** Annual, 1-2 ft. high; stems and branches terete, not bristly. Leaves abruptly-pinnate ; rhachis bristly, 1-2 in. Jong, ending in a bristle; petioles short; stipules scarious, lanceolate, acute, prolonged below their insertion into acute or lacerate auricles. Leaflets subsessile, 9-15 pairs, <sup>^</sup>-f by g-f<sup>^</sup> in. long, linear-oblong, obtuse, bristly on the midrib beneath\* ciliate. Flowers in globose terminal (usually solitary) many-flowered heads; peduncles glabrous; pedicels very short; bracteoles membranous, oblanceolate, about | the length of the calyx, bristle-tipped. Calyx f in. long, membranous,

reticulately

veined ; lips orbicular, truncate, toothed, the teeth ending in stiff bristles. Corolla much exerted. Pods 5-7-jointed; joints neither venose nor papillose. Fl. B. I. v. 2, p. 150 ; Dalz. & Gibs. p. 63 (*not* Desv.); Bedd. Icon. t. 244; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.—Flowers : Sept.-Oct.

KONKAN: *LawU Stocks I* S. M. COUNTRY : Parva Ghat, *Dahelll*—DISTRIB. India (W. Peninsula).

**6. *Smithia pycnantha*, Benth. *ecc Baker, in Hook.f. Fl. B. I. v. 2* (187(>) p. 150. An erect annual £-2 ft. high ; stems and branches bristly with bulbous hairs. Leaves abruptly-pinnate; rhachis | in. long, bristly and bristle-pointed; stipules lanceolate, acute, very hairy, prolonged below their insertion into acuminate or lacerate auricles. Leaflets subsessile, 3-4 pairs, §-§ by ^-| in., linear-oblong, rounded at the apex, not or slightly bristle-pointed, glabrous .above, with a few scattered bristles on the midrib beneath, ciliate. Flowers in dense globose heads ..1 in. or more in diam., formed of congested racemes ; pedicels shorter tna^i the calyx, bristly; bracteoles oblong or oblanceolate-oblong, about half, as long as the calyx. 'Calyx \-| in. long, densely ciliate on the margins with yellow bristles rising from black glandular bases; lips subequal^the upper truncate or emarginate, the lower 3-lobed. Corolla twice as lb.ng as the calyx. Pods 5-9-jointed ; joints venose. Woodr.**

in Journ. Botoib. Nat. v. 11 (1897) p. 422.

Rare. KONKAN: *Stocks^Law I* KANAKA: *Woodrow*.—*DisTRiB.* Apparently endemic.

**7. *Smithia bigemina*, Dalz. in *Kew Journ. Bot. v. 3* (1851) p. 208. Annual, diffuse, 6-12 in. high ; Stems and branches very slender, bristly with yellowish hairs. Leaves abruptly-pinnate; rhachis \ in. long, hairy and bristle-pointed; petioles very short; stipules scarious, lanceolate-cuspidate, prolonged below their insertion into acuminate or lacerate auricles. Leaflets 2 pairs, subsessile, §-^ by TV~§ in., oblanceolate, cuneate, obtuse and bristle-pointed at the apex, glabrous above, more or less strigose beneath, ciliate. Flowers 2-8, in copious axillary racemes crowded towards the tops of the peduncles; peduncles glabrous, longer than the leave^ ; pedicels very short, hairy ; bracts beneath the raceme thinly membranous, oblong, bristle-pointed, glabrous ; bracteoles beneath the calyx scafiious, ovate-lanceolate, bristle-pointed and bristly along the midrib at the back, half as long as the calyx. Calyx ^ in. long, membranous, with dichotomously branched (not parallel) veins; lips equal, bristly outside, strongly bristle-ciliate on the margins, the upper lip truncate or slightly emarginate, the lower acutely 8-toothed, the middle tooth the longest. Corolla yellow, twice as loug as the calyx.**

Pods 6-8-join ted: joints tubercled. Fl. B. I. v. 2, p. 149 ; Dalz. & Gri'bs. p. 64 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 422.—Flowers . >Sept.-Dec. VERN. *Berlci*.

KONKAN : *Stocks!* DECCAN : Poona, *Woodrow* \; Mahableshwar, *Cooke* ! 8. M. COUNTRY : Parva Gh;it, *Dalzell!* SIND : *Stocks ex Prain*.—DISTRIB. India (W\*.

Peninsula).

**8. *Smithia blanda*, var. *racemosa*, Baker, in *Hook. f. Fl. B. 1.* v. 2 (1876) p. 1\*51.** Annual, erect, 1-1½ ft. high ; stems slender, bristly with spreading fulvous hairs. Leaves abruptly-pinnate ; rachis ½ in. long, bristly and bristle-pointed; stipules scarious, more or less

hairy, lanceolate, prolonged, below their insertion into acuminate or lacerate auricles. Leaflets subsessile, 3-4 pairs, §-| by *-fe-l* in., oblanceolate-oblong, rounded at the apex, not or minutely bristle-pointed, ciliate, glabrous above, glabrous or with a few scattered hairs beneath, the lowest pair of leaflets cuneate and nearly equal-sided, the others more or less inequilateral at the base. Flowers in capitate subsecund racemes ; peduncles 6-12-flowered, longer than the leaves, bristly ; pedicels short, hairy ; bracteoles ^ in. long, elliptic-oblong or oblanceolate-oblong, hairy, ciliate at the apex. Calyx -J- in. long., bristly and densely ciliate with yellowish hairs; veins branched, not parallel; upper lip slightly larger than the lower, truncate, retuse or emarginate, cuneate; lower lip 3-lobed, the mid-lobe acute and longer than the lateral ones. Corolla 3 in. long. Pods 4-7-jointed ; joints reticulato-venose. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *Smithia racemosa* (sp.), Heyne, in Wall.\* Cat. 5670 ; Dalz. & Gribs. p. 63.—Flowers : Sept.

KONKAN: *Law I, Dalzell!* S. Af. COUNTRY: Belgauin, *Stocks*, 315!, *Dalzell*. KANARA: *Dalzell I*; Sir si (N. Kanara), *Woodrow*.—DISTRIB. India (W. Peninsula).

0. ***Smithia hirsuta***, *Dalz. in Kew Journ. Bot.* v. 3 (1851) p. 135 (*not* of Baker). Annual, erect, 1-1^ ft. high, sparingly branched; stems and branches bristly with fulvous spreading hairs. Leaves abruptly-pinnate; rhachis bristly and ending in a bristle, |-| in. long; petioles g-| in. long; stipules scarious, lanceolate, slightly hairy on the back, prolonged below their insertion into acuminate or lacerate auricles. Leaflets subsessile, 3-4 pairs, |-f by yV~? ip., oblanceolate, cuneate, rounded and finely bristle-tipped at the apex, unequal-sided, ciliate on the margins and with a few hairs beneath. Flowers in somewhat capitate 4-10-flowered racemes; peduncles longer than the leaves, bristly ; pedicels short, hairy; bracteoles i in. long, somewhat oblique, oblong, acute and with a long bristle-point, glabrous. Calyx % in. long, bristly on the outside and strongly ciliate on the margins with fulvous hairs which spring from black bulbous bases ; upper^ lip much larger than the lower, g in. long by -fy in. broad, truncate and emarginate at the apex ; lower lip | in. long by -^ in. broad, obovate, cuneate, acute and bristle-pointed at the apex not lobed. Corolla g in. long, bright yellow ; standard large, orbicular. Pods 4-7-jointed ; joints reticulato-veuose. Dalz. & Gribs. p. 63. *Smithia humilis*, Benth. MS, in Herb. Ind. Or. H. f. & T. *Smithia blanda*, Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *S. blanda* var. *humilis*, Prain, in Journ. As. Soc. Beng. v. 66 (1898) p. 379.—Flowers : Sept.

As I think that this plant is entitled to rank as a separate species rather than as a variety of *S. blanda*, I have restored its status under the original name given to it by Dalzell. The lips of the calyx are very unequal and the bristles thereon spring from black bulbous glands, while the lower lip is *quite entire* and not 3-lobed, as it is in the case of *S. blanda*. Moreover, the flowers are much larger than they are in that plant. Dalzell (*Z. c.*) calls attention to the distinctive characters afforded by the calyx.

Dalzell says that the plant is very rare and has been found by him in one locality only, viz. Phunda Ghat near Kolhapur in the Deccan. I have found it abundantly on the road from Panchgani to Mahableshwar, and on the roadside, close to the half-way house, it iii-ed to form large brilliant patches of bright yellow.



**10. *Smithia salsuginea*, Hance, Journ. Bot. v. 7 (1869) p. 164.** An erect annual 1-1 j ft. high ; stems reddish-brown, slender, terete, glabrous or with very few scattered inconspicuous bristles ; branches few, very slender, terete. Leaves abruptly-pinnate ; rhachis  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, bristly and shortly bristle-pointed; petioles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long ; stipules oblong-lanceolate, acute, prolonged below their insertion into auricles which usually lie close to the stem or branch. Leaflets 2-4 pairs, oblanceolate-oblong, obtuse, not or rarely apiculate, glabrous on both sides with occasionally a few small bristles on the margins ; petiolules  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Flowers in dichotomously-branched lax few-flowered corymbose panicles ; peduncles slender ; pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, filiform ; bracts ovate-lanceolate ; bracteoles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, ovate-oblong or lanceolate-oblong, acute. Calyx closely reticulately veined, becoming enlarged in fruit, the upper lip somewhat more so than the lower; upper lip (*in flower*)  $\frac{1}{2}$  in., cuneate oblong, deeply 2-lobed at the apex, ciliate ; lower lip (*in flower*)  $\frac{1}{2}$  in. long by  $\frac{1}{2}$  in. broad at its widest part, broadly ovate, acute, mucronate, ciliate and with a few bristles on the back ; upper lip (*in fruit*)  $\frac{1}{2}$  in.; lower lip (*in fruit*)  $\frac{1}{2}$  in. Corolla yellow,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Pods 10-15-jointed; joints, orbicular, papillose. *Smithia dichotoma*, Dalz. MS. ex Baker, in Hook. f. El. B. T. v. 2, p. 150.

As pointed out by Pram (Journ. As. Soc. Beng. v. 66 [1898] p. 379), the name *S. sahuyiaea* was published by Hance in 1869, while the name *S. dichotoma*, though given to the plant by Dalzell many years previously, was not published till 1876. Hence the name *S. salsuginea* must necessarily be adopted.

Hance (*I. c.*) describes the leaves as odd-pinnate, which is evidently a slip. His specimen n. 1513, collected by Sampson in 1868, is in Herb. Kew.

Hare. KONKAN : *Mocks* \, *Law* \—DISTRIIB. China.

## 24. JESCHYNOMENE, Linn.

Herbs, undershrubs or shrubs, not twining. Leaves pinnate ; stipules setaceous or lanceolate. Leaflets numerous, small, entire, exstipellate. Flowers in axillary (rarely terminal) racemes ; bracts usually stipuli-form; bracteoles appressed to the calyx. Calyx 2-lipped ; lips entire or toothed. Corolla fugacious; standard orbicular, shortly clawed ; wings obliquely obovate or oblong, equalling the standard ; keel not beaked. Stamens in 2 bundles of 5 each ; anthers uniform. Ovary stalked, 2-oo-ovulate; style incurved, not bearded; stigma terminal. Pod stalked, jointed ; joints 4-10, flattened or turgid in the middle, 1-seeded, easily separable.—DISTRIB. Throughout the Tropics ; species about 30.

- |   |                       |
|---|-----------------------|
| Stems woody ; calyx glabrous ; joints of pod smooth.....      | 1. <i>M. indica</i> . |
| Stems pith-like; calyx hispid; joints of pod echinulate ..... | 2. <i>M. aspera</i> . |

1. ***Jeschynomene indica*, Linn, Sp. Pl. (1753) p. 713.** A much-branched annual undershrub 1-3 ft. high. Stem slender, scarcely  $\frac{1}{2}$  in. in diam. at the base, glabrous, pale-green ; branches twiggy, terete, glabrous. Leaves imparipinnate; rhachis  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, studded

with minute glandular excrescences almost amounting to prickles ;  
stipules

scarious, lanceolate, acuminate, prolonged below their insertion into acute auricles. Leaflets alternate, 21-71, subsessile, -rV4 by A-JU in., set obliquely on the rachis and overlapping, linear, obtuse, apiculate, glabrous, unequal-sided, thin, 1-nerved, the uppermost much the smallest. Flowers in 1-4-flowered axillary racemes; peduncles about 1 in. long, and as well as the pedicels, glandular, often viscid; pedicels T~S in. long, filiform; bracts foliaceous, bristle-toothed; bracteoles 8-IT™- long, linear-oblong, acute. Calyx \ in. long, thinly membranous, glabrous; upper lip bifid; lower lip minutely 3-toothed. Corolla | in. long, yellow; standard veined with purple. Pods 1-U by | in., slightly curved or nearly straight; upper sutures straight, the lower more or less indented; joints 6-10, readily separating, smooth or slightly papillose. PL B. I. v. 2, p. 151; Grah. Cat. p. 48; Dalz. & Gibs. p. 62; Trim. PL Ceyl. v. 2, p. 38; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423; Watt, Diet. Econ. Prod. v. 1, p. 126.—Flowew-1 Aug.-Dec.

KONKAN : *Stocks* !; hills near Matheran, *KanitJcar* ! DECCAN : Poona? «£Joni!, *Woodrow*!, *Kanitkar*!; Kolhapur, *Woodrow*. GUJARAT : common about Surat, *Dalzell* & *Gibso*?i.—Di\$TRiB. Throughout the Tropics of the Old World.

2. **JEschynomene aspera**, Linn. *Sp. Pl.* (1753) p. 713. An erect perennial shrub reaching 10 ft. in height; stem pith-like, 3 in. or more in diam., often horizontal below and floating, then erect, full of light spongy white pith, glabrous; branches few or none. Leaves sessile or nearly so, imparipinnate; stipules ^ in. long, lanceolate, prolonged below their insertion into short auricles, deciduous. Leaflets 01-101, alternate or opposite, sessile, £-£ by -fg--g in., linear-oblong, obtuse, apiculate, 1-nerved, glabrous. Flowers in axillary 2-4-flowered corymbose racemes shorter than the leaves; peduncles and pedicels hairy; bracts | in. long, ovate, acute; bracteoles 2, broadly ovate, acute, mucronate, ciliate, |—<1 in. long. Calyx § in. long, hispid; upper lip rounded; the lower 3-lobed. Corolla f in. long, fugacious; standard glabrous; keel-petals hairy outside. Pods woody, nearly straight, 2-3 by ;}-§ in., often indented on both sutures, always on the lower one; joints 4-8, echinulate or smooth on the faces. PL B. I. v. 2, p. 152; Trim. FL Ceyl. v. 2, p. 39; Woodr. in Journ. Bomb. Nat. v. 11 (1897) ]>. 423; Watt, Diet. Econ. Prod. v. 1, p. 125.

A swamp-species, not very common in the Bombay Presidency. S. M. COUNTRY : Dharwar districts, *Woodrow* ! KANAKA : \* *Woodrow*!—\*DISTRIB. India (Bengal, Assam, Silhet, Birma); Malay Isles, Tropical Africa.

The soft spongy pith-like stems, known as *Sola*, are used for a variety of purposes. Owing to its lightness fishermen use *Sola* for floats, while the light helmets worn by Europeans (*Sola-topis*) are made from it. It is also employed as a surgical lint. See Watt. Diet. Econ. Prod. 1. c.

## 25. ELEIOTIS, DC.

Annual diffuse slender herbs. Leaves 1-3-foliolate; stipules striate. Leaflets 2-stipellate. Flowers in axillary and terminal racemes. Floral bracts large, ovate, striate, deciduous, each enclosing 2 flowers in bud; bracteoles 0. Calyx small, 5-toothed. Corolla small; standard sub-orbicular, clawed, emarginate; wings oblong; keel obtuse. Stamens diadelphous; anthers uniform. Ovary subsessile or shortly stalked; ovules 1-2; style inflexed above, somewhat thickened the flexure;

# 3

$m \vee g$ , ovate-lanceolate, acuminate, striate  
 f ?\*♦ ften mottled<sup>^</sup> wiTbrown spots, reniform, retuse or rounded at  
 £a?"SB<sup>^</sup>aSySSiithan long, |-H byf-l\* \*■ (the ltt, with a neai  
 the'base of the stem often much smaller) glabrous and veins bJAv  
 scattered appressed hairs beneath base cordate =. long, densely ' V a  
 Wous on the underside; petiolules ablate 1 lowers in lax 6-3U-flow;rt.  
 ls 2 at the base of each petiolule torm hairy; pedicels filiform, hi <sup>^</sup>ared axillary  
 racemes; peduncul<sup>^</sup>l bracts broadly ovate,

reticulately veined,"<sup>^^</sup> p<sup>^1</sup> |<sub>u</sub>bse?<sup>Jt</sup> Seed i <sup>D7</sup> Te \*<sup>n</sup>-> dark-brown,  
 polished. ' Fl. B. I. v. 2, p. L, wher.'" Cat. 5741 ; Wight & Arn. Prodr. p.  
 231 ; Trim. Fl. Ceyl. v/2, p<sup>^</sup>. .0 ; Woodr. in Journ. Bomb. Nat. v. 11  
 (1897) p. 423. *E. monophytla*, DC. (Z. c). *Glycine monophyllos*, Burm. Fl.  
 Ind. p. 161, t. 50, fig. 2. *Hedysanon sororium*, Linn. Mantiss. p.  
 270.—Flowers : July-Aug.

Sometimes there is present a very small pair of stipule-like leaflets  
 at the base of the petiole, above the true stipules. These were noticed  
 by Linnaeus (7. c.) and were considered by DC. to be a character  
 of sufficient importance to found a species on. Wight & Am., however,  
 declare (*I. c.*) that these leaflets are not constant on the same plant, but  
 that some stems, even from the same root, have them, others not.

A very rare plant in the Bombay Presidency. It is abundant at Badami, a station  
 on the S. M. Railway, where it has been found by Mr. Woodrow! and myself. I  
 have not heard of it from any other locality in the Presidency.—DISTRIB. India  
 (plains of Bandelkhand and W. Peninsula) ; Ceylon.

2. **Eleiotis trifoliolata**, *T. Cooke*. Prostrate ; stems many,  
 caespi-tose, reaching 18 in. long, obscurely triquetrous, striate, glabrous.  
 Leaves 3-foliolate ; petioles filiform, -}j-l in. long, glabrous ; stipules <sup>^</sup>V in.  
 long, linear-lanceolate, cuspidate, striate. Leaflets nearly equal, or the  
 terminal one a little longer, |-§ by §-| in., not broader than long,  
 broadly obovate, rounded, truncate or retuse at the apex, glabrous above,  
 with a few appressed hairs beneath, base narrowed (not .cordate); nerves  
 and veins conspicuous on the underside; stipels 2 beneath each leaflet,  
 subulate. Flowers at first aggregated at the tops of the peduncles, elon-  
 gating in fruit in a lax few-flowered raceme ; peduncles hairy, axillary  
 or terminal, with 1 or 2 scarious bracts on the naked portion ; pedicels  
 filiform ; floral bracts large, striate, ovate-orbicular, shortly acuminate,  
 ciliate, each bract enclosing 2 flowers. Calyx -p<sup>1</sup><sup>^</sup> in. long ; teeth triangular,  
 almost as long as the tube. Corolla <sup>^</sup> in; long; standard  
 emarginate.

Ovary pubescent, shortly stalked, 1 (rarely 2) -ovulate; style inflexed, thickened at the flexure. Pods 1-1½ in. long, boat-shaped, pointed, shortly stalked, pubescent and reticulate on the faces, channelled at the back.

Very rare. S. M. COUNTRY: Badami, *Woodrow* !, *Cookel*, *Bhival*—DISTRIB. Apparently endemic.

## 26. PYCNOSPORA, E. Br.

A low shrub. Leaves pinnately 3-foliolate; stipules free, membranous, striate. Leaflets stipellate. Flowers minute, in terminal racemes; bracts membranous, caducous; bracteoles 0. Calyx deeply cleft, the 2 upper teeth subconnate. Corolla much exserted; standard suborbicular, narrowed at the base; wings obliquely oblong, adhering to the keel; keel slightly curved, obtuse. Stamens diadelphous; anthers uniform. Ovary sessile; ovules many; style inflexed, filiform; stigma terminal. Pod oblong, turgid, not jointed, 2-valved, continuous within, valves thin, transversely veined. Seeds small, subreniform.—DISTRIB. India, Ceylon, China, Philippines, N. Australia; species 1, combining the habit and flowers of *Desmodium* with the pod of *Crotalaria*.

1. *Pycnospora hedysaroides*, *B. Br. eoc Wight* <*Sf Am. Prodr.* (1834) p. 197. Perennial; stems and branches numerous from a woody base, appressedly pubescent. Leaves 3-foliolate, sometimes with a few small casually simple ones near the base of the stems; petioles ½ in. long; stipules scarious, lanceolate-cuspidate, striate, hairy. Leaflets 1-1½ by ½-¾ (the terminal much the larger), obovate, obtuse, rounded or slightly emarginate, finely pubescent on both surfaces especially the lower one, reticulately veined, base narrowed; main nerves 5-6 pairs, prominent and pubescent beneath; stipules filiform. Flowers small, in terminal and axillary lax racemes; peduncles hairy; pedicels filiform, pubescent. Calyx ½ in. long, pubescent; teeth longer than the tube, linear, acute. Corolla ½ in. long, purplish. Pods 1-1½ by ½ in., black when ripe, oblong-ellipsoid, turgid, apiculate, veined, pubescent, the upper suture straight, the lower curved. Seeds 6-10. *PL B.* 1. v. 2, p. 153; *Trim. Fl. Ceyl.* v. 2, p. 41; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 423. *Pycnospora nervosa*, *Wight & Arn. Prodr.* p. 197; *Dah. & Gibs.* p. 75.—Flowers: Dec.

KONKAN: *Stocks I*; near Vingorla, *Dalzel*.—Drs Titm. Throughout India; China, India, N. Australia.

## 27. PSEUDARTHRIA, Wight & Arn.

Herbs or undershrubs, villous or viscidly-pubescent. Leaves pinnately 3-foliolate; stipules free, membranous or striate. Leaflets large, stipellate. Flowers small, twin or fascicled along the rhachis of a terminal or axillary raceme or panicle; bracts narrow. Calyx-teeth as long as the tube, the 2 upper subconnate. Corolla much exserted; standard sub-orbicular; wings oblique, oblong; keel obtuse. Stamens diadelphous; anthers uniform. Ovary sessile; ovules many; style inflexed, subulate; stigma small, terminal. Pod linear-oblong, flat, continuous within, not jointed, the faces transversely veined. Seeds compressed, subreniform. Habit of *Desmodium*, from which it differs in pod.—DISTRIB. Species 5, of which 1 is Tropical Asian, the other 4

African.

**1. *Pseudarthria viscida*, Wight & Am. Prodr.** (1834) p. 209. Perennial, diffuse, prostrate; stems 2-4 ft. long, slender, more or less clothed with soft whitish hairs. Leaves 3-foliolate; petioles 1-1½ in. long, densely hairy; stipules 1-1½ in. long, lanceolate-cuspidate, hairy. Leaflets stipellate, the terminal 1½-3 by 1-2 in., rhomboid-ovate, the lateral 1-1½ by ½-1 in., obliquely ovate-oblong or subrhomboid, all more or less hairy above, densely grey-silky beneath; stipels filiform, often ½ in. long. Flowers small, numerous, in distant fascicles along the rachis of terminal and axillary racemes or panicles; peduncles 1-3; pedicels filiform, spreading, much longer than the calyx; bracts lanceolate-subulate, shorter than the pedicels. Calyx 1-1½ in. long, hairy; teeth as long as the tube, the 3 lower linear-subulate, the 2 upper shorter, subconnate. Corolla ½-1 in. long. Pods 1-1½ by ½-1 in., linear-oblong, flattened, clothed on the faces with fine hooked viscous hairs, densely ciliate on the margins, one or both sutures often slightly indented between the seeds. Seeds 4-6, subreniform, compressed, brownish-black. Fl. B. I. v. 2, p. 151; Dalz. & Gibs. p. 74; Trim. El. Ceyl. v. 2, p. 41; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.—Flowers: Aug.-Sept.

KONKAN : *Stocks!*; Vingorla, *Kanitkarl*, *Woodrow*. KANARA : *Kala naddi*, *Bitchie*, 1030!—DISTRIB. India (tropical zone, W. Peninsula); Ceylon, Timor.

## 28. URARIA, Desv.

Herbs or undershrubs. Leaves pinnately 3-9-foliolate or the lower rarely 1-foliolate; stipules free, acuminate, striate at the base. Leaflets often large, stipellate. Flowers in terminal racemes; bracts ovate or lanceolate, acuminate; bracteoles 0. Calyx-tube very short; the upper teeth short, the 3 lower elongated. Corolla purple or yellow; standard orbicular or obovate, narrowed into a claw; wings falcate - oblong, adhering to the keel; keel slightly incurved, obtuse. Stamens dia-delphous; anthers uniform. Ovary sessile or shortly stalked; ovules 2-co; style filiform, inflexed above; stigma capitate, terminal. Pod of 2-6 small turgid 1-seeded joints folded on one another within the calyx. Seeds orbicular or subglobose.—DISTRIB. Tropical Asia, Africa, and Australia; species 8.

**1. *Uraria picta*, Desv. Journ. Bot.** v. 1 (1813) p. 123, t. 5, fig. 19. A suffruticose sparingly branched perennial 3-6 ft. high; stems stout, reaching ½ in. in diam. at the base, finely downy with hooked hairs. Leaves imparipinnate, 8-12 in. long (including the petiole); petioles 1½-2 in. long, striate, downy; stipules 1 in. long, triangular, long-acuminate, striate. Leaflets on the upper part of the stem 5-7 (rarely 9), rigidly subcoriaceous, 4-8 by ½-1 in., linear-oblong, acute, blotched with white and glabrous above, finely reticulately veined and minutely pubescent beneath, base rounded; stipels subulate, ½ in. long; leaflets on the lower part of the stem 1-3-foliolate, suborbicular or oblong. Flowers in close fascicles along the rachis of spicate cylindrical racemes 6-12 in. long, ½ in. broad; rachis and pedicels downy with hooked hairs; pedicels 1-1½ in. long, curved upwards after flowering so that the pods are in contact with the rachis; bracts large, scarious, striate, strongly ciliate, the upper lanceolate-acuminate, the lower ovate-acuminate, completely concealing the buds, soon deciduous. Calyx 1 in. long; teeth

plumose, subulate, much longer than the tube. Corolla \ in. long, purple. Pods glabrous, pale lead-colored ; joints 3-6, smooth, polished, seed-like, i by  $\tau^{\wedge}$  in., folded on one another. Fl. B. I. v. 2, p. 155 ; Dalz. & G-ibs. p. 65 ; Trim. EL Ceyl. v. 2, p. 42 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423; Watt, Diet. Econ. Prod. v. 6, part 4, p. 212. *Hedysarum pictum*, Jacquin, Collect, v. 2, p. 262; Icon. t. 567.—Flowers: Aug.-Sept. VEEN. *Prislmaparni*; *Pithvan*.

Rare. KONKAN : Island of Bombay, *Woodrow!*; Parel, *Ranade* \; near Pen, *Dalzell* \$• *Gibson*; Salatte, *Nairne*.—DISTRIB. Throughout India; Ceylon, Tropical Africa, Malay Islands, Philippines.

## 29. ALYSICARPUS,

Diffuse or erect herbs. Leaves 1- (rarely 3-) foliolate; stipule scarious, acuminate, free or connate. Leaflets 2-stipellate. Fir. in leaf-opposed, terminal, or axillary racemes; pedicels often twin; bracts scarious, geuerally deciduous. Calyx glumaceous; teeth deep, the 2 upper often connate. Corolla not or hardly exserted; standard obovate or orbicular, narrowed into the claw-; wings obliquely oblong, adhering to the keel, slightly curved, obtuse, usually appendiculate. Stamens diadelphous ; anthers uniform. Ovary sessile or shortly stalked; ovules numerous ; style incurved ; stigma capitate. Pod terete or turgid, composed of several indehiscent 1-seeded joints.—DISTEIB. Tropics of the Old World and Australia ; species 15.

- Calyx shorter or very slightly longer than the first joint of the pod.
- |  |                           |
|--|---------------------------|
| Pod moniliform, veinless .....   | 1. <i>A. monilifer</i> .  |
| Pod not moniliform, veined.  |                           |
| Calyx shorter than the first joint of the pod .....                      | 2. <i>A. ha?nosus</i> .   |
| Calyx equalling or slightly longer than the first joint of the pod ..... | 3. <i>A. vaginal is</i> . |
- Calyx much longer than the first joint of the pod.
- |  |                               |
|--|-------------------------------|
| Teeth of calyx imbricate in the fruiting stage.        |                               |
| Pod slightly moniliform, neither veined nor rugose ... | 4. <i>A. hupleurifolius</i> . |
| Pod moniliform, reticulately veined .....              | 5. <i>A. longifolius</i> .    |
| Pod transversely ribbed.                               |                               |
| Pod 2-edged, not exserted .....                        | 6. <i>A. rugosu</i> \$.       |
| Pod 4-angled, exserted.....                            | 7. <i>A. tetragonolobus</i> . |
| Teeth of calyx not imbricate in the fruiting stage.    |                               |
| Flowers sessile .....                                  | 8. <i>A. pubescens</i> .      |
| Flowers pedicelled .....                               | 9. <i>A. belgaumenms</i> .    |

1. **Alysicarpus monilifer**, DO. *Prodr.* v. 2 (1825) p. 353. Stems \-2 ft. long, slender, tufted, prostrate, much-branched; young branches clothed with deciduous bristly hairs. Leaves 1-foliolate; petioles  $\tau^{\wedge}$ -[ in. long, more or loss hairy ; stipules scarious, about as\* long as the petioles, lanceolate, very acute, striate. Leaflets J-1 by ,%-f, oblong-elliptic, rounded and mucronulate at the apex, glabrous above, slightly hairy on the nerves and prominently reticulately veined beneath, base rounded, often cordate : potiuluhvs very short ; stipels minute, filiform. Flowers erect, close, in 4-10-flowered axillary racemes : pedicels very short. Calyx obscurely hairy,  $\tau V$ -g in. long, about equalling or rather less than the first joint of the pod; tube very short; teeth narrow-lanceolate, very acute, striate. Pods \- in. long by  $\tau^{\wedge}$ - in. thick, erect, moniliform ; joints 4-8, turgid, subglobose, finely" downy with minute hooked hairs, not reticulately veined. FL B, I. v. 2, p. 157:



Wight & Arn. Prodr. p. 232; Trim. Fl. Ceyl. v. 2, p. 43; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.—Flowers : Sept.-Oct,

S. M. COUNTRY : Badami, *Cooke* !, *Woodrow* !; Dharwar, *Woodrow*. —  
DISTRIB. Throughout India ; Nubia, Abyssinia.

**2. *Alysicarpus hamosus*, Edcjew. in Journ. Asiat. Soc. Beng. v. 21 (1853) p. 171.** Diffuse; stems 0-30 in. long; branches numerous, ascending, slender, clothed with long spreading hairs. Leaves 1-foliolate ; petioles  $\frac{1}{2}$  in. long, hairy; stipules scarious, reaching  $\frac{1}{2}$  in. long, linear, very acute, striate. Leaflets  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., broadly ovate or suborbicular, rounded or mucronate at the apex, more or less hairy on both surfaces and on the nerves beneath, base rounded or slightly cordate; petiolules short, hairy; stipels minute, subulate. Flowers 2-ly in pairs along the rachis, in axillary 4-8-flowered racemes; rachis filiform, hirsute ; pedicels as long as the calyx ; bracts scarious, ovate, acute, ciliate. Calyx  $\frac{1}{2}$  in. long, shorter than the first joint of the pod, the 3 lower teeth linear-lanceolate, acute, ciliate. Pods  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., compressed, clothed with both straight and hooked hairs, linear, mucronate ; joints 3-7. Fl. B. I. v. 2, p. 157; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *Hedysarum procumbens*, Eoxb. Hort. Beng. p. 56 ; Fl. Ind. v. 3, p. 345.—Flowers : Sept.-Oct.

Rare. KONKAN : Parel (island of Bombay), *Woodrow*!; Bombay, *Capt. Geburne*!  
S. M. COUNTRY : Badarai, *Cooke* !, *Woodrow*!—DISTRIB. India (Plains of Banda, W. Peninsula).

**3. *Alysicarpus vaginalis*, DC. Prodr, v. 2 (1825) p. 353.** Suffruticose, diffuse; stems numerous, robust, ascending, 1-3 ft. long, glabrescent or with a few scattered hairs. Leaves 1-foliolate ; petioles  $\frac{1}{2}$  in. long; stipules scarious, often exceeding  $\frac{1}{2}$  in. long, ovate, acuminate, striate, closely appressed to the stem, straw-colored, persistent. Leaflets very variable in form on one and the same plant,  $\frac{1}{2}$ - $2\frac{1}{2}$  by 1-1 in., lanceolate, oblong, or ovate-oblong, rounded or acute, or sometimes truncate at the apex, apiculate, glabrous, closely reticulately veined, base usually cordate ; petiolules very short; stipels minute-, caducous. Flowers in elongated 6-12-flowered racemes 1-3 in. long; pedicels about  $\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. long, glabrescent, equalling or slightly longer than the first joint of the pod ; teeth longer than the tube, linear, very acute, striate. Corolla pinkish, small, included. Pods  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., subterete, not or very rarely obscurely moniliform, apiculate, glabrous or nearly so, reticulately veined : joints 4-8, longer than broad. Fl. B. I. v. 2, p. 158; Dalz. & Gibs. p. 64; Wight & Arn. Prodr. p. 233; Trim. Fl. Ceyl. v. 2, p. 44 ; Woodr. in Journ. \*Bomb. Nat. v. 11 (1897) p. 423.—Flowers : Oct.

KONKAN : *Stocks* !, *Law* !; Neral, *Cooke* ! DECCAN : *Woodrow*. GUJAKAT : *Woodrow* ; Surat, *Kanitkcur* !, *Dalsell* & *Gibson*.—DISTRIB. Throughout India; Ceylon, Afghanistan, and generally throughout the Tropics of the Old World.

VAB. 1. *nummularifolius*, Baker, in Hook. f. Fl. B. 1. v. 2, p. 15«s,  
Procumbent, diffusely branched ; stems 8-12 in. long, slender. Leaflets elliptic-oblong or roundish, obtuse. Racemes dense, congested, often under 1 in. long. Watt, Diet. Econ. Prod. v. 1, p. 204. *A. nummularifolius* (sp.), -DC. Prodr. v. 2, p. 353 ; Wight & 'Am. Prodr. p. 232 •  
Orah. Cat. p. 50 ; Dalz. & Gib» p. 64.

KONKAN : *Dalzell* DECCAN : *Woodrowl*—DISTRIB. AS common and widely distributed as the type.

VAK.2. *StocJcsii*, Baker, in Hook. f. Fl. B. I. v. 2, j>. 158. Stems clothed with fine spreading hairs. Leaflets much thinner than in the type, elliptic or oblong-elliptic, more or less hairy beneath. Racemes elongated.

I have seen but one specimen in Herb. Kew. marked "Konkan, *Stocks*."—DISTRIB. Apparently endemic.

VAB. 3. *heteropJiyllus*, Baker, in Hook. f. Fl. B. I. v. 2, p. 158. Stems many, slender, 4-10 in. long. Upper leaves 3-foliolate; the lower 1- and 3-foliolate intermixed. Leaflets thin, lanceolate or oblong-lanceolate, acute or subobtuse, the upper sometimes very narrow. Racemes 6-20-flowered, reaching 5 in. long; flowers in distant pairs along a filiform rhachis. *Alysicarpus lieterophyllus*, Benth. MS. in Herb. Kew.

Rare. SIND: *Stocks*!; Jemadar ka Landa near Karachi, *Stocks*, 1181!—DISTRIB. Apparently endemic.

4. ***Alysicarpus bupleurifolius***, DO. *Prodr.* v. 2 (1825) p. 352. Stems 1-2 ft. long, slender, terete, ascending, glabrous. Leaves 1-foliolate; petioles  $\times V \sim nr$   $in$ -  $1^{on} \textcircled{>}$  glabrous; stipules  $\wedge$ -| in. long, linear, very acute, glabrous. Leaflets rigid, variable, usually linear, linear-oblong or lanceolate, acute, f-2i by | in. (the lower leaflets sometimes broadly elliptic), all glabrous, reticulately veined; petiolules very short; stipels minute, caducous. Flowers in 10-20 distant pairs, in rigid erect spicate lax racemes; pedicels very short. Calyx | in. long, much longer than the first joint of the pod; tube funnel-shaped, glabrous; teeth acute, ciliate, imbricate. Corolla red. Pods | in. long, stalked, strongly apiculate, cylindrical, glabrous, smooth, scarcely moniliform; joints 4-8, as broad as long, not veined nor rugose. Fl. B. I. v. 2, p. 158; Grah. Cat. p. 50; Dalz. & Gibs. p. 64; Trim. Fl. Ceyl. v. 2, p. 44; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *Hedysamm bwpleunfolium*, Eoxb. Cor. PI. t. 194.—Flowers: June-Sept.

KONKAN: *Stocks*!; Island of Bombay, *Cookel*; Neral, *Bhiva I* GUJARAT: Nausari, *Kanitkar* ! S. M. COUNTRY : Karlimatti near Badami, *Woodrow I*; Belgaum, *Ritchie*, 164!—DISTRIB. Throughout India; Ceylon, Malay Isles, China, Philippines, Mauritius, Polynesia.

5. ***Alysicarpus longifolius***, *Wight* <\$■ *Am. Prodr.* (1834) p. 233. Stem stout, 4-5 ft. high, ascending, terete, slightly striate, glabrous. Leaves 1-foliolate; petioles  $\wedge$ -| in. long; stipules scarious, | in. long, lanceolate, very acute. Leaflets 2-6 by | in., oblong or lanceolate, obtuse or subacute, glabrous above, appressedly hairy on the nerves

beneath, closely reticulately veined, the reticulations conspicuous on both surfaces, base subcordate ; petiolules very short; stipels linear, acute. Flowers erect, appressed to a more or less, hairy rhachis, in dense spicate racemes 1-1.5 ft. long; pedicels 1/2 in. long, hairy; bracts conspicuous, often exceeding 1/2 in. long, ovate, acuminate, more or less silky outside, ciliate, concealing the buds and falling before the flowers open. Calyx 1/2-1 in. long, pubescent, ciliate, striate, as long as or longer than the two lower joints of the pod; tube funnel-shaped, plicate; teeth much longer than the tube, imbricate in the fruiting stage.  
Pods

usually exserted, |-J by τ<sup>^</sup> in., very shortly stalked, glabrous, terete-compressed, apiculate, slightly raoniliform ; joints 4-6, glabrous, reticu-latek veined, the veins not very conspicuous. El. B. I. v. 2, p. 159 ; Dalz. & Gibs. p. 65; Trim. El. Ceyl. v. 2, p. 45 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.—Flowers: Sept. VERN. *Sevard.*

KONKAN : *Stocks* !; Matunga, *Woodrow*! DECCAN : Poona, *Woodrow*! GUJARAT : Surat, *Cookel*, *Kanitkar* !, *Capt. Geburnel*, *Dalzell*!; Dakor, *Kanitkar* !

The root is like liquorice, *Bahell* § *Gibson*.—DISTRIB. Throughout the plains of India.

**6. *Alysicarpus rugosus*, DO. Prodr. v. 2 (1825) p. 353.** Stems 1-2 ft. long, ascending, glabrous except for a decurrent line of hairs. Leaves 1-foliolate ; petioles -J—J-in. long; stipules scarious, |-| in. long, linear-lanceolate, very acute, striate. Leaflets 1-3 by |-1 in., usually oblong; rarely orbicular or linear-lanceolate, obtuse, apiculate, glabrous above, slightly appressedly hairy and reticilately veined beneath, base often cordate ; petiolules extremely short; stipels minute, caducous. Flowers appressed to the subglabrous rhachis, crowded in dense spicate racemes 1-4 in. long; pedicels |-<sup>^</sup> in. long, slender, glabrous ; bracts large, chaffy, ovate, acuminate, glabrous. Calyx glabrous on the back, |-| in. long, deeply divided; teeth lanceolate, much imbricate, minutely ciliate. Pods j<sup>^</sup> in. broad, turgid, very shortly stalked, apiculate, rmoni-liform, included" in the calyx; joints 3-6, broader than long, closely transversely ribbed, glabrous. EL B. I. v. 2, p. 159. *A. Wallichii*, Wight & Arn. Prodr. p. 234.

Not nearly as common as the varieties. S. M. COUNTRY : Belgauin, *Bltchie*, 180 ! —DISTRIB. Throughout India ; Tropics of the Old World, Ceylon, Cape, W. Indies.

VAR. 1. *Heyneanus*, Baker, in Hook. f. El. B. I. v. 2, p. 159. A larger plant 3-4 ft. high. Stems more robust, pubescent or villous. Leaflets large, obovate-oblong, obtuse, permanently pubescent beneath. Racemes longer, 4-6 in. long; flowers more distant. Calyx shorter. Pods -i in. broad, often exserted. *A. Heyneanus* (sp.), Wight & Arn. Prodr. p. 234. *A. obovatus*, Edgew. Cat. Banda Pl. p. 45. *A. rugosus*, Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.

Common in the Bombay Presidency. KONKAN : *Stocks*!; Matunga, *Woodrow*! DECCAN: Poona, *Woodrow I*, *Kanitkar I* GUJARAT: Dabhoi, *Kanitkar*; Bakor, *Kanitkar*!—DIBTRIB. India (Bandelkhand, W. Peninsula); Ceylon.

VAB. 2. *styracifolii's*, Baker, in Hook. f. Fl. B. I. v. 2, p. 159. A smaller plant; stems diffuse, rarely reaching 18 in. long, finely pubescent. Leaflets small, elliptic-oblong, obtuse, hairy beneath. Racemes short, dense; flowers subsessile along a very hairy rhachis. Calyx hairy on the back, strongly ciliate on the margins. Pods <sup>^</sup> in. broad, included or rarely exserted. Trim. El. Ceyl. v. 2, p. 45. *A. styraci-folius*(8\.), DC. Prodr. v. 2. p. 353 (*exdud. syn.*); Wight & Arn. Prodr. p. 234 ; Grab. Cat. p. 50 ; Dalz. & Gibs. p. 65. *A. lupulinus*. *Stocks*, ex Baker in Hook. f. El. B. I. v. 2, p. 159. *A. scariosus*, Grah. in Wall. Cat. 5766; Aitch. Pb. & Sind PL p. 45.

KONKAN: *Stocks*!, *Law I* GUJARAT: Surat, *Dalzell* % *Gibson*; Ankleshwar, *Kanitkar* !; Dakor, *Kanitkar*! SIND : *Stocks I*; Jemadar ka Landa near Karachi, *Stocks*, 1180!—DISTRIB. Throughout India ; Ceylon.

VA.H. 3. *minor*, Prain, in Journ. As. Soe. Beng. v. ()6 (1898) p. 384.

±)warf, diffuse; stems glabrous. Leaflets small, oblong, ovate or orbicular, obtuse or subacute. Racemes short, dense; bracts and calyx glabrous.

Western India, *Gibson ex Prain (l. c.)*. DECCAN : *Woodrow!* GUJARAT : Rajkote (Kathiawar), *C. Macnaghten ex Prain (l. e.)*.

**7. *Alysicarpus tetragonolobus*, Edgew. in Journ. As. Soc. Beng. v. 21 (1853) p. 169.** Procumbent, aespitose; stems numerous, slender, 1 ft. long, marked with a line of hairs. Leaves 1-foliolate; petioles 1/2 in. long; stipules scarious, 1/4 in. long, lanceolate with a broad base, acute, ciliate, striate. Leaflets 1/2 by 1/4 in., elliptic-oblong or lanceolate, obtuse or subacute, glabrous above, hairy beneath, base rounded or slightly cordate; petioles very short; stipules minute, caducous. Flowers in lax racemes 2-3 in. long, the lower flowers distant pairs along a slender rhachis, the upper approximated; pedicels filiform; bracts 1/2 in. long, ovate-lanceolate, acute, caducous. Calyx 1/2 in. long, deeply divided, puberulous outside; teeth lanceolate, acute, ciliate with long white hairs, imbricate in the early fruiting stage, afterwards spreading. Pods 1/2 in. long, inflated, furnished with a projecting ridge down the middle of each face making the pod quadrangular, distinctly exserted; joints 2-6, transversely ribbed, glabrous. Fl. B. I. v. 2, p. 159; Edgew. Cat. Banda PL p. 45; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *A. quadrangularis*, Edgew. MS. ex Baker, in Hook. f. Fl. B. I. v. 2, p. 159.—Flowers : Aug.

KONKAN : *Stocks!* DECCAN : Poona, *Herb. Mus. Par.*, 393! and 4981, *Woodrow*, 49!, *Cooke!*; Ahmednagar, *Woodrow*. S. M. COUNTRY : Badami, *Cooke!*, *Woodrow!* SIND : *Stocks*, 1181!—DISTRIB. India (Plains of Bandelkhand).

**8. *Alysicarpus pubescens*, Law, in Wight, Icon. (1840) t. 250.** An erect herbaceous plant 3-4 ft. high; stems and branches terete, softly hairy. Leaves 1-foliolate; petioles 1/2 in. long, softly hairy; stipules reaching 1 in. long, linear-lanceolate, prolonged to a fine acicular point, clothed with long white hairs. Leaflets linear-oblong or oblong-lanceolate, acute, mucronate, slightly hairy or subglabrous above, clothed beneath and on the nerves and margins with soft white hairs; base rounded, subacute or slightly cordate; main nerves 3, starting from the base, conspicuous; petioles very short; stipules minute, caducous. Flowers sessile, in dense spikes 2-6 in. long; rhachis plumose; bracts broadly ovate, acuminate, silky-villous outside. Calyx 5 in. long, divided nearly to the base; teeth narrowly lanceolate-subulate, densely plumose, not imbricate. Corolla included or scarcely exserted. Pods

r\j in. broad, moniliform, with a long nmcro, included in the calyx ; joints 3-4, globose, reticulate, the reticulations somewhat honeycombed. El. B. I. v. 2, p. 160 ; Dalz. & Gibs. p. 65 : Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.—Elowers : Sept.-Nov.

A very common plant. KONKAN : *Stocks I* DECCAN : Poona, *Cooke!*, *Woodrow I*; Ohattersinghi hill near Poona, *Kanitkar!*; Kolapur, *Cooke!* S. M. COUNTRY : Bel-gaum, common, *Dalzell # Gibson, Ritchie, 177!*, *Cooke I, Wight I* KANAKA: *DateclV*. GUJARAT : about Broach, *Cooke !*—DISTRIB. Apparently endemic.

9. ***Alysicarpus belgaumensis***, *Wight, Icon.* (1840) t. 92. Erect, 1-2½ ft. high ; stems stout, terete, hairy. Leaves 1- or the upper often

3-foliolate; petioles  $\frac{1}{2}$  in. long, appressedly hairy; stipules  $\frac{1}{2}$  in. long, oblong-lanceolate, prolonged to a long acicular point, ciliate. Leaflets 1-3 by  $\frac{1}{2}$  in., oblong or oblong-lanceolate, acute, inucronate, sub-cordate (those near the base of the stem often smaller and sometimes broadly elliptic), all glabrous and reticulately veined above, densely appressedly-silky beneath, ciliate; petiolules very short, hairy; stipels subulate. Flowers at first in dense close terminal and axillary racemes which afterwards elongate, sometimes reaching 9 in. long; pedicels elongating after flowering to  $\frac{1}{2}$  in., slender, hairy, in pairs along a hairy rhachis; bracts  $\frac{1}{2}$  in. long, broadly ovate, acuminate, strongly nerved, slightly hairy on the back, ciliate, concealing the flowers when in bud, soon falling. Calyx scarious,  $\frac{1}{2}$  in. long, divided nearly to the  $\frac{1}{2}$  i& slightly hairy on the back; teeth oblong-lanceolate, acute, not imbricate, strongly and closely nerved, ciliate with long, stiff hairs, the

2 upper teeth connate for about  $\frac{1}{2}$  their length. Corolla rosy; standard

3 by  $\frac{1}{2}$  in. suborbicular or obovate. Pods  $\frac{1}{2}$  in. broad, included or slightly exserted, subcompressed, finely pubescent, slightly moniliform; joints 3-4, reticulately veined, the reticulations honeycombed. Fl. B. I. v. 2, p. 160; Dalz. & Gibs. p. 65; A Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.—Flowers: Sept.-Oct.

KONKAN: *Stocks*! DECCAN: Ambenali near Lanoli, *Kanitkar*!; Mahableshwar, abundant, *Cooke*! S. M. COUNTRY: Belgaum Districts, *Cooke*!; Parva Ghat, *Ritchie*, 1189!; Ramgbat, *Dalzell* & *Gibson*. KANARA: *Dalzell*!—DISTRIB. Apparently endemic.

VAII. *racemosus*, Baker, in Hook. f. Fl. B. I. v. 2, p. 160. Dwarf, 4-12 in. high. Leaflets 1-foliolate, broadly-elliptic, obovate or sub-orbicular, under 1 in. long, rounded or subacute. Racemes shorter, with fewer and more distant flowers. Calyx  $\frac{1}{2}$  in. long. Pods included or slightly exserted. *A. racemosus* (sp.), Benth. in Hohen. PL Ind. Or. n. 1212; Bedd. Icon. t. 292.

DECCAN: Mahableshwar, *Cooke*!, *Woodrow*!

### 30. OUGEINIA, Benth.

A tree. Leaves pinnately 3-foliolate; stipules free, deciduous. Leaflets large, stipellate. Flowers in fascicled axillary racemes; pedicels filiform, usually fascicled along the rhachis; bracts small, squamiform; bracteoles beneath the calyx minute, persistent. Calyx-tube campanulate; teeth obtuse, the two upper connate into a broad emarginate lip, the lowest tooth longer than the lateral ones. Corolla much exserted; standard suborbicular or obovate, clawed; keel obtuse. Stamens dialophous; anthers uniform. Ovary sessile; ovules many; style incurved, subulate; stigma terminal, capitate. Pod linear, elongate, flat, smooth, formed of 2-5 large, more or less distinct, scarcely dehiscent joints.—DISTRIB. East Indies; species 1.

1. *Ougeinia dalbergioides*, Benth. *PI. Jungh.* (1851-55) p. 216. A tree 20-40 ft. high, with a short crooked trunk; bark dark brown, deeply cracked; branches slender, terete. Leaves pinnately 3-foliolate, often reaching 12 in. long (including the petiole); common petioles  $1\frac{1}{2}$  in. long; stipules  $\frac{1}{2}$  in. long, lanceolate, acute, caducous. Leaflets rigidly coriaceous, the terminal broadly elliptic or roundish, sometimes

trapezoidal, 3-6 by 2-4 in., the lateral leaflets opposite, obliquely ovate, cordate, 3-4 by 1<sup>^</sup>—3 in., on petiolules  $\frac{1}{2}$  in. long, all glabrous above, glabrous or more or less downy beneath, distantly and shallowly crenate, bluntly pointed; main nerves 4-8 pairs, prominent; stipules subulate. Flowers numerous, in short fascicled racemes from the nodes of old branches; pedicels colored, i-f in. long, filiform ; bracts  $\wedge$  in. long, ovate, acuminate, broader than long, villous outside; bracteole 1 beneath the calyx, minute, villous. Calyx  $\wedge$ - $\wedge$  in. long, pubescent; teeth short, triangular. Corolla | | in. long, white or rose-colored, somewhat fragrant. Pods 2-3 in. long; joints reticulately veined, 2-3 times as long as broad. Fl. B. I. v. 2, p. 161 ; Bedd. Flor. Sylvat. t, 36 ; Talb. Trees, Bomb. p. 69 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423 ; Watt, Diet. Econ. Prod. v. 5, p. 657. *Dalbergia ougeinensis*, lioxb. Hbrt. Beng. JJ<sup>^</sup>v<sup>tr</sup> Wight, Icon. t. 391; Dalz. & Gibs.'p. 78.—Flowers : Feb.-May. VW. *Tivas; Kdld-palas.*

KONKAN : *Dalzell & Gibson*. DECCAN : hills near Poona, *Woodrow!* ; Kartriz Ghat, *Gabal*; Khandesh, *Talbot*; Dapuri garden, *Dalzell* GUJARAT: Dang jungles, *Dalzell & Gibson*. KANARA: Yellapur forests of N. Kanara, common, *Talbot*,—DISTRICT. India (Northern Provinces).

The bark affords a fine *Kino* and is used medicinally (*Dalzell & Gibson*). The wood is highly valued for its toughness. See Watt, Diet. Econ. Prod. 1. c.

### 31. DESMODIUM, Desv.

Herbs or shrubs (rarely small trees). Leaves pinnately 1-3- (rarely 5-) foliolate; stipules usually striate, dry, free or united into 1 leaf-opposed one. Leaflets stipellate, often large. Flowers usually small, in copious usually dense racemes, bracteate. Calyx-tube short, the 2 upper teeth more or less connate, the 3 lower acute or acuminate. Corolla exserted ; standard oblong, obovate or orbicular ; wings obliquely oblong, more or less adhering to the keel ; keel obtuse. Vexillary stamen entirely or partially free, the other 9 united; anthers uniform. Ovary sessile or stalked ; ovules 2-oo : style incurved; stigma terminal, minute, capitate. Pod exserted from the calyx, sessile or stalked, usually formed of several 1-seeded indehiscent joints, the faces compressed, the upper suture rarely splitting open, the joints usually separating.—DISTRICT. Throughout the Tropics of both hemispheres, a few in N. America and temperate S. Africa; species about 150.

Leaves 3-foliolate.

Shrubs or undershrubs.

Flowers in axillary peduncled umbels.

Branches terete ..... 1. *D. umbellatum.*

Branches triquetrous ..... 2. *D. Cephalotes.*

Flowers in terminal and axillary racemes.

Pod indehiscent.

Bracts large, leafy, concealing the flowers ..... & *D. pulchelliihi.*

Bracts small, scarious, not concealing the flowers ... 4. *D. laxiflorum.*

Pod dehiscent ..... 5. *D. poly carp urn.*

Herbs.

Erect; stipules foliaceous, auricled ..... 6. *D. difusum.*

Trailing; stipules scarious, not auricled ..... 7. *D. triflorum.*

Leaves 1-foliolate.

Shrubs or undershrubs.

Petiole winged ..... 8. *D. triquetrum.*



Petiole not winged.

- Branches angled; joints of pod longer than broad..... 9. *D. gangeticum*.  
 Branches terete; joints of pod as broad as long..... 10. *B. latifolium*.

Herbs.

- Leaflets broader than long ..... 11. *D. reniforme*.  
 Leaflets as broad as long..... 12. *D. rotundifolium*.

Leaves 1- and 3-foliolate intermixed.

- Herbaceous; pod indehiscent..... 13. *D. farviflorum*.  
 An erect undershrub; pod dehiscent ..... 14. *J. gyrans*.

**1. *Desmodium umbellatum*, DC. Prodr. v. 2 (1825) p. 325. A.**  
 bushy shrub (occasionally growing into a small tree) 5-15 ft. high ;  
 young branches terete, downy with appressed pubescence. Leaves 3-  
 ^oliolate, 3-6 in. long (including the petiole); common petioles f-1 in.  
 [II ?gy thickened at the base, channelled, rusty-puberulous ; stipules ^- in.  
 long, closely parallel-striate, caducous. Leaflets subcoriaceous, ovate-  
 oblong, obtiivse or subacute, glabrous above, canescent beneath (the  
 terminal 2-3 by li-2 in., the lateral 1^2 by 1-1| in.); petiolules  
 k—fe in. long ; main nerves 4-8 pairs, slender, parallel, curved ; stipels  
 ^ in. long, subulate. Flowers in axillary peduncled  
 6-12-flowered  
 umbels; peduncles ^-^ in. long; pedicels ^-i in. long; bracts deci-  
 duous ; bracteoles broadly ovate-oblong, acuminate. Calyx g—^ in. long;  
 teeth triangular, as long as the tube. Corolla i in. long, white.

Pods

1.7-2 in. long, sparsely silky when young, glabrous when ripe, thick and  
 coriaceous, almost turgid, not reticulately veined, indented on both  
 sutures; joints 4-5 (usually 4)^- by | in. Fl. B. 1. v. 2, p.  
 161;

Grah. Cat. p. 49 ; Dalz. & Gibs, p.\* 66 ; Trim. Fl. Ceyl. v. 2, p. 47 :  
 Talb. Trees, Bomb. p. 69 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897)  
 p. 423.

Rare. GUJARAT : 8.E. of Surat, *Dalzellfy Gibson*. S. M. COUNTRY : near Belgaun,  
 always growing on the banks of streams, *Law ex Graham* 1. c.—DISTRIB. India near  
 the coast; Ceylon, Mascarene Islands, Malaya, Philippines, Polynesia. Pram says  
 (Journ. As. ISoc. Beng. y. 66 (1898) p. 137) that all the specimens in the Calcutta  
 Herbarium were invariably sent from the sea-coast or the shores of tidal rivers.

**2. *Desmodium Cephalotes*, Wall. Cat. (1828) 5721 ;**  
 var.

**congestum**, *Pram, in Journ. As. tioc. Beng.* v. 66 (1898) p. 389.

A

shrub 4-5 ft. high; branches appressedly silky, triquetrous.

Leaves

3-foliolate, 4-6 in. long; petioles |~1 in. long, appressedly  
 silky;

stipules i in. long, linear-lanceolate, bristle-pointed, striate, glabrous.  
 Leaflets elliptic-oblong, obovate-oblong, or lanceolate, acuminate, grey-  
 silky and finely reticulately veined beneath (the terminal 2|~4 by 1^~  
 2 in., the lateral 2-34 by ^-li in.) ; petiolules ^ in. long ; main nerves  
 12-1(5 pairs, prominently slender; stipels J-. in. long, filiform, con-  
 spicuous. Flowers 20 or more, crowded in dense axillary  
 peduncled

umbellate heads; peduncles \-| in. long, stout, silky ; pedicels O—^in.  
 long (when present, silky, cup-shaped and fringed with white  
 silky

hairs at the apex); bracts -J—J- in. long, linear-subulate,  
 ciliate,

caducous; bracteoles \ in. long, linear-subulate, ciliate, caducous.

Calyx \ in. long, campanulate, densely silky ; teeth lanceolate, acute, about as long as the tube. Corolla \ in. long, red. Pods f-1 in.

long,

slightly curved, indented on both sutures, more deeply on the lower one,; joints 3-6, as broad as long, slightly pubescent. *D. congestum* (sp.),

Wall. Cat. 5723; Dalz. & Gibs. p. 66.' *D. Cephalotes*, EL B. I. v.

2,

p. 161 (in part); Wight, Icon. t. 373 ; Trim. Fl. Ceyl. v. 2, p. 47 : Talb. Trees, Bomb. p. 69 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897)

p. 423; Watt, Diet. Econ. Prod. v. 3, p. 81.—Flowers : Aug.-Oct.  
VEEN. *Lapoti*.

*B. Cephalotes* (typical) is Subhimalayan, rare in India proper.

KONKAJI : *Law!*, *Stocks I*; Island of Oaranja, *DalzdIQ Gibson*; hills near Matheran, *Kanitkar!*; Matheran Ghat, *H. M. Birdwood*. S. M. COUNTRY: Belgauin, *Ritchie*, 188.; Oastlerock, *Cookcl* KANAKA: ' Yellapur (N. Kanara), *Talbot*—DISTRIB. Throughout the plains of India ; Ceylon.

**3. *Desmodium pulchellum*, BentJi. ex Baker, in Hoolc.f. FL B. I.**  
v. 2 (1876) p. 162. A shrub 4-5 ft. high ; branches slender, terete or sometimes slightly angled, grey-downy. Leaves 3-foliolate, 3-7 in.

long ; petioles g-§ in. long, channelled above, densely downy ; stipules .•• in. long, ovate, long-acuminate. Leaflets coriaceous, ovate-elliptic. obtuse or subacute, subglabrous and subrugose above, finely do<sup>ce</sup>/iy/ reticulately veined and pale beneath, repand or undulate on the margins, base rounded or subcordate (the terminal 2-5 by 1-2<sup>^</sup> in., equilateral, the lateral 1-3 by |-1<sup>^</sup> in. oblique) ; main nerves 8-10 pairs, oblique, prominent beneath; petiolules y<sup>1^</sup>—§• in. long; stipels subulate. In florescence axillary or terminal; flowers in racemes 3-10 in. long, composed of solitary, fascicled or umbellate flowers in the axils of 12-40 compound leafy bracts; bracts 2-foliolate, their leaflets orbicular, stipellate, \ in. across, glabrous on the upper, finely downy on the lower side, placed back to back on a very short densely villous common petiole which is stipulate at the base. Calyx ^ in. long, puberulous; teeth lanceolate, snorter than the tube. Corolla | in. long, yellow.

Pods

^~l in. long, indented on both sutures ; joints usually 2 (rarely 1 or 3), slightly longer than broad, reticulately veined, pubescent. Trim. FL Ceyl. v. 2, p. 48; Talb. Trees, Bomb. p. 69 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423 ; Watt, Diet. Econ. Prod. v. 3, p. 83. *Dicerma pulchellum*, DC. Prodr. v. 2, p. 339; Wight, Icon. t. 418.—Flowers: Aug.-Oct.

KONKAN : *Stocks !* KANARA : common in N. Kanara as undergrowth in the high timber deciduous forests of the Yellapur Ghats, *Talbot*.—DISTRIB. Throughout India; Ceylon, Malaya.

**4. *Desmodium laxiflorum*, DC. Prodr. v. 2 (1825) p. 335.** An erect undershrub 2-5 ft. high; stems slender, woody, obtusely angled, clothed when young with short white subappressed hairs, at length glabrescent. Leaves 3-foliolate; petioles 1-2| in. long, channelled

above, pubescent with appressed hairs; stipules § in. long, linear-

lanceolate, very acute, striate. Leaflets membranous, ovate-elliptic or sometimes broadly lanceolate, acute or .subobtuse, green and glabrous above, appressedly hairy, reticulately veined and paler beneath, base rounded or acute (the terminal 3-0 by 1|-2<sup>^</sup> in., the lateral 1|-4 by 1-1 *i* in.); main nerves 7-12 pairs, slender, prominent beneath; petio lules ^ in. long; stipels | in. long, linear-subulate. Flowers in terminal and axillary racemes 6-10 in. long, usually arranged in distant few-flowered fascicles (rarely solitary) along a slender hairy rhachis ; pedicels filiform, pubescent, ultimately \- \ in. long, finally spreading; bracts and bracteoles linear-acute, hairy. Calyx ^-^ in. long, campa-

nulate, strigose ; teeth lanceolate, slightly longer than the tube. Corolla  
5 in. long; standard white ; wings and keel blue. Pods 1-1½ in.  
long,  
scarcely constricted between the seeds, clothed with minute hooked

2A

hairs ; joints 6-10, flat,  $\frac{1}{2}$  in. long, by  $\frac{1}{2}$  in. broad. Fl. B. I. v. 2, p. 164; Talb. Trees, Bomb. p. 70 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *D. recurvatum*, Wall. Cat. 5717; Grab. Cat. p. 49 ; Wight, Icon. t. 374.—Flowers : Aug.-Oct. VEEN. *Jangli-gdnjd*.

KONKAN: *Law I*; near Poladpur, *Woodrowl*; Matheran, *Cooke I* DECCAN : Koos-gaon near Karkala, *Kanitkar!* S. M. COUNTRY : Castlerock, *Cooke !* KANAKA : common in the forests along the Supa' Ghats of N. Kanara, *Talbot*.—DISTRIB. India generally ; Java, Borneo, Philippines.

5. **Desmodium polycarpum**, *DO. Prodr.* v. 2 (1825) p. 334. An erect or suberect undershrub 2-5 ft. high ; branches woody, slightly angular, slender, clothed upwards with short grey appressed hairs, leaves 3-foliolate; petioles  $\frac{1}{2}$  in. long, angular, more or less appres-secu-lr hairy; stipules  $\frac{1}{2}$  in. long, lanceolate-subulate. Leaflets sub-coriaceous, 1-2 $\frac{1}{2}$  by  $\frac{1}{2}$  in. (the terminal the largest), obovate<sup>^</sup>cuneate, rounded at the apex, glabrous above, paler, closely reticulately veined and with a few appressed hairs beneath ; main nerves 6-8 pairs, inconspicuous ; petiolules  $\frac{1}{2}$  in. long 5 stipels  $\frac{1}{2}$  in. long, filiform. Flowers in dense axillary and terminal subsessile racemes 1-3 in. long ; pedicels  $\frac{1}{2}$  in. long > Aliform, ascending; bracts ovate-cuspidate,  $\frac{1}{2}$  in. long, ciliate with white hairs. Calyx  $\frac{1}{2}$  in. long, glabrescent; teeth triangular, acute, about as long as the tube. Corolla  $\frac{1}{2}$  in. long, purple. Pods  $\frac{1}{2}$  by  $\frac{1}{2}$  in., ciliate on both edges, densely pubescent when young, glabrescent or more or less hairy when ripe, indented and dehiscing along the lower suture ; joints 5-8, faintly reticulately veined, as broad as long, the upper edge straight, the lower rounded. Fl. B. I. v. 2, p. 171; Grab. Cat. p. 49 ; Dalz. & Gibs. p. 66 ; Wight, Icon. t. 406; Talb. Trees, Bomb. p. 70 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423 ; Watt, Diet. Econ. Prod. v. 3, p. 83. *Desmodium heteroocarpum*, DC. Prodr. v. 2, p. 337 ; Trim. Fl. Ceyl. v. 2, p. 53.—Flowers: Aug.-Oct.

Common throughout the Presidency. KONKAN : *Jacquemont*, 664!; hills north-east of Pen, *Dateell & Gibson* ; Dapoli, *Nairne*. S. M. COUNTRY : Castlerock, *Bhiva !*, *Cooke!*; Bamghitt, *Law ^Graham* ; Londa, *Cooke!* KANARA : Kumpta and Yellapur, *Woodrow!*—DISTRIB. Throughout India; Ceylon, Malaya, E. Africa, China, Japan, Philippines, Polynesia.

6. **Desmodium diffusura**, *DC. Prodr.* v. 2 (1825) p. 336, n. 106 (*not* p. 335, n. 88). Herbaceous, 1-2 ft. high; stems stout, angular,

ut?uuo, aixipicAiuau, aunucu. jjoauciis auuauricUJcuuo, x—O| UY  
5~^ ill.,

ovate-oblong, elliptic-oblong, or obovate (the terminal the largest), obtuse, apiculate, hairy on both surfaces, ciliate with long white hairs, reticulately veined beneath, base acute or rounded ; main nerves 10-12 pairs, conspicuous beneath; petiolules  $\frac{1}{2}$  in. long; stipels linear-lanceolate,  $\frac{1}{2}$  in. long. Flowers in terminal and axillary racemes or panicles reaching 1 ft. long, laxly arranged in few- (usually 2-3-) flowered fascicles along a grooved and hairy rhachis ; pedicels filiform,  $\frac{1}{2}$  in. long : bracts  $\frac{1}{2}$  in. long > lanceolate, acute, ciliate. Calyx  $\frac{1}{2}$  in. long, hairy; teeth about as long as the tube, linear, acute, ciliate. Corolla  $\frac{1}{2}$  in. long. Pods  $\frac{1}{2}$  by  $\frac{1}{2}$  in., straight, indented on both sutures, more so on the lower ; joints 3-6, rounded on both edges, as

broad as long, clothed with hooked hairs, faintly reticulately veined. Fl. B. I. v. 2, p. 169 ; Wight, Icon. t. 298 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423; Watt, Diet. Econ. Prod. v. 3, p. 82. *Hedy-sarum diffusum*, Willd. Sp. Pl. v. 3, p. 1180.—Flowers: Sept. VEEN. *Uhikta*,

Bombay Presidency, without locality, *Dalzell!* KONKAN : *Stocks !*; Bombay, *Capt. Geburne!* DECCAN : Poona, *Woodrow*; Nasik, *Nairne.*—DISTRIB. Throughout the greater part of India.

7. **Desmodium triflorum**, *DC. Prodr.* v. 2 (1825) p. 334.

A

small perennial trailing herb; stems slender, 6-18 in. long ; branches numerous, prostrate, rooting at the nodes, sparsely hirsute with white spreading hairs. Leaves 3-foliolate (the lower sometimes 1-foliolate)

petioles  $\frac{1}{2}$  in. long ; stipules ovate, acuminate,  $\frac{1}{2}$  in. long, persistent." Leaflets membranous, obovate, cuneate,  $\frac{1}{2}$  by  $\frac{1}{4}$  in. (the terminal slightly larger than the lateral), truncate or emarginate, rarely rounded, glabrous above, more or less hairy beneath ; petiolules  $\frac{1}{2}$ — $\frac{3}{4}$  in. Flowers 1-5 (usually 3), fascicled in the axils of the leaves; pedicels  $\frac{1}{2}$  in. long, hairy; bracts ovate, acute, ciliate; bracteoles minute\*

Calyx  $\frac{1}{2}$  in. long, clothed with long white hairs ; teeth lanceolate, longer than the campanulate tube, ciliate with long white hairs.

Corolla  $\frac{1}{2}$  in. long, pink or occasionally white; standard  $\frac{1}{2}$  broad, broadly obovate, cuneate, produced into a long slender claw. Pods  $\frac{1}{2}$  by  $\frac{1}{2}$  in., the upper edge straight, the lower indented ; joints 3-5, as broad as long, reticulately veined, more or less puberulous, the upper edge straight, the lower rounded. Fl. B. I. v. 2, p. 173 ; Q-rah. C p. 49; Dalz. & Gibs. p. 67; Trim. Fl. Ceyl. v. 2, p. 54; Woodr. in Journ. Bomb. <sup>ATi</sup>, v. 11 (1897) p. 423 ; Watt, Diet. Econ. Prod. v. 3, p. 84.—Flowers : uct. VEEN. *Rdn-methi*.

A very common plant throughout the Presidency. KONKAN : *Stocks!* DECCAN : widely, *Woodrow*; Mabableswar, *Cooke!*; Koina valley, *Cooke!* S. M. COUNTRY : Belgaum, *Richie*, 187.; Castlerock, *Cooke !*—DISTRIB. Common throughout India; cosmopolitan in the Tropics.

8. **Desmodium triquetrum**, *DC. Prodr.* v. 2 (1825) p. 326. An erect shrub; branches triquetrous, grooved, glabrescent. Leaves

1-foliolate; petioles  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, hairy, furnished on each side with a leaf-like reticulately veined glabrous wing of variable breadth ; stipules scarious,  $\frac{1}{2}$  in. long, linear-lanceolate, acute, closely parallel-striate, persistent. Leaflets 4-6 by 1-2 in., ovate-oblong or oblong-lanceolate, acute, glabrous above, slightly hairy on the nerves and reticulately veined beneath, base rounded or subcordate; main nerves 12-20 pairs ; petiolules very short; stipels adnate to the top of the petiolar wing, curved, acute, nerved. Flowers in axillary and terminal racemes 6-9 in. long, in fascicles of 1-3 in the axils of subulate bracts  $\frac{1}{2}$  in. long; pedicels filiform, short; bracteoles linear-subulate, ciliate. Calyx  $\frac{1}{2}$  in. long, hairy ; teeth unequal, the upper deltoid, the lower linear, acute. Corolla  $\frac{1}{2}$  in. long, violet. Pods 1-2 by  $\frac{1}{2}$  in., linear-oblong, with a long apiculation, flat, continuous, scarcely indented, densely and persistently strigose with appressed grey hairs ; joints 4-8, rather broader than long. Fl. B. I. v. 2, p. 163 (exclud. syn. *D. aurimlatum*, *D. pseudo-*

*triquetrum*, and *D. alatum*, DC.) ; Grah. Cat. p. 49; Dalz. & Gibs. p. 66 ;  
Trim. PI. CeyL v. 2, p. 49 ; King, in Journ. As. Soc. Beng. v.  
66

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(1898) p. 143; Talb. Trees, Bomb. p. 70 ; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (1897) p. 423. *Hedysarum triquetrum*, Linn. Sp. Pl. p. 746. *Hedysarum alatum*, Eoxb. El. Ind. v. 3, p. 348.—Elovers : Sept.-Dec. VEEN. *KdJcgangd*.

.KONKAN: *Stocks* || Malabar Hill (Bombay), *Graham* ; Salsette, *Graham*; Matheran, *Cooke*!; Poladpur, *Woodrow* ! DECCAN : Koosgaon near Karkala, *Woodrow*! ; Panch-gani, *Woodrow*! S. M. COUNTRY: Castlerock, *Cooke* I KANAKA: moist forests of N. Kanara from the coast inwards, *Talbot*.

**9. *Desmodium gangeticum*, DC. Prodr. v. 2 (1825) p. 327.** An undershrub 2-4 ft. high ; stems irregularly angled, glabrescent; branches angled, clothed with appressed white hairs. Leaves 1-folio-<sup>late</sup>; petioles §-f in. long; stipules scarious, 3-3 in.-long, linear-subulate, striate at the base. Leaflets membranous, 3<sup>^</sup>-5 by 1|-2<sup>^</sup> in., ovate-oblong, acute or slightly acuminate, the margins somewhat waved, glabrous and green above, paler and clothed with dense soft whitish appressed hairs beneath, reticulately veined, base rounded, truncate or subcordate; main nerves 8-12 pairs; petiolules -<sup>^</sup> in. long, hairy ; stipels I in. long, subulate. Elovers in copious ascending terminal and axillary racemes 6-12 in. long, arranged in few-flowered fascicles along a slender pubescent somewhat angular rhachis ; pedicels <sup>^</sup>-5 in. long, filiform, pubescent; bracts subulate, -<sup>^</sup>-<sup>^</sup> in. long; bracteoles minute. Calyx j<sup>1^</sup> in. long, hairy ; teeth triangular, longer than the campanulate tube. Corolla -J- in. long, violet or white ; standard g in. broad, cuneate at the base. Pods subfalcate, |-f by -<sup>^</sup> i<sup>n</sup>«> deeply indented on the lower, slightly indented on the upper edge; joints 6-8, longer than broad, indehiscent, sparsely clothed with minute hooked hairs, the lower edge rounded, the upper straight. El. B. I. v. 2, p. 168 ; Grrah. Cat. p. 49; Dalz. & Gibs. p. 66; Trim. Eh Ceyl. v. 2, p. 51; Talb. Trees, Bomb. p. 70; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423; Watt, Diet. Econ. Prod. v. 3, p. 82.—Elovers : May-July. VEEN. *Sdlvan*; *Sdtyarni*.

KONKAN: *Stocks* I; Malabar Hill (Bombay), *Graham*; near Pen, *Balzell* & *Gibson*. DECCAN : Bowdhan near Poona, *Woodrow*, *Kanitkar* !; Kolapur, *Cooke* I S. M. COUNTRY : Belgaum, *Ritchie*, 1033! KANAKA: moist forests of N. Kanara, *Talbot*.—DISTRIB. India (Himalayas to Pegu); Ceylon, Tropical Africa, Malay Islands, Philippines, China.

VAE. *maculatum*, Baker, in Hook. f. El. B. I. v. 2, p. 168. Dwarf, a few inches (rarely 1 ft.) high. Leaflets rounded, cordate, f-1<sup>^</sup> in. long, green blotched with paler spots. *D. maculatum* (sp.), DC. Prodr. v. 2, p. 327. *Hedysarum maculatum*, Linn. Sp. Pl. (1753) p. 746. *Hedysarum humile* (*capparidis folio macidato*), Dill.Hort. Elth. (1732) p. 170, 1.141, fig. 168.

Kare. Belgaum, *Ritchie*, 1033'.—DISTRIB. India (Eohilkhand, Upper Bengal).

**10. *Desmodium latifolium*, DC. Prodr. v. 2 (1825) p. 328.** An erect undershrub 3-6 ft. high; branches terete, spreading, densely clothed with short fulvous hairs. Leaves 1-foliolate; petioles §-£ in. long, densely fulvous-hairy; stipules cordate-ovate at the base, long-acuminate, hairy, ciliate. Leaflets lg-4 by l;j-3| in., broadly ovate or suborbicular, obtuse or subacute, runcronate, densely ciliate with short fulvous hairs, finely hairy above, densely so and reticulately veined beneath, base cordate or truncate; main nerves 6-8 pairs, conspicuous



and densely fulvous-hairy beneath; petiolules  $y^{\wedge}$ -g in. long, densely fulvous-hairy; stipels subulate, hairy. Flowers in terminal and axillary racemes sometimes reaching 1 ft. long, arranged in (usually) 2-flowered fascicles along a hairy rhachis; pedicels shorter than the calyx, hairy; bracts linear-subulate, hairy, longer than the calyx; bracteoles minute, hairy. Calyx  $\wedge$  in. long, densely hairy; teeth triangular, as long as the tube. Corolla i in. long, purple. Pods  $\setminus$ —| by  $y^{\wedge}$ —| in., straight, slightly indented on the upper, more deeply so on the lower suture; joints 4-6, about as broad as long, densely clothed with hooked hairs, the upper edge straight, the lower rounded. Fl. B. I. v. 2, p. 168 (exclud. syn. *D. virgatum*, Zoll.); Grah. Cat. p. 49; Dalz. & Gibs. p. 66; Trim. Fl. Ceyl. v. 2, p. 51; Talb. Trees, Bomb. p. 70; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423; Watt, Dictv<sup>^</sup>con.<sup>7</sup> Prod. v. 3, p. 82.—Flowers: July-Sept.

KONKAN: hilly places, *Graham*; moist forests, *Talbot*; Mira hills near Pen, *Balzell* & *Gibson*. DECCAN: Bowdhan, 8 miles W. of Poona, *Kanitkar*! KANARA: moist forests of N. Kanara, *Talbot*.—DISTRIB. Throughout India; Ceylon, Tropical Africa, Malay Islands, Philippines.

11. **Desmodium reniforme**, DC. *Prodr.* v. 2 (1825) p. 327.

A.

slender plant; stem reaching 18 in. long, very slender, pale, glabrous. Leaves 1-foliolate; petioles |—| in. long, slender, glabrous; stipules

scarious, i in. long, lanceolate, striate. Leaflets broader than long,

$i\sim f$  by  $f\text{-}lj$  in., reniform, glabrous on both surfaces, reticulately veined; main nerves 3-4 pairs; petiolule  $\text{-}\text{£}\text{\$}$  in. long, slightly thickened; stipels subulate. Flowers in racemes which are usually terminal, or a few

flowers solitary or 2 together fascicled in the axils of the leaves; pedicels filiform; bracts scarious, lanceolate, striate. Calyx  $\text{-}\wedge$  in. long,

glabrous; teeth triangular, acute, as long as the tube. Corolla  $\text{-}1\text{—}\wedge$  in.

long. Pods  $\wedge$ —| by  $\wedge$  in., the upper suture straight, the lower slightly

indented; joints 3-5, longer- than broad, glabrous, reticulately veined. Fl. B. I. v. 2, p. 173; Dalz. & Gibs. p. 67. *Hedysarum reniforme*,

Linn.

Sp. PI. ed. 2 (1763) p. 1051; Burm. Fl. Ind. t. 52, fig. 1.

This has been included on the authority of *Balzell* & *Gibson* (Bomb. Fl. 1. a), who state that it is common in subalpine jungles. It does *not* seem, however, to have been found by any other collectors and there are no specimens from the Bombay Presidency in Herb. Kew.—DISTRIB. India (B. Himalayas, Prome, Ava, W. Peninsula); Java.

12. **Desmodium rotundifolium**\* *Baker*, in *Hook, f. Fl. B. I.* v. 2 (1876) p. 172 (*not* of Wall.). An erect much-branched herb 6-18 in. high; stem and branches terete, slender. Leaves 1-foliolate; petioles J-i in. long, filiform; stipules -J- in. long, lanceolate-cuspidate. Leaflets orbicular, |—1 in. long, as broad as long, very shortly acuminate, glabrous above, appressedly hairy beneath; nerves inconspicuous; petiolules  $\text{-}\wedge$  in. long; stipels subulate. Flowers in terminal and axillary lax racemes, at first short, afterwards elongating and reaching 3-5 in. long, the lower flowers in distant pairs, the upper solitary, along

a slender rhachis ; pedicels ascending,  $\frac{1}{2}$ - $\frac{1}{3}$  in. long, filiform; bracts ovate, acuminate, striate, at first concealing the buds, falling after the flowers develop. Calyx  $\frac{1}{2}$  in. long, hairy; tube very short; teeth subulate, 3 times as long as the tube, ciliate with long hairs. Corolla exserted,  $\frac{1}{2}$  in. long, pink. Pods  $\frac{1}{2}$ - $\frac{1}{3}$  by  $\frac{1}{2}$  in., falcate, the lower suture slightly indented; joints 3-6, as broad as long, somewhat turgid, re-

ticulately veined, the upper suture straight, the lower rounded. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423.

"Dalzell (MS. in Herb. Kew.) places this plant in the genus *Alysi-carpus*, but though the pods are somewhat turgid and resemble the pods of that genus, the calyx is not glumaceous and the corolla is considerably exerted.

DECCAN : Mahableshwar, very common, *Cooke!*; Koosgaon near Karkala, *Kanitkar* \ S. M. COUNTRY : Belgaum districts, *Bitchie*, 288.—DISTRIB. Apparently endemic.

13. ***Desmodium parviflorum***, *Baker*, in *Hoolc. f. Fl. B. I.* v. 2 (1876) p. 172. Herbaceous, erect, much-branched; stems numerous, <sup>^</sup>ale<sub>L</sub> 1-2 ft. long, glabrous at the base, clothed with spreading fulvous hairs in the upper part. Leaves 1- and 3-foliolate intermixed; petioles of the 1-foliolate leaves  $\frac{1}{2}$  in., those of the 3-foliolate ones  $\frac{1}{2}$  in. long; stipules  $\frac{1}{2}$  in. long, ovate, produced into a long acicular point. Leaflets elliptic-oblong, obtuse or subacute, mucronate, glabrous above, appressedly hairy beneath, base subcordate (the terminal 1-2 by  $\frac{1}{2}$  in., the lateral when present  $\frac{1}{2}$  by  $\frac{1}{2}$  in.); petiolules short. Flowers in lax, usually terminal racemes, the lower flowers in pairs, the upper solitary along a slender hairy rachis; pedicels filiform,  $\frac{1}{2}$  in. long, hairy; bracts  $\frac{1}{2}$  in. long, lanceolate-cuspidate. Calyx  $\frac{1}{2}$  in. long, hairy, divided almost to the base; teeth subulate, ciliate. Corolla not or very slightly exerted. Pods falcate,  $\frac{1}{2}$  by  $\frac{1}{2}$  in., both sutures indented, the lower the deeper; joints 4-6, rounded on both edges, reticulately veined, glabrescent. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 423. *Alysicarpus parviflorus*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 211; Dalz. & Gibs. p. 65.

This plant forms a connecting link between the genera *Alysicarpus* and *Desmodium* and might with equal reason be placed in either. The corolla is scarcely if at all exerted and the calyx is not glumaceous.

Rare. KONKAN : *Stocks!*, *Dalzell!* DECCAN : Phunda Ghat near Kolhapur, *Dalzell* & *Gibson*. S. M. COUNTRY : Belgaum, *Bitchie*, 184!—DISTRIB. India (Anamallay hills).

14. ***Desmodium gyrans***, *DO.* *Prodr.* v. 2 (1825) p. 326. An erect undershrub 2-4 ft. high; branches slender, grooved, the young ones pubescent. Leaves 1-3-foliolate; petioles  $\frac{1}{2}$  in. long, sparsely hairy; stipules scarious,  $\frac{1}{2}$  in. long, lanceolate, caducous. Leaflets subcoriaceous, oblong-lanceolate, obtuse, glabrous above, more or less silky-pubescent beneath (the terminal 1—2J by  $\frac{1}{2}$  in., the lateral  $\frac{1}{2}$  by  $\frac{1}{2}$  in.); petiolules  $\frac{1}{2}$  in. long; stipels linear-subulate. Flowers in lax terminal and axillary racemes (the terminal often panicled), elongating after flowering; pedicels  $\frac{1}{2}$  in. long, downy; bracts large, ovate, acuminate, striate, completely concealing the flowers in bud, falling as the flowers develop. Calyx membranous, campanulate,  $\frac{1}{2}$  in. long, glabrous; teeth deltoid, shorter than the tube. Corolla  $\frac{1}{2}$  in. long, pink; standard broadly obovate or suborbicular,  $\frac{1}{2}$  in. broad, with a short claw. Pods 1- $\frac{1}{2}$  f by  $\frac{1}{2}$  in., slightly falcate, dehiscing along the ventral suture which is slightly indented; joints 5-10, inconspicuous, rather broader than long, hairy, reticulately veined, the upper suture straight, the lower rounded. The two lateral leaflets move spontaneously by jerks; hence the name. FL B. I. v. 2, p. 174; *Grah. Cat.* p. 49; *Wight, Icon.* t. 294; *Taubert*, in *Engl. & Prantl, Pflanzenf.*

v. 3, part 3, p. 74, fig. 39; Trim. Fl. Ceyl. v. 2, p. 56 : Talb. Trees, Bomb. p. 70.

Apparently confined to the Southern districts of the Presidency. KONKAN : *Stocks I* KANAKA : moist forests of N. Kanara, common, *Talbot*.—DISTRIB. India (along the Himalayas from Hazara to Assam, Ava, Pegu, Tenasserim, W. Peninsula); Ceylon, Malay Islands, Philippines.

32. **ABRUS**, Linn.

Climbing shrubs. Leaves abruptly-pinnate. Leaflets numerous ; petiole terminated by a bristle. Flowers small, in dense racemes, on axillary peduncles or short branches. Calyx small, campanulate, truncate ; teeth very short, the 2 upper subconnate. Corolla much exserted ; standard broadly obovate or suborbicular, narrowed into a short cktfVr;<sup>1\*</sup> more or less adherent to the staminal-tube ; wings narrow/,-oWong-falcate; keel longer and broader than the wings, arcuate<sup>^</sup> ^Stamens 9 (the tenth stamen absent), united into a tube slit above; anthers uniform. Ovary subsessile ; ovules oo ; style short, incurved, beardless; stigma capitate. Pod oblong or linear, flat or turgid, thinly septate between the seeds.—DISTRIB. Cosmopolitan in the Tropics ; species 5.

- Pod turgid, 3-5-seeded ..... 1. *A. precatorius*.
- Pod flat, 8-12-seeded ..... 2. *A. pulchellus*.

1. **Abrus precatorius**, Linn. *Syst. Nat.* ed. 12 (1767) p. 472. A perennial twiner; stems numerous, scarcely woody, slender, glabrous; branches terete, slender, glabrous or sparsely silky. Leaves 2-4 in. long; petioles \- \ in. long, thickened and hairy at the base; stipules J-fV in. long, linear-subulate, pubescent, deciduous. Leaflets 10-20 pairs, :|-f by \-% in. (those near the base of the rhachis smaller), opposite, very deciduous, thinly membranous, ligulate-oblong, rounded, minutely apiculate, glabrous above, slightly hairy beneath, base rounded; petiolules very short; stipels 0. Flowers crowded in many-flowered racemes shorter than the leaves; rhachis usually thickened in fruit; pedicels short. Calyx JJ-% in. long, glabrous or sparsely silky ; teeth very short. Corolla § in. long, pink, or white with a pink tinge. Pods oblong, turgid, 1-11 by §-£ in., truncate, with a sharp deflexed beak, silky-pubescent. Seeds 3-5, as large as a pea, usually bright scarlet with a black spot, sometimes white with a black spot, or uniformly white, polished, shining. In cultivated forms, the seeds are sometimes wholly black. Fl. B. I. v. 2, p. 175 ; Grah. Cat. p. 51; Dalz. & Gibs. p. 76 ; Taubert, in Engl. & Prantl, *Pflanzenf.* v. 3, part 3, p. 356, fig. 130 ; Trim. Fl. Ceyl. v. 2, p. 57; Talb. Trees, Bomb. p. 70; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Watt, *Diet. Econ. Prod.* v. 1, p. 10.—Flowers : Sept.-Oct. VERN. *Gunj*.

KONKAN : *Stocks!*, *Woodrow !* DECCAN : near Poona, *Woodr ow !*, *Cooke!*; Gokak, *Cooke!* GUJARAT : *Woodrow*, KANARA : moist forests of N. Kanara common, *Talbot*.—DISTRIB. Throughout India; Ceylon and throughout the Tropics, often planted.

The roots have been used as a substitute for liquorice. The seeds are used as weights by jewellers and for making rosaries and ornaments. They contain an acrid poison and have been employed to kill cattle, the seeds being powdered, made into a paste and introduced beneath the skin. See Watt, *Diet. Econ. Prod.* 1. c.

2. **Abrus pulchellus**, Wall. *Gat.* (1828) 5819. A much-branched climber. Stems slender; branches slender, glabrous or thinly silky. Leaves 3-5 in. long; petioles |—f in. long, thickened at the base,

pubescent; stipules  $\frac{1}{2}$ -1 in. long, linear-lanceolate. Leaflets membranous 12-16 pairs, opposite,  $\frac{1}{2}$ -1 by  $\frac{1}{2}$ -1 in., ligulate-oblong, rounded, apicu-late, glabrous above, thinly silky beneath, base rounded; petiolules very short; stipels 0. Flowers in many-flowered long-peduncled lax racemes equalling or exceeding the leaves; rachis thickened in fruit; , pedicels very short. Calyx  $\frac{1}{2}$  in. long, thinly silky. Corolla  $\frac{3}{4}$  in. long, pink or pale blue. Pods 2-2 by  $\frac{1}{2}$ -1 in., linear, flat, incurved; valves smooth, thin. Seeds 8-12, oblong,  $\frac{1}{2}$  by  $\frac{1}{2}$  in., compressed, black. El. B. I. v. 2, p. 175; Trim. El. Ceyl. v. 2, p. 57; Talb. Trees, Bomb, p. 70; Watt, Diet. Econ. Prod. v. 1, p. 10.

Confined to the southern districts of the Presidency. KANARA: moist forests of N. Kanara, very common near Karwar and along the coast southwards, *Talbot*.—  
DISTRIB. India (E. Bengal, Birma, Sikkim); Ceylon, Malaya, Tropical & S. Africa, S.E. Abia.

### 33. LATHYRUS, Linn.

Annual or perennial herbs. Leaves abruptly-pinnate, the rachis ending in a tendril or bristle; stipules foliaceous. Flowers solitary or racemose; bracts caducous, usually minute; bracteoles 0. Calyx-tube usually oblique at the base; teeth subequal or the upper shorter. Corolla more or less exserted; standard broadly ovate or orbicular, emarginate, narrowed into a short claw; keel shorter than the wings, incurved, obtuse. Stamens diadelphous, the mouth of the staminal-tube not oblique; anthers uniform. Ovary sessile or stalked; ovules many; style inflexed, bearded on the inner (by the twisting of the style often the outer) face, otherwise glabrous; stigma capitate. Pod compressed or subterete, 2-valved, continuous within, many-seeded.—  
DISTRIB. Species about 170, spread chiefly throughout the north temperate zone.

#### 1. *Lathyrus inconspicuus*, Linn. *Sp. Pl.* (1753) p. 730.

An erect branched herb 4-9 in. high; stems slender, angled, glabrous. Leaves abruptly-pinnate; petioles short, not winged, produced at the apex into a short straight linear or lanceolate bristle; stipules  $\frac{1}{2}$ -1 in. long, linear-lanceolate, caudate at the base, veined. Leaflets 2 (rarely 1), sessile,  $\frac{1}{2}$ -1 by  $\frac{1}{2}$ -1 in., linear-lanceolate, acute, glabrous, conspicuously nerved beneath. Flowers solitary in the axils of the leaves; pedicels short. Calyx  $\frac{1}{2}$  in. long, glabrous; teeth as long as the tube, linear-lanceolate. Corolla 3 in. long, lilac. Pods 1-2 by  $\frac{1}{2}$  in. linear, compressed, slightly incurved at the apex, thickened at the margins, reticulately veined, glabrous. El. B. I. v. 2, p. 180. *L. erectus*, Boiss. *El. Orient.*, v. 2, p. 613.

Rare. SIND: *Stocks*, 897!—DISTRIB. India (Kashmir, Rawalpindi); Beluchistan, Afghanistan, Syria, Mesopotamia.

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*Lathyrus sativus*, Linn. *Sp. Pl.* (1753) p. 730, *Chickling-vetch*, *Jarosse*, *Gesse*, is not indigenous, but is sometimes cultivated in the Presidency, more especially in Gujarat and Sind, where it is grown as a cold-season crop. The use of the grain as a food continuously for some months is often found to produce in human beings incurable paralysis of the lower extremities. El. B. I. v. 2, p. 179; Dalz. & Gibs. *Suppl.* p. 22; Watt *Diet. Econ. Prod.* v. 4, p. 590.—VEEN. *Kasdri*; *Lang*.

### 34. SHUTERIA, Wight & Arn.

Climbing slender herbs. Leaves pinnately 3-foliolate; stipules striate. Leaflets stipellate. Flowers small, in axillary racemes, often twin or fascicled along the rhachis; bracts persistent, striate; bracteoles small. Calyx-tube gibbous; teeth short, the 2 upper connate at the apex. Corolla exserted; standard obovate, narrowed at the base, not auricled; wings narrow, oblique, adhering to the keel; keel shorter than the wings, obtuse. Stamens diadelphous; anthers uniform. Ovary sessile; ovules many; style incurved, filiform, beardless; stigma capitate. Pod linear, 2-valved, obscurely septate within between the seeds. —DISTRIB. Species 5, of which 4 are Indian, the other Tropical African.

1. *Shuteria vestita*, Wight & Arn. *Prodr.* (1834) p. 207. <sup>T~\*</sup>  
 Twining; stems woody, slender, hairy. Leaves pinnately <sup>J</sup>STRIB\* late  
 : petioles 1|-2| in. long, more or less hairy; stipules *jr* in.  
 lanceolate, acute. Leaflets membranous or subcoriaceous, 1^1 J  
 of f-1 in., the terminal rhomboid-obovate, the lateral slightly  
 smaller, ovate-oblong or elliptic, all more or less hairy on both sides,  
 rounded at both ends, minutely apiculate; stipules ^ in.  
 long, linear-subulate. Racemes dense, 1-4 in. long, 2 or 3 sometimes  
 starting from the same node, the lower flowers often twin; pedicels  
 short, densely hairy; bracts rigid, ovate-lanceolate, hairy, persistent,  
 about as long as the pedicels. Calyx ^ in. long, very hairy outside;  
 teeth lanceolate-subulate, shorter than the tube. Corolla | in. long,  
 purplish-red. Pods 1-1 £ by £ in., linear, hairy, slightly  
 recurved. Seeds 5-7, ellipsoid, compressed, brownish-black,  
 Fl. B. I. v. 2, p. 181; Dak. & Gibs. p. 63; Wight, *Icon.* t. 165;  
 Trim. Fl. Ceyl. v. 2, p. 58; Woodr. in *Journ. Bom' Nat.* v. 11  
 (1897) p. 424.—Flowers: Oct.

KONKAN: *Stocks*!; hills near Matheran, *Kanitkar*! DECCAN: Bowdhan  
 Poona, *Kanitkar*!; hills near Poona, *Woodrow*!; Pal jungles, Khandesh, *Kami* ' S.  
 M. COUNTRY: Dharwar, *CooJce*!; between Parva Ghat and Talaveri, *Baize*,  
 DISTRIB. India (E. Himalayas, Khasia, Sikkim, W. Peninsula); Ceylon.

### 35. DUMASIA, DC.

Twining slender herbs. Leaves pinnately 3-foliolate, stipulate. Leaflets stipellate. Flowers solitary or twin along the rhachis of axillary racemes; bracts small, narrow; bracteoles minute. Calyx-tube cylindric, gibbous, with a very oblique subtruncate mouth; teeth obsolete. Corolla exserted; standard obovate, erect, the margins slightly inflexed, the claw auricled; wings and keel adherent, with small blades and long claws. Stamens diadelphous; anthers uniform. Ovary substipitate; ovules many; style flattened above the middle, beardless; stigma capitate. Pod sessile, linear, compressed, torulose, 2-valved, continuous within.—DISTRIB. Tropical and Subtropical Asia; species 3.

1. *Dumasia villosa*, DC. *Mem. Legum.* (1825) p. 257, t. 44.  
 A twining herb; stems slender, terete, more or less fulvous-hairy. Leaves 3-foliolate; petioles -f-1^ in. long, fulvous - hairy; stipules \ in. long, linear-lanceolate, hairy. Leaflets membranous, 1^2| by 1-11 in. (the terminal leaflets not much larger than the lateral ones), ovate, subobtusely, apiculate, glabrous above, more or less hairy beneath, the margins of the young leaves ciliate, base shortly cuneate.

Flowers in axillary 6-20-flowered racemes 2-4 in. long ; rhachis slender, hairy ; pedicels  $\frac{1}{2}$  in. long ; bracts subulate, hairy,  $\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. long, clothed when young with silky hairs, soon glabrescent, the mouth obliquely truncate, the base saccate. Corolla  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, pale yellow. Pods 1 in. long, linear, straight, torulose, velvety. Seeds 3-4, ellipsoid,  $\frac{1}{2}$  in. long, black, shining. Fl. B. I. v. 2, p. 183 ; Trim. Fl. Ceyl. v. 2, p. 58; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424. *D. congesta*, Grah. in Wall. Cat. 5524; Wight, Icon. t. 445.—Flowers : Oct.-Nov.

A rare plant. I have found it only at Mahableswar along one of the paths close to Bombay Point, and it has never been brought to me by any of the plant collectors. i DI<sup>^</sup>TRIB. India (Himalayas and hills of the Western Peninsula); Ceylon, Java,

Cont<sup>T</sup>!<sup>car</sup>> Natal\_

N. Kanar

### 36. GLYCINE, Linn.

SiT wining or prostrate herbs, rarely suberect. Leaves pinnately 3-7-foliolate ; stipules small. Leaflets stipellate. Flowers small, in axillary racemes, solitary or fascicled along the rhachis ; bracts and bracteoles small. Calyx-tube campanulate ; teeth distinct, long or short. Corolla usually but little exerted; standard subauricled at the base; wings narrow, adhering to the keel; keel shorter than the wings, obtuse. Stamens monadelphous, or the vexillary stamen at length free; anthers uniform. Ovary sessile ; ovules many; style slightly incurved, usually short, beardless ; stigma capitate. Pod linear or linear-oblong, 2-valved, Seeds few.—DISTRIB. Tropical Asia and Africa, Australia; species about 12.

Leaves 3-foliolate .....	1. <i>G. javanica</i> .
Leaves 5-7-foliolate .....	2. <i>Gr. pentaphylla</i> .

1. **Glycine javanica**, Linn. 8p. PL (1753) p. 754. An extensive herbaceous twiner; %steins somewhat angular, slender, densely clothed with deflexed grey or fulvous hairs; young shoots silky. Leaves 3-foli< \te; petioles 1|-3J in. long, hairy ; stipules  $\frac{1}{2}$  in. long, triangular, nerved, densely hairy. Leaflets 2-4<sup>^</sup> by 1<sup>^</sup>-3 (the terminal slightly larger than the lateral, the lateral unequal-sided, the lower side the largest), broadly ovate, subacute, mucronate, glabrous or nearly so above, appressedly hairy and pale beneath; stipels linear-subulate. Flowers numerous, crowded in narrow (usually dense) axillary racemes 1-6 in. long; pedicels short, slender, hairy; bracts  $\frac{1}{2}$  in. long, linear-subulate, persistent, hairy. Calyx  $\frac{3}{4}$ - $\frac{1}{2}$  in. long, densely silky ; teeth longer than the tube, subulate, plumose. Corolla 1 in. long, reddish. Pods 1 by i in., linear, compressed, straight, densely appressedly hairy. Seeds 4-5. Fl. B. I. v. 2, p. 183; Trim. Fl. Ceyl. v. 2, p. 59 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424.—Flowers : Nov.

KONKAN : Stocks! S. M. COUNTRY : Belgaum, Ritchie, 213! KANARA : Kala naddi, Bitchiel—DISTRIB. India (Western Peninsula); Ceylon, Tropical Africa, Natal, Java.

2. **Glycine pentaphylla**, Dalz. in Kew Journ. Bot. v. 4 (1852) p. 344. A large twining herb ; stems slender, with a few appressed silky hairs. Leaves reaching 9 in. long, 5-7-foliolate ; petioles |-2| in. long, appressedly silky ; stipules small, linear-subulate, caducous. Leaflets 1-4 by  $\frac{1}{2}$ -1<sup>r</sup> in., opposite (the terminal the longer), oblong-lanceolate, acute, miKTonate, glabrous above, appressedly silky beneath, closely reticulately

veined, base rounded; stipels minute, caducous. Flowers in axillary lax racemes 6-9 in. long, in few-flowered fascicles along an appressedly silky rhachis; pedicels very short; bracts and bracteoles minute, subulate, caducous. Calyx -J- in. long, densely silky; teeth deltoid, shorter than the tube. Corolla 5 in. long, reddish; standard silky on the back, inconspicuously spurred at the base. Pods H by 5-3 in., linear, flat, very slightly recurved, more or less appressedly silky. Seeds 4-5. Fl. B. I. v. 2, p. 184; Dalz. & Gibs. p. 68; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424.—Flowers': Aug.-Oct.

KONKAN: *Stocks 1*; Wari country, *Dalzell* \ KANARA : Yellapur, *Talbot*—DISTRIB. India (Khasia).

### 37. TERAMNUS, Sw.

Twining slender herbs. Leaves pinnately 3-foliolate; stipules small. Leaflets stipellate. Flowers very small, in few-flowered fascicles in the axils of the leaves, or in axillary racemes, the flowers twin or fascicled along the rhachis; bracts and bracteoles small. Calyx-tube/campanulate; the 2 upper teeth connate or distinct. Corolla little exerted; standard obovate, narrowed at the base, not spurred; wings narrow, adhering to the keel; keel shorter than the wings, almost straight, obtuse. • Stamens monadelphous; alternate anthers very small, abortive.—Ovary sessile; ovules many; style short, thick, beardless; stigma capitate. Pod linear, 2-valved, septate within between the seeds, hooked with the persistent style at the tip.—DISTRIB. Tropical Asia, Africa and America; species 4.

1. *Teramnus labialis*, Spreng. Syst. v. 3 (1826) p. 235. A widely spreading twining herb; stems slender, more or less appressedly hairy. Leaves 3-foliolate; petioles 3—H in.; stipules ^ in. long, ovate-lanceolate, acute, deciduous. Leaflets membranous or subcoriaceous, 1^—2^ by |1 in. (the terminal slightly the largest), ovate-oblong or oblong-lanceolate, subacute, apiculate, glabrous above, slightly appressedly hairy beneath, base rounded or acute; stipels subulate, yV~t¥ \*n\* 1<sup>o</sup>ng—Flowers in axillary few-flowered lax racemes 2-6 in. long, solitary or fascicled along a slender more or less hairy rhachis; pedicels ^ in. long; bracts y<sup>1</sup>^ in. long, linear-lanceolate; bracteoles -^ in. It>ng, subulate. Calyx -1—^ in. long, silky; teeth lanceolate, as long as the campanulate tube. Corolla f^—| in. long, reddish. Pods 1^—2 by -^ in., narrowly linear, straight or slightly incurved, hairy when young, nearly glabrous when mature, with a short stout beak bent upwards so as to form nearly a right angle with the pod. Seeds 8-12, oblong, truncate or slightly rounded at the ends, smooth, dark brown. Fl. B. I. v. 2, p. 184; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Trim. Fl. Ceyl. v. 2, p. 60. *Glycine labialis*, Linn. f. Suppl. p. 325; Dalz. & Gibs. p. 68; Wight, Icon. t. 168. *Glycine warrecnsis*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 210; Dalz. & Gibs. p. 68.—Flowers: Aug.-Oct. VEJBN. *Rdn-ndid*.

Very common throughout the Presidency. KONKAN : *Law!*, *Stocks!*, *Dalzell!*; Wari country, *Dalzell # Gibson*; Bombay, *Capt. Geburnel* DECCAN: widely, *Woodrow*; Bowdhan, *Kanitkar!*; Poona, *Woodrow !*; Bhor, *Bhiva!* GUJARAT : Surat, *Kanitkar!* S. M. COUNTRY: *Castlerock, Cooke\* Belgaum, *Ritchie, 182!*—DISTRIB. Throughout India, Ceylon and the Tropics generally, Natal.



**VAR. *mollis***, Baker, in Hook. f. Fl. B. I. v. 2, p. 184. Stems with longer and more spreading hairs. Leaflets densely pubescent beneath. Calyx-teeth shorter than the tube. Pods densely hairy. . *Glycine mollis* (sp.), Wight & Arn. Prodr. p. 209. *Teramnus mollis* (sp.), Benth. in Journ. Linn. Soc. v. 8 (1865) p. 265.

KONKAN : *Balzell!* S. M. COUNTRY : Parva Ghat, *Ritchie*, 1043 !

### <sup>^</sup>38. **MUCUNA**, Adans.

Twining perennials and annuals. Leaves pinnately 3-foliolate; stipules deciduous. Leaflets usually stipellate. Flowers racemose or corymbose, purple or greenish, turning black when dried; bracts small or caducous.\* Ovary tube campanulate, the 2 upper teeth entirely connate, the lower tooth longer than the others. Corolla much exserted; standard more than half as long as the rostrate keel, which usually slightly exceeds the wings. Stamens diadelphous; anthers dimorphous. Ovary sessile; ovules many; style filiform, beardless; stigma capitate. Pod very variable in shape and sculpture, usually clothed with brittle irritant fine bristles.—DISTRIB. Throughout the Tropics ; species about 30.

Perennials.

Pod winged on the sutures.

Pod transversely plaited on the faces.

Pod nearly as broad as long, 1-seeded..... 1. *M. monosperma*.

Pod twice as long as broad, 2-seeded..... 2. *M. atropurpurea*.

Pod not transversely plaited on the faces ..... 3. *M. gigantea*.

Annual. Pod neither winged nor transversely plaited..... • 4. *M. pruriens*.

1. ***Mucuna monosperma***, DC. *Prodr*, v. 2 (1825) p. 406. A large woody perennial twiner: young branches clothed with rusty brown deciduous tomentum. Leaves 6-9 in. long; petioles 3-4 in. long; stipules 1 in. long, linear, deciduous. Leaflets 2—4 by 2-3 in., thinly coriaceous, ovate-oblong or elliptic, shortly acuminate (the lateral leaflets inequilateral, the lower side the largest), glabrous above, more or less pubescent beneath, base rounded. Flowers in 6-12-flowered corymbose axillary racemes shorter than the leaves; peduncles variable in length, 1-2 in. long; pedicels 1 in. long; bracts small, triangular, 1 in. long, deciduous; bracteoles 1/2 in. long, linear-lanceolate. Calyx 1/2 in. long, clothed with irritant bristles; teeth about half as long as the tube, the upper truncate, the lateral deltoid, the lower linear. Corolla 1 in. long, purple; keel abruptly inflexed at the tip. Pods 2-3 by 2 in. (nearly as broad as long), winged on both sutures and obliquely plaited on the faces, covered with brown deciduous irritant bristles. Seed solitary, nearly circular in horizontal cross section, slightly compressed, dark brown, smooth, shining; hilum linear, extending round three-fourths of the edge. Fl. B. I. v. 2, p. 185; Qrah. Cat. p. 53; Dalz. & Gibs. p. 70; Trim. Fl. Ceyl: v. 2, p. 61; Talb. Trees, Bomb. p. 70; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. 5, p. 285.—Flowers : Nov.-Jan.

KONKAN: *Law I, Stocksl* S. M. COUNTRY: Kala naddi, *Ritchie*, 1714!; Ramghat, *Balzell* & *Gibson*.—DISTRIB. India (E. Himalayas, Khasia, Assam, Chittagong, w<sup>^</sup> Peninsula); Ceylon.

The seed is known as the *Negro Bean* and is said to be used by the Brahmans as a restorative. See Watt, Diet. Econ. Prod. 1. c.

2. **Mucuna atropurpurea**, DC. *Prodr.* v. 2 (1825) p. 406.

A

woody perennial twiner; young branches slender, glabrous.

Leaves

reaching 7 in. long; petioles 3-4 in. long; stipules  $\frac{1}{2}$  in. long, lanceolate, caducous. Leaflets 2-5 by  $\frac{1}{2}$ -3 in., thinly coriaceous,

elliptic-

oblong or ovate-oblong, acuminate (the terminal equal-sided and narrowed, the lateral inequilateral and rounded at the base),

glabrous

above, with a few scattered hairs beneath, reticulately veined; stipels  $\frac{1}{2}$ - $\frac{1}{3}$  in. long, subulate. Flowers in short 10-15-flowered racemes

or

panicles; pedicels  $\frac{1}{2}$  in. long; bracts triangular. Calyx  $\frac{1}{2}$ - $\frac{3}{8}$  in.

long,

downy and with a few orange-colored bristles, deeply bilabiate; upper lip about half as long as the tube, the 3 lower segments triangular, equal.

Corolla dark purple, large, 2-2 $\frac{1}{2}$  in. long; keel abruptly curved upwards at the tip; standard 1 in. broad. Pods more than double as long,

as

broad, 3-5 by  $\frac{1}{2}$ -1 in., winged along both sutures with 10-14 parallel plaits running obliquely across the faces from the winged

margins,

clothed with copious orange-colored irritant bristles. Seeds usually

2

(rarely 1), broadly ellipsoid, slightly compressed; hilum extending half round the edge." Fl. B. I. v. 2, p. 186; Grah. Cat. p. 53; Trim. Fl. Ceyl. v. 2, p. 61.

KONKAN: S. Konkan, *Nimmo*, fide *Graham* 1. c.

This plant has been included on the authority of Graham who cites Nimmo. I have seen no specimens from Bombay.—DISTRIB. India (W. Peninsula); Ceylon.'

3. **Mucuna gigantea**, DC. *Prodr.* v. 2 (1825) p. 405. A

large

woody perennial twiner; stems reaching a great length; branches

slender, glabrous. Leaves 5-9 in. long; petioles 4-5 in. long, glabrous

;

stipules linear,  $\frac{1}{2}$  in. long. Leaflets 4-5 by 2-2 $\frac{1}{2}$  in., ovate or elliptic,

acuminate (terminal leaflets equal-sided and cuneate, lateral leaflets inequilateral and rounded at the base), glabrous on both surfaces; stipels

$\frac{1}{2}$  in. long, subulate. Flowers in umbelliform corymbs;

peduncles

4-18 in. long; pedicels  $\frac{1}{2}$  in. long; bracts and bracteoles

minute,

deciduous. Calyx  $\frac{1}{2}$  in. long, with a few irritant bristles;

tube

cylindric; upper lip subtruncate, the 3 lower teeth very small and triangular in bud, afterwards obsolete. Corolla 1-1 $\frac{1}{2}$  in. long,

greenish

yellow; keel not abruptly inflexed at the tip. Pods 3-6 by 2 in., broadly winged down both sutures, but not plaited across the face, clothed with deciduous yellowish-brown irritant bristles. Seeds 2-6; hilum

extending

round more than half the edge. Fl. B. I. v. 2, p. 186; Grab.  
Cat.

p. 53; Trim. Fl. Ceyl. v. 2, p. 62.

KONKAN: *Nimmo*, fide *Graham* l. c.

A littoral species found on the Indian and Malayan coasts. It is included, as the last species has been, on the authority of Graham who gives *Nimmo* as his authority. I have seen no specimens from the Bombay Presidency.

4. ***Mucuna pruriens***, *DC. Prodr.* v. 2 (1825) p. 405. An annual twiner; branches slender, more or less hairy at first, at length glabrescent. Leaves 3-foliolate; petioles 2|-4| in. long, appressedly silky;

stipules lanceolate, -J- in. long. Leaflets membranous, 3-5 by 2-3 in.

(the terminal leaflets slightly the smaller, rhomboid-ovate with cuneate base, the lateral leaflets with truncate base, very inequilateral, the lower side greatly dilated), all subacute, uncinulate, pubescent above, densely clothed with silvery-grey hairs beneath. Flowers in elongate 6-30-

flowered racemes 6-12 in. long, the flowers solitary or 2-3 together

along a slender silky rhachis; pedicels ±\ in. long, hairy; bracts \ in. long, lanceolate, hairy, caducous; bracteoles \ in. long, hairy, caducous. Calyx § in. long, silky and with a few irritant bristles outside; tube canipanulate; upper teeth completely connate into a triangular lip equalling the tube, lateral teeth lanceolate as long as the tube, the lower tooth lanceolate and slightly longer. Corolla 1-1½ in. long, purple ; keel slightly incurved. Pods 2-3 by | in., turgid, with a longitudinal rib running the length of each valve, not winged oh the margins nor transversely plaited on the faces, falcately curved on both ends, somewhat like the letter S, densely clothed with persistent irritant bristles which are at first pale-brown, afterwards steel-grey. Seeds 5-6, small; hilum not half the length of the circumference of the seed. Jbl B. I. v. 2, p. 187; Trim. Fl. Ceyl. v. 2, p. 62 ; Talb. Trees, Bomb, p. 71 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet, Econ. Prod. v. 5, p. 286. *M.prurita*, Hook. Bot. Misc. v. 2, p. 348; Grab. Cat. p. 53; Dalz. & Gibs. p. 70.—Flowers: Aug.-Dec. VERN. *Khdg-kuri*; *Kivdch*.

Common in hedges throughout the Presidency in the rains. KONKAN : *Stocks!*; Bassein, *Cooke!* DECCAN : Khandala, *Cooke!* GUJARAT : Surat, *Kanitkar!*

The tine bristles on the pods cause much irritation to those who venture to pull them with bare hands. The name " *Cowitch*" by which the plant is known to Anglo-Indians, is a corruption of the native name *Kivdch*. The plant has considerable repute in native medicine and the hairs were introduced into European pharmacy more than a century ago as a vermifuge.—See Watt, Diet. Econ. Prod. 1. c.

### 39. ERYTHRINA, Linn.

Trees; branches usually prickly. Leaves pinnately 3-foliolate; stipules small. Leaflets furnished with glanduliform stipels. Flowers in axillary and terminal racemes, handsome, usually bright red, twin or fascicled along the rhachis; bracts and bracteoles small or 0. Calyx with an oblique mouth, splitting down to the base, or campanulately-bilabiate. Petals unequal; standard much exserted, considerably exceeding the keel and wings. Vexillary stamen free nearly to the base or connate with the others half-way up the filaments ; anthers uniform. Ovary stalked ; ovules many; style incurved, subulate at the apex, beardless ; stigma small, terminal. Pod stalked, falcate, turgid, attenuated at the base and apex, compressed, torulose.—DISTRIB. Tropics and warmer regions of both hemispheres ; species 25-30.

Calyx not at all 2-lipped, splitting down the back to the base.

Calyx minutely 5-toothed at the tip; seeds 6-8 ..... 1. *E. indica*.

Calyx entire at the tip; seeds 2-3 ..... 2. *E. stricta*.

Calyx more or less 2-lipped, not splitting down the back to the base. 3. *E. suberosa*.

1. **Erythrina indica**, Lamk. *Encyc. Method*, v. 2 (1786) p. 391. A tree reaching 60 ft. in height; bark thin, smooth, grey, armed with small conical dark-colored prickles. Leaves 6-12 in. long, deciduous ; petioles 4-6 in. long, unarmed, readily disarticulating ; stipules lanceolate, § in. long, very caducous. Leaflets 4-6 by 3<sup>^</sup>-5 in. (the terminal leaflet the largest), membranous, broadly rhomboid-ovate, acute or acuminate, more or less stellately pubescent when young, glabrous when mature, base truncate or rhomboidal; petiolules \-<sup>^</sup> in. long; stipels thick, roundish, gland-like, persistent. Elowers appearing before th' ^aves, in dense racemes, 4-9 in. long, arranged in clusters of 1-3

on a puberulous or tomentose **rhaebis** ; peduncles stout, woody, reaching 6 in. long; pedicels \ in. long; bracts small, triangular, tomentose, deciduous ; braeteoles ^ in. long, subulate, tomentose. Calyx (before the expansion of the flower) tubular, 5-toothed at the tip, 1-1| in. long, clothed with deciduous tomentum, mouth very oblique, the upper segment subulate, **the** 2 lateral similar but smaller, the lowest one longer and doubled over the others so as to form a blunt point to the bud, the calyx soon splitting down the back to the base and appearing like a spathe. Corolla bright red, 2-2Hn. long; standard 1-1-| in. broad; wings and keel-petals subequal, |-| in. long. Stamens much **exserted**: Pods 5-12 in. long, stalked, subcylindricj distinctly torulose, **glabrescentf**. Seeds 4-8, subreniform, **f** by § in., brown. Pl. B. I. v. 2, p. 188; Gral. Cat. p. 54; **Dalz.** & Gibs. p. 70; Trim. Pl. Ceyl. v, 2, p. 03; Wight, Icon. t. 58 ; Talb, Trees, Bomb. p. **71**; Woodr. in Jo urn. Bomb. Nat, v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. **3**, p. **269**.—**Bowers** : "Mar. **VEEN. Pdngara**.

**The** ('oral-tree of Anglo-Indians,—As **JI** wild species it is probably wholly littoral, **although** it ia stated by *Graham* to grow commonly **throughout** the Kortkans, **while** *Talhot* gives as its habitat the **deciduous** forests of the Konkan and N. Kanara.—It ia largely grown **throughout the** Bombay Presidency as a support, for vines or pepper' plants. Gutfcings strike readily and grow quickly. The wood is used for sword-sheaths and **in the** manufacture of light boxes, toys, and the like.—**DISTRIB.** Sea-coasts of India; Java, Polynesia.

2. **Erythrina atricta, Roxb. Hort. Bmg.** (1814) p. 53. A large

tree; branches armed **with** numerous whitish prickles. Leaves un

armed ; petioles reaching 6 in. long, sometimes prickly ; stipules **falcate**. Leaflets 3-6 in- long, nearly as broad as long (the terminal remfonn-**cordate**, **the** lateral unequal-sided, ovate-cordate or subacute **at the ba** **all** shortly acuminate, glabrous ; **petiohiles** |-| in. long ; stipels rounded, **gland-like**, persistent. Flowers in terminal horizontal racemes,

arover^d

in fascicles of 1-3 along **the rhaebis** ; peduncles stout, woody ; petC |-| in. long; bracts minute, **caducous**. Calyx **spathiform**, **h** :

subglabrous, entire at the **tip**, splitting to the base down

Corolla bright scarlet; standard lg| in. long, oblong-l<sup>r</sup>

half as long as the standard, four times as long as the h.n 3-B in. long, narrowed at both ends, slightly **torulose**, °a.

stalked, the stalk longer than the calyx. Seeds 1-3, lig. El. B. I. v. 2, p. **189** ; Grab. Cat. p. 54; Dalz. & Gibs. p. 70, *at\**. Fi.

8vlvat. t. 175 ; Talb. Trees, Bomb. p. 71 ; A Woodr. in Journ. Bomb.

Nat. v. 11 (1897) p. 424; Watt, **Diet.** Econ. Prod, v, 3, p. 270.—

—**Mowers**: Feb.-May.

O N ; Elephanto, *Graham*, *Woodr*<m\ **Matherau**, *H. M. Bird-wood*; deciduous forests, *Talhot*; S, Konkan, **common**, *Dalzett* § *Gibson*, DECOAN : Singhad hill near Poona, *Woodr*mc, **KASARA**: deciduous forests of IS, Kanara, *Tatbot*—**DIM**::: India (Western Peninsula),

3. **Erythriaa suberosa, Boxb. Hort. Bmg.** (1814) p. 53. A tree reaching 40-50 ft. high ; bark corky, deeply cracked ; branches numerous, crooked, spreading, armed with yellowish-white prickles |-J in. long, which fall off after the third year. Leaves usually unarmed, but sometimes with a few scattered prickles; petioles 4-8 in. long, often prickly ; stipules linear-lanceolfttej caducous. Leaflets pale, 4—6 in. long and broad (sometimes broader than Jong), the terminal rhomboid-ovate,

the lateral'obliquely and broadly ovate-cordate, all more or less glabrous above, densely downy with matted pubescence beneath ; petioles  $\wedge$  in. long; stipels rounded, glanduliform, persistent. Racemes 1-4, near the ends of the branchlets, densely capitate, 2-4 in. long ; peduncles short; pedicels  $\setminus$  in. long, in fascicles of 1-3, slender; bracts caducous ; bracteoles minute, subulate. Calyx  $\bullet$ £-§ in. long, more or less pubescent, soon becoming bilabiate. Corolla scarlet; standard  $1^{\wedge}$ -2 by  $|-|$  in.; keel-petals less than half as long as the standard, connate, much longer than the minute falcate wings. Pods stalked, 5-6 in. long, subterete, distinctly torulose. Seeds 2-5. El. B. I. v. 2, p. 189 ; Grab. Cat. p. 54; Dalz. & Gibs. p. 70; Talb. Trees, Bomb. p. 71; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. 3, p. 270.- -Flowers *t* Apr.-May.

DECCAN : Chakan (Poona districts), *Woodrow* !; Poona, *Wbodrow* !; Mawal districts, *Dcdzcll Sf Gibson*; Khandesh, *Graham*. GUJARAT: *Gibson ex Graham*.—DISTRIB. Throughout India.

#### 40. GRONA, Lour.

Prostrate or twining herbs. Leaves 1-foliolate; stipules very caducous. Leaflets stipellate. Flowers in axillary or subterminal racemes, solitary or fascicled along an obscurely nodiform rhachis ; bracts and bracteoles caducous. Calyx-tube campanulate; teeth longer than the tube, the 2 upper connate at the base or beyond the middle. Corolla exerted, its petals nearly equal in length ; standard obovate or suborbicular, with 2 small auricles at the base ; wings falcate, slightly adhering to the keel; keel obtuse, nearly straight. Stamens diadelphous ; anthers uniform. Ovary subsessile ; ovules numerous ; style long, filiform, beardless; stigma capitate. Pod linear, turgid, septate between the seeds.—DISTRIB. 4 species, of which 3 are Asiatic, the other a native of Cochin-China.

1. **Grona Dalzellii**, *Baker, in IlooJe. l. Fl. B. L v. 2* (1876) p. 191. Herbaceous twiner; stems filiform, hispid with brown retrorse hairs. Leaves 1-foliolate; petioles  $|-1|$  in. long, hairy; stipules ovate, acute, hairy, very caducous. Leaflets  $3-4^{\wedge}$  by 2-3 in., ovate, acute, mucronate, green and nearly glabrous above, glaucous and more or less hairy beneath, ciliate, base cordate; stipels  $^{\wedge}$  in. long, linear-subulate, hairy, persistent. Flowers in elongate dense racemes, arranged in clusters along a very hairy rhachis ; bracts  $^{\wedge}$  in. long, ovate, acuminate, deciduous, clothed on the back and margins with long reddish stiff hairs and enclosing in bud a small head of 1-3 subsessile flowers; bracteoles  $^{\wedge}$  in. long, narrowly ovate-lanceolate, densely hairy. Calyx  $\blacksquare$ £-£ in. long, densely clothed with long reddish-brown hairs ; teeth longer than the tube, the 2 upper connate for half their length, the 3 lower lanceolate, subequal. Corolla  $\setminus$  in. long, blue ; standard § in. broad, clawed and with 2 small auricles at the base. Pods 2-3 by  $-J-$  in., linear, straight, acuminate, clothed with brownish hairs. Seeds 8-10, orbicular, compressed. Woodr. in Journ. Bomb. Nat. V. 11 (1897) p. 424. *Galactia simplicifolia*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 209 ; Dalz. & Gibs. p. 69.—Flowers : Sept.-Oct.

A rare plant, confined to the hills. DECCAN : Iarisluihundragad, *Dalzd l § Gibson*;

Panchgani, *Cooke!*, *Woodrow !*; Mahableshwar, *Cooke I* S. M. COUNTRY : hills near Telavari, *Dalzell I*; Parva Ghat, *Stocks !*—PISTRIB. India (Bengal).

In\* the Flora of B. I. (*l. c.*) the plant is said to occur in the *plains* of the Konkan. This is an error. *Stocks*, *Dalzell*, *Woodrow*, and I have found it only at a considerable height above the level of the Konkan plains.

#### 41. GALACTIA, P. Br.

Prostrate or twining herbs or erect shrubs. Leaves pinnately 3-folio-late (rarely 1-5- or 7-foliolate); stipules small, deciduous. Leaflets stipellate. Flowers small or moderate-sized, in axillary racemes with slightly tumid nodes ; bracts and bracteoles minute. Calyx-tube short; teeth linear or lanceolate, entirely fused into one. Corolla slightly exserted, its petals nearly equal; keel obtuse, nearly straight. Stamens diadelphous ; anthers uniform. Ovary subsessile; ovules many; style filiform, beardless; stigma capitate. Pod linear, flattened.—DISTRIB. Chiefly American ; species about 45.

1. **Galactia tenuiflora**, *Wight # Am. Prodr.* ([1834]p. 200. An herbaceous twiner ; stems very slender, slightly pubescent or subglabrous. Leaves 3-foliolate; petioles f-1| in. long; stipules small, lanceolate, acute, caducous. Leaflets membranous, 1-lf by §-£ in., elliptic-oblong or oblong-lanceolate, obtuse or sometimes retuse, minutely apiculate, glabrous above, paler and more or less silky-pubescent beneath ; stipels minute, subulate. Flowers in elongate racemes, 3-6 in. long, in pairs from the slightly tumid nodes of the rhachis ; pedicels short, filiform; bracts small, caducous. Calyx i-|] in. long, slightly hairy ; teeth longer than the tube, lanceolate, acute. Corolla jj—£ in. long, bluish-purple. Pods 14-2 in. by \-^ in., slightly incurved, pubescent at first, afterwards glabrescent. Seeds 6-9. Fl. B. I. v. 2, p. 192.

Throughout the lower Deccan hills, not common.

VAB. 1. *minor*, Baker, in Hook. f. Fl. B. I. v. 2, p. 192. Stems filiform. Leaflets |-1 by \-| in., oblong, obtuse, apiculate, reticulated with whitish veins, glabrous above, thinly grey-silky beneath. Flowers smaller, in axillary short-peduncled racemes, solitary or twin on a filiform rhachis. Corolla \-| in. long, purple. Pods 1-1 \ in. long, glabrous or faintly puberulous, obliquely constricted between the seeds. Seeds 4-5. *G. tenuiflora*, var. /3, W. & A. Prodr. p. 206. *Leueoclictyon malvensis*, Dalz. & Gibs. p. 73.

KONKAN : *Stocks!*, *Dalzell!*; rocky ground in the Malwun district, *Dalzell* & *Gibson*.

VAR. 2. *villosa*, Baker, in Hook. f. Fl. B. I. v. 2, p. 192. Stems, leaves and pods densely grey-downy. Leaflets 1-1^ by |-| in., elliptic-oblong, obtuse, base rounded or subcordate. Flowers fewer and smaller than in the type. Pods li in. long, densely grey-downy. *Galactia villosa* (sp.), W. & A. Prodr.~p. 207. S. M. COUNTRY : hills N. of Belgaum, *Ritchie*, 143 !

VAR. 3. *latifolia*, Baker, in Hook. f. Fl. B. I. v. 2, p. 192. Stems and the leaves beneath densely pubescent. Leaflets subcoriaceous, roundish, H-2 by l|-li in. Racemes elongate. Calyx hoary, more deeply cleft.

IVONKAX : *Stocks!*



## 42. SPATHOLOBUS, liassk.

Large scandent shrubs, often tomentose. Leaves pinnately 3-foliolate ; stipules small. Leaflets stipellate. Flowers small, in ample terminal panicles extending into the axils of the upper leaves ; pedicels densely fasciated at the, tumid nodes ; bracts and bracteoles small. Calyx campanulate, the 2\*upper teeth connate into 1 entire or emarginate tooth. Corolla exserted; petals subequal; keel obtuse, nearly straight. Stamens diadelphous ; anthers uniform. Ovary sessile or stalked ; ovules 2 ; style incurved, beardless; stigma capitate. Pod sessile or stalked, broadly linear, often falcate, splitting round the single apical seed, the lowest part indehiscent.—DISTRIB. Tropical Asia; 1 species in Tropical Africa; species 10.

Pod tomentose, stalked .....	1. 8. <i>Boxburghii</i> .
Pod glabrous, sessile .....	2. <i>S. purpurcus</i> .

1. **Spatholobus Roxburghii**, *Benth. Pl. Jumjh.* (1851-55) p. 23b. A large climber; stem as thick as a man's leg ; young branches clothed with soft downy pubescence. Leaves 3-foliolate ; petioles 3-6 in. long, puberulous; stipules small, deciduous. Leaflets subcoriaceous, 0-8 by 4-5<sup>7</sup> in. (the terminal equal-sided, broadly elliptic or rhomboid-obovate narrowed at the base, the lateral leaflets inequilateral, the lower side much the larger and obtuse or truncate at the base, the upper side acute at the base), obtuse, subacute or shortly acuminate, glabrous above, finely silky or subglabrous beneath ; main nerves 0-8 pairs, slender, conspicuous on the underside; petiolules  $\frac{1}{2}$  in. long; stipules minute subulate. Flowers in large terminal densely pubescent panicles often reaching 12-18 in. long; pedicels  $\frac{1}{2}$  in. long, in close fascicles along the rachis; bracteoles  $\frac{1}{2}$  in. long, linear, velvety. Calyx  $\frac{1}{2}$  in. long, velvety ; teeth subequal in length, about equalling the tube, the 2 upper connate (except at the tip) into an oblong-triangular tooth, the 3 lower teeth lanceolate. Corolla bright red, exserted. Pods stalked, 3-0 in. long, usually  $\frac{1}{2}$ -1<sup>m</sup>- (sometimes reaching 2 in.) broad, equal in breadth or narrowed towards the top, the lower side more or less curved, clothed with ferruginous tomentum (which is thickest at the apex above the solitary seed), reticulately veined ; stalk about 1 in. long. *FL B. I. v. 2, p. 193 ; Talb. Trees, Bomb. p. 71; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. 0, part 3, p. 319. Butta parvijiora, Roxb. Hort. Beug. p. 53; Grah. Cat. p. 54; JDalz. & G-ibs. p. 71; Wight, Icon. t. 210.—1 lowers: Jan.-Feb. VEEN. Phalsan.*

KONKAN : *Stocks!*; Mira hills near Pen and hilly places S. of Panwell, *DaLell & Gibson*; Nagotna, *Graham*. DECCAN : Peiut and Phaltan, *Woodroio*. KANAKA : throughout the forests of N. Kanara, *Talbot*.

This climber does much damage to teak and other timber-trees in N. Kanara (*Talbot*).

The variety *ylatycarpus* (Baker, in *Fl. B. I. 1. e.*) with broad pods conspicuously narrowed at the apex cannot be maintained. Prain (*Journ. As. Soc. Beng. v. 6(3 [1808] p. 412)*) points out that there is no difference between the plants bearing the broad and the narrower pods and that it is, at times, possible to collect both " varieties " on different parts of one plant.

2. **Spatholobus purpureus**, *Benth. ex Baker, hi Hook. l. FL B. l. v. 2 (1876) p. 194*. A lofty climber. Leaves 3-foliolate ; petioles 1- $\frac{1}{2}$ -8 in. long; stipules small, caducous. Leaflets subcoriaceous, 3-5 by 1- $\frac{1}{2}$ -2- $\frac{1}{2}$  in. (the terminal the largest and equilateral, the lateral unequal-

sided), oblong-elliptic, shortly acuminate, glabrous on both surfaces, base rounded; main nerves 6-8 pairs ; petiolules f\~j in. long. Flowers numerous, in terminal and axillary leafy much-branched panicles; pedicels JV in. long, filiform ; bracts and bracteoles linear, caducous. Calyx rV~8 \*n- l°ng> finely pubescent; teeth about ^ as long as the tube, oblong, obtuse, the 2 upper connate, except at the tip. Corolla ^-4- in. long, purple; standard | in. broad, broadly obovate, veined and with a long claw. Pods sessile, 4 in. long, f in. broad at the widest part, Y~| i^n\* broad at the thickened apex, reticulately veined, glabrous. Fl. B. I. v. 2, p. 194; Talb. Trees, Bomb. p. 71: Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424; Prain, in Journ. As. Soe. Beng. v. 66 (1898) p. 414.—Flowers : Dec.-Feb.

Rare. KONKAN: *Stocks I* KANAKA: Supa Qhats, *Talbot*; Diggi (N. Kanara), *Talbot*, 1630 !; Kanara, *Stocks*:—DISTRIB. Apparently endemic.

43. **BUTEA**, Eoxb.

Trees or large climbing shrubs. Leaves pinnately 3-foliolate ; stipules small, caducous. Leaflets stipellate. Flowers large, showy, in axillary or terminal racemes or panicles; pedicels densely fascicled from the nodes of the rhachis; bracts and bracteoles narrow, caducous. Calyx broadly campanulate; teeth short, deltoid. Corolla much exserted ; standard ovale, acute, recurved, inappendiculate ; keel much curved, acute, equalling the standard. Stamens diadelphous : anthers uniform. Ovary sessile or shortly stalked; ovules 2; style elongate, incurv beardless; stigma terminal, very small or truncate. Pod firm, oblong or broadly linear, splitting round the single apical seed, the lowest pa; indehiscent.—DISTRIB. Tropical Asia ; species 3.

- An erect tree..... 1. *B. frondo&a.*
- A climbing shrub ..... 2. *B. sivperba.*

1. **Butea frondosa**, *Konig, ex lloxb. As. Res. v. 3 (1792) p. 469 ; Cor. PL v. 1, p. 21, t. 21.* An erect tre\* 40-50 ft. high, with crooked unk and irregular branches ; bark rough, ash-colored ; .young parts omentose or downy. Leaves 3-foliolate; petioles 4-6 in. long; stipules inear-lanceolate, deciduous. Leaflets coriaceous (the terminal 4-8 in. long and about as broad as long, broadly obovate from a cuneate base, le lateral smaller, 4-6 by 3-4 in., obliquely rounded at the base, in- quilateral, the lower side the larger), all obtuse, glabrous above when Id, finely silky and conspicuously reticulately veined beneath; petiolules in. long, stout; stipeta subulate, deciduous. Flowers large, in rigid icemes 6 in. long, 3 flowers together from the tumid nodes of the dark ive-green velvety rhachis ; pedicels about twice as long as the calyx, Hisely brown-velvety; bracts and bracteoles small, deciduous. Calyx in. long, dark olive-green, densely velvety outside, clothed with silky ,irs within; teeth short, the 2 upper connate, the 3 lower equal, ltoid. Corolla l|-2 in. long, clothed outside with siiky silvery hairs, ange or salmon-colored ;\* standard 1 in. broad; keel semicircular, ;aked, veined. Pods stalked, 5-8 by 1-2 in., thickened at the sutures, ticulately veined, argenteo-canescens; stalk f in. long. Fl. B. 1. v. 2,

194; Grah. Cat. p. 54; Dalz. & Gibs. p. 71; Bedd. Flor. Sylvat. 1.176;  
:im. Fl. Cevl. v. 2, p. 66; Talb. Trees, Bomb. p. 72; Woodr. in Journ.

2B 2

Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. 1, p. 548.  
—Flowers: Feb.-Mar. VERN. *Palas*.

Throughout the Presidency, common. KONKAN : *Graham*-, Tansa, *Cookel* DECCAN :  
Khandesh, *Graham*; Khandala, *Stocks* GUJARAT: *Graham*, *Dalzell* & *Gibson*.—  
DISTRIBUTION. Throughout India; Ceylon.

When in full flower this tree is a conspicuous and handsome object throughout the  
Indian jungles. A gum called *Bengal Kino* is obtained from the bark and the flowers  
furnish a brilliant but fleeting dye. See Watt, Diet. Econ. Prod. 1. c.

2. ***Butea superba*, Roxh. Cor. PI. v. 1 (1795) p. 23, t. 22.** A  
gigantic climber; stem as thick as a man's leg. Terminal leaflet 6-15 in.  
long. Flowers bright orange, rather larger than those in the preceding  
species; pedicels thrice as long as the calyx. In other respects exactly  
resembles *Butea frondosa*. FL B. I. v. 2, p. 195; Grab. Cat. p. 54;  
Dalz. & Gibs. p. 71; Talb. Trees, Bomb. p. 72; Woodr. in Journ.  
Bomb. Nat. v. 11 (1897) p. 424; Watt, Diet. Econ. Prod. v. 1, p. 556.  
—Flowers: Feb.-Mar. VEEN. *Palas-vel*.

KONKAN: forests of N. Konkau, *Dalzell* & *Gibson*, *Talbot*. KANARA : *Woodrow*.

*Butea Gribsonii*, Grab. Cat. Bo. PL p. 55, which, under the vernacular  
name of *Teweas*, Graham describes as having white flowers like the  
*Karanj* (*Pongamia glabra*) and as being common about Junar and to be  
met with at Telloo on the road from Poona to Mahableshwar. I can  
find no record of. It may possibly be *Ougeinia dalbergioides* Benth.

#### 44. CANAVALIA, Adans.

Climbing or prostrate herbs. Leaves pinnately 3-foliolate; stipules  
usually small. Leaflets stipellate. Flowers rather large and showy, in  
axillary racemes; rachis nodiform; bracts minute; bracteoles small,  
caducous. Calyx deep, the limb 2-lipped, the upper lip projecting,  
entire or emarginate, the lower lip shortly 3-toothed. Corolla much  
exserted; standard large, suborbicular; wings narrow, equalling the in-  
curved obtuse or obtusely-rostrate keel. Stamens monadelphous; anther  
uniform. Ovary obscurely stalked; ovules many; style incurved,  
beardless; stigma terminal. Pod large, linear or oblong, compressed or  
turgid, with a distinct rib on each valve near the upper suture.—DISTRIBUTION.  
Warmer regions of both hemispheres; species about 12.

Stipules large, oblong, obtuse; bracteoles large ..... 1. *C. Stocknu*.

Stipules small, triangular; bracteoles minute.

Racemes many-flowered; pods many-seeded, 1½-2 in. broad ... 2. *C. ensifonnii*

Racemes few-flowered; pods few-seeded, ¾-1 in. broad ..... 3. *C. lineata*.

]. ***Canavalia Stocksii*, Dalzell, in Dalzell & Gibs. Bo. FL (1861 p.**  
69. A large twiner; stems very long, terete, smooth. Leaves large  
petioles 6-8 in. long; stipules ½-1 in. long, oblong, obtuse, nerved.  
Leaflets thinly membranous, 5-8 in. long, nearly as broad as long (the  
terminal rhomboid-obovate, the lateral broadly ovate or suborbicular  
glabrous, reticulately veined; the 2 basal nerves opposite, conspicuous  
petiolules ½ in. long, hairy; stipules lauceolate. Flowers several at the  
apex of an angular naked peduncle 12-15 in. long; pedicels short  
bracteoles elliptic-oblong, ½ by ¼ in., veined, concealing the flowers in  
bud. Calyx 5-angled, 5-veined, glabrous; teeth a little shorter than the  
tube, the upper notched, the lower deltoid, ciliate. Corolla 1½ in.

long, bluish-purple, veined. Pods not seen. Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424. *C. ensiformis*, var. *turgida*, Baker, in Hook. f. Fl. B. I. v. 2, p. 196.—Flowers: 'Oct.

This is certainly a distinct species and not a variety of *C. emiformis* as Baker has it in Fl. B. I. (*I. c.*). The var. *turgida* to which it is there referred has been restored to the rank of a species by Pram (Journ. As. Soc. Beng. v. 66 [1898] p. 417) and is a littoral species, whereas *C. StocJesii* is apparently confined to the hills.

Very rare. DECCAN : Badgi hill, Brahminwara range, Dalzell & Gibson ; hills near Lanoli, Krishna! ; Mahableshwar, western slope, Cookel, Woodrow !—DTSTRW. Apparently endemic.

2. **Canavalia ensiformis**, DC. Prodr. v. 2 (1825) p. 404. A stout perennial or biennial twiner ; stems and branches glabrous.

Leaves

10-12 in. long; petioles 6 in. long, glabrous; stipules triangular,

deciduous. Leaflets membranous, 3-6 by 2-4 in., ovate, acute or

shortly acuminate, apiculate, glabrous on both surfaces or nearly so, base rounded ; petiolules  $\frac{1}{2}$  in. long ; stipels  $\frac{1}{2}$  in. long, subulate,

caducous. Flowers in lax 12-20-flowered curved axillary racemes

3-8 in. long ; pedicels  $\frac{1}{2}$  in. long, usually in pairs from the swollen nodes; bracteoles minute, ovate, caducous. Calyx  $\frac{1}{2}$ - $\frac{1}{4}$  in. long,

glabrous or faintly pubescent, the upper lip oblong, notched,  $\frac{1}{2}$  the

length-of the tube. Corolla 1-1 $\frac{1}{2}$  in. long, lilac or white. Pods 6-12 in.

(or more) long, 1-2 in. wide, slightly incurved, shortly pointed, glabrescent, strongly 3-keeled. Seeds 8-20, reddish-brown or white, about

1 in. long. Fl. B. I. v. 2, p. 195; Trim. Fl. Ceyl. v. 2, p. 67; Talb.

Trees, Bomb. p. 72 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 424 ; Watt, Diet. Econ. Prod. v. 2, p. 97. *C. gladiata*, DC. Prodr. v. 2,

p. 404; Grah. Cat. p. 52 ; Dalz. & Gibs. Suppl. p. 23.—Flowers : Aug.-Oct. VERN. *Abai*.

Commonly cultivated, but doubtfully wild. KONKAN : near Bhowndy, Edgeworth ! DECCAN : Bowdhan near Poona, Bhiva ! ; Deccan hills widely, Woodrow.

The tender pods are used as a vegetable and the seeds are largely eaten. The plant is commonly known as the *Sword-bean* or *Patagonian bean*. See Watt, Diet. Econ. Prod. 1. c.

VAR. *virosa*-, Baker, in Hook. f. Fl. B. I. v. 2, p. 196. Leaflets smaller, obovate or obovate-oblong, glabrous. Flowers smaller ; rachis of raceme more densely pubescent. Pods 2-4 by 1-1 $\frac{1}{2}$  in. Seeds 4-6. *O. virosa* (sp.), W. & A. Prodr. p. 253 ; Dalz. & Gibs. p. 69.—VERN. *Gowara*.

KONKAN : *Stocks I* S. M. COUNTRY : Belgaum districts, Ritchie, 201! The seeds are regarded as poisonous by the natives, who say that they produce insanity if eaten.

3. **Canavalia lineata**, DC. Prodr. v. 2 (1825) p. 404. Perennial;

stems spreading, prostrate, sometimes twining, glabrous. Leaves  
3-  
foliolate; petioles 3-5 in. long; stipules  $y^1$  in. long,  
triangular,  
caducous. Leaflets subcoriaceous or thickly membranous, 2-3 in.  
long,  
nearly as broad as long, broadly ovate, obovate or orbicular, sometimes  
emarginate, glabrous, base cuneate; petiolules  $\frac{1}{2}$  in. long; stipels  $\frac{1}{2}$  in.  
long, soon deciduous. Flowers in 4-8-flowered racemes;  
peduncles  
10-15 in. long; pedicels  $\frac{1}{2}$  in. long, solitary or twin from the tumid  
nodes of the rhachis; bracteoles minute, ovate, caducous. Calyx  
fin.

long, pubescent, reticulately veined ; upper lip subentire, | the length of *the* tube. Corolla 1 in. long, violet; standard orbicular, eraarginate. Pods few, 3-5 by j-f in., linear-oblong, shortly beaked, nearly straight, glabrous. Seeds 4-6, dark-brown, over | in. long. King, in Journ. As. Soc. Beng. v. 66 (1898) p. 63; Prain, in Journ. As. Soc. Beng. v. 66 (1898) p. 418. *O. obtusifolia*, Baker, in Hook. f. Fl. B. I. v. 2, p. 196 (*not* of DC.); Cleghorn, Madr. Journ. new series, v. 1, t. 4; Trim. Fl. Ceyl. v. 2, p. 68 ; Talb. Trees, Bomb. p. 72; Watt, Diet. Econ. Prod. v. 2, p. 98.—Flowers : Mar.

A littoral species found sparingly along the sandy shores of the Konkan and N. Kanara.—DISTIB. India (sea-coasts); Malaya, Ceylon, China, Japan, Polynesia, Australia.

#### 45. PUERARIA, DC.

Twining herbs or shrubs. Leaves pinnately 3-foliolate; stipules herbaceous, produced below their insertion in some species. Leaflets entire or sinuately 3-lobed, stipellate. Flowers in long often compound racemes ; pedicels densely fascicled along a nodiform rhachis ; bracts and bracteoles small. Calyx-teeth long or short, the 2 upper connate into one, which is entire or 2-dentate. " Corolla exserted; standard obovate or suborbicular with inflexed auricles at the base, equalling in length the obtuse wings and keel. Stamens monadelphous ; anthers uniform. Ovary sessile; ovules many ; style filiform, inflexed above, beardless; stigma small capitate. Pod linear, more or less flattened.—DISTRIB. Tropical Asia and Japan ; species 10.

1. **Pueraria tuberosa**, DC. *Prodr.* v. 2 (1825) p. 240. A large twiner; root tuberous; stems shrubby. Leaves 3-foliolate; petioles 4-6 in. long, more or less pubescent; stipules -J- in. long, ovate-oblong, cordate. Leaflets subcoriaceous, 5-8 by 4|-7 in. (the terminal broadly ovate, acuminate, equal-sided, ctmeate at the base, the lateral ovate-oblong, inequilateral, truncate at the base), glabrescent above, silky beneath ; petiolules y\$-\ i<sup>n</sup>- 1<sup>o</sup>n© 5 stipels small, subulate. Flowers in lax (sometimes paniced) leafless racemes, 6-12 in. long; pedicels Y2—a in. long, silky-pubescent, fascicled along a more or less pubescent rhachis; bracteoles τ^ in. long, oblong, silky. Calyx [-;] in. long, densely silky; teeth shorter than the tube, oblong, obtuse, ciliate. Corolla bluish; standard ^ in. long and as broad as long, spurred. Pods 2-3 in. long, membranous, flat, constricted between the seeds, clothed with long silky bristly brown hairs. Seeds 3-6. Fl. B. I. v. 2; p. 197; Dalz. & Gibs. p. 67 ;'Wight, Icon. t. 412 ; Talb. Trees, Bomb. p. 72 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425 ; Watt, Diet. Econ. Prod. v. 6, part 1, p. 363.—Flowers : Feb.-Apr. VERN. *Ddri*.

KONKAN: *Law\*; Oorun, *Stocks*]; Karanja hill, *Dalzell* §• *Gibson*; Vingorla, *Nairne*. GUJARAT : Dang jungles, *Woodrow*. KANARA : N. Kanara in open situations, *Talbot*.

#### 46. PHASEOLUS, Linn.

Herbs rarely woody at the base, twining, prostrate or suberect. Leaves pinnately 3-foliolate (very rarely 1-foliolate) ; stipules persistent, striate. Leaflets stipellate. Flowers in axillary racemes; rhachis nodiform ; bracts usually caducous : bracteoies often broader than the

bracts and more persistent. Calyx campanulate, the 2 upper connate or free. Corolla much exerted; standard suborbicular; wings obovate (rarely oblong); keel produced into a very long beak which forms a complete or nearly complete spiral. Stamens diadelphous; anthers uniform. Ovary sessile; ovules many; style within the beak of the keel and twisted with it, usually bearded down the side below the very oblique stigma. Pod linear or falcate, subterete or compressed, 2-valved, more or less septate between the seeds.—DISTRIB. Throughout the warmer regions of the globe, many species widely cultivated; species about 60.

Stipules basifixed.

- |  |                            |
|--|----------------------------|
| A shrubby suberect plant .....                               | 1. <i>P. semierectus</i> . |
| Stipules inserted above the base.                            |                            |
| An erect herb with thick stems .....                         | 2. <i>P. grandis</i> .     |
| Prostrate or twining herbs with slender stems.               |                            |
| Terminal leaflet deeply 3-lobed, the middle lobe obtuse ...  | 3. <i>P. trilobus</i> .    |
| Terminal leaflet not or obscurely lobed, acute or acuminate. |                            |
| Stems and pod glabrous .....                                 | 4. <i>P. Dalzellii</i>     |
| Stems and pod densely hairy .....                            | 5. <i>P. sublobatus</i> .  |

1. **Phaseolus semierectus**, *Linn. Mantiss.* (1767) p. 100. Annual, 2-3 ft. high, suberect, somewhat shrubby; stems terete; branches clothed with long deflexed deciduous hairs. Leaves 3-foliolate; petioles 1-1½ in. long, hairy; stipules basifixed, conspicuous, ½-¾ in. long, lanceolate-subulate. Leaflets membranous, 1½-2½ by ½-1½ in., oblong-lanceolate, acute, minutely apiculate, glabrous on both surfaces when mature, readily disarticulating (the terminal leaflets slightly larger than the lateral), base cuneate; petiolules ¼-½ in. long; stipules ¼-½ in. long, subulate. Flowers in spicate racemes reaching 6 in. long; peduncles 0-12 in. long, terete, pubescent; pedicels very short, usually in pairs along a pubescent rachis; bracts ½ in. long, linear-subulate; bracteoles lanceolate, rather more than half as long as the calyx. Calyx split open by the pod, ½ in. long, pubescent outside; teeth shorter than the tube, triangular at the base, cristate. Corolla ½ in. long, purple. Pods 3-4 by ½ in., nearly cylindrical, sharply beaked, silvery-pubescent when young, nearly glabrous when mature. Seeds about 20, truncate at the ends, dark-brown. PL B. i. v. 2, p. 201; Trim. Fl. Ceyl. v. 2, p. 70; Woodr. in Joarn. Bomb. Nat. v. 11 (1897) p. 425. *P. psoraleoides*, W. & A. Prodr. p. 244; Wight, Icon. t. 249.—Flowers: Oct.

S[ND]: Hyderabad, *Woodrow*, doubtfully wild. The plant is a native of Central and South America and of the West Indies.—It has no doubt been introduced.

2. **Phaseolus grandis**, *Dalzell, in Dalz. & Gibs. Bo. Fl.* (1801) p. 72. Erect, 2-5 ft. high; stem herbaceous, as thick as the finger, 5-angled, glabrous or with a few appressed bristly hairs. Leaves 3-foliolate; petioles 1-2 in. long; stipules large, foliaceous, variable in size, sometimes reaching 2 by 1½ in., attached above the base, obovate or obovate-oblong, obtuse, ciliate, cordate at the base. Leaflets variable in shape, 3-4 in. long (the terminal often 3-lobed and as broad as long,



the lateral frequently 2-lobed the lower lobe the smaller, or sometimes 3-lobed or entire), all sparsely strigose on both surfaces with appressed bristly hairs, base cuneate; petiolules  $\frac{1}{2}$ ~8 in. long; stipels  $\frac{1}{2}$ ~1 in. long, ovate-cuspidate. Flowers in copious close racemes ; peduncle

6-9 in. long, clothed with brownish-black retrorse appressed bristly hairs ; pedicels short; bracts broadly ovate, acute, deciduous ; bracteoles  $\frac{1}{2}$  in. long, oblong or obovate-oblong, obtuse, ciliate, veined, concealing the flower in bud. Calyx  $\frac{1}{2}$  in. long, clothed outside with small blackish hairs ; teeth short, deltoid. Corolla  $\frac{1}{2}$  in. long, pale-yellow. Pods 2-3 in. long, cylindric, about as thick as a goose-quill, septate between the seeds, clothed with appressed black or grey bristles. Seeds 8-10, subcylindric, truncate at the ends,  $\frac{1}{2}$  in. long, dark-brown, rusty-pubescent. Fl. B. I. v. 2, p. 202: Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425.

A very rare plant, found only on Konkan and Deccan hills. KONKAN : highest Ghats east of Bombay, *Dalzell* DECCAN: hills, *Stocks I*; Panchgani, *Woodrowl*; hills near Poona, *Cooke* !

3 **Phaseolus trilobus**, *Ait. Hort. Kew.* ed. 1, v. 3 (1789) p.

30.

> aalor perennial; stems numerous from a woody rootstock, 2-3 ft.

,ijg, prostrate, wiry, slender, not at all twining, glabrous or more or less hairy. Leaves 3-foliolate, petioles  $\frac{1}{2}$ -3 in. long, grooved, glabrous or with a few scattered hairs ; stipules variable in length,  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, ovate-oblong, subacute, attached above the base, ciliate. Leaflets  $\frac{1}{2}$ -1 in. long, usually as broad as long, commonly 3-lobed (the middle lobe the largest and oblong, broadly spatulate, obtuse, the lateral lobes often oblong or more or less spatulate, obtuse or subacute), all pale-green, membranous, glabrous or with a few hairs on the nerves, base subacute; petiolules  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, hairy: stipels small, lanceolate, acute. Flowers in subcapitate few-flowered racemes; peduncles 4-9 in. long, glabrous or sparsely hairy; pedicels  $\frac{1}{2}$  in. long; bracts ovate, acute, deciduous; bracteoles beneath the calyx  $\frac{1}{2}$  in. long, linear-lanceolate, ciliate, deciduous. Calyx  $\frac{1}{2}$  in. long, glabrous ; teeth minute, deltoid. Corolla  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, yellow. Pods 1-2 in. long by  $\frac{1}{2}$  in. in diam., straight, subcylindric, glabrous or sparingly hairy, slightly recurved. Seeds 6-12. Fl. B. I. v. 2, p. 201; Grah. Cat. p. 52; Dalz. & Gibs. p. 71; Wight, Icon. t. 94 ; Trim. Fl. Ceyl. v. 2, p. 71; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425; Watt, Diet. Econ. Prod. v. 6, part 1, p. 194.—Flowers : Oct. YEBN. *Mulcni*; *Jangli-math*.

The leaflets vary much in form and size. The wild perennial form has much more deeply lobed leaflets than the annual cultivated one. Lobed and entire leaflets may, in the latter, often be found on the same plant.

Very common throughout the Presidency, especially on the borders of cultivated fields. KONKAN: *Stocks!* DECCAN: Poona, *Cooke I*, *Woodrowl*; Dongergaon near Ahinednagar, *Cooke* ! GUJARAT : *Woodrow* ! SIND : *Stocks!*; Jemadar ka Landa near Karachi, *Stocks!*

Occasionally cultivated as a mixed crop for fodder purposes. See Watt, Diet. Econ. Prod. 1. c.

4. **Phaseolus Dalzellii**, *T. Cooke*, Herbaceous, twining or creeping and rooting in the absence of support; stems filiform, striate, glabrous. Leaves 3-foliolate ; petioles  $\frac{1}{2}$ -1 in. long, glabrous ; stipules  $\frac{1}{2}$  in. long, attached above the base. Leaflets membranous,  $\frac{1}{2}$ -2 by  $\frac{1}{2}$ -1 in., ovate or rhomboid-ovate with a tendency to become lobate (the terminal the largest, equal-sided, the lateral inequilateral), all acuminate more or less hairy on both surfaces, green above, pale beneath ; petioles  $\frac{1}{2}$  in. long; stipels minute, lanceolate. [Flowers in

capitate

2-3-flowered racemes; peduncles filiform, 1-2 in. long; pedicels short; bracteoles 4- in. long, linear-subulate. Calyx  $\frac{1}{2}$  in. long, glabrous; teeth shorter than the-tube, the 2 upper connate except at the tip, the 2 lateral triangular, obtuse, the lowest longer, lanceolate. Corolla 1 in. long, yellow. Pods 1-J--2 $\frac{1}{2}$  in. long, subcylindric, slightly recurved, beaked, quite glabrous. Seeds 8-10, subcylindric, truncate, smooth, dark-brown. *Phaseolus pauciflorus*, Dalz. in Kew Journ. v. 3 (1851) p. 209; Fl. B. I. v. 2, p. 202; Dalz. & Gibs. p. 72; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425.—Flowers: Sept.

The name *P. pauciflorus* having been given in 1838 by Bentham (Ann. Vieu. Mus. v. 2 [1840] p. 140) to a Texan plant, has priority over that given to a different plant in 1851 by Dalzell. I have therefore changed the name to *P. Dalzellii*.

KONKAN: *Stocks I, Dalzell I*

5. ***Phaseolus sublobatus***, *Uoxh. Hort. Beng.* (1814) p. 54. A perennial herb, twining when it meets support, sometimes suberect; stems slender, clothed with spreading or deflexed reddish-brown hairs. •Leaves 3-f'oliolate; petioles 2-3 in. long; stipules 1- in. long, ovate-oblong, acute, hairy, ciliate, attached a little below the middle. Leaflets 1 £-3 by f-2 in. (the terminal the larger and ovate or rhomboid-ovate, equal-sided with cuneate base, the lateral ovate-acute, inequilateral, with rounded or truncate base), all acute, silky-hairy on both sides, occasionally somewhat 3-lobed, conspicuously 3-nerved from the base; petioles  $\frac{1}{2}$  in. long, hairy; stipels linear-subulate. Flowers in short close 6-12-flowered racemes with swollen nodes; peduncles 2-5 in. long, hairy; pedicels very short; bracts  $\frac{1}{2}$  in. long, ovate-oblong, acute, deciduous; bracteoles  $\frac{1}{2}$  in. long, linear-subulate, ciliate. Calyx  $\frac{1}{2}$  in. long, glabrous; teeth shorter than the tube, deltoid. Corolla  $\frac{1}{2}$ -1 in. long, yellow. Pods 1|-2| in. long, cylindric, straight, densely clothed with reddish-brown hair. Seeds 8-12, oblong with truncate ends, about 1 in. long, dark-brown. Prain, in Journ. As. Soc. Beng. v. 6(> (1898) p. 423. *P. trinervius*, Heyne, in Wall. Cat. (1828) 5003; Fl. B. I. v. 2, p. 203; Grah. Cat. p. 51; Dalz. & Gibs. p. 71; Trim. Fl. Ceyl. v. 2, p. 72; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425; Watt, Diet. Econ. Prod. v. 6, part 1, p. 194.—Flowers: Aug.-Oct.

KONKAN: Neral, *Bhiva*! DECCAN: hills in the Deccan, *Woodrow*!; Mahableswar, *Cooke*!, *Woodrow*!; Bowdhan near Poona, *Cooke*! S. M. COUNTRY: Londa, *Cooke I*—DISTRIB. India (from Eehar to S. India); Ceylon.

Very closely allied to *P. radiatus*, Linn., the cultivated *Mug*, of which it may be the wild form.

VAR. *setidosus*, Prain, in Journ. As. Soc. Beng. v. 66 (1898) p. 423. Hairs on the stems and pods grey. Flowers small. *P. setulosus* (sp.), Dalz. in Kew Journ. v. 2 (1850) p. 33; Dalz. & Gibs. p. 72.

Kcnkan and Western Deccan only.

The following plants of the genus are cultivated throughout the Presidency:—

*PhaseoluA lunulatus*, Linn. Sp. Pl. (17f 3) p. 724. The *Lima Bean*, widely cultivated as a vegetable. A tall, twining biennial with greenish-yellow flowers and pods 2-3 by about f in., a native of Brazil. The

XLVIII. LEGUMINOSAE.

seeds of the best kinds are pure ivory-white and have, when boiled somewhat the flavor of a roasted chestnut. Fl. B I v 2 n Zl, Grah. Cat. p. 51 • Firminger, Man. Gard. ed. 3, p. 153 ; Woodrin'

part 1, p. 186.—VEBJT. *Lohiya*.

*Phaseolus vulgaris*, Linn. Sp. Pl. (1753) supposed by DeCandolle to be<sup>1</sup>, native of India. The dwarf kinds (*P. n* and yield well, particularly if irrigation is available found the runner (*P. JulUHhJ*, Willd. , ^^ to fruit satisfactorily in the Deccan. Fl. B I v 2

**ns.**

p. 51; Dalz. & Gibs. Suppl p. 23. Wood/in To, ^ (1897) p. 425; Watt, DLI Icon PrS. v 6 part<sup>TM</sup> p 7 TM

Ind v 3, p 297; WatC Diet. VAR.2. ^^ Prain, in Journ. <sup>422</sup>

As. Soc. Beng. v G6 HSQ^ ,, d99 r> i-

2, ,% : Watt, B^Ec^^ocTV^tT^ the most important of the pulses cultivated in India.-W\!TP

(Joan., A. Soc. Beng. v. h [1898]%. -^ fi qu?te°Sl up Z^Sf\* \*\*" n<sup>PhZe°!US aTMffoliu</sup>s> Jacquin, Obs. Bot. pars 3 ri 768) u a \* The Jfot or *MatJa*, extensively cultivated throughout thJp '-A' espedallym the Deccan and Gujarat. SteSs^SeJ 1 2^ Leaflets cut mto « narrow lobes/ Flowers yellot? in 'sho"rt

long-peduncled racemes. Pods 1-2 in. long. Fl. B. I. v. 2, p. 202 ; Grah. Cat. p. 52- Woodr. in Jouni. Bomb. Nat. v. 11 (1897) p. 425 ; Watt, Diet, Econ. Prod. v. 0, part 1, p. 182.

