

FLORA

OF THE

PRESIDENCY OF MADRAS

BY

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LATE OF THE INDIAN FOREST DEPARTMENT

PART II

CELASTRACEÆ TO LEGUMINOSÆ-PAPILIONATÆ

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INTRODUCTION TO PART II.

AFTER the Introduction to Part I was in print, it was found advisable to extend the Part to 200 pages so as to end with a Family and avoid the inconvenience of stopping in the middle of a genus. The present Part, similarly, instead of ending at p. 384, has been extended to p. 390 so as to complete the first Sub-Family of the Leguminosae, and end at a definite point.

Owing to its having, in consequence of the war, been found advisable not to have the valuable Madras collections sent home, the later genera have had to be done at home without them. Fortunately, the Calcutta specimens had already been sent home and were available. It is proposed to continue Part III with such material as is available in this country.

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FLORA OF MADRAS.

Family XLIV. CELASTRACEAE.

Trees or erect or climbing shrubs, sometimes thorny. *Leaves* opposite or alternate, simple; stipules caducous or 0. *Flowers* regular, hermaphrodite or polygamous, usually in dichasia. *Calyx* small, 4-5-lobed, persistent; lobes imbricate. *Petals* 4-5, inserted below the disk or continuous with its margin, imbricate. *Disk* usually conspicuous, flattened or pulvinate, lobed or entire, rarely 0. *Stamens* as many as petals and alternate with them, inserted under on or on the margin of the disk; filaments subulate; anthers 2-celled. *Ovary* on the disk or immersed in it, 2-5-celled; style short or 0; stigma simple or lobed; ovules 1-2 in each cell. *Fruit* capsular or drupaceous. *Seed* usually arillate; albumen fleshy or 0; cotyledons, when present, foliaceous.

Fruit a dehiscent capsule:—

Leaves opposite, rarely alternate:—

Petals free; disk flattened, broad, thick, 4-5-lobed:—

Ovules 2 in each cell; petals not pitted.....1. **Euonymus**

Ovules 1 in each cell; petals pitted.....2. **Glyptopetalum**.

Ovules 4 or more in each cell; petals usually crested

3. **Lophopetalum**.

Petals more or less combined with the annular disk; ovules 2 in each cell 4. **Microtropis**.

Leaves alternate:—

Inflorescence paniculate or racemose:—

Flowers hermaphrodite; large trees; capsule deeply 2-lobed

5. **Kurrimia**.

Flowers polygamous; climbing shrubs; capsule 1-3-celled

6. **Celastrus**.

Inflorescence axillary, cymose; small trees or shrubs, often thorny; capsule 2-3-celled.....7. **Gymnosporia**.

Fruit indehiscent:—

Seeds albuminous, arillate; leaves small, entire; style lateral in fruit8. **Pleurostylium**.

Seeds exalbuminous, exarillate; leaves usually crenate; style terminal in fruit 9. **Elaeodendron**.

1. *Euonymus*, Linn.

Trees or shrubs, usually glabrous, sometimes climbing by means of stem rootlets. *Leaves* opposite; stipules deciduous. *Flowers* hermaphrodite, in axillary dichasioid cymes. *Calyx* 4-5-lobed, spreading or recurved, the lobes imbricate. *Petals* 4-5, imbricate. *Stamens* as many as the petals and alternate with them, inserted on the disk; filaments short; anthers broad, 2-celled. *Disk* large, fleshy, 4-5-lobed. *Ovary* sunk in the disk, 3-5-celled; style short, thick; stigma 3-5-lobed; ovules 2 in each cell. *Fruit* a 3-5-celled loculicidal capsule, lobed angled or winged, sometimes echinate; cells 1-2-seeded. *Seeds* enclosed in a fleshy aril; testa thick; albumen copious, oily; cotyledons broad, foliaceous; radicle inferior.

Cymes 1-3-flowered, peduncles and pedicels stout; flowers 4-5 in. in diam., petals fimbriate; leaves entire; capsule-valves deeply obcordate 1. *indicus*.

Cymes 3-7- (rarely 9-) flowered, peduncles and pedicels moderately stout; flowers 3-4 in. in diam.; petals not fimbriate but sometimes crispate; leaves crenulate towards the apex; capsule-valves slightly obcordate 2. *crenulatus*.

Cymes usually more than 7-flowered, peduncles and pedicels slender; flowers usually under 3 in. in diam.; petals entire:—

Leaves entire or nearly so; capsule-valves more or less obcordate, elongate:—

Branchlets terete; flowers 2 in. in diam.; leaves thin, oblong-lanceolate, obtusely acuminate, sometimes obscurely crenate

3. *dichotomus*.

Branchlets quadrangular; flowers 3 in. in diam.; leaves thick, ovate-lanceolate, acute, thickened on the margin, quite entire

4. *angulatus*.

Leaves prominently toothed; branchlets terete:—

Leaves lanceolate, prominently serrate, acuminate; capsule globose 5. *serratifolius*.

Leaves elliptic, crenate-serrate, acute 6. *paniculatus*.

1. *EUONYMUS INDICUS*, Heyne ex Wall.; F. B. I. i. 608; W. & A. 160. *E. Goughii*, Wt. Ic. t. 215.

W. Gháts, in S. Canara, Coorg, Wynaad and W. Nilgiris at 3,000 ft., rarely higher.

A small tree of the evergreen forests with reddish flowers.

2. *EUONYMUS CRENULATUS*, Wall.; F. B. I. i. 608; W. & A. 161; Wt. Ic. t. 973; Bedd. Fl. t. 144.

W. Gháts, in the Nilgiris, Pulneys and the Hills of Travancore and Tinnevely; common in Nilgiri and Pulney Sholas up to 8,000 ft., apparently at lower elevations in Travancore. A small evergreen tree with reddish flowers and a brownish-white, hard, close-grained wood.

3. *EUONYMUS DICHOTOMUS*, Heyne ex Wall.; F. B. I. i. 609; W. & A., 160.

W. Gháts, in the Anamalai, Pulney and Tinnevely Hills, up to 4,500 ft., Travancore.

A small evergreen tree with pale green flowers and drooping habit, sometimes planted in Travancore. Vern. Tam. Vini.

4. *EUONYMUS ANGULATUS*, Wt. Ic. t. 1,053; F. B. I. i. 610.

W. Gháts, in Coorg, Nilgiris below Sispara, about 5,000 ft., Bolampatti Hills of Coimbatore, in evergreen forest.

A small tree with dull purple flowers, the margins of the leaves thickened.

5. *EUONYMUS SERRATIFOLIUS*, Bedd.; F. B. I. i. 609; Bedd. Ic. t. 171.

W. Gháts of S.-E. Wynaad and Malabar (Carcoor Ghát) at 3,000–5,000 ft., Hills of Travancore.

A shrub or small evergreen tree.

6. *EUONYMUS PANICULATUS*, Wight; F. B. I. i. 609. *E. crenulatus* var. *laxiflora*, Wt. Ic. t. 214 and t. 973 (letter-press).

W. Gháts, in the Sivagiri Hills of Tinnevely.

2. *Glyptopetalum*, Thwaites.

Erect shrubs or small trees. *Leaves* opposite or subalternate, exstipulate. *Flowers* in axillary or extra-axillary, dichasioid cymes, sometimes reduced to 3 flowers only. *Calyx* small, 4-lobed. *Petals* 4, with 2 pit-like depressions on the upper surface. *Disk* large, quadrangular. *Stamens* 4, inserted at the angle of the disk, connective enlarged; anther-cells divergent. *Ovary* immersed in the disk, 4-lobed, 4-celled; style short; stigma minute; ovule 1 in each cell, pendulous. *Fruit* a loculicidal 1–4-celled and -seeded subglobose capsule, the walls coriaceous. *Seed* more or less covered by a red fleshy aril; testa thick; albumen fleshy, cotyledons flat, leafy; radicle superior.

Cyme-peduncles 1-1.5 in. long, 5-7-flowered; capsule small, under .5 in. in diam. :—

Leaves membranous, ovate-lanceolate, serrate except at the very base, acute at apex, cuneate at base, 4-6 in. long, 1.5-2.5 in. broad, nerves slender, hardly prominent; petals oblong, about .2 in. long, the pits near the apex.....1. *zeylanicum*.

Leaves coriaceous, elliptic-obovate, entire or with few serratures at apex, more or less obtuse at apex, cuneate at base, 2-3.5 in. long, 1-2.5 in. broad, nerves thick, prominent; petals ovate, obtuse, about .1 in. long, pits oblique2. *Lawsonii*.

Cyme-peduncles 3-6 in. long, 3-flowered; capsule large, about .75-1 in. in diam.; leaves thinly coriaceous, elliptic-oblong, entire, 4-6 in. long, 2-2.5 in. broad; petals obovate, .3-.4 in. long, without or with obscure pits3. *grandiflorum*.

1. GLYPTOPETALUM ZEYLANICUM, Thw.; F. B. I. i. 612.

W. Gháts, Anamalai Hills and Hills of Tinnevely and Travancore at 2,000-3,000 ft.

A large shrub or small tree, with white hard wood.

2. GLYPTOPETALUM LAWSONII, Gamble in Kew Bull. 1916, 131.

W. Gháts, N. slopes of Nilgiris at low elevations (Wight, Lawson), Geddesala Ghát in Coimbatore (A.W. Lushington).

A large shrub or small tree, with prominently-nerved coriaceous leaves.

3. GLYPTOPETALUM GRANDIFLORUM, Bedd. Ic. t. 102; F. B. I. i. 613.

W. Gháts, in Sholas below Devala, S.-E. Wynaad, at 2,000-3,000 ft.

A large shrub with oblong entire leaves, large flowers on long peduncles and a large, pale, smooth, rounded, usually 4-seeded capsule.

3. Lophopetalum, Wight.

Trees or shrubs. *Leaves* opposite or alternate, exstipulate. *Flowers* rather large, hermaphrodite, in axillary or terminal dichasioid cymes. *Calyx* broadly flattened at the base; lobes 5, broad, obtuse, very short. *Petals* 5, continuous with the disk, persistent, the upper surface usually cristate or lamellate. *Disk* large, flat, 5-lobed. *Stamens* 5, inserted on the disk; filaments

subulate; anthers oblong. *Ovary* small, immersed in the disk and continuous with it, triquetrous; style short; stigma capitate; ovules 4 or more in each cell, in 2 series. *Fruit* a coriaceous 3-4-angled, 3-4-celled, loculicidal capsule. *Seeds* few or many, rarely winged, arillate; albumen fleshy; embryo small.

LOPHOPETALUM WIGHTIANUM, Arn.; F. B. I. i. 615; Wt. Ic. t. 162; Bedd. Fl. t. 145.

W. Ghâts, in evergreen forests and on river banks at low elevations and up to 3,000 ft., from S. Canara southwards.

A lofty evergreen tree, with oblong, entire, abruptly acuminate leaves up to 6 in. long, dull reddish flowers and capsule 4 in. long, sharply triangular in section; seeds thin, 2 in. long. Bark smooth, mottled brown and white; wood reddish-grey, close-grained, useful in carpentry, but not durable. Vern. *Tam.* Venkottei; *Mal.* Venkotta; *Kan.* Balpalé.

4. Microtropis, Wall.

Trees or shrubs, glabrous, evergreen. *Leaves* opposite, entire, exstipulate. *Flowers* in sessile clusters or peduncled dichasioid cymes, axillary or supra-axillary, sometimes unisexual. *Sepals* 5, imbricate, often unequal. *Petals* 5, more or less connate at the base with the back of the disk. *Disk* annular, sometimes 0. *Stamens* 5, inserted on the disk. *Ovary* free, ovoid or conical, imperfectly 2-3-celled; style short; stigma minutely 2-4-lobed; ovules 2 in each cell, collateral. *Fruit* an ovoid or oblong, 1-celled, 2-valved, 1-seeded capsule, surrounded at the base by the persistent calyx. *Seed* erect, oblong; testa more or less fleshy; albumen thickly fleshy; cotyledons foliaceous; radicle cylindric, inferior.

Flowers sessile, clustered at the axils of the leaves or of fallen leaves:—

Leaves scarcely coriaceous, elliptic or oblanceolate, obtusely acute at apex, long-attenuate at base, 1.5-4 in. long, 1-2 in. broad; flowers very small, in clusters under .3 in. in diam; capsule .5-.7 in. long; branchlets yellowish, youngest darker1. *Wallichiana*.
Leaves coriaceous, elliptic or somewhat oblanceolate, obtusely acute at apex, cuneate at base, margins reflexed, nerves prominent on lower less so on upper surface, 3-6 in. long, 1-2.5 in. broad; flowers small, in clusters about .5 in. in diam.; capsule oblong, .7-8 in. long; branchlets black-purple.....2. *Stocksii*.

Leaves very coriaceous, margins thickened; branchlets black-purple, rough :—

Leaves elliptic-ovate, acuminate at apex, cuneate to almost rounded at base, prominently rugulose above, the nerves obscure on both surfaces, 4-7 in. long, 2-4.5 in. broad; flowers small, in clusters .5-6 in. in diam.; capsule ellipsoid, .7 in. long 3. *latifolia*.

Leaves broadly elliptic or obovate, rounded or slightly emarginate at apex, rounded or subcordate at base, margins revolute, cucullate, slightly rugulose above, 2-5 in. long, 1-2.5 in. broad; flowers small, in clusters .6 in. in diam.; capsule cylindric when young, ellipsoid when old, channelled, .8 in. long

4. *ramiflora*.

Flowers in axillary or extra-axillary peduncled cymes; leaves more or less elliptic, obtuse :—

Peduncles very short, .3-.4 in. long, stout; cyme-branches short; leaves up to 3 in. long 1.5 in. broad; capsule narrowly oblong, .75 in. long. 5. *densiflora*.

Peduncles .6-1.5 in. long, slender :—

Leaves when dry olive-grey, usually under 2 in. long; petals orbicular, not clawed, scarcely adherent to the narrow disk; stamen-filaments short, anthers orbicular, large; seed testa rusty-brown (Wt.) 6. *microcarpa*.

Leaves when dry greenish-brown, dark above, pale beneath, usually 2-3 in. long; petals long-clawed, the claws adherent to the rather broad disk; stamen-filaments subulate, anthers ovoid; seed testa crimson (Wt.) 7. *ovalifolia*.

1. *MICROTROPIS WALLICHIANA*, Wt.; F. B. I. i. 613.

W. Gháts, Sampagi Ghát, Coorg (Beddome), evergreen forests of Travancore about 4,000 ft. (Bourdillon).

A small tree about 30 ft. high.

2. *MICROTROPIS STOCKSII*, Gamble in Kew Bull. 1916, 132.

W. Gháts, in Coorg (Hohenacker), Nilgiris, Anamalai Hills (Barber); Tinnevely Hills at 5,000 ft. (Beddome); Concan (Stocks).

A small tree with blackish branches and leaves pale and reticulate beneath.

3. *MICROTROPIS LATIFOLIA*, Wt.; F. B. I. i. 613.

W. Gháts, in Malabar, W. Nilgiris, Bolampatti Hills, at 2,000-6,000 ft.

A small tree of evergreen forests with very thick rugulose leaves, obscurely nerved.

4. *MICROTROPIS RAMIFLORA*, Wt. Ic. t. 977; F. B. I. i. 613.

W. Gháts, in Shola forests of the Nilgiris and Pulneys at 6,000–8,000 ft.

A moderate-sized tree, common about Ootacamund and Coonoor.

5. *MICROTROPIS DENSIFLORA*, Wt. Ic. t. 1052; F. B. I. i. 614.

W. Gháts, on the W. slopes of the Nilgiris, scarce.

6. *MICROTROPIS MICROCARPA*, Wt. Ic. t. 975; F. B. I. i. 614.

W. Gháts, common in Shola forests of the Nilgiris and Pulneys at 6,000–8,000 ft.

An evergreen shrub or small tree, with a grey, soft wood. Leaves usually small, but occasionally found up to 4 in. long by 2 in. broad.

7. *MICROTROPIS OVALIFOLIA*, Wt. Ic. t. 976; F. B. I. i. 614.

W. Gháts, in the Shola forests of the Nilgiris at 6,000–8,000 ft.

An evergreen shrub or small tree, closely allied to the preceding and hardly separable from it, but considered quite distinct by Wight.

5. *Kurrimia*, Wall.

Trees. Leaves alternate, glabrous, towards the end of the branchlets, nerves parallel as also the transverse nervules; stipules large, deciduous except at the terminal bud. Flowers hermaphrodite, in axillary, simple or paniculate, racemes. *Calyx* 5-lobed. *Petals* 5, spreading or recurved. *Disk* fleshy, entire or 5-lobed. *Stamens* 5, inserted under or on the margin of the disk; filaments subulate; anthers ovate, the cells opening by vertical slits. *Ovary* ovoid, seated on the disk, 2-celled; styles 2 (rarely 3), slender; stigmas small, capitate; ovules 2 in each cell, erect. *Fruit* a leathery deeply 2-lobed capsule, each lobe 2-valved, 1-seeded; one lobe frequently abortive. *Seeds* large, thick-stalked, covered completely or partially by a fleshy aril; testa coriaceous, smooth; albumen fleshy; cotyledons small, flattened; radicle inferior.

KURRIMIA INDICA, Gamble n. comb. *K. bipartita*, Lawson; F. B. I. i. 622. *Trochisandra indica*, Bedd. Fl. t. 120.

W. Gháts, in the Anamalai Hills and Hills of Tinnevely and Travancore, in evergreen forests, at 3,000–6,000 ft.

A very large tree with coriaceous conspicuously-nerved large leaves, pale yellow flowers and a capsule with 2 oblong equal (when both fertile) lobes 1.5 in. long. The wood is pale greyish-brown and moderately hard. Vern. *Tam.* Kadaplá.

6. *Celastrus*, Linn.

Climbing unarmed shrubs. *Leaves* alternate, entire or crenulate; stipules 0 or minute and deciduous. *Flowers* polygamous, in terminal or axillary racemes or panicles. *Calyx* 5-lobed, lobes imbricate. *Petals* 5, spreading. *Disk* broad, concave, 5-lobed. *Stamens* 5, inserted on the margin of the disk, in ♀ more or less rudimentary; filaments short; anthers oblong. *Ovary* in ♂ flowers rudimentary, conical, 3-lobed; in ♀ flowers globose, 3-celled; style short, thick; stigmas 3, recurved; ovules 2 in each cell, collateral, erect. *Fruit* a globose or ovoid, 1–3-celled, loculicidal capsule, 1–6-seeded. *Seeds* erect, enclosed in a fleshy aril; testa-chartaceous; albumen copious, fleshy; embryo erect with leafy cotyledons.

CELASTRUS PANICULATA, Willd.; F. B. I. i. 617; W. & A. 158; Wt. III. t. 72, Ic. t. 158.

In all Districts, chiefly in deciduous forests.

A large climbing shrub with ovate or obovate crenulate leaves, small white flowers in pendent panicles and yellow capsules opening to show the brown seeds covered with a scarlet aril. Vern. *Hind.* Malkagni; *Ur.* Korsano; *Kan.* Kariganne; *Tam.* Valuluvaí.

7. *Gymnosporia*, W. & A.

Shrubs or small trees, usually thorny. *Leaves* alternate, exstipulate. *Flowers* hermaphrodite, in axillary, solitary or fascicled dichotomous cymes, sometimes on the thorny branchlets. *Calyx* 4–5-lobed. *Petals* 4–5, spreading. *Disk* broad, lobed or sinuate. *Stamens* as many as petals, inserted below the disk; filaments slender; anthers broad. *Ovary* attached by a broad base to or sunk in the disk, 2–3-celled; style usually short; stigmas 3, capitate or spreading; ovules 2 in each cell. *Fruit* a globose or obovoid 2–3-celled 1–4-seeded capsule. *Seeds* usually arillate,

rarely exarillate; testa coriaceous; albumen fleshy; cotyledons foliaceous; radicle inferior.

Aril of seed thin, membranous:—

Aril embracing about half of the seed or more, sometimes 0; leaves obovate, obtuse, minutely crenate, grey when dry; flowers minute, in cymes under 1 in. long; capsules globose, .2 in. in diam.

1. *montana*.

Aril usually embracing nearly the whole seed; leaves ovate-lanceolate, obtusely acute, minutely crenate-serrate, reddish when dry; flowers rather large, in capillary cymes about 1 in. long fascicled on the branches; capsules obovoid; .3 in. in diam. 2. *rufa*.

Aril of seed fleshy, embracing only the base of the seed:—

Leaves lanceolate, acuminate, up to 6 in. by 2 in.; capsule obcordate, .3 in. by .4 in. 3. *acuminata*.

Leaves ovate, obtusely acute, up to 4 in. by 2.5 in.:—

Flowers large, in panicled cymes up to 4 in. long; capsule slightly obcordate, nearly .5 in. long; leaves serrate, cuneate at base

4. *Heyneana*.

Flowers very small. Cymes up to 1.5 in. long; capsule obovoid, .4–.5 in. long; leaves crenulate, reticulate, rounded or subcordate

5. *ovata*.

Leaves obovate, entire, emarginate, 1–2 in. long; flowers very small, in fascicles .5 in. long; capsule pale, slightly obcordate, .3 in. long]..... 6. *emarginata*.

Aril flat, very small, attached to the base of the seed; leaves obovate, obtuse or emarginate, crenate, cuneate at base; flowers small, in fascicles of cymes under 1 in. long; capsule large, slightly obcordate, .5 in. long..... 7. *Wallichiana*.

1. GYMNOSPORA MONTANA, Benth.; F. B. I. i. 621. *Celastrus montana*, W. & A. 159; Wt. Ic. t. 382.

N. Circars and Deccan, common in dry forests; N. slopes of Nilgiris.

A small tree or large shrub with prominent straight thorns often bearing leaves and flowers. Wood light reddish-brown, close-grained. Vern. *Hind.* Baikal; *Tel.* Danti; *Kan.* Tandrasī.

2. GYMNOSPORA RUFa, Lawson; F. B. I. i. 620.

E. Ghâts, in Ganjam and Vizagapatam, up to 4,500 ft. on Mahendragiri; Hills of N. Coimbatore.

A small tree with few straight thorns and red close-grained wood.

3. GYMNOSPORIA ACUMINATA, Hook. f.; F. B. I. i. 619.
 E. Gháts, Mahendragiri Hill in Ganjam at 4,500 ft. (Gamble); Hills of Vizagapatam at 3,500-4,500 ft. (A. W. Lushington).
 A large shrub with small straight sharp thorns and rather thin leaves.
4. GYMNOSPORIA HEYNEANA, Lawson; F. B. I. i. 620.
Celastrus Heyneana, W. & A. 159.
 W. Gháts, in N. Nilgiris, Pulneys and Travancore Hills, in dry deciduous forest.
 A shrub with rather large leaves, rather large flowers, and few straight stout thorns. Vern. *Tam.* Nandunarai.
5. GYMNOSPORIA OVATA, Lawson; F. B. I. i. 619, *Celastrus ovata*, Wall.; W. & A. 159.
 W. Gháts, in the Nilgiri and Pulney Hills at 3,000-6,000 ft., most frequent in Nilgiris, N. slopes.
 An unarmed shrub with coriaceous, ovate or orbicular leaves and very small flowers, in dense fascicles 5 to 1.5 in. long.
6. GYMNOSPORIA EMARGINATA, Lawson; F. B. I. i. 621.
Celastrus emarginata, Willd.; W. & A. 160.
 N. Circars, Deccan and Carnatic, in dry deciduous forests, often on laterite, extending west to the slopes of the Nilgiris and Anamalais.
 A shrub with pale leaves, long straight thorns frequently bearing leaves and flowers, whitish-grey bark and white hard wood. Vern. *Ur.* Gouro kosai; *Tel.* Chinta.
7. GYMNOSPORIA WALLICHIANA, Lawson; F. B. I. i. 621.
Celastrus Wallichiana, W. & A. 159.
 Deccan, in Mysore (G. Thomson); S. Carnatic, in the Tinnevely Hills (Wight, Barber, Fischer).
 A shrub with zigzag branches and long straight thorns frequently bearing leaves and flowers.

8. Pleurostylia, W. & A.

Shrubs or small trees. *Leaves* opposite, entire, coriaceous, exstipulate. *Flowers* in axillary few-flowered cymes. *Calyx* 5-lobed, very small. *Petals* 5. *Disk* thick, crenulate. *Stamens* 5, attached below the margin of the disk; filaments short, flat; anthers with the connective broad at the back. *Ovary* half

immersed in the disk, 1-2-celled; style short, thick; stigma broad, peltate; ovules 2 in each cell, collateral. *Fruit* indehiscent, 1-2-celled, marked on one side by the remains of the style. *Seed* 1, rarely 2, erect, covered by the arillus-like testa; albumen fleshy; cotyledons flat; radicle inferior.

PLEUROSTYLIA WIGHTII, W. & A. 157; F. B. I. i. 617; Wt. Ic. t. 155. *P. Heynei*, W. & A. 157.

N. Circars, in dry forests of Vizagapatam and Godavari; Deccan, in Cuddapah, Mysore and Coimbatore; W. Ghâts, in the drier forests of N. Nilgiris, Travancore and Tinnevely.

A small evergreen tree with small somewhat obovate leaves, minute flowers and small white ovoid fruit. Bark grey, tessellated in small squares; wood light red or greyish, hard, used in Cuddapah to make combs. Vern. *Tām. Chiru piyari*, Karuvali; *Tel. Piyari*.

9. *Elaeodendron*, Jacq. f.

Trees or shrubs. *Leaves* opposite or subopposite, entire or crenate; stipules minute, caducous. *Flowers* hermaphrodite, sometimes polygamous, in axillary dichasioid corymbose cymes. *Calyx* 5-lobed; lobes often unequal, imbricate. *Petals* 5, spreading. *Disk* thick, cushion-like, margin sinuate. *Stamens* 5, inserted into the margin of the disk; filaments slender, at length recurved; anthers subglobose. *Ovary* adnate to the disk, conical, 2-5-celled; style short; stigma small; ovules 2 in each cell. *Fruit* an indehiscent drupe, dry or succulent; stones 1-3-celled, cells 1, rarely 2-seeded. *Seeds* erect, exarillate; testa membranous or spongy; albumen 0; cotyledons thick, fleshy; radicle inferior.

Leaves ovate or elliptic, sometimes obovate, obtuse or acute, usually pale grey when dry, entire or shallowly crenate; flowers .25 in. in diam. in slender cymes usually under 2 in. long, sometimes 3 in.

1. *glaucum*.

Leaves lanceolate or oblanceolate, obtusely acuminate, reddish-brown or almost black when dry, broadly and deeply crenate; flowers .4 in. in diam. in rather stout cymes usually 4 in. long 2. *paniculatum*.

1. *ELAEODENDRON GLAUCUM*, Pers.; F. B. I. i, 623 *in part*. *E. Roxburghii*, W. & A. 157; Wt. Ill. t. 71; Bedd. Fl. t. 148.

Deciduous forests in most forest Districts of N. Circars, Deccan and Carnatic, also on W. Coast.

A graceful tree with a grey bark and light brown close-grained wood, useful for cabinet work. Vern. *Hind.* Jamrási; *Tel.* Nirija; *Tam.* Karuváli.

2. *ELAÉODENDRON PANICULATUM*, W. & A. 157. *E. glaucum*, Pers. F. B. I. i. 623 *in part*.

W. Gháts, N. slopes of Nilgiri and Anamalai Hills up to 3,000 ft.

A large tree.

Family XLY. HIPPOCRATEACEAE.

Small trees or erect or climbing shrubs. *Leaves* opposite or alternate, simple, somewhat coriaceous. *Flowers* usually very small, in axillary dichotomous cymes. *Calyx* 5-lobed, lobes imbricate. *Petals* 5, inserted under the disk, imbricate or valvate. *Disk* fleshy, cupshaped, sometimes ringed at the base. *Stamens* 3, inserted on or within the top of the disk, at first erect, then recurved. *Ovary* more or less sunk in the disk, 3-celled; style 1; stigmas 1-3; ovules 2 or more in each cell, on an axile placenta. *Fruit* of samaroid carpels or fleshy and 1-3-celled. *Seeds* usually many, often angular, sometimes winged; albumen 0; embryo straight; cotyledons fleshy.

Fruit samaroid, flattened, dehiscent, the seeds winged below

1. **Hippocratea.**

Fruit globose, indehiscent, seeds not winged.....2. **Salacia.**

1. *Hippocratea*, Linn.

Climbing shrubs. *Leaves* opposite, petioled, more or less crenate-serrate; stipules small, caducous. *Flowers* in axillary, rarely terminal, cymes or panicles, white or greenish. *Calyx* small, 5-lobed. *Petals* 5, spreading, imbricate or valvate. *Disk* cylindric or cuplike. *Stamens* 3, at first erect, then recurved, inserted on or within the top of the disk; filaments dilated at base; anthers 2-celled, cells opening transversely. *Ovary* 3-celled, sunk in the disk; style short; stigmas 1-3; ovules 2-seriate, 2-10 in each cell, on the inner angle. *Fruit* of three flattened carpels, connate below, each 2-valved or indehiscent. *Seeds* compressed, usually winged below; albumen 0; embryo with fleshy connate cotyledons; radicle inferior.

Flowers .3-.5 in. in diam. :—

Petals triangular lanceolate, *valvate*; leaves under 4 in. long :—

Petals not mucronate at back, glabrous within; leaves sub-coriaceous, elliptic-ovate or -obovate, attenuate at base, margins not recurved; samaras obovate, emarginate, striate, 1.5-2 in. long, broad.....1. *obtusifolia*.

Petals mucronate at back, puberulous within; leaves coriaceous, oblong, rounded at base, margins recurved; samaras not yet known 2. *Bourdillonii*.

Petals orbicular, with a narrow claw, imbricate; leaves coriaceous, elliptic, up to 7 in. long; samaras oblanceolate, narrow, obtuse, striate, up to 3 in. long 3. *Arnottiana*.

Flowers .2 in. in diam.; leaves membranous, under 2 in. long; samaras 1.5 in. long, narrow, acute 4. *indica*.

1. HIPPOCRATEA OBTUSIFOLIA, Roxb.; F. B. I. i. 623; W. & A. 104.

E. Coast, from Nellore to Tanjore in sandy forest tracts; Deccan, in dry forests of Cuddapah and Kurnool, extending to E. slopes of Nilgiri and Pulney Hills; W. Coast, scarce.

A climbing shrub with corky bark and wood of peculiar structure. Vern. *Mar. Danshir*.

2. HIPPOCRATEA BOURDILLONII, Gamble in Kew Bull. 1916, 132.

Travancore, near Colatoorpolay, 300 ft. (Bourdillon).

A climbing shrub.

3. HIPPOCRATEA ARNOTTIANA, Wt. Ill. t. 46-47; F. B. I. 624.

W. Coast and W. Gháts forests from S. Canara to Malabar and Travancore.

A climbing shrub with rather large leaves and long, narrow samaras, at once recognized by the orbicular clawed petals.

4. HIPPOCRATEA INDICA, Willd.; F. B. I. i. 624; Roxb. Cor. Pl. ii. 130; W. & A. 104.

N. Circars, in Vizagapatam; Carnatic, in S. Arcot and Tanjore; E. slopes of W. Gháts, in Coimbatore, Madura and Tinnevely.

A climbing shrub with rather small leaves and small fruit samaras.

2. *Salacia*, Linn.

Small trees or climbing or sarmentose shrubs. *Leaves* opposite, rarely alternate, exstipulate. *Flowers* small, axillary or extra-axillary, in fascicles or cymes. *Calyx* small, 5-lobed. *Petals* 5, imbricate. *Disk* thick, broad. *Stamens* 3, inserted on the inner margin of the disk; filaments at length recurved; usually broadened at base. *Ovary* conical, more or less sunk in the disk, 3-celled; style very short; stigma capitate or 3-lobed; ovules 2-8 in each cell in 1-2 series. *Fruit* an indehiscent 1-3-celled berry; rind usually coriaceous. *Seeds* large, angular; testa thick; albumen 0; cotyledons thick, usually conferruminate; radicle inferior.

Flowers fascicled on axillary tubercles; ovary enclosed in the disk; anther-cells dehiscing transversely:—

Calyx-lobes not fringed:—

Petals clawed at the base; pedicels .15-.2 in. long; branchlets more or less angled; leaves elliptic-lanceolate, crenate-serrate, up to 3 in. long; fruit small..... 1. *prinoides*.

Petals broad at the base; branchlets more or less prominently lenticellate, terete:—

Pedicels .25 in. long; petals .15 in. long, thick; calyx-lobes short, obtuse; leaves coriaceous, ovate- or obovate-oblong, reticulate, 2.5 to 3.5 in. long by 1.5-2 in. broad; fruit large, tuberculate..... 2. *reticulata*.

Pedicels .5 in. long; petals .1 in. long, with white margins; calyx-lobes short, ovate; leaves chartaceous, oblong, 4-6 in. long by 1.5-2 in. broad..... 3. *malabarica*.

Calyx-lobes fringed; pedicels very short; branchlets lenticellate; leaves coriaceous:—

Leaves elliptic-oblong or -ovate, 2-3 in. long by 1.5 in. broad, main nerves irregular, oblique; calyx-lobes shortly fringed; fruit large, smooth..... 4. *macrocarpa*.

Leaves elliptic oblong, 5-6 in. long by 2-2.5 in. broad, main nerves regular, nearly horizontal; calyx-lobes long and prominently fringed..... 5. *Beddomei*.

Flowers in axillary pedunculate heads or branching cymes; anther-cells dehiscing longitudinally:—

Peduncles very short; ovary elongate, conical, much exsert from the disk; leaves elliptic-oblong or -oblanceolate, yellowish when dry; calyx-lobes entire; fruit large, tuberculate..... 6. *oblonga*.

Peduncles elongate, slender; cymes up to 5 in. long, often much branched, many-flowered; ovary rounded, partly exsert from the disk; calyx-lobes minutely ciliate; petals usually with white margins; leaves ovate or lanceolate, obtusely acuminate, 2-4 in. long by 1-2 in. broad, greyish when dry; branchlets rough

7. *fruticosa*.

1. SALACIA PRINOIDES, DC. ; F. B. I. i. 626; W. & A. 105.
Hills of the N. Circars in Ganjam and Vizagapatam.
A straggling shrub.
2. SALACIA RETICULATA, Wt. Ill. i. 134; F. B. I. i. 627.
W. Coast, at Quilon in Travancore.
A climbing shrub with large tuberculate fruit.
3. SALACIA MALABARICA, Gamble in Kew Bull. 1916, 133.
W. Coast, S. Canara to Travancore, in the plains, in moist forest.
A large climber.
4. SALACIA MACROSPERMA, Wt. Ic. t. 962; F. B. I. i. 628.
W. Gháts, in Wynaad and W. Nilgiris, up to 5,000 ft.
A rambling shrub.
5. SALACIA BEDDOMEI, Gamble in Kew Bull. 1916, 133.
W. Gháts, in the Anamalais (Beddome).
6. SALACIA OBLONGA, Wall.; F. B. I. i. 628; W. & A. 106;
Wt. Ill. t. 47B, Ic. t. 97.
W. Gháts, from the Nilgiris to Tinnevely, E. slopes, up to 3000 ft.
A climbing shrub or small tree.
7. SALACIA FRUTICOSA, Lawson; F. B. I. i. 628.
W. Gháts, in almost all Districts from S. Canara to Travancore and up to 4,000 ft., in evergreen forest.
A climbing shrub.

Family XLVI. RHAMNACEAE.

Trees or shrubs, erect or climbing; branches sometimes thorny, sometimes bearing tendrils. Leaves simple, alternate subopposite or opposite, usually coriaceous, often 3-5-ribbed; stipules small or 0, sometimes changed into prickles. Flowers hermaphrodite or polygamous, small, greenish, in lax or dense axillary cymes, solitary or disposed in spikes or panicles. Calyx 4-5-lobed, the lobes triangular, valvate, usually keeled within. Petals 4-5

rarely 0, inserted on the throat of the calyx-tube and shorter than its lobes, cucullate, often clawed. *Disk* fleshy and filling the calyx-tube or membranous and lining it, glabrous or tomentose. *Stamens* as many as and opposite to the petals, often enclosed within them; anthers 2-celled, dehiscing longitudinally, rarely laterally. *Ovary* sessile, free or immersed in the disk, 3- rarely 2- or 4-celled; style short, simple or 2-4-lobed; stigmas terminal, usually capitate. *Fruit* superior or inferior, 3-, rarely 4-celled, free or girt more or less by the adnate calyx-tube, capsular or a dry or fleshy drupe, sometimes winged. *Seeds* solitary in each cell, erect, usually compressed; albumen fleshy, scanty or rarely 0; embryo large, the cotyledons flat.

Fruit superior or only partly enclosed in the calyx-tube:—

Fruit 1-seeded, the style enlarged in a linear-oblong wing; unarmed climbing shrubs; seeds exalbuminous.....1. **Ventilago**.

Fruit a dry or fleshy drupe with 1-4-seeded stone; armed or unarmed trees or shrubs with 3-5-ribbed leaves; seeds with scanty albumen or none.....2. **Zizyphus**.

Fruit baccate with 2-4 pyrenes; seeds albuminous, the albumen often thin:—

Disk thin, lining the calyx-tube; trees or shrubs usually unarmed, leaves alternate.....3. **Rhamnus**.

Disk fleshy, filling the calyx-tube; leaves opposite or sub-opposite:—

Glabrous shrub with many sharp hooked thorns and small coriaceous shining leaves; flowers in axillary fascicles or umbels.....4. **Scutia**.

Straggling, more or less pubescent, shrubs with few but often large thorns; leaves rather large, chartaceous; flowers in spicate panicles.....5 **Sageretia**.

Fruit when ripe capsular; leaves alternate; unarmed, erect or sarmentose shrubs; flowers in short axillary cymes...6. **Colubrina**.

Fruit inferior, crowned with the persistent calyx; climbing shrubs with tendrils:—

Fruit of 3 winged indehiscent mericarps; flowers in spikes or racemes; disk lobed between the stamens.....7. **Gouania**.

Fruit of 3 ovoid dehiscent cocci; flowers in axillary pedunculate umbels; disk merely angular.....8. **Helinus**.

1. *Ventilago*, Gaertn.

Climbing shrubs. *Leaves* alternate, bifarious, usually crenate; stipules very small, caducous. *Flowers* small, in axillary or terminal panicles, rarely fascicles; bracteoles many, small. *Calyx* 5-lobed; lobes spreading, keeled within. *Petals* 5, deltoid or obcordate, cucullate. *Stamens* 5, adnate to the base of the petals and opposite to them; connective of anthers thickened and produced above. *Disk* flattened, 5-angled. *Ovary* sunk in the disk, 2-celled; style very short; stigmas 2, short; ovules solitary in each cell. *Fruit* a subglobose, 1- (rarely 2-) seeded nut, prolonged above by the style enlarged in a linear-oblong coriaceous wing, ending in the remains of the stigmas, the base more or less enclosed in the adherent calyx-tube. *Seed* subglobose; testa thin; albumen 0; cotyledons thick, fleshy.

Flowers in axillary and subterminal panicles :—

Calyx-tube adnate to the lower part of the nut :—

Branchlets stout, grey-puberulous; leaves ovate or elliptic-ovate, usually unequally rounded at base, 3-6 in. long by 1.5-3 in. broad; panicles dense, flowers rather large, disk villous; nut and its wing yellow-pubescent, the calyx-tube covering more than half the nut.....1. *calyculata*.

Branchlets rather slender, minutely puberulous; leaves oblong-lanceolate, subobtuse, attenuate at base, 2-3 in. long by about 1 in. broad; panicles slender, flowers small, disk glabrous or nearly so; nut and its wing greyish, the calyx-tube covering about one-third of the nut.....2. *Goughii*.

Calyx-tube adnate only to the base of the nut; disk glabrous or nearly so :—

Branchlets slender, usually pale; leaves ovate or ovate-lanceolate, obtuse or acute, 1.5-3.5 in. long by 1-1.5 in. broad; panicles minutely grey-pubescent, flowers small; nut with grey nearly glabrous wing, the calyx-tube small, adnate to the base of the nut.....3. *maderaspatana*.

Branchlets stout, dark; leaves oblong-lanceolate, long-acuminate, strongly crenate, 2.5-4 in. long, by 1-1.5 in. broad; panicles long-golden-villous pubescent, flowers very small; nut with brown tomentose wing, the calyx-tube saucer-like, embracing the base of the nut.....4. *lanceolata*.

Flowers in axillary fascicles; branchlets slender, pubescent; leaves oblong, 1.5-4.5 in. long by 0.5-1.5 in. broad; disk slightly villous;

calyx-tube saucer-like, embracing the base of the nut, wings with golden-velvety pubescence.....5. *bombaiensis*.

1. *VENTILAGO CALYCVLATA*, Tul.; F. B. I. i. 631. *V. maderasputana* var. β ; W. & A. 164.
N. Circars, from Ganjam to Godavari in forest tracts; Deccan, in Kurnool forests; W. Coast, in dry forests of Malabar and E. Nilgiris.
A large and conspicuous forest climber. Vern. Tel. Surati chekka.
2. *VENTILAGO GOUGHII*, Gamble in Kew Bull. 1916, 134.
W. Gháts in Coorg and Nilgiris (Gough, Lawson).
A climbing shrub.
3. *VENTILAGO MADERASPUTANA*, Gaertn.; F. B. I. i. 631; Wt. Ic. t. 163; W. & A. 164, var. α .
Deccan forests from Kistna to Mysore and Coimbatore; W. Gháts, chiefly on E. slopes.
A climbing slender shrub. The root bark gives a dye. The leaves are very variable in shape, but always distinguishable from those of *V. calyculata* both in size and venation. Vern. Tel. Surati chekka; Tam. Vempadam.
4. *VENTILAGO LANCEOLATA*, Gamble in Kew Bull. 1916, 134.
W. Gháts, in Malabar and Tinnevely (Barber, Lawson).
A climbing shrub with nearly black branches.
5. *VENTILAGO BOMBAIENSIS*, Dalz.; F. B. I. i. 631; Bedd. Ic. t. 114 (under *Zizyphus wynadensis*, Bedd. corrected in Index p. iii).

Moist woods in Wynaad at 3,000 ft. (Beddome).

2. *Zizyphus*, Juss.

Trees or erect or climbing shrubs, usually armed with sharp straight or hooked thorns, which are transformed stipules, thorns solitary or in pairs, usually one straight, the other curved. Leaves alternate, subdistichous, 3-5-ribbed. Flowers small, greenish or yellowish, in axillary fascicles or in sessile or peduncled cymes. Calyx with broadly obconic tube and 5 triangular acute lobes keeled within, lobes valvate. Petals 5, or rarely 0, cucullate, deflexed. Stamens 5, opposite to and enclosed in the petals and usually longer than them. Disk 5-10-lobed, flat or pitted, the margin free. Ovary sunk in or adnate at the

base to the disk, 2-4-celled; styles 2-3, rarely 4, free or connate; stigmas small, papillose. *Fruit* a globose or oblong drupe, with a woody or bony 1-4-celled and -seeded stone. *Seed* plano-convex; albumen 0 or scanty; cotyledons thick; radicle short.

Petals 5; stone hard and thick, more or less rugose:—

Styles 2; flowers in fascicles or sessile or short-peduncled cymes:—

Erect trees or shrubs:—

Armed:—

Small tree, usually with short thick bole and rounded head; leaves ovate-elliptic, up to 2.5 in. long by 1.5 in. broad, fuscous-tomentose beneath; disk grooved; drupe oblong or globose over .5 in. in diam.....1. *Jujuba*.

Low much-branched shrubs; drupe about 3 in. in diam.:—

Leaves fuscous-tomentose beneath, up to 1.5 in. in diam.; disk grooved; both straight and recurved thorns strong

Jujuba var. *fruticosa*.

Leaves grey-pubescent on both sides, .5-.75 in. in diam.; disk pitted; both straight and recurved thorns slender

2. *nummularia*

Unarmed tree; leaves elliptic, obtuse or slightly acute, glabrous or pubescent on nerves beneath and petiole; disk not pitted or grooved; fruit globose, yellow.....3. *trinervia*.

Very thorny large climber; leaves ovate-lanceolate, acute, 1-2.5 in. long, very oblique at base, silky-pubescent; drupe .25 in. in diam.; disk pitted.....4. *Oenoplia*.

Styles 3; flowers in pedunculate cymes; disk smooth:—

Small tree or straggling shrub, armed or unarmed; leaves usually suborbicular, reticulate and pubescent beneath; drupes globose, grey-tomentose or nearly glabrous, sometimes acute at apex.....5. *Xylopyrus*.

Low shrub with sharp thorns on broad bases; leaves small, glabrous except on nerves beneath; drupes globose, glabrous, the stones rugose.....6. *horrida*.

Petals 0; styles 2; erect small tree or climbing shrub; flowers in pedunculate cymes making panicles on terminal branchlets; leaves large, elliptic, cordate; thorns usually solitary, recurved; drupe

1. rarely 2-celled, stone crustaceous not rugose; disk smooth

7. *rugosa*.

1. ZIZYPHUS JUJUBA, Lamk.; F. B. I. i. 632; W. & A. 162; Wt. Ic. t. 99; Brand. For. Fl. t. 17.

In all dry Districts, wild in deciduous dry forests and

cultivated in and near villages and thence run wild on waste lands.

A low much-branched thorny tree with erect often thick stem and rounded head, the leaves suborbicular, fulvous-tawny beneath. Bark dark grey, nearly black, with irregular cracks. Wood hard, reddish, tough and strong, in regular use for saddle-trees and many other purposes and a good fuel. The fruit is edible. Vern. *Hind.* Bér; *Ur.* Borokoli; *Tel.* Bengha; *Tam.* Yellande, Ilantha; *Kan.* Yelchi; *Mal.* Cherumali.

Var. *fruticosa*, Haines, a shrub with small leaves, smooth very thorny branches and small fruit. Much used for fencing purposes.

Circars, Deccan and Carnatic, from Godavari to Tinnevely, chiefly on stony waste lands.

2. *ZIZYPHUS NUMMULARIA*, W. & A. 162; F. B. I. i. 633.

Deccan and Carnatic, in dry stony scrub forests, common on black cotton soil.

A small shrub with small leaves, divaricating very thorny zigzag branches and small fruit. The stems are cut for fencing purposes.

3. *ZIZYPHUS TRINERVIA*, Roxb. *Z. glabrata*, Wt. Ic. t. 282; W. & A. 162; F. B. I. i. 633.

W. Gháts on the E. side, in Coimbatore, Nilgiris and Anamalais to S. Travancore at low elevations, in dry localities.

A small unarmed tree up to 30 ft. high with a hard olive-brown wood. Vern. *Tam.* Kottei, Karukava; *Mal.* Karkala.

4. *ZIZYPHUS OENOPLIA*, Mill.; F. B. I. i. 634; W. & A. 163.

Almost all Districts, especially in dry forest localities and open bushy places.

A large, very thorny, straggling or climbing shrub. The branches are used in fencing, and the small black fruits are pleasant to eat. Vern. *Hind.* Makoh; *Ur.* Barokoli; *Tel.* Paranu, Pariki; *Tam.* Kottei; *Mal.* Múlli.

5. *ZIZYPHUS XYLOPYRUS*, Willd.; F. B. I. i. 634; W. & A. 162.

Almost all Districts in dry deciduous forests.

A large straggling shrub or small tree with globose,

velvety, sometimes nearly glabrous, fruit and 3-celled hard nut. The leaves are very white woolly when young but nearly glabrous when old. Wood reddish-brown, hard, similar to but not quite so good as that of *Z. Jujuba*. Vern. *Hind.* Kathér; *Ur.* Goto; *Tel.* Got; *Tam.* Kottei; *Mal.* Kotta.

Var. *acuta*, Gamble. Leaves ovate-acuminate, 3-3.5 by 1.5-2 in., very unequal at base. Berry ovoid, acute at apex, .75 in. long, velvety.

Upper Godavari Forests (Gamble).

6. *ZIZYPHUS HORRIDA*, Roth; F. B. I. i. 636; W. & A. 163.

Deccan, in Kurnool and Mysore in dry forests and scrub lands.

A shrub with very thorny branches, occasionally a small tree, the thorns with very broad bases. Leaves sub-orbicular, ovate or elliptic, serrate, nearly glabrous.

7. *ZIZYPHUS RUGOSA*, Lamk.; F. B. I. i. 636; W. & A. 162; Wt. Ic. t. 339.

All Forest Districts and up to 6,000 ft. in the W. Gháts, chiefly in dry deciduous forest localities.

A large straggling thorny shrub or small tree with large elliptic usually cordate leaves, paniculate flowers and small fruit. Wood reddish, moderately hard. Vern. *Hind.* Suran; *Ur.* Chunu koli; *Tam.* Charai; *Mal.* Thodali.

3. *Rhamnus*, Linn.

Small trees or shrubs. Leaves alternate, rarely subopposite, penninerved; stipules small, deciduous. Flowers hermaphrodite or polygamous, in axillary fascicles or in simple or compound racemes. Calyx-tube urceolate, lobes 4-5, keeled within. Petals 4-5 or 0, flat or cucullate. Disk lining the calyx-tube, the margin thin. Stamens as many as and opposite to the petals; filaments short; anthers oblong, in ♀ flowers very small. Ovary free, globose or ovoid, 3-4-celled; styles distinct or somewhat connate; stigmas small, papillose. Fruit a fleshy berry-like drupe, seated on the persistent calyx-tube; pyrenes 2-4, crustaceous. Seed obovoid; testa membranous or crustaceous; albumen fleshy; cotyledons flat, recurved at the margins; radicle short.

Branchlets ending in spines; flowers usually 4-merous, long-pedicel-

late, fascicled in the axils of the also usually fascicled membranous leaves; drupe 1-2-celled1. *virgatus*. Branchlets without spines; flowers 5-merous, short-pedicelled, in cymes or racemes; leaves not fascicled; drupe 3-celled:—

Leaves subcoriaceous, ovate-oblong, closely serrate, usually acute at base, nerves prominent, about 8 pairs.....2. *Wightii*.

Leaves chartaceous, elliptic-oblong, distantly crenate-serrate, usually rounded at base, nerves hardly prominent, about 6 pairs

3. *nepalensis*.

1. *RHAMNUS VIRGATUS*, Roxb. *R. dahuricus* var. *hirsutus*, Lawson; F. B. I. i. 639. *R. hirsutus*, W. & A. 165.

W. Gháts, in the Nilgiris, Pulneys and the Hills of Tinnevely at 5,000–7,000 ft.

A shrub or small tree of forest undergrowth with leaves usually small but sometimes reaching 3 in. in length.

2. *RHAMNUS WIGHTII*, W. & A. 164; Wt. Ic. t. 159; F. B. I. i. 639.

W. Gháts in the Nilgiri and Pulney Hills, up to 7,000 ft.

A large shrub.

3. *RHAMNUS NEPALENSIS*, Lawson; F. B. I. i. 640.

E. Gháts, Mahendragiri Hill in Ganjam, 4,500 ft. (Gamble), Madgol Hills of Vizagapatam at 3,000 ft. (A. W. Lushington).

A large shrub.

4. *Scutia*, Commers.

Glabrous shrubs, usually armed with sharp-hooked thorns which are abortive branchlets, from the leaf-axils. Leaves opposite or subopposite, coriaceous, penninerved. Flowers hermaphrodite, small, in axillary fascicles or short-peduncled umbels. Calyx-tube turbinate; lobes 5, ovate, acute, thickened at the apex. Petals 5, clawed, emarginate, flat or cucullate. Disk adnate to the calyx-tube, cupshaped, the margin free, undulate. Stamens 5, as long as the petals. Ovary ovoid or globose, sunk in the disk, 2-4-celled; style short; stigmas 2-4, papillose. Fruit obovoid or subglobose, dry or slightly fleshy, girt at the base by the persistent calyx-tube; pyrenes 2-4, crustaceous, compressed; seeds compressed; testa membranous; albumen thin or 0; cotyledons plano-convex, fleshy.

SCUTIA MYRTINA, Kurz. *S. indica*, Brongn.; F. B. I. i. 640; W. & A. 165; Wt. Ill. i. t. 73. *S. Rheediana*, Wt. Ic. t. 1071.

N. Circars, Deccan and Carnatic, in dry deciduous and scrub forest; W. Gháts, on eastern slopes and up to 6,000 ft.

A straggling thorny shrub with small orbicular or obovate coriaceous shining leaves. The branches are cut for making dry hedges. Vern. Tel. Gariki; Tam. Tuvadi.

5. Sageretia, Brongn.

Straggling or climbing shrubs, usually armed with thorns which are frequently recurved, branches opposite or subopposite. Leaves subopposite, penninerved; stipules minute, deciduous. Flowers hermaphrodite, very small, sessile in fascicles along terminal leafy or leafless thyrsoid branches. Calyx-tube hemispheric; lobes 5, acute, keeled within. Petals 5, clawed, cucullate. Stamens 5, about equalling the petals. Disk cupshaped, filling the calyx-tube, margin free, 5-lobed. Ovary free, enclosed by the disk, 3-celled; style short, 3-grooved; stigmas 3, capitate. Fruit globose, 3-celled and -seeded, indehiscent; pyrenes 3, flattened. Seeds orbicular; testa crustaceous; albumen thin; cotyledons flat, leafy, obcordate.

Thorns few, straight, short; leaves ovate-lanceolate, gradually shortly acuminate, 2-4 in. long, 1-1.5 in. broad, main nerves about 6 pairs; thyrses slender 1. *parviflora*.

Thorns frequent, recurved, long; leaves elliptic-oblong, abruptly acuminate, 3-6 in. long, 1.5-2.5 in. broad, main nerves 8-10 pairs; thyrses rather stout 2. *hamosa*.

1. SAGERETIA PARVIFLORA, G. Don. *S. oppositifolia*, Brongn.; F. B. I. i. 641 in part. *Berchemia parviflora*, W. & A. 163.

N. Circars, Mahendragiri Hill in Ganjam, 4,500 ft., Rekapalle in Godavari; Deccan, on Hills, as on Horsleykonda, 4,500 ft., in Cuddapah, also in Mysore and Coimbatore; W. Gháts, N. and E. slopes of Nilgiris up to 6,000 ft.

