BENGAL PLANTS

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BENGAL PLANTS

A LIST OF THE PHANEROGAMS, FERNS AND FERN-ALLIES INDIGENOUS TO, OR COMMONLY CULTIVATED IN, THE LOWER PROVINCES AND CHITTAGONG

WITH DEFINITIONS OF THE NATURAL ORDERS AND GENERA, AND KEYS TO THE GENERA AND SPECIES

BOOK NO.
379

BY

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VOL. II.

APOCYNACEÆ—SELAGINELLACEÆ

Calcutta

1903

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IV. BENGAL PLANTS.

A.—PHANEROGAMIA.

III.—COROLLIFLORÆ.

Sepals often connate in a usually persistent calyx, more or less adnate to the ovary or free; free sepals or calyx-lobes as many as petals, or, by union of adjacent lobes, fewer than petals. *Petals* almost always connate in a corolla, the elements of which are 1-seriate, usually 4–5, rarely fewer or 6 or more, very rarely (*Sapotaceæ*) 2-seriate. *Stamens* 1-seriate, as many as petals or fewer, sometimes 2-seriate and twice as many as petals, very rarely (*Styraceæ* and *Ebenaceæ*) indefinite; filaments usually more or less adnate to corolla-tube, rarely free within the corolla, very rarely adnate to pistil. *Carpels* as many as petals, or often fewer, sometimes solitary, always more or less connate, if the carpels themselves be free the styles are united at base or apex, if the styles be free the carpels are connate; ovary in a 2- or more-carpellary pistil, usually with as many cells as the constituent carpels, less often with twice as many cells by development of accessory dissepiments, in either case with 1- or more-ovuled placentas on the inner angle or occasionally on the dissepiments some distance from the inner angle, sometimes with only one cell and then with as many 1- or more-ovuled parietal placentas as the constituent carpels or with a basal central placenta; ovary in a mono-carpellary pistil usually oblique, with the generally 1-ovuled placenta excentric.

Order LXXXIII. APOCYNACEÆ.

Shrubs, twining or erect, rarely trees. *Leaves* opposite or whorled, rarely alternate, entire; stipules 0. *Flowers* hermaphrodite, regular, in terminal or axillary cymes; bracts small. *Sepals*

5, rarely 4, connate in an inferior calyx, imbricate, often glandular at the base within. *Petals* 5, rarely 4, connate in a rotate or hypocrateriform corolla; lobes spreading, contorted, and often twisted in bud, rarely valvate. *Stamens* 5, rarely 4, on the tube, throat, or mouth of the corolla; filaments usually short; anthers oblong, linear or sagittate, conniving; connective sometimes adnate to stigma; cells 2, sometimes produced downwards as empty spurs; dehiscence longitudinal; pollen granular. *Disk* annular, cupular or glandular, sometimes occluding the ovary, occasionally absent. *Carpels* 2, connate in a 1-celled ovary with 2 parietal, or a 2-celled ovary with 2 axial placentas, or only partially connate or free; style simple, or styles 2, free at the base but united above, always thickened at the top; stigma 2-fid, acute or obtuse; ovules in each carpel 2 or few or many, and then 2–many-seriate, very rarely solitary. *Fruit* of a single dry or fleshy drupe, berry or samara; or of 2 drupes, berries or follicles. *Seed* polymorphous, often winged or tipped by a tuft of long, silky hairs (coma); albumen hard, fleshy, or scanty or 0; embryo straight; cotyledons flat, concave, convolute, or twisted; radicle usually superior.

*Anthers free from the stigma, always included within corolla, the anther-cells with rounded bases :—[p. 665]

Ovary of two wholly united carpels; fruit large, either indehiscent and pulpy, or (rarely) a capsule; seeds without wings or coma; corolla-lobes always overlapping to the left :—

Corolla funnel-shaped; ovary 1-celled; fruit deniscent, a 2-valved capsule; seeds with fleshy albumen; flowers large, showy **Allamanda.**

Corolla salver-shaped; fruit indehiscent, fleshy or pulpy within :—

Ovary 1-celled, with parietal ovules; seeds without albumen **Willughbeia.**

Ovary 2-celled, with axial ovules; seeds with fleshy albumen :—

Unarmed shrubs, usually climbing; mouth of corolla with a ring of lobed scales; ovules many in each cell of ovary **Melodinus.**

Armed shrubs, usually erect; mouth of corolla naked; ovules 1–4 in each cell of ovary ..... **Carissa.**

Ovary of two carpels, usually united only by the style, but occasionally also united at their base (*Rauwolfia*) or throughout (*Thevetia*); if united throughout the fruit indehiscent but not pulpy within :—

Leaves alternate; corollas large, showy; lobes overlapping to the left:—

Corolla funnel-shaped; fruit indehiscent:—

Calyx glandular within; fruit somewhat angular, composed of two almost completely united ripe carpels with hard, 2-celled endocarp; seeds in each cell 1–2; flowers yellow.....**Thevetia.**

Calyx not glandular within; fruit of two separate, or sometimes (by abortion) of a single ellipsoid ripe carpel, with a tough, fibrous, 1–2-seeded endocarp; flowers white ...**Cerbera.**

Corolla salver-shaped; calyx not glandular within; fruit of two divaricate, coriaceous, dehiscent follicles; seeds winged; flowers yellowish white or yellowish red .....**Plumeria.**

Leaves opposite or whorled; corolla in all salver-shaped:—

Calyx not glandular within:—

Fruit indehiscent, drupaceous; seeds few, without wings or coma:—

Ripe carpels 1-seeded, more or less united below; corolla-lobes overlapping to the left; leaves almost always whorled **Rauwolfia.**

Ripe carpels 1–2-seeded, free, one carpel sometimes abortive; corolla-lobes overlapping to the right; leaves opposite **Kopsia.**

Fruit dehiscent, of two slender, free, several-seeded follicles; corolla-lobes overlapping to the left:—

Ovules in each carpel 6 or more in two rows; seeds subcylindric, truncate at both ends; leaves opposite; *stigma plumose*.....**Vinca.**

Ovules very many, in several rows in each carpel; seeds ciliate at both ends; leaves whorled .....**Alstonia.**

Calyx glandular within; fruit follicular:—

Follicles few-seeded, coriaceous, sometimes hardly dehiscent; seeds embedded in pulp, without wings or coma; corolla-lobes overlapping to the left .....**Tabernæmontana.**

Follicles many-seeded, slender, woody; seeds not embedded in pulp, tipped with a deciduous coma; corolla-lobes overlapping to the right .....**Holarrhena.**

*Anthers conniving in a cone round the top of the style and attached to it by a point on the connective, the anther-cells produced downward into a subulate empty spur; ovary of two carpels united only by the style, rarely (*Parsonsia*, *Vallaris*) connate throughout in flower; fruit always of two follicles; seeds always comose at one or both ends:—[p. 664]

†Anthers more or less exserted; corolla rotate or salver-shaped; leaves opposite:—[p. 666]

Mouth of corolla with a ring of scales; corolla either rotate or salver-shaped; lobes overlapping to the left; carpels free except at the styles; erect shrubs or small trees.....**Wrightia.**
Mouth of corolla naked; carpels connate or subconnate in flower; climbing shrubs :—
Corolla rotate; lobes overlapping to the right; connective thickened at the back.....**Vallaris.**
Corolla salver-shaped; lobes subvalvate; connective not thickened **Parsonsia.**
†Anthers included; corolla-lobes overlapping to the right :—[p. 665]
Mouth of corolla with a ring of scales; corolla funnel-shaped :—
Erect shrubs; lobes of corolla not tailed; follicles erect; leaves whorled.....**Nerium.**
Spreading or climbing shrubs; follicles spreading; leaves opposite :—
Lobes of corolla tailed .....**Strophanthus.**
Lobes of corolla not tailed.....**Roupellia.**
Mouth of corolla naked; leaves opposite :—
Corolla funnel-shaped, very large, 3–5 in. long; calyx with leafy segments .....**Beaumontia.**
Corolla salver-shaped :—
Corolla very large, 2–3 in. wide; lobes sharply twisted to the left.....**Chonemorpha.**
Corolla medium or small, 1 in. wide or less :—
Lobes of medium corolla nearly straight; ovary completely or partially hidden in the disk; seeds not beaked **Aganosma.**
Lobes small, corolla sharply twisted to the left in bud; seeds beaked :—
Ovary hidden in the cup-shaped disk; tips of corolla-lobes not deflected .....**Anodendron.**
Ovary free from the 5-lobed disk; tips of corolla-lobes deflected .....**Ichnocarpus.**

540. **Allamanda** Linn.

Glabrous or pubescent shrubs often climbing, or small trees; *leaves* whorled or opposite. *Flowers* large, yellow or violet, in few-flowered, lax, terminal racemes. *Sepals* connate in a 5-partite calyx. *Petals* 5, connate in a funnel-shaped corolla; tube cylindric below, suddenly enlarged to a campanulate throat, with a ring of ciliate scales or long ciliæ; lobes wide, contorted to the left. *Stamens* 5, adnate to throat of corolla; filaments very short;

anthers lanceolate, acuminate, with shortly sagittate base. *Disk* thick, fleshy, obscurely 5-lobed. *Carpels* 2, connate in a 1-locular ovary, with 2 parietal placentas; ovules on each placenta 2- or more-seriate; style filiform; stigma thick, base dilated, annular, apex conic, 2-lobed. *Fruit* an ovate, compressed, spinescent capsule, dehiscing by 2 valves along the placentas. *Seeds* imbricate, compressed, with membranous or winged margin; albumen fleshy; cotyledons broad.

1200. ALLAMANDA CARTHARTICA Linn.; E. D. A. 762.
Planted in gardens in most of the provinces; occasionally naturalised in C. and E. Bengal.
A climbing shrub. *Beng.* Har-kakra.

541. Willughbeia Roxb.

Glabrous shrubs, often climbing by peduncles becoming cirrhose; *leaves* opposite, short-petioled. *Flowers* in axillary cymes. *Sepals* connate in a short, 5-lobed calyx. *Petals* 5, connate in a salver-shaped corolla; tube nearly glabrous within; throat naked or with fleshy glands alternating with the lobes; lobes overlapping to the left, nearly straight in bud. *Stamens* 5, included in corolla-tube; filaments very short; anthers ovate or lanceolate; cells rounded at the base. *Disk* 0. *Carpels* 2, connate in a 1-celled ovary; ovules numerous, many-seriate, on 2 parietal placentas; style short, with obconic or urceolate apex; stigma curved or columnar. *Fruit* a large globose or ovoid, many-seeded berry, with a hard pericarp. *Seeds* embedded in pulp, ellipsoid; albumen 0; cotyledons thick.

1201. WILLUGHBEIA EDULIS Roxb.; F. I. ii. 57; F. B. I. iii. 623; E. D. W. 88.
Chittagong.
An immense climber with long, branched tendrils. *Beng.* Luti-am.

542. Melodinus Forst.

Evergreen shrubs, erect or climbing; *leaves* opposite. *Flowers* in terminal and axillary cymes, white or pale-pink, usually 5-merous, rarely 4-merous. *Sepals* connate in a 5-partite calyx, eglandular within. *Petals* 5, connate in a salver-shaped corolla; throat with thick, lobed or cleft scales; lobes overlapping to the left. *Stamens* 5, rarely 4; anthers included subsessile, lanceolate;

cells rounded at the base. *Disk* 0. *Carpels* 2, connate in an acute, 2-celled ovary; ovules numerous in each cell; style short; stigma thick, 2-fid. *Fruit* a globose berry, with hard or leathery pericarp. *Seeds* numerous, embedded in pulp; albumen fleshy; cotyledons thin.

1202. MELODINUS MONOGYNUS Roxb.; F. I. ii. 56; F. B. I. iii. 629; E. D. M. 435.

N. Bengal; Cooch Behar.

A very large climber. *Vernac.* Sandul kon.

543. Carissa Linn.

Much-branched, usually erect, spiny shrubs; *leaves* small, coriaceous, opposite. *Flowers* in terminal and axillary, peduncled, 3-chotomous cymes. *Sepals* connate in a 5-partite calyx, with or without glands inside; lobes acute. *Petals* 5, connate in a corolla, with cylindric tube; throat naked; lobes overlapping to the right. *Stamens* 5, adnate to top of tube, included; anthers lanceolate; cells rounded at the base. *Disk* 0. *Carpels* 2, connate in a 2-celled ovary; ovules in each cell 1–4, rarely more; style filiform; stigma spindle-shaped or columnar, minutely 2-fid. *Fruit* an ellipsoid or globose berry, 2-celled or, by abortion, 1-celled. *Seeds* usually 2, peltately attached to the septum; albumen fleshy; cotyledons ovate.

Leaves shining above :—

Tips of leaves always rounded or obtuse; leaves always glabrous on both surfaces; drupe ellipsoid, ·5–1 in. long; spines stoutish; a large shrub or small tree ..... *Carandas.*

Tips of leaves almost always acute, mucronate, or apiculate, very rarely obtuse; usually finely puberulous or pubescent beneath; drupe subglobose, ·25 in. long; spines slender; small shrubs :—

Leaves glabrous or finely puberulous beneath, as are the branches and cymes ..... *spinarum.*

Leaves beneath, branches and cymes pubescent *spinarum* var. *hirsuta.*

Leaves dull above, glabrous on both surfaces; drupe ellipsoid, ·3 in. long; a small shrub..... *paucinervia.*

1203. CARISSA CARANDAS Linn.; F. I. i. 687; F. B. I. iii. 630; E. D. C. 596.

Cultivated in most of the provinces.

A large shrub or small gnarled tree. *Hind.* Karanda; *Beng.* Karamcha; *Uriya* Kendakeri, kerendo kuli.

1204. CARISSA SPINARUM A. DC.; F. B. I. iii. 631. *C. diffusa* F. I. i. 689.

W. Bengal; Behar; Chota Nagpur.

A small, suberect shrub. *Hind.* Karanda; *Uriya* Auka kuli.

1204/2. Var. HIRSUTA F. B. I. iii. 631. *C. villosa* F. I. i. 690.

Chota Nagpur.

A small shrub.

1205. CARISSA PAUCINERVIA A. DC.; F. B. I. iii. 631.

Behar.

A small, suberect shrub.

544. Thevetia Juss.

Glabrous shrubs or small trees; *leaves* alternate, 1-nerved, or with slender nerves spreading from a strong midrib. *Flowers* large, yellow, in few-flowered terminal cymes. *Sepals* connate in a 5-partite calyx, the base glandular within; lobes acute, spreading. *Petals* 5, connate in a funnel-shaped corolla; tube cylindric below, swelling abruptly into a campanulate throat; scales at top of tube pilose, hiding the anthers; lobes broad, overlapping to the left. *Stamens* 5, adnate to top of tube; anthers small, lanceolate; cells obtuse at base. *Disk* 0. *Carpels* 2, connate in a more or less 2-lobed, 2-celled ovary; ovules 2 in each cell, placentas prominent; style filiform; stigma disciform, thick, with a thick, short, 2-lobed central tip. *Fruit* a drupe, broader than long, compressed at right-angles to septum; endocarp hard, 2-locular; placentas accrescent, 2-lamellate, dividing each cell into 2 1-seeded chambers. *Seeds* broad, with a thin or almost winged margin; testa thickly membranous; albumen 0; cotyledons fleshy, suborbicular, compressed.

1206. THEVETIA NERIIFOLIA Juss.; E. D. T. 410.

In gardens in all the provinces.

A large shrub or small tree. *Hind.* Pila kunér; *Beng.* Kokla-phul, haldi korubi; *Santal.* Berenjo.

545. Cerbera Linn.

Small, glabrous trees; *leaves* elongated, alternate, nerves slender, parallel, spreading from a strong midrib. *Flowers* large,

white or red, in terminal cymes. *Sepals* connate in a 5-partite calyx, not glandular within; lobes obtuse or acute, long. *Petals* 5, connate in a funnel-shaped corolla; tube short, cylindric; throat ribbed within or with adnate, linear, pubescent scales; lobes broad, overlapping to the left. *Stamens* 5, included; anthers lanceolate, apiculate; cells rounded at the base. *Disk* 0. *Carpels* 2, distinct; style filiform, top dilated; stigma 2-lobed; ovules 4 in each carpel, on the faces of thickened placentas. *Fruit* of 1, rarely 2, globose, ovoid or ellipsoid, 1–2-seeded carpels; pericarp thick, fibrous and woody. *Seeds* broad, compressed, peltately affixed; albumen 0; cotyledons thin; radicle very short.

1207. CERBERA ODOLLAM Gaertn.; F. I. i. 692; F. B. I. iii. 638.
Sundribuns; Chittagong, coast.
A large shrub or small tree. *Beng.* Dâkúr.

546. Plumeria Linn.

Erect trees with very thick branches; *leaves* elongated, alternate; nerves horizontal, parallel, spreading from a strong midrib. *Flowers* large, in terminal, 2–3-chotomous cymes; bracts many, broad, deciduous. *Sepals* connate in a small 5-fid calyx; tube not glandular within; lobes wide, obtuse. *Petals* 5, connate in a salver-shaped corolla; throat naked; lobes overlapping to the left, or occasionally to the right. *Stamens* 5, adnate near base of tube; anthers obtuse; cells rounded at the base. *Disk* 0, or lining calyx-tube. *Carpels* 2, distinct; ovules many-seriate in each; style short; stigma 2-lobed. *Fruit* of 2 linear-oblong or ellipsoid follicles. *Seeds* oblong or lanceolate, plano-convex, winged; albumen thin, fleshy; cotyledons oblong or ovate-cordate.

1208. PLUMERIA ACUTIFOLIA Poir.; F. B. I. iii. 641; E. D. P. 989.
P. acuminata F. I. ii. 20.
Planted everywhere in gardens and near temples.
A small tree. *Hind.* Gúlachin, gobur-champ; *Beng.* Gorur-champa; *Uriya* Kátchampa; *Santal.* Champa pungár.

547. Rauwolfia Linn.

Small shrubs; *leaves* 3–4-nately whorled, rarely opposite; nerves slender, remotely arched; axils glandular. *Flowers* in umbelliform cymes, on peduncles alternate with the terminal

leaves, ultimately becoming lateral. *Sepals* connate in a 5-fid or 5-partite calyx; tube not glandular within; lobes obtuse or acute. *Petals* 5, connate in a salver-shaped corolla, with cylindric tube and constricted throat, the latter usually hairy within; lobes broad, overlapping to the left. *Stamens* included, adnate to or above the middle of the tube; anthers small, acute; cells with rounded base. *Disk* large, cupular or annular. *Carpels* 2, distinct or connate; ovules 2 collateral in each carpel; style filiform; stigma with a broad, calyptrate base, and a 2-fid tip. *Fruit* of 2 distinct or connate, drupe-like ripe carpels, each usually 1-seeded. *Seeds* ovoid; albumen fleshy; cotyledons flat.

Leaves glabrous ..... *serpentina.*
Leaves pubescent ..... *canescens.*

1209. RAUWOLFIA SERPENTINA Benth.; F. B. I. iii. 632. *Ophioxylon serpentinum* F. I. i. 694.

N. Bengal; C. Bengal.

A small, glabrous shrub. *Hind.* Chota-chand; *Beng.* Chandrá.

1210. RAUWOLFIA CANESCENS Linn.

C. Bengal, cultivated and at times naturalised.

A small pubescent shrub; native of West Indies.

548. Kopsia Bl.

Glabrous trees or shrubs; *leaves* opposite, narrowed to very short petioles. *Flowers* in terminal cymes. *Sepals* connate in a small, 5-partite calyx; lobes with glandular tips; tube not glandular within. *Petals* 5, connate in a salver-shaped corolla; tube very slender; throat hairy within; lobes overlapping to the right. *Stamens* 5, included, adnate near apex of corolla-tube; anthers acute; cells rounded at the base. *Disk* of 2 glands alternating with the carpels. *Carpels* 2, distinct; ovules 2 in each carpel, one on each side of a thickened placenta; style filiform, thickened at the top; stigma short. *Fruit* of 2 obovoid or obliquely quadrate, coriaceous or rather fleshy carpels, each 1-celled and 1-seeded, or from intrusion of the fleshy placenta 2-celled and 2-seeded. *Seed* oblong; albumen 0; cotyledons rather thin.

1211. KOPSIA FRUTICOSA A. DC.; F. B. I. iii. 639. *Cerbera fruticosa* F. I. i. 691.

In gardens, frequent.

A large evergreen shrub.

549. Vinca Linn.

Erect or procumbent herbs or shrubs; *leaves* opposite. *Flowers* axillary, solitary. *Sepals* connate in a 5-partite calyx; tube not glandular within; lobes narrow. *Petals* 5, connate in a salver-shaped corolla; tube cylindric, usually with reflexed hairs below the stamens; throat constricted, thickened or hirsute; lobes broad, overlapping to the left. *Stamens* 5, included, adnate above middle of tube; anthers with obtuse base. *Disk* of 2 large glands. *Carpels* 2, distinct; ovules 6 or more, 2-seriate in each carpel; style filiform, apex thick; stigma annulate, viscid, sometimes with a reflexed membrane, tip minute, penicillate. *Fruit* of 2 slender, erect or spreading follicles. *Seeds* subcylindric, truncate at both ends; hilum lateral; albumen fleshy; cotyledons ovate; radicle long.

1212. Vinca rosea Linn.; F. B. I. iii. 640; E. D. v. 138. *Vinka rosea* F. I. ii. 1.

Planted everywhere in gardens and near temples, also often subspontaneous.

An erect herb, flowers variously rosy or white; native of West Indies. *Uriya* Ains kati.

550. Alstonia R. Br.

Trees or erect shrubs; *leaves* 3–4-nately whorled, rarely opposite. *Flowers* in subterminal, corymbose cymes. *Sepals* connate in a short, 5-lobed or 5-partite calyx; lobes short, usually obtuse. *Petals* 5, connate in a salver-shaped corolla; tube cylindric; throat naked, annulate or with reflexed hairs; lobes overlapping, sometimes to the right, sometimes to the left. *Stamens* adnate near apex of tube, included; anthers subacute. *Disk* annular, truncate or lobed, or 0. *Carpels* 2, distinct; ovules numerous, many-seriate in each carpel; style filiform, ovoid or oblong at top; stigma minute or 2-toothed. *Fruit* of 2 linear, slender follicles. *Seeds* oblong or linear, flattened, peltately attached, often ciliate; albumen scanty; cotyledons oblong, flattened.

1213. Alstonia scholaris R. Br.; F. B. I. iii. 642; E. D. A. 870.

W. Bengal; N. Bengal.

A tall tree. *Beng.* Chhattin; *Hind.* Satiun; *Uriya* and *Santal.* Chatnia.

551. Tabernæmontana Linn.

Trees or shrubs; *leaves* opposite. *Flowers* white, in terminal or sometimes sublateral, never truly axillary cymes. *Sepals* connate in a 5-lobed or 5-partite calyx; tube usually glandular within; lobes obtuse, imbricate. *Petals* 5, connate in a salver-shaped corolla; tube cylindric, usually slender, inflated in the middle or at apex; throat naked; lobes overlapping to the left. *Stamens* included, at or above the middle of the tube; filaments short or 0; anthers acuminate, base sagittate or obtuse. *Disk* 0. *Carpels* 2, distinct; ovules usually numerous and many-seriate in each carpel; style short or long, apex urceolate, ovoid, or clavate; stigma short or long, 2-lobed. *Fruit* of 2 ovoid-oblong or reniform, dry or fleshy, smooth or ribbed, 1–many-seeded follicles. *Seeds* embedded in pulp, ovoid-oblong, subterete or compressed, grooved down one face; testa smooth, striate, or rugose; albumen fleshy, equable or ruminate; cotyledons ovate.

Calyx 5-lobed; lobes broadly ovate, acute; corolla-lobes obliquely ovate, obtuse, margins curled; follicles 3-ribbed .....*coronaria.*
Calyx 5-partite; segments narrowly lanceolate; corolla-lobes falcately obovate, acute; follicles terete .....*recurva.*

1214. Tabernæmontana coronaria R. Br.; F. I. ii. 23; F. B. I. iii. 646; E. D. T. 3.

Cultivated in all the provinces.

A shrub, 6–8 feet high. *Vernac.* Tagúr.

1215. Tabernæmontana recurva Roxb.; F. I. ii. 26; F. B. I. iii. 648.

Chittagong.

A small shrub.

552. Holarrhena R. Br.

Trees or shrubs; *leaves* membranous, opposite. *Flowers* white, in terminal or subaxillary, many-flowered, corymbose cymes. *Sepals* connate in a 5-lobed or 5-partite calyx, usually glandular within; lobes small, narrow. *Petals* 5, connate in a salver-shaped corolla; tube cylindric; throat contracted, naked; lobes oblong, overlapping to the left. *Stamens* adnate near base of tube, included; anthers oblong, lanceolate, mucronate; cells rounded at the base. *Disk* 0. *Carpels* 2, distinct; ovules in each numerous;

style short, filiform; stigma oblong-fusiform, tip entire or 2-toothed. *Fruit* of 2 terete, elongated, spreading and incurved follicles. *Seeds* linear or oblong, compressed, tipped with a deciduous coma, concave with the funicle in the concavity; albumen scanty; cotyledons broad, complicate.

1216. HOLARRHENA ANTIDYSENTERICA Wall.; F. B. I. iii. 614; E. D. H. 294.

In all the provinces except C. Bengal.

A small, deciduous tree. *Hind.* and *Beng.* Kurchi; *Santal.* and *Kol.* Hat.

553. Wrightia R. Br.

Shrubs or small trees, often with slender, cord-like branches; *leaves* opposite. *Flowers* white, yellow, or red, in terminal or subaxillary, sessile cymes. *Sepals* connate in a short, 5-partite calyx; tube with glands or scales within; lobes obtuse. *Petals* 5, connate in a salver-shaped corolla; tube usually short, cylindric; throat with 1–2 series of usually fimbriate scales; lobes overlapping to the left. *Stamens* 5, adnate to top of corolla-tube; filaments short, dilated; anthers exserted, sagittate, connivent around and adnate to the stigma; cells spurred at the base. *Disk* 0. *Carpels* 2, free or connate, each many-ovuled; style filiform; stigma ovoid, with usually a toothed basal ring. *Fruit* of 2 linear, erect, connate or distinct follicles. *Seeds* linear, compressed, tips narrowed, naked, base with a deciduous coma; albumen scanty or 0; cotyledons broad, convolute.

Flowers yellowish, with short orange scales of corona .....*tomentosa.*
Flowers dark red, with large crimson scales of corona .....*coccinea.*

1217. WRIGHTIA TOMENTOSA Roem. & Schult.; F. B. I. iii. 653; E. D. W. 131. *Nerium tomentosum* F. I. ii. 6.

In all the western and northern provinces.

A small, deciduous tree. *Hind.* Dudhi, dharauli, dhaira; *Beng.* Dudh-koraiya; *Uriya* Pal kurwan, harido; *Santal.* Atkura, buru machkunda.

1218. WRIGHTIA COCCINEA Sims; F. B. I. iii. 654. *Nerium coccineum* F. I. ii. 2.

Chittagong; cultivated in C. and W. Bengal.

A medium tree. *Vernac.* Pállam.

554. Vallaris Burm.

Climbing shrubs; *leaves* opposite, minutely dotted. *Flowers* white, in cymes or fascicles, axillary, subaxillary, or supra-axillary. *Sepals* connate in a 5-partite calyx; tube glandular or not within; lobes narrow. *Petals* 5, connate in a salver-shaped corolla, with short tube and naked throat; lobes broad, overlapping to the right. *Stamens* 5, adnate to top of tube; filaments very short, clavate; anthers exserted, conniving in a cone and adnate to stigma; cells with rigid basal spurs; connective with a large dorsal gland. *Disk* annular or cupshaped, 5-lobed or with 5 scales. *Carpels* 2, at first connate, each many-ovuled; style filiform, pubescent; stigma thick, indistinctly annulate. *Fruit* an oblong capsule, or of 2 at length separating follicles, the placentas detached from each other and from the pericarp. *Seeds* 2-seriate, ovate, acuminate or beaked, compressed, apex comose; albumen scanty; cotyledons thin and flat.

Leaves elliptic-oblong or linear-oblong, acuminate; petioles less than an inch long; cymes pubescent ..... *Heynei.*
Leaves broadly elliptic-obovate or rounded, shortly acute; petioles an inch long or longer; cymes glabrous or puberulous ..... *Pergulana.*

1219. Vallaris Heynei Spreng.; F. B. I. iii. 650; E. D. v. 12. *Echites dichotoma* F. I. ii. 19.

Tirhut; Behar; Chota Nagpur; W. and C. Bengal: also often cultivated.

A climbing shrub. *Hind.* Rámsar; *Beng.* Hápar, mali.

1220. Vallaris Pergulana Burm.; F. B. I. iii. 651. *Echites hircosa* F. I. ii. 18.

Occasionally cultivated.

A climbing shrub, flowers with a goat-like smell.