This, though a native of India, cannot be called wild in the Bombay Presidency. It is very like *P. trilobus*, Ait., from which it is hardly separable as\* a species. It is a very important crop in Bombay, and is sown in June or July and harvested in November. See Watt, Diet. Ecdn. Prod. 1. c.

#### 47. VIGNA, Savi.

Twining or prostrate, rarely suberect herbs. Leaves pinnately 3-foliolate; stipules basifixed, or rarely produced below their insertion. Leaflets stipellate. Flowers in racemes at the upper part of an axillary peduncle; pedicels fascicled on the nodiform rhachis ; bracts and bracteoles small, caducous. Calyx-teeth distinct or the 2 upper connate. Corolla much exerted; standard orbicular, auricled at the base; wings shorter than the standard ; keel equalling the wings, incurved, not beaked, or prolonged into an incurved beak not making a perfect spiral. Stamens diadelphous ; anthers uniform. Ovary sessile; ovules many; style filiform or thickened or dilated above, bearded along the inner face; stigma very oblique. Pod linear, straight or incurved, subterete, septate between the seeds.—DISTRIB. Warm regions of the world; species 40-50.

1. *Vigna capensis*, Walp. in *Linnaea*, v. 13 (1839) p. 533. Perennial, twining; stems subglabrous when mature; root fusiform. Leaves 3-foliolate; petioles 1-2 in. long, clothed with brownish deflexed hairs ; stipules 1 in. long, basifixed, oblong-lanceolate, acute, hairy. Leaflets 2-4 by 1-1½ in., 3-nerved from the base, ovate, acute or acuminate, incurved (the lateral unequal-sided and subtruncate at the base), sparsely clothed on both sides with short appressed hairs ; petioles ½ in. long, hairy; stipules filiform. Flowers 2-4, crowded at the ends of axillary peduncles which are longer than the leaves ; pedicels very short; bracteoles beneath the calyx linear, acute. Calyx nearly ½ in. long, pubescent, nerved ; teeth longer than the tube, linear, acute, from a triangular base, the 2 upper connate below the middle. Corolla ½-1 in. long, rose-colored : standard more than 1 in. broad, emarginate, auricled, veined ; keel obliquely curved into ½ of a circle, beaked. Pods 3-4 by 4-5 in., subterete, straight, clothed when young with brown shining hairs. Seeds 10-15, subreniform, compressed, ½ in. long, black. *Vigna vexillata*, A. Rich. in Sagra, Hist. Cub. Bor. (1845) p. 440; Fl. B. I. v. 2, p. 206; Trim. Fl. Ceyl. v. 2, p. 74; Woodr. in Jouni. Bomb. Nat. v. 11 (1897) p. 425. *Phaseolus sepiarius*, Dalz. in Kew Journ. v. 2 (1850) p. 33; Dalz. & Gibs. p. 72.—Flowers : Sept.-Oct. VERN. *Ilalunda*.

The name *V. capensis* was published by Walpers in 1839 and is prior to that of *V. vexillata* which dates from 1845.

KONKAN: *Stocks*, *Dalzell* DECCAN: Mahableshwar, *Cooke*, *Wood-row I*; Paneh-gani, *Cooke I*

Very common at Mahableshwar, where it is, though not fragrant, called the *Indv Sweet Pea*.—DISTRIB. India (Himalayas and hills of W. Peninsula); Ceylon, O Australia and the Tropics generally.

*Vigna Catjangj*, Walp. in *Linnaea*, v. 13 (1839) p. 533, a suberect annual, cultivated, though not very extensively, in the Bombay Presidency, but not found wild. Its pods vary from 4 in. to 2 ft. in length, and are less than 1 in. broad. The variety *sinensis* (*Vigna sinensis* [sp.J *Endl.*) is a twining plant with larger leaves. *El. B.* 1. v. 2, p. 205; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 425 ; *Watt, Diet, Econ. Prod.* v. 6, part 4, p. 236.—VERN. *Chavli*.

#### 48. CLITORIA, Linn.

Herbs or shrubs erect or climbing. Leaves pinnate, 3-raany-foliolate ; stipules persistent, striate. Leaflets stipellate. Flowers showy, axillary, solitary, fascicled or racemose ; bracts persistent, stipule-like ; bracteoles usually larger, striate, persistent. Calyx tubular; the 2 upper teeth subconnate. "Corolla much exerted ; standard large, erect, emarginate, narrowed and not appendiculate at the base : wings falcate-oblong, spreading, adhering to the middle of the keel; keel shorter than the wings, incurved, acute. Stamens monadelphous or diadelphous; anthers uniform. Ovary stalked ; ovules many ; style elongate, incurved, more or less flattened, bearded along the inner side. Pod stalked, linear, compressed or turgid.—DISTRIB. Warmer regions of the world; species 27.

Twining ; sterna terete ; flowers solitary ..... 1. *C.*

*Ternatea*.

Erect; stems angular ; flowers in pairs ..... 2. *C. hijlora*.

1. **Clitoria Ternatea**, *Linn. Sp. Pl.* (1753) p. 753. A perennial twining herb; stems terete, more or less pubescent. Leaves imparipinnate ; petioles f-1 in. long ; stipules ^ in. long, linear, acute. Leaflets 5-7, subcoriaceous, 1-2 by ^-1^in., elliptic-oblong, obtuse, glabrous or with a few short appressed hairs, base obtuse or acute; stipels filiform. Flowers axillary, solitary; pedicels 3-J in. long; bracts small, linear ; bracteoles \- in. long, roundish, obtuse. Calyx ±>- in. long ; teeth lanceolate, shorter than the tube. Corolla 1|-2 in. long; standard bright-blue or sometimes white, with an orange centre. \* Pods 2-4 by |- in., flattened, nearly straight, sharply beaked, sparsely appressedly hairy. Seeds 6-10, yellowish-brown, smooth. *Fl. B. I.* v. 2, p. 208; *Grab. Cat.* p. 47; *Dalz. & Gibs.* p. 08; *Trim. Fl. Ceyl.* v. 2, p. 75; *Woodr. iir Journ. Bomb. Nat.* v. 11 (1897) p. 425; *Watt, Diet. Econ. Prod.* v. 2, p. 375.—Flowers : June-Jan. VETO. *Gokran ; Supli*.

Very common in hedges everywhere throughout the Presidency. The root is used in medicine, being a powerful cathartic like jalap. See *Watt, Diet. Econ. Prod.* 1. c.—DISTRIB. Cosmopolitan in the Tropics.

VAB. *pilosula*, *Baker*, in *Hook. f. Fl. B. I.* v. 2, p. 208. Leaflets much smaller, |-f in. long. Flowers white ; standard 1 in. long. Pods smaller. *C. pilosula*, *Wall. Cat.* 5347 (sp.).

GUJARAT : Dewar near Kaira, *Stocks*<sup>l</sup>.

2. **Clitoria biflora**, *Dalz. in Kew Journ. Bot.* v. 2 (1850) p. 35. Herbaceous, erect, 15-20 in. high; stems angular, striate with lines of Mrs. Leaves imparipinnate ; petioles |- in. long, hairy; stipules ^ in. ;, subulate. Leaflets 5, membranous (the terminal the largest and lowest pair of lateral leaflets smaller than the rest), 1-3 by |-1| in., table in shape, from broadly elliptic-oblong, subobtuse, to lanceolate,

acute, sparingly strigose above, more densely so beneath; petiolules  $\frac{1}{2}$  in. long; stipules filiform. Flowers in axillary 2-flowered racemes; peduncles and pedicels very short; bracts linear-lanceolate, subulate; bracteoles  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, ovate or lanceolate, aristate. Calyx tubular,  $\frac{1}{2}$  in. long, hairy, nerved; teeth shorter than the tube, lanceolate, aristate. Corolla 1 in. long, blue. Pods 1-2 by  $\frac{1}{2}$  in., flat, reticulately veined, pubescent. Seeds 5-6. *El. B. I. v. 2, p. 208; Dalz. & Gibs, p. 68; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425.*—Flowers: Aug.-Sept.

KONKAN: *Balzelli, Capt. Geburnel; Salsette, Stocks I; near Kalyan, Bhival; Neral, Kanitjear*—DISTRIB. Apparently endemic.

#### 49. DOLICHOS, Linn.

Twining prostrate or suberect herbs. Leaves pinnately 3-foliolate; stipules small. Leaflets stipellate. Flowers axillary, racemose or fascicled; bracts and bracteoles striate, very caducous. Calyx campanulate; teeth usually short, the 2 upper connate into one entire or emarginate one. Corolla much exerted, its petals usually equal in length; standard orbicular, with inflexed auricles at the base; keel obtuse or rostrate, not spiral. Stamens diadelphous; anthers uniform. Ovary sessile; ovules many; style filiform or thickened upwards, bearded down the inner face or penicillate at the apex; stigma terminal. Pod flat, linear or oblong, recurved.—DISTRIB. Tropics of both hemispheres; species about 20.

1. **Dolichos bracteatus**, *Baker, in Book. f. Fl. B. I. v. 2 (1876) p. 210.* A robust glabrous perennial twiner. Leaves 3-foliolate; petioles  $\frac{1}{2}$ -1 in. long, deeply grooved, glabrous; stipules basifixed,  $\frac{1}{2}$  in. long, oblong, acute or subobtuse, glabrous. Leaflets membranous,  $\frac{1}{2}$  in. long, as broad as long, broadly obovate, cuneate, conspicuously 3-nerved from the base; petiolules  $\frac{1}{2}$  in. long; stipules  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, linear-oblong, acute. Flowers in long-peduncled racemes reaching 1 ft. or more in length; peduncles deeply grooved, glabrous; pedicels  $\frac{1}{2}$  in. long; bracts linear, acute, deciduous; bracteoles  $\frac{1}{2}$  in. long, elliptic, obtuse, veined. Calyx  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, glabrous, conspicuously veined; teeth short, deltoid, obtuse or subacute, ciliate. Corolla 1 in. long. Pods 5-6 by  $\frac{1}{2}$  in., linear, much recurved, flattened, obscurely veined, glabrous. Seeds 10-12. *Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425.*

A very rare plant, the only specimens seen being those in Herb. Kew. marked "Konkan, *Stocks*"—DISTRIB. Apparently endemic in the Konkan.

*Dolichos Lablab*, Linn. A large twining perennial or (under cultivation, annual herb with pods about 1 $\frac{1}{2}$ -2 by  $\frac{1}{2}$  in., each containing 2-4 seeds. King (*Journ. As. Soc. Beng. v. 66 [1898] p. 100*) recognizes as a variety *Dolichos lignosus*, Linn., with much shorter and broader pods, which Baker (*Fl. B. I. v. 2, p. 209*) unites with *D. Lablab*. (See also Prain in *Journ. As. Soc. Beng. v. 66 [1898] p. 430.*) *Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425; Watt, "Diet, Econ. Prod. v. 3, p. 18 Lablab vulgaris, Savi, Thv. Enum. p. 90; Grab. Cat. p. 52; Dalz. & Gibs. ISuppl. p. 23.*—VEEN. *Val-papadi; Pavtd.*

Cultivated largely, but not wild, in the Bombay Presidency, where it often



rice as a second crop and is cut in February and March. It is a favorite crop on the sloping lands along the banks of rivers, as well as in river-beds. See Watt, Diet. Econ. Prod. 1. c—DISTRIB. Tropics of the Old World.

*Dolichos biflorus*, Linn. Sp. PL (1753) p. 727. A suberect (*D. uniflorus*, Lamk.) or twining (*D. Uflorus*, Linn.) annual with yellow flowers and much recurved 5-6-seeded pods. Fl. B. I. v. 2, p. 210 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425; Watt, Diet. Econ. Prod., v. 3, p. 175. *Dolichos uniflorus*, Lamk. Encyc. Method, v. 2, p. 299 ; Grali. Cat. p. b2 ; Dalz. & Gibs. Suppl. p. 23. *Johnia congesta*, Dalz. & Gibs. Bo. Fl. (1861) p. 69 & Suppl. p. 23.—VERN. *Kulith* ; *Hulga*.

Extensively cultivated, especially throughout the Deccan, but not wild. In the Deccan it is usually sown in June and cut in November, but in districts with a heavy rainfall (e. g. Thana) it is sometimes sown as a cold-season crop in November, after the rice-crops have been cut, and reaped in March. The grain, which is known as *horse-gram* or *Madras gram*, when boiled and mixed with the ordinary gram (*Cicer arietinum*), is a good food for horses, and the leaves and stalks furnish good fodder. See Watt, Diet. Econ. Prod. 1. c. — DISTRIB. Tropics of the\*Old World.

## 50. ATYLOSIA, Wight & Am.

Herbs or shrubs erect or twining. Leaves pinnately or (rarely) digitately ^-foliolate. Leaflets usually exstipellate, dotted with resinous glands beneath. Flowers usually yellow, fascicled in the leaf-axils, or irregularly fasciculato-racemose at the apex of an axillary peduncle, or the upper paniced ; bracts usually broad, membranous, .deciduous long before flowering. Calyx-teeth distinct, the lowest the longest, the

2 upper connate into one entire or bifid tooth. Corolla more or less exserted; standard orbicular, with inflexed auricles at the base ; keel obtuse. Stamens diadelphous; anthers uniform. Ovary sessile; ovules

3 or more: style filiform, incurved, glabrous ; stigma capitate.

Pod

linear or oblong, usually obtuse, more or less compressed, marked with transverse lines beneath the seeds outside, septate within. Seeds

with

n conspicuous divided strophiole.—DISTRIB. Tropical Asia, Australia, Mauritius ; species about 25.

Erect shrubs.

Leaflets obovate-oblong, 2-2<sup>^</sup> times as long as broad ..... I. *A. Uneata*,

Leaflets oblanceolate, 5-6 times as long as broad ..... '2. *A. scricea*.

Climbing or trailing herbs.

Leaflets stipellate.

Pod rounded at both ends ..... Jj. *A. crassa*.

Pod narrowed at both ends ..... 4. *A. goensis*.

Leaflets exstipellate.

Pod ^ in. broad, with deep lines between the seeds ..... o. *A.*

*scarabaoides*.

Pod .} in. broad, with sharply-defined (not deep) lines  
between the seeds ..... 6. *A. platycarpa*.

**I. *Atylosia lineata*, Wight t\$\* Am. Prodr. (1834) p. 258.** An erect hrub about 2 ft. high ; stem and branches sulcate, densely clothed with ot't hairs. Leaves 3-1'oliolate: petioles \-h in. long, terete, pubescent; 'ipules J- in. long, linear-subulate, hairy. Leaflets g-l| by \-k in., ovate, acute or subobtuse, faintly mucronate, densely silky-villous xn young on both surfaces (more so on the lower), becoming nearly

nus when mature, cuneate at the base, 3-nerved and reticulately  
k (the reticulations visible after the hairs fall); petiolules very

short; stipels 0. Flowers axillary, solitary or in pairs, without a common peduncle ; pedicels less than 1 in. long, hairy. Calyx 1 in. long, hairy ; teeth (except the lowest one) shorter than the tube, deltoid, cuspidate. Corolla  $h$  in. long, yellow. Pods =|-g by \ in., linear, turgid, depressed, but not very deeply so, between the seeds, clothed with long whitish hairs. Seeds 2 (rarely 3), with a conspicuous divided strophiole, black. K. B. 1. v. 2, p. 213 ; Talb. Trees, Bomb. p. 73; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425. A. *Lawn*, Wight, Icon, t; 03 ; Grab. Cat. p. 53; Dalz. & Grib. p. 74.—Flowers : Oct.-Dec. VEBN. *Bdn-tur* ; *Jangli-tur*.

Common in the hills of the Konkan and Deccan. KONKAN: Bombay Ghats, *l)alzcll* Matheran, *Woodrow*. DECCAN: Mahableshwar, *Cookel*, *Wood-row I*; hills at Par, *Stocks I S. M.* -COUNTRY: Belgaum hill south, *Ritehie*, 156!; Ramgbat, *Ritchie*, 156! KANAKA: Hathkumba (Kala naddi), *Ritchie*, 156 !; N. Kanara Ghats, *Talhol*. —DISTKIB. India (hills of the W. Peninsula).

**2. *Atylosia sericea*, Benth. MS. ex Baker, in Hook. / . Fl. B. 1. v. 2 (1876) p. 213.** An erect shrub; steins much grooved, silky-hairy. Leaves 3-fc'oliolate, subdigitate: petioles |-| in. long, pubescent; stipules |-| in. long, filiform. Leaflets 1-11 by \-| io., oblanceolate, obtuse or sub-acute, apiculate, densely and persistently silky, 3-nerved from an acute base : petioluies scarcely any; stipels 0. Flowers axillary, solitary or in pairs, without a common peduncle ; pedicels 1/2 in. long. Calyx \ in. long, softly silky; teeth triangular, acute, as long as the tube. Corolla g-i in. long. Pods \-| by \$-y\ i^n<<> linear-oblong, turgid, oblique at the apex, depressed between the seeds, densely silky. iSeeds 2, sub-cylindric, compressed, rounded at the apex, with a divided strophiole, smooth, black. Talb. Trees, Bomb. p. 73 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 425.

KONKAN : *Balzell.*, *Stocks I*, *Law!*, *Woodrow!* DECCAN : near Talegaun along the railway line, *Bkiva!*; Mahableshwar, *Woodrow*.

**3. *Atylosia crassa*, *Praia*, Journ. As. Soc. Beny. v. 06 (1856) p. 45 & p. 432.** Twining; stems and branches striate, tomentose. Leaves

pinnately 3-f'oliolate; rhachis more or less elongated between the ii of the lateral leaflets and the stipels of the terminal one; petio 24 in. ^long, pubescent; stipules minute, caducous. Leaflets 1^2\ iu., rhomboid-obovate, acute, acuminate or subobtuse (the leaflets smaller than the terminal and very oblique), dark-green puberulous (especially on the nerves) above, fulvous-pubescent reticulately veined beneath ; petioluies J>- in. long; stipels ^ ii subulate. Flowers in lax racemes 2-3 in. long ; peduncles short; twin, 5-i in. long; bracts ^-| in. long, broadly elliptic, conceal buds before the flowers expand. Calyx | in. long, finely grey-the lowest tooth lanceolate, as long as the campanulate tube. | in. long, yellow. Pods 1-1^ by g in., straight, rounded at bot clothed with close greenish-brown pubescence, obliquely depressed between the seeds. Seeds 3-5. *Atylosia mollis*, Benth. in PI. p. 243 (exclud. syn. *Collcea mollis*, Grab.) ; Baker, in Fl. B. I. v. 2, (exclud. syn. *Collcea mollis*, G-rah., *Cajanus glandidosus*, Dalz. ^ and *Atylosia glandtdosa*, Dalz.); Talb. Trees, Bomb. p. 73; Journ. Bomb. Nat. v. 11 (1897) p. 425. *at*

Rare. KONKAN : *Stocks I*

■ **I. Atylosia goensis, Dah. in Jmtrn. Linn. 8gcv. 1B (1873)**

A woody twiner, the whole plant, except the corolla, clothed with soft fulvous hairs. Leaves pinately 3-foliolate; rachis elongated to 1 in. between the insertion of the lateral leaflets and the stipules of the terminal leaflet; petioles 1-2 in. long; stipules 1 in. long, ovate-oblong, acute, ciliate. Leaflets 2-3 by 1-2 in., broadly ovate, acuminate (the lateral smaller than the terminal and very unequal-sided); petioles 1 in. long; stipules 1 in. long, filiform. Inflorescences in many-flowered racemes which are at first close, afterwards elongating to 4 in.; bracts broadly ovate-cuspidate, exceeding the buds, deciduous. Calyx 1 in. long, shaggy; teeth lanceolate, exceeding the tube. Corolla 1 in. long, golden yellow; standard 1 in. broad, with 2 callosities above the base and 2 small auricles below; keel 1/2 in. long. Pods 1.5-2 by 1 in., straight, cuspidate, densely clothed with long yellowish or greyish spreading soft viscid hairs, narrowed at both ends, obliquely dehiscent between the seeds. Seeds 4-6, strophiolate, 1 in. long, black. *Atylosia harhamii*, Baker, in Hook. f. Pl. B. I. y. 2 (1876) p. 216; Talb. Trees, Bomb. p. 73, *Oxjanus goensis*, Dalz. in Kew Journ. Bot. v. 2 (1850) p. 265; Dak. & Qibs. p. 73.

Rare. KOSKAS: *Tiktal* S. M. OUKTRY: Chorla Oh<sup>t</sup>, *Dafcell* Gibson, ~r~DISTBIB. India (Assam, Binna, W. Peninsula); Java.

5. ***Atylosia scarabseoides, Benth, PL Juuyh. v. 3 f 1851-55*** p. 248.

An herbaceous twiner; stem and branches slender, striate, clothed with pale-yellow or grey pubescence. Leaves 3-foliolate; petioles 1 in. long, clothed with yellowish pubescence; stipules 1/2 in. long, acute. Leaflets 1-1.5 by 1/2 in., subcoriaceous, elliptic or elliptic-obovate, acute, thinly pubescent above, densely grey-pubescent and reticulately veined (but not very closely) beneath; petioles very short; stipules 0. Flowers 2-3 on short densely pubescent axillary peduncles; pedicels 1/2 in. long, densely hairy. Calyx 1 in. long, fulvous-pubescent; teeth linear, acute, the lowest twice as long as the tube. Corolla 1 in. long, yellow. Pods 1.5 by 1 in., straight, apiculate, clothed with long

woolly hair, with deep obliquely-transverse lines between the seeds. Seeds 4-6. Fl. B. I. v. 2, p. 215; Trim. Fl. Cejlon. v. 2, p. 79; I in Journ. Bomb. Nat. v. 11 (1897) p. 425,

*Cantharosperti*

*mini*, W. & A. Prodr. p. 255; Dalz. & Gibs. p. 73.—Flowers; Oct.

s: commortia *alsellii* Gibsoit. DSCCAH: Cbattobinghihill (Purmandistricts), hills Hearpoua, Ranadi, Woodroval; between Shelavwadi and Talegaon, [Throughout India; Oeylon, Malays, China, Mauritius, 3d

**I. *Atylosia platycarpa, Bmffi. Pl. junglt, (1851-55) p. 243.***

A trailing herb; stem and branches slender, clothed with fulvous or grey hairs. Leaves 3-foliolate; rachis pro-median insertion of the lateral leaflets; petioles 1-1.5 in. long, grooved, hairy; stipules 1 in. long, ovate, acute. Leaflets 1-1.5 in. long, as broad as long, orbicular, acute (lateral oblique), sparingly hairy on both surfaces, 3-nerved base; petioles of the lateral leaflets 1 in. long, very hairy; inflorescences solitary or in few-flowered racemes; peduncles axillary, at the time of flowering, elongating afterwards; pedicels as the calyx, curved in fruit. Calyx 1 in. long, densely hairy;

feeth lanceolate-subulate, longer than **the tube**. Corolla | in, long. **Pods** L-1^ by \ in., **linear-oblong**, flattened<sup>1</sup>, **mueroiiate**, marked with **■ ply -cteliiled bufc** not very deep lines bet ween the seeds, ret **icu** lately veined, clothed with long grey **hairs**. **Seeds** 5-7, oblong, compressed, rounded at the ends\*, \ by \ in., furnished with a large divided **stroph** ■smooth, -black. FJ. **B. I. v. 2, p. 216.** *Atylosia qminifi&ra*, Dal/, **ia** Journ. Linn. Sac. v. 13 (1873) \u 185; **Baker, in Hook. & R B. L v. 2, p. 212;** Talb. **Trees, Bomb. p. 73;** **Woodr. m Jburn. Bomb. Nat. v. 1 I. (KS07) p. 425.** Balzeil (7. c.) describes the leaflets us stipellafce, but 1 **hare** not found

Ko s K.\v : I) i ieur TuUi lake, || ■ ■ ■ ■ . - DISTKIB. lad ia (GV-n t-ral Hiinalat na, ■ lar, Ocn! ral In d ia, Ju bbu 1 pore).

### 51. DUNBARIA, Wight & Am

Prostrate or twining herbs. Leaves pinnately **3-foliolate**, **Leaflets** dotted with **resinous glands beneath**, rarely **stipeilate**. **Flowers** in axillary peduncled racemes, solitary or twin along a not nodose rhachis, rarely **aoli(ary in the axils of the leaves** ; bracts usual iy \m\m **brauous**, deciduous long **before** flowering ; braeteoles 0. Calyx-teeth long and **trcow, ihe** lowest- **the** longest, (he 2 **upper** connate **into one entire or emarginate** tooth. Corolla more or less **exserted, usually jrelldw ; standard** 'orbicular, erect or spreading, **auricled at the base** ; keel **usually not beaked, Stamens diadeiphous; anthers, uniform.** Ovary **sessile**; | i ovules many ; style **inflexed, filiforin**, beardless; stigma capitate. Pod **iuear, straight** or falcate, **acuminate, flat-compressed**, not or **faintly** between the seed-s. Seeds **suborbicular**, the **funiele** expanded somewhat thickened membrane, but scarcely **sirophiolate**.— ;;.. Eastern Asia, **Japanj N. Australia; species about 12.**

exsti pell **ate; ha** i rs on **the** po d glaad ula v..... i. 1). g  
lefs **stipeUate** ; haij-s on **the** pod not glandular ..... - . f). *Heynei*,

. **Dunbaria glandulosa, Pram, in Jgurti. As. Hoc. Be»g, v, 66 US) p. 433.** A woody twiner; youag parts more or le^s clothed wtili nvish or grey tomentum; stems terete. Leaves pinateiy **8-foliolate**; ns prolonged ^--| in. beyond **the** insertion of the lateral **leaflets** ; ?6les 1 : -3 in. long, pubescent; **stipules \ in.** long, ovatt<sup>1</sup>-lanceolate, 'pidafce. Leaflets 1|~3 by 1|~<H in., usually broader than long **(the**

niaai rhomboid-ovate, aenfe or **acuminate**, the lateral obliquely ovate, ), **subcoriaceoas**, glabrous or with a **few scattered** hairs ; **petiolules** 'lital leaflets §- in. Jong, hairy; **stipels 0,** **Flowers in** long-peduncled **\*\*/racemes, usually in pairs** along a glabrous **terete** is; pedicels lf in. long, **l-etrotfaeted** in fruit. Calyx |—| in. long, .sparingly **bristly Mb. hairs nsing from bulbous bases;** teeth all shorter than **tine tube, M upper** and lateral very short, obtuse, ciliate, the **lower Longer, aeumi-e.** Corolla 1 in, Jong, yellow with brown **lines, showy;** -standard **Hxi.** broad with 2 callosities above the base. Pods faintly depressed %een the seeds, 2^~3 by g **in., nearly straight, narrowed at the tip,** J'nUy beaked, thinly clothed with **stiff** yellowish bristles from bulbous 3es. Seeds **8-10, with** a thickened funiele, scarcely strophiolate. *ylosia ylandulosa*, **Dak.** in Journ. Linn. Soe. v. 13 (1873) p. 185, *ylotia rostrata*, **Baker, in Hook. f. FL B. I. v. 2 (1876) p. 216;** Talb.

Trees, Bomb. p. 73 ; Woodr. in Journ, Bomb. 2s"at. v. 11 (1873) p. 425.  
*Cajanus glandulosus*, Dak. & Gribs. p. 73.

Bare. .KosKAN: *Sleeksi*, *Balzdl!*; Malwan aad Wagotaa (S. Kankan), -DISTBIB. India (Central India, Bengal, Bit-ma, W.

\*F\*gr7tf *Sf Am. Prodr*, (1834) p. 258.

woody twiner ; stems stout, much-branched, more or less clothed

with spreading hairs. Leaves **3-foliolate** ; petioles 1-2| in. long, with a few scattered hairs,; stipules {-§ in. long, ovate-oblong, acuminate, ciliate. Leaflets **membranous**, 2-3 by 1^2 in. (the terminal rhomboid or obovate, **acuminate**, cuneate, with a rounded base, the lateral very unequal-sided, obliquely ovate, acuminate), more or less hairy on both surfaces ; petioles very short, hairy ; gtipela ^ in. long, subulate. Flowers in peduncled **few-flowered** axillary lax racemes; pedicels ^-\ in. long, slender, hairy ; bracts broadly **orate j caducous**. Calyx £-| in. long, roughly puberulous, the lowest tooth much the longest and exceeding the tube.

Corolla £-1 in. long, purple or yellow. Pods 1|-2 by |-| in., straight, cuspidate, **narrowed** at the base, clothed with weak spreading hairs, slightly **lineate between** the seeds. Seeds 4—5, ovoid-reniform, uiottled black and brown.

**SI. B.**, 1. v. % p. 217 ; Trim. FJ. Ceyl. v. 2, p. 80. *Cajanvs*

*Imlnemis*,

Dalz. in Journ. Linn. Soc. v. 13 (1873) p. 180 j PI. B. I. v. 2, n. 214; Talb. Trees, Bomb. p. 73; Woodr. in Journ, Bomb. **Nat** v. 11 (1897) p. 425.—i"lwers : Dec-Mar.

**KONKAH**: evergreen forests. *Talbot*; **Kulnawari** (Wari country), *DcUsr J \$ Gibson*; *Woodrm.* **KASARA** : Potelli, *Talhot* \ Wadi Ghat, *Talbot*.---**DISTBEB. I,tt%**

(**Mysore** hills); Ceylon,

## 52. **CYUSTA**, Ait.

A twining shrub. Leaves piunately 3-£foliolate. Leaflets i Vpell dotted beneath with resinous **glands**. Flowers in **axillary 8t+..** **tinn** paniced racemes : bracts membranous hvaline caducous : **bracW**

panicled racemes ; bracts membranous, hyaline, caducous ; Calyx-tube campanulate; teeth obtuse, scarious, persistent, **accrei** the 2 upper connate into one emarginate tooth, the 2 lateral shorter, lowest the largest, concave-. **Corolla** enclosed in the calyx; stands suborbicular, with inflexed auricles at the base ; wings narrow; 1-incurved, obtuse. Stamens diadelphous ; anthers **uniform**. Ovary *t* sessile ; ovules 1-2 ; style filiform ; stigma terminal. -Pod small, obi-oblong, enclosed in the calyx. Seed without a **strophiole**.—**DISTB** India; species **1**.

1. **Cylista scariosa**, *Bocvb*, *Cor*, *PI.* v. i (1795) p. 04,t. 92, A wo i wiuer ; stems and branches finely downy. Leaves 3-foliolate; **rhai** prolonged £-£ in. **between the** insertion of the lateral leaflets and

stipels of the terminal one; petioles ~2 in. long, downy; stipels 1-2 in. long, triangular, acute, downy. Leaflets 2-4 by 1-2 in. (terminal rhomboid-ovate, the lateral slightly smaller, very obliquely ovate), acute, clothed with **soft** velvety pubescence above, densely downy and prominently reticulate-veined beneath, base subcordate; petioles 1/2 in. long, densely downy; stipels 1/2 in. long, subulate. Flowers copious axillary peduncled racemes or panicles; pedicels very short downy; bracts large, ovate, caducous. Calyx finally 1-1 1/2 in. long, tube downy; lower lip 1/2 in. broad, boat-shaped, conspicuously veined. Corolla yellow, concealed in the calyx. Pods small, oblique, downy.

enclosed in the calyx, 1-seeded. **Fl. B. I. v.** p. 219 ;  
**Grab. Cat. p. 1 Dalz, & Gibs, p, 74; Talb. Trees, Bomb. p. 73 ;**  
**Woodr. in Joarn. Bom Nat. v. 11 (1897) p. -125.— Flowers :**  
**Nov.-Feb.** VEUN. *Mn-ghevdd*, Roxburgh (*I.e.*) and not, Aiton was  
**the first to describe *G. scariosa*,**

A very common plant. KONKAK: *dtocks*, *Gipt Geburnel* Matheran,  
 €\*, -noQtrow!; Eanheri jungles, *Graham*. DSCOAS; hill\* near Poona,  
 fiFW^roto!; Mahablwtbwair, *Cw&el*; Talegnm, *liftiva*!; Egatpuri, *Edgeusorth* S.  
 M. COBSTRT: hills north of Belgaum, *Ritchie*, 208! KAWARA: Yellu (N. (Canara),  
*Ritchie*, 2061— DtSTRiB, India (Central Provinces, Binna, W. Peninsula); Socotra.

### 53. RHYNCHOSIA, Lour.

Herbs or under shrubs, twining or prostrate, rarely erect. Leaves  
**pinnately** (rarely digitately) 3-foliolate; stipules ovate or lanceolate.  
**Leaflets** dotted beneath with resinous glands, exstipellate or minutely  
 stipellate. Flowers in axillary racemes, solitary or twin along the  
 rhachis, rarely solitary in the axils of the leaves; bracts caducous ;  
**bracteoles** 0. Calyx-teeth not accrescent, the 2 upper more or less  
 connate;. Corolla included or exerted ; standard obovate or orbicular  
**with** indexed auricles at the base 5 wings **narrow** ; keel incurved at the  
 apex, Stamens diadelphous; anthers uniform. Ovary  
**subsessile**; ovules "2 (very rarely 1); style long, filiform, much  
 incurved; stigma **capitated** Pod round or oblong, compressed or  
 turgid, usually continuous (**Jbarely** septate) within. Seeds 2 (rarely  
 1), the *kih-m* parallel to the futures and the funicle central upon  
 it; **stroj** ole thick, ^sniill, ogWK—■DISTRIB, Throughout the  
**tropical** regions of *J°oX* \ hemi-n ne extratropical in *N.*  
 America and S, Afr\*<sup>15</sup> ^ spec

- "^TM ■\*? 3 ^ \ ith a wavy strophiole ..... 1. *R. aurea*.  
 honfc a strophiole.  
 calyx-teeth 3 times as long as the tube; seeds blue ..... 2. *R.*  
*eyaimperma*.  
 teeth 1 twice as long as the tube ; seeds black ..... *H,*  
*minima*,  
 ; A fex-teeth shorter than, or equalling, the tube ..... *k R. brae*

**hynchosia aurea, DO, Prodr, v, 2 (1825) p. 380.** Annual ;  
 stems sparingly clothed with fine spreading hairs. Leaves *tte*;  
 rhachis prolonged <sup>1</sup>, § in. **beyond** the insertion of the  
 xerai leaflets; petioles 1^—3 **tri.** long, **slender, grooved**, thinly hairy;  
 stipules *i* in. long, ovate, acuminate. Leaflets \-}. in. long, nearly as  
 •ad as long, rhomboid-ovate or **rhomboid-obovate** (the lateral very  
 [ual-sided), acute or **sabobtuse, with a few** short scattered hair-  
 »th surfaces, reticulately veined ; stipels **0**. **Flowers** in close **6-20-**  
 covered **racemes** longer 'or shorter than the leaves; peduncles slender.  
 1 *i ry* ; **pedicels** \~\ in., **long, densely pubescent**. **Ca ly x | in; ton**  
 dry ; teeth linear-subulate, 3-4 **times** as long as **the** tube, **the** 2 upper  
 connate, except at **the** tip. **Corolla** a little longer than the lowest tooth  
 the calyx, yellow; standard { % in. **broad**, with 2 callosities at the  
 t. Pods orbicular, \ in. **in** diam., **slightly** compressed, **transversely**  
**tte** with nearly parallel lines, mucronate, mottled, sparsely clothed  
 with long fine hairs. Seeds 2, oblong, compressed, rounded at **the** ends,  
 by *I* in., with a waxy strophiole, dark brown. Wight and Aitchison  
**that the plant buries its seed in the ground,** **pi.** B. I. v. 2, p. 221 ;  
 ■\V001lr. in *Jmirn. Bomb. "Xat. v. II (1897) p. 425,* *Noinismia avrea.*



**I peduacled c;** pedicels | -4 in,  
 iy pubescent; involucre! bracts \ in, long, **ovate, acuminate,**  
**shorter than the sepals.** Sepals | in. long,  
 narrow-lanceolate. . Petals exceeding the sepal.  
 Capsules subglobose, v than the sepal. Seeds angled,  
 tuniculate.

**Melhania Denhamii, IL i . in Denh. \$ Clapp. Trav. (1826)**

.. A small shrub ; young parts hoary-pubescent. Lea  
 bely hairy above, **hoary-pubescent** beneath,  
**culate,** I'd ai the base; petioles 4-J in, long  
**lobulate, hairy.** Pedicels in axillary **pedicled**  
**race-pedicels** very short; involucre bracts greatly **enlarged,**  
**up d in fruit, reniform, broader** than long, **membranous,**  
**veined,**

iy enclosing . Sepala **ovate-lanceola**  
 Lt. Petals about **equalling the sepal** . . . . . **ov.** Style as long  
 as

**Capsules** ulv/ ose, **densely pubescent, the size of a pea.** Seeds  
 Jed. M i *Dmhami*, Masters, in Oiv. **PL Trop.**

A.fr,

Fl, B. I. 1, p. 'u'-y: !v. Schum. in Bngl., tt Frantl,  
**Pflanzenf. v. 3, part 6,** 77, fig. 40, G, a; **Wbodr. in Journ, Bomb, \**  
**VNat. v. 11 (1897) p. 120.** *Mdmn bracteosa*^ Boiss. Fl. Orient, v. 1, / ~K  
**841.—Flowers: Nov.-Dec.**

∫?K. JSINO: *Stocks!*, *Coofcel*; hills neat Kamchi. *Strac&an*]—DISTUUL.  
**Beluchiataa,** ipical Africa and Ara

**8. MELOCHIA, Linn.**

\*s, | **Herbs** or **shrubs**, rarely tt\*i [lately pubescent!, **tellate** mixed  
 ^>'h simple hair.-; , j, **rate.** **Flowers** usually small,  
 & **I** or **panicled.** **Caly**^5-fidol **ied, campanulate** or **inflated.**  
 fey^p . ^/ & 5, **spathulate** or **oblong, marcescent,** **Stai** >. **opposite the**  
 .^> **■** 'yond the middle; **staminodes** ^, or  
 or **.inn** ; anther-fells **parallel.** **Ovary sessile**

; **5-celled** ; ovules 2 in each cell; **styles 5, free or**

g, ;  
 y  
 11 ; cotyledons **radicle** next the hi 1 uui. —\_D19ruiB. Wariner

y p  
**ding, more or less albuminous ; embryo**  
 11 ; cotyledons **radicle** next the hi 1 D W  
 <-, **q^'igiona of both henusphi** --pecies about 50.

A small Lre^ ..... 2. M.

**1, Melochia corchorifolia, Linn, PI, (1753) p. 075,**

An

**/her!** ■ ■ **inches** nearly **glabrous.** **Leaves**  
**very**

**∫ial** 1 j in- **ovate-oblong, acute, serrate,**  
 \* ∫?Hr/<\$] and usually **thickened** above. **Capsule**

**locufi**

times obscurely lobed, glabrous on both sides. Petioles with a few  
f2<%r> l« J . rounded or truncate :

petioles

*Hi* <sup>9</sup> I<sup>11,1</sup> u. long, -lender; stipules lanceolate, -/; in. long, ciliate.

Mowers

Fl. r. densely crowded in terminal clusters; involucre—  
late, hairy. Sepals lanceolate, ciliate, -{- in. *fa* in. long,  
thin, oblong-cuneate, truncate. Capsules **tepr<sup>h</sup>icb** ■  
**maringly** hairy. Seeds **angular**, mottled black and <sup>^/tiT: v'^\V<sup>1</sup></sup>  
<sup>^^-{7\*I</sup>; Trim. Fl. Ceyl. v, 1, p. 170; Woodr. in Journ

V

7. MELHANIA, forsk.

**Herbs or and^tshrubs, softly tom<**  
 ■ ai e, crenate or serrate. **Peduncles a s 1 few-flowered**  
**yellow 5 bracts cordate ornarrow, often loi** in the eah  
**5-partite. Petals 5, withering ronnd the ovary. Stamens**  
**5 ari** o a short cup. the staminodi  
 with the per :-ns; **anther-cella parallel.**  
**sessile, 5 celled ■ ovules 1—many in each cell ;** ihort. rarely loi  
**branches 5, >i'::** spreading, stigmatoj  
**loculieidally dehiscent. Seeds albumi** ifcyledone plicate, 2-pari  
**radicle inferior.—'DISTEIB. Africa, the warmer parti of Asia and '\**  
**ustralia ; species 16.**

Cynws a i ITITOI. bracta litieur,  
 Petal ■ ..... I ma.  
 .nan in vol.  
 bi":

fruil.....' .....

**1. Melhania incana.**

**undershrub, 4 15 in. high**  
**tely tomentose. Leaves 1 2** si., obit'  
 HI the trrulate or subentire, as above, m uneu  
 ■ 'i. 3-nerved from the . petiole ' ■ >uk  
**J in. lougj filiform. Blowers axillary ; peduncle**  
**the petiole, 1 -4-flo** tical br>icts ;',,, lineal  
**oblong, a ' bat) th<> sepals**  
**acuminate, torn ■ ■ ■ than the sepals. ' !**  
**hairy, glo shorter than the sepals. Seeds angled, ulr<sup>1</sup>**  
 M B. Lv.i; p. 372 : Wight & Am, Prodr. p. 68.

Rare. Specimens have bean found at Badatni i?i t! ba Countrj,  
 ■ laev here as tat- aa is ;,»: i known,

**2. Melhania abyssinica, A. Rich. Vent. Ft. Ahj**

**pt 7r>. V. low much-branched undershrub; branches 1 ; i**  
**tomentose. i ui.-elli; ■ Loubly serrate or -oi/'**  
**>w< sublobate, pul above, eano-tomentose beneath ;**  
**petiol^**

V Jar^ pubes -\ in. long; stipules \ in. long, subulate. \$'•■

erauc across, axillary, solitary; pc ' in. long; in

bracta linear, snorter than the sepals. Sepals lanceolate, acute, pub

cent. Petals obovate, shorter than the sepaFs. Sii<>-uia subs"

ui iid, stlky-villous, a little longer\*than the Bepals. Fl. h

Pubesce v- l- V- '^'^^ j Oliv. FK Trop, Afr. v. 1, ]) . 231. Md/wuia ovata<sub>1</sub> Bo

E<sup>1</sup>!. Orient, v. i. p. <sup>s</sup>ii; excl. \$yn.

\ have seen but. -,i si i which was collected by Stoek&\ in Siad.—D  
 Abyasinia, Cape de ^ •

**3, Melhania tomentosa, >-■ f. / 7.**

'., p. '>M?t. A eano-tomento^e branched shrub. Leaves

,, ovate-oblong, acute, crenate-seri<sup>1</sup>:: unUerside,

more or le^a pubescent above, rounded or m base;

petioles |-| in. long, tomeatosc ; stipule^,k%yht-

or. 'Man. in Flor. Sylrat, p. xxv, t. 5, fig. 2 ; Talk Trees, Bomb, Watt. Diet. Esc'on. Prod, v, 3, p. 265.—Flowers: Mar.-April.

Bute ; /)--/■-  
ma the

**3. Eriolsena Caridollei, Wall Pi As. Mr. v A (1830) p. 51, t. 64.**

A tree ; barli grey ; young parts stellate-hairy. Leaves 5 7 by 3-5 in., ■ lly ovate, cordate, acute or acuminate, glabrous or with a few

■ beneath. ■■ r crenate-derstate :  
t. across, in corymbose cymes at  
showy : involucral  
pedunc bracts  
■ nbpinnatind | ■ sepals linear-oblong, acute, pubescent on both  
tals oblong, the apes n ; claw thick, villous.  
Stigma  
D. long, woody\* ovoid, acute,  
villous at the inner  
■ 10-valved margins,

Fl. B. I, v.1, p.3705 Dak  
; Wbodr. in Jouru. Bomb. Nat. \.  
Talb, Trees, Bosaib ;  
11(1897)  
p. L29; Watt. Diet. Bcori. Prod, v, 3, pi 265.—Bowers:  
Mar.-May. Yms.

B. M. OOCNTEV: 1J<  
KANARA: deciduous forests of N. Kan

**Eriolsena quinquelocularis, Wight, Icon. i. 882\***  
(1847). i. hge ; Wsmall tre . Leaves up to 0 by 6 in», orbicular,  
cordate,,acuminate,

te-serrate, dotted with ^mall tufts of stellate hairs above.  
2-." in. lonar. tomentose when

:<jommg at ?i]  
S" led, l'e., ■ (u  
■ ^ranches 5 involucral bracts a little distant from th(> flower, inintr-,  
^ a jitire or with toothed margins, very caducous. Sepals  
linear-oblong,  
!- .' ! in. long, pubescent on both surfaces, glandular at the base  
ag, equalling the sepals : claw broad, fhirk.

etween the sepals. Ovary pubescent;  
le long, the lower pori | bigma 5-lobed, the  
lobes revoli

in. loiii,<sup>p</sup> pointed, 5-celled, 5—10-vatved;  
irced, ; ■ ■■ pubescent, asaally silky-villous at  
the inner  
ids numerou: imbricate; wing papery, falcately  
curved.

^V^j, |n Wight's Bgure (Ic \$82) the ar made it  
appear that  
J/k/'- }> petals are outside fcl . The claw i . (1 is in  
appearai  
the sepals an\* (flexed between them, PL B. T. \. 1, p.

371;  
1. IVir. Man. in Flor. Sylvat. p. \.\.v. t. 5, fig. 'J; Talb.

Trees,  
b. p. 24; Woodr. iu Journ. Bomb. , Taabol: \*7) p. 129;  
Hi

Diet. Keon. Prod. v. ;.>. p. 265. Er f(?).  
GrnJi.

Plowers : July. VBEIT. B<xdjari~dhdman ; Bothi. ..  
petii  
, 'arly glabrous. Flowers about '1 in, across,  
in v 1-3-) flowered cymes near the ends of

te Bombay, ( and ■ p. WQQUTQVO i j Puranular, 1' [gaum, Ritchie, 72.]

es thai

not differ in an } i c.Jriochicsns (now Eriottena). froin w hiHi i h o  
anting riocklt  
E

|e.; bractea mull      lacmiafa      **-I caducous. I**  
 or at length 5-partite,      **B**      with dilated ton  
 elaws; blade flat, glabrous.      **Stamina]-'**      »mi bearing outside  
 many  
 seriate, 1-antheriferous filaments a/      • : anther  
 linear, cells parallel; pollen globos      **Staininodi**  
     sile, 5-10-celled; ovul<      , style stigma  
 apex, stelktely 5-10-lobed.      Capsule . xly, d'<-h loculicidali  
**Seeds** ascending, produced above into awing ; albumen thin; eotyledo  
 fokled^or contortuplicate; radicle next the hilum.—**DISTMB. Speci**  
 about 7, all Indian.

Involucral bracts mOltiaet.

Peduncles fww-flowered ,, ..... \t E.Sf:chi'

Peduncles many-flowered.

Sepals lanceolate ; style pubescent ..... 2, E

Sf pain linear-oblong; stylo glabrous..... £ £ <

Involucral bracts entire or toothed, not multiset ..... 4. /..

**1. Eriolana Stocksii, Hmk.f. \$ Thorns, in Ft. B.I. v. 1, p. 370.**

A tree or shrub(?); bark purplish; young parts stellatdy pul  
 fwi ~> by 2|-4 in., deeply cordate, orbicular, shortly and  
 acbminate, irregularly crenate, 5 7-neryed, dotted a"bove with si>li; i  
 hairs, finely pubescent beneath ; petioles 2-3 in. long  
 with dense, ^icllate pubescence ; stipu aear-Mca  
**Flowers** '!.; -2 in. across,, near the top oi: a long pedunc  
 flowered lax axillary racemose cymes; peduncles rei >uk  
     pubescent ;      in. long grooved Duh

bra

:, v 0!

with dense stellate      spals laneolat<sup>0</sup>  
 cuspidate, stellate!      ithin      landular at; fcPst

base inside-.      Petals obovati      ,      Ovary B-10  
 style stout, long, pi3      Fruit no

ralb. Trees, Bomb, p. 24; Wooj jr. in Journ. Bomb. 2s'at. v 11 (18<sup>o</sup>  
 p. 129.\*

Scarcely if at all distinct from E. li      ana, the nexi      Th(  
 are tun good specimens of .      sii in .Herb. K<      Conka

whether the species      I be      Slocks" but as there is  
     jarato or unitea \ \ \ ^ok  
     eti

maintain\*

no fruit on either, it is

**2, Eriolsena Hookeriana, Wight cj- Am. Prodr. p. TO.**

,J I>ub

tree.      Leaves 4 5 in., as broad as Ion      irregularly  
 crenate-dentate, dotted with siaall tufts of .stellate , above,  
 finely pubescent beneath; nerves prominent on the under.^      ,,

\*il i P d l ill

fay'f^etio :l\ in, long. Peduncles axillary, S-C, m. [on^

st,

""pubescent when young, afterwards glabrous.      Flowers 14-2 in. ac  
 many-flowered cymes towards the extremities oi' the branches- r~

h'icral **bracts shorter** than the calyx, **multisect, the seements lij**  
• **Sepals** linear-lanceolate, pubescent outside, **stellately-hairy and elai**  
• **at the bast<sup>1</sup> w** ithin. 'Petals obo-> **ilaw** densely pubescent 7  
Style **pubescent; stigma 8-10-lobed.** Capsules ovoid-oblong **pom\***  
■ <sup>ln</sup> **4ved, valves pubescent.** FL *B. L v, 1, p.* :170- Grab  
\*&\*

**0. Pterospermum reticulatum, Wight & Am. Prodr. p. 69.**

A

**IS**ding-sized tree. I, <aves "I- 6\* by 2-3 in., euneate-oblong, acuminate, cut at the apex into several acute lobes or coarse teeth, oblique cordate at the base, the underside covered with a cream-colored mealy tomentum dotted with darker minute stellate hairs, glabrous

and veins prominent beneath and covered with buff

n ; petioles |—| in. long. Hovers 1—3, in. the upper

axils ; i. across 5 involuoral bracts pin] t, aliiiK- dis1

from ili rs, stellately tomentose, segments filiform. Calyx rus

pub . villous within; sepals linear-oblong,

smbobti

: ils obovate-oblong, spreading. Staminodes filiform. Ovary

hairy 5 ovules about 6 in each cell. Capsules up to 3J in. long, ovoid,

con;

he ba.se, stellately pubescent. Seeds -i in each cell,

prominently ed, dark brown : |v|n% papery, oblique, falcate.

The ripe fruit mains for a long time on the tree. Fl. B. L v. 1\* p.

369 ; Bedd. For.

iv ; Talb. Trees, Bomb. p. 23; Woodr,

in I (X8J97) p. 121). P'ii>/f>\*i><t-t),viti

Lawianwm, 246; Dab. & Gibs. p. -2

-k—Flowers: I)e<

rn Gh&ts,



\ Wt. 6TER(i i

doubtful native.

the Koi

js ; t a habi tat, an d \V pod row and To 5 bot report that : ihkt in 5. on the Detnnan n

Kanara. Graham mentions it as growing in a garde in Kolftbn and tree

bay. Beddome (I. c.) says that the has only been

; y g

ginoua

^p

Leaves 4-6 by 2-3 in., oblong, acuminate, more 5^1 thed towards the

apex, rounded or eubcqrdate, not or but oblii ae at the base, glabrous

above, grey-pubescent beneath; and veins prominent, clothed with

ferruginous pul

J r. v.

in.

, rufous-pubescent, attached a 1 li 111;

! in. within

enssiorm, >racl s

■ lueral " >JIG;. Flowers up to 3^ in. across

imbricate,

subpersiateni. foliaceous.

v ovate, deeply and variously gashed, the s<

riangular,

f. Sepals up to 2 in. long, rufous-pubescent on the outside, viiius

1 Flor.

Sylvat. Bomb. fhin.

ivate, spreading.

Nat. \, Orah. Capsules 2 in. Jong, narrowed at

b ends.

10 in each cell : wing as in

the preceding species.

1J. 1. v. 1. p, 369 ; Bedd. For. Alan, in Flor. Sylvat. p. xxxiv; Talb.

b. p, 23 : Woodr. in Joturn. Bomb. Nat. v. "11 (1897) p. 129,

Vterospermum HeyneanttiUj Wall. Oat,

if Gtairsoppa ;ar

(1828)

'm/cd iree; young shoots t-ored will>

tEib

A



Dec Feb.

iou

11 no 08 of thie tree i'ro)n Bombay. The specimens in Herb. Kew,  
Kea and [;>i1^i^!1 are all referable ('.» /'- *reticulation*. The  
s oblique attl ■ ban those of P.

r<

■ ile it\* stipules and Sowers an The involuoral tirii'^!^ 'i i'.  
>iil: ■ itii filiform ts, those of !'■ //  
CJ-JBH' capsules pfP, *Heynmnum* contain 8 10, those of *I'. retuml* or  
Slate;

### G. ERIOXJENA, DC.

is cordate, crenate or serrate, stellately pubescen  
v\*-K, Peduncles axillary, 1-flo\vcred. Flowers r

■ *Ui*

corrugated or folded; radicle inferior.—DISTRIB. Tropical Asia species 15.

- Leaves deeply cordate and subpeltate..... 2. *P. acerifolium*.
- Leaves deeply cordate and subpeltate..... 4. *P. Heyneanum*.
- Leaves deeply cordate and subpeltate..... 1. *P. suberifolium*.
- Leaves deeply cordate and subpeltate..... 3. *P. reticulatum*.

1. **Pterospermum suberifolium**, Lam. Tab. Encyc. et Method. v. 3 (1823) p. 136, t. 576. A small tree; young parts covered with a light-buff stellate tomentum. Leaves distichous, 2½-4 by 1¼-1¾ in. oblong or obvate-oblong, acuminate, often irregularly angled towards the apex, glabrous above, clothed with a cream-colored tomentum beneath, oblique and rounded at the base; petioles ¼ in. long, tomentose; stipules small, caducous. Flowers fragrant, white, 1½-2 in. across, axillary; buds oblong, prominently 5-ribbed; pedicels thick, jointed, tomentose; involueral bracts 3, a little distant from the flower, entire, bi- or tri-fid, caducous. Calyx divided to the base; sepals linear, subacute, reflexed.

aidy toinejit< the sepals, k the outside ^ hen base; anth long, Capsi covered with Sue wdistan . fcomentuin,

r. 6,  
part  
1, p.

e :is long as the see4. PL B. !, v. Pate. & Gibs. p. 24 ; Talb. Trees, Ekan] Nat. v. i I. fl\$97) p. t20; VVa! 'lowers : Her. VEBX. J/

In the forests of S. Konkan and Kanara; planted in many places. Dalzell & Gibson, Graham, Talbot. DECCAN: planted in the old Botanic Kirkee, Woodrow!; Dapudi, near Poona, Woodrow! KANARA: S. Ghâts of N. Talbot: N. Kanara, Woodrow.

2, **Pterospermum acerifolium**, .V

large tree; kirk ■

Qocose j>u

iii shaj

lar or

utire 01 '■■...

6-12 in., orbiculatgth glabrous abb

whitish So<

sntum ; petiolea -I-lit in. !■ ■

stipules tnnltifid, c ■ o

pmrs : ' ■ ■

dentat  
ghbro

)■ fcomentose ou

fehan the

pals

Stau

lub-shaped.

362.

—Fl

near^oblong, somewhat obliquely CUJ.

ower

l

St

l b h d

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s:

JAr,

p

ys  
laiT. 1

j5-angled, ^celled; ovules

oblong, 5-aagled, cloth

with fi

-

Jlav.

obliquely ovoid, compressed ; ni :

jyiii a long fciuiie on the tree. Fl. B. [ v. I, p, 365

^e,ydfL For, .Man. in i?ipr\* Sylvat. p. xxxi :

Engl.t

Bomb

at ti<sup>nzen</sup>f« v\_ :- )!r! (:\_ ]' ■

Stvl< ^r\* 'n ■"

v- 11 (1897) p. ■ ■

10.

>bes often unequal. Petals 5, equal, or somewhat 2-lipped

\ e ear-shaped appendages, Staminal-gynophore, 5-toothed or 5-lobed at the tip of the column between its teeth; ■ ■ b. Ovary at the top of the column,



subulate, more or less at the tips, and ^: ■ ■ ; i' the tips, iii K' Ken. follicles ...it. i; albumen scanty; cotyledons the one which is next the



ynnn ■ ate t< anthers in groups of 2-4 ■ .. sometimes <' -celled : ovu]

i. Helicteres Isora, Linn, 8p, PL (1753) p. 963. A shrub or ball tree\* ■ ■ ■ «Hth stellate hairs, in the leaves, or round the stem ■ - suddenly and acuminate c i both ■ ■ with stellate hair?, : ■ ■ : | in. long; stipules in Blowers 1 1 ! in. long, disti ■ '. bilabiate, in axillary i ethet: pedicels ■ ■ ■ ly to xQen- small, subulate, hairy. Calyx tubular, | in. ■ somewhat ■ , -wi afoHntftlv nubescens without, curved, laterally compressed, mOlld lead-color, very unequal Sweden the calyx, sepals I j.m doseh hooked together, mil ' I

form of a screw, ■ ■ wrinkled. Fl. 7//,,; m. Fl. Ceyl. v. 1, p-1'68 ; Pii i Bomb. p. 23; Woodr. in (7-V); Watt, Diet. Econ. Prod. v. I.

■ Musdant, in hilly ; jui; nil i ■ Koi

iiiiiv

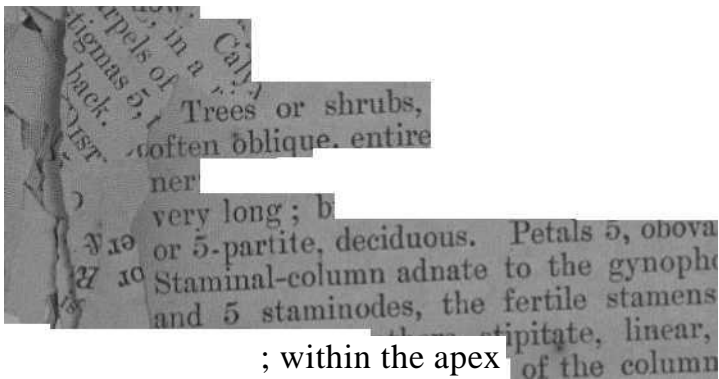
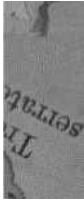
k>:

.....,i f<sub>mn3</sub>,i,c bark and the follicles have been employed

### 5. PTEROSPERMUM, Schreb.

calv or stellately tomentose. Leaves coriaceous, or more or less angled or toothed above, penni-Peduncles axillary, short, I- or few-flowered. Flowers oHen ,s usually 3, entire, Iaciniate,or 0. Calyx tabular, 5-fid

V



with a broad keel] or wing. Seeds ! in. long, J\*he  
fruit remains

the tree Eox a considerable I FI.»-B. I. v. 1,p,363; Gran. ( p. IS; Ihih., & dtfbs. y. 22; Bedd. For. Man. in VU<i\ S-. ,. || i. 11, fig. 6; Trim. l:~L Ceyl. v. 1, p. 107; ly. Schum. in EngL Prantl, BflanzenL v. 3, part 6, p. 99, fig. 53; Talb. Trees, Bomb- i .Watt, Diet. Econ. Prod. v. 4, p. 223.—Flowers: July-Oct. Vjsu

The Looking-glass plant. I I id ney.  
banks of the SSla naddi and ■ ■ dal Ka r, bui  
abundant (Taiboi), . l. c.) give.\* its babitai lvonkan,

■■■■  
■ Date til \$ Gibson (13omb;i; ; p, 22) have failed to find  
ii

Tropics of the Old World, near the coast.

### 3. KtEINHdVIA, Linn

A tree. Leaves quite entire, 3 7-iierved, Flowers in large  
terminal  
panicles; bracts small or remote from the calyx. Sepals 5, at length  
free, deciduous. Petals unequal, the upper wil nargins  
involute, St&mmal-coJurnn i ■■,adnatei>. jynophore, dilafc  
>ve into a 5-fld bell-shaped cup, the divisions each with 3 anthe and  
alternate teeth without anthers; antliera shortly stalked, cells<sup>0</sup>  
divaricate, distinct.  
Ovary inserted , p^ di e within the  
dilated apex of 34

tho""-M&mhxsX-column, 5-lphed^ o-eeiied; ovules 3~4 in each  
cell; style"

slbnder, a ; y turbiiiiately  
J, localicidally 5-valved. Seeds 1 or 2 b each cell, globose,  
naked,

- tubei'cled, oxalbuminous; cotyledons spirally twisted; radicle next the  
hiliun.—DisTRIif. One Bpeciea, Asiatic.

1. Kleiiiihovia Hospita, Linn. Sjp. Pl. ed. 3 (1763) p. >tif, 'u' A  
middle-sized tree; young shoots and panicles toisentose. lAf//Jv' by  
3-5 in., broadly ovate or suborbicular, cordate, acuminffte, yi-. 'Hbroue  
on both surfaces; petioles l~4 in. long, ter

' , ih(i;:ipuios 111 in. o- p osv anil  
in larse : ■

v//J; pubescent outside, , 'A , " :!n"!na' - ■"  
t rneinbranoua inflates ■■"  
j-}, |)t ( v j" ' i, . . ; r'rah.Cat. p. I s : Dalz. & Gibs. p. 23,  
an<

n. i./ v s^hnV I---\* ^Pp^\* ^' Prantl. Pflanzenf. v. 3.  
p. i v (, v ycj j\* j- \* Jlj'2'1- « I'niini, rnanzent. v. a, pari H  
ag. d, ii D; tJead. For. Man. 'w> Flor. ISylvat. p. .v.wiii, t. j  
Ta)b. Trees, Bomb. p. 22; Woodr. in Joitrn. Bomb. Nv^ w 1 ■: ■■  
p. |29; Oiiv, M. 'Prop. Afr. v. "I. p. 226; Watt, Diet., ,on. Prod. v. 'U  
p. 566.—Flowers : July-Aug.

A handsoaoe tree, planted thro . Graham-'

uenca lxnkgenous, plant is refer! s never 1 n by him  
guibro shot<sup>0</sup> anJ ol the soutliern fores not mention it as

growing in tW  
at pubesc 5-a?' ^ot!^an or Kannra. Seterai tr be seen growing  
Sty. v. 6, in the botanical garden of;  
'ano. i he- College of Science at Poona.—DISTJIB. Malaya, Bae! tropical Africa.  
base' , 1 obliqi

, I.inn.

\U1.) > ; i s or **sorubs**, more or less **stella**

\vic\i\ [lowers **axillary, solitary or fascicled**,  
i' III

;: **Leavi**

**Calyx** tubui- -

»iIV b , i<sup>0</sup>, in

**Segals valvate, more or less combined into a calyx. Petals 5, hypogynous, tree or connate at the base or 0. Stamens various; filaments (a), united into a column or tube, divided at the apex into 5 teeth or ligulut' ■ Ij alternating with the petals, and bearing, in the spaces between the staminodes, solitary or 2-5-nate (rarely indefinite), stalked or sub: anthers ; or (h), staminodes 0, the column bearing many anthers i seriate Irani the middle to the top (*Efciolcena*), or**  
**l-seriate at the top of the eup ; or (c), the anthers adnate to the top of Luma and arranged in a ring or without order (*jStqrculia*); or (dt), stamens 5, almost if not entirely fn e arid alternate with the sepals, stauinodi's ii or 5 opposite Hie sepals. An 2-celled; cells parallel or diverging, rarely conihrent at the top (*Hdicteres*). O\ ■. I 5- (rarely 10-12-) celled or reduced to a single carpel: ovules 2 -many (rarely 1), in each cell attached to the inner angl\* Ing or Imri-  
**Kontal, anatropotis or amphitropous; rap or lateral; mieropyl inferior ; stj'les as many ovary, distincti or sno.fi  
 less connate. Fruit dry, rar : earpels sometim ?4'mto****

SV 11 K. IV

it or il'

■ times arilate; albumen fleshy, thin, ■d; cotyledons Folia Hat, folded or convolute, rarely fieshj ; radicle short, pointing in different directions in different species.—**DISTHIB.** Throughout the tropical regions of both iii-uuspheres and in S. Africa and extratropical Australia; mort genera 41 : j than 500.

- Flowers am or polyga IsO.
- Anthers 10 or more ..... ■■..... 1. - i
- Anthers 5 ..... 2. ETSOTIBBA.
- Flowers hermaphrodite j petals present.
- Petals deciduosi andrfleeuim columnar below, . ■! •!
- ..... ■ . ■ - cup,
- Capsule na tflated ..... 3. KJ.IJNHVJ •.
- i Capsule woo
- Anther-cells divari \*ed, 4,
- . ber-cej^ paralle]; seed ..... 5.
- rote i Petals deciduous; an&rojomui tubular, ■■ . tlieri- 0... 6. ERIOI.-KS \.
- rous for aearl ■■ ■
- Boir 'ct.ils persist\* ■■■ i ■ ■ "ou» al
- 0, si MJCLHASIA. ititig with stsuniiodes ... 7.
- Bom Petals marcescent; aw i ■ mlar at the has© oolj ;
- imena e, si - n\_
- Ovary ■ ..... 8. BIFACK ■
- Ov;i;-> I a tied ..... 9- WAJ :

Lj Linn.

**undivided, lobed or digitate. Inflorescence paniculate**  
**•A, usually axillary. Flowers unisexual or poiygamouis^**  
**ir partite, usually c , Petals 0. Staminal-column**  
**rnex 10-30 ' arranged in a ring or without ordei\*.**  
**•hftvary ■ distinct; ovules 2-many in each carpel;**  
**\*.\* i stigmas us many as fche carpels, free,**  
**"els distinct, follicular, sessile or stalked, woody or**



nauy, naked **or** rarely **winged**, sometimes **ariilate**;

Talb. Trees, Bomb. , Woodr. in Journ. Bomb. Nat. v. II | •\*  
 p. 128.—Flowe ■ Is  
 Appears to be vai of Prain la V\*oi 'i^-  
 • p. 07. P-~  
 Southern di common. K "  
 S, Karmni. in deciduousfores I ;■ on the Kiila natldi, 7/  
 1620!—DISTRIB. Burma and v-

### ERIODENDRON, DC.

Trees unarmed or with thorns'. Leaves digital  
**entire.** sis "1 -flowered, axillary, iry or clustered.  
 Involucral  
 braxis0. (Salyx cup-shaped, truncali ■ or irregulai'ly 3-5-lobed,  
 persistent.  
 Flowers n^y or whitish ; petals 5, oblong, slightly commie at the  
 mbescent or woolly. Stamens in 5 bundles he petals, conna  
 t b;i^e. each bearing 2-3 sinuous or linear anthers, Ovary •">■-■  
 cells manv-ovuled; stylo cylindric, dila  
 Capsule woody or o 5 thin  
 " woolly \- obovoid or L^  
 enveloped in copious silky cotton ; testa cru ; album  
 thin; cotyledons eontortuplicate.—DISTRIB. America, tropical &i  
 species about 3,

#### 1. *Eriodendron anfractuosum*, DC. (1824

> ; trunk pri un ( 3  
*Prodr.* v. i

1"lit-'a

L'--5 in. M:<L;\i-u>i>idate, eni mo : ■  
 stipu TO, caducous. Pedicels 1-2 in. long, in clus  
 Calj f, glabrous 0 . hairy al within, 5-li  
 lobes rounded or triangular, soin ' [Wersl]-2in.  
 oung Leaves at the ends  
 : calyx, woolly ou  
 i -nu, bin n't, lined »itb  
 or more, pyciforin,

I'l. H. i. v. I, p.350; &rah.

Gat. ]J. IT; " ,<sup>a</sup>

p ]

& Gibs. p. ^: T.

Bcmb. ti' tu be

Woodr. in ■■

Diet. T^d

Prod, v. 3, p. 2<

. i n . The WI

ti\*ee Y tuu  
 ti

Sha

ftlue and i  
 is known as *Kapok*. 'The tre  
 in Bombay tha nomic importance w that Preside

\ cry .

mi

S. i'l:

Africa.

### OUUEE XXVI. STERCULIACE.S).

Herbs, shrubs or trees, usually with soft wood, **flu->** '\*  
 usually with stellate often mi^d simple hairs ascent. Leaves ep-^  
 !>le, lobed or digitate, usually stipulate. Intlor\*1 ^- Calyx tubuJr  
 <nithi

terminal), usually cyoiose. Flowers regular, he<sup>1</sup>"

ï"\*

i contorfcuplieate ■ g a straight  
radicle.—DISTBIB.  
ropical American; species about i i i -

*Urd.*

Trunk **not prieklj** . uents"flattened ..... I. B,  
2, B.

**Bombax malabaricum, BO. Prodr. v. 1 (1824)' p. 17^.**

A.  
tall deciduous I : aight buttressed trunk and wide-spreading  
branches ; **bar**; d \vltb hard sharp conical prickles.  
Leaves  
large; leaflets &-7, entire, 3^7 in, long, glabrous, penniuerved, retieu-  
lately veined, lanceolate or oval, cuspidate, acute at the 3 in.  
long, glabrous; petiolules .1-1 in. long; stipules small,  
triangular,  
caducous. Flowers numerous, near tin - the  
branches, appearing  
before the new leaves. Calyx  
with the stanr y g coroll orolla bright **red.** y p  
outside, sparingly pi **tin**<sup>1</sup> tomentose op  
vt'ith clo veins. Stn >tic-obji icurved,  
of about; 9-12 each, and an inner arranged in 5 bundles L5  
most are li laments of which the 5 inner lightly  
than half as loi pubescent, rather more ly at  
Ovary conical, glabrous ; stj le a little the base of the bundles. er  
linear, ) in. long. Capsules. **4-5** than the stamens; stigmas 5,  
**in** thick, usually I id; lobes  
rounded.  
densely silky within, glabrous without, coining away from the receptacle  
ih h ll C l l b i h d i

**g g**  
g p. ovoid, downy. 5-valved, lined  
within with white silky hairs. Seeds | in, long, numerous, ovoid,  
packed in white<sup>1</sup> cotton. 1'IB.J. v. L, jf. 349; Grab, Cat, p. 16;  
Woodr. in Journ. Bomb. Nat. v. II (1897) p. L28; Watt, Dict.Econ.  
Prod. v. 1. p. -'ST. *Saltnalia maldbtcrica*, Sehott. & Eudl. .Meietem.  
p. 35; Date. &  
(Jibs. ]). Tin; SiiL-eoUon tree. VERK. *Kdt&S Sdvar*;  
L'2,—Flowers: Feb.-Mar., when **tin**<sup>1</sup> tree is bare of leaves. Ti

•n o!)taiaed from the capsules, though not well adapted  
or  
spiuuj . an excellent inateri^ '<JV fil] cushions and pill<  
s,  
for which purpose it is extensively used in India and, under the name  
*il* exported to Europe. A gum called *Mochct^ra^^* employed ijt  
iqine, is also n product of the tree, while the inner bark affords 3

w  
h  
i  
c  
h  
  
c  
a

n be used in the manufacture of cordage,\*—See Watt, . Prod. 1.

e.  
Ty oowra\* illy parts, '•, altam ; ,\M  
Di

iciency. I  
S. M. OOUNTUY : Law !

. **Bombax insigne**, *Wall. Pl.* , *Bar.* v. I. (18iiO) p.  
71.

79 80. A tree, leafless *h* son ; trunk unarmed; branch-  
trickly. Leaves glabrous ; petioles longer than  
the

, **g** ,  
e at the base; petiolul)  
\ttered On the leafless brai bout, jointed al top. Calyx  
■■■■' ...-olate-globose, truncate i 2-lobed, finally deeply  
ls.vuV^ prickly outside, den-" -y-liairy within. Corolla  
' white; petals 5 in. long, narrowed at bas  
jj side. Staminal-bund consisting of o 0 or m ore  
Taints, about | the length of the corolla. **Ovary**  
>lobed. Capsules oblong, woody,  
1;L% glabrous, *El. B. I. v. 1, p. 349;*

^ v °

I

Cultivated in parts of the Deocan, bui  
Eajpootana and the N.W. Provincej daily  
as "Bengals."

**14. ADANSONIA,** Lutis.

Trees with a low trunk' of greal diameter. agitate.  
I •3-9; quite entire. Pedicels axillary, 1-flov Lnvuhicral bracts 2.  
Flowers large, pendulous. Calyx ovoid or oblo g, deeply 5-fid,  
villoua within. Petals 5. Stauinaal-tube silky-above into  
dividin Io&gish 1-antherjferous filai numero 1. OvaivS  
cells many-m uled; style shortly divided at i apex iii.i) as to  
tl the ov;trv. Fruit  
spreadin uatic branch  
obiong, woody : col Is packed with farinaceous pulp. Seeds "reniform,  
nesting in pulp; hiium lateral; testa thick; albumen thin, membranous ;  
embryo ourved. Cotrjrledons much coutortuplieate, enelbsing a sHg  
curved radicle.—DISTBIB. Species 2, one of whir: Australian.

1. *Adansonia digitata*, *Lmn, Sp. PI.* (1753) p. 1190. Trunk *ot*  
great diameter at base, rapidly narrowing upwards. Cleaves deciduous,  
glabrous; leaflets 2-5 in. long, obovate-oblong, acute or obtuse; petioles  
up to 6 in. long, villous ; petiolulea 0—I in. \ong. Pedicels reaching 8 in.  
*Ions*, softly hairy. Calyx fcawxiy-tomeitose outside, grey sillty-villous  
within, divided below tin.; middle; lobes 2 In. loag, ©blojjg-lanceola late  
Ovary densely villoas; style up to 4 in. long, lower part villous.  
B. I. v. 1, p. 348; Grah, Oat. p. 16; *Dak. & Gibs. Suppl.*  
p.

. in Bngi. & Prantl, *Pfianaenf, Talb,* , p B, p.  
Trees, Bomb. p. 20; Woodr. in Jburu. Bomb.

p. 1.28; Watt, *Di* 5. Prod. v. p. 05. ■ -Flo'  
The Baobab or i -pad  
*chinch.*

The tree is not indigenous to India, but been pla  
[daces in the Bomb tt I to hai  
duced forra dfria by Lrabian traders ?b.e il ! medieiQ,  
natives, who esi s©in it coolin and are ith  
supposed to restrain excessive piration (G>

There are several *trot^* on the so-called and a tree, celebrated in Meadows  
Taylor's ■ held whei >ISTEIH. Endemic in tro] :od. v  
ill (3

... BOMB AX, L

Trees, often lofty, Leaves digitate; leaflets 3-0, siabentu growing in Urn  
axillary or subterminal, solitary or clustered, .1 -flov -'L;LiH";il "a"i'  
narrow or oboval ■>) pub- \yx CUJJ-SIIU.  
irregularly 2-5-lobed. 8  
calyx, adnate to th . . 5 bundle ■ tt. Lea<sup>1</sup>  
Ovary 5-celled ; cells many-ovu<sup>1</sup> alys tulm<sup>1</sup>- fl  
5-fid. Capsule loculieidaliy S-valved ; cells v\*  
*Seeds* obovoid or subglobose, polished or p' cfrt\* .a^

**O** ■d, ovoid. without any anderiytog down Fl. B I.

Did Econ Prod. v ■ l. p. 10. Barbadoes, Bourbon %nd Sea



leetorate, though it. yield per acre was no1 large, t - .  
Bombay Flora, Suppl. p. 8.)  
mnoh-branchpi! shrub. Leaves large, o  
I-  
VAB. 1- <<<< ;V uV [d between the lobes. Involucral  
ed witi the ;V uV !iv YeUovv or yellow  
cts large, deeply la< er than the involucre;

V.

££TJ»3E£S<J an Sanction bythe Portuguese fto»

Peru or Brazil. 0abeU \$ Mb\*TM, }-«■) - ^  
^^

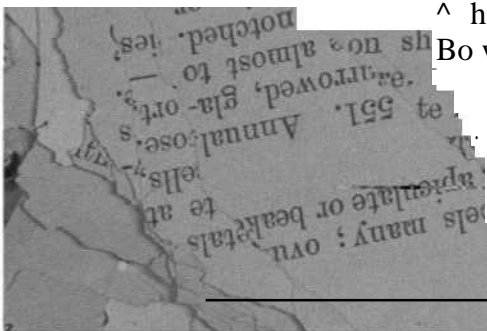
**J. Gossypi»m arboreum**, ii..». -V- ^ fi<sup>72</sup>mStely 5 7-W><l  
mt; branches P<sup>ei</sup>6 8<sup>5</sup>coriaoeou<sub>6</sub>, subglabrouslobes  
■nth often a., extra "" h "" . ^ j"" ,, hri.tlMii.ped: ptiokw villous,  
f\*W-ob)ohg, contracted a\*\_»e 1 ,, .  
axillary,

Ltöö the f^-^iZ invXral bracts << Stamioal-  
Wed, opted above th in iu • .raiding.

dheriferoas fonts white cotton not rea  
ipawbk

S<sub>0</sub>SSa1n-g^1^veketydown: F I . B . L v l ,

, w . u-ni on soil and cultivation.



^ hairy;  
Bo we red ; corolla yeliofl  
Ov. glucra1 hm  
Lral ears, ovate, acute, toothed alfeve  
Capsules  
i below whiba cotton. r--. " ■ .

small, slightly united at the base, ovate, cordate, acute, shortly toothed. Corolla yellow with purple base, becoming reddish on the outside at maturity. Capsules small, ovoid, acute, 4-celled with 8 seeds in each cell. Seeds small, ovoid, subrotund; velvet very short and firmly adherent; wool white or whitish-red. *G. Wightianum*, Tod. Cult. Cot. p. 141, t. 4, figs. 1-9, et t. 11, fig. 10; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 128; Watt, Dict. Econ. Prod. v. 4, p. 28.

Hinganghat cotton, ex Woodrow l. c. This, according to Todaro, is the principal source of the Indian cotton.

The wild cotton from Badami in Woodrow's list l. c. appears to be a wild condition of *G. Wightianum*, or a hybridised form with perhaps *G. neglectum*.

VAR. 2. *religiosum*, Mast. in Fl. B. I. v. 1, p. 347. Perennial, diffuse. Leaves hairy, 3-5-lobed; lobes triangular, acute; stipules cordate, acuminate. Involucral bracts large, deeply laciniate. Corolla uniformly yellow or yellowish-white. Capsules 4-5-celled, oblong, much pointed. Seeds free, with firmly adherent tawny down; underlying cotton of the same color or white; cotton not easily separable from the seeds. *G. religiosum*, Roxb. Fl. Ind. v. 3, p. 185; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 128; Watt, Dict. Econ. Prod. v. 4, p. 16; not of Grah. Cat. p. 15; not of Dalz. & Gibs. Suppl. p. 8.

A vigorous shrub, thriving in moist sandy soil, ex Woodrow, l. c.

Yields the cotton known as Nankin or Khaki cotton. Its cultivation

;i view 10

obtain k or n&ture-dyed cotton. Roxburgh was of opinion

Mast, in Fl. B is divided to the [uvolucral brad !y laemi&te, obtuse, FJ witho' adfierenl se. Capsules 01 w», Linn p. 975;

Sp. Cor. p. fl, V.

Pi Kent. v.

L/Cti DC 01].

■. in Eadia

37. use, var. Upland Georgian. B

t. 3, fig. 4.

of iv. ever, resembles that of *G. herbaceum*, w the seeds which are furnished with unde bable that it may be a hybrid.

... is Qofc IUtt'ing "' the

Groivn [argfilj in tie S. ■

■ ■ Up

3. *Gossypium* barbadense, much-brancbe b rea ing

two petioles rath stout, often glaadiuar at very large, deeply laciniate. (' - ,a.\n





sprinkled with black dots; stipules 1/4 in. long, lanceolate. Pedicels  
axillary, jointed, 1-flowered. Involucral bracts up to 1 in. long, oblong-  
elliptic, not or scarcely cordate at base, palmately nerved, sprinkled like  
the calyx with black dots, deeply lacinate; segments 8-12, linear-  
lanceolate, with rounded sinuses. Corolla  
triangular at base, very acute. Corolla  
base; petals toothed. Staminal-tube

(cotton)

valves purple . . . . . 5 ed;  
valves in  
[ovish, adherent and cl  
ssed

appear before being pull\* d  
Tal. Trees, Bomb. p. 20 ; Woodr. in

Journ.

Bomb. p. 128; Watt, Diet. v. 4, p. 39.  
*Q. obtusifolia* b Herb. Kew.; Dalz. MS. in Herb. ICew.;  
Dalz, & Gibs. p. 21. *Q. aegyptiaca*, Todaro, Cult. Cot, p,  
132.—Mowbray

This appears to be the only involucral bracts are  
not 11

SIND : Stocks, 4691 in Herb. Kew. !; similarly  
in Herb. Kew. ■

books (n. 469, Herb. Kew. ■) *Q. aegyptiaca* is "q  
*hills?* This d to mean that the plant  
which is far from being ■ e. *Q. aegyptiaca* is very abundant on an  
extensive

plain at Moach, near Karachi. The writer rated in  
the small botanical garden attached to the College of 5 Poona,  
' *Q. aegyptiaca* collected by him on this plain. The plants  
grew showing a strong tendency to

*Q. aegyptiaca* tinn. 8p. 1\*1. (1753) p. 693.

Annual plant;  
stem clothed with gland on the midrib beneath, 3-5-  
mottled or less (sonu-  
airy. Leaves

*Q. cordata* U. Willd. hidi b  
7") broadly

■ ■ - shortly truncate,

Involucral bracts ovate obtuse, gashed below the  
vein, slightly cordate, are portion subtended by  
zoic (i- obsolete) are shorter than  
yellow with purple base; petals obovate, cucullate.

v. cordata. Fl. B.I.  
v. I, UG; Dalz. & Gibs. Suppl. p. 8.; Talb. Trees, Bomb. p. 2"; t.  
Cot. p. L31, t. 4, figs. A, B, 0, el t, LI, fig. 13; Watt, Diet. Ecdn, 1(1.  
v. 4, p. 25. > species *Q. aegyptiaca* proper, according to Todaro, does  
not occur

*num.* **Shrubby ; stems erect, somewhat hairy:**  
**ted** with short thick **closely stel** **taira,**  
**L] cordate, 3-5-** (rarely 7-) lobetl: i  
**ted at the base into the rounded** sinus,  
**avea rises up as a fold;** stipules on the **pedicels**  
**'inear-lanceolate, acuminate.** Pedicels **erect** in  
the length *oi* t he **peti<>les»** **Involucial bracts**

DC. Prodr. v. 2 (1825) p. 21 (*in syn.*); W. & A. Pro<sup>1834</sup> p. 162; El. B. I. v. 1, p. 633; Grab. Cat. p. 247; Dalz. & Gibs! o. 49; Talb. Trees, Bomb. p. 52; Woodr. in Journ. Bomb. Nat. v. 11 (.397) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 370.—Flowers: Oct-Dec. VEEN. *Jangra*; *Gangr.*

Very common in Gujarat, where it is often *very* troublesome to sportsmen from its hooked thorns. GUJARAT: Broach, *Woodrow*! Porbandar (Kathiawar), *Cooke* \ S. M. COUNTRY: Belgaum, *Ritchie*, 211!—DISTRIB. India (Punjab, W. Peninsula); Persia.

The fruit has a pleasant acid flavor and is eaten during times of scarcity. See Watt, Diet. Econ. Prod. 1. c.

4. **Zizyphus GBnoplia**, *Mill Oarcl Diet.* ed. 8 (1768) n. 3.

A

straggling shrub often setni-scandent by its prickles; young branches rusty-tomentose. Leaves numerous, distichous, 1-2| by f-1 in., ovate or ovate-lanceolate, acute or subacuminate, with pubescent or tomentose tips, minutely denticulate, glabrous or pubescent above, densely silky with appressed rufous hairs beneath, base very oblique; main basal nerves usually 3, with numerous ascending branches, the lowest branch on the large side of the leaf starting almost, but usually not quite, from the base; petioles ^-^ in. long; stipular prickle 1, stout, short, hooked,

pubescent except the tip. Flowers 12-20, in subsessile pubescent paniculate cymes which are slightly longer than the petioles. Calyx hairy outside; lobes ovate, acute, keeled to the middle or a little below it. Petals obovate, cunfafe, shorter than the calyx-lobes, exceeding the

stamens. Disk with 10 short deeply pitted lobes, glabrous.

Styles

united almost to the apex. Drupe edible, \ in. in diam., globose or

obovoid, 1- (rarely 2-) celled, black, shining; pulp scanty; stone woody or bony. Fl. B. I. v. 1, p. 634; Grah. Cat. p. 39; Dalz. & Gibs. p. 49; Trim. Fl. Ceyl. v. 1, p. 280; Talb. Trees, Bomb. p. 52; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 371.—Flowers: Aug.-Sept. VEEN. *BurgL*

KONKAN: *Graham, Dalzell & Gibson*; in moist forests, *Talbot*. DECCAN: *Dalzell & Gibson*. S. M. COUNTRY: Belgaum jungles, *Ritchie*, 1321; Badami, *Cooke* \; Dharwar, *Woodrow*! KANAKA: in moist forests of N. Kanara, *Talbot*; Kala naddi, *Ritchie*, 1321—DISTRIB. Throughout the hotter parts of India; Tropical Asia, Australia.

5. **Zizyphus xylopyra**, *Willd. Sp. PI* v. 1 (1797) p. 1104.

A

straggling shrub, or in favorable situations, a tree; • branches armed or not, covered when young with a short grey tomentum. Leaves 1|-3 in.

long,

elliptic-oblong or suborbicular, crenate-serrate, often mucronate, glabrous above, covered with white or yellowish tomentum beneath, very oblique and sometimes cordate at the base; petioles ^in. long; stipular prickles frequently absent (when present, twin, one straight, the other curved). Flowers sometimes 4-merous, in small dense pubescent paniculate cymes; peduncles | in. long; pedicels short. Calyx pubescent outside;

lobes

ovate, acute or acuminate, keeled about half way down. Petals spathu-; late, with long claws. Disk thin, 5-angled. Ovary 3-

(rarely 2-<sup>^</sup>

celled ; styles 3 or 2, distinct or nearly so. Fruit hard and woody,

J-1 in. in diam., globose, covered with close dense grey tomentum; stone large, very thick and hard, 2-3-celled, 2-3-seeded. Fl. B. I. v. 1' p. 634; Grah. Cat. p. 39; Dalz. & Gibs. p. 49; Trim. Fl. Ceyl. v! 1] p. 282; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt'

for about half their length. Petals cucullate, rounded at the apex, deflexed with the stamens between the calyx-lobes ; pedicels short, hairy. Stamens enclosed in the petals, but not exerted beyond them ; filaments 2<sup>^</sup> in. long, slightly dilated at the base. Disk with 10 grooved lobes. Ovary about half sunk in the disk, ovoid; styles 2, connate for about half their length. Drupes edible, |-| in. in diam., globose, fleshy, smooth, yellow or orange when ripe ; stone 1-2-celled. Fl. B. I. v. 1, p. 632 ; G-rah. Cat. p. 39 ; Dalz. & Gibs. p. 49 ; Weberbauer, in Engl. & Prantl, Pflanzenf. v. 3, part 5, p. 403, fig. 198, A-D; Talb. Trees, Bomb, 'p. 52 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 367.—Flowers : Sept.-Oct. VERN. *Bor*; *Bar*.

Not abundant in a truly wild state, but plentiful near sites of former villages throughout the Presidency.—Dr. Gibson (fide Graham l. c.) states that it is abundant in the Khandesh jungles, particularly towards the Tapti. It is extensively cultivated throughout India for its edible fruit and for its timber, which, though small, is much valued for certain purposes. See Watt, Diet. Econ. Prod. l. c.—DISTRIB. Throughout India; Afghanistan, Ceylon, China, Australia, Africa.

2. **Zizyphus trinervia**, *Roxb. Hort. Beng.* (1814) p. 17 (*not of Poir.*); *Fl. Ind.* v. 1, p. 606. A small unarmed tree. Leaves 1-3 by jf-1| in., elliptic, subobtuse, often inucronate, serrate (the serratures with short callous points), prominently 3-nerved from the base, glabrous, shining, base more or less oblique, rounded or subacute; petioles ^-| in. long; stipules filiform, caducous. Flowers greenish-yellow, in axillary peduncled cymes scarcely ^ in. long. Calyx finely pubescent outside; lobes triangular, keeled within, deflexed. Petals small, shorter than the recurved stamens, obtriangular, cuneate. Disk 10-lobed, not grooved. Filaments flattened. Ovary 2-celled ; styles 2, united to the middle. Fruit |iu. in diam., globose or obovoid, somewhat rugose, 1-2-celled, yellow when ripe. *Z. trinervius*, var. *glahratus*, Heyne, in Roth, Nov. 8p. (1821) p. 159. *Z. glahrata*, Wight, Icon. t. 282; Laws, in Hook. f. Fl. B. I. v. 1, p. 633 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271; Watt, Diet. Econ. Prod. v. 6, part 4, p. 367.—Flowers : Nov.-Dec.

GUJARAT : Surat, *Woodrow* ; Ahmedabad, *Cooke!*, *Woodrow*.

This species was named *Z. trinervia* by *Roxburgh* (*Hort. Beng.* p. 17) in 18}4, and Wallich (*Roxb. Fl. Ind.* v. 2 [1824] p. 354) after a comparison of *Roxburgh's* plant with that named *Z. glahratus* by *Heyne* (*Roth, Nov. Sp.* [1821] p. 159), found them to be identical. The older name given by *Roxburgh* is therefore retained.—DISTRIB. India (E. Bengal, Bhotan, W. Peninsula).

3. **Zizyphus rotundifolia**, *LamJc. Encyc.* v. 3 (1789) p. 319. A small shrub branched from near the root; branches divaricate, slender, zigzag; bark light-colored. Leaves |-| in., orbicular or ovate, spinous-dentate, clothed beneath with a whitish or buff tomentum, less densely tomentose above; petioles J-^ in. long, tomentose; stipular thorns usually in pairs, one straight, sharp and slender, nearly as long as the leaf, the other short, hooked. Flowers in axillary sessile pubescent cymes ; buds globose ; pedicels short. Calyx pubescent outside, cleft about half way down ; lobes triangular-ovate, keeled on the inner face about half their length. Petals cuneate, rounded or truncate at the x, longer than the stamens. Filaments deflexed together with the closing petals. Disk 10-lobed, with a pit opposite to each lobe, ary 2-celled; styles 2, united to above the middle. Drupes globose 3 in. in diam., glabrous, red when ripe, edible. *Zlzijplms nummularia*,

/,br,»r,. «'''»"TM\*'<«'I '''• 1,'rV^S", L b.W»t of U» Pi\*  
**while**

(Icon. 1.114) figures a plant which he. has n<sup>TM</sup>« f<sup>^</sup> <<sup>s</sup>^f iree<sup>^</sup><sub>a</sub>  
S i e n s exist either »t Kew or „ the BrJ<sup>^^</sup>; J j d « th

(Icon. 1.114) figures a plant which he. ha f<sup>^</sup> ^f iree<sup>^</sup> actly represents  
Specimens exist either »t Kew or „ the BrJ<sup>^^</sup>; Jj, dra«. the nmlf<sub>e</sub> iL«,\*«

# !£S4SSa2=S

Apparently endemic.

## 2 ZIZYPHUS, Juss.

sharp .tmght <» J<sup>'''1</sup>?<sup>1</sup> TM<sup>^</sup>J' n<sup>1</sup>,a,,iy coriaceon.. Flo.-ers axillary.

p<sup>^</sup>tVg both hetnispherea , species about 60.

Petals 5.

- Fruit under . } in. in diam. .... 2. *Z. trinervia*.
- Leaves glabrous ..... m''^'''.j..... 3. *Z. rotund\*folia*.
- Leaves toraentose on both sides ..... z (*Enoplia*).
- Leaves clothed with silky hairs beneath.....
- Styles distinct or nearly so. .... ~ z *xylopyra*.
- Fruit %-\ in- in diam ..... \*..... ^: 2. *horrida*.
- ] ?\_rit ^\_ | in. in diam..... jK' *Z. rugosa*.
- Petals 0 ..... tm<sup>^</sup>F A H

A small

1. *Zixyphus Jujuba*, ^•f^J;Vanches 'softly pubescent. eh-branched tree or l^J<sup>TM^^^</sup>, rounded at U ,nds, Leaves 1-2\* by |-1| in/' TM<sup>o^</sup>' o\_f intr and irregularly denticulate, slightly if^^^fw^thUtha dense whitish or buff tomentum, solitary Longly Served from the base pe petioles l in long; bristles 4 o(her or in pairs, when nvii ers Q], short-peduncled axillary :-~U\_1W m Sm a ent or woolly outside, glabrous within, cleft about triangular, prominently keeled on the inner face

in large spreading and drooping leafless pubescent terminal panicles; buds 5-angled ; pedicels very short. Calyx pubescent or puberulous outside, glabrescent within; lobes erect, triangular, very acute, keeled on the inner face and with a hard incurved point at the apex within. Petals much smaller than the calyx-lobes, enveloping the stamens and shorter than them. Disk softly pubescent. Ovary pubescent; styles more or less divergent. Nuts about 1 in. in diam., yellowish, globular, supported by the persistent calyx which forms a flat disk at the base of the fruit; wing 1-2 in. long by 1/2 in. broad, linear-oblong, 1-nerved, rounded at the apex and terminated by the remains of the bifid style. Fl. B. I. v. 1, p. 631 ; Dalz. & Gibs. p. 48; Talb. Trees, Bomb. p. 51 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 227. *V. maderaspatana*, Wight, Icon. t. 163; Grab. Cat. p. 40; Trim. Fl. Ceyl. v. 1, p. 279.—Flowers: Dec-Jan. VEittf. *Lokandi*; *Kdnvel*.

KONKAN: *Stocks*; common at Matheran, *H. M. Birdwood*; 23 miles east of Ratnagiri, *Woodrow*. DECCAN: Khandala, *Dalzell* & *Gibson*, *Graham*; Lanoli Grove, *Graham*. S. M. COUNTRY : Ramghat, *Bitchie*, 1685!; Padshapur, *Dr. Lush*. — *DiSTMiB*. India (W. Peninsula, Tenasserim); Ceylon.

The root bark produces a valuable dye which is well adapted for *tasar* silk. See Watt, Diet. Econ. Prod. 1. c.

2. **Ventilago calyculata**, *Tulasne in Ann. Sc. Nat.* ser. 4, v. 8 (1857) p. 124. An extensive climber. Leaves 2-5 by 1-2 in.,

elliptic-oblong, subacute, crenate-serrate, pubescent when young (especially the lower surface), base oblique, rounded or acute ; nerves 4-6 pairs ; petioles 1/2 in. long. Flowers with an offensive odor, numerous, greenish, in densely pubescent paniculate spikes. Ovary pubescent. Fruit 1 1/2-

2 in. long (including the wing), girt about the middle by the persistent calyx ; wing pubescent, 1/2 in. broad, rounded at the apex, terminated by the remains of the bifid style. Fl. B. I. v. 1, p. 631; Talb. Trees, Bomb, p. 51; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 271 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 226.

KONKAN, *Law!*, *Stocks!*; in deciduous forests, *Talbot*. S. M. COUNTRY : Belgaum *QchktfRitchie* !; Dharwar, *Woodrow*; Badami, *Bhiva!* KANAKA : Yellapur (N. Kanara), *Woodrow*.—DISTRIB. India (throughout the hotter parts); Java.

3. **Ventilago bombaiensis**, *Dalz. in Hook. Kew Journ. BoU* v. 3 (1851) p. 36. Branches, petioles and inflorescence fulvous-pubescent.

Leaves 3-4 by 1-1 1/2 in., lanceolate, acute or subacuminate, crenate (the crenatures with callous points), glabrous, shining, base oblique, acute ; main nerves 3-4 (rarely 5) pairs, furnished with rufous-villous glands in the axils; petioles 1/2 in. long ; stipules subulate. Flowers (15-20), fascicled in the axils of the leaves ; pedicels shorter than the petioles' fulvous-pubescent. Calyx strongly fulvous-pubescent outside, cleft about

half way down ; lobes triangular, very conspicuously keeled on the inner face. Petals truncate at the apex, cuneate at the base shorter than the stamens. Disk filling the calyx-tube. Filaments flattened : anthers

subglobose, enveloped by the petals; connexive shortly excurrent

Ovary sunk in the disk, 2-celled; ovule 1 in each cell; style bifid fleshy' slightly recurved at the apex. Fruit not seen. Fl. B. I. v 1 p 631

Dalz. & Gibs. p. 48; Woodr. in Journ. Bomb. Nat, v 11 (1897) p 271\*  
—Flowers: Feb.

stipules small or 0, sometimes transformed into prickles. Flowers hermaphrodite or polygamous, small, greenish, usually axillary, solitary or variously fascicled. Calyx 4-5-fid; lobes shortly triangular, erect or recurved, usually keeled within, valvate. Petals 4-5 (rarely 0), inserted on the throat of the calyx-tube, usually less than its lobes, cucul-late or involute, sessile or clawed. Stamens 4-5, opposite to and inserted with the petals, often enclosed within their folds; anthers versatile, 2-celled, sometimes ovoid and dehiscing longitudinally, sometimes reni-form and 1-celled, by the confluence of the cells at top, and opening into 2 valves by an arched slit. Disk fleshy and filling the calyx-tube, or thin and lining it, entire or lobed. Ovary sessile, free or immersed in the disk, wholly free from, or more or less adnate to the calyx-tube, 3- (rarely 2-4-) celled; ovule 1 (rarely 2) in each cell, erect, anatropous; raphe dorsal; style erect, short, usually 2-4-fid. Fruit superior or inferior, 3- (more rarely 1-4-) celled, capsular and often winged, or drupaceous. Seeds with fleshy albumen (rarely exalbuminous); embryo large, straight; cotyledons fl.it, fleshy.—DISTIB. Warm regions and tropics of both hemispheres; genera 37; species about 420.

- |  |               |
|--|---------------|
| Fruit dry, indehiscent, 1-celled; ovary ^-inferior .....   | 1. YENTILAGO. |
| Fruit drupaceous; stone 1-4-celled; ovary j-inferior ..... | 2. ZIZYHIUS.  |
| Fruit baccate; pyrenes 2-4; ovary superior.                |               |
| Disk thin, lining the calyx-tube .....                     | 3. RHAMNUS.   |
| Disk fleshy, filling the calyx-tube.                       |               |
| Flowers pedicelled, in axillary umbels .....               | 4. SCUTIA.    |
| Flowers sessile, in long spkute panicles .....             | 5. SAGERETIA. |
| Fruit capsular.  |               |
| Fruit globose; ovary £-inferior .....                      | 6. COLUBRINA. |
| Fruit boldly angled; ovary quite inferior .....            | 7. Q-OUAXIA.  |

### 1. VENTILAGO, Gasrtn.

Scandent shrubs. Leaves subdistichous, alternate, petioled; stipules very minute, caducous. Flowers small, in terminal and axillary panicles (rarely fascicles). Calyx 5-fid; tube obconic; lobes spreading, acute, keeled within. Petals 5, deltoid or obcordate, cucullate, involute. Stamens 5, adnate to the base of the petals and a little longer than them. Disk 5-gonous, naked or pubescent, its margin free. Ovary immersed in the disk, subglobose, 2-celled; style very short, compressed; stigmas 2, short. Ripe fruit subglobose, 1-celled, 1-seeded, surrounded at its base or middle by the adherent calyx-tube, the fruit prolonged into a linear or linear-oblong coriaceous apical wing. Seed subglobose, exalbuminous.—DISTIB. Tropics; species about 16.

Flowers in terminal panicles.

- |   |                             |
|---|-----------------------------|
| Nut girt at the base by the persistent calyx .....      | 1. <i>V. madraspatana</i> . |
| Nut girt round the middle by the persistent calyx ..... | 2. <i>V. calycukta</i> .    |
| Flowers in axillary fascicles .....                     | 3. <i>V. hombaiensis</i> .  |

**1. Ventilago madraspatana, Gcertn. Fruct. v. 1 (1788) p. 223, t. 49, fig- & -A** 1<sup>ar</sup>g<sup>e</sup> much-branched woody climber; young branches and panicles pubescent. Leaves 2-4 by 1-11 in., oblong-lanceolate or elliptic-ovate, subacute, entire or more or less crenate, glabrous above, glabrous or puberulous beneath, base rounded or acute; main nerves 4-8 pairs, alternate, ascending; petioles |-\$ in. long; stipules small, subulate. Flowers greenish, with an offensive odor, £ in. in diam.,



p. 62G ; Dalz. & Gibs.' p. 33 ; Talb. Trees, Bomb. p. 50 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270.

This has been included on the authority of *Dalzell & Gibson* (Bo. Fl. p. 33), who give its habitat as Banghat (*S. M. Country*), but there is no specimen from that locality in Dalzell's Herbarium in Herb. Kew., and the plant does not seem to have been found by any other collector. There is but one specimen in Herb. Kew. which is from Wight's Herbarium, and this specimen is destitute of fruit and has but a single flower on it. The description above is taken from *Wight & Arnott*, Prodr. 1. c. *Woodrow* *cj Talbot* simply quote *Dalzell & Gibson*.

**3. *Salacia macro spernia*, Wight, Icon. t. 962.** A scandent shrub; branches not lenticellate. Leaves coriaceous, 3<sup>^</sup>-5 by 1<sup>^</sup>-2 in., elliptic-oblong, acuminate, subobtusate, entire, glabrous, cuneate at the base ; petioles |-\* in. long. Flowers in dense fascicles from axillary or extra-axillary tubercles. Calyx-lobes much shorter than the petals, oblong, fringed with rust-colored hairs. Petals elliptic-oblong, 1<sup>^</sup> in. long. Disk convex, slightly depressed in the centre, margined at the edge. Stamens inserted close to the ovary ; filaments very short, broad. Ovary almost entirely sunk in the disk ; style very short. Fruit 1<sup>^</sup>- in. in diam., globose, verrucose, orange when ripe. Fl. B. I. v. 1, p. 628; Talb. Trees, Bomb. p. 50 ; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270. *S. Eoxburghii*(?), Dalz. & Gibs. p. 33.—Flowers : Jan.

KONKAN: N. & S. Konkan, *Law I S. M. COUNTRY*: Ramghat, *Ritchie*, 99! KANAKA : *Gibson*; Yacombi (N. Kanara), *Woodrow* !; Ainshi Ghat, *Talbot*!—DISTRIB. India (W. Peninsula).

**4. *Salacia oblonga*, Wall. Oat. (1828) 4226.** A scandent shrub ; young parts glabrous ; branches lenticellate. Leaves numerous, 3-6 by 1<sup>^</sup>-2 in., elliptic-oblong, rounded or sometimes obtusely acuminate at the apex, crenate-serrate, glabrous, tapering into the petiole, prominently reticulately veined beneath; petioles 1/2 in. long, rugose. Flowers greenish-yellow, axillary, usually 3 together, with or without a short common peduncle. Calyx persistent, glabrous outside, deeply divided; lobes orbicular, finely ciliate, about half as long as the petals. Petals 1 in. long, oblong, rounded at the apex, spreading. Stamens inserted on the disk close up to the ovary ; filaments erect, dilated at the base the triangular dilated base embracing the ovary ; anthers suborbicular-oblong, 2-celled. Ovary about half immersed in the disk, conical, at the apex into the style which is slightly shorter than the stamens. Fruit reaching 2 in. in diam., globose or somewhat pyriform, orange when ripe. Seeds 1-8, angular, large, immersed in pulp. Fl. B. I. v. 1, p. 628; Wight, 111. t. 47, B; Dalz. & Gibs. p. 33; Trim.

Fl'

Ceyl. v. 1, p. 277; Talb. Trees, Bomb. p. 50; Woodr. in Journ Bomb' Nat. v. 11 (1897) p. 270.—Flowers : Dec.-Feb.

KONKAN : N. & S. Konkan, *Law* ! S. M. COUNTRY : Chorla Ghat *Dalzell & Gihwn*  
KANARA: evergreen forests of the N. Kanara Ghats from Ainshi southwards *Tdh t'*  
Ainshi Ghat, *Talbot*, 1378 !-DISTRIB. India (W. Peninsula); C e y l o n ' ,

### ORDER XLI. RHAMNACEIE.

Trees or shrubs, erect or scandent; branches sometimes spinescent sometimes climbing by their extremity which is bare of leaves (*Gouania*) Leaves alternate (opposite in *Scutia* and *Sageretia*), usually coriaceous •

hiscing extrorsely (on account of the recurved filaments), adnate, 2-celled, lobes divaricating at the base. Disk thick, sinuate. Ovary sunk in the disk, conical, 3-celled; ovules 2, 4 or more in each cell, affixed to the axis, 1- or 2-seriate ; style usually very short; stigma simple or 3-lobed. Fruit baccate, edible, 1-3-celled; cells 1-4-seeded; rind coriaceous or s bwoody; pulp mucilaginous. Seeds large, angular; testa rather thick, coriaceous or fibrous ; cotyledons thick, usually conferruminate.—**DISTRIB.** Tropical and subtropical regions of Asia, Africa, and America ; species about 130.

Flowers from axillary or extra-axillary tubercles.

Flowers few.

Flowers 3-6 ..... 1. *S. prinoides*.

Flowers 1-2..... 2. *S. Brunoniana*.

Flowers numerous ..... 3. *S. macrosperma*.

Flowers in short-peduncled cymes, not from axillary tubercles. 4. *S. oblonga*.

**1. *Salacia prinoides*, DC. Prodr. v. 1 (1824) p. 571.** A large straggling or climbing shrub ; branches divaricate; young twigs angular, glabrous. Leaves thinly coriaceous, 1|-3| by 1-1 £ in., elliptic-oblong, shortly acuminate, subobtuse, crenate-serrate or entire, glabrous, base acute; petioles £-| in. long. Flowers yellow, 5 in. in diam., 3-6 (rarely more), from small tubercles in the axils of the leaves or from the smaller branches below the leaves; pedicels slender, ±-j in. long. Calyx cupular, persistent; lobes 5, rounded, concave, pubescent outside, ciliate. Petals much larger than the calyx-lobes, oblong or obovate, clawed, rounded at the apex and with membranous margins. Disk convex, fleshy. Stamens 3 from the face of the disk, inserted at a little distance from the ovary; filaments narrow, flat, erect; anthers small, transversely oblong, 2-celled. Ovary conical, trigonous. Fruit J |i in diam., subglobose, minutely apiculate, fleshy, red when ripe, 1-cellei 1-seeded. Fl. B. I. r. 1, p. 626; Grab. Cat. p. 27; Dalz. & Gibs p. 33; Trim. Fl. Ceyl. v. 1, p. 276 ; Talb. Trees, JBomb. p. 50; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p.270.—Flowers : Dec.-Feb. VERF. *Nisid-bondi*.

KONKAN : *Stocks I, Law!*; Atgaon, *Woodrow I*; Malbar and Amboli (Salsette), *Nimmo ex Graham* ; Wari Country, not common, *JDalzell* & *Gibson*. DECCAN : Khan-dala, *Graham* ; Phunda Ghat, *Ritchie*, 1603 ! S. M. COUNTRY : Parva Ghat (Belgaum districts), *Bitchie*, 1052! KANAKA: near Sirsi, *Hohenhaeker*, 749! Dehalli (*N. Kanara*), *Talbot ex Woodrow*.

The scandent form is often found on river-banks in N. Kanara (Kala naddi, &c), the erect shrubby form is abundant in the evergreen forests of the S. Ghats of N. Kanara, *Talbot*.—**DISTRIB.** India (Silhet, Khasia mountains, and the E. & W. Peninsulas) ; Ceylon, Java, Philippines.

**2. *Salacia Brunoniana*, Wight \$ Am. Prodr. (1834) p. 105.** A scandent shrub (?); branches terete. Leaves coriaceous, oblong or elliptic, acuminate, subobtuse, minutely serrate, glabrous, base acute; Detioles 5 in. long. Flowers few (1-2), from an axillary tubercle; >edicels about equalling the petioles. Calyx with 5 short blunt teeth. Petals ovate from a broad base, sessile, coriaceous, with incurved margins when dried), entire, somewhat persistent. Torus cup-shaped, thick nd fleshy, at first nearly enclosing the ovary. Stamens short, from he inner side of the torus. Ovules 2, superposed. FL B. I. v. 1,

Losener in Engl. & Prain, Pflanzenf. v. 3, part 5, p. 227, fig. 130, E-G; Talb. Trees, Bomb. p. 49; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270.—Elovers: Jan. VERN. *Daushir*.

Not common. KONKAN: *Stocks!*, *DalzelV.*, *Talbot*. DECCAN: Lanoli Grore and Khandala, *Graham*; about Par, *Graham*. KANARA: Ainshi (N. Kanara), *Talbot*.—DISTRIB. India (E. & W. Peninsulas); Ceylon, Malaya, China, Australia, Tropical Africa.

**2. Hippocratea Grahami**, *Wight, III.* v. 1 (1840) p. 134.

A  
climbing glabrous shrub. Leaves coriaceous, entire, 2\~b by lf-2j, ovate-elliptic, acute or subacninate; petioles | in. long. Flowers white, in dense branched panicles longer than the leaves; buds globose; peduncles several, crowded towards the ends of the branches; bracts minute, lanceolate. Calyx divided to the base or nearly so; lobes orbicular, with lacinate or ciliate margins. Petals y^fV in. long, oblong, membranous. Anthers subsessile. Style shorter than the stamens. Carpels linear-oblong, reaching nearly 4 in. long, striate, rounded and emarginate at the apex. Seeds about 1 in. long, ovoid-oblong; basal wing 1-| by \, the funicle conspicuous in its centre. Fl. B. 1. v. 1, p. 624; *Wight, Icon.* t. 380; *Dalz. & Gibs.* p. 32; *Talb. Trees, Bomb.* p. 49; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 270.—Flowers: Jan.-Apr. VERN. *Lo'candi*; *Yesti*,

KONKAN: *Law!*; common at Matheran, *H. M. Birdwood*. DECCAN: Phunda Ghat, *Ritchie*, 1651! S. M. COUNTRY: near Dharwar, *Hohenhacker*, 754! KANAKA: Katgal (N. Kanara), *Talbot!*—DISTRIB. India (W. Peninsula).

**3. Hippocratea indica**, *Willd. Sj?. PI.* v. 1 (1797) p. 193.

A  
climbing shrub; young parts glabrous. Leaves opposite, 1^3 by -f-1| in., elliptic, usually bluntly acuminate, pale, glabrous, tiuely serrate, tapering at the base; petioles |-| in. long. Flowers yellow, minute; cymes corymbosely branched, paniculate, shorter than the leaves, in opposite leaf-axils; buds oblong or obovoid; bracts small, ovate, acute. Calyx glabrous; lobes triangular-ovate. Petals ^\ in. long, subfleshy, elliptic-oblong, acute; filaments longer than the anthers. Style shorter than the stamens. Carpels ellipsoid, 1-1| by £-^, rounded at the apex, not emarginate, striate. Seeds T\ in. long; basal wing | by § in., with conspicuous funicle in its middle. Fl. B. I. v. 1, p. 624; lloxb.

Cor  
*PI.* v. 2, p. 16, t. 130; *Grab. Cat.* p. 27; *Dalz. & Gibs.* p. 32; *Trim!* Y\ *Ceyl.* v. 1, p. 276; *Talb. Trees, Bomb.* p. 49; *Woodr. in Journ!* *Bomb. Nat.* v. 11 (1897) p. 270.—Flowers: Apr. VEEN.

*Kazurdti;*  
*Turruli.*

KONKAN: moist forests, *Talbot*; along the Ghats, pretty common, *Dalzell & Gibson*.  
DECCAN: banks of the Koina river above Par bridge, *Graham*. KANARA: Divimana'  
*Woodrowl*; moist forests of N. Kanara, *Talbot*. — DIS-IRIB. India (hotter parts)'  
Ceylon, Malaya, Africa. \*

## 9. SALACIA, Linn.

Scandent or sarmentose shrubs or small trees. Leaves usually opposite, petioled, coriaceous, shining above, exstipulate. Flowers small axillary or extra-axillary, fascicled or cymose, rarely solitary or 2-nate' Calyx small, 5-partite. Petals 5, spreading, imbricate. Stamens 3 (very rarely 2 or 4), inserted on the disk, free or connate \* ith the ovary; filaments conniving at the apex, recurved; anthers small de-

and fleshy. Drupes obovoid,  $\frac{1}{2}$ -1 in. long, apiculate. Fl. B. I. v. 1, p. 623; Talb. Trees, Bomb, p/49; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270; Watt, Diet. Econ. Prod, v. 3, p. 207. *Elceodendron lloxburghii*, W. & A. Prodr. p. 157; Grah. Cat. p. 38; Dalz. & Gibs, p. 48.—Flowers: Feb.-Aug. VEUN. *Bhutkes*; *Tdmruj*.

KONKAN : *Law !*, *Sfoc/cs !* DECCAN : Dapudi, near Poona, *Woodrow I*; Harishchan-dragad, *Graham*; Sattara and Kamatki Ghats, *Dahell § Gibson-*, Peint taluka, *Woodrow*; Bhimashankar, *Gibson*. S. M. COUNTRY : Belgaum, *Ritchie*, 1000!; Duddi, *Ritchie I*; Padshapur, *Ritchie I*; Dharwar forests near Devilkope, *Talbot*. KANARA ; Ghats of N. Kanara; common in the Goond forests, *Talbot*.—DISTRIB. India (the hotter parts); Malaya.

## 8. HIPPOCRATEA, Linn.

Small trees or scandent shrubs. Leaves opposite, petioled, the petioles articulated at the base; stipules caducous. Flowers in axillary (rarely terminal) cymes or panicles, small, green or white. Calyx small, 5-partite. Petals 5, spreading. Stamens 3; filaments free or adnate to the ovary, dilated at the base, recurved or reflexed at the apex; anthers didymous. Disk conical or cup-shaped. Ovary free or confluent with the disk, 3-celled; ovules 2-6 in each cell; style short. Fruit of 1-3 distinct carpels, each 2-valved or indehiscent; cells few-seeded. Seeds\* compressed, usually winged below, exarillate; albumen 0.—DISTRIB. Tropical Asia, Australia, Africa, and America; species about 60.

Style overtopping the stamens; ripe carpels reaching 2 in. in length .....	1. <i>H. obtusifolia</i> .
Style shorter than the stamens.	
Ripe carpels reaching 4 in. in length; anthers subsessile .....	2. <i>H. Grahami</i> .
Ripe carpels reaching $1\frac{1}{2}$ in. in length; filaments longer than the anthers .....	3. <i>H. indica</i> .

1. **Hippocratea obtusifolia**, *Bo.vb. FL Ind.* v. 1 (1832) p. 16b. A climbing shrub; young parts glabrous. Leaves coriaceous, 3-5 by 1 f-2 in., elliptic, ovate or lanceolate, rounded, acute or very shortly acuminate, entire or shallowly crenate-serrate, reticulately veined, glabrous, base rounded or acute; petioles  $\frac{1}{2}$ -1 in. long. Flowers in axillary paniculate dichotomous cymes usually shorter than the leaves; buds conical. Calyx small, puberulous, deeply divided; lobes triangular-ovate. Petals  $\frac{1}{2}$  in. long, triangular, acute, subfleshy, puberulous outside, 1-nerved. Stamens 3; filaments short, flat, broad. Style overtopping the stamens, conical-subulate. Carpels 1-2 by  $\frac{1}{2}$ -1 in., oblong-obovoid, compressed, emarginate, prominently nerved and veined, 4-6-seeded. Seeds  $\frac{1}{2}$  in. long, subfalcate, compressed, the funicle developing into a large membranous wing  $\frac{1}{2}$  by  $\frac{1}{2}$  in. at the base of the seed, the funicle conspicuous in the middle of the wing. Fl. B. I. v. 1, p. 623; Grah. Cat. p. 27; Wight, Icon. t. 963; Trim. *FL Ceyl.* v. 1, p. 275;

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\* After the opening of the flower, a fold is produced on the back of the ovary which grows rapidly and attains a great size, compared with the rest of the ovary. The fold is hollow and its cavity communicates with that of the cell, on the back of which it is inserted. For a long time the cavity of the fold remains empty, but a short time\* before maturity the funicle which supports each ovule elongates greatly, and forces the ovule to pass out of the cell and into the fold. See Payer, *Organog. Oomp.* p. t. 35.

KONKAN : hills in the Konkan, common, *Dalzell & Gibson*; Matheran, *Kanitkar*! S. M. COUNTRY: Ramghat, *Ititchie*, 141! DECCAN: Panchgani, *Woodrow*; Maha-bleahwar, *Cookel, Graham*. KANAKA: *Ward* \\ Katgal (N. Kanara), *Talbot*.—DISTIB. Apparently endemic.

**3. *Gymnosporia montana*, Benth. Fl. Austral, v. 1 (1863) p. 400.** A tall shrub or sometimes a small tree ; young branches often spinescent at the extremities and bearing leaves and flowers. Leaves turning very pale in drying, coriaceous, about 1<sup>^</sup>-2 by f-l-g-i variable in size and shape, elliptic or obovate, usually rounded at the apex, entire or crenu-late, tapering at the base into the petiole; petioles <sup>^</sup>-| in. long. Mowers in axillary usually f urcately-braunched cymes ; peduncles slender, solitary or fascicled ; pedicels filiform, jointed below the middle ; bracts small, lanceolate, acute. Calyx-lobes broadly elliptic-oblong, rounded at the apex, ciliate. Petals <sup>^</sup> in. long, elliptic-oblong. Filaments flattened and dilated at the base. Disk fleshy, 10-lobed. Ovary glabrous, orbicular ; style in the fertile flowers deeply 2-3-eleft. Capsules about as large as a good-sized peppercorn or small pea, purple when ripe. Seeds glabrous, chestnut-brown, rugose, arillate. El. B. I. v. 1, p. 621 ; Talb. Trees, Bomb. p. 48; Woodr. in Journ. Bomb. Nat. v. 11 (1897) .p. 270. *Cehstrus montana*, Eoth, Nov. PL Sp. (1821) p. 154 ; Eoxb. Fl. Ind. v. 1, p. 620 ; Grah. Cat. p. 38 ; Dalz. & Gibs. p. 48. *Celasrus Senegal-erisis*, Lam. Encyc. v. 1, p. 661; Bedd. For. Man. in Flor. Sylvat. p.lxvi, t, 10, tig. 2; Watt, Diet. Econ. Prod. v. 2, p. 239.—Flowers : Oct. VEHN. *HeJcel; Mdl-hdnguni*.

KONKAN : *Law* !, *Stocks* ! DECCAN : bills near Alandi (Poona districts), *Kanitkar*! Kamatki Ghat, abundant, *Woodrow*; Kartriz hills (Poona districts), *Kanitkar*! Dongergaon(near Ahmednagar), *Cooke*!; Khandesh, *Edgeworth*! GUJARAT : Koodiana, *Dalzell & Gibson*. KANARA: Sirsi, *Hohenhacker*, 734! SIND : *Dalzell Sf Gibso?i*.—DISTIB. India (Central, South-western,and North-western parts); Afghanistan,Central Africa, Malaya, Australia.

## 7. **EL/EODENDRON**, Jacq. f.

Trees and shrubs, usually glabrous. Leaves opposite and alternate; stipules minute, caducous. Flowers in axillary cymes, small, *sometimes* polygamous, usually white or green; peduncles solitary or fascicled. Calyx 4-5-partite. Petals 4-5, spreading. Stamens 4-5, inserted beneat h the margin of the disk ; filaments short, subulate; anthers subglobose. Disk thick, 4-5-sinuate, -angled or -lobed. Ovary pyramidal, confluent with the disk, usually 3-gonous, 2-5-celled; ovules 2 in each cell; style very short; stigma 2-5-lobed. Drupes dry or succulent; stone 1-3-celled, cells 1- (rarely 2-) seeded. Seeds erect, exarillate; albumen fleshy; cotyledons flat.—DISTIB. Tropical Asia, America and Australia, S. Africa; species 30.

**1. *Elaeodendron glaucum*, Pers. Syn. v. 1 (1805) p. 241.** A small tree. Leaves 2<sup>^</sup>-6 by 1-2<sup>^</sup> in., extremely variable, elliptic, acute or acuminate, often twisted at the apex, crenate-serrate or subentire glabrous, base acute or rounded; petioles i-| in. long. Flowers numerous, in divaricate axillary or extra-axillary paniculate dichoto-rnously branched cymes; pedicels slender, glabrous; bracts small ovate cute. Calyx very deeply divided; lobes unequal, orbicular with

<sup>^</sup>S;S<, Pe? \*> 10DJl' oblonS' obtu8e> distant.

er than the petals; anthers roundish. Disk thick

## 6. GYMNOSPORA, Wight &amp; Am.

Shrubs or small trees often spinous. Leaves alternate, **exstipulate**. Flowers small, greenish or yellow, in axillary solitary or fascicled cymes. Calyx 4-5-fid or 4-5-partite. Petals 4-5, spreading. Stamens 4-5, inserted on the margin of, or beneath the disk; anthers broadly didymous. Disk broad, lobed or **sinuate**. Ovary usually with a broad base, confluent with the disk, trigonal or pyramidal, 2~3-celled; ovules 2 **in** each cell; style short; stigmas 3. Capsule obovoid or rarely globose, 3-gonous, 2-3-celled, **1-4-seeded**. Seeds with a perfect or imperfect aril or exarillate; testa coriaceous; albumen fleshy; cotyledons **foliaceous**.—**DISTRIB.** Dry and hot parts of Asia, Africa, Australia, **and Malaya**; less common in the Pacific and Mascarene Islands; species about 55.

Branches unarmed.

Cymes dichotomous, 1-2 in. long ..... 1. *G. puberula*.

Branches armed.

Cymes reduced to sessile clusters from tubercles on the old wood; **ripe capsules bright red** .... 2. *B. Rothia*\*

Cymes axillary; ripe capsules dark purple ..... 3. *G. montana*.

**1. Gymnosporia puberula**, Laws, *in Hook. f. Fl. B. I.* v. 1

(1875) p. 019. A shrub; branches unarmed. Leaves 2-2½ by 1-1½ in.,

obovate, acute or acuminate, serrate-crenate, reticulate-veined, glabrous or nearly so above, hispid on the nerves and veins beneath, base tapering, petioles ½-1 in. long. **Flowers** in slender, dichotomous cymes long, which are axillary or fascicled at the ends, short bracts lanceolate, acute. I

deeply divided; lobes **suborbicular**. Petals ½ in. long, elliptic, obtuse.

Fruit

obovoid, ½ in. long. Talb. Trees, Bomb. p. 48.

**KONAR**: *Laib*! **KANARA**: forests near the Ainshi Gbdt (N. Kanara), *ei Talbot*.—**DISTRIB.**, 'Apparently endemic in the Bombay Presidency.

**2. Gymnosporia Rothiana**\* Laws, *in Hook, f. Fl. B. I.* 1 (1875) p. 620. A large shrub, sometimes a small tree, usually armed with long straight thorns. Leaves coriaceous, 3-4½ by 1½-2½, broadly obovate-cuneate, rounded or very shortly and bluntly acuminate at the apex, crenulate, dark green, glabrous and polished above, pale beneath, reticulate-veined, the veins not **prominent** on the underside; petioles ½-1 in. long, stout. **Flowers greenish-white, in short-peduncled** or subsessile cymes or fascicles from the **tubercles** of the older branches.

Calyx glabrous, divided nearly to the base; lobes broadly ovate or triangular, with membranous ciliolate margins. Petals ½ in. long, ovate-oblong, obtuse, the margin entire or faintly denticulate. Stamens

shorter than the petals; filaments flattened, inserted below the fleshy disk at alternate sinuses. Ovary glabrous; style stout, short, 3-lobed, bright red when ripe, the **valves** turning back in dehiscence showing their white inner surfaces. Seeds 6, ellipsoid, ½ in. long, with a small basal aril, brownish-orange, **smooth**, shining. Talb. Trees, Bomb.

p. 48; Woodr. in Journ. Bomb. Nat. y. 11



(1897) p. 270. *Celastrus*

**Kothiana**, Wight & Arn. Prodr. p. **159** ; Dal/. & Gibs. p. 47 and p. 318.

*Celastms emarginata*, Grab. Cat. p. 39 {not of **Roth**).—Mowers: Apr.- I

J VEEN Yll i

v. 1, p. 271 ; Talb. Trees, Bomb. p. 48; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270.

The Ghats, *Dalzell & Gibson*.—DISTRIB. India (mountains of the W. Peninsula); Ceylon, Mauritius, Madagascar.

### 5. CELASTRUS, Linn.

Shrubs usually scandent, unarmed. Leaves alternate; stipules minute or 0. Flowers in axillary and terminal racemes or panicles, sometimes unisexual. Calyx urceolate at the base, 5-fkl. Petals 5, inserted below the disk, spreading at the apex. Stamens 5, inserted on the margin of the disk. Disk cup-shaped or concave, 5-lobed. \* Ovary seated on the disk (not immersed), 2-4-lobed, 2-4-celled; ovules 2 from the base of the cell, collateral, erect; style thick; stigma 3-4-lobed. Capsule terete, globose or oblong, coriaceous, 2-4-celled, dehiscent loculicidally, the cells 1-2-seeded. Seeds erect, enclosed in a fleshy aril; testa membranous ; albumen copious, fleshy ; cotyledons foliaceous.— DISTRIB. Tropical Asia, China, Japan, Australia, N. America, and Madagascar; species about 15.

1. **Celastrus paniculata**, Willd. *Sp. Pl.* v. 1 (1797) p. 1125. A climbing unarmed shrub; young branches usually covered with pale lenticular warts. Leaves alternate, 2<sup>^</sup>—4 by 11-21 in., broadly elliptic, ovate, or obovate, shortly acuminate, crenate-serrate in the upper part, usually entire near the base, glabrous, base rounded or acute; petioles 1/2 in. long. Flowers yellowish- or greenish-white, unisexual, in terminal pyramidal panicles 2-6 in. long; pedicels pubescent; bracts small, lanceolate. Calyx pubescent outside; lobes semiorbicular, ciliate. Petals 1/2 in. long, oblong, rounded at the apex. MALE FLOWERS : Stamens inserted on the margin of the disk; filaments short; anthers oblong, about 1/2 in. long, rudimentary ovary small, subconical, slightly 3-toothed at the apex. FEMALE FLOWERS : Ovary globose, narrowed into a short stout style, glabrous; stigma large, 3-lobed. Stamens inserted on the edge of the disk which is larger than the disk in the male flowers ; anthers small, without pollen, ovate, acute or subtriangular, about 1/2 in. long. Capsules 1/2-1 in. in diam., subglobose, bright yellow, transversely wrinkled, 3-valved, the valves spreading after dehiscence remaining united at the base exposing the seeds. Seeds 1-6, often solitary, ovoid, cinnamon-brown, striate, completely enveloped in a scarlet fleshy aril. El. B. I. v. 1, p. 617; Grab. Cat. p. 38; Dalz. & Gibs. p. 47; Trim. El. Ceyl. v. 1, p. 272; Losener, in Engl. & Prantl, <sup>^</sup>Hanzenf. v. 3, part 5, p. 194, fig. 120, E-II ; Talb. Trees, Bomb. p. 48 ; <sup>^</sup>oodr. in Journ. Bomb. Nat. v. 11 (1897) p. 270 ; Watt, Diet. Econ. Prod. v. 2, p. 237.—Flowers : Nov.-Feb. VEIN. *Mdl-Jcdngoni* ; *Karad-ledngoni*.

KONKAN : throughout the hilly parts, *Graham, Dalzell & Gibson* ; Matheran, *H. M. Birdwood*. DECCAN : hills near Alandi (Poona districts), *Kanitkar* !; Decoan, widely, ex *Woodrow*. GUJARAT : widely, ex *Woodrow*. S. M. COUNTRY ; Belgaum, *Ritchie*, 1668!

An oil of some therapeutic value is extracted from the seeds and known as Black Oil (*Oleum nigmm*). Consult Watt, Diet. Econ. Prod. 1. c—DISTRIB. Throughout India in hilly districts ; Ceylon, Malaya, Philippines.

atid immersed in it, trigonal or pyramidal, **3-4-celled, contracted** into the style; ovules 4 or more in each **cell, 2-seriate** style short; **stigma** capitate. **Capsule coriaceous**, 3~4-angled, \_ 3-i-edled, loculiddally dehiscent. **Seeds few** or many, rarely winged, **arillate; albumen** fleshy.—**BISTBIB.** India, Malaya, Java; **species about 9,**

**1. Lophopetalum Wightianum, Am. in Ann. JYaf. Efist.** ser. X, v. li (1839) p. 151. A large **tree.** Leaves **3-6** by H"2j- in., coriaceous, ovate-oblong or **oblong-lanceolate**, acute or shortly and bluntly acuminate, glabrous, entire, reticulately veined, base rounded or sub-**acute**; petioles -1~-| in. **long, striate.** Flowers nearly | in. across, in branched terminal and axillary paniced cymes. Calyx **5-lobed, adhering'** to the disk; lobes orbicular. Petals **obovate**, continuous with the lobe of the disk, with a membranous lacinate **crest on the inner face**, minutely denticulate at the apex. Disk fleshy, more **than ;| in. in diam., 6-lobed, adherent** to the calyx. Ovary **triangular in** cross section at the base, sunk in the disk; style short, conical. **Fruit sharply** triangular in cross section, 4 in. long, 3-celled. Weeds oblong, compressed, surrounded by a long linear wing (*fide Dalzell & Gibson l. a.*) **Fl. B. I.** v. 1, p. 615'; Dalz. & Gibs. p. 48; Wight, Icon. t. 162; **Bedd.** Fior. Hylvat. 1.145; Tall). Trees, Bomb. p. 47; Wumlr. **in Journ.** Bomb, Nat. v. 11 (1897) p. 170; Watt, Diet. **Econ.** Trod. v. 5, p. 92.—Flowers: **Mar.-May. VEEN. Bti&pale.**

*Dalsdl, ifi(59J; Wari, Stocks\ S<sup>r</sup>. Kpnfcan, Woodrctiu]-, evergreen* forest of the Konkau Glliiis, Talbot. **KANARA: in evergreen forests of the Gh;itw, Talt Wbodrow,—DISTRIB, India (W. Peninsula).**

#### 4. PLEUROSTYLIA, Wight & Arn. ;J

Trees or shrubs. Leaves opposite, **exstipulate.** Cymes axillary, <sup>or</sup> **short**, few-flowered. Calyx small, **4-lobed.** **Pe^la 5,** exceeding calyx. Stamens 5, inserted below the disk; filaments short, flat; connective of **the anthers dilate\*! at the back.** Disk thick, cremilate. **'■>** Ovary **half-immersed to** the disk and **con** fluent with it, 1-2-celled; ovules 2 in each **cell, erect**; style short, thick; stigma broad, peltate. **'« ]** Vuit coriaceous, in dehiscent, 1 **2-celled.** **Seed 1** (rarely 2), erect, **en\***, covered by an anlliform **endocarp; testa coriaceous**; albumen copious, **y** fleshy; **cotyledons** large, orbicular.—**DISTRIB.** Mountains of the **Indian Peninsula, Ceylon, Ma u ri ti us, a 11 d Malaga** scar; **P p ec ies 2.**

**1. Pleurostyliia Wightii, Wight cj\* Am. Prodr.** (is;u) p. 157\pa. A. shrub or small **much-branched** free; **young** parts glabrous; bark, **x** rough, pale. Leaves 1 J; **24** by %-l j in., elliptic-oblong. **oblong-lanceolate** p. \ **or** somewhat obovato, **usually rounded at the apex^** sometimes **emarginate,** V pale, glabrous, reticulately veined, **entire, acutely tapering at the base** petioles very short, scarcely ^ in. long. **Flowers j]-l in. across, in suiffT -** axillary paniculate cymes'; peduncles short, more or **U^\$ pubes\*** **'** **lodicels** usually shorter **than** the peduncle?. Oilyx **glabroua**; lobes short, /, **undmd.** Petals elliptic-oblong, rounded at the apex, concave. **Stamens •** **<ji-** **orter** than the petals. Drupes | in. long, ovoid, supported on the **per-stent** calyx, white, smooth. **Fl. B. I.** v. 1, p. 017; Dalz. & Gibs. p. **47; Ad. For. Man. in Flor.** Sylvat. p. Ixvi, t. 10, fig. 1; Trim. **Fl. Ceyl**

**mm**

## 2. MICROTROPIS, Wall.

Glabrous trees or shrubs. Leaves opposite, persistent, exstipulate, entire. Flowers in sessile clusters or peduncled cymes, axillary or supra-axillary, sometimes unisexual. Sepals 5, imbricate. Petals 5 (rarely 0), connate at the base. Stamens 5, inserted on the disk or the tube of the corolla; filaments very short; anthers broadly ovate. Disk 0 or annular, free or connate, with the petals. Ovary free, ovoid, perfectly or imperfectly 2-3-celled; ovules 2 in each cell, collateral at the inner angle; style thick; stigma minute, 2-4-lobed. Capsule oblong, coriaceous, 1-celled, 2-valved, 1-seeded, tardily dehiscent, surrounded at the base by the calyx. Seed erect, exarillate; testa polished.—DisriiiB. Singapore, Nepal, Ceylon, Malaya, Java; species 9.

### g

Flowers in sessile clusters.....	1. <i>M. latifolia</i> .
Flowers in peduncled cymes .....	2. <i>M. microcarpa</i> .

1. **Microtropis latifolia**, *Wight, MSS. ex Laws, in Fl. B. I. v. 1* (1875) p. 013. A small tree. Leaves coriaceous, opposite, 3<sup>^</sup>-5 by 1<sup>f</sup>-3 in., elliptic, acute or shortly acuminate, glabrous, light green above, very pale beneath, reticulately veined, base acute, margins repand; petioles  $\frac{1}{2}$  in. long, rugose. Flowers sessile, in axillary or extra-axillary clusters. Calyx 5-lobed, externally rugose, the upper margin membranous, lacerate. Petals  $\frac{1}{2}$ -1 in. long, obovate-cuneate, united at the base into a ring. Stamens, inserted on the ring, erect; filaments short, flat. Ovary somewhat flask-shaped, furrowed. Fruit  $\frac{1}{2}$ -1 in. long, oblong-ellipsoid, narrowed at both ends. Seeds rugose. *Fl. B. I. v. 1*, p. 613; *Talb. Trees, Bomb.* p. 47.

KONKAN: without locality, *Stocks*!—DISTRIB. India (W. Peninsula).

2. **Microtropis microcarpa**, *Wight, Icon.* (1845) t. 975.

An

erect shrub. Leaves coriaceous, opposite, 1<sup>l</sup>-2 by  $\frac{1}{2}$ -1 in., elliptic or oblong-lanceolate, subobtuse, glabrous above, pale beneath, base acute, margins repand; petioles  $\frac{1}{2}$  in. long. Flowers in peduncled cymes, shorter than the leaves. Calyx large, 5-lobed, persistent in fruit, much imbricate, the lower part thick and fleshy and externally rugose, the

upper part membranous, petal-like, lacerate. Petals about  $\frac{1}{2}$  in. long, obovate, clawed, veined, soon falling off. Stamens inserted at the base of the petals; filaments very short; anthers large. Ovary ovoid-ovate, ribbed; style very short. Fruit  $\frac{1}{2}$  in. long, narrow-oblong, cylindrical or ellipsoid, pointed, apiculate, longitudinally rugose, seed 1; testa reddish-brown, shining. Fl. B. I. v. 1, p. 614; Talb. Trees, Bomb. p. 47.

K)NKAN: without locality, *Stocks* !—DISTRIB. India (W. Peninsula).

### 3. LOPHOPETALUM, Wight.

Glabrous trees or shrubs. Leaves opposite or alternate, exstipulate. Flowers rather large, in axillary or terminal cymes. Calyx 5-lobed; lobes short, rounded. Petals 4-5, continuous with the disk, persistent, the inner side cristate or lamellate, the margins usually fimbriate. Stamens 5-6, inserted on the disk; filaments subulate; anthers oblong. Disk large, usually 4-5-lobed. Ovary small, continuous with the disk

XXXVIII. OLACACE-E.

L *Apodytes Beddomei*, *Matters, in ffook.f.*

*Ft. B. I. y. 1* (1875) p. 588. A **shrub**. Leaves

membranous, 3-5 by *ty-21* in., turning black in drying, **ovate**, acute or acuminate, **glabrous**, base rounded or acute more or less inequilateral; petioles -j-j,-i n. long. **Flowers** | in. long, in branched terminal panicles; buds eliip\*soid ; pedicels pubescent, **the** ultimate ones **very** short. Calyx **small**, cup-shaped; lobes obscure, ciliolate. Petals oblong-elliptic, obtuse at the apex. Anthers elongate, linenr-oblong. Drupes obliquely ovoid, § in. Jong, rugose. *Apodytes Benihamiana*, **Yar. 0, Bedd. FJor**, *Sylvat. t. 140.*—Flowers: Mar.

A very rare plant; **I have seen** but a single specimen from the Bombay Presidency, collected by *M* ■■>' from **Dadmane, N. KanaraJ—DISTKIB. India (W. Peninsula).**

7. **MAPPIA, Jacq.**

Trees, Leaves alternate. **Flowers** small, **polygamous**, in terminal **corymbose** cymes, pubescent outside, rarely **glabrate**. Calyx small, **5-toothed**. Petals hypogynous, **valvate**, **villous within**. Stamens **5, hypogynous**, alternate with the **petals j** anthers oblong, **dorsifixed**; connective often **mueronate**. Disk **cup-shaped, surrounding the** ovary, sometimes inconspicuous. Ovary **1-celled; ovules 2**, pendulous ; style short; stigma thickened. Drupe with a slender **crustaeoua** or subwoody put amen. Seed pendulous; erabryo large, in **fleshy** albumen; cotyledons foliaceous ; radicle **superior.**—**DISTHIS. India;\*** Ceylon, Tropical S. America; species 8-10.

**1. Mappia foetida, Miers, Contrib. v. 1 (1851) p. 64.** A **small tree** with a shady head; young branches pale and **with** wrinkled **bark**. Leaves crowd towards the ends of the branches, 3-6 by 14-3 in., ovate-oblong, acuminate, dark green and glabrous above, paler- **and** pubescent on **the** nerves beneath, reticulately veined, base rounded or acute more or less inequilateral; petioles *f-1%* in. long, **glabrous m** faintly **pubescent**. **Flowers** in terminal **panicles 2-4 in.** long; **pedicels stout, densely pubescent**. Calyx **small, pubescent externally, 5-toothed^** teeth triangular, *vei-y* **acute**. **Petals yellow,** } in. long, **linear-oblong acute**, densely seru\*eo-villous **on both surfaces, tip indexed,** Sfcam< a little shorter than **the** petals and alternate with them; filament<sup>v</sup> flattened and dilated below, attached to the **edges** of **the** **petals** at tl base; anthers elliptic-oblong, not apiruhite. **Disk** shallow, **cup-shap** villous within. Ovary ovoid, **densely clothed with** silky hairs, f attenuated into a **stout** slightly conical style. Drupes ellipsoid oi 3 what **obovoid**, | § in, long, pubescent when **young**, glabrous and **pw** when ripe. *FL il I. v. 1, p. 589; Bedd. Flor. Sylvat. t. 141 ; T Trees, Bomb. p. 45 ; Woodr. in Journ. Bomb. Nat, v. 11 (1897) p.: Mappia oblonga, Dal?. & Gibs. p. 28.*—Flowers : Oct.-Nov. **V Kdigur; Ghdnera.**

Common along the : **ibundant at Mahablesbwar,** The flowers are wry **KOXKAIT: Lmvl, Dalzett'; Western** Glmfcs widely, *Woodrow;* Gluita **opposit Dahell § Gibson, DXCCAS: B^ahablesbw&r, abundant, Ctookel, If. M. Bh ■ S. M. COUNTRY: Bel^ura, Bttehie, 1012 J; near Belgauta, CooksI KANAKA; G.\_ N. Kanara, Talbot.** — **DISTBIB, India (W, Peninsula),**

8. **SARCOSTIGMA, Wight & Arn.**

Scandent **shrubs.** Leaves alternate. Flowers dioecious, mim distant sessile fascicles arranged on elongate interrupted **spikes.**

S

**cup-shaped, unequally 4-5-toothed.** Petals 4-5, united into a short tube which is **adnate** to a stipitiform torus, free above, **valvate**, slender, **flat**. M.-UJ: ]■ **LOWERS: Stamens** bypogynous, alternate **with** the petals and **scarcely cohering with them at the base** ; **filaments filiform** ; anthers versatile. **FEMALE FLOWBSS : Ovary sessile, 1-celled**, superior; ovules 2, **pendulous** from the apex of the cell, funiele **thick**; stigma **sessile**. l)rupe oblong; **epicarp** coriaceous; **putamen** woody. Seeds pendulous; albumen 0; cotyledons fleshy, cordate at the base, wrapping round thy sjfctort superior radicle.—**DISTBIB. Tropical** Asia ; species 3 or 4.

**1. Sarcostigma Kleinii, Wight fy Am. in Edin. Neiv Phil. Journ.**

(1832-33) p. 299. A large **climbing shrub**; young branches terete, glabrous. Leaves coriaceous, 4—12 by 2-4 in., oblong, **oblong-jaiieeolate** or ovate, acuminate or **acute**, glabrous, shining, **closely retieulately** veined (the reticulations prominent on both **surfaces**), base acute, rarely **rounded** ; petioles |f iu. long. **Inflorescence** axillary or **extra-axillary**, in spicate racemes which are solitary or fascicled anil longer than **the** leaves : (lowers minute, in fascicles of 1-4, sessile along a woody r! use his. **MALI FLO WEBS :** Calyx small, cup-shaped, **pubescent** outside, **5-toothed** ; teeth abort, triangular. Petals -fa in. long, oblong, acute, reflexed. Stamens a little shorter than **the** petals. Ovary **rudimentary, -small, conical. FEMALE FLOWJEES slightly** larger than the **male**. Calyx <sup>mem</sup>and petals as in the male. Stamens small, about half as loner as the tne 'ovary, **hypogynous**. Ovary large, oblong or somewhat **obovoid, pnbes-shortCen£ . g stigma** large, sessile, conical. Pruit **1-14** in. long, **the** shape l<sup>on</sup>&of an olive, bright orange-red, externally **rugose. M. B. I. v. 1, p. 594; V. 1, Dalz. & Gibs. p. 221 ; Miers, Gontrib. v. 1, p. 103, t, 18** (female ilowers Kosinly): Talb. Trees, Bomb, p, 46; Watt, **Diet. Econ. Prod. v. 0, part 2,** ), 478.—**Flowers : Nov. 2.**

a

i KANAKA: in evergreen forests along the N. Kanara Ghdts; eotnmon near the Falls  
' dt Gtairsoppa, Talbot. S. M. OWNTBT: Choria GbiJ (Belgaiun districts), Dalzell  
& O<sup>bit</sup> Gibson.—l)isT«JU. India (E. & W. Peninsula

shortfe

OiiDEfi XXXIX. ILICACE^.

obovatt

**of** the rees or shrubs. Leaves usually coriaceous and **evergreen**, alternate, onical, le, ex stipulate or wifh 2 **minute** stipules. Flowers **small, usually iibcylindsus, in axillary cymes, fascicles** or umbels, the male flowers with eed 1 ?"-perfect ovary, the female **With** imperfect stair ens. Calyx per- Jrees, But, **3-6-pariite or -lobed ; segments or 1** leafce. Petals 4-5,

y 6-8, connate at the base (or connate in the male and free in the 'e), **deciduous**, imbricate. Stamens **isomerous** wi h the petals ed on the base of the corolla ; filaments subulate; anthers |shortly jr, dor^in'x(?d. Disk 0. **Ovary** free, 3-0- (rarely

Glabrou i or 2, couateral, pendulous ; style very short or 0 ; stigma  
Flowers re or discoid. Drupe with 2 or more 1-seeded free (rarely con-  
'obes shorstones. Seed p ; **anous** ; albumen copious  
the innei; embryo minute.—DISTEIB. Chiefly tropical; genera 3 •  
Stam species  
Disk ens ^20



many-) celled';

1. **ILEX, linn.**

'Frees or shrub\*. **Leaves** alternate, often **shining**. Flowers axillary, fi.ite. Calyx **small**, persistent, 4-6-lobed or **4-6-partite**. Corolla rotate, i-6-partite; lobes obtuse. Stamens isomerous with the corolla-lobes, slightly adherent to the short tube; anthers oblong. Ovary sessile, subglobose, 2-12-celled; ovules 3-2 in each cell; style (short, thick, or 0; stigmas free or confluent. Drupe globose, rarely ovoid, wit!  
2-1 a stones.—DISTBIB. Tropical and **temperate** regions of the world, most numerous **in N. America**, rare in **Africa** and **Australia**; species more than 200.

1. **Ilex malabarica, Bald. Flor. Sylvat. (1871) t. 143. A**

largp

tree quite glabrous. Leaves 2-4 by 1-1½ in., elliptic or lanceolate acute or acuminate, **obtuse mucronate**, usually entire but sometimes with one or two spinulose teeth towards the tip, glabrous on both surface dark green and shining above, very pale beneath, base acute; petiole ½-1 in. long. Flowers in axillary fascicles or very shortly peduncled umbellate cymes, **rarely** solitary; pedicels 3-8, slender. Calyx **puberulous** outside; lobes usually 0, broadly ovate, acute > ciliate. Petals white, united at the base into a deciduous corolla about ½-1 in. long; lobes oblong, **rounded at the apex**. JS.aments 4-0, inserted at the base of the corolla; **filaments** short. Ovary in the female globose; style short; **stigma large, obsolete** Globed. Ovary in the male imperfect with 4 **minute** stigmas. **Drupea** small, globose, ½ in. in diam., usually 6-celled, crowned by the style and supported by the persistent **calyx**. Fl. B. I. v. 1, p. 107; Talb. Trees, Bomb. p. 46; Woodr. Journ. Bomb. Nat. v. 11 (1897) p. 270; Watt, Diet. Econ. Prod. v. 4 \).: V2^ *Ilex Wightiana*, Dalz. & Gibs. p. 143 (not of Wall.).—Flower Feb.-Apr.

K(TNK\N: Q\i&te,-D(!lzeU4 Stocks', De Crespign)/ex Woodrow; in fo rest3, Tat hot; Ghats n a r S i vap UP (Wfri^cwuwtny %, .Dctlze U\ KAKAHA: aloi Kinks of streams near Amod, Supa subdivision of N. Kanura, LaTa'di.—DiWHilU.

## R XL. CELASTEACE^1.

Trees or erect or climbing shrubs, sometimes spinescent. opposite and alternate, usually coriaceous, simple, never lobed; ; very caducous or 0. Flowers small, hermaphrodite or poly usually eymose. Calyx small, 4-5-lobed or -partite, imbricate, persistent. Petals 4-5 (rarely 0), inserted under the edge of the (1: continuous with its margin, imbricate. Stamens 5, 4 or 3 (rarely inserted **under**, on, or within the edge of the disk; filaments usually short; **anthers** short, **muticous**, 2-celled. Disk usually spinous, pulvinate or flattened, lobed or entire, rarely 0, **Ovarj** on the disk, free or adherent at the base, 2-5-celled; ovules 1-2 cell, anatropous, erect, rarely 1 and pendulous, or many ascend attached to the axis; raphe ventral in the ascending, dorsa pendulous", style short, thick or 0; stigma simple or lobed **capsular**, baccate, drupaceous or samaroid. Seeds usually arilla times **wing<d>** albumen fleshy or 0; embryo usually large; w

**flat, foliaceous**; radicle almost always inferior.—DISTRIB. Throughout **tropical** and temperate regions of the world; genera 39; species about 400.

- Stamens 4-3 (rarely 10); filaments usually incurved; seeds albuminous.
- Leaves opposite (sometimes alternate in *Lojikopefalu-ii*). Fruit capsular, (!<-It]'-'■< at. Ovules 1-2 in each oolL
  - Petals free..... I.
  - Petals conn a {" ..... 2. MICBOTROPft.
  - Ovules 4 or more in each cell..... 3.
  - Loi'imrnwurM.
  - Fruit indehiscent, coriaceous ..... 4. PLEIKOSTVUA.
  - Leaves alternate; fruit capsular and dehiscent. Cells 2-ovuled.
  - Shrubs, usually scandent; ovary free ..... 5. CELASTHCS.
  - Erect often suinous shrubs; ovary confluent with the disk..... 6. GTMKOSPOBIA.
  - Leaves alternate and opposite; fruit drupaceous and iiuiehiscnt ..... 7. Et\*(OJ)BJf»BOW.
- Stamens 3 ; filaments recurved; seeds exalhuminoas.
- Fruit dry ; seeds winged ... 8. HIPPOCRATBA,
- Fruit baccate; Beeds not winged ..... 9. SALACIA.

**1. EUONYMUS, Linn.**

**Trees or shrubs, usually glabrous.** Leaves opposite ; stipules caducous. **lowers axillary, small. Calyx 4- 5-fitl., persistent.** Petals 4-5, inserted **3n** the disk; filaments usually very short; anthers broad, 2-celled. **disk large, fleshy, 4-5-lobed,** Ovary sunk in the disk, 3-a-celled; **ovules L<sup>J</sup> in each cell; style short or 0; stigma 3-5-lobed.** Capsule **2-3-celled, 'i -5-lobed, angled, or winged, sometimes ecbiuate,** loculally **S~5-valved, ceila 1 -2-seeded.** Weeds enclosed in a fleshy aril,

**luminous; cotylfdona broad, foliaceois.**—DISXBEB. India, Cliinaj Japan, er> iaya, **Europe and X. America;** species about 40,

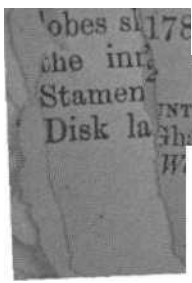
ob  
 mai<sub>t</sub> **Huonymus in die us, JL>t><\ ex Wall, in Bomb. Ft. hid. (ed. shorw) v. 2 (1824) p. 409.** A small tree. Leaves coriaceous, 2-]-4 **by** imbr in., elliptic or oblong-lanceolate, acute or sometimes shortly :<) upnuatt\*, fiifire or with a few obscure serrations towards the apex, odorous **on both surfaces,** smooth and shining above, base acute;

onical, in. across, axillary, solitary or in peduncled umbellate cymes; abeylies 1-2, variable in length, from 0-1¼ in. long; pedicels 1-3, eed 1, when more than 1 and on the top of a peduncle about ¼ in. trees when not peduncled reaching 1 in. long. Calyx glabrous, fleshy.

of tlvs I- | in. long; **stipules linear-subulate,** very caducous.  
 Flowers divided; lobes semicircular, entire. Petals reddish, orbicular-fringed at **the apex.** Stamens inserted on the disk near its ; filaments short, **flattened.** Disk (l in. in diam., 5-lobed, fleshy,

, p ; Talb , Bomb. p. 47; Woodr. in Jo v. ^807) p. 270. **Euonymus QougUi**  
 Flowers. n> Wight . Dalz, & GibSi p. 47. AVigh't> Icon< t 215,~]ow

-sunk **in the disk.** Fruit | in. long, obovoid-clavate, **5-winged b**  
**i** p. 608; **Talb.** Trees, Bomb. p. 47; Woodr. in Journ ^807)  
270 *E*



111

Ca6t10T0ek' lAodTM% ^aniJtTl R^^- evergreen forestB of  
; common on the S. ahits of M. Kantra, *Talbot*; Uerimana Ghit  
"! DirsTKiB. India (W, Peninsula),

g or even exceeding 2 in. long, acute at the apex, the upper and sr halves **subdeltoid**. Racemes more lax, sometimes reaching G in, ;. **Woodr.** in Jouru. Bomb. **Nafc.** v. 11 (1897) p, 426. *It. larri-a* (sp.), Caiub. in Jaequem. **Toy.** Bot. p. 44, t. 54.

Poona, *Woodr&wl* S. M, Oorara: Badami, *Woodrowi*, *Cool-el* Sran  
1: near Karachi, £&

^AR. 2. *Memnonia*. Whole plant canescent with \*hort white velvety persistent pubescence. *It. Memnonia* (sp.), BO. Prodr. v. 2, p. 55(i • |B. I. v. 2, p. 224; Boiss. Fl. Orient, v. 2, p. 625; **Woodr.** in Journ. 3 jnb. JS<sup>T</sup>at. v. 11 (1897) p. 426. *R. puherulenta*, Stocks, in **Kew** foticuluP<sup>0</sup>\*- v. 4 (1852) p. 147 ; **Aitch.** Pb. & Sind *Tl* p. 60.—**Flowers :**  
--,- io. lo

Corolla \$> the pubescence, which is conspicuous and persistent, I can rounded<sup>ter a c'Λose</sup> **examination** of several specimens from Sind, no bracts; *IT* to se<sup>parai:</sup>o this as a distinct species from *E. minima*, of (1898)\* k<sup>ave ^^</sup> constrained to make it a variety. Mr. Baker, in p. 227. ■ *Q<sup>(C)</sup>i* re<sup>ra:</sup>rk<sup>s</sup> that the plant differs from *It. minima* in vesti-



l - . mv. ju<iiEioi{> xg-it? m, io<g, us uroau as plant, confined, in the Bombay Presidency, to Sind. SIXD: 6 . ka Landa near Karachi, *Stocks'*; **hilla st** the Hub near **Karachi**, *Puran* .'; **istricts**, **Coe<sup>Λe</sup> !**—DISTRIB. Arabia, Tropical and S. Africa.

**hynchosia bracteata**, *Benth. MS. ex Baker, in Hook. /.* **FJ.**

2 (1876) p. 225. Sarmentose or twining; stems and branches

ri l h d ih l b

ube, the lowest longer. Corolla ½ in. long, yellow; standard ½–¾ in. broad, finely pubescent on the back, without callosities at the base, varicled. Pods 1–1½ by ¾ in., turgid, mucronate, narrowed at the base.

terminal

bid-orbicular, the lateral obliquely ovate), shortly acuminate, thinly above, densely so beneath ; stipels 0. Flowers in axillary many-i.'d simple or branched peduneled racemes much longer than **the JK»s**; pedicels short; bracts f<sup>Λ</sup>-| in. long, exceeding the pedicels, e, acuminate, softly pubescent. Calyx %-j in. long, softly downy ; - triangular, the upper about equalling or slightly shorter than *thi*

ightly recurved, minutely pubescent. Seeds estrophiolate, dark-brown.

. *molUssima*, Dalz. in Jouru.. Linn. Soc. v. 13 (1873) p. 186. **Dolichos**

■ *acteatiis*, Wall. Cat. 5554.

'A very rare plant. DECCA.V : Khandesh, banks of the **GKrimr**, **Dakell!**—DISTRIB. **dia** (upper Gmigetic plain, Eirraa).

The plant was firat described by Dnlzell (Jbura. Linn. Soc. 1. c.) who named if *moUissi/ns*. Unfortunately there are two different plants named *B. mollissima*, one 4A Tropical Africa and the other in Java, both of which were described ranch earlier \vi'ir ptfhit of time than Dalzell's plant

### :A. FLEMIWGIA, Boxb.

iiirubs (rarely **berbs**) erect or rarely climbing. Leaves 1-folioiate 4 igitately **3-folioIate** ; stipules atriate, usually **caducous**. Leaflets usually **path** prominent veins and gland-dotted beneath (except *F. tuberosa*), Jusually exstipellate. Inflorescence densely spicato-racemose, capitate, or **paniculate**; bracts various; bracteoles usually 0. Calyx-tube short; teeth

subequal or the lowest the longest, free, usually falcate. Corolla slightly exerted or included ; standard elliptic, obovate, or orbicular, auricled; wings obliquely obovate or oblong, usually adhering to the keel; keel straight or incurved, obtuse or acute. Stamens diadelphous; anthers uniform. Ovary sessile, short; ovules 2 ; style filiform or slightly thickened above ; stigma small, capitate. Pod small, oblique, turgid, continuous within. Seeds thick, not strophiolate ; the funicle centric.—DISTEIB. Chiefly natives of Tropical Asia and Australia, a few in Tropical Africa; species about 26.

Leaves 1-foliolate.

Branches terete ; bracts acuminate, glabrescent; corolla white. 1. *F. strobi*

Branches angular; bracts rounded or emarginate, hirsute; corolla rosy or purple ..... 2. *F. b*

Leaves 3-foliolate.

Erect shrubs or undershrubs.

Flowers in panicles ..... 3. *F. lh*

Flowers in axillary racemes ; bracts small. A low undershrub 0-8 in. high, with woody subterranean

stem ..... 4. *F. na*

Woody undershrubs with tall stems. Corolla exerted; calyx with a distinct tube, the lowest tooth the longest..... 5. *F. Co?*

Corolla included; calyx divided nearly to the base, the teeth subequal ..... 6. *F. W*

Flowers in dense globose heads surrounded by large bracts. 7. *F. ini*

Trailing herbs with tuberous roots.

Inflorescence capitate, terminal ..... 8. *F. »•*

Inflorescence lax, axillary ..... 9. *F. fi*

1. **Flemingia strobilifera**, *ll. Br. in Ait. Hort. Kew. ed.*

(1812) p. 350. An erect much-branched shrub 4-10 ft. high ; br. slender, terete, pubescent towards their tips. Leaves 1-folio

petioles \- in. long, pubescent; stipules scarious, \- in. long, lai late, caducous. Leaflets subcoriaceous, minutely gland-dotted, 3 3 by 1½-2 in., ovate-oblong, acute, green and glabrous or nearly so above paler and more or less silky-pubescent (especially on the nerves) beneath. base rounded or truncate ; main nerves 8-10 pairs, very conspicuous on the lower side ; stipels 0. Flowers in axillary and terminal simple

o branched racemes 3-6 in. long, closely arranged along a slender pubescent zigzag rhachis ; bracts large, membranous, persistent, glabrescent broadly orbicular-ovate, shortly acuminate, 1-1 in. long, usually broader than long, cordate at the base, conspicuously nerved and reticulate A'ined, stalked, each bract folded over and enclosing 2 or more small flowers. Calyx \ in. long, pubescent; teeth linear, acute, veined, longer than the tube. Corolla white, ½ in. long ; standard ^ in. broad auricle

Pods 6 by -f in., oblong, turgid, mucronate, densely pubescent, completely concealed by the bracts Seeds 2 (rarely 1), dark-brown

marbled. II. B. I v 2 p. 227 (*exclud. vars.*); *Grah. Cat.* p. 51

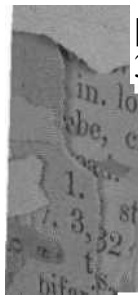
*Dalz. & Gibs. p. 75; Talb. Irees, Bomb. p. 74; Woodr in Journ*

Bomb. Nat. v. 11 (1897) p. 426 ; Watt, Diet. Econ. Prod. v. 3 p 40  
—Flowers : Nov.-Jan. VEEN. *Kdnphiiti*.

Common in hilly parts of the Konkan, usually growing in  
*Stocks I Gratam; mfo\*\*\*. Oookel, Woodrov!*;  
Lableswar Throughout India; S.& Asia.

**2. *Flemingia bracteata*, Wight, *fc*m. (1840) t. 268.** An erect shrub 4-10 ft. high ; branches more or less angular, softly downy when young. Leaves 1-foliolate; petioles  $\wedge$ -| hi. long, downy; stipules  $\blacksquare$ ' ; ; in, long, linear, bristle-pointed, subpersistent. Leaflets 3-5| by I i--2 $\wedge$  in., ovate, acute, glabrous above, slightly hairy (especially on the nerves) beneath, base rounded or cordate; main nerves 4-6 pairs; stipels 0. Flowers in axillary and terminal branched racemes, closely arranged along a pubescent and nearly straight rhachis; bracts membranous, | in. long, usually broader than long, rounded or emarginate at the apex, cordate ut the base, stalked (with linear subulate stipules | in. long below the stalks), softly hirsute and ciliate with long hairs, reticulately veined, the flowers hidden within the folded bracts. Calyx \ in. long, hirsute; teeth triangular, acute, longer than the tube. Corolla \ in. long, purple or rosy. Pods \-\$ in. long, oblong, turgid, rounded and inucronate at the apex, entirely concealed by the persistent, bracts. Seeds 2 (rarely 1). Prain, in Journ. As. Soc. Beng. v. 66 (1898) p. 437. *F. strobUifera*, var. *bracteata*, Baker, in Fl. B. I. v. 2, p. 227. *Jledymrum bmeteatum*, Hoxb. Fl. Ind. v. 3, p. 351.

KT<sup>o\*</sup>r^K: *Hitchie*, S. M. COCXTRY: Oastlerock, *Cooks U BMval* KANAKA: *TaBot we* »),—DISTEIB. India (Oude, Behar, 0. India, Siktim, Birrua, W. Peninsula).