2. SAGERETIA HAMOSA, Brongn.; F. B. I. i. 641.

W. Gháts, in the Nilgiri and Pulney Hills at 6,000-7,000 ft.

6. Colubrina, L. C. Rich.

Erect or sarmentose shrubs, unarmed. Leaves alternate, petioate; stipules small, deciduous. Flowers in very short axillary

cymes. *Calyx*-tube hemispheric, lobes 5, keeled within. *Petals* 5, inserted below the disk, clawed, cucullate. *Disk* fleshy, 5-angled, filling the calyx-tube. *Stamens* 5, enclosed within the petals; filaments filiform. *Ovary* subglobose, sunk in the disk, 3-celled; style 3-cleft; stigmas obtuse, papillose. *Fruit* a 3-celled subglobose drupe, surrounded below the middle by the remains of the calyx-tube, later on capsular, loculicidally dehiscing, cells 1-seeded. *Seeds* obovoid compressed; testa coriaceous; albumen thin; cotyledons suborbicular, cordate, flattened.

Glabrous shrub; leaves ovate, obtusely acuminate at apex, rounded or cordate at base, 1.5-3 in. long, 1-2 in. broad; cymes slender

1. *asiatica*.

Large shrub with young branches, young leaves and inflorescence golden-pubescent; leaves oblong-lanceolate, acuminate at apex, rounded at base, 3-6 in. long, 1.5-2.5 in. broad; cymes rather stout

2. *travancorica*.

1. COLUBRINA ASIATICA, Brongn.; F. B. 1. i. 642; W. & A. 166; Wt. III. i. t. 74.

Coimbatore District (Beddome), often planted, especially near the coast.

2. COLUBRINA TRAVANCORICA, Bedd. Ic. t. 188; F. B. I. i. 643. E. Coast, in Travancore (Wight, Bedd., Bourdillon).

7. *Gouania*, Linn.

Unarmed shrubs, climbing by means of tendrils on the branchlets and at the base of the inflorescence. *Leaves* alternate, penninerved, petiolate; stipules lanceolate, deciduous. *Flowers* small, polygamous, in fascicles in interrupted axillary or terminal spikes or racemes. *Calyx*-tube short, obconic; lobes 5. *Petals* 5, inserted below the margin of the disk, cucullate. *Disk* flat or concave, filling the calyx-tube, with 5 rounded or horn-like lobes alternate with the stamens. *Stamens* 5, enclosed within the petals. *Ovary* sunk in the disk, 3-celled; style 3-cleft; stigmas minute, papillose; ovules solitary. *Fruit* coriaceous, inferior, tipped by the persistent calyx-lobes, of 3 separable indehiscent dry mericarps, attached to a central filiform receptacle, and produced on each side in rounded wings. *Seeds* plano-convex, obovate; testa hard, shining; albumen fleshy; cotyledons ovate, cordate at base, retuse at apex; radicle small.

Disk villous, the lobes rounded; leaves elliptic-ovate, gradually acuminate, rounded at base; entire or slightly crenate-serrate; inflorescence densely whitish-pubescent; mericarps small, .4 in. broad, .3 in. high 1. *microcarpa*.

Disk glabrous, the lobes stellately horned; leaves ovate, abruptly acuminate, subcordate at base, crenate-serrate; inflorescence merely puberulous; mericarps larger, .5-.6 in. broad, .4-.5 in. high

2. *leptostachya*.

1. *GOUANIA MICROCARPA*, DC.; F. B. I. i. 643; W. & A. 167.

W. Gháts, in all Districts from S. Canara and Mysore southwards, up to about 3,000 ft.

A large climbing shrub. Wt. Ic. t. 974 does not agree with either this or the next.

2. *GOUANIA LEPTOSTACHYA*, DC.; F. B. I. i. 643; W. & A.

166. *G. tiliaefolia*, Roxb. Cor. Pl. i. t. 98.

Forests of the N. Circars (see Roxb. W. & A., etc.).

A large climbing shrub. Vern. Tel. Penki tiga.

8. *Helinus*, E. Meyer.

Unarmed shrubs, climbing by means of tendrils; branches slender, angular. Leaves alternate, petiolate, entire; stipules small, deciduous. Flowers small, umbellate, on long slender axillary peduncles. Calyx-tube broadly obconic; lobes 5, superior. Petals 5, inserted on the margin of the disk, cucullate. Disk epigynous, filling the calyx-tube, 5-angled. Stamens 5, as long as the petals. Ovary inferior, 3-celled; style short, 3-cleft; stigmas small, recurved; ovules solitary. Fruit obovoid-globose, 3-celled, tardily separating into 3 crustaceous cocci attached to a central axis, the cocci dehiscent interiorly. Seeds plano-convex, shining; testa leathery, shining; albumen fleshy; cotyledons large, flat, obtuse; radicle very short.

HELINUS LANCEOLATUS, Brand.; F. B. I. i. 644.

E. Gháts, hilly country of Ganjam (Barber), Godavari (Beddome).

A slender climber with ovate-lanceolate entire leaves, 1-2.5 in. long, and flowers in long-stalked umbels.

Noltia africana, Harv. & Sond. is a Cape shrub which has been introduced into and has more or less run wild in the Nilgiris.

Species of *Pomaderris* and *Ceanothus* are grown in hill gardens as ornamental shrubs.

Family XLVII. VITACEAE.

Small trees or erect or climbing shrubs, the latter usually tendril-bearing, stems and branches nodose. *Leaves* alternate, simple lobed digitate or pedate, sometimes pinnate or bipinnate; petiole usually thickened at the articulate base; stipules 2. *Flowers* regular, hermaphrodite or unisexual, in paniced umbelled or spicate cymes usually opposite the leaves, peduncles often transformed into tendrils or tendril-bearing. *Calyx* small, entire or 4-5-toothed or -lobed. *Petals* 4-5, valvate, free or connate, caducous. *Disk* free or connate with the petals stamens or ovary, annular or expanded. *Stamens* 4-5, opposite the petals, inserted at the base of the disk or between its lobes; filaments subulate; anthers free or connate, 2-celled, introrse. *Ovary* usually sunk in the disk, 2-6-celled; ovules 1-2 in each cell, ascending, anatropous; style short; stigma small, capitate or slightly lobed. *Fruit* an indehiscent 1-6-seeded berry, often watery. *Seeds* erect, often rugulose; albumen cartilaginous sometimes ruminant; embryo basal; cotyledons ovate or cordate; radicle short, inferior.

Scandent, rarely erect, usually tendril-bearing, shrubs or herbs; stamens free; ovary 2 celled, cells 2-ovuled:—

Flowers polygamo-dioecious:—

Petals 5, deciduous in a calyptra; stigma obtuse; flowers in leaf-opposed thyrses often bearing tendrils on the peduncles; leaves simple, lobed; seeds pyriform, 2-furrowed on the face, 1-furrowed on the back with a prominent chalaza 1. **Vitis.**

Petals 4, spreading or recurved in flower; stigma 4-lobed; flowers in corymbiform cymes without tendrils on the peduncles; leaves pedately 5- or sometimes 1-3-foliolate; seeds globose, oblong or pyriform, 2-furrowed on face, chalaza on back prominent

2. **Tetrastigma.**

Flowers polygamo-monoecious; petals 4-5, spreading or recurved in flower; stigma small or discoid; flowers in leaf-opposed cymes or thyrses with tendrils on the peduncle; leaves simple or lobed, sometimes digitate or pedate; seeds oblong or obovoid, convex on back, 2-furrowed on face 3. **Ampelocissus.**

Flowers hermaphrodite; tendrils leaf-opposed :—

Petals 5, spreading or sometimes calyptrate; flowers in terminal or leaf-opposed dichotomous cymes ending in umbellules; leaves trifoliate; seeds globose, smooth 4. *Parthenocissus*.

Petals 4, at first connivent, then separating :—

Berry usually 1-seeded, the seeds ellipsoid or pyriform, smooth or faceted or pitted, the albumen with 3 vertical lobes; leaves usually simple, sometimes 3-foliate or digitate 5. *Cissus*.

Berry 2-4-seeded; seeds hemispheric with deep pits, oblong angular or pyriform; albumen only sometimes with 3 vertical lobes; leaves 3-foliate or pedate or digitate 6. *Cayratia*.

Erect shrubs without tendrils; stamens free or connate at their margins, the filaments inserted in the lobes of a staminal tube; ovary 3-6-celled, cells 1-ovuled; leaves large, simple or 1-3-pinnate.

7. *Leea*.

1. *Vitis*, L. (reduced).

Shrubs, usually climbing, with tendrils opposite to the leaves or on the peduncles. *Leaves* simple, variously lobed; stipules 2, deciduous. *Flowers* polygamo-dioecious, in leaf-opposed thyrses. *Calyx* cupular, with 5 obscure teeth. *Petals* 5, coherent by their tips and deciduous as a calyptra. *Stamens* 5; filaments slender, long in ♂ shorter in ♀; anthers introrse. *Disk* of 5 hypogynous glands, sometimes confluent. *Ovary* 2-celled, 2 ovules in each cell; styles very short or 0; stigma obtuse. *Fruit* a 2-celled succulent berry. *Seeds* 4 or less, pyriform, 2-furrowed on the face, 1-furrowed on the back with a prominent rounded or elliptic chalaza.

VITIS LANATA, Roxb.; F. B. I. i. 651 in part; W. & A. 131 in part.

E. Ghâts, in the Hills of Vizagapatam and Godavari at 2,000-3,500 ft.

A climbing shrub with porous wood, dark brown bark, ovate-cordate slightly 3-lobed leaves and small globose fruit, the young shoots and under surface of the leaves covered with cinnamomeous wool.

Vitis vinifera, L. the Vine, is not much cultivated in Madras, but good fruit has been grown in the Deccan Hills as in Mysore and Kurnool,

2. *Tetrastigma*, Planch.

Climbing shrubs with simple or forked tendrils, the stems and branches often flattened. *Leaves* usually pedately 5-foliate, sometimes 1- or 3-foliate. *Flowers* polygamo-dioecious, in axillary rarely leaf-opposed cymes, the cymes corymbose, 2-3-chotomous, puberulous. *Calyx* cupular, scarcely lobed, very small. *Petals* 4, spreading or recurved in flower, the tip usually mucronate-hooded. *Stamens* 4, in ♀ flowers very much reduced and staminodial. *Disk* hypogynous, more or less persistent in fruit. *Ovary* 2-celled with 2 ovules in each cell; style short; stigma 4-lobed. *Fruit* a 1-4-seeded berry, usually succulent, sometimes nearly dry. *Seeds* globose, oblong or pyriform, convex on the back with a prominent chalaza, 2- or forked-furrowed on the face, often crenately channelled on the sides, albumen ruminant.

Berry small, about .25 in. in diam., seed smooth, globose; stems not or little tuberculate:—

Leaves usually pedately 5-foliate, leaflets lanceolate or oblanceolate, sharply acuminate, distantly but prominently serrate, more or less fleshy, not prominently reticulate 1. *lanceolarium*.

Leaves 3-foliate, leaflets elliptic, obtusely acuminate, entire or nearly so, submembranous, prominently reticulate 2. *canarense*.
Berry rather large, over .5 in. in diam.; seed oblong or pyriform, crenate on margin; stems tuberculate:—

Seed oblong, with a clavate chalaza on back and 2 deep furrows on face, crenatures slight; leaves large, pedately 5-foliate, acuminate, crenate on margins 3. *sulcatum*.

Seed pyriform, chalaza on back oblong, furrows on face shallow, marginal crenatures deep; leaves small, 3-foliate or sometimes pedately 5-foliate, uppermost often 3-foliate, acute, glabrous, margins shortly serrate 4. *muricatum*.

1. **TETRASTIGMA LANCEOLARIUM**, Planch. *Vitis lanceolaria* Roxb.; F. B. I. i. 660; W. & A. 128; Wt. Ic. t. 177. *V. serratifolia*, W. & A. 128.

N. Circars and Deccan to the E. slopes of the Nilgiris up to 5,000 ft.

A large climber with flattened stems and dry fruit.

2. **TETRASTIGMA CANARENSE**, Gamble n. comb. *Vitis canariensis*, Dalz.; F. B. I. i. 655.

W. Gháts, in Wynaad at 3,000 ft. (Lawson).

A climber with trifoliolate leaves and red (or dead white Dalzell) berry, liked by monkeys.

3. *TETRASTIGMA SULCATUM*, Gamble, n. comb. *Vitis sulcata*, Laws.; F. B. I. i. 661.

W. Ghâts, from Malabar and W. Nilgiris to the Anamalais and Travancore Hills up to 4,500 ft.

A large climber with thick stems and large green berry.

4. *TETRASTIGMA MURICATUM*, Gamble n. comb. *Vitis muricata*, Wall.; W. & A. 660; Wt. Ic. t. 740. *V. lanceolaria*, Laws. in F. B. I. i. 660 in part; Wt. Ic. t. 28 nol of Roxb. W. Ghâts, in most Districts and up to 6,000 ft., fairly common.

A large climber with prominently warted branchlets.

3. Ampelocissus, Planch.

Climbing shrubs, with tendrils on the peduncles. Leaves simple, entire or lobed, sometimes digitate or pedate or biternate. Flowers polygamo-monoecious, ♂ pseudo-hermaphrodite, in leaf-opposed pedunculate cymes or thyrses, the peduncles tendril-bearing. Calyx cupular, with 4-5 obscure teeth. Petals 4-5, spreading or recurved in flower. Stamens 4-5, inserted without the disk; filaments slender. Disk annular, erect, often vertically 5-10-furrowed. Ovary 2-celled, immersed more or less in the disk; 2 ovules in each cell; style short, conical, often 10-furrowed; stigma small in ♂, discoid in ♀. Fruit a 2-3-seeded succulent berry. Seeds oblong or obovoid, convex on the back, 2-furrowed, with a broad keel (raphe) on the face, often crenately cleft on the margins.

Disk short, thin, embracing merely the base of the ovary, not furrowed:—

Cyme thick-branched, woolly:—

Leaves orbicular-cordate or 3-7-angled or -lobed, cinnamomeous-tomentose beneath, seeds obcordate, crenate on the margins, 2-furrowed and keeled on the face, pitted on the back and with prominent ray-like clefts 1. *tomentosa*.

Leaves 3-foliolate, the side leaflets semi-cordate, the middle one ovate, greyish brown-tomentose beneath; seeds obovate but not crenate on the margins, broadly ridged on the face, pitted and with shallow rays on the back 2. *araneosa*.

Cyme nearly or quite glabrous; leaves thin, 3- rarely 5-foliolate

the side leaflets semicordate, the end one lanceolate, thinly grey-pubescent beneath 3. *divaricata*.
 Disk short, thick, 5-furrowed; leaves orbicular or cordate, rounded or 3-5-angled or -lobed, glabrous; inflorescence a small compact puberulous thyrses; seed oblong, crenate on the margin 4. *latifolia*.
 Disk elongate, thickened, embracing most of the ovary, 5-furrowed; leaves orbicular cordate, the margins denticulate-serrate with hard points :—

Flowers in often very large very thick compound cymes, sessile or subsessile in the middle of copious wool; calyx also with long hairs 5. *eriolada*.
 Flowers in sessile umbels with slender pedicels in short racemes, woolly at base at first, later on nearly free from it; calyx without long hairs 6. *Arnettiana*.

1. *AMPELOCISSUS TOMENTOSA*, Planch. *Vitis tomentosa*, Heyne; F. B. I. i. 650; W. & A. 130; Wt. Ill. t. 57.

N. Circars, Deccan and Carnatic, in hill forests; W. Ghâts, from Coorg to the Anamalais up to 5,000 ft.

A large climbing vine with scarlet flowers; young shoots and leaves and stems with much cinnamonaceous wool, the leaves variable in shape and lobes.

2. *AMPELOCISSUS ARANEOSA*, Planch. *Vitis araneosus*, Lawson; F. B. I. i. 657.

W. Ghâts, in the Nilgiri, Pulney and Anamalai Hills, Shevaroy Hills of Salem, up to 4,500 ft.

A slender far-climbing shrub, the leaves sometimes merely lobed.

3. *AMPELOCISSUS DIVARICATA*, Planch. *Vitis divaricata*, Wall.; F. B. I. i. 657.

E. Ghâts in the Madgol Hills of Vizagapatam at 3,500 ft. (A. W. Lushington).

A slender climber with thin long-acuminate usually 3-foliate leaves.

4. *AMPELOCISSUS LATIFOLIA*, Planch. *Vitis latifolia*, Roxb.; F. B. I. i. 652; W. & A. 130.

N. Circars, Deccan and Carnatic in hill forest regions, westwards to the Nilgiri and Anamalai slopes.

A rather slender herbaceous climbing vine with thin broad variable glabrous leaves, only the young shoots and inflorescence pubescent.

5. *AMPELOCISSUS ERIOCLADA*, Planch. *Vitis erioclada*, W. & A. 130; F. B. I. i. 651.

W. Gháts, Hills of Tinnevely (Wight, etc.).

A stout climber with hollow cylindric stem and large thick-branched panicles of cymes.

6. *AMPELOCISSUS ARNOTTIANA*, Planch; *Vitis indica*, W. & A. 131; F. B. I. i. 653 not of Linn.

W. Coast and W. Gháts from S. Canara to Tinnevely, up to 3,000 ft. in Wynaad.

A slender climbing shrub, the branches and leaves covered with much ferruginous wool; the flowers in short dense racemes of umbels, the seed convex and rugose on the back, hollowed in 2 cavities in front with a sharp ridge between.

4. *Parthenocissus*, Planch.

Climbing shrubs with much-branched tendrils opposite the leaves, the tendril-branches ending in disks which attach themselves to objects; stems often short thick-barked. *Leaves* trifoliolate, long-petiolate, side leaflets semicordate at base on the outer, narrowly contracted on the inner side. *Flowers* hermaphrodite, in terminal or leaf-opposed branched dichotomous cymes, ending in umbellules. *Calyx* cupular, irregularly 5-dentate. *Petals* 5, induplicate-valvate, spreading or sometimes calyptrate, each petal hooded at the tip and with a usually bifid acumen. *Stamens* 5, inserted under the disk; anthers oblong. *Disk* thin and obscure, adnate to the base of the ovary. *Ovary* ovoid, 2-celled; style short, thick; stigma small, capitate; ovules 2 in each cell. *Fruit* a rarely 2-4-seeded berry. *Seeds* globose, smooth, with a narrow raphe half-encircling.

PARTHENOCISSUS NEILGHERRIENSIS, Planch. *Vitis neilgherriensis*, Wt. Ic. t. 965. *Vitis himalayana*, Brandis; F. B. I. i. 655 in part. *V. anamalayana*, Bedd.; F. B. I. i. 656.

W. Gháts, from the Nilgiris to the Anamalai and Pulney Hills, up to 6,000 ft.

A vast climber (Lawson) with large leaves, the leaflets often 6 in. long, cuspidate-serrate and usually very long-acuminate at the tips.

5. *Cissus*, Linn. (modified).

Shrubs, erect or climbing, with tendrils opposite to the leaves, occasionally absent in erect species. *Leaves* simple or lobed, rarely trifoliolate. *Flowers* hermaphrodite, tetramerous, in umbellately divided cymes opposite to the leaves, the branches ending in umbellules. *Calyx* cupshaped, entire or obscurely lobed. *Pétals* 4, triangular-ovate, induplicate-valvate, at first connivent in a calyptrate corolla, afterwards separating. *Stamens* 4; filaments slender; anthers usually oblong. *Disk* small, 4-lobed, adnate to the base of the ovary. *Ovary* 2-celled, with 2 ovules in each cell; style subulate; stigma small. *Fruit* usually 1-seeded, occasionally with 2 or more, a fleshy berry. *Seeds* ellipsoid or pyriform, with an encircling raphe, smooth or faceted or pitted on either side, the testa crustaceous with two interior ridges at the base; albumen with 3 vertical lobes; cotyledons reniform, sometimes 3; radicle rather large.

Seeds smooth except for encircling raphe :—

Seeds ellipsoid, pale; berry globose, red; stems 4-winged, fleshy, contracted at the nodes; leaves broadly reniform, entire or lobed

1. *quadrangularis*.

Seeds more or less pyriform; stems not winged :—

Leaves usually trifoliolate, rarely only lobed or entire, leaflets lanceolate, the side ones very unequal-sided; berry black; slender climbers.....2. *trilobata*.

Leaves ovate acuminate, deeply cordate at base, green when dry, membranous; berry black; slender trailers with glaucous-white stems3. *repens*.

Leaves more or less orbicular, cordate at base :—

Erect glabrous shrubs with grey bark and glaucous branchlets, rarely with tendrils; leaves large, cordate, with shallow incurved serratures; fruiting pedicels thick; berry top globose; seeds smooth.....4. *pallida*.

Climbing shrubs with tendrils :—

Glabrous, the stems pale, smooth, leathery, branchlets glaucous; leaves thick and leathery, poplar-like, cordate, obscurely crenate-serrate, pale when dry; fruiting pedicels clavate; berry-top globose, seeds smooth on the face

5. *Heyneana*.

Tomentose, the stems soft, wrinkled, branchlets terete, soft, subglaucous; leaves shallowly cordate, repand-crenate, dark

when dry; fruiting pedicels slender; berry-top oblong, seeds with a faint crescent ridge on the face 6. *repanda*.

Seeds tessellated on either side of the raphe with angular facets:—

Very tomentose; pedicels usually recurved in fruit:—

Tomentum grey; leaves broadly cordate, 5-angled or sometimes 7-lobed, conspicuously blunt-serrate; berry blue, glaucous

7. *vitiginea*.

Tomentum ferruginous; leaves broadly cordate, acuminate, with inconspicuous bristly serratures; berry black 8. *adnata*.

Glabrous, the branchlets glaucous; pedicels erect in fruit; leaves cordate, rounded above with an abrupt acumen, bristly serrate, nearly black when dry..... 9. *glauc.*

Seeds with pits in lines on either side of the raphe:—

Slender climbing plants, glabrous or nearly so; berries glabrous:—

Seeds obovoid; branchlets subangular, red, herbaceous; leaves ovate, cordate, acuminate, blotched with pink and white on the upper surface, purple on the lower; berry reddish-purple

10. *discolor*.

Seeds obtriangular; branchlets 4-winged, soft; leaves ovate, truncate-cordate at base, green; berry black-purple

11. *glyptocarpa*.

Fleshy herbaceous plants, very bristly setose, especially the berries; leaves trifoliate, the leaflets sharply serrate; berry bright red, the seeds deeply pitted and crenate on the margins 12. *setosa*.

1. *CISSUS QUADRANGULARIS*, Linn. *Vitis quadrangularis*, Wall.; F. B. I. i. 645; W. & A. 125; Wt. Ic. t. 51.

N. Circars, Deccan and Carnatic, in dry regions, extending west to the lower E. slopes of W. Gháts and south to S. Travancore.

A much rambling shrub, the branches climbing over bushes to a long distance. Vern. Tel. Nalleru; Mal. Changalaparanda.

2. *CISSUS TRILOBATA*, Lamk. *Vitis Rheedii*, W. & A. 127; F. B. I. i. 653.

W. Coast and W. slopes of W. Gháts in Malabar and Travancore up to 3,000 ft.

A weak fleshy-stemmed climbing shrub with white berries.

3. *CISSUS REPENS*, Lamk. *Vitis repens*, W. and A. 125; F. B. I. i. 646.

W. Coast and W. Gháts from S. Canara to the Anamalais and Travancore, up to 4,000 ft.

A weak trailing shrub, the stems glaucous and glabrous, with ovate-cordate thin leaves.

4. *CISSUS PALLIDA*, Planch. *Vitis pallida*, W. & A. 125; F. B. I. i. 647.

N. Circars, Deccan and W. Gháts in dry forests, especially in the Ceded Districts.

An erect shrub with large leaves and woody stem, occasionally tendril-bearing and perhaps somewhat scandent.

5. *CISSUS HEYNEANA*, Planch. *Vitis Heyneana*, Wall.; F. B. I. i. 647; W. & A. 125.

W. Gháts, from the Nilgiris to the Pulneys and the Hills of Travancore, at low levels, scarce.

A coarse climber with thick fleshy stems and ovate-cordate pale green poplar-like leaves scarcely serrate.

6. *CISSUS REPANDA*, Vahl. *Vitis repanda*; W. & A. 125; F. B. I. i. 648.

Deccan, in the Hills of Cuddapah, Anantapur and Mysore up to 4,500 ft., Hills of Chingleput; E. slopes of W. Gháts from Nilgiris to Tinnevely.

A climbing shrub with branched and twisted tendrils and pyriform fruit.

7. *CISSUS VITIGINEA*, L. *Vitis Linnaei*, Wall.; F. B. I. i. 649; W. & A. 126.

N. Circars, in Vizagapatam and Godavari; Deccan and Carnatic, in hill scrub forests chiefly, up to 4,500 ft. and west to the lower slopes of the Pulney Hills; W. Coast, in Travancore, in secondary forests.

A small, erect trailing or climbing, grey-tomentose shrub, with blue single-seeded berries.

8. *CISSUS ADNATA*, Roxb.; Wt. Ic. t. 144. *Vitis adnata*, Wall. F. B. I. i. 649; W. & A. 126.

W. Coast and W. slopes of Gháts, at low levels.

A slender far-climbing shrub with ferruginous tomentum on leaves.

9. *CISSUS GLAUCA*, Roxb. *Vitis glauca*, W. & A. 126; F. B. I. i. 648.

W. Coast and W. Gháts up to 4,000 ft.

A stout rambling shrub with glaucous stems and cordate cuspidate leaves.

10. *CISSUS DISCOLOR*, Blume. *Vitis discolor*, Dalz.; F. B. I. i. 647. *V. inaequalis*, W. & A. 125.
W. Coast and W. Gháts, in evergreen forest, up to 4,000 ft.
A slender climber with red branches and pedicels and very pretty blotched leaves, often cultivated.
11. *CISSUS GLYPTOCARPA*, Planch. *Vitis glyptocarpa*, Thw.; F. B. I. i. 646.
W. Gháts, W. slopes of Nilgiris at 1,000 ft. (Lawson), Tinnevely Hills (Barber).
A slender climbing shrub with winged branchlets and conspicuously pitted seeds.
12. *CISSUS SETOSA*, Roxb. *Vitis setosa*, Wall.; F. B. I. i. 654; W. & A. 127; Wt. Ic. t. 170.
Deccan and Carnatic, in dry localities, extending westwards to the E. slopes of the W. Gháts.
A herbaceous Rambler with fleshy stems and leaves and a red hairy berry, the whole plant very acrid.

Cissus gigantea, Planch; *Vitis gigantea*, Bedd, is a little known species of very large size, near *C. repanda*, Vahl, with deeply cordate nearly glabrous leaves, in the Anamalai Hills at 2,000 ft.

6. Cayratia, Juss.

Climbing shrubs with tendrils opposite to the leaves. *Leaves* alternate, trifoliate or pedate; stipules 2, small. *Flowers* hermaphrodite, tetramerous, in axillary or pseudo-terminal corymbs or umbels. *Calyx* cupular, not or rarely toothed. *Petals* 4, valvate, sometimes coriaceous, more or less cucullate within. *Stamens* 4, inserted round the disk; anthers introrse. *Disk* entire, sinuate or lobed, adnate with the ovary. *Ovary* 2-celled, with 2 ovules in each cell; style subulate; stigma indistinct. *Fruit* a 2-4-seeded berry, usually dry. *Seeds* obcordate, smooth or angular, hemispheric pyriform or oblong, convex on the back, with 1 or 2 ventral cavities covered with a membrane, the section of the albumen often making a crescent or a T; cotyledons small, ovate; radicle small.

Seed hemispheric, section of seed-albumen more or less crescent-shaped:—

Section of albumen with nearly circular outline, not grooved within, face-cavity deep; leaves trifoliate, leaflets large, glabrous, entire or undulate-dentate; fruiting peduncles 2 in. long, fruit dry

1. *Roxburghii*

Section of albumen somewhat flattened, 2-grooved within, slightly angled on sides, face cavity round, small; leaves pedately 7-9-foliate, usually softly pubescent, leaflets oblong-lanceolate, acuminate; fruiting peduncles 1-1.5 in. long, fruit rather dry, white

2. *pedata*.

Section of albumen rectangular with incurved ends, 2-grooved within, face cavity the whole length of seed; leaves 3-foliate, long and softly villous as are the branchlets and fruit; fruit fleshy, white, nearly 1 in. in diam

Seed pyriform, small, section of seed-albumen T-shaped:—

Seed very acute at base, much rugose above, chalaza on back round; leaves pedately 5-foliate, glabrous or pubescent, leaflets sharply serrate

4. *japonica*.

Seed trigonous, the plane faces pitted, chalaza on back linear with shallow bars on either side; leaves pedately 3-foliate, usually pubescent, leaflets dentate, rounded or acute

5. *carnosa*.

Seed with sharp angles, the base rounded, the face keeled, section of seed-albumen subrectangular; fruit black; leaves pedately 5-foliate, glabrous, leaflets small, sharply serrate; flower-peduncles and pedicels filiform

6. *tenuifolia*.

Seed obovate-oblong, furrowed and transversely ridged on the back, 2-pitted on the face, the section showing 3 vertical lobes in the albumen; fruit red; leaves digitate, the leaflets obovate, acuminate, serrate, the stipules falcate; flower-peduncles and pedicels fleshy

7. *auriculata*.

1. *CAYRATIA ROXBURGHII*, Gagnep. *Vitis Roxburghii*, W. & A. 127; F. B. I. i. 655.

Tinnevely Hills, at Courtallum (Wight).

A glabrous climbing shrub with smooth black shining bark.

2. *CAYRATIA PEDATA*, Juss. *Vitis pedata*, Vahl; F. B. I. i. 661; W. & A. 128.

N. Circars, in the Hills of Vizagapatam and Godavari; W. Gháts and W. Coast in all Districts.

A large but weak climbing shrub with soft pubescent leaves.

Var. *glabra*, Gamble.

Nilgiri Hills at 3,000 to 6,000 ft.

A small variety with thin glabrous long-acuminate leaflets.

3. CAYRATIA MOLLISSIMA, Gagnep. *Vitis mollissima*, Wall.; F. B. I. i. 656.

W. Gháts, in Malabar and Nilgiris, in evergreen forest, up to 3,000 ft. (Lawson).

4. CAYRATIA JAPONICA, Gagnep. *V. tenuifolia*, W. & A. 129, *in part*; F. B. I. i. 660, *in part*.

W. Gháts, in S.E. Wynaad, W. Nilgiri slopes, at 3,000 ft. (Lawson).

A very slender climber.

5. CAYRATIA CARNOSEA, Gagnep. *Vitis carnea*, Wall.; F. B. I. i. 654; W. & A. 127; Wt. Ic. t. 171.

N. Circars, in Vizagapatam and Godavari; Deccan and Carnatic, but less common and chiefly in hills; W. Coast and W. Gháts, common.

A somewhat fleshy twining shrub with usually pubescent but often nearly glabrous leaves and white berries with trigonous seeds.

6. CAYRATIA TENUIFOLIA, Gagnep. *Vitis tenuifolia*, W. & A. 129 *in part*; F. B. I. i. 660 *in part*. *Cissus tenuifolia*, Heyne; Planch. Monog. 563.

W. Gháts, in S.E. Wynaad, at 3,000 ft., Hills of Tinnevely (Barber).

A very slender graceful little vine with characteristic seeds.

7. CAYRATIA AURICULATA, Gamble n. comb. *Vitis auriculata*, Wall.; F. B. I. i. 658; W. & A. 129, *in part*; Wt. Ic. t. 145.

N. Circars, in Godavari (Barber); W. Gháts, in the Anamalai Hills, at 3,000 ft. (Gamble).

A large climber with spongy stems and red succulent berries, the seed-structure more like that of *Cissus*.

7. Leea, Linn

Small trees, shrubs or herbs; branches striate or furrowed, the pith often very large; no tendrils. *Leaves* alternate, usually large, simple or 1-2-3-pinnate, petiole dilated at the base into sheathing stipules. *Flowers* small, red yellow white or greenish, in leaf-opposed or subterminal peduncled corymbose cymes. *Calyx* cupshaped or funnel-shaped, 5-lobed. *Petals* 5, connate at the base and adhering to the staminal tube, afterwards revolute,

induplicate-valvate, hooded at apex and connate in bud. *Disk* or staminal tube cylindric with 5 lobes, connate at the base with the ovary, furnished within with a dependant toothed membranous fold; lobes entire or more or less prominently notched, sometimes apiculate. *Stamens* 5, the filaments inserted between the lobes of the disk, inflexed; anthers attached by their middles within the tube, introrse, free or connate at their margins in bud, dehiscing longitudinally; connective thick, oblong. *Ovary* inserted on the base of the disk, 3-6-celled; style short; stigma scarcely thickened; ovule 1 in each cell. *Fruit* a 3-6-celled, usually succulent, depressed-globular, lobed, berry with 3-6 seeds attached to the centre. *Seeds* wedge-shaped with a hard external and membranous inner testa, the latter deeply protruded in about 6 folds into the albumen; embryo basal with small ovate cotyledons, radicle long.

Flowers red; anthers united in bud; lobes of staminal tube notched; leaves bipinnate, leaflets ovate-lanceolate, long acuminate, dark brown to nearly black when dry, main nerves curved upwards with 3-4 serratures each, transverse nervules irregularly subparallel

1. *Wightii*.

Flowers white or greenish white:—

Leaves simple or with few large pinnules; anthers united in bud; herbaceous undershrubs:—

Leaves simple, cordate, hoary puberulous beneath, very large, main nerves distant, slightly curved, branching near the margin into 3-4 small serratures; transverse nervules irregular; lobes of staminal tube entire or slightly cleft; fruit black

2. *macrophylla*.

Leaves with 3-5 large pinnules, the lower ones sessile or nearly so, hoary puberulous beneath, main nerves distant, branching towards the margin into 3-5 serratures; transverse nervules subparallel, branched; lobes of staminal tube notched

3. *latifolia*.
Leaves pinnate, sometimes bipinnate, main nerves close and parallel, as also the transverse nervules; anthers not united in bud; lobes of staminal tube notched; undershrubs:—

Stems, petioles and inflorescence branches with crisp wings; leaflets usually oblong, with one main nerve to each serrature and sometimes an intermediate small one, nearly glabrous; ripe fruits steel-grey

4. *crispa*.

Stems, etc., without crisp wings; ripe fruits black:—

Leaflets ovate cordate, main nerves dividing at top, each branch running into a crenature; upper surface usually prominently asperous between the nerves 5. *aspera*.

Leaflets ovate, long acuminate, more or less acute at base, main nerves of leaves not prominently dividing at top, the serratures having smaller ones between each pair; upper surface not or only slightly asperous, often punctate 6. *herbacea*.

Leaves 2-3-pinnate, main nerves more or less distant; anthers united in bud, large shrubs :—

Lobes of staminal tube entire or nearly so :—

Lobes of staminal tube entire or slightly notched or serrate; leaflets large and broad, membranous, pubescent, especially on the nerves, ovate-oblong, rounded or subcordate at base, light brown when dry; main nerves curved, thin, rather distant, each space with several serratures, transverse nervules indistinct, irregular 7. *robusta*.

Lobes of staminal tube apiculate; leaflets small, membranous, ovate or lanceolate, sharply serrate, with stiff hairs on the upper surface and reddish pubescence on the nerves beneath, nearly black when dry; transverse nervules indistinct, irregular 8. *Venkobarrowii*.

Lobes of staminal tube notched at the apex :—

Leaves glabrous, often very large and much divided, leaflets oblong or elliptic-oblong, chartaceous, dark brown when dry, main nerves distant, curved, forked at top, the smaller branch running into the crenature, usually a second crenature between each pair, transverse nervules many, not prominent; fruit black-purple 9. *sambucina*.

Leaves pubescent, often scurfy, especially on nerves, under surface with flat circular disks; leaflets long, oblong, acuminate, with 2-3 shallow serratures to each main nerve, transverse nervules prominent, parallel; fruit black . . 10. *aequata*.

1. LEEA WIGHTII, C. B. Clarke in Journ. Bot. 1881, 105.
L. Stuphylea, Wt. Ill. t. 58 not of Roxb.

W. Ghâts, in Wynaad, W. slopes of Nilgiris, Anamalais and Hills of Tinnevely.

An undershrub of evergreen forests.

2. LEEA MACROPHYLLA, Roxb.; F. B. I. i. 664, in part; Wt. Ic. t. 1154; C. B. Clarke l.c. 137.

W. Ghâts, in Malabar and Nilgiris in forest undergrowth.

A herbaceous plant of Teak and similar dry forests.

3. *LEEA LATIFOLIA*, Wall.; C. B. Clarke l.c. 138. *L. cinerea*, Laws. in F. B. I. i. 665. *L. coriacea*, Laws. l.c.
W. Gháts, in Malabar (Wight, Barber).
4. *LEEA CRISPA*, Linn.; F. B. I. i. 665; C. B. Clarke l.c. 135.
W. Gháts, in Malabar and W. Nilgiri slopes.
A low undershrub, easily recognized by the crispations of the branchlets and petioles.
5. *LEEA ASPERA*, Edgew.; F. B. I. i. 665; C. B. Clarke l.c. 136.
N. Circars, in the Hills of Ganjam and Godavari; W. Gháts, in Wynaad and Anamalais up to 3,000 ft.
A large undershrub of Teak and other rather dry forests.
6. *LEEA HERBACEA*, Ham.; C. B. Clarke l.c. 137.
Deccan, Sandur Hills of Bellary at 3,000 ft.
A large undershrub, hardly distinct from *L. aspera*.
7. *LEEA ROBUSTA*, Roxb.; W. & A. 132. *L. diffusa*, Laws. in F. B. I. i. 667.
E. Gháts, Hills of N. Circars to the Godavari, up to 3,000 ft.; W. Gháts, in Malabar and W. Nilgiris up to 3,000 ft.
A large shrub with thick often hollow stems and thin leaves.
8. *LEEA VENKOBAROWII*, Gamble in Kew. Bull. 1917, 26.
W. Gháts, in the Anamalais at 3,000 ft. (Gamble), Hills of Travancoré (Venkoba Row).
9. *LEEA SAMBUCINA*, Willd.; C. B. Clarke l.c. 139; F. B. I. i. 666 *in part.* *L. Staphylea*, Roxb.; W. & A. 132; Wt. l.c. t. 78.
E. Gháts, in the Hills of the N. Circars. up to 4,000 ft.; Deccan, Seshachellam Hills of Cuddapah at 3,000 ft.; W. Gháts, in all Districts in evergreen forests up to 4,000 ft.
Usually a large shrub, but occasionally growing into a small tree up to 30 ft. high. Vern. *Tam.* Nyekki, Otta náli; *Mal.* Nyeru, Maniporandi; *Mar.* Dino.
10. *LEEA AEQUATA*, Linn.; C. B. Clarke l.c. 163. *L. hirta*, Roxb.; F. B. I. i. 668.
N. Circars, in Ganjam forests (Gamble).
A large shrub with scurfy pubescent leaves, the glands on their undersurface, rather scarce.

Family XLVIII. STAPHYLEACEAE.

Trees or shrubs. *Leaves* opposite or alternate, usually trifoliolate or imparipinnate, stipulate. *Flowers* in terminal or axillary panicles, regular, hermaphrodite. *Calyx* of 5 free or nearly free imbricate sepals. *Petals* 5, imbricate. *Disk* annular, attached to the base of the calyx, usually lobed. *Stamens* 5, opposite the sepals; anthers 2-celled, the cells introrse. *Ovary* of 3 carpels, free or combined; styles short; stigmas capitate; ovules 2 or more in each cell. *Fruit* of 3 dehiscent capsules or follicles or an indehiscent berry. *Seeds* 4, arillate or exarillate, albuminous; embryo oblique; cotyledons flat.

Turpinia, Vent.

Trees or shrubs with terete branches. *Leaves* opposite, imparipinnate, the leaflets opposite, stipellate, serrate. *Flowers* small, regular, in terminal and axillary panicles with opposite branches. *Calyx* of 5 sepals. *Petals* 5, imbricate. *Disk* an erect ring, lobed or crenate. *Stamens* 5, inserted outside the disk. *Ovary* sessile, 3-lobed, 3-celled; ovules 2 collateral or several 2-seriately superposed. *Fruit* a subglobose, fleshy berry, 3-celled. *Seeds* angular without arillus; testa hard, shining, often mottled; hilum large; albumen fleshy; cotyledons flat or plano-convex.

Leaflets lanceolate, long-acuminate; flowers small, about .2 in. in diam.; drupe size of a pea, 1-3-lobed; filaments glabrous; disk deeply lobed.....1. *nepalensis*.
 Leaflets elliptic; abruptly obtuse-acuminate; flowers about .4 in. in diam.; drupe size of a cherry, 1-3 pointed but not lobed; filaments shortly villous; disk evenly crenate 2. *malabarica*.

1. TURPINIA NEPALENSIS, Wall.; W. & A. 156; Wt. Ic. t. 972; Bedd. Fl. t. 159. *T. pomifera*, DC.; F. B. I. i. 698 *in part*.

W. Ghâts, common in Nilgiri Shola forests at high levels, usually about 5,000 ft.; Pulneys and Travancore Hills, less common.

A moderate-sized tree with a soft grey useless wood. Vern. *Badaga*, Nila.

2. TURPINIA MALABARICA, Gamble in Kew Bull. 1916, 135.

W. Coast; W. Ghâts in the Anamalai Hills and Hills of Travancore at low levels.

A large tree with bright yellow young leaves. Vern. *Tam. Kanali*; *Mal. Pamba vetti*.

Family XLIX. ACERACEAE.

Trees or shrubs. *Leaves* opposite, petioled; stipules 0. *Flowers* regular, polygamous. *Sepals* and *petals* isomerous, sometimes wanting. *Disk* annular or lobed, sometimes small or 0. *Stamens* 4-10, more usually 8, inserted outside or upon, rarely inside, the disk; filaments free. *Ovary* of 2 carpels, each 1-2-ovuled. *Fruit* of 2 indehiscent samaroid mericarps; albumen 0.

Acer, Linn.

Trees or shrubs; buds with many scales, the outer short, coriaceous, the inner oblong, membranous, developing later. *Leaves* entire or palmately lobed or divided or pinnately 3-5-foliate. *Flowers* regular, in terminal or lateral racemes or corymbs. *Calyx* usually 5-, sometimes 4-12-lobed, the lobes imbricate, deciduous. *Petals* as many as the calyx-lobes, or 0, erect, shortly clawed. *Disk* thick, annular or cupshaped. *Stamens* usually 8, inserted on the disk; filaments usually shorter in ♂ than in ♀ flowers. *Ovary* 2- rarely 3-lobed and -celled, laterally compressed; cells 2-ovuled; style bipartite, the divisions linear, stigmatose on the inner face. *Fruit* a double samara, indehiscent, the wing large, membranous, thickened at the back. *Seeds* exalbuminous; cotyledons irregularly folded; radicle generally long.

ACER NIVBUM, Blume; F. B. I. i. 693.

N. Circars, Madgol Hills of Vizagapatam, about 3,000 ft. (A. W. Lushington).

A large tree with undivided, entire, oblong, acuminate leaves up to 7 in. long, rounded at base and white-glaucous beneath. Samaras incurved so as to be nearly parallel.

Acer oblongum, Wall., also with undivided leaves, has been introduced from N. India and planted in the Nilgiris with some success.

Family L. SAPINDACEAE.

Trees, shrubs or rarely climbing herbs. *Leaves* alternate, pinnate or rarely simple trifoliate or unifoliate. *Flowers* regular or zygomorphic, generally polygamous. *Calyx* 4-5-lobed

or of 4-5 sepals, usually imbricate. *Petals* 4-5, sometimes 0, generally with scales or tufts of hair above the claw. *Disk* annular or unilateral, rarely (in ♂ flowers) 0, usually lobed. *Stamens* 5-10, usually 8, usually inserted inside the disk or, in zygomorphic flowers, behind it, rarely outside; filaments free, often villous. *Ovary* usually of 3 carpels, 3-celled, often 3-lobed; ovules generally 1, sometimes 2, in each cell. *Fruit* capsular or indehiscent, entire or lobed, sometimes winged. *Seeds* with or without arils, usually more or less globose; albumen 0; embryo with normally curved or convolute cotyledons.

Stamens inserted inside the disk, sometimes unilateral :—

Flowers irregular, zygomorphic; disk usually unilateral :—

Climbing herbs with biternate leaves, the leaflets dentate; fruit a membranous inflated capsule 1. **Cardiospermum.**

Erect shrubs or trees :—

Sepals 4, in opposite pairs; leaves 1- or 3-foliolate, the leaflets usually serrate; fruit indehiscent, 1-2-lobed; seeds with a short aril, cotyledons folded 2. **Allophylus.**

Sepals 5, imbricate; leaflets entire :—

Leaves paripinnate; fruit 3-celled, not lobed; seeds without aril, cotyledons superposed 3. **Lepisanthes.**

Leaves imparipinnate; fruit 1-3-lobed; seeds without aril, cotyledons thick 4. **Erioglossum.**

Flowers regular; disk annular :—

Ovules solitary; fruit not inflated, indehiscent, carpels drupaceous :—

Fruit entire :—

Petals 0; leaves paripinnate, the rhachis not winged, leaflets usually 3 pairs, broad; ovules erect; seeds arillate, cotyledons conduplicate 5. **Schleichera.**

Petals 5; leaves imparipinnate, the rhachis winged, leaflets 6-8 pairs, narrow; ovules pendulous; seeds without aril, cotyledons much crumpled 6. **Filicium.**

Fruit lobed; leaves paripinnate :—

Drupe smooth :—

Drupe globose or ovoid, united at sides, sometimes later on separating; leaves with 2-3 pairs of thick leaflets

7. **Sapindus.**

Drupe oblong, united at base and diverging :—

Leaves large, with usually 3-5 pairs of long lanceolate leaflets; seeds arillate 8. **Thraulococcus.**

Leaves small, sometimes bifoliolate; seeds without aril

9. **Aphania**.

Drupe tubercled or muricate; seeds with a thick fleshy aril

10. **Nephelium**.

Ovules 2 in each cell; fruit a large inflated, 2-lobed capsule; leaves paripinnate with 2-4 pairs of membranous leaflets

11. **Harpullia**.

Stamens inserted outside the disk when present; petals 0; ovules 2 in each cell; fruit a membranous winged capsule; leaves simple, shining, oblanceolate

12. **Dodonaea**.

1. **Cardiospermum**, Linn.

Climbing tendril-bearing herbs with wiry stems and branches. *Leaves* alternate, biternate; leaflets coarsely dentate. *Flowers* irregular, polygamo-dioecious, in axillary racemes or corymbs. the lowest pair of pedicels transformed into spiral tendrils. *Sepals* 4, concave, the outer pair small, the inner large. *Petals* 4, in 2 pairs, the two upper near the stamens with a supra-basal scale, the two lower remote from the stamens with a crested inflexed appendage. *Disk* unilateral, of 2 glands opposite to the lower petals. *Stamens* 8, excentric; filaments unequal, free or connate below. *Ovary* 3-celled; style short, 3-fid, the segments bearing inner stigmatic surfaces; ovule 1 in each cell. *Fruit* a membranous, inflated, trigonous capsule, loculicidally 3-valved the valves reticulate. *Seeds* globose, usually with a conspicuous hilum at the base; testa crustaceous; cotyledons large, transversely conduplicate.

Capsules depressed, pyriform, winged at the angles; leaves nearly glabrous, leaflets acuminate at apex; flowers small; seeds black with a large, white, heart-shaped hilum

1. **Halicacabum**.

Capsules at first ovate acute, afterwards globose, not winged; leaves pubescent, leaflets usually obtuse, the end one mucronate; flowers moderate-sized; seeds black with a small, orbicular, slightly emarginate hilum

2. **canescens**.

1. **CARDIOSPERMUM HALICACABUM**, Linn; F. B. E. i. 670; W. & A. 109; Wt. Ic. t. 508.

N. Circars and Carnatic, along the whole Coromandel Coast from Ganjam to Tinnevely; West Coast, in Malabar and Travancore.

The capsules are sometimes small (var. *microcarpum*, Bl.).

2. *CARDIOSPERMUM CANESCENS*, Wall. Pl. As. Rar. i. t. 14;
F. B. I. i. 670; W. & A. 109; Wt. Ic. t. 74.

Deccan and Carnatic from the Kistna through Mysore to S. Arcot, usually inland, extending to the N. and E. slopes of Nilgiris.

2. *Allophylus*, Linn.

Shrubs or small trees. *Leaves* alternate, 1- or 3-foliolate; leaflets entire or serrate; stipules 0. *Flowers* small, irregular, polygamodioecious, pedicelled, in fascicles in simple or branched axillary thyrses. *Sepals* 4 in opposite pairs, cucullate, imbricate, the outer pair smaller than the inner. *Petals* 4, small or almost obsolete, generally declinate, naked inside or with a reflexed shaggy scale above the claw. *Disk* unilateral, usually with 4 glands opposite the petals. *Stamens* 8, inserted on the receptacle inside the disk, in ♂ flowers surrounding the ovary. *Ovary* usually 2-lobed and 2-celled, in ♂ flowers merely a pistillode; styles 2, free or connate below, stigmatose on the inner face above; ovule 1 in each cell. *Fruit* indehiscent, 1-2-lobed; lobes subglobose. *Seeds* erect, with a short aril; embryo curved, the cotyledons plicate.

Leaves in all trifoliolate:—

Thyrses shorter than the leaves, sometimes shorter than the petiole, not branched; bark of branchlets whitish; leaflets about 2-5 in. long, serrate crenate-serrate or dentate, usually hoary-tomentose beneath; drupes small 1. *serratus*.
Thyrses equalling or longer than the leaves, not or very rarely branched:—

Bark of branchlets brown, young ones and leaves beneath usually tomentose; leaflets about 3-8 in. long, mucronulate-serrate, the nerves reddish; thyrses single, but sometimes one short branch
2. *serrulatus*.

Bark of branchlets white; leaflets glabrous, about 5-7 in. long, ovate-lanceolate, long acuminate; thyrses single or in pairs; drupes rather large, 4 in. long 3. *distachys*.

Thyrses longer than the leaves, with few branches chiefly near the base; bark of branches yellowish-brown, the young ones and leaves beneath densely ferruginous-tomentose; side leaflets ovate, end one obovate, all acuminate, 3-6 in. long 4. *Rheedii*.
Thyrses longer than the leaves, much branched; bark of branchlets

brown with conspicuous reddish lenticels; leaflets subcoriaceous, glabrous, broadly ovate or lanceolate, obtusely short-acuminate

5. *concanicus*.

1. *ALLOPHYLUS SERRATUS*, Radlk. *A. Cobbe*, Bl.; F. B. I. i. 673, in part. *Ornitrophe serrata*, Roxb. Cor. Pl. i. t. 61. *Schmidelia serrata*, var. *a*; W. & A. 110.

Deccan, in the Hills of Kistna, Kurnool and Cuddapah; Carnatic, in Chingleput and Hills westward to the foot of the Pulneys and southwards to Cape Comorin; perhaps on Malabar Coast.

2. *ALLOPHYLUS SERRULATUS*, Radlk. in Rec. Bot. Surv. Ind. iii. 341. *Schmidelia Cobbe*, Wight Ic. t. 964/2.

W. Gháts, in the Nilgiri and Pulney Hills up to 5,000 ft.; probably throughout the W. Gháts but more scarce.

3. *ALLOPHYLUS DISTACHYS*, Radlk. *A. Cobbe*, Bl.; F. B. I. i. 673 in part.

W. Gháts, in Coorg, Wynnaad and elsewhere, scarce.

4. *ALLOPHYLUS RHEEDII*, Radlk. *A. Cobbe*, Bl.; F. B. I. i. 673 in part. *Schmidelia Rheedii*, Wt. Ic. t. 964.

Deccan, Hills of N. Arcot, Bellary, Mysore and Coimbatore at 3,000 ft.; W. Gháts, in the Nilgiris, Anamalais and Travancore Hills up to 5,000 ft.

A large shrub or small tree, very ferruginous-tomentose. Vern. *Mal. Mukannen peru*.

5. *ALLOPHYLUS CONCANICUS*, Radlk.

W. Ghats, in S. Canara (Barber), Malabar (Beddome) and Travancore (Bourdillon).

Var. *lanceolatus*, Gamble, leaflets lanceolate or oblanceolate, coarsely serrate near the apex, obtusely acuminate.

Nilgiris, Anamalai and Pulney Hills (Saulière) up to 4,000 ft.

3. *Lepisanthes*, Bl.

Trees or shrubs. *Leaves* alternate, paripinnate; leaflets entire, subopposite; stipules 0. *Flowers* regular or irregular, polygamodioecious, in axillary or lateral racemes or panicles. *Sepals* 5, widely imbricate, in 2 rows, outer smaller. *Petals* 4, sometimes 5, the 5th small, erect, clawed, each furnished with 1-2 hooded or reflexed, often cristate scales attached to the claw. *Disk* regular or irregular, if the latter, crenately lobed and opposite to the

petals. *Stamens* usually 8, erect, the filaments free, equal. *Ovary* excentric, trigonous, 3-celled; style simple; stigma oblique; ovules in each cell solitary. *Fruit* 3-celled, 3-sided, thickly coriaceous, tomentose or velvety, the cells hirsute within. *Seeds* oblong, exarillate, the hilum linear; testa thick; cotyledons fleshy, obliquely superposed; radicle minute.

Leaflets 2-3 pairs, elliptic-oblong, obtuse or emarginate, rarely acute, 3-10 in. long; flowers 2-3 in. broad; petals with 2 scales, the outer reflexed, the inner lacinate; fruit yellow-velvety, tomentose, depressed at apex when ripe1. *tetraphylla*.
 Leaflets 5-7 pairs, oblong or oblanceolate, acuminate, 4-10 in. long; flowers 3-4 in. broad; petals with 1 reflexed scale; fruit hispidly yellow-tomentose, acute at apex2. *deficiens*.

1. *LEPISANTHES TETRAPHYLLA*, Radlk. *Molinoea canescens*, Roxb. Cor. Pl. i. t. 60. *Hemigyrosa canescens*, Thw.; F. B. I. i. 671; Bedd. Fl. t. 151. *Cupania canescens*, W. & A. 113.

Evergreen dry forests of the E. Coast in the Circars and Carnatic, nowhere very common, ascending to 3,000 ft.

A moderate-sized rather crooked tree with a white hard wood. Vern. Tel. Korivi; Tam. Nekota.