555. Parsonsia R. Br.

Climbing shrubs; *leaves* opposite. *Flowers* small, white, in dichotomous, axillary peduncled cymes, or in terminal thyrsoid cymes. *Sepals* connate in a 5-partite calyx; tube with 5 glands or scales within, or eglandular; lobes narrow. *Petals* 5, connate in a salver-shaped corolla; tube short, cylindric or globose; throat naked; lobes overlapping to the right. *Stamens* 5, adnate to the corolla-tube; filaments often twisted; anthers half-exserted, con-

nivent above and adnate to the stigma; cells spurred and empty below. *Disk* of 5 lobes or scales. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style filiform, apex dilated, truncate; stigma columnar or long-conic. *Fruit* a cylindric capsule, the carpels at length separating from the two placentas. *Seeds* linear or oblong, tip narrow and penicillate; albumen scanty; cotyledons linear-oblong, flat.

1221. PARSONSIA SPIRALIS Wall.; F. B. I. iii. 650.
Sundribuns.
An evergreen twiner.

556. Nerium Linn.

Erect, glabrous shrubs; *leaves* 3–4-nately whorled, rarely opposite, narrow, coriaceous; nerves slender, close-set. *Flowers* large, in racemose cymes. *Sepals* connate in a 5-partite calyx; tube glandular within; lobes narrow. *Petals* 5, connate in a funnel-shaped corolla; tube cylindric, widening into a campanulate throat, with 5 broad, toothed scales; lobes overlapping to the right. *Stamens* adnate to top of tube, included; filaments short; anthers sagittate, connivent round and adnate to the stigma; tips filiform; cells long-spurred, beset with twisted hairs, appendages rigid. *Disk* 0. *Carpels* 2, distinct, each many-ovuled; style filiform, or thickened above the middle; stigma with a basal, reflexed, lobed membrane surmounted by 5 tubercles, tip subglobose. *Fruit* of 2 elongated, cylindric, straight, hard, adpressed follicles. *Seeds* oblong, villous, with terminal, caducous coma; albumen fleshy; cotyledons flat, rather thick.

1222. NERIUM ODORUM Soland.; F. I. ii. 2; F. B. I. iii. 655; E. D. N. 80.
W. Bengal; Chota Nagpur; Behar; cultivated and as if wild: in other provinces cultivated only.
A large, erect shrub. *Hind.* Kanér; *Beng.* Karabi; *Santal.* Rajbaka.

557. Strophanthus DC.

Shrubs, often climbing, or small trees; *leaves* opposite. *Flowers* usually large, in terminal cymes. *Sepals* connate in a 5-partite calyx; tube glandular within; lobes oblong or lanceolate. *Petals* 5, connate in a funnel-shaped corolla; tube short, widening to a large campanulate throat, with 10 free or connate scales; lobes

overlapping to the right, each produced into a short or long, often twisted tail. *Stamens* 5, adnate to top of corolla-tube, included; filaments short; anthers sagittate, tips filiform, connivent round and adnate to stigma; cells spurred at the base. *Disk* 0. *Carpels* 2, glabrous, distinct, each many-ovuled; style filiform, rugose with cellular papillæ, tip dilated; stigma columnar or conic, with cellular papillæ, tip dilated; stigma columnar or conic, simple or 2-fid. *Fruit* of 2, oblong or elongated, hard, spreading follicles. *Seeds* compressed, fusiform, narrowed to a penicillate tail or with a sessile coma; base with a deciduous tuft of hairs.

1223. STROPHANTHUS WALLICHII A. DC.; F. B. I. iii. 655.
Nerium caudatum F. I. ii. 9.
Chittagong.
A climber.

558. Roupellia Wall.

Glabrous shrubs, often climbing; *leaves* opposite. *Flowers* large, showy, white or purplish, in terminal, dichotomous cymes. *Sepals* connate in a 5-partite calyx; tube glandular within; lobes oblong or lanceolate. *Petals* 5, connate in a funnel-shaped corolla; tube short, widening to a large campanulate throat, with 10 scales usually more or less connate at the base; lobes wide, overlapping to the right, without tails. *Stamens* 5, adnate to top of tube, included; filaments short; anthers linear-sagittate, tips acuminate, connivent round and adnate to stigma; bases produced as empty appendages. *Disk* 0. *Carpels* 2, connate or distinct, each many-ovuled; style thickish; stigma thickened, base dilated in a somewhat reflexed membrane. *Fruit* of 2 long, hard, thick follicles, connate at base, divaricate above.

1224. ROUPELLIA GRATA Wall.
Frequently planted.
A large climber; native of Africa.

559. Beaumontia Wall.

Evergreen climbing shrubs; *leaves* opposite, membranous; nerves distant, arched. *Flowers* very large, white, in terminal cymes; bracts leafy. *Sepals* connate in a 5-partite calyx; tube glandular or not within; lobes large, leafy. *Petals* 5, connate in a funnel-shaped corolla; tube very short; throat much widened, narrowly campanulate, naked; lobes broad, overlapping to the right. *Stamens* 5, adnate to the top of the tube, included in the

throat; filaments thickened at the top; anthers horny, sagittate, connivent above and adnate to stigma; cells spurred at base. *Disk* deeply 5-lobed. *Carpels* 2, connate in a 2-celled ovary; cells many-ovuled; style filiform, clavate above; stigma fusiform. *Fruit* long, thick, woody, at length dividing into 2 horizontally spreading follicles. *Seeds* compressed, ovoid or oblong, top contracted, surmounted by a pencil of hairs; albumen scanty; cotyledons thin or thick.

1225. BEAUMONTIA GRANDIFLORA Wall.; F. B. I. iii. 660; E. D. B. 390. *Echites grandiflora* F. I. ii. 14.
Chittagong: elsewhere cultivated.
A lofty climber.

560. Chonemorpha G. Don.

Stout climbing shrubs; *leaves* opposite, broad; nerves distant, arching. *Flowers* large, white, in lax terminal and pseudo-axillary cymes. *Sepals* connate in a 5-cleft or 5-partite calyx; tube with a ring of glands within; lobes rather narrow. *Petals* 5, connate in a salver-shaped corolla; tube very short; throat long, subtubular, naked; lobes broad, obliquely cuneate, overlapping to the right and sharply twisted to the left. *Stamens* 5, adnate to top of corolla-tube; filaments short, broad, villous; anthers sagittate, elongate, pungent, connivent above and adnate to stigma; cells shortly spurred below. *Disk* thick, annular or cuplike. *Carpels* 2, distinct, each many-ovuled; style filiform, cleft below, apex globose or hemispheric; stigma conoid or subclavate. *Fruit* of 2 long, straight, hard, parallel, 3-gonous follicles. *Seeds* ovoid or oblong, flat, shortly beaked; coma long; albumen scanty; cotyledons oblong, flat.

1226. CHONEMORPHA MACROPHYLLA G. Don; F. B. I. iii. 661; E. D. C. 1038. *Echites macrophylla* F. I. ii. 13.
N. Bengal, Duars; elsewhere cultivated.
A lofty climber. *Vernac.* Gar badero.

561. Aganosma G. Don.

Evergreen climbing shrubs; *leaves* opposite. *Flowers* medium or large, in terminal, tomentose cymes. *Sepals* 5, slightly connate below or free, narrowly lanceolate-acuminate, rarely oblong-ovate, with subulate glands near the base within. *Petals* 5, connate in a salver-shaped corolla; tube very short; throat long, cylindric,

with bearded longitudinal bands behind the anthers; lobes lanceolate, linear-oblong, or rounded, overlapping to the right and almost straight in bud. *Stamens* adnate to base of throat, included; anthers sagittate, rigid, connivent above and adnate to stigma; cells spurred at the base. *Disk* 5-lobed, cupular. *Carpels* 2, distinct, tips hirsute rarely glabrous, each many-ovuled; style short, apex urceolate, truncate; stigma columnar. *Fruit* of 2 short or long, terete, straight or curved, linear follicles. *Seeds* ovate or linear-oblong, flattened, glabrous; coma deciduous; albumen scanty; cotyledons oblong.

Leaves with strong nerves beneath, interarching within the margin; ovary glabrous, half-sunk in the disk ..... *marginata*.
Leaves with very oblique nerves (3 pairs), not interarching; ovary pubescent, wholly included in the disk ..... *caryophyllata*.

1227. AGANOSMA MARGINATA G. Don; F. B. I. iii. 663; E. D. A. 587. *Echites marginata* F. I. ii. 15. *E. acuminata* F. I. ii. 15.

Chittagong.

A stout, scandent or subscandent shrub.

1228. AGANOSMA CARYOPHYLLATA G. Don.; F. B. I. iii. 664; E. D. A. 584.

Behar.

A large climber. *Vernac.* Málati, gandho-málati.

562. Anodendron A. DC.

Glabrous, climbing shrubs; *leaves* opposite; nerves distant, arched. *Flowers* in axillary, or axillary and terminal, slender, paniculate, spreading cymes. *Sepals* connate in a 5-cleft calyx; tube without glands; lobes obtuse. *Petals* 5, connate in a salver-shaped corolla; throat contracted; lobes overlapping to the right, twisted to the left. *Stamens* adnate below the middle of the corolla-tube; anthers sagittate, connivent round and adnate to stigma; cells shortly spurred at base. *Disk* cupshaped. *Carpels* 2, distinct, sunk in the disk and dorsally adnate to it at their base, each many-ovuled; style very short, apex cupular; stigma thick, conic. *Fruit* of 2 diverging, acuminate, hard follicles. *Seeds* ovoid or oblong, compressed, beaked, tipped with a long coma.

1229. ANODENDRON PANICULATUM A. DC.; F. B. I. iii. 668; E. D. A. 1141. *Echites paniculata* F. I. ii. 17.

Chittagong.

An immense climber.

563. Ichnocarpus R. Br.

Climbing shrubs with slender branches; *leaves* opposite; nerves distant. *Sepals* connate in a 5-fid calyx; tube glandular or not within; lobes narrow. *Petals* connate in a salver-shaped corolla; throat contracted or villous; lobes narrowed to an obtuse tip, overlapping to the right, upper half deflexed in bud. *Stamens* 5, adnate to the corolla-tube at or below the middle; anthers sagittate, connivent above and adnate to the stigma; cells spurred at the base. *Disk* free, 5-lobed. *Carpels* 2, distinct, hirsute, exserted from the disk, each many-ovuled; style short, top obconic; stigma columnar. *Fruit* of 2 spreading or divaricate follicles, slender and subterete or rigid and compressed. *Seeds* narrowed at the apex; coma deciduous; albumen copious; cotyledons long, flat.

Corolla-tube glabrous, mouth villous ..... *frutescens.*
Corolla-tube pubescent, mouth puberulous ..... *ovatifolius.*

1230. Ichnocarpus frutescens R. Br.; F. B. I. iii. 669; E. D. I. 1. *Echites frutescens* F. I. ii. 12.
In all the provinces.
A climber. *Vernac.* Dudhi, dudhi-lata, siama-lata.

1231. Ichnocarpus ovatifolius A. DC.; F. B. I. iii. 670.
Chittagong; Chota Nagpur.
A climber.

Order LXXXIV. ASCLEPIADACEÆ.

Herbs or shrubs, usually twining. *Leaves* opposite or occasionally obsolete, very rarely alternate, entire; stipules 0. *Flowers* regular, hermaphrodite; inflorescence usually an axillary, umbel-like cyme; bracts small or minute, or obsolete. *Sepals* 5, connate in an inferior calyx; lobes imbricate. *Petals* 5, connate in a gamopetalous corolla; lobes valvate or overlapping to the right, very rarely to the left; throat or tube of corolla with an outer corona of hairs, scales or processes disposed in a ring. *Stamens* 5, at the base of the corolla; filaments in a few genera free, with or without interposed glands, in the majority connate in a generally very short, fleshy column, which usually bears an inner corona of scales or processes disposed in a simple or compound ring, and

attached to the filaments or to the backs of the anthers or to both; anthers crowning the column, free or connate, adnate by the connective to the stigma, 2-celled, the tips often produced into inflexed membranes; pollen aggregated into one or two granular or waxy masses (pollinia) in each cell, the masses united in pairs or fours to a gland (corpuscle) on the stigma. *Carpels* 2, superior, distinct, enclosed within the staminal column; styles 2, short, free almost throughout, but connate at the stigma, which is short, 5-angled, and included between the anthers, or longer and produced beyond as a simple or 2-fid column; ovules many, rarely few, 2-seriate in each carpel. *Fruit* of 2 follicles. *Seeds* compressed, usually flat, ovoid, winged or tipped by a tuft of long, silky hairs (coma), which is rarely absent; albumen dense, copious; embryo large; cotyledons flat; radicle inferior.

Filaments free; anthers acuminate or with a terminal appendage; pollen masses granular, in pairs in each cell:—

Corona of 5 short, thick scales attached to the corolla and separate from the filaments; seeds with coma:—

Corolla large, funnel-shaped, the lobes overlapping ...**Cryptostegia.**

Corolla small, rotate:—

Lobes of corolla overlapping .....**Cryptolepis.**

Lobes of corolla valvate .....**Hemidesmus.**

Corona of 5 filiform or subulate scales closely adjacent or adnate to the filaments:—

Filaments without interposed glands; seeds without coma **Finlaysonia.**

Filaments with interposed teeth or glands; seeds with coma:—

Cymes short, sessile; corolla-lobes short, ovate; follicles smooth **Streptocaulon.**

Cymes loosely panicled; corolla-lobes lanceolate; follicles with many longitudinal, membranous wings .....**Myriopteron.**

Filaments connate; pollen-masses waxy:—

Pollen-masses in pairs in each cell (20 in all), sessile in fours (2 pairs) on the corpuscle; anthers with membranous, inflexed tip; corolla rotate; lobes valvate .....**Genianthus.**

Pollen-masses solitary in each cell (10 in all); sessile or peduncled in pairs on the corpuscle:—

*Pollen-masses pendulous from the tip or side of the corpuscle below the edge of the stigma; anthers with a membranous, inflexed apex; seeds with coma:—[p. 682]

Corona double, the outer annular attached to the corolla, the

inner of 5 free, ligulate scales adnate to the back of the stamens; corolla wide, rotate-campanulate, angularly 5-lobed; stems twining .....**Oxystelma.**

Corona single, or, if double, the outer as well as the inner attached to the stamens :—

Stems leafy, erect or climbing, not jointed :—

Stems erect; corolla-lobes valvate; corona single, of 5 processes, adnate to the back of the stamens :—

Corolla wide-campanulate; coronal processes radiating from the staminal column, laterally compressed, spurred on the back.....**Calotropis.**

Corolla rotate; coronal processes erect, spoon-shaped, ligulate on the face .....**Asclepias.**

Stems twining; corolla-lobes overlapping :—

Corona single, annular, fleshy, truncate, attached to base of 10-ribbed staminal tube .....**Holostemma.**

Corona double, outer annular, membranous, lobed, inner of 5 processes, or, if single (*Raphistemma* and sometimes in *Pentatropis*) not annular :—

Processes of inner corona free from smooth staminal tube; outer corona with 5 distinct lobes opposite the anthers, and with a scale or ligule (inner corona) adnate to face of each lobe; corolla campanulate or subrotate **Cynanchum.**

Processes of inner or only corona adnate to staminal tube :—

Processes of only corona ligulate; corolla campanulate **Raphistemma.**

Processes of inner or only corona compressed, often spurred on the back; corolla rotate or funnel-shaped :—

Outer corona minute or absent, if present 5–10-lobed, with the longer or only lobes opposite the anthers.....**Pentatropis.**

Outer corona conspicuous, always present, 5–10-lobed, with the larger or only lobes alternate with the anthers .....**Dæmia.**

Stems leafless, jointed, trailing; corolla subterete; lobes overlapping; corona double, outer annular, membranous, 10-lobed, inner of 5 processes, joining the outer to the back of the stamens.....**Sarcostemma.**

*Pollen-masses erect, parallel with or rising above the edge of the

stigma, if horizontal or pendulous (rarely in *Tylophora*) still with an erect pedicel :—[p. 681]

†Anthers with a membranous, inflexed apex ; if obtuse (rarely in *Hoya*) then with large, stellate, single corona, rotate corolla, and free petal-tips :—[p. 684]

Corona absent ; fruits globose ; seeds large, without coma ; corolla-lobes overlapping to the right .....**Sarcolobus.**

Corona present, or if (sometimes in *Stephanotis*, rarely in *Marsdenia*) absent, then fruit not globose and seeds provided with a coma :—

Corona adnate to corolla-tube ; lobes of corolla overlapping to the right .....**Gymnema.**

Corona adnate to staminal tube or to the anthers :—

‡Corolla-lobes overlapping to the right, or, if subvalvate (*Tylophora* sometimes) then with stamens inserted in the throat or tube of the corolla :—[p. 684]

Stamens arising from base of corolla :—

Scales of corona minute, attached to the base of the staminal tube ; flowers small, urceolate or wide-campanulate .....**Gongronema.**

Scales of corona conspicuous, attached above the base of the staminal tube, rarely absent :—

Corolla large, 1 in. long or longer, white, salver-shaped or funnel-shaped ; scales of corona erect, attached to back of anthers, sometimes absent **Stephanotis.**

Corolla medium (·5 in. long or less) :—

Scales of corona erect :—

Coronal scales attached to staminal tube and back of anthers, rarely absent ; flowers purplish or greenish, campanulate or urceolate **Marsdenia.**

Coronal scales attached only to staminal tube, free above ; flowers yellow or orange, salver-shaped .....**Pergularia.**

Scales of corona stellately spreading, thick and fleshy, attached to staminal tube ; flowers green, rotate .....**Dregea.**

Stamens arising from throat or tube of corolla ; scales of corona laterally compressed, fleshy, attached to staminal tube, more or less spreading ; flowers small, subrotate, sometimes almost valvate .....**Tylophora.**

‡Corolla-lobes absolutely valvate, the stamens arising from the base of the corolla; coronal scales attached to staminal tube:—[p. 683]

Scales of corona erect, membranous; corolla urceolate **Dischidia.**

Scales of corona stellately spreading, thick and fleshy; corolla rotate; anthers rarely without a membranous tip **Hoya.**

†Anthers without a membranous, inflexed tip; corona double, outer annular, 5–10-lobed, attached to staminal tube, inner of 5 scales opposite the anthers, attached to face of outer; stamens attached to base of corolla; corolla tubular with subglobose base and valvate, lantern-shaped limb, the lobes cohering at their apices; stems twining; seeds with a coma [p. 683] ...**Ceropegia.**

564. Cryptostegia R. Br.

Large climbers; *leaves* opposite. *Flowers* large, in terminal, 3-chotomous cymes. *Sepals* 5, slightly connate below, lanceolate. *Petals* 5, connate in a funnel-shaped corolla; tube short, widened into a campanulate throat; lobes wide, overlapping and twisted to the right: coronal scales 5 at the base of corolla-throat, subulate, entire or 2-cleft. *Stamens* 5, adnate to base of corolla-tube; filaments short, filiform; anthers connate around and adnate to stigma, tips acute, connivent; pollen-masses in pairs in each cell, granular, appendages of corpuscles subspathulate. *Carpels* 2, each many-ovuled; styles distinct; stigma convex. *Fruit* of 2 thick, divaricate, hard, 2-winged follicles, furrowed between the wings. *Seeds* comose.

1232. Cryptostegia grandiflora R. Br.; F. B. I. iv. 6; E. D. C. 2253. *Nerium grandiflorum* F. I. ii. 10.

In gardens in most of the provinces.

A large, stout climber; native of Africa or of Madagascar.

565. Cryptolepis R. Br.

Glabrous, climbing shrubs; *leaves* opposite. *Flowers* in very lax, slender, dichotomous, few-flowered, peduncled, terminal or axillary cymes. *Sepals* connate in a 5-fid calyx; tube with 5 scales near base within. *Petals* 5, connate in a hypocrateriform or subrotate corolla; tube short, cylindric or campanulate; lobes linear, overlapping and twisted to the right: coronal scales 5, near or

above the middle of the tube, linear or clavate, connivent. *Stamens* 5, adnate below middle of corolla-tube; filaments wide-based, somewhat united below, free and narrow above; anthers short, adnate to stigma by their bases, their tips acuminate, connivent; pollen-masses in more or less coherent pairs in each cell, granular, appendages of corpuscles oblong. *Carpels* 2, many-ovuled, and styles distinct; stigma wide-conic. *Fruit* of 2 divaricate, terete, smooth follicles. *Seeds* comose.

Cymes many-flowered, shortly peduncled; branchlets short, divaricate; sepals acute; follicles not exceeding 4 in. in length; flower under an inch across ..... *Buchanani.*

Cymes few-flowered, long-peduncled; branchlets longer, slender; sepals obtuse; follicles 5 in. long or longer; flower an inch or more across *elegans.*

1233. CRYPTOLEPIS BUCHANANI Roem. & Schult.; F. B. I. iv. 5; E. D. C. 2247. *Nerium reticulatum* F. I. ii. 8.

In all the provinces.

A glabrous, twining shrub. *Hind.* Karanta; *Santal.* Utri dudhi.

1234. CRYPTOLEPIS ELEGANS Wall.; F. B. I. iv. 6.

Orissa; N. Bengal, Duars; Chittagong.

A slender, glabrous climber.

566. Hemidesmus R. Br.

Twining shrubs; *leaves* opposite, hoary or pubescent beneath. *Flowers* small, in opposite, crowded, subsessile cymes, greenish-purple. *Sepals* 5, somewhat connate below, acuminate, each glandular within at the base. *Petals* 5, connate in a rotate corolla; lobes thick, valvate; coronal scales 5 on the corolla-throat, alternate with its lobes, short, thick. *Stamens* 5; filaments adnate to base of corolla-tube, faintly connate at base, free above; anthers with connate, inflexed, membranous tips; pollen-masses cohering in pairs in each cell, granular; appendages of corpuscles dilated or hoodlike. *Carpels* 2, many-ovuled, and styles distinct; stigma 5-cornered, with flattened crown. *Fruit* of 2 long, slender, divaricate, terete, smooth follicles. *Seeds* comose.

Stem and leaves above glabrous ..... *indicus.*

Stem and leaves beneath and sometimes above pubescent *indicus* var. *pubescens.*

1235. Hemidesmus indicus R. Br.; F. B. I. iv. 5; E. D. H. 119. *Asclepias pseudo-sarsa* F. I. ii. 39.
Orissa; Chota Nagpur; Behar; C. Bengal; Sundribuns.
A twining shrub. *Vernac.* Ananta-mal.

1235/2. Var. pubescens F. B. I. iv. 5.
Behar.
A twining shrub.

567. Finlaysonia Wall.

A large, glabrous climber; *leaves* opposite. *Flowers* in 2–3-chotomous, axillary cymes, yellow and purple. *Sepals* connate in a short, 5-partite calyx; lobes rounded. *Petals* 5, connate in a rotate corolla; lobes ovate, overlapping to the right: coronal scales 5, close to the stamens, filiform. *Stamens* 5, adnate to throat of corolla; filaments slender, free; anthers adnate to the middle of the stigma, tips membranous, inflexed, acute; pollen-masses in pairs in each cell, granular; tips of the corpuscles slightly dilated. *Carpels* 2, many-ovuled, and styles distinct; stigma 5-angled, the crown flat. *Fruit* of 2 divaricate, turgid follicles, narrowed at both ends, 1–3-winged, with a revolute beak. *Seeds* with a few long, soft, retrorse hairs at the tip.

1236. Finlaysonia obovata Wall.; F. B. I. iv. 7.
Sundribuns.
A large climber. *Beng.* Dudhi-lata.

568. Streptocaulon W. & A.

Twining or prostrate, tomentose herbs or shrubs; *leaves* opposite. *Flowers* small or very small, in lax, sessile or peduncled, trichotomous, panicled cymes. *Sepals* connate in a minute, 5-partite calyx, glandular within. *Petals* 5, connate in a rotate corolla; lobes ovate, overlapping to the right; buds shortly conical; coronal scales 5, filiform, adnate to the back of the filaments. *Stamens* 5, adnate to base of corolla; filaments very short, with alternating, minute teeth; anthers connivent above and adnate to stigma, tips triangular, membranous, obtuse; pollen-masses in pairs in each cell, granular; appendages of minute corpuscles dilated. *Carpels* 2, many-ovuled, and styles distinct; stigma convex, 2-lobed. *Fruit* of 2 divaricate, terete, smooth follicles. *Seeds* comose.

1237. Streptocaulon sylvestre Wight; F. B. I. iv. 10.
N. Bengal.
A prostrate, herbaceous species.

569. Myriopteron Griff.

A glabrous or pubescent, slender, twining shrub; *leaves* opposite, long-petioled. *Flowers* small, in lax, paniculate cymes from opposite axils. *Sepals* connate in a 5-partite calyx; base minutely glandular within. *Petals* 5, connate in a rotate corolla; lobes narrow, overlapping to the right, twisted to the left, wide-conic in bud: coronal scales 5, on the back of the filaments, filiform from a wide base. *Stamens* adnate to base of corolla-tube; filaments connate in a ring below, above free, with alternating teeth; anthers connivent above and adnate to stigma, tips membranous; pollen-masses in pairs in each cell; appendages of the corpuscles 2-fid. *Carpels* 2, many-ovuled, and styles distinct; stigma convex, 2-fid. *Fruit* of 2 short, turgid, straight follicles, with many longitudinal, membranous wings. *Seeds* comose.

1238. Myriopteron paniculatum Griff.; F. B. I. iv. 11.

Chittagong.

A slender, twining shrub.

570. Genianthus Hook. f.

Twining shrubs; *leaves* opposite. *Flowers* small, in axillary, subsimple, or dichotomously branched cymes. *Sepals* connate in a small, 5-partite calyx, minutely glandular within; lobes oblong, obtuse. *Petals* 5, connate in a rotate corolla; tube short; lobes narrow, spreading and recurved, villous on the inner face, valvate: coronal scales 5, adnate to staminal column. *Stamens* 5; filaments connate in a minute column; anthers small, retuse; pollen-masses in each cell 2, minute, waxy, attached in fours to the corpuscle. *Carpels* 2, distinct; stigma sessile, capitate. *Fruit* of 2 slender, terete follicles. *Seeds* comose.

1239. Genianthus laurifolius Hook. f.; F. B. I. iv. 16.

Asclepias laurifolia F. I. ii. 49.

Chittagong.

A glabrous twiner, with pustular stems.

571. Oxystelma R. Br.

Glabrous, twining herbs or undershrubs; *leaves* opposite, narrow. *Flowers* large, in loose, racemose or umbellate cymes, or solitary; pedicels filiform. *Sepals* connate in a small, 5-fid calyx, with 5 or more glands at the base within; lobes acute. *Petals* connate in a wide, urceolate or campanulate or rotate,

5-angled corolla; lobes ciliate and subvalvate below, tips overlapping to the right: corona double; corolline annular at the base of the corolla, papillose within, its margin membranous, truncate; staminal of 5 scales adnate to the bases of the staminal tube, with cordate or dilated bases, 2-keeled within. *Stamens* 5, adnate near base of corolla; filaments connate in a short tube; anthers with membranous, inflexed tips; pollen-masses solitary in each cell, oblong, compressed, pendulous from slender tips, waxy. *Carpels* 2, distinct; stigma depressed or subconvex. *Fruit* of 2 thick, oblique or curved, smooth or narrowly 2-winged follicles. *Seeds* comose.

1240. OXYSTELMA ESCULENTUM R. Br.; F. B. I. iv. 17; E. D. C. 600. *Asclepias rosea* F. I. ii. 40.

N. Bengal; E. Bengal.

A slender, glabrous, climbing perennial herb. *Vernac.* Kirni, dudhia lata.

572. Calotropis R. Br.

Erect herbs, shrubs, or small trees, glabrous or hoary; *leaves* opposite, broad, sessile or short-petioled. *Flowers* medium, in umbelliform or subracemose cymes. *Sepals* connate in a 5-partite calyx, glandular at the base within; lobes lanceolate. *Petals* 5, connate in a wide-campanulate corolla; lobes broad, naked, valvate: coronal scales 5, fleshy, laterally compressed, adnate to and radiating from the large staminal column, dorsally spurred. *Stamens* 5, adnate near base of corolla-tube; filaments connate in a tube; anthers with membranous, inflexed tips; pollen-masses in each cell solitary, flattened, pendulous, waxy. *Carpels* 2, distinct; stigma depressed, 5-angled or 5-lobed. *Fruit* of 2 short, thick, acuminate follicles. *Seeds* comose.

Leaves sessile :—

Corolla-lobes spreading; scales of corona truncate, hairy; large shrubs or small trees ..... *gigantea.*

Corolla-lobes erect; scales of corona acute, glabrous or pubescent; small or medium shrubs..... *procera.*

Leaves petioled; corolla-lobes erect; scales of corona 2-lobed; erect herbs ..... *Acia.*

1241. CALOTROPIS GIGANTEA R. Br.; F. B. I. iv. 17; E. D. C. 170. *Asclepias gigantea* F. I. ii. 30.

In all the provinces, common.

A large shrub or small tree. *Hind.* Madár, ák, ákond; *Beng.* Ákanda, gurtákand; *Santál.* Ahauna.

1242. CALOTROPIS PROCERA R. Br.; F. B. I. iv. 18; E. D. C. 191.
In the western provinces, occasional.
A shrub, 6–15 feet high. *Hind.* Safed-ák, ákadá, madár.