***lineata*, Roxb, *Sort. Beng.* (1814) p. 56,** A small branched shrub; young branches angular, appressedly pubescent. 3-foliolate; petioles |-1 in. long, quadrangular, not winged,  $\uparrow$  nt; stipules conspicuous, ,| in. long, linear-oblong, cuspidate, ;,isient. Leaflets 1-[~2 by |-j\*'-in., rigidly subcoriaceous, plicate, » or oblanceolate, caneate (the lateral smaller than the terminal <7 slightly oblique), rounded or subacute, nearly glabrous above, silky-(especially on the very oblique conspicuous nerves), closely reti-3f ;ly veined and inconspicuously dotted with yellowish glands beneath; "u<sup>1</sup>^ Is 0. Flowers in axillary peduncled spreading lax panicles ; rhachis ider, pubescent; pedicels short; bracts linear, acute, caducous. ilvx i-jl in. long, softly downy ; teeth subequal, linear-lanceolate, a f'i'ttie longer than the tube. Corolla ^ in. long. Pods |-^ by f^ in., oblong, rounded at both ends, minutely apiculate, glandular (sometimes viscid'ly so), pubescent. Seeds 2, orbicular-oblong, black. Fl. B. I. -.2, p 22H; Grah. Cat. p. 51; Wight, *Icon.* t. 327 ; Trim. Fl. Ceyl. 2, p. 87.—Flowers : Bee.-Jan.

I KONBAN: *Stocks'*. DBCCAN: between Nasik ami Igatpuri, *FAgeworth*} GTL-JAK iVInmon, *Dr. Lush ex Graham*; Panch Mahals, *Daizell I*—DiSTaiB, Tli rough out Malay Islands, N. Australia,

**4, *Flemingia nana*, Roxh. *Hon. Beng.* (1814) p. 50; *Fl. lud*, v. 3, 339.** Suffirtitieose, t;~8in. high ; stem scarcely any, about 1 in. above Line!, woody, perennial; branches few, short, subherbaceous. Leaves ffoliokte; petioles 1-3 in. long, winged ; stipules |~| in. long, linear-\ |,nceolate, acute. Leaflets 1-3 by f-1| in. (the- terminal obovate, \ 'Sf)l' arrowed, the lateral obliquely elliptic, rounded at the base), acute at !\*VdL.ie apex, more or less downy, 3-nerved; petiolules short; stipels 0. f-ijlowei'S numerous, in axillary elongate slender racemes 3-4 in. long, <sup>1</sup> Iwbich are solitary or fasciculate; pedicels £-£ in. long, slender, "pubescent and glandular; bracts ^ in. long, lanceolate, caducous. T&Iyx I io. lo<sup>n</sup>g> pubescent and covered with ferruginous glands; teeth



...longer than the tube, the lowest the longest. Corolla 2 in.  
long, greenish-tinged with darker stripes. Pedicels long, slender,  
terse, clothed with a greenish grey tomentum and covered with small  
reddish glands. Seeds 2, round. Wight, Journ. A. Soc. Beng. v. 67 (1808), p. 411.

Baker, in P. B. L. v. 2, p. 212, makes this a variety of *F. congesta*  
a shrub reaching 6 ft. high. There is evidently some mistake as to the  
plant which Mr. Baker took to be *F.* of Roxburgh. The species  
is very badly represented in Herb. Kew., but Roxburgh has in his  
"Journ." an excellent coloured drawing of the plant which has been copied  
by Wight (Journ. A. S.).

A very rare plant in the Bombay Presidency. T. B. v. 2, p. 906 in Calcutta Herb.  
Gard. Wight reports the plant from Louis N. Keays.

5. *Flemingia congesta*, Roxb. Hort. Beng. (1814) p. 66. An erect  
shrub 3-6 ft. high, young branches greenish.

The Journal  
of the  
Society  
for the  
Propagation  
of the  
Gospel  
in  
India  
Vol. 1  
Part 1  
Page 1  
See also  
Vol. 1  
Part 1  
Page 1



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«, W  
Flemingia WalUeHii, W

a\* t?

*n*



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, H

·

hairy, the hairs often rising From largo yellowish bulbous bases; teeth subequal, more than twice as long as the tube, linear-lanceolate, plumose. Corolla .scarcely longer than the calyx, dull-purple ; standard | in. broad, obo vate- oh long, hairy on the back, auricled. Pods \~ in. long, thin, obliquely ovoid or subglobose, pointed,-glabrous, veined. Seed 1, ellipsoid, quite filling the pod, dark-brown, smooth.. *Flemingia £ eumbens*, Wight, Icon. t. 987 (not of Eoxb.); Dalz. & Gibp. 75. *Flemingia vestita*, var. *nilgheriensk*, Bentu, ex Baker, in Fl I. v. 2, p. 230 ; Woodr. in Journ. Bomb. Nat. v. .11 (1807) p. 426-BWers: Aug.-Oet.

I have restored this to the rank of a species accorded to iy Wight. It is quite impossible to consider it a variety of *F. promms*, lloxb., which, as Pram points out (Journ. As. Soc. Beng. v. 66 [181 p. 442), is the same as *F. vestita*, Benth. Wight made" a slip in i»»g the plant *F. proeumbms* (Icon. 987), when he had already figiirJ<sup>1</sup>. *pro-Gumbens*, 3£oxb. in t. 408, He corrected the error, however, a note attached to a specimen in his Herbarium, which is now in H-Kew., in which he named the plant *F. neilyherrensh'*.

Bare. KOSKAIT : *Stocks\**. DECCAS ; Phumla QMt, BalzeU\—~BISTRIB. mvently endemic

9, **Flemingia tuberosa**, Bah. in *Kmjowm. Bot v. 2* (1850)

Perennial, prostrate; root tuberous, 2 in. long, edible; stems i long, copiously branched ; branches terete, glabrous or with spreading hairs, faintly striate. Leaves 3-foliolate; petioles %p long, clothed with spreading hairs ; stipules i in. long, oblongs caducous. Leaflets 1|-2 by |^- in., oblong.lanceolate, acute, sL hairy above, more strongly so on the nerves beneath, not or obsc gland-dotted; midrib very conspicuous on the underside. FloW in few-flowered lax axillary racemose cymes longer than the lei ty branches very slender: bracts and bracteoles rigid, ovate ai 0 Calyx J-f in. long, densely hairy; teeth subequal, longer than t° tube, linear, acute, strongly 3-nerved, Corolla like, -slightly looffe than the calyx<sup>1</sup>; standard hairy on the back. Pods oblong, as W as or slightly exceeding the calyx, glabrous, transversely reticulate towards the apex. Seeds 1-2. Fl, B. I. v. 2, p. 230; Dalz. &

) p

S: *Stoctel, DakeUl, Law'*; Malwto, Dakeli '\$ Gibmn: ,  
DISTRIB. Apparently endemic.

55. **BALBEKGIA**, Linn. f.

Trees or shrubs often climbing. Leaves alternate, imparininnat, , rare y 1-toliolate. Leaflets usually alternate, enti,32£P Xwe small, copious, m terminal or lateral mn\Ae\*. hZT n S 8maU Sub I persistent; bracteoles usually minute cS^' Lort, distinct, the lowest usually the Ion15 "St\*" W standard broad; wings oblong; keel ohWgs" ?T^\_ e fert<^ tip. Stamens ^10 J<^ \ ^ ^ J T ^ % the tube split into 2 equal bundles ; J^f ^ Z cells back to back, dehiscing usualiv hviiTi <!\*ii/ LMSVIALU nun nig I P (Tel) a lon Itudmf lit Ovary stalked ; ovules few. Itvi I P (Tel) a lon Itudmf few, felyie incurved, short; stigma small,

426.-Flowers ; Sept.

K N K    *Stotel*   *D k U l*    *L'*    Ml    *D*    :

**slit.**

terminal. Pod oblong or strap-shaped, usually thin and flat, in-dehiscent, **not** thickened or winged at the sutures. Seeds 1-4, reniform, flat-compressed.--DiSfBiB. America, Afru-a, Tropical Asia, **Australia**

**j**  
species 6'0-70.

AD older name Cor the genus i« *Atnenmnon*, Browne (**Hist. J''ana** 1788] p. 288, t/.Vf- 3).

**Siamenjp** <sup>less common'y IQ</sup>, monadelphous; sfcaminal-l-<sub>a</sub>  
**J%slit** along the upper side **only**.

Tall (■ <sup>!s unarine^</sup>)

r\_A acuminate.....

1. A *Sissoo*.

jffSSottwa .....

2. *D. latifoUo*.

A » ' ,t'iree armed with spines .....

3. 2). *Melamxylon*.

<Jpfod strnigii .....

4. 1). *TvMginosa*.

jsfrod **crecent-shaped** .....

5. *D. torta*,

j p\l\ets **11-15** .....

(i. h, *sympatheüca*,

|.' : 'ijli is i.'5—II .....

7. *P. tamarindifolia*.

**gj** <sup>^</sup> **iplsIO**; sfcininal-tube slit on the upper and **lower**  
leSj so that the st&mens are in 2 bundles of **6** each.

<sup>^</sup> <sup>^</sup> in. broad, with a callosity ut **the base** of  
?V e,t%e limb.....\*

8. />. *lanceolaria*,

itliird |- in. **broad**, without a callosity **at** the base

<sup>1</sup> it; of the limb .....

9- *D. paniculate*.

'on''' UHpreet **sbrub** with **spine-tipped braachlefc** .....

10. i'. sp?'?iom.

o'inbijig sJirub ; leaflets **11-15** .....

11. *D. volubilis*,

s|■' 'hi.fr **albergia Sissoo**, *lixh. Hort, Beng.* (1814) p. 53; *Fl. Ind.*  
N; sill; . 223. A tree reaching 60 ft. high; **young** parts  
pubescent e, mentose; branches numerous, spreading.

Leaves alternate,

iniparipinnate; leaf - rhaehis **zigzag**; petioles terete, very  
when young 5 stipules lanceolate, caducous. Leaflets 3-t5, firm, i by ^\~-\  
0^e terminal the largest and the lowest the **smallest**), nt, alternate,  
suborbicular, conspicuously and abruptly acumioate, >m .\*berulous when  
young, soon glabrescent> base narrowed or cuneate; ! in, long. Flowers  
sessile or nearly so, in axillary panicles

*rephorter* than **the** leaves and composed of several short subsecund spikes ;

**jirhachis** and branches of the panicle densely hairy; bracts  
Hnear-i^re'ybulate hairy. Calyx t-l-^ in. long, hairy; teeth short,  
eiliate, **the** jV'atupper connate except at the tip, the lateral linear, obtuse,  
the lowest \ 5; e longest, subacute. Corolla pale-yellow, J--^ in. long;  
standard l. broad, with a long claw, the limb obovate-orbicular.

Stamens 9 ■ ■g^one bundle, the sheath of the filaments slit only at the top.

**Ovary Klamjbesent**; ovules 2-4. Pods U-4 by \-h in., narrowed at the  
base **Jpi'**, 4° a ^on£ sta'c w^ncn 's twice as long as the calyx, thin, strap-shaped, n  
ibrous, slightly reticulate.' Seeds 1-4. *Fl. B. I.* v. 2, p. 281;

*ah. Cat. p. 55; Dalz. & Gibs. Suppl. p. 24; Benth. in Journ. Linn.*  
*c. v. 4 (1860) Suppl. p. 40; Bedd. Fl. Sylvat. t. 25; Talb. Trees,*  
*greyi mb. p. 74; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 426;*  
*att, Dict. Econ. Prod. v. 3, p. 13.—Flowers: Mar.—June. VERN.*

**Planted**, but not extensively, in the Bombay Presidency; said to be. wild in Gujarat.

■ *paham* (1. «.} says that it is common in the Kanheri jungles and the hilla about

P H , but no doubt self-planted,

The wood is valuable and is largely employed in Bengal for boat-building, **carts, and** furniture. See **Watt**, Diet. Econ. Prod. 1. c—DISTSIB. India (planted throughout the plains, indigenous in the **Sub-Himalayas** from the Indus to Assam).

2. **Dalbergia latifolia**, *Eoseb. Cor, PL* v. 2 (179S) p. 7, t. 113. (A \_ , ,<sup>1(1</sup>  
l f h i h bh dig'

large **glabrous** tree reaching 80 ft. **high; branches** numerous, pg forming a shady head. Leaves imparipinnate, 4-6 in. long •<sup>l</sup>ia<-nis straight, glabrous, much produced beyond the insertion of the r<sup>l</sup>i)P<sup>er</sup>«Jost pair of leaflets. Leaflets 5-7 (usually 5), firm, 1|-2| in. **lon**<sup>^\*</sup> n broad as long (the terminal slightly the largest), broadly ov orbicular, rounded, sometimes emarginate at the apex, glabro., ?\*\* sides, pale beneath, base **shortly cuneate**; petiolules \-\$ in. lonji\* p in axillary or extra-axillary lax divaricate panicles usually **sh**<sup>^</sup> er the leaves; pedicels *fe-l* in. long, filiform; bracts minute; f membranous, very caducous. Calyx J—i in. long, glabrous • teet<sup>l</sup> oblong, obtuse, rather shorter **than the tube**. Corolla .{■ r' <sup>^</sup>ong, greenish- or yellowish-white., the petals with long claws. Starn<sup>^</sup> (^in one bundle. Ovary glabrous; ovules 3-5. Pods 1^3 by "« <sup>l</sup>n>t strap-shaped, **slightly reticulated**, glabrous. Seeds 1-3 (r<sup>J</sup>v 4). EL B. I. v. 2, p. 231; G-rah. Cat. p. 55; Dalz. & Ms. p. ?\ <sup>J</sup>i«Id. **Flor. Sylvat**, t. 24; Benth. in **Journ. Linn. Soc**, v, 4 (1860<sup>^</sup>% p. 38; **Talb.** Trees, Bomb. p. 74; **Woodr.** in Journ, Bomb. **Nai** (1897) p. 42G; **Watt, Diet. Econ. Prod.** v. 3, p. 7.—**Flowers**, 2 n850) **VEEN. Shisham; Sissu; Bid.**

The **Blackymd** or **Rosewood** tree of S. India. **KOHAH: Stocktl, LOIUQT** with **Gebttmel, Balsdl § Gibson.** DBCCAN: hills, **Wood-raw.** 8. M. **Coxrstat: 2**  
*Gibson.* KANAKA: associated with teak in the high **timber** forests of **oblong,**

*Talbot*; banks of K&la **naddi** river, *Law ex Graham.* — **DISTRIB.** Indi;? E. **Bengal, Bebar, Sikkiqi, B&adelichand, 0. India, W.** l.euinsula). icute, sp<sup>^</sup>  
The tree **furnishes** a valuable **hard and heavy** wood which sinks in **water**\*; or obsc<sup>l</sup> seasoning. It is the wood from which the well-known Bombay blackwood furni<sup>le</sup> pi<sup>o</sup> made and commands a very high price in the market. See **Watt, Diet. Econ. Pro**< ', ,  
i^\_

3. **Dalbergia Melanoxylon**, *Guill Sf Per. Flor, Seneg\** v!<sup>ate</sup>> at  
o (1830) p. 227., t, 53. A small tree 15-20 ft, high; branches more J<sup>htul</sup>  
<sup>u</sup> less armed with stout spines; bark **white**. Leaves 4-5 in. longf l<sup>on</sup>.<sup>^</sup> **stipules** very caducous. Leaflets D-35, thinly subcoriaceous, |-  
; by <sup>on</sup>§ )<sup>l</sup>S \ in. (the terminal the largest, obovate, **cuneate**, the lateral oblong) <sup>ou</sup>^\*ds **obtuse** emarginate, glabrous above and nearly wo **beneath-**  
**petioi**uft<sup>^</sup> P" ^:

<sup>l</sup>/<sub>10</sub> in. long. flowers numerous, in axillary panicles about equalling t<sup>l</sup> Sept.  
leaves; pedicels <sup>1</sup>/<sub>20</sub>—<sup>1</sup>/<sub>18</sub> in. long; bracts and bracteoles minute, linear, *Nairne* 2  
Calyx <sup>1</sup>/<sub>10</sub>—<sup>1</sup>/<sub>8</sub> in. long, pubescent; teeth ciliolate, the 2 upper obtuse, t<sup>l</sup>  
lateral smaller, linear-oblong, obtuse, the lowest twice as long as 1  
lateral, linear, acute. Corolla 1 in. long; yellow; standard -Mo. broa  
**oblong-obovate**, emarginate. Stamens 9 (in all that I have "**examii**  
**inonadelphous**, the central stamen longer **than the others'** **Ova**

glabrous; style short. Pods 1-2| in. long, 1-seeded' and then sho broadly  
elliptic-lanceolate, acute (sometimes 2-seeded and then oblou<sup>riil^</sup> i-Iongate),  
quite glabrous, reticulately veined, **narrowed** into a sta<sup>e;</sup> teet in. long.  
**Dak. & Gibs. Suppl. p. 24; Prain, in Journ As Sti\*<sup>8</sup>\*<sup>3</sup>\*<sup>3</sup>\*<sup>8</sup>^ Beng, v. 66**  
**(1808) p. 440. Z>. Stocksn, Benth. in Journ."Linn Hoe 7<sup>j</sup> at<sup>th</sup> (1860)**  
**Suppl. p. 42; Baker, in Hook. f. Fl. B. T. v. 2, p, 234 ■ TalV<sup>side></sup> Ol Trees,**  
**Bomb. p. 75; Woodr. in Journ. Bomb. Nat. v 11 fl897VD 42(7<sup>"^</sup> ^/e**  
' \* ' \* itudinal)  
ia small,

**GruUL** & Per. in their description say **stamens 10, sometimes 9, In their figure, however, 9 stamens are shown. I have found only 9 in all the specimens I have examined and they are monadelphous, though the staminal-tube is slit some way down on the lower side.**

Very **doubtfully** wild in the **Bombay Presidency**.—The tree occurs in **Hanaro, where os by the name of "Chinese blaokwood."** It baa been planted a-s a **roadside tree** in **JDharwar** and also at **Gaaeeh Khiml** near **Poona**. **Dakell O. e.)** says it was **raised** in the **Botanic Gardens at Hewra** and **Dapuri** from seed furnished by Mr. **Nimmo** and - -» \_ was called "Senaur Ebony."

anVJ<sup>le</sup> wood is remarkably hard and is used in **Settegambia** for many of the purposes and according to **Gtuill, & Per. has been imported into Europe.**

**rubiginosa, Eoxb, Cor. FL v. 2 (1798) p. 9, t. 115.**

2<sub>t</sub> branches **terete**, glabrous. Leaves **imparipiunate**, 3-4 m. **ta r**ehis appressedly pubescent. **Leaflets** 5-7, coriaceous, 1~2£ by **k<sub>r</sub> v**the terminal much the largest), elliptic-oblong, obtuse, emar- (glabrous **and** sinning above, pale, **minutely** puberulous and enously reticulately veined beneath, base **rounded** or subacute; **rominent** on the underside; petiolules ',, in. long, pubescent. **f<sup>Q</sup>\*b** in short crowded axillary panicles 1-2 in. lung, **with** finely •^Wers^M <sup>ait</sup> branches; pedicels **in, long**; bracts **ovate-oblong**, sub-'\|ibescent on both sides, ciliolate; bracteoles suborbicular-oblong, v rounded at the apex, pubescent on both skies, ciViolate. Calyx <sup>nieu\|v</sup>-t<sup>lf</sup>ig, finely brown-silky; **teeth** obtuse, about ■]- **tb**e length of<sup>l</sup> the to. lcJ<sub>lr</sub>J <sup>^^</sup>liolate. **Corolla | in. Hong; standard obovate-oblog, fa \n. I!"**Stamens 9 or 10 **in** one bundle. Ovary **stalked**; ovules 2-4 4rongly veined, 1-2-aeeded (**vide Talbot, I.e.**). **FL B. I. v. 2, ■ v. :j !8t?'s^ Benth.** in Joum. "Linn. Soc. v. 4 (1860) **Suppi p. 43; Talb.**

oi' If2i <sup>s</sup>Bomb. p. 75.

\*■ ■ l;ifar\ :<sup>se</sup>d\ e found the number of stamens **to** he usually 10, though I **have** d<sub>ow</sub>M<sup>e</sup>3 9, but very rarely.

I re. KONKAN : *Stocksl* KANABA: N. ICanara, *Talbot, 43>*; in the

 evergreen in the Aiuabi **Ghat southward, Talboi.**—**DISTEIB.** India (W, <sup>r</sup>

**5. Dalbergia torta, Grak. In Wall Oat, (1828) 5873.** A stout **andent** shrub, **climbing** by means ot: its divaricate lateral **twigs** often **g**ttoked at the ends ; **bark purplish-black**, .smooth. Leaves 2-3 in. long ; sAicbis finely pubescent. **Leaflets** 5-7 (usually 5), -|-1 by |—j| in., <sup>10</sup>y-'iptic-oblong, obtuse, usually **emarginate**, quite glabrous above, **glau-nceni** and more or less minutely puberulous beneath, base usually

P\***B,ji**uded (that of the terminal leaflet cuneate); petiolules -^ in. long, <sup>?i</sup>r,beseent. **Flowers in axillary** solitary or twin racemose or

subeymose \$,]ar*i*icles shorter than the leaves; pedicels \$\$-■£\$ **in. long**; bracts and ihkr, icteoles minute, persistent, the former ovate-oblong, subacute, the ter orbicular, concave. **Calyx** J in, long, glabrous; teeth about | y <sup>^</sup>the length oi the tube, subequal, obtuse. **Corolla ^ in.**

**long, white** ; <sub>n</sub>A <sup>^</sup>andard -pr-rV <sup>^n<</sup> **broad, narrowly** oblong, **obtuse, with** a very slender \*% \|v as long as the tube of the calyx, **and** without any callosity at the Kse. Stamens 10 in one bundle. Ovary glabrous; ovules usually 2. ds 1 by *k* in., brown, **shortly** stalked, crescent-shaped (the **upper** <sup>i</sup>titure recurved), polished. Seed 1. *Dalhmjia* **mmosperma**, Dalz. in *k<sub>e</sub>w Journ. v. 2 (1850) p, 36; Fl. B. I. v. 2, p, 237; Date. & Gibs.*



p. 78; Benth. in Journ. Linn. Soc. v. 4 (1800) Suppl. p. 48; Trim. EL Ceyl. v. 2, p. 89; Talb. Trees, Bomb. p. 75; Woodr. in Journ. Bomb. Nat. v., 11 (1897) p. 426.—Elowers: June. VUBS. *Garud-yel*.

Mr. Baker has made a slip in placing this plant (Fl. B. I. I. c.) in the section with isadelphous stamens. Trimen (El. Ceyl. 1, c.) has made a

milar mistake. The stamens are distinctly monadelphous, a fact which Dalzell had noted in his original description and Mr. Beitcham in Journ. Linn. Soc. (I. c).

KONKAK: *Law'*: Malwa, *IMzdl* *tf*<sup>1</sup> *Gibson*, *Woodrow*, *Vmgorla*, *Mutheran* (Ohowk Plateau), // *M. Birdwood*.—*T*>*isTKtB*, India (Bengal in the S. V. bans, W. Peninsula near the coast); Ceylon, Malaya, Philippines, China, N. \*

6. **Dalbergia** *sympathetic* a, *Nimmo*, *ex Grah*, *Oat. Be. I*<sup>s</sup> p. 55. A large scandent shrub climbing over high trees; branch<sup>1</sup> twisted, the young ones pubescent; trunk armed with strong often fantastically curved clustered spines 6-10 in. long. Leaves long; rachis softly pubescent. Leaflets 11-16, moderately firm; by  $\frac{1}{2}$  in., oblong, obtuse, emarginate (the terminal obovate, ciliate softly pubescent on both surfaces, reticulate veined; petiole long. Flowers numerous, in dense short axillary cymose panicle rusty-pubescent corymbose branches; pedicels very short; bracts minute, oblong, obtuse. Calyx  $\frac{1}{2}$  in. long, pubescent  $\frac{1}{2}$  about equalling the tube, the 2 upper broad, obtuse, the 2 lateral and narrower, subacute, the lowest the longest, lanceolate, acute. Petal 1 m. long; standard  $\frac{1}{2}$  in. broad, obovate-oblong, emarginate,  $\frac{1}{2}$  any callosity at the base, the claw shorter than the tube of the Stamens 10 in one bundle. Ovary pubescent. Pods when  $\frac{1}{2}$  in. long, when (less commonly) 2-seeded reaching 3 by  $\frac{1}{2}$  narrowed to the point and at the base into a very short stalky persistent, reticulate. Seeds 1-2. EL B. I. v. 2, p. 234; Dalz. & (p. 78; Benth. in Journ. Linn. Soc. v. 4 (1800) Suppl. p. 42; Talb. Trees, Bomb. p. 75; Woodr. in Journ. Bomb. Nat. v. 11 (1897) p. 42(5); Waft, Diet. Econ. Prod. v. 3, p. 16.—Flowers: Feb.—Ma YBRJT. *Pendgul*; *Yekyel*.

KUMUN: *Dalzeul*, *Law I*; *Stocks I*; *Matheran*, *Cooke*, *H. M. Birdwood*. DUCCAS: near *P*<sup>r</sup>, *Grah* *Kandala*, *Woodrow* \ *KANAKA*: *Mokenhacker*, *3i3*; from the coast inward in the deciduous forests of N. Eanara, *Talbot*.—DISTEIB. India (hills fig the W. Peninsula).

7. **Dalbergia** *tamarindifolia*, *lioxh*. *Hort. Beng.* (1814) p. 6; *i* scan de nt s 11 rub 15-40 ft.; you  $\square$  g b r a n e i i es densely rufous-pubescent. Leaves 4-6 in. long; rachis densely puberulous; stipules lanceolate 1 in. long. Leaflets  $\frac{1}{2}$  in. long, moderately firm, caducous,  $\frac{1}{2}$  by  $\frac{1}{2}$ : trapemid-oblong, truncate, rounded, sometimes emarginate at the apex thickly pubescent on both surfaces, paler beneath; petioles very short

Flowers in congested sessile corymbose-branching axillary panicles  $\frac{1}{2}$ -2 in. long, the branches of the panicle densely brown-pubescent; pedicels  $\frac{1}{8}$  in. long; bracts  $\frac{1}{8}$  in. long, ovate, subacute, pubescent, persistent; bracteole

$\frac{1}{2}$  in. long, broadly oblong, obtuse, pubescent, persistent. Calyx  $\frac{1}{2}$  in. long, glabrous; teeth one-third as long as the tube, short,

m

ilia

subobtus. Corolla  $\frac{1}{2}$  in. long, white; standard  $\frac{1}{2}$  in. broad, not thickened above the claw which is as long as the tube of the calyx<sup>1</sup> Stamens usually 9 (rare!) (L0), monadelphous. Ovary

glabrous; ovule<sup>3</sup>

2-3. Pods 1½-3 by ½-1 in., thin, greenish, drying bright reddish-brown, strap-shaped, glabrous, shining, slightly reticulate. Fl. B. I. v. 2, p. 234; Benth. in Journ. Linn. Soc. v. 4 (1860) p. 44; Talb. Trees.

**Bomb**, p. 75 ; Woodr. in Journ. Bomb. **Hat** v. 11 (1897) p. 426 ; **Watt**, Diet. Econ. Prod. v. 3, p. 1(>.—Flowers : Mar.-May.

A: **Law**!, *Stocks I* KANAKA: in evergreen forests on the S. Grluits of N. Kaiuim, **oomon**, **Talbot**; NiJkund (8. **Kaaraji WofoQW**.—**DISTBIB**. India (Himalayas from Nipat east wards, **W. Peninsula**) ; Indo -China, **Malaya**.

**VAU**. 1. *pubescent*, Baker, in Hook, *t* Pl. B; I. v. 2, p. i'35. Branches and underside oi' leaves clothed with persistent thick ferruginous pubescence.

*Stocks I, Law I*

2. *acacicefolia*, Baker, in Hook. f. EL B.I. v. 2, p. 235.

^ ^ Leaflets'

or, rigidly coriaceous, dark-green and shining above, glaucous and r less hniry beneath. *I*, *acacicefolia* (sp.), Dalz. in Kew Journ.

2 (1850) p. 37.—**Mowers** : Apr.'

•;M: in. i

mate, inconspicuous midrib flowers pubescent

ould appear to deserve the rank oi'a separate species.

*Bahell'*

**albergia lanceolaria**, **Ltim.** /. ^«fty?. i'/. (1781) p. 316.

o .ee 30-40 ft.-high j bark grey/ Leaves 3-7 in. long; stipules caducous. Leaflets **f-Ij by** | in., elliptic or oblong, obtuse, i;ite, glabrous above, pale and more or less puberulous **beneath**, ■inded or subacute: main nerves very oblique, numerous, **parallel**, nous: petiolules **l-l** in. long. **Mowers** in copious **axillary** and

be, ciliate leafless panicles clothed with rufous pubescence; pedicels 1½ in. rufous-hairy; bracts and bracteoles minute, caducous. Calyx ½ in. silky-hairy; teeth half as long as the tube, ciliate, the 2 upper

;If2r.se, the 2 "lateral equalling the upper, subacute, the **lowest the** bif<sub>a</sub>A fest, linear-lanceolate, acute. Corolla § in. long ; standard broadly dow ^ 'Vafce, 4 in. broad, with a large callosity above the claw. Stamens in (/bundles of 5 each. Ovary stalked, usually hairy **at** the base ; ovules 3. \*ods | in. broad and when 1-seeded l|-2 in. long (**when** 2-seeded **Sometimes reaching** 4 in. long), thin, flexible, narrowed to the point and gradually at the base into a long stalk, glabrous or nearly so, retieu lately veined. Fl. B. I. v. 2, p. 235; Dalz. & Gibs. p. 78 ; **Benth. in** Journ.

**1** inn. Soc. v. 4 (1860) **Suppl.** p. 45 ; Trim. **Fl. Ceyl.** y. 2, p. 88; Talk !'>ees, Bomb. p. 75 ; Woodr. in Journ. Bomb. **Nat.** v. 11 (1897) p. 426 ; \* '?!¥4tfc, Diet. **Econ\* Prod.** v. 3, p. 6. *I*, *frondosa*, Eoxb.

**Hort.** Beng. f{ 53; Wight, Icon, t, 260; Grab. Cat. p. 55.-**r-Flowers:** Mar.-Blay.::

»■-,««« TinasJus • flrtv^t'i,ii

'ERST. **IMnaus**; V', KOVKAN: rare, *D. Graham*; *I landi*, *Woodr.* to *Sidda-wPirr*, **common** **K 9. Dalbergia p** **Eft** tree sometime **Krrevisn-brown**

<<fl in. long ; rha

'•- in., obo  
tiolule.s -■■■-  
'\* .ss common  
densely  
lothed with ferr

Calyx £-§ in. long, densely silky; teeth ciliate, a little more than half as long as the tube, Bubdeltoid, the lowest slightly the longest. Corolla *j* in. long, bluish-white; standard oblong, einarginate, |-| in. broad,  $\frac{1}{2}$  by  $\frac{1}{2}$ - $\frac{3}{4}$  in., narrowed at the base and apex, long-stalked, glabrous, reticulately veined. Seeds 1-2. Fl. B. I. v. 2, p. 236; Grah. p. 55; Dalz. & Gibs. p. 78; Benth. in Journ. Linn. Soc. v. 4 (1860) pl. p. 45; Talb. Trees, Bomb. p. 75; Woodr. in Journ. Bomb. Nat.

veined, with a claw about as long as the tube of the calyx and without any callosity at the base. **Stamens** in 2 bundles of 5 each. **Pods** *U-l glabi* Cat.

v. 11 (1897) p. 42B; Watt, Diet, "Econ. Prod. v. 3, p.

**11.—Flowers: Apr.-May. YESST. Fhansi.**

**KOBKAN: Stoeksl, Daisdli; JSatheran Ghat, II M. Birdwood. DSCCAS: Mawal**

districts above the Ghats, *Graham*. S. M. Ooirritv : KalgUatgi taluka of Dha XWfort. KANAKA; deciduous forests of 2f. Kanara, Talhot,—EISTRIB. India (Winaula, Birma).

**10. Dalbergia spinosa, Eoxb. Ft, hid. v, 3 (1832) p. 233.** ^ erect glabrous shrub; lateral **branchletg** short, horizontal, **ending** hard spine. Leaves crowded **in fascicles** **Erom** the nodes of the ^ branch lets; **rhachis slender, rusty-pubescent.** Leaflets 7-11, n\ n by |-| in., oblong, obfcuse, glabrous; pefciolules very short, l'io\ u[ congested corymbose **axillary panicles**; pedicels short. Calyx^ long, puberulous; teeth about equalling the tube, the 2 upper ^ the 2 lateral smaller and narrower, bubaeute, the lowest **Blijgt**^ longest, lanceolate, acute. Corolla -I in. long; **standard -^in.** j elliptic oblong, without any callosity at the base. Stamens in 2 L j v ot 5 each. Ovary glabrous. Pod 1 in. long, reniform, fiat, gla^fe brown. Fl. B. I. v. 2, p, 238; Talb. Trees, Bomb. p. 75; Watt, ' & \. **Econ. Prod. v. 3, x>- 15-** > . r^

This plant Ima been included on the authority of Talbol ['. c.) who bas noted (occurring on the coast of the **Koak&n.** I iiave seen no sped HUM is from the Kin \_ coast nor from any part of the **Presidency of Bombay.**—**DISTHIB.** India (shores oi' E. & W, Peninsulas, **Ohittagocg**).

Watt mentions a curious property which the **powdered roots** ar\*> reputed t-x\~s : possess, viz. that of absorbing alcohol, Kurz states that " a spoonful of the powdered the 3 root in a glass of water is .said to **destroy in** less than **halt'** fn hour the effects of ■- cfg alcohol, eyen in cases bordering on delirium **tremena,**" It seeme next to impossible ^, that any substance should be possessed of **such a property, but, I** quote the statement as given. See Watt, Diet, Eoon. Prod, i. c.

**11. Dalbergia volubiUs, Eoxb. Cor. PI, v. 'I (1798) p. 48, t,** A large woody climber reaching ft, high; branches glabreseent \*.\_ thickened in places **and twisted** into spiral hooks. Leaves 4-6 in. longa rhachis pubescent. Leaflets 11-1S, thickly coriaceous, 1-2 by f-J. ii,j (the terminal the largest), oblong or obovatc-oblong, obtuse or sometimes emarginate, **apiculate,** dark green **above,** paler glabrous; petiohiles | in, long, **glabrous,** Flowers in copious and terminal leafless panicles **8—12** in long, with numerous **later;** i \ n branches 1-3 in. long, bearing **dense** corymbose **cymes;** pedicels ver>?^uai. short; bracts at the base of the panicle small, ovate, **subpersistent,** n0

**ise** at the base of tlj# pedicels T\ in. long, oblong, obtuse, **pubescentjyaj** on both sides, ciliolate; **braeteoles** beneath the calyx 2, **oblong-obtuse** vuj e , ;, **in.** long, pubescent on both sides, ciliolate. Calyx | in. long, **densely**

*i*) puberulous; teeth about one-third the length of the tube, the I upper  
1, oblong, obtuse, the lower longer, triangular, subacute. Corolla  $l \sim i$  in.

*P. Q* olue; standard <sup>^in'</sup> k<sup>roac\*</sup>> suborbicular-oblong. Stamens 10, <sup>tiQ</sup>dles of 5 eJi?Eu Pods 2-3 by |-1 in., stalked, liuear-oblong, wispicUou, JV veJnec^ glabrous. Seeds 1-2. FL JB. 1. v. 2, >(m li. Cat. p. 55 ; Dalz. & Gilts, p. 7S ; Benth. in Journ. Linn. "I (l&fiO) Suppi. p. 46; Talb. Trees, Bomb. p. .75; Woodr. in ^mb. Jfiit. v. 11 (1897) p. 426 ; Watt, Diet. Ecou. Prod. v. 3, •.i.i<i wers:j(eb. - Mar. VEBN.J.WI.

)'■''':.■''.'■n c- Gibson; Miitliei-an, J\ !li bills about Nagotna, *Graham*.  
tta hills, Z?<feeW # (r#<m, ■<.-- DISTMB. Imlia generally.  
undecl with I\*. '• -■<«. Benth., but. nifty easily be dis-  
udelhphous stamens. The latter does not appear to be a Bombay  
iUCHafi-o X thus by Dalzell be ing  
• X>alV ' ■■■ Iril'■■(Touril' A5\* SoA '■'■' (1898) p. 445 & p. 449,

**g^!^-** 5(i, PTEROCARPXJS, Linn.  
unarmed trees.' fjeaves alternate, iraparipinnate.  
Leafiets \*  
exstip< Flowers gen eral ty y el to vv} in axi 11 ary and  
mes or pai and brad sinalj, cadueou  
b'ib wbinate, usually curved before expansion : teeth short. Corolla  
j^ers-,| the petals with lo abrous ; standard orbicular or  
ije<<eei^vate : keel-petals inai-tube slit  
>> pi\vc and below or only, the vexillary stamen often nearly  
e^ireo ; anthers versa - Ovai ■ tie or stalked; ovules  
2-6;  
!•loi slightly inpun naall, terminal. Pod orbicular  
ovate, with a broad rigid wing, the point turned down to  
'■'. 9 the baseSor near it. Seed 1 (rarely 2), oblong or subreiu'orm ;  
iort, incurved.—DISTEIB, Cosmopolitan in the Tropics; species

**p<sup>r</sup>uVterocarpus Marsupium,** *Uoxb. Oar. PI \, 2 (1798) p. J>*,  
:" A\* large deciduous tree with a stout crooked stem and widely  
i^./ding branches; bark thick, yollowish-grey, the outer layer corky,  
/■.■s \*i 9 in. long; rbaehis glabrous, prolonged |-1 in. beyond the  
ertion of the upper lateral leafi\* eaflets 5-7, eoriaceous. 2<sup>1</sup>. —1 by  
2 in., obloag, obtuse, rounded, fcr or more or tesa retuse at the  
obtuse s, glabrous on both surfaces, si above)  
jubacute; main  
3 BUinerous, prominent; petioluL in. long. Flowers in  
rt lateral and terminal fusco-pubescent paniculate racemes, usua than  
the leaves; pedicels short, a rticulated be neat b. 11 te flower, long,  
veined, brown-pubescent; teeth very short, broadly jjhguiar, the  
upper the largest. Corolla -] in. long, pale-yellow, crisped  
margins ; standard A in. broad, w ith a long claw. Stair adelphous or  
ingni, the staminal-titbe often finally slit on both sides making i <sup>3</sup> ^iie Ip  
bons. O v ary sh ortl v st a l ked ; orules 2. Pods 1 ■ 2 i o. in u, '  
-rtprly circular, glabrous or nearly so, the wing veined. 1. °^a. B. I.  
v. 2, p. 2^0 : Grali. Cat, p. 56; Dalz. & Gibs. p. 70; h. in Journ.  
Linn. Boe. v. 4 (1860) Suppi. p. 76; Trim. Fl. Ceyl. p. 90; Talb,  
Trees, Bomb. p. 76; Woodr. in Journ. Bomb. Nat. v. |s<sup>1</sup>,(7) p. 42U  
;-Watt, Diet. Ecnn.l^rod. v. 0, part 1, p. 357.—Blowers : .June, V.L;KX.  
BUM.

*Dalzett \$ Gibson, 8tock\$*; Gborabandar, *Kairnc*. QTMEAT: ;Bangs,  
*Gibso7i*; Rajpipla hills, *Graham*. KANAKA : common in ~N.Ks.mm, T>/hot ;f |r  
*Woodrow*,—DISTKIB. India (W. Venmsula and,S. India); Ceylon.



Mid The tree supplies the gum **Kino** of European phai-matt<sup>afBs</sup> Und the timber is hard durable. It makes excellent **sleepero** for mihvay purposes. Prod, I.e.

*Yxn. acuminatus*, Pram, in Journ. As. hoc. Jieng. v. I <sup>^</sup> *yyalliehn* (sp.>, Bomb. Nat.

Leaflets ovate, cuspidately acurairmte ; pods larger. P. , Wight & Arn, Prodr. p, ^67 ; *P. indicus*, Woodr. in Jour v. II (3897) p. 426 («o< of Wffld.).

This is apparently the variety alluded to by Bentham isi<sup>u</sup> Soc. v. 4 (1860) Suppl. p. 77. As Dr. Praia points out ( ? ' ":' **Pterocarpus indie?**, is not indigenous in Peninsular India,<sup>1</sup> KO»KA»: fi^oc^\*I,£mp! DECCAX: Kartriz Ghat near Poona, <sup>Wu^L;^am)^A,</sup> Yeliapur, *Tatbotet Praia* {L c.).—DISTRIB, India (Rnjmahal hills, Bi. |r

57. PONGAMIA, Vent.

A tree. Leaves **imparipinnate**. Leaflets opposite, exs':. ". .\|\^| "blowers in axillary lax racemes; pedicels **2-4-nate** along the ^uhtV bracts very caducous; bract coles minute or 0. Calyx *camf* " | ^\l **nearly truncate; teeth obsolete. Corolla much** < id; *st&nd.*-<sup>TMK</sup> t ^ ^ orbicular; wings **obliquely oblong, slightly adhering** to the ke<sup>lo</sup> use. **the** petals cohering at **the tip**. Stamens anthers stigma winged at the sutures, **mdehiscent**.

Tropical Asia and Australia ; specjes 1.

There is considerable diversity of opinion as to the name which should be b ">"" » I this gftinvs. Adacson (Fain. Fl. p. &22) proposed the name *Tongant* (wbieJ \2 ; Tamil name of the only species) in 1701.5. Lamarck (En<yo. Method, r. 2,\ed \ n\* gave it the natne of *Gakdvpu* in 1786. Eoxburgh (Fl, Ind\* r. IS, p. 2-^)) anulvoi. .

itly Taubert (Engl. & Pruntl, Pflanzenf.) adopted this name. Lamaivk (Id or t. 003) transformed Adanson's name into *Pviiffamia* in 1797, which Ventenat in altered into *Pongamia*.

**1. Pongamia glabra, Fenf. ,/a?\*rf, 3faon.** (1803) p. 28. A tu of y8 P reaching 40-60 ft. high; branches spreading, glabrous; bark sort><sup>le</sup> greyish-green. Leaves 5-9 in, long, pale-green ; petioles 1^-2 in. long f .,, stipules small, oblong, obtuse, caducous. Leaflets opposite, 5-9 (usually ^ ' 5), 2|-5 by 1|-3 in., ovate-oblong or elliptic, acute or (usually) shorc^j^ , , acuminate, glabrous, base acute or rounded; main nerves **6-8** pai,ent<sup>ec!</sup>/\_ prominent beneatb; petiolules | in. long. Flowers in short **axill%ag** <sup>Te</sup> e racemes shorter than the leaves ; pedicels <sup>3-5</sup> <sub>16-16</sub> in. long, in fascicles <sup>u,</sup> <sub>u,</sub> shor 2-4 along a glabrous or puberulous rhachis; bracteoles ovate, acute<sup>3-2i</sup> <sub>10</sub> in. long. Calyx <sup>1</sup> <sub>8</sub> in. long, purplish, brown-pubescent, truncate at<sup>4</sup> <sub>1</sub> obscurely toothed. Corolla <sup>1</sup> <sub>2</sub> in. long, pinkish-white; standard sular



orbicular, **in. broad**, emarginate, **appendiculate** at the base, the **elster**; <sup>1C</sup> ?°j^ very short. Pods 1|-2 by |~1 in., about | in. thick, **oblong or slighver**) \* obovoid, compressed, narrowed at the base and **with** a short **decurv ent**,^ -, mucic'0 at **the** apex, glabrous. Fl. B. I. v. 2, p. 240 ; Grah. Cat. **p. Bk&tiftr jv-Dalz.** & Gibs. p. 77; Wight, **Icon**, t 59; Trim. Fl. **Ceyl, v. 2, p. 91jse** ;10,

<sup>p</sup>  
p. 426; AVatt, Bict. Econ. Prod. v. 6, part 1, p. 322. *Galahipa*  
jp Lamk. Encyc. v. 2 (1786) p. 594 : Koxb. Fl. **Ind.** v. 3, p. 2; i9.~F!o\ve^  
**in**, Apr.-June. **YEBK, Ramnj.**

Talb, Trees, Bomb. p. 76 ; Woodr. **in** Journ. Bomb. Nat. v. 11

>fteu nl; 'soft

ra in i lie Ron

ex G)

■:m oot tar from felic

KONKAJT: widely planted, '■', along the valley of the Koina river,

DBCCAS: near ri "Jooke I; Mahableshtar (banks of

the

ear the coast); throughout Tropical Asia and (be Seychelles. > yield an oil which is employed us a remedy in Bkin-diseases. Hee Watt,

58. DERRIS, Lour.

Cufflbing shrubs (rarely erect trees). Leaves alternate, impari-^nnate. Leaflets opposite, usually exstipellate. Flowers copious, ;■ ■) ni axillary or terminal racemes or panicles; pedicels usually \*eieled along the rhachis ; bracts small, caducous ; bracteoles ovate or ■ 4il e ular, usual [y s i u all an d cad uco us. C&ly £ i n flower usually eyat h i-«t\*i, truncate or obscurely toothed. Corolla much exerted ; standard in ■;' \*\*fte\* °^use) its petals slightly cohering. Stamens usually Upelphous ; anthers versatile. Ovary sessile ; ovules few; styl^r ■d, filiform; stigma capitate. Pod rigid, thin, flat, iudehiseen\*;, ■ly orbicular, oblong or elongate, distinctly winged down ih ' or both sutures.—DISK&IB. Tropics generally : chiefly in Ti'^^ical species about 40.

I^Eder same €or this genua is Degudio which was girea to it iu 1775 (Aubl.Pl. ie... :1 [177.\*] p. 750, t. 300). This name has been ffiloptod by Taubert in Eagl. &" jaPPnauzeutaimlien. Tbe name Dems datea from L790 and was given to the My Loureiro (Fl. Coehinch. v. Li [17W] p. ili--.

- ■ : tree ..... ■ ..... 1- *B.raibusta*.
- ij ' ng shrubs, nena monadelphous. i.'od winged, down the upjjer atn Lire only. Pud not exceeding \ in. broad ..... 2, *D*,
- iVv exceeding A in. broad. without callosities at the base of the limb .. V>. D< *tdiginosa*.
- 'Standard with 2 callosities at (he base ot\* (he limb ... Pod winged down both sutures. 4. *D. obhnga*.
- Standard without callosities at the base of the limb. 6. *D. Heyneana*.
- Pod glabrous, polished..... (J. *D. breoipes*.
- Pod persistently brown-si Iky ..... 7. *D. canarensis*.
- Standard with 2 callosities at the base of the limb ..... 8. *D.-platypf*.
- Stamens diadelphous .....

Derris robusta Benih. in Jburh. Linn. Soe. v. 4 (1860) Suppl 104. An erect tree 30-40 ft. high; young parts more or less S^besencfcj older branches glabrous, striate. Leaves o-O in. long j %achis deeply channelled; petioles }\_r-\ in. long. Leaflets 9-21; : posite, 1-1.7 by ', in. (the pair at the base o! the leaf the smallest), iptk-oblong or oblong-lanceolate, apiculate, glabrous above, pale and >re or less pubescent beneath, closely reticulately veined, base acute or .'■';'unded; petiolules ^p| in. long. Flowers in elongate simple racemes if ■luilly shorter than or equalling (rarely longer than) the leaves; , filiform, unequal, fascicled along a more or less pubescent ^ achis; bracteoles beneath the calyx minute, oblong, obtuse. Calyx rr-X. in. long; teeth minute, deltoid. Corolla £ in. long; standard-i-Tm. broad^; wings not ciliate above the claw. Stamens mona-fphcras. Ovary pubescent. Pods :|n\ in. broad, when 1-seeded li-in. long, when more-seeded up to 3 in. long, tapering at both ends,

**sfrap-shaped, narrowly winged** on the upper suture, **fuscous-pube**  
 Seeds 1-8. 'in. **B. L. v. %** p. 241: **Talb. Trees, Bomb. p. 76; Wa**  
**Diet, Econ. Prod. v. 3, p. 81. BracJi Date. & C.:**  
**Bo. Fh p. 77. Dalbergm robmta, Koxb. Hort. .Bong, p. 53; Wight,**  
**Icon, t. 244\***

Bare. KOSKAS

U\

**2. Derris scandens, Heath, in, J'&tifh\* Linn. Soc. v. -1 (1860) SuppL**  
**p. L03. A. verv large climber often reaching- 100 ft. in length ; stems**  
**smoothj dark-purple; young parts pubescent. Leaves 3-b' in.**  
 long; rhachis deeply channelled, **glabrous; stipules small,**  
**caducous.**

Leaflets opposite, 9-19, rigidly **subcoriaceous, 1|~2** by | **in. (the lowest ,**  
 pair **the smallest), elliptic-oblong or obovate-oblong, subacute or vejp©,**  
 shortly acuminate, often slightly **emarginate,** glabrous and **shining** a.fed or  
 more or less pubescent **beneath,** reticulate!}- veined, base roim&incled  
 subacute; petiolules | in. long. **FlowersTiumerous, in sbort-pe^ls o\$**  
 axillary **racemes 10-18 in. long, arranged in f&seielea from the no\* ing at**  
 pub-Tulous **rhachis, the flowers from the same node expan\* ;th**  
**the**

different times; pedicels filiform, *j--1* in, long; bracteoles **bene.fthinly**  
 calyx 2<sub>y</sub> orbicular, ^ in. Josig, ciliolate. Calyx in. lon^, ^ pink;  
 givy-silky; teeth obscure. Corolla | in. long, white or **pale\***

; 'd:ml :- in. broad, the daw long; wings cilia to at the base\* Pods  
 a long slender claw. Stiimefis monadelphous. Ovary **pubeso** uly  
**1-3** by %-/j in., tapering to both *emh*, pointed, **straight, na(evi**  
**winged on the upper suture, ilnely appressedly p** soa^i. **PI.**  
 turgid opposite the seeds. Seeds 1-4, FI. B. 1, v. 2, p. 240 ;  
 Tr&otnh. Ceyl. v. 2, p. 91 ; Talb. **Trees, Bomb. p. 70; "Woodr. m**  
 Journ. .1 /

■. v. 11 (1897) p. 426; Watt, Diet. Econ. Prod, v. 3, p. 81. *M!/~*  
*is, lioxb. Cor. Pl. v, 2, t. 192; Grab. Cat. p. 55. Biyalz.*

*pterwn scandms, Beittb. in Ann. Wien, Mus, v, 2 (]*

& Gibs. p. 70.—**Flo .Tune-Aug. VERN. Moia-sinli.**

ONKAS: //■ . ocksU *Copt. Qehutiu* !; Waaeind, (  
 .val districts, *Qrakam. KASAS\:* Karwar, W ; N. Kiinara. from the  
 ■■■ iast inland, nowhere common, *T--?b:d.*—DISTKEB. **India(Beagal,CIndia,Oln ttagon^**  
**Birma, W, Peninsula) ; Ceylon, S.B. Asia to N. Australin.**

∴. **Derris uliginosa, Benth. in I'!, Jmvgh. (1851-55) p. 232.**  
 large climber; **branches'glabrous; hark dark-grey, covered**  
**witj**

**d** lenticels." Leaves 5-8 in. longj rhachis **striate,**  
 glabrou **Leaflets 3-7** (usually 5), 2-^-1 by i ■'. 2 in, (the terminal the  
**large\*^** sub coriaceous, ovate or **ovate-oblong,** acute or acuminate,

slightly emarginate, glabrous on both surfaces, highly polished on f3-  
 upper, minutely reticulately veined, base rounded or cordate; petioluPeite t  
 in long. Flowers in axillary racemes 3-6 in long, the nodes forower  
 rbachis produced into short stalks about ~\ in. long, each **be&vi** 2i sub

l or bl ld d i l ^ l b 51 feet  
 minute, ovate-oblong, subacute. Calyx 1/10 in. long, glabrous or nearolerted  
 so with truncate or obscurel toothed ciliolate mar in. Corolla 1/5 in th

souietiu, /

,  
0/

y

g

f\*

. long, rose-colored , **Standard** | in, broad (broader than **long**), **venifcii**<sup>ua</sup> < ^  
**narginate, without callosities** at the **base**. **Stamens monadelphous**<sup>110</sup>  
 Ovary pubescent. Pods 1~1 | hi. long, variable *in* shape, 8  
 orbicular and as broad as long^ or oblong and about | as broad as  
 thick. **flat**, reticulate **veined** " tly **apiculate**, narrow

found on the upper suture, pale-yellow when ripe. Seed 1, reniform, compressed. Fl. B. I. v. 2, p. 241; Dalz. & Walp. Bot. Schreb. p. 77; Benth. in *Fl. Borac.* p. 107; *Linn. Soc.* v. 4 (1800) Suppl. p. 107; **Trim**; *FL Ceyl.* v. 2. p. 92; *latb. Trees, Bomb.* p. 70; *Woodr. in J*

p. 70; *Woodr. in Journ. Bomb. Nat.* v. 11 (*lbi*)7) »• 420. *Pongamia uliginosa*, DC. *Prodr.* y. 2, p. 416; *Grab. Cat.* p. 55; *ulfinosa*, Eoxb. *Horr. Beng.* p. 53; *Fl. Lid.* v. 3, p. 243.— flowers: Feb.-Mar. **VJBIX. Kajawel,**

**Maloung :** iisj and on the edge of muddy saltwater creeks. **KOXKA\* :** *ell*; *tii*. **!** the Ferge of )ngh-water muck. *Graham*; east **tt'a** tongue, **SaUette**, *Graham*; Muiubru (**Tamia districts**), **Saojii-^-DrststB.** 'ttldy sea-coasts and creeks of the W. Peninsula): Ceylon, China, N. Australia, **Ptfneaia**, Madagascar, **ZanibesUland.**

**1- Derris oblonga**, *Benih. mJoum. Linn. Soc.* v. 4 (1860) *Suppl.* I<sup>1</sup>- Ij2. A woody climber: growing parts puberulous; bark dark-grey, ;, **mentieeliate.** Leaves 4-8 in, long; rachis olabious, striate; petioles/

, ovate, acute, densely pubescent  
 petioles long; stipules in. long  
 9-15, subcoriaceous } 2: by -| in.,  
 oblong-lanceolate (the filial often oblanceolate), subobtusely,  
 often emarginate lobed on the surfaces, glabrous beneath, base acute ;  
 petioles 1/2 in. long. Flowers in short lax racemes 3- 1 in. long, the  
*v.o.l.*:> prolonged into stalks, each bearing 2—3 filiform pubescent  
 pedicels as long as or shorter than the stalks ; bracts minute, ovate,  
 acute, pubescent; 2, a little below the base of the calyx, minute,  
 ovate-oblong-  
 lobes 2, a little below the base of the calyx, minute, glabrous,  
 silky-hairy. Calyx 1/2 in. long, silky-pubescent; teeth  
 triangular, the upper often wanting.  
 Corolla 1/2 in. long, white  
 with 2 call **Pd** with pink, or entirely plain pink;  
 standard 1/2 in. broad, oblong,

at the base. Stamens monadelphous.

pubescent. Pods 1-2 by 1/2, oblong, compressed, with a  
 pointed point, narrowed at the base, winged on the upper suture,  
 glabrous. Seed 1. *FL B. I.* v. 2, p. 242;  
*Talb.* , *Bomb.* p. 70; *Woodr. in Journ. Bomb. Nat.* v. 11 (1897) p. 420.  
**EL>are plant** **KOSHAS: Stocks I**

**o. Derris Heyneana**, *Benih. Pl. Jungh.* (1851-55) p. 252 (in *fadnot.*). A woody climber ; branches glabrous. Leaves 5-8 in. long; rachis glabrous, striate; petioles 1-2 in. long. Leaflets 5-7, subcoriaceous, by 1-2, elliptic-oblong or obovate-oblong, usually acuminate, reticulate-veined, glabrous, base rounded or [acute ; main nerves 6-8 pairs ; petioles 1/2 in. long. Flowers in upright panicles 6-15 in. long, arranged in alternate rather distant whorls of 3-10 flowers, along the rachis and its branches; pedicels slender,

rufous-pubescent, usually longer than the radius; bracteole 2 on the pedicel a little below the calyx, a little ornate, 1/2 in. long, ovate-oblong, subacute. Calyx 1/2 in. long, clothed with reddish-brown pubescence, the mouth ciliate; teeth obscure, \* If rolled in. long, pale pink; standard 1/2 in. broad, suborbicular, acute, without callosities at the base. Stamens monadelphous.

woolly silk; ovules usually 4. Pods 2-4 by 1-1 1/2 in. (including the stalk), reticulately veined (when 1-seeded or empty, or when

3-seeded (strapped), glabrous and polished, winged on both sutures, wing of the upper suture 1/2-3/4, that of the lower 1 in. broad.

'''), I, v. 2, p. 244; Dah. & Gibs.-p, 77; Benth. in Journ. Xinn, *Hoc.*

v. 4 (1860) *bup*! p. 110; 'i'ulb. Trees, **Bomb.** p. 77 ; Wuodr. **iu Journ. Bomb. Nat.** v. 11 (1897) p. 420.—Flowers : Bee.-Mar.

KOSKAN" : *Stoo&s I, Law I, IV-* KANAKA: moist forests of X. ivmunu *Taibt Akshi Ghat, Talbot, 1223 !*—DISTRIB, I n - Peninsula),

**H Derris brevipes**, *Baker, in Hook, f. Fl B. / . ty. 2* (1878)

p. 244. A clhttber; branches glabrous, **lenticellate**. Leaves 6-8 in. long ; rhaehis glabrous ; petioles **1-2** in. long. **Leaflets** 5-7, mod **firm**, 2 3 } by |~1| iu., elliptic-oblong or oblong-lanceolate (the **terminal** sometimes obovate-oblong), **subacute** or bluntly **aeamioate**, quite glabrous on both **surfaces**, the upper surface **Shining**; petiohiles ~~~y\$ iu. long. **Flowers** in copious **f&stigate axillary and terminal** panicles, in short: fe w- **So** we r ed racemes along a de **nsely rufou\*-p ubescen t rhachis**; **pedicels usually shorter** than the calyx, densely rafous-pubeseeni ; \bracteoles 2, close beneath the calyx, mi mite, broadly ovate or **sub-**(Wbieulur, obtuse, **hairy**. Calyx jtf~ in. long, **deusely silky with mi be ; fceeth very short, broadly**

**pu escenc** y y g  
**standard** \ **in. broad**, obovate-oblong, emarginate. without **cal** 5 at base. **Stamens** mouadelphous. Ovary silky, **Pod**a broad, oblong, 1-seeded, 1^1| by 1 in., persistently brown-si Iky, with a **oarrW** winj down the upper and u very obscure one down the lower suture (*Baker*), Talb, Trees, **Bomb.** p. 76. *Berrh Heyneana*, var. *bi-epipes*, **Benth, in Journ- Linn. Soe.** v. 4 (1860) **Suppl. p.** **HO.—Flowers:** Feb.

The **description of the pod h that gtvea** by **Mr. Baker in Fi, B. t.** 1. e. I have **not seen** **rait.** There i<sup>1</sup>^ **no** fruiting specimen triangular. **Corolla X in. Ion**

\ **in. broad**, obovate-oblong, emarginate without **cal** 5 at

KOSKAS: / ligher Qtatts ■ \s\n\ : on I  
toy of Dui\*aing **ti.K'** bi Gl F 1  
D B . India(M)

**7. Derris canarensis**, *BuJcer, in f. FL B. I. v. 2 (1^78)* [**>**. 246. A **scandent** shrub. **Leaves** nearly 1 ft. long; **rhachis**

channelled; **stipule** iovate, broad, clothed with ferruginous ha\*r<. Leaflets 15-21, oblong-laneeolate, 2-2| by \ in\_M glabrous above, sfrigo **beneath**; **pettolulea** short. Flowers in terminal **rusty-tomento** racemes shorter than **the** leaves, the nodes oi: the 'rhaehis prolong into short stalks, each bearing 3 pedicels of equal length with th<

^ks. Calyx **bibracteolate**, wide, **cup-shaped**, with a ring of hi inside the mouth. Corolla pink ; standard with 2 callosities at base **Which** run down the **short claw**. Stamens monadelphious. '> hirsute: **ovules** 2--:\*. **Pods** 1 I| in. longt **flat, elliptic, pointed** both ends and winged on both sides. Talb. Trees, **Bomb.** p. Woodr. in Journ. **Bomb. Nat.** v. 11 (1897) p. 42G. *Pmigamia mnaretL* ( l)alz, ID Hook. Kew **3ourn.** v. 2 (1850) p. !i7. *Bmchypferum canan-^.*^ Baiz. & Gibs. Bo, **Fl.** p. 76.—Flowers ; Apr.-May. 'm^

The above description has been taken from thoea by DaWH & G^i^Let in the works cited. !<[

A rare plant. KASAUA : **Gteirsojjpa** Falls, *DalseU # Gibson*; along the **Gbf** <sup>ltd</sup> A". Kanara from the Ainsbi Ghat to the Mysore frontier in moist **ibreata**, lode, 01 common, *Talhot*. \ **the**

There are no **specimens** of this **plant** in Herb, Kew. **nor** have I seen any. <sup>-^^1)</sup>  
description by Mr. Baker in Fl. B. I. was, as well as mine, **taken** from **DaizOii**  
published ones. Dr. Prain says (Jour. M. Soc. Beng. v. (50 [1898] p. 462) that <sup>au\*</sup>  
it is not authentic species. *n c&nareuse, iDafeellj*



specimen of Stocks referred by Beutliam (Journ. Linn. Soc. T. 4 [1860]  
 p\* 113) to *Derris oblonga*. It is not improbable, therefore, that this species which is the older of the two

**S Derris platyptera, Baher, in Tool;/. FIB. I. v. 2 (1878)**  
 14 \* **robust climber**; branches glabrous, **lenticellate**.

Leaves 8-4 in. long; **rhachis** glabrous, **striate**, **Leaflets 5-if**,  
**subcoriaceous, li-i in.**, oblong or **oblong-lanceolate**, **subacute or**  
 obtusely reticulately veined, **glabrous**, base subacute or rounded  
 ; nerves 5-8 pairs; **petiolules** 4- in. long. Flowers in

thyrsoid axillary and terminal panicles reaching 12 in. long, with  
 numerous ascending silky branches; pedicels  $\frac{1}{8}$ - $\frac{1}{4}$  in. long, silky-hairy,  
 closely arranged, but not fasciated, usually in opposite pairs along the  
 branches of the panicle; bracts at the base of the pedicels  $\frac{1}{10}$  in. long,  
 broad

**copious**

**ovate**, hairy, falling before the opening of the **flower**; bracteoles  
**y appressed** to the base of the calyx, minute, not **exceeding** in,  
**broadly ovate, acute, dilate**. Calyx  $\frac{1}{2}$ - $\frac{1}{3}$  in. long, **silky**;  
 tube  $\frac{1}{2}$  in.

or very short and broadly **deltoid**. **n in. long; standi**  
 3 in\* **broad**, without callosities at the base, the claw **shoyfe Stanu**

**y p**  
 $\frac{1}{2}$ -11 in., oblong, acute at both end's, thin, **flat, glabrous**,  
**veined**, not **sinuate** between the seeds, **distinctly winged**  
**sutures**. *Derris thyrsiflora*, Talb. Trees, Bomb. |>. 77 (MO/ of  
*D. WallieMi*, Pram, in Journ. As. Sue. Efeng. v. 66 (1891)

**owers : Dec.**

3 **ovules** free. **0 vary pubesceni ; ovules 4.**

2-4 [y 1 ^ 1 1 i bi bh d' i fl

**lb**

**P. SQj-**

**frj Baker (? c.) places this plant in the section with monadelphous**  
**branches**, but these are **unmistakably diadelphous**. The distinct **pedicels**  
 and short bracts place it under *D. Wallichii*, Pram, but the

**name**

*platyptera* has the claim of priority.

re plant. ant. KANAKA: on the Gili;Us, *Talhoi* Gairsoppa Giki  
 ia (Silhet, Khosia, Aeatn, Aiidamaas, W. Peninsula).

268!

## 59, SOPHORA, Linn.

Trees or shrubs (rarely perennial herbs). Leaves

**iniparipinnate. eta usnally exstipellate.** Flowers showy, in  
**terminal**

**panicles**; bracts and **bracteoles** minute ov  
**0. jrolia much exseited**; standard **broadly obovate**  
 longer than the **keel**; **vings oblong, oblique**;  
 straight, the petals cohering. **Stamens**  
**free** Hxnnato at the base into a ring; **anthers**

**racemes or**  
**Calyx-teel h**  
**short, r**  
**orbicular,**  
**usually**  
**keel oblong,**  
**obtuse,**

rarely sub-Ovary **shortly bigma**  
minute, terminal. Pod  
g ovules many; style i, woody or membranous,  
**terete or slightly compressed, usually f'.ebiscent; joints turgid.**  
Seeds **obovoid** or globose, **estrophiolate.**

■DISTBIB. Tli rough out the warmer regions of the globe ;  
spec Lit 22.

### Sophora

t, Baker, in *Hook. f. Fl. 11 l. v. 2* (1878)  
(250. A sh rub; you Qg bran ebea clothed With pers is r en t v  
elvety-pubesceence. leaves **6-8 in. long; rhachis**  
**brown-pubescent;**

i |- in. long, rigid, subulate. Leaflets **11-15**, alternate,  
**sub-■'mceous**, 1^—3 by |-| in. (those near tiie base of the rhachis  
the Waller), **lanceolate, acuminate**, green and glabrous  
above, softly

pubescent and **glaucous beneath**, reticylately **veined**; **main nerves amerous**, fine, branched towards the **apex**, the midrib prominent, **fulvous-hairy**; **petiolules f<sup>1</sup>? ni- 1<sup>o</sup>13** & **lowers in leaf-opposed racem** about *ffr*\$ long as the leaves; pedicels ^-| in, long, slender,, brown-pubescent; bracts j- in, long, subulate. Calyx | -^ in. **long, brown-velvety**; **mouth oblique**, truncate or obscurely **toothed**, **Corolla \$ In**, long, **yellowj standard** ;{ **in**. broad, narrowly **oblong**. **Pods stalked, 3-4 in. long**, indehiscent, deeply constrict oil **between the seed?**; **and with a long point at the apex, glabrous** : joints **ellipsoid-oblong**, veined on the faces. Seeds bright-red, **shining**, **Talb. Trees, Bomb. p. 77. 8. heptaghyTfa**, Wight, Icon. t. 1M)5 (not of Linn.); **Dab. &Gribs. p. 79,**

Rare. KOKKASJ S. M. OOCKTRY: near BelgautSj ; hills E. of BelgauIQ, Dateclll— . India (hills of \V\ Peninsula and 53

*Sophora tommtosa*, Linn., is often **grown as an ornamental shrub** in :-den\$ throughout **the Pre** Leaflets 15-17, **alternate or** a **opposite, broadly elliptic**. Corolla nearly 1 low. Pods 3-6 in. long, clothed **with grey velvety down**. 8 8-jointed. Ft. **B. X v, 2, p. 249 ; Grab. Cat. p, I i- ; Dalz. & Q-ibs, Suppl..p. 20 j Woodr.** In Jonrn. Bomb. "\a,f. v, 11 (1807) p. 420.

**The following pon-jndigenous plants**, not belonging to any of the foregoi ng gen e ra of the **B u bprde r**, a re cul ti vated (o ft em y) throig bout the **Bombay Presidency**:—

*Amchjs h* <sup>F</sup>, Linn.; Fl. B. I. v. 2, p. 161. *The Ground-nut* or s-mtf. A native of 8. America, largely **cultivated** throughout India. Vt'ter the flowers **wither, the poel reed underground by the plant** and **ripens** beneath the soil: hence **its specific name**. The parched ;ire eaten and furnish a ^ery **valuable oil** resembling olive-oil.; for which **it is used as a substitute**. **I.<sup>1</sup> he pods are exported to Eurojn in considerable quantities.** See Watt, Diet. Econ. Prod. v. 1, p.

*mm otiHats*, Spreng.; FJ. B. L v, 2, p. 217, *The Pigeon* or\* *i*, known also as *Dhdt*. This pulse is **very largely grown**; : i n d co n sumed th rough out India, Tb e re a re 2 varieties, one ( *C.jltw* with the **standard wholly \* yellow** and tie other c in |||i\ it is **Reined with red**. Its native country is **uncertain**, DeCandollj eohsiders it to be a native of 1'rop tiea. The stalks arc *used ft ?*, making- charcoal forgunp< Watt. Diet. Econ. Prod. v. ; i\_s

*deer* am, Iann. ; Fl. B. i. v. 'J. p. 170. : hit- Widely cultivated thro I India, whereitis, inmost i Province\* food of horses. The parch) i<sup>1</sup>. poorer natives. It should not be confounded with the horse-gri of Madras, which is the seed of *Dolich&s bijtmrm*. An acid h'qui<sup>^JC</sup> (1 by collecti ng the d e w £torn th - ■ ■ ' W^att, Uict. Beoi .Prod. v. 2, p. 274), The native country of the plant is uncertain. T' ■ t ins probable that it e in the south-east of ell, fn Europe.-oat bt '^

*^ lens escuhnta*, **Mo3nch.**; *Erwwm Lens*, Linn. *The lentil*, widely cultivated throughout India, but not very largely in the Bombay Presidency, <sup>M ere</sup> <sup>'\*</sup>; would not perhaps occupy in all 20,000 acres. Its **native** <sup>OtW11'V S ullcerta\*n-</sup> DeCaudolle says that it appears to have existed <sup>J1 xt</sup> <sup>^einPerate</sup> Asia, Greece, and Italy from early prehistoric times. <sup>°ee</sup> Watt, Diet. Econ. Prod. v. 4, p. 621.—*VERTS. Masur.*

*Fachyrhizus angidatus*, **Rich.**; Fl. B. I. v. 2, p. 207. *The Yam bean.*

ccasionally, though **not commonly**, grown in gat for its tuberous root which is eaten boiled. It is not **known in** a wild state, but is **cultivated** more or Jess widelv throughout the Tropics. See Watt, Diet. Prod. v. 6, part 1, p. 1.

*Psophocarpus tetragonolobus*, DC; FL <sup>. L v. 2, p. 211;</sup> I Jjara. in Iud. ed. 5, p. 207. *The* **Wbodr.** *tie /rise bean.*  
*Chevaux*  
wi <sup>W1^ S1 uare poc\*3 6~° "'• 'on g></sup> **with nitteh** crisped aud **toothed** <sup>^'J?S</sup> on the angles. The young fruit is sliced and boiled as a vegetable. <sup>v^K.</sup> *Chaudhdri*; **Ghevda.**

-*Pjsum salivum*, Linn.; Fl. B. I. V. 2, p. 181; Woodr. Gard. in Iud. <sup>^ j</sup> p> P- 263. *The cultivated pea.* The white round-seeded variety is <sup>"^Vated,</sup> but not largely, in Bombay as a field-crop. The garden J^'ietie^ are grown, as a rule, only in tin; gardens of Europeans. In <sup>he</sup> Decipan, if sown after the first rain has **fallen**, they produce excellent fops oV well-flavored peas. The native country of the cultivated **pea** <sup>H UncefVtain,</sup> but the species seems to have existed in W. Asia before it cultivated. See Watt, Diet. Econ. Prod. v. 6, part 1, p. 277. EJT.w. *Ma (dr.*

*ktAm arvense*, Linn.; Fl. B. I. v. 2, p. 1S1. *The grey or jield-pea.* <sup>i\* <ls</sup> also grown as a cold-weather field-crop, and the small marbled used by the natives in the same way as *Dhdl.* See Watt, Diet. <sup>T/i</sup> Prod. v. 6, part 1, p. 276.

## i SUBOEDEH II. CMS ALPINES.

Trees or shrubs, rarely herbs. Leaves 1-2-pinnate, simple or 3-iolate, usually stipulate. Leaflets usually many; stipels 0, or very <sup>•ely</sup> present and **very** minute. Flowers various in size and color, **tegular** (rarely **regular**), **usually hermaphrodite**, racemose, rarely >ose, very rarely spicate, the racemes axillary, lateral, or paniced at apices of the branches. Calyx usually '-), sometimes 4-merous from fusion of the 2 upper lobes, divided to the summit of the disk that ;s the short or long ca!yx-tube, very rarely (some *Baukinias*) gamo-nv'aloua; sepals imbricate, rarely valvate. Petals usually 5 (rarely I er or 0), the upper innermost in bud, the others variously **imbrica** a,,iicns 10 or fewer (very rarely oo); filaments usually **free**, **rarely** wurent, more or less unequal; anthers various. **Ovary** free or sup-(l on a stalk which is more or less adnate to the disk-bearing I ■"-> tube. Pod dehiscent or indehiscent, **somedmes** divided by many **Uusverse** septa. Seeds various; albumen copious, scanty, or 0; licle straight or slightly oblique, hidden between the cotyledons or v exerted.

**LEGIOS 2-piniwte.**

Flowers in raceraea or panicles.

Sepals imbricate.

- Pod not winged (except slightly In ('. *sepiaria*) ..... GO. CjBSAtrimA,
- Pod broadly winged along the upper suture ..... 61, MBZONKURUJJ.

Sepals vulvate.

- Pod thin, flat ..... 62. ParscMKA.
- Pod turgid, moniliform ..... C, S, PASRIHSOHA.

FJoweK in elongate spitea ..... (>4. WAGATSK. /

Leaves simply pinnate (sometimes 2-ibiolate in *Cynomeira*),

Corolla with 5 perfect petals.

- Pod Hasny-seeded; seeds albuminous ..... 05. CASSIA.
- Pod 1-seerfed ; seeds exalbumimnia ..... (JO. OTSOMBTKA.

Petals 0.

- Calyx-tube short; ovary sessile 2-ovnkte ..... fi7, HARDWICKIA.\* <-i
- Calyx-tube elongate; ovary stalfeed, oo-orulfte.; ..... (>8. SARACA.

\*v. I \*j, Lc.ives 1- (rarely by fission 2-) foliolate ; seeds more than 3, albu- minoua..... (J. TAMABisnca. ■\*

(fomefr icATes 2 (or more)-foliolate; seed 1, exalbuianous..... fifk CTMOMBTKA.

**Pods**

**60. CiESALPINIA, Linn.**

Trees or climbing shrubs, unarmed or armed. Leaves large, s^-i;pt!y-pinnate; stipules various. Flowers yellow or red, in axillary o. minal racemes or panicles. Calyx deeply cleft, with the dials confin<j]j(C Jo its jb<<se ; segments 5, imbricate, the lowest concave or boat-shaped<<3a\*Sr^etals distinctly clawed, orbicular (rarely oblong), spreading, imbric; 3, sub-equal or the uppermost (the inner) smaller than the others. **Stamens 10**, free, **decimate**; filaments often viilous or glandular at thb base; rmthers uniform, **dehiscing** longitudinally. Ovary sessile or **SBBsessile** ; **ovules few**; style **filiform**, sometimes **clavate at the a:^x**; stigma **terminal**. Pod oblong or ligulato, flat or turgid, imj<j' \*%ot or dehiscent, smooth or prickly.—Disxruu. Tropics of bot^ ^^uspheres ; s-.ficies about 40.

P(J(1 armed on (ho face with wiry prictlea ..... ] C. Bond; ylfa.

Pori not. armsd with pvicfc

fjeafleta 2-3 pairs ..... 2. O. Nuga.

Lpafiets 8-20 pairs.

A small tree ..... 3. C. 8<rpp>

A climbing shrub ..... 4. (..'. *sepiario*.

in 1 2-Beeded ..... T>. C. tiiii

**1. Caesalpinia Bonducella, Flming, in Asiat. Res. v. 11 (it p. 159,**

An extensive climber; branches **finely grey-downy, armed** \ liooked and **straight** liard yellow prickles. Leaves 1-2 ft. long; pet| prickly; stipules a pair of reduced pinna? at the base of the leaf \*r t furnished with a long mucronate point; pinna? (>~S pairs, 2-3 in. l^ei with a pair of hooked stipulary spines at the base- Leaflets 0-9 p/-ub |->3| by ^-5 in., membranous, elliptic-oblong, obtuse, **strongly mii]^**^ nate, glabrous above, more or less puberulous beneath; peliofules K\_n^ short; **stipels** of short hooked spines. **Flowars in deuse** (asd^j^1^ ' **spicate**) long-[iedunclcd terminal and supra-axillary racemes **densrf]^01** the top, lax **downwards**, 6-10 in. long; pedicels very short in IpM elongating to I in. in flower and ^ in. in fruit, brown-downy ; **bri** n^a) **squarrose**, linear, **acnte**, reaching ■ in. long, **fulvous-hairy**. **CalyJ** [H.j

efor



v°

ccoWo<sup>>ngt</sup>ii \*vous~\*ra3l>y; **^obe3 obovate-oblong**, obtuse. Petals oblan-\*°Of u'rV<sup>-tilame</sup>^ts deelineate, flattened at the base, clothed with **densely j** J hairs< Pot]s **shortly** stalked, oblong, **2-3 by If in.**, lead col<sup>I ned</sup> on the faces with **wiry** prickles. Seeds 1-2, oblong, **id, 2**, ' P Jn- Iong' Fi- B- L v- '2> P- 254 ' Talb- Trees> Bomb- **Watt' ft'' f J Wood\***, in Journ. Bomb. Nat v. 11 (1898) p. 426; PJ QA \ ■ **J&on. Prod. v. 2, p. 3. Guilandina Boudwdla**, Linn. Sp. (in DaLf'P\*<sup>545</sup>- **Guilandina Bonduc**, Wight & Arn. Prodr. p. 280 Sept. Vp h- Cafc\* **P'** 60; Dak- & Gibs" **P- 79.**—**Flowers:** July-

\* ■ <sup>0Wn</sup> as **F&w-mttts** or **Pkfisic-nnU**, have a repute in native tome. See Watt, Diet. **Eoon^Prod. i! o.** medicine

rt. Km. ed. 2, v. 3 (1811) p. 32.

**Prickl H'r^A^8 ' P'nnae 3-4 pairs**, 2-3 in. long, with n pair of **hooked' i-l\*** <sup>Λ \*Λe Λase oΛ e:u'Λ-</sup> **Leaflets 2-3** (often 3) pairs, 1-2 by fL<sup>ni</sup>-s OpAate or elliptic, subaoute, glabrous and shining above, **dull ^Kj\*** base rounded or **sometimes** more or" less **cuneate**; petioles (!(>)<sup>Oil</sup>ii?. Flowers in **long-peduncled** terminal **racemes** 10-15 in. long; <sup>r'''s/.</sup>■]- in. long, elongating to ^ in. in fruit, **articulated** above the i i.xslender, glabrous. Calyx |—| in. long, leathery, glabrous. ! in. aci'oss, yellow, **fragrant**. **StameDS** deelineate; filaments i the base. Pods 2-2| by **1| in.**, **obliquely** oblong-ellipsoid, **narrowed** at the base **into** a short stalk, **compressed**, glabrous, Igose. Seed 1, black, 1 by 3| in., rotund-ovoid, smooth. **Fl.'B.L "5**; Trim. PL **Ceyl. v. 2, p. 99**; Talb. Trees, Bomb. ed. 2, 41; Woodr. in Journ. Bomb. Kat. v. 11 (1898) p. 428 j AVatt, , Ecou. Prod. v. 2. **p. 10.** *Ccfsalpinia* •**paniculata**; **Ioib.** Hort. ng. (1814) p. 82; Grab. Cut. p. 60; I)alz. & Gibs. p. 70; AVight, **D. t. 36.**—**Flowers:** Jan.

**klittoral** species found on the banks of rivers **near the const Kansw:** pretty ■, *Dalzell \$ Gibson*; **Batnagiri, Wbodrow**; banks of the **Ssmiri** between aon and Mnufr, *Graham.*—**DISTBIB.** India (Ohittagong, Stlhet, E. & W. I'enin-l; Ceylon, Malaya, Philippines, CJIina, N. **Australia, Polynesia.**

**j' Csesalpinia Sappan, Linn. Sp. PI.** (1703) p. 3S1. A tree >.M0 ft. high; stem prickly, 6-10 in. in di»in.; branches **ruiotis-fiscenfc**, armed with a few small prickles. Leaves 8-15 in. long; B **8-12** pairs, 4-6 in. long, **sessile**, with small prickles at the t. Leaflets 10-18 pairs. i-| by f| in., sessile, close, oblong, **ltded** at the apex, attached at the lowest **corner**, very **inequilateral**

upper side much the largest), glabrous above, more or less pube- beneath. Flowers in panicles, which are terminal and in the of the upper leaves, 12-16 in. long; pedicels ½-⅝ in. long; bracts

**blate**, 3 in. long, caducous. Calyx T^- in. long, leathery, glabrous. **la 1 in. across i petals** orbicular, **subeoyal, yellow**, the upper with

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Coroll  
woolly  
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a red spot at the base. Stamens declinate, waxy-white; filaments densely woolly at the base. Ovary grey-velvety- Pods 8-4 by 1-2 in., woody, obliquely oblong, subcompressed, polished, indehiscent, with a lard recurved short beak at the upper angle of the obtuse apex. Seeds 3-4. EL B. I. v. 2, p. 255 ; Grab. Cat. p. 60 ; Bedd. For. Man. in Flor. Sylvat. p. xc, t 13, fig. 1; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 426; Watt, Diet. Econ. Prod. v. 2, p. 10.—Flowers: Sept.-Oct. VEEN. *Patang*.

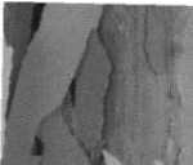
A doubtful native in the Bombay Presidency ; often planted in **gardens in Bombay** and the Deccan. **DECCAN : Poona** (planted), **Wacoarato; Kolhapur** (cultivated), **Ritchie, 1680 !...Digram, India** (R & W. Peninsulas, **Pegu**); Malaya.

The wood yields a valuable red dye which is largely exported and which is used in **Pegu** for dyeing silk, and in **Madras** for dyeing **straw-plait for hat-making**. See **Watt**, Diet. Econ. Prod. 1. o.

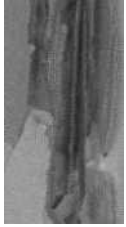
4. *Caesalpinia sepiaria*, *Eoxb. Hon. Beng.* (1814) p. 82. A climbing shrub; stem stout, woody, and, as well as the finely-fibrous branches, armed with strong sharp yellowish hooked prickles. 15 in. long ; main rachis prickly; stipules 1/2 in., obliquely cordate, acuminate, auricled at the lower angle, deciduous; pinnae 5-30 pairs, subequal, 2-3 in. long, with 1 pair of pubescent rhachis. Leaflets subsessile, 8-12 pairs, 1/2 by 1/4 in. oblong, rounded at the apex, pale green, glabrous or faintly pubescent above, glaucous and slightly pubescent beneath, base rounded, oblique. Flowers in simple terminal and axillary racemes 6-12 pairs, pedicels 1/2 in. long, densely pubescent, articulate near the base; bracts 1/2 in. long, ovate-lanceolate, densely pubescent, caducous; sepals 1/2 in. long, densely pubescent; the upper sepals oblong, very pubescent on both sides. Corolla 1/2 in. across; petals subequal, bright yellow, the lower about 1/2 in., the upper 1/2 in. in diam. Filaments declinate, filaments densely woolly in the lower half, Pods sessile, 1/2 in., straight or slightly recurved, linear-oblong, with a long stalk, 7-10 stalked, somewhat turgid, reticulate veined, especially on the lower half, narrowly winged, the faces depressed between the seeds. 6-8, greenish, mottled. Fl. B. I. v. 2, p. 256 ; Grmh. Cat. p. 01 ; *Du & Gibs.* p. 80; Wight, Icon. t. 37; Trim. FL Ceyl. v. 2, p. 100; *Tali Trees.* Bomb, ed, 2, p. 143 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 426; Watt, Diet. Econ. Prod, v. 2, p. 12.—Flowers: Feb.-; V-VI:R\). *Clalhar*.

Common, often used in the Deccan as a fence, which is quite impenetrable to sheep and cattle. It is sometimes called the *Mysore Thorn*. KONKAN: *Stocks!* DECCAN: plentiful, *Dalzell & Gibson*; along the roadside near Wai, *Cooke!* S. M. COAST: very common, *Talbot*.—DISTRIB. Throughout India; Ceylon, Malaya, China, Japan, etc.

5. *Caesalpinia mimosoides*, *Lamk, Ehusyc. Method*, v. 1 (IL, p. 462. A climbing shrub ; stem and branches armed with short stiff bristles ; young parts colored, armed with prickles ; stiff bristles from glandular bases. Leaves 1-2 ft. long ; main rachis reddish, armed with distant curved prickles ; stipules 1/2 in. long, linear, acute, ciliate: pinnae 10-30 pairs 2-3 in. long, the secondary rachis slender, reddish. Leaflets subsessile, membranous, sensitive, 1 pair, 1/2 by 1/4 in., linear-oblong, inequilateral, rounded at the base, apiculate at the apex, glabrous above, glaucous beneath, the main rachis 1/2 in. long.



Flowers **in terminal** and leaf-op posed **racemes** 12-  
 densely clothed with **straight** prickles and minute



roin hard glandular bases ; pedicels |~1 in. long, covered hairs from  
**hard glandular** bases, **intermixed** with a few **with** a\* eg, glandular bristles.  
 Calyx reddish, | in. long ; **tube** clothed and **frwsoled** from  
 "glandular bases ; lobes obtuse, downy paud-dotted. Corolla g-1 in.  
 across, yellow, dotted with black **with**. , .7llauients fattened at the base,  
 the lower half densely eiliate **turffid fh** ^"00Ar Uilrs. Pods 1.1-2 in.  
**long**, oblong-obovoid, **more obliQu i t** " m any otlier \*?«>«» £ in.thiek\*  
**narrowed to the base**, v .^1 WJ truncate and **with** a short "recurved beak at  
 the apex, clothed minute bristles, finally glabreseent, the sutures not  
 thickened.

Gibs "' « ' B\* I# v" 2f p\*" 2Λο ; Grah\_ Cafc> p' 60 & p- 248 ' :Dal/" & Λο \* In

J°um. Bomb. Nat, v.'11 (1898) p/426.—Flowers; Oct^-

KONKAN: Stocks!; Wari country, plentiful, Dalzell & Gibson; Mahim woods  
 Bombay), G. Graham. S. M. COUNTRY: Castlerock, Woodrow; Belgaum, Ritchie, 253!;  
 Ranghat, Ritchie, 253! KANARA: moist forests, Talbot: Kala naddi, Ritchie, 253!  
 -DISTRIB.: India

(Birra, W. Peninsula).

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**Ms!**

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**piia** ]».(lc7ie,rrima, Swartz, Obs. p. 166. A glabrous shrub or J  
 unarmed or with a few weak prickles, cultivated in gardens  
 Jj^nnbay **Presidency** and generally throughout India. L<sup>1</sup>  
 lo"ng; **pinnw 6-8** pairs. Leaflet? 8-12 pairs. Corolla 1J in.  
 or red. Filaments very long, bright red. **Pods 2-3** by and  
 thinner than those of any of the genus.—**Its** native ?Y is  
 uncertain. It is not apparently wild in S.E, Asia, and may  
**Pome** from America. Fl. B. I. v. 2, p. 255; Woodr. in  
 Journ. \* Nat. v. 11 (1898) p. 42u'; Watt, Diet. **Scon.** Prod. v. 2,  
 p. 10. '<{iii> iMleherrima\* Linn. Sp. PL p. 380; Grab. Cat. p. 01 ;  
 Dalz. & ., **Soppl**, p. 27.—Flowers more or less **throughout** the year.

**WOasidpinu coriaria**, Willd. *The American Sumach*. A small  
 tree, kiive of S. America, which has been introduced and is **rapidly**  
 becoming published in Southern India. It is cultivated in Poona,  
**Dharwar**, i"/aum, and **Kanara**. The sinuous pods contain a large  
 quantity of nin, but owing to the oil contamed in the seeds  
 discoloring the **her** during the tanning process, it is necessary that  
 tbe\$e **should** be **nj oved** before exportation. **Woodr**, in Journ. Bomb.

**Nat. v. 11 (1898) Watt**, Diet. Econ. Prod. v. 2, p. 0,--Flo\vers: Oct.

**VEIMT.** ,i. For a full account of the tanning power of the pods **&t**  
**Watt**, Diet. Econ. Prod. 1. c.



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61. MEZONEURUM, Desf.



erandent usually prickly shrubs (rarely trees). Leaves abruptly 2-  
ate; stipules small or inconspicuous. Flowers in ample panicles  
nes; bracts narrow, rarely persistent; bracteoles 0. Calyx very  
; tube short; segments 5, imbricate, the lowest the  
**longest**-, lining the others in bud like a hood. Petals 0, subequal

usually exerted stalked  
 e or orbicular, imbricate.  
 Stamens-anthers uniform.  
 Ovary  
 ed; ovules few or many; style filiform; stigma «\*\*»\*.  
 «<sup>oWo?fr flafc</sup> thin, indehiscent, broadly winged along to  
 suture. Seeds transverse, compressed, orbicular or reniform, < \*  
 -Hats; radicle short, straight—BISTJUB Tropics of the  
 eastern  
 sphere; species 15.

1. *Mezoneurum cucullatum*, Wv/ht \$ Arn. Prodr. I

2-3½ by 1-1½ in., opposite or less commonly alternate, ovate,  
 glabrous, dark green and shining above, paler beneath, base rounded,  
 slightly oblique; petiolules stout, ½-¾ in. long. Flowers in terminal  
 and axillary panicles of simple or sometimes branched rigid racemes.

0\*^

A large climber; branches glabrous, armed with small dark &&?\* be  
 prickles. Leaves 6-12 in. long; pinnae 2-5 pairs, 5-8 in\* fS^airs,  
 rhachia slender, armed with small recurved prickles. Leaflets \*- r  
 main rhachis terete, glabrous; pedicels ±~} in. long, slende  
 above the middle. Calyx h in. iong^ yellow, deeply  
 clei'V,

leathery, the lowest sepal cucullate, obtuse, } in. Jong, the ot  
 smaller, oblong, rounded at the apex; the tube shallow. Cor!  
 \ in. across, greenish-yellow, the upper petal 2-lobed, shorter  
 than the others. Stamens much exerted; filaments pubest  
 base. Ovary shortly stalked; ovules 1-2. Pods thin, 3-3\  
 (excluding the wing which is |~| in. broad), glabrous, faintly re  
 veined. Seed 1 (rarely 2) in. the middle of the pod. o  
 Fl,

p. 258; Grab. Cat, p. 61; Dalz & Gibs. p»80; Talb. Trees, B<  
 p. 142; Woodr. in Journ. Bomb. Kat. v. 11 (1893) p. 42.£H  
 Dee.~Mar. Yaws. JMgi. t\$

Stocks'; higher Qh&is, common, Daleell \$ Gib?  
 forests, Talbot', Matheran, Cookel DECCAM: LJHIOH, Woode^ \*  
 Graham \ ravines about Par, Graham. KANAKA: abunr''^ 1, Jf  
 the extreme south of N. Koukan, Talhot.—DISTKIB. Inura'(E. W. Peninsula);  
 Indo-Ohiua, iLdaja,

62.

POINCIANA, Linu.

Unarmed trees. Leaves 2-pinnate; stipules inconspicuous. Leaf  
 numerous, suiall, exstipellate, i lowers handsome, in corymbose racem  
 bracts small, very caducous; bracteoles 0. Calyx deeply cleft; '  
 short; segments valvate, subequal. Petals 5, orbicular, imbricate, tj  
 equal, the blade crisply iuibriate. Stamens 10, free, declinate, W .  
 exerted; filaments villous at the base; anthers u nil or m. Ovary £  
 sessile; ovules many; style filiform or abbreviated, slightly clavate  
 apex; stigma truncate, ciliolare. Pod elongate, flat, thin, dehisc\* the  
 sutures neither thickened nor winged, fcioeds transverse, obl|

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abruptly 2-pinnate, 4-8 in. **long; main** rachis **slender** (pinna) 4-8 pairs,  
opposite. Leaflets 10-20 **pairs, subsa**  
*h* by *i* in., closely set along the rachis, 1 in. far-oblong, rounded and

<sup>a</sup>P<sup>^</sup>ulate at *i*/

flo<sup>^</sup><sub>ret]</sub>"<sub>e</sub> <sup>n</sup>Ⓜ <sup>a</sup>I>ex, glabrous, **caducous**. **Flowers in terminal**

few-

\$ **ion** <sup>!B</sup> <sup>O.rm raeem</sup>es ; pedicels stout, finely pubescent. **Calyx**  
<sup>acut</sup><sup>^</sup> <sup>Cp</sup><sup>l>laceoujl</sup>i silky-pubescent outside; segments **linear-** <sup>^tlesmnif</sup>  
<sup>eta</sup><sup>As</sup> **Buborbiaular**, yellow', scarcely exerted, the upper <sup>In</sup>«ob curl' xv <sup>d</sup>  
of a <sup>dee</sup><sup>per</sup> color than the others, the margins of all <sup>\*)</sup>llSe- Pod V **i** <sup>nents</sup>  
of <sup>tesn</sup> <sup>2k</sup> >n- long, villous and thickened at **the Serous** « J <sup>■</sup>? <sup>t~^i</sup> <sup>\*n-</sup>>  
attenuated **at** both ends, reticuktely veiaed, **Gibs S**»<sub>n</sub>,, <sup>S</sup> 4~8' FL B\_ L v\_  
2, p. 260; Grab. Cat. p. 61; Dak. & Tnlb\* **Triy** £ <sup>^8</sup> ! %**dd. Flor.**  
Sylvat. 1.178 ; Erandis, For. FL. p. 157; (189S) <sup>D</sup> T<sub>9y</sub> <sup>o</sup>TMb- ed- % P- **142**;  
**Woodr.** in Journ. Bomb. Nat. v. 11

Jun<sup>e</sup>4opt ' tt (IKct; Eeon\_ Prodl v> 6; j)Eirt Xi p> 309; ~Mowers;

. Bojer, ex Bot. Mag. (1829) t. 2884. *The Royal*

*Gut-^*a native of Madagascar, has within the last 80 years been  
**in-**'**HI into** and is now grown everywhere in gardens in the  
Bombay <sup>^</sup>cy, and more or less throughout India. The young  
leaves are **ungly** beautiful, reaching 2 ft. in length, **with**  
11-18 pairs of *f* Flowers bright scarlet, *in* terminal and  
axillary lax racemes, I. v, 2, p. 260; Daiz. & **Ghbs.** Suppl. p.  
27; **Talb.** Trees, Bomb. p. 142; **Woodr.** in Jo urn. Bomb.  
**Nat.** v. II (1898) p. 427; Diet. Econ. Prod. v. 6, part 1, p.  
309.—Flowers : Apr.-June, *QuL-Mohor*,

### 63. PARKIWSONIA, Linn,

Leaves at first sight apparently **simply** pinnate **and** fascicled, in  
reality 2-pinnate from a very short r bach is: stipules usually rfc,  
**p**

**ides** <sup>U</sup> **f.**, <sup>lvitel m tlo</sup> **Bombay Presidency**, but **often** planted in gardens and along skl<sup>ersU</sup>  
y <sup>l</sup><sup>imon</sup> m Poona and in **Byspur near Maiiomed&n** tombs, itafoetf (t. c.) Crests  
M&- <sup>C?ne from Ab^</sup>initt. **Bmndis** (1. e.) says that it is mdi<sup>g</sup>x)»ou9 in

spinescent; **pinnae** 2-6, very long, flattened. Leaflets numerous, *I*  
**small**. Flowers in short axillary lax racemes; bracts small, very  
icous ; bracteoles 0. Calyx deeply cleft; tube short; segments  
6, ibranous, slightly unequal, narrowly imbricate or subvalvate.  
Petals spreading, somewhat unequal, the upper the broadest.  
Stamens 10, - ; ii laments villous at the base ; anthers uniform,  
versatile. Ovary **Irtly** stalked : ovules many ; style **filiform** ;  
stigma **small**, terminal. **i** turgid, mouilifWm, finally  
dehiscent.—DISTEIB. Species 3, of which [<sup>•</sup>e American, the other a  
native of the Cape.

**Parkinsonia aculeata**, Linn. *Sp. PL* (1753) p. 375. A glabrous or  
small tree armed with sharp woody spines which **represent** the raises  
of the 2-pinnate leaves. Pin nee 1-3 pairs, 6-12 in. long, the chis  
much flattened, striate. Leaflets numerous, minute, obtanceolate, ;  
petiolnles distinct, short. Flowers in *hx* axillary racemes  
c/<sup>h</sup>than the leaves ; pedicels |-\$ in. long, slender, jointed near the i  
erecto-patent. Calyx <sup>^</sup>iu. long, divided nearly to the base : segments '  
|tr, obtuse. Corolla yellow; petals §-f in- long, broadly obovate or  
rbicular, with a short stout villous claw, veined. Filaments flattened  
**(densely yittouB** at the base. Ovary silky-villous; ovules  
many.

Pods 3-4 by j- | in., moniliform, attenuated at both ends, finely veined, glabrous Seeds 1-6. Fl. B. I. v. 2, p. 200; Grab. Cat. p. 61j & Gibs. Suppl. p. 28; Bedd. For. Man. in Flor. Sylvat. p. 91 & Anal. Gen. t. 13, fig. 2; Talb. Trees, Bomb, ed, 2, p. 142; A Woodr. in Joarn. Bomb. Nat. v. 11 (1898) p. 427; Watt, Diet. Econ. Prod. v. 6, part: 1. p. 110.—Flowers: Jan.-Mar. VEBN, *Vedi-babhal*; *Vihiyati-kihar*.

A native of Tropical **America**, often grown as a hedge plant, almost naturalized in the Bombay Presidency and more or less so throughout India.

#### 64. WAGATEA, Dalz.

A climbing shrub armed with scattered prickles. Leaves abruptly 2-pinnate: stipules inconspicuous. Flowers subsessile, in long simple or paniced spicate racemes. Calyx-tube campanulate; calyx-segments about as long as the tube, slightly imbricate, the lower concave, slightly larger than the others. Petals 5, subequal, oblong, erect, imbricate, not spreading in aestivation. Stamens 10, free, slightly declinate; filaments short, pilose at the base; anthers uniform. Ovary subsessile, 3-ree; ovules many; style slightly clavate at the apex; stigma oblique. Pod ligulate-oblong, indehiscent, few-seeded, subtorulose, (with thickened sutures (not winged).—DISTIB. Western Peninsula of India species 1.

1. *Wagatea spicata*, *Dalz.*, in *Kew Journ. Bot.* v. 3 (1851) p. 89.

A robust woody climber; branches armed with numerous recurved prickles. Leaves 2-pinnate, 9-12 in. long; main rhachis armed with recurved prickles; pinnae 4-6 pairs, 3-5 in. long, the rhachis puberulous. Leaflets 5-7 pairs, 1-lf by J- in., coriaceous, obtuse or subacute, dark green, glabrous and shining above, beneath, base rounded or cordate; petiolules very short, nearly sessile, in dense spicate racemes sometimes reaching 2 rhachis stout, more or less grooved, clothed with soft brown pubes^ often armed with recurved prickles. Calyx densely puberulous, long, scarlet; segments oblong or subspatulate, obtuse, equalling campanulate tube. Petals 5 in. long, inserted on the top of 1/2 calyx-tube, obovate - apathimite, reticulately veined, dark orange. Stamens equalling the petals, alternately long and short; filaments flattened and densely pilose at the base. Ovary densely pubescent; ovules 4-6; style as long as the filaments and the petals; stigma 2-lobed oblique. Pods 1/2-2h by 1/2-1 in., linear-oblong, swollen above the set and constricted between them, and with thickened sutures. Seeds 3-1 obovate-oblong, transverse; testa hard, thick, bony. Fl. B. I. V. p. 261; Dalz. & Gibs. p. 80; Wight, Icon. 1. 1895; Talb. Trees, Bon ed. 2, p. 143; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 427; Watt, Diet. Econ. Prod. v. 6, part 4, p. 297. *Corsalpinia digyna*, *Grah.* O p. 60.—Flowers: Jan.-Feb. VIEK. *Vugditi*; *Vdlceri*.

KONKAN-: Konkan jungles, *Balzell* & *Gibson*; south of Pan well, *Balzell*; *Bo*<sup>ab</sup>: (*apt. Gef>urm*): pretty common on the Gliats, *Graham*. **DBCCAJC**: Ghat near below *MabaWedbwr*, *Coo&el* KANAKA: *Stocks I*—KISTHIB. Hills of the *WepainBula*.

**Shrubs, or herbs.** Leaves abruptly-pinnate; **riachis** often  
 glands either **between the** leaflets or on the petiole  
 below **wpules** various. **Flowers usually** yellow, **in axillary** or  
 terminal **terminal** panicles, or **subsqliary axillary**; bracts  
 and **various**. Calyx deeply divided; tube very short;  
 segments 5, Petals 5, imbricate, subequal or the lower  
 the largest, or 3\_g ■ non\*mo% 10, all perfect and subequal or  
**the upper** the smaller, b\yfr st; m^e ct 01\* ^ **together** absent;  
 anthers uniform or those of the **Ovary** aU1 Hns t:le ^ **rg^r**, dehiscing by  
 terminal pores or by a short slit. **Wyle** « h f or stalked> i>ree> a\* the  
 bottom of the calyx; ovules many; ^ualiV ^ eIo" S»te; stigma  
 terminal. Pod **variable, terete or flat, tran** £.-^fv^ate between the  
 seeds, dehiscent or **indehiscent**. Seeds **ely** longitudinal,  
 horizontally or vertically compressed, Throughout the Tropics; a  
 few extra-tropical;

- i?2 f[\*lon"teivie ..... ■ ..... 1. <?- *Fistula* ,
- fwa** tbfm 1 ft, long, more or less flattened.
- ,n lie stamens 7 (sometimes 7-10 in *C. nigrkans*),
- > **the others reduced to stainodea**. I :lff" of
- the leaf-rhaehis **solitary**, inserted be->n
- neath** (not between) the leaflets.
- If Leaflets 3-5 pairs ..... 2. *C. occidentalis*,
- p/" Leaflets (5-10 pairs; gland conspitrnons, conical, ">, ('. *Sop/tern*. I'
- Leaflete** 8-18 pairs; gland obscure, **Sat**, sessile... 4. *C niyrkana* (in part). I
- p-lands inserted** between 1 or more **paira** of leaflets. **Leaflets** 3 pairs. Gland **between**
- each of the **2 lowest pairs** of
- leaflets; **plant fetid** ..... 5. *C. Torn*.
- Gland between the lowest pair of leaflets
- owly; plant not fetid ..... G. *C ohiusifolia*.
- Leaflets 8-12 pairs ..... 7. *C. aurkutata*,
- (.; lands of the **leaf-rfaacbis 0**. Pod not above 2 in. long.
- Pod **with** a longitudinal **er\*at** down the middle
- over the seeds ..... 8. *C. obtitsa*.
- Pod not **crested** o rer the seeds ..... 9. *V. koloserkea*.
- Pod £M> in. long.
- Stipules minute, caducous** ..... 10. *C. montana*.
- Stipu les large, **foliaceous**, subpersistenfc..... 11. *C timorien*
- Fertile stamens** 5; stammodes 0.
- Leaflets 2 pairs ..... 12. *C. Absits*.
- Leaflets** 10-2U paira ..... - 13. *C. pumila*,
- If** Fertile stamens 10 (1-3 eotnetimes **reduced to stami-**
- |f** mules in *C, nigriecms*).
- Gland solitary, inserted beneath the leaflets, stalked,
- peltate; leaflets 8-20 pairs ..... 14. *C, Kleinii*.
- Gland inserted** between **each** of the **2-3lowest** pairs
- ofleafiets; leaflets 4-6 paira** ..... 15. *O~gktu*
- Gland** solitary, inserted **beuoath** the leaflets, flat,
- sessilo.
- Leaflets **40-60 pa in** ..... 16. *C. tnimosotdes*.
- Leaflets 8-18 pairs ..... 4. *C. ttu?ricawt(m part)*.

**1. Cassia Fistula, Linn.** % *PI* (1753) p. 877. A tree 20-30 ft.  
**Ugh;** trunk straight; bark smooth and pale-grey when young, rough  
**iod d'ark-b row n wh** en old; branches spreading, slender. **Le aves 9-16 in,**  
**lioiiig; main rhachis pubescent;** stipules minute, liuear-oblong, obtuse,

pubescent. Leaflets 4-8 pairs, ovate or ovate-oblong, acute,  $1\frac{1}{2}$  in., bright green and glabrous above, paler and silver beneath when young, the midrib densely pubescent on the base cuneate; main nerves numerous, close, conspicuous petiolulea  $\frac{1}{2}$  in. long, pubescent or glabrous. Flowers  $1\frac{1}{2}$  in. long; pedicels 1-2 in. long, slender, pubescent or glabrous. Calyx  $\frac{1}{2}$  in. long, divided to the base, pubescent; segments 5, obtuse. Corolla  $1\frac{1}{2}$  in. across, yellow; petals 5, subequal, the shortly clawed, veined. (Stamens all antheriferous, the  $\sigma$  longest with very long curved filaments and oblong anthers longitudinally, the 4 lateral with short straight filaments and anthers opening by pores at the base, the remaining 3 more erect with indehiscent anthers. Pods 1-2 ft. long,  $1\frac{1}{2}$  in. pendulous, cylindrical, nearly straight, smooth, shining, bitorulose, indehiscent, with numerous (40-100) horizontal seeds in a dark-colored sweetish pulp, and completely separated by dissepiments. Seeds broadly ovate,  $\frac{1}{2}$  in. long, slightly less in thickness. PI. B. I. v. 2, p. 261; Grab. Cat. p. 62; Dalz. & Walp. p. 261.

Trim. Fl. Oeyl. v. 2, p. 103; Talb. Trees, Bomb. ed. 2, p. 427; Watt, Diet. Econ. Prod. v. 2, p. 217. *Cassia rhombifolia*, Eoxb. Hort. Beng. fc. 269.—Flowers: Mar.-May. VEEI? ( ? )

Common throughout the Presidency in deciduous forests, and hilly parts, *Graham*. DEUCAS: hills about Poona, Cfo. ~ ~ , hills, *Woodr.*—DISTIB. Throughout India; Ceylon, Malaya, Umna

The tree is known to Anglo-Indians as the *Indian Laburnum*. fruit

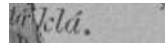
furnishes an excellent and safe purgative. The wood is not of sufficient size for timber. See Watt, Diet. Econ. p. 217.

2. *Cassia occidentalis*, Linn. *Bp. PI* (1753) p. 377. (usually annual) undershrub 2-5 ft. high; branches furrowed, often purplish. Leaves very fetid when bruised, obovate on the rachis glabrous, with a single sessile gland near its base. Leaflet pairs, 1-4 by  $1\frac{1}{2}$  in., membranous, glaucous, ovate-lanceolate, gradually attenuated to a very acute apex, glabrous above, pubescent beneath, base usually rounded and somewhat oblique; petiole

very short  
axillary

white with a pink tinge. Calyx  $\frac{1}{2}$  in. long, divided to the base, glabrous; segments white, slightly tinged with pink, oblong, obtuse, membranous. Petals 5, subequal,  $1\frac{1}{2}$  in. long, ovate-oblong, obtuse, yellow, faintly veined with orange. Stamens 10, of which the 3 upper are reduced to stamens; the anthers of the remaining 7 perfect, the 3 lower longer and with larger anthers than the 4 lateral ones. Pods 4-5 by  $1\frac{1}{2}$  in. and about  $1\frac{1}{2}$  in. thick, recurved, glabrous, compressed, transversely septate, distinctly bitorulose. Seeds 20-30, ovoid, compressed, acute at one end and rounded at the other,  $\frac{1}{2}$  in. long by  $\frac{1}{4}$  in. broad, hard, smooth, shining, dark olive-green. PI. B. I. v. 2, p. 262; Grab. Cat. p. 62; Dabs. & Gibs. p. 81; Benin, in Trans. Linn. Soc. v. 27 (1811) p. 27; Xirra. EL Ceyl. v. 2, p. 105; *Woodr.* in Journ. Bomb. Nat. p. 427; Watt, Diet. Econ. Prod. v. 2, p. 221.—Flowers: *Han-tulda*: *Kasivdd*,

vill;t,rP3' <sup>1</sup>JT' throughout the Presidency in the rains, especially among rubbish near  
**nelea** <sup>g</sup> **P** **gy**  
 slit t V/S' rooΛs' an<Λ seeds are used **medicinally**, the latter also in Africa us a  
 Ute for <^ffee. See Watt, Diet. Econ. Prod. 1. c.  
 TEIB< 'hroughliout India and the Tropics generally.  
 V/S rooΛ ^ d d i i l l h l  
 ,d <?assia s° **pkera**, Linn. S/>. PL (1753) p. 379. A **shrub** or  
 u;t<T>S k @~^-\*'• hig^j annual or perennial. Leaves 7-9 in. long;  
 the 1 ^ ^roovet'> glabrous or nearly so, with a solitary conical gland near  
 glau leaflets 6-10 pairs 1|-2| by |~f in., opposite, membranous,  
 \*ons, lanceolate, acute or acuminate, glabrous, base usually rounded ;  
 in .^erves 10-12 pairs ; petiolules A—fa in. long, glabrous. .Flowers  
 f>u> '■ s\*lori;' few-flowered, corymbose racemes ; pedicels J- in. (in  
 <iei t reae'l'n S s in.) long, pubescent; bracts -} in. long, green, ovate,  
 tie fv Cii eous\_ Calyx T^ in. long, divided to the base;  
 segments  
 yell US) obtuse> g^en. Petals 5, subequal, h in. long, ovate, obtuse,  
 the°-V A tamTMs \*A °f which the 3 upper are reduced to staminodes,  
 ^ ,, remaming^ 7 usually perfect, the 3 lower longer and with larger  
 pa iers than the 4 lateral ones, of which one is sometimes reduced to a  
 k« ? Pods 3"4 h J I in\_ and about i in\_ iliii'k> **slightly** recurved,  
 ,^o me what turgid, septate between the seeds, not or scarcely torulose.  
 V?GC D ^^~4-N broadly ovoid, acute, compressed, dnrfc-brown, -} bv f in. :  
 fl-B. I. v. 2, p. 2U2 ; Gra-h. Cat, p. 62; Dalz, & Gibs. p. 81; Benth.  
 ■^i-ans. Linn. Soc. v. 27 (1871) p. 532; Trim. 1-1. Cey). v. 2, p. 105; in  
 Journ. Bomb. Nat. v. 11 (1898) p. 427 ; Watt, Diet. Econ. p.  
 223,—Flowers : A'ov.-Jan. VBBK. Jarxjli-tdkld; lida-



**JK**^ common weed in neeiltivated places throughout the rains.—DrsTRiB. Throughout  
 ;\*W\*ia find in mosf, Tropical countries.  
 b^Ji, leaves, juid seeds are used medicinally. See Watt, Diet Econ, Prod. i. c.

ssia nigricans, VaM, 8ymb. v. 1 (1790) p. 30. A shrub or '  
 L\_.'[' Lirub o ft. high ; young branches pubescent. Leaves 2-4 in. long; ^/nis  
 hairy ; petioles jr in. long, hairy, furnished with an obscure \*rsile  
 gland below the lowest pair of leaflets; stipules ^ in. long, [riangular,  
 acute, hairy, nerved, closely appressed to the stem. LeanVls lessile, 8-18  
 pairs, |~-1 by k~^\$ in., liofar-oblong, obtuse, mueronate, Inequal-sided^  
 hairy on both sides.' blowers ^-£in. across, solitary or -5 together,  
 supra-axillary; pedicels short, bracteolate. Calyx divided ■ the base,  
 villous, i in. long; segments oblong-lanceolate. I'etals fyellowish-red,  
 scarcely" exserted, the upper the smallest. iStamens 10, 0 perfect or 1-3  
 riH'lrmen!ary,the 3 lowest the largest; filaments short. >vary sessile,  
 densely villoits; style short, hooked. Pods |-1| by ,\_ 'v\*in.,  
 hnear-obloug, straight, impressed, marked with transverse jblique lines  
 between the seeds, clothed with appressed hairs. Weeds

-11, trapezoid-ovoid, compressed, brown, shining. Benth. in Trans.  
 inn. Soc. v. 27 (1871) p. 577 ; Prain, in Journ. As. Soc. Beng. v. 66  
 477. C. Arnottiana, Wight, MS. in Herb. Kew (1835) n. 2410.

1898)p.

> mk-rantha, Guill. & Perr. Fl. Senegamb. (1830-33) p. 262.—ilowers:

Hare apparently confined in the Bombay Presidency to N. TTanara. **KAWAEA:**



'*J ihvnhacker*, 730!; **Kumpta** on the eoagt, of Kanara, *Talbot*,72l; **N. Kanara**, *Stock\**, w  
(fide **Prain**),—**БІВТКІВ**. India (W. **Peninsula**); Tropical Africa.

5. **Cassia Tora**, Linn. *Sj*>. *PL* (1753) p. 376. An annual fetid herb 1-3 ft. high. Leaves 3-4 in. long ; rhachia grooved, more or less pubescent, with a conical gland between each of the 2 lowest pairs of leaflets; stipules 1-4 in. long, linear-subulate, caducous. Leaflets 3 pairs, opposite, 1-lf by 1 in. (the lowest pair the smallest), obovate-oblong, glaucous, membranous, glabrous or more or less pubescent, base somewhat oblique, usually rounded ; main nerves 8-10 pairs ; petiohiles

, in. long, pubescent, blowers usually in subsessile pairs in the axils of the leaves, the upper crowded ; common peduncle in fruit not exceeding 1/2 in. long ; pedicels in fruit rarely exceeding 1/2 in. long. Calyx glabrous, divided to the base; segments 4- in. long, ovate, acute, spreading. Petals 5, pale yellow, subequal, 1-hy fa in., oblong, obtuse, spreading, the upper petal (standard) 2-lobed, the others entire. Stamens 10, the 3 upper reduced to minute staminal nodes, the remaining; 7 perfect, subequal. Pods 5-8 by 1/2 in., subtetragonous, much curved when young, obliquely septate, puberulous, not reticulate, the sutures very broad, Seeds 25-30, rhombohedral, with the long axis in the direction of the pod. Linn. *Sp. PL* ed. 2, p. 538 (exclud. syn. *Hoy. Lugd.* & exclud. *var. ft*); Bilker, in Hook, *t FL B. I.* v. 2, p.263 (partly); Dal/. & Gibs. p. 81 (partly) ; **Benth.** in *Trans. Linn. Soc.* v\ 27 (1.87L) p< 53 ;> (partly); Grah. *Cat-* p. 63 ; *Trim. Fl. Ceyl.* v. 2, p. 106- Woodr. in *Journ. Bomb. Nat.* v. 11 (1898) p. 427; Watt, *Diet. Econ. Prod.* v. 2, p. 224. *Senna Tora*, Koxb. *Fl. Ind.* v. 2, p. 340.—Flowers : Nov.-Der V *Tdkla.*

A very common weed throughout the Presidency, where it may be found in roadsides and in waste ground. ■—DISTRIBUTION. Throughout India, Ceylon, and the Malay Peninsula generally, probably native in Asia only.

6. **Cassia obtusifolia**, Linn. *Sp. PL* (1753) p. 377. At herb 2-7 ft. high, not fetid. Leaves 3-4 in. long; rhachis, more or less pubescent, with a conical gland between the lowest pair of leaflets only; stipules 1-2 in. long, linear-subulate, caducous. Leaflets 3 pairs, opposite, 1-1 by 1 in. (the lowest pair the **smallest**), oblong, green, membranous, glabrous or more or less pubescent, base somewhat oblique, usually rounded; main nerves 8-10 pairs ; petioles 1/2-1 in. long, pubescent. Flowers usually in subsessile pairs in the axils of the leaves, the upper crowded ; common peduncle in fruit not exceeding 1/2 in. long ; pedicels in flower 1-1 1/2 in. long. Calyx glabrous, divided to the base; segments 1 in. long, ovate, acute, spreading. Petals 5, bright yellow, subequal, 1 by 1 in., oblong, obtuse, the upper petal (standard) truncate. Stamens 10, the 3 upper reduced to minute\*

staminal nodes, the remaining 7 perfect, subequal. Pods 8-10 by 1 in., subterete, obliquely septate, glabrous, transversely reticulate, the sutures broad. Seeds 30-35, rhombohedral, 1/2 in. long. Linn. *Sp. PL* ed.

p. 539 (as to the plant, but exclud. references to Dillenius and Rumphius). *Cassia Tora*, Baker, in Hook, *t FL B. L.* v. 2, p. 203 (in part), *not* of Linn/ *Cassia Tora*, var. *j3*, W. & A. *Prod.* p. 291 (exclud. references to Ehedei and Lamarck). *Senna toroidts*, Eoxb. *FL Ind.* v. 2, p. 341. I

The plant may be distinguished from *Cassia Tora* to which it closely allied, by its greater size, longer pedicels and larger flowers, by its odor which is bland and not fetid (as in *C. Tora*), by the presence of a gland between the lowest pair of leaflets only, and by its reticulata and subterete pods. Eoxburgb (*I. c.*) very clearly points out the s''

also Prain, Jouru. As. Soc. Beng.

) p. 475. <sup>^</sup>loclia <sup>ant</sup> \*S <sup>^</sup>nat<sup>ue</sup> o<sup>^</sup> <sup>^</sup>Propieal America, but has become more or less naturalized

**bra' P<sup>^</sup>SSia auric<sup>^</sup>lata**, Linn, *Sp. Pl* (1753) p. 379. A tall muchly <sup>"O</sup> <sup>S<sup>^</sup>UD!</sup> bark smooth, reddish-brown; branchlets finely pubescent, <sup>jj<sub>u</sub><sup>ves</sup></sup> 3-4 in. long ; rhachis densely fulvous-pubescent with an erect ar gland between each pair of leaflets \$ stipules foliaceus, reflexed', <sup>tli/' T<sup>^</sup>e<sup>'</sup> y<sup>ot<sup>u</sup></sup></sup>ndato-reniform, produced at the base on the side nest

<sup>sin f</sup> <sup>\*n<sup>"</sup> S<sub>0</sub><sup>%</sup> ^W</sup> overlapping, obiong-obovafe, obtuse or **enrrn-**  
**L' mueron<sup>ate</sup>**, **glabrous** or finely downy, dull green above, paler \ <sup>pj!<sup>l</sup>j<sup>i</sup>U<sup>^</sup> <sup>la<sup>se</sup> usua<sup>^</sup>y<sup>ro</sup></sup> **unded**; petiol ules -/g- **in. long. Flowers large,** '  
<sup>^</sup> <sup>n<sup>S</sup> 2 in</sup> across in **terminal** and xillary corymbo  
:  
<sup>sin f</sup> <sup>\*n<sup>"</sup> S<sub>0</sub><sup>%</sup> ^W</sup> overlapping, obiong-obovafe, obtuse or **enrrn-**  
a long subulate point, persistent. Leaflets **8-12** pairs,</sup>

<sup>^</sup>ng 2 in. across, in terminal and axillary corymbose racemes ,  
;els |~] j!<sup>k</sup> j<sup>o</sup>11g . <sup>orac<sup>f</sup>s</sup> ovate, acuminate, caducous. **Calyx** glabrous;  
**Rjgmeuts** leathery, concave, the 2 outer much smaller than 'the **other 3**,  
- etajs **with** long claws, crisped on the margin, bright yellow,  
veined **jrch orange**. Stamens 10, .of which **the 3** upper are  
reduced to mimodes, the remaining **7 perfect**, of which the **3 lower**  
are **forger aan** the 4 lateral ones. Pods **3-5 by J-| in.\***, **flat, thin**,  
papery, **oblong, rotuse**, umcronate, pale brown, deeply depressed  
**between** the seeds,

aving a crumpled appearance, transversely veined, pubescent. Seeds  
0-20. Fl. B. I. v. 2, p. 263; Grah. Cat. p. 63; Dalz. & Gibs. p. 81;  
enth. in Trans. Linn. Soc. v. 27 (1871) p. 547; Trim. Fl. Ceyl. v. 2.

106; Talb. Trees, Bomb. ed. 2, p. 144; Woodr. in Journ. **Bomb. Nat.**  
**p. 427**; **Watt**, Diet. **Scott**. Prod. v. 2, p. 215.—"Flowers  
**VE: ins**". *Tarvad; Aval.*

*Gehrne* || **DBCCA**H : abundant in sterile **tracts**, *Graham*,  
*Cooket, Poona, Cookel; Khandesb, Echetoorikl* GUJARAT: very  
common, *klzeUjfr Gibson, Graham. S. M. CODHTSY: Dharwar, Cooke*)—DISTUIB.  
India (dry s'iu the Central Provinces and the W. Peninsula); Ceylon. bark is a most  
**valuable** tanning **material** and the seeda are used medicinally, n says that the  
leaves are used **in Oeylon** as n substitute for tea.

**B. Cassia obtusa, R&vb. EorL Bm<j. (1814) p. 31. A**  
diffuse

>**erennial** herb 1-3 ft. high; stems glabrous, pale groen,  
obtusely  
**r angular, striate,-somewhat** woody below; branches spreading, glabrous  
**except the xery** young parts. Leaves 2-4 in. long ; rhachis glabrous,  
**^striate, without glands** between the leaflets; petioles £-J in.  
long;  
stipules 4" <sup>\*n-</sup> <sup>^on</sup>£i obliquely lanceolate, very acute. Leaflets  
3~(i  
(rarely 7) pairs, |~1 b} in., broadly oblong or obovate-oblong,  
-obtuse, umcronate, pale green and glabrous above, glaucous and **glabrous**  
puberulous beneath, base obtuse.- Flowers in axillary peduneled

denies which elongate in fruit and are ultimately longer than **fehe**  
**Meaves**; pedicels very short. Calyx **■]** **in.** long, divided to **the**  
base; Fsegments oblong, obtuse, membranous, veined. Petals **^**  
**in.** long, Kbovate-oblong, shortly clawed, yellow, **.reticulate** with  
darker veins. **^Perfect** stamens 7, *wry* unequal, the 2 or 3 **lowest** much  
the largest, illie **staminodes** minute; **filaments** short. Ovary  
densely pubescent. 'Pods **1-li** by *i~i* in-, **Sat\*** thin, papery,  
glabrous, rounded at both **mds** much recurved, transversely veined and  
**with a line** of prominent **tion^itudinal** crests down the **middle** of *the*  
pod over **the** seeds, **the**

sutures very thin, and the persistent base of the style near t \ ^ the shorter side of the pod. Seeds 6-12, wedge-shaped, *i J^fa* ft truncate or retime at **fche apex**, finely reticulato-rugose, » gaining-transverse ridge across the middle of each face, dark-bro\ \_ » & gidcl Wight, Icon. t. 757 ; Wight & Am. Prodr. p. 288 ; <sup>AlU</sup> pVa. His\*- PL p. 52; Trim. Fl. Ceyl. v. 2, p. 107. *Cassia obovata*, w » g7|j Cass. (1816) p. 02, t. 15, A ; Benth. in Trans. Linn, hoc v. ^ p. 553; Baker, in Hook, t Fl. B. I. v. 2, p. 264; Grab. WT- -Woodr. in Jfourn. Bomb. Nat. v. 11 (1898) p. 427: ««\*U ^ p Prod. v. 2, p. 220. C«ma <&n»«, Linn. Sp. PL (1753) p; ot 'V Dak. & Gibs. p. 81.—Flowers : Nov.-Feb. VBBS. /> /\* «\*-' « # p.

Roxburgh named the plant *C. otiusa* in 1814 (<sup>Hor</sup> , , , . c " ) Colladon named it *O. obovata* in 1816, two years later- ^ Afl reason why Roxburgh's earlier name should be set aside.

DECCAS: Bhimthuri district, *ValseUf Gibson*; Bijapnr,

abundant, ( 8. M. Ck>usr«Y : *DahM \$ Gtb&m*. SIND: *bt* » \* . penJnBata;

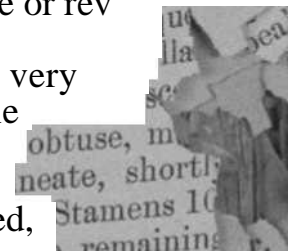
Ily **derabad**, *Ka n ilkar!*; M irpnr, *Kan ii kar i*—D ISTK I B. India (J. a i y » >

Arabia, **Egypt**, Abyssinia. **Nubia**.

ST^

A certain amount of trade is done in the leaves in Sind, » ^ , by fcbe il\* > ^ ! . abundantly. It was **the** first, kind of Senna known, and was\_introa"v ^ ^^ . ^ .vou into Europe, where 2 or 3 centuries ago it was largely cultivated and the south of France.

9. **Cassia holosericea**, *Fresm. in Flora* (1839) v. \* ^ **Suffruticose**, 1-4 ft. high; branches subterete, more or \* r ? j ^ twei Leaves 2-5 in. long; rhachis densely pubescent, <sup>wltiioUJ'</sup> . ^ ^ ^ lauceolaf the leaflets; petioles | - | in. long; stipules - \ in. lojig, " \* ote from t very acute, with a small auricle at the base on the siae ^ « ^ petiole, rigid, densely pubescent. Leaflets 5-8 pairs, g micl-o<sup>fl</sup>-(the upper pair the largest), obovate-oblong, obtuse or rev , ^ clothed on both surfaces with soft velvety pubescence, <sup>Dd</sup> \ ^ rounded or subacute ; petiolules very short. Flowers m nai ^ racemes shorter than the leaves; pedicels very short, *aenbuy i* Calyx | in. long, divided to the base ; segments oblong, branous, **veined**. Petals | in. long, obovate-oblong ^ ci clawed, yellow, conspicuously reticulate with darker veins



recurved, rounded at both ends, velvety-pubescent, slightly turgia, u" « ^ not longitudinally crested above the seeds, transversely veined and wittij **fche** persistent base of the style on the shorter side of the pod somewhat remote from its apex. Seeds 4-10, obovoid-cuneate, | by £ i « \* > ret use at the apex, reticuhtto-rugose, flattened, glabrous, yellow. Benth. m Trans. Linn. Soc. v. 27 (1871) p. 558; Oliver, Fl. Trop. Afr. v. ^ p. 278 ; Pram, in Journ. As. Soc. Beng. v. 66 (1808) p. 476. *Senna ovaUfolia*, Batka, Monogr. Senn. t. 4.—Flowers: Nov.-Jan.

Very closely allied to *C. obovata*, for which it is often mistaken am: from which it may be distinguished by the pods, which have no longi- tudinal crest down the middle above the seeds, and by the greater amount of pubescence. Com taon in **Bind**. SIND : Hyderabad, *CooJte \ Woodrow* !—BTSTBIB, Tropical **Africa**

**Arabia.**

the leaves of *1* *tlu\** are sold as **Semia** in the *mu\*e way as **Shose** of the former *specie\**.

*Cassia* Vahl, Symb., a plant with poble very similJI those of *Cassia* <sup>J10</sup>  
 claim "t<sup>U</sup>L<sup>W</sup>" arrow lanceolate leaflets, is a native of Tropietfirria and has <sup>lw</sup>n  
 at H<sup>e</sup>C011Kiclere<sup>t</sup> indigenous in India. It was (*fide* Dalzell & Gibson.) first ' i exte  
 11^1 j m 96e(\^ 8llPP<sup>nee</sup>^ from Aden by Captain Haines, and WHS subsequently Bo <sup>!?</sup>S1<sup>v</sup>  
 10<sup>n</sup>^ Hura and at Ghinesh Kbind near Poona to supply sennit leaves <sup>10</sup><-y Medical  
 Stores. Its cultivation in these localities has been discontinued firs, us it was  
 found that leaves could be supplied at a cheaper rate from supplied X <sup>"</sup> p <sup>\*nct</sup>'a<sup>t</sup>>  
 w<sup>kere</sup> the plant is still very largely grown, than they could be

***Cassia montana*, Eeyne, etc Both, Nov. PL Sp. (1821) p. 214.** <sup>o</sup>r\_  
 small tree; branches clothed with yellowish pubesseeuce. <sup>~</sup>° in. long  
 ^<sup>n</sup>J; rhachis without glands, channelled, clothed **with** <sup>1</sup> jo wish  
 pubescence; stipules minute, very caducous. Leaflets \* **pairs**,  
 l-ii by §-£ in., oblong, obtuse, **with a** long conspicuous <sup>o</sup>) glabrous  
 or nearly so above, paler and **sparsely** clothed with **ish** hairs  
 1 (more **abundantly** on **the** midrib) beneath; petiolules <sup>n</sup>- long,  
 11. clothed with yellowish **hairs**. Flowers in corymbose  
 pjjV~<sup>es</sup>» **xilJaiy** and forming terminal panicles; pedicels long, clothed  
 side; segments broadly oblong, concave, the 3 outer much smaller  
<sup>a</sup>n the 2 inner. Petals |-| in. long, subequal, oblong, obtuse,  
 very  
 ^<sup>o</sup>TM<sup>y</sup> clawed, yellow, not conspicuously veined. **Stamens 10**, the  
**ipper** reduced to staminodes, the **remaining 7 perfect, subequal.** <sup>s</sup>  
 3-o by | in., straight or slightly curved, flat, **stalked**, tapering **arda**  
 the base and pointed at the apex with the base of the style, >,  
 glabrous. Seeds 12-20. *Fl. B. I. v. 2*, p. 2(54; **Dalz. & Gibs. M<sup>l</sup>** >  
 ^enth. in *Trans. Linn. Soc. v. 27* (1871) **p. 550; Talb.** Trees.  
 gib. ed. 2, p. 144: Woodr. in *Jonrn. Bomb. Nat. v. 11*  
 (1898)  
 pj|^7.—Flowers : Aug.-Oct.  
 HM. COUNTRY: Chorla GbAt (near Belgaum), *Datee.ll S; Gibson; Eel*»anm GhfUs,  
 Wm>t\ Castlerock, *Cooke ! KANAEA* : moist forests of the N. Kanara G-hits, *Talbot.*



***Cassia timoriensis*, DC. Prodr. v. 2 (1825) p. 499.** **A** <sup>large</sup>  
 or sinall tree; branches slender, finely pubescent. Leaves  
 6-9 in. g; rhachis **fulvous-hairy without** glands; **stipules**  
**foliaceous, broad, h a filiform tail, subpersistent.** Leaflets 10-20  
 pairs, i-1| by f~| in., long, obtuse, mucronate, clothed **with appressed**  
 hairs above, densely Ions beneath, base rounded; **petiolules X** in. long,  
 pubescent. Flowers i corymbose racemes from the axils of **the**  
 young leaves, the whole **3rming a terminal** panicle; pedicels f--l in.  
 long, **fulvous-pubescent.**  
 ■alyx divided to the base, pubescent; segments **broadly** oblong, obtuse,  
 ■jncave, the 3  
 bright yellow, faintly veined with orange. outer smaller than  
 the 2 inner.  
**ipper** reduced to **staminodes, the**  
 Petals § by ■£ in.,  
**subequal.**  
 jblong, **Stamens 10**, the perfect, **subequal.**  
 -7 by | in., stalked, slightly **remaining** tapering to both ends,  
 straight, **flat, "bin,** glabrous and shining, **the** sutures  
 thin. Seeds 16-20, o bo void-**juneate**, much compressed, -l-by -\ in.,  
**with an oblong shallow pit on each face.** *Fl. B. I. v. 2*, p. 205;  
*Benth. in Trans. Linn- Soc. v. 27* (1871) , **550** ; *Trim. FL Ceyl. v. 2*, p.  
 108 ; *Talb. Trees, Bomb. ed. 2*, p. 144 ; *Bict. Econ. Prod. v. 2*, p. 224.  
*Cassia goensis, Dnh. id Kew .. Bot. v. 4* (1852) **p. 112.—Flowers :**



Oct. About *Qo* & «U"e, *Daleell* KAITAEA: from the Goa *Gh&ba* «6utbw«rcU; common in t] & forests of the Ankola and Kumpta taluksa in N, Eanara, *Talbot*.

12. *Cassia Absus*, Linn, *Sp. PL* (1753) p. 370. An 27  
 erect, (1871  
 paringly branched annual 6-18 in. high ; stems and branches clothed p!  
 with spreading viscous glandular hairs. Leaves long-petioled ; rhachis 570 ;  
 viscous-hairy, grooved; petioles f-1 in. long; stipules i in. long, Wood  
 subulate. Leaflets 2 pairs, very oblique, f-1^ by \$-l'in. (the terminal r. in  
 pair the largest), elliptic-oblong or elliptic-obovate, obtuse or subacute, Journ  
 minutely mucronate, glabrous or nearly so above, slightly hairy but not .  
 glandular beneath; petiohiles ^ in. long, densely hairy. Plowers Bomb  
 in terminal or leaf-opposed erect narrow few-flowered racemes; pedicels . Nat.  
 short, viscous-hairy; bracts beneath the pedicels ovate, acute ; bracteole, v. 11  
 1 about the middle of each pedicel, small,^ovate. y (1898  
 in ) p.  
 Calyx hairy, long, 427.-  
 o Flow  
 bo vale- ers  
 long; segments oblong,"obtuse, subequal. Petals | in. cuneate, Aug.  
 reddish-yellow, tender, veined. Stamens 5, all perfect, equal? Ovary VEKN  
 densely bristly with long hairs. Pods 1-lf by |^- in., lignlate nearly .  
 straight, oblique, compressed, thin, clothed with bristly hairs.: Seeds Sarm  
 4-6, trapezoid-ovoid, T^i(v by \- in., black, shining. PL li. I. v. 2.) p. 265 al  
 i Wight & Am. Prodr. p. 291 ; Beuth. in Trans. Linn. Soc. v. 27: (1871) Tole  
 p. »dS ; Trim. PI. Ceyl. v, 2, p. 109; Woodr. in Journ. Bomb Nat, v. rably  
 11 (1898) p. 427; Watt, Diet. Eeon. Prod. v. 2, p. 210.-4^ comm  
 Plowers: Sept. VBBH. *Chdfean; Ohimar.* on in  
 Pastur  
 es  
 during  
 the  
 rains  
 KCWK  
 AN;  
*Stoche*  
 l^^\  
 Poon:v
- Pretty common throughout tlio Presidency. KONKAN: *Stock\*\*, Law\;*  
 Pnr<'  
**Woodrow 1; Bandora, Nairne\ Dapoli, Nairne; Tingorla, IVoodrowl**  
**Daoc M**  
 Poona, *Woodrowl*; Bowdhan hill near Poona, *C'ouke !* —DISTIUB. Throughout liu  
 Ceylon, Tropical Africa. Asia, and Australia. in'  
 The steds are largely employed in native medicine in the treatment of ophthahje-ll  
 and also as a cathartiJ. See Watt, Diet. Eeon. Prod. 1. c. ^ji
13. *Cassia pumila*, Lmnk. *Enci/c. Method*, v. 1, p. 651 (17i  
 Suffruticose, diffuse or procumbent; stems numerous, spreading, al<sup>i</sup>: 1 ft.  
 long; brauches slender, clothed with weak spreading white hl<sup>U</sup> Leaves  
 1-2 in. long ; rhachis hairy ; common petiole i-£- in. long, a peltate  
 stalked gland on the petiole below the leaflets; stipules \#jf long,  
 lanceolate, very acute, nerved. Leaflets sessile, 10-20 {P:K i\_| by  
 Y(-B m' (tn(^ llPPer an{\* lower smaller than the middle OJ linear-oblong,  
 very unequal-sided, rounded and apiculate at the ape<sup>l</sup> usually glabrous ;  
 nerves conspicuous beneath. Flowers usually solitaPs or 2-3 together,  
 supra-axillary; pedicels very short, slender; bracts beneath the  
 pedicels lanceolate ; braeteoles 2 above the middle of thtvl<sup>l</sup> pedicel,  
 lanceolate. Calyx divided to the base, TV4 in. long, pubescent j  
 segments oblong-lanceolate, acute, subequal. Petals £ in. long,  
 yellow^ obovate-euueate, tender, veined. Stamens 5; anthers equal.  
 OvaiV densely pubescent; style short; stigma peltate, concave, fringed.  
 Pods j 1-1 £ by I I in., with oblique partitions between the seeds,  
 Linear, straight, or very slightly curved, flat, glabrous or with a few  
 scatterer^ ]n[r< Seeds 6-12, obovoid-cuneate, compressed, bro>vn. Fi.  
 B. I. v. 2 J n <sup>l</sup>>(So- Dalz. & Gibs. p. 82; Benth. in Trans. Linn. Soc. v. Kanara

), *lalbotl-DisTius*. India; TrOj>ical Asia arid Australia.

■"

14, Q

^ ft. h' l ir • ia" > TH^igrAi <J\* Am, JProdr. (1834) p. 293.  
Perennial l^uWscnt V USE' mucn branched from a woody base;  
branches 3S pilose' f ^Ves abruptly-pinnate, 1-1| in. long; rhachis  
more or

lo^est pa- u^nisile d with a small peltate stalked gland just below the  
linear-Ian » i \*ea^ets ? petioles ^ iu. long; stipules ^ in. long, erect,  
(r0(Wd to 4 ft^ Ter^ acute» strongly nerved. Leaflets 8-20 pairs  
^ubaeute hi Pa;rS on fc^e \*ower tea^s)i i~s ^y T2~e \*n-> sess^e» linear,  
the raidrib^ 1 j|^ue^y mncronate, rigidly coriaceous, very unequal-sided,  
Wer ., "eing quite close to the upper edge, strongly nerved on the  
! the fe "Winded or truncate. Flowers 1-3 together in the axils

o^tle Vp' pedicels g-g in. long, slender, downy ; bracts at the base  
lanceola lanceola Peaxcel lanceolate; bracteoles 2 near the top of the pedicel,  
e-subulate. Calyx divided to the base; segments membranous,  
^alfnef V@ry^ acute- Petals obovate, little exserted, yellow. Stamens  
P^Wpnf ^teniatel^y «hort and long ; anthers equal. Ovary densely ^  
I L r^on sutures, nearly glabrous on the flat faces. Pods 1|-1| ^tl^e  
8IA " \* lmoar\_obl^o»g, fiat, slightly recurved, more or less pubescent on £j  
gy^res' freely if at all so on the faces. Seeds 10-15, dark brown. IVi^j  
fi; v\_p^2 P- 266 ; Benth. in Trans. Linn. Soc. v. 27 (1871) p. 581; P JO - J^  
\* v\*^' P\* HO; Woodr. in Journ. Bomb. Nat. v, 11 (1898) -mrs; Oct.  
^e' ^OSRAK: Jatnbhalpada (Colaba), Woodrow.—DISTEEB. India (W. Pemusula);  
j-n, Java,

V:

> **Cassia glauca**, Lamk. *Eneye. Method*, v. 1 (1784) p. 647. A  
^ tree i branches numerous, spreading, **glabrous**. Leaves 5-9  
in.

; rhachis pale, puberulous, with a clavate gland between each of the  
power pairs of leaflets; stipules .^ in. long, linear, acute, falcately id,  
caducous. Leaflets 4-6 pairs, L£-3 by 1-1^ in. (the lower pair  
mallest), elliptic-oblong, subacute, pale green and glabrous above, ;o^'  
and slightly pubescent or glabrous beneath, base usually i-v^d;  
petiolules | in. long, pubescent. Flowers in axillary  
'iibose racemes shorter than the leaves; pedicels grooved and  
Ifced, more or less pubescent; bracts ovate, acuminate, pubescent,  
Jftt^51^ caducous. Calyx divided to the base, yellow, glabrous,  
mem-, ^/n-xel^retioulatly veined ; segments broadly oblong or  
suborbicular, mous, g\_maj]er than the 2 inner. Petals | by §  
in., broadly Me 3 ° jtuse, shortly clawed, yellow. Stamens  
10, all perfect, ^kmg; pods stalked, 6-8 by |-| in., straight, **flat**,  
thin, tapering both ends, marked with raised lines between the  
seeds, veined, cabrous. Seeds 20-30, oblong, rounded at one end,  
narrowed at the

her, ¼ by ½ in., compressed, smooth, dark-brown, shining, with a  
allow oblong pit on each of the flat faces. Fl. B. I. v. 2, p. 265 ;  
ah. Cat. p. 63 ; Dalz. & Gibs. Suppl. p. 30 ; Benth. in Trans. Linn. Soc.

W|27 (1871) p. 555; Talb. Trees, Bomb, ed, 2, p. 144 ; Woodr. in **Journ.** w  
fomb. Nat. v. 11 (1898) p. 427 ; Watt, Diet. Econ. Prod, v.2, p. **819**.— •  
lowers: Sept.-Mar. YEKN. *Motha-tarvad*.

KONKAS : Law !, Stocks !, Capt. Geburne I DECCAN : Poona in gardens, Woodroto! f )  
/vj CouJ^TRY: common in the forests of the Dharwar districts near the N, **Kanara** \*T\*

at" Devikope, *Talbot*. **KAKABA:** forests of **N. Kanara**, *Taiboi*.—**BISTBIB. J**  
onghout India; **Tropical** Asia and Australia generally but **usually cultivated**.

**1**

*t e*

16. *Cassia mimosoides*, Linn. Sp. Pl. (1753) p. 379. A diffuse perennial 1-3 ft. high, usually erect, but sometimes spreading; stems and branches terete, more or less hairy. Leaves abruptly-pinnate, pubescent, with

2-4 in. long; rhachis very slender, curved, **g** **af** flat sessile gland on the very short **petiole** close below <sup>tt)\*</sup>. <sup>^3</sup> <sup>vo0</sup> of **leaflets**; stipules  $\$-J$  in./ovate, lanceolate, cuspidate. <sup>-^</sup> <sup>1</sup> |

by numerous (40-60 pairs), crowded and overlapping.

<sup>^^</sup>Luaf-s<sup>^</sup>

2TI~TV<sup>m-</sup> **Knear**, subacute, obliquely mucronate, very «" 4 jj<sub>en</sub>eai<sup>u</sup> **iroua**, base oblique, rounded; nerves strong, prominent <sup>^</sup>. **Flowers axillary**, solitary or 2-3 **together** \ pedicels <sup>U!ie{1u\*}\^o\^</sup> <sup>in</sup> **long**, slender, pubescent; bracts beneath the pedicels <sup>G00]at^></sup> <sup>^^^</sup> cuspidate; bracteoles 2 a **little** below the calyx, linear-<sup>\*</sup> <sup>^^^</sup> very acute. Calyx  $\sim$  in. long, **sparingly** pilose; **segments** <sup>Joi]gf</sup> membranous, oblong-lanceolate, very **acute**. **Petals** <sup>xvr i ^rf<sup>ec</sup>^</sup> elliptic, obtuse, with a **longish** claw, yellow. **Stamens** 10, **all** <sup>on</sup> alternately long and short. **Ovary silky-pubescent** more especially <sup>^eil</sup> the sutures. **Pods** 1<sup>^</sup>-2 by \ in., linear, nearly **straight**, flat, ■

shining. Fl. B. I, v. 2, p. 20G; Benth. in Trans. Linn. Soc. v. p. 579<sup>^</sup>; Trim. Fl. Ceyl. v. 2, p. 110; Woodr. in Journ. Bomb. (1898) p. 427; A<sup>r</sup>att, Diet. Econ. Prod. v. 2, p. 220.—**Flowers**: Dec.

*Sfocksl*; Asre near Jambhalpada, *Kanitkarl*; Kap;td near Po DKCCAX; Panchgani, *Coo&c i*; *Foonn*, Woodrow.—PLSTKIB. Throud India; Ceylon, Tropics generally.

*Cassia marginata*, Boxb. Hort. Beng. p. 31. A tree with 30-40 of leaflets, pink flowers and **cyliudric** pods **nearly 1** ft. long, introduced from Ceylon, where it is common, into **the** BofanicX at Calcutta in 1802. A tree may be seen in the Bund Gardens in the College of Science Botanic Garden at **FOODS**. **Fl**, B. p. 262; Talb. Trees, Bomb. ed. % p. 144; Woodr. in Journ. Bo Nat. v. 11 (1898) p. 427, & Gard. in *hid.* ed. 5, p. 274; Wat **Econ.** Prod. v. 2, p. 220.—**Flowers** in the rains. **VEEN**, **j** *Uskiamen*.

*Cassia grctndis*, Linn. f. Suppl. p. 230. A small tree with pods  $l_2$  -  $\gg$  long, a native of Tropical and Central America and the W. Indies, **bj** **been** introduced into gardens at Poona, where a plant may be seen f Garden Beach. Date. & Gibs. **Suppl. p. 29**; **Woodr. in Journ. BonJ** Nat. v. 11 (1898) p. 427.—**Flowers**: Apr.-May.

*Cassia tomentosa*, Linn. f. Suppl. p. 231. A **tall** shrub with 6-8 paf of leaflets, bright yellow flowers in corymbose panicles, and finely doui **Pods** 4-5 in. long, a native of Tropical America, is **frequently** planted > gardens. Fl. B. I. v. 2, p. 263; Wight & Am. Prodr. p. 286; **Wood in Journ**, Bomb. Nat. v. 11 (1898) p. 427.—**Flowers**: Jan.-Mar.

*Cassia bicapsularis*, Linn. Sp. Pl. (1753) p. 376. A shrub **3-4** pairs of leaflets, bright yellow flowers and a **sausage-shaped**



6 in. long  
plant  
ed a nat\*ve o^ Tropical and Subtropical S. America, is  
often n^1 8^ar dens and is occasionally found as an escape. 3?]. B.  
I. v. 2. \*} Dab. & Oibs, Suppl ^ 29#

f f f o^ Linn\*Sp\*R(1753) p. 378 < 4shmb with 8~14 nairs  
;nJ 1 ' large yellow flowers, and a pod 4-8 in. long furnished with a  
Wjd n tlte mid(J)le of each valve, has been introduced into the  
8ake f "C^per^aps from the W. Indies, and is occasionally planted for the  
notah] • ^eaves which have a high repute as a remedy in skin-diseases,  
& ^ , nn^vorn- It is not indigenous in the W. Peninsula (see  
Wight

« e' )' Fl\_B\_I\_v\_2' p\_264. Wi\_e !lt & Arn\_Prod\_ p\_ 2ST: Dalz\_ &

Bomi, Ar^Ppl P" 29 J Taib\_ 11ree^ Borab\_ ed. 2, p. 144; AVoodr. in Jouni. Blow  
at V' U' (189S) > V- 427 ; Watt, Diet. Econ. Prod, v. 2, p. 211.— 1 ^er«: Oct.  
VERN. *Shimai-agase*.

*smmea*, Lamk. Encye. Method, v. 1, p. 648. A moderate-si/eel tree  
of quick growth with 6-1.4 pairs of leaflets, large panicles of r flowers  
and flat pods nearly 1 ft. long, is extensively planted as a tie tree. It  
is indigenous in Ceylon, the Malayan Peninsula, Siana y"5outh India,  
but not in the Bombay Presidency EL B. I. v. 2, If >4 ; Trim. Fl.  
Ceyl. v. 2, p. 108 ; Talb. Trees, Bomb. ed. 2, p. 144; ^odr. in Journ.  
Bomb. Nat, v. 11 (1898) p. 427, & Gard. in Ind. ed.5, ' ; Watt, Diet.  
Econ, Prod. v. 2, p. 223. *Cassia sumatrana*, Roxb. Beng. p. 31 ;  
Dab. & Gribs, Suppl. p. 29,—Flowers: Aug.-May.

Q ' 66. CYNOMETRA, Linn.

p[leet 1^cst unarmed trees or shrubs. Leaves abruptly-pinnate;  
stipules Leaflets few pairs, coriaceous, oblique. Flowers  
small, in ymbs or racemes. Calyx with a very short tube and  
sub-fyljk; segments 4-5, imbricate, reflexed during flowering. Petals 5,  
1 or the lowest minute, imbricate. Stamens 10, free;  
filaments ; anthers small, uniform, dehiscing longitudinally.  
Ovary sessile fely stalked; ovules 2; style 11!iform ;  
stigma capitate. Pod Itiate-ovoid or subreniform (rarely  
straight) wif-h thick turgid or sub-Hm pressed usually rugose tough  
somewhat fleshy in dehiscent valves. JKed filling the cavity,  
exalbutninous ; cotyledons thick, fleshy ; radicle %y short, straight,  
included.—BISTEIB. Throughout the Tropics ; fecies 20,

1. *Cynometra raraifloraj* Linn., TAR. mimosoides, *Baker, in*  
*'fook. f. \$1- B' !•* v. 2 (1878) p. 267. A shrub or small tree growing  
t>ar the sea-coast. Leaves 3-5 in. long ; rhacbis grooved, glabrous or  
(Tfcberulous. Leaflets 2 pairs, 1|~3| by |-1| in., coriaceous, obliquely  
Cjlovsate-oblpng, often ercarginate, subsessile, dark green,  
glabrous,  
Eaiining above, base obliquely cuneate ; main nerves numerous, distinct.  
Blowers in small axillary corymbose racemes ; pedicels slender, \-% in.  
fling; bracts broadly ovate,\* deciduous; bracteoles small,  
lanceolate.

dvx-tube very short; segments ovate-lanceolate, TV~I in. long. Petals  
"«hit-e linear-lanceolate, ^in. long. Pods fleshy, much wrinkled, turgid,  
3 1 in Ion\*\* irregularly oblong or ovoid, with a thick fleshy pointed tip.  
*ramifiom*. Grab. Cat, p. 63 ; Dalz. & Gibs. p. 83 ; Talb. Trees, Bomb.

Wm ■ - ■

2 F 2

ed. 2, p. 144 ; Woodr. in Journ. Bomb. Nat. 1.11 (1898) p. 427 ; Watt, *Diet. Econ, Prod.* v. 2, p. 682.—Flowers : Mar.-May. VERJT. i

KoNKAJt : S, Konkan, *very rare*, Dalsell §■ Gibson, *Nimmo ex Graham*. forests of N. Kanara, Talbot, Woodrow. Talbot says {I. <.-.) that the characteristic fruit is carried down the Kala naddi during the rainy season and thrown up ou the seashore near Karwar.™DISTRIB. India (W. Peninsula, the Sunderbans and Bu'ma) ; **Malaya**.

### 67. HARDWICKIA, Koxb.

Unarmed trees. Leaves abruptly-pinnate. Leaflets 1-3 pairs > coriaceous. Flowers numerous, small, in paniced racemes. Calyx with scarcely any tube and a subbasal disk; segments usually 5, oblong or suborbicular, petaloid, subequil. imbricate. Petals 0. Stamens 10, **the** alternate ones slightly shorter; anthers dehiscing longitudinally. Ovary sessile, free ; ovules 2. Pod subindehiscent, dry, with only the\* **upper** seed perfect. Seeds exalbutniuous.—DISTRIB. Species 3. of which 2 are Asiatic, the other African.

1. **Hardwickia binata**, lloxb. *Cor. Pl.* v. 8 (1819) p. 6, t. 20U. A tree 50-60 ft. high ; branches numerous, spreading. Leaves alternate ; rhachis tipped with a minute deciduous bristle; petioles in. |^- long, glabrous; stipules small, caducous. Leaflets 1 pair, like t of *Bauhinia*, subsessile, 1~3 by g-lj in., obtuse, 3-6-nerved from base, tinged with red when young, glabrous. Flowers in axillary terminal panicles; pedicels filiform. Calyx -^4 in. long; **segm** oblong, obtuse, membranous, veined, often dotted. Stamens usually filaments very slender. Stigma peltate. Pods 2-3 by |-| in., st shaped, veined, glabrous, narrowed at both ends, thin, flexible, ope at the apex. Seed 1, near the tip of the pod, M. B. I. v. 2, p. •Grah. Cat. p. 61; Dalz. & Gibs. p. 83; Bedd. *Flor. Sylvat. t, 2G* ; Trees, Bomb. ed. 2, p. 145 ; Woodr. in **Joura.** Bomb. Nat. v."JO-40 \ p. 427; Watt, *Diet. Econ. Prod.* v. 4, p. 200.— Flowers: (k It YEEJiT. *Anjan*.

DECCAN: Lalling PaSB between **Malligaon** and Dhulia (Khandesh), *Dalsell 4' Gibson, Woodrow*, common on the trap of the Sntpudas in Khan *Talbot*. S. M. COUNTRY : Kanebenntir taluka of Dharmir, locally abundant, I^STRIB. India (Behar, N.W. ProTinces, W. Peninsula),

The leaves are given as { 'odder to cattle, who eat them greedily. The wood extremely durable and makes excellent piles for bridgt,\*-i'<jundatit>ns. See Wa Uict. *Econ. Prod.* 1. c.

### 68. SARACA, Linn,

Erect trees. Leaves abruptly pinnate; stipules Inrge, intrapetiolo:\*<sup>1</sup> completely united, or rarely foliaceous and partially free. Lea fie<sup>11</sup> usually of few pairs, coriaceous. Mowers in dense sessile panicula<sup>ouV</sup> (nireJy simple) corymbs on old nodes, or rarely axillary; bracts sm; deciduous; bracteoles persistent, colored, shorter than the tube of £ I p<sub>a</sub> | calyx. Calyx petaloid; tube elongate, cylindric, crowned by a **lob^^^j** disk ; segments 4, oblong, subequal, imbricate. Petals 0. **Stamens** 2-^ free, exserted; filameiits long, filiform; anthers oblong, vereatifo<sup>u\</sup> dehiscing longitudinally. Ovary stalked, the stalk **attached** io a



produced beyond the disk ; ovules many ; style filiform ; stigma in the  
capitate. Pod flat, dehiscent, rigidly coriaceous. Seeds exalbuminous. - ■  
DISTRIB. S.E. Asia ; species 16 or more. d

**1. Saraca indica**, Linn. *Mantiss.* (1767) p. 98. A tree 20-30 ft. corky at the base. Leaves 6-10 in. long; rachis glabrous, petioles short; stipules intrapetiolar, elliptical, 4-8 by 1-2 in., oblong-lanceolate, obtuse or acute, margins rounded or cuneate, slightly oblique; petiolules stout, wrinkled; stipules deciduous. Flowers completely fragrant by the petals, scarious, ovate-oblong, obtuse, parallel-nerved.

72 m. long, red, glabrous; bracts ovate, subacute; bracteoles spatulate-oblong, subacute, finely colored. Calyx passing from yellow to orange segment oblong or obovate-oblong, § in. long. Petals 0. Stamens much exerted; filaments filiform, thrice as long as the calyx. Ovary pubescent, especially on the sutures; 1-fl. Sylvat. t. 57; Trim. Fl. Ceyl. v. 2, p. 114; Talb. Trees, ed. 2, p. 145; Woodr. in Journ. Bomb. Nat. v. 11 (1898) Watt, Diet. Econ. Prod. v. 6, part 2, p. 475. *Jonesia Asofat*, p. 5. in As. Res. v. 4 (1795) p. 355; Grab. Cat. p. 02; Dalz. & Gibs.

**Vern.** *A'shoJc: Jdsyant.*  
**Konkan** : *Stocks I, Law!*; S.

Common, Balzell & Gibson; W. Grtiats, widely, Woodrow; Salsntto, Graham. **N:** Lanoli grove, Graham, Woodrow I. **S. M. COUNTRY:** bottom of Raraghat, r/c, 206J. **KANAKA:** evergreen forests of N. Kanara, sometimes planted, Talhot; **Hraadcu** jungles, Ritchie, 256!—**DISTRIB.** India (Central and Eastern Himalaya, Hpengal, Birma, W. Peninsula); Ceylon, Malaya. Hh?fflnp bark is used in iative medicine. See Watt, Diet. Econ. Prod., 1. c.

**K**

, *puberula*, Prain, in Journ. As. Soc. Beng. v. 6\$ (1898) p, 489.

racemes, peduncles and pedicels puberulous to pubescent.

**UIA** : fide Praia I. c.

**69. TAMARINDUS, Linn.**

unarmed tree. Leaves abruptly-pinnate; stipules minute, us. Leaflets small, multijugate. Flowers in racemes at the end of the branches; bracts and bracteoles ovate-oblong, colored, dusky. Calyx-tube turbinate; segments 4, much imbricate, membranous. Petals : the 3 upper only developed, the 2 lower reduced to stipes. Stamens monadelphous, only 3 developed, the others reduced mere bristles at the top of the sheath; anthers oblong, dehiscing longitudinally. Ovary stalked, the stalk adnate to the calyx-tube; styles many; style elongate; stigma capitate. Pod linear-oblong, curved, subcompressed, indehiscent, with a brittle crustaceous epicarp 5-fld thick pulpy mesocarp. Seeds exalbuminous.—**DISTRIB.** Species 1, now planted everywhere throughout the Tropics.

**1. Tamarindus indica**, Linn. *Sp. PL* (1753) p. 34. A large tree 60 ft. high; branches spreading, glabrous. Leaves 2-5 in. long;

^achis slender, channelled; stipules linear, caducous. Leaflets  
sub-  
fssile 10-20 pairs, tolerably closely set on the rhachis, |~1£ by |^- in.,

oblong, obtuse, glabrous, reticulately veined. Flowers in lax **few-flowered** racemes at the ends of the branchlets; pedicels  $\frac{1}{2}$  in. long, **slender**, articulated below the calyx, glabrous; bracts concave,  $\frac{1}{2}$  in. long, enclosing the buds, caducous; bracteoles small. Calyx  $\frac{1}{2}$  in. long; tube narrowly **turbinate**,  $\frac{1}{2}$  in. long; segments  $\frac{1}{2}$  in. long, subequal, oblong, somewhat oblique, obtuse or subacute. Petals 3 (**an** upper and 2 lateral),  $\frac{1}{2}$  in. long, subequal, obovate-oblong, yellowish **with** pink stripes. **Stamens** 3 fertile, connate nearly half their length: filaments pubescent at the base; anthers oblong. Ovary stalked; ovules 8-12 or more; style pubescent, equalling the stamens. Pods 3-8 in. long by  $\frac{1}{2}$  in. broad and about  $\frac{1}{2}$  in. thick, slightly curved, subcompressed, scurfy. Seeds 3-12, obovate-oblong, truncate at the ends,  $\frac{1}{2}$  by  $\frac{1}{4}$  in., compressed, with a shallow oblong pit on each of the flat faces, smooth, brown, shining. PI. B. I. v. 2, p. 273; Grab. Cat. p. 62; Dalz. & Gibs. p. 82; **Bedd.** Flor. Sylvat. t. 184; Aitch. Pb. & Sind PL p. 53; **Talb.** Trees, Bomb. ed. 2, p. 146; Woodr. in Journ. Bomb. **Nat.** T. U (1898) p. 428; **Watt**, Diet. Econ. Prod. v. 6, part 3, p. 404.—Flowers: May-June. **Vmsr. Amlī Chinch,**

The well-known *Tamarind tree* cultivated and self-sown throughout India and the Tropics generally, probably indigenous in Africa. The tree is of great value, almost all its parts being useful. Two different kinds of fruit are recognized, distinguished by their color, viz., the red and brown tamarind, of which the former is the most valued. Some fine specimens of the red-fruited variety grow at Bijapur in the Deccan. See Watt, Diet. Econ. Prod. 1. c.

## 70. BAUHINIA, Linn.

Unarmed erect trees, or climbing shrubs with **circulate** leaves: Leaves usually simple, more or less deeply cleft from the apex, or rarely divided into 2 leaflets; stipules various, usually simple. Flowers usually white, in simple terminal or rarely axillary racemes, or arranged in a large terminal or corymbose panicle. Calyx  $\frac{1}{2}$  in. long, tube with the disk produced to the top, sometimes long and cylindrical, sometimes short and turbinate or campanulate; limb entire and entire, or cleft into 2 or 5 teeth. Petals 5, subequal, erect or spread imbricate, the upper the inner. Stamens 10, or reduced to 5 if fewer than 10 with or without sterile filaments; filaments filiform; anthers versatile, dehiscing longitudinally. Ovary **stipitate** (rarely **sessile**); ovules many; style long or short; stigma small, large and pedicelate, subterminal or oblique. Pod linear or oblong, continuous **within**, dehiscent or indehiscent. Seeds albuminous.—**PISXEB.** Throughout the Tropics; species 150,

### Fertile Stamens 10.

Leaflets distinct ..... 1. *IJ.*

Leaflets connate. Calyx spathaceous.

Flowers large, 1-3, on short peduncles ..... 2. *B. tomentosa.*

Flowers small, numerous, in copious racemes ..... 3. *B. racemosa.*

**Calyx-limb** divided into 5 segments.

Leaves 7-9-nerved ..... *B. malaliarica:*  
*B. f*

Leaves 15-17-nerved ..... 5.

Fertile stamens 3-5.