2. *LEPISANTHES DEFICIENS*, Radlk. *Hemigyrosa deficiens*, Bedd. Fl. t. 231; F. B. I. i. 671.

W. Gháts, in evergreen forests in the Wynaad, Anamalais and Hills of Travancore, up to 4,000 ft., scarce.

A small tree with purple flowers and narrow leaflets.

4. *Erioglossum*, Blume.

Trees or shrubs. *Leaves* alternate, imparipinnate, exstipulate; leaflets opposite or subopposite, entire. *Flowers* irregular, polygamo-dioecious, in elongated erect terminal panicles. *Sepals* 5, unequal, orbicular, concave, imbricate. *Petals* 4, unequal, obovate, the place of the 5th vacant, each petal with a hooded apically lobed woolly scale on the inner face. *Disk* one-sided, lobed. *Stamens* 8, one-sided; anthers oblong; filaments villous. *Ovary* stipitate, obcordate, 3-lobed, 3-celled; style slender; stigma obscurely 3-lobed; ovules solitary. *Fruit* indehiscent, deeply 1-3-lobed, the segments not separating. *Seeds* oblong, exarillate; testa membranous; embryo straight with thick cotyledons.

ERIOGLOSSUM RUBIGINOSUM, Bl. *E. edule*, Bl.; F. B. I. i. 672. *Sapindus rubiginosus*, Roxb. Cor. Pl. i. 44, t. 62; W. & A. 112.

Eastern Gháts, in the Hills of Ganjam and Vizagapatam, up to 2,000 ft.

A good-sized tree, the branchlets young leaves and inflorescence covered with dense golden-brown tomentum. Leaves up to 2 ft. long with about 6 pairs of leaflets. Vern. *Tel.* Ishi rashi.

5. *Schleichera*, Willd.

Trees. *Leaves* alternate, paripinnate, exstipulate, leaflets opposite or subopposite, usually 3 pairs. *Flowers* regular, polygamo-dioecious, small, fascicled in interrupted slender racemes or panicles; pedicels slender. *Calyx* small, cupular; lobes 4-6, usually valvate. *Petals* 0. *Disk* flat, undulate on the margin. *Stamens* 5-8, inserted within the disk; filaments slender, pubescent; anthers oblong. *Ovary* ovoid, narrowed to the rigid style, 3-celled; stigma 3-4-lobed; ovules erect, solitary; in ♂ flowers a villous pistillode. *Fruit* dry, crustaceous, indehiscent, ovoid, acute, tipped with the style, smooth or sometimes more or less echinate. *Seeds* erect, with a fleshy aril; cotyledons conuplicate, unequal.

SCHLEICHERA TRIJUGA, Willd.; F. B. I. i. 681; W. & A. 114; Bedd. Fl. t. 119; Brand. For. Fl. t. 20.

All forest Districts, chiefly in deciduous forests and up to 3,000 ft., common and important.

A large deciduous tree with large leaflets, which are bright red when young. The aril of the fruit, which is about 7 to 1 in. long, is eaten, and the seeds give an oil. The bark is grey and the wood very hard, light reddish-brown, strong and durable and used for rice-pounders, in oil and other mills and for carts. The best lac is produced on its twigs. Vern. *Hind.* Kusam; *Ur.* Kusamo; *Tel.* Puska; *Tam.* Puvan; *Mal.* Puvam; *Kan.* Chakota.

6. *Filicium*, Thw.

Tree, branchlets angular, covered, like the leaves, with waxy scales. *Leaves* alternate, subcoriaceous, imparipinnate; leaflets 6-8 pairs, subopposite, entire, articulate with the broadly-winged

rhachis. *Flowers* small, polygamous, in axillary panicles. *Calyx* 5-lobed; lobes imbricate, deciduous. *Petals* 5, small, imbricate, without scales. *Disk* 5-lobed, tomentose. *Stamens* 5, inserted within the disk; filaments subulate, anthers ovate. *Ovary* sessile, globose, 2-celled, in ♂ flowers merely a pistillode; style hooked; stigma simple or bilobed; ovules solitary, pendulous. *Fruit* a fleshy drupe, 1-2-celled and -seeded; putamen membranous. *Seeds* oblong; testa membranous; cotyledons foliaceous, much crumpled; radicle ascending.

FILICIUM DECIPiens, Thw.; F. B. I. i. 539; Bedd. Fl. t. 129.

Rhus decipiens, Wt. Ill. i. t. 75; W. & A. 172.

W. Ghâts, from Malabar and Nilgiris to Travancore and Tinnevely, up to about 5,000 ft., in somewhat dry localities, sometimes planted for ornament.

A handsome tree with elegant fern-like leaves up to 15 in. long, the rhachis prominently winged. Wood hard and strong, red. Vern. Tum. Ningal; Mal. Val muriccha, Niroli.

7. *Sapindus*, Linn.

Trees or shrubs. *Leaves* alternate, paripinnate; leaflets entire, subopposite; stipules 0. *Flowers* regular, polygamous, in terminal and axillary panicles. *Sepals* 5, unequal, in 2 series, much imbricate. *Petals* 4-5 with or without scales on the inner face. *Disk* annular, lobed. *Stamens* usually 8, inserted within the disk; filaments free, usually pilose; anthers oblong. *Ovary* entire or 2-4-lobed, 2-4-celled; style terminal; stigma 2-4-lobed; ovule solitary; in ♂ flowers a villous pistillode with usually 3 styles. *Fruit* fleshy or coriaceous, of 1-3 indehiscent drupes; the drupes ovoid or globose, indehiscent, with saponaceous fibrous pericarp, brittle when dry. *Seeds* usually globose with two integuments, the outer very hard, the inner membranous; cotyledons thick, fleshy, unequal, spirally convolute; radicle inferior, pointed.

Leaflets 2-3 pairs, lanceolate, acuminate at apex, shining above, glabrous or very slightly pubescent beneath; petals softly woolly on the inner surface except the claw, scales minute or absent; fruit of 3 ferruginous-velvety drupes, almost completely combined

1. *laurifolius*.

Leaflets 2-3 pairs, oblong, emarginate at apex, dull above, softly pubescent beneath and on nerves above; petals glabrous on the inner surface except for 1-2 tufts of white hair above the claw; fruit of 3 drupes, combined about half-way up, and then separating, smooth and slightly pubescent when young, later glabrous and wrinkled

2. *emarginatus*.

1. *SAPINDUS LAURIFOLIUS*, Vahl; W. & A. 111. *S. trifoliatus*, Hiern in F. B. I. i. 682 *in part, not of* Linn.

W. Ghâts, from S. Canara and Mysore to the Anamalais and Hills of Madura, in evergreen and open forests at low elevations.

A stout shady tree. The fruit is used, like that of the next, for soap. Vern. *Mal.* Pasakotta.

2. *SAPINDUS EMARGINATUS*, Vahl; W. & A. 111; Bedd. Fl. t. 154. *S. trifoliatus*, Hiern in F. B. I. i. 682 *in part, not of* Linn.

N. Circars, Deccan and Carnatic, extending to the E. slopes of the Nilgiris and Pulneys and the Hills of Tinnevely, in deciduous and dry evergreen forests, frequent on the coast as at Striharikota in Nellore; frequently planted. The Soapnut.

A common tree, often of large size, chiefly known for its fruits, which are in universal use as a substitute for soap. Bark grey with rough scales. Wood yellow, hard, but little used. Vern. *Hind.* Ritha; *Ur.* Makta maya; *Tel.* Konkudu; *Tam.* Pounanga; *Kan.* Aratala.

8. *Thraulococcus*, Radlk.

Trees or shrubs. *Leaves* large, alternate, paripinnate or reduced to 1 leaflet; leaflets lanceolate, opposite or subopposite. *Flowers* polygamous, in terminal panicles. *Sepals* 5, unequal, concave, imbricate, pubescent. *Petals* 5, obovate, shortly clawed, furnished with a shaggy scale above the claw. *Disk* annular. *Stamens* 8, inserted within the disk; filaments pilose; anthers oblong. *Ovary* 2-3-celled; style short; stigma 3-lobed; ovules solitary. *Fruit* of 1-3 ellipsoidal drupes only slightly connected at the base; pericarp crustaceous, yellow, finely tomentose. *Seed* oblong, covered with a white fleshy aril; testa thin; cotyledons thick, fleshy, unequal, transverse; radicle inferior, pointed.

THRAULOCOCCUS ERECTUS, Radlk. *Sapindus erectus*, Hiern in F. B. I. i. 683. *Nephelium erectum*, Thw.; Bedd. Fl. lxxiv.

W. Gháts, in Wynaad and the Anamalais at 2,000 to 3,000 ft. (Barber).

A large erect shrub with leaves up to 18 in. long, 3-5 pairs of oblong-lanceolate chartaceous glabrous leaflets up to 9 in. long and drupes 1 in. long, usually in pairs.

9. *Aphania*, Blume.

Trees or shrubs. *Leaves* alternate, paripinnate, exstipulate; leaflets 1-6 pairs, sometimes unifoliolate, subopposite. *Flowers* in racemes or panicles. *Sepals* 4-5, petaloid, widely imbricate. *Petals* 4-6, small, with infolded basal auricles or a basal scale. *Disk* regular, slightly lobed. *Stamens* 5-8, rarely 3, inserted within the disk. *Ovary* 1-3- usually 2-celled; style slender, bifid; ovules solitary. *Fruit* fleshy, deeply divided into 2, rarely 3 divergent lobes united only at the base; endocarp thin, cartilaginous or crustaceous. *Seed* exarillate; cotyledons thick.

APHANIA BIFOLIOLATA, Radlk. *Sapindus bifoliolatus*, Hiern; F. B. I. i. 684. *Nephelium bifoliatum*, Bedd. Ic. t. 289.

Kolaimalai Hills in Trichinopoly (Beddome).²

A branching tree reaching 30 ft. in height with one pair of lanceolate leaflets and masses of white blossom.

10. *Nephelium*, Linn.

Trees or shrubs. *Leaves* alternate, paripinnate, exstipulate; leaflets entire, subopposite. *Flowers* small, regular, polygamous, numerous, in terminal and axillary racemes or panicles. *Calyx* 4-6-lobed, usually cupular; lobes short, valvate or slightly imbricate in bud. *Petals* 4-6, often 0, small, villous, rarely with scales. *Disk* annular, fleshy, in the calyx-tube. *Stamens* 6-8, inserted within the disk; filaments slender. *Ovary* pubescent, often verrucose, 2-3-lobed and -celled; style simple, 2-3-lobed; ovules solitary. *Fruit* of 1-3 indehiscent globose or ovoid cocci, smooth tubercled or echinate. *Seeds* ellipsoid or globose, covered by a fleshy arillus; cotyledons thick, fleshy, usually obliquely superposed.

Petals present; leaves up to 18 in. long with 4-10 pairs of leaflets; leaflets oblong-lanceolate to almost linear lanceolate, up to 12 in.

long, glaucescent beneath; calyx deeply lobed, brown-tomentose; fruit with round tubercles or sometimes nearly smooth, red or purple, '5-7 in. in diam. 1. *Longana*.

Petals 0:—

Leaves 3-9 in. long with 2-8 pairs of lanceolate acuminate leaflets, the lowest pair not stipuliform; calyx merely dentate, with golden tomentum; fruit with conical sharp tubercles, red, 1 in. in diam. or more *Litchi*.

Leaves 6-15 in. long with 4-6 pairs of elliptic obtuse leaflets, the lowest pair small, very unequally reniform, stipule-like, the rest large; calyx deeply lobed, villous; fruit densely covered with soft weak prickles, '75 in. in diam. 2. *stipulaceum*.

1. *NEPHELIUM LONGANA*, Camb.; F. B. I. i. 688; W. & A. 113. *Euphoria Longana*, Lamk.; Bedd. Fl. t. 156.

W. Gháts, from S. Canara and Mysore to Tinnevely, common in evergreen forests up to 5,000 ft. The Longan tree.

A large handsome evergreen tree, the young leaves red and conspicuous. Bark smooth, yellowish-grey; wood red, moderately hard but little used. The aril of the seed is edible. A common form has the leaflets narrow, linear-lanceolate and the pericarp nearly smooth, but is not distinct. Vern. *Tam.* Puvatti, Katta puvan; *Mar.* Wumb; *Kan.* Kanakindeli; *Mal.* Pasakotta.

2. *NEPHELIUM STIPULACEUM*, Bedd.; F. B. I. i. 690; Bedd. Ic. t. 103, Fl. t. 155.

W. Gháts, in the evergreen forests of Malabar, Travancore and Anamalais up to 3,000 ft.

A moderate-sized handsome tree noticeable for the stipule-like pair of lower leaflets. The wood is reddish-brown and hard. Vern. *Mal.* Paviri mulei.

Nephelium Litchi, Camb., is the tree which gives the delicious fruit Lichi, the transparent aril being the edible part. The tree comes from China and is sometimes planted in gardens.

11. *Harpullia*, Roxb.

Trees. *Leaves* alternate, paripinnate, exstipulate; leaflets opposite and alternate, entire. *Flowers* regular, dioecious or polygamous, in axillary or subterminal racemes or panicles. *Sepals* 4-5, erect, equal, imbricate. *Petals* 4-5, usually clawed,

narrowly obovate, without scales. *Disk* obscure. *Stamens* 5-8, inserted inside the disk; filaments slender; anthers oblong. *Ovary* ovoid, 2-celled; style elongate; stigma linear, usually more or less twisted; ovules 2 in each cell, superposed. *Fruit* an inflated, coriaceous, 2-lobed, 2-celled, loculicidally 2-valved capsule; cells 1-2-seeded. *Seeds* subglobose, usually arillate; embryo with thick hemispheric cotyledons.

HARPULLIA IMBRICATA, Thw.; F. B. I. i. 692; Bedd. Fl. t. 158.

W. Gháts, in evergreen forests from S. Canara to the Anamalais and Travancore, up to 4,000 ft.

A large tree with pinnate leaves up to 16 in. long, 3-4 pairs of membranous, usually lanceolate leaflets up to 7 in. long, flowers with delicate clawed greenish petals and brilliant orange-scarlet inflated 2-lobed capsules. Bark smooth, greenish; wood white, soft. Vern. *Tam.* Nei kottei; *Mal.* Chittila madakku.

12. *Dodonaea*, L.

Shrubs or small trees. *Leaves* alternate, simple or pinnate, exstipulate. *Flowers* small, polygamous, in axillary or terminal racemes or panicles. *Sepals* 2-5, imbricate or valvate. *Petals* 0. *Disk* none in ♂ flowers, small in ♀. *Stamens* 5-10, usually 8, inserted without the disk in ♂ flowers, in ♀ round a small pistillode; filaments short; anthers linear-oblong. *Ovary* 3-6-angled and -celled; style 3-6-sided, 3-6-cleft at top; ovules 2 in each cell, collateral or superposed. *Fruit* a 2-6-sided membranous or coriaceous capsule, septicidally 2-6-valved, the valves winged at the back; cells 1-2-seeded. *Seeds* lenticular or subglobose, compressed, exarillate; funicle thickened; testa crustaceous or coriaceous; cotyledons spirally convolute.

DODONAEA VISCOSA, Linn.; F. B. I. i. 697. *D. Burmanniana*, DC.; W. & A. 114; Wt. Ill. i. t. 52.

N. Circars, Deccan and Carnatic, a common shrub often more or less gregarious; W. Gháts, in Shola forests up to 8,000 ft. and often then a small tree; sometimes planted as a hedge plant.

A stiff shrub or a small tree with shining simple oblanceolate leaves and 2-3-winged capsules. Bark thin, grey; wood

dark brown, very hard and heavy and useful for tool-handles and walking-sticks. Vern. *Hind.* Sanatta; *Tam.* Virali; *Tel., Kan.* Bhandaru; *Mal.* Vrali.

Blighia sapida, Koen., the Akee fruit, is occasionally cultivated in Madras Gardens.

Family LI. SABIACEAE.

Trees or erect or climbing shrubs. *Leaves* alternate, simple or compound, stipules 0. *Flowers* small, hermaphrodite or polygamous, usually paniced. *Calyx* 4-5-partite, imbricate. *Petals* 3-5, equal or unequal, opposite to or alternate with the sepals, valvate or imbricate. *Disk* usually small, annular. *Stamens* 4-5, opposite to the petals, inserted at the base of or on the disk; all perfect or 2 only perfect and 3 without anthers. *Ovary* 2-3-celled, compressed or 2-3-lobed; styles 2-3, free or connate or 0; stigmas punctiform; ovules 1-2 in each cell. *Fruit* of 1-2 dry or fleshy, globose or compressed drupes. *Seeds* compressed or globose, basilar; hilum broad; testa membranous or coriaceous; albumen 0; cotyledons often contorted; radicle deflexed.

Stamens 4-5 all perfect and equal; drupes compressed; climbing shrubs with simple entire leaves 1. **Sabia**.
Stamens 5, 2 only fertile, unequal; drupes subglobose; trees with simple or pinnate leaves, entire or serrate 2. **Meliosma**.

1. *Sabia*, Colebr.

Shrubs, sarmentose or climbing. *Leaves* alternate, simple, entire. *Flowers* usually hermaphrodite, 2-bracteolate, axillary and solitary or in axillary simple or paniced cymes, the bracts, calyx-lobes, petals and stamens all opposite. *Calyx* 4-5-partite. *Petals* 4-5. *Disk* annular, 4-5-lobed. *Stamens* 4-5, inserted at base of the disk. *Carpels* 2, rarely 3, very slightly connate; styles 2, erect, terminal, slightly connate; ovules 2 in each carpel. *Fruit* of 1-2 dry or drupaceous ripe carpels, usually compressed and gibbous with a sub-basal style. *Seeds* reniform, testa coriaceous; embryo curved.

SABIA MALABARICA, Bedd. Ic. t. 177; F. B. I. ii. 2.

W. Gháts, in the Palghat and Anamalai Hills at 3,000-4,000 ft. (Beddome).

A glabrous climbing shrub with elliptic-oblong acuminate leaves, very small flowers in short axillary cymes and flat reticulate reniform drupes.

2. *Meliosma*, Blume.

Trees or shrubs, usually pubescent. *Leaves* alternate, simple or imparipinnate; if the latter, leaflets subopposite, the terminal rarely wanting; leaves or leaflets sometimes serrate, especially when young. *Flowers* small, irregular, hermaphrodite, in branched terminal or axillary panicles; bracts caducous. *Sepals* and their bracteoles 5-9, persistent, forming an uninterrupted spiral round the petals. *Petals* 3, nearly orbicular, valvate or imbricate. *Stamens* 5; 2 fertile opposite the inner petals, the filaments short, flattened, incurved, furnished at the base with bifid scales expanded upwards in a cup bearing 2 globose anther-cells bursting transversely and springing back elastically; 3 sterile, deformed, opposite the outer petals, bifid, together forming a hood over the pistil. *Disk* annular or cupular with 2-5 simple or dentate teeth. *Ovary* sessile, 2- rarely 3-celled, contracted into a simple or bifid style; stigma simple; ovules 2 in each cell. *Fruit* a small, obliquely subglobose, drupe; stone crustaceous, 1-celled, with a basilar rounded projection within. *Seed* globose; testa membranous; cotyledons conduplicate; radicle incurved.

Leaves simple; ovary glabrous:—

Leaves membranous, obovate or oblanceolate, usually glabrous, serrate only when young; midrib and main nerves raised on the upper surface; panicles puberulous, flowers very small, sepals and bracteoles about 5; drupe .2 in. in diam., stone deeply rugose

1. *simplicifolia*.

Leaves coriaceous; elliptic-oblong or -lanceolate, usually pubescent beneath, midrib and main nerves impressed on the upper surface; panicles densely ferruginous pubescent, flowers rather large, sepals and bracteoles about 9; drupe .3 in. in diam., stone slightly rugose

2. *Wightii*.

Leaves pinnate; leaflets opposite or subopposite:—

Ovary pubescent; leaflets 9-15, lanceolate, entire, pubescent beneath; panicles rusty-pubescent; stone nearly smooth

3. *Arnottiana*.

Ovary glabrous; leaflets 7-15, oblong-lanceolate or -obovate, serrate, nearly glabrous; panicles puberulous; stone rugose

4. *pinnata*.

1. *MELIOSMA SIMPLICIFOLIA*, Walp.; F. B. I. ii. 5. *Millingtonia simplicifolia*, Roxb. Cor. Pl. iii. t. 254; W. & A. 115.

E. Gháts, Madgol Hills of Vizagapatam at 4,500 ft. (A. W. Lushington); W. Gháts, at low elevations and up to 3,000 ft. in evergreen forests in Malabar, Nilgiris, Anamalais to Travancore.

A small tree with reddish moderately hard wood.

2. *MELIOSMA WIGHTII*, Planch.; F. B. I. ii. 4. *Millingtonia pungens*, Wall.; W. & A. 115; Wt. Ic. t. 964, 3.

W. Gháts, at high elevations, usually above 5,000 ft. in the Nilgiri, Anamalai, Pulney and Travancore Hills in Shola forests.

A medium-sized tree with a dark reddish-brown soft wood of little value. Vern. *Badaga* Tode.

3. *MELIOSMA ARNOTTIANA*, Walp.; F. B. I. ii. 6; Bedd. Fl. t. 160. *Millingtonia Arnottiana*, Wt. Ill. i. t. 53. *Sapindus microcarpus*, W. & A. 112.

W. Gháts, at 4,000-7,000 ft. in Shola forests from S. Canara to Tinnevely, common and conspicuous.

A large tree with thick brown bark and dark reddish-brown soft wood. Vern. *Tam.* Kusavi, Thagari; *Badaga* Huli Makay; *Mal.* Kalavi.

4. *MELIOSMA PINNATA*, Roxb.; F. B. I. ii. 6.

E. Gháts, Madgol Hills of Vizagapatam at 3,000-4,000 ft. (A. W. Lushington).

A medium-sized tree.

Family LII. ANACARDIACEAE.

Trees or shrubs, usually with acrid or resinous juice. *Leaves* alternate or rarely opposite, simple or trifoliolate or imparipinnate, exstipulate. *Flowers* small, regular, hermaphrodite polygamous or unisexual, in a generally paniculate terminal or axillary inflorescence. *Calyx* of 3-5 sepals, sometimes accrescent, sometimes spathaceous. *Petals* 3-5, alternate with the sepals, free, rarely 0, imbricate or valvate. *Disk* flat, cupular or annular, entire or lobed, rarely obsolete. *Stamens* as many as the petals, rarely twice as many, inserted under or rarely on the disk; fila-

ments usually subulate; anthers 2-celled basi- or dorsi-fixed. *Ovary* superior, rarely half inferior, 1- or 2-6-celled, rudimentary or 2-3-fid in the ♂, sometimes of 5-6 free carpels; styles usually combined; stigmas subsessile or capitate; ovules solitary, pendulous from the top or side of the cell or from an ascending basal funicle. *Fruit* superior, rarely inferior, a 1-5-celled, 1-5-seeded drupe; the stone sometimes dehiscent. *Seed* exalbuminous or very nearly so, embryo straight or curved; cotyledons plano-convex; radicle short.

Carpels 5 or 1 only; style lateral; ovule suspended from a basal funicle; leaves simple:—

Carpels 5, 1 only fertile; drupe lenticular, 2-valved 1. **Buchanania**,
Carpel 1:—

Stamens 5-10, 1 only or more fertile:—

Fruit a fleshy drupe; 1 stamen usually only fertile

2. **Mangifera.**

Fruit a reniform nut on a fleshy hypocarp, all or most of the
8-10 stamens fertile3. **Anacardium.**

Stamens 5 fertile; fruit a globose or ovoid drupe ..4. **Gluta.**

Carpels 4-5, rarely 1; style apical; leaves pinnate:—

Petals valvate; leaves usually with an intramarginal nerve:—

Carpels 5; drupe usually large, 1-5 seeded, pericarp fibrous

5. **Spondias.**

Carpel 1; drupe small, 1-seeded, pericarp oily...6. **Solenocarpus.**

Petals imbricate; leaves without intramarginal nerve; drupe compressed.....7. **Odina.**

Carpels 3, rarely 1; style apical or lateral; leaves trifoliolate

8. **Rhus.**

Carpels 3, forming a unilocular ovary; styles apical, free or connate; leaves simple:—

Styles short, terminal; stigma 3-lobed; flowers tetramerous

9. **Nothopegia.**

Styles 3, divergent; stigmas capitate; flowers usually pentamerous:—

Ovary in ♀ or ♂ semi-inferior or superior; petiole without spur-like appendages; fruit with a basal hypocarp ..10. **Semecarpus.**

Ovary in ♀ or ♂ inferior; petiole with 2-4 spur-like appendages; fruit partly or wholly enclosed in a hypocarp

11. **Holigarna.**

1. **Buchanania**, Spreng.

Trees. *Leaves* alternate, petioled, simple, usually coriaceous,

quite entire; stipules 0. *Flowers* small, white, hermaphrodite, in terminal and axillary branched panicles. *Calyx* short, 3-5-toothed or -lobed, persistent, imbricate. *Petals* 4-5, ovate or oblong, imbricate, at length recurved. *Disk* thick, urceolate or cupular, 5-lobed. *Stamens* 8-10, free, inserted at the base of the disk; filaments linear; anthers ovate. *Ovary* of 5-6 free carpels, seated in the cavity of the disk, one fertile, the rest imperfect; style short; stigma truncate; ovule 1, pendulous from a basal funicle. *Fruit* a small slightly fleshy lenticular drupe; stone crustaceous or bony, 2-valved. *Seed* gibbous, acute at one end; albumen 0; cotyledons thick; radicle superior.

Inflorescence pubescent; leaves coriaceous:—

Leaves broadly oblong, obtuse or emarginate, over 6 in. long and 2 in. broad, petiole stout, main nerves straight and parallel; flowers 3 in. in diam., the petals oblong; drupe black, 3-6 in. in diam. 1. *Lanzan*.
Leaves narrowly oblong, under 6 in. long, 2 in. broad; petiole rather slender:—

Leaves elliptic-oblong, obtuse or very slightly acute at apex, rusty villous beneath when young, main nerves regular, sub-horizontal, straight and parallel; flowers 2.5-3 in. in diam., the petals oblong 2. *Barberi*.
Leaves oblong-lanceolate, acuminate at apex, glabrous beneath, main nerves ascending, curved and branched; flowers 1.5 in. in diam., the petals ovate obtuse; drupe red, .6 in. in diam.

3. *lanceolata*.

Inflorescence glabrous; leaves scarcely coriaceous, obtuse and emarginate, under 6 in. long, 2 in. broad, main nerves curved, irregular, petiole slender; flowers 2 in. in diam., petals obtuse; drupe black, .5 in. in diam. 4. *angustifolia*.

1. **BUCHANANIA LANZAN**, Spreng. *B. latifolia*, Roxb.; F. B. I. ii. 23; W. & A. 169; Bedd. Fl. t. 165.

Deciduous forests in all Districts, common, up to 4,000 ft. A tree with conspicuous rough bark tessellated in prominent squares, and a greyish-brown moderately hard wood of little value. It gives a copious gum and the kernels of the seeds are collected and eaten. Vern. *Hind.* Piar; *Mar.* Chironji; *Ur.* Charu; *Tam.* Morala; *Tel.* Morli, Sara; *Kan.* Nurkul; *Mal.* Munga péra.

2. *BUCHANANIA BARBERI*, Gamble in Kew Bull. 1916, 135.
Travancore, at Nadarai (Barber).
3. *BUCHANANIA LANCEOLATA*, Wt. Ic. t. 237; F. B. I. ii. 24.
W. Ghâts, evergreen forests of Travancore, up to 2,000 ft.
A medium-sized tree. The kernels of the seeds are edible.
Vern. *Mal.* Mala mávu.
4. *BUCHANANIA ANGUSTIFOLIA*, Roxb.; Cor. Pl. iii. t. 262;
F. B. I. ii. 23; W. & A. 169; Wt. Ic. t. 101. *B. intermedia*,
Wt. Ic. t. 81.

Deccan and Carnatic, in dry forests from Hyderabad southwards to Travancore.

A medium-sized tree with rough deeply fissured bark and greyish-brown moderately hard wood of no value. The kernels of the seeds, the best of the three species, are largely collected and eaten. Vern. *Tel.* Morli sara, Pedda morali; *Tam.* Mudamah, Kolamávu—the seeds “Sara pappu.”

2. *Mangifera*, Linn.

Trees. *Leaves* alternate, petioled, coriaceous, simple, entire; stipules 0. *Flowers* small, polygamous, in terminal panicles; pedicels jointed; bracts deciduous. *Calyx* 4-5-partite; segments imbricate, deciduous. *Petals* 4-5, free or adnate to the disk, imbricate, furnished on the inside with a lobed glandular scale or crest. *Disk* fleshy, 4-5-lobed. *Stamens* 1-5, inserted inside or on the disk, 1 sometimes 2 fertile the others sterile, slender, tipped with a small gland. *Ovary* sessile, 1-celled, oblique; style lateral; stigma simple; ovule pendulous from a basal or lateral funicle. *Fruit* a large fleshy resinous drupe with a compressed fibrous stone. *Seed* large, ovoid-oblong, compressed; testa thin, papery; albumen 0; cotyledons plano-convex, often unequal and lobed; radicle slightly curved upwards.

MANGIFERA INDICA, Linn.; F. B. I. ii. 13; W. & A. 170; Bedd. Fl. t. 162.

Hill forests of the E. Ghâts, Deccan and W. Ghâts, in ravines up to 4,000 ft.; universally cultivated in gardens, avenues, and “topes,” and run wild. The Mango.

A large spreading evergreen tree reaching 50 ft. in height, the oblong-lanceolate shining leaves crowded at the ends

of the branches; the flowers in dense terminal panicles. Cultivated for its edible, very important fruit, which is eaten fresh, or made into preserves or pickles. Bark rough, dark grey; wood grey, often streaked, moderately hard, used for planking, packing cases, boats, and other purposes. Vern. *Hind. Am.*; *Ur. Ambo*; *Mar. Ambi*; *Tam. Maá*; *Tel. Mamadi*; *Kan. Mavu*.

3. *Anacardium*, Linn.

Shrubs or trees. *Leaves* alternate, petioled, simple, entire; stipules 0. *Flowers* small, polygamous, in terminal bracteate panicles. *Calyx* 5-partite; segments erect, imbricate, deciduous. *Petals* 5, linear-lanceolate, recurved, imbricate. *Disk* filling the base of the calyx, erect. *Stamens* 8-10, all fertile or some sterile, one usually longer than the others; filaments connate at the base and adnate to the disk. *Ovary* obovoid or obcordate, 1-celled; style filiform, excentric; stigma minute; ovule solitary, ascending from a lateral funicle. *Fruit* a reniform nut 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; albumen 0; cotyledons semilunar, radicle short, curved upwards.

ANACARDIUM OCCIDENTALE, Linn.; F. B. I. ii. 20; W. & A. 168; Bedd. Fl. t. 163.

Native of America, cultivated and run wild, especially on the sea coast. The Cashew-nut.

A small tree with short thick trunk, obovate rather large leaves, flowers yellow streaked with pink, in terminal, prominently bracteate, panicles and a greenish-grey nut on a yellow or scarlet fleshy peduncle. Wood reddish-brown, of little use. The nuts are roasted and the kernels eaten for dessert, the peduncles are sometimes eaten but are astringent. The pericarp gives an acrid caustic oil. Vern. *Hind. Kaju*; *Tel. Jidi mamidi*; *Tam. Kola mávu*; *Kan. Godambe*; *Mal. Paringi mávu*.

4. *Gluta*, Linn.

Evergreen trees, with acrid resinous juice. *Leaves* alternate, simple, entire, coriaceous, crowded at the ends of the branches. *Flowers* small, hermaphrodite, in axillary or terminal panicles,

Calyx gamosepalous, spathaceous, splitting irregularly, deciduous. *Petals* 4-6, inserted on the disk and adnate with it below, imbricate, spreading in flower. *Disk* usually elongate, cylindric. *Stamens* as many as the petals and alternate with them; filaments capillary. *Ovary* sessile on the disk or stipitate, oblique, 1-celled; style lateral, filiform; stigma simple; ovule 1, pendulous from a basal funicle. *Fruit* dry, stalked, more or less globose, sometimes furrowed; pericarp thick. *Seed* conform to the pericarp; testa adherent to the pericarp; albumen 0; cotyledons large, thick, plano-convex; radicle short, obtuse, incurved.

GLUTA TRAVANCORICA, Bedd. Fl. t. 60; F. B. I. ii. 22.

W. Gháts, evergreen forests of South Travancore and Tinnevely up to 3,500 ft.

A very large tree reaching 120 ft. in height and 5 ft. in diam. of bole, with spathulate leaves up to 6 in. long and cream-coloured flowers. The bark is smooth, pinkish-grey, and the heartwood dark red, mottled with orange and black streaks, valuable for furniture and house-fittings. Vern. *Tam. Skencurani*; *Mal. Thodappei*.

5. Spondias, Linn.

Deciduous glabrous trees. *Leaves* usually crowded at the ends of the branches, alternate, imparipinnate; leaflets subopposite, usually caudate-acuminate; stipules 0. *Flowers* small, polygamous, in terminal spreading panicles. *Calyx* small, 4-5-lobed, deciduous, lobes imbricate. *Petals* 4-5, spreading, valvate. *Disk* thick, annular, 8-10-crenated. *Stamens* 8-10, inserted below the disk, filaments slender. *Ovary* shortly ovoid or subglobose, 4-5-celled, immersed in the disk; styles 4-5, conniving above; stigmas spreading; ovule 1 in each cell, pendulous. *Fruit* a fleshy drupe with woody endocarp surrounded by longitudinal interwoven fibres, 1-5-seeded. *Seeds* pendulous, oblong; testa membranous; albumen 0; cotyledons elongate, plano-convex; radicle short, superior.

Spondias MANGIFERA, Willd.; F. B. I. ii. 42; W. & A. 173; Wt. Ill. t. 76; Bedd. Fl. t. 169.

Deciduous forests in almost all Districts, up to about 2,000 ft., but not very common; frequently planted. The Indian Hog-plum.

A large tree in good soil with large leaflets, sometimes 9 in.

by 4 in., but small and with smaller leaflets in poor localities. The leaflets have parallel nerves meeting in an intramarginal nerve. The fruit is eaten. Bark smooth, grey; wood light grey, useless. Vern. *Hind.* Amra; *Ur.* Ambota; *Mar.* Amb.; *Tel.* Aravi mamadi; *Tam.* Kat maá, Mám pulicchi; *Mal.* Ambalam.

S. acuminata, Roxb., seems to be only a small-leaved form of the above.

6. *Solenocarpus*, W. & A.

A tree. *Leaves* alternate, imparipinnate, crowded towards the ends of the branches; leaflets opposite or subopposite, crenulate. *Flowers* small, white, hermaphrodite, in branched panicles terminal on old branches. *Calyx* minute, 5-lobed, imbricate, deciduous. *Petals* 5, ovate, valvate, recurved. *Disk* annular, crenately lobed, surrounding the base of the ovary. *Stamens* 10, inserted at the base of the disk; filaments slender; anthers oblong. *Ovary* free, sessile, 1-celled; style thick, furrowed; stigma oblique, truncate; ovule 1, pendulous from one side near the apex of the cell. *Fruit* a small obliquely oblong, truncate, compressed drupe; pericarp cellular, oily; stone bony. *Seed* linear, compressed; cotyledons linear, plano-convex; radicle very short, superior.

SOLENOCARPUS INDICA, W. & A. 171; F. B. I. ii. 27; Bedd. Fl. t. 233.

W. Gháts, from Coorg to the Anamalais and Hills of Travancore and Tinnevely, up to 2,500 ft., not common.

A tree with about 5-7 pairs of oblong acuminate leaflets up to 4 in. long and 1 in. wide with an intramarginal nerve, white small flowers in conspicuous masses and small fruit.

7. *Odina*, Roxb.

Deciduous trees with stout soft branches. *Leaves* alternate, imparipinnate, clustered at the ends of the branchlets; leaflets opposite, entire; stipules 0. *Flowers* small, monoecious or dioecious, fascicled, shortly pedicelled, in simple or paniced, terminal, fascicled, racemes. *Calyx* 4-lobed, persistent; lobes rounded, imbricate. *Petals* 4, imbricate. *Disk* annular, 8-lobed. *Stamens* 8, inserted below the disk; filaments in ♂ unequal, subulate, the anthers ovate or sagittate, in ♀ very short and

small, the anthers small, sterile. *Ovary* in ♂ abortive, styles 4; in ♀ ovoid or subglobose, 4- but rarely more than 1-celled; styles 4, distant, from the 4 corners of the top of the ovary, erect; stigmas small, peltate; ovules pendulous from near the top of the cell. *Fruit* a small compressed ovoid or obovoid thinly fleshy drupe; stone hard, 1 cell only seed-bearing, irregularly pitted outside. *Seed* compressed, on a funicle; testa membranous; albumen 0; cotyledons plano-convex, curved; radicle thick, superior.

ODINA WODIER, Roxb.; F. B. I. ii. 29; W. & A. 171; Wt. Ic. t. 60; Bedd. Fl. t. 123.

Deciduous forests in most Districts, often planted in avenues. In good soil a large tree, in poor soils often small and stunted, and in some localities as on the East Coast almost evergreen. Leaflets 3-4 pairs, long-acuminate. Bark thick, grey, smooth; wood reddish-brown, fairly good but not much used. The copious gum seems rarely to be collected in S. India. Vern. *Hind.* Thingan; *Ur.* Moi; *Tel.* Gumpini; *Tam.* Wodier, Uthi; *Kan.* Godda; *Mal.* Kalasan.

8. Rhus, Linn.

Trees or shrubs, often with acrid juice. *Leaves* alternate, simple 3-foliolate or imparipinnate, the leaflets entire or serrate. *Flowers* small, polygamous, in terminal or axillary panicles. *Calyx* small, 5-partite, the lobes nearly equal, persistent, imbricate. *Petals* 5, spreading, imbricate. *Disk* cupular, lobed. *Stamens* 5, inserted below the disk, in ♂ flowers as long as or longer than the petals, in ♀ flowers minute; filaments subulate; anthers short. *Ovary* sessile, ovoid or globose, 1-celled; styles 3, free or connate; stigmas simple or capitate; ovule pendulous from a basal funicle. *Fruit* a small, dry, compressed drupe; stone coriaceous, crustaceous or bony. *Seed* pendulous from the funicle; testa membranous; albumen 0; embryo curved, with flattish cotyledons; radicle short, superior.

Leaves 3-foliolate; leaflets obovate, the lateral smaller than the terminal:—

Thorny shrub; leaflets prominently sinuate-toothed, the end ones 1-1.5 in. long, the side ones .5-1 in. long1. *mysorensis*.
Small unarmed tree; leaflets entire or slightly undulate, the end one 3-5 in. long, the side ones 1-3 in. long...2. *paniculata*.

1. *RHUS MYSORENSIS*, Heyne; F. B. I. ii. 9; W. & A. 172.
Dry stony lands in the Deccan Hill country extending to the N. slopes of the Nilgiris.
A small shrub with hard reddish-yellow wood. The branches are used for fencing.
2. *RHUS PANICULATA*, Wall; F. B. I. ii. 10.
E. Gháts, Rumpa Hills of Godavari, to 3,000 ft. (Gamble).
A small tree with hard reddish-brown wood.

9. *Nothopegia*, Bl.

Small trees. *Leaves* alternate, opposite or subopposite, coriaceous, entire, petiolate; stipules 0. *Flowers* small, polygamous, bracteate, in short axillary racemes or panicles of racemes. *Calyx* small, 4-lobed, persistent, the lobes imbricate. *Petals* 4, spreading, imbricate. *Disk* annular, 4-lobed. *Stamens* 4, inserted under the margin of the disk; filaments subulate, short in ♂; anthers shortly oblong, introrse, longitudinally dehiscent. *Ovary* abortive in ♂, in ♀ sessile, ovoid, 1-celled; style short; stigma capitate; ovule pendulous from near the top of the cell from a flattened funicle. *Fruit* a globose, acute or depressed, fleshy drupe, tipped with the style, the flesh cellular containing resin. *Seed* pendulous; testa membranous; albumen 0; cotyledons thick, plano-convex; radicle very short, usually basal.

Leaves alternate:—

Drupe with thick pericarp filled with black resin-cells, ovoid, acute at apex; ultimate branchlets pubescent:—

Leaves coriaceous, obovate, shortly and bluntly apiculate, 3–4 in. long by 1–1·5 in. broad, nerves 12–15 pairs, petiole stout, 3 in. long; ♂ racemes up to 1 in. long, dense, fascicled or paniculate, ♂ shorter; drupe 5 in. in diam. 1. *Colebrookiana*.

Leaves thinly coriaceous, variable, from linear to lanceolate or elliptic, obtusely acute, 1·5–5 in. long by 5–1 in. broad, nerves from 15–25 pairs, petiole slender, 1–2 in. long; ♂ racemes slender, up to 5 in. long, ♀ rather long; both sometimes subterminal; drupe under 4 in. in diam., blue 2. *Heyneana*.

Drupe with thin pericarp, transversely oblong, striate, depressed at apex:—

Leaves and branchlets glabrous:—

Leaves oblong, acuminate, up to 8 in. long by 3 in. broad, nerves strong and parallel, about 20 pairs; petiole twisted,

·5-1 in. long; racemes slender, 2-3 in. long, paniculate; petals glabrous; filaments glabrous or slightly pubescent; drupe red (?) 3. *Dalzellii*.
 Leaves lanceolate, acuminate or caudate, 3-5 in. long by 1-1·5 in. broad, nerves rather obscure, up to 20 pairs; petiole slender, ·2-·4 in. long; racemes slender, 1-2 in. long, often paniculate; petals glabrous, filaments villous; drupe purple (?)

4. *Beddomei*.

Leaves and branchlets rusty-villous, leaves linear-oblong or lanceolate, abruptly long acuminate; nerves parallel, 25-30 pairs; petiole ·3-·5 in. long; racemes very short, petals densely villous within, filaments villous; drupe blue 5. *travancorica*.

Leaves subopposite, linear-oblong or oblong-lanceolate, gradually long acuminate; nerves parallel, 25-30 pairs; petiole stout, very shaggy, ·3 in. long; racemes very short, petals glabrous, filaments slightly villous 6. *aureo-fulva*.

1. NOTHOPEGIA COLEBROOKIANA, Blume; F. B. I. ii. 41 *in part only*. *Pegia*? *Colebrookiana*, Wt. Ic. t. 236.

W. Gháts, in the Sivagiri Hills of Tinnevely (Wight); Nilgiris (Bourne).

2. NOTHOPEGIA HEYNEANA, Gamble. *N. Colebrookiana* var. *Heyneana*, Hook. f. in F. B. I. ii. 40.

W. Gháts, in the Anamalais and Hills of Tinnevely (Beddome, Bourne); Mahendragiri Hill in Ganjam at 4,000 ft. ? (Gamble).

3. NOTHOPEGIA DALZELLII, Gamble. *N. Colebrookiana*, Hook. f. in F. B. I. ii. 40, *in part only*. *Glycyarpus racemosus*, Dalz.; Hook. Ic. t. 842.

W. Gháts, from S. Canara southwards to Nilgiris, Pulneys, Anamalais and Travancore, rising to 5,000 ft.
 A small tree with pinkish-yellow hard wood.

Var. *angustifolia*, Gamble. Leaves narrower and less prominently nerved; inflorescence shorter.

Nilgiri and Pulney Hills (Bourne).

4. NOTHOPEGIA BEDDOMEI, Gamble. *N. Colebrookiana*, Hook. f. in F. B. I. ii. 40 *in part*; Bedd. Fl. t. 164.

W. Gháts in the Nilgiri, Coimbatore, Anamalai, Pulney and Tinnevely Hills, up to 5,000 ft.

5. NOTHOPEGIA TRAVANCORICA, Bedd.; F. B. I. ii. 40.

W. Gháts, from S. Canara to Malabar, Travancore and Tinnevely, in hills, up to 3,000 ft.

6. NOTHOPEGIA AUREO-FULVA, Bedd. ; F. B. I. ii. 40.

W. Gháts, in hills of Courtallum in Tinnevely (Beddome).

10. Semecarpus, Linn. f.

Trees. *Leaves* alternate, simple, entire, coriaceous ; stipules 0. *Flowers* small, polygamous or dioecious, in terminal rarely axillary panicles, the ♂ flowers smaller than the ♀ or ♂. *Calyx* usually 5-, sometimes 3-lobed, the segments deciduous. *Petals* 5, rarely 3, ovate or oblong-ovate, imbricate. *Disk* broad, annular. *Stamens* inserted below the disk ; filaments filiform, in ♂ flowers as long as or longer than the petals, in ♀ flowers short ; anthers usually oblong, in ♂ flowers small and imperfect. *Ovary* in ♂ flowers rudimentary or 0, in ♀ or ♂ flowers superior, 1-celled ; styles 3, divergent ; stigmas capitate or bilobed, rather large ; ovule pendulous from a basal funicle. *Fruit* an oblong or subglobose oblique drupe seated on a fleshy receptacle (hypocarp) formed of the accrescent disk and calyx-base ; pericarp thick, with cavities filled with an acrid resin. *Seed* pendulous ; testa membranous or subcoriaceous ; cotyledons plano-convex ; radicle superior.

Leaves and inflorescence pubescent ; ovary densely villous :—

Petals 5 in all flowers ; leaves obovate-oblong, obtuse at apex, rounded at base, glaucous reticulate and more or less hairy beneath, up to 2 ft. long, 1 ft. broad ; drupe black, .75 in. long, on an orange hypocarp as long as the drupe.....1. *Anacardium*.
Leaves and inflorescence glabrous ; ovary glabrous or with a few scattered hairs :—

Petals 5 in all flowers ; leaves thick, obovate-oblong, obtuse at apex, usually acute at base, dark green reticulate and glabrous beneath, up to 20 in. long, 6 in. broad ; drupe very oblique, black, 1 in. long, on a short broad furrowed hypocarp2. *travancorica*.
Petals 3 sometimes 4 in ♂ flowers, 5 in ♀ ; leaves thin, oblanceolate, auricled at base, acuminate at apex, up to 15 in. long, 3 in. broad ; drupe oblique, black, .5 in. long, on a short broad cuplike hypocarp3. *auriculata*.

1. SEMECARPUS ANACARDIUM, Linn. f. ; F. B. I. ii. 30 ; W. & A. 168 ; Roxb. Cor. Pl. i. t. 12 ; Wt. Ic. t. 558 ; Bedd. Fl. t. 166.

Deciduous forests in all forest Districts. The Marking-nut tree.

A moderate-sized tree with brown bark and brownish-grey

wood of no value. The pericarp of the drupe gives a marking ink and the hypocarp is edible. Vern. *Hind.* Bhilawa; *Ur.* Bhallia; *Tel.* Jiri; *Tam.* Shenkottei, Thembarai; *Kan.* Gheru; *Mal.* Thenkotta.

2. *SEMECARPUS TRAVANCORICA*, Bedd. Fl. t. 232; F. B. I. ii. 31. W. Gháts, in the evergreen forests of Travancore and Tinnevely, up to 4,000 ft.

A very large fine tree with grey black-blotched bark and greyish-white wood of no value. Vern. *Tam.* Kattu shenkottei; *Mal.* Avukaram.

3. *SEMECARPUS AURICULATA*, Bedd. Ic. t. 187; F. B. I. ii. 32. W. Gháts, in the evergreen forests of Travancore and Tinnevely, up to 3,000 ft.

A large handsome tree with panicles of small yellow male flowers and inconspicuous greenish females. Bark grey, smooth; wood soft, greyish-white, useless. Vern. *Tam.* Vellei charei; *Mal.* Charei.

11. *Hologarna*, Ham.

Lofty trees often with acrid juice. *Leaves* alternate, simple, entire, coriaceous or subcoriaceous; petiole with one or two pairs of spur-like deciduous appendages. *Flowers* small, polygamodioecious, in axillary and terminal racemes or panicles. *Calyx* superior, shortly 5-toothed, the tube in ♂ flowers cup-shaped or sometimes subcylindric. *Petals* 5, valvate, cohering at the base and with the edge of the disk, densely villous inside. *Disk* lining the calyx-tube, obscure in ♂ flowers. *Stamens* 5, inserted outside the disk; filaments subulate; anthers oblong-cordiform, versatile, dehiscing longitudinally. *Ovary* in ♂ flowers none, in ♀ flowers inferior, 1-celled; styles usually 3, divergent; stigmas capitate; ovule pendulous from near the top of the cell. *Fruit* a resinous, acrid, compressed, ovoid drupe, partly or wholly enclosed in the accrescent calyx and disk (hypocarp). *Seed* parietal; testa membranous; albumen 0; cotyledons thick, plano-convex; radicle lateral.

Leaves glabrous beneath or midrib slightly pubescent when young, obovate or oblanceolate, not suddenly broadening above the middle, coriaceous, petiole-spurs deciduous; hypocarp quite enclosing the drupe:—

Tomentum of inflorescence pale golden-brown; leaves obtusely acute at apex, up to 10 in. long, oblanceolate, main nerves 16-20 pairs; drupe ellipsoid 1. *Arnottiana*.

Tomentum of inflorescence dark purple-brown; leaves obtuse or emarginate at apex:—

Petals of ♂ flowers very short, rounded; leaves obovate, up to 7 in. long, 3 in. broad, olive-brown when dry, main nerves about 12 pairs; drupe obovoid 2. *ferruginea*.

Petals of ♂ flowers nearly 2 in. long, acute; leaves spathulate, up to 5 in. long, 1.5-2 in. broad, usually nearly black when dry, main nerves 6-9 pairs 3. *nigra*.

Leaves pubescent beneath, oblanceolate, suddenly broadened above the middle, usually long acuminate, petiole-spurs persistent; hypocarp enclosing about two-thirds or three-fourths of drupe:—

Leaves up to 18 in. long; 8 in. broad, midrib on upper surface glabrous or only puberulous even when young; petiole-spurs short, golden-tomentose 4. *Grahamii*.

Leaves up to about 15 in. long, 5 in. broad, midrib on upper surface ciliate with long hairs as are margins, at any rate when young; petiole-spurs slender, long-villous-pubescent 5. *Beddomei*.

1. *HOLIGARNA ARNOTTIANA*, Hook. f.; F. B. I. ii. 36. *H. longifolia*, W. & A. 169; Bedd. Fl. t. 107 not of Roxb.

W. Coast and W. Gháts, from S. Canara to Malabar and Travancore in low-level forests.

A large tree with black caustic juice which raises blisters and can be used as a varnish. Bark rough; wood greyish-white, soft and useless. Vern. *Kan.* Holigar; *Tam.* Karun charei; *Mal.* Chera.

2. *HOLIGARNA FERRUGINEA*, March.; F. B. I. ii. 37.

W. Gháts, in S. Canara (Beddome), Coorg, Anamalais (Barber).

A large tree of evergreen forests. Vern. *Tam.* Charei.

3. *HOLIGARNA NIGRA*, Bourd. in Ind. For. xxx. 95.

W. Gháts, evergreen forests of Travancore, at 2000-4000 ft. A large tree reaching 100 ft. in height and 2 ft. in diam. of stem. Bark smooth, grey; wood greyish-white, soft and useless. The juice is black and caustic, and can be used as a varnish. Vern. *Mal.* Chéri.

4. *HOLIGARNA GRAHAMII*, Hook. f.; F. B. I. ii. 37. *Semecarpus Grahamii*, Wt. Ic. t. 235.

W. Gháts, in the Hills of Mysore (Barber); Wynaad (Beddome).

A large tree with large conspicuous leaves.

5. *HOLIGARNA BEDDOMEI*, Hook. f.; F. B. I. ii. 38.

W. Gháts, in the Hills of Malabar, W. Nilgiris, Anamalais and Travancore, in moist forests up to 3,000 ft.

A lofty tree (Beddome), with black juice. Bark smooth; wood light grey, soft and perishable. Vern. *Tam. Pál vidinyán*.

Family LIII. MORINGACEAE.

Trees with soft white wood. *Leaves* deciduous, alternate, 2-3-pinnate, the pinnae and leaflets imparipinnate, opposite, glandular at the base; stipules 0. *Flowers* large, irregular, hermaphrodite, in axillary panicles. *Calyx* cup-shaped, 5-cleft, the segments unequal, petaloid, imbricate. *Petals* 5, unequal, the 2 upper small, the lowest largest. *Disk* lining the calyx-tube. *Stamens* inserted on the margin of the disk, declinate, 5 perfect opposite the petals with 5-7 alternate sterile antherless; filaments free, thickened at base; anthers 1-celled, dorsifixed. *Ovary* stipitate, 1-celled; style slender, tubular; stigma truncate, perforated; ovules many, biseriate, on 3 parietal placentas. *Fruit* an elongate, 1-celled, loculicidally 3-valved, beaked capsule, corky and pitted within. *Seeds* many, in the pits of the valves; testa corky, winged or not, albumen 0; cotyledons plano-convex; radicle very short, superior, plumule many-leaved.

Moringa, Lamk.

Characters of the Family:—

Leaves usually 3-pinnate; leaflets elliptic or obovate, rounded at apex, 5-7 in. long, main nerves obscure; flowers white; seed wings short 1. *oleifera*.

Leaves usually 2-pinnate; leaflets broadly elliptic or orbicular, emarginate at apex, 1-1.5 in long, main nerves distinct; flowers yellow streaked with red; seed wings elongate 2. *concanensis*.

1. *MORINGA OLEIFERA*, Lamk. *M. pterygosperma*, Gaertn.; F. B. I. ii. 45; W. & A. 178; Wt. Ill. t. 77; Bedd. Fl. t. 80.

N. Circars, in Ganjam and Godavari, probably, elsewhere cultivated near villages in the plains, wild in N. India. The Horse-radish tree.

A graceful tree with corky grey bark and soft white wood. The root has the flavour of horse-radish and the seeds are eaten in curries, and give a valuable oil. Vern. *Hind*. Sohajna; *Ur*. Munigha; *Tam*. Moringa; *Tel*. Munga.

2. *MORINGA CONCANENSIS*, Nimmo; F. B. I. ii. 45; Hook. Ic. t. 2596.

N. Circars and Deccan, from Vizagapatam to Guntur, Kurnool and Coimbatore.

A tree with thick corky bark and white soft wood. Vern. *Tel*. Konda munga; *Tam*. Kattu moringa.