1243. CALOTROPIS ACIA Ham.; F. B. I. iv. 18; E. D. C. 169. *Asclepias herbacea* F. I. ii. 50.
Tirhut; N. Bengal, Duars; E. Bengal, Mymensingh.
A herb, with erect stems.

573. Asclepias Linn.

Erect, perennial herbs; *leaves* opposite, alternate, or whorled. *Flowers* medium or small, in umbellate cymes. *Sepals* connate below in a 5-partite calyx; tube 5–10-glandular within. *Petals* 5, connate in a rotate corolla; lobes often reflexed, naked, valvate: coronal scales 5, erect, adnate to staminal column, spoon-shaped. *Stamens* 5, adnate near base of corolla; filaments connate in a short tube; anthers with membranous, inflexed tips; pollen-masses in each cell solitary, pendulous, compressed, waxy. *Carpels* 2, distinct; stigma depressed, 5-angled. *Fruit* of 2 turgid, beaked, smooth follicles. *Seeds* comose.

1244. ASCLEPIAS CURASSAVICA Linn.; F. B. I. iv. 18; E. D. A. 1558.
In waste places near villages in all the provinces.
An erect, perennial herb; native of America.

574. Holostemma R. Br.

Glabrous, twining shrubs; *leaves* opposite, membranous, cordate. *Flowers* large, purple, in axillary, few-flowered cymes. *Sepals* connate in a 5-partite calyx; segments ovate. *Petals* 5, connate in a subrotate corolla; lobes thick, ovate, overlapping to the right: corona adnate to the base of the staminal tube, annular, 10-lobed, fleshy. *Stamens* adnate to base of corolla-tube; filaments connate in a 10-winged column; anthers very large, oblong, horny, shining; tips small, membranous, inflexed; pollen-masses in each cell solitary, elongate, falcate, compressed, pendulous from long black pedicels, waxy. *Carpels* 2, distinct; stigma 5-winged, included. *Fruit* of 2 short, thick, smooth, acute follicles. *Seeds* comose.

1245. Holostemma Rheedei Wall.; F. B. I. iv. 21; E. D. H. 328.
Asclepias annularis F. I. ii. 37.
Chota Nagpur; N. Bengal, Duars.
An extensive climber. *Kol.* Apúng; *Santal.* Apúng, mouron arak'.

575. Cynanchum Linn.

Erect or twining herbs or shrubs; *leaves* opposite, rarely whorled. *Flowers* small, greenish or purplish, in axillary, umbelliform, racemose, or subpaniculate cymes. *Sepals* connate in a 5-partite calyx, usually 5–10-glandular at base within; lobes acute. *Petals* 5, connate in a rotate corolla; lobes overlapping to the right or occasionally valvate: corona membranous, adnate to base of staminal column, 5-partite or campanulate or cupular, variously lobed or toothed, with or without scales or tubercles on the inner face opposite the lobes. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers sessile or stipitate, tips membranous, inflexed; pollen-masses solitary in each cell, not compressed, pendulous, waxy. *Carpels* 2, distinct; stigma flat or umbonate or apiculate. *Fruit* of 2 terete or shortly 2-alate, elongated, somewhat ventricose, usually smooth follicles. *Seeds* comose.

1246. Cynanchum Callialata Ham.; F. B. I. iv. 24.
Chota Nagpur; C. Bengal; E. Bengal; Chittagong.
A glabrous or sparingly hirsute, twining shrub. There is a very distinct form with linear leaves (*C. angustifolium* Wight) which has been collected in N. Bengal, Duars. *Beng.* Chagul-bati; *Hind.* Kalia-lata.

576. Raphistemma Wall.

Twining, glabrous shrubs; *leaves* opposite, membranous, deep-cordate, with wide sinus. *Flowers* large, white, long-pedicelled, in umbelliform, axillary, long-peduncled cymes. *Sepals* connate in a 5-lobed corolla, 5-glandular within. *Petals* 5, connate in a campanulate, 5-fid corolla; lobes spreading, overlapping to the right and twisted to the left: corona of 5 membranous scales, adnate to the column, produced into long, slender, linear ligules. *Stamens* 5, adnate to corolla-tube; filaments connate in a large column; anthers with membranous, inflexed tips; pollen-masses in each cell solitary, pendulous, not compressed, waxy. *Carpels* 2, dis-

tinct; stigma depressed, flat, 2-lobed in centre. *Fruit* of 2 turgid, thick, acute, smooth follicles. *Seeds* comose.

1247. RAPHISTEMMA PULCHELLUM Wall.; F. B. I. iv. 19. *Asclepias pulchella* F. I. ii. 54.

Chota Nagpur.

A glabrous twiner.

577. Pentatropis R. Br.

Slender, twining herbs or undershrubs; *leaves* opposite, small. *Flowers* small, purplish, on slender pedicels, in umbellate, axillary cymes. *Sepals* connate in a small, 5-partite calyx, hardly glandular within; lobes acute. *Petals* 5, connate in a rotate corolla; lobes narrow, long, overlapping to the right and twisted to the left: corona of 5 laterally compressed scales with free tips and spurred bases, adnate vertically to the backs of the anthers, with sometimes a small, annular, outer corona. *Stamens* 5, adnate to corolla-tube; filaments connate in a short column; anthers with membranous, inflexed tips; pollen-masses in each cell solitary, not compressed, waxy. *Carpels* 2, distinct; stigma almost flat. *Fruit* of 2 thickish, smooth follicles. *Seeds* comose.

1248. PENTATROPIS MICROPHYLLA W. & A.; F. B. I. iv. 20; E. D. P. 396. *Asclepias microphylla* F. I. ii. 35.

C. Bengal; Sundribuns.

A slender, twining herb.

578. Dæmia R. Br.

Twining, pubescent or tomentose undershrubs; *leaves* opposite, cordate. *Flowers* greenish-white, on slender pedicels, in axillary, racemose or corymbose cymes. *Sepals* connate in a 5-partite calyx, 5-glandular within; lobes acute. *Petals* 5, connate in a shortly funnel-shaped corolla; lobes large, wide-ovate, overlapping to the right: corona double; outer membranous, annular, 5–10-lobed or crenate; inner of 5 laterally compressed scales, spurred behind, vertically adnate to the anthers, with long, free, subulate tips. *Stamens* 5, adnate to corolla-tube; filaments connate in a column; anthers with membranous, inflexed tips; pollen-masses solitary in each cell, oblong, subcompressed, pendulous, waxy. *Carpels* 2, distinct; stigma with depressed or concave top. *Fruit* of 2 thickish, rigid, acuminate, setosely echinate follicles. *Seeds* comose.

1249. Dæmia extensa R. Br.; F. B. I. iv. 20; E. D. D. 9. *Asclepias echinata* F. I. ii. 44.

In all the provinces except Chittagong.

A fœtid, tomentose, climbing undershrub. *Hind.* Sagauni, juttak; *Beng.* Chagul-bati; *Uriya* Uttururi.

579. Sarcostemma R. Br.

Shrubs with trailing, leafless, jointed stems and pendulous branches. *Flowers* small, on clavate peduncles, in umbellate cymes, terminal or along the nodes. *Sepals* slightly connate below in a small 5-fid calyx, glandular or not within; lobes rather acute. *Petals* 5, connate in a rotate corolla; lobes broad overlapping to the right: corona usually double; outer cupular membranous, adnate to base of staminal column, 10-lobed or 10-crenate, 5 lobes opposite the stamens, with large, fleshy processes joining the corona to the backs of the anthers; inner of 5 erect scales, adnate to the backs of the anthers, shortly produced and free upwards, sometimes absent. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers with membranous, inflexed tips; pollen-masses in each cell solitary, slender, pendulous, waxy. *Carpels* 2, distinct; stigma conic or shortly spindle-shaped. *Fruit* of 2 stoutish or slender, smooth follicles. *Seeds* comose.

1250. Sarcostemma brevistigma Wight; F. B. I. iv. 26; E. D. S. 882. *Asclepias acida* F. I. ii. 31.

Chota Nagpur, Singbhum.

A leafless shrub with green, jointed, trailing or pendent branches. *Vernac.* Soma-lata.

580. Sarcolobus R. Br.

Twining, glabrous shrubs; *leaves* opposite. *Flowers* small, crowded in axillary, corymbose cymes. *Sepals* connate in a 5-partite calyx, minutely 5-glandular within; lobes ovate, obtuse. *Petals* 5, connate in a campanulate or subrotate corolla; lobes ovate, overlapping to the right: corona 0. *Stamens* 5, adnate to corolla-tube; filaments connate in a very short column; anthers wide, with membranous, inflexed tips; pollen-masses solitary in each cell, erect, with long, twisted pedicels, subcompressed, waxy. *Carpels* 2, distinct; stigma flat above. *Fruit* of 2 thick, fleshy,

globose and smooth or oblong and 2-keeled follicles. *Seeds* very large; coma 0.

Corolla purplish; lobes pubescent within; fruit brown, large, globose; leaves 3–4 in. long, oblong or ovate, acuminate or obtuse-apiculate ..... *globosus.*

Corolla yellow with brown dots, nearly glabrous within; fruit yellow, small, ellipsoid; leaves 1–2 in., rarely 3 in., long, elliptic, obovate-lanceolate or linear-oblong, obtuse or acute ..... *carinatus.*

1251. SARCOLOBUS GLOBOSUS Wall.; F. B. I. iv. 27.
Sundribuns.
A twining, stout-branched, glabrous shrub. *Beng.* Baoli-lata.

1252. SARCOLOBUS CARINATUS Wall.; F. B. I. iv. 28.
Sundribuns.
A twining, glabrous shrub, with slender branches. *Beng.* Baoli-lata.

581. Gymnema R. Br.

Twining shrubs or undershrubs; *leaves* opposite. *Flowers* small, in crowded, umbellate cymes. *Sepals* connate below in a 5-partite calyx; base usually 5–10-glandular within; segments ovate, obtuse. *Petals* 5, connate in a subrotate, campanulate, or urceolate corolla; lobes thick, twisted, subvalvate, or slightly overlapping to the right: corona 0, or of 5 fleshy processes, adnate either to the corolla-throat or to the staminal tube. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers erect, with small, membranous tips; pollen-masses solitary in each cell, ovoid-oblong, erect, long-pedicelled, usually small, waxy. *Carpels* 2, distinct; stigma large, conic or clavate or capitate, exserted. *Fruit* of 2 slender or turgid, terete, smooth, acuminate follicles. *Seeds* comose.

*Corolla-tube with the free points of the fleshy coronal processes protruding above the sinuses; processes produced downwards on the tube as double villous ridges:—[p. 694]

Leaves under 3 in. long, softly pubescent on both sides, as are the branches, petioles, and cymes; corolla ·25 in. wide; lobes ciliolate; follicles slender ..... *hirsutum.*

Leaves 3–6 in. long, almost glabrous, shining above, densely tomentose beneath, as are the branches, petioles, and cymes; corolla ·15 in. wide; lobes not ciliolate; follicles turgid, ovoid, beaked ... *acuminatum.*

*Corolla-tube with double villous ridges below the sinuses, but not produced into fleshy points beyond them; leaves 4–6 in. long, glabrous or nearly so, as are the branches, petioles, and cymes; corolla ·35 in. wide; lobes glabrous; follicles ovate-lanceolate [p. 693] .....*tingens.*

1253. GYMNEMA HIRSUTUM W. & A.; F. B. I. iv. 29.
Behar; Chota Nagpur.
A large, stout, woody climber.

1254. GYMNEMA ACUMINATUM Wall.; F. B. I. iv. 30. *Asclepias acuminata* F. I. ii. 55.
E. Bengal; Chittagong.
A large climber, bark of old wood split and spongy.

1255. GYMNEMA TINGENS W. & A.; F. B. I. iv. 31; E. D. G. 751. *Asclepias tingens* F. I. ii. 53.
Behar.
An extensive climber.

582. Gongronema Dene.

Glabrous, twining shrubs or undershrubs; *leaves* opposite. *Flowers* small, in dense sessile, and umbellate peduncled, axillary cymes. *Sepals* connate in a 5-partite calyx, glandular or not within; lobes ovate. *Petals* 5, connate in an urceolate, subrotate, or wide-campanulate corolla; lobes twisted, subvalvate or slightly overlapping to the right: corona of 5 short scales adnate to bases of anthers, or 0. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers erect, with membranous, inflexed tips concealing the stigma; pollen-masses in each cell solitary, ovoid, erect, waxy. *Carpels* 2, distinct; stigma convex, clavate, or conic. *Fruit* of 2 slender or stoutish acuminate follicles. *Seeds* comose.

1256. GONGRONEMA NEPALENSE Dene. var. SAGITTATUM F. B. I. iv. 33.
Chittagong.
An extensive climber.

583. Stephanotis Thouars.

Very large, glabrous, climbing shrubs; *leaves* opposite, coriaceous. *Flowers* large, white, showy, in umbellate, peduncled cymes, or solitary or paired, axillary. *Sepals* connate in a 5-partite calyx, not glandular within; lobes lanceolate, leafy. *Petals*

5, connate in a funnel-shaped corolla; tube cylindric, rather wider at the base; throat more or less dilated; lobes twisted, overlapping to the right: corona of 5 scales, adnate to back of anthers, usually with free tips, sometimes wholly adnate, occasionally 0. *Stamens* 5, adnate to the very base of the corolla-tube; filaments connate in a short column; anthers erect, with erect or inflexed hyaline, membranous tips; pollen-masses solitary in each cell, erect, shortly pedicelled, waxy. *Carpels* 2, distinct; stigma conic, or shortly, obtusely beaked. *Fruit* of 2 stout, obtuse or acuminate follicles. *Seeds* comose.

1257. STEPHANOTIS FLORIBUNDA Thouars.

In gardens.

A large climber, with handsome, white, fragrant flowers; native of Madagascar.

584. Marsdenia R. Br.

Climbing, rarely erect undershrubs or shrubs; *leaves* opposite. *Flowers* small or medium, in simple or branched, umbellate, terminal or axillary cymes. *Sepals* connate in a 5-partite calyx, usually with glands or scales; lobes usually obtuse. *Petals* 5, connate in a campanulate, urceolate, or salver-shaped corolla; throat usually annulate or villous, rarely naked; lobes narrow or broad, overlapping to the right: corona of 5 erect scales, usually flattened, subulate, adnate to back of anthers, very rarely 0. *Stamens* 5, adnate near base of corolla-tube; filaments connate in a short column; anthers with inflexed, membranous tips; pollen-masses solitary in each cell, oblong or ovoid, pedicelled, erect, waxy. *Carpels* 2, distinct; stigma flat, convex, or beaked, sometimes much elongated. *Fruit* of 2 or (by abortion) frequently only 1, lanceolate or dagger-shaped, acuminate, pubescent or glabrous follicles. *Seeds* comose.

Branches, petioles, leaves beneath and cymes velvety or tomentose; corolla-lobes large, fleshy, pubescent without, glabrous within; coronal scales subulate, hardly longer than anther-tips; corolla subcampanulate, ¾ in. wide ..... *tenacissima.*

Branches, petioles, and leaves beneath nearly glabrous; cymes puberulous; corolla ½ in. wide; lobes small:—

*Corolla cylindric, glabrous externally; tube with deflexed hairs within; coronal scales subulate, longer and narrower than the anther-tips [p. 696] ..... *tinctoria.*

*Corolla urceolate, glabrous both without and within; coronal scales minute or absent [p. 695] ..... *thyrsiflora.*

1258. MARSDENIA TENACISSIMA W. & A.; F. B. I. iv. 35; E. D. M. 299. *Asclepias tenacissima* F. I. ii. 31.
Behar; Chittagong.
A stout, twining shrub. *Hind.* Tongus; *Beng.* Jitti.

1259. MARSDENIA TINCTORIA R. Br.; F. B. I. iv. 34; E. D. M. 302. *Asclepias tinctoria* F. I. ii. 43.
Chittagong.
A tall climber.

1260. MARSDENIA THYRSIFLORA Hook. f.; F. B. I. iv. 37.
E. Bengal.
An extensive, twining shrub.

585. Pergularia Linn.

Twining, nearly glabrous undershrubs; *leaves* opposite, membranous, ovate-cordate. *Flowers* yellow or greenish, rather large, in subumbellate cymes. *Sepals* connate in a 5-partite calyx, minutely 5-glandular within; lobes lanceolate. *Petals* 5, connate in a salver-shaped corolla; tube swollen at the base; lobes oblong or linear, overlapping to the right: corona of 5 large, membranous scales, adnate to the back of the stamens, erect, flattened dorsally or laterally, acute, entire or transversely 2-lamellate above the middle. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a column; anthers with inflexed, membranous tips; pollen-masses in each cell solitary, subcylindric, clavate or globosely obovoid, erect, waxy. *Carpels* 2, distinct; stigma umbonate or capitate, rather longer than the anther-cells. *Fruits* of 2 lanceolate, terete, rather turgid follicles. *Seeds* ovate, concave, comose.

Corolla pale yellow, almost scentless; lobes linear, longer than tube; corolla-tube glabrous within; coronal scales with broad points, simple ..... *pallida.*

Corolla dark greenish-yellow, very fragrant; lobes oblong, not exceeding tube; corolla-tube pubescent within; coronal scales double, inner with sharp points ..... *minor.*

1261. PERGULARIA PALLIDA W. & A.; F. B. I. iv. 38. *Asclepias pallida* F. I. ii. 48.
Behar.
An almost glabrous, twining undershrub.

1262. PERGULARIA MINOR Andr.; F. B. I. iv. 38; E. D. P. 410.
Asclepias odoratissima F. I. ii. 46.
In gardens in all the provinces.
An almost glabrous, twining undershrub. *Beng.* Kanjalata.

586. Dregea E. Mey.

Glabrous or hoary twining shrubs, rarely suberect; *leaves* opposite, usually ovate or cordate, acuminate. *Flowers* green, in axillary, umbellate cymes. *Sepals* 5, small, somewhat connate at base, glandular or not within, ovate. *Petals* 5, connate in a rotate corolla; lobes broad, twisted, overlapping to the right: corona of 5 hemispheric, fleshy scales, adnate to the staminal column below, inner angle cuspidate, with the tip incumbent on the anthers. *Stamens* 5, adnate near base of corolla-tube; filaments connate in a short, fleshy column; anthers with short, inflexed tips; pollen-masses in each cell solitary, erect, cylindric-oblong, shortly pedicelled, waxy. *Carpels* 2, distinct; stigma conical or dome-shaped. *Fruit* of 2 thick, hard, winged or ribbed follicles. *Seeds* comose.

Leaves and branches green, glabrous; leaves ovate, suborbicular or cordate, acuminate; climbing ..... *volubilis.*
Leaves and branches hoary or mealy:—
Leaves ovate, suborbicular or cordate, acuminate; climbing
volubilis var. *Lacuna.*
Leaves lanceolate or ovate-lanceolate; small, suberect
volubilis var. *angustifolia.*

1263. DREGEA VOLUBILIS Benth.; F. B. I. iv. 46. *Asclepias volubilis* F. I. ii. 36.
In most of the provinces.
A stout, tall climber. *Hind.* Nak-chikni; *Beng.* Titakunga; *Santal.* Marang-kongat.

1263/2. Var. LACUNA; F. B. I. iv. 47.
Tirhut; Behar.
A stout climber.

1263/3. Var. ANGUSTIFOLIA; F. B. I. iv. 47.
N. Bengal.
A suberect undershrub.

587. Tylophora R. Br.

Twining, rarely erect herbs or undershrubs; *leaves* opposite. *Flowers* small or minute, in umbellate or racemose cymes. *Sepals* 5, slightly connate below, glandular within, ovate or lanceolate. *Petals* 5, connate in a rotate corolla; lobes broad, slightly overlapping to the right: corona of 5 fleshy processes, adnate to the staminal column. *Stamens* 5, adnate to throat or tube of corolla; filaments connate in a very short column; anthers very small, with inflexed tips; pollen-masses in each cell minute, globose or ovoid, erect or ascending, very rarely transverse or pendulous from an erect or ascending pedicel, waxy. *Carpels* 2, distinct; stigma discoid, 5-angled, included. *Fruit* of 2 slender, acuminate, smooth follicles. *Seeds* ovoid, flat, winged, comose.

Sepals glabrous, ovate; cymes glabrous; pedicels long, capillary; coronal processes without free tips ..... *tenuis.*
Sepals hispid; cymes more or less villous or pubescent:—
Sepals ovate; peduncles long, slender; pedicels very short; coronal processes without free tips ..... *exilis.*
Sepals long, lanceolate; peduncles shorter than leaves, hispid at base of umbels; pedicels long, capillary; coronal processes adnate to column only below, and with the tips free ..... *asthmatica.*

1264. Tylophora tenuis Bl.; F. B. I. iv. 42. *Asclepias tenuissima* F. I. ii. 41.
C. Bengal; Sundribuns; E. Bengal.
A slender, prostrate or twining herb.

1265. Tylophora exilis Colebr.; F. B. I. iv. 44.
Chittagong.
A slender, prostrate or twining herb.

1266. Tylophora asthmatica W. & A.; F. B. I. iv. 45; E. D. T. 855. *Asclepias asthmatica* F. I. ii. 33.
Orissa; C. Bengal; N. Bengal; E. Bengal; Chittagong.
A slender, twining herb. *Uriya* Mendi; *Beng.* Antomul; *Hind.* Anta-mul, jangli-pikrán.

588. Dischidia R. Br.

Herbs or undershrubs, usually epiphytic, rooting and climbing or pendulous; *leaves* usually opposite, fleshy, sometimes formed into pitchers. *Flowers* small or minute, white or red, in axillary fascicles, umbels, or racemes. *Sepals* 5, slightly connate below,

ovate, membranous, glandular within. *Petals* 5, connate in an urceolate corolla; mouth contracted; lobes very short, thick, valvate: corona of 5 membranous, erect scales, adnate to back of staminal column, with entire, notched, or 2-fid tips, or with recurved arms. *Stamens* 5, adnate to base of corolla-tube, filaments connate in a very short column; anthers erect, with membranous tips; pollen-masses in each cell solitary, compressed, erect, waxy. *Carpels* 2, distinct; stigma flat or conic. *Fruit* of 2 small, thick or slender, smooth, acuminate follicles. *Seeds* minute; coma long.

1267. Dischidia Nummularia R. Br.; F. B. I. iv. 49.

Sundribuns; Chittagong.

A slender herb, rooting on the bark of trees.

589. Hoya R. Br.

Twining pendulous, or rambling and rooting, rarely erect, often epiphytic shrubs; *leaves* opposite, firmly fleshy or thickly coriaceous. *Flowers* in axillary or terminal umbels. *Sepals* connate in a small, 5-partite calyx, 5-glandular at the base within; lobes ovate or lanceolate. *Petals* 5, connate in a rotate, fleshy or waxy corolla; lobes often convex or spreading and reflexed, valvate in bud: corona of 5 large, membranous, fleshy or horny scales, adnate to the staminal column, stellately spreading or ascending, turgid, or laterally or vertically compressed, often concave on the upper surface, margins usually recurved so as to enclose a cavity, the inner angle often produced in a tooth or spur erect or incumbent on the corresponding anther. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers connivent above the stigma, with membranous, inflexed or erect tips, rarely with tips obsolete; pollen-masses solitary in each cell, erect, pedicelled, waxy. *Carpels* 2, distinct; stigma included, flat or with an apiculate centre. *Fruit* of 2, usually slender acuminate thin-walled, rarely turgid and very thick-walled follicles. *Seeds* very small, ovate or linear-oblong; coma long.

*Leaves, branchlets, and umbels quite glabrous; sepals ovate; corolla pearly white, ·3 in. wide; lobes glabrous within; coronal processes longer than corolla-tube; peduncles short or long; leaves 3–5 in. long, ovate, elliptic, or lanceolate, acute or acuminate, margins flat; petiole ·75–1 in. [p. 700].....*parasitica.*

*Leaves, branchlets, and umbels more or less hirsute :—[p. 699]
Sepals rounded; corolla creamy-yellow, ·5 in. wide; lobes nearly glabrous within; coronal processes shorter than corolla-tube; peduncles long; pedicels villous; leaves 5–7 in. long, elliptic or oblong, cuspidate or acuminate, margins flat; petiole ·5–1 in. *globulosa.*
Sepals lanceolate; corolla white, ·6 in. wide; lobes silkily villous; coronal processes as long as corolla-tube; peduncles short; pedicels sparingly hairy; leaves 1·5–3 in., elliptic, ovate, or lanceolate, acute, margins recurved; petiole ·25–·5 in. ..... *pendula.*

1268. HOYA PARASITICA Wall.; F. B. I. iv. 57. *Asclepias parasitica* F. I. ii. 42.
Sundribuns; E. Bengal; Tippera; Chittagong.
A large climber.

1269. HOYA GLOBULOSA Hook. f.; F. B. I. iv. 60.
Chittagong.
A stout climber.

1270. HOYA PENDULA Wight; F. B. I. iv. 61; E. D. H. 442. *Asclepias pendula* F. I. ii. 36.
Orissa; Chota Nagpur.
A rather slender climber.

590. Ceropegia Linn.

Twining, less often erect herbs, usually with a tuberous root-stock; *leaves* opposite, sometimes minute or 0. *Flowers* often showy, white or greenish or purplish, in axillary, peduncled, umbellate cymes, rarely solitary. *Sepals* very shortly connate below in a 5-partite calyx, 5-glandular within; lobes very narrow. *Petals* 5, connate in an elongated tube, straight or curved, usually swollen at the base; throat dilated or not; lobes various, broad or narrow, erect or incurved, with cohering tips, often ultimately recurved or reflexed, valvate in bud: corona adnate to the staminal column, annular or cupular, 5–10-lobed, and with 5 long or short inner ligulate processes that are free or adnate to the anthers. *Stamens* 5, adnate to base of corolla-tube; filaments connate in a short column; anthers short, obtuse; pollen-masses solitary in each cell, erect, sessile, with one pellucid margin, waxy. *Carpels* 2, distinct; stigma depressed or shortly 2-lobed, included. *Fruit* of two terete, smooth, usually slender follicles. *Seeds* comose.

Corolla nearly straight; tube longer than the ciliate lobes; leaves and branchlets hirsute.....*hirsuta.*
Corolla distinctly curved; tube not longer than the glabrous lobes; leaves and branchlets nearly glabrous .....*macrantha.*

1271. CEROPEGIA HIRSUTA W. & A.; F. B. I. iv. 71.
Behar; Chota Nagpur.
A coarse, subhispidly hairy climber.

1272. CEROPEGIA MACRANTHA Wight; F. B. I. iv. 74.
N. Bengal, Duars.
A stoutish, extensive, almost glabrous climber.

Order LXXXV. LOGANIACEÆ.

Trees, shrubs, or herbs. *Leaves* opposite, rarely ternate, undivided; stipules various or 0. *Flowers* hermaphrodite or, by abortion, subdiœcious, in terminal or axillary, simple or compound cymes, the cymes sometimes subcapitate or reduced to solitary flowers. *Sepals* connate in a small, inferior calyx; limb imbricately 4–5-toothed or lobed. *Petals* connate in a 4–5-lobed or -partite corolla; lobes imbricate, valvate, or contorted. *Stamens* 4 or 5, inserted on the corolla-tube, alternate with the lobes; anthers 2-celled; dehiscence introrse, longitudinal; rarely 1-celled, divaricate, with confluent tips. *Carpels* 2, connate in a free, 2-celled ovary; ovules 1 or more in each cell, placentas on the septum or basal at the inner angle; style simple; stigma capitate, 2-fid or 2-partite. *Fruit* a septicidal capsule or a berry, 1–many-seeded. *Seeds* various; albumen fleshy or cartilaginous; embryo straight.

Herbs; corolla valvate; fruit a compressed, didymous capsule:—
Flowers in cymes, 2–3-chotomously branched; corolla 5-lobed **Mitreola.**
Flowers on solitary or clustered pedicels; corolla 4-lobed **Mitrasacme.**

Shrubs or trees:—
Fruit a 2-valved capsule; corolla imbricate .....**Buddleia.**
Fruit indehiscent:—
Corolla contorted .....**Fagræa.**
Corolla valvate .....**Strychnos.**

591. Mitreola Linn.

Herbs; *leaves* opposite; stipules membranous or small. *Flowers* small, white, in 2–3-chotomous, terminal or axillary, peduncled cymes, often unilateral on the cyme-branches. *Sepals* connate in a 5-partite calyx; lobes lanceolate. *Petals* 5, connate in an urceolate corolla; lobes small, valvate. *Stamens* 5, included; filaments short; anthers ovate, cordate at base; cells parallel. *Carpels* connate in a 2-locular ovary; ovules in each cell many, on peltate placentas; styles 2, short, connate under one small pilose stigma, at length divergent. *Fruit* an obovoid, laterally compressed, truncate or 2-horned capsule, dehiscing by separation from above downwards of the carpels from the septum on each side. *Seeds* very many, minute, globose or elongated; albumen fleshy; embryo linear.