^ge climber ..... « % U-

v, 3\* p, 3??<sup>laif</sup> diP^yUa, *Buch.-ffam., in Symes, Embass.* ed. 2 (1800) 2  
 distil fi \* ^ large climber with circinate tendrils.  
 Leaves of ends Ji<sup>leaflets</sup> » petioles j~lf in. long, slightly thickened  
 at both °r subSn\*r<sup>US</sup> striate. Leaflets sessile, 2| by 1| in.,  
**semiorbicular 7 la** .<sup>m</sup> » **funded** at both ends, glabrous ; nerves  
 5-G. Flowers ■<sup>rfe'</sup> }<sup>n</sup> <sup>ax</sup> ter<sup>5</sup> «inal racemes; pedicels 1|-1| in. long,  
 glabrous, <sup>n</sup>g; buds fusiform. Calyx thick, glabrous; tube |-1 in.  
 long, turbinate; limb divided to the base, segments

1-1½ in. long, reflexed. Petals exserted, oblong-lanceolate, white, with  
 a long claw. Stamens 10, all fertile, equal; filaments glabrous. Ovary  
 stalked, glabrous. Pods stalked, 9-12 by 1½-2½ in., flat, thin, reticu-  
 latedly veined; stalk 1½-2 in. long. Seeds 30-40 along the middle of  
 the pod, ovoid, slightly compressed, ½ by ⅓ in., pale brown, shining.  
 Fl. B. I. v. 2, p. 278. *Talb. Trees Bomb.* ed. 2, p. 147. *Woodr. in*

—*Bomb. Nat.*, v. 11 (1898) p. 428.

KONKAN: *Stokes* lanceolate,

60 Jj,<sup>S</sup> <sup>lri</sup> in<sup>l</sup>ded on the authority of specimens in Herb. Kew he belled as above, but  
 %f/ 11 °? j^tors appear to have found the plant in the Konkun. *B. cort/mhosa* \n  
 j| .ui and Gibson's **Bombay Flora, Suppl.** p. 31, may probably be this species.  
 The  
 Jic r ^iV ere Sui(1 to be cleft t0 llie "We, which ia not the case in *B. corymbosa*,  
 ■».—DlSTtitiBt Binna.

**If. Bauhinia tomentosa, Linn.** % PZ, (1753) p. 375. An erect;  
 y^ » branches slender, terete, zig/ag, downy. Leaves broader than  
 |HSI lg-2 by U-^.'- in., divided a little less than 4 way down into  
 /grounded lobes, glabrous Eibove, pubescent **beneath**, base **truncate** or  
 ?•ply subeordate; **main** nerves 7 (rarely 9) from the base; petioles  
 ^4 in. long, pubescent, thickened at both ends. **Flowers**  
 usually <sup>11</sup> pairs (rarely 1 or 3), on short axillary or leaf-opposed  
 peduncles ; ^1'ts linear, |-4 in. long; pedicels 4 in. long,  
 2-bracteolate. Calyx T\* 1°T1£^ velvety-pubescent; tube -t in. long ;  
 limb | in. long, broadly <sup>v</sup>fl(\ kpathaceous. **Petals 1^-2** in. long, much  
 imbricated, obovate-*W&F* <sup>"av</sup>fate, yellow, the upper with a  
 purple blotch on the face. •fRWens 10, all **fertile,-eubequal**.  
 Ovary **distinctly** stalked, densely ■**mentose**; style i-| in. long; stigma  
 peltate. Pods **stalked**, 4-5 by ||**B-J**| in., flat, pointed, slightly  
 pnberulous wlien fully ripe, veined. ,\*eds 8-12, oblong, rounded  
 at the apex, -x\ by T^ in. Fl. B. I, v. 2, f 275 j *Grah. Cat.* p.  
 08; Dalz. & Gibs. **Suppl.** p. 31; Bedd. For. **an.** p. xcii; Trim. FL  
 Ceyl. v. 2, p, 116; "Woodr. in *Journ. Bomb.* at. v. 11 (1898) p.  
 428; Watt, *Diet. Econ. Prod.* v. 1, p. 423.— lowers: Nov.-Jan.

A very ornamentfil shrub, often cultivated in gardens, but very doubtfully wild in  
 [the Bombay Presidency. *Nimmo* (fide *Graham*, I. e.) states **thai** it is wild in  
 the Konkun, but no other collector scums to have found it there. *Dahdl* <(" *Gibson*  
*say that it is a native of Malabar, and IVondrow* in his list of plants considers it as  
 doubt-jully indigenous. —DISTRUI. India (N.W., Provinces, W. Peninsula); Ceylon,  
 China, U flopieal Africa.

**3. Bauhxnia racemosa, Lamk.** *Encyc. Method*, v. 1 (1783) p. 390  
 'not of Vahl). A small crooked tree with dark scabrous bark ; branches  
 inmeroiis, drooping. Leaves broader than long, f-2 by  
 1-2| in.,  
**Pm**vided a little less than £ way down into 2 rounded lobes, green and  
 tlabrous above, white and more or less tomentose beneath, base usually

t'ordate; main nerves 7 .....9 ; petioles |-| in. long, pubescent.      Flowers

in terminal or leaf-opposed racemes 2-*h* in. long; **rhachis** densely pubescent; buds pointed; pedicels *fa-fa* in. long; bracts beneath the pedicels linear, acute. Calyx pubescent; tube \erj short; limb \-\$ in. long, spathaceous, at length reflexed. Petals narrowly oblanceolate, acute, |~y<sup>7</sup><sub>g</sub>- in. long, white or pale-yellow. Stamens 10, all fertile; filaments densely hairy at the base. Ovary pubescent; stigma sessile. Pods stalked, 6-10 by ^-f in., blunt at the apex, tapering to the base, somewhat falcate, glabrous, turgid, not or scarcely veined; stalk J-1 in. long. Seeds 12-20, oblong, compressed, rounded at the apex, |-\$ by <sub>T</sub>VI in., black. **Fl. B. I.** v. 2, p. 276 ; **Gran.** Cat. p. 64 ; **Dak. & Gibs-p.** 82; **Hook. Icon.** 1.141 ; **Trim. FJ. Ceyl.** v. 2, p. 116 ; **Talb. Trees, Bomb** ed. 2, p. 146; **Woodr. in Journ. Bomb. Nat.** v. 11 (1898) p. **Watt, Diet. Econ. Prod.** v. 1, p. 422.—Flowers : Mar.-June. **1 A'pid; Vditu-rdja.**

Common throughout the Presidency in deciduous forests. **1**  
KONKAN: *S, Dalzell!*; Ghats and hilly parts of the Konkan, *Graham.*  
DECCAN: widely. *Wool SMva I,* Poona districts, *Cookel, Woodrowl*—DISTRIB.  
Throughout India; Ct China, Timor.

A sacred plant of the Hindus, worshipped at the Dasera festival, The leavt sold in the market, to wrap tobacco in and **ma&e** cigarettes **which** are called *bklis*.

4. **Bauhinia malabarica**, *Moseb. Hort. Beng.* (1814<sup>1</sup>) 31.  
erect low bushy tree, sometimes dicecious (*Talbot*). £  
than long, 1|—5 by 1J-6 in., divided about \- the way %itoi  
rounded lobes, glabrous above, pale and more or less pubes<sup>IB^</sup><sub>tf</sub>  
finely reticulately veined, base cordate ; main nerves 7-11 (Ltgpj  
conspicuous : petioles 1 in. long, thickened at both end<sup>5!</sup>, '\  
glabrous or pubescent. Flowers in dense axillary subsessil& .  
pedicels |-1 in. long, slender, ascending, browu-puberuloUL<sup>^</sup>  
clothed with brown pubescence ; tube jjj[-£ in. long, narrowly tt\, -p-"  
limb |—fa in. long, divided into 5 linear subacute segments.  
obovate-spathulati<sup>1</sup>, little exserted. Stamens 10, all fertile, alte<sub>v</sub> i  
; long and short. Ovary pubescent. Pods stalked, 10-12 by |J£<sup>et</sup>"  
nearly straight, somewhat turgid, glabrous, conspicuously reticulate  
veined **with** longitudinal wavy lines, rostrate with the style; stalk 1 *n*  
long. Seeds 20-30, globose-ovoid, *fa* in. in diam., dark  
browj polished, **Fl. B. I.** v. 2, p. 277 ; **Dalz. & Gibs.** p. 82 ;  
**Bedd. Fd Man.** p. xei; **Talb. Trees, Bomb.** ed. 2, p. 147 ; **Woodr.**  
**in Jonnfto Bomb. Nat.** v. 11 (1808) p. 428 ; **Watt, Diet. Econ. Prod.** v. 1,  
p. 420.—1 **Flowers : Oct.-Nov.** VEEN. *Aml.*

Moist forests of the Konkan and Jf. Kanara, *Talbot*.—DISTRIB. Througliout India. *U*

5. **Bauhinia foveolata**, *Dalz. in Jown. Linn. Soc.* v. 13 (1873)  
p. 188. A large dioecious tree reaching 100 ft. high; stem straight<sup>^</sup>  
9-10 ft. in girth. Leaves suborbicular, 5-9 in. long, about as broad  
asj, long, divided about £ of the way down into 2 subacute lobes,  
glabrousH **above**, more or less pubescent or tomentose beneath, closely  
reticulatelyJ veined and with numerous small pits between the veins on  
the lowei side, base cordate with a deep sinus; main nerves 15-17,  
very con-<sup>^</sup>spicuous beneath ; petioles lf-2 in. long, pubescent,  
thickened at bothj ends. Flowers subsessile, in dense racemes  
forming a terminal much-j branched panicle. Calyx  
ferrugineo-tomentose; tube £-| in. longi narrowly turbinate; limb  
|-j in. long, splitting into 5 linear-oblongl

suba  
nito

It<sup>1\*</sup>. Petals not much exerted, obovate-oblong, **obtuse\***  
**Stamens** in the male flowers 10, all fertile, alternately in the  
 female flowers reduced to minute hairy **stami-**vary  
 rudimentary in the male, densely hairy and without **\*\* the**  
 fit-female clothed with long **hairs** and with a peltate stigma. ?y 1-1  
 r°strate in., stalked, linear-oblong, twisted, red, **tomentose, \*\*n the**  
 P-49(5 style. Prain, in Journ. As. Soc. Beng. V. 66 (1898)  
**vaukinia Lawii, Benth.** ex Baker, in Hook. f. FL B. I. v. 2,  
 £at- v. AWb. Trees, Bomb. ed. 2, p. 147; Woodr. in Journ. Bomb.  
 L<sup>1</sup><sub>7</sub> (1898) p. 428.—Flowers: Sept.-Oct. **VEBK.**  
*ChamoU;*

; road to **Matheran near** 3rd milestone from Nerai,  
**Woodrow. taluka, Woodrow. KAKABA** : moist forests of N.  
 Kauara, r/i !—**DISTRIB.** Apparently endemic.

!

**Vahlii, Wight \$ Am. Prodr,** (1834) p. 297- An  
 It) **t** with opposite **circulate** tendrils; young parts clothed or  
 rusty tomentuin. Leaves 4-10 in., **suborbicular,**  
 broader than long, divided about £ of the way down into 2 ^s v\ith a  
 broad sinus, reticulately veined, glabrous or nearly pnsely tomentose  
 beneath, base deeply cordate; main nerves :**oua** hairy ou the  
 underside; petioles **3-6 in. long, densely Flowers** in long-peduncled  
 terminal corymbose racemes; ,**kth** the pedicels |—J in. long,  
 linear-spathulate, ferruginous-fiicels variable **in** length, the lower  
 often reaching 2 in., 8te, the bracteoles linear,  
 subopposite, densely ferruginous-**pisteut.** Calyx densely  
 villous **with** fulvous or rufous hairs ; slender, ^-1 in. long; limb \$—<sup>^</sup>  
 in. long, splitting into 2 avate lobes. Petals white, -;|-1 in.  
 long, obovate-cuneate, 4ong the middle of the back with appressed  
 silky hairs and ^ped margins. Fertile stamens 3; filaments densely  
 villous at base. Staminodes 2-7. Ovary densely villous ; style  
 long, hairy ; r°gma capitate. Pods woody, rusty-downy, 9-12 by 2-2|  
 in., **shortly Liked, flat,** finally splitting open. Seeds **fr-12,**  
**oblong-ellipsoid, 1^ by an.,** compressed, dark-brown, polished. **Fl.**  
 B. I. v. 2, p. 279 ; Grab. ft. p. 64; Balz. & Gibs. p. 83; Talb.  
 Trees, Bomb. ed. 2, p. 147; Poodr. in Journ. Bomb. Nat. v. 11  
 (1898) p. 428; **Watt, Diet. Econ. rod.** v. 1, p. 424.—Flowers: Apr.  
**VEBW. Chambul.**



Tolerably **common throughout** the Presidency. **KONKAN: Stocks I; TConlian Ghats,**  
**'oodrowl;** moist forests of the Konkan **Ohats, Talbot;** Thai Ghat, **Graham;** near  
**oa, Dalzell DKCCAH: Khandala, Graham,**—**JISTHIB.** Throughout India in hilly **stricta.**  
 A sLr> g cordage is obtained from the **bark.** The amis are en ten raw **and** roasted,  
**net** the oung pods are **used** as a vegetable by MM lull tribes. The largo leaves are  
 •ed its lates by the poorer natives. See Watt, Diet. Eeon. Prod, 1. c.

**mhinia purpurea, Liiik, Sp. Pl.** (1753) p. 375. An erect ■30  
 ft. high ; branches stout, ghibrescent. Leaves 4-5 in. **in** mndish,  
 Ham about as broad as long, divided £-| the way down into or  
 subacute lobes, glabrous above, glabrous or faintly puberulous  
 eneath, base cordate; main nerves 9-11; **petioles 1-1^ in.**  
 long, Elabrous; stipules T V **in.** long, triangular-oblong, acute,  
**pubescent, ieciduous.** Flowers fragrant, **in** terminal and axillary  
 few-flowered



corymbose racemes; bracts beneath the **pedicels** <sup>ferian</sup> & \*S'. bu & pubescent; pedicels pubescent, **2-bracteate** below <sup>the mi\_T</sup> **S-fusiform**, pubescent. Calyx fulvous-pubescent; tube **f-rV** •',... **slightly** dilated upwards;" Limb | **in. long, splitting into** <sup>^ <\*</sup> **jj segments** slightly by | **IB,, oblongate**, acute, with a long daw, white, rose **slightly** divided at the apex into 5 short teeth. \* \e.

**fertile stamena 3-4; filaments as long as the petals.** very long **Btalk, puberaloua**; ovules **16—20** ; style # in< - oblique, peltate. Pods 6-12 by **f** in., subwoody, **flat**, pointed ends, gkhrous; stalk j-1 in. long. Seeds 12-16, oblong; <sup>^1 J g4. \</sup> compressed, | by \$ in., brown. Fl. B. 1. v.2, p. 284 ; Grab-<sup>• 1 j^rf^ K</sup> Dalz. & Gibs. **Soppl. p. »0 ; BedcL For. Man. p. xcii; laj^»?r.** Bomb. ed. 2, p. 147 ; Woodr. in Journ, Bomb- Nat, v. **J VaaA\ p. 428 j Watt, Diet. Econ. Prod. v. 1, p. 421.—Flowers: Bfl (1<**

.Nov.

VJEBN. ii\* *akm - h&n ekan\ Deva-kdnch an.*

Cultivated **throughout the** Presidency, **said by Talbot and Wood-row** to the **dry** forests of the **Konkan** and Dec-c;m. Grah»m and Dalzeil & **G-ib** it is only found in gardens, and **Triinea ni^kes** the same **statement** as reg j. Sparingly **throughout India** ;

*Bauhinia acuminata*, **lino. Sp. PI. (1753) p, 375**, an e<sup>vfc</sup> 8 ft. high with leaves divided less than | ~~way down~~ into 2 r acute lobes, pure white fragrant flowers and a pod 4-5 in. J rib at each side of the upper suture, is often cultivated **in gat not** indigenous in the Bombay Presidency, although **indigenoo** Provinces of India. **Fl. B. 1. V. 2, p. 276 ; Grab. Cat. p. 63**

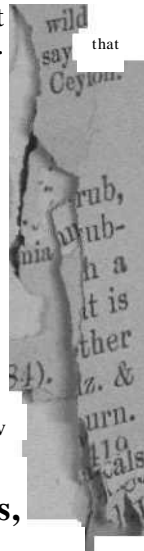
Gibs. Suppl. p. 30; Trim. **Fl. Ceyl. v. 2, p. 116**; Woodr. Bomb, **Nat. v. U (JS9S) p. 428 ; Watt, Diet, Econ. Prod. v. J** —Flowers : June. Y.EKN\ *Kdnc7ian.*

*Bauhinia variegata*, Linn. Sp. PL (1753) p. 375, a '**middle-si** with leaves divided | <sup>^</sup> the way down into 2 obtuse lobes, ""Bowl

**beautifully variegated with** red and yellow, or sometimes pure **wh3** (var. *Candida*) and fiat pods which are frequently variegated \VM|

reddish-brown streaks, is **cultivated** throughout the Presidency, often! a roadside tree, but is not indigenous in Bombay. EL B. I, v. 2, p. 28 Grab. Cut. p. 64 ; Dalz. & Gibs. **Suppl** p. 30; Talb. Trees, Bomb| ed. 2, p. 147; Woodr. in Journ, Bomb. JS<sup>r</sup>at. v. 11 (1898) p. 428 |i Watt, Diet. Econ. Prod. v. 1, p. 425.—Mowers; Nov. A<sup>r</sup>Eitw. %<\*><■'0%/% **nar ; Kovidara ; K&nchan.** j|

*Baukinia monandra*, Kurz, in Jom-n. As. Soc. Beng. v. 42 (1873) part 2, p. 73, which may be found in the old botanic gardens at **Dapodi** end at Graneah Khind **neai** Poona, Lias been mistaken for tfiis, but Las only 1 fertile stamen, whereas the **fertile** stamens of *JS, variegata* are 3-5. The pods of the Dapodi tree are about 6 by | in. flat **and. densely** ptibeseent. See Pram, Journ. As. Soc. Eeng. v, 66 (1898) p. 505.



**ywS**, shrubs, or very rarely herbs. Leaves 2-pinnate or less commonly simply pinnate. Flowers **small**, regular, **usually** 5-merous sessile, in globose heads or cylindrical **spikes** rarely shortly pedicel led a'''

to the calyx, rarely free. Petals valvate, equal in number  
 °ksctirel<sup>SG</sup> 8-' ^tee Or comiate \*n\*''° a i°t>ed corolla, hypogynous or ti i ( |  
 Pei'igynous. Stamens usually exserted, equal in number fo OP atj  
 or tw'ice or tbrice as many, or indefinite, free or momulelphous,

**b** t0 \*Λe Λase oΛ fcΛe \*uΛe oΛ Λie corolla» anthers dehiscing  
 f h l Sd  
 l

radicle straight,

exserted or **included**.

definite, 5-10 (**usually** 10).  
 iers gland-crested, **at** least in an early stage.  
 blowers in globose heads.

- Herbs ..... 71. A'KPTUSIA.
- A tree ..... 72. XVLIA.

**Flowers** in elongate spikes.

- A large **cirrhiferou** **dim** her ..... 73. ENTABA. I
- Erect trees or shrubs.  
 Not prickly ..... 74. ADBN'ANTHBRA.
- Prickly.

- Pod** turgid, **straight** ..... 75. PBOBOKS.
- Pod** this, finally twisted ..... 76- DICHEOETACHYS.

*Jkks* not gland-crested.

] 'od straight, with continuous -valves, **dehiscing**  
 I through the sutures ..... 77. LBUOJUJ. f

**Irod** slightly curved, with segmented valves, with  
 (' persistent inlehiscent sutures ..... 78. MIMOSA. //

tens free ..... 79. ACACIA. \*

Jiens **monadelphous**.

- 'Pod straight, *Hut* ..... 80. Aimzzik.
- ~ **circinate, often twisted** ..... 81. PITHECOLOBIUW. /

### 71. NEPTUNIA, Lour.

without prickles, **diffuse**, prostrate or floating. Leaves  
 2-ma'te; stipules **membranous, obliquely** cordate, persistent. Leaflets  
 •^toothed rac\_emes or globose umbels. Sepals valvate, connate **into** a  
 fco thp<sup>C</sup> or Globed calyx, rarely free. Petals valvate, equal in  
**number**

[umerous, small. **Flowers** 5-merous, sessile, in dense heads on axillary  
 blitary peduncles, polygamous, the upper flowers in each head

rnt H e oΛ fcΛe \*uΛe oΛ Λie corolla» a t h g  
 ^jj tani<iHy. Ovary free, iu the bottom of the calyx. Seeds  
 exal-  
 oi-n<sup>OUS</sup> or wittl **wantj** albumen; cotyledons flat; radic °' %  
 exsertd i l d d

**herma-prodite**, the lower usually male or barren. Calyx **small**, campanula!  
**-toothed**. Petals 5, strap-shaped, connate near the base. **Stamens**  
 [0 (rarely 5), free, exserted ; **anthers** gland-crested. Ovary **stalked**;  
**miles** many; style filiform; stigma **terminal, small**, concave. Pod  
 Coriaceous, flattened, JiguJate or **oblong**, 2-valved, suhseptate between  
 the seeds.—DISTIUB. Cosmopolitan in the Tropics ; species 8.

Annual, **sqaafcio** ..... 1- ^  
*olcracea*.

- iinial, torrcstriil ..... 3..... 2. *N. irkjuctra*.

1. *Weptunia oleracea*, *Lour. Ft. CocMneh.* (1790) p. 054. **Annual**, **looting**; stem elongate, soft, swollen, not **moeh** branched, emitting **Render fibrous** roots **in** abundance from the leaf- arid flower-bearing nodes. Leaves abruptly 2-pinnate; stipules obliquely ovate-cordate, **acute** ; common **petioles** U~1| in. long; **pinna?** 2^i pairs, opposite, **shortly** stalked. Leaflets **b-15** pairs, sessile, j-% by ^j-§ in., narrow-)blong, obtuse, glabrous. Flowers minute, sessile, **in** • **oblong heads** i a ;^% ]0J1g, the lower flowers replaced by numerous yellow staminodes ' I| m\*. long ; peduncles 3-6 in. long, stout, erect, tapering, glabrous,

with frequently a membranous ovate acute bract about the **Oalyx**  $\frac{1}{4}$  in. long, membranous; lobes acute. Corolla  $\frac{1}{2}$  in. \*<sup>01</sup> lobes linear-oblong, acute. Stamens 10, much exserted; anthers crested. Pods stalked, deflexed,  $\frac{1}{2}$  in. by  $\frac{1}{2}$  in., slightly **curro** at the base, depressed between the seeds, beaked, dry, dehiscing the upper suture. Seeds 6-9, obovoid-oblong, slightly compress  $\frac{1}{2}$  in., brown. Fl. B. I. v. 2, p. 285; **Dalz. & Gibs.** p. <sup>84</sup> Lv; 42S; Ceyl. v. 2, p. 118; **Woodr.** in Journ. Bomb. Nat. v. 11 (<sup>18</sup> S<sub>j</sub> gp. Watt, Diet. Econ. Prod. v. 5, p. 348. *Desmanthm natan* \$, v > <sup>iu</sup> PI. v. 4 (1805) p. 1044; Grah. Cat. p. 57.—Flowers : Oct.-1>e.

KOSKAK: in tanks, *Graham, Daleett & Gibson*, GUJARAT: Hausan, *pj* rOH < rh-KAKABA: Halyat (N. Kanara), *Ritchie*, 1035!, 2b#otf, *Wbodtr* W.—PISTBIS-out India in tanks; Ceylon and the [Tropics generally.

## 2. *Neptunia triquetra*, *Benfh.*

se heads; peduncles solitary, axillary, spencer, distant bracts on (he peduncle. **Cahix** » s 10; anthers gland-crested. Pods ly equal-sided and tapering at the base, romncte sessile, |~| by fV in. or absent) in globose heads; peduncles solitary, axillary, spencer, 2 1 di b d 1 ovate

5-toothed. Stamens 10; anthers gland-long, straight, nearly equal-sided and tapering at the base, with a minute beak at the apex, veined, glabrous, black **when** -Seeds 4-8, oblong, rounded at the apex, compressed,  $\frac{1}{2}$  by  $\frac{1}{2}$  in. \* , brown, polished. PI, B. 1. v. 2, p. 286; **Dalz. & Gibs.** p. **84f** in Journ. Bomb. Nat. v. 11 (1898) p. 428. *Desmantlius* Willd. Sp. PI. v. 4 (1805) p. 1045; Grah. Cat. p. 57; t. 756.—Flowers : Aug.-Oct.

KONKAN: Bombay, *Capt. Geburne* \ DBCCAN; Abmednagar, *Choice* !, Q-0JASAT: common in pastures about Surat, *Graham, Dalselty Gibson*; Sura! row. S. M. OotrsTRY: Padshapur, near Belgautn, *Bitc&ie*, 1729!—] (W. Peninsula, Bandelkband),

## 72. *XVLIA*, *Benth.*

A fall unarmed tree with hard wood. Leaves 2-pinnate. Leaflet\* large, of few pairs. Flowers in globose heads, mostly perfect. Calyx! tubular, 5-toothed at the tip. Petals 5, valvate, slightly cohering at the? base. Stamens 10, free, exserted; anthers gland-crested in an early stage. Ovary sessile; ovules many; style filiform; stigma minute, terminal. Pod **large**, woody, flat, broadly falcate, finally dehiscent! septate between **the** seeds. Seeds oblong, compressed, with a short fleshy funicle.—DISTBIB. Tropical Asia • species 1.

1. *Xylia dolabriformis*, *Benth.* in *Hook. Journ. Bot.* v. 4 (1842)\* p. 417. A tall tree; young parts tomentose. Leaves 2-pinnate pinnte 2, terminal on a petiole 1-2J in. long which is furnished with a gland at the apex between the **pinnae**. Leaflets 2-4 pairs, diminishing downwards, with often a small unopposed leaflet on the outside below **the** lowest pair of leaflets, the terminal leaflets 3-6 by 1|-2| in. lowest pair **14—1** in. long, all oblong, acute, with rounded base, coriaceous, glabrous; petiolules ^ in. long. Flowers sessile, in dense

globose heads I

10 fruit o

?~

- in diam.; peduncles 3 in. long, slender, thickening young jointed on short puberulous branchlets developed with the wish' tubular, 4 in. long; teeth 5, valvate. Corolla filaments 5; petals lanceolate, valvate, Stamens 10; anthers crested when young with a 1-2 cell gland. Ovary sessile; ovules many. Pods 4-6 by knot woody, oblonger. falcate, flat, rusty-tomentose, septate

Hlu O/I P\* n 148; W... ir. in Journ. "Bomb. Nat. v. 11 (1898) DcTpi  
■) \*\* ■i<t. Econ. Prod. v. 6, part 4, p. 320. « vyloearpa, Vsto,  
r- \* v" 2» P- 439? Grab- Cat, p. 57.—blowers: Mar.-Apr.

5\*oaur- is/ Law], Dalzell\ Savant?adi, JDalzeU f Gibson, KanitkarX • Kuna  
©at, Graham, g. M. COUNTY\* Kamgbiit, liitchie, 239! KANARA:  
■^i^Da)- cj?' "\*/o d'otoi Kala nadeii, Ritchie, 2\ Vd'. —DISTKIB. India (W. Peninsuln,  
Tiie' »!Pore= Philippines, Indo-China.

:i|i'l tel j'Ooc' s verJ hard and durable and especially adapted for railway sleepers  
^!OQl, Sl> ^oS3 aS It Pesists Ae attacks\* of white ant a. See Watt, J>ict. Econ.

t  
J

### 73. ENTADA, Adams,

woody climbing shrubs, cirrhiferous, unarmed. Leaves 2-pinnate; leaflets small, setaceous. Flowers 5-merous, in long narrow spikes, gamopetalous, polygamous. Calyx campanulate, very shortly and equally

yg y p y y

### q y

i Petals free or slightly cohering, valvate. Stamens 10, free,

young exserted ; anthers crested with a deciduous gland. Ovary sub-bilocular; ovules numerous; style filiform; stigma concave, terminal, flat, woody, very large, composed of many discoid 1-seeded joints, endocarp persistent round the seeds. Seeds orbicular, compressed. BENTHAM. Species 10, of which 1, the following, is widely spread throughout the Tropics; of the others 6 are African and 3 American.

Hi, Entada scandens, Benth, in Hook. Journ. Bot. v. 4 (1842) ' 332. An immense woody climber with a thick trunk; branches reflex, glabrous. Leaves 2-pinnate; main rachis glabrous, grooved, usually ending in a bifid tendril; petioles 2-3 in. long, glabrous; nerved 2-3 pairs, stalked. Leaflets 1—3 by 1-1.5 in., oblong or obovate-long, obtuse, often emarginate, rigidly coriaceous, dark green,

glabrous, ticulately veined, base acute; petiolules  $\frac{1}{2}$  in. long. Flowers in peduncled, paniced, or simple spikes 6-10 in. long, axillary or from the nodes of old leafless branches. Calyx about  $\frac{1}{2}$  in. long, minutely 5-toothed. Corolla  $\frac{1}{2}$  in. long, yellow. Pods 1-3 ft. long by 3-4 in. and  $\frac{1}{2}$  in. thick, slightly curved, woody, the sutures very thick,

indented between the seeds. Seeds 6-10, orbicular or orbicular-oblong,  $\frac{3}{4}$ - $2\frac{1}{4}$  in. in diam., compressed, smooth and shining, brown. The joints of the break away from the thickened sutures which remain as an

pod

I<sup>1</sup> empty frame, Fl. B. I. v. 2, p. 287; Trim. EL Ceyl. v. 2, p. 119; J<sup>A</sup>Talb Trees, Bomb. ed. 2, p. 148; Woodr. in Journ. Bomb. Nat. v. 11 fclC1898) p. 4<sup>s</sup>; Watt, Diet. Econ. Prod. v. 3, p. 245. *Entada pumtka*, J DO. Prod. v. 2, p. 4t?S ; Grah, Cat. p. 56; Dalz. & Gibs. p. 83,— 1 Flowers: Mar.-May, VISES. Odrdnl; G&rambi; GarU,

In the forests alone the Gh&a, *Balsell* # *Gibson*. KOKKAN: S&W& -r; Kḡḡkaḡ fḡ the Mahablesbwar, *RalphX* DacOAir: Lanoli wood, *Woodrow*. KAS\AKA: TM« ?-...,,...,,), N. Kanara Ghats, often along river banks, *Talbot*; Sirsi-Kumpta road (a. ^ (WfW; Kala naddi, *litickie*, 230 f—DISWUB. India (Central and Eastern lavas, Nipal, W, Peninsula); Ceylon, and the Tropics generally-

## 74. ADENANTHERA, Linn.

Unarmed trees. Leaves **2-pinnate**, Leaflets **natnerouSi J** Flowers usually 5-merous, in elongate **spiciform** racemes, axil -. panieled at the tops of **the** brandies, usually **hermaphrodite**. **J** **campanulate**, shortly and equally toothed. Petals valvate, <sup>coa</sup>J^ below the middle **or** at length free. Stamens 10, free, scarcely' «J^iig | anthers crested **with** a deciduous gland. Ovary sessile; ovules : style filiform; stigma small, **terminal** Pod strap-shaped . falcate, compressed or turgid above the seeds, the coriaceous valves ^ twisted after they .separate. .Seeds small, brightt-colored.--~iJIS' Tropics of the Old World ; species 4. |

### 1. *Adenantha pavonina*, Linn, 8p. PI (1753) p

unarmed tree 20-50 ft. high ; young parts glabrous. Leaves 2-pinnate, 8-12 in. long ; petioles 2-4 in. long ; pinnae 3-6 pairs, opposite, 3-6 in. long, with a stalk  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Leaflets alternate, 4-8 pairs, 1-1  $\frac{1}{2}$  by

^| in., papery, **ellipfcie-oblong**, **obtuse**, glabrous, dark green glaucous beneath, base shortly cuneate, unequal-sided ; petiolulee\j long. Flowers in short-pedunded racemes 2-6 in long, axillar panieled at the ends of the branches ; pedicels yV~a <sup>m-</sup> ^on?' s^ Calyx minute ; lobes short, triangular. Corolla pale yellow, about" long; segments united at the base only, linear-Lanceolate, acute, va **Stamens** 10, free, hardly **asserted**; **anthers** gland-crested. Pods urn. by |-1 in., flat, falcately curved, pointed, tapering to the b^ **valves spirally** twisted after **dehiseenee**. Seeds 8—15, l i J 1 with a blunt keel, smooth, shining, usuallv brilliant **scarlet**, A in\* diam. PI. B. I. v. 2, p. 287; Grab. Cat. p. 57; Balz. & Gibs. Sup p. 26; Bedd. Flor. Sylvat. t. 46; Trim. PI. Cey.1. v. 2, p. 120; Tail Trees, Bomb. ed. 2, p. 149 ; Woodr. in -Tourn, Bomb. iSIat. v. 11 (189| p. 428 ; **Watt**, Diet. Econ. Prod. v. 1, p. 107—Flowers : Mar.-Ma *Thorla-gunj*, *liatan-gunj*.

Often planted ; rare in the wild state. In gardens at Kolaba, Byculla, and g wild in some parts of Gujarat und Khandesh, *Graham*. Native of S. India, in garden Bombay, *Dalzell* § *Gibson*. Moist forests of the Konkan and N. Kanara, nowber abundant, *Talhot*,—DISTRIB, India (Bengal, Birnia, W. Peninsula); Ceylon; Ma] Islands, Timor, China, Philippines. <sup>v</sup>

The timber is used as a substitute for red sanclalvood (*Pfcrocarpm santalinus*) an^aj the bright-red polished seeds are used as weights and are also strung as beads. Sees Watt, Diet. Econ. Prod. 1. c.

## 75. PROSOPIS, Linn.

Erect prickly trees or shrubs. Leaves 2-pinnate ; **stipules small or** { Leaflets small, narrow. Flowers 5-merous, usually sessile, in narrow spikes or **subspicafce** racemes. Calyx campanulate, shortly **toothed** o subentire. Petals connate below the middle or at length free, valvate<sup>1</sup> Stamens 10, free, shortly exserted; anthers crested with a deeduou^i gland. Ovary sessile or stalked j ovules many; style filiform ; '



LEGUMINOSAE.

\*r><>oiy tw<sup>4</sup>!fj    ^o^ tuV^» cylindrical or oblong, straight, falcate or  
 d<sub>s</sub> \* j<sup>isfcd</sup>d» septate between the seeds; mesocarp thick, spongy.  
 !i!^ ovto  
 —DISTIB. Tropical and subtropical

ffi 8 K PV<sup>s</sup>; P<sup>o</sup><\* 4-8 in. lone ..... 1- P. •pWffw\*  
 0 ° P^i-s; pod ^\_j in\_ lon^ ..... 2. P. *Slcphu-niaua*.

Zinn. j&m&««. (1767) p. 6S. A tree,

Ingh, sending its roots many feet into the ground ; branches cornpp\*  
 Sjabrous, armed with nearly straight, scattered, somewhat

oblique. Flowers sessile or nearly so, in short-peduncled axillary spikes  
 and terminal panicles; bracts small, membranous. Calyx  $\frac{1}{18}$  in. long,  
 membranous, cup-shaped, faintly 5-toothed or truncate. Corolla yellow,  
 $\frac{1}{8}$  in. long.

torulose. 2-pinnat<sup>l</sup> Pr<sup>r</sup> ickle<sup>s</sup> §-| in. long (very rarely unarmed).  
 a brown Leaves °Pposit 6i <?^U r^acAs glabrous or puberulous ; pinnao  
 Fl. B. I. usually 2 pairs, Leaflet% < in\*Jong» often with round  
 Flor. § insect-galls on their rhaclmes. »/Jr , Pairs' i~R °y B-fV \*"•>  
 ed. 2/ **subsessile**, oblong, obliquely rounded at the apex, very  
 unequal-sided, the upper side **much** the veined, **grey**, glabrous,  
 base **rounded** and very

Pods 4-8 in. long, **turgid**, straight, slender, **cylindric**,  
 glabrous, narrowed gradually into a short stalk and filled with  
 farinaceous edible substance. **Seeds** 10-15. dull-brown, oblong,  
 . v. 2, p. 288 ; Grah. Cat. p. 57 ; Dalz. & Gibs. p. 84 ;  
 Bedd. ■hat. t. 56; Aitch. **Pb.** & **Sind** PL p. 53; **Talb.** Trees,  
**Bomb.** p. 149; Woodr. in Journ. Bomb. Nat. v. 11 (1808) p.  
**428**■; Diet. Econ. Prod. v. 6, part 1, p. 340.—Flowers:  
**Dec-Mar.** *Shemi* ; *Saundad j Sumri* ; *KandL*

lily, i|M:n: *Law*, *Woodrow*. Srsno: *Stocks I*, *Wcodrowl*; Karachi to Mugger  
**Peer**, Shikarpur, *Coo&ei*; Rule, *Cooke* !—DtSTiuu. India (Paujab,  
**Kajptitaaa**, i<sub>(fld)</sub>, and dry regions of W. Peninsula); Belucbistan, Afghanistan.  
**Persia. larinaeouB** snbstance which the pods contain is lurgely **consumed** as  
 food by jorer classes ; ihe pods are also **an** exeellent fodder fui\* e^roels and goats.  
 The is not durable, but furnishes good **fuel**. See Watt, Diet, Econ. Prod. I. c.

**12. Prosopis Stephaniaua, Kunth, in Spreng. Syst.** v. 2 (1825) 3  
 32C. A shrub or small tree; branches **puberulous**, whitish when \*  
 ung\ armed with numerous sharp slender pale-yellow prickles. Leaves **Bf§**  
 pinnate, 1-2 in. long ; main rhacbis finely downy ; petioles short;  
**jinnffl** 3-5 pairs, their rhachises finely downy. Leaflets 8-12 **pairs**,  
 ^\_1 by ^J~TV ^n-j subsessile, oblong, very oblique, closely downy beneath  
**ind** with ciliate margins. Flowers in axillary spikes which are h  
**much** bnger than the leaves. Calyx enp-shaped, ^ in. long,  
 membranous, **ibseurely** 5-tootlied. Petals \$-^ in. long, ovate-oblong,  
 acute, yellow, **eas** 10. Ovary glabrous. Pods stalked, |-1 by |-^  
 in., oblong, [obtuse, black, filled with a soft pulp. Fl. B. I. v. 2, p. 288  
 ; Benth. in Vtlook. Journ. Bot. v. 4 (1842) p. 847; Woodr. in Journ.  
 Bomb. Kafc. 11 (1898) p. 428; Watt, Diet. Econ. Prod, w 0, part 1, p.

342.

Very rare in the Bombay Presidency. GUJAEAT : Goga, *Wbodrow*.—DISTBIB. India  
i; Caucasus, Orient, **Afghanistan**.  
oda are often infested with **inseota** and become large and irregular in form,  
"are **employed** fur tanning in **Afghanistan**.

76. **DICHROSTACHYS, DC.**

^ Shrubs. Leaves 2-pinnate. Leaflets usually small, raultijugate. Flowers 5-merous, minute, polygamous, in solitary or twin peduneled spikes, perfect **in** the upper half of the spike, those of the lower half bearing long filiform staminodes. Calyx campanulate, shortly toothed. Petals cohering below the middle, valvate. Stamens in the hermaphrodite flowers **10**, free, shortly exserted; anthers gland-crested. Ovary subsessile; ovules many; style filiform; stigma terminal, truncate-Pod linear, compressed, twisted up when ripe, continuous within, in-**dehiscent**, or the valves separating irregularly from the sutures. Seeds obovoid, compressed.—DISTBIB. Tropical Asia, Africa, and Australia; species 5.

1. **Dichrostachys cinerea**, *Wight Sf Am. Prodr.* (1834) p. 271. A much-branched thorny shrub, sometimes a small tree 5 bark light-colored, furrowed; branchlets ending in spines. Leaves 2-pinnate, 15-21 in. long; main rhachis more or less softly pubescent, with a **small** erect gland between each pair of pinnae; stipules X in. long, subulate from a triangular base; pinnae 8-14 pairs, 1-1 in. long, sessile or nearly so. Leaflets minute, sessile, 12-20 pairs, close, linear, oblique, subacute. Flowers numerous, crowded in dense axillary or extra-axillary spikes 1-1 in. long, the upper half of the spike yellow, the lower red. **Calyx** 5-lobed, membranous. **Corolla** 5-lobed; lobes 1-1 in. long; Stamens of **the** perfect flowers in the upper half of the spike yellow. Stamens in the lower half of the spike 1-1 in. long, much longer than the **stamens**, red. Pods 2-3 by 1-1 in., glabrous, flat, subarticulated, dark brown, **twisted** up when ripe. Seeds **6-10**. *Fl. B. I. v. 2, p. 288; Griseb. Wn. p. 57; Dalz. & Gibs. p. 84; Wight, Icon. b. 357; Trim. FL Ceylon p. 121; Talb. Trees, Bomb, ed.2, p. 149; Woodr. in Journ. Bom v. 11 (1898) p. 428; Watt, Diet. Econ. Prod. v. 3, p. 100.—FL Sep.-Oct. VERN. Sigam Kdti.*

DECCAN: common on dry stony hills; Poona, *Coofce'*, *Woodrow* [Biidami, *Jey Woodrow*. S. M. COUNTRY: P&Dshapur, *Ritchie*, 1055! KANAKA: cultivated] N. Kanara, *Taibot*.—DISTRIB. India (N.W. Provincea, Central India, **Rajputa W. Peninsula**); Ceylon, Malay Islands, N. Australia.

77. **IMTUXJCJENA, Benth.**

Unarmed trees or shrubs. Leaves **2-pinnate**; stipules setaceous or small. Flowers 5-merous, sessile, usually hermaphrodite, in globose heads; peduncles axillary, subfasciculate, or the upper arranged in terminal leafless raceme; bracts usually 2. **Calyx** tubuloso-campanulate, shortly toothed. Petals free or nearly so, valvate. Stamens 10, free, much exserted; anthers not gland-crested. Ovary stalked; ovules many; style filiform; stigma small, terminal. Pod stalked, strap-shaped, flat, coriaceous, continuous within, dehiscent. Seeds transverse, ovoid, compressed.—DISTRIB. Species 8, chiefly American,

1. **Leucama glauca**, *Benth, in ffooJc, Jburn. Bot. v. 4 (1842) p. 416*, A large erect shrub or small tree 6-20 ft. high, unarmed. Leaf, 2-pinnate, 3-7 in. long; main rhachis slender, channelled, pubescent, ending in a weak spine; petioles 1-2 in. long; pinnae 3-6

pairs, 2-3| m.

\*hort]v  
 1 1 \*^ ed, their xiutchises pubescnt, ending weak memb  
 ^ pairs, rather distant, \$ by ^ in.,  
 Sent ben' 'J7c<:\*l''''o''10n gS acute, glabrous or nearly so  
 above, finely pubes-i (o, ase oblique. Flowers in dense  
 globose heads ; peduncles  
 i-l| in. long, slender, **pubescent, elongate** and **slightly «uit.**  
 Calyx -fe-^ in. long, tubuloso-campanulaU<sup>1</sup>, **mem-' rated** teetfl silorf  
**triangular.** Petals \ in. long, **spathulate-oblong, ea at the tip,**  
 whitish. Stamens 10, **much** exserted ; anthers not *I in* f<sup>e?</sup>\*  
 Ova<sup>T</sup> **shortly stalked, slightly** pubescent. Pods 5-6 by . '» straight,  
 flat, obliquely triangular at the apex, narrowed at the ' p, 2Q<sub>n</sub><sup>^a</sup> stalk  
*l-l* in. long", glabrous. Seeds 15-20. Fl. B. I. v. 2, v **j** <sup>u</sup>i Jalb.  
 Trees, Bomb. ed. 2, p. 150 ; Woodr. in Journ. **Boinb.Nat, (ae y<sup>^</sup>.<sup>98</sup>)**  
**P-<sup>4</sup>-S; Watt, Diet.** Econ. Prod. v. 4, p. 632. *Acacia 'Ph(i)'*  
<sup>^</sup>- Sp- PI. v. 4, p. 1075; **G-rah.** Cat. p. 58. *Acacia teuco-ivfrTfi* Jjink<sup>t</sup>  
**Enum. v. 2, p. 444 ; Dalz. & Gibs. Suppl. p. 26.—Flowers:** ■ "<sup>u</sup>ctj  
 VEEN-. *Kuhdbhal.*  
 ij \* <sup>Ve</sup> **P Tropical America naturalized in the** .Bombay Presidency and more or <sup>^</sup> i%  
 (Vfc<!'n Hni^ ^n^a> It is common in **gardens, where,** owing to its **spreading** roots, <sup>o</sup>iit-;!,  
<sup>^</sup>V to p<sup>r</sup>adieate.—DISTUIB, **Tropical Asia and Africa, but** probably indigenous ' America.

## 78. MIMOSA, Linn.

tep **shrubs,** or small trees with or without prickles.  
**Leaves** te. Leaflets small, usually **sensitive.** **Flowers**  
**polygamous,** , in dense globose heads or **eylindric** spikes, often  
 tetramerous; **leg** axillary, solitary or fascicled, the upper  
 often forming a Je« Calyx usually minute, almost  
 inconspicuous. Petals more or onnate, valvate. **Stamens** twice  
**equal in** number to the petals or **twice finy,** free, exserted ; e>sit  
 anthers small, not **gland-crested.** Ovary **sessile** <sup>^</sup>'jftlkd; e  
 ovules many; style **filiform** ; stigma small, terminal, do up of  
 1-seeded joints that separate when ripe from th tent sutures,  
 Seeds ovoid or orbicular, fiat. — **BISTBIB.** **Chiefly** logical  
 American ; species about 230.

- innpe of **the lesves 12 pairs** ..... 1. *31. pudica,*  
 'mute of the **leaves** move **than** 2 pairs.  
 Pod glabrous, the antures not **prickly** ..... 2. *M. rubicatti\*.*  
 Pod pubescent, **the sutures** **prickly** ..... *S. M. fatt/tata.*

**fl. Mimosa pudica, Linn. Sp. PI, (1753) p. 518.** A **diffuse**  
 under-Krub 1<sup>^</sup>-3 ft. high ; stems and **branches** sparingly prickly *and*  
 clothed fith long weak bristles from bulbous bases. Lea<sup>r</sup>e3 **sensitive,**  
**digitate ; itioles 1-^** in- long, bristly ; stipules | in. long, **linear-laneeolate,**  
**aute<sup>^</sup> ■istly ; pinn»** 1-2 pairs, 2-3 in. long, sessile or nearly so, their  
**rhachises** clothed *with* ascending bristles. Leaflets 12-20 pairs, |-j  
 b)<sup>f</sup> £ in., **feessile,** coriaceous, **linear-oblong,** acute, glabrous above,  
 clothed **with [ppressed** bristles beneath, base obliquely rounded.  
**Flowers 4-merous,** ' )ink, in globose heads, |-^ in. in **diam.** ; peduncles J-1  
 in. long, **prickly,** fisually in axillary pairs all along the branches;  
 bracteole solitary, linear, **Ieute**" ciliolate. Calyx very minute.

divided about  $\frac{3}{4}$  the way down ; lobes 4, ovate-oblong, obtuse. Stamens  
 4, much exserted ; anthers not gland-crested. Pods  $\frac{1}{2}$ - $\frac{3}{4}$  by  $\frac{1}{8}$ - $\frac{1}{6}$  in., flat,  
 slightly recurved, consisting of 3-5 one-seeded joints which fall away

**rom** the persistent sutures which are clothed with spreading **yellow**  
 Corolla pink, ^g—^ in. **Ionff**

**weak** bristles  $\frac{1}{2}$  in. long, the **faces** of the pods **glabrous**. **Fl. B. I. v. 2,** p. 291; Grah. Cat. p. 56; Dalz. & Gibs. Suppl. p. 25; Benth. in Mart. Fl. Bras. v. 15, part 2, p. 316; Talb. Trees, Bomb. ed. 2, p. 150; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 428; Watt, Dict. Econ. Prod. v. 5, p. 248.—Flowers : **Sept-Oct.** **VEBN.** *Ltjdlu.*

The calyx is so minute **that** it is often overlooked. **Linnaeus** (*L. e.*) describes the corolla as the calyx and says there is no corolla.

The *Sensitive Plant*, naturalized more or less throughout India, probably **introduced from Tropica]** America.

2. **Mimosa rubicaulis**, *LamTc. Encyc Metk. v. 1* (1783) p, 20. A large straggling shrub; branches yellowish, grooved, furnished with numerous straw-colored hooked prickles. Leaves 2-pinnate, 5-7 in. long: main rachis slender, grooved, closely set with numerous straw-colored hooked prickles; stipules  $\frac{1}{2}$  in. long, subulate; pinnae 5-11 pairs,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, shortly stalked, the rachises without prickles. Leaflets 8-15 pairs,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, linear-oblong, obtuse, mucronate, unequal-sided, glabrous above, slightly pubescent beneath, base **obliquely rounded** or truncate; petiolules very short. Flowers 4-merous, in globose heads; peduncles slender, axillary and crowded at the ends of the branchlets,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, densely pubescent; bracteole solitary,  $\frac{1}{2}$  in. long, linear-spathulate, ciliate at the apex. Calyx minute,  $\frac{1}{8}$  in. long; teeth very short, ciliolate. Corolla  $\frac{1}{2}$  in. long, divided about  $\frac{1}{2}$  of the way down; lobes 4, ovate-oblong, acute. **Stamens** 8. Ovary shortly stalked, glabrous. Pods 3-4 by  $\frac{1}{2}$  in., flat, falcate, glabrous, consisting of 4-10 one-seeded joints which fall away from the persistent sutures (**which** are not (except very rarely) spiny or bristly on the margin). **Fl. B. I. v. 2,** p. 291; Grah. **Gat/p.** 56; Dak & Gibs. p. 85; Pb. & Sind PI. p. 53; Talb. Trees, Bomb. ed. 2, p. 150; **Joura.** Bomb. Nat. v. 11 (1898) p. 428; Watt, Diet. Econ. p. 249. *Mimosa octandnt*, Koxb. Cor. PI, v. 2, p. 55, t. 200.-Aug.-Oct. **VEHN.** *Aral.*

In the dry districts of the Presidency. **DKCCAN:** Poona, *Woodrow!* **SIKD:** *StccL*  
—**DtSTHIB.** Throughout: India; Afghanistan, *m \*

3. **Mimosa hamata**, *Willd. Sp, PI v. 4* (1805) p. 1033. A **muell** branched armed shrub; branches downy, **furnished** with numerous straw-colored curved or straight prickles. Leaves 2-pinnate, 4-2 in long; main **rachis pubescent**, sometimes prickly; stipules  $\frac{1}{2}$  in. **long subulate**, hairy; pinnae 3-10 pairs,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, shortly stalked, the rachises downy, sometimes prickly. Leaflets 10-15 pairs,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, ovate-oblong, acute, **mucronate**, glabrous or nearly so above, more or less pubescent beneath, base oblique, rounded; petiolules very short. Flowers 4-merous, in globose heads; peduncles **axillary and** crowded at the ends of the branchlets,  $\frac{1}{2}$ - $\frac{3}{4}$  in.

few prickles; bracteole solitary, linear-spathulate, ciliate at the apex. Calyx  $\frac{1}{8}$  in. long, shortly toothed. Corolla pink,  $\frac{1}{8}$  in. long, divided nearly  $\frac{1}{2}$  way down; lobes ovate-oblong, acute. **Stamens** 8. Ovary stalked, pubescent. Pods 2-3 by  $\frac{1}{2}$  in., flat, falcate, pubescent on the faces, consisting of 4-8 one-seeded joints which fall away from the **persistent** sutures which are furnished with hooked or straight prickles. Seeds  $\frac{1}{2}$  by  $\frac{1}{2}$  in., chestnut-brown. **Fl. B. T. v. 2,** p. 291; **Grab.**

**Gai**  
long, slender, downy, often with  $\frac{1}{2}$

**79. ACACIA, Willd.**

**tj|Hfj<sup>ees</sup> °r shrubs** erect or climbing, usually armed. Leaves

p. 56; D  
in Jor  
Arkan

- & Gibs. p. 85 ; Talb. Trees, Bomb. ed. **2, p. 150 ; Woodr.**  
-Bomb. Nat. v. **11** (1898) p. 428.—Flowers: Sept.  
**YEUS\* I Ardti.**

r @Pt; *Geburncl* DECCAN: widely, *Woodrow*; Poona, *Cookel*; Chandri,  
^74431; ravines near Ileivra, *l)k.lzell*; Chattersingbi **bill** near Poona,  
^f-OoTt \*\*U AHAT: iSurafc, *Graham, DaleeUl*; Porbandfir (Kathiawar),  
*Go&Ae*) WET: common on the Kuput range of hills, Dliarwar distrkit, *Talbot*.—  
tia {W. Peninsula).

2-pinnate; **ll\*u I)**<sup>68</sup> s|<sup>n</sup>eseen\* or inconspicuous, rarely membranous.  
Leaflets **BloW** ma^' mu^>J<sup>uffate</sup> or reduced to a leaf-like petiole  
(phyllode), , <sup>er</sup>s small, hermaphrodite or polygamous, usually  
5-nierous, **in »r n** <sup>SQ-</sup> a(As or **cy^ndric** spikes; peduncles axillary,  
solitary or fascicled \*ha i^ec\* at \*Ae enc|s of t<sup>ne</sup> branches. Calyx  
**ctfnipanulate** or funnel-shortly toothed. Petals exserted, more or  
less **uaited**, rarely ■7^«unens indefinite, much fixserted, free ; anthers  
small, not gland-.s} M ! Orary sessile or staUted ; ovules many ; style  
filiform; stigma a p> terminal. Pod ligulate or oblong, not jointed,  
usually compressed s h diy, dehiscent or indehiscent, rarely turgid  
and subcylindric, the ^ straight or wavy, not thickened.—Disritm.  
The leaf-bearing cosmopolitan *in the Tropi.cs..\_f;he* erat  
pbyjldineous series, comprises two-thirds of the genus, almost  
restricted to Australia ; 430.

groups ifeJ^ejt troes or shrubs.  
which . owers in globose heads. ^T  
species' ifeads on axillary peduncles.  
"tU Pod inoniliform ..... J. A.  
*arabka.*  
■Jin s<sup>ufm</sup> ■ *t<sup>o</sup>d eyliailrie*, ttrgid, not moniliform.

- gS H y Pod nearly straight; )etiole glandular ..... 2. A. *Farttesiatm.*
- I ^ / f\*0^ eireinate; petiole pgland i [lar ..... 3. A. *plait if mm.*
- I / Pod fiat.
- Leaflets 5-8 pairs, rinbroua,
- ^% A small (ree -with ill-smelling flowers; pod longi  
tudinally veined ..... 4. A.  
*churnea.*
- A bushy shrub with very fragrant flowers; pod  
transversely or retieulately veined ..... 5. A. *JacquemontL*
- eafietB 20-,)0 pairs, tomentose ..... <>. A. *tomentosa.*
- in panicles ..... 7. A. *leueopMcea,*
- .Flowers in i-pikes,
- Pmn» 10-20pairs; bark white ..... 8. A. *Sttma.*
- J'imnv 20-40 pairs ; bark dark-brown ..... 9. A. *Catechu.*
- Pinnie S-6 pairs. Sttputar spines  
short, hooted.
- Stipuler spines io paire ..... 10. A. *fermginea.*
- Stipolar spines ternate ..... 11. A. *Senegal.*
- Stipular spines long, straight ..... 12. A. *lafronum,*


*IA saffeta* 1SS-30 pair,-?.  
|\xl thick, wrinkled when dry ..... 1\* A. *eorunnna,*  
'^l'od thin, not wrinkled when dry.  
**JIV** Leaflets i-J in. broad ..... |4. A.  
**leaflets j',1 in. broad**..... ■>-  
**40-50 Mirs** ..... 1\*>-

{ **Acacia arabica, WUld. Sp. PI v. 4 (1805) p. 1085.** A  
small

tree with dark brown or black longitudinal-fissured bark; **braichlets** slender, terete, pubescent when young. **Leaves 2-pinnate, 2-4 in.** long; main **rhacbis** downy, often furnished **with** glands; petioles 1-2 **in. long**; stipular spines **very variable, j-2 in.** long, **smooth**, usually whitish, straight, sharp, often absent; **pinnse 4-9 pairs, f-2 in.** long, shortly stalked. <sup>^</sup> Leaflets **subsessiie**, 10-25 pairs, £-£ by <sup>^-^</sup> **in., linear-oblong**, subobtuse, glabrous or nearly so. Flowers yellow, in globose heads; peduncles **axillary, in fascicles** of 2-6, terete, pubescent; bracteoles 2 above the middle of the peduncle, broadly ovate, acute, pubescent. Calyx campanulate, -J(7 in. long; teeth very short. Corolla | in. long; lobes short, triangular. Pods stalked, 3-6 by g-j| **in., moniliformi**, compressed, constricted at the sutures between **the** seeds, densely and **persistently** grey downy. Seeds 8-12. PL **B. I. v. 2, p. 203**; Grab. Cat. p. 59; **Itelz. & Gibs. p. 8G**; **Bedd. Jlor. Sylvat. t. 47**; Trim. **Fl. Ceyl. v. 2, p. 122**; Talb. **Trees, Bomb. ed. 2, p. 152**; **Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 429**; Watt, **Diet. Econ. Prod. v. 1, p. 18.**—**Flowers** : Jjune-Jan. **VEH<sup>1</sup>. Bdbhah**

**Throughout i he** Presidency, **except in** moist regions near **the** const. Widely **planted** in the Deecan, Gujarat, and Sind.—DISTIUU. Throughout the greater part of India; **Oejlon**, Arabia, Egypt, Tropical Africa, **Jfatal**.

The well-known *Bahhal* or *Indian Gwm*, ~ *Arabic* tree. The gum ia used medicinally and by the **calico-printer**, and also forms an **inferior** substitute for true *Gum-Arahw*. The tark and the pods supply a **valuable** tanning **material**. The green **pode, y<sup>mmg</sup>** shoots and leaves form an excellent fodder, and are especially **valuable during** seasons of **drought**. The timber is **bard** and durable and extensively used for wheels, well-curbs, and very largely as fuel. See WuU, **Diet, Eicon. Prod. L o.**

**VAR. 1. cupressiformis**, Stewart, Pb. Pl. (1869) p. 51; branches closing up to the trunk like a cypress. **VAR. cupressina**, Aitch. Sind Pl. p. 54. **VAR. Rámkánta**, Grah. Cat. p. 59; Dalz. & Gibs. 

Woodr. in Journ. Bomb. Nat. v. II (1898) p. 429.—**VJERIT.**

This is rather *n* doubtful variety. The **peculiar** growth of the **branches**

Stewart remarks, have been caused by "j<sup>^</sup>a of **ruthless** lopping of the side brinie Edgewortli states that near Mult&n the Tftriefcy is sometimes seen on the same **with** the ordinary form. It is common *in* the **Deecan** and **Gujarat** us- well <sup>fi</sup> **Sind.**

**Var. 2. vediana**; bark more deeply cracked and exfoliating; **croitg** formed of **twisted angular interlacing** branches; spines usually **whiV** stout, up to 2J in. long; pods **flat**, shortly stalked, | *In.* broad, litj constricted between **the** seeds.

In the 'Indian Forester,' v. 23 (1808) p. 359, Sir D. **Brandis** called to *H* variety of **babhai** sailed in die **vernacular in Berar**, where **be had colleetefTt; ^** plant, "Kanlia **b&bhal**." The **variety** is also common **in the Deoean (Poona, Shol &&), where it is called "Tedi (>\ e. mad) babhal."** Wee **Gleadow** and also **Fagt** 'Indian Forester,' v. 23(1898) p. 416, The ordinary form with nioiiliibrm p<sup>^</sup>A) called "Telia bdbhstl" in **Berar** as well as **in Khandesh** on the i-on/mes of *Berp 7* is known as "**Godi (sweet) babhal**" in the **Deecan** further south. The wood ( 'a "**Kaulia** or **Vedi babhal**" is considered **useless for building or agricultural itnpW\*** and fit only for firewood, **while the wood of the "Telia or Grodi babbal" is useif** every purpose for which a strong timber is needed. The pods of both are consirv



equally valuable as food for sheep and goats. Mr. **Fagan** (*l. c.*) states that the

of **large** logs of the two kind<sup>3</sup> of bttbbat would be as 1 : 5.

The tree (Vedi babhal) is called " Eree bdhhal" by *Dalzell & Gibson* (Bo Fl. \ <sup>s></sup> <sub>xd</sub> aa well a» by **Woodrow** in Journ. Bomb. Nat. v. 11 (1898) p. 429. **Fuller** mf may be obtained by consulting Mr. Fagan's paper in the ' Indian Forester **have** transformed the Decean name "vedi" into a varietal n.-uiaie *valiant*.

2 A«» . «  
 rtib 0 1 \* Faruesia»a» W&d. Sp. PL v. 4 (1805) p. 1083. A  
 H i' Alee ' ArancAies slender, zigzag, marked with grey or pale-  
 i °p' opines **stipular** only. Leaves 2-pinnate, 1-2 in. long;  
 ajisufce \*f niore or less pubescent; petioles usually furnished with a,  
 ;))j , **8'and about the middle**; stipules spinescent, -A~J- in. long, hard  
 pairs a P<sub>i</sub> divaricate J pinna; 4-8 pairs, f-1 in. long. **Leaflets 10-20**  
 ■!j rfflT<sup>T</sup> Λ\*V Λ<sup>T</sup>V \*n<l se3fΛe> r'ig^ly coriaceous, linear-oblong, acute,  
 > ^ubglabrous, base **oblique**, rounded. **Flowers in globose heads,**

navjii g, p y p | g  
 ciliat->i 'V nocΛeiS' slender, **terete, pubescent**, with a ring of small deflexed  
 \* s at or near Aie aP<sup>ex</sup> I braeteole soli d l i d l  
 r ^H il

10 Λ'am\*<sup>i</sup> **Vagrant**, deep yellow • peduncles |~1 in. long, crowded  
 n ^ l d b h i f ll  
 d f l d

p , g  
 aP<sup>ex</sup> I braeteole solitary, deltoid, on a long  
 , t ciliolate. Calyx -^ in. long, membranous; teeth  
 short,  
 j gular acute. Corolla X in. long : lobes very short, obtuse.  
 Ovary fous pj

by ½ in., subcylindric, turgid, slightly curved,  
 conspicuously striately veined, glabrous, brown; mesocarp pulpy. Seeds  
 biseriate. Fl. B. I. v. 2, p. 292; Bedd. Flor. Sylvat. t. 52; Aitch.  
 Pb. & Sind Pl. p. 54; Talb. Trees. Bomb. ed. 2. p. 151; Woodr. in

281  
 JJ-jBomb. Nat. v. 11 (1898) p. 429; Watt, Diet. Ecom Prod, v, 1,  
 • Vachellia Farnesiana, Wight & Arn. Prodr. p. 272; Gh-ah. Cat.  
 ji'Vi-iit; J-^iz. & Gribs. Suppl. p. 26.—Mowers; Aug.-Mar. VsBir. Dev-  
 IJH.^ I; ii.an/cri. v!"

.,hr:dizt>d but not indigenous in the **Bombay Presidency**, where it is often planted.  
 - : eastern parts, common, *Graham*; common in the black soil nMaa of the  
 i. Dalzell & Gibson] Kirkee, Woodrow. SIND ; Stocks \—DISTRIB, Cosmopolitan  
**Tropics**, often planted.



**Acacia planifrons**, Wight & Am. Prodr. (1834) p. 270. A

an umbrella-like head; bark thick, dark grey on the older, purplish on  
 the younger branches. Leaves 2-pinnate, small; petioles without glands;  
 stipular spines of two kinds, either very short and curved downwards or

armed tree **with** an erect stem; branches spreading so as to form  
 in. long, straight, divaricate, white with a brown point; pinna?  
 j#(i pairs, -<sup>1</sup>, g in. long, **closely** placed near the end of the **rhachis**.  
 Raflets **5-10** pairs, τV~g in. long, linear, obtuse. Flowers in globular  
 v^kuls, |-| in. in diam.; peduncles in axillary fascicles, filiform, **jf-3** in,  
 wag; **bracteoles** erect, below the middle of the peduncle. Calyx ^ in.  
**wig**, funnel-shaped; teeth very short. Corolla -iV~j} ln- ^on8i lobes  
 f«ort, obtuse. Ovary glabrous. Pods about **2in.** long and |~| in. **wide**,  
 Jbcylindric, turgid, acute, circinate, glabrous. Fl. B. I. v. 2, p. 293 in  
 part); **Bedd.** For. Man. in Flor. Sylvat. p. xcv; Trim. ¥\ Ceyl. v. 2, I  
**123**;' Woodr. in Journ. Bomb. Nat. v. 11 i'LSQS) p.429; Watt, Diet. con.  
 Prod. v. 1, p. 54,—Flowers: JNov. VEHH. **Sale**.

**Though** abundant in S. India the tree can scarcely be **considered** indigenous in the

ombsty **Presidency**, where it is however often planted. It is known to **Anglo-India** as the *Umbrella Tree*, from the **umbrella-like** appearance of its head.—**DXSTBIB**. India (V. **Peninsula**); Ceylon.

4. **Acacia eburnea**, Willd. *Sp. PL* v. 4 (1805) p. **1081**. A small tree; bark of the young branches purplish-brown. Leaves 1-1.5 in. long; stipular spines straight, varying from 1-2 in. long, **gradually** tapering from a broad base to a very sharp point, ivory-white, polished; petioles 2-7 pairs, 1-2 in. long, sessile or nearly so. Leaflets 5-8 pairs, 1 in. long, linear-subobtusely, glabrous. Flowers bright-yellow, with

a disagreeable **odor**, in globose beads  $\frac{1}{2}$  in. in diam.; peduncles axillary, pubescent; bracts about the **middle of the** peduncle- Calyx  $\frac{1}{4}$  in. long, **campanulate**; teeth short, deltoid. Corolla  $\frac{1}{2}$  in. long; lobes ovate-oblong, acute. Ovary stalked, glabrous. Pods stalked, 3-G by  $\frac{1}{2}$  in., flat, slightly curved, indented on both sutures, **longitudinally veined**, glabrous. Seeds 6-10. Fl. **B. X.** v. 2, p. 293; **Dalz. & Gibs, p. 85; Bedd.** For. Man. in Fbr. Sylvat. p. **xv**; Trim, **Fl. Ceyl.** v. 2, p. 124; Talb. Trees, Bomb. ed. 2, p. 152; **Woodr. in Journ.** Bomb. Nat. v. **11** (1898) p. 429; Watt, Diet, Econ. Prod, v. **1**, p. **48.**—**Flowers'**: Nov.-Feb. VEit3f. *Mctrm*.

**DECCAH:** *Stocks*<sup>1</sup>, *Dalzell*; **Poona**, *Woodrow*, *Oil S. M. COCNTB\**: *Wood-row*; common in atony places, *TalboL SINU*>; *Dalzell*—**DISTIB**, **Throughout** India in dry districts; Ceylon, Arabia, **Afghanistan**.

**5. Acacia Jacquemonti, Benth. in IToofc. Low!** *Journ. BoL* v. 1 (1842) p. 499. A bushy shrub 4-8 ft. high; branches stiff, smooth, brown. Leaves **2-pinnate**; stipular spines straight, slender,  $\frac{1}{2}$  in.

long, ivory-white, connate at the base; pinna 2-4 pairs,  $\frac{1}{2}$  in. long. Leaflets 5-10 pairs,  $\frac{1}{2}$  in. long, linear-oblong, grey-green, rigidly coriaceous, glabrous. **Mowers** yellow, **delightfully** fragrant, in globose heads  $\frac{1}{2}$  in. in diam.; peduncles slender, in axillary fascicles of more; bracts 2, about the middle of the peduncle. Calyx **campanulate**  $\frac{1}{4}$  in. long; teeth very short, deltoid. Corolla  $\frac{1}{2}$  in. long; ovate-oblong, acute. Ovary stalked, glabrous. Pods stalked, 2-t 1

$\frac{1}{2}$  in., **flat**, straight, reticulately or transversely veined. Seeds **Fl. B. I.** v. 2, p. 293; Talb. Trees, Bomb, ed. 2, p. 152; **Woodr.**

*Journ. Bomb. Nat.* v. **11 (1898)** p. 429; Watt, Diet. Econ, Prod, v. **1** p. 51.—**Flowers:** Feb.-May. *VJEKW. lidto*bdwal. I

**GUJAH.** Talbot; **Ahmedabad**, *Woodrow*; Baroda, *Brandts I* **SIN**>; *Talbm*<sup>^</sup> **DISTSIB.** India (Panjdb, Kajputana).

$\frac{1}{2}$  in. i <

1)1.

**6. Acacia tomentosa, Willd. S/K PI** v. 4 (1805) p. 1087, A si tree; bark yellowish, with large lenticles; young parts **tomentose**

Leaves 2-pinnate, 1-3 in. long; main rachis densely pubescent tomentose; stipular spines straight, rapidly tapering from a broad base

, p

f §

**diain.**; peduncles axillary,  $\frac{1}{2}$  in. long, stout, densely downy; bracts a little above the middle of the peduncle. Calyx  $\frac{1}{3}$  in. long, pubescent  
t t h d d i l i l t C l l f i l g i h h i t e o b l o n g

brown; pinna) (5-12 pairs, 1-2 in. long, sessile, their rachises dense pubescent. Leaflets 20-30 pairs,  $\frac{1}{2}$  to  $\frac{3}{4}$  in., linear-oblong, obtuse sessile, pubescent on both sides. Flowers in globose heads,  $\frac{1}{2}$  to 1 in.

teeth rounded, eiliolate. Corolla  $\frac{1}{2}$  in. long, greenish-white, oblong, slightly acute, eiliolate. Ovary very shortly stalked, glabrous. Pods 4-6 by  $\frac{1}{2}$  in. Siliques ligulate, compressed, falcate, at first pubescent, afterwards glabrous. Seeds 5-8, ellipsoid, compressed, with an areole on each face. El. B. I. v. 2, p. 294; Grah. Cat. p. 59; Dalz. & Gibs. p. 86; Bedd, For. Man.: in Flor. Sylvat. p. xcv; Trim. Fl. Ceyl. v. 2, p. 124; Talb. Trees, Bombi ed. 2, p. 152; Woodr. in Jouru. Bomb. Nat. v. 11 (1898) p. 429 Watt, Diet. Econ. Prod. v. 1, p. 61.—Vi: nw. Anjar.

BKCCAM: Sholapur districts, Law ex *Graham*. GUJARAT: Dang jungles, *Wbodrovi* Punch Mahals, *Wait*,

*Balzell* & *Gibson* (Bo. Fl. p. 85) describe the plant as rare and occurring in the Deccan and Khandesh jungles. In the table of Addenda and Corrigenda, p. 51, this statement has been withdrawn, as the plants from which their specimens were

*Stroemia* found by these botanists to have been raised in the Dapitdi botanical garden, probably, from NipdL—DISTKIB. India (W. Peninsula);

\* if h <sup>^</sup>g<sup>o</sup>ia leuco<sup>o</sup>pW\*»a, *WiUd. 8p. Pl* v. 4 (1805) p. 1083. A tree **Leaflets** branches dense, **spreading, the young ones** pubescent. **Usual** subsessile, **1-2 in.** long; main rachis pubescent, **Variation** gland between each pair of pinnae; spines subacute the stipular ones short, straight; pinnae 5-15 pairs, **Gub<sup>^</sup>i if<sup>^</sup>s<sup>^</sup>-long-** Leaflets **12-30** pairs, crowded, **1-1** in. long, **terminal** obtuse, glabrous or nearly so. Flowers in large **Pedunculate** panicles; **heads** numerous, globose, **1-1** in. in diam.; **Calyx** downy, with a toothed ring of bracts above the middle. **hairs**; teeth short. Corolla twice as long as the calyx;

**Tomentum**, clothed with pale brown **tomentum**,  
P- 204; *Grah. Cat.* p. 5SJ; **Dab. & Gibs**, p. 86; **V**; **V**- 2,  
p. 125; *Talb. Trees, Bomb.* ed. 2, p. 102; **Woodr.**  
**Bb N**

subindehi scent,

Seeds 10-20.

Trim. **Woodr.** in

**para.** *Bomb. Nat.* v. 11 (1898) p. 429; *Watt, Diet. Econ. Prod.* v. 1,  
; »-. *Mimosa leucophxa*, *Eoxb. Cor. PL* t. 150.—blowers: Jan.-Feb.  
**s&st Hivar.**

JCCAif: widely, *Woodrow*; Alandi, near Railway Station, *Kanitkarl*;  
Shohipnrifts between the Xistna and Bhima rivers," *Graham*;  
Kfaandesh, *fmwh\ OOI;^TKV*: common, *Talhot, Dalzell <f Gibson.*

the N. M. Country the bark is used in the distillation of spirit find the live\*  
f-3 been farmed on account of Government. See *Watt, Diet. Econ. Prod.* 1. c.

**Acacia** *Suma, Buch.-Ifam. in Wall Cat.* (1828) 5227 C. A  
Idle-sized tree; bark white; young shoots downy. Leaves 2-pinnate,  
long; main rachis pubescent, with glands between many of the E  
pinnae and a large conspicuous gland at or near the **middle** of the  
petioles 1-1 in. long; stipular spines short, straight or slightly  
hooked, from a broad triangular base, polished; pinnae 10-30 pairs,  
**1-2** in. long, shortly stalked. Leaflets 30-50 pairs, **1-1** in.,  
closely set on the rachis, linear, subacute, sessile, pale green, rigidly  
coriaceous, glabrous or nearly so. Flowers sessile, whitish, in  
1-4-nate spikes 3-4 in. long, the rachis densely pubescent. **Jalyx**  
**campanulate**, downy, **1-1** in. long; teeth short, deltoid, ciliaic, Corolla -  
**J<sub>ij</sub>**—**1** in. long, divided about **1/2** way down; lobes narrow-oblong, subacute.  
Pods 3-5 by **1-1** in., **Hat**, with a triangular beak at the **apex**,  
stalk **1-1** in. long, reticulately veined, glabrous. , p. 294; *Kurz, ex*  
**Brandis**, *For. El.* (1874) j. 187; *Talb.*

*Trees, Bomb.* ed. 2, p. 152; *AVoodr. in r. AVoodr. in «Tourn. Bomb. Nat.*  
11 (1898) p. 429; *Watt, Diet. Econ.* 1, p. 60. *Acacia*

*Pron. v. Catechu*, *Wight & Arn, Prodr.* p. 272 (exdud. syn.) *Jedd. Flor. Sylvat.* t. **Kumtia\***, *Son-*

49.—Flowers: May-July. *chain.*

\ g M COUNTRY: in moist places and along rivers, but not common, *Talhot*; near  
bdganm, *Ritchie*, 1056. KANAKA: JV. Kanara, near the *Dharwar frontier, Talhot.*—  
DtSTEIB India (Bengal, Bihar, W. Peninsula).

The extract Catechu may be obtained from the heartwood of the tree and the bark, used  
as a tan. See *Watt, Diet. Econ. Prod.* I. o.

— **9. Acacia Catechu**, *HIM. Sp. PI* v. 4 (1805) p. 1079. A moderate-sized tree **30-40 ft. high**; bark dark-colored, rough; young shoots **dark-brown** or purple, glabrous. Leaves 2-pinnate, 4-0 in. long; main rhaehis pubescent, with **glands** between **many** of the pairs of **pinnae** and a large conspicuous gland at or near **the middle** of the petiole; stipular **spines** short, hooked, from a broad triangular base, polished; pinnae 10-30 **pairs**, 3-2 in. long, nearly sessile, their **rhaehises pubescent**. Leaflets 30-50 pairs,  $\frac{1}{2}$  to  $\frac{1}{4}$  in., linear, **subacute**, sessile, often ciliate. Flowers sessile, pale-yellow, **in** peduncled **1-4-nate axillary** spikes 2-4 in. **long**. Calyx **campanulate**,  $\frac{1}{2}$  in. long, hairy outside; teeth deltoid, ciliate. Corolla 2-3 times "as long as the calyx; lobes ovate-oblong, subacute, pubescent. Pods stalked, 2-3 **by**  $\frac{1}{2}$  in., **flat, thin, brown**, shining, with a triangular beak at the apex and narrowed **at** the base into a sialk  $\frac{1}{2}$  in. **long**. Seeds 3-JO. FL B. I. v. 2, p. **295**; Talb. Trees. Bomb. ed. 2, p. **153**; Woodr. in **Journ. Bomb. Nat**, v. **11** (1808) ]>. 429; Watt, Diet. Econ. Prod. v. 1, p. 27. *Mimosa Catechu*, Eoxb. Cor. PI. t. 175.—Flowers: Aug.-Sept. **YEEN, Khair; Kkair-hdbhat**

Along the coasts of the Konkan and of N. **Kanara**, often on **laterite**, *Talbot*. **DBCCAS: Woodrow**. S. M, COUNTRY : **Woodrow**. **GKTJABAT: Woodrow**.—**DIBTSIB**, India (Punjab, K.W. Himalayas, **Central** India, **Jehar, Ganj&tn, Birma**).

I have cited the localities given by the several authors **named**, but have seen no **specimens** from any. I am therefore unable to say if the **true d. Catechu** or its variety *A. Sandra* is intended. All the specimens I have seen **from the Bombay President**" some of **which** were labelled *A. Catechu*, have proved to be the variety *A. Hiindd* Consult **Praia**, Journ. **Aa. Soe. Beng.** v. 00 (1898) pp. 508-510.

**VAB. Sundra, Train**, in Journ. **As. Soc. Beng.** v. 66 (1898) pp. **508-51**  
**Pinnae 15-20 pairs**. Calyx, petals and rachises all glabrous. *Acacia* (*hu* sp.), DC. Prodr. v. 2 (1825) p. **458**; **FL B. I. v. 2, p. 2! Dalz. & Gibs. p. 86; Bedd. Flor. tSylvat. t. 50; Trim. Fl. Ceyl. v. it p. 12."**:  
**Talb. Trees, Bomb. ed. 2, p. 153; Woodr. in Journ. Bombay \***  
**p. 125; Talb. Trees, Bomb. ed. 2, p. 153; Woodr. in Journ. Bomb.\*® v. IL (1898) p. 429**; Watt, Diet, Econ. Prod. v. 1, p. 00. *Mimosa Svm i \**  
**Eoxb. Cor. PI. t. 225.—Flowers : Aug.-Sept. VEEN-. Khair; Ldl-kM**

Common throughout the Presidency. **KOSKAN: Lau>\, Dalzettl BBCCAK : & Gibson, Woodrow, Karlimatti near Bagalkot, Cookel GUJARAT: Godra, Cookel Bajkot (Kathiawar), Mmnaghten. S. M. OOUNTKY:**

This variety is the most **common** in the Bombay Presidency and has often been recorded as *A. Catechu* proper, which is of somewhat doubtful occurrence. *Praia* (*l.*) says that *A. Catechu* proper has never been reported to the Calcutta Herbarium from **Rajputana, the Konkan, or the Deccan, whereas A. Sundra occurs from Coimbatore northwards to the Deccan, and is common in Kanara and the Konkan.—DISTBIB. Indus (R;ijimta-na, W. Peninsula, Birma); Ceylon.**

**10. Acacia ferruginea, DO. Prodr.** v. 2 (1825) p. 458. A moderate-sized tree; bark **rough**, rusty-brown; **young** parts glabrous; **prickle\* sometimes** suppressed. Leaves **2-pinnate, 2~4| in.** long; main rhaehis slender, glabrous, with a large gland on the petiole and another between<sup>1</sup> the uppermost pair of pinnae; petioles 1-2 in. long, thickened at the base; stipular spines short, hooked, in pairs; pinnae 3-6 pairs, 2-3 in long, distant, shortly stalked, the stalks thickened at the base, and the rhaehis slender, **glabrous**. Leaflets 10-20 pairs,  $\frac{1}{2}$  to  $\frac{1}{4}$  in., linear-oblong, obtuse, unequal-sided, glaucous above, paler beneath, rigidly sub-coriaceous, glabrous; petiolules very short. Flowers pale-yellow, sessile, in slender axillary spikes 3-4 in. long; peduncles often numerous, glabrous. Calyx **campanulate**,  $\frac{1}{2}$  in,

long,  
glabrous;  
teeth  
distinct,





deltoid.  
lanceolate, acute  
brown, reticulat  
rowly winged  
t. 51;  
w

1—4 in. long, divided about  $\frac{1}{2}$  way down ; lobes oblong-Pods stalked, 3-5 by  $\frac{1}{2}$  in., straight, flat, **ibin**, **fcly** veined, glabrous, indehiscent, the upper suture **nar-Seeda** 4-8. **M. B. I. v. 2**, p. 295 ; **Bedd. Flor. SJIYSA.** **FL Ceyl.** v. 2, p. 126: **Talb. Trees. Bomb. ed. 2**, p. 353 ; ; «» **Journ. Bomb. Nat. v. 11 (1898) p. 429**; **Watt, Diet. Econ. • 1) p. 50.** —Flowers : **Jan.-Feb.** **VEHH.**  
*Pdndhard-lhair.*

**X**

*i, Talbot. DBCCAJT\* Pbalssn (Point taluka), row. Woodrow, Punch Mahals, 2«ao?f, Brandts |*

**SeneSaI» H';7W. Sp. 7<sup>^</sup>. v. 4 (1805) p. 1077.** A small icr r  
^\_ \* «gh; **stem** prickly; branches **flexuose**, glaucous-grey; **Pobes**  
**f 8 - pubeseeiQt'** leaves 2-pinnate, | -1 j in. long ; main **rhachis** ^ erit)  
with a gland on the petiole below the lowest pair and one **the 9** w  
**uppermost pair of pfrmse**; stipular spines usually **3, oae**  
e^'a! **nearly straight** or **slightly** curved upwards, the middle U JJ<sup>11\*</sup>]  
downwards, all dark-brown, polished; **pinns** 3-5 pairs, **Lf5**  
-on & ' ver y shortly stalked, their **rhachises** pubescent. **Leaflets Ijtt**  
p<sup>airs</sup>) **tV~i by ., ' , in.**, linear, subobtuse, glabrous, pale glaucous-WL >  
Petiolules very short. Flowers fragrant, in spikes 2-4 in. long-;  
^..l'uncles axillary, **1-3-nate.** Calyx campanulate, **T V in.** long, **divided**  
of the way down ; teeth distinct, deltoid. Corolla white, twice  
|N\*W)g as the calyx, divided about J way down; lobes lanceolate, **acute.**  
Tnents white. Anthers yellow. Pods shortly stalked, 3 by f in.,  
g, thin, **fiat**, flexible,, attenuated at both ends, **reticalately ed,**  
**pale-brown** and glabrous **when** ripe. Seeds 5-6. **Fl. B. I. v. '1,**  
**Taubert, in Engl, & Prantl, Pflanzenf. v. 3, part 3, p. 112, fig. OS ; ?rees,**  
**Bonmb. ed. 2, p. 153; Woodr; in Jouru. Bomb. Nat. v. 11 429;**

**KR.42fU;** **Walt, Uict. JSeou. Prod, v. Watt, Diet. Econ. Prod. v. 1, p. 55.**

**J, p.**

^ Perr. **FL Seneg. (1830-33) p. 245, t. 56, Acacia Verehs**  
^H\ex **Boiss Fl Orient v 2 (1872) p 638 —Fl 6 Acacia**

**rupestris, Flowers:**

**Siocksl—DISTBIB.** ludia b, Eajputana); Beluchistan, Arabia, Tropical **JN<sup>r</sup>ov.~Mar.**

e tree furnishes the true gum-anibie of commerce **which** is largely exported from **reach colony** of Senegal on the West Coast of **Africa,** **It is collected in Siad** ^ajputana, but is not **kept separate, bfeing** mixtid *wiih* the gums from oilier species y **icta.** See Widt., Dic-L **Econ. Prod, I.e.**

^ **Acacia latronum, Wilhl Sj> . PL v. 4 (1805) p. J077.** A  
°is shrub or small tree forming an **umbrella-like** top when **old** ; 7es  
brown, glabrous, Leaves 2-pinnate, often fasciculate, 1-1=J in.  
,1. 'J/Jfl Viain ill act i is slightly pubescent; petiole with a gland about the  
X8'> ; stipular spines **in pairs**, of two kinds, the **smaller | -1 in.** long,  
^d/e-rer 2-2J **in.** long, connate at the base, conical, **hollow inside,** '  
**sharp,** ivory-white or rarely **brown,** polished ; pinna? 2-5 pairs, Leaflets  
6-15 **pairs, g—} by Jir--\> m--> ^neftri** i rigidly sub-

in. l is, glabrous. Flowers at first white, afterwards turning yellow,  
aceol; in lax subsessile often fasciculate spikes 1-1½ in. long. Calyx  
na. canulate. ½ in. long, glabrous : teeth short, ciliolate. Corolla ¼ in.

divided I the way down; lobes triangular. Pods shortly stalked,  
**n by i-| &•»** <sup>nafc</sup>> **obfcuse** afc both ends, falcate, **reticulately** veined, t"  
brown or nearly black, finally dehiscent. Seeds 2-4, orbicular,

**Pressed**, yellowish-brown. **Fl. B. I.** v. 2, p. 206 ; **Grab.. Oat**, p. 58;

*Ikhi.* & Gibs. p. 57; Wight, Icon. t. 1157; Talb. Trees, Bomb. ed. 2, p. 153; Woodr. *hi* Journ.-Buinb. Nat. v. 11 (1818) p. 429; Watt, Diet. Econ. Prod. v. 1, p. 5J.—Flowers: **Oct.-Mar.** VEIIX. *Dev-bdbhal*; *Tambutu*; *Bhesa*,

**DaccAtf**: widely, *Woo&row*; Eastern Deeeau, common, *Dahell* & *Gibson*; common in barren tracts of the **Deoctn**, *Graham*; Gokak, *Bhiva* |

13. **Acacia concinna**, *DO. Prodr. v. 2* (1825) p. 464. An extensive climbing shrub armed with numerous small hooked prickles; branches brown, **dotted with** white. Leaves **2-pinnate**, 2-4 in. long; main **rhacbis** armed with sharp hooked prickles, with a large gland at or below the middle of the petiole, *and* one between the uppermost or the two uppermost pairs of pinnae; stipules ovate, cordate; pinna 4-8 pairs, 1-2 | in. long, their rhachises slender, grooved, ending in a weak spine. LeaSets subsessile, sensitive, 12-25 pairs, \$-£ by ^V'IV \*<sup>n</sup>-j linear, acute or mucronate, unequal-sided, **glabrous**, base rounded or truncate. Flowers in globose heads, on peduncles 1-1 | in. long which are fascicl at the nodes or forming racemose panicles at the ends of the **branche bracts** oblique, membranous, conspicuous. Calyx funnel-shaped, A : **Jong, divided** nearly ^ way down; teeth lanceolate. Corolla ^■■■■■}, i. long; lobes lanceolate. Pods shortly stalked, 8-5 by |-1£in., line;! ■ oblong, thick and **fleshy** when immature, becoming wrinkled whim somewhat depressed between **the** seeds, and with broad sutures \\ are sometimes more or less deeply indented. Seeds f>-10. Fl. i v. 2, p. 296; Grab. Cat. p. 59; **Dais.** & Gibs. p. 87 j Talb. Tr & Bomb. ed. 2, p. 153; Woodr. in Journ. Bomb. **Nat**, v. 11 (j<■ p. 429; Watt, Diet. Econ. Prod. v. 1, p. 41.—Flowers: **Mar.-jJi**

**Common** in the Konkan and O}t;U **jungles**. KOSKAN": *Latvl, Dalzrfl a Talhot. Matheran, C'oo&el* DBCCAM: hills, *Wbodrow*. S. M.OOUNTKY: ueafl, ^\* *Ritchie*, 246! KAITA&A.: *Woodmw*; moist furests, *Talhot*,—DISTRIJ. TIJKP India; **Malay** Isltsa, China.

The pods are used fur washing the hair and a considerable trade is carried in **them** in **Kanara** aud Xolaba. Hue Watt, Diet. Econ. Prod, 1. c.

14. **Acacia Intsia**, *WiUd. Sp. PI. v. 4* (1805) p. 1091. A if climbing or sarmentose shrub; branches grooved, dark-brown, **ajE** with small hooked prickles. Leaves 2-pinnate, 4-8 in. long (inclii|K a stout petiole which often reaches 1 \ in. long); main rhaehis pubcp usually armed with hooked prickles on the underside, with a **on** the petiole below the lowest pair and a gland between each 1-4 uppermost pairs of **pinnae** j pinnae 5-10 **pairs**, 2-3 **in. lonj** sessile, their rhachises more or legs pubescent. Leaflets If not closely crowded, subsessile, |-| by \-| in., **linear-obloi** unequal-sided, the midrib near the upper edge, **shortly** and mucronate, dark green and shining above, paler beneath, **glai** both surfaces, base truncate. Flowers white or yellowish~\| **terminal** panicles; heads globose, %-| in. **in diara.**: peduncles finely downy; bracts at the base of the peduncles linear-oblong, *t falcate*, |-| **in**, long. Calyx campanulate, ^ in. long, divided; | the way down; teeth lanceolate or subdeltoid. Corolla | in. **divided** about | way down; lobes lanceolate, acute. **Pods** stalked, 4-6 by |-1| in., straight, strap-shaped, **flat**, thin, dry, o **the** :^H;X, narrowed at the base, biwu~loini>ntose when young, **aftervj**

glabrous, obscurely veined, dehiscent. Seeds 13-12. Fl. *B*, I. v. 2, ip. 207; *Gran. Cat*", p. 59 ; *Pal/. & G-ibs.* p. 88; *Wiglit & Am. Prodr.* (p. 278; *Talb. Trees, Bomb. ed. 2*, p. 154 (**exclud. syn. *A. cassia*'**), **woodr.** in *Journ. Bomb. Nat.* v. 11 (1898) p. 429; **Watt**, *Diet. Econ.* ^ P d . T. 1, p. 50.—Flowers ; Aug. VEEN. *Chilhar*.

KojfKAS : hilly tracts, *Graham*. DECCAN : Panchganni, Coo&el; M&bableshtar, *k Wood-row*! ; Fitzgerald *Qii&t*, below Mahableshwar, // . *M. Birdwood* : Ankleshwar, *DalseU 4' Gifco?h*: Lalli, *Stocks*, 27d J—DISTWB. India Tropical Himalayas, Ji\ & \V. Peninsulas); *Ceylon*.

**15. *Acacia caesia*, *Wight \$ Am. Prodr.* (1834) p. 278.**

A ardent shrub **armed with** numerous hooked prickles; branches jllowish-brown. **Leaves 2-pinnate**, 4-0 in. long; **main** rhaehis IJubescent, occasionaliy **armed with** hooked **prickles** on the lower side, ^ith a convex gland on the petiole below the leaflets and glands between e^ 2-4 uppermost pairs of **pinnae** ; pinnae 8-15 pairs, 1-2 in. long, eir rhachises densely pubescent. Leaflets 15-35 pairs, crowded, netimes overlapping, £-4 by -^TV <sup>m</sup>-> linear, very



unequal-sided, the near the upper edge, nracronate, pubescent on both surfaces, truncato- Howers in terminal panicles;

heads globose, jf **in.**, .; peduncles in fascicles of 1-4 ; bracts linear-oblong, falcate, Calyx tampanulate, ^ in. long; teeth ovate, subacute. **Corolla** , divided | way **down**; lobes lanceolate, acute. Pods strap- ^a^'i thin, dry, subfalcate,

5~6| by | in., reticulately veined, stalked, glabrous. Seeds **5-10**. Dak. & Gibs. p. 87. *A. Intda* Bk i Hk f

FL B I 2 297

*Ja*, Baker, in. *Hook. f. FL B. I. v. 2*, p. 2(J7.

nite as common as the former species. DECCA K : Ganesh Kliind near Poona, KAITARA : Yeliapur, *Talbat*, 467!

plant is often confounded with *Acacia Intgia*, VVilld., but to anyone who hns to plants growing, their separation as distinct species presents no difficulty, p in *Journ. As. Soc. Beng.* v. 06 (1898) p. 510.



***Acacia pennata*, *W3UL Sp. PL* v. 4 (1S05) p. 1090.**

A shrub, armed with numerous stout slightly hooked or straight rarely unarmed); young branches pubescent. Leaves 2-pinnate, Eching 6 in. long; main rhacius densely pubescent, grooved, often wk'kly, with a large gland above the middle of the petiole and one if^'tween each of the 2-4 upper pairs **of pinnaej** pinnae 8-18

g, , y  
Leaflets 40-50 pairs, slightly overlapping, £~J by ',, in., ^fie, linear, obtuse, unequal-sided, glabrous, base oblique, rounded or ^Scate. Flowers white or pale-yellow, in large terminal panicles ; -ds globose, |-J in. in diam.; peduncles pubescent, 2-4-nate ; bracts , 'ar. Calyx glabrous, ^ **in.** long, divided J- of the **way** down ; lobes ar-lanceolate, acute. Pods stalked, 4-8 by £-1 pairs, |-2^ in. long, subsessile, usually curved, their rhachises densely r.k.-Jn^nf T.«..iffnt« 40--.'i0 nnirs. sliffliitJv nvpriiii.niMnf. I—4 hv '-.- in..

aceoi,\* v 2, p. 127; *Talb. Treeo, Bomb. ed. 2*, p. **154** j *Woodr. in Journ. glt^r*). *Nat*, v. 11 (1898) p. 429 ; *Watt*, *Diet. Econ. Prod.* v. 1, p. 54.—**^ra** : June-Aug. VEKK. *Shembi*; *Shembdii*,

BEKAN: *Dalzell!*, *Law!*, *Woodrow*; Mumbra near Thana, *Kanitkar!* DECCAN:  
M<sup>row</sup>. S. M. COUNTRY: Belgaum, *Ritchie*, 246! KANARA: *Talbot*; banks of  
JO<sup>aba</sup> river, *Law ex Graham*.—DISTRIB. India (Central and Eastern Himalayas,  
E. & W. Peninsulas, Birma); Ceylon, Malay Isles, Trop. Africa, Natal.

## 80. ALBIZZIA, Diirazz.

**frees.** Leaves 2-pinnate. **Flowers (in the Indian species)** in **globose heads, sessile or pedicellate\* hermaphrodite**, usually 5-merous. Calyx **campauulate or** funnel-shaped, distinctly toothed. Corolla funnel-shaped, **the petals connate below** the middle. Stamens indefinite, **monadelphous at the base; filaments** much longer than the corolla; **anthers** minute, not gland-crested. Ovary sessile or shortly stalked; **style filiform; stigma** minute, **capitate**. Pod large, thin, **fiat**, strap-shaped, straight, **itidehiscent** or subindehiscent, continuous within, the sutures not thickened.—DISTUIW. Tropics of the Old **World**; species 25-30.

**JPinnse 2-4 (rarely 6) pairs; leafieta** exceeding £ in. broad.

**Fit met\* pediceiled; calyx** <sup>5</sup>, in. long ..... *I, A. Lchbck.*

!Jowers sessile; calyx less than ^ in. long.

**Calyx** ',, in. long, pubescent; teeth obsolete ..... *2. A. odoraiissi*

Calyx *fa* in. long, glabrous; **teeth distinct** ..... *3. A. procera.*

**Pinna? 6-20 pairs; leaflets** less than \ in. broad.

**Sfcipulea** very large; **heads of flowers paniefed** ..... *4. A. stipufata.*

Stipules minute; heads of flowers not paniefed ..... *5. A. mnara.*

**1. Albizzia Lebbek, Benth. in Hook. Land. Journ. Jiot. v. 3** (1 p. 87, **An unarmed** deciduous tree **40-70 ft. high**; bark pale; y < ' 1 shoots glabrous. Leaves abrupt!} 2-pinnate; main **rhaehis** pubej |\* "M or glabrous, **furnished** with a large gland on the petiole above th f<sup>1</sup> A and one below the **uppermost** pair of pinns; petioles swollen and •<sup>ls</sup> at the base; **pinna** 2-3 (rarely 4) pairs, 4—5 in. long, their rh; glabrous or pubescent, swollen and hairy at the base. **Leaflet V** pairs, 1-11 by g-| in., with glands between their base?, the leaflets elliptic-oblong, the 2 terminal obovate-oblong, all pale unequal -sided, very obtuse, glabrous above, pubescent mid reticul

veined beneath, base obliquely rounded or truncate; petiolules short, hairy. Flowers white, fragrant, in globose umbellate h<sup>8</sup> 3-1½ in. in diam. (not including the stamens); peduncles 1½-3 in. lo

more or less pubescent, solitary or 2-4 together from **the** "axils of t upper leaves; pedicels -,<sup>1</sup>,--<sup>1</sup>! in. long, pubescent. Calyx \ in. loir **pubescent**; teeth short, deltoid. Corolla |.in. long; tube glabrous' in. long, **triangular**, acute, pubescent outside. Stamens **muc** longer than the corolla: **filaments** connate at the base into a short tub! Pods 4-12 in. by f-1| in., linear-oblong, bluntly pointed, thin, pal t yellow, reticulately veined above the seeds, smooth, shining, **am** 4-12, **ellipsoid-oblong, compressed, Eoveolate** on the faces, pale-bro^H *m. B. 1. v. 2, p. 298; V;ite. & Gibs. p. SB; Trim. Fl. Ceyl. v. 2, p. IS Talb. Trees, Bomb. cd. 2, p. 154; Woodr. in Journ. Bomb. Nat. v. I (1898) p. 430; Wait, Diet. Econ. Prod. v. 1, p. }?&. Acacia speciM Willd. Sp. PI. v. 4 (1805) p. 1066; Grah. Cat. p. ?>S. Mimosa sped **Jacquin. Ic. t. 10 8.**—Flo w ers: **Mar -May.** \ .i ■: i; N. *Siras; Ch inchol**

Throughout **the Presidency**, where it is often planted as a roadside tree.—**Difi Throughout** India, but usually planted; Tropical and Subtropical Asia and *Md* but usually planted.

**2. Albizzia odoratissima, Benth. in Book. loud. Journ. But (1844) p. 88.** A tall unarmed tree, often reaching 80 feet **high; y < shoots** dark-colored, **pubescent.** Leaves abruptly **2-pinnate;** . rhaehis downy, **6-12 in. long**, with w large sessile **gland on** the peti

le above **its** base and also at the bases of 1-2 of the upper pinnae ;  
 njo usually 4 pairs, rather **distant**, 3-0 in. long, their rhachises  
 mbescent. Leaflets 8-15 pairs, **sessile**, f-1; by |<sup>-^</sup> in.,  
 obliquely )blong, rounded at the apex, **reticulafc** **ined**, the midrib  
 about ■£ the with of the **blade** from the **upper edge**, dark green i\n<\  
 slightly mhescent above, glaucous and **pubescent** beneath, base **very**  
 obliquely ounded. Flowers fragrant, sessile, in numerous small  
 † **10-12-floweTed heads f-1** in. across; peduncles 1 in. long, solitary  
 or 2-4 **together**, **Arranged** in terminal panicles. **Calyx** -.},, **in.**  
 long, pubescent; **teeth** [obsolete. Corolla white, 1 in. long,  
**grey-silky** outside; teeth **ovate-fanceolafce**, acute. Stamens twice as  
 long as the corolla ; **filaments pale-ellow**, connate at **the** base into a tube  
**half** as long as the corolla-tube. **Jods** shortly stalked, 4-8 by 1-H in.,  
 thin, flexible, glabrous, slightly eticulately veined, brown. Seeds  
**8-12**, **broadly** ovate, g by \ in., much iattened, yellow. **FL B. I. v.**  
 2, p. 299; **Dalz. & Gibs. p. 88** ; **Bedd, Flop, Sylvat. t. 54** ; Trim. FL  
 Ceyl. v. 2, p. V29 ; <sup>r</sup>alb. Trees, Bomb. ed. 2, **i. 155**; **Woodr.in Journ,**  
 icon. Prod. Bomb. Nat. v. 11 (1898) p. 430; **Watt, Diet.**

*ha* . Prod, v. 1, p. 158. *Acacia odoratissima*, Willd. **8p.** PL v. 4  
 (1805) ► **63** ; **Grrah. Cat. p. 58.**—**PI** owers: **A p r. - J une.**

**VEEN. Kdla-siras** ;

• N K vN : *Graham, Dtihell tj- Gibson, Talbot.* *I)a<:CAW : Poonn, If'oocro>r.* K\HAKA

:

. \orests, *TaJbot*; iSirsji (X, **Kanwa**), *Woodrou* ratB. Throughout India ;

**procera**<sup>^</sup> *Benth. ia Thole. Land. Journ. Bot.x. 3 (18-1 I) An unarmed tree 60-80 ft. high ; young shoots pale, lenticellate. <sup>S^</sup>abruptly 2-pinnate; main rhachis glabrous, 12-18 in. long, with le gland on the petiole a little above its base; pinna? 2-6 pair s, in. long, their rhachises glabrous and with an oval gland below <sup>^</sup>uppermost pair of leaflets. Leaflets 0-12 pairs, 1-U by |-| in., or ?<sup>^</sup>iacut-e, dark green and glabrous above, more or less grey-tth, base obliquely cuneate on the upper, l'ounded on tho margin ; petioltils 4\$ in. long. Flowers sessile, in numerous •tall 12 20-flowered heads |- in. across ; peduncles h in. long, in icicles of 3-5 (rarely solitary), arranged in terminal panicles. Calyx " in. long, gibbrous ; teetii distinct, triangular. Corolla J- in. long, outside; teeth lanceolate, <sup>^</sup> as long as the corolla-tube. 11 times as long as the corolla: filaments greenish-yellow, ) at the base into a tube as long as the corolla-tube. Pods*

stalked, at length **dehiscent, 4-8** by \. | in., thin, flexible, **orange-bmwn**, smooth and glossy, faintly reticulate above **the** Seeds 6-12, broadly ovate, | by \ in., much flattened, pale-brown, . v. 2, p. 299 ; Bedtl. For. Man. p. xevi ; Talb. Trees, **Bomb. ed. 2, Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 430; Watt, Diet. . Prod, v.1, p. 159.—Flowers: May-June, <sup>^</sup>BRW. Kivhai; Bdati. IOKKAS: Stocksl, IkiheU, Talbot. S. M. COVNTHY: Etlgaum, BUcMe, 154! - USARA: Talbot.—PISTEIB. Imlia (Oeotral and E. Himalayas, Bebar, W. Peninanla, 'hinua); China, Malay Archipelago, Philippines.**

4. **Albizzia stipulata, Boivin., in Bncyc. efe seix\* S',h-L-, v. 2, p. 33; in Hook. Land, Journ. BoL v. 3 (1844) p. 92. A tail unarmed ..tree; young shoots clothed with fine grey or golden-yellow leseence. Leaves abruptly 2-pinnate; main rhuchis 0-15 in. long, ret pubescent, afterwards' glabrous, with a large sessile gland on the**



## XLYIII.

petiole about 1 in. above its base and with smaller glands between each of the uppermost 2-9 pairs of pinnae; stipules very large, soon deciduous, sometimes exceeding 1 in. long, unequally cordate, acuminate with a filiform tail, membranous, pubescent, orange-brown, the base much dilated, on one side; pinnae 7-20 pairs, shortly stalked, their rachises tawny, 2-5 in. long. Leaflets membranous, 30-45 pairs,  $\frac{1}{4}$ - $\frac{1}{2}$  by  $\frac{1}{4}$ - $\frac{1}{2}$  pubescent,

1-2 in. long, linear-oblong, falcate, pointed, pale-green and glabrous above, glaucous and pubescent beneath, the midrib close to the upper margin, base obliquely rounded at the lower side. Flowers in small panicle heads; peduncles 1-2 in. long, pubescent, solitary or in fascicles of 2-4; bracts ovate, acuminate, membranous,  $\frac{1}{2}$ -1 in. long, deciduous; pedicels  $\frac{1}{2}$  in. long. Calyx  $\frac{1}{2}$  in. long, funnel-shaped, pubescent teeth short, acute. Corolla yellowish-white, densely pubescent outside 1-2 in. long; lobes half as long as the tube, lanceolate, acute. Stamens 4 times as long as the corolla, connate into a tube longer than the corolla-tube. Pods very shortly stalked, 5-7 by 1-1½ in., thin, pale-brown, glabrous, faintly reticulate veined. Seeds 8-12, ovate, 1 by ½ in. much compressed, dark-brown, smooth. The large stipules are sufficiently characteristic to determine this species when growing. These, however, soon fall off and are often wanting in herbarium specimens. FJ. B. I. v. 2, p. 300; Date. & Gibs. p. 88; Bedd. Fl. Ind. Sylvat. t. 55; Trim. Fl. Ceyl. v. 2, p. 129; Talb. Trees, Bomb. ed. p. 155; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 430; Watson Econ. Prod. v. 1, p. 100. *Acacia stipitata*, DC. Prodr. v. 2, p. 15; Grab. Cat. p. 58.—Flowers: Apr.-June, VEEN. *Udal*; *Pkaldrcei*

KOXSAS: *Lcwot*, *Sfocte*; Mathertm, *Coo/eel*, *If. M*, *Birdwood*, *Dahell* Kbanthila, **Graham**; **Fitzgerald** Gbit below **Mabableswar**, **Cooks I** S. M. **O Ramgb&t**, *Rifrhie*, 248! KANAKA: evergreen forests of N. Kanara **Qbdts**, *Sirsi* (K. Kanara), *Talbot*.!—DISTIB, ThrougUout India; S.E. Asia.

5. *Albizzia axnara* Boivin, *%a Encyc. da x-Lv\* Siecte*, v. 2, p. 12. *Jienth. in Hook. Land. Journ\* Bat*, v. 3 (1844) p. 90. A small mm branched unarmed tree; young shoots clothed with yellowish-green pubescence. Leaves abruptly 2-pinnate; main rachis 2-4 in. long, densely pubescent, with a small gland about the middle of the petiole and another between the uppermost pair of pinnae; stipules minute 15 pairs, 1-2 in. long, their rachises pubescent. Leaflets 10-30 pairs, sessile, close,  $\frac{1}{2}$ -1 by  $\frac{1}{2}$ -1 in., linear-oblong, obtuse to subacute, the midrib nearly in the centre, green and glabrous above, glaucous and more or less pubescent beneath. Flowers subsessile fragrant, in 12-20-flowered heads; peduncles solitary or in fascicles of 2-4 in the axils of the upper leaves, not forming a panicle, pubescent. Calyx  $\frac{1}{2}$ -1 in. long, funnel-shaped, pubescent, scarcely pedicel teeth short. Corolla yellow, nearly 3 times as long as the tube, pubescent outside; lobes linear-lanceolate. Stamens 1-2 in. long, filaments pinkish. Pods 4-7 by 1-1½ in., stalked, thin, flat, abruptly pointed slightly transversely veined. Seeds 6-8. Fl. B. I. v. 2, p. 30 Dak. & Gibs. p. 885 Bedd. Flor. Sylvat. t. 61; Trim. Fl. Ceyl. v. 1 p. 130; Talb. Trees, Bomb. ed. p. 155; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 430; Watt, Diet. Econ. Prod. v. 1, p. 155. *Acacia amm* AVikl. Sp. Pl. v. 4 (1805) p. 1074; Grah. Cat. p. 58.—Flowers: A. Tune. V'tvitN. *Tur/U' Lalai*.

Presidency in dry forests. Kos EAR : Staafca f, Zto&g#!; Matbwm  
Gibson; Alexandra Point, Matberan, //'. M, Birdwood; bunks of the  
Inork\* ( !''''''''''- DBCCAN: Poona, Woodrow; Alandi, O>£«! 8. M. COUNTRY: hills  
T>o !, !, / ; ^e^g)ni», Ritchie, 1U57 :■-DJSTKIB. India (W. Peninsula.); Ceylon,  
B.

Ins.-



BeJgaurn,  
AfridL

. ?«#(£\*, Benth. in Hook. Lond. Journ. Bot. v. 3 (1844) p. 80,  
rmed deciduous tree 50-60 ft. high, a native of the Eastern  
ya and Lido-China, is frequently cultivated, but is not indigenous

Bombay Presidency. The leaves are remarkable as having y  
but 1 pair of pinnae. The pod is 6-10 in. long, smooth and  
and of a bright orange-brown color. FL B. I. v. 2, p.

9od 299;

in Journ. Bomb. Nat. v. 11 (1898) p. 430.

i, now in Ills list gives this as occurring at Bfatheran, I have ascertained  
from ever, that the frees lisul been planted there and were not indigenous.

### 81. PITHECOLOBIUM, Mart.

3rect trees or shrubs, unarmed or with spinescent stipules or axillary  
nes. Leaves 2-pinnate; stipules various. Flowers  
usually in jbose heads or cylindrie spikes, 5- (rarely 6-) merous,  
usually henna-Calyx campanulate or funnel-shaped, shortly toothed.

Corolla -shaped\*, the petals valvate, united below for £-§ of their  
length. 'i monadelphous, much exserted; anthers not  
g'and-crested. pLlv. Aessile or stalked ; ovules many ; style filiform ;  
stigma minute, Cfl. i. Pod strap-shaped, circinate or falcate (rarely  
straight), usually svest throughout the lower suture and much  
twisted in a late L the sutures not or slightly tlickened. Seeds  
off en embedded Lcanty pulp, ovate or orbicular, compressed, the  
funicle filiform or rtisly expanded into a fleshy aril.—DisxEiB,  
Cosmopolitan in the tjes ; species about 100, chiefly American.



F?ith.ecolobium bigexninum. Mart, in Flora, v. 20 (1837) ii,  
Fruit' 15 in obs. ; Benth. in Hook, Lond. Journ. Bot. v. 3 (1844)

^ L middle-sized unarmed tree ; young parts glabrous or slightly  
'»«■ Leaves 2-pinnate; main rhachis 4-0 in. long,  
glabrous, i6) nd on the petiole and 1 below each pair of pinnae ;  
pinncs ,W -2 (rarely 3) pairs, the lowest pair the smallest, theirjrAi <sup>1</sup>

F«\*. ^("Leaflets 1-5  
r^ \*J. Clar-

-hfllia

beneath the insertion of each pn, ^-. '1\*Lii. \n ^e  
6) pairs, ^lanceolate, or  
obovate-oblong ; argrM; subcoriaceons,  
elhptipllbeseent at firstc beneath, hafe or acute,  
glabrous above? s subsessile, in few-flowered

heads petiolules ^ in. long. Flowed on the long branches of  
pubescent ^all peduneled clusters, arrange^ Calyx frfr in.  
long, densely "es usually shorter than the lea\* Corolla  
pale-yellow or cream-'; -)silkly ; teeth short, triangula ]yX) s]]ky  
outside ; lobes lanceolate %!, 2-3 times as long us the eaj flat, once  
or twice spiral, bluntly iJJ Stamens | -4 m. long. Pods nearly  
so) reddish-brown outside <sup>1</sup> ; d, roughish, but glabrous or between  
the seeds. Seeds 5-S<sup>2</sup> red within, not indented .

p< 89. M[li Por\_ Man %cyl [ I. v. % p. 303; Dak. & w^Wes,  
Bomb. ed. 2, p. 150; VToodr'



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v. 6, part 1, p. 281. *Inga higemina*, Willd. Sp. PL v. 4, p. 1007; ! Cat. p. 57.—Flowers : Jan.-Feb. VERX. *Kachlor*.

**KOSKAR:** *Stoi-ksl, Dahell 4' Gibson \, Talhot*, **KANAKA:** evergreen forests, Dmmana (N. Kanara), *H'oottrow*; **Supa, Ritchie, 1728!**—**DISTBIB.** India (E. layas, W. Peninsula); Ceylon, Malay Islands, Philippines.

*Pithecolobium duke*, Benth. in Hook. Lond. Journ. Bot. v. 3 < p. 199. A moderately large tree, a native of Mexico, introduced to the Philippine Islands, and thence into India, is cultivated, of a hedge plant, and may be met with in Bombay and Poona. It is armed with short straight stipular thorns, the pods are curved, and the seeds are embedded in a sweet whitish edible; DR FL B.I. v. 2, p. 502; Talb. Trees, Bomb. ed. 2, p. 156; Woodr. Journ. Bomb. Nat. v. 11 (1898) p. 430; Watt, Diet. Econ. Prod. v. part 1, p. 281. *Inga duhw*, Willd. Sp. PL v. 4, p. 1005; Wight, Iccf t. 198; Grab. Cat. p. 56; Dak. & Gibs. Suppl. p. 25.—Flowers : 'Jar Mar. VB&N. *Vildyti-dmli; Vildyti-ehinch*.

*Pithecolobium Saman*, Benth. in Hook. Lond. Journ. Bot. v. 3 (184 p. 210. A tree of rapid growth. A native of Central and Tropical S. America, whence it was introduced into Jamaica, and thence into India. It is called the *Rain Tree* and may be seen growing in Bombay and Poona. It has also been introduced into India. Kanara. The straight and in dehiscent with a sweet pulp around the seeds. Trees, Bomb. ed. 2, p. 150; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 130; Watt, Diet. Econ. Prod. v. 6, part 1, p. 283.

The following non-indigenous plants not belonging to any of the foregoing genera of the Suborder are occasionally cultivated in the Bombay Presidency:—

*Purulia biglanduksa*, Wight & Arn. Prodr. (1834) p. 279. A tree, a native of Africa, with bipinnate leaves, 20-40 pairs of leaflets, 60-100 pairs of leaflets, with flowers in dense subspherical heads, on peduncles 5-8 in. long, is occasionally grown in India. The heads, when the flowers are in bud, are like balls of velvet

and the pods reach 1 ft. or more in length. p. 289; Dalz. & Gibs. Suppl. p. 25; Grab. Cat. p. 57; Woodr. Journ. Bomb. Nat. v. 11 (1898) p. 428; Woodr. Gardening

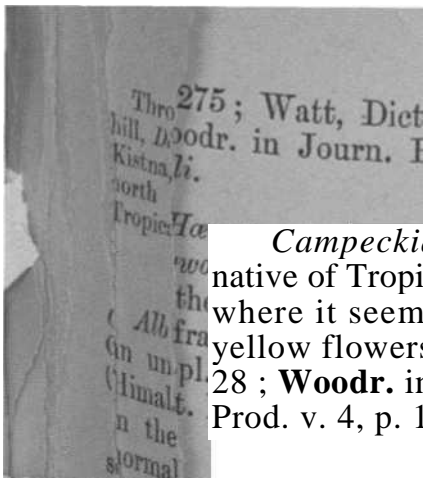
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ed. v. 2, p. 278.—Flowers : Dec. **Vies. Chenduphal.**

*Desmanthus viratus*, Willd. Sp. Pl. (1805) p. 1047. A glabrous shrubby perennial, a native of Tropical America, has been extensively planted in gardens. It has flowers solitary globose peduncled heads and pods 2-3 in. long, each containing 20-30 seeds. Fl. f v. 2, p. 290; Trim, Fl. Oeyl. v. 2, p. 100; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 428.—Flowers: June-July.

*Ceraium Siliqua*, Linn. Sp. PL (1753) p. 1026. The *Locust tree* or *St. John's Bread*, a native of Europe, Syria, and Palestine, has been occasionally planted in gardens; it thrives well if well-established. The pods are dark-red and woody, with edible pulp. Bab. & Gibs. Suppl. p. 25; Woodr. Gard. in Ind.



2, p. 204.  
*Tamariudus Siltg* v. 11 (1898)  
p. 428.—**VasK. Meccani-**

*Campeckianum*, Linn. Sp. Pl. (17-53) p. 384. The , a native of Tropical America, has been successfully grown Deecan, where it seems to thrive well. It has thick spikes grant yellow flowers and small 1-seeded pods. Dak. & **Gibs. P.** 28 ; **Woodr.** in Journ. Bomb. Nat. v. 11 (1808) p. 427 ; Watt, n. Prod. v. 4, p. 108.—Flowers : Oct.

**OBDBE XLIX. ROSACES.**

pV<  
\*Va !o shrubs, or trees. Leaves simple or compound, alternate  
K I ^y opposite), stipulate. Flowers usually regular and hermaphrodite.



(; y<sup>x''(n)</sup>)<sup>e</sup> free or rarely ruinate to the ovary, the limb usually 5-lobed.  
S\J''^nS ^e calyx-tube or forming a ring at its base. Petals 5 (ii), inserted under the margin of the disk, deciduous, usually Stamens perigynous, usually indefinite, in one or many filaments subulate or filiform, usually incurved *in* bud; anthers didymous. Ovary of 1 or more free or connate carpels ; ovules wore in each carpei; styles as many as the carpels, free or connate, W lateral, or subterminal; stigmaas simple, penicillate or capitate. \ variable, consisting of achenes, berries, or drupes, rarely capsular. erect; or pendulous, exalbuminous ; testa membranous or coriaceous, tmes expanded into a wing ; cotyledons lar^e, plano-convex ; radicle *Mr*-DISTRIB. Throughout the world, chiefly in temperate regions ; more than 70 ; species about 1200.

- icd trees..... 1. PYGBTJM.
- T shrubs..... 2. RUBUS.
- Fruit of numerous small aohenea** ..... 3. POTJENTIMA.
- Fruit of 10 connate carpels** ..... 4. NJBDKADA.

to 1. PYGEUM, Gtertn.

. Jte<sup>2n</sup> trees or shrubs. Leaves simple, alternate, persistent, iijy te entire, often with 2 glands at or near the base; ,ogt stipules t, f **Jpcious**. Flowers small, racemose or paniculate, sometimes •1 lal by want of the ovary. Calyx deciduous ; tube obconic, urceo-~ campanulate; limb 5-15-toothed, often unequally. Petals 5-(i 5\_0\_i-oothed **calyx**, 0 in the 8-15-toothed, viilous or toraentose **leiv** glabrous), often indistinguishable from the calyx-lobes. Stamens 150, in 1 or more series at the orifice of the Ctfilvx-tube; filaments form, incurved in bud; anthers small, didymous. Carpel 1, basal in [ **calyx-tube**, ovoid or subglobose; ovules 2, collateral, pendulous; e terminal; stigma capitate. Fruit a transversely oblong 2-lobed ^hiscent drupe; pericarp thin, dry or juicy; cotyledons very thick, iispheric; radicle minute, superior,—DISTRIB. Tropical Asiatic with African species ; species about 30.

i<sub>s</sub> 4-6 • drupe less than 1 in. broad ..... \* ..... I. P.

*Wfyhtitmtm,*

S 0: drupe 1 in. or more broad .....

'2. *P. Gardneri.*  
£ IX

**1. Pygetim Wightiatmm, Bhtme, Milanges Bot. (lSo'y) n. 21 Walp. Ann. v. 4 (1857) p. 642).** A moderate-sized tree; <sup>b&T\rf&f</sup> pale-brown; young shoots slightly pubescent with appressed Leaves 2-5 by U-iM in., coriaceous, dark -green **above, paler** elliptic-oblong, obtuse, entire, glabrous on both sides, with 2 rge lar or oval immersed glands *on* either side **of** the midrib, base roF nerves arched, **spreading**, prominent beneath; petioles J-;f '1U '-vij. stout, rugose. Flowers I in. in diam., in lax pubescent racemes . s long; pedicels g-^ in. long, pubescent **with** oppressed hairs, y \e-w A- in. long, pubescent; tube **obconic** or **turbinate**; teeth usually ;^c Petals 4-6, elliptic-oblong, rounded **at the apex**, softly pubescent^ margins. Stamens 20 or more, much longer **than t lie** petals, glabrous; style stout. Drupe **broader than long**, # in. broad long, **slightly** bilobed, apiculate, glabrous; pericarp **thin**. **Fl. B.** p. 319 j Trim. Fl. Ceyl. r. 2, p. **134**; **Talb.** Trees, Bomb. ed. 2, **Woodr.** in **Jo.ura.** Bomb. Nat. v. 11 (1898) p. 035. *P. ceylanl* FJor. Sylvat. t. £9, exclud. syn. (not of *Q&itn.*)—Flowers: JVo||!

ICANARA : S. Gluits of **Jf. Kanara** in evergreen **forssts, Tal&ot**; Divlmana (N.\*<sup>1</sup>H **oodrow**.)

These localities nrr gireii on the **authority of Talbof nnd Woo&rovv. I b no specimens** from **Kauaro**, and **there** ate none iu Herb, Kew.—UISTBID (W. **Penainsula**); Ceylon.

% *Pygeum Gardneri, Iloolc.f. in Fl S. I. v. 2 (1878) p. 321* middle-sized tree, glabrous except the inflorescence; bark of **the bra.** dotted with white specks. Leaves **coriaceous**, 4-6 by 1^2-|- in., alter ■ovate or **oblong-lanceolate**, **acute** or acuminate, quite entire, gla & base acute or rounded, often unequal-sided, basal glands raivly petio'es stout. |-| in. long, rugose, glabrous. Flowers in racemes 1^3 in. Jong; **rbachis** densely pubescent; pedicels ^ stout, pubescent. Calyx ^--| in. long, densely clothed outsidt fulvous pubescence; tube urceolate; lobe's **8-12**, obtuse, do.noeiv \ cent. Petals 0. Stamens often more than 20, **in** 2 rows; *hlan* about as long as the calyx, mueh-exserted. Ovary glabrous, **surrou** at the base by a ring of hairs. Fruit broader than long, 1-1 :| in. ac **transversely oblong, bilobed, smooth, apiculate in the sinus at the the endocarp** smelling strongly of prussic acid.

The ovary appears at **first** sight to be hirsute, especially **in d** specimens, but it is really glabrous, being seated on a ring of hairs w hi **surround** it. I have examined numerous **fresh** specimens **at Mahablesh** where **the** tree is common. **Talb.** Trees, Bomb. ed. 2, p. 157; " in Journ. Bomb. Nat. v. 11 (1898) p. 635; Watt, Diet. Econ. Prod. part 1, p. 373. *Pygeum acuminatum*, Grah. Cat. p. 247 (not of Col *Pygeum zeylanicum*, Dalz. & Gibs. p. 89, exclud. syn. (not of Gaertn Flowers\*: Nov. **VERN. Dika.**

**DBCCAN:** Bfahableflhwar, *Cooke ?*, *Woodrow*; **Khandala** (rare), *Grafucm. OotJKTRY:* Parva Gh;it, *Dalzd* § *Gibson*; *Ranigli&t*, *Ritchie*, 1748! *J G»irsopj>a* Ghtir, *Talbut*. 275!—**DISTBIB**, Itulia (W. Peninsula).

## 2, RUBUS, Linn.

**Sabereet** or sarmentose prickly shrubs. Leaves alternate, simpf

compound ; stipules free or adnate to the petiole.      Flowers in



**J^P^y** corymbose **.panicles**  
 (rarely **solitary**; white or red. Calyx  
 "t; tube broad; lobes 5. Petals **5**. **Stamens** usually **indefinite**,  
 at the mouth of the calyx ; filaments filiform. Disk lining **the**  
**-\*ube**. **Carpels** many, on a convex **receptacle** ; ovules 2, collateral,  
**subterminal**. Fruit of **numerous small** 1-seeded drupes  
 "P°n a dry spongy conical or eylindrie receptacle. Seed pen-  
 s'— **DISTIUIJ**. Abundant in the northern, rare in the  
 southern species about **200**,

simple .....	— .....	1, /?. <i>moluccanus</i> ,
3-foliolate .....	.....	2. }}, <i>dliptisus</i> ,
<sup>1</sup> 5-9-foliolate .....	.....	3. <i>li. lashcarp</i>

**moluccaTms**, *Linn. Sp. PI.* (1753) p. 1197. An ex-n<]ye  
**subscandenfc** shrub ; young branches villous with yellowish hairs: g c  
 short, recurved, scattered over the branches, petioles and **low** <sup>1</sup> traces of **the**  
 midribs of **the** leaves. Leaves about as broad or (not <sup>1</sup>requently)  
 broader than long, **3-6** in. in **diam.**, **palmately 5-7-Jobed** <sup>e</sup> lobes obtuse  
 or subaeute), irregularly and finely serrate-dentate, "it-green rugulose  
 and sparsely hispid above, "clothed **with** soft l <sup>U0A^AS^</sup>  
 tomentum, retieulately and **prominently veined** beneath, base i P'y:  
 cordate; main nerves often prickly beneath; petioles 1-2.; **in.** <sup>fjj</sup> <sup>r%</sup>  
 /densely fulvous-hairy; stipules usually large, toothed, pinnatifid v,  
<sup>^</sup>/iniate, **densely silky-hairy**. **Flowers** *m* terminal and axillary silky  
 GffijNHes usually shorter than **the leaves**; **peduncles** stout; **pedicels**  
<sup>1</sup>upvtel fulvous-silky ; bracts pectinate. Calyx densely silky ; lobes more  
 j^|tejs triangular, entire or pectmately toothed at the apex. Petals  
 4j Mv, obovate, shorter than the calyx. Fruit globose, succulent, the  
 :-j ?.<sup>1</sup>iJ (huil carpels red, **the** receptacle hairy. **Pi. B. I. v. 2**, p. 330;  
 tj P *m. Ceyl. v. 2*, p. **136**; Talb. Trees, Bomb. ed. 2, p. 157; Woodr. ojjj  
*Mm. Bomb. Nat. v. 11* (1898) p. 035; **Watt, Diet. Beon. Prod. v. 6**, :<sup>1</sup>lrl,  
 p. 5S3. *liitbus nigosus*, 8m. in Ees, Cyclop, v. 30 (1819) *m,s*, 34 ;  
 Grab. Cat. p. 64; Dalz. & Gibs. p. 89 ; Wight, Icon. t. 225. May.

rare plant. DECCAN: Mahableabwar, *Graham, DalzeU \$ Gibson*,  
*Gookel \AHA* : on the Nilkund and Southern GlliiUrf of N. Kanara, *Talbot*.  
 ve found Uuis at Mahableshtar in a ravine below the old temple, in tvljiHi  
 iity Graham also seems to liave found it. I have not met with it elsewhere on  
 |, \_ DrsTRIB. India (Central, Eastern and Tropical Himalayas, Nipal, Sikiia,  
 Lft^ma Assam. W. Peninsula); Ccvloii, -Malaya.

**nately 3-foliolate; leaf-rhachis** (including the petiole)^.] -2 in.,  
**common** petioles **f-1 in.** long, shaggy; stipules subulate. <sup>^</sup>ts  
**broadly elliptic or obovate, acuminate, irregularij serrate-dentate**,  
*en* on both sides, glabrous or nearly-so, prominently **retieulately** L j  
 beneath, the terminal Jennets **3|-5 by 2;j-:!** **in. with petiolulea in**  
 long, the lateral leaflets l^>h **by I-l| in. with** petiolules <sup>^</sup> in. %• "  
 flowers **in** axillary and terminal panicles; pedicels **short**.  
 fineiv pubescent outside, sometimes **with a few** scattered bristly ■ lobes  
 ovate or elliptic, usually **mucronate**. Petals **obovate**, longer

than the calyx-lobes, white. Stamens 1-seriate. -Fruit glo-  
globular, succulent, of numerous drupes on a cylindrical no-  
stone rugose. **B«5t« elliptic™, Talb. Trees, Bomb. ecu**  
if *WaUichiana*, Wight & Am. Prodr. p. 298.

& Gib 89 A 7\* () ^oxh Hort.  
if. *WaUichiana*, Wigt  
Dalz. & Gibs. p. 89. A 7<<\*\*\*«s (sp.),

KANAKA: highest Ghats to the southwards, *Dakdl§ Gibson*; Ghats  
southwards from **Mah»bl«liwar, Talhof.**

**Dalzell & Gibson (I. c.)** state that the plant is found along \*  
whiefc is abundant at Mnl.nblesl.wnr. but I have never  
found \* Woodrow inch.de it, in his lirt. Tb«e are no .pcrnus  
from **DISTMB. India (Himalnyae and \\ estem Peninsula).**

leaflet sometimes lobed, longer than the sessile lateral ones, all

3 **Rubus lasiocarpus, Sm. in fices, Cyclop, v. 30 (1810V)**  
A rambling sarmentose prickly sbrub; old branches  
reddjs smooth; young shoots covered with a thin whitish

compressed, hooked or rarely straight. Leaves 4-8 in. long. (inc  
the petiole), imparipinnate; rhachis closely set with prickles of va  
size and clothed with soft woolly pubescence; petioles  $\frac{3}{4}$ -1½ in.  
stipules linear, acute. Leaflets 5-9, ovate or elliptic, acute, the te  
dark-more or less pubescent and wrinkled on the upper side owing j  
numerous prominent nerves below, hoary beneath with white \\  
tomentum, the margins serrate, the serratures ending in a stout bi  
base cordate or rounded, rarely acute; petioltils of the terminal le  
g-f in. long. **Flowers** in terminal and axillary tomentose cor|  
the axillary corymbs sometimes reduced to a solitary flower; pedi|  
short, tomentose, rarely prickly; bracts linear-subulate, j  
pubescent; tube small *av.d* broad; lobes ovate, with a long si  
acumination. Petals pink, orbicular or broadly obovate, 8e|  
**exceeding the calyx.** Carpels numerous, tomentose; styles red. A—I in.  
in diam.; globose; drupes **nunrieroOs, dark-purple** when ripe] 1 pitted. FJ.  
B. I. v. 2, p. 339; Grah. **Cat.** p. 04; Dalz. & Gibs, p.] Wight, Icon.  
t. 232; Trim. Ff. Ceyl. v. % p. 13S; Talb. Trees, Be<sup>1</sup> ed. 2, p, 158;  
**Woodr.** in Journ. "Bomb. Nat. v. 11 (2898) p. a Waft, Diet.  
Econ. Prod, v. 6, part 1, p. 582.—Flowers: Nov. *Yi GauripJioL*

DECCAN: **Faubgnni, Woadrow, Malmbleadwar, H.M. JJtrdwood, Coolcl**  
highest. Ghats to the southward, *DafceM §' Gibson.*

Very common at Mahabl;slmar, where. it ie found wild find where it  
cultivated, chiefly in the gardens below the lake, for its fruit which is largely en  
by the Europeans who frequent the hill and also mode into jinn. The fruit, wl  
sotnewat resembles a blackberry, is commonly known as the "**Muhoble&h**  
**Raspberry.**"—*DISTRJB. India (Temperate Himalaya, Birma, W. Peninsula); Oei*  
J;iva.

*rostrfolius, Sm. Ic. ined. t. 00, ex Hook. f. in FL B. T. nj*  
p. 341. A subseadent woody shrub, a native of the temperate Iliroalajj  
the **Kbasia Hills**, and Ava, is sometimes grown in gardens. The flow  
are large, |—1 iu. in diaui., white, and the drupes are small. It flower  
A.ilgL<it.

3. FOTENTILLA, Linn.

«ei'Ds usually perennial. Leaves compound ; slipulea adnate to the o\*<sup>e</sup>- Flowers yellow or white (rarely red), solitary or in corymbose  
**h<sup>s</sup>**lyx persistent, usually 5-braeteolate; lobes as many as the erect or **spreading**, valvate in bud. Petals as many as the ; obovate, orbicular, or Knear-spathulate. Stamens usually **mero** Disk annular or lining the calyx-tube. Carpels many (few), on a small dry **receptacle** ; ovule solitary, **pendulous**; <sup>s</sup> persistent or deciduous, ventral or terminal. Achenes many, ou <sup>^</sup> **TM**y **receptacle**.—DISTKIB. Chiefly in the colder regions of the <sup>Jern</sup>> rare in the southern hemisphere; species about **120**,  
 \_\* • \*\***otentilla supina**, Linn. *Sp. Pl.* (1753) p. 497. An annual

\<sup>cute</sup>> entire, hairy. Leaflets 3-0", opposite and alternate, "variable in <sup>c</sup> <sup>^</sup> <sup>ArK</sup> form, usually obovate, sometimes oblong or cuneate, variously .} "airy on both surfaces ; **petiolules** very short or 0. **Flowers** 0 t <sup>ill</sup>\*-r solitary, \ **in. in** diam.; pedicels \- in. long, slender, hairy. . <sup>a</sup>M\*x hairy outside, -I **in.** long; lobes 5, ovate-oblong, subacute; <sup>^</sup>tjeoles5, oblong-ellipfcic, obtuse, about \ as broad as the calyx-lobes. <sup>t</sup>-<sup>tf</sup>U.s yellow, oblong, smaller **than** the calyx. **Achenes** numerous, <sup>^</sup>tir <sup>a</sup>Ar' <sup>smoo</sup>t'h \ receptacle globose. Fl. B. I. v. 2, p. 359 ; Boiss. **Fl.** <sup>:"</sup>"Mt. v. 2, p. 725; **Aitcb.** Pb. & Sind PI. p. 57 ; Woodr. **in** Journ. **■**mb. Nat. v. 11 (1898) p. G35; Watt, Diet. Econ. Prod. v. 0, part 1, 14-1cJ/3.—Flowers : Oct.

Ind \IUT : Kurm'di, Kanifkarl, Ifoodrow. **SISD**: Stocks, 403 I; banks of the

VAR. 1 (ITook. f. FL B, I. I. c.) with smooth (not ribbed) achenes that is foun and Sind.—DISTEIB, Throughout the wanner parts of the plains of India; a and westward to the Atlantic;, N. Asia, JS. Africa.

- 4. NEURADA, Linn.

gard  
 i-colorT An annual woolly depressed branched herb. " Leaves alternate, tiolate, ovate, lobed ; stipules minute or obsolete. **Flowers** axillary, "itary, pedicel led. Calyx-tube flat, dilated, at length conic, spiny **and ■ming with** the ripe carpels an orbicular disk; lobes 5, **triangular**; **■**acteoles 5, subulate. Petals 5, **small**. Stamens 10, inserted **in** the **jntracted** mouth of the calyx ; filaments subulate. Carpels 10, whorled, nited with one another and with the calyx ; ovule solitary from the **yex** of the carpel; styles subulate, persistent. Fruit a depressed cone 'ith spinous **margins** ; **carpels** 10. horizontal, dehiscing above, **terminated** jty the **spinescent** styles. Seeds curved, **germinating** within the carped, 'xalbuminous.—DiSTniu, N. Africa, Arabia, Persia, Afghanistan, Sind, nd the **Panjab** ; species 1.

1 **Neurada procumbens**, Linn. *Sp. PL* (1753) p. 441. A ranched procumbent herb; **branches** 5-10 in, long, densely woolly. Laves <sup>1</sup>-| in. lon», ovate-oblong, variously Jobed, densely **tomentose** **Ci**>**dth**

**SuVfeces** ; petioles J-| in. long, densely woolly. Flowers \ in.

in diam., axillary, seHiary; els sl»<'» ; ■ -tt flat , tli«

ale will coolly, the lower sui fa<- J np vh^ ri)ll..l  
l« aod the roots or "" ^fefft <() ]1.  
J>-

fruit from which they faove emerged as a fojjy gro\*g ^gtfi  
to, the collar remaining even when the plan\* I^f. f;\*

I. v. 3. p. 368; 1 FJ. Orient, v. 2, p.736; i w ^  
pfla^T^)

Aitch. Pb. & Sind Pl. p. 57 : I n »»»<t\* J"&L V.  
H (

part.3, p. 50, %. 23; Woodr. m Journ. BomO- ^  
p. 635.—Flowers : Nov.-Jan. — ...fc. &#?££&\*>  
-PJSTBIB-

. Africa, Arabia,

>te or

The following non-indigenous plants of the Order are grown  
equently in gardens throughout the Presidency :—

*IVunus Amygdalus*, Stokes, Bot. Mat. Med. v. 3, p. 101.  
"Almond" is occasionally, though rarely, grown in gardens, but dot\*:  
fruit well.—YERX. *Badum*.

*Primus Persica*, Stokes, Bot. Mat. Med. v. 3, p. 100. "The  
*Pek* is grown in some quantity at Panchgani. The fruit is,  
however, \*\* and very unlike an English peach. It is used  
chiefly for stewing making jam.—YEUV. *A'la*.

*Vragaria vesca*. "The Strawberry

*y* is very extensively cultivate  
**Mahableshwar**, especially along the banks of the river Yenna.  
me of the delicacies of the hill, and pounds of the fruit are dally  
sumed by the Europeans who visit the station in the hot season.  
in fruit from March to June.

*Erioloinja japonica*, Lindl. in Trans. Linn. Soc. v. 13 (1822) p. \ <sup>li</sup>  
7'he Lofjitat" a Chinese fruit, is occasionally grown in gardens, does  
not fruit well, except perhaps about Belgaum.

*Byriw Mains*, Linn. Sp. Pl. p. 479. <sup>H</sup> The Apple<sup>1'</sup> has been plant!  
at Ahmednagar, Poona, Panchgani, &c, but rarely bears fruit.

*Pijrus communis*, Linn, Sp. PL p- 479. \*: The Pear" has been plants  
at Mahableshwar below the forest officer's house at Lingmala, but tlj fruit  
is woody and of little value.

Roses are largely cultivated and succeed well with ordinaiycare. poll  
and climate of the Deccan suit them. The varieties that have beel  
introduced are numerous. An excellent description of the kinds  
iniri duced into Poona and their mode of culture may be found in  
*GardenirA in India*, ed. 5, pp. 281-300, by Mr. G. M. Wood row, who  
was, whilj| in Indui, a most successful cultivator of roses.

*Cotoneastei'frigida*, Wall., is mentioned by Mr. **IT. M. Birdwood** [Cai  
Flor. **Matheraa & Mahableshtar** (1897) p. 15] as occurring a bo]  
Unibag Matheran. As this tree is an inhabitant of the Central :  
**Eastern Himalayas** and **Nipal** and grows at a high altitude, it is scare;

Matheran. It has not.

found

^ n^S^e

s not

b3en

K..± :lll.V\vlk're else in **the Bombay Presidency**, and **there** is apparently  
 »»' **one tree on the Matheran hill.**

## OSDBB L. SAXIPEAGACE^.

rp

S' S^U^JS' op nerbs of various habit. Leaves alternate and exsti-  
 i stipules adnate to the base of the petiole, or opposite **and** Flowers  
 usually hermaphrodite ; sepals, petals, and stamens *j* regular. Calyx  
 the usually o-merous, more or less adnate to .^;r)! lobes imbricate or  
 valvate. Petals 5 or 4 (rarely 0), usually I 'gynous, oi:ten  
**per** small, imbricate or valvate. Stamens inserted with. ofV^l  
 the \e<l^ua^nf or double their number, rarely indefinite. Ovary oc *t*  
 \*- \* ^ ^ united carpels, usually 2- or 3-5-ceUed with axile placentas,  
 casionally **1-celled** with parietal placentas; ovules numerous,  
 ana-**pous**, erect or pendulous; *styles* as many as the carpels, free or  
 more \*ess connate; stigma capitate, or lateral and subcapita'e.  
**Fruit** \*ular or baccate. Seeds **usually** numerous, usually  
 albuminous.—■ "in. Cold and temperate regions of the world and in  
 the mountains it Tropics ; genera 72; species about 580.

i ^

### 1. VAHUA, Thunb.

fti V>r biennial herbs. Leaves opposite, entire; stipules 0.  
 , small, regular, axillary, **usually** in pairs, **white** or yellowish.  
 M'x-jPtube hemisplieric, adnate to the ovary; lobes 5, ovate or  
 lanceo-V, v^alvate. Petals 5, usually shorter than the calyx-lobes.  
 Stamens 5, ■ -us: filaments subulate. Ovary inferior, 1-eelied,  
 with 2 pen-f lacenlas ; ovules numerous ; styles 2, distinct; stigma  
 capitellate. fl|le dehiscing at the apex between the styles.  
 Seeds numerous,, ^pe, ellipsoid, smooth.—DISTEIE. Tropical  
 and subtropical Asia, and S. Africa; species 3.

**k. Vahlia viscosa**, *Eoxh. Ft. Lid*, v. 2 (1832) p. £9. A  
 glandular-Jjeseeut **herbj** stem G-12 in. **high**, erect or diiTuse, branched.  
**Leaves** I by A~\ in., siibsessi]!^, oblong-lanceolate, acute  
 or subobtuse, fbrous or nearly so ; midrib prominent beneath.  
 Fio\ver3 solitary or rtoairs in most of the upper axils ; |K>dieL-ls very  
 short. Calyx |—\ in. >gj glandular-pubescent; tube hejnispheric;  
 lobes about as long as or little shorter than the lube,  
 triangular-ovate, acute. Petals white >alzel], following  
 Roxburgh, says yellow), not exserted beyond the vx-lobes,  
 ovate-elliptic, acute. Stamens not exserted beyond the  
 'yx-lobes. Capsules ^ in. in diam., subglobose. Seeds  
 minute, merous. Fl. B. !. v. 2, p. 399 ; Wight, Icon. t. 563;  
 Aitch. Pb. & nd PL p. 5S ; **Balz.** & Gibs. p. 90; Woodr. in Journ.  
 Bomb. Nat, v. (1398) p. 635,—Flowers: Jan.

Karanja (Bombay liarbour), *Dal-rell 4' Gibson* ; Pivalp, 23 miles east of  
*JVoodivw'* Alurshi, foot of **Ambeghut**, between Kotaptir and Iiatrmgiri,  
 GUJVB.A.T; *Datedl 4' Gibson*. SIMI; *Siocskl'*, near **Karachi**, C I  
 Tbroughliout India in dry localities ; Persia, Egypt, Tropical Africa.

as

## OBDSB IX CEASSULACE^.

Herbs or undershrubs usually with fleshy \*\*.\*#%& branches. leaves alternate or opposite, sinip^ & (peutf^ pinnaMv divided; stipules 0. Flowers usuaJij c> <sup>regaW. ,</sup> *Bryophyllum*), hermaphrodite or very rarely muse\*'''' ^ MP free, usualh fid or 4-5-partite. Petals as «<sup>ia11?</sup> iellS af<sup>0</sup> alternate with them, free or more or less connate. . HrJLia ^6. the inonopetalous corolla, or inserted alternately vJtu njtag^, tunes double their number. Carpels usually aa m?M as-,Jfi {, opposite to them, free or connate below, narrowed upwards into tne styles, with a hypogynous gland or scale at the base of each; ovules numerous. 2-seriate along the ventral suture, horizontal or pendulous, nnatropous. Follicles membranous or coriaceous, 1-celled, many or few-seeded, dehiscing down the ventral suture. Seeds albuminous, usually minute; embryo terete; cotyledons short.—DISTEIB. Spread over nearly the whole globe except Polynesia ; genera 14 ; species about 400.

Stamens as many as the petals.

Small herbs....., ..... 1, TJLL.-EA.»

Stamens twice as many as the petals. f

Tall erect herbs.

. Calyx shortly 4-fkl ..... 2.

Calyx 4-partite ..... 3.

KALA.AI

## 1. TILLiEA, Linn.

Small subsucculent glabrous herbs. Leaves opposite, the Indian species. Flowers minute, axillary, often fasciculate, si or cymose, white or red. Calyx 4-5-1 obed or 4~5-partite. IV free, or connate at the very base. Stamens 4-5; filaments llypogynous scales 4-5 or 0. Carpels 4-5, free, attenuated subulate styles ; ovules 2 to each carpel in the Indian species. 2-seeded.—DJSTIUB. Cosmopolitan ; species 20.

1. *Tillaea pentandra*, Boyle, III. Bot. Hinud. (1839) p. 222 (naj only). Steins procumbent, branched; internodes shorter than leaves. Leaves J-§ by j-<sup>1</sup>^ in., liuear-lanceoiate, acute, connate! the base. Flowers minute, sessile, asiliary, usually solitary in upper, 2-3 together m the lower axils. Calyx-segments laneeoIJ acuminate. Petals ovate, acuminate, white, not exceeding the sepaj Se< da minute. Fl. B. I. v. 2, p. 412 ; Oliver, FL Trop. Afr. v. f p. 386. \* I

KI.NKAN : Stocks I

The plant Is included on the authority of specimens mar&ed as above in Herb K< The ticket on the specimens is not, however, in the bandwritHg of Br. Stocks, wh! the locality (Konkan) is printed (not written) on the ticket, tfo other botanist hi found the plant in Bombay, and its occurrence in tlie moist Konkan would seem to pomewhat donbtful.—DISTHIB. Iudia (Subtropical Himalaya Mvsore Kilghiria Tropical Africa, Abyssinia.





2. **BRYOPHYLLUM**, Salisb.

**au** erect perennial herbs, thickly fleshy. Leaves opposite, erenate. <sup>^W&r f var S e ></sup> nodding, in spreading panicles with opposite branches. inflated, cylindrical or **4-gonous**, shortly 4-fid, valvate. Corolla <sup>j ^ t e</sup> or subcampanulate; limb shortly 4-fid, spreading. Stamens-8, <sup>^ries</sup> inserted on the middle of the corolla-tube; <sup>carpels 4,</sup> filaments filiform, free or connate at the base,

hypogynous scales 4, free or adnate to the carpels; ovules very numerous. Follicles 4, many-seeded.—**DISTRIB.** Tropical Africa; species 4, of which 1 has been naturalized throughout the Tropics of the Old World.

attenuated into long

styles;

\*• **^ryophyllum calycimim**, *Salisb. in DO. Prod.* v. 3 (182S) p. 396. A succulent glabrous herb 1-4 ft. high; stems obtusely

<sup>f?SH</sup> the older light-colored, the younger reddish speckled with . <sup>"e<</sup> Leaves variable, decussate, the lower usually simple or occasionally compound, the upper usually 3-5- or sometimes 7-foliate, **^ng-petioled**, the petioles united by a ridge round the stem. Leaflets

ovate or elliptic, erenate or serrate. Flowers pendent, in large spreading

racemes with opposite stout branches; pedicels slender. Calyx 1-H

<sup>pp</sup> <sup>;</sup> <sup>p</sup> <sup>y</sup>  
<sup>ong,</sup> striated red and green at the base, pale green above; teeth **feri-**<sup>ail</sup> <sup>gul;</sup> <sup>ir.</sup>

<sup>j^idd-le,</sup> reddish-purple; lobes triangular. <sup>Corolla</sup>  
 Filaments, <sup>?(</sup> pinkish below the anthers. Anthers swollen and  
 hastate, black. **■U**; subquadrate, free or slightly octagonal at  
 adherent to the <sup>a,</sup> <sup>:</sup> <sup>i.</sup> Fruit enclosed in the the base,  
 persistent papery **calyx** <sup>l'i^T'd\*</sup> small, oblong-ellipsoid. constricted in  
<sup>smooth scarcely striate</sup> <sup>TI</sup> the <sup>^iddl</sup>

reddish-purple; lobes triangular. Filaments green at the

h Ah h b l k

hypogynous

carpels. **Stylea**

persistent **papery** calyx and corolla,

small, oblong-ellipsoid, smooth, scarcely striate. The leaves

often

twice, on their crenatures at the extremities of the lateral nerves, buds

5 <sup>p'^aifshd</sup> with root, stem, and leaves, which drop off and at once become

plants. (See Le Maout & Becaisne, *Syst. Bot.* p. 7.) PL B. I.

**■** p. 41:3; *Grab. Cat.*, p. 82; *Trim, Fl. Ceyl.* v. 2, p. 145; *Woodr.*

<sup>^ J</sup> *Bomb. Nat.* v. 11 (1898) p. 636.—Flowers: Jan.


VEHN.

*ftnphne ; Ghaipdt.*

**KOW** *Stocks*]; Matheran, *H. M. Mrdwood*; road to Garbat Point, *Cool-el*; in  
mrdeiiB Bombay, *Graham*: **Wari** country, *Duhell§ Gibson. Due* CAN : *Wai* (Satara  
ptricts), *Woodro-m*• Ma-bableshwar, *Coo&el, H. M. Birdwood*; Koina valley below  
lahableshwar, **abundant**, *CooA-el* S. M. COUKTRV: near **Belgaum**, *Graham,*" *Dalsell*  
*yGihwn* ; **RataghAt, Law.**—DISTEIB. Supposed to be a native of Tropical Africa, but  
. airalized evety where throughout the Tropics of the world,

i

### 3.' KALANCHOE, Adans.



Erect stout perennial herbs. Leaves opposite, or the upper alternate,  
eshv, sessile or petiolate, entire, erenate or pinnatih'd. ^'lowers large,  
many-flowered paniculate cymes, yellow, white, or purplish. Calyx  
partite or 4-fid i-way down, the segments shorter than the  
corolla-be. Corolla with a flask-shaped tube and spreading  
4-fid limb, ,jrsistent. Stamens 8, in 2 series, adnate to the  
corollJa-tube. Hypo-ynous scales 4. Carpels 4, adnate to the  
base of the corolla-tube, **Attenuated into** long subulate styles;  
ovules many. Follicles mem--**anous**. Beeds numerous,  
oblong-ettfipsoid, with 8-15 longitudinal  
*i\** \_\_\_ I)ISTBIB. Tropical and 8. Africa and Tropical Asia ; one  
species

Brazil; species about 25.

simple.  
Flowers yellow.

Calyx 5-lobed; lobes broad at the base...	2. if. s/wZ-WV*:
Rowers white!	3. <i>K. JhribunOt.</i>
<b>Calyx glandular-hairy</b>	A v i-
<i>Calyx</i> glandular-hairy, glabrous.....	4. <i>K. oltvacea.</i>
<i>vaiy</i> *. e]fianauiar, glabrous.....	K v- m, -j*i
Leaves pinnatifid .....	o' &-iilHd<l_
"*'	0. <i>K. lacinia fa.</i>

ieh dmh\*w7«.TM • n<sup>Ut</sup> Peren<sup>9</sup>ial lu<sup>rb</sup> S stein thick at the base, 1-2 l'r. A igii, clothed (especially towards the top) with glandular hairs. Leaves 5 is orate or "i—ite-Janceolate, 4-6 in. long, nearly the base, scarcely petiolate ;

lanceolate  
paniculate sh  
glandular-pubescent, dividi sd<sup>1</sup>

glandular-pubescent in the upper pare; segments of  
m n 7 ■"■JPOgynous scales narrow-h'noar, whitish n]  
«. .Carpel, glabrous. Seeds longitudinally ribbed  
and hi

ally snate, oblong-ellipsoid, brown. Fi, B. I.

Ar.Ln Nat v'lins Vsr; /' ^ r-\<sup>V<"'</sup> P<sup>396'</sup> Woodr.in Journ.  
£\*

i in. ^sumenmes ^-toliolate), frequently  
sessill

l<sup>1</sup>lower<sup>3</sup> in den.se many-flowered cymose panicles ; lower bracts  
leal like. Calyx |--| in. long, glabrous, divided almost to the very  
base^ segments oblong-lanceolate or triangular from a broad base,  
acute oi acuminate, ^ in. broad at the base. Corolla clear yellow ;  
tube glabroui j in. long; lobes broadly lanceolate, acute or shortly

acuminate. Hypo] gynous scales narrow-linear, ^ in. long, often bifid.

DECCAN: Panohgani, Woodrow. Prod. v. 4, p. 504.—Flowers : Oefc-Nov.  
Woodrow.—DISTRIB India (Tropical Iliinalnja, Birma) ; China, Java.

Follicles glabrous\*! l<r'i. B. I. v. 2, p. 414; Woodr. in Journ. Bomb.  
Hat. v. 11 (1S9S<sup>1</sup> p. 638 ; Watt, Diet. Econ. Prod. v. 4, p.

\*: ^r\*. Srxrf'i i-i from v- «■ I  
ovb 2-3 ft. hih. >,,>,,■;,,>,,[,,>,, : ^..I<sup>2'</sup>, ". 41o\_ . A lsa<sup>m</sup>

5G4.—Flowers: Oet.-IVov.

Kala

○ p. 859

var. glabra, O. B. Clarke, in Hook. f. PL B. I. v. 2, p. 415. A  
large perennial herb 2-3 ft. high, quite glabrous throughout ; stem  
erecj, not branched, hollow. Leaves fleshy, the lowest reaching 4



in. IOD gradually becoming smaller upwards, the uppermost about \.\  
in. Jon

... rounded or obtuse, gradually tapering to a long base.  
 ... y crenate-serrate, pale yellowish-green. **Mowers** numerous, in  
 ... flat-topped tribotomous corymbose cymes; bracts linear-lanceolate.  
 ... nearly to the

... ly to the base, glabrous;  
 ... segments  
 ... lanceolate, ^ in. broad at the base, very acuminate. Corolla  
 ... in. long, yellow; tube inflated, glabrous; lobes broadly lanceolate,  
 ... acute. Hypogynous scales -^ in. long, narrow-linear, usually acute.  
**des** glabrous, "Trim. PI. 'Ceyl. v. 2, p. 144; "Woodr. in Journ,  
**Nat. v. 11 (1898) p. 630.**—Flowers: Nov.  
 : hills near Satara, *Woodrow*.

\*• **Kalanchoe olivacea, Bah, in Bah. \$ Gibs, Bomh. Fl, (1861)**  
 <?!?£\$\*\$. **Whole** plant of an olive-brown color; stem 1 ft. high, terete,  
 Lef, US" \_Leavcs 3|-o by 1-2 in., ovate, elliptic, or broadly lanceolate,  
 Lejuarly crenate-serrate, fleshy, dotted with blood-red spots, glabrous,  
 pper leaves the smaller. Flowers in paniculate cymes 5 pedicels l.!!y  
 clothed with glandular viscid hairs. Calyx T V? <<• long,  
 scarflar-hairy; lobes lanceolate, acute or **acuminate**. Corolla  
 white, on tonnes slightly tinged with pink (especially when fading),  
 f-g in. glads tube clothed outside with glandular hairs; segments |-|  
 in. long, ^ neap, acute, apiculate, glandular-hairy outside. Hypogynous  
**scales** £ in. ^ white, linear, slightly bifid at apex. Follicles  
 glabrous.—Flowers :

... abundant,  
 ... near Wai,  
 ... (elgaiim, Ritchie, Mi)!

... The description of this plant, owing no doubt to its having appeared  
 ... a and corrigenda to the 'Bombay Flora' of Dalzell & Gibson (l. c.), has  
 ... escaped notice. No allusion to it is made in the 'Index Kewen  
 ... hitherto sis' nor

... in any other botanical publication, I have, in my own  
 Herbarium, several **iens** obtained from the **cliff at** Panchgani, where  
 Dalzell found it, and Mr. Gammie **jceSily** s^t me a large number of  
 specimena from the, same locality collected by Elude,\* tie

... but one specimen of the plant in Herb. Kew. which was collected by Ritchie  
 ... 330, marked nov. sp.) on hills near Belgaum. Mr. C. B. Clarke in Hook. f. FL  
 I. v. 2, p. 415, places Ritchie's plant under *K. brasiliensis*, Camb., a plant which in

Herbarium Keeper in the College of Science at Poona. There has  
 isjinal description (ri. Jiras. menu. v. z ^in^y; p. LVO) **uamoesseaes oescriDes** as U£  
 near the sea, and further describes the flowers as having a yellow tube and a  
 colored limb, characters which would seem to be sufileiently distinctive. Ritchie, lote  
 attached to his specimen in Herb. K<JW., describes the flowers of his plant aa nd I can  
 add my testimony to the correctness of Ritchie's statement, ns I **base** the plant  
 growing in abundance along the Fanchgani Ghat, where its white ' were a  
 conspicuous object among the rocks.

6 **Kalanchoe BWdei, T. CooJce,** AWhole plant of a reddish color,

**h**erbaceous ; stem erect, **2-3 ft. high.** Leaves **2|-3|** by **1|-2** in.,  
**elliptic**, **venation** **reticulate** and irregularly crenate-serrate, tinged with red,  
 running down midrib a flattened petiole which is enlarged at the base.  
 Flowers numerous, **in terminal cymose panicles**; pedicels slender, **1/2-3/4** in.  
 long; bracts linear-



Height 2-3 ft. Leaves 2-3 in. by 1-2 in., elliptic, venation reticulate and irregularly crenate-serrate, tinged with red, running down midrib a flattened petiole which is enlarged at the base. Flowers numerous, in terminal cymose panicles; pedicels slender, 1/2-3/4 in. long; bracts linear-lanceolate, broad at the base, triangular, acute, appressed to the corolla, glandular. Corolla 1/2-3/4 in. long, pure white; segments 1/2-3/4 in. X in. broad oblong or slightly obovate, acute, apiculate, glabrous, perianth scales 1/2 in. long, linear, acute. Petals glabrous.— Calyx divided to the base; lobes 5 in number.

DECCAN : Sliirgaon *Ghit* between Wathar and **Wai, Shide, 1243!**

The above **apeoiea** was collected in November 1002 by Mr. Blade, the **Heroiw Keeper** in the College of Science at **Poom\***. I have named the plant **after** In in.

6. **Kalanchoe laciniataj DO. Succ. PI 4' Grasses, t.** <sup>100</sup>Ji(h); large succulent herb, glabrous or more or less pubescent, 8-\*. <sup>o</sup> stems stout, slightly branched. Leaves numerous, large ami ^ succulent, 3-4 in. long, very variable; the lowest deeply gashec, ^ segments usually narrow-oblong, acute, dentate, serrate or crenate ;i, middle-stem leaves more or less deeply pinnatifid ; the uppermost eii or nearly so, all shining, pale glaucous-green; petioles 1-1 % in flattened, fleshy, **amplexicaui** Flowers in paniculate cymes; linear. Calyx \—\ in. long, glabrous or glandular-pubescent, divide the base; **segments** narrowly lanceolate, acute, **somewhat** Bprea^ Corolla yellow, § in. long; tube £ in. long ; lobes lanceolate, acuj | acuminate, glabrous or pubescent. Hypogynous scales ^—£ in. : linear. Follicles J in. long, glabrous. Fl. B. I. v. 2, p. 415; Grab. p. 81; Dalz. & Oiks. p. 105; Wight, Icon. t. 1158; Oliver, FL f Afr. v. 2, p. 392 ; Trim. Fl. OeyL v. 2, p. 144; Watt, Diet. Eeon.? v. 2, p. 562.

The plants vary much in pubescence, the mode of division of leaves and the shape of their ultimate **segments**. Mr. C. B. Cl (FL B. 1.1. c.) recognizes 2 varieties, **in** one of which the leaves are c **pinnatifid**, the segments broad and the sepals glabrous, while in other the leaves are **2-3-pinnatifid**, the **segments** linear and the s\* pubescent.

DECCAN : Pandnghar fort near **Wai, Gibson** ex *Graham*. S. M. COUNTRY : hilkj Dharwar, *Lush* ex *Graham, Dalzell* <\$• *Gibson*.

The localities **naroed above** have been given by *Graham* and by *Dalzell* & I **their respective Floras**. I liirv« seen no **Bombay specimens**, nor has Mr. **W** included tiio plant in his list in *Jourii. Bomb. Nat. Hist. Sue.* **Graham** is st«ntial enough in his description, but depends for localities on Dr. *Lush* ami **Dr.** < it **Dalzell** probably quotes **Qrab&m.**—DISTJUB. India (**Bengal, Birina, W. Penini** Cejflon, Malacca, Yunan, Java, Tropical Africa).

## OEDEK LII. DROSEKACE^I.

Perennial, glandular-hairy herbs. Leaves radical or alternate, usual **circulate in vernation**; stipules 0, represented by hairs edging tR dilated base of the petiole, or scarious. Inflorescence various ; **flowe"** **bermuphrodite**, regular. **Calyx 4 8-parfcite**, or **Bepals** free, imbricat persistent. Fetals 4-8, hypogynous or nearly so, imbricate in buq **mareescent**. Stamens as many as the petals, hypogynous or nearly sJ Ovary nearly free, globose or ovoid, 1-3-celled ; ovules numerous, ol 5-3 parietal placentas ; styles 5-3, capitate, limbriate or bifid. **Capsulj** membranous, **5-3-valved**. Seeds numerous, with fleshy albumenL embryo cylindric or minute.—BISTIIB. Throughout the world (excepl the Faciic Islands) **in** temperate and tropical regions; genera GI species 110.



1. DROSERA, Linn.

Perennial herbs, scapigerous or with a leafy stem, **grandul&r-hafry**. **leaves alternate** or **rosulate, usually** ci rein ate in **vernation** j stipules 0 or s^arious and adnate to the petiole, Flowers white or rosy, solitary, TMcemose, eymose or corymbose. Calyx free from the ovary, **4-8-partite, fabricate**. Petals 4-8, **hypogynous** or scarcely perigynous, marcescent. **stamens** as many as the petals and inserted "with them. Ovary free, **ovoid** or globose, **1-ceUed**; ovules **numerous**, parietal; styles 2-5. ^■psule **loculicidally 2-6-Falve^**. Seeds numerous in the Indian species, obovoid-ellipsoid ; testa black, smooth, reticulate, not **lax**.—**DisraiB**. l\*»roughout the world, except Polynesia; very numerous **in** Australia; sPecies 100.

all radical, rosulate, **spathulate-cuneate** ..... 1 - !>■ *Bunnan ni*.  
 cauline, linear ..... 2. 1), *indka*.