II. CALYCIFLORAE.

Sepals herbaceous, partially or completely connate in a tube adnate to or enclosing the ovary, persistent or with the upper portion deciduous, rarely free. *Disk* adnate to the calyx-tube and free from the ovary, or adnate both to ovary and calyx-tube, bearing the stamens on its apex; rarely epigynous and within the stamens. *Petals* as many as the sepals or sometimes fewer by suppression, inserted at the apex of the calyx-tube or on the disk lining the calyx, sometimes absent. *Stamens* variously definite or indefinite, inserted on the margin or inner face of the disk, rarely outside the epigynous disk. *Carpels* free or connate, usually inferior or enclosed in the calyx-tube.

Family LIY. CONNARACEAE.

Trees or shrubs, erect or climbing. *Leaves* alternate, 1-3-foliate or imparipinnate; leaflets entire; stipules 0. *Flowers* usually hermaphrodite, regular or somewhat irregular, in racemes or panicles. *Calyx* usually 5-lobed, generally persistent; lobes imbricate or valvate. *Petals* 5, free or slightly connate below, imbricate or rarely valvate. *Disk* small or none, annular or imperfect. *Stamens* 5 or 10, perigynous or hypogynous, sometimes declinate, those opposite the petals usually shorter; filaments filiform, often connate below; anthers short, didymous. *Carpels* 5, rarely fewer or more, 1-celled; styles subulate or filiform; stigmas capitellate, simple or 2-lobed; ovules 2, collateral, ascending, orthotropous. *Fruit* of 1-, rarely 2- or more, sessile or stalked, 1- rarely 2-seeded follicles, dehiscing ventrally.

Seed erect, often arillate; testa thick, sometimes fleshy below; albumen fleshy or 0; cotyledons fleshy in exalbuminous, leafy in albuminous seeds; radicle superior.

Calyx imbricate; seeds exalbuminous, arillate; leaves imparipinnate:—

Calyx accrescent in fruit, clasping the base of the sessile follicle

1. *Rourea*.

Calyx not accrescent, clasping the pedicel of the stipitate capsule

2. *Connarus*.

Calyx valvate; seeds exalbuminous, arillate; leaflet 1

3. *Ellipanthus*.

1. *Rourea*, Aubl.

Trees or shrubs, sometimes scandent. *Leaves* imparipinnate; leaflets subopposite or alternate. *Flowers* small, in axillary panicles; pedicels usually slender. *Sepals* 5, orbicular, imbricate, enlarged in fruit and clasping its base. *Petals* 5, usually linear-oblong, longer than the calyx. *Stamens* 10, filaments filiform, alternately longer and shorter, connate in a ring at the base. *Carpels* 5, of which 4 are usually imperfect; styles slender; stigma capitellate. *Fruit* a sessile curved follicle. *Seed* erect, arillate; albumen 0; cotyledons plano-convex, fleshy; radicle small.

ROUREA SANTALOIDES, W. & A. 144; F. B. I. ii. 47. *Connarus monocarpus*, W. & A. 143, not of Linn.

W. Coast and W. side of Ghâts, rising to 3,000 ft., from S. Canara to Travancore.

A climbing or sarmentose shrub with 5-9 elliptic, long- and obtusely-acuminate leaflets and follicles about .75 in. long. The leaves and follicles are rather variable in size and shape. Vern. *Mal. Kuriel*.

2. *Connarus*, L.

Trees or shrubs, often climbing. *Leaves* imparipinnate; leaflets usually 5, sometimes 3, sometimes more, entire. *Flowers* in axillary and terminal branched panicles. *Sepals* 5, connate at base in a short tube, not accrescent, in fruit embracing the base of the fruiting pedicel. *Petals* 5, linear or ligulate or oblong, slightly enlarged upwards. *Stamens* 10, those opposite the sepals with long filaments and perfect anthers, those alternate with them

shorter and sometimes without anthers. Ovaries 5, densely pubescent, 4 usually imperfect or obsolete, the fifth with a slender style and capitate stigma. Fruit an oblique, stipitate, inflated follicle, the valves glabrous or pubescent within, usually nearly straight on the dorsal, curved on the ventral suture. Seed solitary, girt with a fleshy aril at the base; testa smooth, shining; albumen 0; cotyledons plano-convex, fleshy; radicle small.

Valves of the follicle glabrous within, rather thin:—

Follicle scarlet, turning brown when dry, 1·5–2 in. long, acute at apex, narrowed at base into the pedicel, not striate; leaflets elliptic, obtusely acuminate at apex, rounded at base, with 3–5 pairs of main nerves, not prominently reticulate.....1. *monocarpus*.

Follicle bright red, turning brown when dry, 1·5 in. long, keeled on the sutures; acute at apex, narrowed at base into the pedicel, striate; leaflets elliptic-ovate with 5–6 pairs of main nerves, prominently minutely reticulate.....2. *Wightii*.

Follicle light brown when dry, turgidly inflated, oblong, 75–1 in. long, obtuse at apex, cordate at base on the top of the pedicel, striate; leaflets elliptic-lanceolate or oblong-lanceolate, acuminate, with 7–8 pairs of main nerves.....3. *Ritchiei*.

Valves of the follicle velvety within:—

Follicle obovoid, woody, obtuse at apex, narrowed at base into the thick pedicel, 1·5–2 in. long; leaflets coriaceous, coarsely reticulate, elliptic, with about 5 pairs of main nerves, the lowest pair rib-like from the base; panicles thickly rusty-pubescent.....4. *sclerocarpus*.

Follicle oblong, obtuse at apex, rounded at base with a short thick pedicel, much inflated, 1–1·5 in. long, striate; leaflets elliptic-ovate, acuminate, with 5–6 pairs of rather obscure main nerves; panicles thinly rusty-pubescent5. *paniculatus*.

1. *CONNARUS MONOCARPUS*, Linn.; F. B. I. ii. 50. *C. pin-natus*, Lamk.; W. & A. 143.

W. Coast, from S. Canara to Travancore, in open forests and waste places.

A low straggling shrub. Vern. *Tam.* Chettupulukodi; *Mal.* Nai kuriel.

2. *CONNARUS WIGHTII*, Hook. f.; F. B. I. ii. 51.

W. Coast in Travancore and W. Ghâts to 1,200 ft. (Bourdillon) in evergreen forest.

A large woody climbing shrub.

3. *CONNARUS RITCHIEI*, Hook. f.; F. B. I. ii. 51.

W. Coast and W. Gháts from S. Canara and Coorg to Travancore.

A climbing shrub or small tree.

4. *CONNARUS SCLEROCARPUS*, Schellenb. *Rourea? sclerocarpa*, W. & A.

W. Gháts, scarce in the North as S. Canara, common in the Anamalai and Tinnevely Hills up to 3,000 ft.

A large climbing shrub.

5. *CONNARUS PANICULATUS*, Roxb.; F. B. I. ii. 52.

N. Circars, in Vizagapatam (Beddome).

A large climbing shrub.

3. *Ellipanthus*, Hook. f.

Trees or shrubs. *Leaves* with 1 leaflet, entire. *Flowers* in short axillary racemes, hermaphrodite or polygamous. *Sepals* 5, valvate. *Petals* 5, imbricate, pubescent, longer than the sepals. *Stamens* 10, 5 long and anther-bearing alternating with 5 short without anthers; filaments subulate, connate in a tube at the base. *Ovary* ovoid, densely villous, attenuate into a short style and lobed stigma. *Fruit* a stalked oblique velvety follicle, valves glabrous within. *Seed* oblong, girt at the base by a fleshy aril; testa of two integuments, outer blackish shining, inner brown leathery; albumen 0; cotyledons plano-convex.

ELLIPANTHUS NEGLECTUS, Gamble in Kew Bull. 1917, 26.

W. Gháts, in the Hills of Travancore and Tinnevely, up to 2,000 ft.

A small tree with elliptic acuminate much reticulate coriaceous leaves, flowers in short rusty-villous racemes fascicled in the leaf-axils and velvety capsule with a large blue-black seed having a pink aril. Vern. *Mal.* Padappen.

Family LV. LEGUMINOSAE.

Herbs, shrubs or trees. *Leaves* alternate, rarely opposite, usually compound; stipules 2, usually free; leaflets often stipellate. *Flowers* usually irregular, hermaphrodite, rarely regular or polygamous, in axillary leaf-opposed or terminal racemes or panicles, rarely solitary, bracteate and usually 2-bracteolate. *Sepals* 5, combined or free, often unequal, sometimes combined

in 2 lips. *Petals* 5, rarely fewer, usually free and unequal. *Stamens* normally 10, rarely fewer, sometimes indefinite, perigynous or subhypogynous; filaments free or variously combined; anthers 2-celled. *Ovary* free, with one or more ovules on the ventral suture; style simple, usually declinate; stigma capitate, terminal or oblique. *Fruit* usually dry, a pod splitting open along both sutures, sometimes continuous and indehiscent, sometimes separating into 1-seeded joints. *Seeds* usually exalbuminous; testa usually hard or leathery, occasionally strophiolate; cotyledons fleshy or leafy, the radicle straight or accumbent.

ANALYSIS OF SUBFAMILIES.

Flowers zygomorphic; stamens definite:—

Corolla papilionaceous; petals imbricate, the uppermost (standard) the outermost, the 4 others in 2 opposite pairs; stamens usually combined I. **Papilionatae.**

Corolla not papilionaceous; petals imbricate, the uppermost the innermost, the rest similar to each other; stamens usually free

II. **Caesalpinioideae.**

Flowers regular; stamens definite or indefinite; petals valvate, usually united above the base III. **Mimosoideae.**

Subfamily I. PAPILIONATAE.

Herbs, shrubs, or trees. *Leaves* alternate, simple or digitately or pinnately compound, rarely bipinnate, sometimes ending in tendrils. *Flowers* irregular, zygomorphic, rarely subregular, hermaphrodite. *Calyx* gamosepalous, 5-toothed or -lobed or the upper lobes more or less connate, or bilabiate the 2 upper opposed to the 3 lower, rarely spathaceous. *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 (usually 9 and 1, the one vexillary) opposite the standard, monadelphous or free. *Ovary* free; embryo with an inflexed radicle, cotyledons accumbent.

Tribe I. GENISTEAE.—Herbs or shrubs; leaves simple or digitately 3-many-foliolate; stamens monadelphous; pod dehiscent, not jointed:—

Stamens combined in a tube cleft above:—

Anthers uniform; keel petals scarcely cohering 1. **Rothia.**

Anthers dimorphous; keel petals cohering in a beak:—

Pod flattened; flowers solitary in the leaf-axils...2. **Heylandia**.

Pod turgid; flowers in terminal or leaf-opposed racemes

3. **Crotalaria**.

Stamens combined in a closed tube:—

Thorny bush; calyx 2-lipped, the upper 2- the lower 3-lobed

Ulex.

Erect shrubs; calyx with 2 upper lobes connate or free, 3 lower connate **Cytisus**.

Tribe II. TRIFOLIEAE.—Herbs; leaves 3-foliolate, the leaflets usually toothed; stamens diadelphous; pod usually dehiscent, not jointed:—

Leaves digitately trifoliolate:—

Petals persistent, adnate to the staminal tube; pod minute, indehiscent 4. **Trifolium**.

Petals caducous, free from the staminal tube; pod linear, 2-valved 5. **Parochetus**.

Leaves pinnately trifoliolate:—

Racemes long; pod short, globose or ovoid 6. **Melilotus**.

Racemes short:—

Pod straight or curved..... **Trigonella**.

Pod spirally twisted **Medicago**.

Tribe III. GALEGEAE.—Herbs or shrubs; leaves imparipinnate, leaflets entire; stamens usually diadelphous; pod usually dehiscent, or if indehiscent usually small, 1-2-seeded or membranous-inflated:—

Anthers apiculate; hairs fixed by the centre:—

Stamens monadelphous, the staminal sheath tubular; leaflets 3, large, toothed..... 7. **Cyamopsis**.

Stamens diadelphous, the vexillary one free; leaves simple, digitate or pinnate, the leaflets usually small, entire

8. **Indigofera**.

Anthers obtuse; hairs basifixed:—

Pod indehiscent, 1-seeded; leaves gland-dotted 9. **Psoralea**.

Pod many-seeded; leaves rarely gland-dotted:—

Inflorescence terminal or leaf-opposed:—

Alternate filaments dilated 10. **Mundulea**.

Filaments not dilated:—

Leaflets parallel-nerved..... 11. **Tephrosia**.

Leaflets with netted venation 12. **Millettia**.

Inflorescence axillary; pod long, septate..... 13. **Sesbania**.

Tribe IV. HEDYSAREAE.—Herbs or shrubs, sometimes twining or

scandent; leaves imparipinnate; stamens diadelphous or monadelphous; pod jointed if more than 1-seeded:—

Leaflets exstipellate:—

Stamens monadelphous:—

Anthers uniform; leaflets 4; slender herb with large ciliate bracts.....14. **Geissaspis**.

Anthers dimorphous:

Calyx-tube short; joints of pod glochidiate, 2-6

15. **Zornia**.

Calyx-tube elongate, slender:—

Joints of pod small, 1-2, rugose, concealed among upper leaves 16. **Stylosanthes**.

Joints of pod large, 1-3, netted, not separating, ripening in the earth..... **Arachis**.

Stamens diadelphous, 9 and 1; anthers uniform:—

Ovule solitary; pod 1-jointed; leaves 3-foliolate...17. **Lespedeza**.

Ovules 2-4; pod 1-4-jointed; leaves 1-3-foliolate

18. **Taverniera**.

Stamens diadelphous, in 2 bundles of 5 each:—

Pod twisted, enclosed in the calyx, the joints orbicular, turgid or flat; calyx conspicuous, 2-lipped, usually bristly

19. **Smithia**.

Pod straight, exserted from the calyx:—

Calyx 2-lipped; water plants with many close leaflets; joints of pod close together.....20. **Aeschynomene**.

Calyx 5-toothed; dry shrubs with few leaflets; joints of pod oblong, far apart.....21. **Ormocarpum**.

Leaflets stipellate; stamens diadelphous, 9 and 1, sometimes (*Desmodium*) monadelphous:—

Seed solitary, pod flattened; leaflets small, 1-3-foliolate:—

Racemes in terminal, capitate, plumose heads; leaflets longer than broad 22. **Leptodesmia**.

Racemes axillary, lax, with distant flowers; leaflets broader than long 23. **Elciotis**.

Seeds 2 or more:—

Pod not distinctly jointed, continuous within:—

Pod inflated; leaflets 3, obovate, small 24. **Pycnospora**.

Pod flat, very viscid-pubescent; leaflets 3, rhomboid, large

25. **Pseudarthria**.

Pod distinctly jointed:—

Pod twisted so that the joints come face to face:—

Calyx accrescent, the teeth lanceolate, subequal 26. **Lourea**.

Calyx not accrescent, the teeth setaceous-pointed, especially the lower lip 27. **Uraria.**

Pod not twisted so that the joints come face to face :—

Joints of pod turgid 28. **Alysicarpus.**

Joints of pod flattened :—

Tree; racemes fascicled on the old wood..... 29. **Ougeinia.**

Herbs or shrubs; racemes simple or panicled, from the year's shoots, flowers sometimes axillary 30. **Desmodium.**

Tribe V. VICIEAE.—Herbs, low or climbing; leaves paripinnate, the leaflets ending in a tendril or bristle; stamens diadelphous or (in *Abrus*) 9 monadelphous; pod dehiscent, not jointed :—

Stems herbaceous; stamens diadelphous, 9 and 1, or monadelphous, the vexillary one joined to the sheath :—

Leaflets entire; style bearded; seeds with short funicle :—

Staminal tube oblique at mouth; pod compressed :—

Style with dorsal tuft of hairs or bearded round the tip; ovules usually more than 2 31. **Vicia.**

Style longitudinally bearded along inner face; ovules less than 2 **Lens.**

Staminal tube truncate at mouth; style bearded along inner face :—

Pod compressed; style flat, dilated at tip **Lathyrus.**

Pod turgid; style 3-cornered, dilated upwards throughout

Pisum.

Leaflets toothed; style not bearded; seeds with a slender funicle; pod turgid..... **Cicer.**

Stems woody; stamens monadelphous, the vexillary stamen absent; style not bearded..... 32. **Abrus.**

Tribe VI. PHASEOLEAE.—Climbing or prostrate, rarely erect, herbs or shrubs, rarely trees; leaves pinnately trifoliate, rarely 1- or 5-7-foliate; stamens monadelphous or diadelphous; pod dehiscent, not jointed :—

Leaves not gland-dotted; leaflets stipellate :—

Style not bearded below the stigma :—

Nodes of raceme not swollen; petals about equal in length :—

Stamens diadelphous; stipules and bracts conspicuous, persistent; leaves 3-foliate :—

Calyx-teeth distinct; style filiform, without a flattened part in the middle... 33. **Shuteria.**

Calyx truncate; style filiform with a flattened part in the middle 34. **Dumasia.**

Stamens monadelphous, at first at any rate; stipules and bracts small, deciduous:—

Pod not hooked at the apex; anthers all fertile; leaves 3-7-foliolate 35. **Glycine**.

Pod conspicuously hooked at the apex; 5 alternate anthers sterile; leaves 3-foliolate 36. **Teramnus**.

Nodes of raceme more or less swollen, scarcely apparent in *Galactia*:—

Petals very unequal in length:—

Trees; anthers uniform; standard exceeding the keel and wings 37 **Erythrina**.

Climbing shrubs; anthers dimorphous; keel exceeding the wings and standard 38. **Mucuna**.

Petals nearly equal in length:—

Stamens diadelphous:—

Herbs; pod linear, 2-valved, many-seeded 39. **Galactia**.
Trees or shrubs; pod woody, lower part thin, seedless, indehiscent, end part 1-seeded, subdehiscent:—

Flowers large, racemose 40. **Butea**.

Flowers small, paniced 41. **Spatholobus**.

Stamens monadelphous:—

Upper lip of calyx large, lower minute ... 42. **Canavalia**.

Calyx campanulate, teeth subequal, the upper 2 connate
43. **Pueraria**.

Style bearded below the stigma; stamens diadelphous:—

Stigma oblique:—

Keel spiral 44. **Phaseolus**.

Keel not spiral 45. **Vigna**.

Stigma terminal:—

Petals very unequal in length; flowers large, blue

46. **Clitoria**.

Petals equal in length; flowers yellow, pink or purple

47. **Dolichos**.

Leaves gland-dotted beneath; stipels often wanting; nodes of raceme not swollen; style not bearded below the stigma:—

Ovules 3 or more:—

Pod depressed outside between the seeds:—

Seeds with a large grooved strophiole 48 **Atylosia**.

Seeds without strophiole, the hilum large **Cajanus**.

Pod not depressed outside between the seeds ... 49. **Dunbaria**.

Ovules 1-2:—

Calyx accrescent 50. **Cylista**.

Calyx not accrescent:—

Leaves pinnate; pod compressed51. **Rhynchosia.**

Leaves digitate; pod turgid.....52. **Flemingia.**

Tribe VII. DALBERGIEAE.—Trees or shrubs, sometimes climbing; leaves imparipinnate; stamens monadelphous or diadelphous; pod continuous, indehiscent:—

Leaflets alternate:—

Flowers small, whitish reddish or pale blue; pods oblong or linear; anthers terminal, dehiscing in a vertical slit

53. **Dalbergia.**

Flowers large, yellow; pods suborbicular; anthers versatile, dehiscing longitudinally54. **Pterocarpus.**

Leaflets opposite:—

Pods flattened, thick, almost woody, not winged . 55. **Pongamia.**

Pods flat, thin, winged down one or both sides56. **Derris.**

Table VIII. SOPHOREAE.—Trees or shrubs; leaves imparipinnate, rarely simple; stamens free or very slightly connate at base; pod not jointed, indehiscent or 2-valved:—

Stigma terminal; pods usually indehiscent:—

Pod moniliform; calyx-teeth very short57. **Sophora.**

Pod flat, membranous; calyx-teeth short58. **Calpurnia.**

Stigma oblique; pod turgid, dehiscence, fleshy or coriaceous; calyx deeply cleft59. **Ormosia.**

1. *Rothia*, Pers.

Annuals. Leaves digitately 3-foliate, stipules free. Flowers small, solitary, or in short racemes from the axils of the leaves. Calyx-tube turbinate, teeth subequal, lanceolate, the 2 upper broader and falcate. Corolla scarcely exerted, the petals long-clawed, standard ovate or oblong; wings narrow; keel-petals like the wings scarcely cohering. Stamens monadelphous; filaments united in a tube cleft above; anthers minute, uniform. Ovary sessile, linear, many-ovuled; style straight, filiform; stigma minute, capitate. Pod linear, slender, compressed, nearly straight, many-seeded, dehiscing at the dorsal suture. Seeds reniform on filiform funicles.

ROTHIA TRIFOLIATA, Pers.; F. B. I. ii. 63; W. & A. 195; Wt. Ic. t. 199.

N. Circars, Deccan and Carnatic, in dry Districts, in fields and on waste land.

A much branched annual with straight flat pods about 2 in. long and small 3-foliolate leaves.

2. Heylandia, DC.

A prostrate herb. *Leaves* simple, alternate, entire; stipules 0. *Flowers* small, solitary, axillary. *Calyx*-tube turbinate; teeth lanceolate, 3 lower longer than the 2 subconnate upper. *Corolla* yellow, much exerted; standard orbicular with 2 basal scales at the top of the short claw; wings obovate-oblong; keel petals connate along the back, narrowed to an incurved beak. *Stamens* monadelphous; filaments united in a tube cleft above; anthers alternately short versatile and long basifixed. Ovary sessile, 2-ovuled; style abruptly incurved at base, longitudinally bearded above; stigma terminal. *Pod* flat, oblong, 1-2-seeded. *Seeds* reniform on filiform funicles.

HEYLANDIA LATEBROSA, DC.; F. B. I. ii. 65; W. & A. 180.

All dry-Districts, on waste land and in open forest.

A prostrate often very silky-hairy herb with small cordate-ovate leaves, pale yellow flowers and small slightly inflated pod.

3. Crotalaria, Linn.

Herbs or shrubs, or more or less herbaceous undershrubs. *Leaves* simple or trifoliolate or sometimes 5-7-digitate; with or without stipules, the stipules sometimes decurrent in wings on the branches. *Flowers* in terminal or leaf-opposed racemes, rarely solitary, usually yellow but sometimes blue, often large and showy. *Calyx*-tube short; lobes linear or lanceolate, subequal or more or less connate in 2 lips. *Corolla* equal to or exceeding the calyx; standard with a short claw and callus above it, usually orbicular or ovate; wings obovate or oblong, shorter than the standard, clawed and usually with minute transverse folds; keel as long as the wings, its petals connate, much incurved, beaked. *Stamens* monadelphous, connate in a sheath cleft above; anthers dimorphous, alternately short versatile with slender filaments and long basifixed with flattened filaments. Ovary sessile or stalked, 2-many-ovuled; style long, abruptly incurved at the base, bearded upwards; stigma small, oblique. *Pod* sessile or stalked, usually globose or oblong, turgid or inflated, continuous within. *Seeds* usually many, rarely 1 or 2, without strophiole; funicle filiform.

Leaves simple, the petiole not articulated :—

Stipules decurrent as a persistent wing to the branchlets; flowers yellow **Alatae.**

Shrub reaching 3-4 ft. in height or more; leaves up to 4 in. long and 3·5 in. broad, elliptic-obovate, obtuse and mucronate at apex, covered with appressed golden shining velvety pubescence; stipular wing gradually expanding to a triangular hooked apex; flowers 1 in. long; pod nearly 2 in. 1. *Wightiana*.

Erect undershrubs up to about 2 ft. in height :—

Leaves densely rusty velvety-pubescent :—

Leaves ovate, acute or obtuse, mucronate, up to 1·5 in. long by 1 in. broad; stipular wing widened upwards into a broad recurved point; flowers 7 in. long; pod 1 in. long

2. *scabrella*.

Leaves elliptic-oblong, acute, up to 9 in. long by 3 in. broad; stipular wing narrow with a small sharp point; flowers 5 in. long; pods up to 1 in. long. 3. *conferta*.

Leaves thinly rusty- or grey-pubescent, somewhat glaucous beneath :—

Lower leaves ovate, up to 2 in. long by 1 in. broad, upper ones narrowly linear-oblong, about 1 in. long by 1 in. broad; stipular wing with long erect or slightly recurved auricles; racemes few-flowered; flowers 5 in. long; pod 1·8 in. long

4. *Bidiei*.

Leaves obovate, obtuse or acute, grey-pubescent, up to 3 in. long by 1 in. broad; stipular wing broad, its top shortly auricled; racemes elongate, many-flowered; flowers 5 in. long; pods 1·2 in. long. 5. *alata*.

Prostrate or diffuse small undershrubs; racemes few-flowered :—

Stems wiry; leaves ovate elliptic or orbicular, sparsely pubescent, up to 1·2 in. long by 7 in. broad; stipular wing narrow, the auricle triangular; flowers 5 in. long; pod 1-1·3 in. long

6. *ovalifolia*.

Stems almost fliform; leaves orbicular, emarginate, sparsely villous, up to 8 in. long by 6 in. broad; stipular wing very narrow with a short recurved auricle; flowers 6 in. long; pod 1 in. 7. *Bourneae*.

Stipules none or small, not decurrent :—

Racemes all lateral, leaf-opposed, few- often only 1-flowered; mostly prostrate trailing herbs. **Diffusae.**

Pod almost globose, hairy; racemes 1-2-flowered, flowers yellow, stipules minute or none :—

Leaves orbicular-ovate to oblong, up to 1 in. long; pod '4 in. by '3 in., covered sparsely with long stiff golden hairs, seeds up to about 20, rather small.....8. *biflora*.
 Leaves orbicular, up to '6 in. long and broad; pod '25-'3 in. by nearly '25 in., covered thickly with short stiff pale hairs, seeds few, 1-4, large.....9. *globosa*.

Pod oblong:—

Pod glabrous:—

Stipules absent; flowers yellow:—

Pod '25 in. long, 8-10-seeded, shortly stalked; branches long, slender; leaves ovate-cordate, prominently nerved, '3-'4 in. long, sparsely hirsute; peduncles and pedicels filiform, 1-3-flowered.....10. *filipes*.

Pod '75 in. long, 16-20-seeded, nearly sessile; branchlets wiry; leaves ovate-oblong, not prominently nerved, '5-1'5 in. long, densely appressed-hirsute; peduncles slender, 1-4-flowered.....11. *prostrata*.

Stipules present:—

Small prostrate herbs with small flowers about '25 in. long; pod small, about '25 in. long, many-seeded:—

Stipules minute, subulate; leaves round, the base cuneate, those in the centre about 1 in. long, those on the radiating branchlets smaller, all glaucous beneath; flowers about 3-6 at the ends of slender peduncles, sparsely hairy.....12. *humifusa*.

Stipules lanceolate; leaves orbicular-oblong, subcordate and unequal at base, up to 1 in. long, glaucous beneath; flowers in many-flowered, densely silky-haired racemes with short peduncles.....13. *acicularis*.

Larger suberect herb with larger flowers '5 in. long, rusty villous; pod over 1 in. long, very many-seeded:—

Stipules lanceolate, long acuminate; leaves obovate-oblong, obtuse, mucronate, pale beneath, up to 2 in. long; flowers in lax racemes 4-5 in. long

14. *ferruginea*.

Pod hairy, except var. of *C. Fysonii*; leaves stipulate:—

Flowers small, under '3 in. long, the corolla longer than calyx; trailing herbs with stems up to 2 ft. long and very variable membranous leaves from orbicular to oblong and even lanceolate, usually obtuse; racemes 3-8-flowered; pod '75 in. long, reflexed, softly hairy.

15. *evolvuloides*.

Flowers medium-sized, 7 in. long; diffuse perennial herbs:—

Leaves ovate, subcoriaceous, pubescent or glabrous, strongly nerved, obtuse retuse or rarely acute and mucronate, up to 1·2 in. long; racemes erect, long-peduncled, 2-8-flowered, the corolla reddish-veined; pod 1-1·2 in. long, cylindric, hirsute or glabrous...16. *Fysonii*.

Leaves obtuse, membranous, variable, from orbicular (lower) to lanceolate (upper), up to 2 in. long, 4-9 in. broad; racemes 1-2-flowered with ovate acuminate bracts, the standard veined; pod about 1 in. long, much inflated and very obtuse, sparsely hairy.17. *bifaria*.

Leaves acute, very membranous, ovate, up to 2·5 in. long and 1·5 in. broad; racemes slender, 2-3-flowered with recurved lanceolate bracts; pod about 1 in. long, obovoid, attenuate at base, strigosely hirsute; branchlets very silky, suberect.....18. *hirsuta*.

Flowers large, 1 in. long; leaves membranous, ovate, acute, mucronate, up to 2·5 in. long, 1·5 in. broad, the stipules long-tailed; racemes long, stout, 2-6-flowered, the standard purple-veined; pod 1·5 in. long, much inflated, densely strigosely brown-hairy.....19. *multiflora*.

Racemes terminal, many-flowered, rarely in age opposite the leaves:—

Pod glabrous, or very nearly so (also no. 46. *lanata*):—

Whole plant glabrous; stipules none; erect annuals

Glaucæ.

Leaves narrow-lanceolate, membranous, mucronate, up to 6 in. long by 75 in. broad; flowers large, yellow, the veined standard 1 in. long, the calyx lobes lanceolate with filiform tips; pod 1-1·5 in. long, attenuate into the 2 in. stalk, broadening upwards.....20. *lutescens*.

Leaves narrow-linear, membranous, mucronate, up to 8 in. long by 25 in. broad; flowers smaller, the standard 75 in. long, the calyx lobes lanceolate acuminate; pod 1·5-2·5 in. long, attenuate into the 25 in. stalk, oblanceolate

21. *peduncularis*.

Plants with more or less silky or pubescent foliage:—

Pods 2 or more times longer than the calyx; erect plants with usually elongated racemes **Erectæ.**

Leaves glabrous on the upper surface:—

Scarcely woody; racemes elongate, at least 6 in. long; leaves oblanceolate:—

Stipules and bracts minute, filiform; leaves obtuse or retuse at apex, white-puberulous beneath; pod narrowed at base.....22. *retusa*.

Stipules and bracts ovate-acuminate, reflexed:—

Leaves usually acute at apex, softly grey-pubescent beneath; pod rounded at base and flatly stalked23. *sericea*.

Leaves obtuse at apex, densely ferruginous-silky-pubescent beneath; pod narrowed at base to a flat stalk.....24. *Leschenaultii*.

Woody shrub; racemes dense, short, under 3 in. long; branches, racemes and leaves beneath densely ferruginous-silky; leaves obtuse or retuse; stipules and bracts lanceolate, small25. *formosa*.

Leaves villous on the upper surface:—

Racemes shortly stalked; hairs on the branches and leaves dark brown; pod scarcely 1·5 in. long:—

Leaves oblanceolate-oblong, subacute, mucronate, subcordate at base, up to 3·5 in. long, 1 in. broad, thinly silky above, densely so beneath, margins slightly reflexed; racemes 6–12-flowered, flowers 1 in. long26. *barbata*.

Leaves elliptic, obtuse, up to 1·2 in. long, 7 in. broad, strigosely stiff-hairy on both surfaces, especially beneath, margins prominently reflexed; racemes 3–4-flowered, flowers 75 in. long

27. *scabra*.

Racemes few-flowered, on long stalks; hairs on the branches and leaves golden-brown, shining; leaves oblong or lanceolate, obtuse or acute, up to 2 in. long by 7 in. broad, margin not reflexed; pod about 2 in. long, very broad.....28. *salicifolia*.

Pods shorter or only little longer than calyx, rarely twice as long; diffuse annuals or low shrubby plants

Calycinae.

Upper calyx-lobes connate except at the tip:—

Flowers very small, under 25 in. long, in terminal or leaf-opposed umbels; corolla shorter than calyx:—

Leaves oblong, obtuse, 2–7 in. long; umbels few-usually 3-flowered, mostly leaf-opposed; pod 25 in. long, oblong, 10–12-seeded29. *nana*.

Leaves oblong, usually acute, up to 1·6 in. long;

umbels many. (6-8-) flowered, terminal or with axillary flowers below the terminal umbel also; pod .25 in. in diam., globose, 6-8-seeded .30. *umbellata*. Flowers over .25 in. long, in elongate terminal racemes; corolla equal to or slightly longer than calyx:—

Leaves oblanceolate or linear, obtuse or retuse, mucronate, .1-3 in. broad; flowers .3 in. long, in slender racemes 4-6 in. or even more long; pod ovoid-oblong, up to .3 in. long, 8-10-seeded

31. *linifolia*

Leaves obovate, cuneate, emarginate, up to .6 in. broad; flowers .6 in. long, in strong racemes up to 9 in. long; pod oblong, .5-.6 in. long, many- (up to 25-) seeded 32. *tecta*.

Upper calyx-lobes not connate or only connate below:—

Pods longer than the calyx:—

Plants with long silky hairs, brown at any rate when dry:—

Low suffruticose plants with ascending branches; racemes short, subcapitate, few-flowered; flowers .4 in. long; pod oblong, .5 in. by .3 in., seeds 15-20; leaves oblong or oblanceolate, obtuse, up to 2.5 in. long, .7 in. broad, stipules 0 or minute... 33. *hirta*

Erect suffruticose plants; racemes long, with distant flowers; flowers .8 in. long; pod obovoid, 1-1.2 in. by .5 in., seeds very many, more than 30; leaves linear oblong, up to 3 in. long, .4 in. broad, stipules linear, conspicuous ... 34. *mysorensis*.

Plants with short appressed silky pubescence, grey when dry; stipules 0; pods few-seeded, .4-.5 in. long:—

Low diffuse undershrubs, branched from low down; flowers in racemes terminal on the branches; leaves thick, cuneate, obtuse or emarginate, pellucid-punctate, grey-pubescent, .5-1 in. long by .1-2 in. broad; flowers .4 in. long

35. *albida*.

Erect subglabrous slender undershrubs; flowers in leafy panicles of racemes; leaves membranous, oblanceolate, obtuse, mucronate, not conspicuously pellucid-punctate, up to 3 in. long by .8 in. broad; flowers .3 in. long 36. *epunctata*

Pods equal to or shorter than the calyx:—

Flowers large, in terminal racemes, the calyx .7-1 in. long; leaves very variable, with minute subulate stipules; standard obovate, rounded or emarginate, with a tuft of hairs at the back, otherwise glabrous; pod 20-30-seeded; whole plant densely appressed-silky.....37. *calycina*.

Flowers moderately large, in terminal heads, the calyx .5 in. long:—

Standard glabrous at the back except for a tuft of hairs near the top; stipules 0; pod about equal to the calyx:—

Standard apiculate; leaves linear-oblong, up to 2 in. long, clothed like the branches with long pale brown silky hairs; erect plants

38. *chinensis*.

Standard emarginate; leaves suborbicular-obovate, .5-.6 in. long, silky-brown-hairy like the branches; low trailing plants, nearly black when dry..... 39. *priestleyoides*.

Standard and keel densely golden-silky-hairy at the back, like the flowers, leaves and branches; stipules minute; heads densely capitate; leaves 1-1.5 in. long, oblong, obtuse; pod very small, much shorter than the calyx; plant sub-shrubby...40. *speciosa*.

Flowers small, in oblong dense terminal heads, the calyx .25 in. long; standard oblong, emarginate, glabrous at the back except for a few hairs; stipules minute; pod .25 in. long by .15 in., 6-8-seeded; leaves membranous, obovate, cuneate, 2-3 in. long, 1-1.5 in. broad; erect annuals 1-2 ft. high..... 41. *dubia*.

Pod hairy (except No. 46, *lanata*) **Eriocarpeae.**

Flowers in single racemes, terminal or terminal and lateral:—

Annual; very small plants, scarcely 6 in. high; calyx .1 in. long, the corolla slightly larger; pod .2 in. long, oblong, silky-villous; leaves linear, oblong, up to .75 in. long, .1 in. broad; stipules 0..... 42. *pusilla*.

Slender undershrubs up to about 2 ft. high, the branches 3-4-angled; stipules present, ovate or lanceolate:—

Branches 3-angled, very slender; racemes 2-3-flowered, the flowers under .5 in. long; leaves membranous; pod .5-.8 in. long, appressed-silky-villous.....43. *triquetra*.

Branches usually 4-angled, rather stout; racemes 3-8-flowered, the flowers over .5 in. long; leaves chartaceous; pod 1.2 in. long, with spreading silky hairs

44. *Clarkei*.

More or less stout shrubs or undershrubs, sometimes herbaceous, usually with prominent stipules:—

Stipules semi-lunate:—

Stems and branches angular:—

Herbaceous; branches, inflorescence and leaves almost glabrous; flowers usually blue; pod 1-1.5 in. long, minutely pubescent; leaves ovate-deltoid or rhomboid, obtuse or acute; bracts and bracteoles minute 45. *verrucosa*.

Shrubby; branches, inflorescence and leaves beneath softly tomentose; flowers yellow; pod 1.5-2 in. long; glabrous; leaves large, elliptic-ovate or -obovate, apiculate; bracts and bracteoles ovate-lanceolate, acuminate, 2-3 in. long 46. *lanata*.

Stems and branches terete, the uppermost sometimes sulcate; pods sparsely pubescent, 10-12-seeded:—

Corolla yellow; leaves moderately thick:—

Large erect shrub, the branches, inflorescence and undersurface of leaves rusty-villous; standard softly silky-villous without; leaves ovate, obtuse or emarginate, the transverse nervules many and prominent on the pale undersurface; stipules usually large 47. *semperflorens*.

Low herbaceous undershrub, often semi-scandent; the branches, inflorescence and leaf undersurface appressed pubescent; standard only slightly villous without; leaves ovate or lanceolate, acute, mucronate, the transverse nervules few and hardly prominent on the pale undersurface; stipules small

48. *Walkeri*.

Corolla blue or the standard pale yellow or white, the wings blue; a low undershrub, the branches, inflorescence and undersurface of leaves appressed puberulous; standard glabrous without; leaves lanceolate, acute or acuminate, very thin; transverse nervules prominent on upper surface; stipules small

49. *Heyneana*.

Stipules subulate or lanceolate, sometimes 0; stems and

branches furrowed; corolla yellow, large, in long terminal racemes; pod densely dark-brown-velvety:—

Stipules lanceolate, curved or deflexed; a densely brown-silky-tomentose shrub; leaves elliptic-ovate or lanceolate, 1·5–2 in. broad, mucronate; standard slightly villous; pod 1·5–2 in. long50. *obtecta*.

Stipules subulate erect or 0; a thinly pale-brown-silky-pubescent shrub; leaves linear-lanceolate or -oblong, 2·5–1·5 in. broad, obtuse and mucronate or acute; standard glabrous; pod 1–1·25 in. long..... 51. *juncea*.

Flowers in panicles:—

Pods long, much longer than the calyx:—

Pods long-stalked, stalk 4 in. long:—

Pedicels of flowers alternate; leaves obovate-oblong, silky-villous with shining hairs; pods nearly glabrous, more than 1 in. long:—

Pods 1 in. long without the stalk; bracts and bracteoles ovate-lanceolate, spreading, more or less deciduous, not shining on upper surface, the bracteoles close under the calyx; calyx-lobes not marginally revolute.....52. *longipes*.

Pods 1–1·5 in. long without the stalk; bracts and bracteoles cordate, acute, reflexed, persistent, shining and viscous on upper surface, the bracteoles 2–3 in. from the calyx; calyx-lobes marginally revolute

53. *shevaroyensis*.

Pedicels of flowers opposite or alternate; leaves oblanceolate, dully pale-brown-villous; pods softly puberulous nearly 2 in. long; bracts and bracteoles broadly ovate, acuminate, recurved, persistent, the bracteoles 1 in. from the calyx; calyx-lobes marginally revolute

54. *subperfoliata*.

Pods sessile or very nearly so, 1–1·2 in. long; leaves golden-silky, often large; bracteoles close under the calyx:—

Bracts and bracteoles ovate-acuminate, more or less deciduous, spreading, not shining and black (when dry) on upper surface; calyx-lobes not prominently revolute55. *madurensis*.

Bracts and bracteoles broadly cordate, acute, persistent, shining viscous and black (when dry) on upper surface; calyx-lobes prominently revolute

56. *candicans*.

Pods .8 in. long, longer than the .5 in. calyx; leaves lanceolate, long-villous, 2.5-3 in. long by .5 in. broad, stipules minute or 0; bracts and bracteoles subcordate, acuminate, recurved; seeds 5-7 57. *sandoorensis*.

Pods short, scarcely, if at all, longer than the calyx:—

Leaves obovate or oblanceolate, densely shining silky, 3-4 in. long by 1-1.5 in. broad; stipules subulate small, or 0; erect shrubs:—

Bracts and bracteoles ovate, erect; upper calyx-lobes obtuse; pods ovoid, .4 in. long with recurved persistent styles, seeds 2 58. *fulva*.

Bracts and bracteoles ovate, cuspidate, recurved; upper calyx-lobes acuminate; pods oblong, .6-.7 in. long with erect persistent styles, seeds 7-8

59. *pulcherrima*.

Leaves oblong-lanceolate or oblanceolate, mucronate, fulvous-villous, 2-3 in. long by .5 to 1 in. broad; stipules like the bracts; erect undershrubs:—

Bracts and bracteoles lunulate, recurved; pods ovoid, .4 in. long with curved persistent styles, 1-2-seeded

60. *lunulata*.

Bracts and bracteoles very many, conspicuous, linear with reflexed margins, curved; pods ovoid, .4 in. long with recurved styles, 1-2-seeded..... 61. *paniculata*

Leaves linear-cuneate, obtuse, densely soft fulvous villous, up to 1.5 in. long, .25 in. broad; stipules linear, usually 0; bracts and bracteoles ovate, recurved; pods .3 in. long, ovoid, 1-seeded; woody herb... 62. *ramosissima*.

Leaves trifoliolate, the petiole articulate..... **Trifoliolatae.**

Seeds 2, the pod obliquely subglobose, small, sessile, beaked:—

Low diffuse perennial herbs, the branches trailing or (in some forms) somewhat ascending; racemes short, few-flowered; leaflets small, obtuse, emarginate, scarcely up to .5 in. long, on very short petioles; corolla .2 in. long; pod .2 in. in diam. ... 63. *medicaginea*.

Erect herbaceous or shrubby perennials:—

Racemes long, 6-10 in., many-flowered; leaflets obovate, emarginate, up to 1 in. long on petioles up to 1.5 in.; stipules minute; corolla .4 in.; pod .2 in. in diam. ... 64. *trifoliatum*.

Racemes short, rarely to 6 in. long; stipules linear:—

Branches and leaves softly grey-pubescent; leaflets oblanceolate, obtuse at apex, up to .75 in. long; flowers .3 in. long; pods .2 in. in diam. 65. *Willdenowiana*.

Branches and leaves softly yellow-pubescent; leaflets obovate, rounded at apex, up to 1·5 in. long; flowers 4 in. long; pods 3 in. in diam. 66. *Notonii*.

Diffuse woody almost spinescent shrubs; leaflets small (1·5 in.), obcordate; racemes short, 2-6-flowered; flowers 3 in. long, standard ovate; pod very small.....67. *rigida*.

Seeds many:—

Pod short, 5-7 in. long, stalked; seeds 8-11; leaflets obovate:—

Flowers small, 2 in. long, keel shortly beaked, rounded at base; bracts ovate, acuminate, reflexed; leaflets all equal or nearly so; pods cylindric, obtuse at both ends, glabrous, stalk 2 in.....68. *orizensis*.

Flowers medium-sized, 5-7 in. long, keel long-beaked, narrow; bracts minute, setaceous; mid-leaflet larger than the side ones; pods oblong, narrowed at both ends, acute and beaked at apex, minutely puberulous, stalk 25 in.....69. *laevigata*.

Pod 1 in. or more long, stalked, seeds more than 10; leaflets usually obovate; bracts small:—

Stalk of pod short, the pods deflexed; flowers medium-sized with prominent curved keel, in elongate stiff terminal racemes:—

Pod and its stalk 1 in. long, clavate, recurved, minutely silky-pubescent, 10-12-seeded; leaflets thick, rather fleshy, emarginate, up to 1·25 in. long 70. *clavata*.

Pod and its stalk 1·5-2 in. long, cylindric-falcate, recurved, puberulous when young, at length glabrous, many-seeded; leaflets membranous, obovate-emarginate or ovate-acute, mucronate, up to 4 in. long 71. *striata*.

Stalk of pod about 1 in. long, the pod cylindric, glabrous, 1·5-2 in. long, 20-30-seeded; flowers very large with prominent incurved keels, in lax racemes; leaflets membranous, 1-2 in. long

72. *laburnifolia*.

Leaves usually 5-, sometimes 3-7-foliolate; pods large, much inflated, hooked at apex, glabrous.....**Multifoliolatae**.

Leaflets 5, linear-oblong or rarely narrow oblanceolate; petioles slender with slender narrowly lanceolate stipules; flowers 5 in. long in slender erect terminal racemes, the bracts linear-lanceolate, reflexed, pedicels 2 in.; pods more or less acute at apex, 2-2·5 in. long by 1 in. broad.....73. *quinquefolia*.

Leaflets 5-7, obovate; petioles long, stout:—

Leaflets glabrous above, appressed silky beneath; stipules and bracts slender, lanceolate, reflexed; flowers 7 in. long, closely

packed in stout erect terminal racemes, pedicels .3 in.; pods cylindric, obtuse at apex, 2.5 in. long by nearly 1 in. broad

74. *Grahamiana*.

Leaflets densely velvety on both sides with loose tomentum white when fresh turning golden brown; flowers nearly 1 in. long in close terminal racemes, pedicels .7 in.; pods cylindric-clavate, 2-2.5 in. long, obtuse at apex; bracts velvety, lanceolate, recurved

75. *digitata*.

1. CROTALARIA WIGHTIANA, Grah.; W. & A. 181. *C. rubiginosa* var. *Wightiana*, Bak. in F. B. I. ii, 69.

W. Gháts, in the Nilgiri, Pulney and Travancore Hills, at 4,000 to 6,000 ft.; Shevaroy Hills of Salem.

A conspicuous and handsome shrub, with beautiful golden-silky obtuse leaves.

2. CROTALARIA SCABRELLA, W. & A. 181; Fyson Hilltops Fl. 104, t. 77. *C. rubiginosa* var. *scabrella*, Bak. in F. B. I. ii, 69.

W. Gháts, in the Nilgiri and Pulney Hills, on the downs, in grass, at about 6,000 ft.

Similar to the first but smaller and with smaller usually acute leaves.

3. CROTALARIA CONFERTA, Fyson in Kew Bull. 1914, 183; Hillt. Fl. 104.

W. Gháts, in the Pulney Hills at 7,000 ft., on the downs, in grass.

4. CROTALARIA BIDIEI, Gamble in Kew Bull. 1917, 27.

W. Gháts, in the Wynaad and Nilgiri Hills, apparently at about 3,000-4,000 ft.

5. CROTALARIA ALATA, Hamilt.; F. B. I. ii, 69.

N. Circars, in the Hills of Ganjam and Vizagapatam, up to 2,500 ft.

6. CROTALARIA OVALIFOLIA, Wall.; Fyson Hillt. Fl. 102, t. 75. *C. rubiginosa*, Bak. in F. B. I. ii, 69, in part, not of Willd.; Wt. Ic. t. 885.

W. Gháts, Nilgiri and Pulney Hills, 6,000 to 8,000 ft., on the downs, in grass.

7. CROTALARIA BOURNEAE, Fyson in Kew Bull. 1914, 183 Hillt. Fl. 103, t. 76.

W. Gháts, in the Pulney Hills; Nilgiris at 6,000 ft. (Lawson).

8. *CROTALARIA BIFLORA*, Linn.; F. B. I. ii. 66; W. & A. 190.
Deccan and Carnatic, chiefly in open forest lands, up to 3,000 ft., westwards to the E. slopes of the W. Gháts.
A trailing annual.
9. *CROTALARIA GLOBOSA*, W. & A. 190; F. B. I. ii. 66.
Hills of the S. Carnatic, from Dindigal southwards.
A trailing annual, scarcer than the former which it resembles.
10. *CROTALARIA FILIPES*, Benth.; F. B. I. ii. 66.
W. Coast, in S. Canara (Beddome).
A very slender trailer with small bifarious leaves and filiform peduncles.
11. *CROTALARIA PROSTRATA*, Roxb.; F. B. I. ii. 67; W. & A. 189.
E. Coast, on pasture land, especially in N. Circars, but down to Cape Comorin; more scarce in Deccan and on W. Coast.
A somewhat shrubby perennial trailing herb.
12. *CROTALARIA HUMIFUSA*, Grah.; F. B. I. ii. 67.
W. Coast and W. Gháts, in Wynaad, Anamalais and Travancore, in dry forest undergrowth, up to 3,000 ft.
13. *CROTALARIA ACICULARIS*, Ham.; F. B. I. ii. 68.
N. Circars, in Ganjam, in dry forest lands; W. Gháts, in the Anamalai Hills and Travancore, up to 3,000 ft.
14. *CROTALARIA FERRUGINEA*, Grah.; F. B. I. ii. 68. *C. involuroides*, Wt. Ic. 31, *probably*.
W. Coast, in S. Canara (Beddome).
15. *CROTALARIA EVOLVULOIDES*, Wt.; F. B. I. ii. 68; W. & A. 188, *excl. syn.*
Carnatic, in Salem and Coimbatore Districts; W. Gháts, in Nilgiris, Malabar, Pulneys and Travancore, up to 5,000 ft., in dry localities.
Var. *acutifolia*, Gamble. Leaves elliptic, acute, mucronate, rather prominently nerved.
W. Gháts, in S.-E. Wynaad.
16. *CROTALARIA FYSONII*, Dunn in Kew Bull. 1914, 26; Fyson Hillt. Fl. 101, t. 74.
W. Gháts, in grass or by roadsides on the downs in the Pulney Hills, up to 7,000 ft., Anamalai Hills (Beddome).
A trailing perennial subshrubby herb.
Var. *glabra*, Gamble. Leaves, flowers, and pod glabrous.
W. Gháts, on the Pulney Downs (Bourne).

17. *CROTALARIA BIFARIA*, Linn.; F. B. I. ii. 69; W. & A. 188, excl. syn.; Wt. Ic. t. 30.
Deccan, in Mysore and Bellary; Carnatic, in Tanjore (Wight).
A straggling perennial herb with weak stems and conspicuously inflated and very obtuse pod. The corolla is yellow or blue.
18. *CROTALARIA HIRSUTA*, Willd.; F. B. I. ii. 68; W. & A. 188.
Deccan, from the Godavari through Kistna and Guntur to Cuddapah.
A subshrubby species with rather large very membranous leaves and stems covered with spreading hairs, the stipules and bracts reflexed.
19. *CROTALARIA MULTIFLORA*, Benth.; F. B. I. ii. 69.
W. Gháts, in the Anamalai Hills, at 5,000 ft. (Beddome).
A subshrubby species with large flowers, apparently scarce.
20. *CROTALARIA LUTESCENS*, Dalz.; F. B. I. ii. 74.
W. Coast, in S. Canara, at Karkal (? Karikal) (Lawson).
An erect annual, reaching 3 ft. in height. It is common in the Konkan so is likely to occur in S. Canara. Flowers yellow.
21. *CROTALARIA PEDUNCULARIS*, Grah., F. B. I. ii. 74; W. & A. 186. *C. elegans*, Bedd. Ic. t. 106.
W. Gháts, in Coimbatore, Nilgiris, Anamalais and Travancore, up to 5,000 ft., in grassy places.
An erect annual with grass-like leaves and yellow flowers.
22. *CROTALARIA RETUSA*, Linn.; F. B. I. ii. 75; W. & A. 187.
In all Districts, in fields, waste places and open forest lands.
An erect herbaceous undershrub reaching 3-4 ft. in height with conspicuous yellow flowers. It gives a fibre.
23. *CROTALARIA SERICEA*, Retz.; F. B. I. ii. 75; W. & A. 186.
N. Circars, in Ganjam, in forest regions up to 2,500 ft.
An erect herbaceous undershrub, corolla yellow with a purple tinge.
24. *CROTALARIA LESCHENAUILLII*, DC.; F. B. I. ii. 76; W. & A. 186.
W. Gháts, in the Nilgiri and Pulney Hills at elevations above 5,000 ft.; Shevaroy Hills of Salem (Lawson).

An erect herbaceous undershrub with yellow flowers tinged outside with brown or red.

25. *CROTALARIA FORMOSA*, Grah.; F. B. I. ii. 76; W. & A. 181; Wt. Ic. t. 980; Eyson Hillt. Fl. 107. t. 79.

W. Gháts, on the Nilgiris in Sholas and on the open downs above 7,000 ft.

A low-growing handsome shrub with yellow flowers and dense tawny pubescence.

26. *CROTALARIA BARBATA*, Grah.; F. B. I. ii. 76; W. & A. 181; Wt. Ic. t. 980; Eyson Hillt. Fl. 108, t. 80.

W. Gháts, in the higher Shola forests of the Nilgiris at 6,000–8,000 ft.

A large shrub with conspicuous bright yellow flowers and characteristic dark brown silky pubescence.

27. *CROTALARIA SCABRA*, Gamble in Kew Bull. 1917, 28.

W. Gháts, on Agastyamalai Peak, Tinnevely (Barber) at about 6,000 ft.

Apparently a good-sized shrub.

28. *CROTALARIA SALICIFOLIA*, Heyne; F. B. I. ii. 77; W. & A. 182.

W. Gháts, from Coorg through Wynaad to Travancore.

An erect herbaceous undershrub with bright yellow flowers and much golden-brown pubescence.

29. *CROTALARIA NANA*, Burm.; W. & A. 191; F. B. I. ii. 71 *in part*.

Carnatic, near the coast; W. Coast and W. Gháts, at low levels in dry localities.

A prostrate annual plant, with often erect branches.

30. *CROTALARIA UMBELLATA*, Wight; W. & A. 191. *C. nana*, Burm.; F. B. I. ii, 71 *in part*.

W. Gháts, in the Hills from S. Canara and Mysore southwards, up to 6,000 ft.; Shevaroy Hills of Salem.

An erect bushy plant, apparently perennial.