1273. Mitreola oldenlandioides Wall.; F. B. I. iv. 79.
Behar; Chota Nagpur.
A small, erect annual.

592. Mitrasacme Labill.

Small herbs; *leaves* opposite; stipules forming a minute sheath. *Flowers* small, white, terminal or axillary, solitary, clustered, or in irregular umbels. *Sepals* connate in a campanulate, 4-fid calyx. *Petals* 4, connate in an urceolate corolla; lobes valvate or reduplicate, sometimes spreading. *Stamens* 4, adnate to corolla-tube; filaments rather short; anthers ovate, base cordate; connective often produced; cells parallel. *Carpels* connate in a 2-locular ovary; ovules in each cell many, on peltate placentas; styles 2, connate, separating from below upwards, usually finally divergent; stigma capitate or 2-lobed. *Fruit* a subglobose capsule, laterally subcompressed, top truncate or almost 2-horned, dehiscing by separation from above downwards of the carpels from the septum on each side. *Seeds* many, minute, subglobose; testa smooth, reticulated; albumen fleshy; embryo straight.

1274. Mitrasacme alsinoides R. Br.; F. B. I. iv. 80.
Chota Nagpur; W. Bengal.
A small, weak annual.

593. Buddleia Linn.

Trees, shrubs, or herbs; *leaves* opposite, entire or crenate, united by a stipular line. *Flowers* densely cymose; cymes

globose or corymbose, axillary or in a thyrsoid, terminal panicle. *Sepals* connate in a campanulate, 4-toothed, or 4-fid calyx. *Petals* 4, connate in an urceolate corolla; lobes imbricate in bud. *Stamens* 4, adnate to corolla-tube; anthers subsessile, ovate or oblong, base cordate or 2-lobed; cells parallel. *Carpels* connate in a 2-celled ovary; ovules many in each loculus; style simple, linear, often curved, clavate; stigma terminal or decurrent on two sides. *Fruit* a septicidally 2-valved capsule, the valves entire or 2-fid. *Seeds* many, oblong or fusiform; testa usually lax or expanded in a wing or tail; albumen fleshy; embryo straight.

1275. BUDDLEIA ASIATICA Lour.; F. B. I. iv. 82; E. D. B. 929.

Chota Nagpur; N. Bengal; Chittagong.

A shrub, 6–15 feet high. *Beng.* Neemda, bad-bhota.

594. Fagræa Thunb.

Trees or shrubs, often epiphytic, sometimes scandent; *leaves* opposite, entire; petioles dilated at the base or united by a stipular sheath. *Flowers* large or small, white or yellowish, rarely pink, in terminal or axillary cymes, grouped in corymbs, racemes, or elongated panicles; bracts small. *Sepals* connate in a deeply 5-fid or 5-partite calyx; lobes thick, broad, obtuse, much imbricate. *Petals* 5, connate in a narrow, tubular or funnel-shaped corolla; lobes broad, twisted, overlapping to the left. *Stamens* 5, adnate to corolla-tube, exserted; filaments filiform; anthers oblong or ovate, base 2-fid or cordate; cells parallel. *Carpels* connate in a 2-locular ovary or, from incomplete intrusion of carpellary margins, the upper portion partly 1-locular; ovules numerous in each complete or incomplete cell; style filiform; stigma capitate. *Fruit* a 1–2-celled berry, many-seeded. *Seeds* embedded in pulp; testa crustaceous; albumen horny; embryo small, straight.

1276. FAGRÆA OBOVATA Wall.; F. B. I. iv. 83; E. D. F. 27.

Chittagong.

A small tree or large shrub.

595. Strychnos Linn.

Scandent shrubs with short tendrils, or trees; *leaves* opposite, usually 3–5-nerved; in scandent species short, axillary tendrils are produced in some of the axils, the adjacent leaf being then often suppressed; in the subterminal axils often both tendrils developed, when usually both adjacent leaves and apex of branch are sup-

pressed. *Flowers* white or yellowish, in terminal or lateral cymes; bracts small. *Sepals* connate in a small 5-lobed or 4-lobed calyx. *Petals* 5 or 4, connate in a short or long tube; lobes valvate. *Stamens* 5 or 4, adnate to corolla-tube; filaments short; anthers ovate, dorsifixed; cells parallel. *Carpels* connate in a completely, rarely partially, 2-celled ovary; ovules many in each cell; style simple, long or short or almost obsolete; stigma capitate, or small terminal, or somewhat 2-lobed. *Fruit* a globose or oblong berry, with usually a crustaceous pericarp, many- or few- (sometimes 2- or 1-) seeded. *Seeds* globose, oblong or discoid; albumen horny; embryo small.

Climber with tendrils; leaves 3-nerved, oblong, caudate; cymes terminal, short-peduncled, many-flowered ..... *Wallichiana.*
Erect trees:—
Leaves ovate, 5-nerved; cymes terminal, short-peduncled, many-flowered; fruit 1·5 in. across, many-seeded ..... *Nux-vomica.*
Leaves elliptic, 3-nerved; cymes axillary, almost sessile; fruit ·3–·6 in. across, 1–2-seeded ..... *potatorum.*

1277. STRYCHNOS WALLICHIANA Benth.; F. B. I. iv. 90.
Chittagong.
A tendril-bearing climber.

1278. STRYCHNOS NUX-VOMICA Linn.; F. I. i. 575; F. B. I. iv. 90; E. D. S. 2943.
Chota Nagpur; Orissa.
A tree, 30–40 feet high. *Vernac.* Kuchila.

1279. STRYCHNOS POTATORUM Linn. f.; F. I. i. 576; F. B. I. iv. 90; E. D. S. 2960.
Western Behar; Chota Nagpur; Orissa.
A tree, 40–50 feet high. *Beng.* and *Hind.* Nirmali; *Santal.* Kuchila; *Uriya* Kotaki.

Order LXXXVI. GENTIANACEÆ.

Herbs. *Leaves* opposite, rarely alternate, entire; very rarely alternate, 3-foliolate. *Flowers* regular or occasionally irregular, hermaphrodite, or very rarely by abortion polygamous, cymose capitate or umbellate, rarely solitary; bracts scale-like or 0; bracteoles very rare. *Sepals* connate in an inferior calyx; lobes 4 or 5, imbricate in bud. *Petals* connate in a funnel-shaped or rotate

corolla; 4 or 5, rarely 6–12, contorted, overlapping to the left, very rarely induplicate-valvate. *Stamens* 4–12, as many as the corolla-lobes and alternate with them, all perfect and equal, or some unequal or abortive or suppressed; filaments linear, sometimes dilated below; anthers oblong; dehiscence longitudinal, introrse, rarely extrorse. *Disk* of 5 glands at base of ovary, or annular, or 0. *Carpels* 2, connate in a superior, 1-celled ovary, or rarely almost 2-celled from the intruded placentas meeting; ovules numerous; style short or linear, simple; stigmas 2, small. *Fruit* usually a membranous capsule, rarely a fleshy berry. *Seeds* small, many, sometimes winged; albumen copious; embryo small.

Leaves opposite; corolla-lobes twisted to the right; terrestrial or marsh herbs, not floating:—
- Ovary completely 2-celled; style filiform ..... **Exacum.**
- Ovary 1-celled:—
  - Style filiform:—
    - Flowers regular ..... **Erythræa.**
    - Flowers irregular:—
      - Stigmas hardly divided; small herbs ..... **Hoppea.**
      - Stigmas 2 ..... **Canscora.**
  - Style very short or wanting; stigmas 2; petals with shallow pits at their base ..... **Swertia.**

Leaves alternate; corolla-lobes induplicate-valvate in bud; aquatic floating herbs ..... **Limnanthemum.**

596. **Exacum** Linn.

Herbs, usually branched; *leaves* opposite, ovate or lanceolate, usually 3–5-nerved. *Flowers* rather showy, in terminal and axillary cymes. *Sepals* connate in a deeply 4–5-lobed calyx; lobes keeled or winged or flat. *Petals* 4 or 5, connate in a rotate corolla, with short, globose tube; lobes contorted, ovate or oblong, blue, purplish, or white. *Stamens* 4 or 5, adnate to corolla-throat; filaments short; anthers large, oblong, obtuse, erect, base shortly 2-lobed, 2-locular throughout, with 2 apical pores that at length usually extend to the base. *Carpels* connate in a more or less completely 2-celled ovary; ovules many, on large, fleshy placentas, adnate to septum; style long; stigma small, subcapitate. *Fruit* a globose, septicidally 2-valved capsule. *Seeds* many, minute, subcuboid; testa granular.

Stems rather stout, hardly branching, usually considerably over a foot high; leaves sessile, broad, lanceolate, 5-nerved; anthers ·25 in. long:—
Calyx-lobes keeled but hardly winged; corolla-lobes blue...*tetragonum*.
Calyx-lobes distinctly winged; corolla-lobes white in lower, blue in upper part .....*bicolor*.
Stems very slender, much-branched upwards, never over a foot high, usually 3–7 in.; anthers ·12 in. long; calyx-lobes distinctly winged:—
Calyx-wings distinct; corolla-lobes blue; leaves subsessile, 3-nerved *pedunculatum*.
Calyx-wings broad; corolla-lobes white or pale blue; leaves petioled, 5-nerved .....*petiolare*.

1280. EXACUM TETRAGONUM Roxb.; F. I. i. 398; F. B. I. iv. 95; E. D. E. 589.
In all the provinces.
An erect annual, 1–4 feet high. *Hind.* Ava-charayatah; *Beng.* Kuchuri.

1281. EXACUM BICOLOR Roxb.; F. I. i. 397; F. B. I. iv. 96; E. D. E. 585.
Orissa.
An erect annual, 1–4 feet high. *Vernac.* Bara-chara-yatah.

1282. EXACUM PEDUNCULATUM Linn.; F. B. I. iv. 97; E. D. E. 587. *E. sulcatum* F. I. i. 400.
Behar; Chota Nagpur.
A slender annual, 3–12 in. high.

1283. EXACUM PETIOLARE Griseb.; F. B. I. iv. 98.
Chota Nagpur.
A slender annual, 2–12 in. high.

597. Erythræa L. C. Rich.

Annual or perennial, erect, branching herbs; *leaves* opposite, sessile. *Flowers* white or rose, in dense or corymbose, dichotomous cymes. *Sepals* connate in a tubular, 4–5-lobed calyx; lobes lanceolate or linear, keeled. *Petals* 5, rarely 4, connate in a short-tubed subrotate, or long-tubed salver-shaped corolla; lobes spreading, contorted. *Stamens* 5, adnate to near throat of corolla; filaments short, linear; anthers narrowly oblong, usually exserted, and usually at length spirally twisted, sometimes hardly altered. *Carpels* connate in a 1-celled ovary, with 2 far-intruded placentas; ovules many; style linear; stigmas semicircular or oblong. *Fruit*

an oblong capsule, nearly as long as calyx, almost 2-celled, septicidally 2-valved. *Seeds* very small, reticulated.

1284. ERYTHRÆA ROXBURGHII G. Don; F. B. I. iv. 102; E. D. E. 338. *Chironia centaurioides* F. I. i. 584.

N. Bengal; C. Bengal; E. Bengal.

A small, erect annual, 2–8 in. high. *Hind.* Charayatah; *Santal.* Gada-sigrik'; *Beng.* Gima, girmi.

598. Hoppea Willd.

Small, much-branched, glabrous herbs; *leaves* small, sessile, ovate or elliptic. *Flowers* sessile or short-pedicelled, in 2–3-chotomous cymes. *Sepals* connate in a campanulate, 4-ribbed calyx; lobes 4, ovate, acuminate. *Petals* 4, connate in a subglobose or elongated corolla; lobes short or long, more or less unequal. *Stamens* only 1 perfect, with 3 rudimentary, attached to corolla-throat; filament linear, short; anther ovate, dehiscing introrsely by 2 longitudinal slits; barren anthers similar but smaller, or absent. *Carpels* connate in a 1-celled ovary; placentas not far intruded; ovules many; style short; stigma subentire. *Fruit* a globose or ellipsoid capsule, dehiscing by separation of the carpels. *Seeds* very many, minute, nearly black, obscurely reticulated.

1285. HOPPEA DICHOTOMA Willd.; F. B. I. iv. 100. *Pladera pusilla* F. I. i. 403.

Behar; Chota Nagpur; C. Bengal; Chittagong.

A small, much-branched, glabrous herb, 1–5 in. high.

599. Canscora Lamk.

Annual, dichotomously branched herbs; *leaves* opposite, petioled, sessile, or perfoliate. *Flowers* in terminal or central cymes, or solitary axillary, or densely spicate on scapes. *Sepals* connate in a 4-toothed, terete, striate, keeled, or winged, tubular calyx. *Petals* 4, connate in a cylindric corolla; tube about as long as calyx; lobes more or less unequal, imbricate. *Stamens* 4, adnate high up in the corolla-tube, 1 or 2 with longer filaments and fertile, ovate or oblong anthers; 3 or 2 with shorter filaments, often adnate lower down and with smaller barren anthers, sometimes almost obsolete. *Carpels* connate in a 1-celled ovary; placentas little intruded; ovules many; style linear; stigmas 2, short, hemispheric. *Fruit* a 2-valved capsule, the 2 carpels separating, or

often very thin-walled and breaking up irregularly. *Seeds* minute, many-angled, dark-brown, reticulated.

Calyx striate or keeled, not winged; stem quadrangular; flowers rose-coloured ..... *diffusa.*
Calyx winged; stem 4-winged; flowers white ..... *decussata.*

1286. CANSCORA DIFFUSA R. Br.; F. B. I. iv. 103; E. D. C. 384. *Pladera virgata* F. I. i. 401.
In all the provinces.
An erect, branching annual.

1287. CANSCORA DECUSSATA Roem. & Schult.; F. B. I. iv. 104; E. D. C. 382. *Pladera decussata* F. I. i. 402.
In all the provinces.
An erect, branching annual. *Hind.* Sankha kuli; *Beng.* Dánkuni.

600. Swertia Linn.

Annual or perennial herbs; *leaves* opposite. *Flowers* blue, lurid, or whitish, sometimes with yellow glands; cymes in thyrsoid or corymbose panicles. *Sepals* connate in a 4–5-partite calyx; lobes linear or lanceolate, rarely ovate, 1–3-nerved. *Petals* 4 or 5, connate in a rotate corolla; lobes twisted to the right, each, or the corolla-tube below each with 1 or 2 pits, depressions, or glands naked or partially occluded by a basal scale; margins of pits fimbriate throughout or at the apex only; scales naked or with fimbriate tips. *Stamens* 4 or 5 (in our species 4), adnate near base of corolla, free or rarely monadelphous; filaments linear, complanate, often more or less widened downwards; anthers oblong-ovate or hastate, versatile. *Carpels* connate in a 1-celled ovary; placentas little intruded, many-ovuled; style 0, or short, rarely linear-cylindric; stigmas 2. *Fruit* a sessile, ovate or oblong capsule, dehiscing by separation of the 2 carpels. *Seeds* many, rarely few, small or very small; testa close or lax or winged, reticulate.

1288. SWERTIA AFFINIS Clarke; F. B. I. iv. 126; E. D. C. 3012.
Chota Nagpur.
An erect annual, 1–3 feet high. *Vernac.* Chiretta.

601. Limnanthemum S. P. Gmel.

Aquatic herbs; *leaves* deeply cordate, entire or sinuate, alternate or subopposite. *Flowers* peduncled, white or yellow; peduncles

fascicled at the nodes. *Sepals* slightly connate in a 4–5-partite calyx; lobes oblong. *Petals* 4 or 5, connate in a rotate corolla; tube often with glands opposite the lobes, sometimes with hirsute throat; lobes valvate in bud, ciliate, fimbriate, or with an oblong, longitudinal fold down the middle. *Stamens* 4 or 5, adnate to corolla-tube; filaments linear, short; anthers hastate-oblong, versatile. *Carpels* connate in a 1-celled ovary; placentas not intruded, many-ovuled; style short; stigma of 2 lamellæ. *Fruit* an ovoid or oblong, irregularly opening or almost indehiscent capsule. *Seeds* many, compressed, orbicular, slightly marginate or almost flat, discoid; testa close, somewhat spongy, finely reticulated, occasionally covered with papillose glands.

Stems floating, rooting at the nodes; leaves orbicular, deeply cordate; flowers white, yellow towards base of corolla within:—

Corolla-lobes entire, with a longitudinal fold down the middle; seeds scabrous ..... *cristatum.*

Corolla-lobes fimbriate, densely papillose, without a fold down the middle; seeds almost or quite smooth ..... *indicum.*

Stems floating, not rooting at the nodes; corolla-lobes fimbriate, without a fold down the middle:—

Leaves all orbicular, deeply cordate; corolla yellow; seeds minutely reticulate, glabrous ..... *aurantiacum.*

Leaves, radical spathulate-orbicular, cauline orbicular, deeply cordate; corolla white; seeds minutely puberulous ..... *parvifolium.*

1289. LIMNANTHEMUM CRISTATUM Griseb.; F. B. I. iv. 131. *Menyanthes cristata* F. I. i. 459.

In ponds in all the provinces.

An aquatic herb. *Beng.* Pan-chúli, chand-malla; *Hind.* Tagar mul.

1290. LIMNANTHEMUM INDICUM Thw.; F. B. I. iv. 131. *Menyanthes indica* F. I. i. 460.

In ponds in all the provinces.

An aquatic herb. *Beng.* Pan-chúli, chand-malla; *Hind.* Tagar mul.

1291. LIMNANTHEMUM AURANTIACUM Dalz.; F. B. I. iv. 132.

E. Bengal.

An aquatic herb. *Beng.* Haldi chand-malla.

1292. LIMNANTHEMUM PARVIFOLIUM Griseb.; F. B. I. iv. 132.

Chittagong.

An aquatic herb.

Order LXXXVII. POLEMONIACEÆ.

Herbs, rarely shrubs, erect or climbing. *Leaves* alternate or opposite, entire or lobed or dissected; stipules 0. *Flowers* regular, hermaphrodite, showy, solitary fascicled or panicled. *Sepals* 5, connate in an inferior calyx; lobes slightly imbricate or valvate. *Petals* connate in a gamopetalous corolla; lobes 5, twisted to the right. *Stamens* 5, inserted on the corolla-tube, alternate with the lobes; anthers versatile; dehiscence longitudinal, introrse. *Carpels* 3, connate in a superior, 3-celled ovary; ovules very many, on the inner angle; style simple; stigma shortly 3-fid. *Fruit* a septicidal, 3-valved capsule. *Seeds* many; albumen fleshy or cartilaginous; embryo straight.

602. Phlox Linn.

Herbs, erect or diffuse, usually perennial, sometimes annual; *leaves* opposite or the uppermost alternate. *Flowers* usually showy, solitary or in terminal cymes. *Sepals* connate in a narrowly campanulate, 5-ribbed, deeply 5-fid calyx; lobes acute, often with scarious edges. *Petals* 5, connate in a salver-shaped corolla, with slender tube and contracted throat; lobes equal, obovate, orbicular, or obcordate. *Stamens* 5, included, unevenly adnate to corolla-tube. *Carpels* connate in a 3-locular, oblong or ovoid ovary; ovules in each cell 1 or 2, rarely more; style simple, with shortly 3-fid apex, the lobes stigmatic within. *Fruit* an ovoid, 3-valved capsule. *Seeds* ovoid, with narrow wings or wingless.

1293. Phlox Drummondi Hook.

In gardens in the cold season; occasionally subspontaneous on rubbish heaps in C. Bengal, but only the white-flowered form.

An annual herb; native of N. America.

Order LXXXVIII. HYDROPHYLLACEÆ.

Annual or perennial herbs. *Leaves* radical or alternate, very rarely opposite, entire or toothed; stipules 0. *Flowers* regular, hermaphrodite, usually in unilateral or dichotomous cymes, sometimes spicate or racemed. *Sepals* 5, connate in an inferior calyx; lobes imbricate. *Petals* 5, connate in a gamopetalous corolla; lobes imbricate, rarely contorted. *Stamens* 5, adnate to corolla-

tube, alternate with corolla-lobes; filaments filiform, often dilated at the base; anthers oblong, versatile; dehiscence longitudinal, introrse. *Disk* hypogynous, small, or 0. *Carpels* 2, connate in a superior, 1-locular, or imperfectly or perfectly 2-locular ovary; ovules usually many; styles usually 2, distinct; stigmas capitate. *Fruit* a globose or ovoid, loculicidally or septicidally 2-valved or irregularly 4-valved capsule. *Seeds* minute; albumen fleshy; embryo small.

603. Hydrolea Linn.

Herbs; *leaves* alternate, entire. *Flowers* blue, in short, terminal racemes or cymes, regular. *Sepals* connate in a deeply 5-partite calyx; lobes lanceolate. *Petals* 5, connate in a widely campanulate, subrotate corolla; lobes imbricate. *Stamens* 5, adnate to corolla-tube, alternate with its lobes; filaments filiform, often dilated at the base; anthers oblong, sagittate. *Carpels* 2, connate in a completely 2-celled ovary; ovules in each cell numerous; styles 2, distinct; stigmas capitate. *Fruit* a globose or ovoid, septicidal or irregularly 4-valved capsule. *Seeds* minute.

1294. HYDROLEA ZEYLANICA Vahl; F. B. I. iv. 133; E. D. H. 504.
Nama zeylanica F. I. ii. 73.
In all the provinces.
An annual marsh weed. *Beng.* Kasschra, isha-langulia.

Order LXXXIX. BORAGINEÆ.

Herbs, shrubs or trees, often hispid or scabrous. *Leaves* alternate, rarely opposite, mostly entire; stipules 0. *Flowers* regular, hermaphrodite, or rarely by abortion polygamous, usually in scorpioid cymes, rarely solitary, axillary; bracts various, rarely 0. *Sepals* connate in an inferior calyx; lobes 5 rarely 6–8, usually persistent, imbricate or open in bud. *Petals* connate in a gamopetalous corolla; lobes 5, rarely 4 or 6, imbricate, rarely twisted in bud. *Stamens* 4–6, adnate to corolla-tube, and alternate with corolla-lobes; anthers ovate, oblong, or linear; dehiscence longitudinal, lateral or introrse. *Carpels* connate in a superior ovary; cells 2 each 2-ovuled, or 4 each 1-ovuled; style terminal or rising from between the lobes of the ovary, long or short, rarely twice 2-fid; stigmas capitate or 2-lobed; ovules suberect from base of inner angle of each cell. *Fruit* drupe-like or dividing into 2–4

nutlets. *Seeds* erect or oblique; testa membranous; albumen fleshy, copious or scanty, or 0; embryo straight or curved; radicle superior.

Leaves all alternate:—

Styles terminal on the entire or only faintly lobed ovary; fruit a drupe, often dry, so that the included pyrenes simulate nutlets:—

Styles twice 2-partite; drupe including one 4-1-seeded stone; trees or shrubs; calyx enlarging in fruit ..... **Cordia.**

Styles simple or only once 2-partite, rarely (*Coldenia*) two more or less distinct, simple styles; drupe including two 2-seeded or four 1-seeded pyrenes; calyx not or scarcely enlarging in fruit:—

Styles depressed-conical at the apex or with a horizontal ring below or at the stigmas:—

Styles short, shortly 2-lobed; pyrenes two, 2-seeded; shrubs, usually more or less scandent ..... **Tournefortia.**

Styles elongated, dilated at apex; stigma above the ring variously none, or elongate-lanceolate simple, or linear double; pyrenes four, 1-seeded, much resembling nutlets; herbs **Heliotropium.**

Styles elongated, not dilated or annular at the apex:—

Styles simple; stigma capitate; pyrenes four, 1-seeded; twiggy shrubs ..... **Rhabdia.**

Styles more or less 2-partite:—

Styles 2-fid at the apex; pyrenes two, 2-seeded, or four, 1-seeded; trees or shrubs ..... **Ehretia.**

Styles more or less separate, distinct at base and at apex, united but readily separable in the middle; pyrenes four, 1-seeded, much resembling nutlets; prostrate herbs **Coldenia.**

Styles rising from between the lobes of the 4-lobed ovary; fruit of 4, rarely by suppression 3–1, indehiscent, 1-seeded nutlets, attached to a carpophore; anthers ovate-obtuse, not exserted; herbs:—

Scar of attachment of granular-scabrid nutlets to the oblong carpophore near middle of their inner face; flowers all pedicelled **Bothriospermum.**

Scar of attachment of glochidiate nutlets to the conical carpophore extending to the top of the nutlet; flowers all sessile or only the very lowest pedicelled ..... **Cynoglossum.**

Leaves opposite below, alternate above; herbs; fruit ellipsoid, of 4 nutlets, closely adnate by their whole inner face to the carpophore under the subterminal style; fruiting calyx enlarged; anthers conniving in a cone, lanceolate, somewhat exserted ..... **Trichodesma.**

604. Cordia Linn.

Trees or shrubs, sometimes subscandent; *leaves* alternate, rarely subopposite, petioled. *Flowers* polygamous, in dichotomous corymbs or clusters, hermaphrodite corymbs much fewer-flowered than the male inflorescence; bracts 0. *Sepals* connate in a tubular or campanulate calyx; teeth very short, often irregular, accrescent in fruit. *Petals* 4–8, connate in a funnel-shaped corolla; lobes white or orange, spreading or recurved. *Stamens* 4–8, evenly or unevenly adnate to corolla-tube; filaments often hirsute at base; anthers oblong or linear, sagittate or hastate, shortly exserted. *Carpels* connate in a 4-celled ovary; ovules in each cell solitary; style terminal, simple below, long, 2-partite, the branches again 2-partite, linear or subspathulate. *Fruit* an ovoid or ellipsoid drupe, with a bony, 1–4-celled putamen, usually only 1 cell with a fertile seed. *Seeds* ascending; albumen 0.

Corolla small, white; tube hardly longer than calyx:—
Leaves scabrous above with white disks; calyx tomentose; fruit size of a cherry; leaves beneath glabrescent ..... *monoica.*
Leaves above smooth or rugose, not scabrous:—
Leaves beneath densely tomentose:—
Leaves white-dotted above; calyx densely tomentose; fruit size of a pea ..... *Clarkei.*
Leaves not white-dotted above; fruit size of a cherry:—
Leaves rugose, impressed above; calyx densely tomentose throughout, ribbed upwards ..... *Macleodii.*
Leaves smooth above; calyx glabrescent beneath, villous but not ribbed upwards ..... *obliqua* var. *Wallichii.*
Leaves beneath pubescent or puberulous when young, but not densely tomentose, glabrescent or glabrous when mature:—
Leaves white-dotted above; calyx pubescent; fruit size of a pea *grandis.*
Leaves not white-dotted above; fruit size of a cherry; calyx glabrous or slightly pubescent:—
Young shoots silver-grey ..... *Myxa.*
Young shoots brown tawny-pubescent ..... *Myxa* var. *brunnea.*
Corolla large, orange; tube much longer than calyx ..... *Sebestena.*

1295. Cordia monoica Roxb.; F. I. i. 592; F. B. I. iv. 137.
Orissa.
A small tree.

1296. Cordia Clarkei Brace. *C. fragrantissima* F. B. I. iv. 137 partly.
E. Bengal; Chittagong.
A large tree.

1297. Cordia Macleodii Hook. f. & Thoms.; F. B. I. iv. 139; E. D. C. 1927.
Chota Nagpur.
A tree, 40 feet high. *Hind.* Dhengan; *Santal.* Jugia; *Kol.* Reuta, porponda.

1298. Cordia obliqua Willd. var. Wallichii; F. B. I. iv. 137; E. D. C. 1940.
Chota Nagpur.
A tree, 40 feet high. *Hind.* Chhota-lasura; *Beng.* Chhoto lashora, chhoto-bohnari.

1299. Cordia grandis Roxb.; F. I. i. 593; F. B. I. iv. 137.
Chittagong.
A large tree.

1300. Cordia Myxa Linn.; F. I. i. 590; F. B. I. iv. 136; E. D. C. 1931.
In all the provinces.
A tree or shrub. *Hind.* Lasura; *Beng.* Lashora, bohnari; *Uriya* Gondi; *Santal.* Buch; *Kol.* Sinbrúm.

1300/2. Var. brunnea Kurz; F. B. I. iv. 136.
Chittagong.
A tree or shrub.

1301. Cordia Sebestena Linn.
Planted in gardens.
A small tree.

605. Tournefortia Linn.

Trees or shrubs, often rambling or subscandent; *leaves* alternate, entire. *Flowers* in dichotomous, scorpioid, terminal, rarely lateral or extra-axillary cymes, white or greenish-yellow, sessile or very shortly pedicelled; bracts 0. *Sepals* connate in a 5-partite, rarely 4-partite calyx; lobes linear-lanceolate or oblong. *Petals* 5, rarely 4, connate in a cylindric corolla, with long, rarely short tube; throat naked; lobes spreading. *Stamens* 5, rarely 4, included, adnate to corolla-tube; filaments short; anthers oblong. *Carpels* connate in a 4-celled ovary; ovules solitary in each cell; style terminal, short, slightly 2-lobed. *Fruit* a small, ovoid,

almost dry drupe, not clearly separating into 2 distinct pyrenes; pyrenes each 2-celled, 2-seeded. *Seed* straight or curved; albumen fleshy.

Corolla-tube nearly thrice as long as calyx-teeth .....*Roxburghii.*
Corolla-tube hardly exceeding the calyx-teeth .....*viridiflora.*

1302. TOURNEFORTIA ROXBURGHII Clarke; F. B. I. iv. 146. *Heliotropium paniculatum* F. I. i. 455. *H. Roxburghii* F. B. I. iv. 153.
Chittagong.
A small, rambling shrub.