1. **Drosera Burmanni, Vald, Symh. v. 3 (1794) p. 50.** Stem CfU<sup>feΛ</sup> ari<sup>y-</sup> Leaves | - | in. long, all radical, forming a close rosette n the ground, spathulate-cuneate, upper surface clothed **with** numerous **gland-tipped** tentacles **longest** at the **margin** ; **petioles** flat; stipules C<sup>J<sup>oar</sup>v as J<sup>ong</sup></sup> & s the petioles, scarious, cut **into** long slender segments. C<sup>1~3<sup>t</sup> erect</sup> ff<sup>labi.ous<sup>t</sup></sup> 2~s<sup>in-</sup> **long**, from the axils of inner leaves.

st...vers a ou - , n secund racemes occupying the upper fourth  
 Note in the scape only; pedicels 1/8-1/4 in. long, slender, glabrous. Calyx  
 ... long, papillose; segments linear-oblong, obtuse. Petals white,  
 S. atly long y, p e . Styles 5,

**undivided,**  
 ailes 5-valved. Seeds numerous, minute, black, reticulate. **Fl. B.**  
 I I b t 4 2 4 C h C t 11 D k & G

**Wt** p. 424; **Grab.** Cat. p. 11; **Dak. & Gibs.** p. 12; **Wight,** Icon. }4; **Trim. Fl. Ceyl.** v. 2, p. 145; **Woodr.** in Journ. Bomb. Xat. I I (1898) p. 636; **Watt, Diet. Econ. Prod.** v. 3, p. 195.-Flowers: \* [-Feb. ']

HSK.VN: Ratnagiri Colleclo rat-e, 2faimel Dapnli, Kctime; 8. Konkan, **IkdseU** % oit JWoodivw'- **KANAKA: Skldaparand TaeomM, Woodroto.**—JDISTKIB. Throughout a ; **Ceylon, China, Japan, Malaya, W, Africa, Australia,**

rai 2 **Drosera in die a, Linn. Sp. PL (1753) p. 2S2.** Stem weak, ibt'rect or decumbent, slightly branched, glandular-pubescent. Leaves **auline** **alternate, 1-2| in.** long, narrow-linear, about ^ **in.** broad, rcinate i" vernation, the upper portion copiously fringed with very [me **eland-tipped** tentacles, the lower half (petiole) glabrous. Dowers **n leaf-opposed** racemes, 3-8 **in.** long ;

ca...the  
 hairy. a yx o n. on ;  
 or less glandular-pubescent. Petals white, narrowly spathulate, slightly  
 oliau the y p ; y

**longei** «. n rjJgeci anc[ **with** raised reticulation. **FL B. I.** v. 2, obovo.d. ^f^l « u Ba]z. & Gibs. p. 12. Xnni. Fl. Ceyl. v. 2, ■ **146- W** **odr.** in Journ. Bomb. Nat. r. 11 (1898) p. 636.-**Flowera:**

pedicels J-J in. long, glandular-Cl J i lg segments  
 oblonglanceolate subacute more

## LIII HALORAGIDACEAE

Herbs often aquatic. Leaves alternate, opposite or whorled, often pectinately pinnatifid when submerged; stipules 0. Flowers  $\text{F}$  phrodite or unisexual, usually minute, often incomplete, axillary, solitary or fascicled, sessile or pedicelled, the nodes between the floral whorls sometimes developed. Calyx superior; tube adnate to the ovary; whorl of the limb 4 or 0. Petals 4, epigynous, or 0. Stamens 8, 4 or  $\wedge$  epigynous in the bisexual flowers. Ovary 4-, 2-, or 1-celled;  $\text{ovule}$  (1 in *Hippuris*), pendulous; styles equal in number to the cells; stigmas papillose or plumose. Fruit small, dry or drupaceous/ $\wedge$  cells as in the ovary, indehiscent or separating into carpels: 4 or 1.—DISTRIBUTION. Cosmopolitan; genera 0; species 80.

## 1. MYRIOPHYLLUM, Linn.

Glabrous aquatic herbs. Leaves entire, dentate, serrate, or pectinately pinnatifid, often whorled. Flowers monoecious or hermaphrodite. sessile or nearly so, in the axils of floral leaves or in nearly spikes. MALE FLOWERS: Calyx minute; tube short; limb 2. or 0. Petals 2-4. Stamens 2-8. FEMALE FLOWERS: Calyx deeply 4-furrowed; limb 0 or of 4 minute lobes. Petals minute Ovary inferior, 4- or rarely 2-celled; ovule solitary in each pendulous; styles 2 or 4, short; stigmas plumose. Fruit 4-furrowed or separating into 4 or 2 carpels.—DISTRIBUTION. Cosmopolitan; species.

**1. Myriophyllum intermedium**, DC. *Prod.* v. 3 (1828) p. An aquatic herb; stems long, the upper portion floating on the water. Leaves  $\wedge$  by  $\text{V}$  in., alternate, solitary or in fascicles of] sometimes in whorls, linear, acute, entire or serrate; the submerged pectinately pinnatifid. Flowers subsessile, axillary. **Fruit**  $\text{obovate}$  long, **with** rounded and minutely scabrous ridges and shallow furrows-between them, usually separating into its component carpels. Fl. B. I. v. 2, p. 433; *Woodr.* in *Journ. Bomb.* JSat. v. 11 (1891) p. 638, *Myriophyllum terandrum* (?), *Gran. Cat.* p. 70; Dalz. & Gib p. 99 (not of Roxb.). *BaUragis oligantha*, W & A. *Prodr.* p. 311 Wight, *Icon.* t. 1061 (not of Arn.).

DEGCAN: Malabar, side of the lake, *Cook*, *Woodr.* S. M. *CorxTuvj* Belgium, *Ritchie*, 1155! KAVARA: **EEiliial** (N. Kanara), *Talbot*, 1353!—INDIA: India (W. Peninsula); Malaya, Australia, New Zealand, S. America.

## OBDEK LTV. RHIZOPHORACEAE.

Trees or shrubs usually quite glabrous; branches *terete*, swollen at the nodes. Leaves opposite and stipulate (rarely alternate and **entire** stipulate), usually coriaceous; stipules **interpeltate**, very caducous! Flowers in axillary cymes, racemes, panicles or spikes, usually hermaphrodite, surrounded at the base by connate or cupuliform bracts or ebracteate. Calyx-tube more or less adnate to the ovary, rarely free; calyx-lobes 4-14, valvate, persistent. Petals isomerous with the calyx-lobes, but usually shorter than them, entire, emarginate 2-fid or lacerate.

Stamens usually twice as many as the petals, oftj

inserted **in** pairs opposite to and partly embraced by **them**, rarely **indefinite** (*Kandelia*), anthers 2-celled, rarely **multiloculate** (*Bhixophora*), Ovary more or less adnate to the calyx, 2-5- (rarely 3-6-) celled or 1-celled by the suppression of the septa; ovules usually 2 in each <sup>cel</sup>U pendulous; style usually simple; **stigma** simple or lobed. **Fruit** coriaceous or woody, crowned **with** or surrounded by the **calyx-limb**, **usually indehiscent** and **1-celled**. Seed 1, pendulous, arillate or not; testa coriaceous or membranous, never lax; albumen fleshy or 0; embryo inverted, small in **the** albuminous seeds, elongate in the **ex-albinninua** ones ; radicle **macropodous**, in many of **the genera perforating** the apex of the pericarp and **protruding** while the fruit still adheres **to t&e tree**.—**DISTBIB.** Tropical plants; many sharing **with** an arboreal **vegetation the muddy** shores of the estuaries of rivers ; genera 17 j <sup>s</sup>Pecies about 70.

Seeds exalbuminosa ; radicle large, **protruding** while the fruit is still on the tree! C1

|  |                  |
|--|------------------|
| Calyx 4-lobed ; <b>stamens 8-12; OTaty 2-celled</b> .....                                      | 1. KIII ZOPHOIU. |
| Calyx 5-6-lobed.   |                  |
| Stamens 10-12; ovary 3-celled .....  | 2. OEKIOPS.      |
| Stamens <b>indefinite; ovary 1-celled</b> .....  | S. KANDBMA.      |
| Calyx 8-14-lobed; <b>stamens 16-28; ovary 2-4-celied</b> .....                                 | 4. Bums ui ERA.  |
| i.-2 j <sub>n</sub> <sup>^s</sup> <b>albuminous; radicle not protruding while the fruit is</b> |                  |
| jfi j* o" tlie tee   |                  |

~1 j<sub>n</sub><sup>\*i</sup> i—Many of the spet-tcs of this Order, **which** grow in muddy creeks and back-  
 ....., at'e **indiscriminately** called "Mangroves," a term **which ia** also **applied to**  
**Kjpnvoljf** bark-yielding plants of similar habit, even though belonging to otlier **Kfttural** t  
 (:ii !S \\*- i>v- ^att (Wet-Econ. Prod. v. 5, p. 157) enumerates the following as the (•)lie I"  
<sup>J</sup>H yielding what is known as mangrove-bark:—*Rhizophora mucronata* (the true **■B?**;  
 lie<sup>ove^</sup> *Ceriops Cattdolleana* (the black mangrove), *Avicennia officinalis*, belonpin<sup>^</sup> ^^\  
 it' Natural Order Verbenaceal (the while mangrove), *Bnu/uicra gipnuorhha*, \  
*ticm pari'iflora*, *Ceriops Roxhurgiana*, *Kanilhia Rheedii*. Mr. Gamble (Indian ]  
 Fter, v, 23 [1898] p. 413) adds to the above list **the** following plants not belonging [ ' o, (e  
 Order EnizoPHOIUCRflB :•—*Lumnitzera racemosa*, *Sonneratia acida*, *Sonnemlia /da*  
 £<sup>f</sup>i<sup>^</sup>ra6 *corniculata*, *Exoscaria Agallocha*.

## Hi 1. RHIZOPHORA, Linn.

I iJft Trees ; branches thick, terete, marked with leaf-scars.  
 Leaves oppo-■"ei-e coriaceous, ovate or elliptic, mucronate, quite  
 entire, glabrous ; linules lar('e **in pairs, interpetiolar**, caducous.  
**Flowers** rather large, ^t MillatT V3-ehotomously-divided and  
 lew-flowered cymes. Calyx **Jobed** **surrounded** at the base by  
 connate bracteoles; tube short, 1 X to the ovary at the base. Petals  
 4, entire, inserted on a fleshy • t Stamens 8-12 j anthers subsessile,  
 multiloculate. 0 vary **2-celled**, Inferior, produced beyond the calyx  
 into a fleshy cone; ovules 2 m Trtftll- style conical at the base,  
 subulate; **stigma bifid**. **Fruit** « ovoid or obconic, girt at the base  
**with** the re flexed persistent tli Seed terminating while the fruit  
 is still *on the tree*; 3PirSnn«\*e perforatmg the apex of the fruit and

descending from .e<sup>1</sup> te'to *fh*» muI-DisiSiB. Muddy shores of the  
Tropics ; species

**S**

11P species Of this genus which grow in muddy creeks and backwaters are  
inc spwi\_ & <sup>tei-in which 18 als(> J)13fle t0 delude geTeml other</sup>  
belonging to **different Natural** Orders, as fox

example *Avicennia ojtinalis*, which is called the "white mangrove.\*<sup>1</sup>

**Rhizophom**

*mucronafa* is the "true mangrove," and *Ceriops Candolleana* is known as the "black nuns grove."

Cymes usually 3-flowered ; petals fleshy, villous on the inner faces and margins ..... 1. /?.  
*mucronata*.  
 Cymes 2-flowered; petals thin, glabrous ..... 2. R.  
*conjugata*.

**1. Rhizophora mucronata, Lamh. Encrjc. Method, v. G** (1804) p. 189. A large evergreen glabrous shrub or small tree ; young branches thick, conspicuously marked with the scars of fallen leaves and stipules. Leaves 3-8 by 1-4 in., elliptic, acute, usually **raucwmate, glabrous**, bright-green above, paler, minutely rugulose and dotted with Mack d beneath, base tapering; petioles 1/2-1 in. long; stipules 2-3 in. long, glabrous, minutely **rugulose**, caducous. Flowers **pedicelled, in** axillary, usually 3- (rarely 2-) flowered cymes slightly longer than the petiole peduncles stout, 1/2-1 in. long, from the axils of leaves of the same year ; pedicels short, rugose. Calyx 1/2 in. long; lobes pale-yellow, **coriaceous**, triangular-oblong, subacute, glabrous, reticulato-rugose, keeled within, reflexed in fruit. Petals white, shorter than the calyx-limb<sup>v</sup> oblong, obtuse, thick and fleshy, densely villous on the margins and so on the inner faces. Stamens 8 ; anthers linear, acute. Fruit 1/2 long, ovoid-conical, surrounded at the base by the persistent calyx-\* protruded radicle cylindrical, **sometimes** reaching 2 ft. long before it from the tree. El. B. I. v.

2, p. 435 ; Dalz. & Gibs. p. 95; Wight t. 238; Betfd. For. Man. in Flor. Sylvat. p. xcix, t. 13, **fig. 4** ; Fl. Ceyl. v. 2, p. 151 ; Talb, Trees/ Bomb. ed. 2, p. 158; Wo Journ/Bomb. **Nat. v. 11** (1898) p. 636? **Watt, Diet. Econ. Pro parti, p. 491.**

**Rhizophora candelaria, Wight & Arn. Proctr, p Grab. Cat. p.**

68.—Flowers :

**Aug.-Dec.**

VEEN. Kamo}

Dumbi; K

**Salt-marshes** and along muddy shores

This is the "true Watt,

**Diet. Econ. Prod. 1. c.**

**2. Rhizophora conjugata, Linn. Sp. PL** (1753) p. 443. glabrous shrub or small tree ; young branches marked with the scars of fallen leaves. Leaves 4-10 by 3-2 1/2 in., elliptic-lanceolate, acute usually **with** a small mucro, dark-green above, paler, rugulose **and minutely** dotted beneath, base **tapering**; petioles 1/2-1 in. long; stipules 2-3 in. long. Flowers sessile, **in** axillary 2-flowered cymes usually shorter than the petioles; peduncles about 1/2 in. long or less, **stout** pedicels 0. Calyx 1/2 in. long, externally rugose, **glabrous**; lobes ovate-oblong, acute. Petals white, slightly shorter than the calyx-limb linear, thin, flat, glabrous, caducous. Stamens 11-12; anthers lineal sessile or nearly so. Fruit 1 in. long,

somewhat conical or obdovate rugose, glabrous, surrounded at the base by the reflexed calyx-lobes protruding radicle cylindrical, sometimes reaching 1 ft. long before falling from the tree. Fl. B. L v. 2, p. 436; **Talb.** Trees, Bomb. ed. 2, p. 15f *Ehizophora cawhlaria*, DC- Prodr. v. 3 (1828) p. 32 (*not* of Wight 4.rn.); Trim. Fl. Ceyl. v. 2, p. 151.—Flowers : Aug.-Dec.

Found in the same **localities** as the preceding, which it **much resemble\*** but is **nearly so** common.

## 2. CERIOPS, Arnott.

>>rubs or small trees with thick leafy branches. Leaves opposite, elliptic or obovate, entire; stipules interpetiolar, caducous. Flowers capitate; peduncle\*? axillary. Calyx 5-6-merous, surrounded at the base by connate bracteoles; tube short, adnate to the ovary at the base; coriaceous. Petals 6-6, inserted at the base of a fleshy 10~12-lobed disk, truncate or emarginate, appendiculate with clavate bristles. ■>s 10-12; filaments slender, inserted between the lobes of the withers oblong or linear, obtuse or acuminate. Ovary |~ 'i 3-celled (at least above), produced beyond the calyx into a cone; ovules 2 in each cell, pendulous near its apex; style short; snuple. Fruit coriaceous, ovoid, girt above the base with the ■ calyx-lobes, 1-celled. Seed 1, pendulous, germinating as in <sup>i</sup>I-n~ <sup>om</sup> ' ^y^ODS con ferr laminate; protruding radicle elongate, ate — DismiB. Muddy shores of Tropical Asia, Africa, Australia, Polynesia; species 7.

L

^ **Candolleana**, Arn. in *Ann. Nat. Hist.* v. 1 (1838) ras  
 m shrub or small tree 8-6 ft. high; branchlets scars of fallen leaves and stipules. Leaves 2-4 by |<., coriaceous, hiobovate-oblong, rounded at the apex, sometimes Wyl emarginate, glabrous, much attenuated at the base; petioles <sup>ln-</sup> \ong> rugose, glabrous. Flowers in axillary, peduncled, branched 'pedicels short, stout. Calyx | in. long; lobes 5, oblong, sub-Petals 5, white, shorter than the calyx, oblong-obovate, \ or emarginate, furnished at the apes with 3 short ctavate Jges, glabrous, with a strong mid-nerve at the back of the petal. <sup>ij</sup>\* 10, about as long as the petals, alternately long and short. *I* ^ghtly conical, | -§ in. long; protruded radicle sometimes *I* % 1 ft. before falling, gradually thickening to near the apex and Q^etoffiirig acute, deeply grooved and angled, reddish-brown. *I. I v* 2, p. 430; Wight, *Icon. t.* 240; Bedd. *For. Man.* <sup>y</sup> con. Prod. in *Flor. it.* ii. xcix, 1.13, fig. 5; Aitch. *Pb. & Sind PI.* p. 59; *Trim. Fi. Ceyl.*

*Jp.* 152; *Talb. Trees, Bomb.* ed. 2, p. 159; *Watt, Diet. B*

%n. 201.— Flowers: July-Sept. VISES. *Kirrari; OhauH.* V, i

vvamns along the coast. KONKAN: *Law!*; Elephanta (**Bombay**), <sup>^21!</sup> *Stocks\**, *Vicary*.—DISTBIB. India {mndtty shores mid tidal creeks); Ceylon,

\* of the Old World,

bark siiDRliea an excellent tanning material, and a decoction of it is used to 7 nrrhaae and as an application to malignant ulcers. A decoction of the is used as a substitute for quinine on the African coast. See *Watt, Diet Econ.*

I.e.

## 3. KANDELIA, Wight & Arn.

imftll tree with terete leafy branches. Leaves opposite, oblong,

F Pntire \* stipules interpetiolar, caducous. Flowers large, few,

on

""v'dki^omoUlv-branched peduncles, white. Calyx 5-6-merous,

/ A Art the base by connate bracteoles; tube short, adnate to the

•ouucieua

petals 5-6, inserted at the base of a fleshy

disk,





° s capillaceo-imitinU Stamens indefinite ; filaments filiform ;  
nail oblong. Ovary ^-inferior, 1-celled, produced beyond  
into a fleshy cone; ovules 6, affixed in pairs to a central

nun ; style filiform, conical at the base ; stigma 3-fii JLjoJe\*  
 aceous, conical-ovoid, girt above the base by the rettese^f.  
 l-ce!ied Seed 1, germinating as in *Bhkophora*; ^JTJ^pisJS\*  
 ruminant; protruding r» ilongate, clavate, aoumin  
 Muck!}- shores of Tropical India and Ceylon ; species i. ^

1. *Kandelia Rheedei*, TF» <M\*-«. «wfr- ^tf^/daVk g^f!  
 small tree. Leaves 2£-e. by 1-4 in., elliptic-oblong, obtm\* ^  
**and polished above, r^SUroin beneath, ^3fj&j J5**  
**ji**

divided into numerous capillary segments Stamens i»«^c Bjcdle  
 wl'fn equal lengths. Fruit |-1 in. long, obelavate; wrt above the ^  
 \_.,i;ndric,  
 the re-flexed calyx-lobes; protruded radicle &-15 ^n\_ ioDA^ .

Wight, 111. t.89; Bedd. For. Man. in Flor. Sjfet\*\*, P\* \*• KT+T 11  
 Trees, Bomb. ed. 2, p. 159; Woodr. in Journ. B^b- ^a Ln  
 (1898) 636 W Di E fchBi?\*TM!

437; acuminate, usually not ridged nor grooved- 1<1, B- ^- v' ^

(1898) p. 636; Watt, <sup>p</sup>Diet, <sup>n</sup>Eeon. Prod. v. 4, p. wfchBi  
 &u^^ Linn. Sp. PL (1753) p. 443; Grab. Cat. p. 88.~i  
 Mar.

Tidal swamps along the coast. KiXASA: ICumpta,  
 Woodrow,—DISTK  
 shores of India and Ceylon, Malaya.

**4. BRUGUIERA, Lamk.**

Trees or shrubs. Leaves opposite, coriaceous, entire;  
 stipul petiolar, caducous. Flowers large ; peduncles axillary,  
 1-many-Calyx ebracteolate at the base; tube obconic or cam pan  
 u late, a the ovary nt the base; lobes 8-14, subulate-lanceolate,  
 valvate. 8-14, inserted on the limb of the calyx, oblong. 2-iid,  
 setigerou lute at fche base, embracing the stamens.  
 Stamens 10-28, opposite to the petals, at length sprjnfi3ng  
 £rOm,,them RJasti menrs" littform; unequal in length; anthers  
 linear, acute or apic Ovary inferior, 2-4-celled; ovules 2 in each  
 cell; style filiform ; sM minutely 2-4-fid. Fruit turbinate, thickly  
 coriaceous, crowned ar apex by'the lobes of the calyx, 1-ceJJed.  
 Seed 1, pendulous, germnl as in *Rhizaphora*; protruding  
 radicle elongate, elavate.—Disl Muddy shores of Tropical  
 Asia, Africa, Australia, and Polynj species about 7.

- Flowers solitary, 2—1^ in. long ..... 1. *B.gyrm&rhL*
- Mowers in axilJai-y eypses, not exceeding ^ in. long.
- Lobes of calyx as Jong aa the tube ..... 2. *Ti. p*



Lobes of calyx \ as long aa the tube ..... 3. *B. parvifl*

1, *Brugniera gymnoriza*, *Lamfc. Tab. Eixcyc. v. 2* (1793) ^ t. 397. A glabrous evergreen shrub or tree ; young branches em m a rl;ed towards the apex with the scars of fallen leaves and stipules. **Lei** 8-6 by 1-J-2J in., elliptic or elliptic-oblong, acute or slightly acumi (not mucronate), bright green above, paler and with a prominent im beneath, glabrous, cuneate at the base ; petioles |-1| in. long; <sup>!</sup> *l* &-2£ in. long, caducous. Flowers solitary, axillary ; peduncles loTtg. deflexed. Calyx 1-11 in. long, orange-yellow, campanulate.

**divided** about £-way down into 10-14 (often 11) narrow **acute**  
erect

°gtnents keeled on the inner face. Petals shorter than the  
<>p|yx-lobes

at f. efflia- to them **in** number, 2-lobed at the apex, with 2-4 stoi^'Vistles  
the point of each lobe and 1 in the notch, hairy at the base, |?w§ons  
of°Ve'i ^taineus ^ opposite to each petal and shorter than it; fila...iy^ts

each pair alternately long and short. Fruit less than **1** in. k  
**dro°ni# crowned at first** by the erect calyx-segments which aftenvaru

P off, scarlet; protruding **radicle** fusiform, more or less angled, often  
\$! **off** <sup>l ft-</sup> »i length before falling. PI. B. I. v. 2, p. 437 ;

Trim.

• veyl.-v. 2, p. 153 - Talb. Trees, Bomb. ed. 2, p. 160 : Watt, Diet.  
£,, " i\_rocl- v. 1, p. **541**, *Bruguiera Rheedii*, Blume, Enum. PI.

Javce,

:^;:2:l: "-; . rMt & s^y\_- ^; w^ icon. t. 239. &£& \*\*

Cat. p. 6S.—1 lowers :

5^3 the"! ^ SeaCOfl3t aild iQ 3alt\_raai<8l'e8-~I>i3TRTB. Tropical Asia, Australia,

**p caryophylloides, Blume, Emm. PI. Jam,**

fasc. 1

Iran h • ^ snru^ or small tree, branched from the base;

young  
emf

Wlt^ Sears of fallen ^aves and stipules towards the'apex,

» 1. Leayes 2\_a~4 bJ" i"! in-' **elUptic-lanceolate** or slightly ob-

**J ;p f j g; p | g**

timers in axillary 2-3- (usually 3-) flowered **cymes** ; peduncles |-| in.  
&Y0]^edicela very short. Calyx |-£ in. long, not ribbed,

divided

**i h** ceofoie <sup>h</sup> subacute, pale, rather thin, <sup>h</sup> shining above, **dull**  
**beneath,**

cuneate; petioles f-lj in. long; stipules 1-2| in. long,  
ill 23 ( 1 1 3)f 1 d dl

|| i

j down ; lobes usually 8, linear, **subacute**, erect or spreading  
afterwards reflexed. Petals **white**, as many as the calyx-lobes  
TJ or than them, hairy outside and on **the margins**, 2-fid at the \  
apical lobes obtuse, each furnished with 3-5 bristles at the end  
lobe and a longer one at the sinus. Stamens twice as many as

kls, 2 opposite to each petal and shorter than it; filaments *oi*  
tir U'iiG^'ual. **Fruit** j] in. long, oblong-obovoid ; protruding radicle  
er **oylindric**, reaching 6-8 in. long before falling. B1. B. I. v.  
2, 8 •' Trim. ¥1 Ceyl.v. 2, p. 154; Talb. Trees, Bomb. ed. 2, p.

1(30.— ' rs: Aug.-Sept.

**very** common. In tidal man grove-forests in the southern parts  
of the

"?p'cies has been included on the authority of **Mr. Talbot**.—**DisTsre**. India  
r **shores** and tidal creeks of the W. Peninsula und Birma); Ceylon, **Malaya**.

*Bruguiera parviflora*, *Wight & Arn. Prodr.* (1834) p. 311 (in  
(.). A shrub; young branches with scars of fallen leaves and  
es slender. Leaves 3-4 by 1-1½ in., oblong-lanceolate or elliptic-

" acute\* shining above," dull beneath, **glabrous**, **base** cuneate ; 1 4  
in \* long; stipules 1-2 in. long. Flowers in laxly 2-5-<sup>G&1</sup>  
**erect** cymes, longer than the petioles ; pedicels slender. Calyx \*<sup>6</sup> 1  
n&' tube 'cylindric or subfusiform, ribbed; lobes 8, about P<sup>n\*</sup> th  
the **length** of the tube, lanceolate, acute, erect. Petals a\* W?  
L cJlvx-lobes but shorter than them broadly oblong 2-lobed, , as  
tne cug- bear; n^ short white hairs at the apex. Stamens <sup>oU</sup>

at  
the  
brac  
one  
suba

the  
as in  
nts of eac  
enlarged cal

y

**^PSj^ Ovary 3-celled**      Fruit co

petals 2 opposite to each petal and embraced by it;  
Ovary **3-celled**.      Fruit concealed by

truncate, **hing 4,5 j<sub>n</sub>** before faUi **pj** B L y# 2) p> 438 . Bedd,  
 ;or\_MaJ-V. ci; Talb. Trees, Bomb. ed. 2, p. 100; **Woodr. in Journ.**  
**Jbomb.j<sup>^</sup> v< u (X898) p. 636. Kanilia parvijtora, Bluwe, M-us.**  
**^•adgd. Bat, v. 1 (1849) p. 140, t. BO; Dal/.. & (libs. p. 95.**  
 ::\*?\*" «>m parvift-om, Koxb. **El. Ind. v. 2, p. 461; Grab. Cat. p.**

**68.**—era : Dec. ft-  
 .Salt-marshes, but nut common. KONKAX : near Moul (Salselte), *Graham.*  
 KAXAKA : A&mar, ffff

**5. CARAIXIA, Iloxb.**

Trees or shrubs. Leaves opposite, **petiolate**, ovate or elliptic, **glabrous**, **shining**; **stipules interpetioiar\* caducous**. Flowers small, sessile, often crowded in **axillary trichotomously-branched** cymes; **peduncles short, stout. Calyx-tube cylindric or campanulate, minutely bracteolate** at the base; limb **5-S-lobed, the lobes erect-valvate. Petals-5-8, inaequal** on the margin of a **renate** disk lining the **calyx-tube**, clawed, 2-fid or entire, **euberrate** or lacerate at the apex. **Disk epigynous, 10-16-lobed. SStamens 10-16, inserted with the petals; filaments filiform**; anthers **small, oblong**. Ovary **inferior**; style subulate or filiform ; stigma **5-lobed**. Fruit small, globose, coriaceous, 1-celled. **Seed 1, globose-reniform** ; testa fibrous ; albumen fleshy ; embryo curved.—DISTRIB. Tropical Asia and Australia, **Madagascar** ; species about 12.

**1. Carallia integerrima, DC. Prodr, r. 3 (1828) p. j moderate-sized glabrous tree.** Leaves 2-4 by 1-2<sup>^</sup> in., very varj shape, broadly elliptic, obovate-oblong or **oblong-lanceolate, roui. i** very shortly acuminate at the apex, entire, smooth and shining paler beneath, base acute or cuneate, rarely rounded; maino numerous, spreading and **interarchiBg** freely; petioles stout, (\o-long; stipules |<sup>-</sup> in. long, caducous. Flowers sessile, **in s n m l L ' on** stout branches of axillary triehotomous cymes shorter **leaves** ; buds exuding a **sticky resinous substance**. Calyx <sup>^</sup>- in. earn pan u late, glabrous, divided about £-way down; lobes 6-8 (**com ID 7**), **triangular**, acute. Petals white, as many as the calyx-lobes shorter than them, broadly obovate or suborbicular, clawed, **irregu** laciniate, with lanceolate segments. Stamens twice as many as petals; one of each pair **oi filaments** opposite to a petal and em In **by** it, slightly **longer than** the other filament, which is opposite a sepal. **Stigma 4-6-lobed.** Fruit filiform, about \ in. in d smooth, **red.** **Seed 1; testa thick, bright-orange.** Fl. B. **I. v. 2, p. -;** **Balz. & (Jibs. p. 96 : Bedd. Fl. Syhfft. t. 193 ; Trim. Fl. Oeyl. p. 155; Talb. Trees, Bomb. ed. 2, p. 160 j Woodr. in Journ. I Nat. v. 11 (1898) p. 080; Watt; "Diet. Econ. Prod. v. 2, p Carallm ceyfonica, Wight, Hlustr. t. 00. Carallia integrifolia<sup>^</sup> (9 Gab. p. 68.1 — Flowers: Bee .-Mar, YIBK . Pan schi.**

**KOHKAS** ■ \, Lav: \-r, liills near Slarmagoa, *Bhival*) *Matberan, Cookel, Kti-ir* vale of tin<sup>4</sup> *Savilri, between Pokdpur an< 1 Ate (i 1 ults, Gmh<>m. DECCAM : billa; P&r, Graham; Khandala, Graham. S. M. OOUSTAT, JBaraghdtd, Ritchie, 279! KJ N. Kaaata, Tfdhot, Stocks I, Law I—DISTRIB. Throughout India ; Ceylon, M*

a, Australia.

The tree is very common and is quite distinct from *Caraltia (/uctda, B^xb\* Beug, p. 02, & Oor. PI. t, 211, Kura (For. gl. Tint. Buvm. v. I, p. 451) mnf, < . luoida* gives tv correct description of *this* plant except, fur the **sfeafc**

the petals do not embrace the stamens, an error into which Mr. Henslow (Fl. B. I. l. c.) has also fallen. Each petal embraces the longer stamen which is opposite to it, as figured in Wight, Ill. t. 90. The petals of *C. integerrima* are white, those of *C. lucida* in Roxburgh's figure yellow. The petals of *C. integerrima* are lacinate, as shown by both Wight and Beddome whereas those of *C. lucida* are fringed.

regularly creuate and the leaves of the latter plant are regularly and serrulate.

LY. COMBRETACEÆ.

rees or shrubs, erect or climbing. Leaves alternate or opposite, (■) Kranoug, simple, entire ; petiole often glandular at the base. Flowers usually hermaphrodite, rarely unisexual or ii f' ii f' Calyx bracteolate at the base; tube adnate to the ovary. W ovary W r -nd or -partite, its lobes deciduous or persistent. Corolla 0, or petals inserted with its lobes, valvate in bud. Stamens m-ih petals, sometimes alternate with them, sometimes double number, of which the alternate 5 are inserted higher than and to the petals; filaments free, filiform or subulate. Ovary, 1-celled, usually crowned with a disk; ovules 1-7 (usually 2-4), stigma usually usually indehiscenc, eoi-iaceous or drupaceous, ovoid, gently winged, crowned in *Calycopteris* by the greatly

or g cotyledons large, plaited j ^ j Tropics of the whole world; outside the Tropics put / Africa \ genera 15 ; species 320.

- vers in spikes or racemes.
- Calyx-limb deciduous ..... 1. TERMIKAUA,
- Calyx-limb persistent, ..... 2.
- tnucfa enlarged in fruit .. OALYCOPTKRIS
- Flowers in globose heads ..... 3.
- Petals 4 or 5.
- Leaves alternate J ealyx-hmo persistent ..... 4.
- LUUHITZEBA,
- Leaves opposite ; calyx-limb deciduous ..... 5.
- COMBKKTUM.
- iera opening by curved valves which open upwards ..... 6. GyaocAsros,

1. TERMINALIA, Linn.

Leaves alternate or subopposite, frequenlv crow ded at tfie ends ■ branches, often with glands on the petiole or at the base of the % bein-ailu Flowers green or sjjhite, rarely colored, small, spicale ikes sometimes paniced), hermaphrodite on often the upper o i the epikea male and the lower bermnphrodite. Oalyx-tube W cylindric, constricted above the ovary; limb of 5 short valvate °/ v lobes, soon deciduous. Petals 0. Stamens 10, inserted 1 ' \ vx-lobes (the epigynoxUi disk »ithin them densely Jiairv), 9 C V 5 iower opposite the calyx-teeth, the 5 upper longer and Pi '-%, , i> subulate, Oiten tineiieneu aim v\*uvu» «•, M« M.\*^ , OV16(U. -i Fruit ovoid, various in size and texture, Bmootb or angular or \m mHphiscent c-oi-iaceous. H^ud solit-nry, extdbuminous;

mnged, " » «• ; \_ , , IB Tropics of both worlds; species

with the calyx-teeth ; filaments Bubuiate or filiform, esserted. <sup>ii:1</sup>.  
'r • . l-celled; ovules 2-3, pendulous from the apex of the "  
i Lbulate often thickened and villdus at the base; stigma  
Fruit ovoid, various in 8 Lti *t-nAehificent.* eoriace

Tropics



Fruit not winged.

Leaves alternate, clustered at the ends of the branches;  
flowers at top of spike rattle.....

Leaves opposite, not clustered; flowers all **hermaphrodite** ...  
*chebula*. Fruit, equally **5-winged**.

Veins of the wings curving upwards.....

**Veins** of the wings **straight**, horizontal .....

Fruit unequally 3-winged ....., .....

*paniculate*

1. *T. heHeriea*.

2. *T.*

3. *T. Arfima*.

4- *T. fomentosa*.

5. *T.*

**1. Terminalia bellerica, Roxb. Cor, Pi.** v. 2 (1798) p. 54, t. 198,  
A large handsome tree 40-100 ft. high. Leaves collected about the  
extremities of the branches, alternate, coriaceous, 4-8 by 8-6 in.  
broadly elliptic or elliptic-obovate rounded or rarely **subaeate** or shortly  
acuminate at the apex, both surfaces pubescent when **young**, glabrous  
and reticulate when old, the margins entire, pellucid, base narrowed •  
main nerves 6-8 pairs, spreading, prominent, the **midrib** prominent oil  
both sides; petioles 1-4 in. long, without **glands** at the apex. Flowers  
pale greenish-yellow, **with an** offensive odor, in axillary slender **spikes**  
longer than the petioles but shorter than the leaves, those in the upper  
**part** of the spike male, **very shortly** pedicelled, those in the lower **part**  
**hermaphrodite**, sessile. Calyx pubescent outside, densely villous within,  
the teeth broadly triangular, acute. Drupe 1/2 in. in diam.,  
suddenly-narrowed into a very short stalk, clothed **with** minute pale  
scales, obscurely tinged **when** dried.

Iturbide (*I. c.*) describes and figures the plant **with** 2 glands at the  
apex of the petiole, but none of the specimens that I have seen possess  
these, while Wight & Arnott and **Brandis** have failed to find them in

specimens of their collection. Fl. B. I. v. 2, p. 445; Graham, Cat. p. 69  
Dalz. & Gibs. p. 91; Wight, Illustr. t. 91; Bedd. Flor. Sylvat. t.  
Wight & Arn. Prodr. p. 313 (*exclud. syn.*); Trim. Fl. Ceyl. v. 1, p. 117

Talb. Trees, Bomb. ed. 2, p. 162; Woodr. in Journ. "Bomb. I  
, & Ht.

(1898) p. 636; Watt, Diet. Econ. Prod. v. 6, part 4, p. 18—Gax  
Feb.-May. Ymns. *Behada*; MeM.

**In deciduous** mixed forest a throughout the **Presidency**, **KONKAN**: *Stscksl* along  
the foot of the **Ghats**, *Grajccm*; Malabar IH1 (Bombay), *Graham*; *Dc|k*  
**Woodrtn.** DEC-CAN: *Cooke*! S. M. COUNTRY: **BeJgaum**, *Eitckie*, IUM4!—I  
| **Throughout** India, except Sim! and the **desert** region of the West; Ceylon, Ma-

The fruit is one of those exported from India under the name of *Myrobalan* used  
for dyeing. The **Myrobalans** from the first species, *T. chebula*, are by *H unott*  
important of any exported from India. See Watt, Diet. Econ. **Prod. 1. c.**

**2. Terminalia chebula, Betz.** O<sup>h</sup>. fasc. 5 (1759) p. 31. sized,  
much-branched tree. Leaves 2-6 by 1-3 in., not alternate or  
subopposite, elliptic-oblong, acute, penninerved, clear **when** young  
with silky hairs, glabrous or nearly so when mature rounded or  
cordate at the base; petioles 1/2 in. long, pubescent, **with** 2  
glands near their summit. Flowers all **hermaphrodite** terminal  
(often panic-led) spikes; **bracteolea** exceeding the flower linear,  
acute, hairy, conspicuous among the buds but soon deciduous. Calyx  
**campanulate**, 1/2 in. long, flat at the base, expanding a little towards  
the mouth, glabrous outside, hairy within; teeth 5, sometimes  
sometimes obscure. Drupe pendulous, 1/2 in. long, ellipse  
obovoid from a broad base, glabrous, more or less 5-ribbed **when**

yellowish-green; stone **oblong**, bony, very thick, obscurely *m*  
¥*U B. I. r. 2, p. 446*; Grab. Cat. p. 69; Dajz. & Gibs. p. 91

^or, Sylvat. t. 27; Trim. FL Ceyl. v. 2, p. 159; Talb. Trees, Bomb. «• 2, p. 162; Woodr. in Journ. Bomb. Nat, v. 11 (1898) p. 680; Watt, "Diet. Eeon. Prod. v. 6, part 4, p. 24.—flowers: Apr.-May. \*«wr. *Birdd; Hirad.*

Abundant along the line of the Ghii-f 3. KONKAN: *Stocks!*, *Gibson \, Law!* DECCAS: 5\*" -wrf of MahableBhwar, *Graham, C'oofoi*; Khandala, *Graham.* KANAKA: "untiant on the later its of N. Kanara. *TaXbof*,—"DiSTais. Throughout the greater P<sup>8^</sup> of India; Cejlon.

] v ^ \* "" \* forms the Chebulie Myrobalan of commerce, one of the most valuable  
^ \*

h Bb

fif] v C b i e Myob  
Fo at^ n \*anQ\* nS materials and a very important souree of revenue to the Bombay Bo\*" ! @Parfcmeat- The grosB revenue obtained in the southern circle of the a l tif \* OP68\* department in 1893 from Chebulic Myrobalans considerably exceeded 41£J1 of TMpees. See Watt, Diet. Eeon. Prod. l. c.

*h%> Terminalia Arjtraa*, *Wight & Arn. Prodr.* (1834) p. 314, *in wxtu.* A large tree reaching 80 ft. high, with a very thick trunk and 'onzontally spreading branches; bark thick, smooth, greenish-white, II n]. °ff in large flat pieces. Leaves usually subopposite, 4-6 by abft ^ n \* ' o ^ ' on S or elliptic-oblong, obtuse or subaeute, pale dull-grot -ii Tei P^le brown beneath, shallowly Grenatenserrate in the upper part r sometimes throughout, base rounded or cordate, often unequal-sided; ^ \ nerves arcuate, 10-15 pairs, veins reticulate, pellucid; petioles ^ 11^1 Ori & \* w^h 1 or usually 2 prominent glands at the top hnmedi-. 'yW- iw the leaves. Flowers sessile, in short axillary spikes OL^M ia^1. ■, Ut'iicJes; bracteoles linear-lanceolate, shorter than the flowers, g Calyx glabrous, £ in. long; mouth broadly campanulate; trK|gular, T^1^ in. long. Ovary quite glabrous. Disk clothed yer'wish or reddish hairs Stamens much exserted D

7 ^l y^si/^k or oddish hairs. Stamens much exserted.

Drupe

■ \*% ~j&i/n- lOn & ovo^ - or obovoid-oblong, fibrous-woody, glabrous, dark- |, with 5 hard projecting wings striated with numerous curved ; ;n. B, I. v. 2, p. 447; Dalz. & Gibs, p. 91; Bedd. Flor. Sylvat. '&T;ilb. Trees, Bomb. ed. 2, p. 162; Woodr. in Journ. Bomb. Nat. LJf (1§S8) p. 036; Watt, Diet. Econ. Prod. v. 6, part 4, p. 16. ' alia glabra, Wight & Arn. Prodr. p. 314; Trim. Fl. Ceyl. v. 2, Pentaptera Arjima, lloxb. Hort. Beng. (1814) p. 34; Fl. Ind. pap. 438; Grab. Cat. p. 69.—Flowers: Apr.-May. Vms. Kahw,

■ (■. ; ; Arjuna-sddadd.

I KAN: *Stocks I*; Matberan, *Cooked* BCCAk: rare, *Datzell 4" Gibson*; Mui ZiJla, I, *Dalsell 4" Gibson*; Koina valley, *C'oo/ce I* GUJARAT: common in jungles aouth-Jbf Surat, *Law es Graham, Bahdl 4' Gibson*, S. M. COUNTRY: Belgium forests, ■ ^ P ^ L § ~ G. ih^on.—Di & TRiB. India (Sub-Himalayan tracts of the N.W. Provinces,

^ly vlon.

*I. I. anjustiju.* ;hes d'roopin' ^\* ®\* Clarke, in Hook, f. Fl. B. 1. v. 2, p. 447.

...le, sometime leaves much narrower, oblong, attenuated into the  
v. 4 m/i, Wight & very shortly acuminate at the apex. *Terminalia*  
*fleshtifolia* Roxb. Prodr. p. 314; Dalz. & Gibs. p. 92. *Pentaptera*

t! \*ii.l.

or *M>iinalia* k^Hort. Beng. (1814) p. 34; FL Ind. v. 2, p. 437 (**not**  
*folia* of Eoxb. cited on the same page); Grah. *Gut.*

at the  
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brae ow  
one my  
suba 1st

. Stocks

*m, Balse'* S. M. COOHTBT : banks of Kdla naddi and Gatpraba rivers, *Law*

? ■ Gibson.

Mart) ^ **tomentosa**, *WigJil 4' -^>'n- Prodr.* (18^4) p. 314  
An erect-growing tree, **reaching** sometimes 80 ft, in

**height**; trunk straight; bark rough, deeply cracked ; young- parts more or less clothed with yellowish-brown pubescence. Leaves **subopposite** or the uppermost alternate, hard, coriaceous, 3-8 by 2-3 m., ova oblong or elliptic-oblong, rarely obovate, softly tomentose when young. \*J becoming more or less glabrous when mature, with 1-2 glands (are often turbinate or long-stalked) usually on the midrib (but sometimes absent, base often cordate ; main nerves arcuate, parallel, 1v-j\*<sup>u</sup> P ^ prominent; petioles § in. long, pubescent when young, g®> -jLjJ nearly so when old. Flowers hermaphrodite, dull-yellow, **m** axi ' £ fulvous-pubescent spikes or terminal panicles. Calyx hairy or g<sup>1\*</sup> outside, 1- in. long; mouth broadly campanulate; teeth f\$ in. lft\* triangular, slightly hairy **within** ; bracteoles \ in. long, linear-lancea- ^ hairy, caducous. Disk clothed with long fulvous hairs. Drupe ^"".^ lung, with 5 broad, coriaceous, brown, glabrous wings striated v| numerous straight lines running horizontally from the axis to the e"S^ Fl. B. I. v. 2, p. 447 ; Wight, Icon. t. 195; Bedd. Flor. Sylvat. t. i/| Talb. Trees. Bomb. ed. 2, p. 1(52 ; A Woodr. in Journ. Bomb. Nat. v. (1898) p. 636 ; Watt, Diet. Econ. Prod. v. 6, part 4, p. 37. *glahra*, var. *tomentosa*, Dalz. & Gibs. p. 91. *T. crenzdata*, AV. < p. 314. *T. coriacea*, W. & A, **Prodr.** p. 315. *Pmtaptera toniew* Koxb. Hort. Beng. p. 34; Grab, Gat. p. 69.—Flowers : Apr ' £jtf#-V EEN. *Ain*.

Common throughout the Pn siclency in mixed deciduous forests. KOXK ■ »• *Lavj I*; common in the jungles at the foot of the Ghi'ite, *Dal-dl* <f *Gihso* bills near Chattersinghi (Poona district), *Cookel*; *Qoksik*, *Ritchie*, 2S£ *Stocks* ! — Di8TE?B, Throughout the meister regions of India; Ceylon.

The well-known *Ain* tree, tb.fi limber of which is used for various purpose o . of the wood were at one time largely used on the Bombay Railways. '1^? % ,J£ useful as a tan, but the fruit is far inferior as a tanning material to Belleric and C)\_f MyrobalanB-. See Watt, Diet, Econ, Prod, 1. e.

**5. Terminalia paniculata, Both, Nov. Ft. 8p.** (1S21) p. 3 { large tree ; young parts rusty-tomentose. Leaves coriaceous, the uf alternate, the lower subopposite, 4-9 by 1f-3^ in., oblong, a< **acuminate**, nearly glabrous or with a few scattered hairs above (\i adult), pale-brown, snore or less **pubescent** and finely reticulately re beneath, usually with 2 glands near the base of the midrib belowJ cordate or rounded, often inequilateral - main nerves 10-15 p arcuate, parallel ; petioles |-| in. long, pubescent. Flowers sessili slender spikes forming compound panicles ; bracts at the forks & long, ovate, acute, recurved; bracteoles T V in. Ion triangular base, recurved. Calyx (free portion) ,■-.-brown, globose when in **bad**, afterwards **enp-shap?** triangular, as long as **the** free portion of the caly° nearly so outside, densely villous within. Disk de^ long yellowish-white hairs. Ovary densely and soft!) ' rusty-tomentose, \-^ in. long, sessile, closely set ii^Y panicles, 3-winged, 2 of the wings much smaller t.lia\ B. 1. v. 2, p. 4^8; Dak. & Gibs. p. 92 ; Bedd. Flor. Sy Trees, Bomb. ed. 2, p. 163; A^oodr. in Journ. Bomb. >ti(i, p. **636**; Watt, Diet. Econ. Prod. v. 6, part 4, p. |hisS> \*, *paniculaia*, **Eoxb.** Hort. Beng. p. 34; Grah. Cat. #en| a VI Aug.-Sept. A^EB^r. *Kinjal*; *Sonal*.

he\

*Terminalia Catappa*, Linn. Mantiss. (1771) p. 519. A often with buttressed trunk, with branches in horizontal whorls tree waves and an ellipsoid fruit keeled all round, a native of the Malabar frequently cultivated. It is known as the *Bengal Almond*, but **kernel**, though edible, is very insipid as compared with the almond. HiJ ■ & • I- v, 2, p. 444; Grah. Cat. p. 69; Dalz. & Gibs. Suppl. p, 33; Talb. Trees, Bomb. ed. 2, p. 103; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 636, & Gard. in India, ed. 5, p. 313; **Watt**, Diet. Econ. Prod. v. 6, part 4, p, 22,—YEIW. *DesM-badam* ; *Bengali-hadam*.

## 2. CALYOPTERIS, Lamk

A diffuse scandent shrub. Leaves opposite, petiolate, elliptic or ovate, acuminate, entire. Flowers in dense axillary racemes crowded towards the ends of the branches so as to form large panicles. Calyx-tube elongate-turbinate, 5-striate, produced above the ovary; limb broadly 5-lobed (anipanulate, 5-fid, accrescent, the lobes persistent, spreading. Petals 0. Stamens 10, biserial, short; filaments subulate; anthers didymous. Ovary 1-celled, inferior; ovules 3, pendulous from the apex of the cell; stigma simple. Fruit ovoid, 5-ribbed, villous, 1-seeded, surrounded by the enlarged calyx.—**BISTSIB**, India; species 1.

v | e ai. **Calycopteris floribunda**, Lamk. *Tab. Encyc. Y. 2*  
(1793) p. 485,

A scandent shrub; young branches slender, rusty-puberulous. Leaves opposite, 3-5 by 1-21 in., ovate-lanceolate or elliptic-oblong, acuminate or obtuse, both surfaces more or less tomentose, the lower rusty-pitted, base usually rounded; main nerves 5-8 pairs, rather prominent beneath; petioles 1/2-1 in. long. Flowers sessile, yellowish-green, in pubescent terminal panicles; bracts short, lanceolate, pubescent. **Branches**. Calyx densely hairy within at the mouth of the tube

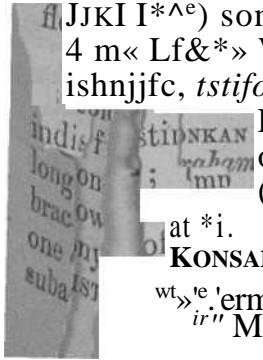
**Produced** above the ovary; lobes accrescent, 1/2-1 in. long in fruit,

linear-lanceolate, acute, strongly 3-nerved and reticulate-pinnate. Stamens unequal, much shorter than the anthers. **Fruit** 1/2-1 in. long, oblong or

sometimes pubescent or tomentose, crowned by the persistent calyx. **Wight & Ar I. v. 2, p. 449; Talb. Trees, Bomb. ed. 2, p. 103; ishnjfc, *tstifolia*, Eoxb. Bomb. Kat. v, 11 (1898) p. 636; "Watt, Diet.**

**Econ.**  
or *dia angustifolia* (*dia angustifolia* Getmia *floribunda*, Eoxb. Cor. PI. v. 1 (1705) p. 61,

at \*i. **Ac-** **P- r0 j**  
**KONSAH: Elephantia**, Graham; Tingoira, ! **DBCCAR; hills, Woodrow I; L**  
; India (Central and Southern Provinces, Assam);  
**Malaya**,  
but



3. ANOGEISSUS, Wall.

Shrubs or small **ferree** <sup>^^^</sup>ate, **petiolate**, entire. Flowers yellow, **m** ' - " t hard) coriaceous, u peduncles slender; :ube compr \*\*\* <sup>^^</sup>obovate, softl} tot.nrodueed above the

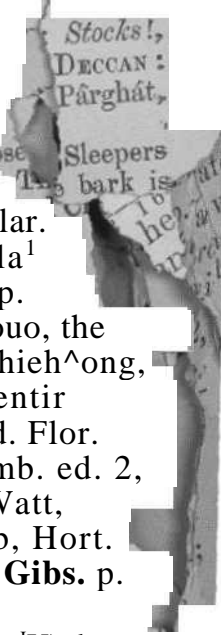
**l-celied; o<sup>4</sup>&§serted**; anthers small, cordate. **OV&\*?£j\***. fy \*<sup>v</sup>, n1L thickened,, pendulous from the top of the cell; sty<sup>l</sup> <sup>^^J</sup>, heads, sre base, villous; stigma simple. Fruit packe<sup>^^</sup> <sup>^</sup>nse by £'thickly coriaceous, broadly trapezoidal, 2-winged,-woimated . ■<sup>f</sup>produced calyx-tube. Seed 1, ovoid; cotyledons convolute.— >ILB. India and Tropical Africa; species 5.

**Beak** of fruit as long as or longer than **its nucleus**.

- Fruit (including the wings) longer than broad ; wings with entire margius ; peduncles branched ..... 1. *A. latifolia*.
- Fruit (including the wings) **broader** than long ; wings with pigged margins ; peduncles not branched ..... 2. *A. sericea*.
- Beak of **fruit** shorter than its nucleus ..... y. *A. pendula*.

<sup>^</sup>rvitnu. A Prodr. 1.

**Anogeissus latifolia**, Wall *Oaf.* (1828) 4015. An erect tre<sup><</sup> <sup>tw</sup>n sometimes reaching 60-70 ft.; bark smooth, **light-colored**; young **parta-<sup>^</sup>** glabrous or silky-pubescent. Leaves 2|-4 by 1£-2 in., **alternate or** [ subopposite, elliptic or oblong-elliptic, obtuse or very often shortly cuspidate, glabrous when fully grown, pale dull, glaucous-green, base' usually rounded, midrib prominent, pink; main nerves 6-10 pairs,; arching, prominent on the lower side, the veins between them reticula\*<sup>A</sup> petioles |-| in. long. Flowers sessile, in small dense heads ; pedur; 1 or more from the same axil, branched, not much longer **than\*?8**: petioles. Calyx-tube pubescent; teeth short, broadly triangular. ]\$<sup>enc</sup> a **small**, several crowded in a globular head, the nucleus nearly pla<sup>l</sup> convex, |~4 in. long (excluding the beak), |~<sup>^</sup> in. broad (including 21) p. Sowings), yellowish-brown, glabrous or more or less pubescent,, .win<sup>^</sup>euou, the tW\*<sup>^^</sup> trown the two longest sides, **beaked with the** persistent calyx whieh<sup>^</sup>ong, acutii as long as or sometimes longer than the nucleus; winga with entir above (w| margins. Seed **solitary**. Fl. B. I. v. 2, p. 450. Bedd. Flor. Sylva\*tlately ><f t. 15; Trim. Fl. Ceyl. v. 2, p. 162; **Talb. Trees**, Bomb. ed. 2, p. **16db** below, t ■\Woodr. in Journ. Bomb, Nat. v. 11 (1898) p. 636; Watt, Diet. Eco **10-15** fl Prod. v. 1, p. 256.. *Conocarpm latifolia*, Uoxb, Hort. Beng. p. 34vers sessil Grab. Cat. p. 70 ; Wight, Icon. t. 094 ; **DaTz. & Gibs.** p. 91.—Flow. May-July. VEHN. *Dhdvda* ; *Dhaura* ; *JDdbria*.



Throughout the Presidency usually in dry forests. KOSKAN ; Xawt; vale<sup>^</sup>4J-<sup>J</sup>U). long, recw;f **Koakan** rivers near their source, *Graham*; Kanheri jungles, *Qraham*; Mat,hf>-|tjd ; teeth brJ \ Ghat, // *M. Birdwood*; Mira hills, *Ihdzell 4" Gibson*. DECCAS: **Kolapur**, *Coo*: t(x<sub>-</sub>tube fflabroit <sup>^</sup> O-iiat neai' Wai, *Woodrowl* ; Gliat near **Wath&r**, *Caoke* \ S. M. COUNTUV ; Belj **msfittr lu**), <sup>f</sup> hills, *Ritchie*, 922!—DISTRIB. Throughout the gertter part of India; Ceylon. > eiorBe(l % The tree **yields** a useful gum and the wood" is very strong and tough. See w>\ P<sup>u</sup>escent. Jl: Diet. Ecou. Prod. 1. c. <sup>^</sup>i<sup>l</sup> dense spread

2. **Anogeissus sericea**, *Brandts*, in *Indian Forester*, v. 25 (19<sup>^</sup> ; **Jivat**. t. 20; T| p. 287. A middle-sized tree ; branchlets clothed **with** silky pubescei<sup>^</sup>. '**Vat**. v. 11 (18| Leaves 1--1| by f-1 in., elliptic, obtuse, apiculate or very sho\ tf/37. *Pent*, cuspidate, glabrous or nearly so above (when mature), clothed on <sup>^</sup>;fiUJ. 70.—Plc4 lower side and the nerves beneath with silky pubescence; main ner 4-6

pairs; petioles | in. long, pubescent.      Flowers in globose hea



g> long by § in. broad (including e g), by he pubescent calyx-tube, which is as long as the nucleus, and" sometimes ftiso by the subpersisfcnt limb; wings pubeseent in the upper part, jagged on the margins, each wing produced upwards beyond the top of «\*e nucleus into a triangular lobe.

Gr.un.vr: Paneh Mahals, ValsdlX

I have seen only one specimen from Bombay marked as above in Herb. Kew.—AUSTaia. India ^Central Provinces, Gujarat).

3. *Auogeissus pendula*, *Edgew. in Journ. As. Soc\* Bang.* v. 21 (1853) p. 171, A. small tree; branches pendulous; young parts pubescent. Leaves |-1| by §-f in., alternate and sub opposite, elliptic or obovate, obtuse or acute, usually mueronate, more or lesa clothed on /both sides with appressed pubescence, or sometimes glabrous, attenuated Vat the base; main nerves 5-7 pairs, arcuate, with reticulate venation pet ween ; petioles -^g in. long. Flowers in small globose heads 1 in. across when in flower ; peduncles usually solitary, not branched, pubes-pent. Fruit subquadrate, ultimately glabrous, the beak less than half fhe length of the nucleus. Fl. B. I. v. 2, p. 451. *Anogeissus myriifolia*, /Wall. Cat. 4017 . Boyle, 111, p. 209.—Mowers : May-June, fmur. Whao; Dhanhra.

^ GUJARAT : IX-esa, Stocks !

(3 1 here is but one poor specimen in Herb. Kew. labelled as above. It is the only ^e>itien I hare seen from the Bombay.Freaidency.—DISTMB. India (N.W. Pr

#### LV. COiBBBBTACEJB.

2-fin. in diara., on Jong axillary simple peduncles which often hear .'" bracts. Calyx densely pubescent. Fruit tomentose, broader than 'ong> i" in. long by § in. broad (including the wings), crowned by the pb calxt b hich i s long as the nucleus and"

#### 4, LUMNITZERA, Willd.

f.B;i" g6-glabrous shrubs or small trees growing along tropical shores ; in salt-marshes along with mangroves. Leaves clustered towards ends of the branches, alternate, thickly coriaceous, subsessile,

ob-cuneate, entire or crenate. Flowers in short axillary or terminal or racemes, scarlet or white. Calyx-tube elongate, oblong, atteuu-at both ends, produced above the ovary, with 2 adnate bracteoles r the base ; limb campanulate, 5-lobed, persistent.

Petals 5, oblong, i treading. Stamens 5-10. Ovary 1-celled; ovules 2—5, pendulous mi the apex of the cell; style filiform, glabrous; stigma simple, nit woody, ellipsoid-oblong or ovoid, crowned with the persistent '; v- Seed solitary ; cotyledons convolute.—DISTRIB. Sea-shores of Tropics of the Old World and Polynesia ; species 2.

#### 4

1 .Wc< *Liimnizera racemosa*, Willd, in *Ges. Naturf. F>\ Neve ScJir.* v-4 to(1803) p. 187, A tall glabrous shrub or small tree. Leaves sessile, fleshhviy, crowded at the ends of the branches, 1-2|- by £-4 in., oblanceolate oj< oi^J^va to, glabrous, shallowly crenate or entire, rounded or emarginate

,ii {}/%&

apex,

Bombay.Freaidency.—DISTMB. India (N. , Eajputana).

tapering much towards the base; main nerves 3-5 pairs, 'tuliJwBtinet.  
Flowers sessile, in short lax axillary spikes. Calyx j|^-^ iu. -,,,, : tube  
fusiform, glabrous; teeth olitu.se, ^ in. long, eiliolate; ^ W V^eo^e3 ^J  
^^nate to the ealvx-tube, about TV in. long, ovate, acute, %\ 'j'i them  
higher up the tube than the other. Petals white, oblong, ^H jciite.  
Stamens 10, **almost** equalling the petals; the alternate

filaments shorter. Fruit \ **in.** long, ovoid, glabrous, longitudinally striate when dry, crowned by the persistent calyx-tube. **Fl. H. I.** v. 2, p. 452 j Grah. 'Cat. p. 70; Dalz. & Gibs. p. 90; **Bedd.** For. Man. in **Flor. Sylvat.** p. ciii, t. 21, fig. 2; Trim. FL Ceyl. v. 2, p. 162 ; **Talb.** Trees, Bomb. ed. 2, p. 164; A^oodr. **in Journ.** Bomb. Nat. v. **11** (1898) p. 030 ; Watt, Diet. Econ. Prod. v. 5, p. 97.—Flowers : Jan.-Apr.

S. Konfean along salt-water creeks and backwaters, *Talbot, Mmmo ex Graham; Ratnagiri, Woodrow.*

The tree grows with the mangrove along the muddy creeks and is, as are **other** shrubs which grow in similar localities, known also as **a mangrove.**

## COMBRETUM, 5.

Linn.

Shrubs often scandent. Leaves usually opposite and simple, **entire**^ petiolate. Flowers hermaphrodite or polygamo-dicecious, in spikes racemes or panicles; bracteoles minute. Calyx-tube **ejlindric** or 4-(i-gonous, constricted above the ovary; limb campanulate, 4-5-fid, deciduous, ■ Petals 4-5 (very rarely 0), inserted between the calyx-lobes. Stamens s\ or 10, biseriate; filaments filiform, elongate; anthers small, didymous. \ Ovary inferior, 1-celled; ovules 2-6, pendulous from the apex of the < cell; style subulate; stigma simple. **Fruit** dry, **usually indehiscent.** 4-5-gonous or 4-5-winged, the wings often membranous. Seed **1** ; **cotyledons** plaited or flat, in a few **species** convolute.—**DISTEIB.** **Tropics** of America, Asia and Africa, also in S. Africa; species **180,**

- Calyx-limb cup-shaped....., ..... 1, C.  
*ovalifolium*  
 Calyx-limb funnel-shaped..... 2. C.  
*extensum,*

### 1. *Combretum ovalifolium*, *Eoxh. ffort. Beng.* (1814)

A large scandent shrub; bark **pale-brown**, smooth; branches young **parts** glabrous. Leaves 2-4 by li~2| in., opposite, elliptic^ elliptic-lanceolate, obtusely **acuminate**, glabrous or nearly so, **narrowed** at the base into the petiole ; main nerves 4-6 pairs ; **petio** in, long, channelled. Flowers sessile, YV~"T **ill.** long, in sh rather dense, often panieled axillary spikes, occasionally **fonnin** large terminal panicle ; main **rbachis** of the panicle densely **pubesde!** its branches slender, pubescent, often opposite or **d<** subopposite; **bti** globose, apiculate ; bracteole at **the** base of the calyx minute. OalyJ| tube **glabrous** outside, **constricted** into a short neck above the ovaJf then suddenly expanded into a cup-shaped limb, densely hairy at \ \

• **within;** lobes 4, ovate, acute, reh\»xed, T\\$ in. long. Petals I!?', oblong, obtuse, -^ in. long by ., \- in. **broad**, white. Disk ha' ]o/, Stamens 8, in 2 series, those opposite to the petals **inserted** higher **ten** than the others. Fruit **pale-golden-brown**, f-1 in. long **and nearljbe broad**, with 4 papery finely transversely striate wings. Seed 4-SIP c 11. B. I. v. 2, p. 458; Grah. Cat. p. 70; Dak. & Gibs. p. 90 ; Fl. Ceyl. v. 2, p. 1G3; Talb. Trees, Bomb. ed. 2, p. **165** ; Woodi<sub>5nse</sub> ~T Journ. Bomb. Nat. v. 11 (1898) p. **636** j Watt, Diet. Econ. **Vhe** **othe** v. 2, p. 514. *Combretum Jleynecmum*, Wall, Cat. 4001; **Wight;** \ ^Q 5'J\* Hook. Miscell. v. 3 (1833) p. **86**, Suppl. Tab. 22.—flowers : **Jan.-B** v. ' n 'ni

A'ERS. *Zellusii* Madbel.

zx }

*r\*be\$cZ7*

3<; **Koukan, Stocks]** DBCCAS: **Karli, Woodrow.** GUJARAT: *Graham*; Bujkot, *C. Macnaffhten* S. M, COCNTUT : Belgaimi, *Ritohie, ffl I*—**BISTKJB. India (Gujarat to Cape Cumorin); Ceylon.**

2. *Combretum extensum*, **Roxb. Sort. Seng.** (1814) p. 28.

& large scandent shrub, glabrous or nearly so. Leaves opposite, \*6 by 1J-3 in. (sometimes, though rarely, reaching 8 by 4| in.), usually broadly elliptic, shortly acuminate or cuspidate, glabrous on both sides, base usually rounded; main nerves 4-7 pairs; petioles in. long. Flowers sessile, -fain, long, usually in solitary dense axillary spikes, rarely pamed or terminal; buds ovoid or subglobose, very acute at the apices. Calyx puberulous outside, contracted above the ovary and then at once expanding into a funnel-shaped limb; lobes 4, triangular, very acute or acuminate, reflexed, y<sup>1</sup>^- in. long. Petals yellowish-white, T<sup>1</sup>^- in. long and broad, oblong, truncate or very slightly emarginate at the apex. Disk hairy. Ovary 4-gonous. Fruit \*5~\*1| w. and (including the wings) almost as broad as long; wings soarous, horizontally striate, glabrous. £t B. I. v. 2, p. 458 ; Trim. H Ceyl. p. 164; Talb. Trees, Bomb. ed. 2, p. 166; (Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 636. *Combretum WighManum*, Wall. Cat. 4007; Wight, Icon. t. 227; Grab. Cat. p. 70; Dak. & Gibs. p. 90.— Flowers: Jan. VERN. *Piluki*.

KON-IUN: hilly parts, *Dalzett # Gibson*; Vingorla, *DaheU \$ Gibson, Ritchie*, 363! J^KCOAJT : abundant at Khamitala and Lauoli, *Graham*; Khandaiia, *Cooke*], *Wbodroiel* o. M. COUNTRY: Eamghat, *Ritchie*, KASTAUAT moist forests of N. **Kanara**, *Talbot*.— **IjisTSiB.** India (W. Peninsula) ; Ceylon, Malaya.

fc™

*coccineum*, Lamk. Encyc. Method, y. 1 (1784) p. 734.  
 ■A4 ^ beautiful plant, a native of Madagascar and the Mauritius.  
 Ajiage is dark-green, and the flowers, which are produced  
 in ^e elegant racemes, are of a brilliant scarlet color. It does  
 not fs flower freely in the Decean. It is usually propagated by  
 layers,

. p. 504.

## t j 6. **GYROCARPUS**, Jacquin.

\ ;t Stall tree with thick branches. Leaves alternate, large, entire (nkl, membranous, crowded at the ends of the branches.

Flowers i. [taj&iniseual and monoecious, or polygamous, in dense ebracteate / MALE EL0W.KRS very numerous. Calyx 4-7-partite. Petals 0. flfns 4-7, inserted at the bottom of the calyx, alternating with as / clavate fleshy staminodes ; anthers 2-celled, dehiscing by valves, [y 0. FIMALB FLOWEBS few. Calyx-tube adnate to the ovary, fl; limb 2-lobed, the lobes oblong, obtuse, persistent, much enlarged ruit. Petals 0. Stamens 0. Ovary 1-celled; ovule 1, pendulous the apex of the cell; style 0; stigma sessile. Fruit drape-like, ned with the long wing-like persistent calyx-segments: stone Seed broadly oblong, terete; cotyledons large, convolute.—BIB. Tropics generally; species 1.

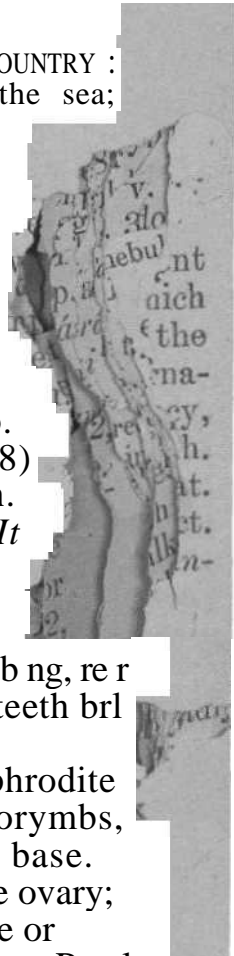
1, *Gyroearpus americanus*, *Jacquin, Select. Stir p. Amir.* (1763) p. 282, t. 178, fig. 80. A moderate-sized tree; bark smooth, shining, greenish-white; young branches stout, marked with leaf-scars, glabrous. Leaves 4-6 in, long and nearly as broad as long, ovate, acuminate, sometimes irregularly lobed, pubescent when young, afterwards glabrous or nearly so, base broad, truncate, cordate or sometimes shortly cuneate, 3-nerved from the base, the 2 lateral nerves soon forked, veins closely reticulate; petioles 3-5 in. long, slender. Flowers small, white, clustered in large branched cymes, the males very numerous, the females few; peduncles long, pubescent, several arising from the twigs above the new leaves. Calyx densely hairy on both sides. Stamens alternating with hairy clavate staminodes; anthers large, dehiscing by valves which open upwards (as the anthers of *Laia'aeem*). Fruit (without the wings) 1-1.5 in. in diam., globose-ovoid, slightly pubescent, wrinkled in the lower part, furrowed in the upper, surmounted by 2 pubescent longitudinally striate ohlanceolate or spatulate wings about 1/2 in. broad in the widest part and often 3 in. long. *Gyroearpus Jacquini*, *Gtsernt. Frucfc.* v. 2 (1791) p. 92, t. 97, fig. 3; *Koxb. Cor. Pi v, J.* (1795) t. 1; *Grah.* < p. 250; O. B. Clarke, in *Hook. f. FL B. T.* v. 2, p. 461; *Bedd. Flor. Sylvat.* t. 196; *Trim. Fl. Ceyl.* v. 2, p. 165; *Talb. Trees, Bomb.* ed. 2, p. 165; *Watt, Diet. ficon. Prod.* v. 4, p. 197.—Flowers: July-Aug. **VERST. Zaitun.**

**DECCAK:** banks of the Krishna river near Nalatwar, *Graham. S. M. COUNTRY:* Belgaum districts in dry forests, *Talbot.*—**DISTBIB.** India near the sea; Ceylon, Malaya.

*QuisquaUs indica*, Linn, 8p. *PI. ed. ii,* p. 556, a large subsor shrub with elliptic acuminate leaves and handsome showy flow are at first white, then orange, and finally red, a native of Java a? Malayan Peninsula, is very extensively cultivated in gardens as a mental plant. It rarely if ever produces fruit in the Bombay Presid where it is known as the *Rangoon Creeper.* *Fl. B. T.* v. 2, p. 469; *G Cat.* p. 70; *Dab. & Gibs. Suppl.* p. 33; *Woodr. in Journ. Bomb. N v.* 11(1898) p. 637, & *Gardening in Ind.* ed. 5, p. 312; *Watt B\ Eeon. Prod.* v. 6, part 1, p. 388.—Flowers: Mar.-Aug. **VBEST. It gunachavel; Barmdsi; Ldlachameli,**

OBD BE LYI. MYKTACEiE.

Er ect t rees or shrubs, rarely h erbs. Lea ves usually opposi te, pe b ng, re r simple, entire, rarely denticulate or crenate, often with an intranteeth brl nerve and punctate with resinous or pellucid glands; stipules i glabroil and deciduous or 0. Flowers usually regular; hermaphrodite or lothe^ polygamous, axillary, solitary, or in spikes, cymes, corymbs, or Leai^ naked or with an involucre, often with 2 bracts at the base. ( Sjv^10 superior or ^-superior, the tube rarely produced beyond the ovary; ;thePat<?: usually 4-5-fid or -part ite, persistent or deciduous, valvate or imbri<20 i w^0 often closed in bud. Disk lining the calyx-tube. Petals as manyasn calyx-lobes and alternate with them (rarely 0), inserted on the » the disk, usually much imbricate in bud, sometimes more or less



itito a deciduous cap. Stamens usually numerous, inserted on the margin or within the **margin** of the disk, in one or several rows ; filaments distinct or connate below, or in **bundles** opposite the petals ; anthers 2-celled, usually dehiscent **longitudinally**. Ovary inferior or ^-inferior, 1-celled, with 1 or more ovules, or more commonly 2-many-celled with **laany** ovules; style simple; **stigma** small, capitate or peltate. Fruit usually crowned with **the calyx-limb**, either 1-celled and 1-seeded' by ^rest, or 2-many-celled with loculieidal dehiscence, or baccate and ^dehiscent with the cells many-seeded or 1-seeded by arrest. Seeds <sup>an</sup>gnlar, **cylindric** or compressed ; testa hard or membranous, sometimes **winged**; albumen 0; embryo straight, curved or spirally **twisted** ; **Cotyledons** short and obtuse, sometimes combined into a mass with the radicle, very rarely leafy ; radicle often thick.—DISTRIB. Tropical and subtropical regions of both hemispheres; genera 76; species upwards

Leaves opposite, gland-dotted ..... 1, EunssrA.  
 fcs alternate, not. **gland-dotted**.  
 Fruit angular, fibrous, 1-seeded ..... % BARRISGTOMIA.  
 Fruit ovoid or globular, fleshy, many-seeded..... 3. **OA&STA**.

## 1, EUGENIA, Linn.

Evergreen trees or shrubs. Leaves opposite, penninerved, gland-dotted, ex stipulate. Flowers in terminal or axillary **paniculate** cymes, or solitary **in** the axils of the leaves or of scales below the leaves, often on suppressed branchlets, appearing to be fasciculate or racemose ; bracts usually small and deciduous. Calyx-tube globose, ovoid, turbinate, or elongate, not or more or less produced above the ovary; **segments of the limb** 4 (rarely 5), or the limb subtruncate." Petals 4 (**rarely** 5 or more or 0), free and spreading, or more or less connate into a **plyptra** which falls off on the expansion of the flower. Stamens oo, £& **many rows, distinct** or slightly combined into 4 bundles; **filaments** filiform ; **anthers** small, versatile, dehiscent longitudinally. **Ovs Inferior**, 2- (rarely 3-) celled; ovules many in each cell; style filiform ; Stigma small. **Fruit** usually a juicy berry (rarely dry), crowned ^th the remains of the calyx. Seeds few, globose or ellipsoid ; albumen 0 or very scanty'; embryo thick, fleshy; radicle short; cotyledons **thick**, more or less connate or distinct.—DISTRIB. Tropical ■Asia and America, a few in Tropical Africa and ■Australia; spt about 650.

The name " Eugenia" was first given to this genus by P. Antonio Michel) (*Nov. Pl.* "■en. [17-29] .. 22i; ,fc. 108) in honor of Prince Eugene of Savoy. The plant from \*oich ho established the glints was *E. Michelii*, Lamk., a **native** of S. **AH** wad a early introduction into India.

Flowers in  
 Petals 1-

M  
 jrtHJ; calyx with large stamina! disk; fruit  
 ^, § in. in diam,  
 Calyx-1 ■: i.-: p 11 e rie; **stamens yellowish-white** ..... 1. &•  
*hemispherica*,  
**Oalyi-tabe long-cylindric**; stamens crimson ..... '2. *E. l<eta*.  
 Petals small, usually calyptmte ; sUiminal disk nbaent; fruit  
 lees than J in. in diam, (except *E. lanceoia/a*).





Petals 4-5. Cymes terminal or in the axils of present leaves (except

## LVI. MYRTACEÆ.

4. *E. toddalioides*,  
5. *B. spusetia*.

sometimes in *E. Stock*. Calyx J-J in. long. Calyx-tube slender, not thicker than the pedicels... Calyx-tube funnel-shaped; fruit globose, **white** ... Calyx short, less than } in. long. Branches 4-gonous.

Lateral nerves very numerous, close ..... 6. *Stocksi*.

*E. rubkuudu*.

Lateral nerves few, distant ..... 7. *E.*

Branches **o**ylindric or often compressed.

A large **s**bra b; leaves obovate ..... 8. *E.*

**c&rymbow**.

Lofty trees; leaves elliptic.

Fruit less than § in, in diam., crowned with the calyx-segments ..... 9. *E. utilis*.

**Fruit §-§ in.** in ilium., not crowned with the calyx-segments..... 10. *A. Ganhicri*.

Cymes in the axils of fallen leaves.

A large forest tree; **leave**\* exceeding 1 in. in **breadth**. 11. *E. Jambolana*, A large shrub growing in the beds of river and streams; leaves not exceeding 1 in. in breadth ... 12. *E. Heyneana*.

**Eleven** solitary or fascicled; petals free. Flowers sessile.

Flowers lateral from the leafless axils; **bracteolee** linear ... 13. *E. macrosepaia*.

Flowers axillary or terminal; bracteoles broadly ova to ... 14. *K. eodyeasis*.

Flowers pedicelled ,.....\*..... 15. *E. Mooniama*.

I

1, *Eugenia hemispherica*, *Wight, III, v. 2 (1850) p. 14.* A moderate-sized tree; bark yellowish-grey; upper branches subtetra-gonous. Leaves 3-6 by 1|-2| in., ovate-lanceolate or sometimes ob-lanceolate, acuminate or sometimes rounded at the apex, minutely dotted, glabrous and shining, base tapering; nerves inconspicuous above, more prominent beneath, uniting, but not very regularly, within the margin, with sometimes a second but fainter nerve close to the edge; petioles J-4 in. long. Flowers fragrant, in axillary and terminal; paniculate cymes which are sometimes in pairs in the axils. Calyx slightly rugose outside; tube hemispheric, 1|-1| in. long; lobes rounded, reflexed and with membranous margins. Disk thickened, Petals 1 in. long, broadly ovate or orbicular, concave, acute, gland-dotted, reflexed, cream-colored or with a pink tinge. Stamens yellowish-white. Berry globose, 1 in. in diam., crowned with the calyx-segment *VL B. I. v. 2, p. 477*; *Wight, Icon. t. 525*; *Bedd. Elor. Sylvat. t. 203*; *Trim. It Ceyl. v. 2, p. 170*; *Talb. Trees, Bomb. ed. 2, p. 167*; *Woodr. in JourD. Bomb. Xat, v. 11 (1898) p. 637*; *Watt, Diet. Econ. Prod. v. 3, p. 284*—*Eugenia lanceolaria*, *Boxb. Hort. Beng. (1814) p. 37*; *Wight, [con. t. 613. Jambosa lanceolaria, Bume, Mus. Bojc, Lugd, Bat. v. 1 (1850) p. 103*; *Dak. & Gibs. p. 94*—*Mowers: Mar.-Apr.*

*KoaE A Lam I B. M. ComrrBT: Ranighit, Daheii ! ~K|»,|n.| : Qth&ts < ST. Kanara, I Nilkuud Oh;it, DeUsell \$■ Gibson, Taibot| Ainslii Ohut., Talbo Woodfow.—DJ.STRIB. India (W. Peninsula); Ceylon.*

2, *Eugenia Iseta*, *Buch.-Ham. in Trans. Wern. Soc. v. 5 (1824 p. 338 (excl. syn. liu mph.)*. A small tree; branches slender, terete smooth. Leaves 3-41 by 1-1| in., lanceolate or

oblong-lanceolate

usually with a longish obtuse acumen, pellucid-dotted,

glabrous

or what

is 1.5-2 in. across

tapering;  
main  
nerves  
\2 15  
pairs,  
uniting  
into  
a  
SOH  
W  
intramarginal  
nerve;  
petioles  
A—i  
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expanded,  
solitary or  
few,  
in  
terminal or  
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cymes; pedicels jointed below the calyx. Calyx  $\frac{1}{2}$  in. long; tube narrow, subcylindric or obconical, faintly striate, suddenly expanded at Uie mouth; lobes 4, about  $\frac{1}{8}$  in. long, rounded, IV flexed in flower, -tets white,  $\frac{1}{8}$  in. long, orbicular, subacute, glandular and conspicuously veined; buds globose. Disk thickened, lining the calyx-tube. Stamens very numerous, bright crimson, much exceeding the petals. Style 1 in. long, persistent. Berry oblong-ellipsoid, 1 by  $\frac{1}{2}$  in., abrous, dark-brown, crowned conspicuously with the reflexed calyx-lobes, pi. B. I. v. 2, p. 479; Talb. Trees, Bomb. ed. 2, p. 168; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637.—Flowers : Nov.-Jan.

KONKAN: *Stocks I*; W. Gh.-its, *Woodrow*. DECCAN: Phunda Ghat, *Ritchie*, 1755! <sup>A J</sup> \* A : *Gibson*; higher Ghats of N. Xanara; common on the Gairsoppa Ghat, , *Woodrow I*; Yellapur, *Gibson* !—DISTRIB. India (W. Peninsula).

y<sup>A</sup>B. *pauciflora*, Duthie, in Hook. f. Pl. B. I. v. 2, p. 479. Pedicels solitary from the extreme axils, 1-flowered. Wight, Icon. t. 526 (sp.). *Eugenia Whjlitii*, Bedd. For. Man. in Flor. Svlvat. p. cix. *Jambosa Pauciflora*, Wight, 111. v. 2, p. 14. AN: *Dr. Gibson I*

3. ***Eugenia lanceolata***, *Lamb. Encyc Method*, v. 3 (1789) p. 200 {not of Berg). A small tree ; bark grey; branchlets slender, terete, <sup>Sm</sup>-ooth. Leaves 2<sup>A</sup>-4<sup>I</sup> by 1<sup>A</sup>-1<sup>I</sup> in., elliptic-lanceolate, caudate-acuminate, acute, inconspicuously pellucid-dotted, base tapering ; main nerves Numerous, rather faint, parallel, uniting in an intramarginal nerve close to the edge; petioles <sup>A</sup>—J- in. long. Flowers nearly sessile, articulated, J<sup>11</sup> short usually few-flowered cymes which are axillary or from the leaf-<sup>A</sup>ss branches. Calyx <sup>A</sup>-<sup>A</sup> in. long, elongate, clavate or infundibuliform, glandular outside; lobes 4-5, very shallow, rounded, repand. Petals <sup>Av</sup>hite, numerous, often as many as 12, usually calyptrate, broadly ob-ovate or suborbicular. Fruit 1 in. long, dark-brown, ellipsoid, taper-<sup>ln</sup>S to a very slender base, crowned with the thickened calyx-lobes and Persistent style. Wight, 111. v. 2 (1850) p. 15; Icon. t. 530; Bedd. \*or. Man. in Flor. Sylvat. p. cix; Trim. Fi. Ceyl. v. 2, p. 172.

, g, O P. ; ; u,  
Uook. f. Fl. B. I. v. 2, p. 485; Talb. Trees, Bomb. ed. 2, p. 168;

Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637.—Flowers :  
*Eugenia Wvjhtiana*, Wight, 111. v. 2 (1850) p. 15; Icon. t. 529;  
Duthie, in Fl B I 2 485 T1b T Bb  
d 2 168

specific name "*lanceolata*" given to the plant by Lamarck is 60 years prior to the name "*Wightiana*" given to it by Wight.

H V<sup>ONKAN</sup>: *Stocks I*, *Talbot*, *Woodrow*. KANARA : near rivers and along watercourses <sup>n</sup> N. Kanara, rare, *Talbot*.—DISTRIB. India (W. Peninsula); Ceylon.

4- ***Eugenia toddalioides***, *Wight, III*. v. 2, p. 16. A small tree; ung braiichlets slender, subterete,\* smooth. Leaves 2-4 by 1-1] in., <sup>A</sup>nceolate, with a long slender acumen, pellucid-dotted, glabrous, base <sup>u</sup>pering; <sup>nia</sup>i<sub>n</sub> nerves numerous, close, parallel, uniting in an intra-<sup>lar</sup>ginal nerve close to the edge ; petioles <sup>A</sup>-] in. long. Flowers less <sup>la</sup>^ & in. across, in di- tri-chotomous axillary or extra-axillary cymes, <sup>ac</sup>n branch 1-3-flowered. Calyx i-] in.

long; tube very slender, scarcely thicker than the pedicels,  
suddenly dilated into a large eup-<sup>a</sup>P<sup>e</sup>d limb • lobes 4, very slender.  
rinnu'ii, snm<'f i n n w jilmo.st obsolete.

Petals -J- in. in diam., orbicular, tender, free. Fruit not seen. El. B. I. v. 2, p. 482 ; Wight, Icon. t. 542 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637.—Flowers : Jan.

S. M. COUNTRY : Castlerock, *Woodrow*.

This plant has been reported by Woodrow from Castlerock near the Railway Station on the Ghat at that place. It is no doubt a rare plant as it had not previously been collected in the Presidency.

5. **Eugenia spicata**, *LamJc. Encyc. Method*, v. 3 (1789) p. 201. A large shrub or small tree, very handsome when in full flower ; Jjarif pale-brown ; branchlets slender, obsoletely 4-angled or terete, purplish-brown, shining. Leaves aromatically fragrant when bruised, coriaceous, variable. lg~4 by g-li in., ovate-elliptic to linear-lanceolate, usually caudate-acuminate, smooth and shining *on* both surfaces, paler and minutely glandular beneath, the margins slightly recurved, base acute ; main nerves numerous, inconspicuous, uniting into an inconspicuous intramarginal nerve near the edge; petioles y<sup>l</sup><j-"4 in. long. Flowers white, conspicuous, in axillary and terminal many-flowered paniculate cymes, in clusters of 3-5 at the ends of the ultimate cyme-branches. Calyx funnel-shaped, i in. long, tubercled with glands on the outside, sessile or nearly so ; lobes 4-5, broadly ovate or rotundate, concave, erect. Petals 4-5, orbicular, usually calyptrate but sometimes imperfectly so. Fruit pisiform, less than | in. in diam., pure white, 1-seeded. Trim. El. Ceyl. v. 2. p. 171. *Euijenla zeylanica*, Wight, 111. v. 2 (1850) p. 15; Bedd. Elor. Sylvat. t. 202; Duthie, in Hook. f. El. B. I. v. 2, p. 485 ; Talb. Trees, Bomb. ed. 2, p. 168 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637; Watt, Diet. Econ. Prod. v. 3, p. 29:). *Kyzygium zeylanicum*, DC. Prodr. v. 3, p. 260 ; Grah. Cat. p. 73 ; Wight, Icon. t. 73; Dalz. & Gibs. p. 94. *Myrtus zeylanica*, Linn. Sp. Pl. (1753) p. 472.—Flowers : Feb. «-Apr. VEEN. *PithiU*.

The specific name "*spicata*" was adopted by Lamarck in 1789, while Wight's name "*zeylanica*" (derived no doubt from *Myrtus zeylanica*, Linn.) was given in 1850. There can be no question as to the "ropViety' Of restoring tile older nomenclature.

KONKAN : *Law!*, *Stocks!*, *Dalzell!*; S. Konkan, *Nimmo ex Graham*. S. M. COUNTRY : Parva Ghat, *Ritchie*, 1752!; Ambgaon, *Ritchie*, 1752! KANAKA : Sawad, *Woodrow* ; common in N. Kanara, *Talhet*; higher Ghats south of Bombay, *Dalzell* & *Gibson*.—DISTRIB. India (W. Peninsula, Orissa, Silhet); Ceylon, Malaya, Sumatra, Borneo.

G. **Eugenia rubicunda**, *Wight, M-* v. 2 (1850) p. 15. A middling-SJZK! tree; young branches quadrangular. Leaves variable, |l-3j by ±-h in., oblong-lanceolate, elliptic-lanceolate or sometimes oblanceolate, icuuiiinate, glabrous on both surfaces, shining above, paler and minutely pellucid-dotted beneath, base tapering ; mian nerves very numerous, fine, parallel, uniting in a distinct intramarginal nerve near the margin; petioles £—J- in. long. Flowers pinkish-white, sessile or nearly so, usually 3 together at the ends of the quadrangular branches of terminal and axillary cymes which are often longer than the leaves. Calyx 1 in. long, shortly turbinate, rugose outside; lobes 4, very short, rounded or almost obsolete. Petals calyptrate. Berry round, size of a small pea, crowned with the persistent calyx-limb, black when ripe, glabrous. I'l. B. I. v. 2, p. 495 ; Wight, Icon. t. 538; Bedd. For. Man. in Fior. Sylvat. p. cviii; Talh. T<sup>n</sup>< T?omb. ed. 2, p. 168; Woodr. in Journ.

Bomb. Nat. v. 11 (1898) p. 637. *Syzygium rubicundum*, Wight & Arn. Arodr. p. 330 ; Dalz. & Gibs. p. 94. *Syzygium salicifolium*, Wall. Cat. ■\* > 97 (not of Graham). *Eugenia lissophylla*, Duthie, in Hook. f. Fl. B. I. £ 2 (1878) p. 488; Bedd. For. Man. in Flor. Sylvat. p. cviii; Trim. \*! • Ceyl. v. 2, p. 173; Talb. Trees, Bomb, ed 2, p. 168; Woodr. in Journ. Bomb. Nat, v. 11 (1898) p. 637. *Syzygium lissopJiyllum*, Thwaites, -BiUum. p. 117.—Flowers : Mar.-May. VEEN. *Lendi-Jcimbhal*

-Rare. Higher Glmts along streams, *Dalzell's* § *Gibson*. KONKAN : *Stocks* \ DECCAN : <sup>to</sup>inghad, near Poona, *Woodrow*.—*DiST RIB*. India (W. Peninsula); Ceylon.

**7. Eugenia Stocksii**, *Duthie, in Hook. f. Fl. B. I. v. 2, p. 498*. A lofty tree; branches 4-gonous. . Leaves 4-6£ by 1|-3 in., thin, lanceolate-oblong or obovate-oblong, rounded or shortly and obtusely acuminate, glabrous, finely dotted with opaque (not pellucid) dots, base tapering; main nerves 12-16 pairs, slender, curving upwards and becoming faint towards the margin, not uniting into an intramarginal oervil | ^ i e; pet o es ½- in. long. Flowers about in. across, numerous, n branched cymes which are axillary and from the leafless axils; peduncles 1-2 in. long. Calyx ¼-½ in. long, funnel-shaped, rugose outside; lobes 4, short, subacute or rounded. Petals calyptrate, gland-dotted. fruit not seen. Talb. Trees, Bomb. ed. 2, p. 169 ; Woodr. in Journ. ■Bomb. Nat. v. 11 (189S) p. 637.

-A rare plant. KONKAN : *Stocks* !, *Law* ! KANAKA : *Dalzell*!

**8. Eugenia corymbosa**, *Lamlc. Encyc. Method, v. 3 (1789) p. 199*. A large shrub or small tree; branch lets terete or slightly compressed, brown. Leaves subcoriaceous, 2^-3i by g-lf in., obovate or rarely ovate-lanceolate, obtuse, or suddenly and shortly bluntly acuminate, bright-green and shining above, paler and inconspicuously dotted beneath, base tapering; main nerves numerous, fine, conspicuous beneath, Uniting in a distinct intramarginal nerve ; petioles g-^ in. long. Mowers numerous, small, sessile or nearly so, in terminal com laxly trichotomous cymes with quadrangular branches; buds globose. abrx \$ in. long, campanulate, externally rugose; lobes 4, shallow, subacute, often scarcely distinguishable. Petals white, calyptrate. \*ruit depressed-globose, dark purple OT nearly black, about the size a pea, 1-seeded, shining, juicy, edible. Trim. Fl. Ceyl. v. 2, p. 174. *ia caryophyllma*, Wight, 111. v. 2 (1850) p. 15; Icon. t. 540; 3, in Hook. f. Fl. B. I. v. 2, p. 490 ; Bedd. For. Man. in Flor.

• p. cviii; Talb. Trees, Bomb. ed. 2, p. 168; Woodr. in Journ.

• Nat. w 11 (1898) p. 637 ; Watt, Diet. Econ. Prod. v. 3, p. 283.

*ium caryophyllceum*, Gaertn. Fruct. v. 1 (1788) p. 166, t. 33 ; Grab.

• P« 73 ; Dalz. & Gibs. p. 93. *Syzygium rubicundum*, Grab. Cat. V- 73 (not of Wight & Arn.). *Myrtus caryophyllata*, Linn. !Sp. Pl. (1753) P%472.—Flowers: Mar.-May. VEKX. *Nimhuli* \ *IMnlavang*.

specific name "*corymbosa*" is 60 years prior to that of a."

JCONKAN : *Stocks*!; S. Konkan, *Kimn* ex *Graham* ; on the banks of streams, *Dahcll* " *Gibson*. DECCAN: Mahableshwar, bed of tho Yenna river, *Graham*; on the banks !.streams, *Cookel*, *Woodrowl*; near the Fountain Hotel and Carnac Point, *H. M. oH* <sup>Woocl</sup> S. M. COUNTRY: Kala naddi, *Ritchie*, 1751! KANAKA: moist forests, near tho sea, *Talhot*.—DISTEIB. India (W. Peninsula); Ceylon, Borneo.

9. **Eugenia utilis**, Talbot, in Journ. Domh Nat. HM ff• J^

(1897) p. 235. A large quite glabrous tree ; bark grey, seal), terete! ' Leaves coi-iaceous, 2-3 by 1-1| in., elliptic, abrupt la nd -nor y acuminate, conspicuously gland-dotted, base acute; mam ^ numerous, fine, close, uniting at the margin . 'n\* JJ TM nd fci\_rminul nerve; petioles H in. long. Mowers small, m ^a^ a^ a' 2\_3 flowers corymbose paniced cymes winch are Sorter than the lu«es,-together on the ends of the slender angular branches^ tut c>m globose or pear-shaped; bracteoles lanceolate. Ca hx ^ i ^ turbinate, rugulose externally, truncate or very in W.nutty 1 Petals calvprtrate. IVuit small, black, succulent, «°«»^J,J^ : persistent" calyx-lobes. Talb. Trees, Bomb. ed. 2, p. 16J. A

K3Lly heavy and to««h, of a reddishbro demand in the Sirsi subdivision of N. Kanura for buiWiny purges Apparently cndeiuio.

10. **Eugenia Gardner!**, Dulhic, in Hook f. Fl. B I. ^g p. 480. A large glabrous tree; bark s-ooth p.le-£^b.anchlet

terete, or sometunes somewhat compressed, white ^ I ' ^ i-1\* in., elliptic-oblong, usually TM ^ ? - M U i n l " a ^ ; > % Sotted, base acute; main nerves conspicuous ve.y nu 1 close, uniting in an intramarginal nerve ; petioles ^ \*■ ■ b- ft white, }-\ in. across, numerous, sessile or near y »o, usu. > the extremities of the branches of£ copious axillary and U nn. | which are shorter than the leaves ; buds g ob^ J^\*J^ . Petals

calyx-segments. Thwaites, Enum. p. 117. Eugenia kanarensis, Talb. in Journ. Bomb. Nat. Hist. Soc. v. 11 (1897) p. 236, t. 4 ; Talb. Trees, Bomb. ed. 2, p. 169.

KANARA: Gairsoppa Ghát above Mulamani (N. Kanara), 2000 ft., Talbot, 3552!— DISTRIB. India (Ghâts of the W. Peninsula) ; Ceylon.

11 A **Eugenia Jambolana**, Lamk. Encyc. Méthod. v. 3 (1789) p. 198. larg e tree; bark light-colored, thick, rough, exfoliating ; branches terete Leaves coriaceous, variable, 2½-4½ by te-elliptic, acuv, dotted.

in evergreen or on the borders of evergreen forests ia the

southern parts and toiiiRh, of a reddish-brown

<=^T^}jf^jJ"

terete, very uu-iu vynun uij. ~- - -

14-21 in., lanceolate, elliptic-oblong or broadly ova subobtuse or shortly acuminate, smooth and sinning sle» ^ slio-htly narrowed at the base; main nerves ver) ^-e, mwj, prominent on the lower surface, uniting into an »>tramarf "j in. loi>f; reticulations numerous between the main nerves; petioles j- glo^rtl)

Flowers dirty-white, fragrant, about 1/2 in. across. ?S, -fines r^  
.. ii i l.,l ;, li»-ii< nn thfi cnrlu r>f Invlv nn.nicleU C) H"-0  
;-i^UX

irate Fruit the shape of an olive, or subglobose, varying in size from a pea to a pigeon's egg, dark-purple, smooth, juicy, crowned with a truncate calyx-limb, 1-seeded. R B. 1. v. ii, p. 409 ; WigW'



.....!<\*>- VJUUT. JVmUhal.

hi\* cHR " - \*>\*«\*\* : Mah,  
(< A- Wm, TWa^-bumml

the commonest  
RA : common in the moist  
India; Ceylon; Malaya,

ed fruit is often as large as a pigeon's egg and is eaten largely by the  
flavor is subacid and rather astringent. For other uses of the products  
Watt, Dict. Econ. Prod. 1. c.

12. **Eugenia Heyneana**, Duthie, in Hook. f. Fl. B. I. v. 2 (1878)  
p. 500. A shrub, scarcely a small tree, 12-15 ft. high, growing in the  
beds or on the banks of streams and rivers. Leaves 3-4 by  $\frac{5}{8}$ -1 in.,  
oblong-lanceolate, subobtuse, glabrous and shining, pellucid-dotted, base  
tapering; main nerves very numerous, fine, uniting in an intramarginal  
nerve; petiole  $\frac{1}{8}$ - $\frac{3}{8}$  in. long. Flowers  $\frac{1}{4}$  in. across, white, sessile or  
shortly pedicelled, in small heads.

Throughout

which ar  
 $\frac{1}{8}$ - $\frac{3}{8}$   
Fruit ob  
limb. T. Trees, Bomb. ed. 2, p. 170; Woodr. in Journ. Bomb. Nat.  
v. 11 (1898) p. 637; Watt, Dict. Econ. Prod. v. 3, p. 284. *Eugenia*  
*salicifolia*, Wight, Ill. v. 2 (1850) p. 16; Icon. t. 539; Bedd. For. Man.  
in Flor. Sylvat. p. six (not *E. salicifolia*, DC. Prodr. v. 3 (1828) p. 278,  
in Mart. Fl. Bras. v. 14, part 1, p. 312). *Syzygium*  
*heyneanum*, Wall. Cat. 3599. *Syzygium salicifolium*, Grab. Cat. (1839)  
p. 73. D. 94 (not Wall. Cat. 3597).—Flow

iltiva! «.

Tli..  
of Berg, i . \V ■ <^

mo etuis of the branches of cymes

ara of fallen leaves, rarely axillary. Calyx

■ in. long, externally rugulose, funnel-shaped. Petals  
ealyptrate. tig-ellipsoid, \ in. toog, crowned with feh« #>««\_«

: -Mar.-May.

U-1DS. p

- : Bol

U« ana rivers ?',/>,,,

(W. ... Chandv  
ar, and Central Provinces).  
VAR. *alternans*, Duthie, in Hook. f.  
from the axils of the upper leaves. S  
Hohenhacker.  
KONKAN and KANARA: Stocks!, Hohenhacker.

«• Kanara in the beds  
of

Cy  
. in Herb.

13. **Eugenia macrosepala**, Duthie  
(1878) p. 50. A s re

P  
Peainsuia, R-

; stout! \_\_\_\_\_ a-z  
 I ^ ^ g<sup>btj</sup>?<sup>el</sup>y; acui»inate, base usually acute;" main nerves slender,  
 indistinct above, conspicuous beneath, uniting some-  
 e. "ly wiUiiti the margin; petioles | in. long. Flowers  
 sessile,

•tent i P ^ g "»»hy shrub; bark  
 brownish j •tout. Leaves 2|-4| by Lf-1|  
 in.veUiptic-ob]ong or o  
 r i() jg »8@iy acuiBinate\* base usually acute; i n l  
 di

■alvv"! " 11M 1t; tti^ axils, solitary m-iti pairs; braci soles i<sup>j</sup> beneath  
 .^jjn ' llm^»r, pilose. Calyx ] in. long, clothed outside wifch long  
 ^e 8 white hairs; tube wry .-hurt.; lobes 4, tauceolate,  
 acute,  
 ^I'UJl "h exceeding the petals. Petals orate-oblong,  
 obtuse,  
 \*ruit not seen. There is no fruit on any of the sp  
 as in

Herb. Kew. Talb. Trees, Bomb. ed. 2, p. 170 : Woodr, in Journ. Nat v. 11 (1893) p. 637—Flowers: Jan.-Feb. *aSfySPJ*, Ahmednagar, Woodrow. KANAKA: N. Kanara, *Stocks I*; bonier of *V umt*(£i. KanaraJ, pretfy common, *Talbot*.

14. *Eugenia codyensis*, *Munro*, in *Wight*, *HI* v. 2 (1850) ]<- A small evergreen tree; bark'smooth ; branchlets slender, terete, *I>M'*-Leaves coriaceous, 1^~2. | by £-1J in., elliptic, bluntly acuminate or sub-obtuse, finely pellucid-dotted, margins slightly recurved, base tapering ; main nerves about 15-20 pairs, slender, uniting in an intranaargina\* nerve; petioles \- \* in. long. Flowers white, about £ in. act \*"» or nearly so, axillary, solitary, or in fascicles of 2 or more, or in terminal beads at the ends of short abortive branches; bracteoles conspicuous, -fV in. long, broadly ovate, acute, pubescent. Calyx £ in, longJ<sup>h</sup> pubescent or tomentose outside; tube very short; lobes 4, broadly ovate, ciliate on the margins, gland-dotted. "Petals 4, twice the length of the calyx, spreading. Fruit globose, 1 in. in diam., crowned with the persistent calyx-lobes ; seeds 1-2. *Eugenia memecylifolia*, *Talbot*, in Journ. Bomb. Nat. Hist. Soc. v. 11 (1897) p. 230, t/o," & Trees, Bomb, ed. 2, p. 170,—Mowers: Mar.-May,

I cannot separate Mr, Talbot's *K memecylifolia* from *E. codyi* Munro. Mr. Talbot describes the fruit of the former as white. pil« Munro (*l.c*) makes no mention of the color of the fruit oi^ the latter.

KASABA: JUlpa on the Supa Gli/its of N. Kanara (3100 feet), *Ta2bot*,) \$l\$<sup>f</sup> s. India (Nilgliiri and Kurg mountains).

15. *Eugenia Mooniana*, *Wight*, *111*. v. 2 (1850) p. 13. (*Aft* of Gardner, in Loud. Journ. Bot. v. 2 (1843) p. 352.) Shrubby, gJabfoOS, or the young shoots puberulous. Leaves very variable in size Wild shape, *li~2%* by |-1| in., ovate or elliptic or sometimes oborS acuminate (the acumen either short and obtuse or prolonged to a mW> or less fine point) base usually tapering, but

## P Y pg

a nerves inconspicuous, s^djg, uniting in an i"V{u>v-J"WflnHflrve; DetiJr ig. Flowers white, about J in. across, solitary or 2 together on filiform pedicels about | in. long which are axillary or from the old wood ; bracteoles small, lanceolate-subulate. Calyx | in. long, pubescent outside ; tube about equalling the lobes, funnel-shaped, not prolonged beyond the ovary; lobes 4, oblong, acute or obtuse, reflexea. Petals longer than the calyx-lobes, broadly ovate or elliptic, obtuse, glandular. Fruit globose, about the size of a cherry, scarlet or crimson (*Trimen*). *m. B. i*, v. 2, p. 505; *Wight*, Icon, t. 55] ; *Trim. FL CeyL* v. 2, p. 187. *Eugenia WUdenowii* (?), *Dalz. & Gibs*. p. 94 (*not* of DO.).

KOBKAN: *Stocfa!*

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Flor.

Sylvat p. ex; Talb. Trees, Bomb. ed. 2, p. 170.—Flowers ; Feb.-Mar.

Evergreen forests of the Koukati and N. Kanara, *Talbot*; **Ainshi** GUt, (N. Kanara)  
" ' . " f<sup>M</sup> i oommoi in the forests near **ICarwar** on the coast, *TalboUD*



Ia<sup>r</sup>^S<sup>c</sup>K<sup>9</sup> Li^ -irfp-J<sup>L</sup> <Yf> p-<sup>TM</sup> A Slnnii t<<3 or  
cr'''iso<sup>tl</sup> flowers W-1 7 , IP and , deuse " <>>•>>>>• of large brH,t-<sup>Stat</sup>Mens  
about 1 T<sup>suborbiculai></sup> glandular petals and numerous 8>><<fen<sub>8</sub> in ff<sup>n</sup>f'''•  
lo''S' a " f' ve of the Moluccas, is often grown in  
SDw11. apple and! S<sup>o1</sup>^ ^T<sup>1</sup> -s^ The fruit is of the^^ a ^ 2' P 471 T<l  
e^ten> ^ though it is not very palatable. l'. B I  
5?>>b. lit 'v n'fe D<sup>B01</sup>S; eJ 2- P- 167/Wood, in Jour':  
^/' Wet. Eo fff^ \* s<sup>Gard</sup>y >> \* <l. od. 5, p.  
316;

. 3 D oo<< . p , ■ v- f P- 288- *Jambosa malaceensis*,  
DC & Jiay. V VEBN. *Malafce-jdmb.* Dalz. & Qibs- Suppl. p.  
35.--ipr.-Jiay.

- V- 3' P" 28(i 5 Gr^\_ Cat. p. 74 • ers:  
Feb. *VEHN. Guldbjd., P.*  
*hracieata* > Eoxb. Hort. Beng. (1814) ,,

\Woodr. in Journ. Bomb. <sup>^0%</sup> & <sup>fdmTm^Sl'</sup> ^' P' 182;  
July. P: xx 10 6, p. ody. - 1 < lowers: Apr. -  
*ffi'nia Michdii*, Lamk. Enoyc. Method, v. 3 (1789) ,, 9(n ,

# ^ ^ ^ J i ^

plant. b<sub>v</sub>n Vn ie Rame ^ ww>r<< subsequently given to the  
iii<sup>Ust</sup> j<sup>i</sup> Jilnn^l's, which included both this and a forin of *E. malacenaii* , .  
<<€> abaiidoiied in favor of A\ J/ic^^/r, La.nk. /^^H<< *nniflora*]  
^<sup>nA^^</sup>J-jrO^. *B.L* v.2, p. 505; A Wood, in Joum!

## 2. BARRINGTONIA, Forst.

<sup>s</sup>Uall 3> ^eav es alternate, crowded towards the ends of the branches, ,d  
j^<sup>mem</sup>bi'anous, penninerved, not gland-dotted. Flowers in terminal 'acto  
l<sup>r. aeci</sup>>>es or interrupted spikes ; bracts small, very caducous ; f-ole8  
minute or 0. Calyx-tube ovoid or turbinate, not or scarcely <sup>1(t'lf)</sup>  
above the ovary; lobes 2-4 (rarely 5). Petals 4 (rarely r>).

imbricate, adnate at the base to the staminal-tube. Stamens numerous, in several rows, connate at the base into a ring or very short cup; filaments, filiform, all antheriferous; anthers small. Disk annular, at the top of the ovary between the stamens. Ovary inferior, 2-4-celled ; ovules ^-8 in each cell, pendulous or horizontal: style long, filiform ; stigma small. Fruit fibrous or leathery, globose, ellipsoid, or quadrangular, crowned with the calyx-limb, usually 1-seeded. Seed ovoid or ellipsoid, exalbuminous ; embryo thick, fleshy, consisting of two concentric homogeneous layers; cotyledons rudimentary, scale-like.— DISTEIB. Tropical Asia, Africa, Australia and Polynesia ; species 25.

On the structure of seeds of *Barringtonia* and *Careya*, see Thomson, in Journ. Linn. Soc. v. 2 (1858) p. 47.

Leaves reaching 12 in. long; fruit ovoid ... 1. *B. racemosa*.  
leaves reaching 6 in. long ; fruit quadrangular ".....". 2. *B. acutangula*.

T | BARRINGTONIA <sup>OTM\*</sup> **racemosa, Roceb. Hort. Beng. (1814) p. 52 ; Ft. ma.** v. J, p. b<34. A glabrous tree often reaching 50 ft. high; bark grey. Leaves 4-12 by 2-5 in., membranous, obovate-oblong or ob-lanceolate, shortly acuminate, slightly crenate-denticulate, glabrous, base cuneate ; main nerves 10-20 pairs, spreading or ascending, prominent beneath; petioles ^ in. long. Flowers 1|-2 in. across, distant, in pendulous many-flowered racemes 1-2 ft. long, terminal or in the axils of fallen leaves ; buds globose; pedicels slender, f-J in. long; bracteoles minute, caducous. Calyx turbinate; tube funnel-shaped in bud ; lobes 2-3, ovate, acute, |-| in. long. Petals 4, oblong-elliptic, acute, |-1 in. long. Stamens very numerous; filaments erect, spreading, about 1 in. long. Style 1£-1J in. long. Fruit 2-2i by 4 in. <sup>Horizontal</sup> cross-section or very bluntly <sup>W-ornate</sup> crowned with the persistent calyx-lobes; pericarp leathery. Seed solitary, ovoid-ellipsoid 1| in. long. El. B. J.

P 74- \S T V? DC\* Prodr. v. 3 (1828) p. 288? Grah. Cat.

^"■P nt P\* YA P V 189; Talbot Trees Bomb: ed. P- IH; Watt!  
n'm^m%i^ V\* lj P-402--Flowers : Apr.-May. VERB. JWWR;  
*Samudra-yphal!*

KONKAN: *Stocks I, Nimmo ex Graham*; <sup>everridigtaluka</sup>, *DdbeU* ^"^^1^^ the coast, *Talbot*. KANARA : plentiful, *Dahell # Gibson* ; along rivers and <sup>n<ual</sup> the coast of N. Kanara, *Talbot*.—DIS-JRIB. India (eastern and western sea-tu Malaya, Polynesia.

2. ***Barringtonia acutangula*, Gcertn. Fruct. v. 2 (1791) P-^ t. 101.** A glabrous tree 25-50 ft. high ; young branches slender, p\* ' grey. Leaves 21-0 by 11-3-i in., obovate-oblong or elliptic-cuneate,, 1 pex rounded or subacute, the margins minutely denticulate or crenate in"uch narrowed into the petiole; main nerves 10-13 pairs, spreading j cuives --t in. long. flowers fragrant, dark-scarlet, \$-\$ in. <sup>TM^</sup> slender pendulous many-flowered racemes 6-15 in. long; pedicels T\*T3 ;

tube puberulous outside, about as long as the lobes; lobes 4, oblong, rounded, ciliolate. Petals  $\frac{1}{8}$  in. long. Filaments  $\frac{3}{4}$  in. long. <sup>Fruit</sup>  $1\frac{1}{4}$ - $1\frac{1}{2}$  by  $\frac{1}{2}$ - \$ y q g a r , broadest in th <sup>jj</sup> narrowed towards and truncate at each end, crowned by the su\* persistent calyx. El. B. I. v. 2, p. 508; Grah. Cat. p. 74; Redd. V° apex rounded or subacute, the margins minutely denticulate or crenate»<sup>l'</sup> base liTuch narrowed into the netinlp • mn;« nowo« 10\_13 nairs, spreading

. t. 204; Dalz. & Gibs. p. 95; Trim. FJ. Ceyl. v. 2, p. 191; Talb. es, Bomb. ed. 2, p. 171; AVoodr. in Jourii. Bomb. JS<sup>T</sup>at. v. 11 (1898) P-037; Watt, Diet. Econ. Prod. v. 1, p. 401.—Flowers: Sept.-Oct. <sup>V</sup>\*iW. *Tivdr; Inqli.*

wyodrow; between Indapur and JDasgaon, *Dalzell & Gibson*, ( ),  
 ooaruw. & M. COUNTRY: near 13elgaum, *Law ex Graham*. KANAKA: banks  
 of  
 KONKAN: banks of creeks in the S. Konkan, *Daklll*; Shrivardhan (S. Konfcan),  
 yodrow bt I dJD *D l l l & Gib* W Gh dl

streams throughout N. Kanara, common near the coast, *Talbot*; island in  
 Kala naddi, *Ritchie*, 280!—DISTKIB. Throughout India; Ceylon, Malaya, N.

### 3. CAREYA, Eoxb.

Trees or a small undershrub (*C. herbacea*). Leaves alternate, crowded at the ends of the branches, pennierved, not clotted. Flowers large <sup>ail</sup><-i handsome, in racemes or interrupted spikes. Calyx-tube campa-aulate or ovoid, not produced above the ovary; limb deeply 4-lobed. etals 4, imbricate. Stamens very numerous, epigynous, in several °y, slightly connate at the base; filaments very long, the innermost <sup>ai</sup>Kl outermost rows often without anthers, the intermediate perfect; anthers versatile, dehiscing longitudinally. Ovary inferior, 4- (rarely 5-) ceJled, crowned by an annular disk; ovules numerous, in 2 rows on <sup>ax</sup>ile placentas. *Fruit* large, globose, fleshy, indehiscent, crowned with the calyx-limb. Seeds numerous, nesting in fleshy pulp; albumen 0; embryo large; cotyledons obsolete.—DisraiB. India, Ceylon, N. Australia, Queensland; species 4.

1. *Careya arborea*, *Eoxb. Cor. Pl.* v. 3 (1819) p. 14, t. 218. A glabrous middle-sized or sometimes a large tree attaining 60 ft. with founded head; bark thick, rough, dark-grey. Leaves 0-12 by 3-7 in., usually sessile, broadly obovate or oblong-obovate, rounded or shortly acuminate, crenate-denticulate, glabrous, tapering at the base; main nerves 10-12 pairs; petioles 0-J in. long, margined. Flowers yellowish-<sup>h</sup>ite, ill-smelling, sessile, 21-3J in. across, in thick swollen hard ter-

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oj >^ v<.o\^ Kjt. ol.IUU\UIC< j. iicnuKziiuo auKJuv eouaiJiug ov sJigMLiy JongCi.  
 'ian the petals, red. Fruit 2|-3 in. in diam., globular, green, glabrous, somewhat like an apple in appearance. *Yl B. I.* v. 2, p. 511; Grrah. Ut. p. 74. Wight, 111. tt. 99 & 100; Dalz. & Gibs. p. 95; Talb. Trees, <sup>J</sup>\*omb. ed. 2, p. 172; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637; V<sup>^</sup>tt Diet. Econ. Prod. v. 2, p. 157.—Flowers: Mar.-Apr. VEN

Throughout the Presidency in deciduous forests. KONKAN: common in S. Konkan, *Dalzell & Gibson*; W. Ghats, widely, *Woodrow*; Matheran, abundant, *Cooke*!; Malabar and Parel hills (Bombay), *Graham*; jungles in Salsette, *Graham*; Indapur, *Dalzell & Gibson*.

d *Kubd.*

GUJAKAT: where it attains

.. . y *isi'Jdun.* URCCA: ivuanuesn, *uranam.* ~ ~ ..

size, *Gibson ex Graham*. S. M. COUNTRY: Belgaum jungles, *Ritchie I*

M<sup>N</sup> AUA: K<sup>A</sup>la naddi, *Ritchie*, 300!

., <sup>A</sup>the timber is useful, stands water well, and the heartwood takes a fine polish.  
the inner bark fuses for matchlocks are made, and the bark is also used m  
\*!;l« medicine. The dried calyces under the name " Vaku.nbha are sold in  
the

^k«t and used as a demulcent in coughs and colds. See Watt, Diet. Econ. Trod. I.e.



*Psidium Guyava*, Linn. Sp. PL (1753) p. 470. **The Guava Tree**, a native of Mexico and possibly other parts of America, is cultivated throughout and naturalized in India and in tropical countries. It is valued for its fruit and is deserving of more attention than it generally receives. As the trees in cultivation are mostly seedlings, there is naturally an immense variety in the quality.

which could be much improved by a judicious selection. Fl. B. I. v. 2, p. 468; Firminger, Man. Gard. ed. 3, p. 261; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 637, & Gard. in Ind. ed. 5, p. 314; Watt, Dict. Econ. Prod. v. 6, part 1, p. 351. *Psidium piperi* Linn. Sp. Pl. ed. 2 (1762) p. 672; Grah. Cat. p. 72; Dalz. &

grafting W

**P-**

*ferum*,

Gibs. Suppl. p. 34.—VERN. *Jamb* ; *Peru*.

*Myrtus communis*. Linn. Sp. Pl. (1753) p. 471. **The Myrtle**, a well-known sweet-scented shrub, a native of S. Europe, is cultivated in every garden for its fragrant leaves. Dalz. & Gibs. Suppl. p. 34; Firminger, Man. Gard. ed. 3, p. 571; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 314; Watt, Dict. Econ. Prod. v. 5,

garden Man. p. 63/, & Gard. in Ind. ed. 5, p. 316.—VERN. *Vilelyti-Mendhi*.

### ORDER LVII. MELASTOMACE.E.

Herbs or shrubs, rarely erect trees, sometimes climbed, opposite (rarely whorled), simple, equal or unequal, exstipulate, petiolate, often 3-11-nerved, the nerves converging from the base towards the apex (rarely penninerved). Flowers regular, herinate, in spikes, panicles or corymbs, rarely solitary or fasciated. Calyx tube free or partly or entirely adherent to the ovary by long septa; limb truncate, 3-6-lobed, or calyptrate. Petals as many as calyx-lobes, inserted on the mouth of the calyx-limb, sometimes very rarely cohering at the base, imbricate. Stamens commonly double as many as the petals and inserted within (rarely subindennite), 1-seriate, the alternate stamens rudimentary, rarely all equal; filaments various, rarely glandular, inflexed in bud; anthers basifixed, opening at the top one or two pores, rarely by slits down the face, the connective appendaged. Ovary sometimes wholly free, usually variously 3-(-)-celled (1-celled in *Memecylon*); ovules numerous (except in *Memecylon*, on axile, parietal or free central placentas; style terete, filiform. Fruit usually enclosed in the calyx-tube, capsular, breaking up irregularly or by slits through the top of its cells. Albumen many (usually 1 in *Memecylon*); cotyledons small and much folded in *Memecylon*).—DISTIB. Tropical with a large number in America, a smaller number in Asia, and a less number in Africa and Polynesia; genera 138; species 300.

Seeds numerous.

Petals 4 or 5.

Stamens equal or subequal .....

Stamens very unequal ... ..

^ OSBEC KI\*.

o\* \*

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o  
Seeds solitary (rarely 2)

1. OSBECKIA, Linn.

Herbs or shrubs, usually erect and setose; branches commonly 4-gonous. Leaves subcoriaceous, sessile or petiolate, 3-7-nerved, Usually quite entire. Flowers terminal, solitary, capitate or paniculate; facts often forming an involucre. Calyx usually clothed with pectinate

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5 (rarely 4), obovate, often ciliate. Stamens twice as many as petals, equal or subequal; anthers large, obtuse, or attenuated, or the connective rarely inconspicuously produced below the base. Jly dilated and with 2 tubercles there. Ovary ovoid, capsule included in the calyx-tube and partially adnate to it below, 4-5-valved at the apex. Seeds minute, numerous, cochleate.—DISTRIB. Tropical Asia, Australia, Madagascar, and Tropical Africa; species 51.

or stellate hairs; tube ovoid, urceolate or subglobose, sometimes produced beyond the ovary; lobes 4-5, subulate or lanceolate, generally with bristle-pointed teeth alternating with them,

- |   |  |       |
|---|--|-------|
| 1 | Calyx-teeth $\tau^{\wedge}$ in.; petals J-£ in. long; fruit 8-ribbed                                     | 1. 0. |
|   | <i>truncata</i> .  |       |
|   | $\wedge^{\text{tyx}}$ -tceth l-l in.; petals $\wedge$ -£ in. long; fruit sometimes obscurely many-ribbed | 2. 0. |
|   | <i>cinquedaris</i> .   |       |

1- **Osbeckia truncata**, Don, in *Wight fy Am. Prodr.* (1834) P« «322. Annual, herbaceous, 4-16 in. high; stem simple or more or less branched, 4-gonous, and as well as the branches clothed with long stiff spreading hairs. Leaves £-l by |g in., drying yellow, elliptic, subacute, densely clothed on both sides with rather long hairs, 3-nerved, entire or sometimes very slightly serrulate, base subacute; petioles  $y^{\wedge}$ -i in. long, bristly. Flowers capitate, often with 2 or 4 leaves close under the head; pedicels  $\wedge$ -g in. long; bracts ovate,  $\tau^{\wedge}$  in. long, bristle-ciliate, glabrous on their backs. Calyx \ in. long, clothed externally with long stellate, intermixed with simple bristly hairs; tube campanulate; teeth erect,  $\tau^{\vee}$  in. long, broadly triangular, bristle-ciliate and with a tuft of long spreading bristles springing from an enlarged glandular apex; intermediate teeth scarcely A- in. long, stout, terete with a tuft of bristles from an enlarged glandular apex. Petals  $\wedge$ -} in. long, purple. Ovary with 16-20 bristles at the apex. Fruit ovoid-oblong, 8-ribbed. Fl. B. I. v. 2, p. 514; Wight, Icon. t. 375; Cogniaux, in DC. Monogr. Phan. v. 7, p. 327; Woodr. in Journ. Bomb. Nat. v. 11 (1898) *Osbeckia*?, Grah. Cat. p. 71 (not of Linn.).

*Osbeckia*, p. (337). *Osbeckia zeylo*

*Leschenaultiana*, Dalz. & Gibs. p. 92 (not of DC.).—Flowers :

KONKAN: *Stocks!*, *Lawl*, *Kimmo* ex *Graham*. S. M.  
 COUNTRY: *iy*<\*drow\; *Badaini*, *Woodrowl*; *Kamgh*;it, *Law*  
 ex *Graham*.  $\wedge$ ; *Kanara*, *Hitchie*, 1109!; *Kfila naddi*,  
*Ritchie*; *Balzell!*—• *l* $\wedge$ *niimula*, *Chota Nagpur*, *East Bengal*,  
*Behar*).

*Lontla*, *Cooke!*,  
 KANAKA: *Supa*  
 -DISTRIB. *India*

*Chota Nagpur*, *East Bengal*, *Behar*).

**2- Osbeckia cupularis**, *Bon, in Wight # Am. Prodr*  
(1834)

! ^ Herbaceous, biennial or (not improbably) perennial, 8-2C  
m.  
branched ; root thick, nodose. Stems many, 4-gonous, rather  
' ; densely clothed with simple appressed long bristly hairs. Leaves  
i yellow 1-21- by \*-H m., elliptic or elliptic-oblong, usually  
3 yuiow, i j by 2 i4 j d hairy on both surfaces,  
base

» o- (or sometimes 5-) neiveu, uan.y w ^ nm nQ  
ViA A\*io » X in lonsr. i lowers  
4-o-meious,  
or fcubobtuse ; petioles T'%-| Jn« JUib\*

subcapitate (sometimes rather laxly arranged), often with 2 or 4 under the head ; bracts <sup>^</sup> in. long, ovate, acute, ciliate on the n and with a long bristle-point at the apex, glabrous on the back. <y 14 in. long, densely clothed with stalked stellate long hairs; <sup>^</sup> campanulate ; teeth  $\pm$ -l in. long, triangular, ciliate and with <sup>a ^</sup> long bristles from the enlarged glandular apex ; intermediate <sup>teetm a\* taig</sup> long, with a tuft of bristles from the enlarged glandular apex. <sup>^</sup> \-i in. long, purple or sometimes white. Fruit <sup>o</sup>void-<sup>o</sup>Mong, som obscurely many-ribbed. Fl. B. I. v. 2, p. 514 : Cogniaux, in <sup>u^ ^/ &</sup> Phan. v. 7, p. 328. *Osbecjeia virgata* ?, Grah. Cat. p. 71 (not oi:wnb Arn.). *Osbecjeia Leschenaultlana*, Wight, Icon. t. 996 (not ot U.W-

KONKAN : *Stocks* ex *Cogniaux* (1. a).

-. v js

sotne-

The occurrence of this plant within the limits of the Bombay Presiactn <sup>j ^</sup> the what doubtful. Cogniaux cites *Stocks* as an authority for its occur <sup>^</sup> clucles \n Konkan, but there is no specimen from *Stocks* in Herb. Kevv. *Gmnan* <sup>^ .n</sup> his Catalogue a plant which he calls *O. virgata*, W. & A., the habitat oiwi <sup>\_pisTial</sup>. as S. Konkan on the authority of Nimmo, which may possibly be this plan .. India (W. Peninsula).

## 2. MELASTOMA, Linn.

Shrubs, usually erect and strigo?e-hairy. Leaves petiolate, <sup>^ o e Y 3</sup> lanceolate, usually coriaceous and quite entire, 3-7-nerve . <sup>g\_nierouSg</sup> terminal, solitary, fasciculate or paniced, showy, purple, usua <sup>j ^ ^ ^ g</sup> Calyx-tube strigose, setose or paleaceous, ovoid or campam <sup>^ ^</sup> deciduous, ovate or lanceolate, usually about as long as y calyx-alternating with subulate teeth. Petals equal in number to <sup>^ ^</sup> lobes, sometimes pilose on the back. Stamens twice as <sup>ma -^</sup> purple petals, unequal ; those opposite the calyx-lobes longer and w F <sup>^ ^</sup> anthers, the connective produced below the cells and <sup>en ' o t j i e</sup> blunt lobes; those opposite the petals with yellow <sup>a j i r "</sup>ube'rci(s, connective not or scarcely produced and ending in <sup>2 vL</sup> 5-celled, Ovary ovoid, more or less adnate to the calyx-tube, <sup>us ^ ^ a'</sup> obtusc bristly on the apex; ovules numerous; style filiform; <sup>y 1 " \* ^</sup> in the Eciry coriaceous or fleshy, irregularly dehiscent, <sup>e?lcV)S^ .pisTRii^</sup> persistent calyx-tube. Seeds minute, numerous, cochleare. <sup>^ 40></sup> Tropical and East Asia, N. Australia, and Polynesia; species a

### 1. *Melastoma malabathricum*, Linn. <sup>^?</sup>.

( <sup>^ b</sup>

much-branched shrub sometimes reaching 8 ft. high. <sup>^olV £ a</sup> petioles, and nerves of the leaves beneath densely clothed wi <sup>^ j ^ ^</sup> flat lanceolate acuminate paleaceous hairs. Leaves some \ <sup>4\_s r i g o s e</sup> <sup>2 ~ H ^ b y i ~ l |</sup> in., ovate-oblong or lanceolate-oblong, <sup>a C L I t V</sup> nerves above with appressed thick hairs, softly hairy between <sup>I bag0</sup> beneath, 5-nerved, the outer nerves fine and close to the <sup>n T M b b o s e</sup> usually rounded; petioles | -1 in. long. Flowers in terminal cu ) <sup>^ ^</sup> 1-5-flowered panicles ; pedicels about as long as the calyx-tiID , <sup>^</sup> l-g- in. long, oblong-lanceolate, shortly stalked, clothed on <sup>] a t e</sup> \uth scaly hairs. Calyx clothed all over with silvery <sup>^ o ] f i t e</sup>, scaly hairs; tube broadly campanulate; lobes g in. long, j < <sup>i n t e d .</sup> acute, deciduous ; intermediate teeth -J- in. long, subulate, bristi "1 <sup>v v e d</sup> Petals | -1 in. long, obovate, rounded or truncate at the apex, n <sup>^</sup> at the base. Filaments yellow. Anthers alternately yellowv <sup>^ ^ ^</sup> Ovary crowned at top with numerous silvery lanceolate nan

1. **Melastoma malabathricum**, *Linn.* <sup>^?</sup> *PI\** (1<sup>^o3/ ^</sup>  
hb f h i h

**I<sup>^</sup>iri<sup>1</sup>** 1<sup>^</sup>?<sup>?</sup>; style near<sup>7</sup> l in\_ lon<sup>g</sup>> exceeding the stamens. Fruit circle n <sup>^</sup> <sup>o</sup>td. <sup>^</sup>y <sup>o</sup>void> truncate, bursting irregularly usually in a wifu I <sup>ex</sup>P<sup>o</sup>sing the 5 large purplish-black pulpy placentas covered

ni uuiiu. DUUJU. i\iir. v. Li *florvoj* p. oo / ; Watt on. Prod. v. o, p. 210.—Flowers: Oct.-Mar. VERN. *Palore*. KOXK S

IHY\*<sup>1</sup> A<sup>@</sup>00\*<sup>81</sup>, Bahel<sup>1</sup> <sup>^</sup>Law\; near Vingorla, Cooke\% Woodrow! S M

<sup>^</sup>Kanar<sup>i</sup>in anVVa<\_r\ Dr<sup>r</sup> Lu>ih ex Graham, Ramglmr, Ritchie, 293! KANAKA: 'tidhnt' V <sup>''</sup>loist Jorests, often along the banks of mias near evergreen forests tliede<sup>^</sup>n <sup>^</sup> <sup>''</sup>noodrow'> Siddapiir, Woodrow.—DISTRIB. Throughout India (except Tl <sup>^</sup>^ylon. •

mouth black<sup>o</sup>l Uje frUit is Cdibl<3> tastinS something like a blackberry; it stains the

**3- SONERILA, Eoxb.**

**H** W<sup>^</sup>usl<sup>^</sup>w W<sup>o</sup>Od>>y at the baS6j usualJ\_y small<sup>1</sup> sometimes stemless. <sup>^</sup>5-ner I TVTMubranous' e(qual or dimorphous, entire or serrulate, Calyx eULL 'T "' <sup>^</sup>f"<sup>168</sup> or 8Cor<sup>o</sup>id spikes' usually reddish, short ni? i?<sup>U8</sup>; or I <sup>o</sup>Se ; <sup>^</sup>llbe camp Panulate or funnel-shaped ; teeth 3, \ (verv y d<sup>@</sup>clduoT Petals 3<sup>r</sup> acute' acuminate, or obtuse. Stamens wer> rarely 6) ; anthers blunt, pointed or rostrate, the cells more or le<sup>^</sup> aivergent at the base, not produced below. Ovary adnate to the <sup>^</sup>x-tube 3-celled (the cells alternate with the petals), glabrous at the <sup>^</sup>x; ovules many; style filiform; stigma truncate or capitate \*psule included in the calyx-tube, 3-gonous, dehiscing at the apex by K, n<sup>GS</sup>\* T ! numerous, usually muriculate with minute tubercles — ismii3. India and Malaya with 1 species in S. China; species about 60. Stem 0 ; leaves small; seeds small . i Q c/> .

stem distinct; leaves large; seeds tubercuiaie■:.....: I: tssr t 9<sup>^</sup> S<sup>o</sup> A<sup>neri</sup>l<sup>^</sup> sca**Pigera**, Hook. Lond. Journ. Bot. v. 7 (1848) p. 672, Mil x S<sup>1</sup> . 1 g<sup>labro</sup>us stemless herb 3-4 in. high. Leaves radical, "btu <sup>^</sup> i m#<sup>1</sup> oVate or ovate\_obl<sup>on</sup>g<sup>^</sup> sometimes tinged with purple, s<sup>se</sup>. or subacute, minutely crenate-serrate, glabrous on both sides or <sup>^</sup> netnnes minutely glandular-puberulous, base cordate; petioles 1|-2| in" 1 <sup>on</sup>Λ<sup>1</sup> <sup>lowers</sup> 4-10> crowded, subumbellate : flowering scapes 1-3 shaw!<sup>S</sup>; ,pedic<sup>^</sup>s slender, <sup>^</sup> in. long. Calyx &-<sup>\$</sup> in. long, funnel-Pet 1 Obscurel<sup>7</sup> 3-sulcate; teeth short, triangular, acute, deciduous. . mauve-colored, 4-g in. long, obovate, obliquely acute. Stamens rs 1-i. m. lised poini DC. MOIK

r<sup>was</sup> originally described by Hooker (Lond. Journ. Bot. 1. c.) and i<sup>s</sup> f ■<sup>\$</sup>-L>alzell, as erroneously stated in Fl. B. I. (I c.\ a mistake which <sup>^</sup> <sup>^</sup>owed by Cogniaux and by the ' Index Kewensis.' DKCC!<sup>KAN</sup> <sup>Dal</sup>Λ<sup>ll</sup>\; North and South Konkan, Law I; Gbats near Bombay, Dalzdlx <sup>ANA</sup> KhandHla, Woodrow I, Cooke!—DISTRIB. India (W. Peninsula).

2.- **Sonerila Rheedei**, *Wight & Arn. Prodr.* (1834) p. 321 (*not* Wall-Cat. 4096). A small herb 4-6 in. high; stem distinct, quadrangul<sup>u</sup>,

sparsely clothed with weak hairs. Leaves 1|-3 by 1/2|-1 in. > °\ - c g remotely bristle-serrate, often tinged with purple, the upper sur < sparsely clothed with short thick bristles, the lower surface i p<sup>alelj</sup>..oleS usually with minute scaly points, base subcordate or rounded ; pe i-L± in. long, usually with a few scattered weak hairs. \*loΛe .r8<sub>h</sub> ^ crowded, subumbellate on terminal or axillary peduncles whJ<sup>c</sup> \_a ^

sometimes 2^ in. long; pedicels g-g-in. long, hairy. Calyx j6: j\* long, hairy; lobes triangular, deciduous. Petals violet, 3- \* • ^x^

oblong-obovate., acute. Anthers y\ in. long, bright-yellow, s /^

sagittate at the base. Capsule £-£ in. long. Seeds with rawea 1 Grab. Cat. p. 71. So^WZa *Wallichii*, Woodr. in Journ. J\*>mu. v. 11 (1898) p. 637.-Plowers : July-Aug. following him, Triana (Trans. Linn. Soc. v. 28 [1873J p. 77) and, tol o\ui g

to Mr. C. B. Clarke (Hook. f. El. B. 1. v. 2, p. W8) reduce tins J"

” & IF«^c7m (Benn. PI. Jav. Ear. p. 215) and cite 5. ^\*%P Mono^r. as equivalent to 8. *Rheedei*, *Wight & Arn.* Cogmaux \U/u- t Ind&eX Phan. v.7, p. 512) follows Mr. Clarke with a query, ^^.^ WalL and Kewensis? retains 8. *Rheedii* as a separate species, citing o Wight & Arn. ,.. Tyall are,

The two plants, 8. *Rheedei*, *Wight & Arn.*, and *S. litieT\^* having however, quite distinct and belong to different sections, u ..fic ^th a stem and the latter (*JS. Rheedii*, Wall.), which is consp ^ 25 /Sf. *Wallichii*, Benn., and with & da/MZi», Bedd. (Trans. ^n.n;. & " Arn., [1866] p. 216), being entirely stemless. *S. liheedei*^lg \* *maculata*, should properly take its place in PI. B. I. after no. ^, \*>.

Eoxb., to which it is nearly allied. IQJ \_DISTKIB.

KONKAN : *S. Konkan*, *Nimmo ex Graham.* KANARA: Karwar, *Talhot*, India (W. Peninsula).

**4. MEMECYLON, Linn.**

Trees and shrubs, quite glabrous ; branches usually tere u.e.'te entire, sessile or shortly petiolate, coriaceous, ovate or oblong, qt ^ leaves usually penninerved. PJowers usually axillary or from ^el^ & Qr white. hi (rarely terminal), in fascicles, panicles or short umbels, p u Calyx lj<sub>md</sub> quite glabrous; tube broadly camp&nulate or hemisp dilated, truncate or shortly 4-lobed. Petals 4, broadly ovate o ^ obtuse or apiculate. Stamens 8, equal; filaments nitorin,

rior, 1-celled, glabrous, the apex convex or depressed; o jf<sub>orna</sub> whorled about a free central placenta; style filiform ; stigma \ e Berry globose, umbilicate at the apex, normally 1-seedecl. p<sub>acifii</sub> embryo involute; cotyledons acute.—DISTIUB. Asia, Austr Islands, Tropical Africa ; species about 130. Trees.

- Berries blackish when ripe. ^ ^ )\ 'ightii'
- Branchlets quadrangular, winged .....\*
- Branchlets terete, not winged. 9 \*r malah^/Cllin'
- Leaves usually cordate at the base, sessile or nearly so. ^ • Leaves
- not cordate, usually attenuate at the base, ^ umhc'tat<sup>um'</sup>
- petiolate ..... £ M\ Tlbtia\*11\*'



Berries bright-yellow when ripe ..... ' /  
A small shrub 2-3 ft. high ..... 0, 1, , /

1. **Memecylon Wightii**, *Thw. Enum.* (1859) p. 113. A small tree; branchlets slender, quadrangular, winged, the wings broader between each node. Leaves 2|-4| by 1|-2| in., sessile or very nearly so, ovate-oblong or lanceolate-oblong, acute or somewhat acuminate, thick, shining above, penninerved, abrous, thick, shining beneath, fascicled on tubercles usually on the lower pedicels  $\tau V \sim \tau V$  in. long, slender. Calyx  $\tau V$  in. long; tube slightly 4-lobed or almost truncate. Petals long; tube campanulate; lobes above, penninerved, base cordate. Flowers fascicled on tubercle

■ VANAHA : N. Kanara in evergreen forests, common in the forests near the Doclmune Talbot; Mendele, Ritchie, 1740!

2. **Memecylon malabaricum**, *Cogniaux, in DC. Monogr. Phan.* J- (1891) p. 1148 (not of Kostel). A small tree; branches robust, terete. Leaves 3-5 by 1-2J in., oblong or ovate-oblong, acute or sub-<sup>o</sup>otuse, coriaceous, glabrous, shining above, amplexicaul or shortly P<sup>c</sup>-tiolate, cordate or rounded at the base; nerves obscure. Flowers in umbels of 8-12 from the old wood; peduncles short, thickened at the apex and furnished there with numerous bracts below the pedicels; pedicels filiform,  $\tau V \sim o$  \*llg  $\wedge$  on  $\text{f}^*$  Calyx  $\wedge$  in. long and about as broad across the mouth when fully expanded; tube campanulate or sub-heinispheric, about  $\text{-} \text{-} \text{\$}$  in. long; limb saucer-shaped, subtruncate. Petals  $\text{To}$  in. long, suborbicular, blue? Berry spherical,  $\text{-} \text{-} \text{\wedge}$  in. in diam., conspicuously crowned by the calyx-limb, blackish. Brandis, in *Talb. Trees*,  $\text{-} \text{-} \text{\ouib}$ . ed. 2 (Appendix). *Memecylon amplexicaule*, var. *mala bar ica*, C. B. Clarke, in *Hook, f. Fl. B. I. v. 2*, p. 559; *Talb. Trees*, Bomb. ed. 2, P 173.—Flowers: May VERN. *Limba*; *Limtoli*.

*SampUmcl' Talbot*

$\wedge m^3; il$  B? *Memecylon* «*mbellatum*, *Barm. Fl. Tnd.* (1768) p 87 A  
 Lji ii<sup>ree</sup>,  $\text{V} y \text{?} \text{U} \text{U} \text{g}$  branches terete, pale when drv. Leaves 1.4-3 by Siabroiw' *I!lf*  $\wedge \wedge$   $\text{I} \text{su} \text{ba} \text{cu} \text{*e}$  or sbortly  $\text{an}(\text{i})$  bluntly acuminate, but Vompf-  $\text{greeD}$  a  $\text{ld}$   $\text{Poll} \text{shed}$   $\text{ab} \text{0Ve}$   $\text{paier}$  beneath, usual  $\text{J} >$  attenuated prominent w  $\text{r} \text{°} \text{U} \text{"}$  tled at the base, margins slightly rovolute; midrib nunJr  $\text{'}$   $\text{Herves}$  obscure; petioles  $\wedge \text{-} \text{l}$  in. long. Flowers aid wo?  $\text{'}$   $\text{m}$   $\text{\|tnbellate}$  cymes from the axils of th  $\text{\textcircled{R}}$  fallen le «ives on the ultimate  $\text{I}$   $\text{p}$   $\text{ecll}$   $\text{!ncl}$   $\text{f}$   $\text{Yera}$  together,  $\text{\$}$ -g in. long, elongating in fruit; innate ped.cels  $\tau V i$  in. long, very slender; buds pyriform. Calvx edl  $\text{i'}$   $\text{cain}$   $\text{pailulate}$  before expansion (saucer-shaped when ex-tl  $\text{1}$  "  $\text{pand}$   $\text{"}$   $\text{■}$  across the moutb- wlien flowering; limb truncate or 4-too  $\text{ec}$ .; teeth, when present, small, triangular. Disk without or with very faint rays. Berry globose,  $\frac{1}{4}$  in. in diam., purplish-black, crowned, though rather inconspicuously, with the calyx-limb, 1- (less commonly 2-) seeded. *Trim. Fl. Ceyl.* v. 2, p. 216; Brandis, in *Talb. Trees*, Bomb. ed. 2 (Appendix). *Memecylon edule*, *Roxb. Cor. Pl.* v. 1 (1795) p. 59, t. 82; C. B. Clarke, in *Hook. f. Fl. B. I. v. 2*, p. 563; *Dalz. & Gibs.* p. 93; *Cogniaux, in DC. Monogr. Phan.* v. 7, p. 1155; *Talb. Trees*, Bomb. ed. 2, p. 174; *Woodr. in Journ. Bomb. Nat.* v. 11 (1898) p. 638; *Watt, Dict. Econ. Prod.* v. 5, p. 226. *M. tinctorium*,

Kesri, ex W. & A. Prodr. p. 319; Wight, III. t. 93; Grah. Cat. p. 7-Flowers : Jan.-Mar. VKR>-. Anjan.

Roxburgh (I c.) and Dalzell ^Gibson (t e.) notice the \* > ^ccurr^ ] 2 seeds. I can fully endorse this, as I have examined a large n of berries in the fresh slate at Mahableswar and frequently toum 2-seeded.

seeded.

jescribi<<g

Burmnn named the plant M. itmbelUtum in 1768, merely ^e8ctip" the leaves as ovate and the flowers as umbellate, but quoting ' -3 nHhe tion of the elder Burmann (Thes. Zeyl. p. 76, t. 31). TM%\*%/" M. edule dates from 1795, and as the names are admitte the older name should have the preference.

Very common at Mahableswar and Matheran, where it is called the Ironwood Tree. KONKAN: Stocks!; Matheran, Cooke! DECCAN: Mahableswar, Cooke!; Khandala, Nene!; Lanoli, Woodrow! S. M. COUNTRY: Ramghat, Ritchie, 292! KANARA: Law! DISTRIB. India Mrs. Ward, 'U8 <J moist evergreen "forests of N. Kimara, Taum. (E. & W, Peninsulas); Ceylcm, Malaya.

rj^4

VAR. capitellata, O. B. Clarke, in\* Hook, t Fl B- 1- £ » (exclud. syn.); peduncles more elongated, sometimes i

KONKAK: Stocks t

4. Memecylon Talbotianum, BrndS\*\*TM \*» \* hrn nchlet8 terete, (1902) (JflpeMcTw). A large shrub or

slightly quadrangular just below the nodes. Leaves 2-4 by 1-2 in., thickly coriaceous, elliptic, shortly and obtusely acuminate, margins obscure; petioles 1/4 in. long.

BttUW!^11

sugntiy revoiuete, base acute; main nervw UI T \* << bracteate, nearly Flowers small, sessile, few, in compact clusters, ^ pyriform. sessile tubercles in the axils of present and former ea\|tb,

^an\*nilar-

Calyx ^ in. long; tube catnpanulate j limb 4-lobecl; w ye n off, Petals Jff in, long, orbicular, blue. Berry globose, | m. m <<^tl " ^

—blowers: Mar.-Apr. . . . , ^, 1; ! ^ from

The colour of the berry serves to distinguish this plant reanv M. umbellatum. KANAKA :

K'JSK.W; Stocks! DKCCAS: hi\|s new Malmbleshwar, Cooie, \*\*\*^/L, QAAS J 0?inai (N. Kanara), fftfcftie, 1738 i; Buttaw (N. Kanara), r<<^i Jt)JO

5. Memecylon terminale, DaU. in Kew Jotim. Hot. v. \* ( , J p. 121. A shrub 2-3 ft. high; branches diehotomous, verj | terete or somewhat 4-gonous, smooth. Leaves subsesslie, 1\* cum ^ a ^ J in., ovate, ovate-oblong or ovate-lanceolate, very acuteor

glabrous, obscurely penninerved, base cordate, i lowers K.. ' o , ! ' ^

terminal umbels; peduncles 1/2-1 1/8 in. long, 1-3 together from the sam point, very slender; pedicels 1/8 in. long, filiform. Calyx 1/8 in. across

fully e: p saucer-shaped, truncate. Petals 1/10 in. long, ovate, obtuse. Berry

1 in. in diam., the areole at the apex about 1/8 in. in diam. Fl. B. I. v. 2, p. 558; Dalz. & Gibs. p. 93; Cogniaux, in DC. Monogr. Journ. Phan. v. 7, p. 1163. Talb. Trees Bomb, ed. 2, p. 173; Woodr. in Bedd. Icon. Pl.

M. amabile,

Bomb. Nat. v. 11 (1898) p. 638.

Ind. Or. t. 163.—Flowers : Dec.-Feb.

I think that *M. amabUe*, Bedd., from S. Kanara, s iou)(1<sub>|i|</sub> in } \

Kew.

KANAKA: evergreen forests of K\ Kanara from Ainshi southwards, 2»  
Bouthwards, *Woodrow*; Southern Gfai

^u c ^ (lif

AV. \*■

ORDEE LVIII. LYTHRACEJE.

usuany<sup>8'</sup> shn<sup>1</sup>bs<sup>1</sup> or herbs 5 branches often 4-gonous. Leaves entire herm  
i<sup>Opp</sup> oslte<sup>></sup> sometimes alternate or whorled; stipules 0. Flowers free  
\* P<sup>d</sup>lte<sup>1</sup> us<sup>1</sup> usually regular, cymose or paniculate. Calyx usually acceU f  
t; p<sup>rimai</sup>T<sup>teeth</sup> or lobes 3-6, with sometimes as many the o I<sup>7</sup> l added<sup>r</sup>  
valv<sup>ate</sup>. Petals as many as the primary teeth of varioi I' TM<sup>u</sup> J fewer Or  
o' Sfamens definite or indefinite, inserted at 1-6 o il flghts on the  
calyx-tube. Ovary superior (rarely inferior), filifor ' .OVules man><sup>r</sup>  
Placentas axile, rarely parietal; style usually memh ' ligma capitat<<,  
rarely 2-lobed. Fruit capsular or baccate, ih oU or coriaceous  
S<sup>irt</sup> r<sup>o</sup>und the base by the calyx or entirely

y dehiscent (rarely indehiscent).

with a I<sup>u</sup> f<sup>9</sup>Uall<sup>f</sup>. ?blong<sup>£</sup> or Ocular, flat, 2-auricled at the base and  
•bout 27\* radicle—DISTRIB— Chiefly tropical; genera 30 ; species

Herbs

Shrubs <sup>^</sup> or trees.....	L AMMANNIA.
Stamens 12 .....	o XXT
Stamens S .....	2. WOODFORDIA.
Stamens indefinite. ....	3: LAWSONIA
Fruit a 3-6-celled, 3-6-valved capsule .....	4. LAOEHESTROSMIA,
Fruit a many-celled indehiscent berry .....	5. SONNERATIA

1. AMMANNIA, Linn.

Annual usually glabrous herbs; stem usually 4-gonous.  
Leaves entire, opposite (rarely alternate) or whorled; stipules 0.  
Flowers small, axillary solitary and sessile, or in small trichotomous  
cymes ; bacteoles usually 2 Calyx more or less deeply campanula ;  
teeth 3-7 often with intermediate teeth or folds. Petals 3-7 or 0,  
inserted be-Svl\ ?e ^y^'-teeth. Stamens 2-8, inserted in the  
middle of the calyx-tube; filaments filiform. Ovary superior,  
1-o-celled, the sept« o ten becoming absorbed; ovules very numerous,  
pbcentas axile; style niuorm exserted; stigma capitate. Capsule  
membranous, enclosed\* in itnougQ f<sup>ree</sup> f<sup>rom</sup> the p<sup>ers</sup>istent calyx; giobose or  
ellipsoid, 1-5-celled, <ienlscInDy valveg or IrregUlarly breaking up or  
circumsciss. Seeds ^"iute, very numerous.—DISTRIB. Marshy  
and moist places in the ropics and warmer regions of the world;  
species 30. Capsule 2-valved.

Flowers axillary, solitary.....	1. A. <i>peplodes</i> .
-r lowers in terminal spicate racemes.	
Leaves opposite.....	2. A. <i>tennis</i> .
leaves alternate .....	3. A. <i>floribunda</i> .
Wsule 3-valved.	
leaves in whorls of 3-6 .....	4. A. <i>Eotala</i> .
Leaves in opposite pairs .....	5. A. <i>pentandra</i> .
Capsule 4-valved.	
Flowers axillary, solitary; leaves elliptic .....	6. A. <i>Ritrhin</i> .
Mowers in terminal spicate racemes ; leaves orbicular ....	7. A. <i>rotundifolia</i> ,
g g	
p wholly covered by the	
calyx.	
Calyx distinctly 4-winged.....	*. A.
<sup>a</sup> pentandra	
apsule circumsciss or bursting irregularly,	
^appul h l l i	

- Capsule not wholly covered by the calyx. - ^ miiU'>fl<sup>ora</sup>"
- Calyx striate with 8 vertical lines .....
- Calyx not striate with vertical lines. -~ ^ baccifer(t'
- Leaves narrowed at the base ..... :-.' ^ salicifoH<sup>a'</sup>
- Leaves rounded or cordate at the base .....

**1. Ammannia peploides, Spreng. Syst. Veg. v. 1** (<sup>1S2</sup>, <sup>5</sup>lflo, ve i  
Stems 3-12 in., usually decumbent at the base and rooting; au u ^ fche  
nodes ; branches ascending, 4-gonous. Leaves opposite; tno.

ded  
main stem |-| by |-§ in., sessile or nearly so, elliptic-spatHula<sup>^</sup>,  
at the apex, narrowed at the base, the midrib and lateral neive ^ ^  
nent beneath; the leaves on the floriferous branches ^ mucn  
^

linear-oblong, bract-like. Flowers very small, sohtar7 ?Vfhe branch-  
reduced leaves which are more or less approximated so tnat ^  
^^

lets appear like spikes ; bracteoles 2, linear, acute, scanous, i>^ ' o y y  
Calyx campanulate, -^ in. long ; teeth 4, acutely triangular■,

ule  
teeth minute or 0. Petals 4, very small or 0. btamens .

^js  
ellipsoid, longer than broad, opening by 2 valves from <sup>tn</sup>® ap. rf.rim. Fl.  
very minute, narrowly ellipsoid, red. Fl. B. I. v. 2, p. ' .

g3g#  
Ceyl. v. 2, p. 223; Woodr. in Journ. Bomb. Nat. v. 11 (^^^  
*Ameletia indica*, DC. in Mem. Soc. Hist. Nat. Genev. v. <U^  
p. 82 ; Dal\* & Gibs. p. 96.—Flowers: Nov.-Jan.

A common weed in wet places. KONKAN: Malwan, in <sup>^ce''^</sup>  
throug GUJARAT: Surat, *Kanitkar*, 48!; Obikli near Surat, *Mival—vi&Tv* .  
^hanistan India in rice-fields and damp places; Cejlon, Malaya, Philippines, Uuina,  
Persia.

**2. Ammannia tenuis, C. B. Clarice, in Hootc.f. FL B.** <sup>L\*' A^t fti</sup>  
p. 567. Stems often numerous, c^spitose, somewhat proci ^^  
the base, afterwards »' Jle8\ Jterete,  
pound, reaching 8-10 in. long, very slender (almost <sup>Dllt01</sup>JjA<sub>ic</sub> (the  
shining, red. Leaves opposite, subsessile, broadly ovate or e ^ . uous>  
lower sometimes orbicular), obtuse or acute; lateral nerves ""^^ lon^  
Flowers in dense terminal slender racemes (almost <sup>sPlkf^e2</sup>ach flower,  
on filiform peduncles ; pedicels very short; bracts 1 to ^^ |lliear-  
j^A-^ in. long, oblong-lanceolate, acute; bracteoles TQ- in^ate^ampanu-  
lanceolate, acute, herbaceous. Calyx TV~8 ^n# ^on^' urc® ^ \eefa J^ in.  
late, constricted at the top of the tube below the teetli; ^^ ag  
long, triangular, acute; accessory teeth 0. Petnls <sup>obova?e'i</sup>iongeF thai/  
the calyx-teeth, pink. Capsule" narrowly ellipsoid, <sup>m"cl\</sup> ^ jouriA  
broad. Seeds narrowly ellipsoid, pink or yellow. X; ^ o 1 ' t. 257 J  
Bomb. JS<sup>T</sup>at. v. 11 (1898) p. 638. *Ameletia tenuis*, Wigt, xt  
Dalz. & Gibs. p. 96.—Flowers : Oct.-Dec. ^ nkg of PeO

KONKAN: in beds of rivers, *Law I, Woodrowl*; Sayu, <sup>Ga Wa TMm</sup> }lfoT G  
river, not common, Dafeg// ^ G7fo<w. DECCAN: Kolnpur, /?/^, *Ritchie*, 1<sup>O(38</sup>  
Bangs, on rocks, *Woodrow*, 19! S. M. COUNTRY: Belgaum mas,  
DISTRIB. India (Behar, Central India, E. Bengal, W. Peninsula). 0

**3. Ammannia floribunda, (7. B. Clarke, in Hook. /.** \* • ' bigh ;  
(1879) p. 567. Erect or shortly creeping at the base, t> io ^ J e s S  
stems reddish, often much branched, the lower portion m  
angular, the upper terete and very slender. Leaves alteri^ ' ggsite,  
1-nerved ; the lower 1-2 by TY-i in., oblong, obtuse or acute , up per  
*i-i* in. long, often only ^ in. broad, narrow-linear, acute. enS

— «i, anjuie, iieruaceous, i-u«rvcu. vcu j A JQ y —-----o>  
dimorphic, in dense terminal racemes (almost spikes), i-j in. long, on  
long filifo d l d i l very short; bracts 1 to each flower  
 $\frac{1}{8}$ – $\frac{1}{5}$  in. long, linear-lanceolate, acute, 1-nerved; bracteoles  $\frac{1}{12}$  in. long,  
linear acute, 1-nerved. Calyx  $\frac{1}{16}$ – $\frac{1}{8}$  in long: tube elong  
campanulate; teeth 4, triangular, acute, ^V iu- long s ' y teeth  
accessory 0 Stamens  
Petals  $\frac{1}{4}$ – $\frac{1}{2}$  in. long, oblong-obovate, bright rose-colored. Stam-----  
style of 2 kinds, the flowers having either long exerted stamens and a  
short included style, or a long exerted style and stamens not exerted  
beyond the calyx; stamens 4. Stigma 2-lobed, the lobes ^ in. long,  
papillose. Capsule ellipsoid, 2-valved, much longer than broad. Seeds  
ellipsoid, brown-yellow. Woodr. in Journ. Bomb. Nat. v. 11 (1898)  
P; 638. *Amehtia floribunda*, Wight, 111. p. 206; Dalz. & Gibs. p. 96.  
*Kimmoia floribunda*, Wight, in Madr. Journ. Lit. & Science, v. 5 (1837)  
P- 312, t. 20. *Nimmonia floribunda*, Grab. Cat. p. 83.—Flowers :  
Dec-Jan.

Bare rocky ground on the highest Ghats, *Balzell & Gibson*. DEOCAN: Mahableshwar,  
« M. Birdwood, Cookel, Woodrow !, DalzellX, Law \—DISTRIB. Apparently endemic on  
the hills of the Bombay Presidency.

The plant is very common in Mahableshwar, where it is known as the "Mahableshwar  
heather."—It grows in large dense patches on the bare damp rocks.

4. **Ammannia Rotala**, *F. Mueller, Fragm.* v. 3 (1862-63) p. 108.  
Stems 3-6 in., often procumbent and rooting at the very base, then erect,  
slightly branched, more or less striate. Leaves sessile, ^-| by -gVrV i<sup>n</sup>\*>  
in whorls of 4-8, linear, truncate or bifid at the apex, 1-nerved.  
Flowers 3-4-merous, sessile, in axillary whorls, 1 flower in the axil of  
each leaf, the lower whorls distant, the upper approximated. Calyx  
tubular, very thin, slightly constricted at the mouth; teeth 3-4, small,  
erect, triangular, acute. Petals usually 3 (rarely 4), small,  
fugacious  
or 0, when present rose-colored. Stamens 3. Ovary 3-celled.  
Capsule  
ellipsoid, nearly as broad as long, 3-valved. Seeds ^-obovoid,  
yellowish-brown, the plane face often excavated. Fl. B. I. v. 2, p. 567;  
Trim. Fl.  
Ceyl. v. 2, p. 224. *Rotala verticillata*, Linn. Mantiss. v. 2 (1771) p. 175;  
Wight, Icon. t. 260, A; Grab. Cat. p. 67; Dalz. & Gibs. p.  
96.—  
Flowers: Dec.

i KONKAN: *Lawl* "KANARA: Halihal, *Talbot ex Woodrow*.—DISTRIB.  
India (W. vPeninsula); Ceylon, Australia, Tropical Africa.

5. **Ammannia pentandra**, *Roxb. FL Ind.* v. 1 (1832) p. 427.  
Stem stout, 4-gonous, rooting at the base, 3-12 in. long, with numerous  
4-gonous opposite slender branches covered with flowers.  
Leaves  
opposite; those on the stem ^-f by i-T\ in., sessile, oblong, obtuse or  
obtusely acute, sometimes rounded at the base; those on the branches smaller  
\*Nd bract-like. Flowers sessile, solitary in the axils of nearly  
horizontal  
axillary leaves (bracts), 1 flower to each bract, the lower whorls of flowers  
distant, the upper approximate, almost spicate; bracteoles subulate, as  
long as or longer than the calyx. Calyx shortly campanulate, JUX in.  
long, very slightly longer than broad, semiglobose in fruit; teeth usually

0, small, triangular, very acute ; accessory teeth longer than the primary  
subulate. Petals 5, small, fugacious. Stamens 5. Capsule  
subglobose

■tf-valved. Seeds hemispheric or broadly ^-ellipsoid Fl B I  
v 9

P. 563; Trim. FL Ceyl. v. 2, p. 224; Woodr. in Journ.'Bomb \.it'  
v-11 (1898) p. 638.—Flowers: Aug. ■ at\*

2L2



KONKAN: Malwan, *Woodrow*; road Poladpur to Wada, *KanitJcarl*  
*f<sup>00</sup>^^*, J)BCCAN: Panchgani, *Cookel* S. M. COUNTRY: Belgaum, *Bitchie*,  
 1/JU-<sup>r</sup>Vopical *Voodrow*. KANAKA : on the Kala naddi, *Bitchie*, 1185 !-DISTRIB.  
 Throughout ir F India in moist places, common; Ceylon, China, Malaya, Australia,

**6. *Ammannia Ritchiei*, C. B. Clarke, in Hook. f. Fl. B. I. v. 2 (1819)**  
 . 566. Stem 6-12 in. long, 4-gonous, creeping and rooting. Leaves  
 Tropical the cauline <sup>3-1</sup> b<sup>r</sup> <sup>3</sup> 1 in. sessile elliptic-oblong, rounded  
 \*

**P**

opposite gg J TrT , , ^r -rTpflich  
 axiA>

at the apex, not conspicuously nerved. Flowers solitary m e<w>  
 pedicels ^ in. long or less. \* Calyx TV in. long, tubular-campan  
 ^ teeth 4, minute, the accessory teeth rather larger than the P<sup>nnial</sup>V<sup>red</sup>.  
 Petals 4, o\ate or obovate, longer than the calyx-teeth, pale <sup>rose</sup>uc. <sup>tjjo</sup>  
 Stamens 4, included. Style short. Capsule ellipsoid, includea i  
 calyx, 4-valved. Seeds ^-ellipsoid, brown. Woodr. in Journ. \*>  
 Nat. v. 11 (1898) p. 638.—Flowers : Oct.

Belgaum in rice-fields, *Bitchie*, 1184! A very rare plant.

**7. *Ammannia rotundifolia*, Buch.-Ham. in D. Von, Prodr-**  
 • *Nep.* (1825) p. 220. Stems 4-gonous, creeping and rooting at \*TM>  
 then ascending, leafy, 4-6 in. long. Leaves £-§ in. in <sup>duim\*</sup>, ZL'ith  
 sessile or nearly so, orbicular or broadly obovate, strongly nerved De \*  
 Inflorescence in peduncled cylindric racemes (almost spikes), i <sup>J-lce\3</sup>  
 commonly 3) together, forming a kind of terminal thyrus ; P  
<sup>r(Js</sup> very short, scarcely more than ^ in. long ; flowers crowclea the  
 apex of the raceme, often lax towards its base ; bracts coraa<sup>\*</sup>, ^  
 ular, acute, sessile, about TV in. in diam., adnate to the peace ;  
 short claw ; bracteoles minute, linear-lanceolate, acute, scarioiis.  
 <^ TV m. long; lobes more or less unequal, triangular,  
<sup>ac"ie'</sup> b ate. equalling the tube; accessory teeth 0. Petals ^ m-  
 long, ou. \*pathulate, bright rose-colored. Capsule 4-valved,  
 ellipsoid, e e J longer than broad. Seeds  
 brownish-yellow, ellipsoid. ±1 ^ ' ^ p 566;  
 Woodr. in Journ. Bomb. Nat. v. 11 (1\*>») P Jf  
*rotundifoha*, Wight, Icon. t. 258 ; Dalz. & Gibs. p. W-

KONKAN: Sawantwari in rice-fields, *Kamtkarl*,  
*Woodrow!*; ^ S. M. CouNTity : Belgaum, 7?^/c, 1069 I-UISTJUB.  
 Throughout the in damp localities; China, Formosa.