31. *CROTALARIA LINIFOLIA*, Linn. f.; F. B. I. ii. 72; W. & A. 190 *excl. syn.*

N. Circars, in Godavari; Deccan, in Mysore; Carnatic, in Chingleput and S. Arcot.

An annual slenderly-branched plant.

32. *CROTALARIA TECTA*, Roth; F. B. I. ii. 72. *C. viminea*, Grah.; W. & A. 189.

W. Ghâts, at the foot of the Pulney Hills (Bourne), Nagarcoil in Travancore, plains of Tinnevely.
A low undershrub.

33. CROTALARIA HIRTA, Willd.; F. B. I. ii. 70; W. & A. 182.
N. Circars, in Godavari; Salem District in Carnatic; at low levels.

A low small straggling undershrub.

34. CROTALARIA MYSORENSIS, Roth; F. B. I. ii. 70; W. & A. 182.

Deccan and Carnatic, in hilly country, up to 4,000 ft.; W. Ghâts, in the Nilgiris, Anamalais, Pulneys and Hills of Travancore, up to 4,000 ft.

An erect densely silky plant, the hairs at first silvery, turning brown in drying.

35. CROTALARIA ALBIDA, Heyne; F. B. I. ii. 71; Fyson Hilt. Fl. 105, t. 78. *C. montana*, Roxb.; W. & A. 182.

N. Circars, in the Hills of Ganjam and Vizagapatam up to 4,500 ft.; W. Ghâts, in the Nilgiri and Pulney Hills up to 7,000 ft.

A bushy twiggy undershrub with pale yellow flowers and small grey-pubescent thick leaves.

36. CROTALARIA EPUNCTATA, Dalz. *C. albida* var. *epunctata*, Baker in F. B. I. ii. 71.

N. Circars, in the Hills of Ganjam up to 4,500 ft. in open forest; W. Ghâts, Hills of Tinnevely.

An erect slender branching undershrub, with membranous leaves.

37. CROTALARIA CALYCINA, Schrank; F. B. I. ii. 72. *C. anthylloides*, W. & A. 181.

Almost all Districts in hilly country, among grass and in open forest lands.

An annual plant reaching 2 ft. or even more in height at low levels, but at high levels reduced to about 6 in. The flowers and fruit are constant, but the leaves are very variable and form 4 fairly well-marked groups:—

Group 1 (*anthylloides*).—Tall plants, leaves linear, 2-6 in. long, 2-4 in. broad, usually glabrous above.

Group 2 (*Roxburghiana*).—Tall plants, leaves elliptic-lanceolate, 1-2 in. long, 6-7 in. broad, usually glabrous above.

Group 3 (*crinita*).—Low plants with erect branches, leaves linear-oblong, 1–2 in. long, 1–2 in. broad, strigosely hairy above.

Group 4.—Low plants, branches scarcely 6 in. long, leaves oblong, 5–8 in. long, 1–3 in. broad, strigosely hairy above.

The last group is only found at high levels. Fyson says it is called “Rabbits’ ears” on the Pulneys.

38. *CROTALARIA CHINENSIS*, Linn.; F. B. I. ii. 73.

W. Gháts, in Malabar and Coorg, in scrub forest up to 4,000 ft.

An erect annual about 2 ft. high, with yellow flowers and golden-brown hairs.

39. *CROTALARIA PRIESTLEYOIDES*, Benth.; F. B. I. ii. 74.

W. Gháts, in the Nilgiri and Anamalai Hills (Wight, Beddome), Bababudan Hills of Mysore, up to 5000 ft.

A low trailing undershrub with long dark hairs and capitate flowers.

40. *CROTALARIA SPECIOSA*, Heyne; F. B. I. ii. 73.

Deccan Hills, in the Ceded Districts and Mysore; Nagari Hills of N. Arcot and Kambakam Hills of Chingleput.

An erect woody undershrub with beautiful silky leaves and capitate flowers having a silky standard and large lanceolate bract and bracteoles.

41. *CROTALARIA DUBIA*, Grah.; F. B. I. ii. 73.

W. Gháts, in Wynaad and Anamalais and Hills of Cochin at about 3,000 ft., in dry forest undergrowth.

An easily recognised species with dense heads of small flowers and rather large leaves.

42. *CROTALARIA PUSILLA*, Heyne; F. B. I. ii. 70; W. & A. 189.

Deccan and Carnatic, on dry waste lands.

The smallest species of the genus.

43. *CROTALARIA TRIQUETRA*, Dalz.; F. B. I. ii. 71.

W. Gháts, in S. Mysore and Nilgiris, at about 3,000 ft.

A very slender plant with white or pale yellow flowers.

44. *CROTALARIA CLARKEI*, Gamble in Kew Bull. 1917, 27.

W. Gháts, in the Nilgiri, Pulney and Tinnevely Hills, up to 5,500 ft.

A much stouter plant than the preceding, with yellow flowers and thicker leaves.

45. *CROTALARIA VERRUCOSA*, Linn.; F. B. I. ii. 77; W. & A. 187; Wt. Ic. t. 200.
Almost all Districts, a weed of roadsides, waste places, gardens and fields.
A much-branched herbaceous, usually annual, plant with blue, sometimes white, flowers.
46. *CROTALARIA LANATA*, Bedd. Ic. t. 105; F. B. I. ii. 77.
W. Gháts, Anamalai, Pulney and Travancore Hills at 3,000 to 4,000 ft.
A shrub, reaching 12-15 ft. in height.
47. *CROTALARIA SEMPERFLORENS*, Vent.; F. B. I. ii. 78; W. & A. 187. *C. Wallichiana*, W. & A. 187; Wt. Ic. t. 982.
W. Gháts, in the Nilgiri and Pulney Hills, at high levels, above 6,000 ft.
A very conspicuous shrub on the borders of Sholas and by roadsides.
48. *CROTALARIA WALKERI*, Arn.; Trimen Fl. Ceyl. ii. 16, t. 26. *C. semperflorens* var. *Walkeri*, Baker in F. B. I. ii. 78.
W. Gháts, in the Nilgiri and Pulney Hills, at low levels, up to 6,000 ft.
A low undershrub with yellow flowers and smaller leaves than the preceding.
49. *CROTALARIA HEYNEANA*, Grah.; F. B. I. ii. 78; W. & A. 187.
W. Coast, in Malabar and Travancore; W. Gháts, in S. Canara, S. Mysore; Wynaad and Anamalais, to 3,000 ft.
A low undershrub with blue flowers, very membranous leaves and terete branches.
50. *CROTALARIA OBTECTA*, Grah.; F. B. I. ii. 79; W. & A. 185; Wt. Ic. t. 208 and t. 383.
W. Gháts, in Nilgiris, above 4,000 ft.
A large shrub with conspicuous flowers and pods and velvety foliage.
Var. *glabrescens*, Baker, branches and leaves glabrescent.
W. Gháts, in the Tinnevely Hills, about Courtallum, Sispara Ghát in Nilgiris, etc.
51. *CROTALARIA JUNCEA*, Linn.; F. B. I. ii. 79; W. & A. 185; Roxb. Cor. Pl. ii. t. 193.
All Districts, possibly wild in the Circar Hills and W. Gháts,

but more usually found run wild; cultivated especially in the Circars and Deccan. Sun-hemp.

A tall shrub reaching 8 ft. in height, with prominently grooved and striated stems; cultivated for its valuable fibre. Vern. *Hind.* Sunn; *Tel.* Shanama; *Tam.* Janupa, Wuckoo.

52. *CROTALARIA LONGIPES*, W. & A. 183; F. B. I. ii. 76.
Carnatic, in the Kollaimalai Hills of Salem (Wight).
53. *CROTALARIA SHEVAROYENSIS*, Gamble in Kew Bull. 1917, 28.
Shevaroy Hills of Salem (Bidie, Bourne); Madura District (Beddome).
54. *CROTALARIA SUBPERFOLIATA*, Wight; F. B. I. ii. 79; W. & A. 184.
W. Gháts, on the E. slopes of the Pulney and Tinnevely Hills, Hills of Travancore.
A tall species, at once recognised by the slender racemes with obtuse opposite bracts and usually opposite pedicels.
55. *CROTALARIA MADURENSIS*, Wight; F. B. I. ii. 79; W. & A. 184.
W. Gháts, in the Nilgiri and Pulney Hills, on open downs, up to 6,000 ft.
A very fine tall-growing handsome plant with yellow flowers.
56. *CROTALARIA CANDICANS*, W. & A. 184. *C. madurensis*, Wt.; F. B. I. ii. 79 *in part*.
W. Gháts, in the Nilgiris, at about 6,000 ft.
57. *CROTALARIA SANDOORENSIS*, Bedd.; Gamble in Kew Bull. 1917, 29.
Deccan, Sandúr Hills of Bellary (Beddome).
An erect viscous undershrub with very short fulvous hair.
58. *CROTALARIA FULVA*, Roxb.; F. B. I. ii. 80; W. & A. 183.
Deccan, Hills of Mysore, W. Gháts, in Wynaad and Nilgiris, up to 6,000 ft., scarcer to south.
A handsome shrub with golden silky hairs, erect bracts and yellow flowers in close panicles.
59. *CROTALARIA PULCHERRIMA*, Roxb.; F. B. I. ii. 80; W. & A. 184; Wt. Ic. t. 481.
Hills of the Deccan and Carnatic, from Kambakam in Chingleput to Ramandrug in Bellary, up to 4,500 ft.; Nilgiris.

A very handsome viscous shrub with bright yellow flowers and conspicuous reflexed bracts on the elongated branches of the panicles.

60. *CROTALARIA LUNULATA*, Heyne; F. B. I. ii. 80; W. & A. 183; Wt. Ic. t. 480.

Deccan, Muchukota in Anantapur; Carnatic, Hills of Chingleput, Tanjore.

An erect undershrub, very sticky; flowers yellow; in elongate panicle-branches.

61. *CROTALARIA PANICULATA*, Willd.; F. B. I. ii. 81; W. & A. 183.

Deccan, dry tracts in Cuddapah, and South to Salem; old forts in Bellary, Kistna and Guntur; Carnatic, coast region from Madras southwards.

A sticky, bad-smelling, erect undershrub with many linear bracts and stipules and yellow flowers.

Sometimes the bracts below the flowering ones are in threes, the middle one ovate acuminate, the others linear, and the stipules are often in fascicles. The tomentum is grey at first but changes on drying.

62. *CROTALARIA RAMOISSIMA*, Roxb.; F. B. I. ii. 80; W. & A. 183.

Deccan, in dry stony lands from the Godavari to Cuddapah and Mysore.

A low much-branched woody herb with much silky hair, very sticky; panicles short, close. Flowers yellow, tinged with purple.

63. *CROTALARIA MEDICAGINEA*, Lamk.; F. B. I. ii. 81; W. & A. 192. *C. neglecta*, W. & A. 192. *C. herniarioides*, W. & A. 192.

A common very variable plant, found in three fairly well-marked varieties, which, however, are more or less connected by intermediates.

Branches prostrate, weak, very slender, with slender filiform divaricating branchlets and pedicels and racemes with only 2-3 flowers; the leaflets narrow oblanceolate

var. 1. *typica*.

Branches prostrate and somewhat ascending with shorter branchlets and pedicels and 6-9-flowered racemes; the leaflets obovate, broader var. 2. *neglecta*.

Branches very long, prostrate, racemes terminal, about 8-flowered; leaflets obcordate, about 25 in. long

var. 3. *herniarioides*.

Variety 1 seems to be scarce and chiefly confined to the coast of the Carnatic; variety 2 is common in the Deccan and Carnatic to the Eastern slopes of the W. Gháts, in dry localities and up to 3,000 ft.; variety 3, the best marked, chiefly occurs on sandy tracts near the sea coast of Coromandel, making large flat rosettes of some size from a thick rootstock.

64. *CROTALARIA TRIFOLIASTRUM*, Willd.; F. B. I. ii. 82; W. & A. 191; Wt. Ic. t. 421.

N. Circars and Carnatic, near the coast, from Ganjam to Madras.

An erect perennial with yellow flowers in long racemes, reaching 2-3 ft. in height.

65. *CROTALARIA WILLDENOWIANA*, DC.; F. B. I. ii. 81; W. & A. 191.

Carnatic, in the plains and low hills from the Kistna southwards.

An erect perennial with soft grey-villous foliage and yellow flowers.

66. *CROTALARIA NOTONII*, W. & A. 192; F. B. I. ii. 82; Wt. Ic. t. 752. *C. rostrata*, W. & A. 191.

W. Gháts, in the Nilgiri and Anamalai Hills, at elevations of 4,000 to 6,000 ft.

A pretty erect shrub with yellowish pubescence and bright yellow flowers.

67. *CROTALARIA RIGIDA*, Heyne; F. B. I. ii. 82; W. & A. 191.

Sea coast of the Carnatic from the Kistna to Negapatam, rarer inland from Coimbatore to Tinnevely.

A rigid stiff shrub with many thorny-looking branches.

68. *CROTALARIA ORIXENSIS*, Rottl.; F. B. I. ii. 83; W. & A. 193.

N. Circars and Carnatic, scarce.

A diffuse herbaceous much-branched perennial.

69. *CROTALARIA LAEVIGATA*, Lamk.; F. B. I. ii. 83. *C. stipitata*, W. & A. 193.

W. Gháts, from S. Canara to Nilgiris and Anamalais, up to 3,000 ft.

A small erect shrub with yellow flowers.

70. *CROTALARIA CLAVATA*, W. & A. 194; F. B. I. ii. 83.
Carnatic, from Coimbatore southwards, on and near the eastern slope of the Gháts, up to 2,000 ft.
A low shrub, flowers yellow.
71. *CROTALARIA STRIATA*, DC.; F. B. I. ii. 84.
N. Circars, at Chatrapur in Ganjam; W. Coast, in Travancore.
An erect herbaceous shrub, reaching 4 ft. in height, with flowers yellow striped with red.
Var. *acutifolia*, Trim. in Fl. Ceyl. ii. 19. Stems stouter, leaflets larger, ovate, acute, mucronate, on long stout petioles; racemes more densely flowered.
W. Coast in S. Canara (Beddome, Barber); Nilgiris below Coonoor (Fischer); Bangalore, in Mysore (Cameron).
An erect shrub, reaching 5 ft.; flowers yellow striped with purple.
72. *CROTALARIA LABURNIFOLIA*, Linn.; F. B. I. ii. 84; W. & A. 193.
N. Circars and Carnatic, especially near the coast; Deccan, in Mysore; W. Coast at Quilon, Travancore.
An erect shrubby perennial with large yellow flowers and conspicuously long-stalked pod.
73. *CROTALARIA QUINQUEFOLIA*, Linn.; F. B. I. ii. 84; W. & A. 194; Wt. Ic. t. 16.
Carnatic, W. Coast and W. Gháts, up to 3,000 ft., chiefly growing in wet rice fields.
An erect annual with fairly large yellow flowers.
74. *CROTALARIA GRAHAMIANA*, W. & A. 194; F. B. I. ii. 85.
W. Gháts, in the Anamalai and Pulney Hills and Hills of Travancore and Tinnevely, up to 6,000 ft.
An erect undershrub with yellow flowers and shining silky pubescence.
75. *CROTALARIA DIGITATA*, Hook. Bot. Misc. ii. t. 16; F. B. I. ii. 85; W. & A. 194.
Carnatic, Kollaimalai Hills of Salem District (Wight).
A low erect very velvety shrub with yellow flowers.

Ulex europaeus, Linn., the "Gorse" or "Furze," has become completely naturalized on the Nilgiri and Pulney Hills at high levels. Two species of *Cytisus*—*C. albus*, Link., the White Broom, with white flowers, and *C. monspessulanus*, Linn., a soft-

leaved shrub with yellow flowers and silky pod—are found run wild on the Nilgiri Hills. The former is a native of Algeria; the latter common in the S. of France and other Mediterranean regions.

4. *Trifolium*, L.

Herbs. *Leaves* digitately trifoliolate, the stipules adnate to the petiole. *Flowers* usually red or white, sometimes yellow, in dense axillary heads spikes or umbels, rarely solitary. *Calyx*-tube campanulate; lobes 5, subequal, the lower ones sometimes longer. *Corolla* adnate to the calyx-tube and fading without falling; standard and wings narrow; keel straight, obtuse. *Stamens* diadelphous; filaments more or less dilated; anthers uniform. *Ovary* sessile or stalked, with few ovules; style filiform, incurved above the base; stigma oblique. *Pod* minute, included, membranous, indehiscent, 1- or few-seeded.

Flowers red, in dense rounded heads about 1 in. in diam., subtended by a pair of opposite leaves; leaflets oblong, stipules broad

1. *pratense*.

Flowers white or pinkish, in globose heads about 7 in. in diam., without leaves and long-stalked; leaflets obovate, emarginate, stipules narrow...

2. *repens*.

Flowers yellow, in leafless stalked heads about 2 in. in diam.; leaflets very small, obcordate, stipules small

3. *dubium*.

1. *TRIFOLIUM PRATENSE*, Linn.; F. B. I. ii. 86.

Nilgiri Hills near the stations at 6,000–8,000 ft., introduced and run wild, "Red Clover."

A perennial erect herb, a useful forage plant.

2. *TRIFOLIUM REPENS*, Linn.; F. B. I. ii. 86.

Nilgiri Hills, in pastures at high levels, introduced and run wild, "White or Dutch Clover."

A perennial creeping herb, also a useful forage plant.

3. *TRIFOLIUM DUBIUM*, Sibth. *T. minus*, Sm.; F. B. I. ii. 86.

Nilgiri Hills, on roadside and waste lands on the plateau, introduced and run wild; N. Circars (Beddome).

An annual herb.

5. *Parochetus*, Hamilt.

A slender, creeping herb, rooting at the nodes. *Leaves* trifoliolate; stipules free or shortly adnate to the petiole. *Flowers*

rather large, on axillary peduncles, solitary or 2-3 in an umbel. *Calyx*-tube campanulate; teeth 5, subequal, the 2 upper connate nearly to the apex. *Corolla* blue or purplish-white, the petals free from the staminal tube, exserted; standard suborbicular, retuse, narrowed into a short claw; wings falcate-oblong with a narrow basal lobe; keel petals connected above, oblong-falcate, shorter than the wings, abruptly inflexed. *Stamens* diadelphous, the vexillary one free, filaments of the rest connate to near the top, anthers uniform. *Ovary* sessile, linear, multiovulate; style inflexed above; stigma terminal, small. *Pod* linear, turgid, obliquely acute, 2-valved. *Seeds* many, on filiform funicles.

PAROCHETUS COMMUNIS, Hamilt.; F. B. I. ii. 86. *P. major*, Don; W. & A. 252; Wt. Ic. t. 483.

Nilgiri and Pulney Hills at 6,000-8,000 ft.

A small pretty trailing and rooting herb with pale blue or purplish flowers, and clover-like leaves with obcordate leaflets.

6. *Melilotus*, Juss.

Annual or biennial herbs. *Leaves* pinnately 3-foliolate, the main nerves excurrent as marginal teeth; stipules adnate to the petiole. *Flowers* small, yellow or white, in slender axillary racemes; bracts and bracteoles minute or 0. *Calyx*-tube campanulate; teeth 5, subequal. *Petals* deciduous, free from the staminal tube; standard obovate or oblong, subsessile; wings oblong, longer than the obtuse keel. *Stamens* 10, vexillary filament free or connate in the middle with the others; filaments filiform; anthers uniform. *Ovary* sessile or stalked, with few ovules; style filiform, incurved; stigma terminal. *Pod* subglobose or oblong, indehiscent or tardily dehiscent; seeds 1 or few.

Corolla minute, yellow; pod usually 1-seeded; annual . . . 1. *indica*.
Corolla rather larger, white; pod often 2-seeded; biennial . 2. *alba*.

1. *MELILOTUS INDICA*, All. *M. parviflora*, Desf.; F. B. I. ii. 89; W. & A. 196.

Eastern Coast Districts, a cold-weather weed in fields.

2. *MELILOTUS ALBA*, Lamk.; F. B. I. ii. 89. *M. leucantha*, Koch; W. & A. 196.

Northern Districts, a cold-weather weed of cultivation.

Trigonella Foenum-Graecum, Linn., the Fenugreek, is an annual

herb cultivated occasionally, as a pot-herb and medicinal plant. *Medicago sativa*, Linn., the Lucerne, is occasionally cultivated as a fodder-crop.

7. *Cyamopsis*, DC.

Erect herbs with appressed laterally attached hairs. *Leaves* pinnately 3-foliolate (Indian species); leaflets toothed; stipules small, setaceous; stipels 0. *Flowers* in axillary racemes, small, purplish; bracts caducous; bracteoles 0. *Sepals* 5, connate in an oblique tube, lowest tooth longest, setaceous. *Petals* caducous; standard obovate; wings oblong, free; keel obtuse, subincurved, the petals connate above. *Stamens* monadelphous in a tubular sheath; anthers uniform, the connective apiculate. *Ovary* sessile, many-ovuled; style incurved at tip; stigma capitate. *Pod* linear, subquadrangular, acuminate, septate within. *Seeds* square, compressed, strophiole 0.

CYAMOPSIS TETRAGONOLoba, Taub. *C. psoraloides*, DC; F. B. I. ii. 92; W. & A. 197; Wt. Ic. t. 248.

Eastern plains Districts, cultivated and occasionally found run-wild. Cluster-bean.

A stout annual, 2-3 ft. high, with rather large leaflets and beaked pod. The pods are eaten as a vegetable, and the whole plant is cultivated for cattle-fodder. Vern. *Tam.* Koth-averay; *Tel.* Goor chikurkai.

8. *Indigofera*, Linn.

Herbs, undershrubs or shrubs, with appressed laterally attached hairs, sometimes mixed with basifixed hairs, frequently silvery-canescens. *Leaves* simple, trifoliolate or imparipinnate, the side leaflets usually opposite, but sometimes alternate, entire; stipules usually small, shortly adnate to the petiole; stipels setaceous or 0. *Flowers* generally very small, usually reddish or purple, in axillary racemes or spikes, rarely solitary, rarely panicled, each flower pedicelled in the axil of a caducous bract; bracteoles 0. *Calyx* minute, campanulate, teeth subequal or the lowest longest. *Corolla* more or less caducous; standard ovate or orbicular, sessile or slightly clawed; wings oblong, slightly adherent to the keel; keel petals erect, obtuse, with a downward spur on each side near the base. *Stamens* diadelphous, the vexillary stamen free, the others with connate filaments; anthers uniform, apiculate. *Ovary* sessile or subsessile, 1-2- or

many-ovulate; style glabrous; stigma capitate, sometimes pedicellate. Pod usually linear-cylindric, rarely oblong or globose, straight or curved, sometimes angled, sometimes muricate, often torulose, septate within between the seeds. Seeds globose or cylindric and truncate; strophiole 0.

Pod 1-seeded; leaves simple; annuals with very small flowers:—

Pod short, recurved, sickle-shaped, prickly on the broadened ventral suture; green plants nearly glabrous with broadly obovate obtuse leaves 1. *echinata*.

Pod very small, globose, smooth; silvery-hoary plants with linear to obovate leaves 2. *linifolia*

Pod 2-many-seeded, linear or oblong or 4-angled; leaves simple or pinnate:—

Leaves simple, ovate-cordate, densely covered with long white soft hairs; flowers very small, the setaceous calyx-lobes longer than the corolla; pod minute, 2-seeded 3. *cordifolia*.

Leaves imparipinnate:—

Flowers solitary, pedicellate; pods slender, cylindric:—

Herbaceous perennial with slender prostrate reddish branches; leaflets usually 5, thin, oblanceolate, flat; pedicels filiform, 3-4 in. long; pod 4 in. long 4. *uniflora*.

Erect much-branched stiff undershrub, young branches silvery pubescent; leaflets usually 3, thick, oblanceolate, folded; pedicels slender, 2 in. long; pod 6 in. long... 5. *aspalathoides*.

Flowers in axillary racemes:—

Racemes very short, subcapitate; pod oblong, 2-seeded:—

Leaves trifoliolate, leaflets up to 1 in. or more long, black-glandular beneath; pod pubescent, dentately winged on either side of the sutures, 2 in. long, sometimes 1-seeded

6. *glandulosa*.

Leaves 7-9-or more-foliolate, leaflets scarcely 5 in. long, not glandular, alternate; pod sparsely white-hirsute, not winged; 15 in. long 7. *enneaphylla*.

Racemes more or less elongate, not capitate; pod linear, flattened or cylindric, several-seeded:—

Leaves trifoliolate, the under-surface of the leaflets usually with round glands:—

Racemes slender, subcorymbose, up to 1 or 1.5 in. long, with pedicellate flowers; pods 6-8 in. long, not deflexed; leaflets apiculate, the glands large and prominent

8. *pedicellata*.

Racemes short with densely packed shortly pedicellate flowers; pods deflexed:—

Plants densely clothed with short spreading brownish hairs; pod cylindric, '3-'4 in. long, '1 in. thick, not torulose; racemes short, scarcely up to 4 in. long

9. *vestita*.

Plants with sparse appressed brownish pubescence; racemes very short:—

Pods somewhat stout, '4-'5 in. long, '1 in. thick, narrowly winged on both sides of the sutures, not torulose, about 4-6-seeded; leaflets oblanceolate emarginate, the end one almost or quite sessile

10. *trifoliata*.

Pods very slender, '6 in. long, under '05 in. thick, very faintly winged at the sides of the sutures, slightly torulose, about 8-seeded; leaflets obovate, obtuse or acute, apiculate, the end one very shortly petiolulate

11. *prostrata*.

Plants with white appressed pubescence; end leaflets petiolulate:—

Pods '5-'6 in. long, brown, with appressed, white pubescence, torulose, the sharp apex upcurved, seeds 2-4; leaflets membranous, obovate, mucronate, sparsely villous, glands prominent; racemes up to '4 in. long

12. *Barberi*.

Pods about 1 in. long, tetragonous, appressed grey-pubescent, not torulose, the sharp apex straight, seeds 6-10; leaflets thick, obovate, obtuse, much appressed pubescent, no glands; racemes up to 1 in. long, usually less, the upper flowers not fertile

13. *trita*.

Leaflets 1-4 rarely 5, alternate, densely covered, as the branches and inflorescence, with white appressed hairs; racemes many-flowered, elongate, up to 4 in. long; pods slender, deflexed and then curved upwards, torulose, 6-8-seeded

14. *oblongifolia*.

Leaflets 5, sometimes 7, thin, the side ones opposite; racemes slender, pods not torulose:—

Leaflets obovate, obtuse, '5 rarely '7 in. long, stipules lanceolate; racemes slender, 2-5-flowered, under 2 in. long; pods spreading, subcylindric, smooth, slender, '75 in. long, 10-12-seeded

15. *glabra*.

Leaflets elliptic obovate, usually acute, up to 1 in. or even

1.5 in. long; stipules subulate; racemes elongate; pods deflexed:—

Racemes up to 8 in. long or longer; pods linear, slender, subtetragonal, curved outwards, 2 in. long, 10-15-seeded

16. *subulata*.

Racemes up to 4 in. long; pods straight, cylindric or obscurely tetragonal, 1 in. long, 5-6-seeded

17. *marginulata*.

Leaflets 7-13; flowers small, under .3 in. long:—

Side leaflets alternate, oblanceolate, up to 1 in. long, usually from 9 to 12, stipules lanceolate, scarious; racemes up to 4 in. long, many-flowered; pods .75-1 in. long, much deflexed, tetragonous, sharp-pointed, straight, 6-10-seeded

18. *endecaphylla*.

Side leaflets opposite:—

Racemes 3-6-flowered, short; leaflets small and narrow, stipules setaceous; pod flattened, margined, appressed pubescent, slightly torulose, .6 in. long, 10-12-seeded

19. *tenuifolia*.

Racemes 6-12-flowered:—

Densely pubescent with gland-tipped viscos hairs; leaflets small, elliptic-obovate with white appressed hairs as well as the glandular ones, stipules setaceous; pod cylindric, .8 in. long, mucronate, very hirsute

20. *viscosa*.

No gland-tipped hairs, only appressed white ones, leaflets up to 1 in. long, linear-oblong or oblanceolate, often only 5, stipules minute; pod linear, compressed, pubescent, 1-1.5 in. long, curved at the tip; racemes very short

21. *parviflora*.

Racemes more than 12-flowered:—

Pods cylindric, more or less curved:—

Branchlets very silvery canescent; pods appressed silvery pubescent, .4-.5 in. long, 3-4-seeded, slightly torulose; leaflets 7-9, obovate, emarginate

22. *articulata*.

Branchlets glabrous, the youngest only slightly silvery canescent; pods green, .5-1 in. long, 6-12-seeded; leaflets 7-11, elliptic-obovate:—

Pods slender, under .1 in. thick, sharply pointed, slightly torulose, 10-12-seeded; racemes usually shorter than the leaves.....23. *tinctoria*.

Pods stout, over .1 in. thick, obtuse at apex with a small mucro, slightly torulose, 8-10-seeded; racemes usually longer than the leaves

24. *sumatrana*.

Pods stout, .5-.75 in. long, about .1 in. thick, nearly straight, shortly mucronate, not torulose, about 6-seeded; racemes slender, up to 7 in. long

25. *longeracemosa*.

Pods more or less tetragonous;—

Pods straight, imbricately deflexed, densely clothed with soft spreading hairs, .5 to .75 in. long, seeds 6-8; racemes densely-flowered, 2-6 in. long, pedicels very short; leaflets rather large 26. *hirsuta*.

Pods linear, curved, much constricted between the elongate joints, 1.5-2 in. or more long; slightly appressed silky; racemes slender, about 2 in. long, buds canescent; leaflets 7-11, elliptic oblong, slightly appressed-pubescent, up to 1 in. long

27. *constricta*.

Leaflets usually more than 13, occasionally less; flowers .3 in. long or longer:—

Flowers .3 in. long; stiff shrubs with appressed silvery pubescence; branches striated; leaflets elliptic-oblong or -obovate, emarginate or mucronate, coriaceous, .25-.75 in. long; pods straight, cylindric, acuminate, 1-1.5 in. long, grey-pubescent, 8-12-seeded 28. *Wightii*.
Flowers over .3 in. long; shrubs nearly glabrous, not silvery pubescent; pods glabrous:—

Pods up to 3 in. long, straight, prominently beaked; flowers .4-.5 in. long; leaflets elliptic-oblong, membranous, up to 1 in. long 29. *galegoides*.

Pods up to 2 in. long, straight, shortly beaked; flowers .4-.7 in. long; leaflets obovate-oblong, obtuse or emarginate, apiculate, subcoriaceous, up to 1 in. long 30. *pulchella*.

Flowers in paniced bracteate racemes, the bracts leaflet (1-3)-like, stipulate, the true leaves sessile with up to 10 pairs of opposite elliptic-oblong softly pubescent side leaflets, each .25-.5 in. long; pod cylindric, pubescent, .3-.5 in. long, 3-4-seeded

31. *mysorensis*.

1. INDIGOFERA ECHINATA, Willd.; F. B. I. ii. 92; W. & A. 198; Wt. Ic. t. 316.

N. Circars and Carnatic, along the East Coast.

A diffuse annual herb with pink flowers and prickly pod.

2. *INDIGOFERA LINIFOLIA*, Retz; F. B. I. ii. 92; W. & A. 198; Wt. Ic. t. 313; Roxb. Cor. Pl. ii. t. 195.

Circars, Deccan and Carnatic, common, often on black cotton soil; W. Coast, in S. Canara.

A prostrate annual branching from the ground and lying flat on it or only erect among grass. It has bright red flowers, a minute silvery pod, narrow leaves, and a somewhat 2-edged stem.

Var. *Campbellii*, Wt. Stem prominently 2-edged; leaves broader, obovate, mucronate.

Deccan Districts, Kistna to Cuddapah.

3. *INDIGOFERA CORDIFOLIA*, Heyne; F. B. I. ii. 93; W. & A. 199.

Deccan and Carnatic, on stony ground and black-cotton soil.

A prostrate silky annual with minute red flowers.

4. *INDIGOFERA UNIFLORA*, Buch.-Ham.; F. B. I. ii. 94, W. & A. 199; Wt. Ic. t. 333.

W. Coast from Malabar to Travancore; Coimbatore.

A very slenderly-branched prostrate plant with minute red flowers and cylindric pod.

5. *INDIGOFERA ASPALATHOIDES*, Vahl; F. B. I. ii. 94; W. & A. 199; Wt. Ic. t. 332.

E. Coast of the Carnatic from Nellore to Cape Comorin and Nagarcoil, on sandy lands; rarer inland.

A stiff silvery hoary undershrub with minute red flowers and straight cylindric pod.

6. *INDIGOFERA GLANDULOSA*, Willd.; F. B. I. ii. 94; W. & A. 199; Wt. Ic. t. 330.

Circars and Deccan from the Godavari to Salem, on wet lands, scarcer in Carnatic.

A stout undershrub with thick rootstock and long prostrate branches. Flowers red. Vern. Tel. Baragadam.

7. *INDIGOFERA ENNEAPHYLLA*, Linn.; F. B. I. ii. 94; W. & A. 199; Wt. Ic. t. 403.

Circars, Deccan and Carnatic, up to 3,000 ft. in hills, on pasture lands, common.

An undershrub with thick rootstock and prostrate branches. Flowers bright red. Vern. Tel. Cheragadam.

8. INDIGOFERA PEDICELLATA, W. & A. 200; F. B. I. ii. 95; Wt. Ic. t. 983.

W. Ghâts, in the Nilgiri, Anamalai and Pulney Hills from 5,000 ft. upwards; Shevaroy Hills of Salem; in pasture lands and on roadsides.

An undershrub with thick rootstock and many slender branches, the flowers bright brick-red.

9. INDIGOFERA VESTITA, Baker in F. B. I. ii. 96.

W. Ghâts, in the Nilgiri, N. Coimbatore, S. Malabar and Pulney Hills at 3,000 to 4,000 ft.

An undershrub with thick rootstock and very brown-hairy leaves and pods.

10. INDIGOFERA TRIFOLIATA, Linn.; F. B. I. ii. 96 in part; W. & A. 201 in part; Wt. Ic. t. 314.

Deccan, in Kurnool, Bellary and Mysore, up to 3,000 ft.; Anamalai Hills.

An undershrub with long trailing branches; flowers red.

Var. *multicaulis*, Gamble. *I. multicaulis*, DC. A larger plant with stiff erect branches and thicker, more numerous pods, nearly glabrous.

Deccan, in Mysore and Bellary, up to 3,000 ft.

11. INDIGOFERA PROSTRATA, Willd. *I. trifoliata*, Baker in F. B. I. ii. 96 in part; W. & A. 201 in part.

Deccan and Carnatic in hilly regions from the Kistna southwards; W. Coast and hills of the W. Ghâts, rising to 3,000 ft., chiefly in grassy lands.

An undershrub with long very slender trailing branches, red flowers and almost filiform pods.

12. INDIGOFERA BARBERI, Gamble in Kew Bull. 1918, Deccan and Carnatic from Cuddapah to S. Arcot and the Shevaroy Hills.

An erect canescent undershrub with slender branches.

13. INDIGOFERA TRITA, Linn. f.; F. B. I. ii. 96; W. & A. 203; Wt. Ic. t. 315, 386.

S. Circars, Deccan and Carnatic from the Godavari to Travancore, inland to Coimbatore and Madura, roadsides and waste places, common.

A stiff very grey undershrub up to 3 ft. high, with salmon-pink flowers and long tetragonous sharply-pointed pod. Vern. Tel. Nakanaru.

14. INDIGOFERA OBLONGIFOLIA, Forsk. *I. paucifolia*, Del.; F. B. I. ii. 97; W. & A. 201; Wt. Ic. t. 331.
East Coast and Deccan, on the borders of fields in the plains country.
A stiff grey erect shrub reaching 6 ft. in height, with red flowers, and 1-5 usually 4 alternate leaflets variable in size.
15. INDIGOFERA GLABRA, Linn. *I. pentaphylla*, Linn.; F. B. I. ii. 95; W. & A. 200; Wt. Ic. t. 385.
Plains of the Circars, Deccan and Carnatic, also on the Travancore coast.
A small undershrub with many branches, flowers red.
16. INDIGOFERA SUBULATA, Vahl; F. B. I. ii. 96. *I. flaccida*, Koenig; W. & A. 204; Wt. Ic. t. 387.
Hills of the Kistna District; W. Gháts, in the Anamalais, up to 3,000 ft.; Coimbatore and Salem Districts; growing among bushes.
A weak undershrub with long branches, subangular stems and red flowers.
17. INDIGOFERA MARGINULATA, Grah.; F. B. I. ii. 97; W. & A. 204.
E. slopes of the Nilgiris at 2,000 ft.; Dindigal Hills of Madura.
A weak undershrub, similar to the last except in pod.
18. INDIGOFERA ENDECAPHYLLA, Jacq.; F. B. I. ii. 98. *I. Kleinii*, W. & A. 204.
Hills of the Deccan, Nellore to Mysore; W. Gháts, in Coimbatore and Nilgiris, up to 6,000 ft.
A trailing annual or biennial herb with purple flowers.
19. INDIGOFERA TENUIFOLIA, Rottl.; F. B. I. ii. 94; W. & A. 200.
Deccan, in Mysore and Bellary.
A small thin undershrub with small narrow leaflets and torulose pod.
20. INDIGOFERA VISCOSA, Lamk.; F. B. I. ii. 95; W. & A. 200; Wt. Ic. t. 404.
Circars, Deccan and Carnatic, from the Godavari to Madura, in sandy soils.
A small erect viscous pubescent shrub with many branches, flowers red.
21. INDIGOFERA PARVIFLORA, Heyne; F. B. I. ii. 97; W. & A. 201.

Deccan and Carnatic from Mysore to Madura and up to 3,000 ft., often in wet places.

A much-branched annual plant up to 2 ft. high with slender stems, long narrow leaflets and lilac flowers.

22. INDIGÖFERA ARTICULATA, Gouan.; Prain and E. Baker in Journ. Bot. 1902, 141. *I. caerulea*, Roxb.: W. & A. 203; Wt. Ic. t. 365. *I. argentea* var. *caerulea*, Baker in F. B. I. ii. 99.

Circars, Deccan and Carnatic, often on black cotton soil. Surat Indigo.

An erect shrub, up to 3 ft. high, flowers reddish-yellow, gives an indigo dye. Vern. *Tel.* Karunili.

23. INDIGÖFERA TINCTORIA, Linn.; F. B. I. ii. 99 in part; W. & A. 202 in part; Wt. Ic. t. 365.

Circars, Deccan and Carnatic, also West Coast, cultivated and run wild. Madras Indigo.

A branching shrub, up to about 6 ft. high. Vern. *Hind.* Jinjini; *Tel.* Nili; *Tam.* Averi; *Kan.* Ajara; *Mal.* Amari.

24. INDIGÖFERA SUMATRANA, Gaertn. *I. tinctoria*, F. B. I. ii. 99 in part; W. & A. 202 in part, not of Linn.

Circars and Deccan chiefly, occasionally elsewhere, cultivated and perhaps run wild. Bengal Indigo.

A twiggy shrub up to about 6 ft. high. Vern. *Hind.* Nil.

25. INDIGÖFERA LONGERACEMOSA, Boivin; Prain and E. Baker in Journ. Bot. 1902, 144.

South Travancore (Beddome, Lawson, Barber).

A slender shrub with woody branches and leaves with rather small very thin leaflets.

26. INDIGÖFERA HIRSUTA, Linn.; F. B. I. ii. 98; W. & A. 204.

Almost all Districts, common.

An annual or biennial densely pubescent erect herb with pink flowers hidden by long subulate calyx lobes, rather large leaflets and conspicuous filiform stipules.

27. INDIGÖFERA CONSTRICTA, Trimen. *I. flaccida* var. *constricta*, Thw.; F. B. I. ii. 99 in note under *I. tinctoria*.

Cochin, at Kavalay, 2,000 ft. (Meebold), but extends probably northwards to N. Kanara (coll. Talbot), though rare as in Ceylon.

An erect shrub, up to about 3 ft. high, with characteristic constricted pod and leaves like those of indigo, though with large leaflets.

28. *INDIGOFEA WIGHTII*, Grah.; F. B. I. ii. 99; W. & A. 202.
Madgol Hills of Vizagapatam, 4,500 ft. (A. W. Lushington);
Deccan Hills in Mysore, Coimbatore and Salem; W. Ghâts,
up to 4,000 ft., in Nilgiris, Anamalais and Pulneys.
A stiff silvery shrub with small leaflets and yellowish-red
flowers.
29. *INDIGOFEA GALEGOIDES*, DC.; F. B. I. ii. 100.
W. Coast and W. Ghâts, Malabar to Travancore, up to
2,000 ft.
A tall shrub with pale red flowers and very long-beaked
pods.
30. *INDIGOFEA PULCHELLA*, Roxb.; F. B. I. ii. 101, W. & A.
203; Wt. Ic. t. 367.
Hills of N. Circars, Deccan and W. Ghâts, up to 5,000 ft.,
in dry forests.
A large shrub with handsome purple-red flowers, reaching
6 ft. in height. Vern. *Ur.* Girili; *Tel.* Siralli; *Tam.*
Narinci.
31. *INDIGOFEA MYSORENSIS*, Rottl.; F. B. I. ii. 102; W. & A.
202.
Hills of the Deccan in Chingleput and Mysore, up to
4,000 ft.; W. Ghâts, on dry Nilgiri slopes, but scarce.
An erect much-branched, softly grey-pubescent shrub with
red flowers and small cylindric pods. The leafy bracts
make it appear as if the flowers were solitary in the leaf-
axils. Vern. *Tel.* Bapanga.

I found *Indigofera anabaptista*, Steud.; F. B. I. ii. 102 in the
Fort at Bellary. It had probably come from a seed casually
imported from Sind or Arabia.

9. *Psoralea*, Lind.

Herbs or undershrubs, punctate with black or pellucid glands.
Leaves unifoliate or imparipinnate, often dentate, stipulate.
Flowers capitate spicate subracemose or fascicled, rarely solitary,
in the axils of reduced floral leaves; bracts membranous, often
with 2-3 flowers each; bracteoles 0. *Calyx*-tube campanulate,
lobes subequal or the lowest the longest, the 2 upper often connate.
Corolla little exserted; standard ovate or orbicular, clawed;
wings oblong, falcate; keel petals obtuse, slightly connate.
Stamens diadelphous or the vexillary filament sometimes connate

with the rest; anthers small, uniform or slightly dimorphous. *Ovary* sessile or shortly stalked, 1-ovuled; style filiform or dilated at base; stigma terminal. *Pod* ovoid or oblong, 1-seeded, indehiscent, the pericarp usually adherent to the seed.

PSORALEA CORYLIFOLIA, Linn.; F. B. I. ii. 103; W. & A. 198.

Deccan and Carnatic, in most Districts, a weed of roadsides and waste places.

An erect annual, 1-3 ft. high, with blue flowers in dense long-peduncled heads and ovoid pitted pods. Leaves unifoliolate, broadly elliptic, dentate, petioled, covered with large black glands and a few white hairs. The seeds are used medicinally.

Vern. *Hind.* Babachi; *Tel.* Bapunga; *Tam.* Karporgam.

A South African shrub, *Psoralea pinnata*, Linn., has established itself about Ootacamund. It has blue flowers and very narrow leaflets.

10. *Mundulea*, DC.

Shrubs or small trees, usually silky-pubescent. *Leaves* imparipinnate, the leaflets reticulate and penninerved; stipules small. *Flowers* in terminal racemes, the pedicels fascicled; bracts small; bracteoles 0. *Calyx* campanulate, lobes short, the two upper often subconnate. *Corolla* much exserted; standard large, with 2 calluses at the base above the claw; wings falcate-oblong, long-clawed; keel petals incurved, obtuse at apex, clawed at base. *Stamens* monadelphous, the vexillary filament free only at base, alternate filaments slightly dilated above; anthers uniform. *Ovary* sessile; ovules many; style incurved, glabrous; stigma capitate. *Pod* large, linear, flat, subindehiscent, the sutures thickened. *Seeds* reniform, estrophiolate.

MUNDULEA SUBEROSA, Benth.; F. B. I. ii. 110. *Tephrosia suberosa*, DC.; W. & A. 210; Wt. III. t. 79.

Circars, Deccan and Carnatic, from Vizagapatam to Tinnevely, in dry forests on rocky hills and up to 4,000 ft.

A pretty little tree with thick corky yellow bark, close-grained yellow wood resembling satinwood, pink rather large flowers and silky shining leaves. Vern. *Tam.* Pilavaram.

11. *Tephrosia*, Pers.

Herbs or undershrubs, rarely shrubs. *Leaves* imparipinnate, sometimes reduced to one leaflet; side leaflets opposite, usually

numerous, all leaflets parallel-nerved, usually silky beneath; stipules free from the petiole, usually lanceolate or subulaté, sometimes reduced to spines; stipels scarce or 0 or, in one case, almost spinous. *Flowers* reddish or white, in terminal or leaf-opposed racemes or solitary or in pairs in the axils of the leaves, bracteate; bracteoles 0. *Calyx*-tube campanulate, teeth subequal or the lower longer, the 2 upper often slightly connate. *Petals* clawed; standard suborbicular; wings obliquely oblong or obovate, slightly adherent to the incurved keel petals. *Stamens* diadelphous, the vexillary filament at first free below connate above, afterwards quite free; anthers uniform. *Ovary* sessile, linear, many-ovuled; style incurved, often flattened, glabrous or bearded; stigma terminal, often penicillate. *Pod* linear, flattened, continuous within or obscurely septate, dehiscing by both sutures. *Seeds* many, reniform elliptic or ovoid; strophiole usually 0, sometimes small, sometimes rather conspicuous.

ANALYSIS AND DESCRIPTIONS AFTER J. R. DRUMMOND.

Flower (including calyx) less than .125 in. long; claw of standard more than one-third as long as the limb; pod not more than 1 in. long; style in fruit deflexed.....1. *tenuis*.
 Flower (including calyx) at least .125 in. long; claw of standard less than one-third as long as the limb; pod 1-3.5 in. long; style in fruit more or less recurved or ascending:—

Petiole angled and compressed, the angles and margins winged, the marginal wings excurrent as a pair of short stipellary spines; leaflet-margin indurated 2. *calophylla*.
 Petiole not compressed, its margins not winged; wings exstipellate; leaflet-margin not indurated;—

Calyx-teeth broadly deltoid, the anterior alone equalling or longer than the tube; pedicels in fruit manifestly articulate upon the axis:—

Pod more than 2.5 in. long; inflorescence not elongate:—

Terminal leaflet larger than the lateral ones which are about 1 in. long, white-silky beneath; stipules and bracts deltoid-lanceolate, deciduous; pod closely covered with short dull golden (when dry) tomentum; seeds oblong-reniform in outline, hardly compressed, .2 by .1 in., smooth; strophiole narrowly horseshoe-shaped, chalk-white.....3. *wynaadensis*.
 Terminal leaflet about equalling the lateral, 1.5-2 in. long;

stipules and bracts subulate, persistent; pod clothed with coarse cottony villi, ashy-brown to grey; seeds lenticular, .16 by .125 in., margin bluntly keeled, strophiole dull brown, anvil-shaped.....4. *fusca*.

Pod less than 2.5 in. long, usually 1.5-2 in.; inflorescence elongate; stipules long filiform; leaflets 1-1.5 in. long

5. *noctiflora*.

Calyx-teeth narrowly deltoid or lanceolate below, cuspidate above, all equalling or exceeding the tube (at aestivation); pedicels not manifestly articulate upon the axis:—

Septa of pod manifest, persistent:—

Flowers very few, axillary; leaflets narrowly oblong-cuneate, terminal .5 in. or more long, upper surface pale green, lower cinereo-canescens; pod 1.5 in. long, .15 in. broad, falcate from above the middle, hairs on the valves closely appressed-canescens, on sutures ascending, fulvous; seed oblong-elliptic, .16 in. long, clay-coloured flecked with brown

6. *pentaphylla*.

Septa of pod evanescent or obscure:—

Pod entirely covered with dense villous tomentum, arcuately curving from the very base; flowers in fascicles on a long spiciform rhachis.....7. *hirta*.

Pod pilose or glabrescent, but never when mature covered with thick villous tomentum:—

Flowers in racemes (casually reduced to few in the axils or at the ends of branches):—

Racemes axillary; style bearded:—

Leaflets obovate-cuneate, terminal .75-1 in. by .125-.25 in., under-surface not silvery.....8. *marima*.

Leaflets obovate, oblong or elliptical, base obtuse or (less frequently) bluntly cuneate, terminal .75-5 in. long, under-surface more or less silvery (casually glabrescent):—

Stipules broadly ovate-deltoid, .25 by .125 in., conspicuously carinate-striate, brown-scarious; bracts and bracteoles similar; leaflets with a distinct (but not indurated) margin; pod densely clothed with laxly appressed-silky fulvous hairs

9. *pulcherrima*.

Stipules linear-lanceolate, .25 by .04 in., obscurely striate, herbaceous; bracts and bracteoles subulate or almost setaceous; leaflets not marginate; pod

sparsely furnished with strigose cottony white hairs :—

Pod at least 2 in. long :—

Pod about 3 in. long; standard .75 in. long
seeds mottled.....10. *canarensis*.

Pod under 2.5 in. long; standard .35 in. or less;
seeds not mottled :—

Stem and peduncles densely clothed, particularly on the angle, with ascending hairs;
longest calyx-tooth about .125 in. long

11. *tinctoria*.

Stem and peduncles sparsely furnished with appressed hairs; longest calyx-tooth about .075 in. long12. *senticosa*.

Pod less than 2 in. long; standard .4-.5 in. long

13. *Roxburghiana*.

Racemes extra-axillary; style not bearded :—

Stem not procumbent; racemes normally more than 3-flowered :—

Pod parchment-like or horny, normally more than 1 in. long :—

Leaflets lanceolate, normally acute 14. *lanceolata*.

Leaflets never truly lanceolate :—

Floral bracts not longer than the pedicels, before aestivation, subulate; pubescence of pedicel and calyx appressed :—

Stem ascending, subulate, glabrescent; flowers less than .3 in. long, bluish-purple

15. *purpurea*.

Stem erect, branches zigzag, angled, hairy; flowers more than .3 in. long, rose-coloured or scarlet16. *Hamiltonii*.

Floral bracts longer than the pedicels, setaceous; pubescence of calyx spreading ..17. *Hookeriana*.

Pod papery, less than 1 in. long; leaves less than 3 by 1.5 in.; side leaflets 3-4 pairs, cuneate-obcordate..... ..18. *Barberi*.

Stems procumbent or (rarely) ascending; racemes 1-3-flowered; pod 9-12 (casually fewer-) seeded, valves closely pilose, the hairs short, white, ascending; seed irregularly trapezoidal, the testa bony, aril obsolete

19. *procumbens*.

Flowers in axillary fascicles; stipules spinose; pod drepaniform, obscurely pubescent, up to 1.25 in. long; leaflets obovate-cuneate, terminal .5 in. long or less....20. *spinosa*.

1. *TEPHROSIA TENUIS*, Wall.; F. B. I. ii. 111.

East Coast, in the Kistna District, in sandy places.

A slender caespitose plant with filiform stems and linear oblong membranous leaflet 1-2 in. long; flowers pink, on capillary pedicels.

2. *TEPHROSIA CALOPHYLLA*, Bedd. Ic. t. 166; F. B. I. ii. 111.

N. Coimbatore, on dry rocky hills above the Gazulhati Pass, at 3,000 ft. (Beddome).

A woody perennial with coriaceous strongly nerved leaflet 3-5 in. long, purplish-red flowers in elongate racemes and glabrous pod 2-3 in. long.

3. *TEPHROSIA WYNAADENSIS*, J. R. Drumm.

W. Ghâts, Tambracheri Ghât, Wynaad (Barber).

An erect undershrub, resembling *T. candida*, DC., and leaflets up to 1.5 in. long.

4. *TEPHROSIA FUSCA*, W. & A. 210; F. B. I. ii. 114.

Carnatic, Hills of Dindigal in Madura District (Wight).

Apparently a shrub and perhaps not indigenous. Though more woolly it resembles, like the preceding, the North Indian *T. candida*, DC. often cultivated in Madras Hill gardens.

5. *TEPHROSIA NOCTIFLORA*, Bojer. *T. Hookeriana*, Baker; F. B. I. ii. 113 not of W. & A.

Madras Presidency (?) (Walker).

An undershrub with golden-silky deflexed pods and narrowly oblong-oblongate emarginate leaflets.

6. *TEPHROSIA PENTAPHYLLA*, Sweet. *T. senticosa*, Wt. Ic. t. 370. *Galega pentaphylla*, Roxb. Fl. Ind. iii. 384.

Deccan, in Bellary District, on black cotton soil (Wight).

A stout much branched undershrub, with very coriaceous stems and leaves.

7. *TEPHROSIA HIRTA*, Ham. *T. villosa*, W. & A. 212; F. B. I. ii. 113 excl. some synonyms. *T. argentea*, W. & A. 212 excl. synonyms. *T. incana*, W. & A. 212.

All plains Districts, on waste lands and by roadsides, ascending the hills to 3,000 ft.

An erect silky-villous undershrub with pale red flowers.

8. *TEPHROSIA MAXIMA*, Pers.; W. & A. 213; Trimen Fl. Ceyl. t. xxvii. *T. purpurea* var. *maxima*, Baker in F. B. I. ii. 113.
Deccan and Carnatic, especially along the coast and on dry hills inland, to the south end of Travancore.
A slender often prostrate undershrub with large pale pink flowers.
9. *TEPHROSIA PULCHERRIMA*, Wight ex Baker. *T. tinctoria*, Pers. var. *pulcherrima*, Baker in F. B. I. ii. 112.
W. Gháts, in the Mysore, Malabar, Nilgiri, Anamalai and Travancore Hills, at about 3,000 ft.
A pretty undershrub with pale red flowers and angular velvety branchlets and leaves, the end leaflet much the longest.
10. *TEPHROSIA CANARENSIS*, J. R. Drum. *T. tinctoria*, Pers. var. *interrupta*, Baker in F. B. I. ii. 112 in part only.
W. Gháts, in S. Canara, extending northwards, southwards to Wynaad.
An erect undershrub with large reddish flowers and leaflets up to 2·5 in. long.
11. *TEPHROSIA TINCTORIA*, Pers.; F. B. I. ii. 111; W. & A. 211; Wt. Ic. t. 388.
W. Gháts, common in all the region, chiefly between 3,000 and 7,000 ft.; extending eastwards to the Hills of Mysore, Coimbatore, Salem and even N. Arcot.
A pretty undershrub with golden-brown pubescence, red flowers and leaflets variable in number from 1 to 13, the end one usually the longest.
12. *TEPHROSIA SENTICOSA*, Pers.; W. & A. 211 not of F. B. I.
Deccan, Horsleykonda Hill in Cuddapah, at 4,500 ft. (Gamble); Kottayam in Travancore (Rangachari).
A slender undershrub with narrow silvery leaves.
13. *TEPHROSIA ROXBURGHIANA*, J. R. Drum. *T. tinctoria* var. γ . W. & A. 211.
N. Circars, Mahendragiri Hill in Ganjam. 4,000 ft., Hills of Vizagapatam and Godavari; Deccan, Sandúr Hills of Bellary.
A slender undershrub with usually a single leaflet, rarely more, the stems and under-surface of leaflets white-silky-pubescent.
14. *TEPHROSIA LANCEOLATA*, Grah. ex W. & A. 213. *T. purpurea*, Pers. var. β . W. & A. 213. *T. purpurea*, Pers.