1303. TOURNEFORTIA VIRIDIFLORA Wall.; F. B. I. iv. 146. *Lithospermum viridiflorum* F. I. i. 455.
Chittagong.
A small shrub; not so common as the preceding.

606. Heliotropium Linn.

Annual or perennial, villous or scabrid herbs, rarely undershrubs or shrubs; *leaves* alternate. *Flowers* small, white or pale purple, in usually terminal, dichotomous cymes, with often long, scorpioid branches; bracts small or 0, sometimes bracts leafy and inflorescence axillary. *Sepals* connate in a 5-lobed or 5-partite calyx; segments lanceolate or linear, rarely short. *Petals* 5, connate in a tubular corolla; throat naked; lobes spreading in flower, imbricate or induplicate in bud. *Stamens* 5, adnate to corolla-tube, included; filaments very short; anthers ovate or lanceolate. *Carpels* connate in a more or less perfectly 4-celled ovary; ovules solitary in each cell; style terminal, short or long, with a flat or conical apical disk; stigma on the disk 0, or short or elongate, lanceolate, entire, rarely 2-armed. *Fruit* dry, indehiscent, 4-lobed, or of four more or less free nutlets. *Seeds* straight or curved; albumen scanty or 0, rarely copious.

Calyx enveloping the fruit; lobes short, subvalvate; leaves petioled, elliptic-ovate; spikes short, woolly .....*supinum.*
Calyx not enveloping the fruit; lobes narrow, long:—
*Fruit breaking up into four nutlike, 1-seeded pyrenes:—[p. 716]
Leaves elliptic or obovate, obtuse, mucronate or not; spikes persistently bracteate.....*ovalifolium.*
Leaves lanceolate or linear-lanceolate, acute:—

Spikes not conspicuously bracteate towards the upper part:—
Leaves lanceolate, over ·5 in. long .....*strigosum.*
Leaves narrow-lanceolate, under ·5 in. long
strigosum var. *brevifolia.*
Spikes conspicuously bracteate throughout:—
Stems rigid, not intricately branched .....*marifolium.*
Stems decumbent, intricately branched
marifolium var. *Wallichii.*
*Fruit separating into two nut-like, 2-seeded pyrenes; leaves petioled, ovate, subserrate [p. 715] .....*indicum.*

1304. HELIOTROPIUM SUPINUM Linn.; F. B. I. iv. 149.
Western Behar, rare.
A prostrate annual.

1305. HELIOTROPIUM OVALIFOLIUM Forsk.; F. B. I. iv. 150. *H. coromandelianum* F. I. i. 454.
N. Bengal; C. Bengal; Behar; Tirhut.
A herb with rigid, woody stems and ascending branches. *Beng.* Naga-phuli.

1306. HELIOTROPIUM STRIGOSUM Willd.; F. B. I. iv. 151; E. D. H. 106.
In all the western provinces.
A procumbent, much-branched herb. *Hind.* Safed-bhangra, chiti-phul.

1306/2. Var. BREVIFOLIA F. B. I. iv. 151.
In all the provinces.
As the preceding, but with shorter, narrowly lanceolate leaves.

1307. HELIOTROPIUM MARIFOLIUM Retz; F. B. I. iv. 152.
Behar; Chota Nagpur.
A small, rigid herb.

1307/2. Var. WALLICHII F. B. I. iv. 152. *Cynoglossum marifolium* F. I. i. 457.
In all the northern and eastern provinces.
A small, diffuse annual.

1308. HELIOTROPIUM INDICUM Linn.; F. I. i. 454; F. B. I. iv. 152; E. D. H. 102.
In all the provinces.
A diffuse, branching annual weed of waste places. *Vernac.* Hatisura.

607. Rhabdia Mart.

A shrub, with tough, twiggy branches; *leaves* small, alternate or clustered, linear-oblong, entire or toothed. *Flowers* small, in few-flowered, subterminal or lateral, short racemes. *Sepals* slightly connate below in a 5-partite calyx; lobes lanceolate, acuminate. *Petals* 5, connate in a shortly campanulate, pinkish-purple corolla; lobes oblong, imbricate. *Stamens* 5, adnate to corolla-tube; filaments filiform; anthers oblong or ovate. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell, or sometimes the cell more or less completely divided into two 1-ovuled chambers; style terminal; stigma capitate or faintly 2-lobed. *Fruit* a drupe with 4 crustaceous, 1-seeded pyrenes. *Seeds* oblong; albumen scanty.

1309. RHABDIA LYCIOIDES Mart.; F. B. I. iv. 145.

Chota Nagpur; N. Bengal: on gravel banks in rivers.

A shrub, with twiggy branches.

608. Ehretia Linn.

Shrubs or trees, glabrous or scabrid; *leaves* alternate. *Flowers* small, white, in axillary or terminal panicles or corymbs, rarely on 1-flowered, axillary peduncles. *Sepals* connate in a small, 5-partite calyx; lobes narrow open, or wider imbricate. *Petals* 5, connate in a shortly tubular or cylindric corolla; lobes imbricate, spreading or reflexed. *Stamens* 5, adnate to corolla-tube, usually exserted; filaments filiform; anthers ovate or oblong. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style terminal, cylindric, 2-fid or 2-partite; stigmas small, capitate. *Fruit* a small, subglobose drupe, with 4 or, by suppression, 3–1 seeds; pyrenes 4 each 1-seeded, or 2 each 2-seeded, or 1 with 4 seeds, 1 or more of the pyrenes or cells frequently suppressed. *Seeds* straight; testa thin; albumen scanty.

Leaves serrate; flowers in terminal, dense, compound panicles ..... *acuminata.*

Leaves quite entire; flowers in axillary corymbs:—

Corymbs mostly subaxillary, 3 in. across ..... *lævis.*

Corymbs axillary, larger and often subpaniculate towards ends of branches, 6 in. across ..... *lævis* var. *floribunda.*

1310. EHRETIA ACUMINATA R. Br.; F. B. I. iv. 141; E. D. E. 20. *E. serrata* Roxb.; F. I. i. 596.

N. Bengal; Chittagong.

A tree, 40 feet high. *Hind.* Panyan; *Beng.* Kula-aja.

1311. Ehretia lævis Roxb.; F. I. i. 597; F. B. I. iv. 141; E. D. E. 25.
Orissa; Chota Nagpur; Behar.
A tree, 30–40 feet high.

1311/2. Var. floribunda Brand.; F. B. I. iv. 142.
Western Behar.
A tree, 30–40 feet high.

609. Coldenia Linn.

Prostrate, scabrid herbs; *leaves* alternate, crisped. *Flowers* white, axillary, sessile or subsessile, sometimes the upper in a unilateral raceme or spike, with leafy bracts. *Sepals* connate in a 4–5-partite calyx; lobes narrow. *Petals* 4 or 5, connate in a short, tubular corolla; throat naked or with 4–5 scales; lobes spreading, imbricate. *Stamens* 4 or 5, adnate to corolla-tube, included; filaments short; anthers ovate. *Carpels* connate in an ovoid ovary, 2-celled or imperfectly 4-celled; ovules 4, 2 in each cell or solitary in each imperfect chamber; style terminal, 2-fid. *Fruit* an almost dry drupe of 4 subconnate, 1-seeded pyrenes, sometimes one or more abortive. *Seeds* with thin testa; albumen 0 or very scanty; cotyledons flat.

1312. Coldenia procumbens Linn.; F. I. i. 448; F. B. I. iv. 141; E. D. C. 1707.
In most of the provinces.
A flatly prostrate, scabrous annual. *Vernac.* Tripunkhi.

610. Bothriospermum Bunge.

Annual or biennial, weak, strigose or hirsute herbs; *leaves* alternate, ovate or lanceolate. *Flowers* small, blue or white, axillary, pedicelled, the uppermost passing into a bracteate raceme. *Sepals* connate in a 5-partite calyx; lobes narrow, hardly accrescent. *Petals* 5, connate in a short-tubed corolla; throat with 5 scales; lobes obtuse, spreading, in bud imbricate. *Stamens* 5, included, adnate to corolla-tube; filaments very short; anthers ovate, obtuse. *Carpels* connate in deeply 4-lobed corolla; lobes distinct, lateral, on a prominent gynobase; ovules 1 in each lobe; style short, rising between the lobes; stigma capitate. *Fruit* of 4 ellipsoid, granular, scabrid nutlets; scar near the middle of the inner face large, hollow, and smooth, with an inflexed margin; carpophore oblong. *Seeds* somewhat incurved; cotyledons flat.

1313. Bothriospermum tenellum Fisch. & Mey.; F. B. I. iv. 167. *Cynoglossum diffusum* F. I. i. 457.
Behar; Tirhut; N. Bengal; E. Bengal.
A prostrate or diffuse weak herb.

611. Cynoglossum Linn.

Biennial or perennial, erect, hairy herbs; *leaves* alternate, radical petioled, cauline sessile. *Flowers* in elongated racemes, ultimately distant, sessile or the lower pedicelled, purple or bluish; bracts 0. *Sepals* connate in a deeply 5-lobed calyx; lobes in fruit spreading, hardly accrescent. *Petals* 5, connate in a short-tubed corolla; throat with 5 obtuse or emarginate scales; lobes obtuse, imbricate in bud. *Stamens* 5, adnate to corolla-tube, included under the scales; filaments short; anthers small, ovate, their tips hardly above the corolla-throat. *Carpels* connate in a 4-lobed ovary; style short or long, from between the bases of the lobes; stigma small. *Fruit* of 4 nutlets, forming together a depressed pyramid, their tips hardly produced beyond the hilum, their bases rounded and produced downwards, the outer faces convex or flattened, glochidiate, margined or not; carpophore linear, with a shortly conic base. *Seeds* straight or slightly curved; cotyledons large, flat.

Hispidly hairy; flowers of lower and middle thirds of inflorescence distinctly pedicelled; nutlets very obscurely or not at all margined, glochidiate on all sides ..... *lanceolatum.*
Softly hirsute or strigose; flowers of only the lower fourth of inflorescence distinctly pedicelled; nutlets very prominently margined, glochidiate on the faces ..... *denticulatum.*

1314. Cynoglossum lanceolatum Forsk.; F. B. I. iv. 156. *C. racemosum* F. I. i. 456.
Behar; Tirhut; N. Bengal; C. Bengal; E. Bengal.
An erect, annual herb.

1315. Cynoglossum denticulatum A. DC.; F. B. I. iv. 157.
Chota Nagpur.
An erect, annual herb.

612. Trichodesma R. Br.

Coarse, hispid herbs; *leaves* opposite, or the upper alternate, entire. *Flowers* solitary, on axillary pedicels, but passing into

terminal racemes by gradual reduction of the floral leaves. *Sepals* connate below in a deeply 5-lobed calyx; lobes triangular, lanceolate, accrescent. *Petals* 5, connate in a campanulate-cylindric corolla; throat naked; lobes twisted to the left, each with a basal or subbasal pit or gland. *Stamens* 5, adnate to corolla-tube; filaments short; anthers elongate, lanceolate, connivent in a cone, the connective more or less dorsally hirsute, the tips excurrent, at length twisted. *Carpels* connate in a 4-lobed ovary; lobes distinct, but slightly prominent; ovules in each lobe solitary, subhorizontal; placentas on inner angles of each lobe; style terminal, filiform; stigma small. *Fruit* ellipsoid, 4-ridged, composed of 4 ovoid-oblong nutlets, with shining backs and scabrid, more or less margined inner faces, which are at first wholly adnate to the carpophore below the style, at length separating. *Seed* suborbicular or obovate, subhorizontal or pendulous; cotyledons plano-convex.

Calyx-lobes in fruit cordate or hastate at base .....*indicum.*
Calyx-lobes in fruit ovate or rounded at base .....*zeylanicum.*

1316. TRICHODESMA INDICUM R. Br.; F. B. I. iv. 153; E. D. T. 562. *Borago indica* F. I. i. 458. *B. spinulosa* F. I. i. 459.

In all the western and northern provinces.

An erect or diffuse annual. *B. spinulosa* is described from a stray cold-weather seedling in Central Bengal (where the species very rarely occurs), with the accidental peculiarity of all the leaves being alternate. *Hind.* and *Beng.* Chota-kulpha; *Santal.* Hetmudia.

1317. TRICHODESMA ZEYLANICUM R. Br.; F. B. I. iv. 154; E. D. T. 565. *Borago zeylanica* F. I. i. 458.

Chota Nagpur; Orissa.

As the preceding. This species is very rare in our area, only crossing its south-western borders. *Hind.* Hetenuria.

Order XC. CONVOLVULACEÆ.

Herbs or shrubs, usually twining, rarely erect, very rarely trees; sometimes parasitic. *Leaves* alternate or in parasitic species 0; stipules 0. *Flowers* regular, hermaphrodite, cymose, rarely soli-

tary; bracts at base of cymes or under solitary flowers opposite; bracteoles under pedicels small, scale-like. *Sepals* 5, imbricate, occasionally slightly connate at base, often persistent, sometimes accrescent. *Petals* 5, connate in a campanulate or funnel-shaped, rarely subrotate corolla; lobes of limb short or long, often plicate in bud, after flowering the limb either incurled or reverting to the original æstivation. *Stamens* 5, adnate to corolla-tube; anthers oblong; dehiscence longitudinal, introrse or lateral. *Carpels* 2, very rarely 3 or more, connate in a superior ovary, the base often encircled by an annular or lobed disk, the cells as many or by spurious dissepiments twice as many as carpels; ovules in each carpel 2, sessile, erect, anatropous; styles 1, rarely 2; stigma capitate, 2-lobed, or 2-fid. *Fruit* an indehiscent berry, or a 2–4-valved, or circumscissile, or irregularly rupturing capsule. *Seeds* 4–2, rarely 1, erect; albumen 0 or scanty; cotyledons generally plaited, rarely flat.

*Corolla-tube usually uniformly enlarged from base to apex, the 5 bands on the lobes rarely clearly defined from the intervening spaces; pollen not spinescent:—[p. 722]

Yellow, parasitic, twining herbs without leaves; lobes of corolla imbricate; mouth scaly; embryo spiral, without cotyledons **Cuscuta.**

Green, non-parasitic, leafy herbs or shrubs, usually twining:—

Fruit indehiscent, woody or fleshy, rather large; style short or none; stigma 5–10-rayed; corolla-lobes 2-fid, induplicate-contorted **Erycibe.**

Fruit dehiscent, or if indehiscent, small, with thin, fragile walls:—

Flowers in racemes or panicles; corolla-lobes induplicate-contorted; ovary 1-locular 2-ovuled, rarely 4-ovuled 1–2-locular; capsule 1-seeded, indehiscent, or rarely 2-valved; outer 3 or all the sepals enlarged in fruit; style entire or shortly 2-lobed **Porana.**

Flowers in cymes or solitary; capsule valvate or opercular, rarely dehiscing irregularly:—

†Styles 2, free or partly united below; sepals not or slightly enlarging in fruit:—[p. 722]

Corolla-lobes imbricate; flowers axillary, solitary; stamens exserted; styles quite free; stigmas globose; capsule 1-locular, 4-valved, 1-seeded ..... **Cressa.**

Corolla-lobes induplicate-contorted; flowers cymose; stamens not exserted:—

Capsule 4-valved, 2–1-locular, 4- or 2- or 1-seeded: styles quite free, each 2-branched; stigmas along inner face of style-arms; cymes few-flowered or flowers one...**Evolvulus.**
Capsule irregularly dehiscent, splitting into many vertical segments; styles usually partly united below, undivided above; stigmas 2, capitate; cymes subcapitate...**Bonamia.**

†Style entire; stigmas usually 2:—[p. 721]
Ovary 1-locular; capsule 4-valved, 3-seeded; stigmas short, oblong; calyx-lobes not enlarged:—
Bract enveloping the calyx; pollen spherical...**Calystegia.**
Bract not enveloping the calyx; pollen polyhedral **Hewittia.**

Ovary 2-locular, sometimes 4-locular:—
Outer 3 sepals much larger than the 2 inner and decurrent on the peduncle; stigmas capitate .....**Aniseia.**
Outer 3 sepals not larger than the 2 inner, nor decurrent on the peduncle:—
Stigmas elongated:—
Stigmas filiform; ovary 2-locular, 4-ovuled; capsule 4-valved or indehiscent; hairs simple or rarely 2-branched .....**Convolvulus.**
Stigmas elliptic, short or long; ovary 2-locular, 4-ovuled; capsule 8-valved, rarely 4-valved; hairs 3–many-branched .....**Jacquemontia.**
Stigmas globose:—
Capsule 4-valved; ovary 2-locular or often 4-locular; fruiting sepals not enlarged; bands of corolla usually with 5 purple lines; stems not winged .....**Merremia.**
Capsule with circumscissile dehiscence; ovary 2-locular; fruiting sepals considerably enlarged; bands of corolla without lines; stems winged .....**Operculina.**

*Corolla-tube not uniformly enlarged from base to apex, the 5 bands on the lobes clearly defined by 2 prominent lines; pollen spinescent:—[p. 721]

‡Fruit dehiscent, or if indehiscent, then with thin, fragile walls:—[p. 723]

§Stamens arising directly from the corolla-tube:—[p. 723]
Corolla more or less campanulate; calyx-lobes never aristate, inflorescence never scorpioid; stamens not exserted .....**Ipomœa.**
Corolla more or less hypocrateriform; calyx-lobes aristate, or if obtuse the inflorescence scorpioid; stamens exserted:—
Flowers rather small, pink, slightly irregular .....**Quamoclit.**

Flowers large, white or purple, never pink, quite regular
Calonyction.

§Stamens arising from the backs of 5 scales attached to the corolla-tube; flowers small, urceolate, fasciculate; fruit 4-valved [p. 722]
Lepistemon.

‡Fruit indehiscent, woody or mealy or fleshy:—[p. 722]

Fruit woody; stigmas elliptic-oblong; corolla hypocrateriform
Rivea.

Fruit mealy or fleshy; stigmas globose; corolla not or very rarely hypocrateriform:—

Sepals large, orbicular, accrescent, mucilaginous, ultimately completely enveloping the fruit ..... **Stictocardia.**

Sepals small, ovate or narrow-oblong, leathery, ultimately dry, not enlarging so as to envelop the fruit:—

Ovary 4-celled ..... **Argyreia.**

Ovary 2-celled ..... **Lettsomia.**

613. Cuscuta Linn.

Leafless, twining, yellow or reddish parasitic herbs. *Flowers* small, white or rose-coloured, fascicled, sessile or shortly pedicelled; bracts small or 0. *Sepals* 5 or 4, subequal, free or shortly connate at the base. *Petals* 5 or 4, connate in an ovoid or campanulate corolla, usually with a ring of fimbriate or lobed scales near the base or below the stamens; lobes short, imbricate. *Stamens* 5 or 4, adnate near throat of corolla; filaments short, linear; anthers oblong, partially exserted. *Carpels* connate in a more or less completely 2-celled ovary; ovules 4; styles 1 or 2; stigmas 2. *Fruit* a globose or ovoid, dry or succulent, circumscissile or irregularly rupturing 4–2-seeded capsule. *Seeds* glabrous; albumen fleshy; embryo slender, spiral; cotyledons 0 or obscure.

1318. Cuscuta reflexa Roxb.; F. I. i. 446; F. B. I. iv. 225; E. D. C. 2508.

In all the provinces.

A yellow, leafless, fleshy parasite. *Beng.* Haldi algusi, algusi-lata.

614. Erycibe Roxb.

Scandent or diffuse shrubs, rarely trees; *leaves* alternate, entire, coriaceous, elliptic. *Flowers* small; cymes in axillary or terminal racemes or panicles; bracts small, lanceolate. *Sepals* 5, small, subequal, orbicular, coriaceous, adpressed to base of fruit. *Petals*

5, connate in a small, subrotate corolla, white or yellowish; tube outside hirsute; lobes obcordate, induplicate, contorted in bud, with thicker centre hirsute without; and submembranous, semicordate, glabrous margins. *Stamens* 5, subincluded, adnate to corolla-throat; filaments short; anthers ovate-lanceolate. *Carpels* connate in a globose, 1-celled ovary; ovules 4; style 0; stigma large, subglobose or conic, 5- or 10-ridged. *Fruit* a fleshy or woody berry, ovoid or ellipsoid. *Seed* solitary, glabrous; albumen scanty, intruded between folds of fleshy, plicate cotyledons.

Flowers yellowish ..... *paniculata.*
Flowers white ..... *peguensis.*

1319. ERYCIBE PANICULATA Roxb.; F. I. i. 585; F. B. I. iv. 180; E. D. E. 333.

Chota Nagpur; Orissa.

A small tree with spreading branches or a diffuse shrub. *Kol.* Uranim; *Santal.* Kari.

1320. ERYCIBE PEGUENSIS Prain. *E. paniculata* var. *peguensis* F. B. I. iv. 181.

Chittagong.

A diffuse, subscandent shrub.

615. Porana Burm.

Large climbers; *leaves* petioled, ovate, entire. *Flowers* white, blue, or purple; cymes often in large panicles; bracts persistent; bracteoles subulate or 0. *Sepals* 5, in flower small, narrow; in fruit 3, outer or all much enlarged, membranous, spreading, usually spathulate. *Petals* 5, connate in a usually small, campanulate or funnel-shaped corolla; mouth wide or narrow; limb plicate, subentire or lobed. *Stamens* 5, subincluded; filaments filiform or linear. *Carpels* connate in a 2-celled or 1-celled ovary; ovules 2 or 4; style long or short, entire or 2-fid, with a single 2-lobed or with 2 capitate stigmas. *Fruit* a globose, oblong or obconic, membranous, 1-seeded capsule, indehiscent or 2-valved. *Seed* glabrous; cotyledons plicate.

1321. PORANA PANICULATA Roxb.; F. I. i. 466; F. B. I. iv. 222.

Chota Nagpur; Behar; N. Bengal; E. Bengal.

A large, handsome climber. Bridal Creeper.

616. Cressa Linn.

Small, branching undershrubs, erect or diffuse, grey-pubescent; *leaves* small, sessile, ovate. *Flowers* small, sessile in the upper axils or passing into terminal spikes or heads; bracts 2, small. *Sepals* 5, small, not enlarging, thin, obovate, equal. *Petals* 5, connate in a small, funnel-shaped corolla; tube short; lobes ovate, distinct, hirsute externally, imbricate. *Stamens* 5, exserted; filaments slightly connate below. *Carpels* connate in a 2-celled ovary; ovules 4; styles 2, free, entire, equal; stigmas capitate. *Fruit* a 2–4-valved capsule, usually 1-locular and 1-seeded. *Seed* glabrous; cotyledons linear, plicate.

1322. Cressa cretica Linn.; F. B. I. iv. 225; E. D. C. 2057. *C. indica* F. I. ii. 72.

C. Bengal.

A small, erect, branching annual.

617. Evolvulus Linn.

Small herbs or undershrubs, prostrate or erect, never climbing; *leaves* small, entire, often distichous. *Flowers* small, white or bluish, in axillary, few-flowered, peduncled or subsessile cymes. *Sepals* 5, small, subequal, not enlarged in fruit. *Petals* 5, connate in a small funnel-shaped or subrotate corolla; limb plicate, subentire. *Stamens* 5, included or exserted; filaments slender. *Carpels* connate in a 2-celled, or rarely 1-celled ovary; ovules 4; styles 2, free from the base, each cleft into 2 linear or subclavate stigmas, papillose on the inner face. *Fruit* a 4-valved, less often 2-valved, 2- or 1-celled capsule. *Seeds* 4 or 2, rarely solitary, glabrous; cotyledons twice folded.

Leaves oblong or linear-lanceolate, all parts more or less silky-hairy; hairs white, tawny, or rusty; flowers blue or almost white; corolla almost transparent; branches diffuse, not rooting at the nodes:—

Leaves oblong ..... *alsinoides.*

Leaves linear-lanceolate ..... *alsinoides* var. *linifolius.*

Leaves almost orbicular, subcordate, all parts green, very sparingly hairy; flowers pure white; corolla opaque; branches prostrate, rooting at the nodes ..... *nummularius.*

1323. Evolvulus alsinoides Linn.; F. I. ii. 105; F. B. I. iv. 220. *E. hirsutus* F. I. ii. 106.

In all the western provinces, common; C. Bengal, rather rare.

A small, diffuse perennial. *Santal.* Tandi-kodebaha.

1323/2. Var. LINIFOLIUS F. B. I. iv. 221. *E. angustifolius* F. I. ii. 107.

In most of the western provinces.

A small, diffuse perennial.

1324. EVOLVULUS NUMMULARIUS Linn.

C. Bengal.

A small, prostrate perennial; a native of the West Indies, now completely naturalised and rapidly spreading.

618. Bonamia Thouars.

Large climbing shrubs; *leaves* large, elliptic, entire, firm. *Flowers* medium, in axillary, peduncled cymes; bracts small. *Sepals* 5, subequal, firm, ovate, not enlarged. *Petals* 5, connate in a funnel-shaped corolla, hairy externally except opposite the sepals; limb plicate. *Stamens* 5, included, adnate to corolla-tube; filaments filiform, at least above. *Carpels* connate in a 2-celled ovary; ovules 4; style 2-fid to the middle; stigmas capitate. *Fruit* a globose or ovoid capsule, with thin valves irregularly splitting at their apices. *Seeds* normally 4, glabrous or nearly so.

1325. BONAMIA SEMIDIGYNA Hallier f. *Convolvulus semidigynus* F. I. i. 468. *Breweria cordata* F. B. I. iv. 223.

Chittagong; E. Bengal; Tippera.

A powerful climber.

619. Calystegia R. Br.

Climbing or prostrate perennial herbs; *leaves* entire or lobed, glabrous or nearly so. *Flowers* axillary, solitary, rarely in few-flowered cymes; bracts 2, large, leafy, persistent, enclosing the calyx. *Sepals* 5, ovate or oblong, the 2 inner rather smaller. *Petals* 5, connate in a funnel-shaped or campanulate, glabrous corolla; tube with bands in centre of petals each with 5 pellucid lines at the base; limb subentire, plicate. *Stamens* 5, included; filaments subequal. *Carpels* connate in a 1-celled or imperfectly 2-celled ovary; ovules 4; style filiform; stigma of 2 oblong lobes. *Fruit* a globose, 1-celled, 4-valved, 4-seeded capsule. *Seeds* black, glabrous or verrucose.

1326. CALYSTEGIA HEDERACEA Wall.; F. B. I. iv. 217.
Tirhut; N. Bengal; E. Bengal.
In fields and hedges, prostrate or climbing.

620. Hewittia W. & A.

A pubescent, twining herb; *leaves* cordate, entire, angled or lobed. *Flowers* axillary, solitary, or in few-flowered cymes; bracts 2, linear-lanceolate below the calyx. *Sepals* 5, acute, the 3 outer wide-ovate, enlarging in fruit, the 2 inner narrow-lanceolate. *Petals* 5, connate in a medium, yellow or white corolla, with purplish eye; limb plicate. *Stamens* 5, included; filaments linear, dilated at the base. *Carpels* connate in a hirsute, 1-celled, or imperfectly 2-celled ovary; ovules 4; style filiform; stigma of 2 ovate-oblong lobes. *Fruit* a globose, 4-valved, 1-celled, normally 4-seeded capsule. *Seeds* black, glabrous.

1327. HEWITTIA BICOLOR Wight; F. B. I. iv. 216. *Convolvulus bicolor* F. I. i. 475.
N. Bengal; E. Bengal; Chittagong.
A perennial, twining herb. *Hind.* Jarad-kalmi.

621. Aniseia Choisy.

Twining herbs; *leaves* elliptic, mucronulate or lanceolate. *Flowers* axillary, solitary, or in few-flowered cymes. *Sepals* 5, herbaceous, acuminate, the 3 outer larger, ovate, decurrent on the peduncle, enlarged in fruit, the 2 inner lanceolate, unaltered. *Petals* 5, connate in a wide-tubular corolla; hirsute externally except on spaces opposite the sepals, with 5 distinct, vertical bands; limb subentire. *Stamens* 5, included; filaments filiform. *Carpels* connate in a glabrous, 2-celled ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a 2-locular, 4-valved capsule. *Seeds* 4, large, black, smooth.

1328. ANISEIA MARTINICENSIS Choisy. *Ipomœa uniflora* F. B. I. iv. 201.
Chota Nagpur; E. Bengal.
A prostrate herb.

622. Convolvulus Linn.

Herbs or undershrubs, erect, prostrate, or twining, sometimes armed with spines; *leaves* entire, toothed, or lobed. *Flowers* axillary, solitary, or in few-flowered cymes; bracts usually narrow.

Sepals 5, usually subequal. *Petals* 5, connate in a campanulate or funnel-shaped corolla; limb plicate, subentire. *Stamens* 5, included; filaments usually unequal. *Carpels* connate in a 2-celled ovary; ovules 4; style filiform; stigmas 2, oblong or linear, distinct. *Fruit* a 4-valved 2-locular, or irregularly rupturing capsule. *Seeds* normally 4, glabrous, black, verrucose.