**8. *Ammannia octandra*, Linn. f.**

*Suppl* ^ ^ part

6-36 in. high erect, stiff, the upper part 4-gouous, the io  
 d{.an

terete and often woody; branches numerous, <sup>shalpiy</sup> <sup>4</sup> <sup>llbaur</sup>iculit<  
 Leaves sessile, linear-lanceolate, tapering to an acute apex, <sup>brfinc</sup>he.\*  
 at the base, those of the stem 14-2\* by TV'A<sup>111"</sup> <sup>tj</sup>1oSe p\*

8. *A. tica*  
 flowers: Nov.  
*lwán, Woodrow.*  
 plains of India  
 7. Stem  
 sub-  
 ulaf

*i#* ; pedicels short. <sup>7 c a m p</sup> O.lyx H in- lollg, ' fp the  
 quadrangular, the angles winged and minutely ser<sup>TM^</sup>  
 of eaCb  
 between the wings furnished with a distinct rib in the mid<sup>^</sup>cessory  
 face ; mouth nearly truncate or with 4 very short teetu., in,  
 teeth short, horn-like, spreading. Petals 4, broadly <sup>oborJ</sup>Xserted;  
 long, irregularly crenulate, rose-colored, veined. Stamens o, uailing  
 filaments dark-red. Capsule enclosed in the calyx and aDou <sup>^ ^</sup>&  
 it, globose-ellipsoid. Seeds i-ovoid. Fl. B. I. v. A P'^/ YPVI. v. 2'  
 Qibs.j>. 97; Koxb. Cor. PI. v. 2, p. 18, t. 133 ; Trim. H- <sup>^</sup>P-<sup>225</sup>-  
 This plant is given as occurring in Bombay on the authority -of  
 (/ . c). I have seen no Bombay specimens, nor are there any in tier  
 smaller. Flowers in short-peduncled usually <sup>^7</sup>ve  
 duncles scabrous ; pedicels short. O.lyx H d 1

S m *ultiflora*» *Ro* \**h*- *Bart. Bear.*, (1814) p. 11. Stem  
 les\* terete -> t\ g ' 4" S O U O U ? or sometimes almost 4-winged, more or  
 angular T Very tSe ' branches numerous, slender, acutely quadr-  
 oon\* dilite^? V88 , PP? slte' sessile> linear-oblong or frarek)"elliptio-I-U  
 bv I i \_an .u S UbaUnculate at the b'ise, the leaves on the stem solitary  
 n! ? ; \* 1D" j \* , , on the b.anches smaller. Flowers axillary,  
 Peduncles , ? /edu"cl(.d 3-many-flowered simple or compound cymes';  
 bf acts beL^w. Pe u Ce S very slender' ^mewhat variable in length  
 C'alvx-L j ht^le bj»nches of the cyme linear, acute, ^-J, in. Ion-] •  
 8 faint V4i 1D; ii ° ng' Campanulate or often hemispheric, marked with Sorter  
 than Si i @ 8 [ ^ ^ ribs ) ; teeth 4, shortly triangular, much v \* ry  
 caducous %? J " ^ Petals 4+ obovafce' about T » in. long, violet, "" « calx  
 ' nf T ntl o g> , Capsules S lobose' not ^ 10% ^ red b; one encUxcavaEl  
 ii t" i " 01 " 117 , ^obovoid' almosfc Pointed at o; b.s. p 97 Si 011 the  
 TP plane fTM. Fl- B. I. v. 2, p. 570; Dalz. &  
 ^ \* m : Nov 7 m \* mb' Nat V \_ H (1898) > P- 638\_\_

J' a ° & ' o ^ ECCAN: in water-holes, *DateBf Gibson*; Kelgaon near Poona  
 of

? bacci?er a> «>>> • ^' - ■ <<. (1753) p. 120. Glabrous,  
 1 T ereCu: fS onT's' often TM t^b numerous horizonta  
 branches . yhl ? h SFrivMj b become shorter towards the  
 fcbTISK ^TP P f > f?A: XrtW!; Salsette - *Graham* - DEeCAN. K  
 naddf uT]' ^ Woodrow : GUJARAT : Surat, *Kanitkar!*, Woodrowl a  
 oughout WH, • , o67! SIND: Mulir' near Karachi, *Woodrow-Vwiun*  
 ieil Africa "" moSt plaC6S ; C^lo" > Afghanistan, Malaya, China; Australia;

pain .CtSLSL<sup>1</sup> ^ n^LS P<sup>e</sup>Sfr<sup>ious</sup>but

P- 112 " ^ o lannia **salicifolia**, *Monti*, in *Comm. Bonon.* v. 1 (1767)  
 ^gonousintt" er6Ct> sometimes reaching 3 ft. high, purple, smooth, 8 «ssile  
 ohln , PP<sup>er</sup> P<sup>art</sup>> almost terete in the lower. Leaves opposite, at the'baJ  
 fu "lauceolate> obtuse or subacute, rounded or often cordate irl by -J!!' 3 th?Se  
 oo the stem H-H bJ H " .. those on the branches al most sesJII ±lowers  
 numerous, densely clustered in the axils in «Wte cymes; pedicels  
 very short. Calyx *fafr* in. long, sub-

hemispheric; teeth about as long as the tube, broadly triangular, acute; accessory teeth inconspicuous. Petals 0 or minute.

<sup>J</sup>gCjsS.

not wholly covered by the calyx, globose, red, irregularly *en* ^ ^ Seeds ^-obovoid, excavated on the plane face, much smaller end than the other, yellowish-brown.—Flowers : Nov. which are

May be distinguished from *A. baccifera* by the leaves ^ ated.

rounded or cordate at the base, those of *A. baccifera* being a -gomb. PI. B. I. v. 2, p. 569 ; Dalz. & Gibs. p. 97; Woodr. in J^uiii. ^ % Nat. v. 11 (1898) p. 638. *A. verticillata*, Lamk. Encyc. Mtu\* (J 783) p. 131, & 111. t. 77, f. 3 (not of Wight). J aon near

KONKAN: *Dalzell I, Stocks I; Malw&n, Dalzell & Gibson. ~Dv.cc \*\*'•\*\** ^oodrow<sup>l</sup>-Poona, *Bhiva !, Woodrow I* S. M. COUNTRY : Belgaum, *Eitichic*, 268. &<sup>1W</sup> —DISTRIB. Generally throughout India; Tropical Africa.

## 2. WOODFORDIA, Salisb.

Shrubs, often arborescent; younger tranches quadrangular<sup>ula^es? g]a-less</sup> or tomentose, the older terete or compressed beneath the n ^eat\h brate. Leaves decussate, more or less coriaceous, nigro-punctate e^ oll penninerved and reticulately veined. Flowers in paniculate -^ base. axillary peduncles, rarely solitary ; pedicels bracteate at or ^ d above Calyx tubular, the limb sometimes dilated, more or less contipetals the fruit; teeth 6, short, with as many minute accessory te<sup>e</sup> ^ calyx-6, minute, or 0. Stamens 12, inserted near the bottom or ^iiorvn ; tube, much exerted, the alternate ones longer; filal? !e\*L;c 2-celled anthers broadly ovate or subrotund. Ovary sessile, cy<sup>liu</sup> j gted on (sometimes incompletely so); ovules numerous, min<sup>1u</sup> nVfornl, long<sup>Ar</sup> thick placentas adnate to the axis of the ovary ; style n<sup>11</sup> rroWed at than the ovary, slightly longer than the stamens, sometimes eljipsOjd, the apex ; stigma punctiform. Capsule covered by the cai) . ' uilarly. often splitting the calyx, thinly membranous, often b!rst" {f Tropical beads small, narrowly cuneate-obovoid.—DISTRIB. India, ^ ' Africa, Madagascar ; species 2.

, /i«06) t. 42. A

1. **Woodfordia floribunda**, *Salisb. Parad.Lond.* {i° reading ; straggling leafy shrub reaching 12 ft. high; branches io & ^ shoots bark smooth, cinnamon-brown, peeling off in fibreS V31 by I<sup>1</sup> in terete, often clothed with fine white pubescence. ^e^frcindis), sessile, opposite or subopposite, sometimes in whorls oN(^ and always ovate-lanceolate, acute, softly velvety above, usually nody ^ 6-1\* nigro-punctate beneath, base rounded or cordate ; niam ramarginal pairs, arcuate, prominent beneath, uniting in a dlsTM Cflo.vered cym<sup>e9</sup> nerve. Flowers numerous, in short 2-15- (rarely I-) n diceIs short, from the axils of former, less commonly of present leaves; 1 g]andular glandular-pubescent. Calyx fin. long, striate, covered \* & d bright-dots, with a small campanulate base and a long sligntiy mQlIm red tube which is slightly contracted above the included caj giigbtij oblique; teeth about ^ in. long, triangular, acute, r to,a longer than the calyx-teeth, narrowly linear, produced au near<sup>tl\</sup>e long fine point. Capsule | in. long, usually splitting tn® C\*J qmo<sup>of</sup> base, irregularly dehiscent. Seeds cuneate-obovoid, 010 , qfy<sup>^</sup> Fl. B. I. v. 2, p. 572 (exclud. syn. *Grislea uniflora*, Kicn., \*

*h*, Hochst. & Steud.) ; Trim. Fl. Ceyl. v. 2, p. 226 ; Talb. Trees, ed. 2, p. 174; Watt, Diet. Econ. Prod. v. 6, part 4, p. 312. *tomentosa*, Boxb. Cor. Pl. v. 1 (1795) p. 29, t. 31; Grab. Cat. P<sup>Λ</sup>- & Gribs. p. 97. *Woodfordia tomentosa*, Bedd. For. Man. inylvat. p. cxvii, t. 14, fig. 4.—Flowers: Dec-May. VERK. > *Dhdyati*. The plant is trimorphic like *Lythrum Salicaria*.

Cor/°!CAN: <sup>Λ</sup>ecC<sup>an</sup> hills widely, *Woodrow*; Poona, *Kuskal*; Poona near the river *Tal*)<sup>6\*</sup> ' K<sup>Λ</sup>mtesh, abundant, *Graham*. KANARA : N. Kanara near the sea-coast <sup>Λ</sup>ot.~DISTRIB. Throughout India; Ooylon, Beluchistan, Tropical Africa, Madag<sup>Λ</sup>car China, Japan, Sumatra, Java.  
c .<sup>1</sup>(? iea<sup>v</sup>es supply an excellent and largely used tanning material. The flowers also fr i<sup>U</sup>1? muc<sup>r</sup>h tannin and are used throughout India as a dye. See Watt, Diet. Econ.

r i?

sen <sup>ea</sup> *uniflora*, Rich. (in union with *Grislea multiflora*, Rich.), has been made a (188n <sup>8</sup>P<sup>ees</sup>> viz. *Woodfordia uniflora*, Koehe (Monogr. Lythr. in Engl. Jahrb. v. 1 StP A \*?' &&), with which, according to Koehne (1. c), *Grislea mieropetala*, Hochst. & Lea-> is synonymous.

### 3. LAWSONIA, Linn.

A glabrous shrub ; younger branches sometimes 4-gonous, the older erete, often spinescent. Leaves opposite, shortly petiolate, ovate-auceolate, entire. Flowers in terminal paniced cymes. Calyx-tube <sup>s</sup>Λort; lobes 4, spreading, broadly ovate; accessory teeth 0, Petals 4, Very shortly clawed, inserted at the top of the calyx-tube. Stamens 8 (rarely 4), inserted at the base of the calyx-tube in pairs opposite the-calyx-lobes ; anthers broadly oblong, the connective thick. Ovary sub-globose, 2-4-celled ; ovules many, placentas axile ; style thick, slightly longer than the stamens ; stigma capitate. Capsule globose, stalked in the base of the calyx-tube, coriaceous, irregularly breaking up, ultimately 1-celled. Seeds closely packed on a central placenta, angular, pyramidal. —UiSTitiB. Asia (probably); cultivated in many tropical and subtropical countries; species 1.

1. **Lawsonia inermis**, Linn, *Sp. Pl.* (1753) p. 349 (*charac. ampl.*). A glabrous much-branched shrub ; lateral branches 4-gonous, often ending in a spinous point. Leaves J-1? <sup>u</sup>y i~fl <sup>m</sup>-> elliptic or broadly lanceolate, acute or obtuse, often mucronulate, base tapering; petioles very short or 0. Flowers numerous, less than \ in. across, fragrant, white or rose-colored, in large terminal pyramidal paucicled cymes; pedicels short, slender. Calyx \- \ iu. long, broadly eampanulate ; lobes rV-8 in. long, ovate, acute.<sub>m</sub> Petals § in. long, as broad as long, sub-orbicular or subreniform, undulate. Stamens 8, inserted in paLrs on the calyx-tube. Capsule | in. iu diam., globose, slightly veined outside, supported by the persistent calyx and tipped with the style. Seeds trigono-pyramidal, about <sup>-</sup>Λj in. long, externally subtuberculate. Koehne, in Engl. Bot. Jahrb. v. 4 (1883) p. 36, & in Engl. & Prantl, Pflanzenf. V. 3, part 7, p. 15, fig. 6. *Lawsonia spinosa*, Linn. *Sp. PL* (1753) p. 349 {partly}, *Lawsonia alba*, Lamk. *Encyc. Method*, v. 3 (1789) p. 106 ;

Fl. B. I. v. 2, p. 573; Grah. Cat. p. 67; Dalz. & Gibs. p. 97 ; Trim  
FL Ceyl. v. 2, p. 228 ; Talb. Trees, Bomb. ed. 2, p. 175; Woodr. in  
Jo'urn. Boib. Nat. v. 11 (1898) p. 638; Watt, Diet. Econ. Prod. v. 4,  
p. 597.—Flowers : Apr.-July. TERN. *Mendhi*.

Doubtfully wild in the Bombay Presidency, said by \$ £  
 indigenous in Gujarat. Woodrow mentions (*I. c.*) that it is P<sup>161</sup>TM<sup>1</sup> flirouc hout the land  
 near Bombay and that seedlings are abundant. Cultivated .<sup>TM</sup> in<sup>B</sup> England.  
 Presidency, and often used as a hedge-plant in the same manner as priT natives for The  
 plant is the Henna of Egypt, and is largely used m<sup>India</sup>J\$J. j)jct. Econ. dyeing the  
 nails, skin, and hair. It is also used medicinally, bee vva , Prod. 1. c, where a very  
 full account of its various uses may be touna.

4. LAGERSTRCEMIA, Linn. ^

Trees or shrubs. Leaves opposite, distichous or the \*<sup>1</sup>PP<sup>eneat</sup>b.  
 alternate, petiolate, oblong or ovate, entire, often ?<sup>lal</sup>|<sup>c0</sup>" ic<sup>i</sup>es, the  
 Mowers often large and showy, in axillary and terminal V' ^' apex;  
 ultimate branchlets usually cymose ; peduncles 2-bracteate a ^^ or  
 pedicels 2-bracteolate. Calyx-tube campanulate, coriaceous, ^<sub>n</sub>  
 ibbd id lb 6 ( t i 7 9 ) ate or <sup>tl</sup>TM^

ps bracteolate. Calyx tube c a p ^  
 ribbed, or winged ; lobes 6 (sometimes 7-9), ovate or <sup>tl</sup>TM^ Q  
 (some-caudate, valvate; accessory teeth 0 or (rarely) minute, -t e a  
 ^<sub>re</sub> times 7-9) or 0, inserted at the summit of the calyx-tube, cia fimj)riate.  
 or less orbicular, wrinkled, the margin crisped, <sup>erose</sup>fi<sup>o</sup>\* ents much  
 Stamens oo , inserted near the bottom of the calyx-tube ; . ^ j . ovules  
 exserted. Ovary sessile at the bottom of the calyx, 3-^-ce ^ c'apitafce.  
 numerous, ascending; placentas axile ; style long, bent; s J^^ grnOoth,  
 Capsule more or less adnate to the calyx, ellipsoid, coriac >  
 com.3-6-celled, loculicidally 3-6-valved. Seeds many (rarely »^ the  
 pressed, ascending or horizontal; testa membranous, w ^ h• ies 13.  
 summit.—DISTMB. South-east Asia, extending to Australia, »i

Calyx not ribbed ; petals less than f in. long. j £# parvip<sup>ra</sup>-

Capsule |-1 £ in. long ; calyx-lobes appressed to the fruit ... • £ ianCeolata.

^ Capsule |-J in. long ; calyx-lobes spreading or reflexed ..... £ £

*Flos-Beg*<sup>l</sup>@-

Calyx ribbed ; petals 1 in. long or more .....

1 (1705) p\* 47,

1. Lagerstrcemia parviflora, Boxb. Cor. PI<sup>v</sup>- wnces some-  
 t. 66. A large tree attaining 50-70 ft. high ; youngest tic,oblong,  
 times slightly pubescent. Leaves 2-4 by \hrH<sup>in</sup>ome times hoary-  
 acute or acuminate, green and glabrous above, pale or narrowe d or  
 tomentose beneath, conspicuously reticulately <sup>vein</sup>'ate? prominent

, p 83. Lagerstrcemia lanceolate,  
 Sylvat. t. 32 (not of Wall.).—Flowers : June. ^ ^ ^

KONKAN: Stocks], Law!, Gibson !; M&themn, Cooke I V\*TM\*\* m£anitkar ! 6.  
 #• Woodrow !; Koina valley, Cooke!; Chattersinghi hill near roon»,

cuneate at the base ; main nerves 6-10 pairs, a ^'axillary and  
 beneath ; petioles 0-| in. long. Flowers white, <sup>traf^aer</sup> short. Calyx<sup>r</sup>  
 terminal many- or few-flowered panicles ; pedicels <sup>s!^n</sup> <sup>la^roUS</sup> or finely  
 \ in. long in flower, enlarged to \ in. or more in fruit, g <sup>.fc</sup> <sup>gomeW</sup>hat  
 cano-pubescent, not ribbed ; tube subhemispheric, or <sup>acut</sup>e, closely  
 funnel-shaped below; teeth 6, variable in size, <sup>jj^naT</sup> <sup>g</sup> <sup>nvate.o</sup>blong, \ <sup>lll^r</sup>  
 appressed to the fruit. Petals 6, white, broadly ooot. \* ^ ^ but  
 long, with a long slender claw, undulate. Capsules <sup>va^</sup> <sup>the wing</sup>)  
 usually about | -11 by £-f i\_n., ellipsoid. Seeds (<sup>incl</sup> <sup>r\_in</sup> <sup>o</sup> <sup>long</sup>, cultri-  
 |-f in. long, the wing much longer than the seed, aDoiu> <sup>Q</sup> <sup>^</sup> <sup>^</sup> <sup>^</sup> <sup>^</sup> <sup>575</sup> .  
 form, thin on the inside edge, thick on the outer. X • • ^ <sup>00</sup>(ir. in  
 Brandis, For. Fl. p. 239; Talb. Trees, Bomb. ed. A P- ' ' prod. v.  
 Journ. Bomb. Nat. v. 11 (1898) p. 638; Watt, Vict. xi <sup>^</sup> <sup>rJor</sup>.  
 4, p. 583. *Lagerstrcemia lanceolate*, Dalz. & <sup>^lbs\*</sup> P' <sup>^</sup> <sup>fard</sup>.  
 S 1 t t 32 ( f W11)F1 J n e VER\*. \*>



UNTHY : Belgaum, *Ritchie*, 276! & 949!—DISTRIB. India (base of the W. Himalaya, . Peninsula); Ava.

<sup>a</sup> <sup>e</sup> <sup>Λ</sup> <sup>ooc</sup> <sup>l</sup> is valued for its timber, which is tough, elastic, and durable. The leaves <sup>e</sup> "sea to feed *tasar* silkworms. See Watt, Diet. Econ. Prod. 1. c.

<sup>2</sup>- **Lagerstrcexnia lanceolata**, *Wall. Oat.* (1828) 2120. A <sup>ar</sup>ge tree 30-50 ft. high ; bark ash-colored, peeling off in large strips.

eaves 2|-4 by f-2 in., elliptic-lanceolate, acute, glabrous above, usually <sup>o</sup>ary-tomentose beneath ; main nerves 8-12 pairs, prominent; petioles 4 2 in. long. Flowers in large usually compound panicles; pedicels snort, pubescent. Calyx \ in. long, usually hoary-tomentose; tube

etnispheric; lobes about -<sup>^</sup> in. long, triangular, acute, patent or often <sup>r</sup>etiexed. Petals \- by -*fa* in., oblong-obovate, with a long slender <sup>c</sup>aw. Capsules |~| in. long, ellipsoid, not ribbed. Seeds (including the <sup>^</sup>ln<sup>g</sup>) about \ in. long, the wing about \ in. long and J in. broad at the <sup>o</sup>ase, cultriform. Fl. B. I. v. 2, p. 576'; Woodr. in Journ. Bomb. Nat. v-11 (1898) p. 638 ; Watt, Diet. Econ. Prod. v. 4, p. 583. *Lagerstrcemia Purviflora*, Dalz. & Gibs. p. 98 {not of Eoxb.). *L. microcarpa*, Wight, Icon (1840) t. 109; Bedd. Flor. Sylvat. t. 30 ; Talb. Trees, Bomb. <sup>ea</sup>- A p. 176.—Flowers : Mar.-Apr. VERI\*. *Ndna*.

*Dalzd* *Sf Gibson* (Bomb. Fl. 1. c.) have transposed the names *L. lanceo-wta* and *L. parvijbra*.

KONKAN: *Stocks* \, *Law I, Dalzell*\, *Gibson*]; Wari country, common, *Dalzell* \$ *rison* \_\_\_ S. M. COUNTRY : Ramghat and Belgaum, *Bitchie*, 277! KANARA :

<sup>g</sup> <sup>7</sup> <sup>7</sup> <sup>h</sup> <sup>g</sup> , ,  
Talbot ; Kumpta-Sirsi Road, Woodrow.—DISTRIB. India (from Bombay southwards).

**3. Lagerstrcemia Flos Reginse**, *Betz. Obs.* (1789) fasc. 5, p. 25.

A large tree 30-60 ft. high ; branches widely spreading ; bark pale, smooth, flaking off in irregular pieces. Leaves 4-8 by 1<sup>^</sup>-3 in., oblong-lanceolate or elliptic, subacute, glabrous and finely reticulate on both surfaces, pale beneath, base acute or rounded ; main nerves 10-13 pairs, prominent, curving upwards ; petioles £-§ in. long, stout. Flowers 2-3 in. across, in large panicles sometimes reaching 1 ft. long; pedicels stout, pubescent, thickened upwards and articulated below the middle. Calyx turbinate, fin. long, covered with white or ferruginous tomentum, ribbed with 12-14 prominent stout ridges, those opposite the calyx-teeth broader; teeth 6-7, triangular, acute, spreading,  $\frac{1}{2}$  in. long, thickened at the edges. Petals 6-7, purple, 1-1 i in. long, suborbicular or rotund-

>vate, clawed, much undulate and crumpled, spreading. Stamens all equal, shorter than the style. Capsules ellipsoid or subglobose, f-11 by |-1 in., minutely apiculate. Seeds (including the wing) J-<sup>^</sup> by J-W in., glabrous, pale-brown. Fl. B. I. v. 2, p. 577 ; Trim. Fl. Ceyl. v.

2, p. 228; Talb. Trees, Bomb. ed. 2, p. 176; Woodr. in Journ. Bomb. Xat. v. 11 (1898) p. 638; Watt, Diet. Econ. Prod. v. 4, p. 582.

*Laquerstroemia lieginw*, Eoxb. Cor. Pl. v. 1 (1795) p. 46, t. 65; Grah. Cat. p. 67 ; Dalz. & Gibs. p. 98 ; Wight, Icon. t. 413 ; Bedd. Flor. Sylvat, t. 29. *L. speciosa*, Pers. Syn. v. 2 (1807) p. 72; Kcehne, in Engl. &

Prantl, Pflanzenf. v. 3, part 7, p. 14, fig. 5, P-T.—Flowers : Apr.-June. YERN. *Tdman*; *Mota-bonddrd*.

KONKAN : S. Konkan, *Woodrow*; wild in the vale of the Nagotna river near its source (Graham) Vingorla, *Dalzell* & *Gibson*. KANARA: N. Kanara Ghats on the banks of nalas and rivers, *Talbot*.—DISTRIB. India (W. Peninsula, Assam); Ceylon, Malaya, China, in many cases only cultivated.

Sir G. King in his "Materials for a Flora of the Malayan Peninsula" (Journal of the Royal Asiatic Society, vol. 67, 1898) gives most convincing reasons for adopting *L. blos-Beginn*, Retz. (1789), instead of *L. speciosa*, Persoon (1807).

*Lagerstrœmia indica*, Linn. Syst. ed. 10 (1759) p. 1076. A very handsome shrub introduced from China and cultivated largely in gardens, A-glabrous leaves 2 in. long and showy flowers of every shade from rose to dark crimson. It is propagated by cuttings or seeds. • v. 2, p. 575; Grah. Cat. p. 67; Dalz. & Gibs. Suppl. p. 33; Journ. Bomb. Nat. v. 11 (1898) p. 638, & Gard. in Ind. ed., 0, P- Watt, Diet. Econ. Prod. v. 4, p. 583.—Flowers: June-July. *Chinai-Mendlii*.

### 5. SONNERATIA, Linn. f.

Trees growing near the sea. Leaves opposite, petiolate, entire. Flowers 3 together at the apices of the branches, or solitary, ebracteolate. Calyx thickly coriaceous; tube 4-lobed, lobes 4-8, triangular-ovate or lanceolate. Petals 0, or as many as lobes. Stamens 00, inserted in the throat of the calyx; filaments filiform, at length reflexed; anthers reniform. Ovary free or adnate at the base to the calyx-tube, 10-15-celled, with thin septa; ovules numerous, ascending, style elongate, filiform; stigma subcapitate. Berry supported by the persistent calyx, 10-15-celled, many-seeded, nesting in pulp, curved, angular; cotyledons short, rostrate; radicle elongate, terete.—DISTRIB. Tropical sea-coast Eastern hemisphere; species 5-6.

Ovary-lobes 4; petals 0 ..... & *Lida*.

Calyx-lobes 6; petals 6 .....

**Petala**, Buch.-Ham. in Syme, *Einb. Ava*, v. 1, p. 313. An erect tree reaching 40 ft. high growing in swamps; branches slender, drooping. Leaves 2-4 by lanceolate, obtuse, thick, glabrous, much attenuated at the base; main nerves 10-12 pairs, not conspicuous. Solitary or, more commonly, 3 together, large, ovate-oblong, 1 in. long. Calyx 1 in. long; tube cup-shaped; lobes 4, ovate acute, 1 in. long. Petals 0. Stamens slightly exerted; style

longer than the stamens; stigma umbrella-shaped. Capsule about 1/2 in. diam.

depressed-globose, tipped with the style, smooth. FL B. 1. v. 1, p. 177.

Grah. Cat. p. 72; Trim. Fl. Ceyl. v. 2, p. 229; Talbot Trees ed. 2 p. 177; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 63\*, Wa-Uict. Econ. Prod. v. 6, part 3, p. 276.—Flowers: Feb. Bombay

Rather rare. KONKAN: *Law I*; salt-marsh by the road leadin  
to Sewree *Graham*; Mumbra (Thana districts), *Wbodrow*; <sup>^ iar£u'^</sup> .....  
DISTRIB. India (in tidal creeks of Bengal, the Western Peninsula, 13 ^  
. This plant and the next have been included in the list of so-called mang yeS "  
given on page 471.

**2, Sonneratia acida, Linn. f. Sujpl. PI. (I?<sup>81</sup>) P-<sup>2</sup>L<sub>h</sub>f Th**  
tree rarely reaching 15 ft. high. Leaves nearly sessile, <sup>suDn</sup>; V; t the  
by \$-2± in., elliptic-oblong or obovate, obtuse, much attenuate< \*  
]s base. JFlowers large, terminal, solitary, on very short thick y

Rather rare      KONKA      L      I      lh b      th  
^^^^Z^

buds ellipsoid. Calyx 3|-1§ in. long; tube hemispheric; lobes 6, mneeolate-oblong, acute, f in. long. Petals 6, linear-oblong, | by \*ri in., dark rose-colored. Style very long, often exceeding 2 in. -bruit 1-2 rn. in diam., cushion-shaped, supported by the persistent calyx which forms a shallow cup, and tipped by the persistent tapering Btyle-base which forms a point about 1 in. long in its centre. Pl. B. I. \* 2> P. 579; Grah. Cat, p. 72; Dalz. &~Gibs. p. 98; Trim. El. 1 v. 2, p. 230 ; Talb. Trees, Bomb. ed. 2, p. 176; Woodr. in n. Bomb. Nat. v. 11 (1898) p. 638 ; Watt, Diet. Econ. Prod. v. 6, 3, p. 275.—Flowers : Feb.-July.

KONKAN: salt-marshes of the Konkan, *Talbot*; salt-marsh on the Salsette side o| Sion Causeway near Bombay, *Graham, Dalzell*; Ratnagiri, Vingorla, *Dalzell*; ilareshvar, *Kanitkar*!; Dharmntar, *Woodrow*! KANARA : salt-water creeks of &' Kanara, *Talhot*,—DISTUUB. India (tidal creeks and mangrove swamps); Ceylon, Java, Siam.

rhe erect root-branches, which reach 18-24 in. in length by 3 in. in diain., have a soit fir<sub>m</sub> texture like cork and have been used as a substitute for it in Ceylon. |iTi7tien, 1. c.)

*Punica Granatum*, Linn. Sp. Pl. (1753) p. 472. *The Pomegranate*. A small tree or large shrub, wild in Persia, Cabul, and Beluchistan, is cultivated throughout India for its fruit and flowers and has become naturalized in many places. It is largely cultivated in the Bombay -Presidency at Alandi near Poona. The fruit is infested by a curious caterpillar which, in order to enjoy the fruit in safety, fastens it to the stalk with a web of silky threads, so that the fruit may not fall off the tree and the depredator be injured. Fl. B. I. v. 2, p. 581 ; Grah. Cat. p. 72; Dalz. & Gibs. Suppl. p. 34; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 638, & Gard. in Ind. ed. 5, p. 319; Watt, Diet. Econ. Prod. v. 6, part 1, p. SiiS.—VEEN. *Andr\ Ddlimbi*.

### OEDEE LIX. ONAGRACE53,

Herbs, rarely undershrubs, sometimes aquatic. Leaves opposite or alternate, membranous, entire or toothed, undivided (in *Trapa* the submerged leaves pinnatipartite), exstipulate. Flowers hermaphrodite, regular (rarely irregular), axillary and solitary, or in spikes or racemes towards the ends of the branches. Calyx-tube wholly adnate to the ovary (£-adnate in *Trapa*) ; limb 2-5-lobed, the lobes valvate. Petals epigynous, alternate with the calyx-lobes, rarely 0. Stamens as many or twice as many as the calyx-lobes, inserted with the petals when these are present. Ovary inferior (J-inferior in *Trapa*), 1-G- (commonly 4-) celled ; ovules 1 or many in each cell, pendulous or j-ascending, placentas axile ; style cylindric or subulate; stigma capitate, entire, 2-lobed or 4-fid. Fruit various, dehiscent or indehiscent, membranous, capsular or bony, 1-many-celled, 1-many-seeded. Seeds exalbuminous or nearly so.—DISTRIB. Throughout the temperate regions of the world, rarer in the Tropics ; genera 22 ; species 300.

Seeds very many.	IT *
Stamens twice as many as the calyx-lobes .....	1. JussiiEA.
Stamens as many as the calyx-lobes .....	2.
LUDWIGIA.	
Seeds 1-2.	T
Aquatic; stamens 4 .....	«*. IRAPA.

## 1. JUSSIEA, Linn.

Herbs or undershrubs usually growing in swamps. Leaves usually membranous and entire, rarely coriaceous and ferrate. yellow or white, axillary, solitary; pedicels usually at the apex. Calyx-tube narrow, not or slightly produced above the teeth 4-6, acute, persistent. Petals 4-6, inserted beneath the disk of an epigynous disk. Stamens twice as many as the petals inserted with them. Ovary 4-5-celled; ovules numerous, axile in vertical rows at the inner angle of each cell, placentas often perispermic style simple, sometimes very short; stigma 4-6-lobed. Capsules rowned or 4-12-angled or ribbed, 4-6-celled, septicidally 4-5-valved, c

with the disk and calyx-lobes. Seeds numerous, without cotyledons obtuse; radicle short.—DISTRIBUTION. Chiefly Tropical Asian species 30.

Stems creeping or floating; petals 5 ..... *Jussiea repens*.

Stems erect; petals 4..... *Jussiea suffruticosa*.

**1. *Jussiea repens*, Linn. Sp. Pl. (1753) p. 388.** stem rooting at the nodes, elongate, prostrate or creeping, the water, sustained by means of white spongy bodies which tufts from each side of the base of the petioles and may stipules. Leaves 1-2 by 1/2 in., oblanceolate or obovate-oblong at the apex, glabrous or slightly pubescent, much shorter than the petiole; main nerves 6-10 pairs, slender, nearly straight or curved upwards; petioles very short. Flowers pale-yellow or with yellowish veins; pedicels usually as long as the capsule, or less hairy. Calyx-tube about 1/2 in. long, cylindrical, glabrous or pubescent; lobes 5, lanceolate, 1/2 in. long. Petals 5, broadly ovate, 1/2 in. long, obovate, obtuse, sometimes retuse. Stamens 4-14 mm long cylindrical, glabrous or sparsely clothed with hairs. El. B. 1. v. 2, n. 587- fl. mli Pit. n. 75; Dalz. & Hook Bot. Misc. v. 3 fig. 33; Sot t. 40; M. Z. Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 638.—Mowers. Dec.

Common on the margins of tanks and in rice-fields. *Woodrow*. S. M. COUNTRY: Belgaum, *Ritchie*, 1758!; India. Ceylon; KANARA: Hulikal, *Bhiva*!—DISTRIBUTION. Throughout the plains of India, generally distributed throughout the warmer regions of the world.

**2. *Jussiea suffruticosa*, Linn. Sp. Pl. (1753) p. 388.**

shrubby erect perennial, 1-4 ft. high; stem woody branched; branches stiff, terete, striate. Leaves nearly sessile, 1/2 to 1 in., varying from linear to broadly elliptic, but usually lanceolate, acute, tapering much towards the base, villous, pubescent or smooth. main nerves numerous; petioles very short or 0. pedicels shorter than the calyx, pubescent; bracts minute, calyx tube subquadrate; lobes 4, ovate-elliptic, acute or subacuminate, 1/2 in. long, hairy, obscurely nerved. Petals 4, broadly obovate 1/2 to 3/4 in. long, pinnately veined. Capsules 1-1/2 in. long, truncate, tapering towards the base, 8-ribbed, villous or membranous, breaking up between the ribs which persist for so long. Seeds minute, ovoid,

didymous. brown, polished. Fl.  $\frac{1}{2}$  v.  $\frac{1}{2}$  w.  $\gg 1$

. Fl. Ceyl. v.2, p. 233 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 638 ; Watt, Diet. Econ. Prod. v. 4, p. 556. *Jussicea villosa*, Lamk. -kneyc. Method, v. 3 (1789) p. 331; Grah. Cat. p. 75 ; Dalz. & Gibs. p. 98.—Flowers : Aug.-Oct. VERN. *Pdnlavang*.

KONKAN : *Graham, Law !, Stocks!*; Vingorla, *Balzell & Gibson*. DECCAN : Tulsi "jnk near Poona, *Wbodrowl*; Bowdhan near Poona, *Bhival*; road to Kadakvasla, *isooke!*; Kliandala, *Graham*. S. M. COUNTRY : Belgaum, *Ritchie*, 304!; Louda, *woke I* KANARA: Yellapur, *Talbot!*—DISTRIB. Throughout India; Ceylon, warmer regions of the world.

## 2. LUDWIGIA, Linn.

-Perennial or annual herbs. Leaves alternate or opposite, usually lanceolate, entire, membranous. Flowers usually axillary, solitary, sessile or nearly so ; peduncles when present 2-bracteate at the apex, calyx-tube not or scarcely produced above the ovary ; lobes 3-5, acute, persistent or tardily deciduous. Petals 3-5 (or 0), inserted beneath the margin of an epigynous disk, spreading. Stamens 3-5, inserted with the petals ; filaments short. Ovary 4-5-celled; ovules numerous, attached in 2 or more vertical rows to the inner angle of each cell, capsule crowned with the epigynous disk and calyx-lobes, opening by terminal pores or breaking up irregularly along the sides. Seeds many, minute.—DISTRIB. Chiefly North American ; species 20.

1. *Ludwigia parviflora*, *Roxb. Hort. Beng.* (1814) p. 11. An erect herb 6-24 in. high; stem more or less angular, much-branched, glabrous. Leaves variable in size, 1-3 by 1/2 in., lanceolate or linear-lanceolate, narrowed to each end, glabrous ; petioles obscure. Flowers small, solitary, axillary; pedicels very short. Calyx-tube subcylindric, glabrous or slightly pubescent; lobes 4, ovate, acute, 1/2 in. long. Petals 4, elliptic-oblong, as long as the calyx-lobes. Style short, stout. Capsule 1/2-1 in. long, obsoletely 4-angled, smooth, crowned for a time by the sub persistent calyx-lobes, breaking away from the ribs. Seeds very numerous, in several rows in each cell, minute, ellipsoid, yellowish-brown, polished. Fl. B. I. v. 2, p. 588 ; Grah. Cat. p. 75 ; Dalz. & Gibs, p. 99; Wight, 111. t. 101; Trim. Fl. Ceyl. v. 2, p. 234; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 638.—Flowers : May-June.

KONKAN : common, *Balzell & Gibson, Graham*; Neral, *Woodrowl*; hills near Matheran, *Kunitkar !* DECCAN : Poona districts, *Cooke I*—DISTRIB. Throughout India ; Ceylon, Malaya, N. Australia, Persia, Abyssinia.

## 3. TRAPA, Linn.

Aquatic herbs. Leaves alternate, floating, petiolate, rhomboid, toothed, stipulate ; petiole spongy, inflated. Flowers axillary, solitary. Calyx-tube short, adnate to the lower part of the ovary ; calyx-limb 4-partite, 2 or all the segments persistent and becoming spinescent on the fruit. Petals 4, sessile, inserted at the base of an undulate epigynous disk. Stamens 4, inserted with the petals. Ovary 2-celled, 1/2-inferior, conical above the calyx, attenuated into a persistent subulate style; ovule solitary in each cell, pendulous ; stigma capitate. Fruit bony, 1-celled, obovoid, with 4 angles 2 or all of which carry spines, indehiscent, with a short cylindric beak at the top through which the radicle is protruded. Seed 1, inverse; cotyledons very unequal; radicle incurved.—



A\* «- AM..

species 2-3.

1 **Trapa bispinosa**, *Soxb. Hort* <sup>,1R1^</sup> <sup>^/J^</sup> n. Stems  
submerged flexJeXn sevLl feet long -^y ^o^t^ike  
spreading

alternate, crov

only broaaer \juun AV»&> \*■\* ,...  
onmpwhat truncate and c

**JSS»- in the**

**upper tf£<\*^**

mo **ZS ^ ^ - ^ f^**

**\$ i ^**

Hoatmg roots There , a g^ sh=wsthes organ »^ ^ ^ UqUK,.  
3 0 P A A

of severa! kinds are grown

# KSX^3^^^VS^S

died after the second year. At an  
they grow and flower freely.

^ 2(17S9)p-3-

ld i] >\* ^^LU Hj^J £

p. 590 ; Grah  
(1819) p. 29,  
B  
p.

in  
Gib:  
Ceyl. v. 2, p. 235,  
Watt, Dict. Econ. Prod. v. 6, part 4,

Gujarat.  
Anglo-Indians &  
Tropical Africa.

Note.—Considerable diversity of opinion exists as to the exact nature of the  
“pectinate organs.” Roxburgh (*l. c.*) considered them to be a second pair of stipules  
below the true ones. In the ‘Genera Plantarum’ (Benth. & Hook.) and Barnéoud (M.) they are described as being pectinate.

Hook.) and Barnéoud (M.) and Pflanzenf. v. 1, p. 100, t. 1, f. 100. In the water.  
A small plant, a native of Meneo, Ceylon, 1 ft. high  
the bottom, but remains in the water.

on the hills and are common in every garden at Mahableshtar, where they thrive very well. They do not, however, stand the climate of the Deccan plains. I have taken down large established plants in pots from Mahableshtar to Poona which all hills, and thrives well at Mahableshtar altitude of 4000 ft. and upwards.

pink flowers with obovate petals woar in  
(1808) p 639 & Gard in Ind. ed. 5, p. 100.

Bonlb. >at. >■

**ORDER LX. SAMYDACEÆ.**

. Trees or shrubs. Leaves usually alternate and distichous, petiolate, simple, entire or serrate, the teeth sometimes terminated by a gland; stipules small or 0. Flowers regular, usually hermaphrodite, inconspicuous, fasciculate, racemose, or paniculate, pedicelled, the pedicels articulated at the base, bracteolate. Calyx coriaceous, persistent; tube short or long, rarely adnate to the ovary; lobes 3-7, imbricate or valvate. petals as many as the calyx-lobes or 0, perigynous, imbricate. Stamens definite or indefinite, often alternating with staminodes, equidistant or collected into fascicles opposite to the petals; filaments filiform or capillary, free or connate at the base or throughout their entire length. Ovary free or rarely adnate to the calyx-tube, sessile, 1-celled; ovules very many or few, attached to 2-5 (usually 3) parietal placentas; style capitate or 3-fid at the apex, or styles 2-5, simple or capitellate. Fruit capsular or rarely indehiscent, 1-celled, 1-many-seeded, 2-5- (usually 3-) valved at the apex or throughout its entire length, the valves alternating with the placentas. Seeds usually few (always fewer than the ovules), oblong or angular, albuminous, usually arilled; cotyledons oblong, orbicular or cordate, often foliaceous; radicle very short or elongate and terete.—DISTRIB. Throughout the Tropics of both hemispheres, rare in subtropical regions; genera 17; species 150.

Flowers in axillary fascicles. Petals 0..... 1. CASEARIA.  
flowers in axillary and terminal racemes. Petals 4 or 5 ..... 2. HOMALIUM.

**1. CASEARIA, Jacq.**

Shrubs or small trees. Leaves alternate, distichous, entire or serrate, often marked with pellucid dots or lines; stipules small, lateral, caducous. Flowers small (clustered in the axils in the Indian species); pedicels articulated above the base. Calyx inferior, deeply 4-5-lobed; lobes imbricate, obtuse, persistent. Petals 0. Stamens 6-15 (rarely 20-40), inserted on the tube or at the base of the calyx, alternating with as many staminodes; filaments free or connate into a ring at the base with one another and the staminodes; connective sometimes penicillate at the apex. Ovary free, ovoid, 1-celled; ovules many, parietal; style short; stigma capitate, or stigmas 3. Capsule succulent, globose or ellipsoid (when dry sometimes 3-angular or 6-ribbed), 3- rarely 2-valved. Seeds many, angular or obovoid, with a fleshy usually colored aril; testa coriaceous or crustaceous; albumen fleshy; embryo straight; cotyledons oblong or orbicular, flat; radicle terete.—DISTRIB. Warmer parts of the globe, most abundant in America; species 80.

Small trees.

Stipules long, lanceolate-subulate.

Leaves glabrous; calyx pubescent; lobes oblong; style  $\frac{1}{4}$  in.  
long..... 1. *C. graveolens*.

Stipules minute, scale-like.

Leaves and calyx glabrous; calyx-lobes suborbicular; style almost 0..... 2. *C. esculenta*.

Leaves and calyx pubescent; calyx-lobes elliptic; style  $\frac{1}{2}$  in.  
long ..... 3. *C. tomentosa*.

A shrub 4-6 ft. high..... 4. *C.*  
*rubescens.*

n, , 4 H852)

1. **Casearia graveolens**, Balz. in Keiv Journ. Hot v. v ^  
 p. 107. A shrub or small tree; young branches <>btu^ves^P3|-8  
 glabrous; new leaves appearing at the end of April. ' o^ase  
 by 1|-4 in., coriaceous and hard when old, broadly e{"PTM2culately  
 or shortly acuminate, more or less crenate-serrate, nne.y beneath;  
 veined, glabrous; main nerves 8-12 pairs, slender, promme  
 petioles H in.'long; stipules \* in. long lanceo a e-subulate, s\_  
 deciduous. Flowers with a disagreeable odor, green, when  
 \_:n\_\_ \_i..\_i \_\_. ^j^oio nWir.nlatfifl above the base, vei ous

or subglabrous above it. Calyx pubescent outside, ^-j o eaualling the  
 . 5-lobed; lobes oblong, obtuse, concave, green. Stan ions o, i

calyx, the alternating staminodes villous; filaments g^la^?u " ^ i^uit  
 long as the stamens, about T\ in. long; stigma large disc ^  
 deep-yellow, f-1 in. long, ellipsoid or "ubglobose, smoot^^ ^  
 3-valved. Seeds about 12, ovoid, compressed, with a woodr. Fl  
 B. I. v. 2, p. 592; Talb. Trees, Bomb. ed. 2, p. i < ^ > » pr(Mi. in  
 Journ. Bomb. Nat. v. 11 (1898) p. 639; Watt Diet./^^ .  
 v. 2, p. 209. *Casearia* ----?, *Bocarah*, Grah. tat. p. \*"•

Aug'.-Jan. VBRN. Bokhdda.

KONKAN: *Stock*, !, *Law I*; open hills of the S. Konkan *Dahe H*; ^n Cool:e |  
 DECCAN: Fitzgerald Ghat below Mahableshwar *Cooke* \ *Majwj* ( \_ , na districts),  
*Wbodrow*; hills near Kadkala, jKawi^ar!; Hitlot, W^orfww. India  
 (Gurwhal, Kuniaon, Sikkim, W. Peninsula, Birma).

2. **Casearia esculenta**, ^- ^- TM ■ ^Jii^Je, smooth;  
 small tree reaching 20-30 ft. high; bark ^IOTish wfi c'oriaeeollS)  
 young branches slender, pale, glabrous. Leavew t> ^ t  
 usually

3-6 by 11-2| in., elliptic-oblong to elliptic-lanceolate s-^ pai .  
 shortly acuminate, tapering to the base; main' " « fc  
 powers m

petioles 1-f in. long, glabrous; stipules minute, s^o^e . Jg longer than  
 clusters in the axils of past and present leaves, i ^  
 articulation,

the calyx, articulated above the base, glabrous auuv ^

glabrous;  
 surrounded at the base by numerous snl^U, bra? , etimes ciliolate,  
 lobes 4 or 5, suborbicular, TV in. long and oroa, ^^ &t th&  
 concave. Stamens 8; staminodes oblong, trunca,ie g

scarcely,  
 apex, shorter than the stamens; filaments puwsce> . .

labrous  
 any. Fruit | in. long, ellipsoid or subglobose. orange ye ,6^

f  
 dehiscing by 2 or 3 (usually 3) thick valves. 8'^TM\$^ . Cat. p. 40: '  
 large fleshy lacerate scarlet aril. Fl. B. 1. v. ^, p.j^" » g .  
 -^ -Qodr. ir.

Trim. Fl. Ceyl. v. 2, p. 237; Talb. Trees, Bomb ed 2 p. i/o , v\_  
 Journ. Bomb. Nat. v. 11 (1898) p. 639; Wat£ Dict. TM^g\^ t. 208  
 p. 209. *Casearia varians*, Thw. Enum. p. 19; *Beaa.* xi . j\_

lz\_

C. tevij/ate, Dalz. in Kew Journ. Bot. v. 4 (18p2) P-/"^»  
 Gibs.p.ll.-Flowers: May-June. VEEN. 3fod»; ^«tttl"\*- ^^  
 KONKAN: SKufe !; billy parts of the Konkan, *Nmww ex Grakamj* , R.(ch  
 S. M. COUNTRY: Eamghat, *Ritchie*, 677!; Talaren, *BUchte* 919. , Amog •  
 9-i»! KANAIA: moist forests of N. Kanara, *Talbot*; \*^TM'\*£%TM1?  
*Talbot, Woodrow.-nxB-niB*. India (W. Peninsula) ; Ceylon, Malay Fenmsu .  
 3. **Casearia tomentosa**, *Boxb. Fl. Ind.* v. 2 (1832) p. 421- ^  
 small tree attaining 30 ft. high; bark thick, ash-colored, brancme  
 tomentose or pubescent, rarely glabrous. Leaves *J\_s* ' "■>  
 2 ?

oblong, acute, more or less serrulate, or sometimes almost entire, slightly pubescent or glabrous above, pubescent or tomentose (densely so on the nerves) beneath, base usually rounded or subcordate (more or less obliquely); main nerves 8-10 pairs; petioles  $\frac{1}{2}$  in. long, densely pubescent; stipules minute, densely pubescent, deciduous. Flowers peeni\$-white, crowded in axillary fascicles; pedicels less than  $\frac{1}{2}$  in. long, densely pubescent, articulated near the base. Calyx pubescent; tube scarcely  $\frac{1}{2}$  in. long; lobes  $\frac{1}{2}$  in. long, broadly elliptic, obtuse, stamens usually 8; filaments glabrous; staminodes clavate, much shorter than the stamens, villous at the apex. Style  $\frac{1}{2}$  in. long; stigma subglobose. Fruit broadly ellipsoid,  $\frac{1}{2}$  in. long, smooth and shining, 3-valved. Seeds embedded in a soft pulpy scarlet mass consisting of the agglomerate arils. Fl. B. I. v. 2, p. 593; Trim. \*Oeyl. v. 2, p. 238; Talb. Trees, Bomb. ed. 2, p. 178; "Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 639; "Watt, Diet. Econ. Prod. v. 2, p. 209. *Casearia elliptica*, Willd. Sp. PL v. 2, p. 628; AVight, Icon. J; 1&49. *C. ovata*, Eoxb. Fl. Ind. v. 2 (1832) p. 420 (not of Willd.); wah. Cat. p. 40. *C. Anavinga*, Dalz. & Gibs. p. 11.—Flowers: Jan.-May. VERN. *Chilld'*, *Chari*.

o/ yS y , e b y common.

KONA

;>?. •' Law !; Vingorla, Stocks ! DECCAN : near Poona, Woodrow ; hills near Poona, »niQa\ g# T& COUNTRY : Belgaum (east hills), Ritchie, 1011!—DISTRIB. Throughout India; Ceylon, Malaya, N. Australia.

4. ***Casearia rubescens***, Dalz. in *Kew Journ. Bot.* v. 4 (1852) p. 108. A shrub 4-6 ft. high, all glabrous; branches pale. Leaves 2-5 in. long, sometimes reaching 10 in. long in 1ST. Kanara (*Talboi*), elliptic-oblong, shortly acuminate, obtuse or acute, entire, quite glabrous, base subacute; main nerves 6-8 pairs, the midrib of the young leaves fed; petioles  $\frac{1}{2}$  in. long, glabrous, channelled, those of the young leaves red. Stipules minute, scale-like, glabrous. Flowers in axillary clusters; pedicels minutely pubescent, articulated near the base. Calyx  $\frac{1}{2}$  in. long, thick and fleshy, glabrous; lobes  $\frac{1}{2}$  in. long, broadly elliptic-oblong, obtuse. Stamens 8; staminodes oblong, truncate and villous at the apex, shorter than the stamens; filaments pubescent. Ovary conical; style almost 0. Fruit ellipsoid, glabrous,  $\frac{1}{2}$  in. long. Fl. B. I. v. 2, p. 593; Dalz. & Gibs. p. 11; Talb. Trees, Bomb. ed. 2, p. 178; Woodr. in Journ. fcomb. Nat. v. 11 (1898) p. 639.—Flowers: Feb. (*Dalzell*). I am quite unable to separate this from *C. graveolens*, except by assuming Dalzell's description to be correct, viz. that it is a shrub 4-6 ft. high Dalzell was himself doubtful of its being a good species.

y<sup>1011</sup>Sh<sup>o</sup>ut the Presidency in deciduous forests, tolerably common. KONKAN ? L !V i l Sk ! D P Wd hill P  
KONKAN : Stocks!, Woodrow. S. M. COUNTRY : Talaveri, Dalzell!; Ramghat, Ritchie, 043! KANARA: forests near the Kilkund Ghat (N. Kanara), Talbot,—  
^ India (W. Peninsula).

## 2. HOMALIUM, Jacq.

Shrubs or trees. Leaves alternate, petiolate, crenate or serrate, rarely entire; stipules small, rarely 0. Flowers small, in axillary slender panicles. Calyx-tube turbinate, adnate to the base of the ovary; lobes 4-7, persistent. Petals 4-7, inserted in the throat of the calyx,

persistent. Stamens opposite to the petals and equal in number  
to

2 M



them, or more, in fascicles opposite the petals, alternating with staminal  
inodes ; filaments filiform ; anthers small, didymous. Ovary <sup>^</sup>-superior;  
ovules many or few, attached to 2-5 parietal placentas; styles 2-5,  
filiform; stigmas capitate. Capsule <sup>^</sup>-superior, coriaceous.  
2-5-valved, few-seeded. Seeds angled or oblong; testa crustaceous;  
albumen fleshy; cotyledons foliaceous.—DISTEIB. Asia, Africa, N.  
**Australia, Fiji** Islands, Tropical America; species 30.

**1. Homalium zeylanicum, Benih.** in *Journ, Linn, Soc.* v. 4 (1860) p.  
85. A tree reaching 60 ft. high and 2½ ft in diam.; bark smooth,  
grey, lenticellate, breaking off in irregular pieces. Leaves 3-4½ by  
1½-2<sup>^</sup> in., elliptic, acuminate, crenate-serrate, glabrous and shining on  
both sides, base narrowed into the petiole: main nerves 8-10 pairs,  
prominent and purplish-red beneath; petioles ½-¾ in. long, puberulous.  
Flowers greenish-white, in long panicles, arranged in numerous clusters  
along a slender rachis 6-10 in. long; pedicels <sup>^</sup> to 1 in. long, arti-  
culated beneath the calyx-; buds pear-shaped. Calyx pubescent, 1<sup>^</sup> in.  
long; lobes 4-5, slightly longer than the turbinate tube, oblong,  
sub-acute, ciliate, open. Petals 4-5, equalling or a little longer than  
the **calyx-lobes**, obovate, ciliate. Stamens as many as the petals and  
longer than them ; **staminodea** rounded, pubescent. Styles 3-4.  
Fruit not seen. FL B. I. v. 2, p. 56; Dab. & Gibs. p. 53 ; Budd.  
**Flor. Sylvat.** t. 210 ; Trim. **Fl. Ceyl.** v. 2, p. 239 ; Talb. Trees, Bomb. ed.  
**2**, p. 178 ; **Woodr.** in *Journ. Bomb. Nat.* v. 11 (1898) p. 639 ; Watt,  
*Diet. Econ. Prod.* v. 4, p. 262.—Flowers: Apr.-May.

**KOSKAN** : *Stocks* !, *Law* ! S. M. COUNTRY : Puna Ghat, *Ritchie*, 1854 !; BamgMfc,  
*Daleel A Gibson*. **KAHAJU**; evergreen forests of the K. Ghats of N. **Kanara**,  
*Talbot*—**BISTBIB**. India (W. Peninsula); Ceylon.

### OttBrit LXL FASSIFLOUACEIE.

Shrubs or herbs usually twining. Leaves alternate, petiolate, simple,  
**lobed**, or palmately **3-7-foliolate**, frequently glandular beneath ; petiole 3  
usually glandular ; stipules 0 or twin, deciduous or persistent. **Tendrils**  
axillary or 0. Flowers hermaphrodite or unisexual, solitary, **racemos** or  
cymoso-paniculate, often showy ; bracteoles 3 (rarely 0), minute ; r  
scattered or foliaceous and **forming** an epicalyx. Calyx-tube short long,  
coriaceous or herbaceous, persistent; lobes 5, imbricate. Petals 5 or  
as many as the calyx-lobes, inserted in the tube of the calyx, free or  
connate into a **caulpanulate** corolla, membranous, coriaceous or fleshy  
imbricate, often marcescent. Corona simple or double, springing from the  
throat or bottom of the calyx, tubular or split into erect or radial **filaments**  
(rarely 0). Stamens 5, on a gynophore or free at the base perigynous;  
**filaments** subulate or filiform, free or monadelphous; anthers didymous  
or oblong, basifixed or versatile, the cells dehiscent **introrsely**.  
Ovary <sup>^</sup>-superior, sessile or stalked; ovules numerous,  
attached to parietal placentas, the funicle <sup>^</sup> into a  
cup-shaped aril; styles 1 or 3 ; stigmas capitate, **elavate** dilated,  
sometimes multinerved. Fruit baccate or capsular. Seeds numerous: **roua**,  
**usually** ovoid, compressed, often pitted, covered with a fleshy aril albumen  
fleshy ; embryo rather large; cotyledons leafy ; radicle terete.-

ahft f^ Chiefly Tropical; moat numerous in S. Ainerica;  
genera out w i species about 300.

### 1. MODECCA, Lamk.

enf >^a i\* oe rbs or undershrubs, scandent or twining. Leaves alternate,  
sth) K mi\_lobed or Pinna-tifid, with 2 glands at the apex of the petiole ; tvvf^T  
>^or ^ncons p^Acuous- Tendrils lateral, undivided, circinate or prod -'^  
.^Offeilfi unisexual, usually small; peduncles axillary, often l<jbe, UC] J^nto  
ten drils, MALE FLOWERS : Calyx turbinate or tubular ; bott\* t S^1Olt or  
e^0B S^ate- Petals 4-5, inserted on the throat or nnn om o\* ^e  
calyx-tube and included in it, small, sometimes fimbriate. vj or a ring  
calvf J! ^ g  
ODD " t Sttmens 4"5' inserted at the bottom of the calyx-tube,  
antl^! o \*\* man^ scaies or S\*ands ; filaments free or connate below;

of white cilia arising from near the base of the

, scales or glands ; filaments free or connate below;  
basilixed, oblong or linear, the connective usually apiculate.  
**rudimentary** or 0. FEMALE FLOWERS : Calyx and petals as in **the**  
otaminodes 4-5. Ovary stalked or sessile, ovoid, terete or  
is ; ovules numerous, attached to 3 parietal placentas; style 0 or  
stigmas 3. Fruit capsular, dehiscing loculicidally by 'd  
valves, numerous, enveloped in a fleshy aril, **flattened**;  
funicle long; fleshy; cotyledons **foliaceous**,—DISTRIB.  
Asia, Africa, and Australia ; species about 25.

**1. Modecca palmata, Lamk. Encyc. Method, v. 4 (1796) p. 209.** large  
**perennial** herb becoming woody at the base; root large, **fusi**-m; stems  
long, thickened at the nodes, terete, smooth and shining, Eiotled with  
purple, not much branched. Leaves membranous, broader than long, 4-5  
**by** 0-7 in., cordate, **with 2** Hat glands at the apex of the petiole aud 1 at  
the base of each sinus in the divided leaves, usually very deeply **paimately**  
5-lobed (rarely 3-lobed or undivided), glabrous and **shining**; lobes  
oblong-lanceolate, acute, entire ; **nerves** and veins conspicuous; petioles 2  
**in.** long, grooved, glabrous. Flowers in 2 opposite Vcymes (usually of 3)  
on a long axillary peduncle which is produced into [a long simple tendril.  
MALE FLOWERS : Calyx broadly cam pa nu late, -| **in.** long, dilated at  
the base; lobes 5, ovate, acute. Petals linear-long, acute, cilia te,  
inserted at **the** base of the calyx-tube. Corona ring of threads from **the**  
calyx-tube just, fibow Afe?. dilated-• portion-:• **tmenfl** distant; filaments  
subulate, connate at the base ; anthers linear-on"1. Ovary rudimentary.  
**FEMAIB** FLOWERS ; Calyx | in. long, Kumlate ; lobes ovate, acute.  
Petals as in the male. Staminodes 5, ., flat, strap-shaped, connate at the  
base into a membranous cup. ■y shortly stalked, globose, smooth,  
tapering into 3 long styles; las much divided, feathery. Fruit reaching 2  
in. **in** diam., shortly ;edj globose, apiculate, smooth, orange-colored,  
splitting into 3 **fleshy** es. Seeds nearly h, **in, in** diam., discoid,  
compressed, muriculate and

d, each with a pulpy aril. Fl. B. I. v. 2, p. 603; Dalz. & Gibs. p. 104;  
ht, Icon. t. 201; Trim. Fl. Ceyl. v. 2, p. 241; Woodr. in Journ.  
Nat. v. 11 (1898) p. 639; Watt, Diet. Econ. Prod. v. 5, p. 254.

b. lowers : Apr.-May.

iiither rare. KONKAS: *Stocks* !; Mai wan, *Dalzell* & *Gibsov*, KASARA :

**d** (N. Kanara), *Woodrowl*; **ObandrAr, Ritchie, 17&BJ—BISTBIB.** India (U'.  
Ceylon. \_\_\_\_\_ :

*Carica Papaya*, Linn. *The Papaw*, a rapidly growing tree, considered by DeCandolle to be a native of the W. Indies, is native to the shores of the Gulf of Mexico and doubtfully of Brazil, is cultivated throughout India. It has large glabrous pinnatifid and pinnately nerved leaves 1-2 ft. across, and fragrant (dioecious) flowers; the males are in long drooping panicles and the females in racemes. The fruit, which is of the size of a small melon, with a soft pulp, is eaten and is regarded as possessing properties similar to those of the water-melon. It seems to be a well-established fact that meat wrapped in it and treated with the juice of the fruit becomes tender. The unripe fruit has been extensively used in medicine (see *Econ. Prod.* v. 2, p. 158). *PL B. I.* v. 2, p. 599; *Grab. Cat-Date. & Gibs. Suppl.* p. 37; *Woodr. in Journ. Bomb. Mat. f.* p. 639, & *Gard. in Ind. ed.* 5, p. 324.—*VERK Papaya; Popau*

*Passiflora foetida*, Linn., a native of Tropical America, is a very plant in gardens and is frequently found as an escape, flowers and a remarkable pectinate and moss-like involucre *Veli-ghdni*,

Several other species of *Passiflora* are grown in gardens in the Presidency, of which may be mentioned *P. pauciflora* L. altitude bluish-purple fragrant flowers, not fruiting much below 4000 ft. and then bearing a plum-like edible yellow fruit; *P. fawcettii* R. & S. blue fragrant flowers; *P. racemosa* with deep-red or orange flowers; *P. 7w?* with mottled flowers about 2 in. across; and *l. (better known as P. hermesina)* which bears in great abundance red flowers with narrow petals. (See *Woodrow, Gard. in w.* \* pp. 322-324.)

## ORBEU LXII. CUCURBITACEAE:

Herbs or undershrubs usually climbing. Leaves alternate, frequently cordate, simple, or palmately or pedately divided, when present lateral, solitary, simple or divided, spirally. Flowers monoecious or dioecious, yellow or white, solitary, paniculate or racemose. Calyx-tube adnate to the ovary; limb rotate, campanulate tubular, 5- (rarely 3-6-) lobed, imbricate. Petals as many as the calyx lobes, inserted on the limb of the calyx, free or rarely gamopetalous sometimes lobed or fimbriate, valvate or involute in bud. Stamens inserted at the mouth, or about the middle, or at the base of the corolla tube, usually 3 (rarely 5); anthers free, cohering, or confluent in a caputulum, one usually 1-celled, the other two 2-celled, the cells flexuous or conduplicate, extrorsely dehiscent; the connective sometimes produced beyond the cells. Ovary inferior, or rarely free at the apex or usually 3-carpellary; ovules usually many, horizontal, rarely few pendulous; style 1 with 3 large stigmas (more rarely styles 2-3) placentas usually 3, the edges of the carpellary leaves being not turned in so far that the ovary (even before fertilization) is spuriously 3-celled. Emit usually a fleshy berry, indehiscent or dehiscent by valves or by a circumscissile lid. Seeds numerous, often packed |



Np or fibre; albumen 0.—DISTBIB. Wanner parts of the globe, **especially** in the Tropics; genera 80; species about 100.

**horizontal.**

3 (rarely 2 or 5); female flowers usually solitary, as commonly fascicled. Anther-cells flexuose or conduplicate.

Corolla 5-partite to the base or 5-petalous.

Petals fimbriate ..... 1. TmcHosAimiss.

Petals not **fimbriate**.

Stamens? free, inserted on the mouth of the calyx.

Calyx with scales at the bottom ..... 2. MOMORDICA.

Stamens free, inserted on the tube of the calyx. Male flowers racemose.

Fruit dry, fibrous, dehiscent **operculately** at the apex ..... 3. LUFFA.

Male flowers solitary or fascicled.

Pollen smooth; rudimentary ovary 0 ..... 4. BKYOXOPSIS.

Pollen smooth; rudimentary ovary glandular, Connective of anthers produced

beyond the cells; tendrils simple. 5. OUCUMIS.

Connective **of** anthers not produced beyond the cells; tendrils

usually 2-3-fid ..... 6. CITRUXIUS.

Corolla campanulate, divided to the middle or a little below it ..... 7. COCCINIA.

Anther-cells straight or curved, not flexuose.

Style inserted on a cup-shaped or annular disk ..... 8. MELOTHKIA.

Disk at base of style 0 or obscure.

Petiole with a **stipuliform** bract at the base ..... 9. BLASTANIA.

Petiole ebracteate at the base.

Fruit indehiscent ..... 10. KEDROSTIS.

Fruit operculately dehiscent above the base ..... 11. COHALLOCARPCS.

Stamens 3 ..... \*\*■ DIC(ELOSPBMUM).

Stamens 5; female flowers in racemes ..... YJ. ZANONIA.

## L TRICHOSANTHES, Linn.

pendant herbs. Leaves entire or **3-9-lobed**, denticulate; tendrils 1 or 2-5-fid. Flowers dioecious (rarely monoecious), white. Male flowers usually racemose (rarely solitary), often bracteolate. Perianth-tube cylindrical, dilated above, 5-lobed. Corolla 5-fid nearly to the base; lobes long, fimbriate. Stamens 5, inserted *in* the calyx-tube; filaments very short; anthers almost included, usually connate, one included, the others 2-celled, the cells conduplicate; connective narrow, produced. Eudicotyledonous ovaries 3, filiform. FEMALE FLOWERS [pendulous]. Calyx and corolla as in the male. Stamens 0. Ovary inferior, ovoid or fusiform, 1-celled, 3-placentiferous; ovules very many, **horizontal** or semi-pendulous; style slender; stigmas 3, entire or bifid. Fruit fleshy, globose, ovoid or fusiform, indehiscent, many-seeded, **lanceolate** smooth and glabrous. Seeds packed in pulp, ellipsoid, sori-

times angular, usually margined.—DISTHIB. Tropical Asia, N. Aus ;rft  
Polynesia; species 40.

Leaves entire.

Male racemes with small bracts ..... \*■^i

Leaves lobed or angled.

f- ritbhwebmrti ..... -  
Male racemes ebracteato ..... ■..... oii

**1. Trichosanthes nervifolia**, Lmi % *PL* (2753) p

^ **Perennial**; stems somewhat woody below, much-branched;  
stem slender, **striate**, glabrous. Tendrils **2-fid**, glabrous.

Leaves \*-\*" 1T2| in., ovate-oblong (not lobed), acute,  
incurvate, the <sup>ma^</sup>

minutely and remotely denticulate, glabrous on both surfaces,  
green above, paler beneath, base cordate: main nerves 3 from the

the two lateral not quite reaching the apex, with strong <sup>B®P™\*</sup>|

th id h l i f d es co

qt

eg p,

U

nerves on the **outside**, the lowest pair of secondary nerves conspicuous  
branching **into the** basal lobes of the leaf at either side of the **sura**,  
petioles 1/2-1 in. long. MALE **KLOWEBS** in axillary 4-10-flowered corym-  
bose racemes; peduncles slender, sulcate, 1-2| in. long; P\*\*1™ 7; f  
long; bracts minute, caducous. Calyx-tube **puberulous**, **f-i-t** >"■.

,|;

very narrow, about 1/4 in. wide at the mouth and 1/2 in. wide in the **miaat**,  
teeth linear, acute, **JUX in.** long. Petals ovate-oblong, acute, tube <sup>umux t</sup>  
at the apex much **branched** and much longer than the blade of **we pewu**,  
doubled inwards in bud. FEMALE **FXOWBBS** axillary, solitary, on a  
peduncles, Calyx-tube nearly 2 in. long, much produced **above the**  
**ovary.**

Fruit

1|-3

in.

long,

ellipsoid, shortly beaked, tapering to both ends,

**green with** white lines when immature, scarlet when ripe; pericarp mm.

Seeds

1

h i k d t the <sup>ma^</sup>V

each Grab. v. 6, part

< p. 84. KONKAN:

**Graham.**

This is included on the authority of Graham (*l. c.*). It has not appeared  
found by **anj** other collector. I myself seen no specimens  
from the Presidency.—BisTHiB. S. India; Ceylon.

**2. Trichosanthes palmata**, *liowh. Fl.* 2nd. v. 3 (1832) p. 70f

Climbing often to a height of 30 ft.; stems robust, woody  
below branched, grooved, the older **light-grey** with scabrous spots, the  
young smooth, green. Tendrils 2-, more commonly 3-cleft. Leaves  
2/3-1, long and about as broad as long, variable, usually palmately

<sup>3</sup> to about the middle (more or less), dark-green above, paler **below** frequently with dark-colored circular glands scattered along the lower side, glabrous, often scabrous **with** small scales above and on the **underside**, base cordate ; lobes usually ovate-oblong, acute, more or dentate or serrate; petioles 1-3 in. long, striate, puberulous or length glabrous. MALE FLOWERS **in** axillary 5-10-flowered raceme 6-9 **in.** long (rarely solitary); pedicels thick, erect, very short; bracts 1 **in.** long and more, **broadly** ovate, pale-green, many-nerved and **marginally** dotted **with** dark-green glandular **spots**; Calyx-tube **short** **and** **pubescent**, longitudinally striate; teeth lanceolate, erect or spreading or lacinate. Petals 1 in. long, wedge-shaped, fringed, exceeding the calyx-teeth. **Filaments slightly** villous. **FEMALE FLOWERS** axillary

solitary, peduncles less than 1 in. long. **Fruit** 1|-2 in. in diam., **Koese, red** when ripe, streaked with 10 orange streaks; pericarp thick. **Fl.** numerous, §-| in. long, ellipsoid, smooth, slightly attenuated at <sup>TM</sup>base, not margined. **Fl. B.**, I. v. 2, p. 606; **Grab. Cat.** p. 79; **Dalz. W. J. P.** <sup>103</sup> 5 **Wight**, 111. tt. 104, 105; **Trim. M. Oeyl.** v. 2, p. 244; **Hoodr. in Journ. Bomb. Nat.** v. 11 (1898) p. 039; **Watt**, **Diet. Econ. rod.** v. 6, part 4, p. 84. *Trichosanthes bracteata*, **Voigt**, **Hort. Sub. JJ.** (1845) p. 58; **Cogniaux**, **in DC. Monogr. Phan.** v. 3, p. 375.—**era; Apr.-July.** **YERN.** *Kmmdal; Mukdl.*

**S. M. K.** <sup>^ftw</sup>: **DBCCAS:** Lanoli, *KanUkari, Woodrow; Mahableshwar, CooJtel* <sup>i</sup> **V<sup>DSTR</sup>:** Castlerock, **Ctaie!**; **Kakti** (Sangli State), **.#&?&&**, 10711D

**f"\* IKHa** i Ceylon, Malaya, China, Japan, N. Australia, **lant** has some **repute** as a remedy in certain diseases of cattle.

**3. Trichosanthes cucumerina**, /.HWI. % i\$. (1753) p. 1008. **j<sup>v</sup>j**nual, **monoecious**; stems 12-15 ft. long, slender, furrowed, slightly **nairj** or **subglabrous**, leafy. **Tendrils** 2-3- (usually 3-) **lid**. **Leaves** <sup>SJ</sup> m. long, usually a little broader than long, orbicular-renal'orm or , **tjoadly** <sup>OTate!</sup> distantly denticulate, more or less deeply 5- (rarely 3-7-) **°t>**ed, the lobes broad, acute, glabrous or nearly so above, more or less pubescent, or, when old, sometimes **seabrid** beneath, base deeply cordate, **Hie sinus** often subrectangular; **petioles** 1-3 in. long, striate, pubescent. **MAIS FLOWERS** **in** axillary racemes, with sometimes a solitary male **nower** from the same axil as the raceme; peduncles of the racemes **-~6** in. long, slender, striate, bearing 8-15 flowers near the apex; **pedicels** **puberulous**, 4-| in. long; **bracts** 0. **Calyx-tube** dilated at the **apex**, |~1 in. long, about £ in. wide at the mouth; **teeth** short, acutely triangular. **Petals** white, § **in.** long, lanceolate-oblong, laciniate at the apex. **FEJIALE FLOWERS** axillary, solitary, or occasionally a female flower in the same axil as the male peduncle; **peduncles** of female flowers **g-j|** in. long. **Fruit** 1-3 in. long, ovoid-fusiforin, tapering **|at** both ends and with a long sharp beak, green and striped with white when immature, scarlet when ripe: pericarp thin. **Seeds** semi-ellipsoid,

compressed, rugulose, surrounded with red pulp. **Fl. B.** I. v. 2, p. 609; **Grab. Cat.** p. 79; **Dalz. & Gibs.** p. 102; **Trim. Fl. Ceyl.** v. 2, p. 245; **Woodr. in Journ. Bomb. Nat.** v. 11 (1898) p. 639; **Watt, Diet. Econ.**

. v. 6, part 4, p. 82.—**Flowers:** July-Octc. **VERM.** *Jangli-padvel,*

**KONKAX:** S. Konkan, *Balzd % Gibson, DBCCAS: Poona, Woodrow; Vitalwadi,*

**Rtiles** west of Poona, *Krishna\**; **Shrirardhan** (Jinju-a State), *Kamtkarl* **GUJARAT:** **limon** in hedges, *BalzeU 4" Gibson; Baroda, Cooke!*; **Godra, Coo&el;** **Udwada, &ei** **KAN.VRA:** Karwar, *Woodrow.*—**DISTEIB.** **Throughout India; Oeylon, Malaya, lustraiia.**

*Ykhosanthes Anguina*. Linn, Sp. PL (1753) p, 1008. *The Snake Gourd* **Lnglo-Indians.** The fruit of this gourd often attains 3 ft. in length i a thickness of 3 in. The leaves and flowers are like those of *cucumerina*, but the **fruit** is entirely different. **Mr. C. B. Clarke** ggests that it may perhaps be a cultivated form of that plant. It is **Jtivated** as a rainy season crop throughout the Bombay Presidency, it is not known in the wild state. **FL B.**, I. v. 2, p. 610; **Grrah. Cat.** 78 • **Dalz. & Gibs. Suppl.** p. 37; **Duthie, Field and Gard. Crops**, t. 46; **/oodr. in Journ. Bomb. Nat.** v. 11 (1898) p. 639, & **G-ard. in Ind,**



ad. 5, p. 330 ; Watt, Diet, Econ. Prod. v. 6, part 4, p. 81.—VEBN.  
*lOhil'onda.*

## 2. MOMORDICA, Linn.

Climbing annual or perennial herbs. Leaves entire, lobed or pedately 3-7-foliolate. Tendrils simple or bifid. Flowers yellow or white, monoecious or dioecious. MALE FLOWERS corymbose or racemose. Calyx-tube short, campanulate, closed at the bottom with 2-3 incurved oblong scales; lobes 5. Corolla usually 5-partite to the base or nearly so, rotate or broadly campanulate : segments obovate, costate. Stamens 3 (2 in *M. Cymbalaria*), inserted on the mouth of the calyx-tube ; filaments short, free : anthers at first cohering, at length free, one 1-celled, the others 2-celled, the cells flexuose (rarely short and straight or curved), connective not produced at the apex. Eudimentary ovary 0 or glanduliform. FEMALE FLOWERS solitary. Calyx and corolla as in the male. Eudimentary stamens 0, or 3 glands surrounding the base of the style. Ovary oblong or fusiform, 3-placentiferous; ovules 6, horizontal; styles slender; stigmas 3. Fruit oblong, fusiform, or cylindrical, baccate, indehiscent or 3-valvate, few or many-seeded. Seeds tumid or flattened, smooth or variously sculptured.—DISTIB. Chiefly African, a few scattered through the tropics of both hemispheres; species 25.

Male peduncles 1-flowered.

Flowers monoecious.

Bracts of male flowers about the middle or below the middle of the peduncle .....

1. *M. Chamntia*.

Bracts of male flowers at the apex of the peduncle ...

2. *M. Balsamina*.

Flowers dioecious.

Petioles without glands.

Calyx-lobes linear-lanceolate, acute .....

3. *M. dioica*.

Calyx-lobes ovate-oblong, obtuse .....

4. *M. suhangulata*.

Petioles glandular .....

5. *M. cochinchinensis*.

Male flowers in racemes "!!!!.!!!!!!".!!!!!!"!!!!!!" .....

6. *M. Cymbalaria*.

1. **Momordica Charantia**, Linn. *Sjp. Pl.* (1753) p. 1009. Annual; stem 3-6 ft. Ion", much branched, angled and grooved, more or less pubescent or hairy'; young parts hairy or villous. Tendrils simple, slender, elongate, pubescent. Leaves almost orbicular in outline, 2-5 in. in diam., pubescent or subglabrous on both sides, cordate at the base, deeply divided into 5-7 lobes, the lobes acute or subacute, apicu-late, coarsely spinous-dentate, constricted at the base, the sinus between them narrow, rounded ; petioles 1-2 in. long, channelled, pubescent. Flowers monoecious. MALE FLOWERS solitary; peduncles 2-4 in. IonL glabrous or pubescent, furnished with a large reniform or orbicul bract at or below the middle. Calyx ^-| in. long, pubescent; lob 1 in. long, elliptic, subacute. Corolla somewhat irregular, lemo yellow ; segments obtuse or emarginate, f-f in. long, veined. FEMALE FLOWERS : Peduncles 2-4 in. long, slender, bracteate usually at or near the base. Staminodes 3, glanduliform. Ovary fusiform, muricate stigmas 3, bifid. Fruit bright orange-colored, 2-6 in. long, pendulous fusiform, usually pointed or beaked, ribbed, and bearing numerous triangular tubercles giving it the appearance of a crocodile's back (*Graham*), 3-valved at the apex when mature. Seeds  $\frac{1}{2}$  in. long, compressed, corrugate on the margin, sculptured on both faces. Fl. B. I. v. 2, p. 616 ; Grab. Cat. p. 78 ; Dalz. & Gibs. p. 102; Trim. Fl. Ceyl.

., p. 248; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 5, p. 256.—Flowers: May-Aug. VERN. *Kdrale*.

L-I' ^ cu^ivated. DECCAN: *Woodrow!*; Foona districts, *KanitJcar!*  
SIND: *rkhana, Cooke!*; near Karachi, *Bhola Puran!*—DISTRIB. Throughout India ;  
Oeylon,

Th o .hi9la> Tropical Africa.

The fruit is eaten, but requires steeping in salt water before use. The root, as well as the fruit, is also used medicinally.

& **Momordica Balsamina**, *Linn. Sp. Pl* (1753) p. 1009. Monoecious ; stem 2-5 ft, long, very slender, branched, grooved, sub-glabrous. Tendrils simple, filiform, glabrous. Leaves membranous, orbicular in outline, 11-3 in. in diam., cordate at the base with a broad sinus, palmately 3-5-lobed to about the middle, the lobes rhomboid, deeply lobulate, acute and mucronulate at the apex, usually constricted

at the base, the sinus between the lobes broad and rounded ; petioles 2-1J in. long, striate, pubescent. MALE FLOWERS :

Peduncles 1-

flowered, slightly pubescent at the apex, otherwise glabrous or nearly so, slender, 1-3 in. long ; bract towards the apex of the peduncle,  $\frac{1}{4}$ - $\frac{3}{8}$  in. wide, cordate, orbicular, denticulate, variegated green and white.

reticulately veined. Calyx  $\frac{1}{2}$  in. long, pubescent; lobes  $\frac{1}{2}$ -in. long, 5-7-nerved, triangular, acute, with a long slender mucro. Corolla subregular, yellowish with a dark base,  $\frac{1}{2}$  in. long, obovate, subobtusely, reticulately veined, sometimes apiculate. Anther-cells flexuous, the connective broad. FEMALE FLOWERS : Peduncles  $\frac{1}{2}$ -in. long, usually ebracteate, or bracteate at the base. Calyx-lobes linear-lanceolate. Ovary fusiform, beaked, verrucose. Fruit 1-3 in. long, ovoid, narrowed to both ends, rostrate, fleshy, smooth or muricate. Seeds ash-colored, ellipsoid, compressed,  $\frac{1}{2}$  by  $\frac{1}{2}$  by  $\frac{1}{2}$  in., rugulose on the flat faces, and with a grooved margin which is tuberculate on the edges. Fl. B. I. v. 2, p. 617; Aitch. Pb. & Sind Pl. p. 63; Hook. f. in Oliver, Fl. Trop. Afr. v. 2, p. 537; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 5, p. 256.—Flowers: Nov. VEEN. (Sindi) *Kurelo-jangro*.

Common in Sind, also found in Gujarat, but rare in the Deccan. GUJARAT: *Pahlanpur, Woodrow*; Ahmedabad, *Baojil* SIND: indigenous, *Stocks & Aitchison, Bhola Puran & Woodrow*, Mulir near Karachi, *Cookel*—DISTRIB. India (Panjab, N.W. Provinces); Malaya, Australia, W. Asia, Africa.

**3. Momordica dioica**, *Boxb. in Willd. Sp. PL* v. 4 (1805) p. 605. Dioecious, perennial, with tuberous roots; stem slender, branched, furrowed, glabrous and shining. Tendrils simple, elongate, striate, glabrous. Leaves membranous, broadly ovate in outline, variable, 1 $\frac{1}{2}$ -4 by 1 $\frac{1}{2}$ -3 $\frac{1}{2}$  in., cordate at the base, glabrous, minutely punctate, entire or more or less deeply 3-5-lobed, the lobes triangular, ovate or oblong, distantly denticulate; petioles  $\frac{1}{2}$ -1 in. long, channelled above, pubescent, eglandular. MALE FLOWERS : Peduncle solitary, 1-flowered, 1 $\frac{1}{2}$ -5 in. long, slender, angled, usually pubescent near the top, otherwise glabrous; bract cucullate, inserted a little below the flower and enclosing it, orbicular-reniform,  $\frac{1}{2}$ -in. broad, usually pubescent on both sides, strongly nerved, often ciliolate. Calyx-lobes distant, 1-1 $\frac{1}{2}$  in. long, linear-lanceolate. Petals  $\frac{1}{2}$ -1 in. long, wholly yellow, oblong-lanceolate. FEMALE FLOWERS : Peduncles nearly as long as those of the male,

usually with a small bract near the base. Ovary clothed with long soft papilla. Fruit 1-2| in. long, ellipsoid, shortly beaked, densely echinate

with soft spines. Seeds many, | in. long, broadly ellipsoid,

shgh%

compressed, slightly and irregularly corrugated, enclosea «\* . i

Fl. B. I. v. 2, p. 617 (exclud syn. *M. subangulata* Bhime) <\*rah^

p. 78; Dalz. & Gibs. p. 102; Wight Icon. tt. 5<to506\_g> ^ m\_o4O.

Ceyl. v. 2, p. 249; Woodr. in Journ. Bomb. Nat. v. H (1»^ 1 y\_i;BN.

Watt, Dirt. Bcon. Prod. v. 5, p. 258.-Howers: June-Aug.

*Kartoli*,

, (7^<J

!;

Widely cultivated in the Deccan. KONKAN : Law! DKCCASr: ^"J^

^ 1

Kothrud near Poona, *Kan Marl* S. M. COUNTRY : Bad ami ^ C asler

^

#### 4. *Momordica subangulata*, Blume, *Btjdr.* (U

Dioecious ; stem slender, branched, furrowed, glabrous or u\_.

rulous at the nodes. Tendrils simple, slender, turro\*£?v£\_u8 the

Leaves membranous, deeply cordate, the upper surface giau\_gub\_3\_5,

lower more or less pubescent, broadly ovate, acute, eiit-ir, ^\_petioles

lobed, the margins remotely denticulate, 2-4 by U-d\_z M A T E FLOWEBS :

1-2 in. long, slender, striate, subglabrous eglandular • ^AL especially

Peduncle solitary, 1-flowered, 1-3 in. long, furrowed, P\_u\_3^D^e" ^j^1\_110t as

at the apex; bract cucullate, close.to the flower, 3-4 i"- CalyX

long as broad, pubescent on both sides and with ciliate m^y .^\_long>

dark-purplish; lobes ovate-oblong, obtuse, g^land\_ular:1 « „? FEMALE

Corolla yellow, partite to the base, the segments owov ■ ^\_the

FLOWBES not known. Fruit ellipsoid, 2-3 in. long, atte u c ^^\_ribg

base and apex, densely and softly echinate, obscurely n ' m King>

broken into joints. Cogniaux, in DC. Monogr. Phan. v. o, p. in Journ.

As. 80c. Beng. v. 67, part 2 (1898) p. 36.

5. M. COUNTRY: *Ritchie*, 311!; Belgaum, *Ritchie*, 311!

Herb# Kew.—

A rare plant, of which only 2 specimens from Bombay ex«

DISTRIB. India (W. Peninsula); Java, Malaya. ^

#### 5. *Momordica cochinchinensis*, *Spreng. Syst.* • V^AJ perennial;

A strong climber ascending trees, dioecious ; root tuDer, 1\_jabroUS#

stem robust, angular, glabrous. Tendrils simple, ^\_tollt^fjf in/iong and

Leaves suborbicular in outline, cordate at the base, ^\_£\_limj\_sne^i

broad, glabrous on both surfaces, the margin near the < ^^\_nto

with umbilicate glands, divided to the middle or almost to ■ ^\_mf\_

3 (rarely 5) lobes, the lobes ovate or oblong-lanceolate, a^\_ioleg 2\_3 in.

nate, diverging, the margins entire or faintly toothed : p ^^\_long,

stout, sulcate, almost invariably glandular at the mia ^\_apex,

glabrous or nearly so. MALE FLOWEBS : reclunc^ . J J ear

'2-6 in. long, angularly furrowed, more or Jess pubescent esp

^

the apex ; bract at the top of the peduncle.embracing; the no , ^

than long, 1A-1| by 1J-2 in., cordate at the base P^ub\_eBC^V\_te acute.

Calyx hfr'su^e o^r LSriA; lobes\_H in. long, obtoogJj"^^ less so

Corolla white, tinged with yellow, pubescent outside ana.m . u

inside; segments reaching 2| by 1 in-, obovate-oblong ^\_TMf with a

obtuse or subacute. FEMALE FLOWERS : Peduncles 1-- m. \* ■

small bract about the middle. Fruit 4-6 in. long, ovoid pointet

, fleshy, terete, densely covered with raised points aDoui 8 •

Seeds numerous, g by g by i in., ovoid, much coinpresse.d, sculJ on

both faces, ll. B I. v. 2, p. 618; Woodr. in Journ. Bomb

v- 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 5, p. 257.—Flowers: June-Aug.

TIT, <sup>re></sup> KANARA: *Law*!; N. Kanara, *Woodrow*.—DISTRIB. Throughout India • Malaya, Philippines.

6. **Momordica Cymbalaria**, *Fenzl, ex Naudin, in Ann. Sci. Nat. ser. 4, v. 12 (1859) p. 134.* Monoecious; root woody, tuberous, perennia? stem very slender, scandent, branched, striate, pubescent or sub-glabrous. Tendrils filiform, slightly pubescent, simple. Leaves orbicular-reniform in outline, 1-2 in. long, glabrous or with a few scattered hairs, punctate (but not scabrid) on both surfaces, deeply cordate at the base, obtusely but not deeply 5-7-lobed, the lobes short, acute or obtuse; petioles 1-2 in. long, striate, pubescent. MALE FLOWERS in 2-5-flowered racemes; peduncles 1 in. long, filiform, pubescent, ebracteate; pedicels 1-2 in. long. Calyx hairy; tube short, broadly campanulate, narrowed at the base; lobes 1 in. long, lanceolate, acute. Corolla pale yellow; segments obovate, obtuse, 1-2 in. long. Stamens 2; filaments very short, thick, flattened; anthers 1-2 in. long, one 2-partite, the others 3-partite, the cells conduplicate, the connective broad. FEMALE FLOWERS: Peduncles 1-2 in. long, slender, ebracteate. Ovary fusiform, beaked; style stout; stigmas 2, spreading, 2-partite. Fruit 1-2 in. long, pyriform or broadly fusiform, narrowed into the curved peduncle, fleshy, dark-green, 8-ribbed, sparsely hairy. Seeds 1-2 in. long, broadly ovoid, slightly compressed, strophiolate, not margined; testa polished and shining, dark-brown. Fl. B. I. v. 2, p. 618; Hook. f. in Oliv. Fl. Trop. Afr. vt 2, p. 540; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 040; Watt, Diet. Econ. Prod. v. 5, p. 258. *Momordica tuberosa*, Cogniaux, in DC. Monogr. Phan. v. 3 (1881) p. 454. *Luffa tuberosa*, Loxb. Hort. Beng. p. 104.—Flowers: Nov. VERTS *Kadvanchi*.

DECCAN: Sholapur districts, Igatpuri, Sattara, *Nairne*. S. M. COUNTRY: Dharwar, *Woodrow*!—DISTRIB. India (W. Peninsula); Tropical Africa.

### 3. LUPFA, Cav.

Annual herbs. Tendrils 2-many-fid. Leaves 5-7-lobed (rarely sub-entire); petiole without glands at the apex. Flowers monoecious (rarely dioecious), rather large, yellow or white, males and females often from the same axil. MALE FLOWERS racemose. Calyx-tube campanulate or turbinate; lobes 5, triangular or lanceolate. Petals 5, free, spreading, obovate or obcordate. Stamens 3 (rarely 5), inserted on the calyx-tube; filaments free or connate; anthers exserted, free, one 1-celled, the others 2-celled, the cells sigmoid, often on the margin of a broad connective. Rudimentary ovary glanduliform or 0. FEMALE FLOWERS solitary. Calyx-tube produced beyond the ovary; lobes as in the male. Corolla as in the male. Staminodes usually 3, thick. Ovary elongate, sulcate, angled or cylindrical, 3-placentiferous; ovules numerous, horizontal; style columnar; stigma 3-lobed. Fruit dry, oblong or cylindrical (not spherical), acutely ribbed or terete, smooth or echinate, fibrous within, 3-celled, terminated by the persistent style, usually circumscissile near the apex. Seeds many, oblong, compressed.—DISTRIB. Warmer regions of the Old World, one species indigenous in America; species 6.

Stamens 5.

a A : J 11 \*u

Seeds winged, usually smooth .....

1. *L. (sqyptiaca.*  
Vj/r

amens 3.

Fruit 10-ribbed (not echinate); seeds rugose, wingless .....

9 T

j- \*±.

Fruit echinate ; seeds slightly verrucose, wingless .....

\*&gt; J.

1. **Luffa \*gyptiaca**, *Mill, Diet. ed. 8 (1768)*. Monc^ous, climbing to a considerable height ; stems stout, 5-angled, twisted, g^Drois or slightly pubescent, often scabrous at the angles. Tendrils usuaiiy 3-fid. Leaves orbicular-reniforin in outline, 4-8 in. long, often broader than long, palinately 5- (rarely 7-) lobed, the lobes acute or acuminate, lobulate and distantly denticulate, both surfaces finely scabrous, punctate, glabrous except the pubescent nerves beneath, base deeply cordate, ...«4.:liL T A • ii!\* ..i\_ ^: ^u^, r OOK^HQ MALE FLOWERS in petioles 1-1 in. long, angular, singly scabrous. MALE FLOWERS in axillary 4-20-flowered racemes, usually crowded near the top of the raceme ; peduncles 4-6 in. long ; pedicels  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, pubescent, articulated near the apex, each bearing a small lanceolate glandular bract at or, more commonly, a little above its base ; buds ovoid, pointed. Calyx pubescent,  $\frac{3}{4}$  in. long ; lobes lanceolate, acute,  $\frac{1}{2}$  in. long. Petals spreading 1 in. long, obovate, yellow with green veins. Stamens n^couiug, x in. iujjg, uovate-Ouloug, yeuuw VTHU 6L.w~ ..... 5, distinct. FEMALE FLOWERS solitary, usually from the same axils as the males ; peduncles stout, 1-3 in. long. Staminodes usually 5. V<sup>vai</sup>7 cylindric-oblong, glabrous or pubescent. Fruit 5-12 in. long, cylindric or somewhat trigonous, blunt at the end, marked with longitudinal lines. Seeds black or grey, § by J in., much compressed, narrowly winged, smooth or slightly" tuberculate. Fl. B. I. v. 2, p. 614? inm. Fl. Ceyl. v. 2, p. 251 ; Woodr. in Journ. Bomb. Nat. v. 11 (1»»»J

rod. v

p. 77;

&gt;-Sepk

Very common in native gardens and sometimes as an escape, but scarcely to be regarded as a wild plant. The young fruit is eaten as a vegetable, and as &\*•£• . Clarke points out (Fl. B. I. 1. o.) being the only part attended to in cultivation is hence too variable to afford good diagnostic characters. The seeds are used medicinally and the fibrous network in the fruit employed as a flesh-brush.

2. **Luffa acutangula**, *Roxb. Hart. Bmg. (1814) p. 70*. Monoecious, climbing to a considerable height; stems 5-angled, glabrous, with sharp angles which are often scabrid. Tendrils usually 3-fid. Leaves orDi-cular in outline, pale green, 6-8 in. long and broad, palmately 5-7-angiea or sublobate, scabrid on both sides, base cordate ; nerves and veins prominent beneath; petioles 2-5 in. long, angular, scabrid. MALE FLOWEBS in axillary 12-20-flowered racemes 4-6 in. long. Calyx pubescent, h in. long; lobes lanceolate, § in. long. Petals | in. long, spreading, obovate, yellow with green hairy veins. Stamens 3. FEMALE FLOWERS solitary, in the same axils as the males ; peduncles 2-4 in. long. Ovary strongly ribbed. Fruit 6-12 in. long, clavate-oblong, tapering towards tne base, very obtuse, smooth, longitudinally ribbed (almost winged) with 10 sharp angles. Seeds | by ±-j in., ovoid-oblong, much compressed, slightly corrugated on the sides, not winged, black.



Fl. Ceyl. v. 2, p. 252; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 6, p. 94.—Flowers: June-Sept VER\*. *Shirdld; Shirol; DodJca-turai*.

<sup>s</sup>- M. COUNTRY: Belgaum hill south, *Ritchie*, ^Mp! KANARA: Halyal, *'Ritchie ~X~%* As i<sup>n</sup> the case of the preceding species, this cannot be regarded as truly wild. At is cultivated extensively, and when half grown is an excellent and palatable vegetable. The seeds possess emetic and purgative properties and are used in medicine, see Watt, Diet. Econ. Prod. 1. c.

. *amara*, C. B. Clarke, in Hook. f. Fl. B. I. v. 2, p. 615. Leaves smaller, at first whitish and softly villous, at length scabrid. Flowers smaller. Fruit obovoid, obtusely conical at both ends, 2-4 in. long by about 1-1½ in. thick, 10-ribbed, bitter. Seeds smaller. Trim. Fl. Ceyl. v. 2, p. 252; Cogniaux, in DC. Monogr. Phan. v. 3, p. 461; Watt, Diet. Econ. Prod. v. 5, p. 95. *Luffa amara* (sp.), Eoxb. Hort. Beng. p. 70: Grah. Cat. p. 77; Dalz. & Gibs. p. 102; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640.—Flowers: Sept. VEEN. *Bdn-titrai*.

Common in hedges in the rains. KONKAN: wild about Bombay and in the Konkans, *Graham*; W. Ghats, *Woodrow*. S. M. COUNTRY: Belgaum, *Ritchie*. GUJARAT: Godra, *Cooke*!, *Woodrow*.—DISTRIB. Throughout India, especially the Western Peninsula; Ceylon.

The whole plant is exceedingly bitter and the seeds are cathartic and emetic. Their action is said to be safe and sure, and more satisfactory than that of the seeds of *L. acutangula*. See Watt, Diet. Econ. Prod. 1. c.

3. **Luffa echinata**, *Eoxb. Hort. Beng.* (1814) p. 104. Climbing but not extensively; stem slender, branched, furrowed, glabrous. Tendrils 2-fid. Leaves lg-2J in. long, usually a little broader than long, reniform-suborbicular in outline, broadly cordate at the base, obscurely 5-angled or more or less deeply 5-lobed, the lobes rounded or rarely subacute at the apex, the margins minutely denticulate; petioles 1-2 in. long, striate, puberulous or sometimes slightly scabrid. Flowers usually dioecious. MALE FLOWERS: Peduncles 3-6 in. long, usually in pairs, one 1-flowered, the other with a raceme of 5-12 flowers at the apex; pedicels §-f in. long, bracteate near the base. Calyx hairy, \ in. long; tube very short; lobes ovate-lanceolate, acute. Petals white,

**Xruit uruitu.iv cuiuouiU) J- j-2 \*JJ ^ ^ \*»\*, -.ww ->^—^, ————— ^ .. \*w\*» ^+\*.\*\*,s.lj**  
bristles <sup>-1</sup>-5 in. long; operculum conical, without bristles. Seeds numerous X-\ by g in., not v\inged, slightly verrucose. Fl. B. I. v. 2, p. 615; Dalz. & \*Gibs. p. 102; Aitch. Pb. & Sind Pl. p. 63; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 5, p. 97, \_ Flowers: Sept. YERN. *Kukad-vel*.

Bare, except in Gujarat and Sind. GUJARAT: *Balzell* \; Gundar, *Dalzell* §• *Gibson*; Godra, *Woodrow*; Deesa, *Stocks I* SIND: *Stocks*.—DISTRIB. India (Gujarat, Sind, Dacca); Tropical Africa.

The fruit is used in medicine.

#### 4. **BRYONOPSIS**, Arn. in Hook. Journ. Bot. v. 3, p. 274.

Annual scaberulous scandent herbs. Tendrils 2-fid. Leaves deeply palmately 5-lobed. Flowers monoecious, the male and female fascicled, often in the same axils, MALE FLOWERS: Calyx-tube broadly campanu-

late ; lobes 5, subulate. Corolla campanulate, 5-partite ; segments ovate. Stamens 3, free, inserted on the calyx-tube; filaments short; anthers cohering, one 1-celled, the others 2-celled ; cells flexuose round the broad connective, which is not produced at the apex. Pollen muriculate. Rudimentary ovary 0. FEMALE FLOWERS : Calyx and corolla as in the male. Staminodes 3, small. Ovary globose or ovoid, 3-placentiferous ; ovules numerous, horizontal; style slender ; stigmas 3, papillose, deeply 2-lobed. Fruit baccate, spherical or ovoid-conical, pulpy, many-seeded. Seeds subpyriform, very turgid, surrounded by a very thick grooved crenulate ring, on each side of which the tumid faces of the seed project.—DISTRIB. S. Asia, Indian and Pacific Islands, Australia ; species 2.

1. **Bryonopsis laciniosa**, *Naud. in Ann, Sci. Nat.* ser. 4, v. 1° (1862) p. 194. Stems much branched, slender, grooved, glabrous. Tendrils slender, striate, glabrous, 2-fid. Leaves membranous, 4-6 in. long and about as broad, green and scabrid above, paler and smooth or nearly so beneath, deeply cordate at the base, 5-lobed, the lobes oblong-lanceolate (the middle sometimes reaching 4 in. long), the margins sinuate, distantly denticulate, sometimes subserrate ; petioles 1-3 in. long, striate, slender. MALE FLOWERS in small fascicles of 3-6; peduncles 1/2 in. long, filiform, glabrous. Calyx glabrous, 1/2 in. long; teeth subulate, less than 1/2 in. long. Corolla 5-lobed > segments ovate-oblong, acute, pubescent. FEMALE FLOWERS solitary, or few, or many ; peduncles shorter than in the male. Fruit sessile, 1/2-1 in. in diam., globose, smooth, bluish-green streaked with broad vertical lines. Seeds 4—1/2 in. long, yellowish-brown. Hook. f. in Oliv. PI. Trop. Afr. v. 2, p. 556; Cogniaux, in DC. Monogr. Phan. v. 3, p. 477. *Bryonia laciniosa*, Linn. Sp. Pl. (1753) p. 1013; C. B. Clarke, in Hook. f. PI. B. I. v. 2, p. 022; Grab. Cat. p. 78; Dalz. & Gibs, p. 101 ; Trim. PI. Ceyl. v. 2, p. 254; Wight, Icon. t. 500 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640; Watt, Diet. Econ. Prod. v. 1, p. 542.—Flowers : Aug.-Sept. VERJT. *Sivalingi; Kvdvodi*.

Common in hedges, *Graham, Dalzell & Gibson*. DECCAN : Poona, *Woodrow!* S. M. COUNTRY: Belgaum, *Ritchie*, 314!—DISTRIB. Throughout India; Ceylon, Malaya, Mauritius, Tropical Africa, Australia.

## 5. CUCUMIS, Linn.

Annual herbs with a perennial root, climbing or trailing, hispid or scabrous. Tendrils simple, sometimes straight and spinescent. Leaves entire or palmately 3-7-lobed or 5-angled. Flowers yellow, monoecious. MALE FLOWERS fascicled (rarely solitary). Calyx-tube turbinate or campanulate; lobes 5. Corolla subcampanulate, deeply 5-lobed or 5-partite. Stamens 3, free; filaments short; anthers free, oblong, one 1-celled, the others 2-celled, the cells linear, straight, curved or flexuose, the connective produced above into a papillose appendage. Pollen smooth. Rudimentary ovary glanduliform. FEMALE FLOWERS solitary. Calyx and corolla as in the male. Rudimentary stamens 0. Ovary ovoid or globose, 3-5-placentiferous : ovules oo, horizontal; style short; stigmas 3, obtuse. Fruit fleshy or corky, globose or cylindrical, terete or obtusely 4-angled, smooth or echinate, inehiscent, or 3-valved and tardily

Seeds numerous, oblong, compressed, usually smooth.—  
Tropical Asia and Africa, a few in Australia and America :  
species 26.

- Pl<sup>t</sup> smooth, glabrous or pubescent, perennial ; leaves  
deeply cut into 5-7 obtuse lobes,  
scabrid ..... 1. *Q. trigonus*.  
Annual; leaves usually 5-angled, softly hairy ..... 2. & *Id eh*.  
"uitechinate ..... 3. *C. prophetarum*.

Stems 35 ft. long, slender, angled, rough with short  
hairs. Tendrils simple. Leaves suborbicular in outline,  
1-2 in.  
Long and broad (sometimes larger), scabrid on both surfaces, hispid on  
joints nerves beneath, cordate at the base, deeply palmately 5-7-lobed, the

1. **Cucumis trigonus**, *Roxb. Hort. Beng.* (1814) p. 70.

Perennial,  
brittle

**j** , **py py**  
lobes ovate-oblong or obovate, often narrowed at the base, rounded at  
the apex, lobulate or dentate; petioles slender, striate, scabrid, often  
mispid, r~2 in. long. MALE FLOWERS : Peduncles slender, 1-1/2 in. long,  
tubular (rarely solitary). Calyx narrowly campanulate, hairy ; tube  
1 in. long. Teeth short, subulate. Corolla yellow, 1/2 in. long,  
less pubescent; segments elliptic, acute. Appendage of the connective  
of the anthers a little shorter than the anther. FEMALE FLOWERS :  
Peduncles slender, 1/2 in. long in fruit. Ovary hairy, fruit  
ellipsoid or subglobose, 1/2 by 1/4 in., longitudinally variegated with 10  
green stripes, pale yellow when ripe, with bitter pulp. Seeds white,  
ellipsoid, not margined. *El. B. I. v. 2, p. 619 ; Dalz. & Gibs. p. 103 ;*  
*Wight, Icon. t. 497; Trim. El. Ceyl. v. 2, p. 250; Woodr. in Journ.*  
*Bomb. Nat. v. 11 (1898) p. 640 ; Watt, Diet, Econ. Prod. v. 2, p. 635.—*  
Flowers : June. VERN. *Kdrit*.

DECCAN: very common, *Dalzell & Gibson*; jungles about Poona, *Woodrow*!;  
*Bowdhan* near Poona, *Kanitkar*!; *Rajwadi*, *Kanitkar*! SIND: *Dalzell*, 37!;  
*Landhi* near Karachi, *Cooke*!; *Bhubak*, *Cooke*!; *Hyderabad*, *Cooke*!—DISTRIB.  
Throughout India; Ceylon, Malaya, N. Australia, Afghanistan, Persia.

2. **Cucumis Melo**, *Linn. Sp. Pl.* (1753) p. 1011, var. **agrestis**,  
*Naud. in Ann. Sci. Nat*, ser. 4, v. 11 (1859) p. 73, & v. 12, p. 110.  
Annual ; stems creeping, branched, obtusely angular, with stiff (some-  
times hooked) hairs on the ridges. Tendrils simple. Leaves 2-4 in.  
long and about as broad as long, acute at the apex, cordate at the base,  
more or less hairy on both sides, denticulate, usually 5-angled ; petioles  
1-1/2 in. long, grooved and roughly hairy. MALE FLOWERS in axillary  
lascicles of about 2 or 3 ; peduncles 1/4 in. long, very slender, densely  
hairy. Calyx densely hairy ; tube narrowly campanulate, 1/2 in. long ;  
teeth 1/2 in\*, long, subulate, densely hairy. Corolla 1/2 in. long, the  
segments hairy outside, often terminated by a hairy apiculation.  
FEMALE FLOWERS : Calyx-tube constricted above the ovary. Ovary  
ellipsoid, clothed with long bristly deciduous hairs. Emit ellipsoid or  
turbinate, about 1/2 in. long, smooth or with a few small bristles. Seeds  
numerous, narrowly ovoid, compressed, smooth. *Cogniaux*, in *DC.*  
*Monogr. Phan. v. 3\** (1881) p. 483. *Cucumis Melo*, var. *pubescens*, *Kurz*,

in Journ As. Soc. Beng. v.46, part 2 (1877) p. 103. *Cucumis pubescent*  
rsn ) Willd. Sp. PL v. 4 (1805) p. 614 : Wight, Icon. t. 496; Dalz. &  
Gibs. p. 103 ; El. B. I. v. 2, p. 619 (under *C. tngonus*); Trim. El. Ceyl.  
v 2 "p. 250. *Cucumis madraspatanus*, Eoxb. in Wall. Cat. 6734  
(not

of Linn.). *Ci(cumis cicatrisatiis*, Stocks, in Kew Journ. Bot. v. 4 (1852) p. 148.—VERN. *Takmak* ; *Shinde*.

DECCAN : common, *Dalzell* & *Gibson* ; Khandala, *Bhiva* ! S. M. COUNTRY : Castle-rock, *Cooke* ! ; Londa, *Cooke* ! SIND : (cultivated) *Valzell* & *Gibson*, *Stocks*, The plant is cultivated in Sind and the fruit is eaten (*Stocks*).

*Cucumis Melo*. The Melon (VERN. *Kharbuj*). The origin of the plant is uncertain. M. DeCandolle considers it to be probably a native of N.W. India, Beluchistan, and perhaps Tropical Africa. It is largely cultivated throughout India, especially in the sandy beds of rivers. A good figure may be seen in Duthie & Fuller's 'Field and Garden Crops' (1882) t. 50. (See also Firminger, Man. Gard. ed. 3, p. 189, and Watt, Diet. Econ. Prod. v. 2, p. 627.)

There are several varieties differing much in properties and in the size and appearance of the fruit. Duthie & Fuller (*l. c.*) give figures of two of the varieties, viz. *Momordica*, t. 49, and *utilissimus*, tt. 53 & 54.

3. **Cucumis prophetarum**, Linn. *Cent. Amcen. Academ.* v. 4 (1759) p. 295. Monoecious. Stems slender, branched, angled and grooved, scabrid. Tendrils very short, striate, sometimes 0. Leaves polymorphous, rigid,  $\sim 2$  in. long and broad, somewhat ash-colored, scabrid, coarsely hairy on the nerves beneath, cordate or truncate at the base, frequently 3-lobed, the lobes often lobulate with rounded apices, the terminal lobe often contracted at the base ; nerves prominent beneath ; petioles  $\sim 1$  in. long. MALE FLOWERS solitary or fascicled; peduncles filiform, densely hairy,  $\sim 1$  in. long. Calyx-tube subcylindric,  $\sim 1$  in. long, densely hirsute; teeth linear,  $\sim 1$  in. long. Corolla hairy,  $\sim 1$  in. long; segments ovate-oblong, subacute. Filaments filiform, slightly hairy ; anthers oblong, the appendage to the connective slightly dilated at the apex. FEMALE FLOWERS : Peduncle (in fruit) stout,  $\sim 1$  in. long. Fruit subglobose,  $1-1 \frac{1}{2}$  in. long and nearly as broad, longitudinal! v striped with green and white, echinate, the spines not or scarcely pungent,  $\sim 1$  in. long. Seeds ellipsoid, not margined,  $\sim 1$  in. long. Fl. B. 1. v. 2, p. 619 ; "Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640.

In the Bombay Presidency confined to Sind. SIND : *Dalzell* & *Gibson*, p. 103 (under *Cucumis pitbescens*), *Jalzell*, 361, *Stocks*, The Hub, near Karachi, *Bhola lhiran* 1; Mulir, *Woodrow* 1—DISTRIB. India (Sind); Beluchistan, Arabia, Tropical Africa.

*Cucumis sativus*. Linn. The Cucumber (VERN". *Kakri*; *Khira*), DeCandolle considers N. India to be the original home of this plant. It is cultivated widely throughout India. Duthie & Fuller, 'Field and Garden Crops' (1882), give good figures (tt. 51 & 52). See also Watt, Diet. Econ. Prod. v. 2, p. 632.

## 6. CITRULLUS, Schrader.

Perennial herbs usually trailing. Tendrils 2-3-fid, rarely undivided. Leaves deeply 3-7-lobed, the lobes usually lobulate. Flowers rather large, yellow, monoecious, all solitary. MALE FLOWERS: Calyx-tube broadly campanulate; lobes 5. Corolla 5-partite beyond the middle, subcampanulate ; segments oblong-ovate, obtuse. Stamens 3; filaments short, free ; anthers scarcely cohering, one 1-celled, the others 2-celled, the cells linear, flexuose, the connective not produced. Pollen smooth.

LXH. *ovcuRmrxczjE*.

Rudimen  
as in the  
ovoid, 3-p  
thick, r  
Seeds y  
terrane

uniform. FEM, V u; FLO WEES : Calyx and  
corolla  
male Rudimentary stamens 3, setose or ligulate,  
Ovary  
horizontal; style abort; stigmas 8  
Fruit globose or ellipsoid, smooth, fleshy,

**indehiscence,**

Y > much compressed, smooth.—DISTBIB. Eastern JVfedi-  
M. ^gioa, Tropical Africa, Western Asia; species 3.

Colocynthis, Schroder, in Linnm, v. 12 (1838) p. 414.

kranelwT^-' root perenni^a^; steins diffuse or creeping, slender, angled,  
U&vI^ birsute w scabrid. Tendrils simple or 2-fid, slender, hairy.  
c<<^-ivatTy Variable! 1~2; bX l~2 <<• in \*he wild form (larger in tlu?  
Sfi^abr?d ?n6^ n8Ua^7 deltoid in outline, pale-green above, ashy beneath,  
3obe t? o? Otb sur^ces, 5-7-lobed or very commonly 3-lobed, the middle  
toente V4^ar^est^ eacii io^e deeply pinnatifid or sinuate-lobulate, the sep-  
fcirsut S6; petioles 2^1 ilu (ionger in the cultivated form), densely  
<\*mta^! \* ALE FLOWELIS : Peduncles |4 in. long, villous. Calyx hairy,  
lonJ 1 l' t m' JonS ; ^eth lanceolate, i in. long. Corolla 1 in.  
OvSrSr^yH^low5 ee^gi<<ents obovate, apiculate. PEMALE TLOWEKS':  
iu diim P8o\_ ' dense^ hair^ Frilit globular, slightly depressed, 2-3 in.  
drv vanfgated green and white, glabrous when ripe, filled with a  
brm pOnR^vei7 titter Pulp; epicarp thin. Seeds 1-| in. long, pale  
o!!' 1:L B- I- v- 2» P- <<20; D»la. & Oibs. p. 101 ; Wight, Icon.  
^4^<< ; Aitch. Pb. & Sind Fl, p. 64; Trim. FL Ceyl, y. 2, p. 253 ■  
in -Tourn. Bomb. Nat. v. 11 (1898) p. 640; Dathie & Fuller, and  
Gard. Crops, t, 57; Watt, Diet. Econ. Prod. v. 2, p. 328 w

**y**

I^VOXKAN: Salsette jungles, Graham. DKCCAN : Graham, Dahdl \$ Gibson,  
Choke\*, Moodrow] GtriABAt: Graham (sea-shores), 7>rt^e/^<f (?Aw<<, Stocks',  
Wbodraw [  
nr»: <to«A»t; Sebwan, C'ooi-e!—DISTKIB. Throughout India, wild  
or Cultivated; Ceylon, W. Asia, Arabia, Africa, Spain.  
Colocynth-is, Linn. Sp. PL (1753) p. 1011 ; Grab. Cat. p, 77.™  
owers : Nov.-Jan. VJSBS. Kadu-vrindavun ; Kadu-indrdyan,

/ , The Water M4pn(VEBSr. Tarbuj; Kalingad).

The plant is indigenous in Tropical Africa, but is extensively cultivated  
i most warm countries. Duthie & Puller, 'Eield and Garden Crops'  
[1882), give figures of the typical plant (tr. 55 & 5G) and of the variety  
g ftstulosus, Stocks (t. 47)." See also Watt, Diet. Econ. Prod. v. 2,  
iJ31, and AVoodrow, Gard. in Ind, ed, 5, p. 331,

**7. COCCIWIA, Wight & Arn. Prodr. (1834) p. 347.**

CEPIIALASDRA, Schrad. in Eckl, & Zeyh. Euum. PI. Afr, Austr,  
(1836) p. 280.

Slender scandent or prostrate herbs ; root often tuberous. Tendrils  
snder, simple. Leaves petiolate, deltoid or subrotund, angled or lobed,  
tmetimes glandular beneath. Flowers rather large, whire or jellow,  
**RioBcious.** MALE FLOWERS solitary, or subeymose at the apex of  
a leduncle. Calyx sbort, campanulate or turbinata; limb  
**5-lobed.** Corolla campanulatr, shortly o-fid. Stamens 3 ; filaraents  
connate into column, rarely free ; anthers connate into a capitnlum or  
cohering, the cells conduplicate. Budinaentary ovary 0.

~~FEMALE FIIOWXIRI Calyx and oorolia as in the noale.~~



short or long. Ovary ovoid or ellipsoid, 3-placentiferous ; ovules oo , horizontal; style slender; stigmas 3, bifid. Fruit baccate, ovoid or ellipsoid, indehiscent. Seeds many, ovoid, compressed, margined ; testa smooth or scrobiculate.—DISTRIB. Tropical Asia, Tropical and South Africa ; species 13.

The genus was established as *Coccinia* by "Wight & Arnott in 1834, two years prior to the publication of the genus as *Cephalandra* by Schrader.

1. ***Coccinia indica***, *Wight & Arnott, Prodr.* (1834) p. 347. Perennial, scandent or prostrate, much branched; root thick; stems grooved, slender, glabrous. Tendrils slender, striate, simple. Leaves 2-4 in. long and broad, bright-green above, paler beneath, studded and sometimes rough with papillae, palmately 5-nerved from a cordate base, often with circular glands between the nerves, obtusely 5-angled or sometimes deeply 5-lobed, the lobes broad, obtuse or acute, apiculate, more or less sinuate-toothed ; petioles 1/2-1 in. long. MALE FLOWERS : Peduncles 1-flowered, 1/2-1 in. long, subcylindrical. Calyx-tube glabrous, broadly campanulate, 1/2-1 in. long) teeth 1/2 in. long, linear. Corolla 1 in. long, veined, pubescent inside, glabrous outside ; segments 1/2-1 in. long, triangular, acute. Staminal column glabrous; capitulum of anthers subglobose. FEMALE FLOWERS : Peduncles 1/2-1 in. long. Stamines 3, subulate, 1/2 in. long. Ovary fusiform, glabrous, slightly ribbed. Fruit fusiform-ellipsoid, slightly beaked, 1-2 by 1/2 in., marked when immature with white streaks, bright scarlet when fully ripe. Seeds somewhat obovoid, rounded at the apex, slightly papillose, much compressed, yellowish-grey. *Grab. Cat.* p. 78; *Dalz. & Gibs*, p. 103; *Hook. Icon. Pl.* v. 2 (1837) t. 138 ; *Wight*, 111. t, 105\* (bis). *Cephalandra indica*, *Naud.* in *Ann. Sci. Nat.* ser. 5, v. 5 (1866) p. 16; *C. B. Clarke*, in *Hook. f. Fl. 13. I.* v. 2, p. 621 ; *Trim. Fl. Ceyl.* v. 2 p. 247; *Woodr. in Journ. Bomb. Nat.* v. 11 (1898) p. 640; *Watt, Diet. Econ. Prod.* v. 2, p. 252. *Bryonia cordifolia*, *Linn. Sp. Pl.* (1753) p. 1012. *Coccinia cordifolia* Cogniaux, in *DC. Monogr. Phan.* v. 3 (1881) p. 529,—Flowers ; Aug.,-Sept, VERN. *Tondli*.

DECCAN : *Woodrow*. S. M. COUNTRY : *Badanri, Cooke I; Belgaum, Ritchie*, 306! GUJARAT : *Eajkot, Woodrow*. SIND : *Mulir, near Karachi, JBhola Puran!*—DISTRIB. Throughout India; Ceylon, Malaya, Tropical Africa.

## 8. MELOTHRIA, Linn.

Slender scandent or prostrate herbs, annual or with a perennial root monoecious or very rarely dioecious. Tendrils simple, rarely binomial. Leaves usually membranous, entire or more or less lobed. Flower small, yellow or white. MALE FLOWERS racemose or corymbose, the commonly fascicled or solitary. Calyx<sup>1</sup> campanulate, 5-toothed. Corolla deeply 5-partite; segments entire. Stamens 3, inserted on the tube (rarely at the base) of the calyx ; filaments free ; anthers free or rarely, slightly cohering, one 1-celled, the others 2-celled or sometimes a 2-celled. the cells straight, rarely curved, the connective sometimes produced. Rudimentary ovary globose or annular, rarely 3-lobed. FEMALE FLOWERS solitary, fascicled, or corymbose. Calyx and corolla as in the male. Stamines 3 or 0. Ovary ovoid, globose or fusiform\* 3-placentiferous, constricted beneath the flower ; ovules



usually

surrounded at the base by  
 an  
 stigmas 3, linear, rarely 2, or stigma 3-lobed.  
 Fruit ovorcl\* globose, ovoid or fusiform, usually many-seeded.  
 Seeds robic<sup>01</sup>" P<sup>so^</sup>> compressed, usually margined, smooth  
 or rarely I'he<sup>U</sup> —DISTRIB. Warmer regions of the globe; species  
 54. 88n ^Gnus ^as Deen enlarged by Oogniaux (DO. Monogr. Phan. v. 3  
 \*^)^ 80 as to include the genera *Muhia*, Arn., and *Zehneria*, a course  
 which has been followed by Jackson in 'Index Kewensis.'

Endl

Male flow<sub>ei,s</sub> fascicled.

<eds smooth; leaves softly vilious beneath ..... 1. *M. Uiosperma*,  
 3 scvo^acu^te ; leaves hirsute or **gcabrid** beneath. 2. itf. *maderaspat*

fl scvo^acu^te ; leaves hirsute or **gcabrid** beneath. 2. itf. *maderaspa* tana.

D<sup>o</sup>.weps aubmbellate at the apex of the **pp** 4.  
 peduncle . 3. *M. perpusilla*. *M. keterophylla*.

O"»oiou8 4 *M keterophyl*

881) el<sup>otliria</sup> leiosperma, *Coynimix*, in DO. Monogr. Phan. v. 3  
 P' Monoecious ; stems hispid, furrowed, slightly

branched;

2-3JJ<sup>o</sup>.par<sup>J</sup>s densely and softly villous-hairy. Tendrils simple.

Leaves

in 'oLi<sup>y</sup> \*~<sup>a</sup> in-» bright-green above, paler beneath, broadly

ovate

] \*fi<sup>aeute</sup>» C01" d<sup>ate</sup> at the base, scabrid and coarsely hairy above,  
 ^f- v . beneat<sup>h</sup>, usually 5-angled or slightly 3-5-lobed, strongly  
 a e» petioles |-2 in. long, densely hairy. Flowers axillary. MALE

w^BS fascicled ; peduncles very short. Calyx densely hairy; tube  
 8 . long, campanulate ; teeth linear-subulate, ^-^ in. long.

Corolla

pubescent outside; segments ovate-oblong, |- in. long. Anthers

sub-

®ssile obl th ti ht i l t FE

c\*othed with long hairs. Ovary densely hairy. Fruit £ in. in  
 globose, glabrous or slightly hairy. Seeds ellipsoid, ^ by A by j<sup>1^</sup> in.,  
 f'turgid, conspicuously margined, smooth on the faces. Jackson, &  
 'Index Kew. v. 3, p. 203. *Mukia leiosperma*, Wight, in Ann. Mag.

Nat,

Hist. v. 8 (1842) p. 288 ; C. B. Clarke, in Hook. f. Fl. B. I. ? . 2, p. 62X ;  
 Trim. PL Ceyl. v. 2, p. 255.—Flowers : July-Aug.

"Rare. KOKKAN: SCatfaeran, *S. M. Birdwood*. DECCAN: Eolhapur,

*Cookel*—\*

DISTRIB, India (W. Peninsula); Ceylon.

2. *Melothria maderaspatana*, *CognioMtf*, in DO. Monogr. Phan. /.  
 3 (1.881) p. 623. Annual, monoecious; stems seudent or prostrate,  
 slender, much branched, angular, very hispid; young parts densely  
 hovered with white hair. Tendrils simple, striate, sparingly hirsute,  
 Reaves variable in size, 1-5 by 1-4 in., deltoid-ovate, entire, 5-angled  
 or 3-5-lobed, very scabrid above, scabrid or shortly hispid beneath,  
 icute at the apex, cordate at the base with a wide sinus, the lobes often  
 )verlapping, the margins dentate or subserrate; petioles \-l in. long,  
 hairy. MALE IXOWI%S in small fascicles on very short  
 peduncles, balyx hairy; tube -^ in. long, narrowly campanulate;  
 teeth about ^\*in. long, subulate". Corolla pubescent;  
 segments ovate-oblong, 'founded at the apex, y<sup>1^</sup> in. long. FEU ALE  
 FLOWEKS almost sessile. Fruit the size of a pea, smooth or slightly

echinulate, at first green and variegated with yellow, finally wholly red. Seeds ellipsoid, compressed, not or scarcely margined, scrobiculate on both faces. Jackson, in *Index Kew.* v. 3, p. 203. *Mukia scabrella*, Am. in Hook. *Journ, Bot.* v. 3 (1841) p. 276 ; C. B. Clarke, in Hook. *f. Fl. B. I.* v. 2, p. 623 • Dak &

2,

Gibs, p. 100 ; Aitch. Pb. & Bind \*1. p. 64 ; Trim. Fl. Ceyl. v. 2, P<sup>^</sup>J  
Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640 ; Watt, Diet.  
Jieon-Prod. v. 5, p. 287. *Bryonia scabrella*, Linn. f. Suppl. p. 424;  
bran, oa . p. 78 ; Wight, Icon. t. 501. *Cucumis maderaspatanus*,  
Linn. bp. (1753) p. 1012.—Flowers: July. VEEN. G<sup>^</sup>iratf.

Very common in hedges, Dalzell # 0/6«w. KONKAN: common about Bombay  
in the rains, Graham. DECCAN : common, Cooke!, Woodrow!; Kolapur, c <w •;  
Hotgi, Woodrow ; Hornbal, Woodrow I; hills near Poona, Woodrow. S. M. °°U\* !  
Belgaum, 2?tfcAi«, .-116!; Badami, Cfcote! GUJARAT: Dakor, Woodrow.  
&><sup>v</sup>-Stocks.—DISTRIB. Throughout India ; Cejlon, Africa, Malaya, Australia.

3. **Melothria perpusilla**, Cognicmv, in DC. Monogr. Than. v.  
(1881) p. 607. Monoecious, climbing; root an oblong flattened  
tuber;

stems deeply striate, glabrous. Tendrils simple, striate, glabrous. Leave  
^

broadly ovate in outline, 1 j-3| in. long and as broad or sometimes broadei  
than long, acute or shortly acuminate and inucronate at the apex, usually \*"  
angled, the angles at the base rounded, the margins distantly toothed, tn&  
upper side usually rough with scabrous spots, the lower side smooth and  
prominently veined, base subcordate or nearly truncate; petioles f-1 <sup>1D\*</sup>  
long. MALE FLOWERS 3-10 at the apex of a peduncle, f-1f in.

long,

capitate or in subumbellate racemes ; pedicels short, filiform.

Calyx-

tube TJV—pf in. long, oampanulate, rounded at the base ; teeth very  
short, recurved. Corolla pale-yellow; segments | in. long,

ovate-

oblong, subacute, slightly hairy within the throat. Filaments  
hairy.

FEMALE FLOWERS solitary or rarely subumbellate ; peduncles 3-3 <sup>in-</sup>  
long, in the same axils as the males. Ovary globose. Fruit  
saiootn,

globose,, minutely pitted, red when ripe, |-| in. in diam. Seeds  
many,

much flattened, smooth. Jackson, in Index Kew. v. 3, p. 203. ^

*Bryonia*

*per-pusilla*, Blume, Bijdr. p. 926. *Zehneria Hookeriana*, Arn, in  
Hootf.

Journ. Bot. v. 3 (1841) p. 275 ; C. B. Clarke, in Hook. f. Fl. B. I. v. 2,<sup>1</sup>  
p. 624 (exclud. syn.) ; Trim. Fl. Ceyl. v. 2. p. 256. *Bryonia*

*maysorensis*,

Wight, Icon. t. 758 (not of Wall!); Dak & Gibs. p. 101.

*Zehneria*

*Baueriana*, Woodr. in Journ. Bomb. !S<sup>f</sup>at. v. 11 (1898) p.  
640.—

Flowers : June-Nov. VERN. *Vardli*.

KONKAN: *Stocks* !, *Law* !; Wari country, Dalzell \$ Gibson ; Ambeghut, Woodrow !;  
Mahableshwar, abundant, Cooke!, Woodrow I, H. M. Birdwood.—DISTRIB. India  
(N. Bengal, Sikkim, Assam, Khasia, W. Peninsula); Ceylon, Malaya, Africa.

I

4. **Melothria heterophylla**, Cogniaux, in DC. Monogr,  
*Phan*,

v. 3 (1881) p. 618. Dioecious; root perennial, consisting of  
severa\*  
tubers; stems slender, branched, furrowed, glabrous. Tendrils simple  
Leaves 3-6 in. long, polymorphous, regularly ovate, or 3-5-angled or  
lobed, or hastate, acute or acuminate, usually cordate at the  
base  
generally scabrid and pale-green above, paler or cinereous and reticu-  
lately veined beneath, margins remotely denticulate; petioles 5-g in.  
long, pubescent. MALE FLOWERS subumbellate, 15-20 on a peduncle  
^| in. long; pedicels filiform, ^-^ in. long. Calyx glabrous;  
tube  
campanulate, rounded at the base, ^—^ in. long; teeth minute, subulate.  
Corolla small, yellowish-white; segments triangular, acute, y<sup>1</sup>-^ in. long,  
Filaments slender, subglabrous, ^ in. long. FEMALE  
FLOWERS:  
Peduncles solitary, £-£ in. long. Ovary narrowly oblong,  
glabrous  
or more or less pubescent, 10-ribbed. Fruit 1^2 in. long, oblong-ovoid,  
pylindric, tapering towards the apex, ribbed, bright r\*d when  
ripe,

j. u. i<sup>s</sup> ovoid or subglobose, scarcely compressed, smooth, white. \*n r! ?<sup>11</sup> in \* "dex Kew. v. 3, p. 203. *Bnjoma wnbellaia*, Klein, in Willd!

<sup>^1</sup> \*1. v 4 rv ftIQ r^ 1\_ /"i i. \*7Q T^ 1 P/ " < " L 1A1  
ir. \* \* p < o i o ; It ran. Lat. p. to ^ JJaiz. < x iriDs. p. Jol. *JZehneria* \*Wa<sub>9</sub> Miq. Fl Ind. Bat. v. I, part I, p. 656 ; Trim. Fl. Ceyl. v. 2, rr', <sup>b</sup>\* *Zehneria umbeUata*, Thwaites, Enum. p. 125 ; C. B. Clarke in < JROO \ <sup>FL B' I\_ v\_</sup> 2' P- 625 Woodr. in Journ. Bomb. Nat. v. II Tii <sup>P' 64o ; Wattj Dict\*</sup>  
Econ\* Pro(L v' 6 > part 4 > P' 855 —blowers :

e. VKIUST. *gomeim*

e leaves are of very variable shape. Cogniaux (*I. c.*)

C o e n f f <sup>8foc & sl.</sup> Law I-, Neral, *Bklval*; Amboli Ghat", *Kanit/carl* (all of *JBhin TJJ* \* form <sup>^\*</sup> ^BCCAN: Mahableswar, *Cooke\ Woodrow!* (form 1); Karli (form *ir* <sup>TM</sup> 2); Kadkala, <sup>^</sup>irw! (form 8). S. M. COUNTRY: *Bitchie*, 3081 <sup>Q</sup> A).—DISTHIB. Throughout India; Ceylon, China, CochinChina, Java,

<sup>9^</sup> **BLASTANIA**, Kotschy & Peyr. PL Tinn. (1865-66) p. 15, t. 7.

<sup>^</sup>TENOLEPIS, Hook. f. in Benth. & Hook. Gen. Pl. v. 1 (1867) p. 832.  
di <sup>Ar° fSt; rat\_</sup> or <sup>8Canclent</sup> annual herbs. Tendrils simple.

Leaves

gigately 5-7-lobed or -partite. Bracts stipuliform, in the axils of the

aves, toothed or pectinately ciliate. Flowers minute, monoecious.

distinguishes <sup>no</sup> less than 12 different forms. Calyx tube short, com

pannlate ; Jobses 5, subulate, very small. Corolla rotate, deeply 5-partite. anthers 3, inserted on the calyx-tube, free ; filaments remote, very short; anthers small, one 1-celled, the others 2-celled, the cells short, straight, the connective not produced. Rudimentary ovary 0. FEMALE FLOWERS solitary, in the same axils as the males ; peduncle short. Calyx and corolla as in the male. Staminodes 0. Ovary ovoid, 2-3-placentiferous ; ovules few, horizontal; style columnar, without a basal disk ; stigmas 2 (rarely 3). Fruit fleshy, globose or obliquely sub-quadrate. Seeds few, ovoid, much compressed or boat-shaped, the margins obtuse or acute; testa smooth.—DISTHIB. Tropical and subtropical Asia, Tropical Africa; species 2.

Fruit globose .....\* ..... 1- *B. fimbristipida*.

Fruit inversely reniform or hammer-shaped ..... 2. *B. Garcini*.

1. **Blastania fimbristipula**, Kotschy Sf Peyr. *Pl. Tinn.* (1865-66) p. 15, t. 7. An extensive climber ; stems subterrestrial, elongate, much-branched, grooved and angled, glabrous, smooth or slightly

scabrid. Tendrils slender, elongate, striate, simple. Leaves membranous, 1<sup>^</sup>-4 in. long and broad, scabrid on both surfaces with white spots, usually 3-partite (rarely 5-lobed), the segments ovate-oblong' or lanceolate, acute, narrowed at the base, denticulate or crenulate, the lateral segments more or less 2-lobed, the intermediate segment entire or 3-lobed, often with a long mucro; petioles | -1 | in. long, slender, grooved, hirsute, at length scabrid with white spots. Stipular bracts \ - \ in. long, orbicular, reniform or dimidiate, scabrid with minute white spots, ciliate with hairs as long as the breadth of the bract. MALE FLOWERS 5-10 at the apex of a glabrous filiform peduncle | -1 | in. long; pedicels ebracteate, - ^ - J in. long. Calyx-teeth minute. Corolla minute; segments ovate-oblong, obtuse, spreading. FEMALE FLOWERS solitary ; peduncles short. Fruit sessile, globose, scarlet, glabrous, \ in. in diam. Seeds 2, ovoid, \ in. long, f ^ - ± - in. broad,

smooth, yellowish-grey, convex on one side, deeply concave on the other, edge sharp. Jackson, in Index Kew. v. 1, p. 311. *Ctenolepis cerasiformis*, Hook. f. in Oliv. Fl. Trop. Afr. v. 2, p. 558; C. B. Clarke, in Hook. f. Pl. B. I. v. 2, p. 630; Woodr. in Journ. Bomb. Nat. v. U (1898) p. 641. *Zehneria cerasiformis*, Stocks, in Kew Journ. Bot. v. \* (1852) p. 149; Dalz. & Gibs. p. 100; Aitch. Pb. & Sind Pl. p. 65.

GUJARAT: Balzell; Verawul (Kathiawar), Woodrow; SIND: Dalzell, Stocks ex Aitchison.—DISTRIB. Tropical and S. Africa, Arabia.

2. **Blastania Garcini**, Cogniaux, in DG. Monogr. Than, v. 3 (1881) p. G29. Climbing; stems slender, elongate, striate, branched, glabrous. Tendrils capillary. Leaves membranous, 1-2 in. long and broad, a first hirsute, afterwards scabrid with white spots, deeply 3-5-lobed, the lobes usually obovate, obtuse or acute, constricted at the base, denticulate or crenulately toothed, the intermediate lobe scarcely longer than the others, mucronate; petioles  $g-1\frac{1}{2}$  in. long, slender, striate, shortly hirsute, at length scabrid. Stipular bracts  $g-tV$  in. long, ovate or rotundate, shortly hairy, fringed on the margin with long filiform cilia—MALE FLOWERS yellowish-white, 3-4 at the apex of a slender peduncle less than  $\wedge$  in. long; pedicels  $J-T-T^{\wedge}$  in. long. FEMALE FLOWERS solitary on very short peduncles. Fruit broader than long,  $\setminus-\setminus$  by  $3-g$  in<sup>#</sup>» bright-red, glabrous, inversely subreniform or hammer-shaped. Seeds 1-1 by  $g$  in., oblong, yellowish-grey, rounded at the apex, slightly attenuated at the base, with a deep pit on one face, convex on the other, the edge thick and obtuse. Jackson, in Index Kew. v. 1, p. 3H» *Ctenolepis Garcini*, C. B. Clarke, in Hook. f. Pl. B. I. v. 2, p. 629; Trim. Fl. Ceyl. v. 2, p. 2oO; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 041; Watt/ Diet. Econ. Prod. v. 2, p. 626. *Zehneria Garcini*, Stocks, in Kew Journ. Bot. v. 4 (1852) p. 149; Dalz. & Gibs. p. 99; Aitch. Pb. & Sind Pl. p. 65.—Flowers: Oct.

DECCAN: Dhulia, Woodrow; GUJARAT: Surat, Woodrow; Ahmedabad, Raoji; Doms near Surat, Dalzell; Deesa, Stocks ex Aitchison; Kathiawar coast plentiful, Dalzell & Gibson. S. M. COUNTRY: Badaini, Bhiva!

10. **KEDROSTIS**, Medikus, in Phil. Bot. v. 2 (1791) p. 69.

EHY<sup>^</sup>cnocARPA, Schrad. in Linnsea, v. 12 (1838) p. 403.

Prostrate or scandent herbs; root perennial. Tendrils simple. Leaves entire or lobed. Flowers small, monoecious (rarely dioecious). MALE FLOWERS racemose or corymbose. Calyx-tube campanulate, usually glabrous within; lobes 5, short. Corolla rotate, 5-partite. Stamens 3 (rarely 5), inserted in the calyx-tube; filaments short, glabrous; anthers short, glabrous, one 1-celled, the others 2-celled (or when 5, all 1-celled), free or slightly cohering, the cells straight or slightly curved, the connective usually 2-fid or 2-partite, produced beyond the cells. Eudimentary ovary 0 or glanduliform. FEMALE FLOWERS sessile, solitary or aggregated, shortly pedicelled. Calyx and corolla as in the male. Eudimentary stamens\* 0 or 3, very small. Ovary usually ovoid, beaked, 2-3-placentiferous; ovules few, horizontal; style sometimes obscurely surrounded by a disk at the base; stigmas 2 or 3. Fruit baccate, ovoid, usually \* rostrate. Seeds usually few, tumid, margined; testa usually crustaceous, smooth.—DISTRIB. Tropical arid subtropical Asia and Africa; species 11.



*drostis rostrata*, Cogniaux, in *DO. Monogr. Phccn.* v. 3 (1881)  
 nairy 'rr, ca^lc^enfci^# monoecious; stems slender, branched, angled, sparsely  
 broad a 1 S s\*mPle^ nn^£orm\* glabrous. Leaves f-2 in. long and as  
 more 9 i ^ mem^rari0ll8» orbicular in outline, bright-green, hairy and  
 cordat^ or S sca^r^ 0ll DOtn sides, margins entire or distantly toothed,  
 Picul^f base, sometimes 5-angled or sublobate, the lobes subacute,  
 filifor I Pet^oles i~H^ m- 1^on»» hairy. MALE FLOWERS: Peduncles  
 J\_i^', 5'''! m- 1^on^> ~2-4-flowered at the apex; pedicels capillary,  
 PaniVf' g' usua% bracteolate at the base. Calyx hairy; tube  
 cam-seem f rounded at the base; teeth minute. Corolla  
 pale-yellow; w S^ok^long-lanceolate, acute, £-i in. lon%, pubescent.  
 FEMALE ER\; ■ Peduncles ^W in\_ long- Ovary oblong, beaked, pubescent.  
 ^68^6^ deep-red, about 1 in. long, ovoid, tapering into a long winr?\  
 k' pubescent. Seeds ^ in. long, ovoid, with a narrow sharp rout \  
 r?wn\* Jackson, in *Index Kevv.* v. 3, p. 4. *Rhyachocarpa* A  
 7' aud\* in Ann\* Sci« Nat\_ se'r\_ 4^ v\_ 16, P- 177; Kurz, in *Jouru.*

**T** ng\*(1877) part 2^ p. 105^ Trim. £L Ceyl^ v. 2^ p. 258.  
 } C^m foetida> C\_ B^ Clarke^ in Hook\_ f\_ ^ B\_ L\_ v. 2, p. 627 ^5 Woodr\_ in  
 Journ\_ Bomb\_ Nat. v. 11 (1898) p. 640; Watt, i^on> Prod> y> 6^ part  
 1? ^ 5(12> *Echmandra rostrata*, Aru. in  
 . Journ. Bot. v. 3 (1841) p. 274; Dalz. & Gibs. p. 100. *Bn/onia*  
 , fioxb. Hort. Beng, p. 104; Grah. Cat, p. 248.—Flowers: Sept.-  
 VEEN, *flurakvel*.

, *flurakvel*.

K.ONKAN: S. Konkan, *Nimmo ex Graham*; Miradonger near Pen, *Kanitkar I*  
 Y^U^A^RAT : common in hedges, *Dalzell & Gibson, Dalzell*, 38 ! S. M. COUNTRY :  
 Pad-shapur (Belgaum districts), *Bitchie*, 1761!—DISTRIB. India (VV. Peninsula,  
 Ava); Ceylon.

## 11. CORALLOCARPUS, Welw.

Prostrate or climbing herbs. Tendrils simple. Leaves roundish or  
 cordate, lobed or palmate. Flowers minute, monoecious. MALE

FLOWERS crowded at the apex of a long peduncle. Calyx-tube broadly campanulate; lobes 5, short. Corolla 5-partite ; segments ovate-oblong. Stamens 3, free, inserted on the calyx-tube; filaments very short; withers glabrous, entire or 2-partite, one 1-celled, the others 2-celled, the cells straight, the connective produced or not, often bifid. Rudimentary ovary 0 or minute. FEMALE FLOWERS sessile or shortly pedi-3elled, solitary or fascicled, sometimes subspicate. Calyx and corolla as fn the male. Kudimentary stamens 0 or minute. Ovary ovoid, beaked, 2-3-celled; ovules few, horizontal; style straight, without a basal disk; Stigma 3- (rarely 2-4-) lobed. Berry fleshy, ovoid or ellipsoid, rostrate >r 'obtuse, operculately dehiscent near the base. Seeds few, obovoid or ub^lobose, tumid.—DISTIUB. India and Tropical Africa ; species 15.

Seeds obovoid or pyriform, slightly attenuated at the base; steins slender.

Female flowers usually solitary ; seeds margined ..... 1. *C. epigaus*.

Females flowers usually fascicled or subspicate; seeds not margined ..... 2. *C. conocarpns*.

Seeds globose or subglobose, not attenuated at the base ; steins stout ..... 3. *C. velutinus*.

1. **Corallocarpus epigaeus**, *O. B. Clarke, in Hook. f. FL B. I. j. 2* (1879) p. 528. Prostrate or climbing, monoecious; root large.

turnip-shaped ; stems slender, grooved, zigzag, glabrous. Tendrils simple, slender, glabrous. Leaves suborbicular in outline, f-3 in. long\* usually a little broader than long, light-green above, paler beneath, shortly roughly hairy on both surfaces, deeply cordate at the base, angled or more or less deeply 3-5-lobed, the lobes usually lobulate and obtuse, sometimes apiculate, more or less irregularly dentate on the margins; petioles |1| in. long, glabrous. MALE FLOWERS small, 5-15 at the apex of a straight stiff glabrous peduncle li-2J \*n. \*on&' pedicels filiform, yV~iV in. long. Calyx slightly hairy ; tube TV iQ. \*onO' slightly rounded" at the base; teeth minute,\* erect, distant, subulate. Corolla greenish-yellow; segments -^ in. long. Anthers yellow , connective green, produced beyond the cells, bih'd. FEMALE FLOWERS usually solitary ; peduncles short, stout, glabrous. Emit stalked, g-1<sup>u#</sup> long (including the beak), ellipsoid or ovoid, suddenly contracted into a slender beak \ in. long, scarlet in the middle, the base and beak green. circumscissilely dehiscent at the junction of the green and red portions near the base. Seeds 6-9, in orange-colored pulp, pyriform,  $\frac{1}{8}$ - $\frac{1}{8}$  by  $\frac{1}{12}$ - $\frac{1}{10}$  in.. turgid. brown. with a whitish corded margin. Trim. Fl. Ceyl. 258; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 641. •*Bryonia epigcea*, Wight, Icon. t. 503. *JErhimandni epigcea*, Am. in Hook. Journ. Bot. v. 3 (1841) p. 274; Dalz. & Gibs. p. 100.—Flowers: June-Aug. VEEN. *Karvina*; *Kannuyli*.

DECCAN : *Dalzell* & *Gibson* ; Poona, *Woodrow* I GUJARAT : *Dalzell*, 40 I S\* ^r\* COUNTRY : Badami, *Bhiva* I; *Karlimatti*, *Cooke* I; Kakti hills near Belgaum, *Ritchie*, 1076! SIND: *Dalzell*, 40!—DISTRIB. India (Panjab, Sind, Gujarat, W. Peninsula); Ceylon.

2. ***Corallocarpus conocarpus***, *C. B. Clarke*, in *Hook. f. FL B. I*-v. 2 (1879) p. 628. Climbing, monoecious; stems slender, striate,

glabrous. Tendrils simple, slender, glabrous. Leaves 2-2| by li-^1 in.,

pale-green above, ash-colored beneath, both surfaces and especially

the lower clothed with minute white hairs (scarcely scabrid), cordate at the base, deeply palmately 3-5-lobed, the lobes oblong-lanceolate, acute or acuminate, the terminal lobe the longest much contracted at the base; petioles |— 1^ in. long, slender, rugulose. MALE

FLOWERS

6-15 at the apex of a slender glabrous peduncle |-1\$ in. long ; pedicels filiform, ^V~TV ^n\* I^n£- FEMALE FLOWERS fascicled or subspicate.

Fruit glabrous or slightly pubescent, sessile, fascicled or sometimes subspicate, conical-oblong, not suddenly contracted into the beak, orange-red except the cup-shaped base which remains green. Seeds

pyriform,

turgid, ^-^ by TVTV ^D-» dark-brown (nearly black), not margined.

Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 641. *jEchmandra ceno-carpa*, Dalz. & Gibs. Bomb. FL p. 100.—Flowers: June-Aug.

Bare. GUJARAT : *Dalzell* (in *Herb. Kew.*), 39!; Malpor and Gundar, *Dalzell* & *Gibson*. There is a single specimen from *Herb. Stocks* at Kew without locality.

3. **Corallocarpus velutinus**, *Benth.* § *Uook. f. Gen. Pl.* v.  
1  
(1862-67) p. 831. A stout climber; root fibrous ; stems stout, angular,  
hairy, deeply grooved,\*not much branched. Tendrils very long, striate,  
simple. Leaves fleshy, suborbicular in outline, 2-3 in. long and  
as  
broad as long, pale-green and at first softly villous, finally scabrid above,  
tomentose and ashy-grey beneath, cordate or subtruncate at the base,  
deeply palmately 3~5-lobed, the lobes rounded or oblong,  
sometimes

**Stout U\_o?** <sup>tertmna1</sup> lobe the longest), irregularly denticulate ; **petioles** **raceme** <sup>m\*</sup> <sup>\*ou&></sup> **densely hairy**. MALE ELOWJ-ES in 15-20-flowered *tyfiohn* <sup>J1</sup> <sup>t^e.loP</sup> of a hairy slender peduncle 2-4 in. long; pedicels <sup>J</sup> <sup>in</sup> <sup>!</sup> <sup>TiT</sup> <sup>"i</sup> in. long. Calyx shortly hairy; tube subhemispheric, <sup>■</sup> <sup>ollg</sup>; teeth, narrowly triangular, less than <sup>^</sup> in. long. Corolla <sup>iiibse v^w</sup> <sup>'</sup> <sup>segra</sup>ents ovate-oblong, **subaeute**, <sup>-, \-</sup> in. long. Anthers <sup>Wi</sup> <sup>]8J</sup>) <sup>i]</sup> <sup>conne('</sup>tive scarcely produced, bifid. **FEMALE FLOWEKS**

**Fruit** | in. long ( <sup>n c l g</sup> ), <sup>ellioo ^.1'</sup> **finely** <sup>r i</sup> <sup>e i 3 1 ^</sup> **arrowed** into a beak about | in. long, red when ripe, <sup>■</sup> <sup>velvety</sup>. Heads \$ in. in diam., **globose**, margined. Fl. B. I. v. % <sup>^ l t i l</sup> <sup>\</sup> <sup>ootlr</sup>; <sup>m</sup>, <sup>Jour</sup>»- Bomb. Nat. v. 11 (1893) p. 641. *JSchmandm*

<sup>■</sup> <sup>HinL^</sup> <sup>su</sup> **bsessile**. Fruit | in. long (including the beak), <sup>sessile</sup>,

SIHD: <sup>conflnedf0</sup>

*Dalzell*, 41!; Karachi, Ctoofol—DISITBIB.

12.

**DICCELOSPERMUM, C. B. Clarke.**

<sup>ol</sup> <sup>.scabrid</sup> <sup>seandent</sup> slender herb. Tendrils simple. Leaves <sup>petiolate</sup>, <sup>Wm</sup> <sup>e C'ol</sup> <sup>or</sup> <sup>sllo</sup> <sup>bas\*a\*e-</sup> Flowers white, minute, <sup>shortly</sup> <sup>pedicelled\*</sup>

<sup>s |.</sup> <sup>eiott\$</sup>, the males and females in the same axils. MALE <sup>FLOWEBS</sup> <sup>Co</sup> <sup>J7</sup> <sup>or</sup> <sup>^l?clc^A^\*</sup> Calyx-tube short, campanulate; teeth 5, minute. <sup>J1</sup> <sup>olia</sup> deeply 5-partite ; segments entire, triangular-ovate. Stamens 3, <sup>ee</sup> > inserted on the calyx-tube; filaments very short; anthers oblong, <sup>°tts</sup> <sup>\-</sup> celled, the others 2-celled, fche cells straight, connective narrow, <sup>^</sup> <sup>areely</sup> produced at the apex. Budimentary ovary <sup>giandulil'orm.</sup> <sup>^</sup> <sup>KMALE</sup> <sup>FLOWEH8</sup> unknown. Fruit dry, depressed-globose, 1-celJed. <sup>^eds</sup> 3, erect, inserted ; <sup>tt</sup> the bottom of the cell.—DISTKIB. India Peninsula), apparently endemic.

<sup>rl.</sup> *Dicoelospermum Hxtchiei*, *G. B. Clarice, in Hook, /. Fl. B. /. ■. 2*, p. 630. Stems elongate, not much branched, grooved, scabrid. Tendrils slender, elongate, striate, sparingly hairy. Leaves 1|-3 in. long and about as broad as long, deep-green and sparingly hirsute above, paler, hirsute and at length scabrid beneath, denticulate, usually orate-siibtriangular and slightly 3-lobed, the lateral lobes very short, acute, <sup>^</sup> <sup>divergent</sup>, the terminal triangular, acute or acuminate ; petioles f-1| in. »ng, very scabrid (almost echinulate). MALE <sup>PXOWEKS</sup> fascicled ; luncles filiform, <sup>T</sup> <sup>V4</sup> <sup>in-</sup> <sup>longS-</sup> <sup>hair^</sup> Calyx-tube -fo in. long ; teeth t, subulate, X in\* long. Corolla pubescent; segments subaeute, <sup>>.\</sup> long. FEMALE <sup>FLOWBBS</sup> not seen. Fruit sessile, glabrous, smooth, <sup>Jrabiiccate</sup> at the apex, about 1 in. long and somewhat broader than long, led when ripe. Heads whitish-brown, J by £ by ^ in., broadly ovoid, impressed, slightly beaked, longitudinally ridged and slightly rugulose i the middle, containing 3 cavities, the central one enclosing the embryo, ie 2 lateral empty. Woodr. in Journ. Bomb. Nat. v. 11 (1698) p. 641. -Flowers : July-Sept. VffittX. *Gogara*.

<sup>R;ire</sup> *Stocks* (without loealif y) in Herb. *Kew. I* KONKAS : W. Gb4ts noar *Matfaeran, Yoodrow*, DKCCAX: **Amboyne**, 12 miles from Lanoli, *Woodrowl* S. M. COUNTRY: <sup>elaaiim,</sup> *Ritchie*, 310 !—**DISTRIB.** Apparently endemic. None of the specimens have **female** flowers, all having been collected *m* the **fruiting**

13. **ZANONIA**, Linn. Scandent glabrous or pubescent shrubs. Tendrils simple or ^ Leaves petiolate, ovate or oblong, entire. Flowers dioecious, all race ^ or the males paniced. MALE FLOWERS : Sepals 3, broadly ?<sup>blon</sup>S<sub>g</sub> or orbicular, membranous, concave. Corolla rotate, 5-partite, coriaceous ^ i ^ fleshy; the segments narrowed at the apex. Stamens 5, free, nis on a fleshy disk ; filaments very short and thick ; anthers transvers ^ oblong, adnate to the filaments, 1-celled. Eudimentary <sup>o/ar^</sup>er<sup>y</sup> FEMALE FLOWERS : Calyx and corolla as in the male. Staminodes <sup>j</sup> short, alternate with the petals. Ovary elongate, at first 3-cellea., length 1-celled by the absorption of the septa ; ovules 2-many m e cell, attached at both sides to parietal placentas, pendulous. Fruit c> dric, clavate or hemispheric, terete or sub-trigonus, truncate and u<sup>r0</sup> j 3-valved at the apex. Seeds large, pendulous, oblong, <sup>com</sup>r<sup>j</sup>^eS^J imbricate, surrounded by a large membranous wing.—DISTBIB. Ir<sup>o</sup>P Asia, Java; species 2.

1. **Zanonia indica**, Linn. *Sp. Pl.* ed. 2 (1763) p. 1457. Scandent, climbing to a height of 30-50 ft. Stems stout, cylindric, striate, woody, glabrous. Tendrils elongate, terete, glabrous. Leaves coriaceous, cie ciduous (leaving a prominent circular scar), 3-6 by 2-4 in., ovate-oblong acute, entire, bright-green and glabrous above, paler and couspicuous y reticulate beneath, 3-nerved from a rounded or slightly cordate base

somewhat stout, articulated aabout trie middle, τ<sup>^</sup>—£in. long, ui<sup>^^</sup> at the base. Sepals yL in. long, ovate, acute, concave, glabrous. Petals greenish-yellow, oblong, obtuse, ^ in. long, τ<sup>l</sup>y in. broad at the base. FEMALE ELOWEES in 5-12-flowered racemes 4-12 in. long. Sepal" broadly triangular, ^ in. long. Petals ovate-oblong, -J--3 in. long. Ovary cyliudric, h in. long. Capsule in shape like a candle-extinguisher. 2-4 in. long, cylindric-obconic, slightly tapering towards a rounded base, truncate at the apex, glabrous, pale yellowish-brown. Seeds much compressed, I by § in., pale-yellow, smooth; the wing 2-2i in. long by \ in. broad, rounded at the base and apex. Fl. B. T. v. 2, p. 633 ; Dalz. & Gibs. p. 99 : Wight, 111. t. 103 ; Trim. Fl. Ceyl. v. 2, p. 261; WooaVS in Journ. Bomb. J\Tat. v. 11 (1898) p. 641; Watt, Diet. Econ. Prof<sup>l</sup> v. 6, part 4, p. 322.—The fruit is ripe in May. VERN. *Chhyoti*.

Rare. *Stocks!*, without locality (Herb. Kew.). XONKAN: Vingorla, *Dahelly Woodrow*.—DISTKIB. India (Assam, E. Bengal, W. Peninsula); Ceylon, Java, Jtornei New Guinea, Malaya.

The following plants which do not belong to any of the genera in th preceding pages are cultivated:—

*Lagenaria vulcjaris*, Seringe, the Bottle-Gourd (VEEN. *Da<17ii\ ihulJnja Dudh-bliopald*), said by DeCandolle to be wild in India (Malabar and the moist forests of Dehra Doon), the Moluccas and Abyssinia, is cultivated throughout India and in tropical and warm regions throughout the world. There are several varieties distinguished chiefly by the fruit which assumes a diversity of shapes. One of these which is shaped like a flask is, when emptied and dried, largely used by the natives for toddy-

\*e- The fr! 'f SA CO)umonly carried by beggars as a receptacle for alms,  
 Us m<sup>uch</sup> as 90 Ik<sup>8</sup> eaten\_ when <sup>Λ</sup>UDΛ; when \*tll> ' if Pe it; often weighs  
*dudhya*) \* \*"<sup>ΛLU ^</sup> **edible** variety known as *Kudva-dudhya* (bitter  
 Garden P<sup>US</sup> for floatB b<sup>Λ</sup> fishermen. Duthie & Fuller (Field and Dal<sup>2</sup>  
 p £ pion and **figure**(t. 48). Fl. E. I. v. 2, p.  
**613;** P P J ( 8 )  
 |<sup>J</sup>-580!) *Tn* <sup>Wup]</sup> iu Ind\* eΛ' 5' P- y<sup>3i</sup> J **Watt**, Diet, Econ. Prod. v. 4,  
 A p-?ps) £<sup>Ive</sup> a description and **figure**(t. 48). Fl. E. I. v. 2, p. **613;** p 639  
 T<sup>Wup</sup>P<sup>1</sup>- P<sup>m</sup> J Woodr in Journ Borab Nat v 11 (1

\*\**moschata*, Duchesne, the Musk Melon (*Yum Kdla-hhopald*),  
 cultivated in India and in most tropical and subtropical ■  
 Its native country is unknown. The fruit is of various tor/<sup>0</sup>  
 1<sup>vate</sup> or SL<sup>1</sup>k<sup>1</sup> globose and depressed at the apex and base<sup>v</sup> less  
 ribbed, dark-green when young, covered with a delicate >tn when  
 ripe (*DuthU*). Duthie & Fuller (Field and Garden 4 plates (tt.  
 58-61). The **fruiting** peduncle is angular and

'alt, Diet. Econ. Prod. v. 3, p. 640.\*

*maxima*, <sup>Λ</sup>"Duchesne, the Melon-Pumpkin, Squash-Gourd,  
 (VB&jr, *Tamhada-bhopala; Kada*), is cultivated throughout  
 1 most **warm** regions of the world. The **fruit** is the largest  
 an<sup>Λ</sup> ced by the Cucurbitaceas, sometimes weighing 2 cwt. and  
 , 6 to 8 feet in circumference. **Woodrow** (**Qard.** in Ind. ed. 5<sub>r</sub>  
**Th** describes the mode **by** **which** very large fruit may be  
 grown.  
 \*fe **fruiting** peduncle is round and smooth. **FL B. I.** v. 2, p. 622 ;  
**Woodr.** in Journ. Bomb. Nat. v. 11 (1898) p. 640; **Watt**, Diet. Econ.  
 l<sup>r</sup>od. v. 2, p. (iSS.

/ *Cucurbita Pepo*, DC, the Pumpkin, Vegetable Marrow (VERN.  
*Kdshi-Sc>]iald; Kuala*), is cultivated, but not extensively, in the Bombay  
 Tresidency, where the commonly grown *Lacjenaria vulgari*\* (duihya)

P ;

( ) P

Gard. in Ind. ed. 5, p. 334 ; **Watt**, Diet. Econ. Prod. v. 2, p. 041.

three plants *Cucurbita moschata*, *C. maxima*, and *C. Pepo* are somewhat difficult  
 istinguish from one another. Duthie & Fuller (Field and Garden Crops, p.  
 58) i the following distinguishing i;Lutraeter8:—

The hairiness of *C. moschata* is harsher than **that**) of *C. maxima*, **but much less** so  
 ,n that of *C. Pepo*, which is decidedly pungent. The leaves of *O. mosehuia*  
**are** ally marbled with **whitish** blotches; not eo in *C. maxima*, rarely in *C. Pepo*.  
 Tlit\* .yx-segiments of tljo female flower of *C. 'moschata* are leaf-like, thoao of the other  
 two £bulate, while the glaucous bloom on the fruit of *O. moschata* is characteristic.

*Bmicasa cerifera*, Savi, the White Pumpkin or **White** Gourd-Melon  
 EiiN. *Bhura-kold; Kohald*), probably, according to DeCandolle,  
 a tive of Japan and Java, is cultivated more or less throughout India  
 d in many warm countries, but not largely in the Bombay Presidency,  
 he fruit, which is without ribs, softly hairy and covered when ripe  
**ith** a **waxy** bloom, is eaten as a vegetable and used in the manufacture f  
 a native sweetmeat. Dutbie & Fuller (Field and Garden Crops) give  
 ia figure (t, 45). **FL B. I.** v. 2, p. 616 ; **Woodr.** in Journ. **Bomb.**  
 l<sup>r</sup>at. v. **11** (1898) p. 640 ; **W<sup>r</sup>att**, Diet. Econ. Prod. v. **1**, p. 439.  
*Bemcasa Jus/ndu, Cogniaux, in DC. Mortogr.* Phan. v. 3 (1881) p. 513.

is-posed in preference. The fruiting peduncle is woody and strongly grooved. **EL B. 1.** v. 2, **p. 622**; Woodr. in Journ. Bomb. **IS<sup>T</sup>at. v. 11 (1898)** **p. 640**,



## ORDER LXIII. BEGONIACEE.

Succulent herbs, sometimes shrubs; stem sometimes with rhizome or tuber. Leaves alternate, more or less inequilateral lobed or digitately partite, usually dentate; stipules 2, tree, caducous. Flowers handsome, white or rosy (rarely yellow). unsymmetrical, monoecious; peduncles axillary, bracteate, dichotomous 1- or 2-sexual cymes; bracts and bracteoles opposite. MALE FLOWERS: Perianth-segments (of the only genus) 2 or 4 in pairs, the outer pair valvate, the inner (when smaller. Stamens numerous, inserted on a more or less convex filaments free or connate; anthers linear-oblong or clavate.

mentary ovary 0. FEMALE FLOWERS: Perianth-segments 2-5, or the 2 exterior are larger and sepaloid. Stamens 0. Ovary usually 3- (rarely 2- or 4-) celled; ovules numerous, crowded on placentas; styles 2-4, free or connate at the base; stigmas branched or tortuous. Fruit capsular, loculicidally (rarely septicidally) dehiscent or less commonly a fleshy berry breaking up irregularly, usually 3-celled and 3-gonous, often winged, more rarely 2- or 4-celled. Seeds numerous, minute; albumen scanty or 0.—DISTRIB. Tropical America, Asia, Africa, Tropical and South Africa, not in Australia; genera 2, of which only (*Begonia*) occurs in India; species about 400, of which the *Begonia* contains 398.