F. B. I. ii. 112 *in part* (*Galega lanceaefolia*, Roxb. Fl. Ind. iii. 386).

N. Circars, on sandy lands near the coast, as far south as the Godavari.

An undershrub with bright purple flowers.

15. *TEPHROSIA PURPUREA*, Pers.; F. B. I. ii. 112 *in part*; W. & A. 213 *in part*.

In all plains Districts, on waste lands and by roadsides, very common.

An erect perennial undershrub with small red flowers. Said to give a blue dye resembling indigo. Vern. *Tam.* Kat-kolingi.

16. *TEPHROSIA HAMILTONII*, J. R. Drumm. *T. purpurea*, Pers.; F. B. I. ii. 212 *in part* (*Galega tinctoria*, Roxb. Fl. Ind. iii. 386 *not of* Linn.).

Deccan, in Northern and Western areas, on sandy soils (Wight 898).

A gregarious undershrub with large bright rose-coloured flowers.

17. *TEPHROSIA HOOKERIANA*, W. & A. 212; *not of* F. B. I. W. Ghâts, on dry soils at Sigúr, N. Nilgiris, at 3,000 ft. (Lawson, Gamble); Carnatic, at Trichinopoly (Wight).

A shrub with brownish silky stems and leaves and small flowers on short pedicels in elongated racemes.

18. *TEPHROSIA BARBERI*, J. R. Drumm.

S. Carnatic at Kudiramalai Teri, Tinnevely (Barber); Tuticorin (Wight).

A distinct-looking undershrub with reddish flexuose branchlets and small obovate obtuse leaflets, softly villous.

19. *TEPHROSIA PROCUMBENS*, Ham. *T. purpurea* var. *pumila*, Baker in F. B. I. ii. 113. *T. diffusa*, W. & A. 213.

Circars, Deccan and Carnatic, on waste lands in open forest and among grass in pastures, up to 3,000 ft. in the hills.

A slender herbaceous perennial with white flowers.

20. *TEPHROSIA SPINOSA*, Pers.; F. B. I. ii. 112; W. & A. 214 *excl. cert. syn.*; Wt. Ic. t. 372.

Carnatic, from the Kistna southwards, on dry barren lands on the coast and inland to the Hills of Coimbatore, Madura and Tinnevely.

A stiff thorny grey-canescient low shrub.

12. *Millettia*, W. & A.

Trees or large shrubs, usually climbing. *Leaves* imparipinnate, stipulate, the side leaflets opposite, usually stipellate, penninerved. *Flowers* rather large, showy, fascicled, rarely scattered, on the rhachis of axillary or terminal racemes or panicles; bracts and bracteoles usually small, caducous. *Calyx* campanulate, the teeth short. *Corolla* much exserted; standard ovate or orbicular, emarginate, spreading or reflexed, glabrous or silky on the back; wings obliquely oblong, clawed; petals of keel incurved, obtuse, clawed. *Stamens* monadelphous, sometimes diadelphous by the vexillary filament being quite free; anthers uniform, ovate. *Ovary* sessile or rarely stalked, few-ovuled; style inflexed, glabrous; stigma capitate. *Pod* linear or oblong or oblanceolate, flat or turgid, coriaceous or woody, late in dehiscing. *Seeds* few, orbicular or reniform, estrophiolate.

Standard not auricled at the base:—

Leaves very silky-pubescent beneath, especially when young; stamens monadelphous; pods velvety, the endocarp not separable:—

Pubescence very shining, silvery; leaflets 7-9, oblanceolate, obtuse at apex, main nerves 15-25 pairs; calyx distinctly toothed; pods flattened, 3-4 in. long, .75 in. broad...1. *splendens*. Pubescence ferruginous; leaflets 5-7, obovate, acute at apex, main nerves 8-10 pairs; calyx-teeth very indistinct; pods thick, oblong or trapezoid, turgid, 2-4 in. long, 1-1.5 in. broad

2. *rubiginosa*.

Leaves not silky, merely slightly pubescent; leaflets 11-15, obovate, obtuse; calyx-teeth short; stamens diadelphous; pods glabrous, linear, torulose, the endocarp separable, 4-10 in. long, .5 in. broad

3. *racemosa*.

Standard auricled at the base; leaflets 7-9 pairs, obovate, obtuse; calyx shortly toothed; stamens monadelphous; pod linear, flattened, velvety, 6-9 in. long, 1 in. broad, the sutures thickened

4. *auriculata*.

1. *MILLETTIA SPLENDENS*, W. & A. 263; F. B. I. ii. 104; Bedd. Ic. t. 295.

W. Gháts, in the Nilgiri and Anamalai Hills, up to 4,000 ft. A large, very handsome climbing shrub with reddish flowers.

2. *MILLETTIA RUBIGINOSA*, W. & A. 263; F. B. I. ii. 104; Wt. Ic. t. 207.

W. Ghâts, in the forests of Tinnevely and Travancore, up to 5,000 ft.

A large climbing shrub with reddish flowers.

3. *MILLETTIA RACEMOSA*, Benth.; F. B. I. ii. 105. *Tephrosia racemosa*, W. & A. 210.

N. Circars and Deccan, in dry hill forests at low levels, from Ganjam to Bellary and Coimbatore.

A large climbing shrub with thick brown rough bark, large leaves, torulose pods and whitish flowers. Vern. Tel. Galuga.

4. *MILLETTIA AURICULATA*, Baker; F. B. I. ii. 108.

Forests of Ganjam and Vizagapatam, chiefly with Sâl, up to 4,000 ft.

A large climber with light brown bark and wood in alternate layers of soft woody and bast tissue. It is sometimes found as a nearly erect shrub. Flowers whitish. The bark gives a rough fibre. Vern. Hind. Ganj; Ur. Rekorlo.

13. *Sesbania*, Scop.

Herbs, shrubs or small soft-wooded trees, often prickly. *Leaves* abruptly pinnate, long, narrow; leaflets numerous, linear-oblong, mucronate, deciduous; stipules lanceolate or setaceous, deciduous. *Flowers* in lax axillary racemes; bracts and bracteoles setaceous, usually early deciduous. *Calyx* campanulate, with 5 short equal teeth. *Corolla* much exserted, the petals all with long claws; standard orbicular or ovate, spreading or reflexed; wings falcate-oblong; keel petals obtuse or subrostrate. *Stamens* diadelphous; anthers uniform. *Ovary* linear, usually stipitate, many-ovuled; style incurved, glabrous; stigma capitate. *Pod* long, linear, narrow, flattened or 4-angled, septate within between the seeds. *Seeds* transversely oblong, strophiole 0.

Flowers under .75 in. long, buds straight:—

Stems without prickles; standard with 2 appendages at the base which run as keels into the claw; pods twisted, pendulous:

Flowers usually .5–.6 in. long, standard appendages long-tailed; pods torulose, 6–9 in. long 1. *aegyptiaca*.

Flowers usually .75–1 in. long, standard appendages triangular; pods slightly torulose, 10–12 in. long 2. *paludosa*.

Stems and leaf-rhachises prickly; standard without appendages:—

Flowers 4–5 in. long; pod straight, erect, 8–12 in. long, 1 in. broad, slightly torulose.....3. *aculeata*.

Flowers 25 in. long or less; pod straight, erect, 2–4 in. long, much torulose.....4. *procumbens*.

Flowers 3 in. long; buds falcately recurved; pods 1 ft. or more long, 3 in. broad, falcate, not torulose, the sutures much thickened

5. *grandiflora*.

1. *SESBANIA AEGYPTIACA*, Pers.; F. B. I. ii. 114; W. & A. 214; Wt. Ic. t. 32.

Cultivated or found run wild in almost all plains Districts.

A soft wooded shrub with yellow flowers, the standard usually purple or purple-spotted. It is used to make hedges and the wood gives a good charcoal for gunpowder.

Vern. *Hind.* Jait; *Tel.* Suiminta; *Tam.* Chittakatti.

2. *SESBANIA PALUDOSA*, Prain. *S. aculeata* var. *paludosa*, Bak. in F. B. I. ii. 115, excl. syn. *Aeschynomene uliginosa*, Roxb.

Marshy places on W. Coast, Travancore (M. Rama Row).

An annual shrub with pith-like stems and yellow flowers.

Vern. *Hind.* Kathsola.

3. *SESBANIA ACULEATA*, Poir.; F. B. I. ii. 114; W. & A. 214.

Wet places in plains Districts, chiefly in the Carnatic, extending to the hills.

A soft-wooded prickly shrub with long leaves, and very many small leaflets and pale yellow flowers.

4. *SESBANIA PROCUMBENS*, W. & A. 215; F. B. I. ii. 115.

Coast Districts on the East side, chiefly in rice-fields, but scarce.

A diffuse prickly annual herb.

5. *SESBANIA GRANDIFLORA*, Pers.; F. B. I. ii. 115. *Agati grandiflora*, Desv.; W. & A. 215.

Cultivated in gardens or betel-vine plantations, not indigenous.

A small soft-wooded tree reaching 20–30 ft. high, with large showy red or white flowers and long pods. The wood is sometimes used for posts, and the young leaves, flowers and pods eaten as a vegetable. Vern. *Hind.* Basna; *Tel.* Avesi; *Tam.* Agati.

14. *Geissaspis*, W. & A.

Slender diffuse annual herbs. *Leaves* abruptly pinnate; leaflets 2 pairs, obovate; stipules membranous, produced below the insertion; stipels 0. *Flowers* very small, yellow or purplish, in long-peduncled axillary racemes; bracts large, oblique, veined, imbricate, persistent, more or less concealing the flowers and fruit. *Calyx* deeply 2-lipped, the upper entire, the lower obscurely 3-toothed. *Corolla* longer than the calyx; standard suborbicular, shortly clawed; wings oblong or obovate; keel petals incurved, obtuse, slightly united at the back. *Stamens* monadelphous, the filaments free in the upper third; anthers uniform. *Ovary* shortly stalked; ovules 2; style incurved; stigma minute, terminal. *Pods* 1-2-jointed, the joints turgid in the middle at first with a flat border, reticulately veined, indehiscent. *Seeds* subreniform.

Flowers much shorter than the bracts; bracts orbicular, the margins with many long stiff brown hairs, the bases long-sagittate; stipules lanceolate, long-spurred, long-ciliate, persistent; corolla purplish; leaflets 4-5 in long 1. *cristata*.
 Flowers as long as or longer than the bracts; bracts ovate, mucronate-dentate, the bases shortly sagittate; stipules oblanceolate, shortly spurred, spinous-ciliate, deciduous; corolla yellow; leaflets 2-3 in. long 2. *tenella*.

1. *GEISSASPIS CRISTATA*, W. & A. 218; F. B. I. ii. 141; Bedd. Ic. t. 293.

W. Coast, from S. Canara to Travancore; W. Ghâts, in Mysore, lower Nilgiris and Malabar, up to 3,000 ft., usually in rice-fields.

A very pretty plant, conspicuous for its beautiful long-ciliate imbricate bracts.

2. *GEISSASPIS TENELLA*, Benth.; F. B. I. ii. 141.

W. Coast, plains of S. Canara, in rice-fields.

A much smaller plant than the preceding, the bracts only mucronate-dentate.

15. *Zornia*, Gmel.

Herbs. *Leaves* digitately 2-4-foliolate; leaflets gland-dotted; stipules subfoliaceous, gland-dotted, usually peltate; stipels 0. *Flowers* in interrupted spikes or solitary, on terminal or axillary

peduncles; bracts geminate, stipular, foliaceous. each pair enclosing a sessile flower; bracteoles 0. *Calyx* small, membranous or hyaline, the 2 upper lobes connate in a lip, the 2 lateral small, the lowest as long as the upper. *Corolla* exserted, the petals clawed; standard suborbicular; wings obliquely oblong; keel petals incurved, acute. *Stamens* monadelphous in a closed tube, the free part of filaments about one-third of their length; anthers dimorphous. *Ovary* sessile; ovules many; style filiform; stigma minute, terminal. *Pod* a compressed lomentum of several, smooth or with glochidiate prickles, 1-seeded joints. Seeds subreniform, estrophiolate.

Leaflets usually lanceolate acuminate, glabrous, rarely ovate, up to 1 in. long, dotted with scattered black glands; standard cordate above the claw; joints of lomentum 1 in. in diam., the prickles retrorsely scabrous..... 1. *diphylla*. Leaves ovate mucronate, up to 6 in. long, glabrous or more or less white-villous, dotted with many minute white glands; standard narrowed above the claw; joints of lomentum 2 in. in diam., the prickles glabrous 2. *zeylonensis*.

1. *ZORNIA DIPHYLLA*, Pers.; F. B. I. ii. 147. *Z. angustifolia*, Sm.; W. & A. 217.

All dry Districts especially near the coast; inland up to 3,500 ft., often on rocks.

A diffuse wiry herb with yellow flowers. Leaves usually lanceolate, but those near the base are often ovate and even emarginate. The bracts and stipules are very characteristic.

2. *ZORNIA ZEYLONENSIS*, Pers.; W. & A. 217. *Z. diphylla* var. *zeylonensis*, Baker; F. B. I. ii. 118.

East Coast Districts from Ganjam to Travancore, in sandy places near the sea.

A diffuse herb with longer branches and stouter rootstock than the former.

16. *Stylosanthes*, Swartz.

Stiff undershrubs. Leaves pinnately trifoliolate; stipules large, adnate to the base of the petiole; stipels 0. Flowers small, usually yellow, in dense terminal heads, imbricate with the leaf-stipules and linear lanceolate scarious bracts. *Calyx*-tube very

long, slender, filiform; lobes obtuse, membranous, ciliate, unequal, the upper 4 connate. *Petals* inserted at the throat of the calyx-tube; standard orbicular; wings oblong, free; keel petals incurved, obtuse. *Stamens* monadelphous; anthers dimorphous. *Ovary* subsessile at the base of the calyx-tube; ovules 2-3; style elongate, filiform; stigma minute, terminal. *Pod* sessile, compressed, hooked at the apex with the persistent base of the style; joints 1-2, reticulate or muricate. *Seeds* compressed, lenticular, estrophiolate.

STYLOSANTHES MUCRONATA, Willd.; F. B. I. ii. 148; W. & A. 218; Bedd. Ic. t. 294.

N. Circars, Deccan and Carnatic, in dry localities, up to 3,000 ft. in the hills.

A stiff undershrub with trifoliolate sharply mucronate leaves and conspicuous sheathing stipules, the pods small, hard, reticulate, flowers yellow. Vern. *Tel.* Saille kumpa.

Arachis hypogaea, Willd. is the "Ground nut" or "Monkey nut," largely cultivated for its edible seed, from which a valuable oil is expressed. It is an article of considerable trade.

17. *Lespedeza*, Michx.

Herbs or shrubs. *Leaves* pinnately 3- rarely 1-foliolate; leaflets entire without stipels; stipules free, small. *Flowers* purple pink white or yellow, in axillary fascicles or racemes or terminal panicles; bracts small; bracteoles 2 at the base of the calyx-tube. *Calyx*-tube campanulate, teeth 5 subequal or the 2 upper slightly connate, lanceolate or linear. *Corolla* exserted; standard obovate, narrowed to a claw; wings falcate; keel petals incurved, obtuse or beaked. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile or stalked, 1-ovuled; style filiform, incurved; stigma capitate. *Pod* small, orbicular or ovate, compressed, 1-seeded, flattened, indehiscent. *Seeds*, suborbicular, estrophiolate.

LESPEDeza SERICEA, Miq.; F. B. I. ii. 142.

W. Ghâts, in the Pulney Hills, at 6,000-7,000 ft. (Bourne, Fischer).

An erect undershrub with long slender virgate branches, small white flowers tinged with purple, linear cuneate silky leaflets and very small orbicular pod.

18. *Taverniera*, DC.

Much-branched undershrubs. *Leaves* 1- or pinnately 3-foliate; leaflets usually obovate or orbicular; stipules scarious, sheathing, opposite the leaves. *Flowers* white or rose, in lax axillary racemes; bracts minute, deciduous; bracteoles 2, at the base of the calyx. *Calyx*-tube campanulate, teeth 5, subbilabiate, subequal. *Corolla* much exserted, scarious and persistent; standard obovate, shortly clawed; wings oblong, much smaller than the standard; keel petals about equal to the standard, obliquely truncate at apex, clawed. *Stamens* diadelphous, 9 and 1; the vexillary one connate with the others at the middle at first, afterwards free; anthers uniform. *Ovary* stalked, 1-2-ovuled; style filiform, inflexed; stigma small, terminal. *Pod* flattened, compressed, of 1-3 joints usually echinate and transversely ridged.

TAVERNIERA CUNEIFOLIA, Arn. in Wt. Ic. t. 1055. *T. nummularia*, Baker in F. B. I. ii. 140 not of DC.

Deccan, in Kurnool and Bellary (Beddome).

A much-branched undershrub with terete hoary branches, 3- or 1-foliolate leaves, persistent scarious corolla and glabrous echinate 1-2-jointed pod.

19. *Smithia*, Ait.

Herbs or undershrubs. *Leaves* paripinnate, rarely imparipinnate, the rhachis usually ending in a bristle; leaflets small, sensitive, without stipels; stipules scarious, persistent, usually produced below the insertion (in Asiatic species). *Flowers* yellow or blue, in axillary often unilateral racemes, sometimes collected in terminal heads or panicles; bracts and bracteoles scarious or membranous, persistent. *Calyx* deeply 2-lipped, the upper entire or emarginate, the lower entire or 3-toothed. *Corolla* exserted; standard suborbicular, cuneate at base; wings obliquely oblong, clawed and auricled; keel petals obtuse, incurved, clawed. *Stamens* diadelphous in 2 bundles of 5 each; anthers uniform. *Ovary* sessile or stalked, many-ovuled; style filiform; stigma small, terminal. *Fruit* a lomentum of flattened or turgid 1-seeded orbicular joints, folded together inside the calyx. *Seeds* reniform, strophiole 0.

Calyx rigid, with close parallel simple veins; flowers yellow :—

Stems not bristly; calyx-lips equal, acute :—

Lomentum joints papillose :—

Flowers in short racemes; lower calyx-lip with a few scattered bristles; leaflets 3-10 pairs, each 2-4 in. long, bristly only on margins and midrib beneath1. *sensitiva*.

Flowers in pairs or single from the leaf-axils; lower calyx-lip with a tuft of bristles near the apex; leaflets 4-7 pairs, each 3-6 in. long, very bristly on margins and midrib with smaller ones between.....2. *geminiflora*.

Lomentum joints smooth; flowers in pairs in the axils of leaves crowded at the ends of the branches; lower calyx-lip bristly along the keel at the back; leaflets 4-7 pairs, 2-4 in. long, very bristly all over on the back.....3. *conferta*.

Stems conspicuously bristly; calyx-lips obtuse, the upper much the longer, both very yellow-bristly; flowers in terminal panicles of racemes; leaflets glabrous with few bristles, 4-12 pairs, 1-1.5 in. long; lomentum joints reticulate.....4. *setulosa*.

Calyx membranous, with anastomosing veins :—

Flowers yellow :—

Flowers in loose racemes with filiform peduncles and pedicels :—

Leaflets usually 2 pairs; calyx-lips equal, the upper truncate, the lower 3-lobed; lomentum joints reticulate and papillose, very small, under 1 in. in diam.5. *bigemina*.

Leaflets 3 pairs; calyx-lips equal in length, the upper broad with 3 parallel nerves in the middle, the lower acute scarcely lobed; lomentum joints reticulate with flat margins, 1 in. in diam. or more6. *gracilis*.

Flowers in close more or less corymbose racemes with short pedicels, lomenta with 4-7 reticulate joints; leaflets 3-4 pairs :—

Calyx-lips bristly and ciliate with yellow hairs not on black bases, upper lip truncate, retuse, lower smaller, obscurely 3-lobed; racemes short7. *racemosa*.

Calyx-lips with conspicuous bristles on black bulbous bases, upper lip truncate, emarginate, lower smaller, acute, obscurely 3-lobed; racemes elongate, one-sided.....8. *hirsuta*.

Flowers in subcapitate heads on peduncles 1-1.5 in. long, in pairs or threes in the upper leaf axils; leaflets 4 pairs, up to 1 in. long by 3 in. broad; lomentum with 3-6 reticulate bordered joints; calyx-lips merely short, ciliate on the edges, upper lip broad, emarginate, lower 3-lobed9. *Venkobarrowii*.

Flowers in terminal panicles of corymbose racemes one-sided in

fruit; leaflets 4-5 pairs, often very bristly like the stems; calyx-lips obtuse, upper emarginate, lower 3-lobed, softly yellow-bristly; lomentum joints reticulate, bordered 10. *blanda*.

Flowers in dichotomously branched lax few-flowered corymbose panicles; leaflets 2-4 pairs, glabrous, with very few bristles; calyx-lips accrescent in fruit, the lower the longer, ciliate and with very few bristles; lomentum joints margined on one side papillose..... 11. *salsuginea*.

Flowers blue or purplish, in terminal spherical heads, very numerous; leaflets 9-15 pair, ciliate on the margins and midrib, bristly on the rhachis; calyx-lips broadly obovate, obtuse, long-bristly toothed on the margins; bracteoles long; lomentum joints smooth 12. *capitata*.

1. *SMITHIA SENSITIVA*, Ait.; F.B. I. ii. 148; W. & A. 220 in part, var. *α*.

W. Coast, in S. Canara (Hohenacker); W. Ghâts, in the Anamalai Hills (Wight).

A diffuse weed with somewhat woody stems, "bi- or triennial (Roxb.)."

2. *SMITHIA GEMINIFLORA*, Roth; F. B. I. ii. 149; W. & A. 220 in part, var. *β*.

W. Coast and W. Ghâts, from S. Canara southwards, eastwards to Mysore and Coimbatore Hills, up to 4,500 ft.

An erect herbaceous plant of grassy places and open forest undergrowth.

3. *SMITHIA CONFERTA*, Sm. *S. geminiflora* var. *conferta*, Baker in F. B. I. ii. 149.

N. Circars, Hills of Ganjam, up to 4,500 ft. on Mahendragiri; W. Coast and W. Ghâts, from S. Canara to Travancore, eastwards to Mysore and Coimbatore, up to 4,000 ft.

A much branched herbaceous undershrub of open forest undergrowth.

4. *SMITHIA SETULOSA*, Dalz.; F. B. I. ii. 149; Bedd. Ic. t. 243. W. Coast and W. Ghâts, in S. Canara; Mysore and Wynad, up to 3,000 ft.

A tall annual herb up to 4 ft. high.

5. *SMITHIA BIGEMINA*, Dalz.; F. B. I. ii. 149.

W. Ghâts, eastern side, in Mysore at 3,500 ft. (Meebold).

A much branched annual with very slender wiry stems.

6. **SMITHIA GRACILIS**, Benth. ; F. B. I. ii. 150.
W. Gháts, in the Nilgiri and Pulney Hills at 5,000 to 7,000 ft. on grassy slopes.
A diffuse slender herbaceous plant.
7. **SMITHIA RACEMOSA**, Heyne ; W. & A. 221. *S. blanda* var. *racemosa*, Bak. in F. B. I. ii. 151 *in part*.
W. Gháts, Bababudan Hills of Mysore (Talbot), Anamalai Hills of Coimbatore at 3,000 to 4,000 ft. (Beddome, Fischer).
A small diffuse herbaceous plant.
8. **SMITHIA HIRSUTA**, Dalz. *S. blanda* var. *racemosa*, Baker in F. B. I. ii. 151 *in part*. *S. blanda* var. *humilis*, Prain in Journ. As. Soc. Beng. LXVI. 66.
W. Gháts, in Wynaad, Nilgiri, Anamalai and Pulney Hills, at 3,000 to 7,000 ft. in wet places ; Hills of Vizagapatam in E. Gháts 3,500 to 5,000 ft. (?).
An erect diffuse plant with rather few branches.
9. **SMITHIA VENKOBAROWII**, Gamble in Kew Bull. 1918, ined. Travancore Hills, at Peermade (K. Venkoba Row.).
A trailing herb with rather large bright orange-yellow flowers.
10. **SMITHIA BLANDA**, Wall. ; W. & A. 221 ; F. B. I. ii. 151 ; Wt. Ic. t. 986 except fig. 6 (*S. hirsuta* ?).
W. Gháts, in the Mysore, Nilgiri, Anamalai, Travancore and Cochin Hills, at 4,000 to 6,000 ft.
A tall almost shrubby plant reaching 2 ft. or more in height and conspicuous for its bright yellow rather large flowers.
11. **SMITHIA SALSUGINEA**, Hance. *S. dichotoma*, Dalz. ; F. B. I. ii. 150.
W. Coast, in S. Canara (Hohenacker, K. Rungachari).
An erect annual with reddish branches. The calyx-lips are about equal in fruit, in flower the lower is the longer.
12. **SMITHIA CAPITATA**, Dalz. ; F. B. I. ii. 150 ; Bedd. Ic. t. 244.
W. Gháts, in the Hills of Mysore, S.-E. Wynaad, the Bolampatti valley and the Anamalais, at 2,000-3,000 ft., in open grass lands.
A pretty branching annual at once recognised by the bluish flowers and capitate heads.

20. *Aeschynomene*, L.

Erect herbs, undershrubs or shrubs. *Leaves* imparipinnate with very numerous close sensitive linear leaflets; stipules setaceous or lanceolate; stipels 0. *Flowers* yellow, often purple-striate, in axillary rarely terminal racemes; bracts stipuliform; bracteoles 2 at the base of the calyx. *Calyx* deeply 2-lipped, the upper lip entire or bifid the lower entire or trifid, sometimes the lobes subequal. *Corolla* exsert; standard orbicular; wings obliquely obovate, equal to or shorter than the standard, transversely barred; keel petals oblong or falcate, obtuse or acute. *Stamens* diadelphous, in 2 bundles of 5 each; anthers uniform. *Ovary* stipitate, 2-many-ovuled; style filiform, incurved; stigma terminal. *Pod* a long-stipitate lomentum with 2-10 flattened 1-seeded easily separating joints. *Seeds* subreniform, estrophiolate.

Stems slender, woody; flowers small, the calyx membranous, glabrous; upper suture of the pod straight, up to 1·5 in. long, joints about ·15 in. in diam., smooth or papillose on the faces 1. *indica*.

Stems stout, pith-like; flowers large, the calyx ·4 in. long, hispid; upper suture of the pod indented almost as the lower, up to 2·5 in. long, joints ·4 in. long by ·3 in. broad, echinulate opposite the seeds

2. *aspera*.

1. *AESCHYNOMENE INDICA*, Linn.; F. B. I. ii. 151; W. & A. 219; Wt. Ic. t. 405.

In most Districts, in wet pasture land near water, up to 3,000 ft. in hilly country.

A slender undershrub with numerous minute leaflets and viscid inflorescence. Vern. *Tel.* Tiga jeluga.

2. *AESCHYNOMENE ASPERA*, Linn.; F. B. I. ii. 152; W. & A. 219; Wt. Ic. t. 299.

Borders of ponds and tanks in the Deccan and Carnatic, not very common.

A tall soft perennial shrub reaching 10 ft. in height, the stems easily floating. They are used for making sun hats, fishing floats, toys, and for many other purposes. Vern. *Hind.* Sola; *Tel.* Nir jiluza; *Tam.* Attuneddi.

21. *Ormocarpum*, Beauv.

Shrubs. *Leaves* imparipinnate or 1-foliolate; leaflets alternate, exstipellate; stipules small, striate. *Flowers* in short few-flowered

axillary racemes; bracts small, scarious; bracteoles 2, at the base of the calyx-tube. *Calyx*-tube campanulate; lobes 5, the 2 upper subconnate broad, the median ones similar, the lowest longer and narrow. *Corolla* exserted, petals all clawed; standard orbicular, short; wings obliquely obovate; keel petals incurved, usually obtuse, equal to the wings. *Stamens* at first monadelphous, the tube cleft above, later on in two bundles of 5 each; anthers uniform. *Ovary* linear, few-ovuled; style filiform; stigma minute, terminal. *Pod* stalked, compressed, striate longitudinally and prickly-warted, the joints oblong, narrow at both ends. *Seeds* narrowly oblong.

ORMOCARPUM SENNOIDES, DC.; F. B. I. ii. 152; W. & A. 216; Wt. Ic. t. 297.

Deccan, in Cuddapah, N. Arcot and Chingleput, in woods and hedges and on waste lands, scarce.

A low shrub with oblong obtuse membranous leaflets, yellow flowers, and prickly pods with 2-4 distant joints. Vern. Tel. Nal kashina.

22. *Leptodesmia*, Benth. & Hook. f.

Diffuse perennial herbs. *Leaves* 1- or 3-foliolate; leaflets small, stipellate; stipules free. *Flowers* small, crowded in short terminal capitate racemes; bracts scarious, imbricate, deciduous. *Calyx* of 5 subequal setaceous lobes. *Corolla* small, included; standard suborbicular, clawed; wings obliquely oblong; keel lobes obtuse. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile, 1-ovuled; style filiform, incurved; stigma capitate. *Pod* small, membranous, 1-seeded, included in the calyx, the valves opening widely. *Seed* estrophiolate.

LEPTODESMIA CONGESTA, Benth.; F. B. I. ii. 152. *Nicolsonia congesta*, Wt. Ic. t. 1056.

W. Ghâts, in the Nilgiri and Pulney Hills, at 4,000 to 7,000 ft. A small trailing perennial with orbicular or orbicular-oblong leaves up to 75 in. long, small reticulate pods and crowded capitate flower-heads yellow or white plumose with the long hairs on the setaceous sepals.

23. *Eleiotis*, DC.

Annual procumbent slender herbs with triquetrous stems. *Leaves* 1-3-foliolate; leaflets stipellate; stipules striate. *Flowers*

single or in pairs, distant, in slender axillary racemes; bracts large, scarious, striate, deciduous; bracteoles minute or 0. *Calyx*-tube campanulate, 5-toothed. *Corolla* exserted; standard obovate, emarginate; wings oblong; keel petals obtuse. *Stamens* diadelphous, 9 and 1, persistent; anthers uniform. *Ovary* subsessile, 1-2-ovuled; style short, inflexed above; stigma capitate. *Pod* a single, boat-shaped, membranous, reticulate, compressed joint, the dorsal margin straight. *Seed* transversely oblong, subreniform; strophiole 0.

ELEIOTIS SORORIA, DC.; F. B. I. ii. 153; W. & A. 231.

Deccan and Carnatic, westwards to the Shevaroy Hills and the lower E. slopes of the Nilgiris and Pulneys.

A long-trailing plant with usually a single leaflet about .5 in. long and .75 in. broad, emarginate at apex, cordate at base, sometimes with a pair of small leaflets above the petiole; very small flowers and pod.

24. Pycnospora, R. Br.

A low shrub with slender stems. *Leaves* pinnately trifoliolate; leaflets stipellate; stipules free, membranous, striate. *Flowers* small, purplish, in slender terminal or axillary racemes; bracts membranous, deciduous; bracteoles 0. *Calyx* deeply cleft, the teeth subulate, the 2 upper connate except at apex. *Corolla* exserted; standard orbicular, clawed; wings oblong, oblique, adherent to the obtuse slightly curved keel petals. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile, many-ovuled; style inflexed; stigma minute, capitate. *Pod* oblong, inflated, 2-valved, continuous within, the thin valves transversely veined, 6-10-seeded. *Seeds* small, subreniform, with a minute strophiole.

PYCNOSPORA HEDYSAROIDES, R. Br.; F. B. I. ii. 153. *P. nervosa*, W. & A. 197.

Hills of the Carnatic, Shevaroy and Sirumalais to Tinnevely; W. Gháts and W. Coast from S. Canara southwards, and to 3,000 ft. in Nilgiris and Pulneys.

A slender often trailing plant with the habit of *Desmodium* and the pod of *Crotalaria*; leaflets obovate, prominently nerved, reaching 1.5 in. long.

25. *Pseudarthria*, W. & A.

Herbs and undershrubs, villous or viscid-pubescent. *Leaves* pinnately trifoliolate; leaflets large, stipellate; stipules free, subulate, striate. *Flowers* small, in pairs or fascicled along the rachis of a terminal or axillary slender raceme, occasionally paniculate; bracts and bracteoles subulate like the stipules. *Calyx*-tube campanulate, cleft to the middle in 2 obscure lips, the 2 upper lobes connate. *Corolla* exserted; standard suborbicular; wings obliquely oblong; keel petals obtuse, not spurred. *Stamens* diadelphous, 9 and 1, anthers uniform. *Ovary* subsessile; ovules many; style subulate, inflexed; stigma small, capitate. *Pod* linear-oblong, flat, continuous within and not jointed, the valves transversely veined. *Seeds* compressed, reniform.

PSEUDARTHRIA VISCIDA, W. & A. 209; F. B. I. ii. 154; Wt. Ic. t. 286.

Nearly all Districts from the Godavari southwards, up to 3,000 ft. in the hills, common in somewhat damp forest undergrowth.

A viscid *Desmodium*-like undershrub with leaflets rhomboid-ovate, repand sinuate on the margins, the pods very sticky and adherent, .72 in. long. .25 in. broad, the flowers pink.

26. *Lourea*, Neck.

Erect or prostrate herbs. *Leaves* 1-3-foliolate; leaflets often broader than long, stipellate; stipules free, subulate. *Flowers* white or reddish, usually in pairs in lax terminal racemes; bracts acuminate, caducous; bracteoles 0. *Calyx* campanulate, reticulately veined, accrescent, persistent, subequally 5-lobed, the uppermost two lobes sometimes partly connate, all lanceolate. *Corolla* short; standard obovate or obcordate; wings obliquely oblong, adnate to the obtuse keel. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile or stipitate, few-ovuled; style subulate, inflexed; stigma capitate. *Pod* a lomentum of 2 or more 1-seeded indehiscent turgid joints folded up within the calyx, the joints thin- and reticulately-valved. *Seeds* reniform or subglobose, strophiole 0.

Erect; end leaflets transverse with two divaricating oblong-lanceolate falcately-recurved 3-nerved obtuse lobes, .5 in. long, 2-3 in. broad, side ones obliquely obcordate1. *Vespertilionis*.

Prostrate and trailing; leaflets suborbicular, emarginate, end one rather broader than long, .25 to .75 in. long.....2. *obcordata*.

1. LOUREA VESPERTILIONIS, Desv.; F. B. I. ii. 154; W. & A. 221; Wt. Ic. t. 285.

An introduced species, occasional as a weed in waste places, sometimes in gardens.

A curiously leaved plant, the leaves often clouded with white; flowers white.

2. LOUREA OBCORDATA, Desv.; F. B. I. ii. 154.

Coimbatore District, at Sengadi, 2,600 ft. (Fischer).

27. *Uraria*, Desv.

Perennial herbs or undershrubs. *Leaves* imparipinnate or 3-foliolate, often 1-foliolate, with subulate stipels; stipules lanceolate, acuminate, scarious, striate. *Flowers* in terminal racemes or panicles of racemes, usually purple or yellow, the racemes often elongate; bracts stipular, ovate or lanceolate, acuminate, striate, conspicuous, persistent or deciduous; bracteoles 0. *Calyx*-tube short, 2-lipped, the upper lip 2-partite, the lower 3-partite, often elongate. *Corolla* small; standard orbicular or obovate, clawed; wings oblong-falcate, adherent to the obtuse keel. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile or shortly stalked, 2-many-ovuled; style inflexed, filiform; stigma capitate. *Pod* a lomentum of 2-6 small, turgid, 1-seeded, indehiscent joints folded within the calyx, occasionally continuous. *Seeds* orbicular or subglobose, strophiole 0.

Upper leaves 5-9-foliolate, the leaflets linear-oblong, clouded; racemes long, cylindrical; calyx-teeth subulate-lanceolate, the lower twice the length of the upper, plumose; lomentum joints 3-6, usually white and polished 1. *picta*
Leaves 3- and 1-foliolate intermixed:—

Racemes dense, very hairy; lower teeth of calyx very long, the upper very small; lomentum joints usually 2, smooth and faintly reticulate:—

Trailing undershrub with racemes usually under 1.5 in. long; leaflets 1 or 3, small, ovate, obtuse at apex, mucronate

2. *lagopodioides*.

Erect undershrub with racemes 2-4 in. long; leaflets 1 or 3, large, usually cordate at base, subacute at apex, mucronate

3. *alopecuroides*.

Racemes in panicles, slender, up to 1 ft. long, the flowers distant; calyx-teeth subequal, deltoid-cuspidate; lomentum joints 4-6, brown or black, minutely hispid4. *hamosa*.

1. *URARIA PICTA*, Desv.; F. B. I. ii. 155; W. & A. 221.

N. Circars, in the Sál forests of Ganjam (Gamble).

An erect undershrub reaching 3 ft. in height, recognised by the narrow white-clouded upper leaflets and white joints to the pod.

2. *URARIA LAGOPODIODES*, Merr. *U. lagopoides*, DC.; F. B. I. ii. 156; W. & A. 222; Wt. Ic. t. 289.

W. Gháts, E. slopes of the Pulney Hills (Bourne).

A trailing perennial of grassy lands, the flower racemes short and dense, the leaflets rather small and obtuse.

3. *URARIA ALOPECUROIDES*, Wt. Ic. t. 290. *U. repanda*, Wall.; F. B. I. ii. 156.

N. Circars, in the Ganjam Sál forests; Hills of Mysore, about 3,000 ft.

An erect undershrub of forest undergrowth, the flower racemes elongated, dense; the leaflets often cordate at base.

4. *URARIA HAMOSA*, Wall.; F. B. I. ii. 156; W. & A. 222; Wt. Ic. t. 284.

N. Circars, Deccan and W. Gháts, in dry forest undergrowth, up to 3,500 ft., common.

A straggling undershrub with elongate racemes in panicles and often rather large subacute leaflets.

28. *Alysicarpus*, Neck.

Diffuse or erect herbs. *Leaves* 1-foliolate, sometimes 3-foliolate also; stipules scarious, acuminate, free or connate; stipels subulate. *Flowers* small, in terminal, rarely axillary, racemes or spikes; pedicels usually in pairs; bracts scarious, usually deciduous; bracteoles 0. *Calyx* glumaceous, slightly campanulate, deeply 4-cleft, the upper segment bifid. *Corolla* not exerted; standard obovate or orbicular, narrowed to a claw; wings obliquely oblong, adnate to the keel; keel slightly incurved, obtuse, usually with a lateral appendage on each petal. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile or shortly stipitate, many-ovuled; style filiform, incurved at tip; stigma

capitate. Pod a terete or turgid lomentum of several indehiscent 1-seeded joints. Seeds suborbicular, strophiole 0.

Calyx shorter or very slightly longer than the first joint of the pod, under .15 in. long:—

Pod moniliform, the joints turgid, subglobose, downy with minute hooked hairs; stem with rather short bristly hairs; leaflets variable in shape, elliptic or lanceolate, obtuse, mucronulate, often cordate at base 1. *monilifer*.

Pod not or only occasionally moniliform, the joints turgid, tetragonous, reticulate, nearly glabrous; stems glabrescent; leaflet variable in shape from linear-oblong or -lanceolate to orbicular, usually cordate at base 2. *vaginalis*.

Pod not moniliform, curved, the joints flattened, reticulate, with both straight and hooked hairs; stem with long bristly hairs; leaflet orbicular, mucronate, pubescent 3. *hamosus*.

Calyx much longer than the first joint of the pod, at least .2 in. long:—

Calyx-teeth imbricate in fruit:—

Pod slightly moniliform, joints not transversely ribbed:—

Joints of pod smooth, glabrous; leaflet linear or linear-oblong 1-3 in. long, narrow; racemes 3-6 in. long, very slender

4. *brupleurifolius*.

Joints of pod reticulate, puberulous; leaflet linear-lanceolate, 3-6 in. long, narrow; racemes 6-12 in. long, rather stout

5. *longifolius*.

Pod moniliform, the joints strongly and closely ribbed transversely; leaves usually 1-, sometimes 3-foliolate, variable

6. *rugosus*.

Calyx-teeth not imbricate in fruit:—

Flowers in dense terminal white-silky spikes; leaflets linear-oblong or -lanceolate, 3-ribbed from near the base; pods moniliform, the joints 3-4, strongly reticulate ... 7. *pubescens*.

Flowers in terminal or axillary racemes on long pedicels; upper leaves often 3-foliolate:—

Pod only slightly exsert from the lanceolate golden-pilose calyx-teeth, which are .3 in. long, the joints 3-4, large; leaflets ovate, under 1 in. long; racemes rather close, the pedicels .5 in. long or less ... 8. *racemosus*.

Pod much exsert from the setaceous pilose calyx-teeth, which are .2 in. long, the joints 5-6, small; leaflets often up to 1.5 in. long and oblong; racemes lax, the pedicels .5 in. long or more

9. *parviflorus*.

1. *ALYSICARPUS MONILIFER*, DC. ; F. B. I. ii. 157; W. & A. 232.
In all dry Districts, especially the E. Coast, on pasture land.
A small prostrate much-branched perennial herb ; flowers pink. Vern. *Tel. Amera*.

2. *ALYSICARPUS VAGINALIS*, DC.; F. B. I. ii. 158; W. & A. 233.
In all dry Districts and on both Coasts, on pasture land.
A suberect much-branched herbaceous plant.

Var. *nummularifolius*, Baker in F. B. I. ii. 158. *A. nummularifolius*, W. & A. 232.

As widely distributed as the type from which it differs in the short dense racemes ; flowers pink.

3. *ALYSICARPUS HAMOSUS*, Edgew. ; F. B. I. ii. 157.
East Coast, at Masulipatam (Bourne) ; Deccan, at Bellary (Wight).

A slender, diffuse, very hairy, herbaceous plant ; flowers bluish-purple.

4. *ALYSICARPUS BUPLEURIFOLIUS*, DC.; F. B. I. ii. 158; W. & A. 233. *Hedysarum bupleurifolium*, Linn. ; Roxb. Cor. Pl. t. 194.

In most forest Districts, chiefly among long grass, and up to 3,000 ft. in hilly country.

A very slender perennial with narrow acute leaflets, usually linear, but basal ones sometimes elliptic or even orbicular. Flowers with orange standard and keel and crimson wings ; pod with 4-6 joints.

Var. *gracilis*, Baker in F. B. I. ii. 158.

Deccan, Hills of Cuddapah and Coimbatore up to 3,500 ft. ; W. Gháts, in the lower Pulneys (Bourne).

Leaves linear-oblong, broader and obtuse at apex ; joints of pod 1-3.

5. *ALYSICARPUS LONGIFOLIUS*, W. & A. 233 ; F. B. I. ii. 159 ; Wt. Ic. t. 251.

Northern Division (Cleghorn) ; "cornfields near Ongole, Circars" (W. & A.) ; "not infrequent in black cotton soil in the Ceded Districts and Circars" (Wight).

A stout erect undershrub reaching 4-5 ft. in height ; leaflet 3-6 in. long, reticulate, prominently nerved ; pod 3-6-jointed.

6. *ALYSICARPUS RUGOSUS*, DC. ; F. B. I. ii. 159 ; *A. Wallichii*, W. & A. 234.

Hills of the Deccan, in Mysore and Coimbatore up to

3,500 ft.; W. Gháts, in the Anamalais and Pulneys and Travancore Hills at similar levels.

A rather short herbaceous plant with ascending branches, short dense racemes, the calyx-teeth ciliate only, and 1-sometimes 3-foliolate leaflets, elliptic below, linear-oblong above. In addition to this there are also 3 fairly well-marked varieties, viz.:

Var. 1, *Heyneanus*, Baker; F. B. I. ii. 159. *A. Heyneanus*, W. & A. 234.

Stems stouter, up to 3 or 4 ft., usually pubescent; leaflet 1, large obovate-oblong; racemes elongate; calyx-teeth glabrous or slightly ciliate.

N. Circars and Deccan.

Var. 2, *pilifer*, Prain in Journ., As. Soc. Beng. LXVI. ii. 2. 384.

Stems erect, short, with spreading hairs; leaflet 1, oblong below, linear-oblong above; racemes short, dense, the calyx conspicuously long-white-ciliate.

Hills of the Deccan and Carnatic to 3,500 ft.

Var. 3, *styracifolius*, Baker; F. B. I. ii. 159. *A. styracifolius*, W. & A. 234.

A dwarf diffuse plant with spreading hairs; leaflet 1, lower small, upper linear-lanceolate; racemes short, dense, the calyx with spreading hairs.

Deccan and Carnatic, in dry places.

7. *ALYSICARPUS PUBESCENS*, Law in Wt. Ic. t. 250; F. B. I. ii. 160.

N. Circars, in Godavari (Cleghorn).

An erect herb reaching 3-4 ft. high; flowers, at any rate the wings, purple.

8. *ALYSICARPUS RACEMOSUS*, Benth.; Bedd. Ic. t. 292. *A. belgaumensis* var. *racemosus*, Bak. in F. B. I. ii. 160.

N. Circars, Mahendragiri Hill in Ganjam, 4,500 ft. (Fischer); Deccan, Bababudan Hills of Mysore (Talbot), W. Gháts, in Wynaad, Nilgiris, Bolampattis and Anamalais, at 3,000 to 7,000 ft.

An erect herb with golden pubescence and purple flowers.

9. *ALYSICARPUS PARVIFLORUS*, Dalz. *Desmodium parviflorum*, Bak. in F. B. I. ii. 172.

W. Gháts, in the Hills of Mysore, Coimbatore, the Anamalais and Cochin, at 2,000 to 5,000 ft.

An erect annual with lax racemes and purplish flowers.

29. *Ougeinia*, Benth.

A tree. *Leaves* pinnately 3-foliolate; leaflets large, stipellate; stipules free, deciduous. *Flowers* in densely fasciated racemes in leaf-axils and on old wood; pedicels filiform, fasciated along the rhachis; bracts small, scale-like; bracteoles beneath the calyx, minute, persistent. *Calyx-tube* campanulate, the lobes obtuse, in 2 lips, the upper of 2 connate, the lower of 3. *Corolla* exserted, rose-coloured or white, the petals clawed; standard suborbicular; wings obliquely oblong, spurred, slightly adnate to the obtuse incurved keel. *Stamens* diadelphous, 9 and 1; anthers uniform. *Ovary* sessile, many-ovuled; style incurved, subulate; stigma capitate. *Pod* linear, elongate, flat, of 2 or more oblong, large, more or less distinct, scarcely dehiscent joints. *Seeds* compressed, reniform; cotyledons foliaceous; strophiole 0.

OUGEINIA DALBERGROIDES, Benth.; F. B. I. ii. 161; Bedd. Fl. t. 36; Brand. For. Fl. t. 23. *Dalbergia oojeinensis*, Roxb.; Wt. Ic. t. 391.

Northern Circars, forests of Ganjam, Vizagapatam and Godavari, up to 4,000 ft; Deccan, scarce in the forests of Mysore to the N. slopes of the Nilgiris; sometimes planted for ornament.

A moderate-sized, often gregarious tree, very pretty when its masses of rose-coloured flowers are open before the new leaves appear. Bark light brown; wood hard, close-grained and tough, with a light brown heartwood, useful for carts and implements. Vern. *Hind.* Sandan; *Ur.* Bandhona; *Mar.* Tiwas; *Tel.* Tella motku.

30. *Desmodium*, Desv.

Herbs or shrubs, rarely small trees. *Leaves* pinnately 1-3-rarely 5-foliolate; stipules usually striate, dry, free or united into one leaf-opposed one; stipels subulate. *Flowers* usually small, purple or red or white, in copious usually dense, terminal or axillary racemes, sometimes in axillary umbels or fascicles; bracts single or in threes, striate or subulate and persistent or membranous and deciduous; bracteoles large and persistent or minute or wanting. *Calyx-tube* short, campanulate or turbinate, the 2 upper teeth more or less connate, the 3 lower acute or acuminate. *Corolla* exserted; standard obovate or orbicular,

usually narrowed at the base; wings obliquely oblong, more or less adhering to the keel, the petals of which are obtuse, often incurved, sometimes spurred towards the claw. *Stamens* usually diadelphous, 9 and 1, sometimes monadelphous, sometimes with the vexillary filament free in the upper half; anthers uniform. *Ovary* sessile or stalked, 2-many-ovuled; style incurved, sometimes sharply; stigma capitate. *Pod* a lomentum of several 1-seeded joints, the joints usually indehiscent and easily separating, less often dehiscent at one suture, in one section dehiscent along the whole ventral suture. *Seeds* compressed, usually reniform, estrophiolate.

Pods distinctly divided into several 1-seeded joints:—

Flowers in short dense peduncled axillary umbels; shrubs with triquetrous stems and 3-foliolate leaves; stamens monadelphous; pods curved, 4-6-jointed.....1. *Cephalotes*.

Flowers in elongated racemes:—

Joints of pods indehiscent:—

Pods with 1-3 usually 2 joints, the joints round, reticulate; stamens monadelphous, the vexillary one free above the middle; leaves 3-foliolate:—

Racemes with flower fascicles in the axils of conspicuous bifarious floral leaves each with 2 round leaflets and a terminal bristle or rarely an oblong leaflet; leaves large, membranous2. *pulchellum*.

Racemes with flower fascicles in the axils of stipular bracts, not leafy; leaves small, coriaceous.....3. *biarticulatum*.

Pods with oblong compressed joints, 2-4 times longer than broad, with sticky hooked hairs; stamens diadelphous, 9 and 1; racemes slender:—

Leaves 3-foliolate:—

Joints of pod 6-8, each twice longer than broad; leaflets chartaceous, lanceolate4. *laburnifolium*.

Joints of pod 6-10, each 3-4 times as long as broad; leaflets membranous, ovate or ovate-lanceolate5. *laxiflorum*.

Leaves 1-foliolate, the leaflet subcoriaceous, ovate or lanceolate; joints of pod 6-8, each 4-5 times as long as broad

6. *ormocarpoides*.

Pods with 1-3 scimitar- or crescent-shaped joints, the lowest stalked; leaves 3-foliolate, membranous, the lowest pair of nerves starting from the base and prominent; flowers in few-flowered very lax racemes; stamens monadelphous:—

Joints of pod 2-3, 3 times as long as broad, narrowed at base, the upper margin concave, the stalk about .5 in. long; leaflets ovate acuminate.....7. *laxum*.

Joint of pod 1, 3 times as long as broad, dolabriform, reticulate, the stalk about .15 in. long; leaflets ovate-rhomboid, elongate above, the apex obtuse.....8. *dolabriforme*.

Joints of pod 1-3, semi-oblong, more or less crescent-shaped, puberulous, the stalk short, about .1 in. long; leaflets broadly ovate-rhomboid, acute at apex, the margins usually repand

9. *Scalpe*.

Pods slightly curved, with 6-8 square joints, the ventral suture very slightly indented; leaflet 1, lanceolate, cordate, the petiole broadly winged; stamens monadelphous, the vexillary one free above the middle10. *triquetrum*.

Pods with several moniliform joints, each semicircular; stamens diadelphous:—

Pod straight or slightly indented on the dorsal suture; stipules subulate with a broad base:—

Leaflet 1; calyx-lobes short, triangular:—

Leaflet ovate or lanceolate, acute, glabrescent on upper surface, membranous; stems angular; joints of pod sparsely pubescent with hooked hairs, reticulate

11. *gangeticum*.

Leaflet broadly ovate or deltoid, repand, coriaceous, obtuse or subacute, densely pubescent; stems round, fulvous-hairy; joints of pod densely pubescent with hooked hairs.....12. *latifolium*.

Leaflets 3, the end one rhomboid-lanceolate, the side ones ovate, all acuminate, membranous; racemes very slender, lax; pod 4-6-jointed, slightly indented on the dorsal suture, joints glabrous, pale, reticulate.13. *Wightii*.

Pod somewhat deeply indented on the dorsal suture as on the ventral, 5-6-jointed, hispid with hooked hairs; stipules broad, amplexicaul, auricled; leaflets elliptic or orbicular, pubescent; racemes many, corolla minute....14. *diffusum*.

Joints of pods 6-9, reticulate, more or less dehiscent on the ventral suture, the dorsal not or only slightly indented; leaflets 3; stamens diadelphous:—

Pedicels not filiform, deflexed, .2 in. long; flowers large; leaflets elliptic or obovate, obtuse at apex, mucronate, indistinctly nerved, under-surface with innovations very silvery-silky or

tawny; pods slightly curved, slightly indented ventrally,
 '1-15 in. broad.....15. *rufescens*.

Pedicels filiform:—

Pedicels '4-5 in. long, spreading; flowers large; leaflets lanceolate, acute or slightly obtuse at apex, prominently nerved, under-surface softly tawny-villous; pods curved, reticulate, glabrous, pale when dry, slightly indented ventrally, '2 in. broad.....16. *wynaadense*.

Pedicels '15 in. long, erect; flowers small; leaflets elliptic or obovate obtuse, indistinctly nerved, more or less pubescent beneath; pods straight, fragile, slightly indented ventrally, '1 in. broad17. *polycarpum*.

Flowers in short racemes or axillary; stamens diadelphous:—

Leaflet '1, elliptic, cordate at base, emarginate at apex, up to 1.7 in. long, sparsely strigose beneath; racemes up to 1 in. long, crowded, the pedicels recurved, the calyx white-villous; pod with 1-3 joints, subglabrous.....18. *brachystachyum*.