1329. Convolvulus pluricaulis Choisy; F. B. I. iv. 218; E. D. C. 1781. *Evolvulus pilosus* F. I. ii. 106.
Tirhut; Behar; Chota Nagpur.
A diffuse, hairy perennial.

623. Jacquemontia Choisy.

Climbing herbs or undershrubs, usually pubescent; *leaves* usually cordate or elliptic, entire or rarely toothed or lobed. *Flowers* in axillary, compound, umbellate or capitate cymes, rarely solitary; bracts small, rarely leafy. *Sepals* 5, equal or unequal. *Petals* 5, connate in a usually small, funnel-shaped corolla; throat wide or narrow; limb plicate, vertical bands ending in 2 distinct nerves. *Stamens* 5, included. *Carpels* connate in a glabrous, 2-celled ovary; ovules 4; style filiform; stigmas 2, linear or elliptic-oblong. *Fruit* a globose, 8-valved, rarely 4-valved, 2-locular capsule. *Seeds* normally 4, usually glabrous, often slightly marginally winged.

Flowers pink or white; mouth of corolla narrow .....*paniculata*.
Flowers blue; mouth of corolla wide .....*cærulea*.

1330. Jacquemontia paniculata Hallier f. *Convolvulus parviflorus* F. I. i. 471; F. B. I. iv. 220; E. D. C. 1780.
Behar; W. Bengal; Chittagong.
A slender, matted twiner.

1331. Jacquemontia cœrulea Choisy; F. B. I. iv. 220.
In gardens, general.
A slender twiner.

624. Merremia Dennst.

Climbing, rarely prostrate or erect shrubs or herbs; stems rarely winged; *leaves* alternate, entire, lobed or divided. *Flowers* axillary, usually long-peduncled, solitary or in few-flowered, rarely many-flowered cymes; bracts small. *Sepals* 5, subequal, elliptic or lanceolate-acuminate, rarely rounded or truncate, convex, usually

slightly enlarged and thickened in fruit. *Petals* 5, connate in a campanulate corolla, white, less often yellow or orange, the 5 vertical bands each usually marked by 5 dark violet lines; limb plicate, margin slightly lobed. *Stamens* 5, unequal, included or exserted; filaments filiform; anthers usually twisted; pollen usually with longitudinal folds, never spinulose. *Carpels* connate in a 2-celled or sometimes 4-celled ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a 4-valved capsule, 1–4-locular, sometimes the style separating with a small stopple. *Seeds* 4, rarely fewer, dull, glabrous, rarely puberulous.

Corolla-tube with badly defined interspaces between the bands, the spaces never marked with dark purple lines; seeds pubescent:—

Seeds with spreading hairs; capsules globose; corolla glabrous externally except for a few hairs near the apex in bud; cymes compressed, subumbellate; leaves cordate ..... *umbellata.*

Seeds minutely velvety with almost villous margins; capsules ovoid; corolla shaggy externally; cymes elongated, subracemose; leaves ovate-acute, base cuneate or truncate, rarely cordate ..... *crispatula.*

Corolla-tube with clearly defined interspaces between the bands, the spaces usually marked with 5 dark purple or violet lines:—

Buds long, conical, acute:—

Leaves palmately 5-lobed; an extensive climber ..... *vitifolia.*

Leaves narrowly oblong; small herbs:—

Prostrate but never twining; peduncles 1–3-flowered; sepals acuminate; leaves sessile, hastate, oblong or subquadrate, obtuse, truncate or 3-toothed ..... *tridentata.*

Twining; leaves acute:—

Peduncles 1–3-flowered; sepals ovate-acuminate; leaves sessile, hastate-oblong or hastate-linear, apex gradually tapering *hastata.*

Peduncles 3–many-flowered; sepals obtuse; leaves petioled, narrow-oblong, base of lower often subcordate, of upper always cuneate, apex abruptly acute ..... *cæspitosa.*

Buds short, globose, obtuse:—

Leaves acute, ovate-cordate; peduncles distinct or long, many-flowered:—

Leaves glabrous, some usually toothed or 3-lobed; corolla funnel-shaped ..... *chryseides.*

Leaves sparingly pubescent, all entire; corolla subcampanulate *hederacea.*

Leaves obtuse, small, reniform or ovate-cordate, toothed; peduncles short or none, few-flowered ..... *emarginata.*

1332. MERREMIA UMBELLATA Hallier f. *Convolvulus blandus* F. I. i. 470. *Ipomœa cymosa* F. B. I. iv. 211; E. D. I. 375.
Chota Nagpur; Chittagong.
A large climber. *Santal.* Karmbi arak'.

1333. MERREMIA CRISPATULA Prain. *Ipomœa petaloidea* F. B. I. iv. 212.
Behar; Chota Nagpur; Orissa.
A large climber.

1334. MERREMIA VITIFOLIA Hallier f. *Convolvulus vitifolius* F. I. i. 476. *Ipomœa vitifolia* F. B. I. iv. 213; E. D. I. 421.
In most of the provinces.
A large climber.

1335. MERREMIA TRIDENTATA Hallier f. *Convolvulus tridentatus* F. I. i. 475. *Ipomœa tridentata* F. B. I. iv. 205.
Behar; Chota Nagpur.
A small, much-branched, closely prostrate herb.

1336. MERREMIA HASTATA Hallier f. *Convolvulus medius* F. I. i. 474. *Ipomœa angustifolia* F. B. I. iv. 205.
Orissa. A diffuse, twining biennial herb.

1337. MERREMIA CÆSPITOSA Hallier f. *Convolvulus cæspitosus* F. I. i. 483. *Ipomœa linifolia* F. B. I. iv. 205.
N. Bengal; E. Bengal.
A small, twining or creeping, annual or biennial herb.

1338. MERREMIA CHRYSEIDES Hallier f. *Ipomœa chryseides* F. B. I. iv. 206. *Convolvulus dentatus* F. I. i. 477.
Tirhut; Behar; C. Bengal; N. Bengal; Chota Nagpur.
A twining herb.

1339. MERREMIA HEDERACEA Hallier f. *Ipomœa polyantha* F. B. I. iv. 206.
E. Bengal; Sundribuns; Chittagong.
A twining herb.

1340. MERREMIA EMARGINATA Hallier f. *Convolvulus reniformis* F. I. i. 481. *Ipomœa reniformis* F. B. I. iv. 206; E. D. I. 407.
Behar; Chota Nagpur; W. Bengal; C. Bengal.
A prostrate, creeping herb, rooting at the nodes.

625. Operculina Manso.

Large climbing herbs; stems and peduncles and petioles winged; *leaves* large, entire or lobed, rarely peltate. *Flowers* showy, large, axillary, solitary, or often in few-flowered cymes. *Sepals* 5, large, ovoid, glabrous, increasing and thickening in fruit, at length splitting irregularly from the tip. *Petals* 5, connate in a funnel-shaped, rarely campanulate corolla; tube with 5 vertical, smooth bands. *Stamens* 5; filaments filiform; anthers large, at length contorted; pollen not spinulose. *Carpels* connate in a glabrous, 2-celled ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a valveless capsule, the epicarp circumscissile above the middle, the cap in dehiscing, carrying away the style; endocarp at length irregularly rupturing. *Seeds* 1, rarely more, black, smooth, usually large.

1341. Operculina Turpethum Manso. *Convolvulus Turpethum* F. I. i. 476. *Ipomœa Turpethum* F. B. I. iv. 212; E. D. I. 415.

In all the provinces.

A stout climber, with winged stems. *Beng.* Tohri. dudh kalmi; *Hind.* Nuk-patar, pitohri; *Santal.* Bana etka.

626. Ipomœa Linn.

Herbs, rarely shrubs, twining or prostrate, less often suberect or erect; *leaves* alternate, entire, lobed or divided. *Flowers* axillary, solitary, or cymose; cymes rarely paniculate or in terminal spikes; bracts various. *Sepals* 5, ovate or linear, equal or unequal. *Petals* 5, connate in a campanulate or funnel-shaped corolla; limb plicate, very slightly lobed. *Stamens* 5, included or rarely exserted; filaments filiform or dilated below, often somewhat unequal; anthers straight or contorted; pollen spinulose. *Carpels* connate in a 1–3-celled, rarely 4-celled ovary; ovules 4, rarely 6; style filiform; stigma capitate, entire or 2–3-globose, rarely stigmas 2-linear. *Fruit* a 4–6-valved capsule, rarely indehiscent. *Seeds* 4 or 6, rarely 1, glabrous, bearded or uniformly velvety or woolly.

Sepals sagittate or cordate at the base; corolla white or rose; seeds villous; margins with long hairs .....*calycina*,
Sepals not cordate at the base:—

Seeds not shaggy along the angles :—

Sepals markedly enlarging in fruit; seeds villous or pubescent, margins somewhat hirsute; flowers purple or whitish, solitary *barlerioides.*

Sepals not, or only slightly, altered in fruit; flowers in cymes :—

Capsules hispid with spreading hairs; flowers pink, sessile or nearly so; seeds puberulous ..... *hispida.*

Capsules not hispid; flowers peduncled :—

*Sepals hirsute, lanceolate, acute or subacute; corollas pink or purple :—[p. 733]

Flowers in usually dense, long-peduncled heads, surrounded by prominent, persistent outer bracts; corolla under an inch and a half long :—

Leaves deeply, palmately 5-9-lobed; lobes spathulate, acuminate; outer bracts several, ovate-oblong, an inch long, much exceeding the inner; corolla 1-1·25 in. long *Pes-tigridis.*

Leaves ovate-cordate, acute; corolla ·75 in. long :—

Leaves white, woolly beneath, often deeply 3-lobed; outer bracts several, ·25 in. long, linear-lanceolate, not much exceeding the inner..... *pilosa.*

Leaves sparsely hairy, green beneath, always entire; outer bracts solitary, large, boat-shaped, enclosing the flower-head..... *involucrata.*

Flowers in usually lax, rarely congested, mostly subumbellate cymes, not surrounded by prominent, persistent bracts; corolla over an inch and a half long; leaves ovate-cordate :—

Flowers large, 2·5-3 in. long, in congested cymes, with often one large, leafy bract on the peduncle; leaves entire or slightly 3-lobed; peduncles exceeding petioles; corolla glabrous externally ..... *Learii.*

Flowers 1·5-2 in. long, the bracts always small :—

Sepals with very long, ligulate tips; peduncles rarely longer than pedicels; pedicels ·25 in. long; corolla glabrous externally :—

Leaves deeply 3-lobed..... *Nil.*

Leaves entire ..... *Nil* var. *cœrulescens.**

Sepals without ligulate tips; peduncles almost always exceeding pedicels; leaves entire :—

Pedicels 1 in. long, deflexed in fruit; sepals narrow-lanceolate; corolla glabrous externally ..... *purpurea.*

Pedicels under 1 in. long, not deflexed; sepals ovate-

lanceolate, subacute; corolla silky on the plaits externally.....*rubens.*

*Sepals glabrous:—[p. 732]

Seeds shaggy along the angles with long hairs; sepals obtuse:—

Flowers white; leaves ovate-cordate, entire or slightly 3-lobed; stems more or less muricate:—

Corolla hypocrateriform; leaves entire .....*longiflora.*

Corolla funnel-shaped; leaves often more or less lobed or toothed .....*aspera.*

Flowers pink-purple, wide-campanulate; stems smooth:—

Leaves ovate-cordate, entire.....*illustris.*

Leaves palmately 5–7-lobed .....*paniculata.*

Seeds not shaggy with long hairs along the angles:—

†Seeds not crested at the apex:—[p. 734]

*Leaves not palmate:—[p. 734]

‡Flowers wide-campanulate, purple throughout, or white or yellowish-white with a purple eye:—[p. 734]

Sepals all, or at least the outer, with more or less pronounced herbaceous, mucronate tips:—

Sepals acute, all with a long, herbaceous mucro; leaves ovate-cordate, acute, angular or more or less lobed; seeds glabrous; root tuberous .....*Batatas.*

Sepals obtuse, the outer with a short, herbaceous mucro; seeds more or less hirsute:—

Leaves orbicular, obtuse emarginate or 2-lobed; seeds villous .....*Pes-capræ.*

Leaves elliptic-oblong, cordate or hastate, entire or angularly sublobed; seeds minutely silky; aquatic .....*reptans.*

Sepals not tipped with a herbaceous mucro; leaves ovate-cordate:—

Sepals obtuse; pedicels subumbellate, in fruit clavate; corolla-limb pale-purple or sometimes white; throat with dark-purple eye; seeds furred:—

Leaves entire .....*sepiaria.*

Leaves more or less lobed

sepiaria var. *stipulacea.*

Sepals acute:—

Sepals wide-ovate, not ridged along middle; corolla-limb yellowish-white; throat with dark-purple eye; seeds velvety [p. 734] .....*obscura.*

§Sepals narrow-lanceolate, ridged along the middle; corolla purple, turning red when fading; seeds glabrous [p. 733] .....*tricolor.*

‡Flowers narrow-hypocrateriform, pure white; leaves narrow-lanceolate or oblong; sepals obtuse; seeds closely, shortly hairy [p. 733] .....*salicifolia.*

¶Leaves palmate; flowers narrow-campanulate, pale purple; sepals acute; seeds hairy [p. 733] .....*pulchella.*

†Seeds crested at apex; leaves palmate; flowers white or purplish; sepals obtuse [p. 733] .....*quinata.*

1342. IPOMŒA CALYCINA Clarke; F. B. I. iv. 201. *Convolvulus calycinus* F. I. i. 471.
Behar; Chota Nagpur.
A twining herb.

1343. IPOMŒA BARLERIOIDES Clarke; F. B. I. iv. 201.
Chota Nagpur.
A hirsute, twining perennial.

1344. IPOMŒA HISPIDA Roem & Schult. *I. eriocarpa* F. B. I. iv. 204; E. D. I. 382. *Convolvulus sphærocephalus* F. I. i. 472.
Behar; Chota Nagpur.
A twiner, with villous stems.

1345. IPOMŒA PES-TIGRIDIS Linn.; F. I. i. 503; F. B. I. iv. 204; E. D. I. 399.
Behar; Chota Nagpur.
A twiner, with hirsute stems. *Beng.* Languli-lata.

1346. IPOMŒA PILOSA Sw.; F. B. I. i. 213. *Convolvulus pilosus* F. I. i. 473.
Behar.
An annual twiner, with pilose stems.

1347. IPOMŒA INVOLUCRATA Beauv. *I. pileata* F. I. i. 504; F. B. I. iv. 203.
N. Bengal; E. Bengal.
A twining perennial.

1348. IPOMŒA LEARII Paxt.
A favourite garden plant; semi-naturalised in Chittagong.
A large perennial twiner.

1349. IPOMŒA NIL Roth. *I. cærulea* F. I. i. 501. *I. hederacea* F. B. I. iv. 199; E. D. I. 384.

In gardens in all the provinces; as if wild at times in the western parts.

An annual, hairy twiner. *Beng.* Nil-kalmi.

1349/2. Var. INTEGRIFOLIA F. B. I. iv. 200. *I. cœrulescens* F. I. i. 500.

Occasionally in gardens.

A hirsute, twining plant.

1350. IPOMŒA PURPUREA Lamk; F. B. I. iv. 200.

In gardens sometimes, in the northern and western provinces.

A hirsute twiner.

This, though often found growing as if wild in the Himalayas, is only to be met with in gardens in the plains.

1351. IPOMŒA RUBENS Choisy. *Lettsomia rubens* F. B. I. iv. 195.

N. Bengal; E. Bengal.

A large climber.

1352. IPOMŒA LONGIFLORA R. Br. *I. grandiflora* F. B. I. iv. 198.

Sundribuns, sea-face, rare.

A large climber.

1353. IPOMŒA ASPERA Vatke. *I. trichosperma* F. B. I. iv. 198 partly.

Chittagong.

A large climber.

1354. IPOMŒA ILLUSTRIS Prain. *I. campanulata* var. *illustris* F. B. I. iv. 211.

Sundribuns, sea-face, common.

A large climber.

Quite different from *I. campanulata*, which has more numerous but much smaller flowers, and is, besides, an inland plant, whereas this is quite confined to the sea-coasts of Ceylon, the Sundribuns, Burma, the Andamans, and Malaya.

1355. IPOMŒA PANICULATA R. Br. *I. digitata* F. B. I. iv. 202; E. D. I. 379. *Convolvulus paniculatus* F. I. i. 478.

C. and E. Bengal, common; Chota Nagpur, rare.

A large climber. *Vernac.* Bilai-kand, Bhui-kumrá.

1356. IPOMŒA BATATAS Lamk; F. B. I. iv. 202; E. D. I. 348. *Convolvulus Batatas* F. I. i. 483.

Cultivated occasionally, especially in the western provinces.

A creeping, rarely twining plant, with tuberous roots. *Vernac.* Mita-alu, Shakarkand-alu. The Sweet Potato; the red variety is more frequently found in cultivation in our provinces than is the white.

1357. IPOMŒA PES-CAPRÆ Sweet. *I. biloba* F. B. I. iv. 212; E. D. I. 362. *Convolvulus Pes-caprœ* F. I. i. 485.

Orissa; Sundribuns; Chittagong: on the sea-shore among sand, common. Mr. Kurz once found the plant growing on a hill near Raniganj in W. Bengal; how it found its way there is unknown.

A sand-binding, littoral, creeping perennial. *Uriya* Kansarinata; *Beng.* Chagal-kuri.

1358. IPOMŒA REPTANS Poir. *I. aquatica* F. B. I. iv. 210; E. D. I. 343. *Convolvulus repens* F. I. i. 432.

In all the provinces, very common.

A long-stemmed creeper, emitting roots at each node, floating on the surface of ponds, marshes, or sluggish ditches, or prostrate on wet mud where water has recently stood; often purposely planted: the leaves and young shoots very generally used as a vegetable. *Beng.* Kalmi-sák.

1359. IPOMŒA SEPIARIA Kœn.; F. I. i. 499; F. B. I. iv. 209; E. D. I. 410.

In the central and eastern provinces.

A twining, hirsute perennial. *Beng.* Ban-kalmi.

1359/2. Var. STIPULACEA F. B. I. iv. 209. *Convolvulus stipulaceus* F. I. i. 484.

In the southern, central, and eastern provinces, from Orissa to Chittagong.

A twining, hirsute perennial.

1360. IPOMŒA OBSCURA Ker; F. B. I. iv. 207 E. D. I. 397. *Convolvulus obscurus* F. I. i. 472.

In most of the provinces.

An annual twiner.

1361. IPOMŒA TRICOLOR Cav.

In gardens.

An annual climber; native of America.

This species, though of recent introduction, is now one of the most favourite of *annual* trellis-climbers; it is usually known to horticulturists as *I. rubro-cærulea*.

1362. IPOMŒA SALICIFOLIA Roxb.; F. I. i. 498; F. B. I. iv. 210.
N. Bengal, Rangpur.
A biennial climber.

This has not been found in N. Bengal since early in the present century. It has more recently been collected in the Godavery jungles, and may therefore possibly be found, if searched for, in the southern parts of Chota Nagpur.

1363. IPOMŒA PULCHELLA Roth. *I. palmata* F. B. I. iv. 214 partly. *Convolvulus digitatus* Roxb.
In gardens everywhere; a favourite trellis-creeper.
A perennial twiner. The "Railway Creeper."

1364. IPOMŒA QUINATA R. Br.; F. B. I. iv. 214.
Chota Nagpur.
A prostrate twiner.

627. Quamoclit Moench.

Annual, twining, glabrous herbs; *leaves* cordate, angled, lobed, or sometimes divided. *Flowers* axillary, in few-flowered cymes; bracts small. *Sepals* 5, subequal, or the outer rather smaller, often subaristate. *Petals* 5, connate in a pink, salver-shaped corolla; tube slender or somewhat funnel-shaped; limb spreading. *Stamens* 5, much exserted, resupinate; filaments unequal. *Carpels* connate in a glabrous, 4-celled ovary; ovules 4; style rather longer than stamens; stigma 2-globose. *Fruit* a 4-celled, 1-valved capsule; the septa thin, persistent. *Seeds* 4, black, dull, puberulous or glabrous.

Leaves ovate-cordate, acute, entire or lobed; sepals acuminate; seeds densely hirsute ..... *phœnicea*.
Leaves pinnately dissected; segments linear; sepals elliptic; seeds nearly glabrous ..... *pinnata*.

1365. QUAMOCLIT PHŒNICEA Choisy. *Ipomœa phœnicea* F. I. i. 502. *I. coccinea* F. B. I. iv. 199.
In all the provinces, cultivated and naturalised.
A weak, subscandent annual.

1366. QUAMOCLIT PINNATA Boj. *Ipomœa Quamoclit* F. I. i. 503; F. B. I. iv. 199; E. D. I. 405.

In most of the provinces, cultivated and naturalised.

A slender, glabrous, annual twiner. *Beng.* Taru-lata, Kam-lata.

628. Calonyction Choisy.

Large, herbaceous climbers; stems usually muricate; *leaves* large, cordate, entire or angled. *Flowers* solitary or in 2-flowered, axillary cymes; bracts caducous. *Sepals* 5, herbaceous, smooth, usually aristate, subequal or the outer smaller. *Petals* 5, connate in a large, glabrous, white or rose-purple, salver-shaped corolla; tube narrow, cylindric; limb plicate. *Stamens* 5, exserted. *Carpels* connate in a glabrous, 2-locular ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a 4-valved capsule. *Seeds* four, dull, glabrous.

Corolla white ..... *bona-nox.*
Corolla rose-purple ..... *muricatum.*

1367. CALONYCTION BONA-NOX Boj. *Ipomœa grandiflora* F. I. i. 497. *I. Bona-nox* var. *grandiflora* F. B. I. iv. 197; E. D. I. 368.

In most of the provinces, sometimes cultivated, but usually wild.

A large, scandent twiner. *Beng.* Dudhia-kalmi, hal-kalmi.

1368. CALONYCTION MURICATUM Don. *Ipomœa muricata* F. I. i. 499; F. B. I. iv. 197; E. D. I. 393.

Behar and other western provinces, cultivated.

A scandent twiner.

629. Lepistemon Bl.

Stout, scandent, villous herbs; *leaves* cordate, usually lobed. *Flowers* in very dense, axillary cymes; bracts narrow, deciduous. *Sepals* 5, herbaceous, hispid externally, acuminate, subequal. *Petals* 5, connate in a small, urceolate corolla, narrowed below to a short tube, externally hairy. *Stamens* 5, included; filaments dilated at base into 5 subequal, concave scales, arched over the ovary; disk large, cup-shaped. *Carpels* connate in a 2-celled ovary; ovules 4; style very short; stigma capitate, 2-partite. *Fruit* a 4-valved capsule. *Seeds* glabrous.

1369. LEPISTEMON WALLICHII Choisy; F. B. I. iv. 216.
Chittagong.
A stout, hirsute climber.

630. Rivea Choisy.

Climbing shrubs; *leaves* cordate, glabrous above, silky beneath; petiole long. *Flowers* axillary, on 1–3-flowered, sometimes 7-flowered peduncles; bracts 2–3, narrow. *Sepals* 5, ovate or lanceolate-oblong, subequal. *Petals* 5, connate in a large, white, salver-shaped corolla; tube narrow, cylindric; lobes rounded, plicate. *Stamens* 5, included; anthers narrow, oblong, straight. *Disk* annular. *Carpels* connate in a glabrous, 4-celled ovary; ovules 4; style filiform; stigmas 2, linear-oblong. *Fruit* a subglobose, dry, woody berry, or irregularly opening capsule, often 1-locular from absorption of septa. *Seeds* 4 or fewer, glabrous, surrounded by mealy pulp.

Sepals ovate, obtuse; peduncles 1-, rarely 3-flowered; leaves rarely broader than long, usually 3·5 in. long by 3 in. wide, or smaller *hypocrateriformis.*

Sepals lanceolate, acute; peduncles rarely 3-, usually 7-flowered; leaves usually broader than long, 4 in. long by 5 in. wide, or larger .....*ornata.*

1370. RIVEA HYPOCRATERIFORMIS Choisy; F. B. I. iv. 184; E. D. R. 487. *Lettsomia Bona-nox* F. I. i. 494. *L. uniflora* F. I. i. 495.
Behar; Chota Nagpur; W. Bengal; Orissa.
A large climber. *Beng.* Kalmi-lata.

1371. RIVEA ORNATA Choisy. *R. ornata* var. *Griffithii* F. B. I. iv. 183. *Lettsomia ornata* F. I. i. 496.
N. Bengal, Duars.
A large, spreading shrub.

631. Stictocardia Hallier f.

Climbing shrubs; *leaves* cordate, long-petioled. *Flowers* axillary, peduncles 1–3-flowered; bracts small. *Sepals* 5, orbicular, herbaceous, subequal, at length greatly enlarged, much imbricate, mucilaginous, enclosing the fruit in an apple-like case. *Petals* 5, connate in a purple, widely funnel-shaped corolla; limb plicate, nearly glabrous externally. *Stamens* 5, included; anthers oblong, straight. *Disk* annular. *Carpels* connate in a 4-celled ovary;

ovules 4; style filiform; stigma 2-globose. *Fruit* a thin-walled, indehiscent, dry berry, closely enveloped by the accrescent, softly fleshy sepals. *Seeds* 4, minutely villous, with hirsute hilum.

1372. STICTOCARDIA TILIÆFOLIA Hallier f. *Argyreia tiliæfolia* F. B. I. iv. 184. *Convolvulus gangeticus* F. I. i. 467.

C. Bengal; Sundribuns; Chittagong: on banks of tidal rivers and near the sea-face.

An extensive, perennial climber.

632. Argyreia Lour.

Climbing, rarely suberect shrubs; *leaves* cordate to lanceolate, pubescent or silky. *Flowers* axillary, usually in many-flowered cymes, often capitate; bracts often conspicuous. *Sepals* 5, herbaceous, in fruit leathery, little enlarged, often red within. *Petals* 5, connate in a rose-purple, funnel-shaped corolla; limb plicate, more or less hirsute externally, shortly lobed. *Stamens* 5, included; anthers oblong, straight. *Disk* annular. *Carpels* connate in a 4-celled ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a dry, hard berry. *Seeds* 4 or fewer, embedded in mealy pulp.

Leaves quite glabrous above :—

Leaves oblong or elliptic, acute, base rhomboid or rounded; bracts small; flowers in lax cymes; corolla sparsely hairy on the folds externally :—

Leaves sparsely adpressed-strigose beneath; bracts persistent ..... *Daltoni.*

Leaves densely, softly adpressed-silky beneath; bracts caducous ..... *splendens.*

Leaves ovate-cordate, acute, basal sinus deep, softly adpressed, white-tomentose beneath; bracts large, ovate, deciduous; flowers in dense heads; corolla densely silky on the folds externally ..... *speciosa.*

Leaves sparsely, patently hairy above, ovate-cordate, acute; basal sinus shallow; corolla sparsely hairy on the folds externally :—

Leaves densely, softly adpressed-silky beneath; bracts all similar, lanceolate ..... *argentea.*

Leaves sparsely, patently hairy beneath as well as above; one bract near apex of peduncle often large, leafy, the rest lanceolate ..... *Roxburghii* var. *ampla.*

1373. ARGYREIA DALTONI Clarke; F. B. I. iv. 190.

Chota Nagpur.

A large climber.

1374. Argyreia splendens Sweet; F. B. I. iv. 186. *Lettsomia splendens* F. I. i. 487.
Chittagong.
A large climber.

1375. Argyreia speciosa Sweet; F. B. I. iv. 185; E. D. A. 1362. *Lettsomia nervosa* F. I. i. 488.
In most of the provinces.
An extensive climber. *Beng.* Bich-tarak, guguli; *Hind.* Samandar-sok.

1376. Argyreia argentea Choisy; F. B. I. iv. 185. *Lettsomia argentea* F. I. i. 489.
E. Bengal; Chittagong.
A large climber. *Vernac.* Chota bich-tarak, samandar sok.

1377. Argyreia Roxburghii Choisy var. ampla; F. B. I. iv. 185. *Ipomœa multiflora* F. I. i. 499; F. B. I. iv. 215.
N. Bengal.
A considerable climber.

633. Lettsomia Roxb.

Scandent, more or less hirsute or strigose shrubs; *leaves* cordate or rounded. *Flowers* in axillary, peduncled, corymbose or capitate cymes; bracts conspicuous. *Sepals* 5, orbicular or elliptic, somewhat thickened and coriaceous in fruit. *Petals* 5, connate in a funnel-shaped corolla, usually pink; limb plicate; lobes small. *Stamens* 5, exserted or included; anthers oblong or linear, straight. *Disk* annular or cup-shaped. *Carpels* connate in a 2-celled ovary; ovules 4; style filiform; stigma 2-globose. *Fruit* a dry berry. *Seeds* 4 or fewer, embedded in mealy pulp.

Anthers exserted; corolla less than an inch long; leaves densely white-tomentose beneath ..... *bella.*
Anthers included; corolla more than an inch long; leaves not white-tomentose beneath:—
Flowers corymbose; bracts obovate, obtuse, half an inch long or less, adpressed-strigose, as are the sepals and the branches ..... *setosa.*
Flowers capitate; bracts elliptic-oblong, an inch long, sparsely hispid sepals densely bristly, as are the branches ..... *strigosa.*

1378. Lettsomia bella Clarke; F. B. I. iv. 192.
Chota Nagpur.
A considerable climber.

1379. LETTSOMIA SETOSA Roxb.; F. I. i. 490; F. B. I. iv. 194.
Behar; Chota Nagpur.
A large climber.

1380. LETTSOMIA STRIGOSA Roxb.; F. I. i. 491; F. B. I. iv. 193.
N. Bengal; C. Bengal; E. Bengal; Tippera; Chittagong.
A powerful climber.