## 1. BEGONIA, Linn.

## Characters of the Order.

Fruit not winged.	•	1. <i>B. Roxburghii</i>
Fruit 4-celled, 4-angled	.....	1. <i>B. Roxburghii</i>
Fruit winged. Capsule 2-celled.		
Leaves crenate-dentate, scarcely oblique at the base, whitish beneath	.....	2. <i>B. crenata</i> .
Leaves nearly entire, ciliate, very oblique at the base,		
blood-red beneath	.....	3. <i>B. integrifolia</i> .
Capsule 3-celled.		
Flowers rosy; wings of capsule unequal	.....	4. <i>B. concanensis</i>
Flowers white; wings of capsule subequal	.....	5. <i>B. trichocarpa</i> .

**1. Begonia Roxburghii**, A. DC. *Prodr.* v. 15, part 1 (186, p. 398). A stout succulent plant 1-3 ft. high; root fibrous; stem many, erect, often nearly as thick as the thumb, striate, pubescent when young, afterwards glabrous. Leaves very unequal at the base, 6-12 by 4-8 in., ovate, acuminate, irregularly dentate, glabrous or minutely pubescent on the nerves, very obliquely cordate at the base, strongly nerved; petioles 3-9 in. long; stipules oblong-lanceolate, glabrous, deciduous. Flowers fragrant, white or very pale pink, in short dichotomous few- or

many-flowered cymes; bracts linear-lanceolate U MALE FLOWERS :  
Sepals 2, orbicular, glabrous. Petals 2, smaller than the sepals.  
Stamens about 50. FEMALE FLOWERS: Ovary 4-celled ; placentas  
equally 2-partite; styles 4, bifid almost from the base;  
stigmas spirally twisted. Fruit subpyramidal with thick walls,  
4-celled, 4-angled, the angles obtuse, each ending in a small  
horn, upwards.

## Seed ■

Pi InH<sup>ma</sup>Λ' oΛovoid\_ \*l. B. I. v. 2, p. 035. *Begonia malabarica*, Eoxb.  
 • uu\_ v\_ 3, p. 648 (*not* of Lamk.); Grab. Cat. p. 172.

.tvare. IT  
 ^e auth KAN : S. Konkan, *Nimmo ex Graham*. This plant has been included  
 on S. Konka ^ oΛ ^raΛam (^ c«)> w<sup>n</sup>o states that it was found by Nimmo in  
 the \*<sup>n</sup> Herb JC A e Seen no <sup>8</sup>p<sup>ec</sup>h<sup>ns</sup> from the Bombay Presidency ; there are  
 none • -^ew.—DISTRIB. India (North and East Bengal, Assam, Birma).

P- 16' ?eS<sup>o</sup>aia crenata> *Pryand. in Trans. Linn. Soc.* v. 1 (1791)  
 root "' 'Λ- A small herbaceous 1-4-leaved plant, 4-10 in.  
 high;

|-2i eroUS; Stems usi»al]y red, smooth, slender. Leaves 1-3 by  
 cr ll\*"> Ovate, acute, or rarely suborbicular, with crenate margins (the  
 ^out h ^ Crowned with a slnaU subulate tooth), with a few scattered alu. .  
 .rs aΛove 5 glabrous (except on the nerves) and ashy grey or Binu ."T  
 ery White beneath base col<sup>1</sup> date, the lobes at each side of the leay<sup>8</sup>- 9 -^^  
 une4ua>1 or often quire equal; petioles of the radical ! es 2~5 in.  
 lon^ those of the caulie £-1£ in. long, usually red, Flo <sup>10</sup>US<sup>3</sup> or With a ±eW<sup>2</sup>  
 scattered nairs 5 stipules small, triangular, acute. Ivid<sup>we</sup>TM llot ver<sup>y</sup> niany, pinkish  
 or pinkish-white, beautifully marked bai - g v. s teninS dots when tresn 5  
 peduncles weak, with a few scattered irs which are tipped with black  
 glandular dots ; bracts minute, acute, a ^brous. ^ MALE FLOWEHS :  
 Sepals 2. Petals 2, narrower than the <sup>5</sup>^pals. Stamens many,  
 monadelphous; anthers yellow. FEMALE LOWERS : Perianth-segments  
 5, the outer elliptic, tho inner oblong and Maculate, soon becoming larger  
 than the male flowers. Styles usually 3, L<sup>o</sup>nnate | -way up or more;  
 stigmas reniforin. Capsules | by 5 in., In^ nibranous, crowned by the  
 accrescent perianth, 3-winged (one wing snialler than the other two, the  
 margins oh' all 3 ciliate with hairs tipped with glandular black dots),  
 2-celled, with one side, at which dehiscence /fikea place, concave. Seeds  
 minute, ellipsoid. EL B. I. v. 2, p. 651 ; jrrah. Cat. p. 172; Dalz. &  
 Gribs. p. 104; Woodr. in Journ. Bomb. Nat. i<sup>r</sup>. 11 (18&8) p. 641.  
*Begonia minima*, Bedd. Icon. PI. Ind. Or. 1.110.— Flowers: Aug.-Sept.

KONKAN: *Stocks I, Lawl*; Salsette, *Graham*. DECCAN : hills, *Wbodrowl*;  
 Maha-)leshwar, *Coo/ce* !; Khandala, *Bhiva* ! KANAKA : *Law* !— DISTRIB. India (W.  
 Peninsula).

I have examined numerous fresh specimens and ha\o invariably found 3 styles.  
 Peddouie, in his figure of *B. minima* (Icon. PI. t. 110), gives a correct drawing of the  
 pies.

; 3. ***Begonia integrifolia***, *Dalz. in Kew Journ. Bot.* v. 3(1851)  
 ,, 230. A succulent herbaceous plant 6-12 in. high;  
 rootstock

uberous, the tubers of the size of a large pea: stem herbaceous, slender,  
 striate, pubescent or glabrous. Leaves 3-7 by 1^4 in., very inequi-  
 lateral, obliquely ovate, subobtuse, sparingly clothed with stout short  
 hairs above, pubescent, especially on the nerves, and dark-red beneath,  
 margins entire or nearly so, finely ciliate, base very unequally cordate ;  
 petioles 1-2 in. long, pubescent; stipules | in. long, ovate or elliptic,  
 obtuse. Flowers white, | in. in diam., few, glabrous ; peduncles longer  
 than the petioles, glabrous or nearly so ; bracts broadly ovate, acute,  
 ciliate, caducous. MALE FLOWEHS: Sepals 2, orbicular. Petals 2,  
 oblong. Stamens numerous (about 50), monadelphous. FEMALE  
 FLOWEBS: Perianth-segments 5, the inner the smaller. Styles 2,  
 connate below, branched and much twisted upwaivls. Capsules |  
 by

f-| in., 3-winged (one wing much larger than the others), dehiscing  $\wedge$  y an elliptic line round the narrow face. Seeds minute, ellipsoid. J- • I. v. 2, p. 648; Dalz. & Gibs. p. 104; Woodr. in Journ. Bomb. JNat. • 11 (1898) p. 641.—Flowers : Aug.-Sept.

Rare. KONKAN : *Stocks I*; on rocks on the Ghats, *Dalzell* KANARA : *Law!*—DISTRIB. India (W. Peninsula, Birma).

4. **Begonia concanensis**, A. DC. *Prodr.* v. 15, part 1 (1864) p. 314. Succulent, about 1 ft. high; root tuberous; stem simp, glabrous. Leaves 2-5 by 1|-4 in., ovate (sometimes lobed), acute or subacute, palmately 7-9-nerved, with a few short thick hairs above, glabrous or nearly so (except on the nerves) beneath, the <sup>mar</sup>£<sup>1</sup>, serrate or undulate-dentate and denticulate, base almost subequal y cordate or slightly oblique; petioles of the radical leaves often 6 in. long or more, those of the cauline leaves 1-2± in. long; stipules ovate-lanceolate,  $\wedge$  in. long, glabrous. Flowers rosy, few, on elonga dichotomous nearly glabrous peduncles; pedicels hairy; bracts | in. \*<sup>0j</sup> lanceolate, acuminate, subciliate. MALE FLOWERS: Sepals 2, broadly elliptic, | in. long. Petals 2, obovate-oblong, | in. long. Stamens numerous, nearly free. FEMALE FLOWERS: Perianth-segments 5, the exterior broadly ovate or suborbicular, much larger than the <sup>1</sup>;<sup>ier</sup> clothed with short stout hairs outside. Styles 3, nearly free, bifid a the apex. Capsules turbinate, |-| by |-| in. (including the wing<sup>s</sup>)» terminated by the styles, 3-celled, hispid or at length glabrous, 3-wingea, one wing larger than the others, the larger wing obtusely triangular. Seeds ellipsoid. Fl. B. I. v. 2, p. 653; Dalz. & Gibs. p. 104; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 641.—Flowers : Aug.-Oct.

Not common. KONKAN: *Stocks*<sup>1</sup>; above the Ghats, *Law I* DECCAN: *Lanol*» *Woodrow* !—DISTRIB. India (W. Peninsula).

5. **Begonia trichocarpa**, Dalz. in *Kew Journ. Bot.* v. 3 (1851) p. 230. Root tuberous; stem 1-1| ft. long, glabrous or nearly so. Leaves 2-5 by 1 $\wedge$ —3 in., ovate, acute or subacute, sparingly clothed\*, with short thick hairs above, more or less pubescent (especially on the nerves) beneath, irregularly sinuate-dentate, lacerate and denticulate on/ the margins, palmately 7-9-nerved; petioles of the radical leaves 4-f«. in. long, those of the cauline 1-2 in. long; stipules  $\wedge$ —| in. long, ovate lanceolate, hairy on the back. Flowers white, 2 in. in diam.; peduncle\*) longer than the petioles, 4-6-flowered at the apex, glabrous or nearly so<sup>ls</sup> pedicels slender, hairy; bracts J- $\wedge$  in. long, ovate, acuminate, dentate<sup>11</sup> pubescent, caducous. MALE FLOWERS: Sepals 2, broadly elliptic, ory suborbicular, f-f in. long, denticulate or subentire, glabrous or slightly/ pubescent. Petals i-| in. long, obovate-oblong. Stamens numerous,/ nearly free. FEMALE FLOWERS: Perianth-segments 5, the inner<sup>3</sup>\* narrower, the outer often denticulate. Ovary hispid. Styles 3, nearly $\wedge$  free, each divided into 2 branches. Capsules 3-celled, at first hispid, at $\wedge$ » length glabrous, §-f by g (including the wings), with 3 almost equals obtuse ciliate wings. Seeds ellipsoid. Fl. B. I. v. 2, p. 653; Dalz & Gibs. p. 104; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 641.—Flowers : Aug.-Oct.

Rare. KONKAN: *Stoc/csl*; W. Ghats, *Dalzell* KANAKA: *Law I*—DISTRIB. India (W. Peninsula).



subsessile, in pubescent panicles 6-10 in long. Calyx-lobes linear-oblong, subacute, glabrous, exceeding the tube. Stamens much exserted : filaments very long ; anthers small, subglobose. FEMALE FLOWERS sessile or nearly so, in pendulous spicate pubescent racemes. Calyx urceolate, pubescent outside; teeth 4, short, triangular, acute. Ovary faintly 8-ribbed, slightly pubescent; styles much exserted ; stigmas club-shaped. Fruit \- in. long, urceolate, truncate, 8-ribbed, glandular. Seeds minute, ellipsoid. Fl. B. I. v. 2, p. 657 ; Bedd. Flor. Sylvat. t. 212; Trim. Fl. Ceyl. v. 2, p. 265; Talb. Trees, Bomb. ed. 2, p. 179 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 641; Watt, Diet. Econ. Prod. v. 6, part 4, p. 41. *Tetrameles* (without specific name), Dalz. & Gibs. p. 311,

*Tetrameles Gmhamiana*, Wight, Icon. t. 1956. *Anictoclea Orahamiana*, Niinmo, in Qrah. Cat. p. 252,—flowers: Feb.-Mar. VBUN. *Ugad*; *Bondsä*.

KONKAN : *Stocks!*, *Law !*; W. G-hats, *Woodrow*. DECCAN : foot of Parghafc, <sup>Grah</sup>\*<sup>m</sup> (Oat. p. 88). KANARA: *Law I*, *Woodrow*; common in the evergreen forests of the Ghats of N. Kanara, *Talbot*.—DISTRIB. India (W. Peninsula, Birma, Andamans; Ceylon, Java,

### ORDER LXV. CACTACEA.

A large Order comprising perhaps 1000 species, confined almost entirely to the New World. It is introduced here in consequence of the naturalization of certain species of the genus *Opuntia* (*Ofiuntia Dillenii*, Haw., and *O. nigricans*, Haw.). The latter, commonly called the Prickly Pear, has spread widely throughout the Deccan, where it is known by the vernacular name *Nigadung* and has become so common about native villages as to be a regular pest, forming a harbor for snakes and filth of all kinds.

Several species of the Order are grown in gardens, but none of them are indigenous.

### ORDER LXVI. PICOIDEA.

Annual or perennial herbs. Leaves simple, often fleshy, opposite, alternate or falsely whorled; stipules 0 or scarious. Flowers regular, hermaphrodite (rarely polygamous), in cymes or clusters, rarely solitary, never racemose. Calyx 4-5-sepalous or 4-5-partite, free or rarely adnate to the ovary, the lobes usually green, herbaceous, imbricate-, always persistent in fruit. Petals usually wanting; when present, small. Stamens perigynous or hypogynous, definite or indefinite, when equal to the number of sepals usually opposite to them, when more, equidistant or in bundles; filaments subulate or dilated, free or connate into a membranous cup. Disk 0 or annular, often produced into subulate staminal nodes alternating with the stamens. Ovary usually free, 2-5-celled; ovules solitary in each cell and basal, or many, inserted on placentas adnate to the interior angle of the cell, amphitropous; styles as many as the cells of the ovary, free, or connate into one split at the apex. Fruit usually capsular, splitting dorsally or circumscissilely, or less commonly separating into cocci, usually smaller than the persistent calyx and included in it. Seeds solitary or numerous, usually reniform, compressed; testa membranous or crustaceous; embryo curved round, farinaceous or fleshy albumen.—DISTRIB. Scattered throughout the tropical and subtropical regions of the globe; genera 22; species 450,

Stamens inserted on the calyx-tube.	
Capsule loculicidally or septuicidally dehiscent.....	1. AIZOON.
Capsule circumscissilely dehiscent.	
Ovary 3-5-celled .....	2. SESUVIUM.
Ovary 1-2-celled .....	3. TKIANTHKMA.
Stamens hypogynous.	
Fruit capsular.	
Petals many .....	4. ORYGIA.
Petals 0 .....	5. MOLLUGO.
Fruit of 2-5 one-seeded cocci.	
Carpels 3-5; petals 0 .....	6. GJSEKTA.
Carpels 2; petals 3-5 .....	7. 7-IMLIM.

## 1, AIZOON, Linn.

**peti J** \* or 1<sup>n</sup>(ΛersΛu<sup>1</sup>-ibs. **Leaves** alternate (rarely opposite), sessile of  
**Cal** ■ + V sΛP<sup>u</sup>Λea Λ' Flowers axillary, solitary, or in spikes or **cymes**.  
**Talvf** <sup>snort</sup>i turbinate or hemispheric; lobes 4-5,  
**spreading**,  
 fii n or imbric<ate> often colored within. Petals 0. Stamens **many**  
 \ usually about 20), inserted in the throat of the calyx, united into tufts  
 4 **alternating with** the calyx-lobes : filaments **filiform**; anthers oblong.  
 L<sup>J</sup> tree, nearly **included** within the calyx-tube, 4-5-gonous, 4-5-  
 ovules 2-Λ<sup>o</sup> in each cell; styles 4-5, free, papillose. Capsule

woody, surrounded by the persistent calyx, 4-5-celled, locicidal (locicidality  
 U'areiv septeidally) 5-valved at the apex, the valves gaping, the cells  
 e~V<sup>o</sup> ~i<sup>s?</sup>eΛe(Λ Seeds small, pendulous, subreniform ; embryo curved,  
 ^Mmdric.—DISTSUB. Southern Europe, North and South Africa, Arabia,  
 canary Islands, India, Australia; species 8.

1. **Aizoon canariense**, Linn. *Bp. Pl.* (1753) p. 48S. A woody  
 ^VU;C<sup>I</sup> • raiK'bed **procumbent** densely **hairy** annual or subperennial, \t  
 \ \ Λ Leaves a<sup>n</sup>! in. long, alternate,\* obovate-spathulate, cuneate « the  
 base and running down into the petiole, papillose and densely hairy  
 with often mixed hairs ; petioles ^-| in. long. Flowers solitary, sessile,  
 in almost every axil. Calyx £-£ in. long, hairy; tube sub-hemispheric :  
 lobes broadly triangular-ovate, yV-yV ^n\* ^onS' yellowish **Within**,  
 Capsules sessile, woody, pentagonal when looked down upon, **much**  
 depressed, l-\ in. long, the valves inflexed. Seeds smooth, black, shining,  
 with a few ridges on the back. Fl. B. I. v. 2, p. 60<) \ Oliver, Ft. Trop.  
 Afr. v. 2, p. 584; **Woodr.** in Journ. Bomb. Nat. v. 11 (1898) p.  
 642.—Flowers ; Sept.-ZS'ov,

In the Bombay Presidency confined to Sind. St?f r>: *Vkary!*, *Stocks*, 472 !; Jemadar  
 fai Landa, near Karachi, *Mocks* !; banks of the Hub river near Karachi, *Cooke* !,  
*Wood-row* 1—DISTRIB. Africa, Canary Islands, Arabia, Beluchistan, Afghanistan.

## 2. SESUVIUM, Linn.

Herbs or undershrubs, erect or prostrate, branched, succulent. Leaves  
 /opposite, succulent ; stipules 0, but the petioles are sometimes connate  
 j by a stipuliform membrane. Flowers axillary, sessile or  
 peduncled, i olitary or clustered (rarely subcymose), often  
 flesh-colored or purple, %:acteaie or not. Calyx-tube turbinate ;  
 lobes 5, oblong or triangular, ^Slored within. **Petals** 0. Stamens  
 many or 5, inserted round the top the calyx-tube; filaments filiform,  
 sometimes connate at the base; **others didymous**. Ovary free.  
**3-6-celled**; ovules numerous; styles **i-5, longitudinally papillose on the**  
 inside. **Capsule ellipsoid or ovoid**, Cf,<sup>n</sup>membranous, 3-5-celled,



circumscissilely dehiscent. Seeds very many in each cell, reniform; embryo annular.—DISTRIBUTION. Throughout the tropics of the world near sea-shores; species 4,

**1. *Seauvium Portulacastrum*, Linn. Syst. ed. 10 (1759) p. 105S.**

Herbaceous; stems prostrate, creeping and rooting at the nodes, often buried in the sand, stout, succulent, much branched, red, glabrous.

Leaves opposite, 1-11 by 1/2 in., linear or spatulate-oblong, sometimes subcylindric, fleshy, obtuse, glabrous, tapering much towards the base;

petioles short, much dilated and amplexicaul at the base, with broad scarious margins. Flowers axillary, solitary; pedicels about equalling

the calyx, filiform, glabrous. Calyx deeply 5-lobed, purplish outside, rosy within, 1-fV in. long; lobes lanceolate-oblong, obtuse, with a mucro just below the apex behind. Stamens numerous, free or nearly so; filaments red. Ovary usually 3-celled ; styles\* usually 3. ^ Capsules 3-celled, ■\*■ in. long, enclosed within the persistent calyx, pointed, cir-cumscissile. Seeds black, smooth and polished. Fl. B. I. v. 2, p. 659; Grah. Cat. p. 248 ; Dalz. & Gibs. p. 15 ; Trim. Fl. Ceyl. v. 2, p. 268; Pax, in Engl. & Prantl, Pflanzenf. v. 3, part 1, B, p. 42, fig. 17; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 642.—Flowers: JN<sup>T</sup>ov.-Dec.

A tolerably common weed on the sea-coast throughout the Presidency. KONKAN : sea-shore near J3assein, *Bhiua* !; sea-shore, Kevadanda, *Woodrow* !; Salsette, *Graham* ; Ooran, *Graham*.—*Vis*<sup>TM</sup>\*. India (on sea-shores); Ceylon, shores of tropical and subtropical regions.

### 3. TRIANTHEMA, Linn.

Diffuse prostrate branched herbs, glabrous, pubescent or papillose. Leaves petiolate, opposite, unequal, linear, ovate or obovate, quite entire; stipules 0, but the petiole dilated, with membranous stipuliform margins. Flowers axillary, sessile or peduncled, solitary, cymose or paniced. Calyx-tube short or long; lobes 5, colored within, mucronate at the back. Petals 0. Stamens 5-10 or many, inserted near the top of the calyx-tube. Ovary free, sessile, 1-2-celled, often truncate ai the apex ; ovules 1-oo , basal; styles 1 or 2. Capsule membranous below, with a hard thick cap which is detached by a circumscissile dehiscence and carries away one or more seeds, 1-2-celled. Seeds 1-oo , subreniform ; embryo annular.—DISTIUB. Widely spread in tropical and subtropical regions ; species 10.

- Stamens 10 or more.
  - Style 1..... 1. *T. monogyna*.
  - Styles 2..... 4. *T. decandra*.
- Stamens less than 10.
  - Lower half of capsule 8-12-seeded ..... 5. *T. hydaspica*.
  - Lower half of capsule 1-2-seeded.
    - Leaves less than § in. long ; style 1 ..... 2. *T. triquetrai*
    - Leaves £-l£ in. long ; styles 2..... 3. *T. pentandr*<sup>^</sup>

**1. *Trianthema monogyna*, Linn. Mantiss. (1767) p. 09.** A pros- trate somewhat succulent herb; stems more or less angular, glabro' or pubescent, much branched. Leaves subfleshy, obliquely opposi unequal, the upper one of the pair the larger, f-1| by |-1| in., t lower |-| by ^-§ in., broadly obovate, rounded and often apiculate i the apex, cuneate at the base, glabrous ; petioles |-| in. long, muc dilated and membranous at the base, especially those of the smalle leaves in which the membranous enlargement forms a triangular poucl Flowers solitary, sessile, almost concealed by the pouch of the petioL Calyx-lobes ovate, acute. Stamens 10-20. Ovary truncate; style "■ Capsules small, almost concealed in the petiolar \*pouch, lid truncate slightly concave, with 2 spreading teeth, carrying away at least one seec the lower part 3-5-seeded. Seeds reniforra, muriculate, dull-black Fl. B. I. v. 2, p. 660 ; Trim. Fl. Ceyl. v. 2, p. 269 ; Woodr. in Journ. Bomb. Nat. y. U (1898) p. 642; Watt, Diet. Econ. Prod. v. 6, part 4, p. 1 i. *Trianthema obcordata*, Eoxb. Hort. Beng. p. 34 ; Dab. <fe Gibs, p. 14 ; Wight, Icon. t. 288; Aitch. Pb. & Sind PI. p. 65.—Flowers : Juue-Aug. YERN. *Bh-khdprd*. \*

RSCCAS: Poona, *Wwxlrow\* S«H»: Karachi,  
roughout India; Ceylon and most iropical regions.

# **^nthema triquetra**, tfo^Z. # **TfilW!**, fa <?e& .VaiH;/.  
Fr.

« *hchr.Y.* 4 (1803) p. 181. A small diffuse much-branched herb  
llSu\*J,<sup>Ul'</sup> liigh, with a woody root-stock; stems and branches slender,  
div ^d, covered with minute papillae; branches **numerous**,  
**prostrate**,  
the upper part more or less triquetrous. Leaves opposite or  
i' \*~« ^y TVT\*S iu\*,' lineaP or linear-lanceolate, subacute, fleshy,

with many slentler ribs » lobes broad' triangular, about  
Stamens 5 J anthers purple. Style simple. Fruit  
r-the tulje> b ^ ^ 2 d d h H **dd i** g;  
enclos centre  
pressed, concentrically striate on the faces, about  $\frac{1}{20}$  in. in diam., black.  
I Ceyl. v. 2, p. 269; Aitch. Pb. & Sind Pl. p.  
-!/sw --- g & Arn. Prodr. p. 355 (*not oi* Vahl); Dalz. &  
Gibs. !C. B. Clarke, in Hook. f. Fl. B. I. v. 2, p. 660;  
Woodr^in Journ. Xat lx ^ld98] 642 W Di  
E Pd

covered with crystalline papilke; petioles short, dilated and  
i s^eatning at the base. Flowers sessile or nearly so, several in  
InOt enclosed in the **sheath** of the petiole. Calyx -fa-^ in. long;  
0 ith ll ib lb bd il  
b

-«". iSat. v. 11 (1898) p. 642; Watt, Diet, Eoon. Prod. v. 6, part 4,  
P- /6.—Flowers : Sept.-Oct. ..^ Trinaen (i.e.) has pointed out,  
this **plant** appears to be quite ^stinet from *T. cristaUina*, Vahl, from  
Arabia and Nubia.

UU - Stocks ! DECCAM : Byapur, Wood row ! S. M. COUNTRY : Badami, \_  
j ^&AT: Dehgaon near Oambay, Dalzdl (J- Gibson. Srso: Stocks,  
512:—DISTBIB. F<sup>a</sup>(Paaj4b, Sind, W. Peninsula.); Ceylon.

?. **Trianthema pentandra**, linn. *Mantiss.* (1707) p. 70. Diffuse,  
ffich-branched, from a few inches to 1| ft. high; stems and branches  
Jpre or less papillose (sometimes glabrous), angled and  
grooved. Reaves |~1-| by |—| in., elliptic-oblong, sometimes slightly  
obovate, **labrous** or more orless papillose, rounded (rarely subacute) at  
the apex, ^-arrowed at the base ; petioles distinct, |—| in. long, dilated at  
the base, J jightly sheathing. Flowers sessile or subsessile, in  
**few-** or us any-■'dowered axillary fascicles; bracteoles thinly  
niembrauous. **Calyx** in. long, deeply **5-lobed** : ^obes  
ovate-oblong, colored within, a short apiculation at the back below  
the apex. **Stamens** 5.

ith  
Styles 2. Capsules  $\frac{1}{3}$  in. long, exserted, the cap with broad denexed  
horns, mitriform, dividing into two 1-seeded portions, the lower half  
of the capsule containing 2 seeds. Seeds  $\frac{1}{18}$ — $\frac{1}{12}$  in. in diam., orbicular-  
reniform, compressed, rugulose, dull-black. Fl. B. I. v. 2, p. 660; Aitch.

■Pb & Sind PL p. «5; Woodr. in Journ. Bomb. Na\*. v. 11 (1898) p. 642 j  
Watt, Diet. Econ. Protl^ . 0, part 4, p. 77.—Flowers: Oct.-Nov.

V \ common Avced in BijT Komu\*: *Stocks\** DBCCAJT: Poona, *oodrow*  
S. M. ., "™ SUm, iTfIMbviiir! S1SD: 6fe^'»'lj M«lir, «^ Karachj.  
^orfww! OICTV\ India (Punjab, N.W. Provinces, Sind, W. Peninsula) ; Tropical  
Atnea.

4 **Triantbema decandra**, *Linn. Mantiss.* (1767) p. 70. Stems  
elon'-ate, prostrate, not much branched, angular and stnate, glabrous.  
Leaves subfleshy, **f-lj** by |-§ in-'the 0PP<sup>os,te</sup> P^fomewhat unequal,  
elliptic-oblong, rounded and usually apiculate **at the apex? petioles**  
**1 -fin.** long, puberulous, much dilated and amplexicaul at **the** base, but

not enclosing the flower. Flowers in dense **axillary** subumbels. Peduncles and pedicels *very* short; bracteoles thinly membranous. Calyx **in. long**; tube very short; lobes much longer than tube, oblong, **obtuse**, with scarious margins and with a distinct long apiculation at the back below the apex. **Stamens 10**. Styles 2. Capsule enclosed **in the tube** of the calyx, 4-seeded, the cap very truncate, **in.**; in. **long**, solid, subcylindrical with a **narrow** acute rim round its base, carrying away 2 seeds. Seeds **orbicular-reniform**, striate, black, **in.** ! B. I. v. 2, p. 601 ; Grab. Cat, p. 81 ; Dalz. & Gibs. p. 15; Wight, **Icon. t. 296** ; Trim. **Fl. Ceyl. v. 2**, p. 270 ; Woodr. **in Journ. Bomb. Nat. v. 11 (1898)** p. 642 ; Watt, "Diet. **Boon. Prod. v. 6**, part 4, p. 77.—Flowers: Dec. S. M. **OOHTRY: Adur village 10 miles west of Haveri (Dharwar CoHectorate), JWoodrowl; Badaim, Cooke**—DJSifUB. India (W. Peninsula); Ceylon, Timor.

**5. Trianthema hydaspica, Edgew., in Journ. Linn. Socv. 6 (1862)** p. 2(3). A **prostrate** succulent papillose herb; branches **dichotomous**. Leaves **in.** by **j-j in., fleshy, elliptic-oblong**, obtuse (the younger **revolute**), narrowed into the petiole; petioles **in.**; in. **long**, dilated and membranous at the base. Flowers sessile, axillary, solitary or **clustered**. Calyx-tube obconic, **in.** long, many-ribbed; lobes 5, rose-colored with **in.**, about equalling the tube, triangular, acuminate, with a tooth or horn at the base of each at the sinus giving the lobe a somewhat hastate appearance. Stamens 5-7; filaments filiform ; anthers rosy. Ovary 2-celled ; styles 2. Capsules **in.** long, the cap conical, **thin**, membranous, hollow, not completely enclosing a seed, the lower part of the capsule containing 8-12 seeds. Seeds **in.**, rugose, black. **Fl. B. I. v. 2, p. 661; Woodr. in Journ. Bot. Nat. v. 11 (1898) p. 642; Watt, Diet. Boon. Prod. v. 6, part 4, p. 77. Diplochonium Hoelsteiteri, Stocks, ex Aitch. Pb. & Sind Pl. p. 66.—Flowers: Dec.**

**In the Bombay Presidency confined to Sind. SIND: Jemadar ka Landa near**

Karachi, *Stocks*, 470'; Karachi, *Wood row I, Bltola, Puntl—Dis-Tinti*. India Tropical Africa.

#### 4. ORYGIA, Forsk.

A somewhat rigid diffuse branched glabrous herb. Leaves opposite or alternate, rather fleshy, petiolate ; stipules 0. Flowers rather large! pedicelled, in terminal or leaf-opposed lax few-flowered cymes. Sepals ovate-cuspidate, with membranous margins. Petals 0. Stamens many, narrow, connate at the base. Stamens numerous, inserted at the base of the calyx, subhypogynous; **filaments** filiform; anther. linear-oblong. Ovary subglobose, **6-celled** ; ovules many, attached to the interior angle of the cells ; styles 5, **filiform**. **Capsule subglobose** included in the calyx, 5-celled, loculoidally **5-valved, many-seeded!** Seeds compressed, **reniform, strobiloid**.—**JDISTJUB**. Warm parts of Africa, Arabia, and India; species 1.

**1. Orygia decumbens, Forsk. Fl. JSgypt.-Arab. (1775) p. 3**  
**03.1** A decumbent diffuse wiry herb, from a few inches to more than 1 ft. high ; root woody at the crown ; stems pale, obscurely angled. Leaves **in.** by **in.**, alternate, obovate, cuspidate, glabrous, glaucous; petioles **in.** long, with a small membranous wing. Flowers **in.** in diam., **in racemose lax terminal** or leaf-opposed cymes, sometimes (including the slender obscurely winged peduncle) reaching **in.** **in. long; pedicels in.** long; bracts at Use base of the peduncles **in.**—**in. long, membranous,**

**ni**

3<sup>T</sup>x glabrous, divided to the base; sepals *l~l* in. **long**, ovate-« (JI acuminate, green, **with** pink membranous margins. <sup>!</sup>**about** 20, purple-red. **Stamens** 12 or more. Ovary **5-ribbed**. <sup>J</sup>n. long, pale-yellow, smooth and shining. Seeds reniform, strophiolate, finely striate, black. Fl. B. I. v. 2, p. 061; •<sup>J</sup>n Journ. Bomb. Nat. v. 11 (1898) p. 042.—Flowers : Dec-Jan.

la nt\*<sup>tS</sup> T- " ^""^!" district, Woodrowl, Bhola Puran!, Cookel; Jemadat  
\*\*i Africa, iraeliii' St9dt\$!—IhtSTRiB, India (Panjab, Sind, Mj8or©)j  
Western

**g** **5, MOLLTJGO, Linn.**

<sup>^e</sup>hotom<sup>01</sup> J e **Serous pubescent** or stellately **tomentose** herbs, often a<sup>^tt</sup>Ulic<sup>l</sup>]o<sup>r</sup> branched. Leaves often falsely **whorfed** or **alternate**, or <sup>^fowepa</sup> ' <sup>^eai></sup> obovate or **spathulate** ; stipules membranous, **fugacious, axillary**, solitary, fascicled or in diffuse or umbellifortn **cymes, greenish**. Sepals 5, subequal, **persistent**, with membranous \* "etals 0. Stamens 3-5, **subhypogynoa**s, usually alternate with <sup>^</sup> -jJais sometimes intermixed with subulate staminodes. Ovary \*\*\$ jj - le? ; **ovules** x , **attached** to the interior angle of the cells ; >' ft. r ~" ^: Capsule membranous, included in the calyx, oblong, globose Sfffil i . or o\* 3~5\_cel^d, loculicidally **3-6-valved**. Seeds several ' \* 1) in each cell, reniform, appendaged at the hilum or **not** ; o more or less curved.—**DISTBIB**. Tropical and subtropietil regions hemispheres ; of species **12**.

- in axillary fascicles; seeds a p p g
- y stellately hairy ..... 1. *M. hirta*.
- rous ..... - *M.*
- o* *yyposifi* *folia*.

**dd**

- <sup>→1</sup>
- wvers iu terminal cymes ; seeds not appendaged.
- Seeds with raised tubercular points ..... 3. *M.*
- pettaphylla*\*
- Seeds without raised tubercular points ..... 4. *M. Cerviani*.

1. **Mollugo hirta, Thunb. Prodr. PL Cap.** (1704) p. 24. Annual, **softly** villous with (chiefly) stellate hairs ; stems many, usually prostrate ind spreading 0-18 in. from a centre, sometimes ascending, leafy, eaves **opposite** or several at a node, | -f by A-^ in., densely stellately illous on both sides, broadly obovate or suborbicular, very obtuse afc the apex, cuneate afc the base ; petioles £-| in. long, slender, stellately

>**hairy**. Flowers pinkish-white, in axillary fascicles, 1-0 together ; pedi- cels unequal, i<sup>l</sup>.,-,'. **in.long, divaricate**. Calyx stellately hairy outside; Isepala ~l in. long, elliptic-lanceolate, acute. Stamens usually 10 or **more, varying** to 5. Ovary **ovoid**, quite glabrous, **5-lobed, 5-celled** ; ovules **oo**; **styles** almost 0 or very short; stigmas usually 5, **spreading**. **Capsules** a little shorter than the sepals, ovoid. Seeds x , **subreniform**, with raised tubercular points, black, appendaged with a white scale at the hilum extended into a long filiform process which carves round iho seed. FL B. I. v. 2, p. 662 j Trim. Fl. Ceyl. v. 2, p. 270; Woodr. in <sup>s</sup> Journ. Bomb. Nat. v. 11 (1898) p, 642; Watt, Diet. Eeon.- Prod. v. 5, p. 255. *Mollufjo Glinu*\*, A. Kich. Tent. Fl. Abyss, v. 1 (1847) p. 4\$

•  
Aiteb. Pb. & Sind Pl. p. 66. *Glinus lotoides*, Lœfl. It. Hisp. (1758)  
p. 145 ; Linn. Sp. Pl. ed. 2 (1762) p. 663 ; Grah. Cat. p. 82 ; Dalz. &  
Gibs. pp. 16 & all.—Flowers : Feb.-Ap. VERN. *Dasará-ság* ; *Kotrak*.

K\* (.NKV> : *Stock*! ; Bombay, common, *Graham*, *Dalzell* <.f*G-ibson*. BECCAS : Kb art-  
diila *Weodrotol* ; Mahahieshwar, *Cooke*! S. M. COUNTRY: Belganro, *Ritchie*,  
61!

SISTJ: *IM.:CU*\; bills near Karachi, *Bhola Puran I*—DISTRIB, Throughout  
India,  
common ; Ceylon, wanner regions of tlic work!

**2. Mollugo oppositifolia, Linn. Sp. PL (1753) p. 89. gj**

prostrate or ascending ; stems numerous, dichotomously branched, \* —  
 Jong internodes, slender, glabrous or pubescent near the ends. <sup>^ ea</sup> —  
 z~i by 14. in., in whorls of 4-5, unequal, oblanceolate or  
 jjn\* lanceolate or sometimes spatulate, rounded or acute and  
 apicula the apex, much tapered into the petiole which is therefore  
 obscu^ • Flowers white, in axillary fascicles of 2 or more; pedicels \-\  
 "J- || iiliform. Calyx glabrous outside ; sepals \ in. long,  
 oblong, <sup>su^</sup> v<sup>ft</sup>r y with membranous margins. Staminodes 0. Stamens  
 usually 3. U £ glabrous ; styles 3, very short; stigmas spreading.  
 Capsules ellipso \ ^ little shorter than the sepals, 3-celJed. Seeds  
 very numerous, suDr^ ^ form, with raised tubercular points,  
 dark-brown, appendaged^v<sup>l</sup> s very small white scale at the hilum  
 extended into a bristle ?^ick °u round the seed. Jackson, Index  
 Kewen. v. 3, p. 254; Trim. xl« •> > v. 2, p. 271. *Mollugo*  
*Spergula*, Linn. Syst. ed. 10 (1759) P- °V' Grab. Cat. p. 12 ; C. B.  
 Clarke, in Hook, f. ¥IB. I. v. 2, p. 662 ; W 001 -in Journ. Bomb. JS<sup>T</sup>at.  
 v. 11 (1898) p. 642.— Flowers : Sept.-Oct.

DECCAN: Bijapur, *Woodrow!* S. M. COUNTRY: Belgaum, *Woodrow!*; Badami,  
*Rhiva!* GUJARAT: Baroda, *Kanitkar!* KANARA: Kála naddi, *Ritchie, 40!*; Chand-  
 wár, *Ritchie, 40!*—DISTRIB. India (W. Peninsula, Birma); Ceylon, Tropical Africa,  
 Australia.

**3. Mollugo pentaphylla, Linn. Sj>. PL (1753) p. 89. ^**  
 diffuse, glabrous, 6-12 in. high ; stems numerous, with many mor less  
 quadrangular leafy dichotomously arranged branches, i\*  
 v l-l\* in. by |-| in., in whorls of 2-9, linear-lanceolate to <sup>ob</sup>ov<sup>at</sup>®! °^  
 tuse or acute, sometimes apiculate, much narrowed at the base : petio  
 obscure. Flowers white, numerous, in lax corymbose terminal  
 peduncles and pedicels iiliform; bracts lanceolate, scarious.  
 glabrous ; sepals <sub>T</sub>V~TV <sup>TM</sup>. J<sup>on</sup>g> broadly elliptic-oblong, obtuse, p?ir2  
 nerved. Stamens usually 3. Styles 3, short, linear. Capsules  
 sub globose, as long as or slightly longer than the sepals, with thin  
 wain Seeds numerous, roundish-reniform, compressed, covered with  
 rais< tubercular points, dark-brown. Jackson, in Index Kewen. v. 3,  
 p. 254' Grab. Cat. p. 12; Dalz. & Gibs. p. 16; Trim. Fl. Ceyl. v. 2, p.  
 271.1 *Mollugo stricta*, Linn. Sp. PL ed. 2 (1762) p. 131 ; Dalz. & Gibs.  
 p. 16 ; C. B. Clarke, in Hook. f. Fl. B. I. v. 2, p. 663 ; Woodr. in Journ.  
 Bomb. Nat. v. 11 (1898) p. 642 ; Watt, Diet. Econ. Prod. v. 5, p. 2o5.  
*Mollur/o triphylla*, Lour. Fl. Cochinch. v. 1 (1790) p. 62 {not of  
 Burm.); Grab. Cat. p. 12.—Flowers : Sept.-Nov. VEHX. Jharasi.

A common weed, *Graham, Dalzell Sf Gibson*. DECCAN : Poona, *Woodrow I*;  
 Panchgani, *Cooke I, Woodrow I* S. M. COUNTRY : Belgaum, *Woodrow I*; bills north  
 of Bolgaura, *Ritchie, 9501*; Pharwar districts, *Talbot, 25361*; Badami, *Cooke I*  
 — DISTRJB, Throughout India ; Ceylon, Malacca, China, Japan, Fiji.

VAR. *rvpestris*. A much smaller plant, 2£-6 in. high. Leaves  
 narrow-linear, |-1 by ^0- in., apiculate; in other respects as in  
*M.pen-taphylla*.

I have found this very abundantly in October on the wet rocks of the hill called  
 <he Table rock just above the Travellers' Bungalow at Panchgani. I have also  
 found it on wet rocks near Marmagoa, but it has not been reported from any other  
 locality. The inflorescence and seeds are exactly as in *M. pentaphylla*, but the leaves  
 are entirely different. It seems scarcely entitled to specific rank, but is quite distinct  
 &B a van el v.



Annual Sect 8? p? h

Stems very  
manv,

? umbellate, the nodes thickened.

Radical

4-| spatulate or linear-spathulate. Cauline  
Petioles obscure, apiculate, 2-8 in a whorl; [bellate]  
lower numerous, on long filiform stiff pedicels sub-  
in threes on the top of long filiform  
Peduncles. Sepals in. long, elliptic-oblong, very short  
membranous margins. Stamens 3-5. Styles 3, 8tooth, \vitho? 6S  
equalling the sepals. Seeds numerous, P: 6(53:-A,\* ... i

dr in T & Sind PI p. 66; Trim. Ceylon v. 2, p. 272;  
Jfod. v 5 or n\* Eomb. t. v. 11 (1898) p. 642; Watt, Diet. Econ.

8.M  
GUJARAT: Kanitkar; Deesa, ff^7.»  
Pical Africa\* Aust. DISTRICT: India (Panjab, Sind, W. Peninsula); Ceylon,

points, yellowish-brown. FJ. B. I. v. 2, & Sind PI. p. 66 ;  
Trim.

### j). 6. GISEKIA, Linn.

usually annual herbs. Leaves opposite or falsely  
0. p. subfleshy, linear or spatulate, abounding in raphides ; stipules  
Pedi small, in lax or dense axilla sessile fascicles or shortly  
umbellate cymes, hermaphrodite or polygamous. Sepals 5,  
5^1\* erbaceous or with membranous margins. Petals 0. Stamens  
hypogynous ; filaments dilated at the base; anthers oblong,  
i il ll 1 1 d

pgy ; g  
fpels usually 5, distinct, sessile on a small torus, 1-celled; ovules  
Wary, basal; styles as many as the carpels. Fruit of 5 free  
mem-anous compressed papillose indehiscent 1-seeded carpels.  
Seeds ver-

.%i, compressed, subreniform ; embryo annular.—DISTEIB.

Africa,

\*jfabia, India ; species 5.

1. **Gisekia pharnaceoid.es**, Linn. *Mantiss.* (1771) p. 562. A  
I, If use somewhat succulent glabrous herb ; stems 6-18 in. long; branches  
fjrostrate or ascending. Leaves subfleshy, subopposite, |-1^ by |—|

in.,

(near-oblong, elliptic-lanceolate or spatulate-oblong, obtuse or sub-cute, entire, tapering at the base, glabrous, glaucous ; petioles 0-1 in.

ing. Flowers numerous, in almost sessile umbellate cymes ; pedicels  
• hinder, 1/2-1 in. long. Sepals 1/2-1 in. long, elliptic-oblong, obtuse, with membranous margins. Stamens 5 ; filaments dilated at the base. Ovary carpels membranous, as long as the sepals and surrounded by them. Seed solitary, rounded on the back, black, with scattered white glandular prominences. El. B. I. v. 2, p. 664.; Grab. Cat. p. 250; Wight, Icon. t. 1167 ; Aitch. Pb. & Sind Pl. p. 66 ; Trim. Fl. Ceyl. v. 2, p. 273; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 642; Watt, Diet. Econ. Prod. v. 3, p. 502.—Flowers : Aug.-Sept.

KONKAN: *Nimmo* ex *Graharn*, S. M. COUNTRY: Badami, *Woodrow!*, *Bhiva!* GUJARAT: *Stocks* \ SIND: *Dalzelli*, *Stocks*, 6!—DISTRIB. India (Panjab, W. Peninsula) ; Ceylon, Beluchistan, Afghanistan, Africa. VERN. *Vdluchi-bhdji*.

Strong anthehntic properties have been claimed for this plant, which has been especially recommended as a specific for tape-worm. See Watt, Diet. Econ. Prod. 1. c

**LIMEUM, Linn.**

Annual or perennial low branched glabrous herbs, sometimes fr<sup>cent</sup> at the base; branches usually prostrate. Leaves alterna subopposite, linear-lanceolate, elliptic or obovate, entire or oDs<sup>^</sup> ciliolate; stipules 0. flowers small, bracteate, greenish, herinapnr<sup>^</sup> or unisexual, in dense terminal and subaxillary cymes. S<sup>^</sup>P<sup>ais</sup>, '3<sup>^</sup> equal, ovate, herbaceous or with membranous margins. Peta s<sup>^</sup>» oblong or spatulate, or minute, or 0. Stamens 5-10, <sup>somet</sup> Q<sup>vary</sup> perfect, hypogynous; filaments dilated and connate at the base. ' free, globose, compressed, 2-celled; ovule solitary in each cell, ascen j with basal funicle; style very short, with 2 branches which are ©. matose within. Fruit separating into 2 orbicular or hemispheric<sup>^</sup> which at length dehisce vent rally. Seeds vertical; embryo<sup>^nn^</sup> radicle inferior.—DISTRIB. Tropical and S. Africa, India; species 1

**1. Limeum indicum**, *Stocks, ex T. Anders, in Journ. Linn. Soc.* \- ♦  
Suppl. 1 (1860) p. 30. A prostrate glandular herb; root P<sup>erenn^</sup>te' stems diffuse, much-branched, glandular-pubescent. Leaves opp<sup>o</sup>

%, in. long, slightly dilated at the base. Flowers crowded, in ax subsessile cymes; pedicels short, glandular, bracteate at the base. <sup>^eP</sup>  
-<sup>^</sup> in. long, glandular-pubescent, ovate, acute, with membranous marg\* \*  
Petals much shorter than the sepals, clawed, truncate and 2-dentate the apex. Stamens 7 (*Stocks*). Carpels in fruit as long as the sepa<sup>1^</sup>

hemispheric, dehiscing ventrally, the margins of the valves inflexed s as to retain the seed till moistened. Seeds broader than long, about -f\$}

broad, concavo-convex, quite smooth on the back,  
or nearly so, |~\$ by JV~T in., broadly elliptic or suborbicular, j<sup>n^</sup> |.  
lateral, shortly apiculate, entire, glandular-pubescent; petioles distj

%i l lh d i l d h l d d i

In the Bombay Presidency confined to Sind. SIND: *Woodrow, Dafcell; Cno/tcl*; sandy bed of the Mulir river near Karachi, *Stocks, 535!*—DISTIUB. Inu (Punjab, Multan); Beluchistan, Aden, Nubia.

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*Telragonia evpansa*, Murr. in *Comm. Gotling*, v. 6 (1785) p. 13, t. o. *New Zealand JSjnnach*. A creeping herb with succulent stems, small yellow flowers on short pedicels, triangular-ovate succulent leaves and ;t 4-5-horned fruit, a native of Australasia. It has been introduced recently into a few gardens in the Bombay Presidency. It grows exceedingly well and seeds abundantly in the Deccan, where it comes upj self-sown when once introduced. Its leaves furnish an excellent spinach j for the table. See *Woodrow, Gard. in Ind.* ed. 5, p. 339.

*ORDEH* LXVII. UMBELLIFEKJE.

Herbs (rarely shrubs or trees). Leaves usually alternate, simple or compound, exstipulate (except *Hydrocotyle*) ; petiole generally sheathing at the base. Flowers usually bisexual, often slightly irregular, in simple or compound umbels, rarely in heads or whorls; umbels and umbellules

UMBELLIFLORAE.

tube adnate to H! an involucre of bracts or one or both naked. Calyx-  
 el ? ovate 5 ( h h b

dnate to H! y  
 calyx). pet ? - ovate 5 or 0 (so that there seems to be no

times valvate an imbricate midrib, imbricate in bud (some-  
 the petals  $C^X$  Stamens 5, epigynous, alternating with  
 usually 2-celled, crowned by a large epigynous  
 of the & dilated; styles 2,  
 minute which crown the ovary; stigmas  
 Pressed sessile indehiscent dorsally or laterally com-  
 attached to the carpels (*mericarps*), separated by a commissure and  
 pendulous from a slender central axis (*carpophore*),  
 are usually marked by 5 longitudinal lines {primary  
 marginal and 2 intermediate, and often with 4 more  
 h ) l

inflorance distinct, sometimes unequal, often bifid,  
 an inferior umbel

g d intermediate, and often th  
 more

havers alternating with the primary ones; pericarp often  
 the no-canals (*yittce*). Seed 1 in each carpel, pendulous from  
 central to the carpophore; testa thin; albumen carti-  
 Superio L\*? minute, straishear the apex of the seed; radicle  
 es Poci // TRIB\* large Order, abundant in temperate  
 regions, throughout the world; genera 152; species 1300.

labels simple..... 1.

HYDROCOTYLB.

Labels compound.

- fruit laterally compressed, not winged; commissure narrow.  
 Leaves quite entire, grass-like..... 2. BUPLEURUM.
- Leaves pinnate or decomposed (sometimes simple and  
 broadly ovate-cordate in *Pimpinella*).  
 Ridges of fruit slender; furrows 1-vittate ..... 3. CARUM.
- Ridges of fruit slender; furrows 2-3-vittate; root  
 usually fusiform ..... 4. PIMPINELLA.
- Fruit somewhat dorsally compressed, not winged; commis-  
 sure broad; root tuberous ..... 5. POLYZYGUS.
- Fruit much dorsally compressed; lateral ridges winged.  
 Portion of the fruit between the margin and the seed  
 hyaline ..... 6. ZOSIMIA.
- Portion of the fruit between the margin and the seed not  
 hyaline.

Herbs, usually glabrous ; petals not radiant; ovary glabrous ; wings of fruit with thin margins .....	7. PEUCEDANUM.
Herbs, usually hairy ; petals often radiant; ovary usually pubescent; wings of fruit thickened at the "margin" .....	8.

HERACLEUM.

### 1. **HYDROCOTYLE**, Linn.

Annual or perennial herbs growing in moist places, usually prostrate and creeping and rooting at the nodes. Leaves orbicular or reniform ; stipules small, scarious, sometimes lacerate. Flowers (in the Indian species) in very small heads or simple umbels, white or purplish, sometimes unisexual. Involucre-bracts few or 0. Calyx-teeth minute or obsolete. Petals entire, valvate or imbricate. Fruit somewhat fleshy, laterally compressed ; commissure narrow ; mericarps with the primary and sometimes the secondary ridges visible; vittae 0. Carpophore 0. Seed laterally compressed.—DISTRIB. Temperate and tropical regions of the world, abundant in Australasia, S. Africa and S. America; species about 70.

LXVII. UMBELLIFEM.

Petals valvate in bud; secondary ridges of fruit 0: pericarp not thickened ..... •• \*■L'  
 Petals imbricate in bud; secondary ridges of fruit distinct; pericarp much thickened ..... 2. -»•

**1. Hydrocotyle javanica**, *Thunb. Dls.* (1798); *edit. Pers.* v. 2 (1800) p. 415, t. 3. Stems long, succulent, pubescent beneath the Tioae&

ut branching shoots more than 6 in. high. /^ef ?

sending up erect stout branching shoots more than 6 m. long. —. Jv suborbicular, broader than long, 1½-3 by 2-3 in., subentire or palmately 7-9-lobed one-fourth of the way down, coarsely crenate, shining on DO^ sides, with a few weak hairs on the nerves; petioles pubescent, those ^ the leaves of the prostrate stems sometimes reaching 10 in. long, those the erect shoots much shorter; stipules entire, scarious. Flowers pale-green, very small, sessile or shortly pedicelled, 20 or more crowded in dense globular heads or umbels on the apex of peduncles ½-2 m. 1° b which are often in clusters of 2-6 from the nodes of the P^i branches; pedicels 0—1 in. long; bracts small. Calyx-teeth 0. Petals ^ lanceolate, acute, valvate in bud. Fruit ½ in., orbicular or subquadrate, 5-mericarps with acute primary but not secondary ridges. Fl. B. !• v# ?' p. 667; Wight, Icon. t. 1003; Trim. Fl. Ceyl. v. 2, p. 275; Woodr. Journ. Bomb. Nat., v. 11 (1898) p. 642.—Flowers: Feb.

KANARA: Hulikal, Woodrow.

This plant has been included on Woodrow's authority, who gives the above-named locality as its habitat. I have seen 110 Bombay specimens, and there are none from that Presidency in Herb. Kew.

**2. Hydrocotyle asiatica**, *Linn. S<sub>2</sub>* > . P<sup>1</sup> - C<sup>1</sup>^3) p. 234. A slender herbaceous creeping plant; stems long, prostrate, coming off from the leaf-axils of a vertical rootstock, filiform, often reddish, and with 10 internodes, rooting at the nodes. Leaves ½-1 in. long, several from the rootstock which often have much elongated petioles, and 1 from each node of the stems, orbicular-reniform, rather broader than long; more or less cupped, entire or shallowly crenate, glabrous on both sides, and with numerous slender nerves from a deeply cordate base; petioles\*, very variable in length, 3-6 in. long or more, channelled, glabrous or nearly so; stipules short, adnate to the petioles, forming a sheathing base. Flowers in fascicled umbels, each umbel consisting of 3-4 pink, sessile (rarely pedicelled) flowers; peduncles pubescent or glabrous, short, pink; bracts ovate, acute, concave, 2 beneath each umbel. Calyx-teeth 0. Petals minute, pink, ovate, acute. Fruit ½ in. long, longer than broad, ovoid, hard, with thickened pericarp, reticulato-rugose, often crowned by the persistent petals, the primary and secondary ridges distinct. Fl. B. I. v. 2, p. 669; Grab. Cat, p. 84; Dalz. & Gibs. p. 105 • Wight, Icon. t. 1003; Trim. Fl.

Ceyl. v. 2, p. 276 ; Woodr. in Jouru, Bomb. Nat. v. 11 (1898) p. 642; Watt, Diet. Econ. Prod. v. 4, p. 311.— Flowers : Muy-Nov. VERX. *Bralimi*.

In moist situations throughout the Presidency. KONKAN : Matheran, *Cooke I* DECCAN : *Woodrow!*; banks of the Poona river, *Cooke!*; Mabableshwar, *Cooke I* S. M. COUNTRY: *Woodrow*; Belgaum, *Ritchie*, 1080!—DISTRIB. Throughout India; Ceylon, tropical and subtropical regions of the world.

The plant is extensively employed in medicine. It was employed by Dr. Bhau Daji as a remedy for leprosy and has considerable reputation as an alterative in skin-diseases. See Watt, Diet. Econ. Prod. 1. c, where an exhaustive account of the medicinal uses of the plant may be found.



JS <sup>Λ</sup>epW S > . Λ Hopt\_ BenΛ (18U) P- 21\_ A P<sup>r</sup>etty 'V e fi ombav  
 Pr. <sup>occasional</sup>% grown in gardens, but not indigenous I <sup>Qse</sup> green m<sub>n</sub>  
 ! i T " Ifc covers the surface of a flower-pot with <sup>Λ</sup>o<sup>o</sup>nda<sup>y</sup> sim nnT<sup>i</sup> and  
 is eas<sup>Λ</sup> of culture if kept shaded from the <sup>t</sup> is comm l i watered\_ Xt  
 is propagated by division. The <sup>o</sup>odrow On i' y J<sup>mown</sup> by its  
 synonym *I£. nitidula*, Eich. See > <sup>Λ</sup>ard. in Ind. ed. 5, p. 342. "

**Glabrous**

2" BUPLEURUM &gt; Linn\_

<sup>Λe</sup> lowest <sup>aUnual</sup> or perennial herbs or shrubs. Leaves quite entire,  
 !<sup>inv</sup>o Wes nn I-<sup>a</sup> i <sup>Flowe</sup>i>\_s in compound umbels, usually  
 with  
<sup>oad</sup>> eml <sup>Involu</sup>cels, small, yellow or lurid. Calyx-teeth 0. Petals  
 ?<sup>ore</sup> o<sup>r</sup> les 1 at6j inflexed\_ Disk br<sup>oad</sup>, flat. Styles short.

.<sup>a</sup> d com S\* <sup>eral</sup>Λ compressed, slightly constricted at a somewhat  
 1-3 <sup>v</sup>tf<sup>SSU</sup>ue' <sup>mericar</sup>Ps subpentagonal; primary ridges distinct, 2-fid  
 between t<sup>Qem</sup>; secondary ridges 0 or obscure. Carpo-i<sup>Λ</sup>rn or ~<sup>Λ</sup>P<sup>ar</sup>tite.  
 Seed subterete, sometimes grooved on the - <sup>Λ</sup><u<sup>re</sup> ?\ <sup>o</sup>pe'  
<sup>temperate</sup> Asia, N. Africa, Canary Islands <sup>s</sup>Pecie\* ni S<sup>i</sup> <sup>vvltn</sup> one  
 species in S. Africa and one in N.W. America; <sup>1</sup>ue\*> about 60.

(<sup>Λ</sup>ofW<sup>PleUrUm</sup> **virgatum**, *Wight & Arn. Prodr.* (1834) p. 370 asc<sup>e</sup>  
 ,. <sup>a</sup>ll.)- Perennial; stem erect, 1-3 ft. high; branches numerous, <sup>o</sup>bl<sup>o</sup> <sup>Λ</sup>  
<sup>c</sup>y<sup>Λ</sup>n<sup>c</sup>lic, striate, glabrous. Leaves 2-5 by |-J in., linear-JJ<sup>U</sup> n<sup>Λ</sup>'  
 S<sup>l</sup>ass-Hke, sessile, usually acute or acuminate (rarely subobtuse), ti<sup>Λ</sup>  
<sup>rona</sup>te, glabrous, glaucous, with numerous parallel prominent slender Co  
 VeS<sup>i</sup> 1]arrowec] at the base, amplexicaul but not sheathing. Flowers in ■  
 J<sup>Λ</sup>pound umbels, yellow. ]?primary umbels in lax elongated corymbose or  
 "corymbose panicles, 5-8-ra3<sup>r</sup>ed; bracts 3-6, linear-lanceolate, acuni-  
 TM6. Partial umbels (*umbdlules*) 6-8-flowered; pedicels short; bracteoies  
 ■-■5, linear-lanceolate, longer than the umbellules. Calyx-teeth 0.

Petals  
 i<sup>Λ</sup>lant, the apex much inflexed. Fruit <sup>Λ</sup> in. long, longer than  
 broad,  
 lliipsoid, dark brown, shining; mericarps rounded on the back, the primary  
 <ibs ]rominent, rounded, with a broad vitta in each furrow, often with a  
 smaller one on either side. *Trim. Fl. Ceyl.* v. 2, p. 277.

*Bupleurum*

\**amosissimum*, *Wight & Arn. Prodr.* p. 370; *Wight, Icon.* t.  
 1007.

*B. falcatum*, *Dalz. & Gibs.* p. 108 (*not of Linn.*). *B. mucronatum*,  
*Wight*

*fe Arn. Prodr.* p. 370; *C. B. Clarke, in Hook. f. Fl. B. I.* v. 2, p. 676;  
 /oodr. in *Journ. Bomb. Nat.* v. 11 (1898) p. 642.—Flowers: Dec.

The specific name *virgatum* *f* *Wight & Arn.* 1. c, has precedence over <sup>o</sup>at  
 of *mucronatum*.

A rare plant in the Bombay Presidency. S. M. COUNTRY: Dharwar, *Dalzcll* \$;  
*Gibson*,—DISTRIB. India (W. Peninsula); Ceylon.

Annual or perennial herbs. Leaves pinnate or decomposed. Umbels compound. Bracts of the involucre few or 0 ; bracteoles of the involucre usually numerous, undivided. Flowers white (in the Indian species), hermaphrodite or polygamous, the petals of the sterile flowers often irregular. Calyx-teeth small or 0. Petals broad, obtuse, entire, emarginate or 2-lobed. Fruit ovoid or ellipsoid, more or less laterally

compressed and more or less constricted at the <sup>^0Ull''</sup>}<sup>S^</sup>, marginal u<sup>^1</sup> ll  
 subpentagonal, the primary ridges obtuse, the lateral  
 i<sup>^p</sup>l<sub>s</sub>T<sup>Ri</sup>B.

single vitta in the furrows. Carpophore 2-fid or <sup>^"</sup>P<sup>al</sup>, Q<sub>1c</sub>J  
 World;

Europe and most temperate and subtropical regions or  
 species about 50.

9

1. **Carum stictocarpum**, C. B. Clarke, in *TToolc.* / . y • ■ ' .  
 roOt (1879) p. 681. Annual, ±3 ft. high, erect, mlleI<sub>a</sub><sup>b</sup>Λ ^  
 fusiform; stem glabrous. Lower leaves 2-pinnate;  
 into linear-lanceolate apiculate glabrous or minutely pubesce<sup>ge0.</sup> ^»  
 the segments of the upper leaves often linear; petioles  
 p  
 fusiform; stem glabrous. "Lower leaves 2-pinnate; lea »

the segments of the upper leaves often linear;  
 petioles sheaths, their margins membranous, ciliolate.

umbels 5-10-rayed; bracts 3-6, linear, acute,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Partia  
 umbels 6-20-flowered; pedicels  $\frac{1}{8}$ - $\frac{1}{6}$  in. long; bracteoles 4-8, linear-  
 lanceolate - in. long with white scarious ciliate margins. Ovary  
 Flowers white.

minutely pubescent; stales long, recurved on the fruit; <sup>s\*I&flaa-. 'ate</sup> at  
 Petals broadly obovate or suborbicular, rounded (not <sup>eniar^!1K</sup> rllloU.S  
 the apex, -<sup>^</sup> in. long. Fruit <sup>^-j<sup>l</sup></sup> in. long, ovoid, glabrous or pube<sup>^.</sup> ^.  
 brown; mericarps scarcely compressed, the ridges slender, faint. ^\  
 Fl. Ceyl. v. 2, p. 278; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. H C<sup>1</sup>C  
 p. 642.—Flowers: Aug.-Oct. VERN. *lidn-onva*.

KONKAN: *Law*!, *Stocks* \ DECCAN: hills, *Woodrow*, *Jejuri*, *Remade I*, \* Jk<sup>o</sup> 8  
 miles west of Poona, *Bhiva*!; Panchgani Ghat, *Cooke* \— DISTIUB. India (VV.  
 sula); Ceylon.

^ VAR. *hebecarpa*, C. B. Clarke, in Hook. f. Fl. B. I. v. 2,  
 p. Fruit larger, xg-yV in. long, hispidulous, sometimes densely so.  
 KONKAN: *Lawl*, *StocJcsl*

*Carum Rocburgdanum*, Benth. & Hook. f. Gen. Pl. v. 1, p. 891<sub>v</sub><sup>15</sup>  
 cultivated in native gardens (extensively so in Gujarat) and is probably,  
 as suggested by Mr. C. B. Clarke (El. B. I. v. 2, p. 682), a cultivated  
 form of *C. stictocarpum*, from some forms of the variety *hebecarpa* oi  
 which it is hardly separable. It is not known wild (C. B. Clarke, 1. c.)  
 The seeds are used for flavoring curries and the leaves as a substitute  
 for parsley. Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 642; Watt,  
 Diet. Econ. Prod. v. 2, p. 201. *PimpineUa involuerata*, Wight &  
 Ami Prodr. p. 369; Dalz. & Gibs. p. 106. *A pi urn involucreatum*, Eoxb.  
 Hort. Beng. p. 22; Dalz. & Gibs. Suppl. p. 41.—Flowers: JN<sup>r</sup>ov.-Dec.  
 VEEN. *Ajmod*; *Chanu*; *Handhuni*.

*Oarum copticum*, Benth. & Hook. f. Gen. Pl. v. 1, p. 891. *The Bishops*  
*Weed*; *Lovage*. A plant 1-3 ft. high, cultivated extensively for its

seeds which are largely employed in medicine and also in England and Germany in the manufacture of *Thymol* which is used as an antiseptic. ±1. B. I. v. 2, p. 682 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 642 ; Watt, Diet. Econ. Prod. v. 2, p. 198. *Ptychotis Ajowan*, Wight & Arn. Prodr. p. 368 ; Grah. Cat. p. 84 ; Dalz. & Gibs. Suppl. p. 41.—Flowers : Apr. VERN. *Ajvdn; Onvd.*

}\* Benth. & Hook. f. Gen. Pl. v. 1, p. 891. *Parsley*.  
occasionally in European gardens, but not much grown by

; I \ I 7 T A > Linn\* Sp. PL <1753> p. 264. Grah.  
 ; p i-- ^bs\* oupl. p. 41. *Petroselinum sativum*,  
 Hoffm. 1 • "5 Watt, Diet. Eeon. Prod. v. 6, part 1, p.  
 181.

ual . ^ PIMCPI:N ELLA, Linn.

ITl Cot» pound 1n7t7; lial u herbs' Leaves simple or compound. Flowers  
 tile involuor ft 'r plrodite or polygamo-monecious. Bracts  
 Or small. p<sup>re</sup>/J<sup>o</sup>Pte\ v; bracteoles small or 0. Calyx-teeth obsolete  
 flriar ginato r f usually with long inflexed points, more or less  
 ial? erally com e, Or eutire- Fruit ovoid or broader than long, subterete  
 or, ^esse(\*» o^en constricted at the commissure; mericarps obscure or  
 subpentagonal, often dorsally compressed; ridges slender, ^U or 2<sup>1</sup>  
 rominent > vittaB 2-3 in each furrow. Carpophore entire, face "£aT<sup>lte\*</sup>  
 ^eeca subterete or dorsally subcompressed, the  
 PW, 8 A r • or nearly so.—DISTRIB. Northern hemisphere of the '  
 • Atrica, a few in extratropical S. America; species about 70.  
 "l' glabroi, 8  
 U\* y ?' 8 Cabrid or Pubescent. , p rr  
 Wp, !v eleave88ini Ple ..... 2. *P. Candolleana*.  
 p, er cauhne leaves pinnate.  
 jowers monoecious ..... 3. *P. monoica*.  
 • towers hermaphrodite.  
 ^acts0 ..... 4. *P. tomentosa*.  
 • Bracts 3-7.  
 Leaves simply pinnate; flowers wliite ..... 5. *P.*  
*acUcendens*. ora.  
 Leaves tern ate; leaflets 2-ternat©; flowers pink ..... *G. P. later ifl*

**I \ Pimpinella Heyneana, Wall. Cat. (1823) 566.** Annual; root  
 Usuortn; stem erect, ]|-3 ft. high, with ascending glabrous branches.  
 jV<sup>eaves</sup> 3-foliolate, smaller upwards, the lateral leaflets usually ternate, v&  
 terminal leaflet sometimes ternate, but often simple, entire or lobed;  
 iltiniate segments of the lower cauline leaves usually stalked,  
 ovate-huiceolate, f-2 by g-| in., \evy acute, sharply serrate,  
 glabrous or nearly so, base tapering; ultimate segments of the upper  
 cauline leaves often much narrower; common petioles 1-1J in. Jong,  
 dilated and ciliate at the base. Primary umbels 6-20-rayed, the rays  
 unequal, very slender, 1-2 in. long, glabrous; bracts 0. Partial umbels 4-3  
 2-flowered; pedicels filiform, very unequal, ^-| in. long; bracteoles  
 1-2, linear, £-£ in. long, or 0. Styles short. Fruit subglobose, T^ in.  
 in diam., glabrous; primary ridges slender. Fl. B. I. v. 2, p. 684; Trim.  
 Fl. Ceyl. v. 2, p. 279; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p.  
 643. *Helosciuuliam Ifeyneanum*, DC. Prodr. v. 4, p. 106; Dalz. &  
 Gibs, p. 106.—Flowers: Aug.-Oct.

KONKAN: *Stocks* !. *Dafcell* !; near Marningao, *CooIce* ! DECCAN: *Bowellian* 8 j>ii)os  
 west of Poona, *Conkc* \ S. M. COUNTS: *Woodrow* I KANARA: *Krila naddi*, *Ritchie*,  
 1767 !—DISTIUB. India (Circars, Chittagong, W. Peninsula); Ceylon.

**2. Pimpinella Candolleana, Wic/Jd c j\* Am. Prodr. (1834) p. 369.**  
 An erect herb 1-2£ ft. high; root fusiform, perennial; stems stout,  
 striate, pubescent or villous. Leaves with cartilaginously crenate>  
 serrate margins: lower cauline leaves simple (rarely pinnate), ] g-2^ by  
 ]^2]- in., broadly ovate, usually acute, deeply cordate at the base, the  
 lower surface pubescent, the upper more or less so; petioles  
 long.

densely pubescent: middle cauline leaves 3-partite, the segments  
 ^ and sometimes lobed : upper leaves often irregularly 1-2-pinna tin a,  
 ^  
 Styles long, divaricate. Fruit  $\frac{1}{10}$  in. long, ovoid, ~~acutely~~ <sup>covered</sup> with granular tubercles; mericarps rounded on the back,  
 slightly concave on the inner face. the ridges prominent. Fl. B. I. v. 2,  
 11

p. 687; Wight, Icon. t, 341; Woodr. in Journ. Bomb. Nat. v. (1898) p. 643.—Flowers : Sept.-Oct.

Not very common in the Bombay Presidency. DECCA\* : *Foonn* districts, *Bana e* Panchgani, *Coo/ce* !, *Woodrow*.—DISTRIB. India (W. Peninsula).

3. **Pimpinella monoica**, *Dalz. in Keiv Journ. Bot.* v. 3 (1 p. 212. A tall plant reaching 6-8 ft. high ; stem as thick as a goose-quill, terete, simple below, branched above, glabrous, smooth, stria ? branches alternate and-bifarious. Lower cauline leaves pinna -e; 3-foliolate; leaflets 1|-4 by f-2 in., ovate or ovate-lanceolate, acute, more or less pubescent, sharply serrate, base cordate, truncate oi sometimes tapering; common petioles 3-6 in. long, sheathing, cilia\* , petiolules 1-2 in. long : upper leaves often cut into numerous setaceo linear segments, or sometimes reduced to mere sheaths. <sup>-^0VVf^S</sup>the compound umbels, some of the umbels consisting wholly of male, others of female flowers. Primary umbels with 6-12 slender ra.v » 1 in. long; bracts 0, or 1 subulate. Partial umbels 8-20-flovrerea, bracteoles 1-4, linear-subulate, £-£ in. long, or often 0. Petals white, g^j- in. long, obovate or suborbicular, rounded at the apex. Fruit  $12 \frac{1}{2}$  long, ovoid, crowned by the conspicuous disk, clothed when young w<sup>1^</sup> pellucid granules; mericarps rounded on the back. Fl. B. I. v. p. 687 ; Dalz. & Gibs. p. 106; Woodr. in Journ. Bomb. JVat. v. 11 (lo p. 643.—Flowers : JS<sup>T</sup>ov.

On the highest Ghats, *Dalzell & Gibson*. KONKAN : *Stocks*!, *Law*! DECCAN Mahableshtar, *Cookel*; Panchgani, *Cookel* S. M. COUNTRY : Belgauin south, *Ritchi*> ♦339 t—DISTRIB. India (\V. Peninsula).

4. **Pimpinella tomentosa**, *Dalz. ex C. B. Clarke, in Hoolc. f. Fl, B. I. v. 2* (1879) p. 689. Erect, 2-3 ft. high ; root narrowly fusiform ; stems pubescent or tomentose; branches numerous. Lower cauline leaves 2-3-pinnatipartite ; leaf-blade (excluding the petiole) 3-6 in. long ;, ultimate segments sharply inciso-serrate, the teeth pointed with a stout<sup>1</sup> sharp bristle; common petioles sometimes 4 in. long, sheathing at the base, striate, pubescent or tomentose : upper leaves often reduced to sheaths. Flowers white. Primary umbels 4-8-rayed, the rays subequal,  $\frac{3}{4}$  in. long, pubescent ; bract 1, subulate,  $\frac{1}{4}$  in. long, or 0. Partial umbels 3-12-flowered ; pedicels short, pubescent ; bracteoles 1-3, linear. Styles long, their bases enlarged into conical yellowish-brown stylopods persistent on the fruit. Fruit ^ in. long, narrowly oblong, attenuate upwards, scabrid with numerous small whitish scales; ridges xery obscure. Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 643. *Ilracleum tomen-tosum*, Dalz. & Gibs. p. 108 & p. 313 {not of Smith).—Flowers: Nov.

KONKAN: *Stocks I*; S. Konkan, *Law* ! DKCCAN: Panchgani, *Cooke* !; Maliableshwar, *isooA-e.*; b.nghad near Poona, *Woodrow*.—DISTRIB. India (W. Peninsula).

i leate at the h p (ole); lea^ets 4-8 pairs, rotund-ovate or obovate,  
 ^? ilJ. W tl \* \*cutel. Y and irregularly serrate, the lateral leaflets  
 leaflet usually longer than the lateral ones :  
 leaves few, the upper pinnatisect. Flowers in terminal compound  
 umbels. Primary umbels 4-12-rayed, the rays subequal,  $\frac{1}{4}$ - $\frac{3}{4}$  in. long ;  
 bracts 4-8, linear-subulate,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long. Partial umbels 8-16-flowered ;  
 pedicels  $\frac{1}{10}$ - $\frac{1}{6}$  in. long ; bracteoles 3, linear-subulate,  $\frac{1}{8}$ - $\frac{1}{4}$  in. long.  
 Petals white, broadly obovate, externally pubescent. Fruit  $\frac{1}{16}$  in. long,  
 brown, ovoid, subobtuse, laterally compressed, minutely pilose ; disk not  
 prominent ; ridges obscure. Fl. B. I. v. 2, p. 689 ; Dalz. & Gibs. p. 106 ;  
 Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 643.—Flowers : Jan.-  
 Feb.  
 CaUlin<l \*' ille terminal leaflet. usually lnnfir tlin.n thft lft.oml  
 nno<<•

^ONKAN. ^  
 °W<sup>u</sup> Woodro \* : '' 9 of r\_ivers ill the Konkan' Ddhelll BECCAN: Stocks';  
 ^-COUNT P'I ohad, Woodrow; between N.isrk and I^atpuri,  
 Egdeworthl \*• lielgaum, Woodrow \, Ritchie, 1081 !—UISTUIB. India (W.  
 Peninsula).

**pinella lateriflora**, Dalz. \$ Gibs. Bomb. FL (1861) p. 106. 2 it.  
 high; stems puberulous. Leaves termite, the leaflets MJJea ii l°bes of  
 the lower leaves lanceolate, those of the upper lea£ ' a" ■ acute,  
 mucronate. Flowers pink ; peduncles long, slender, I^arf f^oSeC^  
 Primary umbels 3-1U-rayed ; bracts 3-7, subulate, de? i Um^s with  
 7 subulate bracteoles as long as the pedicels. Fruit \\r ^y covered  
 with small granular tubercles. Fl. B. I. v. 2, p. G89 ; °°ar. in Joarri.  
 Bomb. Nat. v. 11 (1898) p. (343. rp.<sup>E</sup>p<sup>CAN</sup> '• in ravines, common, Dalzell \$ Gibson.

fa\* P^ant has been included on the authority of Dalzell & Gibson. It has not,  
 as jj as I am aware, been found by any other collectors, though Dalzell & Gibson  
 btate <u, it is common in ravines in the Peccan. I have never seen a specimen.  
 There •( none in Herb. Kew., and the description has been taken from Dalzell &  
 Gibson, ^1):"b. Fl. i.e.

## 5. POLYZYGUS, Dalz.

A glabrous herb ; root tuberous. Leaves ternate|j and  
 pinnately  
 decomposed; segments rather broad, pinnatifid. involucre-bracts xery  
 few, or 0 ; bracteoles of the involucels few, small, setaceous.  
 Flowers  
 white, in compound umbels. Calyx-teeth small, or the exterior larger.  
 Petals oblong, iuflexed at the apex, emarginate. Fruit small, ovoid,  
 transversely subterete, with a broad commissure, glabrous ; mericarps  
 jsemiterete, primary ridges scarcely prominent, furrows broad, 1-3-vittate.  
 Carpophore 2-partite. Heed Hat on the inner face.—DifeTitiB.  
 India  
 (W. Peninsula) ; species 1.

**1.\*Polyzygus tuberosus**, Dalz. in Kew Journ. Bot. v. 2 (1850)  
 ]). 260. A herb 5-8 ft. high, quite glabrous; root tuberous; stem  
 erect, sparingly branched, terete below, angular and furrowed above.  
 Kadkal leaves several, deltoid in outline, triternate ; pinnae distant ;  
 common petioles very long, 3-6 in. long or more; partial petioles of the  
 lowest pinnae 1-2 in. long, becoming shorter upwards; ultimate leaflets  
 pinnatisect, the segments with irregular bristle-pointed serratures :

cauline leaves few, smaller. Flowers white, in terminal and axillary compound umbels. Primary umbels 3-8-rayed, f-1 ] in. long; bract 1,



subulate, J in. long, or 0. Partial umbels 6-12-flowered, H.<sup>int</sup>

subulate, J in. long, or 0. Partial umbels 6-12-flowered, H.<sup>int</sup> the outer flowers fertile with long divaricate purple styles, the sterile with scarcely any styles; bracteoles 3, unilateral, long, dorsally compressed, ovoid, glabrous, shining, many-ribbed. v. 2, p. 698; Dalz. & Gibs. p. 107.—Flowers : June-July.

A rare plant. KONKAN : Stocks!; Mai wan, Dahcll!; Dapoli, Kairne. Law I

## 6. ZOSIMIA, Hoffm.

A perennial pubescent or hirsute herb. Leaves pinnately compound; segments small. Flowers white or greenish-yellow; compound, many-rayed; bracts and bracteoles usually many, Calyx-teeth prominent. Petals equal or unequal, rarely radiant, an inflexed acumen, emarginate or 2-lobed. Disk depressed, with dulate margin. Fruit orbicular or elliptic, dorsally much compressed > surrounded by a broad tumid margin before dehiscence; margin J. slightly convex in the middle of the back; dorsal and intermediate ridges slender, the lateral dilated into closely contiguous wings which form the margin of the fruit, the space between the margin and seed-bearing cell hyaline; vittae large, solitary in the furrows. Pore 2-partite. Seed flat or slightly convex on the back.—"W. Asia; species 1.

1. *Zosimia orientalis*, Hoffm. *Gen. PL Umbel*, ed. 1 (1814) p. 111, B, fig. 7. A stout perennial pubescent or hirsute herb 1-3 ft. - root large, fusiform; stems grooved, pubescent. Leaves reaching 8 in. long, decomposed, oblong-lanceolate in outline, pubescent, much cut, ultimate segments narrow, linear, obtuse or subacute, -p—A" i<sup>Q</sup>« broad. Flowers greenish-yellow; petals obovate-oblong, in. long with a very long inflexed acumen. Primary umbels 10-30-rayed, the rays unequal, 2-4 in. long, stout, pubescent; bracts about 10, linear-lanceolate very acute, § in. long, pubescent (often araneously so when young, Partial umbels 8-25-rayed; bracteoles 8-12, linear-lanceolate, | in. long, pubescent; pedicels !•-§ in. long. Disk very large. Ovary densel; pubescent; style bases not dilated. Fruit pubescent until fully ripe obovate or elliptic, \ by § in. with a broad wing; dorsal and intermediate ridges prominent, very slender; vittae thick, solitary in the furrows; commissural vittae 2-4. Jackson, in *Index Kewen*. v. 4, p. 1254, *Zosimia absinthiiifolia*, DC. *Prodr.* v. 4 (1830) p. 195; C. B. Clarke, in *Hook. f. FL B. I.* v. 2, p. 717. *Heracleum absinthiiifolium*, Vent. *Choix.* t. 7.

A rare plant, confined in the Bombay Presidency to Sind. SIKD : Stocks, 958!— BISTRIB. India (Panjab); Afghanistan, Beluchistan.

## 7. PEUCEDANUM, Linn.

Perennial (rarely annual) usually glabrous herbs. Leaves pinnately or ternately decomposed (rarely simply pinnate). Flowers white or yellow (rarely pink), often polygamous, those of the central umbels usually perfect. Umbels compound, usually with many rays; bracts various; bracteoles many, rarely minute or 6. Calyx-teeth obsolete or more or less prominent, small. Petals obovate, cuneate, or subovate, inflexed at the tip, emarginate or entire, not radiant. Disk

undulate

id, oblong usually small. Ovary glabrous.  
 Fruit  
 Primary dorsal caps slightly convex on the back,  
 lateral dorsal intermediate ridges filiform or little  
 elevated,  
 W of the 5 vittae usually solitary in the furrows reaching  
 flat surface, abbreviated, the commissural vittae 2-6.  
 Saccate on the back, the face

ve. - Li) ack, the face flat or rarely somewhat  
 Picai and X throughout the northern hemisphere of the world,  
 Africa, Tropical America; species about 100.  
 ginseng; commissure 2-vittate ..... 1. P. Dhana.  
 oriels serrate; commissure 4-vittate ..... % P.  
 grande.

# Ham- in Wall. Cat. 7216, var. **Dalzellii**,  
 abrous, Glaucous,  
 branched form; stem rigid, 6-8 in. high,  
 scarcely divided, lying on the ground, subcoriaceous,  
 pinnately 1-1 in. entire, or, more commonly, deeply  
 2-3-lobed, in long, ovate-oblong, mucronate, entire;  
 petioles in lower yellow. Calyx obscurely 5-toothed.  
 Primary dorsal rays 1-1 in. long; bracts 3-6, lanceolate,  
 acute, umbels 20-flowered; pedicels unequal, lanceolate,  
 lanceolate, 1/2-1 in. long. Styles long, recurved. broadly  
 elliptic; vittae linear, solitary between the and as long as them,  
 the commissure 2-vittate, the vittae marginal. Bomb- Nat.  
 v. 11 (1898) p. 643. *Pastinaca glauca*, p. in Kew Journ. Bot. v.  
 4 (1852) p. 293; Dalz. & Gibs. p. 107— lower: July-Aug.  
 VERN. Koland.

A. ONK. near Pen Woodrow. S. M. COUNTRY: pastures near Belgum, Balzell §  
 son; Belgum, Dalzell, Ritchie, 1078!  
 (W eaten and has the taste and odor of a carrot.—DISTKIB.  
 India Peninsula, Jabalpur, Chota Nagpur).

**/2. Peucedanum grande**, C. B. Clarice, in Hook. f. Fl. B. I. v. 2,  
 /: 710. Glabrous, 3 ft. high; root large, woody, perennial; stem erect,  
 rooved, as thick as the little finger at the base. Leaves mostly radical,  
 bipinnate, 8-12 in. long (including the common petiole which is 2-5 in.  
 long); pinnae usually 2 pairs and a terminal leaflet, the lowest pair  
 ternately divided, with petioles 1/2-1 in. long, the upper pair often simple,  
 sessile or nearly so, the terminal leaflet 3-lobed nearly to the base, the  
 ultimate leaflets 2-2 1/2 by 1-1 1/2 in., with deeply and irregularly gashed  
 and serrate margins, the serratures ending in a stiff hard bristle: cauline  
 leaves usually ternate, very variable in size and shape, usually deeply  
 lobed (sometimes almost entire), with crenate-serrate margins and  
 petioles much dilated at the base. Flowers yellow. Calyx-teeth 5,  
 short, triangular. Petals 1/2 in. long, ovate-oblong, with a long inflexed  
 acumen. Primary umbels 10-20-rayed, the rays unequal, 1-2 in. long;  
 bracts 5, herbaceous, 1/2 in. long, ovate-oblong, acuminate. Partial umbels  
 10-20-rayed; pedicels 1/4-1/2 in. long; bracteoles 5, oblong, acute, 1/8 in.  
 Ovary glabrous. Fruit obovate, 3/8-1/2 in. long, narrowly winged;  
 and intermediate ridges prominent, the furrows 1-vittate, the  
 long.

dorsal

vittae nearly as long as the fruit; lateral usually 2-vittate, the vitta abbreviated ; commissural vittae 4, abbreviated. Woodr. in Journ. Bomb. Nat. T. 11 (1898) p. 643; AVatt, Diet. Econ. Prod. v. 6, part 1, p. 181.

2P

*Pastinaca grandis*, Dalz. & Gibs. p. 107. — Hovers : July.  
*Bdphali*.

Ghats near Bombay, *Dalzett # Gibson*. KONKAN : Matberan, *H. M-<sup>Bt</sup> Sa'*  
Pen, *Woodrow I* DECCAN : Mawal taluka, *Woodrow !*; Khandala, *Cooke.*; *Jv*  
*Cooke I*—DISTIB. India (hills of the Western Peninsula), apparently <sup>ende</sup>.f \onkan

The plant has some repute in native medicine. The fruit collected from tue  
\* *hills* is sold in the Bombay market. See Watt, Diet. Econ. Prod. 1. c.

*Peucedanwni graveolens*, Benth. & Hook. f. Gen. Pl. ▼••\*» V\* *The*  
*Dill* or *Sowa*. A glabrous herb 1-3 ft. high, with 2-3-pi"»ate lea<sup>^</sup>  
and yellow flowers, extensively cultivated for culinary and <sup>^eaic</sup> <sup>^^</sup>  
purposes. The seed is sold in every Indian market. Fl. i>\* <sup>7J</sup> /  
p. 709 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 643 ; Watt,<sup>^</sup> •  
Econ. Prod. v. 6, part 1, p. 181. *Anethum Sowa*, Eoxb. Hort. *Wb'*  
p. 22; Grah. Cat. p. 248 ; Dalz. & Gibs. Suppl. p. 41.—VEKK. *WP*  
(the plant); *Bdlantsliep* (the fruit).

*Peucedanum sativum*, Benth. & Hook. f. Gen. PL r. 1, p» <sup>^^#</sup>  
*Parsnij*). Cultivated but very sparingly in the gardens of European  
• It grows remarkably well in the Deccan, especially if irrigation  
available. I have grown it most successfully *in* my own garden  
Poona and it seems a pity that this valuable esculent is not in  
<sup>^</sup> generally cultivated. *Pastinaca sativa*, Linn. Sp. Pl. (1753) p. <sup>^</sup>  
-\*' Grah. Cat. p. 84; Dalz. & Gibs. Suppl. p. 41.

## 8. HERACLEUM, Linn.

Perennial or biennial more or less hairy (rarely glabrous) her  
• Leaves lobed, pinnate or pinnately (rarely ternately) divided ; segmen  
broad, lobed and toothed, rarely small. Umbels compound,  
many-rayea, often large ; bracts few, 0, or many, foliaceous ; bracteoles  
usually man<sup>v</sup> Flowers often polygamous. Calyx-teeth obsolete or  
more or less Cr<sup>^</sup> spicuous. Petals white (rarely yellow), usually  
unequal, often radiant, t lobes of the larger often widely spreading,  
emarginate or 2-lobed. Ovat usually pubescent, the fruit often at  
length glabrate. Jfruit orbicuW obovate or elliptic, much dorsally  
compressed, winged, the wing wit thickened margins (wing obsolete or  
nearly so in *H. concanense*); dorsa<sup>v</sup> and intermediate ridges prominent or  
obscure, the lateral expanded into closely contiguous wings forming  
the wing of the fruit; vittae usuall; solitary in the furrows, the  
commissural 2-4, all descending from a shor thick stylopod to or  
beyond the *middle* of the fruit, often more or les; dilated towards their  
extremities.—DISTBIB. Temperate regions of the, northern hemisphere  
of the Old World, 1 widely spread through N. America, 1  
in Abyssinia ; species about 50.

Petals not radiant.

Wing of fruit broad ..... ). *H. aquilegifolium*.

Wing of fruit narrow ..... 2. *H.*

*Sprengemamtm*.

Petals radiant.

Bracts linear-lanceolate; bracteoles 5; commissure 6-  
vittate ..... 3. *ff. concanense*.

Bracts broadly ovate; bracteoles 3 ; commissure 2-vittate. 4. *H. Pinda*.

**1. *Heracleum aquilegifolium*, C. *£. Clarke, in Book, f Fl. B. 1.*  
v. 2 (1879) p. 7.15. Glabrous, branched; root fusiform. Eadical  
leaves**

1

?% 2 <sup>9</sup>ES ff oleS 4~8 irL lon£> dil^ed at the base; pinna  
 T^ate,with d^Va a terminal leaflet, the lowest pair of pinnae usually  
 0, P<sup>Ie</sup> <5r lobeH ft! 2 ln^lon£> the second pair sessile or nearly so,  
 1 loH sompl'm t er, minal leaflet undivided or more or less deeply  
 lon & all irreo-nl T a win Sed petiolule; ultimate leaflets 1|-3 in.  
 \erves : caulrn 1 serrate deri tate and with many prominent slender  
 Hin.lorJ p y^S usua^\* z in- long; bracts 3-5,  
 oblong-lanceolate  
 acute x in 1 artal un^els 6-10-rayed; bracteoles 3-5, linear-oblong,  
 Skb "Jr^S; pedicels 1 §£ i 1 Pt1 1 O

rayed; bracteoles 3,  
 e o o n g , Sbroug Jr^; pedicels unequal, §-£ in. long. Petals  
 equal. Ovary  
 Sickened at fh 8 @mall\* Fruit i b^ i in\* ellipsoid> glabrous, the wing  
 Current • marg^m > .dorsal and intermediate ridges distinct, shortly  
 10-'i^r^ "road with a minute marginal vitta; vittae on the back t\*elw  
 h near» produced nearly to the base of the fruit, not dilated v- llvl \*qq\  
 ; commis sural vittae 4-6. Woodr. in Journ. Bomb. Nat.  
 Koir (P, 643\* ~ Flowers: Sept.-Oct. ONR AN:  
 Stocks I, Law I; Ooran, Stocks I

p. 372 ^f oleUm SprenSeli a»um> Wight # Am. Prodr. (1834)  
 to\le "i stout herb 2-4 ft. high; stem branched, much  
 grooved. cloth V(\ 7es pi^nate or 2-pinnate, 8-12 in. long, ovate  
 in outline, ben e<u w^^ minute scattered hairs above and  
 slightly larger ones ^ eath; pinnae 2-3 pairs and a terminal leaflet, the  
 lower pair (or when Pairs are present, the 2 lower pairs) pinnate or  
 undivided on petioles of i r^ao^le lengths, the uppermost pair nearly sessile,  
 not divided, the terminal a«let large and usually deeply 3-lobed on a  
 long petiolule; ultimate eaflets sometimes 4 in. long : upper leaves  
 usually 3-foliolate, the uppermost often reduced to sheaths. Flowers  
 small; petals equal. Primary ^ttibels 8-20-rayed, the rays unequal,  
 1-3 in. long, pubescent; bracts 0 Or 1-2, oblong-lanceolate. Partial  
 umbels 8-16-rayed; bracteoles 3-5, lanceolate, caducous, ^ in. long;  
 pedicels \-^ in. long, pubescent. Ovary /pubescent. Stylopods  
 conical, large. Fruit \ by ^ in., ellipsoid, with a very narrow wing ;  
 dorsal and intermediate ridges often obscure; vittae 4 on the back, about |  
 the length of the fruit, not dilated at the lower end ; commissural vittae  
 2-4. El. B. I. v. 2, p. 716; Dalz. & Gibs. p. 108 ; Woodr. in Journ.  
 Bomb. Nat. v. 11 (1898) p. 643. Pa&tinaca, Sjprea-yeliana, Wight,  
 Icon. t. 1008.—Flowers: Aug.

Rare. DECCAN : Khandala, Woodrow. S. M. COUNTRY : on the road between  
 Belgaum and the Bamghat, Dalzell Sf Gibson.—DISTRIB. India (W. Peninsula).

3. **Heracleum concanense**, *Dalz. in Kew Journ. Bot.* v. 2 (1850) p. 260. Erect, 1<sup>^</sup>-2<sup>^</sup> ft. high, more or less hairy; root pisiform ; stem striate, dichotomously branched, usually with a few scattered hairs. Lower leaves 2-ternate; leaflets 3-lobed or ternately divided; segments 1-1<sup>^</sup> in. long, pubescent, ovate, cuneate at the base, irregularly serrate, the serratures with a hard mucro: upper leaves often reduced to sheaths. Flowers white, the outer radiant. Calyx 5-toothed, the 2 exterior teeth ovate, subobtuse, subsistent on the fruit beneath the stylopods, the 3 interior obsolete, but the margin of the calyx thickened there. Petals of the radiant flowers 3 by  $\frac{1}{2}$  in., broadly obovate, cuneate, strongly veined, 2-lobed, with a shortly inflexed tooth

between the lobes; inner petals broadly elliptic, with a shortly<sup>i</sup> acumen. Primary umbels 5-12-rayed, the rays unequal, J-1<sup>2</sup>/<sub>n</sub>-pubescent; bracts 1-3, linear-lanceolate, acute, unilateral, | in. Partial umbels 5-10-rayed; bracteoles usually 5, lanceolate-acumina<sup>^</sup>, \ in. long, strongly nerved; pedicels | in. long. Ovary pubescent wiier young. Stylopods large, conical. Fruit less flattened than *m* most<sup>^</sup> the other species of the genus, very hard, not or *obsoletely* winged, ^ 5 by ^ in., glabrous; dorsal and intermediate ridges obtuse, equally pi -minent; vittse on the back about 8-10, reaching nearly to the base the fruit, solitary in the dorsal furrows, usually 2 in the lateral on commissural vitt® usually 6. Fl. B. I. v. 2, p. 716; Dalz. & ^ p. 107; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 643. *JBeraeleum grandiflorum*, Dalz. & Gibs. p. 108.—Flowers: July-Aug.

KONKAN: *Stocks*!, *Dalzell* DECCAN: Khandala, *Woodrow I, Cookel*; Mahableshtar, *Cookel*; Panchgani, *Woodrow*. S. M. COUNTRY: Rainghafc, *Stocks*!—DISTUIB. Ina (W. Peninsula).

TAR. *StocMi*, C. B. Clarke, in Hook. f. Fl. B. I. v. 2, p. 716. Dorsal and intermediate ridges (in the unripe fruit) slender; lateral ridge<sup>3</sup> excurrent into a very thin wing.

KONKAN: *Stocks*!

4. **Heracleum Pinda**, *Dalz. & Gibs. Bomb. FL* (1861) p- 107. Perennial; root as thick as the finger; whole plant clothed with *long* weak white fiat hairs; stem erect, branched. Leaves chiefly radical, 2-pinnate; segments cuneate at the base, coarsely toothed, the teetn mucronate; petioles long. Flowers white, in terminal umbels, radiant—Petals of the radiant flowers large, obeordate, deeply 2-lobed. Primary umbels 6-8-rayed, the rays unequal; bracts 1-3, foliaceous, broadly ovate, acute. Partial umbels with 3 bracteoles similar to the bract<sup>^</sup>. Fruit with 6 vittae on the back, 2 on the commissure. Fl. B. I. v. % p. 717; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 643.—Flowers j July-Aug, VEEN. *Panda*.

DECCAN: hill forts of Harishchandragad and Harsar, *Dafcell & Gibson*.

The above is included on the authority of Dalzell & Gibson, from whom the description bae been taken (/ . <?). I have never seen the plant, nor, as far as I know, has it been found by any collectors.—There are no specimens in Herb. Keve.

The following plants not belonging to any of the foregoing genera are cultivated more or less throughout the Presidency:—

*Daucus Carota*, Linn. Sp. Pl. (1753) p. 242. *The Carrot*. Extensively cultivated. Fl. B. I. v. 2, p. 718; Grah. Cat. p. 85; Dalz. & Gibs. Suppl. p. 41; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p 643 • Watt, Diet. Econ. Prod. v. 3, p. 43.—VEEN. *Gdjar*.

*Apium graveolens*, Linn. Sp. Pl. (1753) p. 264. *Celery*. Cultivated occasionally in gardens. Fl. B. I. v. 2, p. 679; Grah. Cat. p 84 • Dalz. & Gibs. Suppl. p. 41; Watt, Diet. Econ. Prod. v. 1, p. 271.

*f v i ?* c. v. 1, p. 105, fig. 5. *Fennel*.

Cul-  
§ ?? ■  
and Gujarat. Fl. B. J. v. 2, p. 695; Grah. Cat. p. 84;  
ia> and<sup>1</sup> in the BoTmba7 Presidency, largely in



■L'alz. & Q.^  
 P> 643; Watt- TV<sup>1!</sup> I" 41; Wodr. in Journ. Bomb. Nat. v. 11 (L893) vatt,  
 Diet. Econ. Prod. v. 3, p. 405.-VERN. *Badishep*.

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Arah- Cat. si r\ i e Bombay Presidency. Fl. B. I. v. 2, p. 718 ; ■I\*at. v. H  
 /Voq; ■Ualz- & Grib. Suppl. p. 41 ; Woodr. in Journ. Bomb. J%ore%  
 A°\*Q) P. 643; Watt, Diet. Econ. Prod. v. 2, p. 642.—VERN.

tetl sivelv oiTif- 5f TMwm> Linn. Sp. Pl. (1753) p. 256. *Coriander*. Ex-<sup>Vt</sup>  
 2> P 717 n, thro'ughout India, largely in the Deccan. El. B. I. Jour'n  
 BnmK xr Cat" P- 85 5 Dalz. & Gibs. Suppl. p. 41; Woodr. in P- 567  
 Jvv ^^ v\* U (1898> P. «43; Watt, Diet. Econ. Prod. v. 2, Y\*»sr.  
*Kothmir* (the herb); Z)/i«>wf (the fruit).

## ORDER LXVIII. ARALIACE^].

U o r SruAs somet;it>es climbing (very rarely herbs), glabrous or  
 cent or t°nientose. Leaves alternate (rarely opposite),  
 within A POUll(i (rarely simple); petioles longp  
 regul h part\_y adnate to the petiole (rarely free or 0). Flowers  
 }je j ^» nei>ftiaphrodite or polygamous, in umbels, racemes, or paniced  
 .s (rar6ly solitary), with bracts and bracteoles ; pedicels continuous  
 & th b f h id C l b d  
 or AecomPOUll(i (rarely simple); petioles long;  
 stipules  
 patl dt l il l f 0 Fl

^., (y solitary), with bracts and bracteoles ; pedicels continuous  
 & the base of the calyx, or there articulated. Calyx-tube adnate to  
 e ovary ; limk annular or shortly cup-shaped, truncate or more or less  
 Ds curely toothed or obsolete. Petals usually 5 (rarely 6 or 7), valvate  
 ^ slightly imbricate, singly or calyprately deciduous, rarely persistent,  
 at as many as the petals (rarely more), alternate with the petals  
 inserted with them within the margin of the calyx around an epi- disk.  
 Ovary inferior, 1-many-celled; ovules solitary in each CQu,  
 pendulous, anatropous ; styles as many as the cells of the ovary, /distinct  
 or united, erect or recurved. Fruit usually drupaceous or dry, with as  
 many cells and seeds as the ovary. Seed pendulous ; albumen copious,  
 uniform or ruminant ; embryo next the hilum ; radicle super-  
 rior.—DISTKIB. Chiefly tropical and subtropical; genera 38 ; species  
 about 340.

## 1. HEPTAPLETJRUM, G\*ertn.

Trees or shrubs often climbing. Leaves alternate, digitate, crowded  
 near the ends of the branches ; petioles long, dilated and clasping at the  
 base; stipules usually connate within the petiole, prominent. Um-  
 bellules (rarely capitate) or racemes amply or shortly paniculate  
 or rarely the umbellule subsolitary ; bracts beneath the peduncles mem-  
 branous, usually very caducous, those beneath the umbellules small  
 or 0 ; pedicels usually not articulated. Calyx-teeth obsolete or the  
 calyx-margin truncate. Petals 5-60 (usually 5-6), valvate. Stamens  
 as many as the petals ; anthers ovate. Disk convex or conical; in male  
 flowers concave. Ovary-cells as many as the petals; stigmas sessile in  
 the middle of an umbonate or conical disk, which is more or less pro-

duced into a columnar style. Fruit subglobose, 5-6-angled. Seeds laterally compressed; albumen uniform.— **DISTRIB.** Asia, Tropical Africa, Pacific Islands, and Australia 5 species about 60.

J<sup>^</sup> evergreen forests  
etA i l

Ss<sup>a</sup> if 5. co<sup>^</sup>only grown as<sup>2</sup> <sup>^^</sup> W OJ. P; gJ'(1898)  
pots about houses. JI- £ <sup>^</sup> JoUrn. Bomb. Nat.  
& Gibs. Suppl. P- <sup>4^</sup>

*Panax cochleatum*, DC. Prodr. v. 4 (18... P.  
*Panax*. A shrub with long simple concave leaves, a native c.  
Eastern Islands, very common as a foliage plant in gardens. Grah. Cat  
85. Dalz. & Gibs. Suppl. p. 42; Woodr. in Journ. Bomb. Nat. v. 13

P<sup>643</sup>- 3 0 ) 2 5 3 <sup>^^</sup> <- f<sup>^</sup>  
(1898) p. 643. , 939. *The*  
*Chinese*

Kew Journ. Bot. v. <sup>^</sup> V /  
Flowers: Dec. 4 (1842) p. 26i?

straggling panicles \\ «• <sup>^</sup> Woodr.<sup>J</sup> in Journ. Bomb. Nat. v.  
Poona. Fl. B. I. v. A P- <<sup>o</sup> ' -

ORDER LXIX. CORNACEiE.

Leaves opposite or alternate, usually petiolate, unequal at the base ; stipules 0. Flowers Panicles regular, in terminal or axillary cymes, Calyx-tube adnate to the ovary ; limb 0, or truncate, bed, persistent, valvate or open in aestivation! Stamens inserted disk, usually equal in cell a rarely 2-4 times as many. Ovary inferior, cell solitary (rarely 2), pendulous from the apex of monl drupaceous ; putamen 1-4-celled, less pyrenes. Seed oblong, pendulous ; usually fleshy albumen; cotyledons 2, foliaceous ; radicle.—DISTRIB. Scattered throughout Asia, but chiefly in the northern hemisphere; species 75.

- we 8vΛ ; Pec<a!S Vfr y long! Stamens 15 or more ..... I-
- ALANGIUM. petals short; stamens 4-5..... 2.
- MASTIXIA.

1. ALANGIUM, Lamk.

Or small trees, armed or not. Leaves alternate, petiolate, quite entire, 3-nerved from the base, persistent. Flowers white, hermaphrodite, in axillary fascicles, ebracteate, shortly pedicelated with the pedicel. Calyx-tube turbinate, often sulcate; large, 5-10-toothed or truncate. Petals 5-10, linear-oblong, at h reflexed or revolute, valvate. Stamens usually 2-4 times as y as the petals ; filaments filiform or flattened, more or less villous; anthers long. Disk cushion-shaped, depressed in the centre, lobed or crenulate. Ovary 1-celled; ovule solitary in each cell, pendulous; > style narrowly clavate or filiform ; stigma clavate or capitate, 4-many-fid or many-lobed, the lobes conduplicate. Berry crowned with the calyx-limb. Seed oblong; testa thin; albumen usually fleshy; cotyledons foliaceous; radicle elongate, cylindric, thick.—DISTRIB. Asia and Tropical Africa ; species 8-10.

1. **Alangium Lamarckii**, *Thw. Enum.* (1859) p. 133. A small tree with more or less spinescent branches; bark light-colored; young parts pubescent. Leaves variable, 3-5 by 1-2-J- in., narrowly oblong or ovate-lanceolate, more or less acuminate, subobtuse, entire, glabrous above, pubescent on the nerves and prominently reticulately veined beneath, base rounded or acute ; petioles \- \ in. long, densely pubescent. Flowers few, in axillary fascicles ; pedicels \- \ in. long, densely pubescent, jointed at the top. Calyx turbinate, \ in. long, densely silky-pubescent; teeth triangular, -^ 'in. long. Petals 5-10 (usually 6), densely pubescent outside, | - f in. long and about T \ in. wide, narrowly linear, reflexed. Stamens numerous (usually more than 20), nearly as long as the petals ; filaments hairy at the base. Style as long as

the stamens ; stigma very large. Fruit when young ovoid or ellipsoid, becoming nearly globular when ripe, ½-f in. in diam., crowned by the persistent calyx-limb, finely pubescent, not or obscurely ribbed, purplish-

red; endocarp bony; albumen fleshy outside, friable " ^ V ^ j \ . 2, ruminant; cotyledons foliaceous, flat, not crumpled, *t* *rv' -iu' Trees*, p. 741; Dalz. & Gibs, p. 109; Trim. *Yl Ceyl.* v. 2, p. 280; <sup>la \ D "</sup> ^ Bomb. ed. 2, p. 181; Woodr. in Journ. Bomb. Nat. v. 11 { ^ ) F-

Watt, Diet. Econ. Prod. v. 1, p. 153. *Alangium dtcapetalun*, ^ Encyc. Method, v. 1, p. 174; Grah. Cat. p. 72; Wight, Icon. t. i \* • -Flowers : Feb.-Apr. VEEN. *A'nkul; Ansaroli*.

KONKAN: Stodfe!, ! > « & \* # # < 3 W \* w; Elephanta, *Graham*. *V \* < L CA \* : / ^ \** tf

\* ? & « » \* ; Poona, *Woodrow I* GUJARAT: *Dnngs, JBhival; ^ d*

COUNTRY: Belgaum, *Ritchie*, 1070! KANARA: Godhuli,

Throughout India; Ceylon, S. China, Malaya, Philippines.

i c]ose.

The fruit though astringent and acid is eaten. The wood is hard, tough, a grained, and is valuable as fuel.

## 2. MASTIXIA, Blume.

Trees with terete branches. Leaves alternate, subopposite, & <sup>n</sup> ^ opposite, oblong, quite entire, drying black. Flowers small, berin < phrodite, in terminal panicles, articulated with a 2-bracteolate pedice. Calyx-tube campanulate; limb dilated, 4-5-toothed. Petals 4-5, ovate, leathery, valvate. Stamens 4-5; filaments short; anthers cordate. Disk fleshy. Ovary 1-celled; ovule 1, pendulous from one side or trie cell near its summit. Drupe ovoid or ellipsoid, usually areolate at the apex; putamen woody, grooved down one face. Seed conform to the cell; testa membranous; albumen copious, fleshy; embryo smafi, cotyledons foliaceous, thin; radicle subelongate, cylindrical.—DISTBI ^ \* Indian Peninsula, Ceylon, Java; species about 8.

1. *Mastixia pentandra*, *Blume, Bijdr.* (1825) p. 654. A moderate-sized tree; bark smooth. Leaves 4-6 by 1|-2 in., elliptic-oblong, often obtusely acuminate, green and glabrous above, paler, reticulately veined, and, when young, puberulous beneath, base usually unequally sided; main nerves 6-8 pairs; petioles f-1 in. long, glabrous. Flowerd numerous, in terminal densely pubescent panicles; buds silky-pubescent; ■ lower bracts foliaceous, sometimes nearly 1 in. long, the upper narrowly linear £ in. long; bracfceoles y <sup>1</sup> ^ in. long, acute, pubescent. Calyx 1 in. long, pubescent outside; tube narrowly campanulate; teeth 5, ovate, subacute, ^ <sup>m'</sup> 1 <sup>oD</sup> & - Petals 5, ovate, very acute, leathery, a little longer than the calyx. Stamens 5. Style very short. Fruit H by f in., ellipsoid. El. *B. I.* v. 2, p. 746; *Ta'lb. Trees*, Bomb. ed. 2, p. 182; Woodr. in Journ. Bomb. *JVat.* v. 11 (1898) p. 644. *Bursino-petalum arhoreum*, Dalz. & Gibs. p. 28 (not of Wight).—Flowers : Jan.-May.

KONKAN: *Stocks], Dalsell], Law I*; Western Glmts from Bombay southwards, *Talhot*. S. M. COUNTRY: Dharwar, *Woodrow*; Parva Ghat, *Bahell \$ Gibson*. KANAKA : in evergreen forests and along nalas in N. Kanara, *Talbot*.—DISTKIB. India (W. Peninsula).

## ORDER LXX. RUBIACEJ3.

Trees, shrubs or herbs, erect, prostrate, or scandent Leaves opposite or whorled, simple, entire, stipulate (except in *Ruhia*); stipules various, inter- or mtra-petiole, persistent or deciduous, sometimes free, some-«mog united to the leaf or the neighbouring stipule, entire<sup>4</sup>

toothed

or setose PI  
 ■floreesc" ■<sup>Lim</sup>7ers hermaphrodite (rarely 1-sexual), usually regular.  
 ^orolla<sup>Ce</sup> Va<sup>TM</sup>us' Calyx-tube adnate to the ovary ; limb various.  
 rotate- i-re?u ar' gamopetalous, infundibuliform, hypocrateriform or  
 co<sup>o</sup>torted r<sup>o</sup>Λ<sup>~</sup>Ⓜ<sup>se</sup>S<sup>men</sup>ts, usually equal, valvate or imbricate or  
 Se&tt>ent £<sup>Λe</sup>Λ as seen Λrom outside). Stamens as many as the  
 or long -S J<sup>Λe</sup> corolla> inserted on its mouth or tube ; filaments short  
 8^ped r? ers. 2~celled. Disk epigynous, usually annular or cushion-  
 slyle s<sup>j</sup> y<sup>v</sup>ary inferior, 2-10-celled ; ovules 1 or more in each cell ;  
 Pace<sup>or</sup> mu<sup>Λ</sup>Λ<sup>Λ</sup> 5 stigmas various. Fruit berried, capsular,  
 variations . U<sup>Λ</sup>V<sup>Or</sup> o<sup>Λ</sup> Λ<sup>e</sup>hiscent or indehiscent cocci, 2-10-celled. Seeds  
 dons flni<sup>U</sup>ne<<sup>n</sup> fleshy or horny ; embryo straight or curved ;  
 cotyle-\*ro<sup>p</sup>ical o<sup>Λ</sup> sem<sup>Λ</sup>"Λerete 5 radicle superior or inferior.—DISTUIB.  
 Chiefly q<sup>A</sup> and subtropical; genera about 340 ; species about  
 4000.

solitary %1G n "" usua<sup>Λ</sup>y numerous in each cell [rarely  
 plo / ln some species of *Anofis* (12)].  
 CTs<sup>o</sup>toweled in dense globose beads.

avx-tnK- r—A into fleshy mass ..... h SARCOCEPIHALUS.

- ?                      ↓
- not fused into a fleshy mass.
- Corolla-lobes imbricate.
    - Seeds not winged ; stigma fusiform ..... 2.
    - ANTIIOCEPIHALUS.
    - beeds wmged; stigma globose ..... 3. NAUCLEA.
  - Corolla-lobes valvate.
    - Calyx cleft £ -way down ; stigma clavate ..... 4. ADINA.
    - t. Calyx truncate ; teeth obbcure ; stigma mitriform. 5. MITRAGYNA.
  - 14 lowers not in dense heads.
    - Fruit capsular. Trees or shrubs.
      - Corolla-lobes valvate ; seeds winged ..... G
      - Corolla-lobes twisted ; seeds not winged ..... 7. WENDLANDIA.
    - Herbs (the Bombay species).
      - Corolla-lobes valvate.
        - Corolla-lobes with a tooth on each side ..... 8. DENTELLA.
        - Corolla-lobes entire.
          - Anthers connivent, dehiscing by apical pores; capsule bursting irregularly at



- the apex ..... 9. ARGOSTEMMA.
- Anthers not connivent, dehiscing  
laterally ; capsule usually regularly  
dehiscing, rarely indehiscent. Calyx-teeth  
4.  
Calyx-teeth contiguous on the  
capsule ..... 10. HEDYOTIS.
- Calyx-teeth distant on the capsule.  
"Seeds numerous, minute, an  
gular ..... 11. OLDENLANDIA.
- Seeds few, piano - convex,  
or globose with a large  
ventral  
cavity ..... 12. ANOTIS.
- Calyx-teeth 5 ..... 13. OrinoRRinzA.
- Fruit a fleshy berry.
- Corolla-lobes valvate ..... 14. MusSiENDA.
- Corolla-lobes twisted.
- Inflorescence terminal [sometimes axillary  
or leaf-opposed in *llandia* (10)]. Ovary  
2-celled.  
Seeds few ..... 15. TARENNA.
- Seeds numerous ..... 10. RANDIA.
- Ovary 1-celled ..... 17. GARDENIA.
- Inflorescence axillary [see also *llandia* (16)].  
Flowers in clusters; ovary 2-3-celled ..... 18. DIPLOSPORA.

Ovules solitary in each cell [see also *Anotis* (12)]\*

Leaves with stipules.

Radicle superior; corolla-lobes valvate.

Fruit of 2 cocci .....	19 <sup>2</sup> KNOx <sup>Tr</sup> A*	→
Fruit a drupe with 2-many free or cohering pyrenes.		R <sup>2</sup> ON <sup>1</sup> A.
Ovary 2-celled .....	?V* L <sup>LEC</sup>	M "
Ovary 5-3-celled .....	2IV M A	

Radicle inferior.

Corolla-lobes twisted.

Style shortly exerted, 2-branched ..... 22.

Style much exerted, entire ..... 23.

Corolla-lobes valvate.

Calyx-tubes confluent ..... 24. MOBINUA.

Calyx-tubes not confluent.

Ovules basilar, erect, anatropous.

Style-branches 2. Trees or shrubs.

Stipules intrapetiolar.

Corolla-tube short, straight ... 2~). PSVCHOTRIA.

Corolla-tube long, curved ..... 2(>. CHASALIA.

Stipules interpetiolar.

Corolla - tube funnel - shaped ; berry blue; a fetid shrub ... 27. SAPROSMA.

Slender creeping herbs ..... 28. GBOFIH><sup>A</sup>-

Style-branches 3-9.

Fruit drupaceous ..... 29. IMSIANTIUS.

Fruit capsular ..... 30. HAMILTONIA.

Ovules attached to the septum, amphitropous.

Herbs.

Fruit of 2 indehiscent cocci ..... 31. HYDROIMIYLAX.

Fruit of 2 cocci, both or 1 only dehiscent ventrally ..... 32. S'ERMACOCE.

A small shrub; fruit of 2 connate cocci;

calyx-limb greatly enlarged ..... 33. GAILLONIA.

Leaves without stipules.

Herbs; leaves whorled ..... 34. RUBIA.

### 1. SARCOCEPHALUS, Afzel.

Shrubs or trees. Leaves petiolate ; stipules interpetiolar and caducous- or intrapetiolar and persistent. Flowers packed into globose heads, th<

calyx-tubes fused into a fleshy mass ; peduncles simple, usually solitary, terminal, bracteate below the middle; bracts small. Calyx-lobes 4-5, persistent or caducous. Corolla-tube long, narrowly

funnel-shaped, glabrous; lobes 4-5, imbricate, glabrous or pubescent. Stamens 4-5,

inserted on the mouth or throat of the corolla. Ovary 2-celled; ovules

numerous, imbricate, on pendulous placentas ; style filiform, exerted; stigma fusiform. Fruits combined into a fleshy globose mass of

2-celled pyrenes with very thin septa. Seeds few in each cell, not

winged; testa crustaceous ; albumen fleshy.—DISTEIB. Tropical Asia, Africa and Australia; species 13.

**1. *Sarcocephalus missionis*, Haviland, Rev. Naocl. in Journ. Linn. Soc. v. 33 (1897) p. 32.** A small tree. Leaves 4-6 by \|-2\ in., elliptic-lanceolate, subobtuse, membranous, glabrous, shining above,

running down wing-like into the petiole; main nerves 10-12 pairs, slender; petioles scarcely  $\frac{1}{2}$  in. long; stipules intrapetiolar, persistent,  $\frac{1}{2}$  in. long, triangular, acute, more or less connate, forming a sheath. 1 peduncles stout, solitary, usually inclined,  $\frac{1}{2}$  in. long, with stipular sheathing bracts at the base and 4 small bracts  $\frac{1}{2}$  in. long united

flo\ver, l^vi ^U^ .Cached on the peduncle below its  
 tV in. l<sub>on</sub> 5<sup>ln\*</sup> \*<sup>n</sup> diam. Calyx hairy, the calyx-tu  
 VY baid ea<sub>v</sub>x~lobes ■f--1 in. long, oblong, subc its middle.  
 inh<- i, and. OUtstflp Pr^rkIUi vollnw • tnKo Heads of c-tubes  
 J 5 fused together,

■Jiis^f Ca!^X^J)es i~k \*". ^ollg> oblong, subclavate at the apex, l^bes  
 oblo<sup>6</sup> a ou^S^e- Corolla yellow; tube -J—^ in. long, glabrous; ^t'hino- +^'  
 o" tuse, hairy on both sides, y<sup>l^</sup> in. long. Anthers apiculate, a \*<sup>D</sup>- bev<sup>o</sup>J  
 \* l^e m\*ddle o^ the corolla-lobes. Style exserted about fleshy ij i<sup>e</sup>  
 cor oHa-lobes; stigma fusiform. Fruits connate into a \*<sup>es</sup>\*a Ma \ oSe  
 rmass# Seeds arillate, irregularly flattened, imbricate; v. 3 \*<sup>ofe</sup>>

crustaceous. *Nauclea missionis*, Wall. Cat. 6099; Fl. B. I.  
 ttat' v 11 Vi b< Trees> Bomb\_ ed\_ 2> P- 186 5 Woodr. in Journ. Bomb, p. li>V  
 (18^8) p. 644. *Nauclea dliptica*, Dalz. & Gibs. Bomb. Fl. Knot of  
 Bedd.).—Flowers: Apr.-May. VEJRN. *Phuqa*.

coUl mon n aloPS rivers and waterourses in N. Kanara, *Talhot*; N. Kanara, *Woodrow*!  
 (8o uthern rlf. ^aPur» *Talbot*; Sirsi, *Talbot*!; \*Karwar, *Woodrow* !—DISTRIB. India  
 •totfe \_jai^tric^ of the Western Penin|gla). ^%ica wV, 'V<sup>6</sup> carefu% examined the

specimens of what Dalzell called *Nauclea*  
 live\_r (whi X • WGre SGnfc by Dalze11 h; iniself to Kew in 1873, with a letter to Prof.  
 to ^e L,!? Preserved in Herb. Kew.), and these specimens certainly do not belong  
 the y donff • Indeed Dalze11 himself admits, in the letter referred to, that  
 P> U8) T) l n \_ng tO genua' In his descriptiou of *N. elliptica* (Bomb. Flora,  
 \* in\_ and 1 glVeS leri\_g^th of ttle peduncle as 2^ in., whereas it does not exceed ^ ^8^tli  
 t" i\_moi; i^cover describes the stigma as round-headed, whereas in his specimens but th<sup>S</sup> !nctv  
 fusiform. Dalzell's description would apply to *Nauclea purpurea* y Jja ■, e Plant he has  
 himself sent is *Nauclea missionis*, Wall., *Sarcocephalus missionis*,

2. ANTHOCEPHALXJS, A. Rich.

Glabrous trees. Leaves petiolate, coriaceous; stipules interpetiolar,  
 Ca^ducous. Flowers orange, crowded in terminal globose  
 peduncled

8o Htary heads, ebracteolate; peduncles with basal stipular bracts. Calyx-  
 ^ibes closely pressed together but not fused; limb tubular, with 5 linear  
 persistent or deciduous lobes. Corolla-tube long, funnel-shaped,  
 the

Throat glabrous; segments 5, imbricate. Stamens inserted on the  
 throat  
 of the corolla; filaments short. Disk inconspicuous. Ovary  
 2-celled

)elow, 4-celled above; ovules very many, horizontal, on 2 bifid placentas.  
 % which ascend from the septum below its middle and send an arm into  
 each of the upper cells; style filiform, exserted; stigma  
 fusiform.

Fruits packed into a fleshy globose mass of many few-seeded coriaceous  
 pyrenes. Seeds minute; testa rather thin; embryo clavate, in  
 fleshy  
 albumen.—DISTRIB. Tropical Asia and the Indian Archipelago; species 2.

**1. Anthocephalus indicus**, A. Etch, in *Mem. Soc. Hist. Nat. Par.*  
 (1834) v. 5, p. 2^58. A large tree with erect trunk and widely spreading  
 horizontal branches; young parts pubescent. Leaves coriaceous, decus-  
 sate, 5-8 by 2|-4 in., elliptic-oblong, shortly acuminate, entire, glabrous  
 and shining above, more or less pubescent beneath, base usually rounded,  
 sometimes cordate; main nerves 8-12 pairs, parallel, prominent on both  
 sides; petioles %-\\ in. long; stipules lanceolate, acute, caducous.  
 Flowers fragrant, in solitary terminal globular heads 1-lf in. in diam.,  
 on stout peduncles. Calyx \-| in. long; lobes 5, linear, obtuse, hairy  
 at the top outside. Corolla orange, g-| in. long; tube infundibuliform,

slender; segments about 1/2 in. long, erect, linear-oblong, acute, imbricate, slightly pubescent outside. Styles and stigmas white. Fruit the size of a small orange, yellow when ripe. Seeds muriculate. *Anihocephalus morindcefolius*, Korth. Verh. Nat. Gesch. Bot. (1839-42) p. 154, & Obs.

Nauc. Ind. p. 20; Jackson, in Index Kewen. v. 1, R; .^ ^ f#  
in

*t't'phalus Cadamba*, Miq. Fl. Ind. Bat. v. 2 (1856) p. > Bomb.  
Fl. B. I. v. 3, p. 23; Trim. Fl. Ceyl. v. 2, p. 293;: ^J<sup>10</sup>- 644; Wa^ ed.  
2, p. 184; Woodr. in Journ. Bomb. Nat. v. 11 (^y V Hort. Beng-Diet.  
Econ. Prod. v. 1, p. 266. *Nauclea Cadamba*, \*<sup>0X</sup>TfI'mverg. Jfov.-p. 14 ;  
Grab. Cat. p. 87 ; Dalz. & Gibs. Suppl. p. 43.-Feb. VEUS". Niv ;  
*Kadam*.

A doubtful native, common near villages throughout the Konkan, but apparently  
found unmistakably wild. KONKAN: Poladpur, *Graham*; Dasgaon (Ratnagiri  
not Woodrow! Hátkhaha near Ratnagiri. *Bhiva*! KANARA: N. Kanara, rare,  
diStricts) r uisw v WJ. «. «. «. ~\*~\*~\* ~\*~\* ~\*~\* ^).w ~\*~\* ~\*~\*  
Talbot; Kala "naddi", *Ytitchie*, 987!—DISTRIB. Throughout India,  
Ceylon, Sumatra, Borneo. often cultivated;

There used to be a very large tree at the Wada Travellers' Bungalow  
bleshtar.

### 3. JNTAUCLEA, Linn.

Trees or shrubs. Leaves opposite, sessile or petiolate; the se ., u9#  
nerves usually few; stipules interpetiolar, flat, entire^ dec  
. ^ Flowers crowded in globose bracteate heads ; peduncles  
terminal, ^ V solitary or termitic; bracts often large, caducous ; bracteoles  
0 or g<sup>1a</sup> ^ -' seriform, intermixed with the flowers. Calyx-tube  
prism-shaped; l<sup>oD</sup> ' deciduous, linear-subulate, often tipped with  
valvate processes a-t^ apex. Corolla-tube infundibuliform ; lobes 5,  
imbricate. Stamens o ^ the throat of the corolla ; anthers oblong or  
linear. Ovary 2-cejje > ovules numerous in each cell on  
pendulous placentas ; style l<sup>o</sup> »J thickened ; stigma globose.  
Fruit of 2 cocci, the cocci often separati » from a persistent axis.  
Seeds imbricate ; testa winged, the upper \*<sup>1</sup> } b 2-horned, the lower  
acuminate.—DISTRIB. Tropical Asia and Polynesia, species 30.

Linnaeus is usually cited as the author of the genus *Nauclea*, but the plant (*Nauc  
oriental-is*) on which\* Linnaeus founded the genus is now *Sarcocephalus cordata*; he  
the real *Nauclea* of Linnseus does not now exist as *Nauclea*. 14

1. *Nauclea purpurea*, Ro.vb. *Cor. Pl.* v. 1 (1705) p. 41, t. 54. ,  
small glabrous tree. Leaves 4-8 by 1|-4 in., membranous, elliptic oil  
lanceolate, acute or acuminate, glabrous, base much tapering;  
main  
nerves 8-10 pairs; petioles |-1 in. long, drying black.  
Peduncles  
l-2\ in. long, usually solitary, bracteate about the middle,  
terete,  
thickened above; bracts very caducous. Calyx i in. long; tube glabrous  
or nearly so ; teeth triangular-subulate, ^ in. long, silky. Corolla § in.  
long, externally glabrous or nearly so ; lobes ^ in. long, oblong-obovate,  
obtuse, glabrous or slightly pubescent outside. Anthers included  
within  
the corolla-lobes, apiculate. Fruit of 2 dehiscent many-seeded  
cocci.

Fl. B. I. v. 3, p. 26; Talb. Trees, Bomb. ed. 2, p. 185;  
Journ. Bomb. Nat. v. 11 (1898) p. 644. *Nauclea elliptica*, Bedd. Icon.  
Pl. Ind. Or. t. 19 For. Man. in Flor. Sivat. . x t. 29, fig. 3

Woodr. in *anas*.

; y p exix,  
(not of Dalzell & Gibson).—Flowers : Feb. VERN. *Dev-ph*

Not common in the Bombay Presidency. *Stocks* in Herb. Kew. (without locality) !  
KANARA: *Woodrow*; Tinai Ghat (N. Kanara), *Talbot*, 1601 .!—DJSTUIB. India (W\ Peninsula).

#### 4. ADINA, Salisb.

Trees or shrubs with terete branches. Leaves petiolate, ovate, lanceolate or cordate ; stipules interpetiolar, large, oblong, obtuse, caducous. ±lowers small, crowded in solitary paniced globose heads surrounded by

lobes o. <sup>oU8Q</sup> <sup>cteoles></sup> the calyces not fused together. Calyx-tube angled ;  
 side; sL <sup>oro^a</sup>-tube elongate, funnel-shaped, the throat glabrous in-  
 c o 1 <sup>?eu^s ^</sup> valvt St 5 i n t d th th

<sup>co</sup>roll<sub>a</sub> • fii? ' valvate. Stamens 5, inserted on the mouth of the  
 lluniero' <sup>U<sub>s</sub></sup> • ents sllort\_ J)isk cup-shaped. Ovary 2-celled; ovules <sup>st'gtna</sup>  
 .1\* <sup>Inser^ec^</sup> on a pendulous placenta, imbricate; style filiform ; Reeled  
 o <sup>Va^e^</sup> rar^ly capitate. Capsule of 2 dehiscent cocci, many-fleshy.' <sup>?ec\*s</sup>  
 oblong; testa winged ; nucleus small; albumen copious, <sup>^tvL</sup> <sup>lc\*e</sup>  
 superior.—DISTBIB. Tropical and subtropical Asia and <sup>uca</sup>; species  
 9.

A <sup>tre</sup> <sup>^di-na</sup> cordifolia, *Benth. \$ Hook. f. Gen. Pl. v. 2 (1873) p. 30. <sup>^</sup>ith  
 erect trunk and horizontal branches; bark brownish-grey, arrowed;  
 young parts pubescent. Leaves 4-10 in. long and <sup>ls</sup> broad as long,  
 orbicular, shortly acuminate, glabrous or slightly <sup>ent</sup> <sup>a</sup>boye, more or less  
 densely so (especially when young) beneath ; <sup>l</sup>erves 5-7 pairs ; petioles  
 2-4 in. long, softly pubescent; stipules ■ obtuse, pubescent, £-£ in.  
 long. Flowers numerous, in globose tsthp\* i <sup>m</sup> <sup>dllim'></sup> <sup>Peduncles</sup> 1-2 in.  
 long, stout, axillary, 1-3 <sup>rrin</sup> 1 <sup>ea^</sup> <sup>bearm</sup> <sup>S</sup> <sup>l</sup> (rarely 2) heads of  
 yellow flowers. Calyx dilated, <sup>ngi</sup> hairy <sup>l</sup> <sup>obeS</sup> <sup>club'shaped\*</sup> Corolla <sup>^</sup> in.  
 long ; tube slender, I<sup>«e</sup> above, pubescent; segments <sup>T</sup> <sup>^</sup> in. long,  
 ovate-oblong, subaoute, (In <sup>d%</sup> <sup>^</sup>tyle much exserted. Capsules i—J in.  
 long, cuneate, densely <sup>o</sup> <sup>Owny</sup>. Seeds about 6 in each cell. <sup>¥1</sup>. B. I. v.  
 3, p. 24 ; Trim. Fl. <sup>ic^yl</sup>. V. 2, p. 293; Talb. Trees, Bomb. ed. 2, p.  
 184; Woodr. in Journ. T<sup>ottu\</sup> Kat. v. 11 (1898) p. 644; Watt, Diet.  
 Econ. Prod. v. 1, p. 114. *Select cordifolia*, Eoxb. Cor. Pl. v. 1 (1795)  
 p. 40, t. 53; Grah. Cat. P\* & 7 ; Dalz. & Gribs. p. 118.—Flowers :  
 June-Sept. VEHN. *Hedu; Bed.**

KONKAN: near Kalyan, *Woodrowl* DECCA-N : Nasik, *Woodrow*; Chikli near Nasik,  
*tyva* !; Gokak, *Ritchie*, 1771 !

5. MYTRAGYNA, Korth. Obs. Naocl. (1839) p. 19 ;  
 Index Kewensis, v. 3, p. 249.

STEPHEGYKE, Korth. Verh. Nat. Gesch. Bot. (1840 ?) p. 1G0 ;  
 Benth. & Hook. f. Gen. PL v. 2 (1873) p. 31.

Shrubs or trees. Leaves petiolate, usually with transverse parallel  
 nerves ; stipules interpetiolar, large, caducous. Flowers yellow, crowded  
 in globose axillary and terminal solitary paniced or subumbellate usually  
 2-bracteate heads ; bracteoles paleaceous. Calyx-tube short, ovoid or  
 obconic; limb cupular or tubular, truncate or obscurely 5-toothed.  
 Corolla funnel-shaped ; tube long, the throat glabrous or pilose ; lobes 5,  
 short valvate. Stamens 5, on the throat or below the apex of the  
 corolla-tube ; filaments short, filiform ; anthers oblong, apiculate. Disk  
 annular. Ovary 2-celled ; ovules numerous, on pendulous placentas,  
 imbricate upwards; style long, filiform; stigma much exserted,  
 mitri-form. Fruit of 2 dehiscent cocci. Seeds many ; testa winged ;  
 albumen #\_DISTKIB. Asia, Tropical Africa ; species 8.

1. *Mitragyna parvifolia*, Korth. Obs. Naocl. Ind. (1839) p. 19.

A large deciduous tree, glabrous or pubescent. Leaves variable in size  
 and shape, 2-5 by 1^3 in., elliptic, suborbicular, or obovate, rounded,  
 acute or bluntly acuminate at the apex, glabrous on both sides, base



rounded or acute, sometimes cordate ; main nerves 6-8 pairs, ob i q << j >  
 petioles §-f in. long; stipules | by yVfV in-> ohlong-spathi<sup>llate'</sup> °^<sup>les'</sup>  
 parallel-nerved, pink. Flowers greenish-yellow, fragrant; peau  
 ^ . ^ solitary, terminal, short, each carrying a globose head of flowers 4-  
 • in diam. Calyx τV in. long, funnel-shaped; limb truncate,  
 w ^ \ -T \ in. long ; tube narrowly infundibuliform, glabrous ; lobes  
 ^ • long, triangular-ovate, acute, recurved. Style white, much  
 f ? s e , ' stigma miferiform. Head of fruits |-g in.in diam.; capsules  
 5 m.. sj oblong, with blunt rounded tops and 10 blunt ribs.  
 Jackson, " \* Kewen. v. 3, p. 249; Hav. Evv. Naucl. in Journ. Linn. Soc. v.  
 \*W p. 69. *Stephegyne parvifolia*, Korth. Yerh. Nat. Gesch. Bot p.  
 161 ; Hook. f. PI. B. I. v. 3, p. 25; Trim. Fl. Ceyl. y Talb. Trees,  
 Bomb. ed. 2, p. 185 ; Woodr. in Journ. Bomb. JNat (1898) p. 644;  
 Watt, Diet. Econ. Prod. v. 6, part 3, p. 360. *JSaut* ^ *parvifolia*,  
 Eoxb. Cor. PI. v. 1 (1795) p. 40, t. 52; Grah. Cat. p. °' ' Bedd. Flor.  
 Sylvat, t. 34. *JVaudea parviflora* (an evident <sup>mls</sup>P<sup>r</sup>^L-N.  
*parvifolia*), Dalz. & Gibs. p. 118.—Flowers : May-Aug. VE1  
*Kadam; Kalam.*

In deciduous forests throughout the Presidency, *Talhot.* KONKAN :  
 ^a ^ PECCAN : Mawal districts, *Graham, Dalzell*; Chinch wad (near  
 Poona), G-UJARAT: *Cookel*; JBaroda, *Cookel*; Dabhoi, *Woodrow, Kanitkarl* S. M.  
 Belgaura, J?eV^w, 341 ! KANAKA: Kala naddi, *Ritchie*, 341 !—DISTRIB. Ibroug the  
 drier parts of India ; Ceylon.

## 6. HYMENODICTYON, Wall.

Trees or shrubs with thick branches and bitter bark. Leaves oppiF<sup>g</sup> J<sup>J</sup>  
 petiolate, deciduous ; stipules interpetiolar, glandular-serrate, deciduP<sup>u</sup> '  
 Flowers small, spicate, in axillary and terminal nodding panicles; br#  
 1 or 2, foliaceous, reticulate, subsistent; bracteoles small  
 or i  
 Calyx-tube short; lobes 5-6, ovate or subulate, deciduous.  
 Coro. J  
 infundibuliform or narrowly campanulate, glabrous inside ; lobes 5, shorn  
 erect, reduplicato-valvate. Stamens 5, inserted below the throat of  
 the  
 corolla ; filaments short, dilated upwards ; anthers linear.  
 Ovary  
 2-celled; ovules numerous, on c}lindric placentas adnate to the septum ;  
 style filiform, exserted; stigma fusiform. Capsule loculicidally 2-valved,  
 many-seeded; placentas at \ength free. Seeds imbricating  
 upwards;  
 testa broadly winged; embryo small in fleshy  
 albumen.—DISTRIB.

Tropical Asia and Africa ; species 4-5.

Flowers pedicelled; corolla £ in. long; capsules on decurved  
 peduncles ..... 1. *H. excelsum*.  
 Flowers sessile; corolla τV<sup>m</sup>- long; capsules erect ..... 2. *H. obovatum*.

1. **Hymenodictyon excelsum**, Wall, in *Roccb. FL Ind. ed. Carey*,  
 v. 2 (1824) p. 149. A tree 30-40 ft. high ; bark usually smooth.  
 Leaves membranous, 4-9 by 3-4| in., ovate-elliptic, abruptly-acuminate,  
 pubescent on both surfaces, base narrowed into the petiole ; main nerves  
 7-10 pairs; petioles 1-3 in. long, pubescent; stipules broadly oblong,  
 obtuse, recurved, deciduous. Flowers numerous, greenish-white, frag-  
 rant, pedicelled, in clusters along the rhachis of dense cylindrical

pubescent spiciform racemes in erect terminal panicles; floral leaves shaped like the other leaves but smaller, colored, bullate, on petioles  $1\frac{1}{2}$ ~2 in. long. Calyx,  $\frac{1}{2}$  in. long, narrowly campanulate, pubescent ;

lobes 4. | ,

r y !^ ;  
 ^onS« Ca\* 1 a(0% campanulate with short acute lobes. Styles very  
 long "pi x \* s ^ \*n\* ^0DS> ellipsoid, on stout decurved pedicels \-± in  
 WigU T I% V\* 3' P- 35\*> Grah\* Cat\_ P\* 875 Dalz\_ & Gibs\_ P- U7;

Bomb JV^C!n\*tm 79 ' > Talb\_ Trees> Bomb\_ ed\_ 2' P\_186 ' Woodr. in Journ.

-PW V\* U (1898) P- 644 5 Watt> Dict\_ Econ\_ Prod\_ v\_ 4> P- 317.

Ab June-Aug. VERN. *Kdla-Kaddu; Bhorsal.*

*bdkelft. M^tsi Graham, Dalzett\$ Gibson.* KONKAN : *Law* !; Ghats near Bombay,

^yo^» a eran (Porcupine Point), *H. M. Birdwood.* DECCAN : Kartriz Ghat,

!k^e 289!^?AT "" Pancli Mahals TaZ^ S M COUNTRY: hills near

Belgaum

o- y' !^ acute. Corolla ± in. long, pubescent outside; tube

C\* a(0% campanulate with short acute lobes Styles very

^» a (P),  
 e, 289>!^T?AT "" Pancli Mahals, TaZ^ S. M. COUNTRY: hills near Belgaum, The  
 ii^ n •""^ ^IST RiB. India (base of the Himalayas, W. Peninsula, Birma); Java. ne and cl  
 r CoaA oA Ae AarA A8 bitter and has been used as a febrifuge. The wood is ^fonaiim  
 oAe" g\*'ainecl and is employed for making agricultural implements, scabbards, 1^in8, toys,  
 &c. See Watt, Diet. Econ. Prod. 1 c.

v. 2\*/iS??^enodicty<sup>011</sup> **obovatum**, Wall, in *Roxb. Fl. Inch ed. Carey*, 1|-3  
 i ' P- !53\_ A larSe tree reaching 50 ft. high. Leaves 4-G by Or  
 less<sup>11\*</sup> f ptic or obovate> abruptly-acuminate, glabrous above, more pairs •  
 pUes cent beneath, narrowed into the petiole; main nerves 6-8

Margin m 1~2 in' long ; stiPules obovate-oblong with glandular iu<sup>o</sup>  
 . ' -t lowers small, inconspicuous, greenish, with a pungent odor, spik<sup>88</sup>  
 cAusters along the rhachis of dense cylindric pubescent paniced g Kes;  
 floral leaves bullate, white or cream-colored, with petioles 1^ -ln« long.  
 Calyx broadly campanulate, -^ in. long, pubescent outside; eeth  
 triangular, acute, -fa in. long. Corolla y<sup>1^</sup> in. long, pubescent outside ;  
 tube very short; limb broadly campanulate, T^ in. long, the lobes  
 ovate-oblong, acute. Capsules £ in. long, ellipsoid, on very short e^ect  
 pedicels. Jb'l. B. I. v. 3, p. 36 ; Grab. Cat. p. 88; Dalz. & Gibs. P.  
 117; Bedd. Flor. Sylvat. t. 219 ; Talb. Trees, Bomb. ed. 2, p. 186 ;  
 tyoodr. in Journ. Bomb. Nat. v. 11 (1898) p. 644; Watt, Diet. Econ.  
 JWd. v. 4, p. 319.—Elowers : July-Sept. VEEN. *Kadvd-sirid.*

/ KONKAN : moist forests, *Talbot*; Matheran, *Woodrow*; island of Karanja, *Balzell \$*  
*Gibson.* S. M. COUNTRY : Ramghat, *Law, Balzell <\$ Gibson, Ritchie, 1048 !* KANAKA :  
*Talbot.*—DISTRIB. India (W. Peninsula).

Mr. Talbot distinguishes 2 varieties of this tree, one with large obovate pubescent  
 leaves and capsules 1 in. long, the other with small ovate nearly glabrous leaves  
 and capsules ^ in. long. The erect capsules serve to distinguish this species from  
*11. flaccid am*, which it otherwise much resembles.

## 7. WENDLANDIA, Bartl.

Shrubs or small trees. Leaves opposite or ternately whorled,  
 sub-sessile or petiolate, ovate or oblong, subcoriaceous ; stipules entire  
 or 2-fid. Flowers rosy or white, in terminal dense thyrsoid or  
 paniced cymes, 2-3-bracteate. Calyx-tube subglobose; lobes 4-5,  
 subequal, persistent. Corolla tubular, salver-shaped or

funnel-shaped, throat glabrous or hairy ; lobes 4-5, imbricate in bud.  
Stamens 4-5, inserted between the corolla-lobes ; filaments 0 or  
elongate ; anthers versatile, exerted. Ovary 2 (rarely 3) -celled ;  
ovules numerous, on small sub-globose placentas adnate to the septum ;  
style slender ; stigma entire, 2-lobed or 2-partite. Capsule small,  
globose, crustaceous, loculicidally (rarely septocidally) 2-valved,  
many-seeded. Seeds minute, horizontal, compressed ; testa  
membranous, not winged ; albumen fleshy ; embryo short,  
cylindric.—DISTRIBUTION. Tropical and subtropical Asia ; species 16.

Leaves opposite ; corolla-tube  $\tau V$  in. long, glabrous inside ; filaments exerted .....  $l' >$   
 Leaves usually ternately whorled ; corolla-tube  $\backslash - \backslash$  in.  $l^{on}g >$   $\wedge$   
*Wendlandia wotoniana*.  
 hairy inside ; filaments not exerted.....  $\sim j$

**1. *Wendlandia exserta*, BO. Prod. v. 4 (1830) p. 411. A**  
 deciduous pubescent or tomentose crooked tree with *brown rough*  
 $\wedge \wedge$  ranches terete. Leaves coriaceous, opposite, 3-7 by  $l^i$  in\*  $>$   $a^*$   $ove >$   
 te or ovate-lanceolate entire acute more or less pubescent  $^6 *$   
 $-\wedge$

late or ovate-lanceolate, entire, acute, more or less pubescent $\wedge$   
 $x$ -grey-tomentose or grey-pubescent beneath, base acute, often 1 H  
 lateral ; main nerves 10-18 pairs, arched ; petioles  $\pounds - 1$  in. long,  $cio J^A$   
 stipules interpetiolar, ovate, acute, softly downy, the upper  $P^{* \wedge \wedge}$   
 curved. Flowers subsessile, fragrant, in sessile tomentose  $pyr <$   $\wedge$   
 panicles 6-10 in. long and as broad as long ; bracteoles linear-lance  $\gg$   
 hairy. Calyx hairy,  $JU -$  in. long ; tube subglobose ; lobes 5,  $ootu j$   
 triangular,  $\wedge$  in. long. Corolla white ; tube  $\tau V$  in. long,  $\pounds^{J^A DroU}$   $with$   
 side; lobes  $-j^A$  in. long, ovate-oblong, subacute, reflexed, vein $^{ea}$  .  $\wedge$

Talb. Trees, Bomb. ed. 2, p. 187; Woodr. in Journ. Bomb. JNat, v. ;  
 (1898) p. 644; Watt, Diet. Econ. Prod. v. 6, part 4, p. *MJ.*—*XW*  
 Mar.-Apr.

Rather\* rare. KONKAN : *Law I, Gibson I* DECCAN : N. Deccan,  
 India (Tropical Himalaya, Orissa, Central India, YV. Peninsula).

**2. *Wendlandia Wotoniana*, Wall Oat. (1828) 6273; \$ Am. Prodr. (1834) p. 403.** A shrub or small tree ; young  $b$  pubescent, often reddish. Leaves usually ternately whorled (rare  $w$  opposite),  $3-4^A$  by 1—2 in., elliptic-lanceolate, acuminate, glabrous  $-yft$  nearly so above, pubescent beneath, base much tapering ; main nerves 8-10 pairs, prominent, pink on the young leaves ; petioles  $g-J$  in. long; stipules variable, about  $\backslash$  in. long, oblong and rounded at the apex, or linear-lanceolate, acute, sometimes 2-fid. Flowers fragrant, having somewhat the odor of newly mown hay, in dense pyramidal hirsute panicles 6-12 in. long. Calyx  $y^{1^A}$  in. long ; tube globose, pubescent; teeth as long as the tube, lanceolate, acute, more or less pubescent. Corolla white ; tube cylindrical,  $-1-J-$  in. long, hairy inside; lobes  $\tau^A$  in. long, oblong-orbicular, obtuse, not veined with dark veins. Filaments not exerted. Style 2-fid at the apex. Capsules globose,  $y^{1^A}$  in. in diam., pubescent, crowned with the calyx-teeth. Fl. B. I. v. 3, p. 40 ; Grab. Cat. p. 89 ; Dalz. & Gibs. p. 117; Wright, Icon. t. 1033; Bedd. FJor. Sylvat. t. 224; Trim. Fl. Ceyl. v. 2, p. 297; Talb. Trees, Bomb. ed. 2/p. 187; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 644; Watt, Diet. Econ. Prod. v. 6, part 4, p. 302.—Flowers : Feb.-Mar.

KONKAN : Wari jungles, *Stocks I* DECCAN : Koina river banks, *Dalzell \$ Gibson* ; banks of the Yenna river below Lingmala, Mahableshwar, *Graham, Dalzell \$ Gibson*,

*H. M. Birdwood, Cooke! S. M. COUNTRY : Oastlerock, Woodrow; Londa, Cooke! Woodrow!; K-amgmt, Dalzell & Gibson; Belgaum Ghats, Ritchie, 350! KANARA: Supa Ghats of N. Kanara, Talbot.—DISTRIB. India (hills of the W. Peninsula); Ceylon.*

**8. DENTEIAA, Forst.**

ousi co <sup>ProS</sup> <sup>ra</sup> te herb. Leaves small, opposite; stipules short, sessile or short, minute, solitary, axillary and in the forks of the stem. Calyx-tube subglobose; limb membranous, persistent. Corolla infundibuliform; tube hairy duplicato-valvate, 2-3-toothed. Stamens 5, inserted in the corolla-tube; filaments short; anthers linear. Ovules numerous, on hemispheric placentas; style filiform. Fruit small, dry, globose, 2-celled, indehiscent, minute, angled; testa dotted; albumen fleshy.—Asia, Tropical Australia and the Pacific Islands; species 1.

*repens* Forst. *Char. Gen.* (1776) p. 26, t. 13. Leaves 5 stems long, slender, rooting at the nodes. A few branches subspathulate, glabrous or with serrations on the margins. Petioles obscure; stipules scarious. Calyx 5-lobed, lobes subglobose; limb persistent; teeth acute. Corolla-lobes 5, lobes with a tooth on each side. Filaments very short. Stigmas 2. Ovary 2-celled, ovules numerous, on swollen placentas attached to the middle of the septum; style filiform; stigma capitellate. Capsule coriaceous or membranous, 2-celled, many-seeded, dehiscent by a torn apex or by the top coming off operculately. Seeds minute, angled or compressed; testa granulate or reticulate; embryo very minute, in dense fleshy albumen.—*DISTRIB.* Mountains of India and the Indian Archipelago except one African species (which is also Indian); species about 40.

Flowers 4-merous ..... 1. *A. courtallense*.  
 Flowers 5-merous ..... 2. *A. verticillatum*.

1. **Argostemma courtallense**, *Am. in Ann. Nat. Hist.* v. 3 (1839)

**9. ARGOSTEMMA, Wall.**

Low fleshy or membranous delicate herbs. Leaves opposite, the pairs equal or very unequal, or falsely whorled; stipules interpetiolar, entire, persistent or obsolete. Flowers white, in peduncled cymes or umbels. Calyx-tube short; lobes 5, rarely 3-7. Corolla rotate, 4-5-partite, valvate. Stamens 4-5, inserted on the corolla-tube; filaments short; anthers conniving or cohering, dehiscent by terminal pores. Ovary 2-celled; ovules numerous, on swollen placentas attached to the middle of the septum; style filiform; stigma capitellate. Capsule coriaceous or membranous, 2-celled, many-seeded, dehiscent by a torn apex or by the top coming off operculately. Seeds minute, angled or compressed; testa granulate or reticulate; embryo very minute, in dense fleshy albumen.—*DISTRIB.* Mountains of India and the Indian Archipelago except one African species (which is also Indian); species about 40.

Flowers 4-merous ..... 1. *A. courtallense*.  
 Flowers 5-merous ..... 2. *A. verticillatum*.

1. **Argostemma courtallense**, *Am. in Ann. Nat. Hist.* v. 3 (1839)

p. 22. A small herb 3-6 in. high with a tuberous root. Leaves very variable in size and shape, in whorls of 4, thinly membranous, very uu-



equal, 1 or 2 of the leaves of the whorl sometimes not being more than 1 in. long, while 1 or both of the other 2 may exceed 1/2 in. long or sessile or rarely shortly petioled, ovate or orbicular-ovate; sides;

acute. Corolla white, divided almost to the base; lobes ovate. Anthers 4, oblong-lanceolate, curved, 5 by pores. *Fl. B. -I. v. 3, p. 42; Wight, Icon, t. 1160.* *A. cuneatum* (Dolz. in *Kew Journ. Bot. v. 3 (1851) p. 345.* *A. cuneatum* (Dolz. & Gibs. p. 118.—Flowers : Aug.

S. M. COUNTRY : on rocks at the Chorla Ghat, *Dalzell!* KANAKA : *haw*  
 • India (W. Peninsula).

- 2. **Argostemma trecticillatum**, *Wall in Roxl. Fl Ind. ed. Carey, v. 2 (1824) p. 325.* Erect, 4-6 in. high. Leaves thinly membranous 4 in a whorl, unequal, 1-4 1/2 in., sessile or nearly so, lanceolate or ovate-lanceolate, acuminate, glabrous, inequilateral at the base. • Flowers white, 5-merous, in terminal peduncled few-flowered umbels shorter than the leaves, often 3 umbels together of which the central one is frequently compound, the lateral ones usually simple; beneath the umbels conspicuous, oblong-lanceolate or linear-lanceolate. Calyx 7 in. long; teeth 1/2 in. long, subacutely triangular from a broad base. Corolla 1/2 in. long, divided almost to the base; lobes narrow triangular-oblong or ovate, very acute. Anthers linear-oblong, opening by pores. *Fl. B. I. v, 3, p. 43.* *Argostemma giaberrimqht* Dolz. in *Kew Journ. Bot. v. 3 (1851) p. 345 ; Dolz. & Gibs. p. 118.* e?

KONKAN : on trees in the Wari country, *Dalzell!*

### 10. HEDYOTIS, Linn,

Herbs, undershrubs or shrubs (herbs in the Bombay species). Leaves opposite (rarely ternately whorled) ; stipules free, or connate with the petioles into a bristly sheath. Flowers usually white, in terminal or axillary dense or lax cymes. Calyx-tube ovoid, globose or turbinate ; lobes 4, usually short, acute, persistent, without interposed teeth. Corolla infundibuliform or campanulate; lobes 4, ovate or linear, valvate in bud. Stamens 4, inserted in the tube or throat of the corolla. Ovary 2-celled ; ovules numerous, on sessile or pedicelled placentas attached to the septum at or below the middle ; style filiform ; stigma 2-fid or 2-lobed. Fruit small, coriaceous or crustaceous (very rarely membranous), indehiscent or septicidally or loculicidally dehiscent, or separable into 2 indehiscent cocci, 2-many-seeded. Seeds plano-convex or angled; albumen horny.

- Capsule indehiscent ..... 1. *H. Auricularia.*
- Capsule loculicidal on the crown only.
- Leaves linear-subulate, aristate ..... 2. *H. cymulea.*
- Leaves elliptic or linear-lanceolate, acute ..... 3. *H. nilida.*

1. **Hedyotis Auricularia**, *Linn. Sp. Pl (1753) p. 101.* Annual; branches numerous, prostrate or suberect, spreading, not rooting at the nodes, glabrous or hairy especially at the nodes, often purple when young.

<sup>aves</sup> sessile T.  
 til>>es nivi<sup>V</sup>U<sup>i</sup> Ssile or shortly petioled, ovate or ovate-lanceolate or  
 erves TJ <sup>lanc</sup> eolate, acuminate, glabrous or slightly pubescent on  
 u lateral <sup>6'</sup> <sup>rΛ</sup> on the nerves beneath, base acute or rounded ;  
 I? .1? short <sup>nf17es</sup> <sup>iln</sup> pressed above, prominent beneath, curved ; petioles  
 !}'tt'orm kr- <sup>Λr</sup> 'st'ipules membranous, furnished with 3 or 5  
 unequal  
<sup>nse</sup> sessil <sup>Λiowers</sup> white, sessile or very shortly pedicelled, in  
 Or Weokf or subsessile axillary cymes. Calyx-teeth small, triangular  
 re curvea h\* <sup>acummate</sup> Carolla-tube very short; lobes oblong, obtuse,  
 £kibrou«• }y at ttle base. Capsules globose, hard, hairy or  
 nearly t. 27. rn' <sup>md</sup>ehiscent. Fl. B. I. v. 3, p. 58 ; Bedd. Icon. PI.  
 Ind. Or  
<sup>lfec</sup>koti\* • <sup>Cey</sup>L v. 2' P\* 313 5 Watt>Diet. Econ. Prod. v. 4> P. 208. (not  
 of ID <sup>ve</sup>?ht a, Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 644  
 KOSK, <sup>m Wall</sup> Cat')—lowers : Sept.-Nov. <sup>^C^l''</sup> £apmarl'>  
 Savantwari, Woodrowl S. M. COUNTRY : Londa, Bhiva'-  
 auks of thJ v ? !; north of Dbarwar> Ritchie, 271 ! KANAKA : Kumpta, Woodrow! •

£kb' • }ry at ttle base. Capsules globose, hard, hairy or  
 nearly <sup>md</sup>ehiscent Fl B I 3 58 Bdd I  
 PI Id O

<sup>C3Λrulea</sup>5 <sup>^^^</sup> 4- Am. Proclr. (1834) p.  
 412. s e . i ct, 4-15 in. high, much-branched from a little  
 above the fasciej 1 <sup>Uo</sup> <sup>terete</sup>; slender, rough to the touch.  
 Leaves opposite or <sup>^Uuif-l</sup> <sup>Usua</sup>Λy I~i <sup>^</sup> 2RT~TV <sup>Λn-></sup> linear,  
 sessile, bristle-pointed, )eof- y <sup>sc</sup>aberulous above, 1-nerved, the  
 margins reflexed; stipules \* <sup>Ltl</sup>nate with filiform bristles. Flowers  
 blue (Wight & Aim.), sessile Nearly so, in axillary and terminal sessile  
 capitate few-flowered cymes, \* sometimes solitary in the forks. Calyx  
 -^4- in. long ; teeth lanceolate, Wid, tipped with a fine sharp bristle.  
 Capsule globose, pubescent or fibrous, loculicidally dehiscent on the  
 top only, crowned with the erect Jlyx-teeth which about equal the  
 capsule. Fl. 33. I. v. 3, p. 60; Bedd. Iton. PI. Ind. Or. t. 30 ; Trim.  
 FL Ceyl. v. 2, p. 312.

Rare. Herb. Stocks without locality! Kanara, Dharwar, and Bellary districts,  
*i. <tw\* The plant is included on the authority of Law, who states that it has been  
 found in the Dharwar districts. I have seen no specimens from the Bombay  
 Presidency.

**3. Hedyotis nitida**, Wight & Arn. Prodr. (1834) p. 412. Annual;  
 branches numerous, prostrate or ascending, 4-angled, slightly rough on  
 the angles. Leaves subsessile, 1-2^ by J-| in., lanceolate or  
 ovate-lanceolate, acute, rigid, light-green, glabrous and shining above,  
 scabrous, towards the much-recurved margins, whitish and with the  
 midrib oftea rough beneath, base usually acute; nerves (except the strong  
 midrib) not visible ; stipules with numerous long bristles. Flowers solitary  
 or few, axillary, sessile. Calyx glabrous ; teeth rigid, triangular, shortly  
 spinoso-ciliate. Capsules \ in. long, dehiscent at the top only, ovoid,  
 glabrous, veined, crowned by the erect calyx-teeth which about equal the  
 capsule. Seeds numerous, pale-brown, angled. Fl. B. I. v. 3, p. 61 ;  
 Trim. Fl. Ceyl. v. 2, p. 312. *Hedjtotis glabdla*, Br. in Wall. Cat. 886 ;  
 Bedd. Icon. PI. Ind. Or. t. 36; Watt, Diet. Econ. Prod. v. 4, p.  
 209.—Flowers: Sept.-Nov.

S M COUNTRY : north of Dharwar, Ritchie, 357 !; Londa, Woodrow !, Bhiva!  
 KANAKA.: Kala naddi, Ritchie, 357 !—DISTRIB. India (W. Peninsula, Tenasserim);  
 Ceylon.



## 11. OLDENLANDIA, Linn.

Slender erect or diffuse di- tri-chotomously-branched usually g<sup>^</sup>? herbs. Leaves opposite, usually small, narrow; stipules acute or D<sup>"8</sup> Jj Flowers small, white or pink, in dichotomous axillary and <sup>te</sup>£<sup>m</sup> y usually paniced cymes, rarely solitary. Calyx-tube turbinate<sup>^</sup> ODO\ <sup>^</sup> or subglobose; teeth 4 (rarely 5), usually erect and distant in *tr* <sup>^</sup> sometimes with alternating teeth. Corolla rotate, infundibuJj<sup>t0TM</sup> e> hypocrateriform; tube short or long; lobes 4 (rarely 5), obtuse, <sup>'^ai</sup> \* Stamens 4 (rarely 5), inserted in the throat of the corolla; <sup>ftlame'</sup>he short; anthers usually exserted. Ovary 2-celled; ovules numerous,, placentas attached to the septum; style filiform; stigmas A H j Capsule small, usually membranous, terete, didymous or angled, Jocu<sup>i</sup> <sup>^</sup> at top, rarely indehiscent, many-seeded. Seeds angled, gl<sup>oD0</sup> , ellipsoid; testa not winged, smooth or pitted; embryo clayate in J albumen.—DISTRIB. Tropical and subtropical, chiefly Asiatic; sp about 70.

## Corolla-tube short

Peduncles 1-4-flowered from the lower or all the axils.

Leaves linea\*r, not exceeding £ in. broad; bases of calyx-teeth not touching in fruit.

Top of capsule flat, not protruded.

Flowers pedicelled, usually in pairs .....

Flowers sessile or nearly so, solitary .....

Top of capsule rounded, protruded .....

Leaves elliptic, exceeding J in. broad; base of calyx-teeth truchirg in fruit .....

Peduncles many-flowered, chiefly from the axils.

Flowers in umbels; pedicels very short .....

*umbeUata.hl*

Flowers in axillary clusters, sessile or nearly so; capsule hairy .....

Flowers on long capillary pedicels or in slender panicles; capsule minute, glabrous .....

Corolla-tube long.

Leaves whorled.

Branches scabrid with whitish points; capsule scabrid ...

Branches retrorsely hispid; capsule glabrous .....

Leaves opposite, not whorled.

Corolla-tube <sup>T</sup>V in. long; lobes obtuse; capsule obovoid...

Corolla-tube \ in. long; lobes acuminate; capsule globose. 11. *O. senegalensis*.

- *O. corymbosa*.  
 \* ~ <sup>^</sup>Jf<sup>usa</sup>  
 j; <sup>'^</sup>acm> i.  
*falVnc*  
 4. *O. corymbosa*  
 5. *O. trinervia*  
 6. *O. trinervia*  
 7. *O. dkhotoma*  
 8. *O. aspera*  
 9. *O. retrorsa*  
 10. *O. gracill*  
 11. *O. senegalensis*

1. **Oldenlandia corymbosa**, *Jnn.Sp. PI* (1753) p. 119. Annual, ^varying from 3-15 in. high; stems terete, numerous, slender, erect, ascending or spreading, glabrous or pubescent. Leaves subsessile, ■|-lf by <sup>T</sup>V~i in., linear or linear-lanceolate, acute, often with recurved and frequently scabrous margins; stipules short, membranous, truncate, with a few short bristles. Flowers on filiform pedicels longer than the calyx, usually 2-3 (rarely 1 or very rarely 4) on the top of a very slender axillary solitary peduncle; bract beneath the pedicels -£\$—j<sup>^</sup>in. long, sabulate. Calyx <sup>T</sup>^ in. long, pubescent; teeth narrowly triangular, about equalling the calyx-tube when in flower. Corolla white, ^ in. long; lobes acute, about ^ in. long. Capsules globose or sometimes slightly pyriform, somewhat didymous, the top rather flat and not protruded beyond the calyx, glabrous. Seeds pale-brown, angular. *F\ B. I. v. 3, p. 64; Trim. Fl. Ceyl. v. 2, p. 314; K. Schum. in Engl. & Prantl, Pflanzenf. v. 4, part 4, p. 22, fig. 8, D-G; Woodr. in Journ. Bomb.*

I XX RITHACITIF  
 Ifat. *mdia i* ?8) P- 644 ? Watt' Dlct\_ Econ\_ Prod. v. 5, p. 480  
 & S. ' !• m Wall Gat 868 <ia P<art>; Grah\_ ^t. p. 90 ■ P  
 lowers : SeptNov VEEN P i i d

Wall. Cat. 868 (in part); Grah. Cat. r>  
 90-  
 A c " m ^ DS> P- 116.—Flowers : Sept.-Nov. VERX. *Pitpapda*.  
 ^Ukar\ ^ Wee<i- KONKAN: *Stocks* \ Dhararatar, *Woodrow* !;  
 Savant, wari  
 ^oina vail' ^aD) W<sup>o</sup>odrow \ DECCAN: *Khandala*, *Cooke I*; Poona,  
*Wood-row I*-  
 ^STIIB TT' \*\*' S> M' CouNTUY: *Londa*, *Cooke I*; *Belgaum*, *Ritchie*, ^-*Hill*  
 Epical Afj: "u6<sup>h</sup>out India: Oeylon, Tropical E. Asia to Java and the Philipnines  
 % Plant h aU America\_  
 ^ious fetfl^ cf^olne repute ^ native medicine and is employed in the treatment of  
 «vers. See Watt, Diet. Econ. Prod. 1. c.