Leaflets usually 1, sometimes 3, the side ones much smaller than the terminal, the latter orbicular, cordate, 1-2 in. long and broad, densely appressed white silky beneath; racemes crowded, up to 1 in. long, pedicels reflexed; calyx white- or tawny-villous; pod with 3-5 joints, slightly pubescent19. *retroflexum*.

Leaflets 3, small, never over 1 in. long; trailing herbs:—

Flowers all axillary, 1-3 together; pedicels '35 in. long; leaflets obovate cuneate, truncate or emarginate at apex; pods 3-5-jointed, straight on the dorsal, indented on the ventral suture; '1 in. broad20. *triflorum*.

Flowers both 1-3 together axillary and 2-6 in small lax racemes; pedicels '5 in. long; leaflets elliptic or obovate, rounded at apex; pods 4-5-jointed, straight on the dorsal, indented on the ventral suture, '2 in. broad

21. *heterophyllum*.

Flowers all in lax racemes:—

Joints of pod 1-2, longer than broad, the dorsal suture straight, the ventral deeply indented; leaflets obovate, emarginate; racemes lax, 6-8-flowered22. *Rottleri*.

Joints of pod 3-4, as broad as long, both sutures distinctly indented; leaflets very small and even minute, obovate; racemes terminal, filiform, with filiform pedicels

23. *parvifolium*.

Pods dehiscing in a continuous line along the ventral suture, the 5-10 joints not separating; leaflets 3, the end one large, oblong-

lanceolate, up to 4 in. long, the side ones very small and moving in jerks; flowers large; stamens diadelphous.....24. *gyrans*.

1. *DESMODIUM CEPHALOTES*, Wall.; F. B. I. ii. 161; W. & A. 244; Wt. Ic. t. 373.

Var. *congestum*, Prain. *D. congestum*, Wall.; W. & A. 224; Wt. Ic. t. 209.

Northern Circars, Hills of the Deccan and Carnatic, and W. Gháts, up to 3,000 ft., in forest undergrowth, especially with *teak* in the South, with *Sál* in the North.

A shrub, with white silky triquetrous branchlets, white or yellowish flowers, and 4-6-jointed, nearly glabrous curved pods. Vern. *Tel.* Chetenda.

2. *DESMODIUM PULCHELLUM*, Benth.; F. B. I. ii. 162. *Dicerma pulchellum*, DC.; W. & A. 230; Wt. Ic. t. 418.

In most dry forest Districts, in forest undergrowth, up to 4,000 ft.

A shrub, easily recognized by its conspicuous floral leaves, and large ovate-lanceolate repand leaflets; flowers pale yellow; pod usually 2-jointed, long-apiculate.

3. *DESMODIUM BIARTICULATUM*, Benth.; F. B. I. ii. 163. *Dicerma biarticulatum*, W. & A. 230; Wt. Ic. t. 419.

E. Coast Districts from the Chilka Lake to Cape Comorin and on W. Coast as far North as Quilon, in sandy places chiefly; rare inland, Cuddapah and Salem.

A slender shrub with small coriaceous cinereous leaves, bright red flowers and 2-jointed reticulate pod, the floral leaves reduced to chaffy stipules.

4. *DESMODIUM LABURNIFOLIUM*, DC.; F. B. I. ii. 163.

E. Gháts, Hills of Vizagapatam at about 4,000 ft. (A. W. Lushington).

A slender shrub with lanceolate leaflets, whitish flowers in long racemes and slender pods with oblong sticky joints very easily separable.

5. *DESMODIUM LAXIFLORUM*, DC.; F. B. I. ii. 164. *D. recurvatum*, Grah.; W. & A. 226; Wt. Ic. t. 374. *D. diffusum*, DC. Prodr. ii. 335, No. 88; Wt. Ic. t. 409.

W. Gháts, in Mysore, Coimbatore, Nilgiris and Travancore, up to 3,000 ft.

An erect undershrub up to 5 ft. high with angular stems,

rather large leaves and flowers in fascicles, on a long slender raceme, the standard white, wings and keel blue.

6. *DESMODIUM ORMOCARPOIDES*, DC. ; F. B. I. ii. 164.

W. Gháts, in Mysore, the Anamalais, Tinnevely and Travancore, up to 3,500 ft.

A slender erect undershrub with a single lanceolate acuminate leaflet reaching 7 in. long, and pale violet flowers in few-flowered distant fascicles in lax racemes.

7. *DESMODIUM LAXUM*, DC. *D. podocarpum* var. *laxum*, Bak. in F. B. I. ii. 165. *D. Gardneri*, Benth. ; F. B. I. ii. 165.

W. Gháts, in the Atapadi, Anamalai and Sivagiri Hills, up to 3,000 ft.

An erect, usually single-stemmed undershrub with pink flowers and scimitar-shaped joints to the pod.

8. *DESMODIUM DOLABRIFORME*, Benth. ; F. B. I. ii. 165.

W. Gháts, in the Hills of Tinnevely.

An undershrub with short erect stem, crowded leaves, slender erect racemes and single-jointed pod.

9. *DESMODIUM SCALPE*, DC. ; F. B. I. ii. 165. *D. strangulatum*, W. & A. 228 ; Wt. Ic. t. 985.

W. Gháts, from Mysore and Coimbatore southwards at 3,000 to 7,000 ft., in shady woods ; Shevaroy Hills in Salem.

An erect herbaceous undershrub with rather large brick-red flowers and usually pubescent leaves with prominent stipules.

10. *DESMODIUM TRIQUETRUM*, DC. ; F. B. I. ii. 163 ; W. & A. 224.

N. Circars, forests from Ganjam to Godavari ; W. Gháts, from S. Canara to Travancore, up to 3,000 ft.

An erect shrub with leaflets up to 6-8 in. long and triquetrous stems ; flowers purple ; pod appressed-pubescent.

11. *DESMODIUM GANGETICUM*, DC. ; F. B. I. ii. 168 ; W. & A. 225 ; Wt. Ic. t. 271. *D. collinum*, Wt. Ic. t. 272.

N. Circars, forests in the hills, to 3,000 ft. on Mahendragiri ; W. Gháts, in dry forests at low levels ; Shevaroy Hills of Salem ; in forest undergrowth.

An erect undershrub reaching 3-4 ft. with white or lilac-tinged flowers.

Var. *maculatum*, Bak. in F. B. I. ii. 668.

N. Circars, in Ganjam Sál forests (Gamble).

A dwarf undershrub reaching about 1 ft. in height; leaflets ovate, obtuse or cordate at base, usually under 1 in. long.

12. *DESMODIUM LATIFOLIUM*, DC.; F. B. I. ii. 168; W. & A. 225; Wt. Ic. t. 270.

N. Circars, forests in the Hills of Godavari; W. Gháts, in dry forests, up to 3,000 ft., chiefly on the east side; usually in open glades.

An erect undershrub, up to 6 ft. high, with purple flowers, pod sometimes 1-jointed.

13. *DESMODIUM WIGHTII*, Grah.; F. B. I. ii. 169; W. & A. 226.

W. Gháts, in the Nilgiri and Pulney Hills, at low levels.

A slender erect herbaceous plant with long racemes.

14. *DESMODIUM DIFFUSUM*, DC. Prod. ii. 336; W. & A. 226; Wt. Ic. t. 208. *D. quinquangulare*, Wt. Ic. t. 293.

Deccan, in Guntur, also rising to 3,000 ft. in Mysore.

A diffuse straggling plant with angled stems and broad stipules, the flowers very small.

15. *DESMODIUM RUFESCENS*, DC.; F. B. I. ii. 171; W. & A. 228; Wt. Ic. t. 984, Ill. t. 79.

W. Gháts, in the Nilgiri, Anamalai and Pulney Hills, common from 4,000 to 7,000 ft.; Hills of Coimbatore and Shevaroy Hills of Salem.

An erect pretty shrub with purple flowers and silvery silky branches and foliage.

16. *DESMODIUM WYNAADENSE*, Bedd. M.S. ex Gamble in Kew Bull. 1918, ined.

W. Gháts, Nilgiri, Anamalai and Travancore Hills, at 2,000 to 5,000 ft.

A handsome erect undershrub with large purple flowers, lanceolate leaflets and curved rather broad reticulate pod with dehiscent joints.

17. *DESMODIUM POLYCARPUM*, DC.; F. B. I. ii. 171; W. & A. 277; Wt. Ic. t. 406. *D. patens*, Wt. Ic. t. 407.

In all Districts, rising to 3,000 ft. in the hills.

An erect or suberect, sometimes trailing undershrub, with leaflets variable in shape and size, usually obovate, purple-blue flowers and very easily disarticulated pods, strongly ciliate on the sutures. Vern. *Tel.* Adivi utchinta.

Var. *trichocaulon*, Bak. in F. B. I. ii. 172.

W. Gháts, from S. Canara to the Pulneys, usually at 3,000 to 6,000 ft.; Shevaroy Hills.

Stems with spreading grey hairs; leaves more villous beneath, racemes more elongate and lax, pods pubescent all over, not so ciliate on the sutures or so fragile; sometimes white flowers.

Var. *Fischeri*, Gamble.

Hills of Coimbatore at Bailur, 3,800 ft. (Fischer); Travancore Hills, 4,700 ft. (Venkoba Row).

Stems grey-pubescent; leaflets small, obovate, almost truncate at apex, mucronate, white-villous beneath; racemes close, the flowers large; pods glabrous, not ciliate on the sutures.

18. *DESMODIUM BRACHYSTACHYUM*, Grah.; F. B. I. ii. 171.

N. Circars, Sál forests of Ganjam, under light cover (Gamble).

A slender undershrub up to 2 ft. high with deep purple flowers.

19. *DESMODIUM RETROFLEXUM*, DC.; F. B. I. ii. 170. *Uraria* ? *styracifolia*, W. & A. 222.

W. Coast, foot of the Gháts in Malabar (Beddome, Fischer); Pulney Hills, 4,000 ft. (Saulière).

A large shrub (Beddome) with purple flowers, the pod nearly straight on the dorsal suture.

20. *DESMODIUM TRIFLORUM*, DC.; F. B. I. ii. 173; W. & A. 229 *in part*; Wt. Ic. t. 292.

All plains Districts and up to 3,000 ft. in hills, a common weed.

A wiry much-branched herb, rooting and spreading over the ground like the small clovers; flowers pink or white.

21. *DESMODIUM HETEROPHYLLUM*, DC.; F. B. I. ii. 173. *D. triflorum*, W. & A. 229 *in part*; Wt. Ic. t. 291.

Plains Districts of E. and W. Coast, scarce.

Similar to the last, but larger, the leaflets sometimes reaching 1 in. in length; flowers purple.

22. *DESMODIUM ROTTLERI*, Bak. in F. B. I. ii. 174. *Eleiotis Rottleri*, W. & A. 231.

Plains of Mysore (Rottler).

A small trailing plant with 1-2-jointed pods.

23. *DESMODIUM PARVIFOLIUM*, DC.; F. B. I. ii. 174; W. & A. 229.

W. Gháts, in the Nilgiri and Pulney Hills, usually above 5,000 ft., in grass and on banks.

A pretty densely caespitose trailer with blue or pink flowers.

24. *DESMODIUM GYRANS*, DC.; F. B. I. ii. 174; W. & A. 227; Wt. Ic. t. 294.

N. Circars, Deccan and Hills of Carnatic, also W. Gháts, up to about 3,000 ft., in grass lands and forest undergrowth, widespread, but nowhere very common. The Semaphore plant.

An erect undershrub with pink flowers, reaching 3-4 ft. in height: the gyrating side leaflets are sometimes absent.

31. *Vicia*, Linn.

Annual or perennial herbs. *Leaves* paripinnate, the rhachis ending in a twisted tendril; stipules semisagittate; stipels 0. *Flowers* subsessile or in peduncled axillary racemes; bracts small, caducous; bracteoles 0. *Calyx*-tube campanulate; teeth long, often unequal. *Corolla* more or less exserted; standard obovate, emarginate, with a broad claw; wings oblong, oblique adnate in their middle to the shorter keel. *Stamens* diadelphous, 9 and 1, the vexillary one sometimes slightly connate with the rest. *Ovary* nearly sessile, 2-many-ovuled; style inflexed, usually with a dorsal tuft of hairs or ring of hairs below the apex; stigma capitate. *Pod* compressed, continuous within. *Seeds* globose or compressed.

VICIA SATIVA, Linn.; F. B. I. ii. 178.

Nilgiri Hills, about Ootacamund, run wild. Common Vetch or Tare.

A slender climbing herb with reddish-blue flowers.

The following species also occur only in cultivation, or as escapes, or as casual weeds:—

VICIA FABA, Linn. "Bean." cultivated in gardens.

LENS ESCULENTA, Moench. "Lentil." Vern. *Hind.* Masúr, rare in cultivation.

LATHYRUS SATIVUS, Linn. "Chikling Vetch." Vern. *Hind.* Kasári, also rare.

LATHYRUS APHACA, Linn. has been found as a weed in the Nilgiris.

PISUM SATIVUM, Linn. "Pea," and *PISUM ARVENSE*, Linn. "Field Pea," are found in cultivation.

CICER ARIETINUM, Linn. "Gram." Vern. *Hind.* Chana, sometimes cultivated.

32. *Abrus*, L.

Climbing shrubs. *Leaves* abruptly pinnate with many pairs of leaflets, the rhachis ending in a bristle; stipules subscarious. deciduous; stipels minute. *Flowers* in fascicles in dense thickened racemes on axillary peduncles or short branches; bracts small, deciduous; bracteoles under the calyx 2, deciduous. *Calyx*-tube small, campanulate, truncate, the teeth very short. *Corolla* much exerted; standard broadly ovate, narrowed into a short claw, slightly adherent to the staminal tube; wings narrow. oblong-falcate; keel curved. *Stamens* 9, in a sheath, the vexillary one absent, anthers uniform. *Ovary* subsessile, many-ovuled; style short, incurved, not bearded; stigma capitate. *Pod* oblong or linear, more or less compressed, thinly septate between the seeds, early dehiscent. *Seeds* globose or compressed. hilum near the top.

Leaflets large, ligulate-oblong:—

Leaflets up to .75 in. long, .25 in. broad; pod thick, 1-1.5 in. long, .5 in. broad, wrinkled; seeds rounded, hard, scarlet or white with a black spot or white only 1. *precatorius*.
 Leaflets up to 1.5 in. long, .5 in. broad; pod thin, flat, 2-2.5 in. long, .5 in. broad, smooth; seeds compressed, black .. 2. *pulchellus*.
 Leaflets very small, linear-ligulate, about .25 in. long, under .1 in. broad; pod compressed, linear-oblong, 1-1.25 in. long, .3 in. broad; seeds rounded 3. *fruticulosus*.

1. *ABRUS PRECATORIUS*, Linn.; F. B. I. ii. 175; W. & A. 236.

Most Districts, in hedges and among bushes, on open lands.

A rather conspicuous wiry climber with pink flowers and usually scarlet seeds with a black end. They are very hard, used for jeweller's weights and for necklaces and other ornaments. Vern. *Hind.* Gunchi, Rakti; *Ur.* Kaincho; *Tam.* Kuntumani; *Mal.* Kunni.

2. ABRUS PULCHELLUS, Wall.; F. B. I. ii. 175.*

S. Canara (Barber).

A wiry climber similar to the last, but with different pods.

3. ABRUS FRUTICULOSUS, Wall.; F. B. I. ii. 176; W. & A. 236; Wt. Ic. t. 33.

Malabar and Tinnevely, scarce.

A wiry climber with slender branches and very small Acacia-like leaves.

33. Shuteria, W. & A.

Slender climbing herbs. *Leaves* pinnately 3-foliolate; stipules scarious, striate; stipels subulate. *Flowers* in axillary racemes, solitary or in pairs on the rhachis; bracts persistent, striate; bracteoles 2, small. *Calyx*-tube gibbous, teeth distinct, the 2 upper connate, the lateral ones shorter than the others. *Corolla* exserted; standard obovate, narrowed at the base into a claw; wings oblique, sharply spurred, slightly adherent to the shorter obtuse keel. *Stamens* diadelphous, anthers uniform. *Ovary* sessile, many-ovuled; style incurved, not bearded; stigma capitate. *Pod* linear, flat, recurved, the valves thin, twisted when open, slightly septate. *Seeds* oblong-reniform, estrophiolate.

SHUTERIA VESTITA, W. & A. 207; F. B. I. ii. 181. *excl.* vars. 2 and 3; Wt. Ic. t. 165. *S. glabrata*, W. & A. 207.

N. Circars, on Mahendragiri at 4,500 ft.; W. Gháts, Hills of Mysore, Nilgiris and Pulneys at 2,000 to 6,000 ft.; Shevaroy Hills of Salem.

A slender climber with ovate slightly acute mucronate leaflets, the end one subrhomboid, the flowers purplish-red, the seeds brown.

34. Dumasia, DC.

Slender twining herbs. *Leaves* pinnately 3-foliolate; stipules setaceous; stipels minute. *Flowers* yellow, in axillary racemes, solitary or in pairs on the rhachis; bracts small, narrow; bracteoles minute. *Calyx*-tube gibbous, cylindrical, mouth very oblique, truncate. *Corolla* exserted; standard obovate, erect, auricled on both sides above the rather long claw, wings and keel slightly adherent, very long-clawed, the blades small, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* substipitate,

many-ovuled, linear; style long, filiform, incurved, flattened at the curve, not bearded; stigma capitate. *Pod* subsessile, linear, compressed, torulose. *Seeds* subglobose, estrophiolate, the testa hard, blue-black.

DUMASIA VILLOSA, DC.; F. B. I. ii. 183. *D. congesta*, W. & A. 206; Wt. Ic. t. 445.

W. Gháts, Hills of Mysore, the Nilgiris and Pulneys, above 6,000 ft.

A slender climber with ovate obtuse apiculate often velvety leaflets, yellow flowers and a velvety torulose pod.

35. Glycine, Linn.

Herbs, twining or prostrate, rarely suberect. *Leaves* pinnately 3-7-foliolate; stipules small; stipels subulate. *Flowers* small, in axillary racemes, solitary or fascicled on the rhachis: bracts small; bracteoles setaceous or linear, sometimes long. *Calyx*-tube campanulate, teeth long or short, the upper connate at the base or for half their length. *Corolla* hardly exerted; standard suborbiculate, slightly auricled above the claw, wings narrow, auricled, more or less connate with the shorter obtuse keel. *Stamens* at first monadelphous, the vexillary one afterwards free. *Ovary* subsessile, many-ovuled; style short, incurved; stigma capitate. *Pod* linear or linear-oblong, septate between the seeds. *Seeds* slightly compressed, estrophiolate.

Leaves 3-foliolate; bracteoles and calyx-teeth long, very villous; pod densely villous, deflexed, torulose.....1. *javanica*.

Leaves 5-7-foliolate; bracteoles minute, calyx-teeth short, deltoid; pod flat, appressed-pubescent, spreading, not torulose

2. *pentaphylla*.

1. GLYCINE JAVANICA, Linn., F. B. I. ii. 183. *Notonia Wightii*, W. & A. 208. *Johnia Wightii*, W. & A. 449.

W. Gháts, Hills of Mysore, Nilgiris and Pulneys, up to 6,000 ft.

An extensively climbing plant with reddish flowers in long dense racemes and large pubescent leaflets, the side ones unequally ovate-cordate, the end one rhomboid-ovate.

2. GLYCINE PENTAPHYLLA, Dalz.; F. B. I. ii. 184.

W. Gháts, in Wynaad (Beddome).

A large climbing herb with reddish flowers in long spicate

racemes, usually 7-foliolate leaves and oblong lanceolate mucronate leaflets, the end one much the longest.

36. *Teramnus*, Sw.

Slender twining herbs. *Leaves* pinnately 3-foliolate; stipules small; stipels subulate. *Flowers* very small, in very slender axillary racemes, solitary or fascicled on the rhachis, sometimes in fascicles or pairs; bracts small; bracteoles linear or lanceolate. *Calyx*-tube campanulate, teeth distinct or the 2 upper connate to the middle. *Corolla* little exserted; standard obovate, narrowed into the claw; wings oblong, narrow, adherent to the obtuse keel, both long-clawed. *Stamens* monadelphous; anthers alternately perfect and small and sterile. *Ovary* sessile, many-ovuled; style short, thick, not bearded; stigma capitate. *Pod* linear, compressed, narrow, septate between the seeds, ending in a hook formed by the persistent style. *Seeds* slightly oblong, estrophiolate.

Leaflets ovate, acute, nearly glabrous, end one up to 2 in. long, side ones 1.5 in.; racemes very slender, nearly glabrous; pod glabrous except a few acicular hairs 1. *labialis*.
 Leaflets ovate-lanceolate, acute, strigosely hairy, end one up to 6 in. long, side ones as long or slightly shorter; racemes slender, villous with tawny spreading hairs; pod also villous with tawny hairs
 2. *mollis*.

1. *TERAMNUS LABIALIS*, Spr.; F. B. I. ii 184. *Glycine labialis*, Linn.; W. & A. 208; Wt. Ic. t. 168.

N. Circars, in Godavari; Deccan, in Mysore and Coimbatore; Carnatic, about Madras and in S. Travancore, widespread but not common.

A twining herb with ovate acute leaflets, minute reddish flowers and narrow elongate papery hooked pods which open early and twist in spirals.

2. *TERAMNUS MOLLIS*, Benth. *T. labialis* var. *mollis*, Baker in F. B. I. ii. 184., *Glycine mollis*, W. & A. 209.

Brumagiri Hills, Malabar (Beddome); Tinnevely Hills (Wight).

A twining herb.

37. *Erythrina*, Linn.

Trees or rarely undershrubs, the branches, sometimes also the stems, usually studded with prickles. *Leaves* pinnately 3-foliate; stipules small; stipels gland-like. *Flowers* large and showy, scarlet or sometimes white, in dense peduncled axillary or terminal racemes, in pairs or fascicles on the rhachis; bracts and bracteoles small or 0. *Calyx* oblique at the mouth, spathaceous or campanulate with very short teeth. *Corolla* long-exsert, the petals very unequal, the standard much exceeding the wings and keel. *Stamens* 10, the vexillary filament free in the upper two-thirds, sometimes altogether, the rest free above, alternately longer and shorter; anthers uniform. *Ovary* stipitate, many-ovuled; style curved, subulate at the apex, not bearded; stigma capitate. *Pod* stipitate, falcate, turgid, torulose, dehiscing as a follicle. *Seeds* ovoid, hilum lateral, oblong, strophiole 0.

Calyx spathaceous, oblique, split on one side:—

Calyx split to the base, recurved, 5-toothed at the tip; flowers very large, the standard 2-2.5 in. long, wings and keel subequal, .5-7 in. long, the keel petals free; pod 6-12 in. long, thick, torulose, 6-8-seeded; prickles on branches nearly black; leaflets broadly deltoid, acute, membranous 1. *indica*.

Calyx split half-way down, erect; flowers large, the standard 1-1.25 in. long:—

Tip of calyx entire; wings minute, .2 in. long, keel petals combined, .75 in. long; pod stalked, 6-8 in. long, thin, 2-5-seeded; prickles on branches pale green; leaflets broadly deltoid-ovate, abruptly acuminate, membranous 2. *stricta*.

Tip of calyx minutely toothed: wings and keel about equal, .5 in. long, the keel petals free; stamens diadelphous; leaflets broadly ovate, abruptly acuminate, subcoriaceous... 3. *mysorensis*.

Calyx not spathaceous, splitting into two lips; flowers large, standard 1.5-2 in. long, wings minute, .25 in. long, keel petals combined, .6 in. long; pod 3-6 in. long, thin, torulose, 2-5-seeded; prickles on branches yellowish-white; leaflets rhomboid ovate, entire or sinuate-lobed, obtuse, densely tomentose beneath 4. *suberosa*.

1. *ERYTHRINA INDICA*, Lam.; F. B. I. ii. 188; W. & A. 260; Wt. Ic. t. 58.

Planted in hedges and as a support for pepper, perhaps wild on the E. Coast. Coral-tree.

A striking tree in flower. Bark yellowish, smooth, shining, papery; wood very soft and white but fairly durable and in use like that of *E. suberosa*. Vern. *Hind.* Mandara. Pangra.

2. *ERYTHRINA STRICTA*, Roxb.; F. B. I. ii. 189; W. & A. 260; Bedd. Fl. t. 175.

West Coast, in Malabar and Travancore.

A moderate-sized tree with corky bark armed with prickles, the wood white, soft and spongy but tough, used for fishing-net floats. Vern. *Tam. Mal.* Murukku.

3. *ERYTHRINA MYSORENSIS*, Gamble in Kew Bull., 1918, ined. Mysore at Chikanhalli, 3,000 ft. (Meebold).

Apparently a small tree with few or no prickles.

4. *ERYTHRINA SUBEROSA*, Roxb.; F. B. I. ii. 189; W. & A. 260. *E. sublobata*, Roxb.; W. & A. 261.

N. Circars and Deccan. in dry forests, up to 3,000 ft.

A moderate-sized deciduous tree with thick corky grey bark and white soft wood, fibrous but tough. The wood is used for scabbards, boxes and jars, and for covering with lacquer, it weighs about 19 lbs. per c. ft. Vern. *Hind.* Pangra; *Ur.* Paldua, Chaldua; *Tel.* Mula modugu.

38. *Mucuna*, Adams.

Large twining shrubs or herbs. *Leaves* pinnately 3-foliolate; stipules deciduous; stipels minute, subulate. *Flowers* large, purple or greenish, turning black when dried, fasciculately racemed on usually long axillary or lateral peduncles, sometimes subcymose, the rhachis nodose; bracts deciduous; bracteoles small. *Calyx*-tube widely campanulate, the lowest tooth long, the lateral short, the upper 2 connate. *Corolla* much exserted; standard about half the length of the wings and keel, folded, auricled at base; wings oblong or ovate, incurved, semisagittate at base; keel as long as or longer than the wings, incurved, acute or beaked. *Stamens* diadelphous; anthers dimorphous, the longer basifixed, the shorter ovate and bearded. *Ovary* sessile, villous, few- or many-ovuled; style filiform; stigma capitate. *Pod* very variable in shape and sculpture, usually covered with fine brittle needle-like irritant bristles. *Seed* orbicular with long linear hilum or transversely oblong with short hilum; strophiole 0.

Woody climbers with perennial stems; seeds large, flat, with long hilum :—

Pods winged on the sutures, large :—

Pods transversely or obliquely plaited on their faces; flowers dark purple; bristles orange-red :—

Pods nearly as broad as long, 1-seeded; flowers 1·5 in. long; leaflets more or less pubescent beneath.....1. *monosperma*.

Pods twice as long as broad, 2 seeded; flowers 2·5 in. long; leaflets nearly glabrous beneath.....2. *atropurpurea*.

Pods not plaited on their faces which are flat; flowers pale green or yellow, 1·5 in. long; bristles yellowish-brown; leaflets glabrous
3. *gigantea*.

Herbaceous climbers with annual stems and purple flowers; seeds 5-6, oblong with an oblong funicular hilum :—

Pods 3-4 in. long, curved, with dark silvery-brown hairs; leaflets densely golden-silky-tomentose beneath; flowers 1·5-2 in. long
4. *hirsuta*.

Pods 2-3 in. long, curved like an S and ridged longitudinally; leaflets with short appressed white hairs beneath; flowers 1-1·5 in. long 5. *prurita*.

1. *MUCUNA MONOSPERMA*, DC.; F. B. I. ii. 185; W. & A. 254.
N. Circars, near Samulcotta, *vide* Wight; Deccan, Hills of Mysore at 2,000 to 3,500 ft.; W. Ghâts, in Wynaad at 3,000 ft.

A woody climber with large nearly orbicular plaited pod and single seed.

2. *MUCUNA ATROPURPUREA*, DC.; F. B. I. ii. 186; W. & A. 254.
Deccan, Hills of Mysore and N. Coimbatore at 3,000 ft.; W. Ghâts, in the Pulney Hills, Sirumalais and Hills of Tinnevely.

A woody climber like the last but with oblong 2-seeded pods and narrower thinner leaflets.

3. *MUCUNA GIGANTEA*, DC.; F. B. I. ii. 186; W. & A. 254.
Coast forests about Negapatam and in Malabar, in sandy soils, *vide* Wight, etc.

A woody climber with pale green or yellow flowers and broad prominently winged pod.

4. *MUCUNA HIRSUTA*, W. & A. 254; F. B. I. ii. 187.
W. Ghâts, Nilgiri and Pulney Hills, at low levels (Bourne).
A climber with annual stems and silky shining leaves.

5. *MUCUNA PRURITA*, Hook. Bot. Misc. ii. 348, t. xiii; W. & A. 255. *M. pruriens*, Bak. in F. B. I. ii. 187 not of DC.

East and West Coast regions, twining among hedges and bushes. Cowhage.

A slender climber with annual shoots, leaves pubescent. The irritant hairs are very troublesome. Vern. *Hind.* Kiwách; *Tel.* Piliadagu kaila; *Tam.* Poonaykali.

39. *Galactia*, P. Browne.

Prostrate or twining herbs. *Leaves* pinnately 3-foliolate, rarely 1-5 or -7-foliolate; stipules small, deciduous; stipels subulate. *Flowers* small or moderate-sized, in axillary racemes, paired or fascicled at the very slightly swollen nodes; bracts setaceous; bracteoles minute. *Calyx*-tube short; teeth lanceolate or linear, the 2 upper connate into one. *Corolla* slightly exserted; standard ovate or orbicular, slightly auriculate; wings narrowed, adnate to the nearly straight obtuse keel. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style filiform, beardless; stigma capitate. *Pod* linear, straight or incurved, subseptate between the seeds. *Seeds* somewhat compressed; strophiole 0.

Leaflets elliptic, almost membranous, thinly grey-silky beneath, obtuse or emarginate, mucronate, up to 1·5 in. long, ·7 in. broad, main nerves about 6; calyx-lobes narrow, lanceolate, glabrescent; pod 1 in. long, thinly grey-silky1. *tenuiflora*.

Leaflets linear-oblong, subcoriaceous, very slightly appressed-villous beneath, obtuse, mucronate, up to 2·5 and even 5 in. long, ·5--·7 in. broad, main nerves about 10; calyx-lobes rather broad, acuminate, glabrescent; pod 1·5 in. long, glabrous2. *longiflora*.

Leaflets oblong-lanceolate, submembranous, densely villous beneath, obtuse, mucronate, up to 3·5 in. long, 1·2 in. broad, main nerves about 7-8; calyx-lobes broad, acuminate, very villous; pod villous

3. *villosa*.

1. *GALACTIA TENUIFLORA*, W. & A. 206; F. B. I. ii. 192.

N. Circars, Deccan and Carnatic, not common.

A slender wiry climber with reddish flowers and small leaves.

2. *GALACTIA LONGIFOLIA*, Benth.; Wt. Ic. t. 482. *G. tenuiflora*, var. *lucida*, Bak. in F. B. I. ii. 192.

W. Gháts, in the Hills of Coimbatore, the Nilgiris and Pulneys, up to 3,000 ft.

A slender climber distinguished by its narrow leaflets.

3. *GALACTIA VILLOSA*, W. & A. 207. *G. tenuiflora* var. *villosa*, Bak. in F. B. I. ii. 192.

W. Gháts, in the Nilgiris and Pulneys, up to 6,000 ft.

A slender climber but stouter and with larger leaflets than the others.

40. *Butea*, Roxb.

Trees or large climbing shrubs. *Leaves* pinnately 3-foliolate, leaflets large; stipules small, caducous; stipels subulate. *Flowers* large, showy, densely fascicled in axillary or terminal racemes or panicles; bracts and bracteoles narrow, caducous. *Calyx* broadly campanulate, the teeth deltoid, short, the 2 upper connate in an entire or emarginate lip. *Corolla* much exserted; standard ovate or lanceolate, acute, recurved, equal to or shorter than the keel; wings falcate, adnate to the much incurved acute keel. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or shortly stalked, 2-ovuled; style long, incurved, beardless; stigma very small, terminal. *Pod* an oblong follicle, the base flat, wing-like and indehiscent, the tip splitting round the single apical seed. *Seed* obovate, compressed; hilum small; strophiole 0.

An erect tree; lowest calyx-tooth much shorter than the side ones base of pod rounded, almost semi-cordate, breadth of pod 1·5 in.

1. *frondosa*.

A large climbing shrub; lowest calyx-tooth equal to the side ones; base of pod narrowed; breadth of pod 1 in.....2. *superba*.

1. *BUTEA FRONDOSA*, Koen.; Roxb. Cor. Pl. t. 21; F. B. I. ii. 194; W. & A. 261; Bedd. Fl. t. 176.

In all dry Districts both in open country and deciduous forests, frequently gregarious, less common in the Circars than in the Deccan. Common on black cotton soil, also on salt lands.

A deciduous tree, very conspicuous when in flower before the leaves appear, the large flowers being orange-scarlet set in dark velvety calyces, the large leaflets broadly obovate, coriaceous and reticulate. The wood is grey, soft, and said to be durable under water. It yields a red "Kino" gum and the lac insect is grown upon it. Vern. *Hind.* Dhák, Palás; *Ur.* Porásu; *Tel.* Modugu; *Tam.* Porasu; *Mal.* Palasin samatha.

2. *BUTEA SUPERBA*, Roxb. Cor. Pl. t. 22; F. B. I. ii. 195; W. & A. 261.

N. Circars, in the forests of Ganjam and Vizagapatam.

An immense climbing shrub, the leaves and flowers and pods very like those of *B. frondosa*, but the flowers rather more yellow and slightly larger. Like it also, it gives a "Kino" gum and the flowers a red dye.

41. *Spatholobus*, Hassk.

Large climbing shrubs. *Leaves* pinnately 3-foliolate; stipules small, deciduous; stipels small, subulate. *Flowers* small, in large terminal panicles extending to the axils of the upper leaves; pedicels fascicled; bracts and bracteoles small, deciduous. *Calyx* campanulate; teeth lanceolate or deltoid, the two upper connate. *Corolla* exserted, the petals subequal, clawed; standard ovate or orbicular; wings obliquely oblong, free; keel straight, obtuse, auricled above the claw. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, 2-ovuled; style subulate, incurved, beardless; stigma capitate. *Pod* an oblong, often somewhat falcate, follicle, the base flat, wing-like, reticulate and indehiscent, the tip splitting round the single apical seed. *Seed* compressed; hilum small; strophiole 0.

Leaflets large, the terminal one reaching sometimes 12 in. long by 9 in. broad, usually shining silky pubescent beneath; corolla cream-coloured; pod tomentose, stalked, 3-4 in. long by 1-1½ in. broad

1. *Roxburghii*.

Leaflets rather small, up to 5 in. long by 2½ in. broad, glabrous beneath; corolla purple; pod glabrous, sessile, 4 in. long by 75 in. broad..... 2. *purpureus*.

1. *SPATHOLOBUS ROXBURGHII*, Benth.; F. B. I. ii. 193. *Butea parviflora*, Roxb.; W. & A. 261; Wt. Ic. t. 210,

N. Circars and Deccan, in hill forests; W. Gháts, from S. Canara to Travancore, up to 3,000 ft.

A large climbing shrub with dark brown rough bark and wood in concentric layers of very porous tissue and bast tissue exuding a red gum. It is very damaging to forest trees. The bark gives a coarse fibre. Vern. Hind. Maula; Ur. Poráso; Tam. Piláccchi valli; Mal. Athambu.

2. SPATHOLOBUS PURPUREUS, Benth.; F. B. I. ii. 194.
 Travancore, in Aryanad forests (M. Rama Rao).
 A large climbing shrub, with papery pods.

42. Canavalia, DC.

Climbing or prostrate herbs. *Leaves* pinnately 3-foliolate; stipules small, sometimes wart-like; stipels subulate. *Flowers* showy, in elongated peduncled axillary racemes, fascicled on a nodose rhachis; bracts minute; bracteoles small, roundish, caducous. *Calyx* campanulate, bilabiate, the upper lip broad, entire or emarginate, the lower smaller, shortly 3-toothed. *Corolla* much exserted; standard large, suborbicular, reflexed; wings narrow, free from and equalling the obtuse incurved keel. *Stamens* monadelphous, the axillary one shortly free at the base; anthers uniform. *Ovary* obscurely stalked; ovules many; style incurved, beardless; stigma terminal, minute. *Pod* large, linear or oblong, compressed or turgid, with a distinct rib on each valve near the dorsal suture. *Seeds* ovate, compressed; hilum linear.

Pods flattened, not turgid:—

Pods 6–12 in. long, 1–1.5 in. broad, seeds 8–12; leaflets ovate, acute

1. *ensiformis*.

Pods 4–6 in. long, .5–1 in. broad, seeds 4–6:—

Racemes many-flowered; climbing herbs with large obovate, acute, or obtuse leaflets 2. *virosa*.

Racemes few-flowered; prostrate herbs with rather small, orbicular, obtuse or retuse leaflets 3. *lineata*.

Pods turgid, broad, 4–6-seeded, beaked; leaflets ovate, acuminate

4. *obtusifolia*.

1. CANAVALLIA ENSIFORMIS, DC.; F. B. I. ii. 195. *C. gladiata*, DC.; W. & A. 253; Wt. Ic. t. 753.

In gardens and on the roofs of huts, cultivated as a vegetable. The Sword-bean.

A climbing bean with pink or white large flowers. Vern. *Hind* Kadsambal; *Tam.* Segapu; *Tel.* Tumbetten kaya.

2. CANAVALLIA VIROSA, W. & A. 253. *C. ensiformis* var. *virosa*, Bak. in F. B. I. ii. 196.

In most Districts, especially in the Deccan and Carnatic.

A large climber with lilac flowers and short pods.

Var. *mollis*. *Canavalia mollis*, W. & A. 253. *C. ensiformis* var. *mollis*, Bak. in F. B. I. ii. 196.

W. Gháts, Hills of Mysore, Coimbatore, Nilgiris and Pulneys, at 4,000 to 5,000 ft.

Branches, leaves and calyx more or less densely hairy.

3. *CANAVALIA LINEATA*, DC. *C. obtusifolia*, Bak. in F. B. I. ii. 196.

Coast sands of the Coromandel and lower Malabar coast.

A trailing plant, valuable as a sandbinder (*cf.* Clegh. Madr. Journ. i. t. 4) and rooting at the nodes, often in company with *Ipomaea biloba*, Forsk. Flowers pink or lilac, leaflets rather small and orbicular.

4. *CANAVALIA OBTUSIFOLIA*, DC. *C. ensiformis* var. *turgida*, Bak. in F. B. I. ii. 196.

Banks of canals and backwaters near Quilon in Travancore (K. Venkoba Rao).

A climber, probably biennial, with pink flowers.

43. *Pueraria*, DC.

Climbing shrubs or herbs, sometimes with tuberous roots. *Leaves* pinnately 3-foliolate, the leaflets broadly ovate or rhomboid, sometimes palmately lobed; stipules herbaceous, basifixed or peltate; stipels subulate. *Flowers* purplish or blue, in long often compound axillary racemes, fascicled on the nodose rhachis; bracts small, deciduous; bracteoles small. *Calyx* campanulate, teeth 5, the two upper connate in an entire or 2-lobed lip. *Corolla* exsert; standard obovate or orbicular with auricles above the claw; wings oblong or falcate, equalling the obtuse keel. *Stamens* monadelphous, the axillary one free at the base, sometimes quite free; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, curved, beardless; stigma capitate. *Pod* linear, more or less flattened, continuous or septate within, sometimes jointed. *Seeds* suborbicular or transversely oblong; hilum oblong; strophiole small or 0.

PUERARIA TUBEROSA, DC.; F. B. I. ii. 197; W. & A. 205, 449; Wt. Ic. t. 412.

Hill forests of the N. Circars, Deccan and W. Gháts, up to about 3,000 ft., down to Travancore, nowhere very common. A large climber with huge tuberous roots, blue flowers which appear in the hot season when the plant is leafless, large leaflets with cordate peltate stipules and jointed pods up to 3 in. long, covered with long reddish bristly hairs. The

tubers are sometimes eaten. Vern. *Hind.* Tirra; *Tel.* Dari, Gumodi.

44. Phaseolus, Linn.

Herbs, rarely undershrubs, twining or suberect, often prostrate. *Leaves* pinnately 3-foliolate; stipules membranous, lanceolate, basifixed or peltately attached; stipules subulate. *Flowers* in axillary racemes, fasciated on the rhachis; bracts and bracteoles often conspicuous, usually persistent. *Calyx* campanulate, the lowest tooth the longest, the upper two connate or free. *Corolla* exserted; standard orbicular, subauriculate at base; wings obovate, adnate to the keel, often large; keel petals prolonged into a spiral beak. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style enclosed in the beak of the keel and twisted with it, conspicuously bearded down the side below the oblique stigma. *Pod* linear or falcate, terete or compressed, more or less septate between the seeds. *Seeds* smooth, the hilum punctate or shortly linear; strophiole 0.

Stipules basifixed; corolla red white or purple, not yellow; leaflets usually entire:—

Pods narrow, subcylindric, almost straight, many-seeded; flowers dull purplish-red ... 1. *semierectus*.

Pods broad, subcompressed, more or less recurved:—

Racemes dense; flowers large, the standard cream-coloured, the wings purple; pods linear, 10–15-seeded, 4–6 in. long, 4–5 in. broad ... 2. *adenanthus*.

Racemes lax:—

Pods few-seeded:—

Flowers small, yellowish-green or dirty white; pods broad and scimitar-shaped, 2–4-seeded ... *lunatus*.

Flowers medium-sized:—

Racemes shorter than the leaves; flowers lilac to white; pod linear, smooth, 5 in. broad ... *vulgaris*.

Racemes as long or longer than the leaves; flowers scarlet or white; pod curved, scabrous, 1 in. broad ... *multiflorus*.

Pods many-seeded, 3–4 in. long, 1–2 in. broad, bordered; flowers violet-purple, medium-sized ... 3. *Grahamianus*.

Stipules peltately fixed; corolla yellow:—

Pods glabrous:—

Pods cylindric; leaflets distinctly lobed:—

Stipules ovate or oblong, bracteoles ovate; leaflets 3-lobed, the lobes various in shape.....4. *trilobus*.

Stipules lanceolate as also bracteoles; leaflets deeply 3-lobed the lobes again variously cut 5. *aconitifolius*.

Pods more or less compressed; leaflets entire or only obscurely lobed:—

Stems glabrous or nearly so; stipules minute, lanceolate, .15 in. long, glabrous; bracteoles linear, .25 in. long; leaflets ovate, under 2 in. long, often slightly lobed, acute

6. *Dalzellii*.

Stems clothed with stiff deflexed hairs; stipules lanceolate, .2 in. long, hispid; bracteoles linear, .15 in. long; leaflets broadly ovate, 2–4 in. long, scarcely ever lobed, acuminate

7. *calcaratus*.

Pods hirsute, slightly compressed:—

Stems erect; leaves large, leaflets entire or rarely slightly lobed:—

Pods erect or suberect; seeds black..... *Mungo*.

Pods spreading; seeds green *radiatus*.

Stems twining; leaves rather small, leaflets obtuse or acute, the side ones and sometimes the terminal lobed.....8. *sublobatus*.

1. *PHASEOLUS SEMIERECTUS*, Linn.; F. B. I. ii. 201. *P. psoraleoides*, W. & A. 244; Wt. Ic. t. 249.

Carnatic, especially near Madras, a weed of waste land, probably introduced.

An erect herbaceous plant with very narrow pods and many rectangular seeds.

2. *PHASEOLUS ADENANTHUS*, G. F. Mey.; F. B. I. ii. 200. *P. rostratus*, Wall.; W. & A. 244; Wt. Ic. t. 34.

W. Coast, in Malabar and Travancore.

A twining perennial with large showy flowers and flat many-seeded pod. The tuberous root is sometimes eaten.

Vern. *Tam. Karalsona*.

3. *PHASEOLUS GRAHAMIANUS*, W. & A. 244; F. B. I. ii. 201.

W. Gháts, in the Nilgiri, Pulney and Tinnevely Hills, up to 4,000 ft., also Hills of Coimbatore (Fischer).

A slender climber with rather small deltoid leaflets and very narrow, flat, many-seeded pod.

4. *PHASEOLUS TRILOBUS*, Ait.; F. B. I. ii. 201; W. & A. 246 Wt. Ic. t. 94.

All plains Districts, on fallow lands, waste places, river banks and the sea-coast; common.

A diffuse trailing herb, good for fodder and sometimes cultivated for its seeds. Vern. *Hind.* Mugani; *Tel.* Pilli persara; *Tam.* Pani payir.

5. PHASEOLUS ACONTIFOLIUS, Jacq.; F. B. I. ii. 202; W. & A. 247.

Deccan and Carnatic, in similar places to the last, but perhaps not truly wild.

A diffuse trailing plant, cultivated as a fodder crop and for its seeds, in dry sandy lands. Vern. *Hind.* Moth; *Tam.* Tulka payir.

6. PHASEOLUS DALZELLII, T. Cooke. *P. pauciflorus*, Dalz.; F. B. I. ii. 202.

W. Gháts, in the Nilgiri and Pulney Hills (Bourne), at about 3,000 ft.

A slender climber with pale yellow flowers.

7. PHASEOLUS CALCARATUS, Roxb.; F. B. I. ii. 203; W. & A. 245.

W. Gháts, in the Nilgiri, Pulney and Travancore Hills, up to 7,000 ft.

A slender hairy climber with yellow flowers, sometimes cultivated.

8. PHASEOLUS SUBLOBATUS, Roxb. *P. trinervius*, Heyne; F. B. I. ii. 377; W. & A. 245.

Hills of the Deccan and Western Gháts, up to 6,000 ft.

A slender very hairy climber, very variable in its leaves, the stipules large and prominent.

The following species are found in cultivation:—

P. lunatus, Linn., the “Lima Bean.” Cultivated in gardens for its pods and usually white seeds.

P. vulgaris, Linn., the “French Bean” or “Haricot Bean.” Cultivated in gardens for its pods.

P. multiflorus, Willd., the “Scarlet Runner.” Cultivated for its pods, especially in gardens in the hills.

P. radiatus, Linn. Vern. *Hind.* Múng. Cultivated as a crop for its seeds.

P. Mungo, Linn. Vern. *Hind.* Tikari kalai, Urd. Cultivated as a fodder crop and for its seeds, but apparently rare.

45. *Vigna*, Savi.

Twining, rarely suberect, herbs or undershrubs. *Leaves* pinnately 3-foliolate; stipules basifixed or rarely peltate; stipels subulate. *Flowers* in racemes at the end of an axillary peduncle, fascicled on a nodose rhachis; bracts small, deciduous; bracteoles sometimes large and subpersistent. *Calyx* campanulate, the teeth distinct or the 2 upper more or less connate. *Corolla* exserted; standard orbicular, auricled at base; wings obovate falcate, slightly adnate to the keel; keel petals equalling the wings, incurved, acute or if beaked not spirally. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style filiform or thickened upwards, longitudinally bearded on the inner face; stigma oblique. *Pod* linear, straight or incurved, usually acuminate, septate between the seeds. *Seeds* reniform or subquadrate, the hilum short, lateral; strophiole 0.

Keel not beaked, a suberect or twining annual with white, pink or yellowish flowers and long glabrous pods with many seeds...*Catjang*.
Keel beaked but not spiral as in *Phaseolus*:—

Flowers large, 1 in. or more long; calyx-teeth subequal, about .25 in long, as long as the tube; leaflets rather small:—

Calyx strigosely hirsute; petals long-clawed; leaflets ovate or lanceolate, acute; pod with nearly black hairs, later glabrous

1. *vexillata*

Calyx softly villous; petals short-clawed; leaflets ovate, mucronate, subobtuse; pod with pale brown hairs..... 2. *Wightii*

Flowers medium-sized, under .75 in. long:—

Calyx-teeth unequal, the upper pair short, connate, the lowest the longest; keel petals very long-clawed; leaflets large, ovate, acute, the end one deltoid at base; pod densely brown-villous, long-acuminate..... 3. *pilosa*.

Calyx-teeth subequal, the upper pair rounded, connate; keel petals short-clawed; leaflets large, ovate, acuminate, densely tawny villous on both sides, the end one deltoid or rounded; pod at first densely villous; afterwards glabrescent...4. *Bourneae*.

1. *VIGNA VEXILLATA*, Benth.; F. B. I. ii. 206. *Phaseolus pulniensis*, Wt. Ic. t. 202.

W. Gháts, in the S. Canara, Nilgiri and Pulney Hills, up to 7,000 ft.

A very pretty climber with large reddish-purple flowers.

Var. *Stocksii*, Benth. Leaflets broadly ovate, often cordate at base, with more abundant brown silky hairs.

Kadur Hills of Mysore, at 5,500 ft. (Talbot).

2. *VIGNA WIGHTII*, Benth.; F. B. I. ii. 206; Bedd. Ic. t. 296.

W. Gháts, in the Wynaad, Coimbatore and Pulney Hills, in grass lands, at about 5,000 ft. "Wynaad Sweet Pea (Beddome)."

Similar to the last, with pink flowers.

3. *VIGNA PILOSA*, Bak. in F. B. I. ii. 207. *Dolichos pilosus*, Roxb.; W. & A. 249.

W. Gháts, in evergreen forests, S. Canara to Travancore, at low levels.

A slender climber with reddish flowers and very long-pointed velvety pods.

4. *VIGNA BOURNEAE*, Gamble in Kew Bull. 1918, ined.

W. Ghats, in the Pulney Hills at low elevations (Bourne).

A stout climber with prominent oblong-lanceolate peltate stipules, very thickly villous branches and leaves and long peduncled very nodose racemes. Flowers larger than those of *V. pilosa* apparently reddish-purple.

Vigna Catjang, Walp. is a suberect annual plant cultivated for its pods, which are eaten like French beans, and for its seeds Vern. *Hind.* Lobia; *Tam.* Karamani.

46. Clitoria, Linn.

Herbs or shrubs, erect or climbing. *Leaves* pinnate, 3-many-foliolate; stipules persistent, striate; stipels small, subulate. *Flowers* showy, axillary, solitary fascicled or racemose; bracts persistent, stipule-like; bracteoles usually large, persistent. *Calyx* membranous, tubular, the 2 upper teeth subconnate. *Corolla* much exserted; standard large, erect, emarginate, narrowed at base; wings falcate-oblong, spreading, adnate in the middle to the keel; keel shorter than the wings, incurved, acute. *Stamens* usually diadelphous, the vexillary one sometimes connate with the others; anthers uniform. *Ovary* stipitate, many-ovuled; style elongate, incurved, bearded along the inner side. *Pod* linear-oblong, flattened or turgid, many-seeded. *Seeds* subglobose or compressed; strophiole 0.

CLITORIA TERNATEA, Linn.; F. B. I. ii. 208; W. & A. 205.

Cultivated in gardens everywhere, but also common self-sown in hedges and thickets.

A very pretty climber with large bright blue prominently bracteolate flowers, the standard having an orange centre. Vern *Hind.* Khagin; *Tel.* Nalla-ghentana; *Tam.* Karka kartun.

47. *Dolichos*, Linn.

Twining prostrate or suberect herbs. *Leaves* pinnately 3-foliolate; stipules basifixed, subpersistent; stipels subulate. *Flowers* in axillary racemes or fascicles or solitary; bracts and bracteoles minute, striate, subpersistent. *Calyx*-tube campanulate, the teeth short or long, the 2 upper connate. *Corolla* exserted; standard orbicular, auricled at base and with projecting appendages above the claw; wings oblong or obovate, slightly adnate to the keel; keel much incurved, usually with a straight beak. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style thickened upwards and bearded down the inner face or filiform and bearded round the terminal stigma. *Pod* flat, linear or oblong, recurved, usually tipped with the persistent style. *Seeds* thick or somewhat flattened, hilum short with slender funicle or elongate with thickened subpersistent funicle.

Style thickened upwards, bearded down the inner edge; large climbing herbs with elongate racemes on tumid nodes *Lablab*.
Style filiform, bearded only round the stigma; nodes not tumid:—

Twining herbs with tuberous roots, perennial:—

Flowers about 2-8, lilac or pink, on slender peduncles varying up to 2 in. long; calyx-teeth short; leaflets broadly deltoid-ovate, the end one often 3-lobed; pod linear, glabrous, 2-3 in. long, .35 in. broad, 6-8-seeded 1. *falcatus*.

Flowers about 3-6, yellow, in short cymes under .5 in. long, the petals striate; calyx-teeth long; leaflets elliptic-ovate, obtuse, prominently ciliate on the margins; pod linear-oblong, glabrous, 1-1.5 in. long, .4-.5 in. broad, 3-4-seeded 2. *ciliatus*.

Erect or somewhat twining herbs, the roots not tuberous, annual; flowers 1-3 together in leaf-axils, yellow, softly hairy, wings narrow; calyx-teeth setaceous; leaflets ovate, acute; pod linear, 1.5-2 in. long, .25 in. broad, 5-6-seeded *biflorus*.

1. *DOLICHOS FALCATUS*, Klein; F. B. I. ii. 211; W. & A. 249.
All Districts, and up to 6,000 ft. in the hills.

A slender twiner with pretty lilac or pink flowers.

2. *DOLICHOS CILIATUS*, Klein; F. B. I. ii. 210; W. & A. 249.

Carnatic, chiefly near the coast, common about Madras.

A slender twiner with ciliate leaflets.

Dolichos Lablab, Linn. is cultivated in gardens and on sheds for its pods, which are eaten like French beans. There are two varieties, distinguished by their pods, var. *typicus*, Prain, with rather long narrow pods and seeds with the long axis parallel to the sutures, and var. *lignosus*, Prain, with shorter broader pods and seeds with the long axis at right angles to sutures. The latter seems the most common in Madras. Vern. *Hind.* Sem; *Tam.* Avarai; *Tel.* Alsunda.

Dolichos biflorus, Linn., is the "Horse Gram," largely cultivated, especially in the Circars and Deccan, on poor soils, for its seeds and as a fodder crop for horses and cattle. Vern. *Hind.* Kulti; *Tam.* Kollu; *Tel.* Wulawala; *Kan.* Hurali.

48. *Atylosia*, W. & A.