Order XCI. SOLANACEÆ.

Herbs, shrubs, or rarely small trees. *Leaves* alternate, often in unequal pairs, rarely clustered, never opposite, entire, lobed, or pinnate; stipules 0. *Flowers* regular, hermaphrodite, very rarely dicœcious, in terminal or lateral axillary or extra-axillary cymes, or on solitary or clustered pedicels; bracts 0; bracteoles 0. *Sepals* connate in an inferior calyx; limb 5-, rarely 3–7-lobed or toothed, very rarely teeth more numerous or lobes partite, in fruit usually persistent, often accrescent. *Petals* connate in a funnel-shaped, campanulate, or rotate, often plicate corolla; lobes 5, rarely 10, or limb subentire. *Stamens* 5, adnate to corolla-tube; anthers ovate or oblong; dehiscence introrse, longitudinal or apical, porous. *Carpels* usually 2, connate in a 2-celled or imperfectly 1-celled or 4-celled ovary, very rarely ovary 3–5-celled; ovules very many on prominent, peltate placentas; style linear; stigma capitate or very shortly lobed. *Fruit* a berry or a circumscissile or valved capsule, usually 2-celled, always many-seeded. *Seeds* compressed, discoid, or subreniform, with embryo peripheric, or occasionally seeds hardly compressed and embryo straight.

*Fruit indehiscent, a berry with many compressed, subdiscoid seeds; embryo curved or subspiral; corolla-lobes plaited or valvate:—[p. 743]

†Corolla rotate or wide-campanulate:—[p. 743]

Anthers connivent in a cone, longer than the filaments, not dehiscing throughout their length:—

Anthers dehiscing introrsely by longitudinal slits, the tips empty; leaves pinnatisect ..... **Lycopersicum.**

Anthers dehiscing by apical pores or by short apical slits; leaves entire, lobed or pinnatifid ..... **Solanum.**

Anthers not connivent in a cone and not longer than the filaments, dehiscing throughout their length by lateral slits; flowers pedicelled:—

Calyx in fruit small; flowers solitary or in pairs.....**Capsicum.**
Calyx in fruit enlarged, overtopping the berry; flowers solitary **Physalis.**

†Corolla urceolate; anthers not connivent in a cone; calyx in fruit enlarged, overtopping the berry; flowers clustered, subsessile [p. 742] **Withania.**

*Fruit capsular, valves completely or partially separating:—[p. 742]
Stamens 5, all perfect:—
Flowers axillary, solitary; corolla-lobes plaited; seeds somewhat compressed; embryo curved.....**Datura.**
Flowers in terminal panicles; corolla-lobes induplicate-valvate; seeds hardly compressed; embryo straight.....**Nicotiana.**
Stamens 4 only, perfect, didynamous; flowers solitary or in unilateral racemes .....**Browallia.**

634. Lycopersicum Mill.

Tall, pubescent herbs; *leaves* pinnate; pinnæ lyrate or toothed. *Flowers* in lax, few-flowered, peduncled cymes. *Sepals* connate in a 5-partite, rarely 6-partite calyx; lobes narrow. *Petals* 5, rarely 6, connate in a rotate, short-tubed corolla; limb plicate in bud. *Stamens* 5, rarely 6, adnate to corolla-throat; filaments very short; anthers connivent in an elongated cone, dehiscing by slits. *Carpels* connate in a 2–3-celled ovary; style cylindric; stigma small, capitate. *Fruit* a fleshy berry, globose, pyriform, or lobed. *Seeds* many, compressed, papillose; embryo peripheric.

1381. LYCOPERSICUM ESCULENTUM Mill.; F. B. I. iv. 237; E. D. L. 596. *Solanum Lycopersicum* F. I. i. 565.
Cultivated and sometimes as an escape.
A tall herb. *Vernac.* Gur-begun. The Tomato.

635. Solanum Linn.

Herbs, shrubs, or small trees, unarmed or prickly; *leaves* alternate or subopposite, in equal pairs, entire or lobed or pinnatifid. *Flowers* in dichotomous or racemose, lateral or terminal cymes. *Sepals* connate in a 5–10-lobed, rarely 4-lobed or subentire calyx, accrescent or not in fruit. *Petals* usually 5, rarely 4 or 6, connate in a rotate, rarely campanulate corolla with short tube; lobes plicate in bud. *Stamens* 5, rarely 4 or 6, adnate to corolla-throat; filaments short; anthers oblong, narrowed upwards, connivent in a short cone, opening by terminal chinks or pores. *Carpels* connate in a 2-celled ovary, rarely in cultivated forms 3–4-celled;

style columnar; stigma small. *Fruit* a small or large, globose or elongated berry. *Seeds* very many, discoid; embryo peripheric.

Unarmed; calyx unaltered or little altered in fruit; sepals never overtopping the berry; flowers always several, in racemes or corymbs, white, or if blue (*S. tuberosum* sometimes) the roots mixed with underground tuberous branches; berry globose, glabrous:—

Roots mixed with tubers; stems herbaceous, faintly angular; leaves pinnatifid; flowers large, blue or white ..... *tuberosum.*

Roots not mixed with tubers; stems round; flowers small, white:—

Leaves and stems glabrous or sparingly hairy; herbs or undershrubs; peduncles lateral, extra-axillary:—

Leaves ovate or oblong, sinuately lobed; pedicels subumbellate; herbs ..... *nigrum.*

Leaves elliptic, acute, entire; pedicels spirally racemose; undershrubs ..... *spirale.*

Leaves and stems stellately woolly; shrubs or small trees; peduncles subterminal; corymbs dense, very woolly; leaves elliptic, acuminate, entire ..... *verbascifolium.*

Armed with prickles, or if unarmed (some cultivated forms of *S. Melongena*), the flowers blue, the calyx enlarged and the roots not mixed with tubers; racemes lateral:—

Calyx-tube inflated, deeply cup-shaped, much enlarged, at first overtopping the glabrous, globose berry, ultimately reflexed and exposing the fruit; leaves oblong, pinnatifid or twice pinnatifid; flowers racemose, white or violet; undershrubs ..... *sisymbriifolium.*

Calyx-tube not inflated, shallowly cup-shaped, little altered or unaltered in fruit, or if enlarged, deeply cup-shaped (*S. Melongena* sometimes), the leaves not pinnatifid; racemes lateral:—

Flowers white; leaves ovate; calyx unaltered in fruit; berry globose:—

Leaves very prickly on the nerves, with distinct, angular lobes and sinuses an inch deep; corolla densely woolly; berry an inch across or larger, hispid with needle-like hairs; a stout herb *ferox.*

Leaves not prickly on the nerves, with rounded lobes and sinuses less than an inch deep; corolla sparsely pubescent; berry one-third of an inch across or smaller, smooth; a woody shrub *torvum.*

Flowers blue; berry smooth; corolla sparsely pubescent:—

*Stems erect; stout herbs or undershrubs; leaves stellately woolly, ovate, sinuate or lobed:—[p. 745]

Racemes many-flowered; calyx-lobes triangular-oblong, unaltered in fruit; berry small, globose, one-third of an inch across or less; a much-branched, prickly undershrub...*indicum*.
Racemes few-flowered; calyx-lobes narrowly elliptic or linear-oblong, enlarged in fruit; berry large, globose, rarely ovate in semi-wild plants, and then at least ·75 in. across, sometimes overtopped by the calyx; ovate, elliptic, or oblong, rarely globose in cultivated forms, and then 2–9 in. long, much exceeding the calyx:—

Fruiting peduncle solitary, with usually a small accompanying raceme of sterile flowers; cultivated forms:—

Stems, leaves, and calyx unarmed .....*Melongena*.
Stems, leaves, and calyx armed with prickles
Melongena var. *esculenta*.

Fruiting peduncle 3–4-flowered; stems, leaves, and calyx armed with prickles; spontaneous or subspontaneous forms
Melongena var. *insana*.

*Stems not erect; leaves glabrescent:—[p. 744]

Herbaceous, diffuse; leaves 4 in. long or longer, elliptic, deeply sinuate or subpinnatifid, very prickly; berry half an inch or more across .....*xanthocarpum*.
Shrubby, scandent or trailing; leaves 3 in. long or less, ovate, irregularly shallow-sinuate or lobed, sparsely prickly, at first finely woolly, but soon almost glabrous; berry one-third of an inch across or less .....*trilobatum*.

1382. SOLANUM TUBEROSUM Linn.; F. B. I. iv. 229; E. D. S. 2320.

Cultivated sparingly.

A herb with tuberous underground branches. *Vernac.* Álu. The Potato.

1383. SOLANUM NIGRUM Linn.; F. B. I. iv. 229; E. D. S. 2299. *S. rubrum* F. I. i. 565.

In all the provinces.

A small, herbaceous weed of fields and waysides. *Hind.* Makoi; *Beng.* Gurkhi, gurkamai.

1384. SOLANUM SPIRALE Roxb.; F. I. i. 566; F. B. I. iv. 230; E. D. S. 2311.

E. Bengal, Mymensingh.

An undershrub or shrub, 4–12 feet high. *Vernac.* Bagna.

1385. SOLANUM VERBASCIFOLIUM Linn.; F. B. I. iv. 230; E. D. S. 2341. *S. pubescens* F. I. i. 564.
In all the provinces.
A shrub or small tree, 8–20 feet high; in village thickets and waste places. *Beng.* Arasa.

1386. SOLANUM SISYMBRIIFOLIUM Lamk.
C. Bengal.
A viscid undershrub; on river banks, an escape: native of America.

1387. SOLANUM FEROX Linn.; F. B. I. iv. 233; E. D. S. 2273. *S. hirsutum* F. I. i. 571.
C. Bengal; E. Bengal; Chittagong.
A stout herb. *Beng.* Ram-begun.

1388. SOLANUM TORVUM Swartz; F. B. I. iv. 234; E. D. S. 2313. *S. stramonifolium* F. I. i. 572.
In all the provinces.
A shrub, 8–12 feet high, of roadsides and waste places. *Beng.* Gota-begun.

1389. SOLANUM INDICUM Linn.; F. I. i. 570; F. B. I. iv. 234; E. D. S. 2280.
In all the provinces.
An undershrub or shrub, 1–6 feet high, of roadsides and rubbish heaps. *Hind.* Barhanta; *Beng.* Byakur, gurkamai.

1390. SOLANUM MELONGENA Linn.; F. I. i. 566; F. B. I. iv. 235; E. D. S. 2284.
Cultivated everywhere.
A stout herb. *Vernac.* Baigun, begun. The Begun, Brinjal, or Egg-plant.

1390/2. Var. ESCULENTA. *S. longum* F. I. i. 567.
Cultivated everywhere.
A stout, prickly herb. The Kuli-begun or Long Brinjal.

1390/3. Var. INSANA. *S. insanum* F. I. i. 568.
In most of the provinces.
A very prickly herb, in thickets and waste places near villages. A form feral by reversion, not a truly wild stock.

1391. SOLANUM XANTHOCARPUM Schrad. & Wendl.; F. B. I. iv. 236; E. D. S. 2345. *S. diffusum* F. I. i. 568. *S. Jacquini* F. I. i. 569

In all the provinces.

A very prickly, diffuse herb, 1–4 feet across. *Hind.* Kateli, ringni; *Beng.* Kantakari; *Uriya* Bheji-begun, ankranti; *Santal.* Rangaini janum.

1392. SOLANUM TRILOBATUM Linn.; F. I. i. 571; F. B. I. i. 236; E. D. S. 2315.

Sundribuns; Orissa.

A scandent or trailing undershrub, 6–12 feet long. *Uriya* Nabhi-ankuri.

636. Capsicum Linn.

Annual or perennial glabrous herbs or undershrubs; *leaves* alternate, entire or repand. *Flowers* pedicelled, axillary, solitary or 2–3 together. *Sepals* connate in a subentire or minutely 5-toothed calyx, much shorter than the fruit. *Petals* 5, connate in a rotate corolla; tube short; lobes valvate in bud. *Stamens* 5, adnate nearly to base of corolla-tube; filaments short; anthers not exceeding filaments; dehiscence longitudinal. *Carpels* connate in a 2-celled, rarely a 3-celled ovary; style linear; stigma subcapitate. *Fruit* a globose or elongated or irregularly shaped, many-seeded berry. *Seeds* discoid, smooth or subscabrous; embryo peripheric.

*Pedicels solitary, variously erect or reflexed; fruits erect or spreading or pendent, at least as long as, usually longer than, the pedicels; plants annual or biennial:—[p. 748]

†Flowers white; berries at first green, afterwards becoming red, orange, or yellow:—[p. 748]

‡Fruit not globular:—[p. 748]

Berries tapering, much longer than broad:—

Fruit stout; flesh thick, usually mildly pungent; calyx not enclosing base of berry ..... *annuum.*

Fruit slender; flesh thin, keenly pungent; calyx enclosing base of berry ..... *annuum* var. *acuminata.*

Berries not much, if at all longer than broad, usually obtuse; calyx not enclosing base of berry:—

Berries circular in section, subconical or ovate or oblong; flesh thin, pungent ..... *annuum* var. *abbreviata.*

Berries swollen, angular in section, prismatic or quadrate or oblate; flesh very thick, hardly at all pungent

annuum var. *grossa.*

‡Fruit globular, extremely pungent [p. 747]...*annuum* var. *cerasiformis*.
†Flowers purple; berries at first dark purple, afterwards becoming orange-red, much longer than broad, only slightly pungent; calyx hardly enclosing the base [p. 747].....*annuum* var. *nigra*.
*Pedicels 2 or more, erect; fruit always erect, red, shorter than the pedicels, pungent; plants perennial; flowers white:—[p. 747]
Berries elongated, tapering, base embraced by the calyx.....*frutescens*.
Berries globose or nearly so, base seated on the calyx
frutescens var. *baccata*.

1393. CAPSICUM ANNUUM Linn.; E. D. C. 448.
Cultivated sparingly in gardens of Europeans.
A shrubby herb.
This includes the majority of the mild forms of Chillie, usually raised from European seed.

1393/2. Var. ACUMINATA Fingerh. *C. frutescens* F. I. i. 574; F. B. I. iv. 239; E. D. C. 455.
Cultivated generally.
A shrubby herb.
The forms with erect fruits are the *true* Red and Yellow Chillies; these are hardly known in the fields of our provinces: those with pendent fruits are the Gachh mirich or Lal gachh mirich, Lanka mirich or Lal lanka mirich of native cultivators, according as the fruits are yellow or red. These native names would indicate a southern origin for the plant, but, curiously, the usual English names are either Red or Yellow "Chillies," which the plants properly are *not*, or Red or Yellow "Nepal Peppers." Whether of southern (Ceylon, Lanka) or of northern (Nepal) origin, there is little doubt that the forms have been evolved since *C. annuum* was first introduced to India, for in America they are only known as having been raised from Indian seed.

1393/3. Var. ABBREVIATA Fingerh. *C. annuum* F. I. i. 573.
Cultivated sparingly in gardens of Europeans.
A shrubby herb.
This includes the majority of the pungent forms of Chillie usually raised from European seed.

1393/4. Var. GROSSA Sendt. *C. grossum* F. I. i. 574; F. B. I. iv. 239; E. D. C. 464.
Cultivated in gardens, both European and native.
A shrubby herb. *Vernac.* Káphari mirich. Spanish Pepper.

1393/5. Var. CERASIFORMIS Mill. *C. cerasiforme* F. I. i. 574. *C. grossum* var. *cerasiformis* F. B. I. iv. 239.
Cultivated occasionally in European gardens.
A shrubby herb. Cherry-pepper.

1392/6. Var. NIGRA. *C. purpureum* F. I. i. 574.
Cultivated occasionally in native gardens.
A shrubby herb. Purple Chillie.

1394. CAPSICUM FRUTESCENS Linn. *C. minimum* F. I. i. 574; F. B. I. iv. 239; E. D. C. 466.
Cultivated, but not very extensively; quite naturalised in waste places in all the provinces.
A much-branched shrub. Bird's Eye Chillie of Europeans. *Vernac.* Dhan gachh mirich or Dhan lanka mirich.

1394/2. Var. BACCATA Irish. *C. minimum* F. B. I. iv. 239 in part.
Cultivated occasionally.
A much-branched shrub. Brazil Pepper or Pimentas.

637. Physalis Linn.

Annual or perennial herbs; *leaves* alternate, entire, sinuate, or shortly lobed. *Flowers* solitary, axillary, pedicelled. *Sepals* connate in a campanulate, 5-fid calyx, much accrescent in fruit, limb then ventricose, loosely enclosing the fruit; teeth small, connivent. *Petals* 5, connate in a campanulate, lurid-yellow corolla, sometimes with purple spots in the base of the tube. *Stamens* 5, adnate near base of corolla; filaments rather short; anthers oblong, shorter than the filaments; dehiscence longitudinal. *Carpels* connate in a 2-celled ovary; style linear; stigma obscurely 2-lobed. *Fruit* a globose berry, enveloped in the bladder-like calyx. *Seeds* many or few, smooth or rugose, compressed; embryo peripheric.

Corolla ·25 in. across or less; calyx in fruit not over 1 in. in length, ovoid or subglobose; berry not over ·5 in. across, insipid:—

Leaves and fruiting calyx pubescent; calyx globose or faintly angular; corolla clear-yellow or, rarely, with 5 small basal spots .....*minima*.

Leaves and fruiting calyx glabrescent; calyx distinctly 5-angular; corolla clear-yellow .....*minima* var. *indica*.

Corolla ·5 in. across or more; calyx in fruit almost always over 1 in. in length, usually 1·5–1·75 in., ovoid-conical; berry over ·5 in. across, palatable; leaves and fruiting calyx usually villous or pubescent; corolla with always 5 large purple spots near base within .....*peruviana*.

1395. PHYSALIS MINIMA Linn.; F. I. i. 563; F. B. I. iv. 238; E. D. P. 678.

In all the provinces.

A herbaceous, pubescent, annual weed of roadsides and waste places. *Hind.* Tuleti-pati; *Beng.* Ban-tipariya; *Santal.* Handi khandi.

1395/2. Var. INDICA F. B. I. iv. 238; E. D. P. 678.

In the central and eastern provinces in the same situations as the type.

A small, herbaceous, glabrescent, annual weed. *Beng.* Ban-tipariya.

1396. PHYSALIS PERUVIANA Linn.; F. I. i. 562; F. B. I. iv. 238; E. D. P. 682.

In all the provinces, cultivated in gardens.

A stoutish, annual herb. *Vernac.* Tipariya. The Tipari; the European name is "Cape" Gooseberry, though the plant is of American, not African origin.

638. Withania Pauq.

Unarmed shrubs; *leaves* entire. *Flowers* axillary, sessile or short-pedicelled, fascicled or solitary, sometimes polygamo-diœcious. *Sepals* connate in a 5–6-toothed, campanulate, sub-globose calyx, accrescent in fruit. *Petals* connate in a campanulate corolla; lobes 3–6, short, valvate in bud. *Stamens* 5, adnate near base of corolla; anthers oblong; dehiscence longitudinal. *Carpels* connate in a 2-celled ovary; ovules numerous; style linear; stigma shortly 2-fid. *Fruit* a globose berry. *Seeds* very many, discoid; embryo peripheric.

1397. WITHANIA SOMNIFERA Dun.; F. B. I. iv. 239; E. D. W. 98. *Physalis flexuosa* F. I. i. 561.

N. Bengal; cultivated in small gardens for its reputed alexipharmic properties.

An erect shrub, reaching 5 feet in height. *Vernac.* Asgánd, asvagándha.

639. Datura Linn.

Coarse, rank, shrubby herbs, glabrous or minutely pubescent; *leaves* large, entire, sinuate or deeply toothed. *Flowers* large, purple or white, solitary, pedicelled. *Sepals* connate in a long, tubular, herbaceous calyx; mouth 5-toothed, deciduous in fruit by

a circumscissile scar above the base. *Petals* 5, connate in a long, tubular corolla, with funnel-shaped throat and spreading, plaited limb, entire or shortly 5- or 10-lobed. *Stamens* 5, adnate to near base of corolla-tube; filaments filiform; anthers included, linear; dehiscence longitudinal. *Carpels* connate in a 2-celled or, by development of accessory septa from the placentas, spuriously 4-celled ovary; ovules many; style filiform; stigma 2-lobed. *Fruit* an ellipsoid, 4-celled, spinescent capsule, 4-valved or irregularly bursting near the apex. *Seeds* very many, compressed, rugose; embryo peripheric.

Capsule opening irregularly near apex, usually pendent:—
Flowers more or less purple .....*fastuosa.*
Flowers white or cream-coloured .....*fastuosa* var. *alba.*
Capsule deeply 4-valved almost to the base, erect; flowers purple
Stramonium var. *Tatula.*

1398. DATURA FASTUOSA Linn.; F. I. i. 561; F. B. I. iv. 242; E. D. D. 151.
Everywhere in gardens; occasionally subspontaneous.
A coarse, shrubby annual. *Vernac.* Kala dhutra.

1398/2. Var. ALBA; F. B. I. iv. 243; E. D. D. 160. *D. alba* F. I. i. 561.
In all the provinces, in gardens and as if wild.
A coarse, shrubby annual. *Vernac.* Dhutra. Datura.

1399. DATURA STRAMONIUM Linn. var. TATULA; F. B. I. iv. 242.
Chota Nagpur, in waste places near villages.
A coarse, shrubby annual. *Vernac.* Dhutra.

640. Nicotiana Linn.

Erect, viscidly pubescent herbs or shrubs; *leaves* alternate, entire or sinuate. *Flowers* in terminal panicles or subterminal racemes. *Sepals* connate in a 5-fid, ovoid or tubular calyx; lobes narrow. *Petals* 5, connate in a funnel-shaped or campanulate corolla; lobes induplicate in bud. *Stamens* 5, adnate to lower part of corolla-tube; filaments filiform; anthers ovate; dehiscence longitudinal. *Carpels* connate in a 2-celled ovary; ovules many; style filiform; stigma shortly 2-fid. *Fruit* a capsule, 2-celled or occasionally imperfectly 4-celled; valves 2, separating to the middle from the apex, often again splitting. *Seeds* very many, small, hardly compressed; embryo nearly straight.

Leaves ovate, base rounded or cordate; panicle close; calyx-teeth sub-obtuse; corolla yellowish, narrow-campanulate; capsule subglobose, ·5 in. across ..... *rustica.*

Leaves oblong or elliptic, base cuneate; panicle open; calyx-teeth lanceolate, acute; corolla narrowly funnel-shaped; capsule conical:—

Branches of corymb short; corolla rosy-white, large; capsule ·75 in. long ..... *Tabacum.*

Branches of corymb long, laxly racemose; corolla pure white, very narrow; capsule ·25 in. long ..... *plumbaginifolia.*

1400. NICOTIANA RUSTICA Linn.; F. B. I. iv. 245; E. D. N. 98.
In all the provinces sparingly cultivated, except in N. Bengal, where its cultivation is general.
A coarse, annual herb. *Vernac.* Angrezi tamaku, or Hamaku. "English" Tobacco.

1401. NICOTIANA TABACUM Linn.; F. B. I. iv. 245; E. D. N. 101.
In all the provinces, generally cultivated, but most extensively in N. Bengal along with the preceding. *Vernac.* Tamaku. Tobacco.

1402. NICOTIANA PLUMBAGINIFOLIA Viv.; F. B. I. iv. 246.
N. Bengal; C. Bengal; E. Bengal.
A common annual weed. *Beng.* Ban-tamaku.

Though now so general a weed, this plant is not alluded to by Roxburgh; it is not, however, certain that it is an introduction subsequent to Roxburgh's time, because the genus *Nicotiana* is omitted from the *Flora Indica;* though it is probable, because Roxburgh enumerates the two preceding species in the *Hortus Bengalensis* but omits this one.

641. Browallia Linn.

Annual, glabrous or viscidly pubescent herbs; *leaves* alternate, entire, membranous. *Flowers* blue or white, solitary, axillary, or the uppermost passing into a 1-sided, terminal, bracteate raceme. *Sepals* connate in a tubular, 4–5-lobed calyx; lobes small. *Petals* 5, connate in a slender corolla, with long, straight, narrow tube, narrowed and connate at its base with stipe of ovary; limb spreading, somewhat 2-lipped, the lobes subplicate-imbricate, the 2 upper outermost. *Stamens* 4, perfect, didynamous, adnate to corolla-tube above the middle, included; anthers dimorphous, those of upper perfect stamens subdivaricate, perfectly 2-celled, the cells at length confluent at the tips, of the lower stamens

dimidiate, with one perfect and one empty or aborted cell; rudimentary fifth stamen present or 0. *Disk* small. *Carpels* connate in a stipitate, 2-celled ovary; ovules many; style filiform; stigma dilated, 2-lobed. *Fruit* a membranous or subcoriaceous capsule enclosed in the calyx; valves 2, each 2-fid. *Seeds* many, very small, pitted-reticulate; embryo straight or slightly curved.

1403. BROWALLIA ELATA Linn.

In gardens in the cold season; often occurring spontaneously in garden-beds and on rubbish-heaps.

A small herb; native of Peru.

Order XCII. SCROPHULARINEÆ.

Herbs or shrubs, rarely trees, often semi-parasitic, rarely quite parasitic on roots. *Leaves* all, or the lower only, opposite, rarely all alternate or whorled, occasionally all radical, subrosulate; stipules 0. *Flowers* hermaphrodite, usually irregular; inflorescence centripetal or composite. *Sepals* connate in an inferior calyx, sometimes only shortly united, generally persistent; lobes 5, rarely 4. *Petals* connate in a hypogynous, more or less 2-lipped or occasionally personate 4–5-lobed corolla. *Stamens* usually 4, didynamous or subequal, with or without a stamonide, more rarely 5 or only 2; anthers variously shaped; dehiscence longitudinal; cells 2, distinct or apically or throughout confluent; or 1, the other imperfect or abortive; when stamens didynamous the anthers often connivent and sometimes connate at their apices in anterior and posterior pairs. *Disk* annular, cupular, or glandular. *Carpels* 2, connate in a 2-celled, superior ovary; ovules many, rarely few or only 2 in each cell, anatropous or amphitropous; style simple; stigma simple, capitate or dilated, or 2-lobed or 2-lamellate. *Fruit* a capsule, rarely a berry; placentas either remaining on a persistent central axis or attached to the margins of the valves. *Seeds* small, various in shape; hilum lateral or ventral; albumen fleshy, rarely 0; embryo straight or curved.