***diffusa*, *Roob. Hort. Beng.* (1814) p. 11.**

Annual,

^ave ; stems numerous, prostrate, often rooting at the nodes'  
 glabrcL<sup>SU</sup>Tssi>e> I"1? by *io-h* TM-> linear or linear-lanceolate, acute,'  
 forelv ol stlpules short> sightly pectinate. Flowers usually solitary  
 fcarrowl to & ether> sessile or oa ver y short pedicels. Calyx-teeth Ion\* Capsul]p i  
 angU lar' cuspidate^ finely ciliate, very distant in fruit! and fl<sub>nf</sub><sup>S</sup> rg5 than  
 m or con Jmbosa> broader than long, very truncate tl K r On<sub>o</sub> the tOp' not  
 protruded beyond the calyx. Seeds angular.  
 Bomk V<sub>p</sub> 65; Trim\* EL Ceyl v. 2, p. 315 5 Woodr. in Journ.  
 ■<sub>o</sub>at. v. 11 (1898) p. 644.—Flowers : Aug.-Oct.

common. S. M. COUNTRY : *Belgaum*, *Ritchie*, ^p ! KANAKA : N. Kanara,  
 ; Sir>i, *Talbot ex Woodrow*.—DISTRIB. Throughout India ; OeJlon, Borneo,  
 os, Japan.

(i3. ***Oldenlandia herbacea*, *Roxh. Hort, Beng.* (1814) p. 11 ; *FL*  
*nd.* v. 1, p. 424. An erect glabrous annual or biennial 3-18 in. high ;  
 >i-anches numerous, dichotomous, slender, 4-gonous, divaricate. Leaves  
 ;\_11 by ^ij~h ^e l<sup>o</sup>wer leaves often broader than the upper ones,  
 sessile, linear or linear-lanceolate, acute, glabrous, usually with recurved  
 margins; stipules very short, inconspicuous or very shortly  
 setose. \Flowers usually on solitary or 2-nate axillary filiform peduncles,  
 sometimes however (especially the upper.flowers) forming a paniculate  
 cyme. \*•>Calyx-teeth triangular-subulate, acute, distant on the fruit, very  
 short. [ Corolla I in. long ; tube J in. long, slender. Capsules -fo in.  
 in diam^ V'void or subglobose, somewhat didymous, the crown much  
 protruded ■^>eyond the calvx, glabrous. Seeds somewhat  
 ellipsoid in outline. 'Trim FL Ceyl. v. 2, p. 315. *Oldenlandia*  
*Heynil*, G. Don, *Gen.. Syst.* (' 3 (1834) p. 531; Hook. f. in *FL B. I.* v.  
 3, p. 65 ; Woodr. in *Journ. Bomb. Nat.* v. 11 (1898) p. 644.  
*Hedyotis herbacea*, Linn. *Sp. PL* '•1753) p. 102. *Hedyotis*  
*Heynii*, Br. iu Wall. Cat. 8G7; Grah. Cat. p. 90 ; Dalz. & Gibs. p.  
 116.—Flowers: Aug.-Oct. VEUN. *Paripdth*.**

KONKAN : *Stocks*!, *Ritchie*, ^-^!; Mai wan, *Woodrow*. DECCAN : Koina valley, *Cooke I*  
 S M COUNTRY : *Belgaum hills*, *Ritchie*, 11G2!; *Belgaum*, *Supekar*!., *Woodrow*. KANARA :  
*Thomson*'.—DISTRIB. Throughout India in lilly districts; Malay Islands, Tropical  
 Africa.

**4. *Oldenlandia crystallina*, *Roxb.. IfoH. Beng.* (1814) p. 11.** A  
 prostrate glabrous herb, much-branched from the base ; branches leafy,  
 2-6 in. long. Leaves |-| by \-| in., elliptic or elliptic-lanceolate,  
 sub-acute, flat, sessile or nearly so, tapering to the base ; stipules with a  
 few short' bristles. Flowers on solitary 1-2 (rarely 3) -flowered filiform  
 peduncles about equalling the leaves. Calyx (in flower) -^ in. long,

the

teeth  $J_{-ff}$  in. long; the teeth in fruit  $\wedge$  in. long,  $^{trJ^f r|_{rteC}}$  beyo»<sup>d</sup> bases touching." Corolla white, short, but little e  $^{-\wedge}$  or pyrites'''  
 calyx; tube about X in. long. Capsules £ in. long, o  $^{, , ,}$  teo<sup>tb</sup>  
 wf glabrous, ribbed, crowned by the brond triangular cwjr  
 $J^{\wedge} B^{\wedge}$  touch at their bases, the crown of the capsule not pron v. 3<sub>r</sub> p.  
 Go. *Otcknlandut pumild*, DC Prodr. v. \*, P- '±~'J' ^<sup>^</sup> sparing<sup>l\*</sup>  
 Rare. S. ST. OOSHTRY: Belgaum, SftwAs, 330r, JKfelfe 2781 t—3\*<sup>sl</sup>  
 throughout the plains of India; Java. mial;

**6. Oldenlandia umbellata, JCwm.** #/>. PZ.(1753) p. i  $\cdot$   $^{J^{\wedge} I I J W^*}$   
 the steins semi-woody at the base, 6-10 in. high, much-branciie  
 base; branches more or less angular and rough. Leave  
 often fascicled, rather close, sessile, | -1 by £-£ in\*. 'linea<sup>^</sup>  $^{-\wedge}$   
 acute; stipules short, pectinate. Flowers 3-10, in sin all  
 $^{\wedge}$   
 axillary pedancled umbels; peduncles usually longer than tft  $^{\wedge}$   
 stout, erect, pubescent; pedicels very short, pubescent. \*joe  
 flower)  $^{\wedge}$  in. long; teeth r'g- in. long, triangular, cuspidate,  $^c$ , joi<sup>11g</sup>,  
 Corolla  $^{\wedge}$  in. long, glabrous on both sides; lobes triangular- $^{\wedge}$   $^{\wedge}$   
 equalling the tube. Capsules globose,  $\tau|j$ - in. in diam., glabrous,  $cvo$   $^{\wedge}$   
 $TM^*_{-}*_{\gg}$  the not very distant calyx-teetli, the jtop of the  $^{cfl} P^s$   
 $re v l$

protruded. Fl. B. I. v. 2, p. 66; Roxb. Cor. Pl. t. 3; Trim.  $^{\wedge}$   
 v. 2, p. 316; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 644; Watt,  
 Dict. Econ. Prod. v. 5, p. 481.—Flowers: Aug.—Dec. VERN. *Chirval.*

$^{\wedge} JCAN$ : Wadi on the G. I. P. Railway line, *JVbodrowl* I have only  $WjjJ$   
 plant from the locality above aamed,—DIBTEIH. India (Orissa, Bengal,  $B^{\wedge 111}$   
 W. Peniasula); Ceylon. \*

The root of the plant known commercially as *Chay-root* or *Indian Madder* furnis a  
 permanent red dye which was much used in Madras where the plant has be\*<sup>11t</sup>  
 extensively cultivated. See Watt, Diet. Econ. Prod. 1. c.

**C. Oldenlandia trinervia, Betz. Ohs. Bot. fase. 4 (1736\*) p. 23 1**  
 A small procumbent leafy annual; stems weak, flaccid, slender, angular<sup>^TM</sup>  
 glabrous or slightly hairy, often rooting near the base.  
 Leave; numerous,  $\setminus$ - $^{\wedge}$  in., broadly elliptic or suborbicular, tapering to the  
 bast or to an obscure petiole, glabrous or nearly so, very thin,  
 distinct!v 3-nerved from the base; stipules 2-partite, acuminate.  
 Flowers 1-6  $IJ$  the axils of the leaves, sessile or very shortly  
 pedicelled. Calyx hairy teeth short, narrowly lanceolate, acute. *nsis.*  
 Corolla rotate, white (*Dalzeif\**) Fruit globose, very hairy, dehiscing by a  
 wide circular opening at th  $i$  top, the crown not protruded. Fl.  
 B. I. y. 3, p. 66; Trim. ft. Ce<sup>^^</sup> v. 2, p. 316. *Ihdyotis trinervia*,  
 Emm. & Schult. Syst. v. 3 (1818\*nT p. 197; Dalz. & Gibs. p. 115; Bedd.  
 Icon. VI. ind. Or. t. 29.—Flowers  $e$ (

W« (ex Herb. *Dal\*e8*), 178G ! without localiti. Herb. Stocks without locality  
 $iiffhe$   
 Herb. ICew.! KoftXAH: Malw&n, /?a^g// 4- ff/Aaw. /

**7. Oldenlandia dichotoma, Boole, f. Fh B. /, v. 3 (1880) p. 67 <g>**  
 A very slender annual 8-18 in. high; stem erect, terete,  
 usually  $^{ar}$  glabrous; branches filiform, the ultimate ones like fine hairs.  
 Leaves ?J linear-lanceolate, acute, flat, the lower leaves' larger than  
 the upper,  $^{lv}$  1-3 by  $i$ - $^{\wedge}g$ -iu., some of the uppermost leases sometimes  
 not being more than £-! by *fa-fe in.*; stipules small, truncate, without  
 bristles, or Bometnnes with 2-3 short bristles. **Flowers white**

(*Ritchie*), on long capillary pedicels, rarely solitary, sometimes 2-3 from the apex of a



peduncle, or often arranged in terminal and axillary

peduncle distant. Corolla 1-4 in. long ; tube 1/2-3/4 in.

1/2-3/4 in. long ; tube 1/2-3/4 in.

1/2-3/4 in. long ; tube 1/2-3/4 in. Capsules 1/2-3/4 in. in diam.,

globose. ; v. 4 p. 67; Woodr, in Journ.

Bomb. Nat. v. 11 (1898) p. 644.

of Br. Flowers -

Eitja\* IcOn\* Pi\* lad\* or\* L

Eitjr. Kajuri.

Poona districts, Woodrow\* S. M. COUNTRY: Belgium, Ritchie, India (Banddkand, W. Peninsula).

E a I Pi Id o 33 A £

### B)Fl

**aspera**, DC. Prodr, v, 4 (1830) p. 428. A stout 5 in. high ; stems and branches scabrid with minute **Leaves wborled**, 1-2 by |-| in., linear, acute, **sub\*** 1-3 j^'. ^ltu slightly recurved margins; stipules membranous, with in ter . ' Flowers pale blue (*Dahsell*) rose-colored (*Ritchie*), **small, pedic^if^1^\*** **Attached** cymes, solitary or **in** pairs, sessile or shortly W.f , ai 011£. the branGh«s of the c^me. Calyx (in **flower**) -^ **ik hih I 2«** in- lon»' ^angular-subulate. Corolla infundilmHtorin, >bo^ n" : lube v\_ery slen(ier» Tff il1\_lo»g- Capsules |-~i.

..., somewhat didymous, scabrid with white points, crowned by the distant calyx-teeth. Fl. B. I. v. 3, p. 68 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 644. *Hedyotis aspera*, Heyne, in Roth, Nov. Pl. Sp. p. 94.

in. in

z. & Gibs. p. 115.—Flowers: Aug.

**SK**: Poona, *Coo7ce*!, *Woedros*!, *Semad-a I*, *Kaniifcar* ■ OIMAJIAT: Surat, S. M. CotiMTim : Badumi, RKJwdroitrl; Pida&apur, *Eitkie*, 1782 V—DISTUIL.; ia (W. Peninaala).

9. **Oldenlandia retrorsa**, Bois\*. *Fl. Orient*, v. 3 (1875) p. 1L\*. ..ootstock woody; stems 12-18 in. long, **numerous**, terete, **slend<** **©trorsely hispid** with short **stiff** hairs. Ijeares **wborled**, 4--1 by |'~| in., ubsessile, linear-oblong, subobtuse, **flat**, hispid on both sides with short Jiff hairs; stipules membranous, with 1-3 bristles. **Flowers sessile** |d pedicel!ed, scattered along the long branches of glabrous **spreading** .**seminal** cymes. Calyx (in flower) slightly pubescent, A- in. long; obes 4\$ in\*, long, **linear** or subtriangular, acute. Corolla |-# in. long; ^ube very slender (almost **filiform**), |-| in. long, glabrous; *lobux* £ in. on", linear-oblong, obtuse. Capsules -|-i in\* in **diam.**, crowned by the istant ealvx-teeth, subglobose, truncate, didymou.s quite glabrous, **fee** crown of the capsule about level with the top of the calyx or very Sightly protruding. Fl. B. I. v. 3, p. 63 ; Woodr, in Journ. Bomb. Nat,

**H. 11 (1898) p.** (344.--Flowers : **Oct.~Kov.**

¥ **Ooufinea** to **Si** ml. **Sura** : *Stocksl*, *Bhola Puran* !; on sand hills, *DalzeU*; banks of.

**ifMulir** i-ivei<sup>l</sup> noar Karachi, *iVoodrow* ; **Jemadar** ka Landa near **Karaehi**, *Stocks*, 48s DISTHIB. Arabia.

10. **Oldenlandia gracilis**, *Hook, f. in FL B. T. v. 1(1880) & . \*-s.*  
A slender erect herb **6-12 in. high**; branches few, erect, **slender**,  
glabrous. Leaves opposite (not whorled), 2-3 by <sup>^</sup>| **in.** (the upper-  
most leaves often **much** narrower<sup>^</sup>sometimes not more than **g»\$in. wide**),  
linear, acuminate, glabrous, fiat; stipules truncate. Flowers **in** lax  
**branched** cymes, the branches slender, spreading **in** flower, erect in  
fruit; pedicels very slender. Calyx **1** in, long, glabrous: teeth  
**triangular-subulate**, <sup>^</sup> **in**, long, very **acute**, Corolla **brown**  
(*Hooker*);

tube *ft* in. long, very slender; lobes 1 in  
Capsules ellipsoid, £-£ in- long, glabrous, slightly prou  
ot the calyx. *Hedyotis asjyera*, Bedd. Icon. Pl. Ind. Ur.  
Heyne).—Flowers: Apr.

Rare in the Bombay Presidency. S. M. COUNTRY: Belgaum  
Throughout India in hilly districts; Ava.

11. **Oldenlandia senegalensis**, *Hiern, in Otiver FL Tr<sup>o</sup>2<sup>7</sup>*; <sup>gtem</sup>  
v. 3 (1877) p. 56, Annual, 8-16 in. high, sparingly branched  
very erect, glabrous or minutely scaberulous, slender, wiry, <sup>puin</sup>inate,  
1|\_2 by &-£ in., not whorled, linear-lanceolate, acute or ao  
apiculate, flat or with slightly recurved margins; stipules with  
bristles. Flowers in very lax open terminal pyramidal panicles  
peduncles long, slender; pedicels capillary, 1-2 in. long.  
long; teeth subulate, slightly shorter than the obovoid calyx.  
Corolla *i-i* in. long; lobes *ft* in. long, linear, acute or acute  
Capsules' £ in. in diam., on long filiform pedicels, globose,  
by the very distant calyx-teeth which are below the top of the  
PI. B. I. V. 3, p. 68; Woodr. in Journ. Bomb. Nat. v. U  
p. 644.—Flowers: Sept.

DECCAN: Kirkee, Woodrow; Poona, Woodrow, 292!—DISTRIB. India  
(

Naepore); W. Tropical Africa.

Sir J. Hooker (Fl. B. I. 1. c.) referred this to the Senegal plant with  
The flowers are smaller than those of the African plant, but as there are only 2  
in Herb. Kew., of which 2 (collected by one and the same collector) are from  
Nagpore and the other from the Deccan, the material is still insufficient for accurate  
determination.

## 12. ANOTIS, DC.

Herbs prostrate or ascending, rarely erect, often with flaccid hair  
Leaves opposite; stipules interpetiolar, usually bristly. Flowers small  
in heads or in axillary and terminal cymes. Calyx-tube compressed  
lobes 4, erect or recurved, usually with broad sinuses. Corolla tubular  
or infundibuliform; lobes 4, ovate, usually shorter than the  
tube

valvate in bud. Stamens 4; filaments short or long; anthers included  
or exserted. Ovary 2 (rarely 3-4) -celled; ovules usually few (rarely 1  
in each cell on placentas ascending from near the base of the septum  
style filiform; stigmas 2-4, linear. Capsule didymous,  
lateral 1

compressed, the crown produced, loculicidally 2-valved at top, rarely  
indehiscent; cells 1-few (rarely many) -seeded. Seeds peltate,  
boat'

shaped or plano-convex; testa coarsely pitted; embryo clavate in horn'  
albumen.—DISTRIB. Chiefly Tropical Asia; species about 25.

Cymes corymbose.

Capsule subglobose; calyx-teeth suberect in fruit, a  
little below the top of the capsule ..... 1. *A. Leschenaultiana*.

Capsule broader than long, reaching \ in. broad;  
calyx-teeth large, deflexed in fruit, a little below  
the top  
of the capsule ..... 2. *A. lancifolia*.

Capsule globose,  $\frac{1}{2}$  in. in diam.; calyx-teeth minute, ^-way  
down or more from the top of the capsule in fruit. ... 3. *A.*

*Ehedei*. Cymes clustered; capsules in clusters or heads.

Leaves fleshy ; calyx-teeth large ..... 4. *A. carnos*.

Leaves membranous.

Capsule usually 4-lobed and 4-celled; calyx-teeth

Jminute ..... 5. *A. quadrilocularis*.

nearer the Pedicel than the top of the  
 Ipped with a fine bristle ..... 6; A- *Montholoni*  
 Li» not bristle-tipped.  
 Aves exceeding ^ in. long ..... 7. A. *fcetida*.  
 «0,ves not exceeding \* in. long ..... 8.-4. *Ritchiei*.

) n \* Q Lesc^ **enaultiana**, *Bentlu* \$ *Hook. f. Gen. Pl.* v

2  
 - high & *Hoolc* /• ^ -B- J- v- 3 (1880) > P- 72' A stout Plant ially <sup>W1</sup>  
 a Perennia<sup>l</sup> root; stems straggling, more or less hairy oois <sup>near</sup>  
 t^le ext<sup>remities</sup> and beneath the nodes, sometimes  
 oVate or o<sup>ftly</sup> S0# Leaves 1~2<sup>h</sup> J I"18 in-> sessile or petioled,  
 011 b<sup>oth</sup> s<sup>^</sup> Vate~lanceolat<sup>e</sup>, acute or subobtuse, usually densely villous  
 i<sup>^</sup> r acute, sometimes cordate ; lateral nerves  
 \* prominent beneath ; petioles 0-J in. long ; stipules bristly.  
 \*? cAR^mbose usually hairy dense peduncled terminal cymes •  
 e<sup>qualli</sup>no. f<sup>G</sup>V \ shorf<sup>c</sup> hair^ C^X in flower TV ^ long; teeth tube 3 ^ e  
 ,<sup>inbet</sup> narrowly triangular, acute. Corolla red-purple • SsulI7!V?nug; lob?o  
 TV in- long, oblong, obtuse. Anthers blue! Seeds ?^ sub^lobose!  
 didymous, with the calyx-teeth near the top. Varies ^ \^U0:G0I1Ye^ A-TV  
 in- long, deeply pitted. The plant IWJ mucn m hairiness.  
*Hedyotis Leschenaultiana*, Wight & Arn.

ro^ p. 411 ; Wight, 111. t. 125 ; Dalz. & Gibs. p. 115.

j-M. COUNTRY : Belgaum, *Dalzell* \$ *Gibson*.  
 (& 7e Been no aut^ent^e specimens from the Bombay Presidency. Dalzell & Gibson  
 j O « Fl. 1. c.) give Belgaum as the locality in which the plant occurs, and there are in  
 ^b. Kew. specimens of one of the varieties of the plant from Stocks' Herbarium and  
 jS^1 one from Dalzell's Herbarium, but none of these have localities assigned to them, d  
 does not include the plant in his list.

/ 2. **Anotis lancifolia**, *Hook. f. in Fl. B. I. v. 3* (1880) p. 73.  
 'Herbaceous, erect, diffusely branched, 2-3 ft. high ; stems and branches  
 glabrous. Leaves membranous, 1-3 by |-1 in., ovate or ovate-lanceolate,  
 acuminate, bright-green and pubescent above, paler and hairy on the  
 .nerves beneath, base acute or obtuse; petioles ^-§ in. long; stipules  
 ^pubescent, shortly bristly. Flowers purple, in terminal and  
 subterminal jnany-flowered corymbose (usually glabrous) cymes which are  
 sometimes i-6 in. in diam.; peduncles 4-gonous, pubescent or glabrous.  
 Calyx y<sup>1</sup>^ in. Jong, hairy ; teeth j<sup>1</sup>^ in. long, triangular, acuminate.  
 Corolla | in. ,long ; lobes triangular-oblong, acute, -^ in. long, hairy  
 outside. Capsules compressed, -f-% in. broad, much broader than long,  
 dehiscing across the top, 2-lobed at the apex, crowned by the larg  
 distant recurved calyx-teeth. Seeds 4-6, broadly ellipsoid or suborb\*  
 alar, convex on the back, cdeeply excavated on the face, pitted, black.  
 Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645. *Hedyotis lancifolia*,  
 Dalz. in Kew. Journ. Bot. v. 2 (1850) p. 135 ; Dalz. & Gibs. p.  
 116.—Flowers: Sept.-Oct.

KONKAX : *Stocks I, Dalzell!* DECCAN : Mahableshtar, *Cooke I, Wbodrow I*; Purandhar,  
*Woodrow*; Phunda Ghat, *Dalzell* \$ *Gibson*. S. M. COUNTRY : Belgaum south, *Ritchie*,  
 1777!; Castlerock, *Cooke !*; Belgaum, *Ritchie*, 356 !—DISTRIB. India (W. Peninsula).

3. **Anotis Rheedei**, *Benth. \$ Hook. /. Gen. Pl. v. 2* (1873) p. 59,  
 & *Hook. /. Fl. B. I. v. 3* (1880) p. 73. Annual, slender; stem erect,  
 glabrous, 4-gonous, almost 4-winged. Leaves 1^—3 by f-1 in., mem-  
 branous, ovate, acute or acuminate, with a few scattered hairs on both  
 surfaces, tapering at the base into the petiole; petioles slender, g-| in

long; stipules short, crenate. Flowers few, minute, m<sup>axl</sup>^<sup>ay</sup>. terminal very lax and open cymes; peduncles and pedicels long, c j ^ Calyx-teeth very minute. Corolla pale rose-colored; tube snort, ty Capsules ^ in. in diain., appearing after dehiscence as 4 conn \_ ^ globose, puberulous, broadly didymous, much protruded, the ca J ' -^ being about the middle of the capsule. Seeds 4-12, semiei v^ rounded on the back, deeply excavated on the face, ml\*T°\*f<sup>l</sup> atf reticulate, black. Woodr. in Journ. Bomb. Nat. v. 11 (18J^ { ' x & *Hedyotis latifolia*, Dalz. in Kew Journ. Bot. v. 2 (1850) p. 1\* > 5 £\* • Gibs. p. 116. *Hedyotis Bheedel*, Wight & Arn. Prodr. p. 409.—I<sup>TM</sup>ecu ' Hort. Mai. v. 10, p. 49, t. 25.—Flowers : July.

KONKAN: *Stocks 1*, Dalzell; Mai wan, Dalzell \$ Gibson; near Matheran, Woo<sup>r0</sup>^ hills near Matheran, Kanitkarl; Ghats near Goa, Woodrow.—Dis<sup>TRi</sup>B.. in<sup>ai</sup>a ^ Peninsula).

4. ***Anotis carnos***, Benth. & Hook. f. *Gen. Pl.* v. 2 (1873) p. 59, & f. *Fl. B. I.* v. 3 (1880) p. 74. Annual, 4-6 in. high, diffusely from the base. Leaves  $\frac{3}{4}$ -1 $\frac{1}{4}$  by  $\frac{1}{4}$ - $\frac{3}{8}$  in., elliptic-lanceolate Hook, bes98)

subobtuse, thick and fleshy, scaberulous with papilla<sup>3</sup> above, pale and with recurved margins, attenuated at the base into a short<sup>r</sup> or almost sessile; stipules truncate or almost obsolete. Flowers (Ohota 3-6, in capitate cymes which are sessile and axillary, or pedunc<sup>^</sup> . terminal, each head of flowers with 2 large floral leaves (bracts) ^"g base; peduncles £-1 in. long. Calyx £ in. long, externally papiK<sub>ota</sub> teeth -fa in. long, slightly longer than the tube, linear-oblong, aCf<sup>n</sup> when in fruit about | the way down from the top of the caps Corolla purple, T\ in. long ; lobes ovate, ■£\$ in. long. Capsules ^~£ ^ broader than long, sessile, 2-lobed, 2-celled, glabrous, crowned by t large papillose calyx-teeth ; cells 3-6-seeded; Seeds elliptic or orbicula. in horizontal section, compressed, convex on the back, excavated on th<jl face, pitted, black. *Hedyotis carnos*, Dalz. in Kew Journ. Bot. v. z] (1850) p. 135 ; Dalz. & Gibs. p. 116.

KONKAN : on rocky sea-shore Mai wan, Dalzell; sandy margins of rivulets Ooran Dalzell! KANARA : *Law 1*—DISTKIB. India (W. Peninsula).

5. ***Anotis quadrilocularis***, Boole. f. *FL B. L.* v. 3 (1880) p. 74 Annual, 6-18 in. high, with many flaccid spreading glabrous cylindrii branches. Leaves f-l\$ by J—J in., thinly membranous, subacute, more or less hairy on both surfaces, pale beneath, shortly tapering at the base petioles g~| in. long; stipules short, truncate, the upper with short bristles. Elowers sessile or Jiearly so, solitary or 2-4 together in the axils (those on short branchlets with a single pair of leaves appearing terminal). Calyx-teeth ^ in. long, broadly ovate, acute, apiculate, ciliate in fruit, about j the way down from the top of the capsule. Corolla ^ in. long; lobes y<sup>1</sup>^ in. long, ovate, subacute, pubescent on the back. Capsules sessile, broader than long, usually 4 (sometimes 2 or 3) -lobed, usually 4 (sometimes 2 or 3) -celled. Seeds 3 in each cell, hemispheric or semiellipsoid, deeply excavated on the face, pitted, black. Trim. *Fl. Ceyl.* v. 2, p. 318. *Hedyotis quadrilocularis*, Thw. Enum. p. 144.

Belgaum, Ritchie, 191!

I have seen only on<sup>e</sup> specimen from the Bombay Presidency collected by Ritchie at lgaum.—DJSTRIB. India (W. Peninsula); Ceylon.

V<sup>nnu</sup>al, ere<sup>St</sup> Montholoni > *Hook. f. in Fl. B. I. v. 3* (1880) p. 73. Us<sup>pid</sup>.  
 ' T sparingly branched; stem and branches more or less  
 k~% by |-| in., ovate or ovate-lanceolate, acute, more , ->th  
 surfaces; petioles T V~i in. long; stipules with short cat>if~f \Wers \*n  
 Aerm;ina^ anc^ axillary peduncled many-flowered -b-rthc cymes! Peduncles  
 hairy. Calyx y<sup>1^</sup> in. long; teeth he pe(i-' ? "e tube, in fruit below  
 the middle of the capsule nearer to -°rolla f ^an the crown, ovate,  
 pointed with a fine capillary bristle. Subacut Un^e^~s^a^pec^> purple, -i- in.  
 loug; lobes y<sup>1^</sup> in. long, oblong. k<sup>ro</sup>ader^li k<sup>rous</sup> ou^s^e\* Capsules  
 clustered, subsessile, didymous, . an<sup>ce</sup> n f<sup>lau</sup> l<sup>ong</sup>? with a large double  
 convex crown giving the appear-^obos ° hemispheric bosses,  
 pubescent; cells 1-3-seeded. Seeds b!ack ?? S<sup>01</sup>uewhat beehive-shaped,  
 deeply excavated on the face, pitted, "\y<sub>0</sub> i r^e hair-points on the  
 calyx-teeth are a good distinctive mark. ^uar- m Journ. Bomb. Nat. v.  
 11 (1898) p. 645.—Mowers : Aug.

banks of Nij<sup>Poonat</sup> ^ana^el\* Woodrowl S. M. COUNTRY: Belgaum, *Ritchie*, 1778 !; <sup>1</sup>  
 naias nea-r Belgaum, *Ritchie* ! KANAKA : *Law* !—DI&TRIB. India (W. Peninsula).

7/ ; **Anotis fctida**, *Benth. \$ Boole f. Gen. Pl. v. 2* (1873) p. 59, &  
 stem' • *Fl. B. L. V. 3* X<sup>1880</sup>) P- T<sup>4-</sup> A slender annual 4-6 in. high ; s<sub>j</sub>  
 simple or sometimes excessively branched; branches erect, very 3  
 \*J(ier, more or less 4-gonous, glabrous. Leaves sessile, -|-1 by -J-Q-T^  
 Iny, linear or narrowly linear-lanceolate, subacute, scaberulous with ^Hu^e  
 papillao above, pale beneath and with recurved margins; stipules ^ajil,  
 bristly. Elowers subsessile, in 2-3-nowered capitate cymes  
 \*e|Thinating simple or forked subterminal capillary erect peduncles.  
 Ca.ayx TW ^n\* ^onS > teeth ^ in. long, narrowly triangular, acute, apiculate.  
 Qirolla 4^ in. long, funnel-shaped, purple; lobes ovate, acute, ^in.long<sub>r</sub>  
 A^xternally papillose. Capsules yV~s in., sessile, broader than long,,  
 lidymous, the crown very prominent, with the calyx-teeth about ^-way  
 flown from the top of the capsule; cells 1-6-seeded. Seeds elliptic or  
 orbicular in horizontal section, compressed, convex on the back, excavated  
 r on the face, pitted, black. Woodr. in Journ. Bomb. Nat. v. 11 (1898)  
 '\*p. 645. *Hedijotis foetida*, Dalz. in Kew Journ. Bot. v. 2 (1850) p. 134 ;  
 Dalz. & Gibs. p. 116.—Flowers: July-Aug.

KONKAN : Malwan in stony ground during the rains, *BalzelV.*; Bombay, *Lambert 1*  
 ^ECCAN : Khandala, *Bhiva* ! S. M. COUNTRY: Belgaum, *Ritchie*, 1163!; Londa,  
 ('Woodrow. KANAKA: *Woodrow*; Karwar, *Talbot*, 554 !—DISTRIB. Apparently  
 endemic.

. 8. **Anotis Ritchiei**, *Hook.f. Fl. B. I. v. 3* (1880) p. 74. A small  
 blender plant 4-7 in. high; stems coaspitose, more or less angled, glabrous  
 (Or pubescent. Leaves £-£ by Y\$-} in., oblong-lanceolate, acute or  
 obtuse, hairy on both surfaces, narrowed at the base into a very short  
 petiole; stipules inconspicuous. Flowers in small terminal shortly  
 peduncled cymes; branches of the cyme few, pubescent, each carrying a  
 head of 2-3 sessile or subsessile flowers. Calyx -fa in. long, hairy; teeth  
 jJ-jr in. long, linear-lanceolate, acute. Corolla purple, -J^i- in. long;  
 tube very slender; lobes T<sup>x</sup>-6 in. long, pubescent on both sides, with a  
 darker purple spot at the base of each lobe (*Bitdiie*). Stamens exerted;  
 anthers linear, blue (*Bitchie*). Ovary 2-celled : cells 2-4-seeded. Fruit  
 unknown.

There is but a single sheet of this species (without fruit.) in Herb. Kew.

The

specimens on it *were* collected by *T>r. Ritchie*, but **the** locality whence they obtained is not given. They may have been collected at or near **Belgaum, wiv Dr. .Ritchie** collected largely, but there is absolutely no evidence that eudi was case, or that they were found within the limits of the Presidency at all.

### 13. OPHIORRHIZA, Linn.

Erect, creeping or decumbent small herbs, rarely **undershrubs**.  
opposite; stipules interpetiolar, caducous, Flowers secund on  
•<-branches of axillary or terminal dichotomous cymes, with or  
v<sup>n</sup>w<sup>o</sup> -yx-tube short; lobes 5, small, persistent. Corolla  
or funnel-shaped; lobes 5, valvate in bud, often winged or appends? at  
the back, sometimes also with a fold in the sinus. Stamens 5, i<sup>TM</sup>

ow the throa o , y ;  
of 2 large prominent erect lobes which become much enlarged in  
Ovary 2-celled; ovules many in each cell, inserted on basal ascenoiD<sub>D</sub>  
placentas; style filiform > stigmas 2, broad or linear. Capsule corjaceou ,  
compressed, obcordate, girt by the calyx-limb, the crown dehiscing »/  
2 broad gaping valves; placentas divaricating, many-seeded. ?<sup>e</sup>  
i l d h i l b l t i  
below the throat of the corolla, usually included; anthers linear

g p g ; p g y /;  
minute, angled; testa thinly crustaceous; embryo elavate in  
\*<sup>Λs</sup>,  
albumen.—DISTRIB. Tropical Asian, with a few Australian and  
nesian; species about 50. \*<sup>essi</sup>

#### 1. Ophiorrhiza Harrisiana, Heym, in Wall Cat. (1828)

Herbaceous, woody at the base, 6-15 in. high; branches num often  
rooting near the base, glabrous or more or less pubescent. 2-3| by 1-1½  
in., elliptic or elliptic-lanceolate, acute or **acumin** glabrous or  
with a few scattered hairs above, whitish on the **iomj** surface and  
pubescent on the nerves beneath; petioles ^-§ in. **lout** stipules with  
1 or more long rather stout bristles. Flowers in rathe dense  
terminal cymes; peduncles and pedicels densely hairy; bracteoloj at base  
of pedicels τV in- long, linear, acute, hairy. Calyx -^ in. long' hairy;  
tube turbinatej teeth ^ in, long, triangular, acute. Corolla! |  
in. long, externally pubescent; lobes jV in. long, triangular-oblong,,  
acute, not keeled on the back, pubescent inside. Capsules somewha  
canoe-shaped, pubescent, much compressed, -J-\$ in, broad, much broader  
than long, rounded at the ends, surmounted by the very distant short;  
calyx-teeth. Fl. B. I. v. 3, p. 78; Trim. FL Ceyl. y. 2,  
p. 32] *Ophiorrhiza Ilarrisonii*, Wight, Icon. t. 1162; Dalz. <fe Grib. p.  
117.-Mowers: Aug.

KONKAN: *Stocks!*; Amba Ghtlt, *Woodrow*. S. M. COUNTRY: *XtAmgMt, Dated!*  
*Gibson*. KANAKA: *Hohenhaefar, 792al*; *Divimana, Woodrow*; near Grondabel, *Bahcll*  
*Uombardi, Ritchie, 1775!*—DISTRIB. Throughout India in hilly districts; Ceylon.

### 14. MUSS-ffilVDA, Liun.

Shrubs or undershrubs (rarely herbs), erect or climbing. Leaves



opposite or 3-nafely whorled; stipules interpeiiolar, **solitary** or *twin* usually deciduous. Flowers yellow or scarlet (rarely white) in terminal cymes; bracts and bracteoles deciduous. Calyx-tube oblong or turbinate • lobes 5, usually deciduous, one frequently forming a large stalked white **or** colored leaf. Corolla infundibuliform; tube usually silky, throat villous ; lobes 5, short, induplicato-valvate. Stamens 5, inserted in the throat of the **corolla** or lower down : filaments *xery* short; anthers

fleshy'n] <sup>ai^</sup> ^-celled ; ovules very numerous in each cell, on peltate <sup>ar</sup> <sup>eo</sup> <sup>iat</sup> <sup>aCentas</sup> » <sup>s</sup> <sup>tyte</sup> filiform ; stigmas 2, linear. Fruit a fleshy berry, minuf <sup>e</sup> <sup>at</sup> <sup>ae</sup> <sup>aPex</sup>» many-seeded. Seeds minute; testa pitted; embryo <sup>p</sup> <sup>ac-fi</sup> <sup>eT</sup> <sup>ln</sup> dense fleshy albumen.—DISTRIB. Asia, Africa, and the <sup>ac</sup> <sup>Isl</sup>ands ; species about 40.

**^ ^ ssaenda frondosa**, *Linn. Sp. PL* (1753) p. 177. A rambling by its long flexuose divaricate branches which are

cyljJj . g y g  
 itt <sup>,clri</sup>c and appressedly hairy (rarely glabrous). Leaves 3-5 by 2-3 |  
 gj<sup>^5</sup>, <sup>Droa</sup>dly elliptic, shortly acuminate, more or less pubescent (rarely  
 Vei <sup>Vo</sup>h<sup>^</sup> <sup>a^over</sup> P<sup>u</sup>bescient on the nerves and on the numerous reticulate ^  
<sup>s</sup> beneath, base rounded or often tapering into the petiole ; main  
 Pet<sup>v</sup> <sup>VE|S</sup> <sup>8</sup> <sup>1:^</sup> P<sup>airs</sup> conspicuous on both surfaces, curving upwards;  
 \ . <sup>10^s</sup> | -1 in. long, more or less appressedly hairy; stipules twin,  
 \*<sup>ln</sup> - long and about -fa in. broad at the base, linear-lanceolate, very  
 ute, hairy. Flowers in terminal somewhat open cymes; peduncles  
 °ut, coarsely hairy; pedicels short, hairy; buds densely hairy, clavate,  
 ~<sup>angled</sup>; bracteoles subulate. Calyx-teeth reaching § in. long,  
 linear-<sup>bulate</sup>, hairy, the enlarged segments (only developed on the outer  
 side <sup>r</sup> a few flowers) leaf-like, creamy-white, persistent, 2±-4£ by 1<sup>^-2^</sup>  
 in., <sup>Droa</sup>dly ovate or elliptic, acuminate, usually tapering at the base,  
 more <sup>Or</sup> less velvety when young, when older nearly glabrous or with a  
 few scattered hairs, strongly 5-7-nerved from the base and  
 reticulately filled between the nerves, the stalk about ^-1 in. long.  
 Corolla 1§-1 | <sup>ln</sup>; long, of a deep golden-yellow ; tube slender, very hairy  
 outside and <sup>^ith</sup>, a dense lining of yellowish hairs completely blocking  
 the mouth ; lob'es \ in. long, broadly ovate or elliptic, apiculate,  
 pubescent on the b\*Vck. Berries |-| in., subglobose or obovoid,  
 glabrous. This is the *Vfr. cjlabrata* of Hook. f. *Fl. B. I.* Fl. B.  
*I. v. 3*, p. 89; *Grab. Cat.* ■V. 88; *Dalz. & Gibs.* p. 121; *Bedd. For.*  
*Man. in Flor. Sylvat.* p. cxxxix, v. 16, ^g. 3 ; *Talb. Trees, Bomb.* ed. 2, p.  
 187; *Woodr. in' Journ. Bomb.* .tfat. v. 11 (1898) p. 645.—Flowers:  
 July-Oct. YERK. *Sarvad*; *BhutJces*.

KONKAN : *Law!*; hills, *Dalzell & Gibson* ; Matheran, *Cooke !*; near Simpson's  
 Lake,  
 . *fl. M. Birdwoai*; Vingorla, *Kanitkar* \ DECCAN : Khandala, *Woodrow !*; Koina  
 valley,  
*Jooke I* KASJ, RA : moist forests where there is a heavy rainfall, *Talbot*; N.  
 Kanara,  
*Woodrow*.—DISTRIB. India (Tropical Himalaya, Assam, Andamans, W. Peninsula);  
 Ceylon, Malay Islands.

## 15. TARENNA, Gsertn.

Shrubs or trees. Leaves opposite, petiolate; stipules usually deciduous,  
 blowers in terminal many-flowered corymbiform cymes. Calyx-tube  
 obovoid or turbinate; limb small, shortly tubular, 5-fid or 5-partite  
 (very rarely 4- or 6-fid or -partite), deciduous or subsistent. Corolla

infundibuliform or hypocrateriform; tube short or long, the throat glabrous or villous; lobes 5, spreading or reflexed, twisted in bud. Stamens 5, inserted on the mouth of the corolla; filaments short, or 0; anthers narrow, often acute. Ovary 2-celled; ovules few in each cell, immersed or J-immersed in fleshy peltate placentas ; style stout, usually pubescent; stigma fusiform, grooved, usually much exserted. Fruit a hard 2-celled berry. Seeds few.—DISTRIB. Tropical Asia and Africa.

The genus should properly be called *Chomelia*, Linn., which dates from 1737 (GJ-en. Pi. ed. 1, p. 55), but the name has been retained for another (American) genus of the

Order ns *Ckomdia*, Jacq. (1700). E. Sehum. in Engl. & Prantl, Pflanzonf. v. 4, p<sup>31</sup> p. 74, adopts **ChomMa** as the name of the **genus**.

**iVote**—The genus was founded by **Gartner** from the Ceylon plant *Tarenna* of In his original description, Gaertner describes the calyx as 4-pai-tite, a<sup>eon</sup>2n\ the rare occurrence, but, as has been pointed out by **Wight & Arnott**. (Prodr. p. V^toar calyx is sometimes (though rarely), 4- or even 6-clefr., and from the fact that Lrrj,ere CIOOB not describe the corolla, his specimens may have been few or impel"jec<sup>tp<</sup> .fc RT6 can scarcely bo any doubt aa to the plant GiKrtner, whose figures of the ^j excellent, intended to describe; in fact *Tarenna zeylanlca* appears to be g^ recognized as a synonym for *Webera corymbosa*, Willd., and *Stylocovyna* A. Rich. It is significant too that the name *Tarcnnawns* derived front the Oi name (Tarana) of *Tarenna z&ylanlca* (see Trim. Fl. Ceyl. v. 2, p. 328, and Arn. Prodr. I. c). As the name *Tarenna* dates from 1788 it is clearly p<sup>f</sup> *Webera*, Schreb. (1791), or *Stylocoryna*, Oav. (1797).

**1. Tarenna zeylanica**, *Gmrtn. Fruct. y.* 1 (1788) p. 139, \*■ ^' large shrub or small tree; bark smooth, pale-grey; twigs coiTJp^e^ glabrous; young shoots often covered with a resinous exU, jj Leaves coriaceous, 3-6 by £-2| in., oblong-lanceolate, acute at both e<sup>l</sup> (sometimes acuminate at the apex), glabrous, polished above, P ^ beneath; main nerves 10-12 pairs, prominent on the lower side; P® i« J-§ in. long, stout \ stipules triangular from a broad base, acute, c°/o^ appressed to the stem and at first glued to it by a waxy secretion, long, subsistent. Flowers faintly odorous, in terminal tricl i corymbose cymes: peduncles stout; ultimate pedicels about T\ €alyx £ in. long, slightly pubescent; teeth triangular, -fa ciliolate. Corolla white, 4 in. long; lobes 1 in. long, oblong, hairy at the mouth. Berries the size of a pea, 2~celled, glf glabrous, at first dark-green, becoming black when fully ripe, surmoi at first by the calyx-lobes, which however often drop off before inaturl leaving a conspicuous scar. Seeds **6-10**, semilunate, wettge-shap rounded on the back, in shape like a section of an orange, hard, rag< black, shining. I have never found more than 10 seeds in a bei Jackson, in Index Kewen. v. 4 (1895) p. 1038. *Webera corymbosc* Willd. Sp. Pl. v. 1 (1797) p. 1224; Hook. L in Fl. B. t v, 3, p. 102 Trim. PL Ceyl. v. 2, p. 328; Talb. Trees, Bomb. ed. 2, p. 188; AYoodr in Joarn. Bomb. Nat. v. 11 (1898) p. 645; Watt, Diet. Econ. Prod, vj 6, part 4, p. 300. *Stylocoryna Webera*, A\* Eich. Mem. Tain. EubiacJ (1829) p. 16S, & in Mem. Soc. Hist. Nat. Par. v. 5 (1834) p. 248J *Styhcoryne Webera*, Wight & Arn. Prodr. (1834) p. 401; Wight, Icon tt. 309 & 584; Grab. Cat. p. 89; palz." & Gibs. p. 119.—Flowers: Apr. June and again in Pec. YEBST. Kare.

•KONKAN: S. Konfcan, *Nimmo ex Graham, Balzell §■ Gibson*; jungles near Gon *Dr. Lush ex Graham*. КААААА: *Laiol, Hohenhacker, 123!*; N. Kanara in moist forests on the Ghiite, common near the Ainshi Ghat, *Talbot*,—**DIBTBIB**, India (southern<sup>l</sup> parta of the Western Peninsula); Ceylon, Malay Islands.

### 1(5. **RANDIA**, Linn.

Trees and shrubs unarmed or spinous. Leaves opposite, or with one of the pair often arrested; stipules short, intrapetiolar, free or connate. Flowers rather large, solitary and terminal or in axillary or leaf-opposed cymes, white or yellowish. Calyx-tube ovoid or turbinate, ribbed or terete; limb often tubular, truncate, toothed or lobed, the lobes sometimes foliaceous. Corolla various; tube long or short, the throat glabrous or **ydlous**; lobes 5 (rarely more), short or long,

TY Stamens 5 (rarely more) ; anthers sessile,  
narrowly  
ro annular or cushion-shaped. Ovary 2-celled;  
ovules

1S) sunk in fleshy placentas; style short or slender;

stigma

117psoi!\*o<sup>te</sup> or fusiform > entire or 2/M' BerrΛ globose > ovoid or testate  
celled > many-seeded. Seeds often immersed in pulp, angled ; eh\* • '  
aΛumeQnorn7» cotyledons orbicular.—PISTHIB. Throughout Ap<sup>ro</sup>Pics of the  
world; species about 90.

3?Jo "Λrect trees or shrubs.

ers 1-3<sub>1</sub> terminal; calyx-limb persistent, -flowers  
exceeding 1£ in. in diam.; fruit exceeding 2 in.

in diam.....

1. •/?• *uliginosa*.

Flowers and fruit both less than 1 in\* in diam.....

2. 7^ *dumetorum*.

TJ lowers in cymes ; calyx-limb not persistent.....

& i? *malabarica*.

warmed; a climbing shrub .....

4. *It. ruguhsa*.

t 1- **Randia uliginosa**, Z><7. Pm7r. v. 4 (1830) p. 386. A small  
e rarely reaching 20 ft. high ; bark reddish-brown, scaly; branches  
Urnerous, thick, horizontal (the younger 4-angled), many of them short<sup>nd</sup>  
terminating in 1-2 pairs of strong sharp thorns \ in. long. Leaves  
^scicled. on suppressed branchlets, thin, 2±-5 by lg-2 in., obovate or  
°bovate-oblong, obtuse, glabrous above, more or less pubescent and  
re<sup>re</sup>ticulately veined beneath, tapering to the base; main nerves  
6-8 Pairs ; petioles very short; stipules acute from a broad base.

Flowers solitary at the ends of suppressed branches, white, fragrant,  
l|-2 in. in d i / . ; pedicels short. Calyx \ in. long, fleshy, green;

u/

y \ g

Cor,olla glabrous outside ; tube very short with a ring of white hairs at tip  
mouth; lobes 5-7, orbicular, much overlapping. Stamens 5-7, sessile.  
Qvary 2-celled; ovules oo; style ribbed; stigma large with  
subcon-yjolute spiral lacinise. Fruit 2-2^ in. long, ovoid, smooth,  
yellowish-^rown, crowned with the persistent calyx-limb,  
2-celled. Seeds

•■numerous, compressed, smooth, closely packed in pulp. PI. B. I. v. 3,  
p. 110; Grab. Cat. p. 89; Dalz. & Gibs. p. 119 ; Wight, Icon. t.  
397;

" jTriin. "K- Ceyl. v. 2, p. 330; Talk Trees, Bomb. ed. 2, p. 188;  
Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (189S) p. 645; Watt, Diet. Econ,  
limb broadly iar with 5-7 broad rounded ciliate shallow lobes scarcely \  
in. long.

i £ hi  
hi

Throughout the Presidency often in abandoned rice-fields, *Talhot*. KONKAN : banks  
jf river3 in the Konkan, *Graham* ; S. Konkan, *Dalzell Sf Gibson* ; near Pen, *Woodrow*.  
G UJARAT : Porbander (Kathiawar), *Woodrow*. S. M. COUNTRY : *Graham*; S. of Belgaum,  
*Ritchie*, 343 (a) I KANAKA : Kala naddi, *Ritchie*, 343! —DISTRIB. Throughout India ;  
Ceylon.

The fruit is eaten when boiled or roasted. See Watt, Diet. Econ. Prod. 1. c.

2. **Randia dumetorum**, *Lamcl. Tab. Encyc.* v. 2 (1793) p. 227. A  
large shrub or small tree armed with strong straight nearly opposite  
decussate spines |-1J in. long, coming off from above the branchlets ;  
branches horizontal, rigid, many of the lateral ones suppressed and very  
short. Leaves usually fascicled on the suppressed branches, 1-J-2-J. by  
|-1| in., obovate, obtuse, wrinkled, shining above, more or less pubescent  
above and on the nerves beneath (especially when young), base cuneate ;

main nerves 6-10 pairs ; petioles  $\frac{1}{2}$  in. long, densely pubescent •  
stipules ovate, acuminate. Flowers at the ends of short leaf-bearing  
branchlets, fragrant, solitary or 2 (rarely 3) together; peduncles short.  
Calyx  $\frac{1}{2}$  in. long, densely hairy; tube broadly campanulate; teeth  
5\*

foliaceous, 1 in. long, ovate-oblong, subaeute, often with small intermediate teeth between. Corolla f in. long, at first white, at ferwar becoming yellow; tube f-J- in. long, densely hairy outside; lobes \$

long and nearly as broad as long, obovate-oblong, rounded at *mea v* ^ pubescent outside, spreading. Fruit like a small crab-apple, yen

» globose or broadly ovoid, smooth or obscurely longitudinally <sup>ri</sup>

crowned with the large calyx-limb, 2-celled, glabrous; pericarp i Seeds many, flat, imbedded in pulp. Fl. B. L v. 3, p. 110 ;

^\*Xn!

8 h I t 580 Bedd ±or.

p. 645 ; Watt, Diet. Econ. Prodr. v. 6, part 1, p. 389.

*spina*-, DC. Prodr. v. 4, p. 386 ; Grab. Cat. p. 89; Dalz. <

Flowers : Mar.-June. YEETST. *Geheld j Gel*.

Common throughout the Presidency in **deciduous** forests.

Woodrow ! DBCCAH : Kbandala, **BUm** !; MabablesUwar, **Cooked**

near Lanoli, *Banadel*; Karli, *Bhival*; Lanoli, *Bhival*;

*Gibson*. S. 3Vf. Cousiny ; Sulebhavi near Belgaum, *Woodrow*.

*Woodrow*.—DrsTiuB. Throughout India; Ceylon, Ja>>,

Sumatra,

E. Tropical Africa.

The bark, rind, and fruit are used medicinally and the bruised root an « fruit are used to poison fish. See Watt, Diet. Ecoa. Prod. L o.

3. **Randia malabarica**, *LamTc. Encyc, Method*, v. 3 (1789)

An erect much-branched glabrous shrub ; brauchlets

sometimes r

to short sharp spines which are, however, often absent, coriaceous, 1£-2| by f~l^, elliptic-oblong or oblong-lanceolate,

glabrous, tapering to the base; nerves not conspicuous; petioles 8 8 long; stipules triangular, caducous. Flowers white, in leat-oppo

spreading glabrous cymes fascicled on the top of a very short pe-mim pedicels \$-\$ in. long, each with a pair of acute connate bracts <sup>tor""n</sup>|

a cup at its base. Calyx \$ in. long, campanulate, glabrous;

wtu

triangular, acute, about X in. long. Corolla lemon-yellow, hairy ax ifie

j mouth; tube A in. long, glabrous; lobss \ by TV ^., ovate-oblong acute, veined. Stigma fusiform. Anthers long, exserted.

globose, \-± in. in diam., red (*Graham*), marked at the apex j

the scar of the calyx-limb. Seeds 6-8 in each cell, closely pac

i.

angled, compressed. Fl. B. I. v. 3, p. Ill; Trim. Fl. Ceyl. v. A ft

*Griffithia fragrant*, Wight & Arn. Prodr. p. 400; Wight, Icon. t|

Grah. Cat.' p. 89 ; Dalz. & Gibs. p. 119.

S. KONKAK: *Dalzellfi Gibson, Nimmo ex Graham*, 1. c.

p^sideJ^ ■\*■

I have seen no speeinienB from Bombay and there are none from that A resiu-i^-

Herb.' Kew. Kimmo ex Graham (Oat p. 89) and DaUell & G^son (Bo. XL p.

give its habitat as S. Konkan. Neither Talbot nor Woodrow enumerates the species.  
DISTRIB. India (W, Peninsula); Ceylon,

4. **Randia rugiilosa**, *Hook.f. in FL B. 1. v. 3* (1880) p. 113.

A

large climbing unarmed shrub with many drooping branches;  
stem

reaching 4 in, in diam. at the base. Leaves 2|-4| by 1-2| in.,  
elliptic-

oblong or elliptic-lanceolate, acuminate, glabrous ; main nerves 5-6 pairs,  
prominent beneath ; petioles  $\frac{1}{2}$ -1 in. long, glabrous ; stipules ovate cus-  
pidate. Flowers in leaf-opposed paniculate cymes; peduncles very  
short;

pedicels longer than the calyx; bracts numerous, connate, cuspidate.  
Calyx 1 in. long, leathery, glabrous or puberulous; tube campanulate; irrid



^cate, with minute distant triangular teeth not more than ^ in. long. Corolla white; tube j in. long; lobes | by £ in., oblong, subacute, glabrous. Stigma very large, fusiform. Berry § in. in diam., pisiform, the calyx-limb not persistent in fruit, but soon falling and leaving a conspicuous scar. Seeds rugose. Trim. Fl. Ceyl. v. 2, p. 331; Talb. <sup>re</sup>^, Bomb, ed 2, p. 189; Woodr. in Journ. Bomb. Nat. v. 11 (1898) P- 64-5. *Grimthia speciosa*, Bedd. Icon. Pl. Ind. Or: t. 37.—Flowers: Jan.-Mar.

KONKAN: Matheran, *Wood row*; near Simpson's lake, *Cookel*; Chowk plateau // *M. wdwood*. S. M. COUNTRY- Castlerock, *Kanitkarl* KANAKA: common in the forests near the Tinai and Gairaoppa Ghats, *Talbot*; Divimana, *Woodrow*; Mendele (N. ^anara), *Ritchie*, 1772. —DISTRIB. India (W. Peninsula); Ceylon.

### 17. GARDENIA, Linn.

Shrubs rarely trees, armed or not. Leaves opposite, rarely 3-nately whorled; stipules intrapetiolar, often connate. Flowers often large, terminal or axillary, solitary, fascicled, or rarely cymose, sometimes dimorphic and polygamous. Calyx-tube ovoid or obconic; limb tubular or dilated, variously cleft or lobed. Corolla various; lobes 5-12, twisted in bud. Stamens as many as the corolla-lobes, inserted in the throat of the corolla; anthers sessile or subsessile, linear, included.

Ovary 1-celled; ovules numerous, 2-seriate, on 2-0 parietal placentas; style thick; stigma large, club-shaped or fusiform, usually 2-fid. Fruit often large, ovoid, ellipsoid or globose, coriaceous or fleshy and irregularly bursting, or with a hard bony endocarp which sometimes splits along the placental sutures. Seeds many, imbedded in the placentas, coin-pressed; testa thin; embryo small, in horny albumen.—DISTRIB. Tropical and subtropical parts of the Old World; species GO.

Small trees.

- |   |   |
|---|---|
| Armed; flowers dimorphic; placentas 5-6.....                            | 1. <i>G. turgida</i> ,<br>[var. <i>montana</i> .] |
| Unarmed; flowers not dimorphic.   |   |
| Leaves petioled; calyx-teeth long, subulate, erect; placentas 2.....    | 2. <i>G. lucida</i> .                             |
| Leaves sessile; calyx-teeth long, recurved; placentas 4-5.              | 3. <i>G. latifolia</i> .                          |
| A shrub unarmed; leaves sessile; calyx-teeth minute; placentas 4-5..... | 4. <i>G. gummifera</i> ,                          |

1. **Gardenia turgida** a, *Roxb. Ifort. Beng.* (181\*4) p. 15, var. **montana**, *Hook. l. Fl. B. I.* v. 3 (1880) p. 118. A small deciduous tree reaching 20 ft. high; bark smooth, thick, soft, that on the young branches yellowish; branches numerous, thick and stout, usually armed with strong straight sometimes leaf-bearing thorns. Leaves 2-3.] by 1^2| in., oblong or semiorbicular, obtuse, glabrous above, velvety-tomentose beneath, base much tapered into an obscure petiole; nerves inconspicuous; stipules triangular, cuspidate, caducous. Flowers from the young leafless shoots, dimorphic, the males in fascicles, the females solitary. ^ MALE FLOWERS: Calyx £ in. long, turbinate, pubescent, the mouth wide, truncate; teeth minute. Corolla f-1 in. long, glabrous; lobes |-£ in. long, oblong, obtuse. FEMALE FLOWERS: Calyx J-^ in. long, flask-shaped, the mouth dilated; teeth foliaceous, J in. long-narrowly linear, obtuse. Corolla as in the male. Fruit 1-3 in. in diam. ovoid or subglobose, often bluntly pointed but not beaked, smooth •

pericarp thick; endocarp woody, shining inside; placentasi o» or • Talb. Trees, Bomb. ed. 2, p. 190; Woodr. in Journ. Bomb. IN at. v. i (1898) p. 645 ; Watt, Diet. Econ. Prod. v. 3, p. 483. *Gardenia montaw* (sp.), Eoxb. Fl. Ind. v. 1, p. 709; Wight, Icon. t. 577 j Grah. Oat. p. oo, Dalz. & Gibs. p. 120.—Flowers : Apr.-June.

*Balzell* (without locality) in his Herbarium of Bombay Plants in nero. ; DECCAN: Poona districts, *Woodrowl* S. M. COUNTRY: Belgaum, "\*/^Dharwar, *Tall>ot*. KANARA: common in the N. Kanara jungles, India (Himalayas, Behar, W. Peninsula).

2. ***Gardenia lucida***, *Eoxb. Hort. Beng.* (1814) p. 15. A glabrous shrub or small tree reaching 20-25 ft. high ; bark sr grey; young shoots greyish-green, smooth, resinous. Leaves 2%- ^ 1-3 in., elliptic-oblong, subacute or shortly acuminate, base narro into a short petiole; main nerves 20-25 pairs, slender, P<sup>rom</sup> in e beneath; petioles somewhat obscure, about | in. long; stipules Ja ©^ broadly ovate, acute, membranous. Flowers fragrant, axillary, solita. ^ from the axils of the uppermost leaves near the ends of the branch » ^rll^la }-i in. long. Calyx | in. long, pubescent or  $\frac{3}{8}$  in. long, erect, lanceolate, subulate. Corolla large, at first pure white, soon turning yellow ; tube  $1\frac{1}{4}$ -2 in. long, slender, puberulous outside ; lobes 5 obovate obtuse 1 b ^ i readin veined, labrous. Fruit lon itudin

+TM\*ontnse: tee

ellipsoid or globose, |-1 in. in diam., smooth, marked with g^ lines, crowned by the persistent calyx-limb; pericarp thick, wooaj» placentas 2. The flowers open in the evening, soon turn from white!^ yellow and die. Fl. B. I. v. 3, p. 115 ; Grah. Cat. p. 88 ; Dalz\* ^ Gibs. p. 120 ; Wight, Icon. t. 575; Bedd. For. Man. in Flor. Sylva| p. exxxiv, t. 15, fig. 6; Talb. Trees, Bomb. ed. 2, p. 190; Woodr. lft Journ. Bomb. Nat. v. 11 (1898) p. 645 ; Watt, Diet. Econ. Prod. v. 3, \ p. 482.—Flowers : Mar.-June. VEIUST. *Dikemdli*.

KONKAN: *Lambert!*, *Balzell!*, *Law!*; Elepbanta, *Graham* ; Kanheri jungles, *Graham*; ^ S. M. COUNTRY: *Graham*-, Belgaum, *Talbot*. KANARA: N. Kanara, *Woodrow*.—DiSTRiBi' India (Birna, Chittagong, W. Peninsula). I

This species is, as well as *G. gummifera*, one of the sources of the *Dikemdli* resin which is much used by the natives in medicine. The resin, which has a most offensive' orior, is erplojed extensively to ieep oif flies from sores. See Watt, Diet. Econ. Prod. 1. c.

3. ***Gardenia latifolia***, *Aiu Hort. Kew.* v. 1 (1789) p. 294 (*not of Eoxb.*). A small deciduous tree reaching 30 ft. high, with stiff divergent branches forming a rounded head; bark smooth, pale-grey, flaking off in small round pieces ; young parts glabrous but coated with a resinous exudation. Leaves opposite or 3-nately whorled, crowded towards the ends of the branches, subsessile, 4-8 by 2%-6% in., broadly elliptic or obovate, rounded or very shortly and obtusely acuminate at the apex, apple-green above, paler beneath, glabrous or more or less pubescent; main nerves 10-20 pairs ; stipules adnate to the base of the petiole, connate, forming a thin truncate tube at first enclosing the young leaves, but, after the fall of the leaf, separating at the base and forming a loose ring round the stem. Flowers solitary or 2-nate, subsessile, white changing to yellow, fragrant. Calyx |~-1 in. long, densely pubescent; limb broadly tubular, slightly dilated at the apex; teeth 5-0,

lanceolate-subulate, unequal, recurved, and with ciliate margins.  
Corolla-tube 2 in. or more long, striate, densely pubescent  
outside; lobes 5-9,

bos<sub>e</sub>, if <sup>^</sup>vate-oblong, obtuse, 1J-1J by | in. Fruit nearly glo-you<sub>n</sub>' \*yt in. in diam., without ribs, appressedly pubescent when *i* in o<sup>P</sup> e<sup>u</sup> f<sup>ree</sup>n <sup>^</sup>d speckled, surmounted by the calyx-limb, which is with}/ <sup>?</sup>ore long? epicarp dry, fleshy; endocarp *bony, yellow*, polished Purnru <sup>valved</sup> - <sup>Seeds</sup> numerous, small, flattened, pale-brown, in P. 88 i<sup>?</sup> <sup>^</sup>P<sup>ul</sup>P; P<sup>^</sup>centas 4-5. Fl. B. I. v. 3, p. 116; Grah Cat. P W <sup>Balz'</sup> & <sup>Gibs.</sup> p. 120; Wight, Icon. t. 759; Trim. \*1. Ceyl. v. 2, P. 489; T<sup>?</sup>lb<sup>'</sup> Trees<sup>'</sup> Bomb<sup>'</sup> ed\* 2j p\* 190; Wafct> Dih ECon<sup>'</sup> V3>

""^"Kowers; Mar.-May.

<sup>neap</sup> <sup>^</sup>gOUNTRY: sandstone hills north of Belgamn, i<sup>?</sup> <sup>^</sup>1083 I KANAKA: Zow!; hi\W <sup>?</sup>-Uddi <sup>o</sup>> the Gatpraba river, Z<<w ex tfmAflw, <sup>^</sup>w, 1080!-DISTRIB. Dry Cey{ <sup>strict</sup>8 of Western, Central, and South-western India, Behar and VV. Bengal;

<sup>the</sup> wood has been recommended as a substitute for boxwood for engravers' use. <sup>18</sup> employed by the natives to make combs. See Watt, Diet. Econ. Prod. 1. c.

. 4- **Gardenia gummifera**, Linn. f. *Suppl.* (1781) p. 104. A shrub <sup>ab</sup>out 6 ft. high, glabrous or nearly so, unarmed; buds resinous. Leaves <sup>s</sup>fssile or nearly so, 1|-2| by f-1 in., elliptic-oblong or obovate-oblong, <sup>o</sup>otuse or subacute, glabrous, shining, base obtuse, acute, or sometimes <sup>e</sup>oruate; main nerves 12-18 pairs; stipules connate, truncate or mucronate. Flowers not odorous (*Ritchie*), subsessile, 1-3 together. Calyx <sup>3</sup>/<sub>8</sub> in. long, densely pubescent; teeth triangular, <sup>1</sup>/<sub>2</sub>-<sup>1</sup>/<sub>8</sub> in. long. Corolla <sup>at</sup> first white, soon changing to yellow; tube pubescent outside, 2J-1| in. on l blon obtuse 1-1 b Sg; obes o g , j y J-| in. Fruit 1-11 in. long, oblong or ellipsoid, with numerous longitudinal elevated lines and with a stout beak, smooth; pericarp thin; placentas 4-5. El. B. I. v. 3, p. 110; < Irah. Cat. p. 88; Dalz. & *Gibs.* p. 120; Wight, Icon. t. 576 (*figure good*); Talb. Trees, Bomb. ed. 2, p. 190; Woodr. in Journ. Bomb. t. v. 11 (1898) p. 645; Watt, Diet. Econ. Prod. v. 3, p. 480.—iiFlowers: Feb.-June. VEBN. *Dikemlli*; *Kamarri*.

f S. M. COUNTRY: barren plains south of Bharwar, *Dalzell* \$\* *G'dmn*; Belgaum, *Ritchie*, 344! KANARA: *Dalzell* \$ *Gibson*; common on the laterite plains from Kumpta southwards, also near Siddapur, *Talbot*; Bhatkal (N. Kanara), *Woodrow* *l*, *fihiva* \; Duddi on the Gatpraba river, *Law* ex *Graham*.—DISTEIB. India (W. Peninsula).

This shrub, as well as the small tree *G. ltdcida*, produces the resinous material j-nown as *Dikemlli*, which is largely used by the natives *in* medicine and to keep flies >ff sores. See Watt, Diet. Econ. Prod. 1. c.

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*Gardenia jasminoides*, Ellis, in Phil. Trans, v. 51 (1761) parfc ii. p. 935, sometimes known as the *Cape Jasmine*, has been introduced from China and is much valued as an ornamental plant in gardens in districts where there is a tolerably heavy rainfall. The double-flowered variety is that most commonly cultivated. It has oblong-elliptic coriaceous leaves 2-4 in. long, large white very fragrant flowers, and oblong fruit about 1 in. long. *Gardenia florida*, Linn. Sp. Pl. ed. 2 (1762) p. 305; Bot. Mag. (1826) t. 2627 (the double-flowered variety); Grah. Cat, p. 88\*; Dalz. & *Gibs.* *Suppl.* p. 43; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645, & *Gard.* in Ind. ed. 5, p. 355; Watt, Diet. Econ. Prod. v. 3 p. 480.—Flowers in the rains. VEEN. *Gandarajd*. \*

## 18. DIPLOSPORA, DC.

Evergreen shrubs or trees; branches terete. Leaves  $\frac{1}{2}$  to 1 in. long, late, coriaceous; stipules triangular, long-pointed or acuminate, small, inconspicuous, in axillary fascicles or short cymes, gamo-dicecious; bracts connate, often involuclate. Laiyx-tu

obconic or hemispheric; limb truncate or 4-5-lobed or -toothed. tube short, cylindrical or campanulate; lobes 4-5, spreading, bud. Stamens 4-5, inserted at the mouth of the corolla, m

short or long; anthers oblong or linear, often recurved, 2 (rarely 3)-celled; ovules 2-5 in each cell on placentas attached to the septum; style short or long, with oblong or linear branches. ovoid or globose, 2-celled, few-seeded. Seeds rather large; testa embryo small.

Fruit umbonate with a conical beak within the calyx-limb..... 1-  
Fruit not umbonate, marked at the apex with the scar of the calyx-limb .....

1. **Diplospora apiocarpa**, Boole, f. *Fl. B. L.* v. 3 (1880) p. 123 moderate-sized tree; bark pale. Leaves 3-6 by 1 in. elliptic-lanceolate, obtusely acuminate, glabrous, base nerves 6-8 pairs, sometimes with hairy glands (? galls) in the beneath; petioles  $\frac{1}{2}$  in. long; stipules  $\frac{1}{2}$  in. long, triangular, Flowers sessile, in axillary fascicles; buds resinous connate into a cup or epicalyx. Calyx  $\frac{1}{2}$  in. long, campanulate, with a resinous substance; limb truncate, entire or with 5-6 angular teeth. Corolla  $\frac{1}{2}$  in. long, glabrous; lobes  $\frac{1}{2}$  in. long, ODIO «:

use. Stamens in the male and 2-sexual flower  
Fruit  $\frac{1}{2}$  in. long, sessile or subsessile, ellipsoid or pyriform, bluntly umbonate with a conical beak within the calyx-limb. Seeds flat, compressed, few. Bedd. *Flor. Sylvat.* t. 223 ?; Talb. *Trees, Bomb. eel.* p. 191. *Discospermum apiocarpium*, Dalz. in *Kew Journ. bot.* v. \* (1850) p. 257; Dale. & Gibs. p. 120; Watt, *Diet. Econ. Prod.* v. 6, p. 156.—Flowers: July-Oct.

KONKAN: *Stocks*; the Ghats lat. 16°, Dalz. *U # ^n' > ^ & \* TM } ^ < \**  
Vingorla, *Talbd.* KANAKA: *Law* !-DISTRIB. Apparently endemic in the Western Peninsula of India. f...,\*

I have cited Beddome's t. 223 in *Flor. Sylvat.* for this, but the illustration as figured by Beddome, does not agree at all with that of Dalz. s plan t, in fact Beddome, in *For. Man.* p. cxxxiv-3, is himself doubtful of the correctness of the obtuse. Stamens in the male and 2-sexual flowers much ex&eiteya.

2. **Diplospora spherocarpa**. Hook. f. *Fl. B. I.* v. 3 (1880) p. 123. A small glabrous tree. Leaves elliptic-lanceolate, obtuse, subacute or shortly acuminate, glabrous, base tapering; main nerves 4-6 pairs; petioles  $\frac{1}{2}$  in. long; stipules  $\frac{1}{2}$  in. long, triangular, acute. Flowers sessile, fascicled on a very short peduncle, without connate bracts. Calyx resinous outside,  $\frac{1}{2}$  in. long; lobes 4, equalling the tube, orbicular-oblong, ciliolate. Corolla-tube very short, not as long as the lobes of the calyx, throat glabrous; lobes  $\frac{1}{2}$  in. long, oblong, obtuse. Fruit globose,  $\frac{1}{2}$  in. in diam., shortly pedicelled, marked at the apex with the scar of the calyx-limb, not umbonate. Seeds few, vertically imbricate, much compressed. Bedd. *For. Man.* in *Flor. Sylvat.* p. cxxxiv-3 (exclud. syn.); Talb. *Trees, Bomb. ed.* 2, p. 191. *Discospermum*

*sp7ia>ro-*

P ' ' l ' '

-Rare.

■ of India.

19. **KNOXIA**, Linn.

nt Erect herbs or undershrubs : stems terete or obtusely angled. Leaves  
 2f P<\*ite ; stipules connate with the petiole into an entire or bristly  
 .neath. Pi~ \_\_\_ J:\_\_\_\_\_i.:< ,,:<u TM Kion snlisftssile on the elongatuiff

P. '120' Dalz' in Kew Journ\_ Bot V\* 2 (1850) P\* 257; *mh'* & *Ghs'* u—Flowers:  
 Oct.

. Ko>>\*AN : Western Peninsula on the Ghats from Bombay southwards Talbof.  
 mountains, lat. 16° X., *DaUdl* # *Gibson*. -*ViSTMB*. Endemic in the Western la  
 of India

; stipules connate with the petiol

^ Flowers dimorphic Dink or lilac, sessile on the elongating  
 ^nches of terminal cymes (rarely spicate), ebracteolate. Calyx-tube  
 t<sup>OV01</sup>d or didymous ; teeth 4, minute, and subequal or 1 or 2 elongate,  
 distent. Corolla-tube long, throat usually villous ; lobes 4 valvate  
 n bud, with inflexed tips. Stamens 4, inserted within the throat of  
 Ule corolla; anthers linear, included or exerted. Ovary 2-celled ;  
 °vule 1, pendulous in each cell; style filiform ; stigma 2-lobed. Fruit  
 fil?all, of 2 semi-terete or dorsally compressed indehiscent cocci. Seeds  
 Xvi\* h a thickened funicle; testa membranous ; albumen fleshy ; embryo  
 pX\*J? ' c^yledons thin ; radicle superior.—DISTRIB. India, Java, China,  
 ■\*■ hilippines, Tropical Australia ; species 6-8\*

3. **Knoxia corymbosa**, *Willd S§*>- *Pl*- v. 1 (1797) p. 582. An erect  
 r annual 1-4 ft. high ; stem sparingly branched, somewhat stout,  
 with

i'ong internodes, often obtusely 4-angled, softly- and more or less densely  
 ■ hairy. Leaves 2-4 by 1 in., lanceolate or linear-lanceolate, sessile or  
 Miortlv petioled, acute, more or less hairy on both sides, tapering much  
 f the\* base into a short petiole; main nerves 8-12 pairs, conspicuous  
 ,,n the lower side, very oblique ; stipules with 3-5 filiform hairy bristles.  
 Mowers small, numerous, on the sides of slender pubescent branches of  
 'urge lax corymbose cymes ; pedicels very short, almost 0. Calyx ^ in.  
 fpng; teeth minute, triangular, subequal. Corolla ^ in. long, somewhat  
 \A ub-shaped ; lobes short, 3V" 2V ^n\* I^n£? triangular-oblong, subacute.  
 Fruit y<sup>1</sup> in. long, sessile or shortly pedicelled, ellipsoid, 4-angled, secund,  
 indehiscent, perforate at the base. The mericarps when ripe separate  
 from the persistent columella with the least pressure. El. B. I. v. 3,  
 p. 128; Dalz. & Gibs. p. III ; Wight, 111. t. 128 ; Trim. Fl. Ceyl. v. 2,  
 p. 340 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645.—Flowers :  
 Aug.-Oct.

KONKAK: Wag Donger near Vingorla, *Dalzell* 4" *Gibson*. S. M. COUNTRY: Londa,  
*Cookel*; Gamji Station (S. M. Railway), *Woodrow*!; BeigaiDi, *Ritchie*, 1089!  
 KANARA : Kala naddi, *Ritchie*, 1089 !—DISTRIB. Throughout Tropical India ; Ceylon,  
 Malay Archipelago, Tropical Australia.

## 20. **PLECTRONIA**, Linn.

Shrubs (sometimes small trees), armed or unarmed, sometimes scandent. Leaves opposite, shortly petiolate; stipules connate. Flowers axillary, fascicled, or in corymbose peduncled cymes, small, white or green. Calyx-tube short, obconic, turbinate or hemispheric; limb very short, truncate or 4-5-toothed. Corolla-tube infundibuliform, campanulate, globose or urceolate, usually with a ring of deflexed hairs within • lobes 4-5, at length reflexed, valvate in bud. Stamens 4-5, subsessile' on the throat or mouth of the corolla. Ovary 2-celled; ovules solitary



in each cell, pendulous ; style stout; stigma large. Drupe didym<sup>^</sup> or subglobose, or with one carpel suppressed, then reniform or obio & with 1-2 pyrenes or a 2-celled putamen. Seeds oblong, P<sup>end</sup>Λ<sup>o</sup> r testa membranous ; albumen fleshy; embryo elongate; cotyledons<sup>o</sup> radicle superior.—DISTRIB. Tropical Asia, Africa and Australia? Africa and Pacific Islands ; species about 70.

Branches without spines.

Flowers 5-merous ..... !•-\*•

Branches with spines.

Flowers 5-merous ..... 2. P«

Flowers 4-merous ..... 3. P-

**1. Plectronia Wightii, T. Cooke.** An unarmed handsome ia<sup>^</sup> erect shrub or small tree ; young shoots 4-angled. Leaves 3g-4<sub>2</sub> J | -2 in., elliptic-lanceolate, obtuse or shortly acuminate, coriaceous<sup>^</sup> entire, bright-green, polished and shining above, paler beneath, q<sup>u</sup> glabrous on both sides, base narrowed into a very short petiole; ma<sup>a</sup> nerves 4-6 pairs, oblique, often with hollow galls "(the work of insect in their axils; stipules rounded-ovate at base, with a long subuia' acumination. Flowers 5-merous, in peduncled umbels in the oppose

«iigui»i, gg- in. iuu<sup>^</sup>, sngnriy cmojate. uoroJla tnicK anu snuu<sup>^</sup>-no<sup>^</sup> long, densely bearded with white hairs in the throat; lobes 5, obf?ll<sup>t</sup>( acute, | by T\ in. Fruit obovoid, didymous, §4 in. long, warted, black when ripe, polished. The wood is very hard ; even the yonng brancne test the penknife. *Ganthium umbellatum*<sub>x</sub> Wight, Icon. t. 1034 (not oi Korth.); Hook. f. F17E. X v. 3, p. 132; Dalz. & Gibs. p. 113;» Trees, Bomb. ed. 2, p. 192; Woodr. in Journ. Bomb. Nat. v. 11 (*lwoh* p. 645; Watt, Diet, Econ. Prod. v. 2, p. 129. *Ganthium dichymumj* Grab. Cat. p. 91 (not of G»rtm.); Trim. Fl. Ceyl. v. 2, p. 34A-Flowers: JSov.-Jan. VERN. *Tupd*; *Arsul*.

KONKAN: evergreen forests, *Talhot*- hills in the Konkan, *Law I* DECCAN: Mahableshwar, common, *Cooke!*; Khandala *Cooke!*, *Woodrow I* S. M. COUNTRY : Ramgmt, *Ritchie*, 1787! KANARA: evergreen forests of N. Kanara, *Talbot*.—*Viwub*. India (W. Peninsula, Ava).

Trimen (/ c.) makes this synonymous Twith *Canthimn diclymum*, Ghertn., but no inflorescence is sufficiently distinctive to warrant its retention as a separate spe<sup>e</sup>«les. As the name *Plectroma umhellata* has>en already adopted, for a Madagascar plane with 4-merous flowers by Mr. Baker (Journ. Linn. Soc. v. 20 [1884] p. 168), Wights specific name cannot be used for this plant. I have therefore named tne punt P. *Wightii* after Dr. Wight, who first discovered, described, and figured it.

**2. Plectronia Rheedei, Bedd. For. Menu in Flor. Sylvat.** p. cxxxiv-5 (1874). A scandent anm;d shrub : stem slender, 1 in. in diam., spinous to near the base ; bark smooth, shining ; branches divaricate, slender, terete, more or less clothed with appressed pubescence, usually armed with straight or slightly curved sharp supra-axillary spines \-% in. long. Leaves thin, 1-4 by |-2 in., ovate, acute or acuminate, glabrous on both sides or with a few scattered hairs on the nerves beneath, rounded or cordate at the base; main nerves 4-6 pairs, of 1 en with galls m their axils; petioles ±-\ in. long; stipules ovate, cuspidate, hairy. Flowers greenish, axillary, solitary or in fascicles of 2-4 (rarely in very shortly peduncled cymes); pedicels very short; buds very acute. Calyx T<sup>^</sup> JV in. long, turbiate ; limb truncate or with 5 very minute distant

teeth. Corolla -] - iu. long ; tube short and wide; lobes 5, linear-lanceolate, acuminate, -fa-% by -J-g- in. Style hairy ; stigma iniriform, bifid. Fruit slightly broader than long, about 3 in. broad, didymous, compressed, 2-lobed at the apex, rugose. *Canthium Rheedel*, DC. Prodr. v. 4 (1830) P- 474; Hook. f. Fl. B. I. v. 3, p. 134; Grah. Cat. p. 91; Dalz. & Gibs. P- H3; Trim. Fl. Ceyl. v. 2, p. 344; Talb. Trees, Bomb. ed. 2, p. 192; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645. *Canthium angiiisti-folium*, Eoxb. Fl. Ind. v. 1 (1832) p. 533 ; Hook. f. Fl. B. I. v. 3, p. 135; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645. *Canthium Lesche-naulv*, Wight & Arn. Prodr. p. 426 ; Dalz. & Gibs. p. 113.—Flowers : Feb.-May.

KONKAN : *Stocks!*; foot of the Ghats, *Dalzell!*; evergreen forests, *Talbot*; near Sewree Fort (Bombay), *Graham*. S. M. COUNTRY: ámg át, *te e*, . ; u as, foot of Rámghát, *Dalzell & Gibson*; near Belgaum, *Cooke!*; Párva Ghát, *Ritchie*, 1193! evergreen India (W. N. Kanara, *Talbot*; Yacombi, *Woodrow!*—DISTRIB. Peninsula); Ceylon.

The fruit has the taste of the blieberry, *Dalzell*,

**3. *Plectronia parviflora*, Bedd. For. Man. in Flor. Sylvat' p. cxxxiv-5 (1874).** A shrub usually rigid, but sometimes subscondent in hedges (*Talbot*) ; brauches many, with opposite supra-axillary nearly horizontal sharp straight spines j-| in. long, the spines sometimes wanting when the branches are less rigid. Leaves |-| by J-1 in., often fascicled on the young shoots, ovate, obovate or suborbicular, obtuse, glabrous, green above, whitish beneath, base cuneate; main nerves 4-6 pairs ; petioles yV~? <sup>U1#</sup> 1<sup>on</sup>S» slender; stipules shortly triangular at the base, with a long subulate point. Flowers 4-merous, small, yellowish, in many-flowered usually peduncled cymes which are sometimes fascicled;

dl d d i l ld f i b l l t h Cl  
Bh Rih 119'3!  
MI

y y p y  
r peduncles and pedicels slender, of variable length. Calyx ^~TV ^n. ^OUS 5 lobes 4, triangular, acute, ■£\$ in. long. Corolla ^ in. long; tube inflated ; lobes as long as the tube, ovate, acute. Style glabrous; stigma large, globose. Drupe |—j^ in. long, about T^ iu. broad, oblong-ellipsoid, compressed, didymous, areolate at the apex, yellow when ripe, edible. *Canthium parvijlorum*, Lamk. Encyc. Method, v. 1 (1783) p. 602; Hook. f. Fl. B. I. v. 3, p. 136 ; Dalz. & Gibs. p. 113; Jtoxb. Cor. PI. t. 51; Trim. Fl. Ceyl. v. 2, p. 346; Talb. Trees, Bomb. ed. 2, p. 192; Woodr. iu Journ. Bomb. JS<sup>T</sup>at. v. 11 (1898) p. 645; Watt, Diet. Econ. Prod. v. 2, p. 129.—Flowers : Apr.-May. VEEN. *Kirni*.

DECCAN : Kothrud near Poona, *Woodrow!* S. M. COUNTRY: Ghats between Belgaum and Nipiuii (rare), *Dalzell # Gibson*; Belgninn, *Ritchie*, 1007! KANARA: Mangod

(N. Kanara), *Woodrow I*— DISTJUB. India (W. Peninsula); Ceylon.  
The leaves are eaten in curries and the wood is hard and used for turning.

## 21. **VANGUERIA**, Juss.

A genus closely allied to *Plectronia*, from which it differs chiefly in the ovary which is 3-6 (usually 5) -celled, and in the fruit which is larger than that of *Plectronia*; pyrenes 5-3 or putamen 5-3-celled.

1. **Vangueria spinosa**, *Roxb. Hort. Bewj.* (1814) p. 15. A large shrub or small tree with straight opposite (sometimes 3-nate) sharp spines 1-2 in. long ; bark dark-colored, nearly smooth. Leaves 2-5 by 1-2 in., membranous, elliptic-oblong, acuminate, glabrous, base shortly cuneate ; main nerves 6-8 pairs ; petioles 1/2-1 in. long; stipules  $\pm$  *hi.* long, glabrous, broadly triangular at the base, with a slender subulate

acuniinatiou about -£-£ in. long. Flowers greenish-white, in peduncled cymes from the old 'scars below the leaves; peduncles usually short; pedicels slender; buds acute, somewhat mitre-shaped. Calyx TV in. J<sup>on</sup>& glabrous ; tube cup-shaped, ribbed, rugose ; teeth 5, somewhat scario«s, 3V in. long, distant, triangular, very acute. Corolla j in. long ; tu^ very broad, glabrous outside, the throat densely hairy within; lobes o> ovate-lanceokte, acute, equalling the tube. Fruit about 1 in. in & \ \*f'l on slender pedicels, globose, smooth, yellowish when ripe, ec^1^1^ pyrenes 4-5, woody, smooth. Fl. B. I. v. 3, p. 136; Grah. Cat. p. W> Talb. Trees, Bomb. ed. 2, p. 192; Woodr. in Journ. Bomb. Nat. v. 1<sup>L</sup> (1898) p. 645; A^ratt, Diet. Econ. Prod. v. 6, part 4, p. 221.—Flowers: Jan.-Apr. TERN. A'lu.

KONKAN: Thai Ghat, Kanit&arl; Matheran, Coolcl, Kanitkarl DBCCAN: L^11 Woodrowl S. M. COUNTRY: near Belgaum; Ritchie, 1786/3; KAKARA : coium" . Bitchie, 1786 !—DJSTRIB. India (N. Bengal, W. Peninsula, Birma, Pegu) ; Java.

22. IXORA, Linn.

Shrubs or small trees usually glabrous. Leaves opposite (rarel 3-nately verticelled); stipules interpetiolar. Flowers usually 4-roerous, m terminal 3-chotomously branched often corymbose cymes, 2-bracteolate. Calyx-tube ovoid ; limb short, 4 (rarely 5) -toothed, persistent. Corolla-tube long, very slender; lobes 4 (rarely 5), usually shorter than the tube, spreading, twisted in bud. Stamens 4 (rarely 5), on the mouth qt the corolla ; filaments s h t 0 th ld ft ith an apic tip. Ovary 2-celled the septum ; style filiform ; branches rarely persistently connate. Fruit globose or subdidymou with 2 plano-convex or vent rally concave coriaceous pyrenes. Seeds: peltate; testa membranous; albumen horny; cotyledons flat, thin ; radicle inferior.—DISTRIB. Tropical Asia and Africa, America, Australia, and the Pacific Islands.

- Calyx-teeth longer than the OTarv.
    - Calyx i in. long; corolla-tube Jeaching j in..... 1. /. lanceolaria.
    - Oaljx j in. long; corolla-tube reaching 1£ in..... 2. I. polyantha.
  - Calyx-teeth shorter than the ovary.
    - Leaves and inflorescence turning black in drying ..... 3. /. nigricans.
    - Leaves and inflorescence not turning black in drying.
      - Peduncles 4-7 in. long ..... 4. L dongata.
      - reduncles less than 3 in. lung.
    - Flowers white. Small trees.
      - Corolla-tube less than J in. long; flower-buds globose. 5. I, hrachiata
      - Corolla-tube exceeding £ in. long; flower-buds ellipsoid ..... n T ...
    - Flowers bright-scarlet. ■■■"-'-' ..... ' J'P^TMtfora.
  - A shrub; corolla-tube 1\* in. long..... 7 > j ^ . ^
- a820^r S97^anC^ra 1f^ Co\el\{l RoXh Fl Ind' < \*• Varey, v. 1 4 5^  
 by^P^1 9 in nhln l^S^8^^ bl^ancb^ ash colored. Leaves  
 rounded at fhP h^^ nCeolate. aoUte^ labrous^ attenuate. (rarely  
 loundedel) at the base; mam nerves slender, 14-18 pairs- petioles i-gin-

2 at ln Z \* "1 J^A FLOWERS numerous, in brachiate cymes lf ported by a pair of floral leaves ; bracts beneath of the cyme lanceolate-subulate, caducous; bracteoles 2,

SI LiVsh^ort;7 t r i l t h ^ Ki^S/

oppressed to the calyx, linear-lanceolate, acute,  $\frac{1}{2}$  in. long. Calyx more or less pubescent,  $\frac{1}{2}$  in. long; teeth 4, fleshy, linear-lanceolate, acute,  $\frac{1}{2}$ — $\frac{1}{3}$  in. long by  $\frac{1}{2}$  in. broad. Corolla white; tube very slender, up to  $\frac{1}{2}$  in. long, mouth naked; lobes linear-oblong, obtuse,  $\frac{1}{2}$  by  $\frac{1}{2}$  in. Filaments  $\frac{1}{2}$  in. long, flattened, slender. Style exerted beyond the corolla-tube, but the exerted portion shorter than the corolla-lobes; branches of the stigma linear,  $\frac{1}{2}$ — $\frac{1}{3}$  in. long. Fruit globose or didymous,  $\frac{1}{2}$  in. in diam., smooth, crowned with the 4 erect calyx-teeth. Fl. B. I. v. 3, p. 138; Wight, Icon. t. 827; Talb. Trees, Bomb, ed. 2, p. 193; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645.—Flowers: June-July.

Chiefly in the southern districts of the Presidency. KANAKA: evergreen forests of K Kanara particularly on the southern Ghats, Talbot; Godhuli, Woodrow; Kanara, Woodrow; Elai jungles below Supa (N. Kanara), Ritchie, 1789.—DISTRIB. Southern districts of the Western Peninsula of India.

2. ***Ixora polyantha***, Wvght, Icon. t. 1066. A small shrub. Leaves 6-11 by  $\frac{2}{3}$ — $\frac{1}{2}$  in., obovate, elliptic-oblong or oblong-lanceolate, acute or acuminate, coriaceous, glabrous on both sides, base usually acute; main nerves about 8-12 pairs; petioles  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, rugose; stipules broadly ovate, cuspidate. Flowers in corymbiform cymes open or collected into a globose head; branches of the cyme usually densely clothed with white hairs; bracts ovate, acute, caducous; bracteoles reaching 5 in. long, ovate, very acute. Calyx  $\frac{1}{2}$  in. long; tube hairy,  $\frac{1}{2}$  in. long; teeth  $\frac{1}{2}$  by  $\frac{1}{2}$  in. elliptic-lanceolate, acute, the upper part of each glabrous, the lower half with a few scattered hairs. Corolla-tube reaching 1 in. long, slender, glabrous, without hairs in the mouth; lobes reaching  $\frac{1}{2}$  by  $\frac{1}{2}$  in., broadly elliptic, obtuse. Style exerted beyond the tube, the exerted portion much shorter than the

corolla-lobes; branches of the stigma  $\frac{1}{2}$ — $\frac{1}{3}$  in. long, linear, recurved. Fruit  $\frac{1}{2}$  in. long, ovoid, on hairy pedicels  $\frac{1}{2}$  in. long, striate, sparsely hairy, crowned with the persistent calyx-teeth, red when ripe. YL B. I.

v. 3, p. 140; Talb. Trees, Bomb. ed. 2, p. 193; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645.—Flowers: Mar.

KONKAN: N. & S. Konkan, Law I KANARA: Southern Ghats of N. Kanara, Talbot; Gondabel Ghat, Stocks I; Nilkund, Woodrow I—DISTRIB. India (W. Peninsula).

3. ***Ixora nigricans***, Br. in Wall, Cat (1828) 6154. A large evergreen shrub or small tree; young branches, leaves, and inflorescence turning black in drying. Leaves 4-6 by  $\frac{1}{2}$ — $\frac{2}{3}$  in., membranous, elliptic-oblong, elliptic-lanceolate, or (sometimes) elliptic-obovate, acute or shortly acuminate, glabrous, base acute or rounded; main nerves 12-15 pairs, slender, arched; petioles  $\frac{1}{2}$  in. long; stipules shortly triangular at base, cuspidate with a long stiff bristle. Flowers white, odorous, in sessile or peduncled brachiate usually glabrous cymes which are broader than long; bracts at the base of the main peduncles foliaceous,  $\frac{1}{2}$  in. long, lanceolate, cuspidate, those beneath the branches of the cyme subulate; bracteoles minute, subulate; buds very narrowly fusiform, not much broader than the corolla-tube. Calyx glabrous,  $\frac{1}{2}$  in. long; teeth  $\frac{1}{2}$  in. long, triangular, acute, subfleshy. Corolla-tube  $\frac{1}{2}$  in. long, slender, glabrous, without hairs in the mouth; lobes  $\frac{1}{2}$  by  $\frac{1}{2}$  in., oblong, sub-acute, glabrous. Style glabrous. Stigma-branches recurved. Fruit globose or didymous, size of a pea. Seeds plano-convex, rugose on

the back. Fl. B. I. v. 3, p. 148; Dak & Gibs. p. **113**; Wight, Icon. t.  
318;

Talb. Trees, Bomb. ed. 2, p. 195; Woodr. in Journ. Bomb. Nat. v. (1898) p. 646.—Flowers more or less throughout the year. ^  
*Kat-Jciida*.

Common in thick shaded jungles of the Gháts, *Dalzell & Gibson*. KONKAN: Miradonger near Pen, *Kanitkar!* DECCAN: Lanoli, *Woodrow!*; Khandala, *Woodrow!*; *Wála naddi*, *Ritchie*, &

Mahableshtar, *Uofce I, woorow*. AANARA: Kumpta, *woorow*; JV 351!; common in the evergreen forests of N. Kanara, *Talbot*.—DISTKIB. India (W. Peninsula, Birma); Malay Archipelago.

VAR. *arguta*, Hook. f. Fl. B. I. v. 3, p. 149. Leaves narrowly ob-lanceolate or elliptic-lanceolate, acuminate, 4-5 by 1-14 in.

S. M. COUNTRY: Parva Ghat, *Bitchie*, -^j-1 I

4. ***Ixora elongata***, *IJeyne*, in *Wall. Cat.* (1828) 6131. A small shrub, glabrous except the calyx, bracts and corolla-lobes. Leaves by 1½-2 in., elliptic-lanceolate, obtuse, or subacute, glabrous^, narrowed into the petiole; main nerves 10-15 pairs; petioles 5-f p \* long; stipules broadly ovate, with a long slender cuspidate po<sup>1^</sup>\* Flowers pink, in peduncled brachiate cymes; main peduncles ^~', <sup>11^</sup> long, with a pair of sessile leaves 1-4 in. lorn\* below the middle; branch -

of the cyme hairy, the lowest pair sometimes 3 in. long; bracteoles linear,  $\frac{1}{20}$  in. long, very hairy. Calyx  $\frac{1}{12}$  in. long, hairy; teeth 4, triangular, subobtuse, hairy,  $\frac{1}{30}$  in. long. Corolla-tube  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, without hairs at the mouth; lobes 4, ovate-oblong, acute,  $\frac{1}{4}$  by  $\frac{1}{10}$  in., usually hairy on the back. Filaments thick, short. Anthers sagittate at the base, apiculate at the apex. Branches of the stigma  $\frac{1}{20}$  in. long, linear. Fruit glabrous slightly 2-lobed (*Dalzell*) smooth. black when ripe. Fl. B. I. v. 3, p. 141; Talb. Trees, Bomb. ed. 2, p. 194; Woodr. in Journ. Bomb. JS<sup>T</sup>at. v. 11 (1898) p. 645. *Ixora pedunculata*, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 121; Dalz. & Gibs. p. 113.—Flowers: Feb.

KONKAN: *Stocks*] BECCAN: Bhimashankar, *Dalzell*, *Woodrow*. S. M. COUNTRY: Parva Ghat, *Dalzell & Gibson*. KANAKA: Ghats of N. Kanara, *Talbot*.—DISTKIB. India (W. Peninsula).

5. ***Ixora brachiata***, *Eoxb. Hort. Beng.* (1814) p. 10. A small tree 15-30 ft. high; bark smooth, grey. Leaves 3-5 by 1^-2^, pale when dry, elliptic-oblong or lanceolate, obtuse, reticulately veined, glabrous, usually attenuated at the base; main nerves numerous, faint, very slender; petioles ^-| in. long, stout, rugose; stipules short, broad, shortly cuspidate. Flowers white, odorous, in sessile or shortly peduncled cymes brachiate with 2-3 pairs of long puberulous or sometimes nearly glabrous branches; flower-buds globose; the lowest bracts like the stipules, the upper lanceolate-subulate united by a stipule-like membrane across the nodes; bracteoles minute, subulate. Calyx -^ in. long, urceolate; teeth 4, minute, triangular, membranous. Corolla-tube \-^ in. long, without hairs in the mouth; lobes T^- by -fa in., broadly oblong, rounded at the apex, deflexed. Style clothed sparingly with long white hairs, not much exerted; branches of the stigma at first connate, usually separating later. Fruit globose or didymous, the size of a pea, smooth, purplish-black, edible. Seeds hemispheric, with deep pit on the ventral side within which the funicle was attached rugose. The flowers are the smallest of the genus and the only ~-

with globose buds (*Hooker*). Fl. B. I. v. 3, p. 142; Wight, Icon. t. 710; Talb. Trees, Bomb. ed. 2, p. 194.—Flowers: JS<sup>T</sup>ov.-Feb. VEBN. *Gorbdlle*.

KONKAN: *Law!*, *Stocks!*; S. Konkan, *Ritchie*, 354! DECCAN: Khandala, *Woodrow I* KANAKA: *Mrs. Ward I*; Mendele, *Ritchie*, 354/2.—DISTRIB. India (W. Peninsula).

6. *Ixora parviflora*, *Vahl*, *Symb.* v. 3 (1724) p. 11, t. 52.

A

8inall much-branched evergreen tree; bark thick, reddish-brown; branchlets somewhat compressed, glabrous. Leaves 3-5 by 1|-2<sup>^</sup> in., very coriaceous and hard, reticulately veined, oblong or elliptic, obtuse, glabrous and shining, pale when dry, base usually rounded, sometimes cordate; main lateral nerves 8-10 pairs, slender, faint; petioles scarcely § in. long, rugose; stipules \ in. long, broadly ovate, with a cuspidate point about £ in. long. Flowers white, odorous, small and very numerous, in subglobose clusters, in sessile cymes brachiate with 3-5 pairs of short branches; pedicels very short or 0; bracts and bracteoles as in /. *brachiata*; flower-buds ellipsoid. Calyx -<sup>^</sup> in. long, ovoid-oblong; teeth 4, minute, not more than 4Q- in. long, triangular, subacute. Corolla-tube 3~<sup>T</sup><sup>7</sup><sup>^</sup> in. long, without hairs in the mouth; lobes 4, linear-oblong, obtuse, ^\|- by 4% in. Style deusely clothed with white hairs; branches of the stigma elliptic-lanceolate. Fruit \ in. in diam., didyinous. Fl. B. 1. v. 3, p. 142; *Grah. Col.* p. 92; *Dalz. & Gibs.* p. 113; *Trim. Fl. Ceyl.* v. 2, p. 348; Talb. Trees, Bomb. ed. 2, p. 194; *Woodr. in Journ. Bomb. Nat.* v. 11 (1898) p. 645; *Watt, Diet. Econ. Prod.* v. 4, p. 533.—Flowers: Jan.-Apr. VERN. *llai-Kmhi*.

Throughout the Presidency in deciduous forests, *Talhot*. KOXKAX: *Elephanta, Graham*; Matheran, *Cooke!*, *Woodrow I* DECCAN: *Nasik, Kanitkar!*; Kh.mdala, *Cookel*; Gokak, *Bhival* S. M. COUNTRY: Kakti hills near Belgaum, *Ritchie*, 1788! KANAKA: on the K;ila nnddi, *Ritchie!*—DISTRIB. Throughout a considerable part of India, chiefly in hilly districts; Ceylon.

The tree has been called the "*Torch Tree*" in consequence of its branches having been used by dak runners for torches. The wood is very hard and close-grained and takes a good polish.

7. *Ixora coccinea*, *Linn.* S-p. *PL* (1753) p. 110. A glabrous shrub 2-3 ft. high. Leaves 2-4 by 1<sup>^</sup>-2<sup>^</sup> in., coriaceous, pale when dry,

sessile or nearly so, oblong, obtuse (rarely acute), apiculate, base rounded or subcordate; main nerves 8-12 pairs, slender; stipules with a long rio-id cuspidate point. Flowers numerous, bright-scarlet, in dense sessile

or very shortly peduncled corymbiform cymes; pedicels very short,

glabrous or puberulous; bracts and bracteoles small, lanceolate-subulate, acute; buds fusiform, very acute. Calyx <sup>T</sup>V in. long, glabrous; teeth lu in', long, triangular, acute. Corolla-tube reaching li in. long,

slender, without hairs in the mouth; lobes £ by -J-4 in., elliptic-oblong,

lvipnt'e Fruit globose, size of a pea, smooth, fleshy, crowned with

1C<sup>o</sup> 1<sup>1</sup>; i<sup>1</sup> WoodVin Journ. Bomb. Nat. v. 11 (1898) p. 646

V<sup>r</sup> 1<sup>1</sup>; i<sup>1</sup> WoodVin Journ. Bomb. Nat. v. 11 (1898) p. 646  
Econ. xi o • v 4 P<sup>-</sup> 5;33< Lvom Bandhūca\* Eo2k6 - Hōrt  
year. g^^—blowers more or less throughout the (81^)

I\* "RI'ovci

i vnfc known as the "*Flame of the Wood*?" often grown in gardens, but A handsome shi"<sup>"</sup> i(ency< KONKAN: common, *Dahell \$ Gibson*,; S. Konkan, indigenous m wie *iywdrowl*; Ooran (an islaud in Bombay harbour), <*Jookel*\



*liitchk*W''<sup>v1</sup> &

Salsette, *Graham*; Thana, *Woodrow*; Katnagui, Bea. ^,  
 Owte! KANAKA: common in the moist forests of N. \*anara TMTM, di as an  
 TWfcrf; Kala naddi, iHfcAfe, 348! -DISTRIB. Cultivated throughout India  
 ornamental shrub, indigenous in the W. Peninsula; Ceylon.

### 23. PAVETTA, Linn.

Shrubs or small trees. Leaves opposite, petiolate, usually  
 membranous; stipules intrapetiolar, usually connate into a, lax  
 deciduous. Flowers in axillary or terminal 3-chotomousl)  
 Ijj^te.  
 usually many-flowered corymbose cymes, white or greenish, ora.  
 Calyx-tube ovoid, turbinate or campanulate; lobes 4 (verj w  
 ^  
 short or long. Corolla hypocrateriform; tube slender, cylindnc.,  
 naked or bearded; lobes 4 (very rarely 5), frequently Jonger than ^  
 tube, twisted. Stamens 4 (very rarely 5), inserted in tne TMr llej;  
 mouth of the corolla; filaments short or long, or 0 Uvary ?  
 ovules solitary in each cell, attached to the middle ot wej i  
 ^ amphitropous, the placenta fleshy, often tumid; style  
 10" &'tate# exserted; stigma fusiform or somewhat clavate, undivided or ^  
 ' ^ Berry pisiform, fleshy, with 2 pyrenes which are convex on the oac  
 \* concave on the face. Seeds conform to the pyrenes; testa meinoia  
 , albumen horny;, cotyledons foliaceous; radicle inferior.—^  
 Tropics of the Old World and S. Africa; species about 60.

A genus very closely allied to *Lvora* from which it may be  
 distinguished by the stipules, the very long style, and the tumid piacenui .

Leaves pale when dry; corolla-tube \ in. long..... J • ■ f • V ^ J ^ - ^

Leaves black when dry; corolla-tube 1 in. long ..... - . \* . \* ^ >

**1. Pavetta indica, Linn. Sp. Ft. (1753) p. HO.** A stout bushy  
 shrub 2-4 ft. high; bark thin, smooth, yellowish; young branches  
 terete, glabrous. Leaves 3-6 by 1-2\* in., membranous, variable in  
 shape and size, elliptic-oblong or elliptic-lanceolate, sometimes  
 obovate-oblong, obtuse, acute or acuminate, glabrous on both sides, base  
 tapering; main nerves 8-10 pairs; petioles \-± in. long; stipules  
 connate triangular, acute, thin, deciduous. Flowers white, odorous, in  
 terminal sessile corymbose pubescent cymes; pedicels \- in. long, densely  
 pubescent; bracts broad, membranous, the lower cupular; buds  
 oblong-clavate. Calyx densely pubescent, £ in. long; tube narrowly  
 campanulate; teeth Jg- in. long, triangular, acute, slightly reflexed at  
 the tip. Corolla-tube | in. long; lobes \--^ in. by ^ in.,  
 linear-oblong, subacute. style white, glabrous or nearly so; stigma  
 green, narrowly clavate, puberulous. Fruit |-g in. in diam., globose,  
 black, smooth. In all the specimens I have examined from the  
 Bombay hills I have found the pedicels and calyx to be densely  
 pubescent even though the leaves were quite glabrous. FL B. I. v. 3,  
 p. 150; Grah. Cat. p. 92; Dalz & Gibs. 5. 112; Wight, Icon. t. 148;  
 -Trim. FL Ceyl. v. 2, p. 349; Talb. Trees, Bomb ed 2, p. 195; Woodr. in  
 Journ. Bomb. Nat. v. 11 (1898) p. 646, Watt, Diet. Bcon. Prod. v. 6,  
 part 1, p. 114.—Flowers: Mar.-May. YERN. *Pdpat*.

Very common on hills throughout the Presidency. KONKAN:  
*Birdwood, Woodrow; Karanja bill, Dalzell & Gibson.* DBCCAN:

very common, *Cookel, Graham; Khandala, Woodrow!*; Igatpun, *Kamtkai*  
.-Throughout India ; Ceylon, Malay Archipelago, S. China, >. Australia.

, *tomentosa*, Hook. f. in Fl. B. I. v. 3 (1880) p. 150.

Leaves

6 abrous or slightly or harshly puberulous above, tomentose or softly  
yjalous beneath. Cymes pubescent, tomentose or softly villous.

Talb.

As Bomb. ed. 2, p. 195. *Pavetta tomentosa* (sp.) Roxb. ex Sm. in

^ . ed. , p (p),

^ydop. v. 26 (1819) n. 2 ; Wight & Arn. Prodr. p. 431. P.

*Brunonis*,

W%ht, Icon. t. 1065 ; Dalz. & Gibs. p. 112.

.2. ***Pavetta hispidula***, Wight # *Am. Prodr.* (1834) p. 431 ; var.

***s\*phonantha***, Hook. f. *FL B. L* v. 3, p. 151. A slender  
branched

shrub 3-12 ft. high (*llitchie*). Leaves 3-7 by 1-2| in., elliptic-lanceolate,  
acuminate, black when dry, glabrous, attenuated into the  
petiole;

petioles \-| in. long ; stipules connate, triangular, acute, from a broad  
base, membranous, pilose within. Flowers white, in large  
terminal

cjorymbose more or less pubescent peduncled cymes. Calyx  
pubescent,

~\$ in. long ; teeth ■£% in. long, triangular, acute, slightly reflexed at the  
tip. Corolla-tube 1-11 in. long, slender, glabrous ; lobes  
\-| by

TV~To <sup>m</sup>-> linear-oblong, subacute. Style very slender, exerted for  
li|J in. or even more, gradually tapering; stigma hardly distinguishable  
(rfrom the style, scarcely if at all fusiform. Fruit size of a pea,  
globose,

insmooth, purple. Talb. Trees, Bomb. ed. 2, p. 195; Woodr. in  
Journ.

corfomb. Nat. v. 11 (1898) p. 646. *Pavetta siphonantha* (sp.), Dalz.  
in

tiiKew Journ. Bot, v. 2 (1850) p. 133 ; Dalz. & Gibs. p. 112 ; Bedd.  
For.

inMan. in Flor. Sylvat. p. cxxxiv-8.—Flowers : May.

KONKAN : *Stocks!*, *Dalzell!*; Matheran, *Woodroto*; Bhimashankar, *Woodrow*.  
S. M. COUNTRY: Parpoli Gh;vt (Belgaum districts), *Dahell* § *Gibson*; Ramghat,  
*Jiitchie*, 670! KANAKA: Supa Grhats of N. Kanara (rare), *Tcdbot* ; Mendele, *Ritchie*,  
076 !—JhsTitiB. India (W. Peninsula).

## 24. MORINDA, Linn.

Shrubs or trees; branches terete or obscurely 4-gonous. Leaves  
opposite, rarely 3-nately verticillate, usually membranous ; stipules  
connate, sheathing. Flowers in axillary or terminal simple, paniced, or  
umbellate heads, white, more or less connate by the calyces.  
Calyx-tube urceolate or hemispheric; limb short, truncate or obscurely  
toothed, persistent. Corolla-tube short or long; lobes 4-7, coriaceous,  
valvate in bud. Stamens 4-7; filaments short; anthers linear or  
oblong. Ovary 2- or (sometimes imperfectly) 4-celled ; ovules solitary,  
ascending from towards the base of the septum in each cell; style  
slender, with 2 short or long linear branches. Fruit a syncarpium  
formed by the succulent enlarged calyces enclosing many cartilaginous or  
bony 1-seeded pyrenes which sometimes cohere into a 2-4-celled

putamen, rarely of nearly free drupes. Seeds obovoid or reniform ; testa membranous ; albumen fleshy or horny ; embryo terete ; radicle inferior.

- Leaves 5-8 in. long, glabrous\*, shining ..... — ..... 1. *M. citrifolia*.  
Leaves 4-6 in. long, tomentose, dull, not shining ..... 2. *M. tinctoria*,  
[var. *tomentosa*,

1. **Morinda citrifolia**, *Linn. Sp. PL* (1753) p. 176. A small glabrous tree ; trunk straight; bark smooth, yellowish-white ; branchlets obtusely 4-angled. Leaves 5-8 by 3-4 in., broadly elliptic, acute, acuminate or obtuse, bright-green, glabrous, shining, one of the pair next the peduncle often suppressed, base acute ; main nerves 8-10 pairs, prominent; petioles | in. long; stipules connate, short, broad, obtuse,

membranous. Flowers white, in dense ovoid heads over 1 in. long; peduncles solitary (rarely 2-3 together), usually leaf-opposed, 1-2 in. long. Calyx-limb truncate. Corolla infundibuliform; tube  $\frac{1}{2}$  in. long, the mouth hairy; lobes 5, lanceolate, acute. Stamens 5; filaments hairy; anthers about  $\frac{1}{2}$ -exserted. Fruit white when ripe, smooth and glossy, about the size of a small egg; pyrenes ovoid, compressed, concavo-convex, winged on the edge. Fl. B. I. v. 3, p. 155; Grah. Cat. p. 90; Dalz. & Gibs. p. 114; G@rtn. Fruct. v. 1, t. 29; Wall. Cat. 8418; Eoxb. Fl. Ind. v. 1, p. 541; Talb. Trees, Bomb. ed. 2, p. 19&5 Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 646; Watt, Diet. Econ. Prod. v. 5, p. 261.—Flowers: May-June. VERN. A'I; *Bdrontli*.

Cultivated widely in many places throughout India, found also as an escape, but not truly wild.—It has not been much cultivated in the Bombay Presidency except Khandesh and less commonly at Pandarpur in the Deccan. The roots furnish a valuable red dye. A very full description of the mode of cultivation of the tree and of preparing and using the dye may be found in Watt's Diet. Econ. Prod. 1. c.

*m* VAR. 1. *bracteata*, Hook. f. Fl. B. I. v. 3 (1880) p. 156. Anthers included within the hairy mouth of the corolla-tube. Calyx-limb often with a lanceolate or spatulate white foliaceous lobe sometimes nearly 2 in. long. Talb. Trees, Bomb. ed. 2, p. 196; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 646. *Morinda bracteata*, Koxb. Hort. Beng. p. 10 ■  
■M. Ind. v. 1, p. 544; Dalz. & Gibs. p. 114. *M. citrifolia*, Trim. Fl. Ceyl. v. 2, p. 354 (*not* of Linn.).

KONKAN: Malwan, Dalzell # Gibson-, Vingorla, Dalzell \$ Gibson) coast of the Konkan near the sea, Talhor; near Mannagao close to the sea, Woodrow.

This ought perhaps to take rank as a separate species. It is certainly indigenous, along the coast, while *M. citrifolia* is an introduction.

VAR. 2. *elliptica*, Hook. f. Fl. B. I. v. 3 (1880) p. 156. Leaves 6-8 in. long, elliptic, polished, acuminate; nerves strong on both surfaces.

I have seen no authentic specimens which can with certainty be referred to Bombay, there is one specimen in Herb. Kew marked "Herb. Stocks," but, like many of the specimens in the Stocksian Herbarium, this has had no locality assigned to it. It is merely a supposition that this specimen was collected in the Konkan. Other specimens of the var. in Herb. Kew. have come from Tenasserim, the Andamans, Binna, the Malay Peninsula, Malacca.

2. ***Morinda tinctoria***, Roxb. Hort. Beng. (1814) p. 15, var. ***tomentosa***, Hook. f. Fl. B. I. v. 2, p. 156. A small tree; young branches 4-angled, tomentose. Leaves 4-6 by 2-3 in., elliptic, or oblong-lanceolate, acuminate, tomentose on both surfaces, one of the pair of leaves near the peduncle usually suppressed or its place sometimes taken by a small linear leaf from the axil of which the peduncle arises; petioles  $\frac{1}{2}$  in. long, densely tomentose; stipules often bifid, the lobes triangular, acute. Flowers pure white, in globose heads; peduncles  $\frac{1}{2}$  in. long, tomentose, solitary, leaf-opposed, or sometimes in the axil of a small linear leaf which has taken the place of the suppressed leaf. Calyx  $\frac{1}{2}$  in. long, truncate; the limb sometimes (though rarely) with a foliaceous oblong obtuse or subacute veined lobe reaching  $\frac{1}{2}$  in. long, hairy outside. Corolla-tube  $\frac{1}{2}$  in. long, very hairy outside, but not hairy at the mouth: lobes  $\frac{1}{2}$  by  $\frac{1}{2}$  in., oblong, obtuse or subacute, hairy on the back. Anthers included within the tube. Fruit globose

ed. 9<sup>PS0ic1> flesny?</sup> | in. in diam.—Flowers : Apr. Talb. Trees, Bomb.  
 QO,~' P\* 196. *Morinda tomentosa* (sp.), Heyne, in Iloth, Nov. Pl.  
 Sp. ""\*.) p. 147 ; Dalz. & Gibs. p. 114.  
 Q-ou?£<sup>c\*N:</sup> Chattersingi hill near Poona, *Bhival*; Sholapur districts, *Woodrow* ! ;

g,  
 ic :  
 KanUkarX

## 25. PSYCHOTRIA, Linn.

Shrubs or small trees, usually erect. Leaves opposite, rarely whorled ; stipules intrapetiolar, often connate, solitary or in pairs, often with glandular hairs. Flowers in terminal (rarely axillary) cymes, heads °r fascicles, bracteate or not. Calyx-tube short; limb often deciduous. /Corolla-tube straight, short (in the Indian species), throat naked or i hairy ; lobes 5, rarely 4 or 6, valvate in bud. stamens as many as the ■ corolla-lobes, inserted on the throat or mouth of the corolla ; filaments short or long ; anthers included or exerted. Ovary 2-celled ; ovules solitary in each cell, basal, erect, anatropous, usually cuneate; style long or short, with 2 brandies. Fruit small, ovoid, globose or oblong (rarely didymous), with 2 plano-convex 1-seeded pyrenes, rarely separating into 2 cocci. Seeds usually plano-convex (the ventral base rarely concave), often lc. gitudinally grooved ; testa thin ; albumen hard, sometimes ruminant ; embryo small, basal; cotyledons broad, thin ; radicle inferior.—DISTHIB. Tropics of the world ; species about 500.

Albumen ruminant.

- |  |                            |
|--|----------------------------|
| Cyme-branches whorled.   |                            |
| Flowers mixed with reddish-brown hairs .....   | 1. <i>P. Thwaitesii</i> .  |
| Flowers not mixed with reddish-brown hairs.  |                            |
| Calyx truncate, teeth 0 or obscure; seeds without dorsal ridges .....                  | 2. <i>V. truncata</i> .    |
| Calyx-teeth distinct, with membranous ciliate margins; seeds with 1 dorsal ridge ..... | 3. <i>P. DaheUii</i> .     |
| Cyme-branches opposite, bright-yellow in fruit; seeds with 1 dorsal ridge .....        | 4. <i>P. flauida</i> .     |
| Albumen uniform (not ruminant).  |                            |
| Cyme-branches opposite or whorled; seeds with 1 dorsal ridge .....                     | 5. <i>P. canarensis</i> .  |
| Cyme-branches opposite ; seeds with 4 dorsal ridges .....                              | 6. <i>P. octosulcata</i> . |

1. **Psychotria Thwaitesii**, *Hool\ f. Fl. B. I. v. 3* (1880) p. 162. A stout glabrous shrub ; branchlets smooth, compressed. Leaves 4-8 by 1|-2| in., subcoriaceous, elliptic-oblong, obovate-oblong or oblong-lanceolate, acuminate or acute, glabrous ; base tapering into the petiole ; main nerves 12-15 pairs, prominent; petioles |-| in. long ; stipules variable, usually broadly wate, acute, small. Flowers sessile or nearly sessile, with reddish-brown hairs at their bases, in small round heads on the usually whorled glabro^ branches of pyramidal peduncled cymes. Calyx -V in. long; limb deciduous ; segments broad.

Corolla ^ in. lone ; tube sbort, straight, with a few white hairs^at the mouth ; lobes lr iu. long, oblong, obtuse. Fruit ellipsoid or subglobose, |-| in. in • diatn., marked with the scar of but not crowned by the calyx-limb; nvrenes without furrows, plano-convex. Seeds plano-convex; albumen very ruminant. Trim. Fl. Ceyl. v. 2, p. 358 ; Talb. Trees, Bomb. ed. 2, i97 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 640.—Flowers : Mar.-Apr.



KANAKA : Southern Ghats of N. Kanara in evergreen forests; common on NilkundGhat, *Talbot*; Falls of Gairsoppa, *Talbot*, 258!

YAK. *peninsularis*, Hook. f. *Fl. B. I.* 1. c. Leaves smaller, obovate; cymes always sessile, their branches moderate or short, or U, the inflorescence a peduncled globose head.

KONKAN : *Law*, 34 !

**2. *Psychotria truncata*, Wall, in *Roxb. Fl. Lid. ed.* <sup>Car</sup>J<sup>V</sup>: (1824) p. 162.** A stout erect glabrous shrub. Leaves 4-7 by <sup>^T^</sup> green above, pale beneath, obovate, shortly and abruptly <sup>^ol\*IU</sup> margins slightly recurved, base cuneate; main nerves 14-arcuate, very prominent; petioles <sup>|</sup>-1 in. long, stout; stipules <sup>^</sup> reaching sometimes 1 in. and even more in length, combined into a sheath, very caducous. Flowers sessile or shortly pedicelled, m dense terminal cymes; branches long or short, usually whorled. Calyx y-g- in. long, broadly campanulate, truncate; teeth 0 or very obscure. Corolla waxy-white; tube <sup>r\</sup> in. long, straight, broad, glabrous outside, with a ring of hairs at the mouth; lobes <sup>£</sup> in. long, oblong, subacute. Fruit ellipsoid, <sup>£</sup> in. long, smooth, crowned by the truncate calyx; pyrenes without furrows, plano-convex. Seeds plano-convex; albumen ruminant. *Talb. Trees, Bomb. ed. 2*, p. 197; *Woodr. in Journ. Bomb. Nat. v. 11* (1898) p. 646. *Grumilea vaginnans*, *Date*, in *Dalz. & Gibs. Bo. Fl.* (1861) p. 111. *Grumilea congesta*, *Grah. Cat.* p. 92 {not of Wight & Arn.}.—Flowers : Apr.-May.

DECCAN: Mahableshwar, *Cooke*!, *Woodrow*; near Carnac Point, Mahableshwar, *H. M. Birdwood*. S. M. COUNTRY: Chorla Ghát, *Ritchie*, 1792! KANARA: *Law*!; *Mendele*, *Ritchie*, 1792!; *Diægi*. *Woodrow*; evergreen forests of N. Kanara Gháts, *Talbot*.—DISTRIB. India (W. Peninsula).

A

**3. *Psychotria Dalzellii*, Hook.f. *Fl. B. I.* v. 3 (1880) p. 163.** A large shrub reaching 20 ft. high; stem 2 in. in diara. at the base, not much branched. Leaves coriaceous, 5J-9 by 2-3£ in., obovate-oblong, rounded and apiculate at the apex, glabrous, cuneate at the base; main nerves 12-20 pairs, prominent; petioles 44 in. long, stout; stipules *I* in. long, broadly ovate, acuminate. Flowers in terminal peduncled brachiate cymes; branches whorled, the lower usually m whorls of *o*, subtended by 4 large bracts, the upper in whorls of 3 subtended by *J* bracts; branches of the lower whorl often reaching 2 in. long; each branch carrying a head of 1-5 sessile or nearly sessile flowers surrounded by large oblong or suborbicular more or less cucullate bracteoles. Calyx broadly campanulate, glabrous, *I* in. long; teeth a little shorter than the tube, oblong, rounded or truncate at the apex, emargmate, the margins membranous, ciliate. Corolla-tube very short, straight, densely bearded in the throat; lobes <sup>£</sup> by <sup>-^</sup> in., ovate-oblong, acute<sup>^</sup> Fruit <sup>g</sup> ID. in diam., subglobose, smooth, succulent, black when ripe, edible, crowned by the calyx-limb; pyrenes with 1 conspicuous dorsal ridge, beads plano-convex, rugose, with a conspicuous dorsal ridge; albumen, lunate. *Talb. Trees, Bomb. ed. 2*, p. 197; *Woodr. in Journ. Bomb. Nat. v. 11* (1898) p. 646. *Psychotria bracteata*, *Wight & Arn. Froclr.* (1834) p. 434 (not of DC.).—Flowers : June-July.

The name *P. bracteata* given to the plant by Wight & Arn. (18.54; had been given by DC. in 1830 to a different plant, a native of Guiana.

^tooiuK <sup>Sioo^s!</sup> T>alzdll; Banda (Wari Country), *Kanitar I* KANAKA: Woodrow!;  
o!—j) <sup>rou</sup>ghout the evergreen forests of N. Kanara, *Talbot*; Yellapur,  
*Talbot* <sup>1st</sup>RTB. India (W. Peninsula), apparently endemic.

ft "M **Psychotria flavida**, *Talbot, Trees & Shrubs, Bomb.* ed. 1 (1894)  
jjLi • A small shrub. Leaves coriaceous, 4-10 by 2-4 in.,  
elliptic-, <sup>on</sup>Si acute or shortly acuminate, glabrous, tapering to the  
base; Jiaui nerves 10-12 pairs; petioles | in. long; stipules ovate,  
acumi-deciduous. Flowers numerous, small, in terminal peduncled  
; peduncles 1-2 in. long; cyme-branches opposite, flattened, rthan the  
peduncles; pedicels very short; bracts leafy, deciduous. TV~TV \*<sup>n</sup>- 1<sup>on</sup>S>  
truncate; teeth obscure or 0. Corolla -J- in. long; }\$ in. long, densely  
hairy in the throat inside. Fruit ^ in. in diam., ellipsoid, compressed,  
crowned with the calyx, black when ripe; pyrenes with 1 dorsal ridge.  
Seeds plano-convex, with a narrow dorsal ridge, rugose, black;  
albumen ruminant. Cyme-branches turning bright yellow in fruit.  
*Talb. Trees, Bomb.* ed. 2, p. 197. Closely allied to *P. nudijlora*,  
Wight & Arn., from which it differs by the short corolla-tube which  
is densely hairy within, that of *P. nudijlora* being longhand glabrous  
inside.—Flowers: May-July. VER\*. *Shivan-Yallaki*.

KONKAN: *Hohen hacker*, 735 a!, *Law I* KANAKA: abundant in the evergreen forests  
of Sirsi and Siddapur; Hulikal, *Talbot*, 3G61!; Ghats near Yellapur, *Talbot*, 230 ! —  
DISTRIB. Konkan and Kanara, apparently endemic.

**5. Psychotria canarensis**, *Talbot, Trees & Shrubs, Bomb.* ed. 1  
(1894) p. 113. A small erect shrub with smooth branches. Leaves  
2-5

by | in., ovate, obovate, or lanceolate, acute, thin, nearly glabrous-,  
minutely punctate and pale beneath, attenuate at the base; main nerves  
8 pairs, distinctly looping within the margin; petioles \ in.  
long;

stipules short, acute, caducous. Flowers small, sessile, in few- or  
many-

flowered mostly terminal cymes 1-3 in. long; branches opposite  
or

whorled, slender, as long as or longer than the peduncles; bracts and  
bracteoles minute, linear, caducous. Calyx short, tubular,  
4-toothed.

Corolla white, tubular or slightly funnel-shaped, the mouth of the tube  
hairy inside; lobes 4, spreading or reflexed. Stamens at the mouth  
of

the tube; filaments very short. Ovary 4-lobed; style as long as  
the

corolla-tube. Fruit ovoid, slightly curved, black, shining, ridged,  
about

\ in. long, crowned with the toothed calyx. Seeds with 1 ridge  
along

the back, ventrally flat; albumen uniform. There is but 1 specimen  
in

*Herb. Kew.* -(in fruit). The description has been taken from Mr.  
*Talbot*

(*I. c.*) *Talb. in Journ. Bomb. Nat.* v. 11 (1898) p. 691, t. 12;  
*Trees,*

*Bomb.* ed. 2, p. 197.

KANARA: moist evergreen forests near the Falls of Gairsoppa in N. Kanara,  
*Talbot!*—DISTRIB. Apparently endemic.

**6. Psychotria octosulcata**, *Talbot, in Journ. Bomb. Nat. Hist. Soc*\*

v. 11 (1897) p. 237, t. 7. An erect shrub 10-20 ft. high ; stem 1-2 in.  
in diain. at the base; bark smooth ; branches green, glabrous.  
Leaves  
thin, 3-6 by 1-2 in., elliptic, obovate, or oblanceolate, shortly  
and  
abruptly acuminate, shining above, pale beneath, glabrous, base much  
tapered; main nerves 8-10 pairs, prominent, frequently with galls ia  
their axils; petioles \- in. long; stipules connate at the base, acuminate,  
deciduous. Flowers white, in short terminal corymbose cymes 1-2  
in.  
long ; branches opposite. Calyx -£■\$ in. long; teeth 5, minute,  
triangular.

**2 s**

CoroUa-tube very short, hairy at the mouth inside. Fruit obovoid or pyriform, f-| in. long, straight or slightly curved, 8-ridged, black and succulent when ripe, soon drying and becoming regularly ridged with a flattened top. Seeds dorsally 4-ridged (*Talbot*); albumen uniform, horny. *Talb. Trees, Bomb. ed. 2, \*p. 198. Psychotria sannentosa, Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 046(wo\*of Blume).—Flowers: 3^f" Aug.*

KANAKA : common in some of the evergreen forests of the Siddapnr and ^ subdivisions of N. Kanara, *Talbot*; Yacombi, *Talbot, 3556!*, *Woodrow l*, *Bhiva*. DISTKIB. Apparently endemic.

## 2G. CHASALIA, Commers.

Shrubs or small trees ; branchlets terete. Leaves opposite or 3-nate y whorled, petiolate ; stipules intrapetiolar, simple or 2-fid, free or connate. Flowers in terminal cymes. Calyx-tube ovoid or subglobose; ^ truncate or 5-toothed, persistent. Corolla-tube elongate, terete usual<sup>1</sup>) curved, the throat bearded or naked; lobes 5, much smaller than to tube, erect or spreading, valvate. Stamens 5, inserted in the corolla-tube ; filaments 0 or short. Disk annular or tumid. Ovary 2-cel ed; ovules solitary in each cell, erect from the base. Fruit dry or slightly fleshy; pyrenes 2, very thin, \ery concave on the ventral face, cup-shaped (crescent-shaped in section). Seeds orbicular, compressed, (onvex on the back, concave on the ventral face; testa membranous; albumen horny, not ruminant; embryo small; cotyledons broad; radicle terete, inferior.—DISTKIB. Asia, Tropical Africa, Mascarene Islands; species 10.

1. **Chasalia curviflora**, *Thw. Enum.* (1859) p. 150. A small shrub 2-4.1 ft. high; branchlets compressed, glabrous. Leaves 5-9 by 1£-2| in., elliptic, oblong-lanceolate, or sometimes obovate, acute, acuminate, or obtuse, glabrous, base tapering, sometimes much so; main nerves 8-10 pairs; petioles 4-U in. long, often obscure owing to the tapering of the leaf-blade; stipules short,-} in. long, usually 2-*hd*. Flowers dimorphic, one form with exserted anthers and included styles, the other the opposite, sessile or nearly so, in trichotomously branched terminal peduncled cymes 1£-2 in. long; peduncles 1-2 in. long; branches short, often purplish; bracts persistent, ovate-lanceolate or subulate. Calyx vL i<sub>n</sub>. long, glabrous : limb slightly dilated above ; teeth scarcely ^ in. long, triangular, acute. Corolla waxy-white or pinkish, with a yellow throat, variable in length, sometimes reaching nearly f in. long\*; tube slender, glabrous outside, hairy in the throat inside; lobes ^ in long oblong subobtuse Berry size of a pea,

p. 362; *Talb. Trees, Bomb. ed. 2, p. 198 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 646. Psychotria longifolia, Dalz. in Kew Journ. Bot. v. 2 (1850) p. 133 (not of Beddome). Psychotria ambigua, Wjghfc & Arn. Prodr. p. 433; Wight, 111. t. 127; Dalz. & Gibs. p. 111.—Flowers : Apr.-July.*

KONKAN: *Law I*; Malwan, *Ritchie, 1793!* S. M. COUNTRY: Parva Ghat, *Dalzell \$ Gibson, Ritchie, 1795!* KANARA : evergreen forests of N. Kanara, *Talbot*; Karwar, *Woodrow*; Divimana, *Woodrow*, Siddapur, *Woodrow*; Usheli, *Ritchie, 1793 !*—DISTRIB.

More or less throughout India; Ceylon, Malaya, Borneo.

**27. SAPROSMA, Blume.**

br" t<sup>r</sup> usually glabrous, fetid when bruised, often with subulate  
 ^Ues at the tips of the branches and bases of the peduncles. Leaves  
 Pposite or 3-4-whorled, membranous; stipules interpetiolar,  
 broad,  
 sually connate, 1-3-cuspidate, deciduous. Flowers small, white, sessile  
 aQu congested, or on axillary or terminal peduncles, solitary or 3-cate ;  
 bracts and bracteoles minute, often connate. Calyx-tube obconic ;  
 limb  
 dilated, 4-6-lobed or -toothed, persistent. Corolla  
 campanulate or  
 infundibuliform, throat villous ; lobes 4-5, broad, obtuse, valvate, with  
 mflexed flat or crisped margins. Stamens 4-5, in the  
 corolla-throat;  
 filaments short or 0. Ovary 2-celled; ovules solitary in each  
 cell,  
 erect from the base, anatropous. Drupe small; pyrenes  
 1-2, thin,  
 CTustaceous. Seeds erect, plano-convex, the ventral face not  
 hollowed  
 out; testa membranous; cotyledons foliaceous; radicle  
 elongate,  
 terete, truncate, inferior, next\* the hilum.—DISTRIB. Tropical  
 Asia;  
 species 8.

1. **Saprosraa indicum, Dalz. in Kew Journ. Bot. v. 3 (1851) p. 37.**  
 A shrub 3-4 ft. high; branches pale, terete, dichotomous, glabrous.  
 Leaves opposite (one of the pair often smaller than the other), sessile or  
 nearly so, 2|-5 by g-1f in., thin, elliptic-oblong or oblong-lanceolate,  
 acute or acuminate, glabrous, base acute or rounded ; main nerves  
 8-10 pairs; stipules usually 3-cuspidate, small. Flowers terminal,  
 on short pedicels, 1-3 in a fascicle at the apices of twigs between the last  
 pairs of leaves; pedicels ^V H<sup>1</sup># l<sup>ong</sup>> with a cup-shaped whorl of  
 rigid connate glabrous scaly bracts at the base. Calyx ^ in. long,  
 cup-shaped, unequally 4-5-toothed; teeth triangular, acuminate, with  
 broad sinuses between. Corolla | in. long, white; lobes ovate, acute,  
 as long as the tube. Style shortly 2-fid. Berry \-% in. long, ellipsoid,  
 smooth, crowned by the calyx, blue, very fetid, usually 1-seeded by  
 suppression. Seeds broadly ellipsoid or globose. Fl. B. I. v. 3, p. 192;  
 Dalz. & Gibs. p. 112; Trim. FL Ceyl. v. 2, p. 308 ; Talb. Trees, Bomb,  
 ed. 2, p. 109; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 616.

KONKAN: Western Ghats, *Woodrow*. S. M. COUNTRY: Ohorla Ghat, *Dalzell*  
 KANARA : common on the southern Ghats of N. Kanara, *Talbot*.

**28. GEOPHILA, 1). Don.**

Small slender perennial herbs, creeping and rooting. Leaves opposite,  
 long-petiolate, orbicular-reniforin or ovate-cordate; stipules inter-  
 petiolar, ovate, entire. Flowers small, solitary or umbelled, subsessile,  
 or on axillary or terminal peduncles ; bracts subulate, linear, or leafy.  
 Calyx-tube obovoid; limb short, 5-7-toothed or -partite, persistent.

Corolla elongate, infundibuliform, throat hairy ; lobes 4-7, spreading or recurved, valvate. Stamens 4-7, inserted on the corolla-tube; filaments filiform ; anthers linear. Ovary 2-celled ; ovules solitary in each cell erect from the base, anatropous ; style slender, with 2 short or elongate branches. Drupe fleshy; pyrenes 2, plano-convex, not grooved on the ventral face; testa membranous; albumen horny; embryo basal, minute; radicle inferior. —DISTBIB. Tropical Asia, Africa, and America ; species 8-10.

1. **Geophila reniformis**, *D. Don, Pvodr. Fl. Nepal* (1825) p A  
small creeping herb ; stems prostrate, 1 ft. long or less, root fe  
at the nodes, filiform, puberulous. Leaves £-1^ in. in diarn., orJic-  
;

«/1«f« «. A«««T f TM IolirnnB r»ntinln« i-2 in. loilff. nUDeSCtII ..

at the nodes, filiform, puberulous. Lea £^  
deeply cordate, pubescent or glabrous ; petioles £-2 in. long, P^ ^  
stipules broadly ovate, obtuse. Flowers terminal, solitary, o  
peduncled 2-3-flowered umbels; peduncles |-1| in. long; V\*T T  
very short; bracts lanceolate-subulate. Calyx £ in. long ; teetn IUB  
than the tube, lanceolate, acuminate, ciliate. Corolla glabrous or'^^  
pubescent outside; tube dilated upwards, hairy in the throaty .^  
ovate-oblong, acute, shorter than the tube, recurved. Berry 4 8 ^  
diam., globose, crowned with the large calyx-limb, smooth, P^]7' d  
when ripe ; pyrenes small, flat and smooth on the ventral, roug ^ ^  
bluntly keeled on the convex dorsal surface. Fl. B. 1. v-<>> P- >  
Dalz. & Gibs. p. Ill; Trim. Fl. Ceyl. v. 2, p. 363 ; Watt, Diet.  
Jicon-Prod. v. 3, p. 438. *Psychotria herbacea*, Jacq. Enum. PL  
CariD. ^i ) p. 16 ; Grah. Cat. p. 92.

Rare. KONKAN : S. Konkan, *Nimmo ex Graham* ; Vingorla, *Dabell # &\*>#''\**  
f The plant is said by Kurz to possess properties similar though inferior to, uiu  
*Cepkalis Ipecacuanha*. See Watt, Diet. Eeon. Prod. 1. c—DISTRIB. India ^liuet  
Khasia hills, Tenasserim, the Andamans, W. Peninsula); Ceylon.

## 29. LASIANTHUS, Jack.

Shrubs often fetid ; brandies terete, compressed at the nodes. Lea^  
distichous, opposite, shortly petiolate, usually caudate-acuminate, \\n  
arching nerves and closely-set transverse veins which are simp e  
forked, or branched and reticulate ; stipules interpetiolar, broad, rare y  
narrow. Flowers small, in axillary, rarely peduncled, often bracteaw  
clusters, cymes or heads. Calyx-tube short, subglobose, ovoid or oblong,  
limb short or long, 3-7-toothed or -lobed, persistent. Corolla intunai-  
buliform or hypocrateriform, throat villous ; lobes 3-7, valvate. \*tam£n\*  
4-6 on the corolla-throat; filaments short; anthers included, otten  
apiculate. Ovary 4-9-celled; ovules solitary in each cell, erect trom me  
base, anatropous. Drupes of 4-9 pyrenes ; pyrenes cartilaginous or  
crustaceous, triquetrous, sometimes keeled or winged on tne oac\*,  
1-seeded. Seeds narrowly oblong, slightly curved ; testa membranous ;  
albumen fleshy; embryo terete, elongate; cotyledons short, obtuse,  
radicle elongate, inferior.—DISTRIB. Chiefly Tropical Asian ; species  
about 80.

S

Cymes sessile; corolla hairy outside ; drupe black ..... 1- -&• seSSIII^  
Cymes peduncled ; corolla glabrous outside ; drupe black ..... I- ^- venuio^.

1. **Lasianthus sessilis**, *Talbot, Trees Sf Shrubs, Bomb. ed. 1* (1894)  
p. 114. A stout gregarious shrub usually branched from the base ;  
branchlets appressedly hairv. Leaves opposite, 2-5 by 1-2 in., elliptic,  
acuminate, glabrous'above, hairy on the nerves beneath, base acute  
or rounded; main nerves 6 pairs, prominent beneath, curved upwards ;



petioles \ in. long, hairy; stipules broad, acuminate, hairy. ±flowers small, white, sessile, in axillary fascicles; bracts triangular, hairy. Calyx-tube short; teeth triangular, hairy. Corolla tubular slightly hairy outside, villous inside. Ovary 4-celled; style with 4 branches. Drupe fleshy, black; pyrenes 4, triangular, dorsally tubercled.  
me

leaves and fruit are fetid when bruised. Talb. Trees, Bomb, ed. 2, p. 199.—Flowers : Aug.-Sept.

■\*-he above description is taken from that of Mr. Talbot (*I. c.*). I have seen only 2 somewhat imperfect specimens which are in Herb. Kew.

KANAKA : *evergreen* forests of N, Kanara from Yellapup southwards to Gairsoppa Falls, *Talbot I*

**2. *Lasianthus venulosus*, Wight, in Cede. Journ. Nat. Hist. v. 6 (1846) p. 508.** A large robust nearly glabrous leafy shrub. Leaves light-green, 1|-3| by g-1<sup>^</sup> in., elliptic-oblong, acute, acuminate or cuspidate, glabrous above, more or less hairy on the midrib and nerves beneath, base rounded; main nerves 6-8 pairs, prominent on both sides, the veins between closely reticulated; petioles <sup>^</sup> in. long; stipules small, triangular, hairy. Flowers yellowish-white, sessile, or shortly pedicelled and racemose, on short stout peduncles longer than the petioles; pedicels hairy; bracts hairy. Calyx hairy, -J- in. long; teeth 4-5, linear-subulate, hairy, <sup>^</sup> in. long. Corolla *j* in. long; tube glabrous outside, throat hairy; lobes 4-5, shorter than the tube, villous inside. Stamens 4-5. Style 3-5-branched. Drupe globose, -Jr in. in diam., blue, crowned by the persistent calyx-teeth; pyrenes <sup>^</sup>-5, with thick walls. Fl. B. I. v. 3, p. 190 j Wight, Icon. t. 1032; Bedd. For. Man. in Flor. Sylvat. p. cxxxiv-11, t. 17, f. 5. *Santia venulosa*, Wight & Arn. Prodr. p. 422; Dalz. & Gibs. p. 114.

On the Ghats but very rare, *Dalzell & Gibson*. Western Ghats, *De Crespigny ex Woodrow*.

This is included on the authority of Dalzell & Gibson ("Bo. FL p. 114). I am inclined to doubt its occurrence within the limits of the Bombay Presidency. Dalzell says that it is to be found on the Ghats, and that it is very rare, but there are no specimens in Dalzell's Herbarium in Herb. Kew. The only specimen which reached the Poona Herbarium was furnished by Dr. DeOespigny and ticketed "Western Ghats." Neither Woodrow nor Talbot have found the plant, which seems to flourish at higher elevations than are obtainable in the Bombay Presidency.—DISTRIB. India (W. Peninsula).

### 30. HAMILTONIA, Eoxb.

Trichotomously branched imdershrubs; branches terete. Leaves opposite, petiolate, fetid when bruised, many-nerved; stipules intrapetiolar, short, acute, persistent. Flowers small, in broad terminal trichotomously branched paniced or subuin bell ate cymes, white or blue, fragrant, bracteate and bracteolate. Calyx-tube ovoid; teeth 4-5, persistent. Corolla infundibuliform; tube long, straight; lobes 5, short, valvate. {Stamens 5, inserted in the throat of the corolla; filaments short, subulate; anthers included, obovate-oblong, obtuse. Ovary 5-furrowed, 5-celled, the septa soon disappearing; ovules solitary in each cell, erect from the base, anatropous; style filiform, with 5 linear arms. Capsules 1-celled, from the absorption of the septa, 5-valved, 5- or fewer-seeded. Seeds surrounded by a loose clathrate envelope which splits into 3-4 segments from the base; cotyledons foliaceous, induplicate, cordate; radicle terete, inferior.—DISTRIB. Mountains of the East Indies, 1 species in Northern China; species 3-4.

**1. *Hamiltonia suaveolens*, Boccb. ffort. Beng. (1814) p. 15.** A small shrub with divaricate more or less herbaceous branches. Leaves

rather rigid, 5-8 by 1-3 in., elliptic-lanceolate, acute, glabrous or pubescent above, more or less hairy especially on the nerves beneath, reticulately veined, base acute; main nerves 10-16 pairs, arcuate; petioles 1-2 in. long; stipules triangular, hairy. Flowers numerous.

cent panicles, white or blue; bracteoles beneath the calyx subulate. Calyx 1-in. long, hairy; tube narrow; teeth 4-5, lanceolate, acute, 1/2 in. long, pubescent. Corolla up to 1/2 in. long, cent outside; tube slender, slightly enlarged at the top, without in the throat; lobes 4-5, ovate, acute, glabrous inside, 1/2-3/4 in. long. Seeds 3-quetrous, with a loose arillate like covering. Fl. B. I. v. 3, p. 197; Bedd. For. Man. in Flor. S p. cxxxiv-12, t. 17, f. 3; Talb. Trees, Bomb. ed. 2, p. 200; W in Journ. Bomb. Nat. v. 11 (1898) p. 646; Watt, Diet. Econ. v. 4, p. 200. *Hamiltonia mmorensis*, Wight & Am. Prodr. P-Grab. Cat. p. 91; Dalz. & Gibs, p. 115. Flowers: Oct. Feb.

Jace-

Grab. Cat. p. 91; Dalz. & Gibs, p. 115.—Flow  
*Gidesa*; *Gidas*; *Gidasdiva*.

Hills throughout the Presidency. KONKAN: island of Karanja, *Dateell* & *G@j!*<sup>TM'</sup><sub>m</sub>  
DBCCAX: Mahableshwar, *Woodrow* • Fitzgerald Ghat below Mahableshwar y<sup>o</sup>»" >  
Warra Ghat road and Falkland Point, Matiableshwar, // *M. Birdwood*; Kartnz Wwc,  
*Woodrow* \; Kamatki Gh\*t, CW/b.'; Sinhagad hill near Poona, i?to<! K^ARA.  
on the highest hills of the Supa taluka, N. Kanara, TW^.-DISTRIB. India (tropical  
and subtropical Himtdayas, Central India, W. Peninsula); China.

### 31. HYDROPHYLAX, Linn. f.

Subsucculent herbs, creeping, glabrous; branches^ terete. Leaves opposite, sessile, ovate or oblong; stipules combined into an entire or toothed cup-like sheath, persistent. Flowers solitary, axillary, sessile or shortly pedicelled, lilac. Calyx-tube 4-angled; limb 4-partite, the segments ovate-lanceolate, acute, persistent. Corolla subfleshy, between campanulate and infundibuliform; tube with a ring of hairs inside; lobes 4, ovate, valvate. Stamens 4, on the corolla-throat; filaments filiform; anthers linear. Ovary 2-celled; ovules solitary, peltateiy attached to the septum in each cell; style filiform, pubescent; s.tlg<sup>ma</sup> obscurely 2-lobed. Fruit large, corky, oblong-ovoid, compressed, ^g^Y curved, acutely 3-4-keeled between the acute margins, 1-2-celled, 2-seeded. Seeds linear-oblong, convex on the back, longitudinally grooved on the face; testa minutely granulate; albumen cartilaginous; embryo straight; radicle elongate, terete, inferior.—DISTIUB. Species 3, of which 1 is in India, 1 in Madagascar, and 1 in Natal.

1. *Hydrophylax maritima*, Linn. f. *Suppl* (1781) p. 126. A perennial herb; stems numerous, prostrate, rooting at the nodes, stout, glabrous, clothed with the cup-like persistent stipules of fallen leaves.

Leaves 1/2 to 1 in., sessile, more or less recurved, ovate-oblong or obovate-oblong, acute, fleshy, much wrinkled when dry, smooth or papillose; stipules large, membranous, forming a cup round the stem, truncate or obscurely toothed, sometimes ciliate. Flowers sessile, solitary, axillary. Calyx 1/2 in. long, glabrous; teeth lanceolate or narrowly triangular, acute, 1/2 in. long. Corolla 1/2 in. long; tube enlarged at the top and with a ring of hairs in the throat; lobes ovate, acute, much shorter than the tube. Fruit 1/2 in. long, oblong, tapered at both ends,

cro r<sup>aeu</sup>Λ<sup>e</sup> Inar g<sup>Λ</sup>s and with about 3 prominent acute ribs on each face, I.  
w\*ted with the large calyx-teeth, smooth, glabrous and shining. Seeds  
T<sup>Λ</sup>long, linear-oblong, J-terete, rounded on the back and with a groove  
on the ventral face. YL B. I. v. 3, p. 199 ; Grah. Cat, p. 93 ; Trim.  
\*£ Ceyl. v. 2, p. 370 ; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. (546 ;

, P  
; , Icon. t. 760.

: Balzell; Ooran, Nimmo ex Graham. GUJARAT: Porbander  
(coast of ), Iihival—DISTRIB. India (shores of W. Peninsula); Ceylon,

### 32. SPERMACOCE, Linn.

Annual or perennial herbs or low undershrubs ; branches usually 4-gonous. Leaves opposite, sessile or petiolate; stipules connate with the petioles into a broad truncate tube with unequal bristles. Flowers small or minute, solitary, or in axillary or terminal fascicles, heads, or cymes. Calyx-tube various; limb 2-4 (rarely 5) -toothed, sometimes with interposed teeth or bristles. Corolla infundibuliform or hypo-crateriform ; throat naked or hairy ; lobes 4, valvate. Stamens 4, on the throat or tube of the corolla; filaments short or long; anthers linear or oblong. Ovary 2-celled ; ovules solitary in each cell, attached to the middle of the septum, amphitropous ; style filiform, with 2 short arms or a capitate stigma. Fruit of 2 coriaceous or crustaceous mericarps which dehisce variously. Seeds oblong, ventrally grooved; testa thin, often granulate ; cotyledons leafy; radicle terete, inferior.— DiSTitiB. Scattered throughout tropical and subtropical regions, abundant in America : species about 150.

Stem erect; both mericarps ventrally dehiscent ..... 1. 8.

*stricta*.

Stem procumbent; one mericarp only ventrally dehiscent..... 2. S.

*hispida*.

1. **Spermacoce stricta**, Linn. /. *Suppl.* (1781) p. 120. Annual; stem erect, 6-14 in. long, slender, thickened at the nodes, quadrangular, the angles scabrid with recurved prickles ; internodes long. Leaves subsessile, 1-2 by \-£ in., linear-oblong or ovate-oblong, acute, HUKTO-nate, more or less scabrous on both sides, the margins often recurved, base much tapered ; stipules hairy and with numerous long filiform bristles which are much longer than the sheath. Flowers in globose dense-flowered heads, surrounded by a whorl of 2-6 linear, acute, spreading or at length reflexed leaves ; bracteoles filiform, hyaline, as Ion<sup>0</sup> as or longer than the calyx. Calyx y<sup>1</sup>Λ-Λ in. long; tube densely pubescent in the upper part, glabrous near the base; teeth about a3 long as the tube, linear-subulate, pubescent and with pointed hyaline tips. Corolla white, £ in. long; tube almost filiform ; lobes ^ in. long, linear, acute. Stamens much exerted; filaments very long. Stigma subglobose or somewhat funnel-shaped. Capsules ^ iru long, membranous, narrowed, veined and glabrous at the base, densely pubescent towards the apex, crowned with the erect calyx-teeth,

dehiscing from above, each mericarp<sup>1</sup> ventrally dehiscent. Seeds  $\tau$ V in. long, ^-ellipsoid, rounded at hnth ends smooth, polished, with a deep groove on the ventral face, brown *h* B. I. v. 3, p. 200; Trim. *Yl* Ceyl. v. 2, p. 371 ; Woodr. in *Journ.* Bomb. Nat T. 11 (1898) p. 646.-Howers: Oct.-Noir.

. *Stocks* <sup>f</sup> *Lambert I*; Worlee (Bombay), *Stocks I* DECCAN : Poona, *Woodrow*!; aon near Ahmednagar, *Cooke I* S M. OOUKTBT : Badami *Woodrow* ; Belgaum, 1707 •— DISTRIB. Throughout India ; Ceylon, Tropical Asia and Africa.

2. **Spermacoce hispida**, *Linm. Sp. Pl.* (1753) p. 102. A pro-  
cumbent herb; stems quadrangular, hirsute, hispid, or subglabrous,  
usually with long internodes. Leaves subsessile  $\frac{1}{2}$ -2 by  $\frac{1}{4}$ - $\frac{3}{8}$  in., oblong  
or elliptic, acute, scabrid, pubescent, or nearly glabrous, with <sup>scaorl(\*)</sup> ^  
ciliate margins; stipules membranous, hispid, with few bristles. || 1  
are usually longer than the sheath. Flowers 4-6, in a whorl within t

stipularcup; pedicels short; bracts lanceolate-subulate, hyaline\*

J'

hispid, ^ in. long; tube narrowly campanulate; teeth as long as  
tube, linear-lanceolate, very acutely pointed, reflexed, hairy. ^

pale-blue or white, £-4- in. long; lobes ^ in. long, oblong, acute, bristly  
on the back near the tip. Stigmas 2, very short. Capsules I in.  
long,

hairy, ellipsoid, rounded at both ends, crowned with the calyx-teeth,  
one mericarp only ventrally dehiscent, the other closed by the septum  
which remains attached to it, finally separating as a membranous plate.  
Seeds ^-^ in. long, ^-ellipsoid, one end rounded, the other truncate,  
finely granulate, rounded on the back, with a deep groove on the flat face,  
brown. Fl. B. I. v. 3, p. 200; Grah. Cat. p. 93; Dalz. & Gibs. p. III

Trim. Fl. Ceyl. v. 2, p. 371; Woodr. in Journ. Bomb. Nat. v. 11 (1898)  
p. 64G; Watt, Diet. Econ. Prod. v. 6, part 3, p. 320.—Flowers: Sept.-  
Oct. VERN. *Madanglianti*.

KONKAN: *Law 1*; Vingorla, *Kanitkar!* S. M. COUNTRY: Castlerock, *Cookel*;  
Londa, *Shiva*; Belgauin, *Ritchie*, 358!

### 33. GAILLONIA, A. Eich.

Low rigid branched shrubs. Leaves small, rigid, opposite, linear  
or subulate; stipules usually connate with the petioles into a 2-setose or  
2-spinous sheath, rarely remote from the petiole or obsolete. Flowers  
small, solitary, or in simple spicate cymes, white. Calyx-tube ovoid;  
limb 2-7-toothed or -lobed, dilated after flowering into a scarious crenate  
wing or feathery bristles. Corolla infundibuliform; throat naked;  
lobes 4-5, valvate. Stamens 4-5, inserted on the throat or tube of the  
corolla; filaments short; anthers linear-oblong. Disk inconspicuous.  
Ovary 2-celled; ovules solitary in each cell, attached to the middle  
of the septum, amphitropous; style filiform, with 2 short linear branches.  
Fruit small, ovoid, of 2 terete indehiscent cocci, crowned with the  
enlarged calyx. Seeds oblong, ventrally grooved; albumen horny;  
cotyledons fiat; radicle slender, inferior.—DISTRIC. W. Asia and  
N. Africa; species 10.

1. **Gaillonia hymenostephana**, *Jaub. \$ 8pac7i, III. PL Or.* v. 1  
(1842) p. 146, t. 79. A small shrub 6-12 in. high, fetid when fresh;  
stem as thick as a goose-quill, irregularly branched; branches numerous,  
terete, slender, hoary and scaberulous. Leaves -J—j| by yV'TTT in-'  
linear-oblong, sessile, subobtuse, attenuated at the base, scabrid,  
margins ciliate, sometimes recurved; stipules of the lower leaves  
usually obsolete, those of the upper small, membranous, connate.  
Flowers terminal, solitary, or in 2-3-flo\vered fascicles. Calyx-tube  
-jL in. long, hairy; limb membranous, reticulately veined, subpellucid,  
pale-yellow, hairy, unequally 5-7-lobed, the lobes rounded or broadly

ovate, apiculate or acuminate, small before flowering, afterwards enlarged to a diameter of about  $\frac{1}{2}$  in. when spread out. Corolla white,  $\frac{1}{2}$  in. long, infundibuliform ; lobes 5, hairy outside, glabrous inside, much shorter than the tube, linear, subobtus. Fruit small, of 2 terete



dehiscent cocci, crowned with the enlarged calyx. PI. B. I. v. 3, p. 202; Boisa PI Orient, v. 3, p. 15; Woodr. in Journ. Bomb. Nat. v. U (1898) p. 646.

A rare plant confined (in the Bombay Presidency) to Sind. SIND : Thano-Bullo-<sup>^</sup>nan, Woodrow.

Woodrow reports this plant from Sind, but I have seen no specimens from there. 6 specimens in Herb. Kew. are from Waziristan, the Panjab, Afghanistan, and  
h i

### 34. RUBIA, Linn.

Scabrid hispid or prickly erect diffuse or climbing herbs ; stems long, 4-gonous. Leaves 4-8 in a whorl, exstipulate. Flowers small or minute, in axillary and terminal cymes ; pedicels articulate with the calyx. Calyx-tube ovoid or globose; limb 0. Corolla rotate or sub-campanulate ; lobes 4-5-valvate. Stamens 4-5, inserted on the corolla-tube ; filaments short; anthers didymous, exerted. Ovary 2-celled ; ovules solitary in each cell, attached to the septum, amphitropous; style 2-fid or styles 2; stigmas capitellate. Fruit small, fleshy, didymous or globose by the suppression of a carpel. Seeds suberect, adhering to the pericarp; testa membranous; cotyledons broad, thin; radicle slender, inferior.—DISTRIB. Chiefly in the temperate regions of the world; species about 30.

1. **Rubia cordifolia**, Linn. Syst. Nat. ed. 12, v. 3 (1768) p. 229.—Perennial, herbaceous, climbing ; roots very long, cylindric, flexuose, with a thin red bark ; stems often many yards long, rough, grooved, becoming slightly woody at the base ; bark white; branches scandent by means of numerous divaricate or deflexed branchlets and petioles, quadrangular, sometimes prickly on the angles, glabrous, shining. Leaves 1-3 by 1-1½, in whorls of 4 (one pair of each whorl often larger and with longer petioles than the other), ovate, acute, the lower leaves larger than the upper, all scabrous above, on the nerves beneath, and on the margins with minute white prickles, base rounded or slightly cordate, the base of the upper leaves sometimes acute, all 5 (rarely 7)-nerved from the base; petioles triangular, with many sharp recurved prickles on the edges, often deflexed ; stipules 0. Flowers in terminal panic-led glabrous cymes; branches trichotomous, spreading; bracts ovate acute, leafy. Calyx <sup>^</sup> in. long; tube globose, glabrous, limb 0. Corolla greenish, divided nearly to the base ; tube scarcely any ; lobes 5, ovate, acute, 1 in long. Styles 2; stigmas globose. Fruit 1-1½ in. in diam., didymous or globose, smooth, shining, purplish-black when ripe. PI. B. I. v. 3, p. 202 ; Grah. Cat. p. 93; Dalz. & Gibs. p. 121 ; Wight, 111. t. 128, bis, % 1; Trim. PL Ceyl. v. 2, p. 372; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 646 ; Watt, Diet. Econ. Prod. v. 6, part 1, pt 57Q,—Flowers : Oct.-Jan. VERN. *Manjishth*; *Itta*.

On the higher Ghats tolerably common. KONKAN: *Stocks* \; Amboli Ghat, *Kanitkarl* DECCAN: Phunda Ghat, *liitchie*, 361!; hills at Bhor, *KanUkarl* ; hills at Par, *Law* !; Mahableshwar, *Cooke* !; hills near Sinhadgad (Poona districts), *Bhiva* ! S. M. COUNTRY : Belgaum, *Ritchie*, 361!—DISTRIB. Throughout India in hilly districts; Ceylon, Malacca, Japan, Java, Tropical Africa.

The roots furnish a valuable dye which is used largely by the natives of India. The plant is known as *Indian Madder*. A very full description of the dyeing process will be found in Watt's Diet. Econ. Prod. 1. c.

•""will te it,%sWt M/t, JU1UJ1. KJU. 11, I 1/0t;i L/. J.Vt7. J-uvy j-«»-v,^w

plant, not indigenous in India, but, according to De Candolle, a native of western temperate Asia and the south-east of Europe. It is cultivated in India and is a scandent herb with lanceolate acuminate obscurely penninerved leaves 4-6 in a whorl, leafy cymes, and didymous or globose fruit 1-1½ in. diam. Fl. B. I. v. 3, p. 203; Boiss. Fl. Orient, v. 3, p. 578. A. Vatt, Diet. Econ. Prod. v. 6, part 1, p. 578.

Under genera not included in the foregoing pages the most important plants grown in the Bombay Presidency are the following:—

*Coffea arabica*, Linn. Sp. Pl. (1753) p. 172. The Coffee Plant, a native of Abyssinia, the Soudan, and the coasts of Guinea and Mozambique, has been cultivated on the hills between Panchgani and Mahableswar at an altitude of about 4000 ft., but not to any great extent.—Flowers: Jan.-Apr.

*Serissa foetida*, Lamk. Tab. Encyc. v. 2 (1793) p. 211. A small shrub about 2 ft. high, a native of China and Japan, is often grown in gardens. It has ovate-lanceolate dark-green shining myrtle-like leaves and axillary solitary small sessile white flowers, which, as well as the leaves, are fetid when bruised. Grab. Cat. p. 93; Dalz. & Gibs. Suppl. p. 44; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 646; Firminger, Gard. ed. 3, p. 579.—Flowers: May.

*Hamelia patens*, Jacquin, Enum. Pl. Carib. (1760) p. 16. A shrub 4-10 ft. high with dense rich-green foliage, a native of Tropical America and the West Indies, is often cultivated in gardens. It has elliptic-lanceolate villous and strongly nerved petiolate leaves about 4 by 2 in. and scarlet and yellow flowers in terminal corymbose cymes; the corolla with a long tube and short lobes. Dalz. & Gibs. Suppl. p. 44; Woodr. in Journ. Bomb. Nat. v. 11 (1898) p. 645; Firminger, Gard. ed. 3, p. 580.

*Pentas carnea*, Benth. in Bot. Mag. v. 17 (1844) t. 4086. A plant about 1 ft. high, scarcely shrubby (the branches all herbaceous), is very commonly grown in gardens. It bears a constant succession of flowers of a delicate lavender-color in large corymbs. Dalz. & Gibs. Suppl. p. 44; Firminger, Gard. ed. 3, p. 586.

*Liondelelia odorata*, Jacq. Enum. Pl. Carib. (1760) p. 16. A hard-wooded shrub, a native of Cuba and Mexico, has been introduced into gardens in the Bombay Presidency. It has ovate, acute or acuminate leaves on very short petioles and scarlet or orange fragrant flowers. Dalz. & Gibs. Suppl. p. 45; Woodr. Gard. in Ind. ed. 5, p. 354.

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*The Synonyms are printed in italics.*

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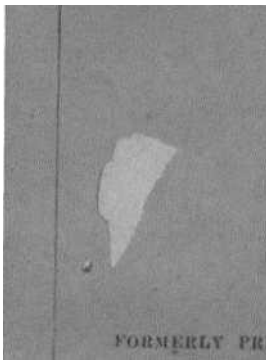
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