Herbs or shrubs, erect or twining. *Leaves* pinnately or rarely digitately 3-foliolate; leaflets with resinous glands beneath; stipules lanceolate or setaceous; stipels small or 0. *Flowers* usually yellow, axillary, in pairs or racemes; bracts usually broad, membranous, deciduous; bracteoles 0. *Calyx*-tube campanulate, the lobes distinct, the lowest the longest, the two upper connate in an entire or bifid lip. *Corolla* more or less exserted, sometimes marcescent; standard orbicular, auricled at base; wings obliquely obovate or oblong; keel slightly curved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, ovules 3 or more; style filiform, incurved, glabrous; stigma capitate. *Pod* linear or oblong, septate within, the valves more or less transversely or obliquely depressed between the seeds. *Seeds* ovate or orbicular with a conspicuous strophiole.

Erect shrubs; flowers in pairs; pod not prominently depressed between the seeds:—

Flowers large, peduncled; leaflets thick, obovate or oblanceolate, up to 3 in. long, densely brown-silky-pubescent beneath; pod oblong, brown-silky, 1-1.5 in. long by .5 in. broad, 3-4-seeded

J. trinervia.

Flowers small, under .5 in. long, not peduncled:—

Leaflets thin, obovate or oblanceolate, up to 1.5 in. long, grey-

silky-pubescent beneath; pod oblong, .5-.75 in. long by .25 in. broad, thinly grey-silky, 2-3-seeded..... 2. *lineata*.
 Leaflets thick, linear-oblongate, up to 1.5 in. long, densely white-silky-pubescent; pod small, white-silky, .5 in. long by .25 in. broad, 2-seeded..... 3. *sericea*.

Climbing shrubs; pod distinctly depressed between the seeds:—

Flowers in lax rather stout racemes; depressions of pod oblique; leaflets stipellate:—

Petals exerted, marcescent; bracts large, elliptic, conspicuous in season of bud, then deciduous; leaflets coriaceous, densely grey-pubescent beneath..... 4. *volubilis*.

Petals included, not marcescent; bracts ovate cuspidate, deciduous; leaflets chartaceous, thinly pubescent beneath..... 5. *goensis*.

Flowers in slender short racemes; depressions of pod straight or slightly oblique; leaflets exstipellate:—

Calyx-teeth short; pod more than 1 in. long, 5-7-seeded, thinly white-hoary; leaflets broadly obovate, obtuse, grey-canescens

6. *albicans*.

Calyx-teeth long; pod under 1 in. long, with brown hairs:—

Leaflets broadly obovate, rugose above, prominently reticulate beneath and white-canescens; pod 3-4-seeded, shortly villous, the apex hooked..... 7. *rugosa*.

Leaflets obovate-oblong, only slightly rugose and reticulate, slightly grey-canescens beneath; pod 4-6-seeded with golden spreading hairs, the apex straight..... 8. *scarabaeoides*.

1. *ATYLOSIA TRINERVIA*, Gamble n. comb. *A. Candollei*, W. & A. 257; F. B. I. ii. 212; Wt. Ic. t. 754.

W. Gháts, in the Nilgiri Hills, above 5,000 ft., Hills of Travancore, at 7,000 ft.

A handsome shrub with bright yellow flowers.

Var. *major*, Prain. *A. major*, W. & A. 257. Flowers larger, on longer peduncles; leaflets larger and more silky as are the branchlets.

W. Gháts, in the Nilgiri Hills, about 6,000 ft.; Atapadi Hills of Malabar, at 5,500 ft. (Fischer).

2. *ATYLOSIA LINEATA*, W. & A. 258; F. B. I. ii. 213. *A. Lawii*, Wt. Ic. t. 93.

W. Gháts, from S. Canara and Mysore to Travancore, at 3,000 to 5,000 ft.

A compact ashy-grey bush with yellow flowers.

3. *ATYLOSIA SERICEA*, Benth.; F. B. I. ii. 213.

E. Gháts, in the Hills of Vizagapatam, at 4,000 ft. and higher (A. W. Lushington).

An erect white silky shrub with red flowers.

4. *ATYLOSIA VOLUBILIS*, Gamble n. comb. *A. crassa*, Prain in Journ. As. Soc. Beng. lxvi, 45. *A. mollis*, Benth.; F. B. I. ii. 213 *in part*. *Cytisus volubilis*, Blanco.

E. Gháts, in the Hills of Ganjam and Vizagapatam, up to 3,000 ft.

A climbing shrub with densely rusty tomentose foliage and yellow flowers.

5. *ATYLOSIA GOENSIS*, Dalz. *A. barbata*, Bak. in F. B. I. ii. 216.

W. Gháts, from S. Canara to Travancore, at low elevations and up to 3,500 ft.

A climbing grey-pubescent shrub with yellow flowers.

6. *ATYLOSIA ALBICANS*, Benth.; F. B. I. ii. 215. *Cantharospermum albicans*, W. & A. 256 *in part*.

E. Gháts, Hills of Vizagapatam, at 1,500 ft.; Hills of W. Deccan; W. Gháts from Mysore to Travancore, up to 5,000 ft., usually in somewhat dry localities.

A climbing shrub easily known by its bluish grey striate stems and leaflets. Flowers yellow.

7. *ATYLOSIA RUGOSA*, W. & A. 257; F. B. I. ii. 215.

W. Gháts, in the Nilgiri, Anamalai and Pulney Hills, from 5,000 to 7,000 ft.; Shevaroy Hills of Salem.

A climbing shrub with reticulate leaflets grey-canescant beneath, and yellow flowers.

8. *ATYLOSIA SCARABAEOIDES*, Benth.; F. B. I. ii. 215. *Cantharospermum pauciflorum*, W. & A. 255.

N. Circars, from Ganjam to Godavari; Deccan, in Mysore and Coimbatore; W. Gháts, at low levels on the E. side, from Nilgiris to Cape Comorin.

A slender twining shrub with softly golden-villous pods and yellow flowers.

Cajanus indicus, Spreng., is the "Pigeon pea"—an erect shrub with corolla yellow or yellow veined with red, cultivated for its seeds especially in forest regions. The leaves are used for cattle-fodder. Vern. *Hind.* Arhar dál; *Tam.* Tuvárai; *Tel.* Kandalu.

49. *Dunbaria*, W. & A.

Prostrate or twining woody herbs. Leaves pinnately 3-foliate, glandular beneath; stipules setaceous or lanceolate; stipels small or 0. *Flowers* in axillary peduncled racemes, solitary or paired on the rachis; bracts membranous, usually broadly ovate, very early deciduous; bracteoles 0. *Calyx*-tube campanulate, the teeth lanceolate or triangular, the lowest the longest, the 2 upper ones connate in an entire or bifid lobe. *Corolla* exserted, sometimes marcescent; standard obovate or orbicular with auricles at the base and 2 callosities above it; wings obliquely obovate or oblong, auricled; keel petals incurved, obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or shortly stipitate, many-ovuled; style inflexed, filiform or thickened, beardless; stigma capitate. *Pod* oblong, compressed, subseptate within, not depressed between the seeds outside. *Seeds* suborbicular, the funicle expanded but scarcely strophiolate.

Corolla large, marcescent:—

Stems and leaves tawny-pubescent, the leaflets thick, broadly ovate, acute or acuminate; stipels generally 0; calyx-lobes lanceolate; standard over 1 in. long, emarginate; pod softly tawny-pubescent

1. *ferruginea*.

Stems and leaves with scattered strigose hairs, the leaflets thin, end one obovate, side ones unequally lanceolate, all acuminate; stipels present; calyx-lobes short except the lowest; standard 75 in. long, obtuse; pod with long villous hairs 2. *Heynei*.

1. DUNBARIA FERRUGINEA, W. & A. 258; F. B. I. ii. 217.

D. latifolia, W. & A. 258.

Deccan, Hills of Cuddapah and N. Coimbatore; W. Gháts, in the Nilgiri, Pulney and Travancore Hills, up to 3,000 ft. A stout climber with large yellow flowers.

2. DUNBARIA HEYNEI, W. & A. 258; F. B. I. ii. 217.

W. Gháts, in Mysore, Wynaad and the Anamalais, up to 3,000 ft.

A climber with yellow flowers; stipules and stipels prominent.

50. *Cylista*, Ait.

A twining shrub. *Leaves* pinnately 3-foliate, with resinous glands beneath; leaflets ovate or rhomboidal, acuminate; stipules

lanceolate, deciduous; stipels subulate. *Flowers* in axillary sometimes panicled racemes; bracts lanceolate, acuminate, membranous, caducous; bracteoles 0. *Calyx*-tube campanulate, lobes obtuse scarious, accrescent, persistent, the lowest the largest and boat-shaped, the upper 2 connate in an emarginate lip, the 2 lateral shorter. *Corolla* included; standard suborbicular, auricled at base with 2 callosities above it; wings narrow, auricled; keel incurved, obtuse. *Stamens* diadelphous, anthers uniform. *Ovary* subsessile, 1-ovuled; style long, filiform; stigma terminal, capitate. *Pod* small, oblique, enclosed in the calyx. *Seed* 1, oblong, not strophiolate.

CYLISTA SCARIOSA, Roxb. Cor. Pl. t. 92; F. B. I. ii. 219; W. & A. 259; Wt. Ic. t. 1597.

N. Circars, common in the open forests from Ganjam to Godavari at low levels; Deccan, in Kurnool and Mysore; Carnatic, in Tinnevely.

A climber with yellow flowers concealed in a prominent accrescent calyx, the leaflets reticulate beneath and softly pubescent.

51. Rhynchosia, Lour.

Twining or erect herbs or shrubs. *Leaves* pinnately or sometimes subdigitately 3-foliolate; stipules ovate or lanceolate; stipels subulate or minute or 0. *Flowers* in axillary racemes, solitary or in pairs on the rhachis, rarely solitary; bracts usually caducous; bracteoles 0. *Calyx*-tube short, lobes subequal, the 2 upper more or less connate, not or only slightly accrescent. *Corolla* included or exserted; standard obovate or orbicular with inflexed auricles at the base; wings narrow; keel incurved, hardly beaked. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, usually 2- rarely 1-ovuled; style long, filiform, much incurved; stigma capitate. *Pod* round or oblong, more or less compressed, continuous or septate within. *Seeds* 2, rarely 1, subreniform; strophiole present or absent.

Seeds strophiolate :—

Calyx conspicuous, accrescent; leaflets ovate, acute; flowers in lax racemes :—

Calyx-lobes oblong, obtuse; bracts ovate, pod as long as broad, pointed, 1-seeded 1. *rufescens*.
Calyx-lobes lanceolate, acute; bracts cordate; pod twice as long as broad, 2-seeded 2. *Heynei*.

Calyx not accrescent.—

Calyx-lobes linear, the lowest longest; *leaflets* obtuse; trailing undershrubs or herbs. —

Pod 1-seeded, *orbicular*, with few branching transverse veins; flowers small, in elongate racemes; leaflets broadly ovate-cuneate, the end one truncate or emarginate, 1-2 in. in diam.

3. *nummularia*.

Pod 2-seeded; flowers moderate-sized. —

Flowers in racemes; pod with close transverse wrinkles on the faces. —

Racemes few-flowered, the peduncle shorter than the leaves, naked; standard yellow striped with purple; leaflets suborbicular, deltoid, 3-4 in. in diameter

4. *aurea*.

Racemes many-flowered, capitate, the peduncle longer than the leaves with a slender leafless shoot near the middle; standard yellow, not striped; leaflets orbicular-ovate, deltoid, up to 2 in. in diam. 5. *capitata*.

Flowers solitary on thread-like pedicels with bracts a short way below the calyx; leaflets coriaceous, obovate, white-velvety beneath and reticulate, mucronate, up to 2.5 in. long; pod oblong, 5 in. long, softly pubescent, not wrinkled on the faces 6. *filipes*.

Calyx-lobes lanceolate, acuminate, nearly equal; leaflets acute; erect undershrubs with 2-flowered axillary peduncles; seeds 2. —

Viscous-pubescent, yellowish when dry; pod indented without between the seeds and with a partition within; leaflets ovate acuminate, up to 3 in. long. 7. *suaveolens*.

Glandular-pubescent but not viscous, greyish-green when dry; pod slightly indented without between the seeds but with no partition within; leaflets ovate acute or almost obtuse, up to 2 in. long. 8. *cana*.

Calyx-lobes oblong, obtuse, longer than the corolla, the lowest shortest; erect undershrub with white-silky, coriaceous, reticulate, ovate or lanceolate leaflets up to 1.25 in. long; flowers in short racemes; pod suborbicular, 2-3 in. in diam., seed 1

9. *Beddomei*.

Seeds estrophiolate. —

Calyx-lobes large, foliaceous, .75 in. long; flowers large, in long racemes with large ovate-cuspidate deciduous bracts; pod as long as the calyx, densely velvety, with 2 blue-black seeds

10. *cyanoasperma*.

Calyx-lobes acuminate, not foliaceous :—

Leaflets small, usually obtuse, under 1·5 in. in diam. :—

Racemes slender, lax, 1–3 in. long; flowers small, 2 in. long; pod 5–6 in. long, 2 in. broad, nearly glabrous, slightly curved

11. *minima*.

Racemes short, cymose, about 5 in. long; flowers larger, 5 in. long; pod 1–1·25 in. long, 4 in. broad, slightly puberulous, much curved.....

12. *velutina*.

Leaflets moderately large to large, acute or acuminate, at any rate over 1 in. in diam. even at the ends of the branchlets :—

Flowers in more or less lax racemes; pod much longer than the calyx, tipped with the persistent base of the style :—

Pod acute at apex below the base of the style :—

Pod with bulbous-based setose hairs, as well as pubescence :—

Corolla yellow; pubescence glandular; leaflets broadly deltoid, shortly acuminate, rarely over 3 in. long; bracts minute, deciduous; pod sparsely pubescent

13. *viscosa*.

Corolla purple; pubescence silky; leaflets broadly ovate, acute, the end one rhomboid, usually over 3 in. long; bracts lanceolate, subpersistent; pod tawny-villous

14. *sericea*.

Pod softly grey-tomentose without setose hairs; corolla yellow veined with red; pubescence very short, fulvous; leaflets rhomboid-ovate, very long acuminate, 3–5 in. long

15. *acutissima*.

Pod obtuse at apex below the curved style, minutely pubescent; corolla yellow; pubescence softly fulvous; bracts lanceolate, deciduous; leaflets deltoid, shortly acuminate, coriaceous, up to 4 in. long

16. *bracteata*.

Flowers in dense almost capitate racemes; pod only slightly longer than the calyx, acute at tip, slightly villous; calyx-lobes lanceolate, acuminate, silky-villous and dotted with red glands; bracts lanceolate, persistent; leaflets rhomboid ovate, acute, membranous, 1–2 in. long

17. *densiflora*.

1. *RHYNCHOSIA RUFESCENS*, DC.; F. B. I. ii. 220; W. & A. 239. N. Circars, from Ganjam to Godavari, at low levels Deccan, in Mysore and Bellary; Carnatic, dry hills of S. Arcot and Chingleput; W. Gháts, in N. Nilgiris, E. Anamalais and Pulneys, up to 3,000 ft.

An erect shrub with trailing branches, yellow flowers and conspicuous calyx hiding the flowers and pod.

2. *RHYNCHOSIA HEYNEI*, W. & A. 240; F. B. I. ii. 220.
R. codoorensis, Bedd. Ic. t. 297.

Deccan, in Mysore, Cuddapah and Bellary, in hilly country.

A herbaceous trailing undershrub with yellow flowers.

3. *RHYNCHOSIA NUMMULARIA*, DC.; F. B. I. ii. 221. *Nomis-mia nummularia*, W. & A. 237; Wt. Ic. t. 283.

Carnatic, in Tinnevely, also Shevaroy Hills of Salem.

A trailing annual herb.

4. *RHYNCHOSIA AUREA*, DC.; F. B. I. ii. 221 *in part*. *Nomis-mia aurea*, W. & A. 237.

Carnatic, not uncommon near Madras; Deccan, in Coimbatore.

A slender trailing annual herb.

5. *RHYNCHOSIA CAPITATA*, DC. *R. aurea*, DC.; F. B. I. ii. 221 *in part*. *Nomis-mia capitata*, W. & A. 237; Wt. Ic. t. 295.

Deccan, in the Hills of Cuddapah, Anantapur and Coimbatore, up to 1,500 ft.; E. Coast, at Masulipatam (Bourne).

A slender climber with flowers in many-flowered heads, softly villous.

6. *RHYNCHOSIA FILIPES*, Benth.; F. B. I. ii. 221.

W. Gháts, in the Nilgiri and Pulney Hills, at low levels; Shevaroy Hills of Salem.

A slender wide-trailing undershrub with filiform stems and peduncles.

7. *RHYNCHOSIA SUAVEOLENS*, DC.; F. B. I. ii. 221; W. & A. 240.

Deccan and Carnatic, in dry forest localities, up to 3,000 ft. in Coimbatore.

A viscons hairy undershrub with yellow flowers.

8. *RHYNCHOSIA CANA*, DC.; F. B. I. ii. 222; W. & A. 240.

Deccan and Carnatic, in dry forest localities from the Godavari southwards, up to 4,000 ft.; W. Gháts, in the Nilgiri, Pulney and Travancore Hills, up to 5,000 ft.

A glandular undershrub with yellow flowers.

9. *RHYNCHOSIA BEDDOMEI*, Bak. in F. B. I. ii. 222.

Deccan, on rocks on Horsleykonda, at 4,000 ft., and other hills in Cuddapah and Bellary.

A stiff undershrub with bright yellow flowers.

10. **RHYNCHOSIA CYANOSPERMA**, Benth.; F. B. I. ii. 222. *Cyanospermum tomentosum*, W. & A. 260; Wt. III. t. 81. *Cylista tomentosa*, Roxb. Cor. Pl. t. 221.
N. Circars, in the Hills of Vizagapatam, at 4,500 ft.; W. Gháts, from S. Canara and Mysore to Travancore, up to 4,000 ft.
A stout woody climber with large velvety leaves and red yellow or white flowers, the 2 seeds blue-black.
11. **RHYNCHOSIA MINIMA**, DC.; F. B. I. ii. 223. *R. medicaginea*, DC. and *R. nuda*, DC.; W. & A. 238.
Circars, Deccan and Carnatic and westwards to the foot of the Gháts, in dry places.
A slender trailing annual with small obtuse leaflets and small yellow flowers.
Var. *laaxiflora*, Bak. in F. B. I. ii. 223. Leaflets larger and acute at apex; racemes longer and laxer.
Circars and Deccan.
12. **RHYNCHOSIA VELUTINA**, W. & A. 238; F. B. I. ii. 224.
Fort St. George (Bulkeley, 1,700); Tanjore and Tinnevely (Wight).
A wide trailing herb with suborbicular leaflets, grey-canescient beneath.
13. **RHYNCHOSIA VISCOSA**, DC.; F. B. I. ii. 225. *Dolichos glutinosus*, W. & A. 248.
Deccan, Hills of Kurnool; W. Gháts, Bolampatti Valley in Coimbatore and Lower Pulneys, up to 1,500 ft.; Shevaroy Hills of Salem.
A climber with glandular branches and yellow flowers.
14. **RHYNCHOSIA SERICEA**, Span.; F. B. I. ii. 225. *Dolichos tomentosus*, W. & A. 248.
Deccan, Kondapalle in Kistna; W. Gháts, from Mysore to the Pulney Hills, up to 4,000 ft.
A climbing shrub with soft silky pubescence and long racemes of purple flowers.
15. **RHYNCHOSIA ACUTISSIMA**, Thw.; F. B. I. ii. 226.
Evergreen forests of the low country of Travancore (Beddome, Rama Rao).
A slender climber with pale brown tomentum and long acuminate leaflets.

16. *RHYNCHOSIA BRACTEATA*, Benth. ; F. B. I. ii. 225.

Deccan, Mantralakanama Pass in Kurnool, 2,000 ft. (Gamble).

A rather stiff climber with tawny pubescence and yellow flowers.

17. *RHYNCHOSIA DENSIFLORA*, DC. ; F. B. I. ii. 226 ; W. & A. 239.

W. Gháts, in the Nilgiris, Anamalais and Pulneys, up to 5,000 ft.

A slender twiner, softly villous, with yellow flowers, the standard often streaked with red.

52. *Flemingia*, Roxb.

Shrubs or undershrubs, rarely herbs, erect or trailing. *Leaves* 1-foliolate or digitately 3-foliolate ; stipules striate, often deciduous ; stipels 0. *Flowers* in axillary or terminal simple or compound racemes panicles or sometimes heads ; bracts foliaceous or scarious, persistent or caducous ; bracteoles 0 or minute. *Calyx*-tube short, teeth subequal or the lowest the longest, usually lanceolate. *Corolla* little or not exerted ; standard obovate or orbicular, auricled at base ; wings obliquely oblong or obovate, sometimes short, adnate to the obtuse or slightly rostrate keel. *Stamens* diadelphous, anthers uniform. *Ovary* subsessile, short, 2-ovuled ; style filiform or thickened above ; stigma capitate. *Pod* small, oblique, turgid, usually 2-seeded. *Seeds* suborbicular, estrophiolate.

Leaves unifoliolate ; flowers in axillary and terminal distichous racemes of small cymes, each of which is hidden within a large folded persistent cordate floral leaf, the cymes with many bracteoles :—

Leaflet lanceolate ; flowers 2-3 in. long ; rhachis of inflorescence flexuose :—

Branchlets terete ; floral leaves up to 1 in. long, glabrescent, usually very shortly cuspidate ; lateral nerves of leaflets close, usually more than 8 pairs 1. *strobilifera*.

Branchlets angular ; floral leaves up to 75 in. long, softly hirsute, usually emarginate ; lateral nerves of leaflets distant, usually less than 6 pairs 2. *bracteata*.

Leaflet orbicular, cordate, cuspidate, 2-4 in. in diam. ; flowers

·3-·4 in. long; floral leaves much broader than long, deeply emarginate; rhachis of inflorescence straight 3. *Chapparr.*
 Leaves 3-foliolate:—

Flowers very small, in lax panicles of racemes; leaflets oblanceolate, cuneate, plicate, with strong oblique nerves, 1·5-2·5 in. long; pods oblong, glandular-pubescent, under ·5 in. long 4. *lineata.*
 Flowers fairly large, in subspicate axillary racemes; erect shrubs with scarious bracts and 3-ribbed leaflets:—

Branches prominently triquetrous; bracts linear-lanceolate, ·5-·75 in. long, much exceeding the buds; leaflets oblong-lanceolate, up to 1 ft. long, the ribs not very distinguishable from the other nerves; calyx-lobes white-silky, not glandular, short, the lowest the longest 5. *stricta.*

Branches terete or slightly triquetrous; bracts not exceeding the buds; calyx-lobes linear, elongate; leaflet ribs prominent:—

Leaflets thin, acuminate, glabrous except on the nerves beneath:—

Racemes short, 1·5-2·5 in. long; calyx-lobes white-silky, prominently dotted with black glands as is the almost glabrous under-surface of the leaflets; petiole not or only slightly winged 6. *congesta.*

Racemes long, up to 4 or even 6 in.; calyx-lobes tawny-silky, without glands; under-surface of leaflets villous on the nerves, not or only slightly glandular; petiole winged

7. *semialata.*

Leaflets thick, acute or obtuse, pubescent or tomentose beneath:—

Calyx-lobes and pod densely covered with red glands (black when dry):—

Leaflets obovate, obtuse or subacute, reticulate, grey- or tawny-silky beneath 8. *Grahamiana.*

Leaflets oblanceolate, acuminate, densely softly golden-villous beneath 9. *Wightiana.*

Calyx-lobes covered with hairs springing from yellow glands; pods not glandular; leaflets small, strongly ribbed and nerved and reticulate 10. *Wallichii.*

Flowers in capitate terminal heads; trailing herbs with small ovate acute leaflets, calyx-lobes with hairs on yellow bulbous bases; pod very small, membranous, 1-seeded 11. *nilgheriensis.*

1. FLEMINGIA STROBILIFERA, R. Br.; F. B. I. ii. 227 excl. vars.; W. & A. 243; Wt. Ic. t. 267.

E. Gháts, Hills of Vizagapatam; Deccan, Hills of Kurnool; W. Gháts, Mysore to Malabar and Travancore, up to 3,000 ft.

An erect branching shrub, 4-6 ft. high with white flowers.

2. *FLEMINGIA BRACTEATA*, Wt. Ic. t. 268. *F. strobilifera* var. *bracteata*, Bak. in F. B. I. ii. 227.

W. Gháts, in the Nilgiris, Anamalais and Hills of Malabar, up to 4,000 ft.; Shevaroy Hills of Salem.

An erect branching shrub, 1-3 ft. high, with pink or purple flowers.

3. *FLEMINGIA CHAPPAE*, Ham.; F. B. I. ii. 227.

N. Circars, Sál forests of Ganjam at low levels (Gamble).

An erect shrub with conspicuous floral leaves and white flowers, often gregarious.

4. *FLEMINGIA LINEATA*, Roxb.; F. B. I. ii. 228; W. & A. 242; Wt. Ic. t. 327.

E. Gháts, in the forests of the Upper Godavari (Gamble); W. Gháts, Nilgiri Hills. *vide* DC.

A small erect shrub, with small pinkish flowers.

5. *FLEMINGIA STRICTA*, Roxb. Cor. Pl. t. 248; F. B. I. ii. 228; W. & A. 241; Wt. Ic. t. 329.

E. Gháts, in hill forests from Ganjam to Godavari, up to 2,000 ft.

A tall shrub with triquetrous branches, very large stipules and bracts, and flowers striped with pink, yellow and violet. Vern. Tel. Gudda.

6. *FLEMINGIA CONGESTA*, Roxb.; F. B. I. ii. 228; W. & A. 241; Wt. Ic. t. 390.

N. Circars, Sál forests of Ganjam; Deccan, in Mysore.

An erect shrub, 4 ft. high or higher; flowers streaked with purple and yellow.

7. *FLEMINGIA SEMIALATA*, Roxb. Cor. Pl. t. 249; W. & A. 241 Wt. Ic. t. 326. *F. congesta* var. *semialata*, Bak. in F. B. I. ii. 229.

N. Circars, Hills of Vizagapatam; W. Gháts, in Malabar, Coimbatore, Cochin and Travancore, up to 5,000 ft.

An erect shrub; flowers pink with purple and orange streaks.

8. *FLEMINGIA GRAHAMIANA*, W. & A. 242; F. B. I. ii. 228.

W. Gháts, in the Nilgiri, Anamalai and Pulney Hills and the Hills of Travancore, 4,000 to 7,000 ft.

An erect shrub with red, sticky glands which give a dye (Waras); flowers pink.

9. *FLEMINGIA WIGHTIANA*, Grah.; W. & A. 242. *F. congesta* var. *Wightiana*, Bak. in F. B. I. ii. 229.

N. Circars, Mahendragiri Hill, Ganjam, at 4,000 ft.; W. Ghâts, in the Nilgiri. Pulney and Tinnevely Hills, in dry localities at low levels; Shevaroy Hills in Salem.

An erect shrub, densely golden silky, close to *F. Grahamiana*, but much less glandular.

10. *FLEMINGIA WALLIGHII*, W. & A. 242; F. B. I. ii. 229

W. Ghâts, in Wynaad and Coimbatore, up to 4,000 ft.

An erect shrub with yellow glands and small reticulate leaflets.

11. *FLEMINGIA NILGHERIENSIS*. Wight. *F. vestita* var. *nilgheriensis*, Bak. in F. B. I. ii. 230. *F. procumbens*. Wt. Ic. t. 987.

W. Ghâts, from the Bababudan Hills of Mysore to the Nilgiris and Pulneys, at 4,000 to 7,000 ft.

A trailing plant with many yellow glands and purple flowers.

53. *Dalbergia*, Linn. f.

Trees or shrubs, often climbing. *Leaves* alternate, imparipinnate or rarely 1-foliolate; leaflets alternate, usually 5 or more; stipules usually small, deciduous; stipels 0. *Flowers* small, usually numerous, in simple or paniced axillary or terminal cymes; bracts small, subsistent; bracteoles 2, usually small and deciduous. *Calyx* campanulate; teeth short, distinct, the lowest usually longest. *Corolla* exserted; standard ovate obovate or orbicular; wings oblong, free; keel obtuse, the petals joined at the tip. *Stamens* monadelphous (9 or 10) or isodadelphous (5 and 5), rarely diadelphous (9 and 1), anthers minute, the cells back to back, dehiscing apically. *Ovary* stalked; ovules few; style incurved, short, beardless; stigma small, capitate. *Pod* indehiscent, samaroid and compressed, sometimes thickened, usually reticulate opposite the seed. *Seeds* 1-4, reniform, compressed; hilum small.

Standard erect, wings cuneate, rarely truncate or subhastate at base, keel petals cuneate or hastate; style thick, cylindric, usually short; stamens usually monadelphous;—

Flowers minute; bracteoles usually persistent; inflorescence dichotomously cymose; small, erect or climbing shrubs:—

Pod thickened, reniform-falcate; branchlets ending in spines; flowers in axillary racemes; leaflets 5-9, '4-7 in. long, obovate, obtuse or retuse; seeds 1, rarely 21. *spinosa*.

Pod samaroid; flowers in axillary cymose panicles:—

Pod pubescent, broadly oblong; stem armed, branchlets unarmed; leaflets 11-15, '2-6 in. long, elliptic-oblong, emarginate; seeds 1, rarely 2 or 3 2. *multiflora*.

Pod glabrous, narrowly ovate; branchlets ending in spines; leaflets 7-11, '3 in. long, elliptic, obtuse or retuse; pod ovate, acute at both ends, seed 13. *coromandeliana*.

Flowers small; bracteoles deciduous; inflorescence cymosely paniculate; leaflets few, suborbicular, cuspidate; pod narrowly ligulate, 1-2- or rarely 3-seeded; tree *Sissoo*.

Standard refract or reflexed, wings hastate or sagittate at base, keel petals hastate, style slender; stamens variously arranged:—

All petals with a slender claw; stamens usually monadelphous; standard refract; climbing shrubs:—

Pod thickened, reniform-falcate; leaflets 5-7, emarginate, under 1 in. long; bracteoles obtuse.....4. *candensis*.

Pod samaroid, broadly ligulate; leaflets 3-5 or fewer, abruptly cuspidate and retuse at apex, up to 4 in. long, 2 in. broad; bracteoles subulate 5. *rostrata*.

Pod samaroid, oblong, netted-veined; leaflets 3-5, obtuse or emarginate at apex, up to 2.5 in. long, 1.25 in. wide; bracteoles obtuse6. *rubiginosa*.

Pod samaroid, ovate:—

Leaflets 5-11, cuneate at base, retuse at apex, '75-1.75 in. long, prominently nerved, ferruginous-pubescent beneath when young; pod smooth but reticulate opposite the seeds, shortly stalked7. *congesta*.

Leaflets rounded at base and apex, obscurely nerved:—

Leaflets 7-11, '5-7.5 in. long, shining above, densely rusty-tomentose beneath; stalk of pod .25 in. long...8. *Gardneriana*.

Leaflets 21-31, '5 in. long, elliptic-oblong, rusty-pubescent beneath; pod with .75 in. filiform stalk.....9. *malabarica*.

Pod samaroid, narrowly ligulate; leaflets very many, small, '6-8 in. long, .25 in. wide, linear-oblong, obtuse; pod long-stipitate10. *acaciaefolia*.

All petals except the cuneate standard with a slender claw, standard reflexed:—

Stamens usually monadelphous, 9 or 10; trees :—

Flowers in corymbose panicles fasciated on old wood below the upper leaves or in the axils of older leaves; leaflets orbicular, obtuse or emarginate, curved to the petiole at base; pod usually obtuse at apex with a minute apicule, 7 in. broad; young leaves green 11. *latifolia*.

Flowers in loose single panicles terminal or axillary to leaves of new shoots; leaflets obovate acute, rarely suborbicular or obtuse, more or less cuneate at base; pod acute at apex with a longish apicule, 5 in. broad; young leaves yellowish

12. *sissoides*.

Stamens isodiadelphous, 5 and 5 :—

Standard narrow, obovate-oblong, slightly auricled at base with a rather long claw and not thickened above it; flowers in dense panicles; leaflets 9–13, elliptic, retuse, nerves not prominent; pod short-stipitate, coriaceous, narrowed at both ends, 1–2-seeded; tree 13. *paniculata*. Standard broad, obovate, thickened above the very short claw :—

Tree; leaflets 7–11, ovate-oblong, rarely suborbicular, nerves usually prominent; flowers in loose panicles; pod long-stipitate, oblong, tapering to both ends, 1–3-seeded

14. *lanceolaria*.

Climbing shrub; leaflets 11–13, obovate- or ovate-oblong, obtuse, mucronulate, nerves fairly prominent; pod short-stipitate, oblong, obtuse at apex, 1- rarely 2-seeded

15. *vulabilis*.

1. DALBERGIA SPINOSA, Roxb.; F. B. I. ii. 238; Prain Ann. Calc. x. 35, t. 9.

Coast forests of S. Arcot (Wooldridge); Tuticorin (Wight). A stiff, often climbing shrub with whitish small flowers. Bark blackish-grey, rough; wood in alternate layers of wood and bark tissue.

2. DALBERGIA MULTIFLORA, Heyne; Prain Ann. Calc. x. t. 18. *D. sympathetica*, Nimmo; F. B. I. ii. 234.

W. Ghâts, lower hills from S. Canara to Travancore and Tinnevely.

A large climbing shrub, often with curiously twisted branches bearing spines; flowers white; leaflets pubescent or glabrous.

3. *DALBERGIA COROMANDELIANA*, Prain Ann. Calc. x. 46, t. 21.
W. Gháts, Sivagiri Hills of Tinnevely (Wight).
An erect spinous shrub with very small leaves and sub-acute pod.
4. *DALBERGIA CANDENATENSIS*, Prain. *D. torta*, Grah.; Prain Ann. Calc. x. 54, t. 42. *D. monosperma*, Dalz.; F. B. I. ii. 237.
Coast of Travancore and Malabar, in Mangrove swamps.
A stout climbing shrub with the twigs often twisted into spiral hooks; flowers white.
5. *DALBERGIA ROSTRATA*, Grah.; Prain Ann. Calc. x. 60, t. 36. *D. Championii*, Thw.; F. B. I. ii. 231.
W. Gháts, Tambraparni river (Beddome).
A shrubby climber with cream-coloured flowers, the leaflets cuspidate with a retuse tip.
6. *DALBERGIA RUBIGINOSA*, Roxb.; Cor. Pl. t. 115; F. B. I. ii. 232; W. & A. 265; Prain Ann. Calc. x. 63, t. 40.
N. Circars, in the hills (*vide* Roxburgh); Mangalore in S. Canara (Wight); Coimbatore Hills, at 4,000 ft. (A. W. Lushington, Fischer).
A large climbing shrub.
7. *DALBERGIA CONGESTA*, Grah.; F. B. I. ii. 232, excl. syn. *D. Gardneriana*; W. & A. 265; Prain Ann. Calc. x. 66, t. 43.
W. Gháts, in the Nilgiri Hills, at 5,000 ft.
A large climbing shrub with white flowers and 1-seeded coriaceous pod.
8. *DALBERGIA GARDNERIANA*, Benth.; Prain Ann. Calc. x. 66, t. 44. *D. congesta*, Bak. in F. B. I. ii. 232 *in part*.
W. Gháts, in the Nilgiri Hills, at 5,000 to 7,000 ft.
A climbing shrub with white flowers, rusty-tomentose branchlets and 1-seeded thin pod.
9. *DALBERGIA MALABARICA*, Prain Ann. Calc. x. 67, t. 46. *D. tamarindifolia* var. *pubescens*, Bak. in F. B. I. ii. 235.
W. Coast, in dry forests of S. Canara, S. Travancore and Tinnevely.
A climbing shrub with white flowers and 1-seeded ovate-oblong thinly coriaceous pod.
10. *DALBERGIA ACACIAEFOLIA*, Dalz.; Prain Ann. Calc. x. 68, t. 47. *D. tamarindifolia* var. *acaciaefolia*, Bak. in F. B. I. ii. 235.

W. Coast, in dry forests in S. Canara and Tinnevely.

A woody climbing shrub or small tree with white flowers and very thin 1-2-seeded pod.

11. *DALBERGIA LATIFOLIA*, Roxb. Cor. Pl. t. 113; Fl. Br. Ind. ii. 231; W. & A. 264; Prain Ann. Calc. x. 80, t. 62.

N. Circars, scattered in hill forests, more common on the Godavari; Deccan, in forests in all Districts; W. Ghâts, in dry forests as far South as the Anamalais. Blackwood or Rosewood.

A large deciduous tree in good soil, a small one in poor soil. Bark thick, grey; wood extremely hard, the heartwood dark purple with black streaks, used chiefly for furniture but also for agricultural purposes. Flowers white. Vern. *Hind.* Sitsal; *Ur.* Sissua; *Tel.* Jitegi; *Tam.* Eravadi.

12. *DALBERGIA SISSOIDES*, Grah.; W. & A. 265; Prain Ann. Calc. x. 81, t. 63. *D. latifolia* var. *sissoïdes*, Bak. in F. B. I. ii. 231. *D. latifolia*, Wt. Ic. t. 1156; Bedd. Fl. t. 24.

W. Ghâts, from the Mysore Hills southwards to the Pulneys and Hills of Travancore, at rather low levels but occasionally up to 5,000 ft. Malabar Blackwood.

A large deciduous tree, giving a fine dark-purple heartwood similar to the timber of *D. latifolia*, of which it seems to be the moist forest form. Flowers white. Vern. *Tam.* Thothagatti; *Mal.* Eetti, Vitti, Karitti.

13. *DALBERGIA PANICULATA*, Roxb. Cor. Pl. t. 114; F. B. I. ii. 236; W. & A. 265; Prain Ann. Calc. x. 87, t. 68.

All dry Districts, in deciduous forests, up to 1,500 ft.

A conspicuous tree from its smooth grey bark. The wood is rather soft, yellowish-white, in concentric bands of wood and bast tissue, and of no value, and so the tree is often left standing alone in forests which have been worked for timber and fuel. Flowers white or bluish-white. Vern. *Hind.* Passi; *Ur.* Dhupi; *Tel.* Patsaru; *Tam.* Panni vagei *Mal.* Vetta tholi.

14. *DALBERGIA LANCEOLARIA*, Linn f.; F. B. I. ii. 235. *D. frondosa*, Roxb.; W. & A. 266 in part; Wt. Ic. t. 266; Prain Ann. Calc. x. 93, t. 76.

N. Circars and Deccan, scarce, in dry forests in hilly country; W. Ghâts, from Canara to the Pulneys and Travancore, at low elevations, in grassy forests.

A large and pretty deciduous tree with grey smooth bark and white moderately hard wood of no great value. Flowers pinkish or bluish-white. Vern. *Tel.* Yerra patsaru; *Tam.* Erigei.

15. *DALBERGIA VOLUBILIS*, Roxb. Cor. Pl. t. 191; F. B. I. ii. 235; W. & A. 265; Prain Ann. Calc. x. 100, t. 85.

All dry Districts, in deciduous forests.

A large woody climber with light brown hard wood, the flowers pale blue.

Dalbergia Sissoo, Roxb., a tree of river beds in the Subhimalayan tract of N. India and valuable for its hard dark brown wood used for furniture and Ordnance purposes, is often planted in S. India and may sometimes be found run wild.

54. *Pterocarpus*, Linn.

Trees. *Leaves* alternate, imparipinnate; leaflets alternate, usually coriaceous; stipules small, deciduous; stipels 0. *Flowers* yellowish, in terminal or axillary racemes or panicles; bracts small, deciduous; bracteoles 2, caducous. *Calyx*-tube campanulate, somewhat curved; teeth short, the 2 upper often subconnate. *Corolla* exserted, the petals all long-clawed; standard orbicular, crisped at the margin; wings oblique, the margins also crisped; keel-petals oblique, smaller, slightly connate. *Stamens* 10, the filaments connate in a tube split above, sometimes split in 2 bundles of 5, sometimes the vexillary filament free; anthers uniform. *Ovary* sessile or stalked; ovules 2-6; style filiform, incurved, beardless; stigma capitate. *Pod* orbicular, compressed, with a broad wing, the style turned down towards the stipe. *Seeds* 1 rarely 2, oblong or subreniform; hilum small.

Flowers axillary, in simple or sparingly branched racemes; leaflets usually 3, rarely 4-5, broadly ovate or nearly orbicular, slightly emarginate; pod with .35 in. long stipe, concavely curved between the stipe and style... 1. *santalinus*. Flowers in terminal panicles; leaflets 5-7 from elliptic-oblong, obtuse emarginate or even bilobed at apex to ovate acuminate; pod with .2 in. long stipe, convexly curved between the stipe and style

2. *Marsupium*.

1. *PTEROCARPUS SANTALINUS*, Linn. f.; F. B. I. ii. 239, W. & A. 266; Bedd. Fl. t. 22.

Deccan, in the Hills of Cuddapah, S. Kurnool, N. Arcot and Chingleput, up to 1,500 ft. Red Sanders.

A very pretty and valuable moderate-sized tree, found only on a limited area. Bark blackish-brown deeply cleft into rectangular plates; wood extremely hard, dark claret red to nearly black, used for house-posts, carvings and as a dye.

Vern. *Tel.* Yerra chandanum.

2. *PTEROCARPUS MARSUPIUM*, Roxb. Cor. Pl. t. 116; F. B. I. ii. 239; W. & A. 266; Bedd. Fl. t. 21.

All forest Districts. chiefly in deciduous forest, up to 4,500 ft.

A large deciduous tree, one of the most valuable in the Madras forests. Bark thick, grey, with vertical cracks. Wood very hard, yellowish-brown with darker streaks, used for building, furniture, agricultural and railway purposes. It gives a red gum-resin "Kino," used in medicine. Vern. *Hind.* Bijasal; *Ur.* Byása; *Tel.* Yegi; *Tam.* Vengai; *Kan.* Honné; *Mal.* Venga.

Var. *canus*, Gamble. Branchlets, leaves beneath, calyx and rhachis softly white-silky pubescent; leaves much smaller; flowers small, in shorter racemes.

Hills of the Kistna District (Beddome).

55. *Pongamia*, Vent.

A tree. *Leaves* alternate, imparipinnate; leaflets opposite; stipules small; stipels 0. *Flowers* in lax axillary racemes, the flowers in fascicles of 2-4 on the rhachis; bracts small, caducous; bracteoles minute. *Calyx* campanulate, truncate; teeth obsolete. *Corolla* much exserted; standard suborbicular with curved folds above the claw; wings obliquely oblong, slightly adnate above the claws to the obtuse keel petals which are joined near the tip. *Stamens* 10 monadelphous, the vexillary stamen free below and above; anthers uniform. *Ovary* subsessile; ovules 2; style incurved, beardless; stigma capitate. *Pod* obliquely oblong, attenuated at both ends, curved at apex, thick, more or less compressed, indehiscent. *Seed* 1, reniform, rather thick; hilum small.

PONGAMIA GLABRA, Vent.; F. B. I. ii. 240; W. & A. 262; Wt. Ic. t. 59; Bedd. Fl. t. 177.

Coast forests and on tidal river banks; inland chiefly along

streams and rivers in most Districts, in the hills up to 3,000 ft. Often planted in gardens and avenues.

A moderate-sized nearly evergreen tree with 5 or more rather large ovate acuminate leaflets and pinkish-white flowers. Bark thick, greyish-brown, tubercled; wood white, moderately hard, used for cart-wheels and other purposes. The seeds give an oil, used for burning and in medicine. Vern. *Hind. Karanj; Ur. Koranjú; Tel. Kanuga; Tam. Ponga.*

56. Derris, Lour.

Climbing shrubs, rarely erect trees. *Leaves* alternate, imparipinnate; leaflets opposite; stipules small; stipels usually 0. *Flowers* in fascicles, rarely solitary, on the rhachis of axillary or terminal racemes or panicles; bracts small, caducous; bracteoles ovate or orbicular, small, often caducous. *Calyx*-tube campanulate, nearly truncate; teeth very short. *Corolla* much exerted; standard obovate or orbicular; broad, not auricled and rarely callose; wings obliquely oblong, often spurred above the long claw, slightly adnate to the incurved obtuse keel. *Stamens* usually monadelphous, the vexillary filament free below, rarely quite free; anthers uniform, versatile. *Ovary* sessile or shortly stipitate, few-ovuled; style incurved; stigma capitate. *Pod* usually thin, sometimes thickened, indehiscent, oblong or obliquely orbicular, winged along the upper or both sutures. *Seeds* solitary or few, compressed, reniform or orbicular; hilum small.

Pod winged along the upper suture only:—

Pod narrow, ligulate, acute at both ends, up to 4 in. long and 5-seeded; leaflets many, elliptic-oblong, oblong-lanceolate or the end one obovate or oblanceolate, coriaceous, shining above, 1-2 in. long 1. *scandens*.

Pod broad, obliquely ovate or orbicular, obtuse at both ends, 1-1.5 in. long, 1 in. broad, 1-2-seeded; leaflets usually 5-7, ovate, acuminate, subcoriaceous, dull, 2.5-4 in. long 2. *uliginosa*

Pod winged on both sutures:—

Wings of pod narrow, the pods more or less flattened:—

Pods usually pointed at both ends:—

Pods glabrous, 1-3-seeded, up to 3.5 in. long, 1 in. broad, the tip hooked; leaflets oblong-lanceolate or -oblanceolate, up to 4 in. long, .5-1.5 in. broad..... 3. *canarensis*.

Pods ferruginous-tomentose, 1-2 in. long, .5-6 in. broad, the

lower wing very narrow, the apex sometimes obtuse, slightly hooked, the few veins prominent; leaflets 5-7, elliptic-ovate, coriaceous, greyish-green when dry, 1-1.5 in. or more long, .75-1 in. broad 4. *Bentharii*.

Pods obtuse at both ends, especially at base, ferruginous-tomentose, about 2 in. long, 1 in. broad; leaflets 5-7, elliptic-obovate, abruptly obtusely acuminate, shining above, coriaceous, up to 4 in. long by 2 in. broad 5. *brevipes*.

Wings of pod broad, the pod flat, glabrous, reticulately veined, the apex acute and hooked:—

Pod 2-4 in. long, 1-1.5 in. broad, ovate or oblong, seeds 1-3; flowers small, monadelphous, in lax panicles; leaflets 5-7, ovate or lanceolate, obtusely and often emarginately acuminate, coriaceous, 2-2.5 in. long 6. *Heyneana*.

Pod 4-5 in. long, 1-1.25 in. broad, oblong, 1-3-seeded; flowers large for the genus, diadelphous, in long panicles of racemes; leaflets 7-9, ovate- or lanceolate-oblong, rounded at base, obtusely acuminate at apex, reticulate, coriaceous, 3-4.5 long, 1.5-2 in. broad 7. *eulata*.

1. DERRIS SCANDENS, Benth.; F. B. I. ii. 240. *Dalbergia scandens*, Roxb. Cor. Pl. t. 192; W. & A. 264; Wt. Ic. t. 275.

Almost all forest Districts, from the N. Circars southwards, chiefly in open places.

A large climbing shrub with white or pink flowers on drooping branches, the pod sometimes up to 5-seeded.

Vern. *Tel.* Nalla tige; *Tam.* Tekil.

2. DERRIS ULIGINOSA, Benth.; F. B. I. ii. 241. *Pongamia uliginosa*, DC.; W. & A. 262.

Sea-coast forests and tidal river banks on both sides of the Peninsula.

A large evergreen climbing shrub with rose-coloured flowers and rather large leaflets.

3. DERRIS CANARENSIS, Bak. in F. B. I. ii. 246. *D. oblonga*, Benth.; F. B. I. ii. 242; Trim. Fl. Ceyl. t. 29.

W. Coast, in evergreen forest and along backwaters.

A large climbing shrub with pink flowers.

4. DERRIS BENTHAMII, Thw. *D. paniculata*, Benth.; F. B. I. ii. 242. *D. Wightii*, Bak. in F. B. I. ii. 247.

W. Gháts, in the Sivagiri Hills, Tinnevely (Wight).

A slender glabrous climber.

5. DERRIS BREVIPES, Bak. in F. B. I. ii. 244.

W. Gháts, from the Nilgiris to the Hills of Travancore, up to 5,000 ft., common.

A large climbing shrub with red flowers, the pods very little known.

6. DERRIS HEYNEANA, Benth.; F. B. I. ii. 244.

W. Gháts, Hills of Travancore, up to 5,000 ft.

A large climber with small rose-red flowers in large panicles.

7. DERRIS EUALATA, Bedd. Ic. 42, t. 186, doubtfully of F. B. I. ii. 244. *D. platyptera*, Bak. in F. B. I. ii. 245.

W. Gháts and W. Coast, from S. Canara and Coorg to Travancore, at low levels.

A very large climbing shrub, with rather large white flowers and broadly-winged flat pods. The flowers solitary and not fascicled on the rhachis, the diadelphous stamens and reticulate leaves easily characterize this species.

57. *Sophora*, Linn.

Trees or shrubs. *Leaves* imparipinnate; leaflets opposite or subopposite; stipules lanceolate, deciduous; stipels setaceous or 0. *Flowers* showy, in terminal racemes or panicles; bracts linear, caducous; bracteoles 0. *Calyx*-tube widely campanulate, oblique at mouth; teeth short, deltoid. *Corolla* much exserted, the petals clawed; standard oblong obovate or orbicular; wings oblong, obtuse, sagittate or hastate above the claw; keel petals obtuse, cohering, sometimes with a mucro. *Stamens* 10, free; anthers versatile. *Ovary* stipitate, many-ovuled; style incurved; stigma terminal, minute. *Pod* moniliform, dehiscent or indehiscent, the joints turgid, sometimes with 4 wings. *Seeds* obovoid or globose; strophiole 0.

Pod not winged; standard narrow; attenuate into a broad claw:—

Pod velvety, 1-6-seeded, not much constricted between the seeds; standard obovate; leaflets more than 21, close, elliptic-oblong, subacute, mucronate, .75-1.25 in. long, densely golden-silky beneath; seeds white.....1. *glauca*.

Pod pubescent, 2-4-seeded, much constricted between the seeds; standard oblong; leaflets 11-15, distant, lanceolate, long-acuminate, 2-3 in. long, slightly brown silky beneath; seeds red2. *Wrightii*.

Pod crisply 4-winged, especially opposite the seeds, much narrowed between them; standard orbicular with a slender claw; leaflets more than 19, elliptic, obtuse or emarginate, .75-1.25 in. long, prominently reticulate above, very slightly pubescent beneath.....3. *interrupta*.

1. *SOPHORA GLAUCA*, Lesch.; F. B. I. ii. 249; W. & A. 179; Wt. Ic. t. 979. *Edwardsia maderaspatana*, Wt. Ic. t. 1054, *except the pods*.

N. Circars, Mahendragiri Hill in Ganjam, at 3,000 ft. (Fischer and Gage); W. Gháts, common on open downs in the Nilgiri Hills, at 5,000 to 8,000 ft.; Hills of Travancore at Peermade, etc.; Shevaroy Hills of Salem.

A pretty shrub with white pink or purplish flowers.

2. *SOPHORA WIGHTII*, Bak. in F. B. I. ii. 250. *S. heptaphylla*, Wt. Ic. t. 1155, *not of Linn.*

W. Gháts, in the Nilgiri Hills, at about 4,000 ft.

A small tree with yellow flowers.

3. *SOPHORA INTERRUPTA*, Bedd. Ic. t. 165; F. B. I. ii. 251. *Edwardsia maderaspatana*, Wt. Ic. t. 1054, *Pods only*.

Deccan, Hills of Cuddapah and N. Arcot, at 2,500-3,000 ft. (Wight, Beddome).

A large shrub or small tree, with corky bark, yellow flowers and curiously winged and jointed pod.

58. *Calpurnia*; E. Mey.

Shrubs or trees. *Leaves* imparipinnate; leaflets many, opposite; stipules small; stipels 0. *Flowers* yellow, in racemes, axillary or paniced at the ends of the branchlets; bracts very small; bracteoles 0. *Calyx*-tube broadly campanulate, the teeth short and broad, the 2 upper subconnate. *Corolla* much exserted, the petals clawed; standard suborbicular, erect or recurved; wings falcate-oblong; keel petals incurved, obtuse, cohering at the back. *Stamens* 10, free; anthers versatile. *Ovary* stalked, linear, many-ovuled; style subulate, incurved; stigma capitate. *Pod* linear, flat, membranous, indehiscent, with a narrow wing on the dorsal suture, many-seeded. *Seeds* oblong, compressed, transverse; strophiole 0.

CALPURNIA AUREA, Bak. in F. B. I. ii. 251. *Virgilia aurea*, Lam.; W. & A. 179.

Deccan, in the Hills of Mysore and Coimbatore and the

Denkincottah Hills of Salem, up to 5,000 ft.; W. Gháts, in the Courtallum Hills of Tinnevely.

A large showy shrub with yellow flowers, leaves with many ovate oblong leaflets 1-1.5 in. long, and flat pods about 3 in. long and .5 in. broad with 3-6 seeds.

59. *Ormosia*, Jacks.

Erect trees. *Leaves* imparipinnate; leaflets opposite; stipules small; stipels usually 0. *Flowers* in terminal panicles or in racemes from upper leaf-axils; bracts small; bracteoles minute, linear. *Calyx*-tube shortly campanulate, deeply cleft, the upper teeth the shortest. *Corolla* little exerted, the petals with short claws; standard suborbicular; wings oblong, often more or less sagittate at base; keel petals free, somewhat incurved. *Stamens* 10, free, unequal; anthers versatile. *Ovary* subsessile, 2-many-ovuled; style subulate, involute; stigma oblique. *Pod* thick, often woody, oblong or elongate, dehiscent, not winged. *Seeds* obovate or oblong, shining, the testa scarlet or brown-red, sometimes arillate.

ORMOSIA TRAVANCORICA, Bedd. Fl. t. 45; F. B. I. ii. 253.

W. Gháts, from S. Canara and Mysore to the Anamalais and the Hills of Travancore and Tinnevely, up to 3,000 ft., in evergreen forests, scattered and not common.

A lofty tree with stem unbranched for a considerable height, grey smooth bark and white moderately hard wood. The flowers are purple striped with green, the pod red with one red seed and the leaves have 7-9 ovate obtusely cuspidate coriaceous leaflets 2-3 in. long. Vern. *Tam.*, *Mal.* Malei manchádi.

Virgilia capensis, Lam., is a pretty Cape shrub with silvery leaves and pinkish flowers, cultivated in gardens on the Nilgiri Hills.