Leaves all alternate; corolla subrotate; tube short; throat narrow; lobes 5, broad, subequal, the two upper outermost in bud; stamens 4, didynamous ..... **Celsia.**

Leaves, at least the lower if not all, opposite; corolla-tube elongated, or, if short, then (*Microcarpæa*, *Glossostigma*, *Veronica*) stamens 2, or if

stamens 4, either (*Scoparia*) corolla-lobes 4, imbricate, and stamens subequal or (*Sopubia*) corolla-throat wide and 2 upper lobes innermost in bud :—

Corolla-tube bulging or spurred at the base in front; limb personate, the palate on the lower lip closing the throat; upper lip also 2-gibbous, outermost in bud; capsule opening by pores; stamens 4, didynamous; anther-cells discrete; leaves opposite below, alternate above:—

Corolla spurred in front at the base .....**Linaria.**

Corolla saccate in front at the base, but not spurred ...**Antirrhinum.**

Corolla-tube not enlarged at the base in front; limb not personate; capsule dehiscing by valves :—

*Corolla with upper lip or two upper lobes outermost and lower lobe innermost in the bud, or if corolla-lobes regularly imbricate (*Microcarpæa*, *Glossostigma*), the lobes 5 and stamens 2 :—[p. 756]

†Corolla elongated; tube cylindric, with more or less expanded throat; limb distinctly 2-lipped, or, if lobes subequal (*Russelia*, *Sutera*, *Herpestis*), with 4 stamens; if stamens 2 and filaments filiform (*Dopatrium*), the anther-cells parallel and distinct; if stamens 2 and anther-cells divaricate, cohering or confluent (*Ilysanthes*, *Bonnaya*), the filaments arcuate, not filiform :—[p. 756]

‡Stamens if 4 all, if 2 (*Dopatrium*) both staminodes and stamens inserted within the tube :—[p. 755]

Corolla not distinctly 2-labiate; lobes all rounded, subequal; anther-cells divaricate, confluent 1-locular; calyx 5-partite; capsule septicidal, valves shortly 2-fid :—

Calyx-lobes much imbricated; filaments incurved; leaves opposite or whorled; capsule subglobose .....**Russelia.**

Calyx-lobes hardly imbricated; filaments filiform; leaves opposite below, alternate above; capsule ovate-oblong **Sutera.**

Corolla distinctly 2-labiate, or if lobes subequal (*Herpestis*), the anther-cells contiguous but distinct, parallel or diverging; capsule loculicidal or both loculicidal and septicidal; if anther-cells confluent (*Mimulus*), lower lip with 2-gibbous throat :—

§Corolla with 2-gibbous throat; anther-cells divaricate; capsule loculicidal; stamens 4 :—[p. 755]

Calyx 5-angled and 5-toothed; anther-cells confluent, often 1-celled; leaves all opposite .....**Mimulus.**

Calyx wide-campanulate, 2-fid; anther-cells contiguous but distinct; lower leaves opposite, upper alternate **Mazus.**

§Corolla with throat not 2-gibbous ; anther-cells distinct :—[p. 754]

Stamens 4 ; corolla-throat little widened :—

Calyx wide-campanulate, 2-fid ; corolla-throat with 2 parallel ridges ; anther-cells disjoined, stipitate ; capsule loculicidal ..... **Lindenbergia.**

Calyx 5-partite ; corolla-throat without ridges ; capsule both loculicidal and septicidal :—

Anther-cells disjoined, stipitate :—

Uppermost lobe of calyx considerably or much exceeding the others, 2 or all the stamens with one imperfect cell ..... **Adenosma.**

Uppermost lobe of calyx not much, if at all, larger than the others ; all the stamens perfect :—

Placentas either separating in the fruit, or if conjoined in a column, the column not winged ; seeds terete ..... **Stemodia.**

Placentas always conjoined in a column, winged by the remains of the septa ; seeds angular **Limnophila.**

Anther-cells contiguous though distinct ; calyx 5-partite, lateral segments inmost much narrower than the others ; corolla with 5 subequal lobes **Herpestis.**

Stamens 2, perfect, the anterior pair reduced to staminodes ; corolla-throat much widened ; calyx deeply 5-fid **Dopatrium.**

‡Stamens if 4 the anterior pair, if 2 the staminodes attached to corolla-throat, the posterior or only perfect pair, inserted within corolla-tube ; capsule septicidal ; leaves opposite :—[p. 754]

All four stamens with anthers perfect :—

Calyx with 3–5 ridges or wings ; mouth oblique, 3–5-toothed or 2-lipped ; capsule oblong, not exceeding the calyx ..... **Torenia.**

Calyx without wings, 5-lobed or 5-partite ; segments equal ; capsule ovoid or oblong not exceeding, or linear exceeding the calyx ..... **Vandellia.**

Only the two upper stamens with perfect anthers ; calyx without wings :—

¶Calyx 5-partite ; lobes all narrow :—[p. 756]

Leaves with parallel veins ; staminodes unequally 2-lobed ; capsule ovate or shortly oblong ..... **Ilysanthes.**

Leaves with pinnate veins ; staminodes entire ; capsule linear or oblong-linear ..... **Bonnaya.**

¶Calyx 4-partite; upper and lower lobes very large, lateral; lobes narrow [p. 755] .....**Curanga.**

†Corolla small; tube very short, uniform; lobes subequal; stamens 2; filaments filiform; anther-cells divaricate, confluent 1-celled; very small, branching, diffuse herbs with opposite leaves; capsule loculicidal:—[p. 754]

Calyx tubular, 5-angled, shortly, acutely 5-fid; leaves opposite, narrow .....**Microcarpæa.**

Calyx campanulate, with 3–4 short, obtuse lobes; leaves opposite, fascicled.....**Glossostigma.**

*Corolla with upper lip or two upper lobes innermost in bud, or if corolla-lobes imbricate (*Scoparia*), lobes 4 and stamens 4:—[p. 754]

Corolla-tube short, subrotate, the throat narrow; non-parasitic plants; leaves opposite:—

Corolla-lobes 4, subequal, imbricate; stamens 4, subequal; capsule globose, septicidal .....**Scoparia.**

Corolla-lobes 4–5, unequal, one or both of the lateral outermost in bud, the lateral considerably wider than the lower and upper; stamens 2; capsule compressed, loculicidal...**Veronica.**

Corolla-tube elongated, or if short (*Sopubia*), the throat wide; corolla-lobes 5, the two upper innermost and the lower outermost in bud; stamens 4, didynamous; plants parasitic or partially parasitic; capsule loculicidal; leaves opposite below, often alternate above:—

Leaves entire or dentate or reduced to scales:-

Corolla subglobose-campanulate; limb oblique; calyx campanulate; anther-cells both perfect.....**Alectra.**

Corolla narrow-tubular; only one anther-cell perfect:—

Calyx tubular, 5-toothed or 5-fid; corolla-tube narrow; anthers 1-locular, vertical:—

Corolla-tube straight or slightly incurved; lobes subequal; basal leaves much larger than those above **Buchnera.**

Corolla-tube abruptly incurved at or above the middle, 2 upper lobes smaller than the others; basal leaves not much larger than those above .....**Striga.**

Calyx spathaceous, compressed, split in front; corolla slightly ventricose at the throat; limb obscurely 2-lipped; anthers with one perfect and one sessile empty cell **Centranthera.**

Leaves pinnately dissected, segments linear; calyx campanulate; corolla-tube short; throat much widened; lobes subequal; anthers with one cell stipitate, empty .....**Sopubia.**

642. Celsia Linn.

Annual or biennial herbs; *leaves* alternate, crenate, sinuate, dentate, or incised. *Flowers* in terminal spikes or racemes, simple or rarely branched. *Sepals* connate in a deeply 5-fid calyx; lobes imbricate. *Petals* 5, connate in a wide-rotate corolla, with hardly any tube; lobes broad, somewhat unequal, the posterior outmost in bud. *Stamens* 4, subdidynamous or (in our species) subequal; filaments all woolly; anthers transverse or oblique, with confluent tips. *Carpels* connate in a 2-locular ovary; ovules many; style entire; stigma compressed, terminal. *Fruit* a globose or ovoid, septicidal capsule; valves 2, each usually 2-fid. *Seeds* many, very small, transversely rugose, not winged.

1404. Celsia coromandeliana Vahl; F. I. iii. 100; F. B. I. 251; E. D. C. 878.
In all the provinces.
An erect, annual weed. *Beng.* Koksima.

643. Linaria Juss.

Herbs; *leaves* opposite or whorled below and alternate above. *Flowers* axillary, or passing into terminal racemes or spikes, with floral leaves reduced to bracts; bracteoles 0. *Sepals* connate in a 5-partite calyx; lobes imbricate. *Petals* 5, connate in a personate corolla; tube spurred in front; upper lip erect, 2-lobed, lower spreading, 3-lobed; throat usually closed by the tumid palate, sometimes slightly pervious. *Stamens* 4, didynamous, included, ascending; anthers with distinct, parallel cells. *Carpels* connate in a 2-locular ovary; ovules many; style filiform; stigma minute. *Fruit* an ovoid or globose, 2-celled capsule, both cells or only the anterior one opening by an apical pore. *Seeds* many, rugose or angled wingless, or discoid winged.

Leaves nearly glabrous, lower usually 6–7-lobed; spur shorter than corolla-tube ..... *ramosissima.*
Leaves softly pubescent, lower never much lobed; spur longer than corolla-tube ..... *incana.*

1405. Linaria ramosissima Wall.; F. B. I. iv. 251; E. D. L. 369.
In most of the provinces.
A prostrate, tufted herb.

1406. Linaria incana Wall. *L. cabulica* F. B. I. iv. 251.
Western Behar.
A prostrate, tufted herb.

¶Calyx 4-partite; upper and lower lobes very large, lateral; lobes narrow [p. 755] .....**Curanga.**

†Corolla small; tube very short, uniform; lobes subequal; stamens 2; filaments filiform; anther-cells divaricate, confluent 1-celled; very small, branching, diffuse herbs with opposite leaves; capsule loculicidal:—[p. 754]

Calyx tubular, 5-angled, shortly, acutely 5-fid; leaves opposite, narrow .....**Microcarpæa.**

Calyx campanulate, with 3–4 short, obtuse lobes; leaves opposite, fascicled.....**Glossostigma.**

*Corolla with upper lip or two upper lobes innermost in bud, or if corolla-lobes imbricate (*Scoparia*), lobes 4 and stamens 4:—[p. 754]

Corolla-tube short, subrotate, the throat narrow; non-parasitic plants; leaves opposite:—

Corolla-lobes 4, subequal, imbricate; stamens 4, subequal; capsule globose, septicidal .....**Scoparia.**

Corolla-lobes 4–5, unequal, one or both of the lateral outermost in bud, the lateral considerably wider than the lower and upper; stamens 2; capsule compressed, loculicidal...**Veronica.**

Corolla-tube elongated, or if short (*Sopubia*), the throat wide; corolla-lobes 5, the two upper innermost and the lower outermost in bud; stamens 4, didynamous; plants parasitic or partially parasitic; capsule loculicidal; leaves opposite below, often alternate above:—

Leaves entire or dentate or reduced to scales:-

Corolla subglobose-campanulate; limb oblique; calyx campanulate; anther-cells both perfect.....**Alectra.**

Corolla narrow-tubular; only one anther-cell perfect:—

Calyx tubular, 5-toothed or 5-fid; corolla-tube narrow; anthers 1-locular, vertical:—

Corolla-tube straight or slightly incurved; lobes subequal; basal leaves much larger than those above **Buchnera.**

Corolla-tube abruptly incurved at or above the middle, 2 upper lobes smaller than the others; basal leaves not much larger than those above .....**Striga.**

Calyx spathaceous, compressed, split in front; corolla slightly ventricose at the throat; limb obscurely 2-lipped; anthers with one perfect and one sessile empty cell **Centranthera.**

Leaves pinnately dissected, segments linear; calyx campanulate; corolla-tube short; throat much widened; lobes subequal; anthers with one cell stipitate, empty .....**Sopubia.**

642. Celsia Linn.

Annual or biennial herbs; *leaves* alternate, crenate, sinuate, dentate, or incised. *Flowers* in terminal spikes or racemes, simple or rarely branched. *Sepals* connate in a deeply 5-fid calyx; lobes imbricate. *Petals* 5, connate in a wide-rotate corolla, with hardly any tube; lobes broad, somewhat unequal, the posterior outmost in bud. *Stamens* 4, subdidynamous or (in our species) subequal; filaments all woolly; anthers transverse or oblique, with confluent tips. *Carpels* connate in a 2-locular ovary; ovules many; style entire; stigma compressed, terminal. *Fruit* a globose or ovoid, septicidal capsule; valves 2, each usually 2-fid. *Seeds* many, very small, transversely rugose, not winged.

1404. CELSIA COROMANDELIANA Vahl; F. I. iii. 100; F. B. I. 251; E. D. C. 878.
In all the provinces.
An erect, annual weed. *Beng.* Koksima.

643. Linaria Juss.

Herbs; *leaves* opposite or whorled below and alternate above. *Flowers* axillary, or passing into terminal racemes or spikes, with floral leaves reduced to bracts; bracteoles 0. *Sepals* connate in a 5-partite calyx; lobes imbricate. *Petals* 5, connate in a personate corolla; tube spurred in front; upper lip erect, 2-lobed, lower spreading, 3-lobed; throat usually closed by the tumid palate, sometimes slightly pervious. *Stamens* 4, didynamous, included, ascending; anthers with distinct, parallel cells. *Carpels* connate in a 2-locular ovary; ovules many; style filiform; stigma minute. *Fruit* an ovoid or globose, 2-celled capsule, both cells or only the anterior one opening by an apical pore. *Seeds* many, rugose or angled wingless, or discoid winged.

Leaves nearly glabrous, lower usually 6–7-lobed; spur shorter than corolla-tube ..... *ramosissima.*
Leaves softly pubescent, lower never much lobed; spur longer than corolla-tube ..... *incana.*

1405. LINARIA RAMOSISSIMA Wall.; F. B. I. iv. 251; E. D. L. 369.
In most of the provinces.
A prostrate, tufted herb.

1406. LINARIA INCANA Wall. *L. cabulica* F. B. I. iv. 251.
Western Behar.
A prostrate, tufted herb.

644. Antirrhinum Linn.

Annual or perennial herbs; *leaves* entire or lobed, lower opposite, upper alternate. *Flowers* solitary, axillary, or passing into terminal racemes, with bract-like floral leaves; bracteoles 0. *Sepals* connate in a 5-partite calyx; lobes imbricate. *Petals* 5, connate in a compressed, tubular corolla, saccate at the base; upper lip erect, 2-lobed; lower spreading, 3-lobed, with a bearded, broad palate closing the throat. *Stamens* 4, didynamous; anthers with distinct parallel cells. *Carpels* connate in a 2-celled ovary; ovules numerous; style filiform; stigma 2-lobed. *Fruit* an ovoid or globose, 2-celled capsule, each cell opening by one pore, or the posterior by two toothed pores. *Seeds* minute, numerous, oblong, truncate, rugose or pitted.

1407. Antirrhinum majus Linn.; F. B. I. iv. 253.

In gardens during the cold season; subspontaneous in some parts of India, but not so in Lower Bengal.

An erect annual. Snap-dragon.

645. Russelia Jacq.

Shrubs or undershrubs with angular branches; *leaves* opposite or whorled, those of stem often reduced to scales. *Flowers* in lax, dichotomous cymes, sometimes reduced to a single flower; bracts small, leafy. *Sepals* 5, connate in a deeply lobed calyx; lobes imbricate. *Petals* 5, connate in a pink cylindric corolla; limb somewhat 2-lipped; lobes all rounded, subequal, the two upper outermost. *Stamens* 4, didynamous; anthers with divaricate cells, with ultimately confluent tips. *Carpels* connate in a 2-celled ovary; ovules many; style filiform; stigma minute. *Fruit* a subglobose, septicidal, 2-valved capsule. *Seeds* numerous, ovoid, wingless, surrounded by long, dilated, hyaline hairs.

1408. Russelia juncea Jacq.

In gardens, very common.

A closely tufted perennial with numerous slender, green branches.

646. Sutera Roth.

A low, diffuse, viscid herb; *leaves* pinnatifid, lower opposite, upper alternate. *Flowers* small, axillary, passing into terminal racemes; bracts small, leafy; bracteoles 0. *Sepals* 5, connate in a deeply divided calyx; lobes narrow, hardly imbricate. *Petals* 5, connate in a slender, tubular corolla; throat undilated; lobes

obtuse, the 2 upper outermost in bud, slightly smaller than the 3 lower. *Stamens* 4, didynamous, included; filaments filiform; anthers confluent, 1-locular. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style short, filiform; stigma slightly 2-lobed. *Fruit* an ovoid-oblong, septicidal capsule with 2 bifid valves. *Seeds* many; testa pitted.

1409. SUTERA GLANDULOSA Roth; F. B. I. vi. 258.

Behar.

An annual weed.

647. Mimulus Linn.

Erect, prostrate, or creeping herbs; *leaves* opposite. *Flowers* solitary, axillary. *Sepals* 5, connate in a tubular, 5-angled calyx; lobes short. *Petals* 5, connate in a 2-lipped corolla, upper lip 2-lobed, outmost in bud, erect or reflexed, lower 3-lobed, spreading; throat with usually a swollen, 2-lobed palate. *Stamens* 4, didynamous; anthers with divergent, subconfluent cells. *Carpels* connate in a 2-celled ovary ovules many in each cell; style filiform; stigma 2-lamellate. *Fruit* a compressed, loculicidal capsule, the valves separating from the placentiferous dissepiment. *Seeds* many, oblong, minute.

1410. MIMULUS GRACILIS R. Br.; F. B. I. iv. 259.

Behar; N. Bengal.

A stoutish herb, branching at the base, 6–12 in. high.

648. Mazus Lour.

Small herbs, often with runners; *leaves* rosulate or opposite below, opposite or alternate above. *Flowers* in terminal, subsecund racemes; bracts minute or 0; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; lobes leafy. *Petals* 5, connate in a shortly tubular, 2-lipped corolla; upper lip erect, ovate, 2-fid; lower much larger, spreading, 3-fid; throat with 2-lobed palate. *Stamens* 4, didynamous; anthers with distinct, close-lying, divaricate cells. *Carpels* connate in a 2-celled ovary; ovules in each cell many; style short; stigma 2-lamellate. *Fruit* a small globose or compressed, obtuse, loculicidal capsule, with entire valves, included in the calyx. *Seeds* many, very minute, ovoid.

1411. MAZUS RUGOSUS Lour.; F. B. I. iv. 259. *Columnea tomentosa* F. I. iii. 98.

Tirhut; N. Bengal; C. Bengal; Behar; Chota Nagpur.

A small annual, with tufted radical leaves.

649. Lindenbergia Lehm.

Annual or perennial herbs, woody below; branches erect, straggling or ascending; *leaves* opposite or the upper alternate, toothed. *Flowers* yellow, axillary, or passing into terminal spikes or racemes; bracts small, leafy; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; lobes leafy. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper lip outermost, short, wide, notched or 2-fid; lower larger, 3-lobed, spreading; throat and lip with a 2-plicate palate. *Stamens* 4, didynamous, included; anthers with discrete, stipitate cells, all fertile. *Carpels* connate in a 2-celled ovary; ovules in each cell many; style filiform, clavate upwards; stigma capitate. *Fruit* a 2-grooved, loculicidal capsule, the entire valves separating from the placentiferous dissepiment. *Seeds* many, minute.

Calyx longer than the bracts, with ovate-lanceolate, acuminate lobes; leaves ovate-lanceolate; apex acute; margins dentate; petiole long ..... *philippinensis.*

Calyx shorter than the bracts, with obtuse lobes; leaves ovate; apex obtuse; margins crenate-serrate:—

Leaves usually very shortly petioled, always under ·75, generally only ·5 in. long; flowers sessile ..... *polyantha.*

Leaves long-petioled, blade 1 in. or more long; flowers pedicelled ..... *urticifolia.*

1412. LINDENBERGIA PHILIPPINENSIS Benth.; F. B. I. iv. 261.
Chittagong.
A tall, erect herb, 2–3 feet high.

1413. LINDENBERGIA POLYANTHA Royle; F. B. I. iv. 262.
Behar; E. Bengal.
A much-branched herb, on walls and banks.

1414. LINDENBERGIA URTICIFOLIA Lehm.; F. B. I. iv. 262; E. D. L. 371. *Stemodia ruderalis* F. I. iii. 94.
In all the provinces.
An annual herb with brittle stem and branches, on walls and banks everywhere.

650. Adenosma R. Br.

Annual, villous or glandular, aromatic herbs; *leaves* opposite, rugose, crenulate. *Flowers* axillary or in leafy spikes, racemes or heads; bracteoles conspicuous or 0. *Sepals* 5, connate in a deeply lobed calyx; lobes imbricate, the uppermost largest, sometimes all

enlarging in fruit. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper lip erect, entire or notched, outmost in bud; lower spreading, 3-lobed; throat not plicate. *Stamens* 4, didynamous, included; anthers with discrete, stipitate cells, one cell of each anterior stamen or of all 4 stamens empty. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style filiform below, winged upwards under the entire or 2-lamellate stigma. *Fruit* an ovoid, ellipsoid or lanceolate, 2-grooved, 4-valved capsule, opening both loculicidally and septicidally. *Seeds* many, minute, reticulate.

1415. Adenosma capitatum Benth.; F. B. I. iv. 264. *Erinus bilabiatus* F. I. iii. 92.

Chota Nagpur; N. Bengal; E. Bengal; Chittagong.

A stoutish, annual herb, a weed of rice-fields.

651. Stemodia Linn.

Herbs, sometimes woody below, glandular-pubescent, often aromatic; *leaves* opposite or sometimes whorled. *Flowers* solitary, axillary, passing into terminal leafy spikes or close racemes; bracts leafy; bracteoles usually present. *Sepals* 5, connate in a deeply lobed calyx; lobes narrow, imbricate, equal, or the upper somewhat larger. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper outer lip suberect, entire or notched; lower spreading, 3-lobed; throat not plicate. *Stamens* 4, didynamous, included; anthers with discrete, stipitate cells all fertile. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style filiform, dilated but not winged above; stigma usually 2-lobed. *Fruit* a globose or ovoid capsule; valves 2, bifid, dehiscing septicidally, or valves 4, dehiscing both septicidally and loculicidally. *Seeds* many, small, striate, and usually reticulate.

1416. Stemodia viscosa Roxb.; F. I. iii. 94; F. B. I. iv. 265; E. D. S. 2792.

W. Behar.

An erect, viscid, aromatic herb, branching at the base. *Beng.* Nukachuni.

652. Limnophila R. Br.

Herbs, often paludine or aquatic, glabrous or pubescent, aromatic; *leaves* with transparent dots, opposite or whorled, toothed or cut, or where submerged often multifid. *Flowers*

axillary, solitary, sessile or pedicelled, passing into terminal spikes or racemes; bracts leafy; bracteoles small or 0. *Sepals* connate in a 5-partite calyx; lobes narrow, imbricate, equal or the upper largest. *Petals* 5, connate in a 2-labiate corolla; tube cylindric; upper lip outermost, suberect, entire or 2-fid; lower spreading, 3-lobed; throat not plicate. *Stamens* 4, didynamous; included; anthers with usually discrete and stipitate, less often contiguous cells. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style slender, deflexed at the tip; stigma 2-lamellate. *Fruit* an ovoid or oblong capsule, opening both septicidally and loculicidally, the placentiferous dissepiment separating with the valves. *Seeds* many, small, truncate, angular, reticulate.

*Leaves with nerves pinnate, arching from the midrib; no whorls of pinnatifid or multifid leaves:—[p. 763]

Calyx-lobes not striate in fruit:—

Leaves opposite, petioled, elliptic or ovate, obtuse or subacute, crenulate; nerves prominent; flowers sessile, axillary in peduncled heads, rarely solitary; calyx-lobes lanceolate, finely acuminate *Roxburghii.*

Leaves 4-nately whorled, half-stem-clasping, linear, serrulate; nerves obscure; flowers very many, shortly pedicelled, small, in panicled, terminal corymbs; calyx-lobes subulate.....*polyantha.*

Calyx-lobes striate in fruit:—

Leaves petioled, elliptic, ovate or oblong-lanceolate, subacute, all opposite; flowers sessile or, rarely, pedicelled; calyx hirsute *diffusa.*

Leaves sessile or rarely (*L. conferta* sometimes) sub-petioled:—

Flowers sessile; leaves all opposite; calyx glabrous or nearly so:—

Leaves oblong or elliptic-oblong, obtuse, crenate-serrate, sessile or sometimes sub-petioled; erect or diffuse herbs; flowers ·25 in. long; calyx-lobes lanceolate-acuminate.....*conferta.*

Leaves linear, entire or subserrate, always sessile; small herbs; flowers ·12 in. long; calyx-lobes subulate .....*micrantha.*

Flowers pedicelled:—

Leaves elliptic-oblong, subcrenate, obtuse, always opposite; flowers always axillary, solitary; calyx hirsute; lobes subulate; pedicels shorter than calyx.....*pulcherrima.*

Leaves linear-oblong, serrulate, subacute, often 3–4-nately whorled; flowers in axillary or terminal, many-flowered racemes at end of stems, rarely solitary; calyx-lobes lanceolate-acuminate; pedicels usually longer than calyx:—

Calyx glabrate; capsule oblong .....*gratissima.*
Calyx hirsute, rarely glabrous; capsule suborbicular...*hirsuta.*

*Leaves with 3–5 nerves running from the base to the apex, or lower leaves whorled, pinnatifid or multifid; fruiting calyx not striate:— [p. 762]

Flowers sessile or very shortly pedicelled:—
Stem stout, hirsute; leaves all 3–6-nately whorled, sessile, the uppermost elliptic or linear-oblong, 3–5-nerved, the lowermost pinnatifid; flowers crowded in erect, close, leafy spikes; calyx-lobes subulate .....*cana.*
Stem slender; leaves either all 3–6-nately whorled, lobulate or pinnate, or the 2 uppermost only opposite, sessile, not divided; flowers usually axillary, solitary; calyx in fruit hemispheric; lobes broad:—
Stem usually hirsute, rarely glabrate; leaves usually all 3–6-nately whorled, lobulate or pinnate, very rarely the 2 uppermost opposite, entire; flowers all axillary, solitary; calyx-lobes ovate, long-acuminate .....*sessiliflora.*
Stem always glabrous; leaves the 2 uppermost usually opposite, crenulate, the next below, 4–6-nately whorled, pinnate, the lowest submerged, multifid, with capillary segments; occasionally the uppermost flowers in a leafy spike; calyx-lobes ovate, shortly acuminate .....*heterophylla.*

Flowers pedicelled; pedicels as long as or longer than the calyx; calyx-lobes ovate, acuminate:—
Stems erect, stout, 1–2 feet high; flowers large, ·5–·6 in. long, usually in erect, terminal racemes; upper leaves always sessile, ovate or linear-oblong, serrate, entire or 3-nate, lower multifid with capillary segments.....*racemosa.*
Stems, if erect, stout, only 4–8 in. high, often elongate, diffusely branching or suberect, slender; flowers ·3 in. long, axillary, solitary, very rarely subracemose; upper leaves rarely entire and opposite, usually leaves all whorled, pinnatifid, or sometimes the upper pinnatifid, the lower multifid with capillary segments *gratioloides.*

1417. LIMNOPHILA ROXBURGHII G. Don.; F. B. I. iv. 265.
Capraria gratissima F. I. iii. 92.
Chota Nagpur; N. Bengal.
An aromatic annual.

1418. LIMNOPHILA POLYANTHA Kurz; F. B. I iv. 268.
N. Bengal, Duars.
A graceful, slender annual.

1419. LIMNOPHILA DIFFUSA Benth.; F. B. I. iv. 266.
In all the provinces.
An erect or procumbent weed of damp places.

1420. LIMNOPHILA CONFERTA Benth.; F. B. I. iv. 266.
In all the provinces.
A very variable erect or procumbent weed of damp places.

1421. LIMNOPHILA MICRANTHA Benth.; F. B. I. iv. 267.
N. Bengal; Chittagong.
A dwarf, stout, branching weed of marshy places.

1422. LIMNOPHILA PULCHERRIMA Hook. f.; F. B. I. iv. 267.
Tippera.
A small, stout, erect weed of damp places.

1423. LIMNOPHILA GRATISSIMA Bl.; F. B. I. iv. 268.
Chota Nagpur; N. Bengal.
A stout, erect weed of damp places, simple or only branching upwards.

1424. LIMNOPHILA HIRSUTA Benth.; F. B. I. iv. 268.
N. Bengal; Chittagong; Chota Nagpur.
A stout, erect weed of damp places.

1425. LIMNOPHILA CANA Griff.; F. B. I. iv. 269.
E. Bengal.
A herb of marshes with submerged, creeping stems, sending up erect, simple branches.

1426. LIMNOPHILA SESSILIFLORA Bl.; F. B. I. iv. 270.
N. Bengal; E. Bengal.
A herb in swamps and rice-fields, submerged below.

1427. LIMNOPHILA HETEROPHYLLA Benth.; F. B. I. iv. 270. *Columnea heterophylla* F. I. iii. 97.
In all the provinces.
A weed of swamps and rice-fields, submerged below.

1428. LIMNOPHILA RACEMOSA Benth.; F. B. I. iv. 271. *Cyrilla aquatica* F. I. iii. 115.
N. Bengal; C. Bengal.
A weed of swamps and rice-fields, submerged below.

1429. LIMNOPHILA GRATIOLOIDES R. Br.; F. B. I. iv. 271. *Columnea balsamica* F. I. iii. 97.
In all the provinces.
A weed of swamps, rice-fields, and damp spots, usually submerged below. *Beng.* Karpur.

653. Herpestis Gaertn. f.

Glabrous herbs; *leaves* often punctate, entire or toothed, or submerged and multifid. *Flowers* axillary or racemose; bracteoles small or 0. *Sepals* connate below in a 5-partite calyx; lobes imbricate, the upper largest, the two lateral innermost often very narrow. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper lip outermost, spreading, emarginate or 2-lobed; lower 3-lobed. *Stamens* 4, didynamous, included; anthers sometimes approximate in pairs; cells contiguous, parallel, distinct. *Carpels* connate in a 2-celled ovary; ovules in each cell many; style dilated at top; stigma entire or 2-lobed. *Fruit* a globose or ovoid, 2-grooved capsule; valves 2 or 4, separating septicidally and loculicidally from the placentiferous dissepiment. *Seeds* many, very minute.

Leaves ovate or obovate; flowers long-peduncled; capsule ovoid:—
Creeping, leaves obovate-oblong or spathulate, entire, obtuse; corolla tinged with purple ..... *Monnieria.*
Erect; leaves ovate, crenate-serrate, subacute; corolla yellow *chamædroides.*
Leaves linear-lanceolate, entire or subserrate; flowers sessile; capsule globose ..... *Hamiltoniana.*

1430. Herpestis Monnieria H. B. & K.; F. B. I. iv. 272; E. D. H. 149. *Gratiola Monnieria* F. I. i. 141.
In all the provinces.
A glabrous, succulent marsh weed. *Uriya* Urisha-parni; *Beng.* Adha-birni; *Hind.* Safed chamni.

1431. Herpestis chamædroides Linn.
C. Bengal.
A small weed of garden paths, of recent introduction, but now thoroughly naturalised. Native of America.

1432. Herpestis Hamiltoniana Benth.; F. B. I. iv. 272.
Chota Nagpur; Behar; E. Bengal.
An erect, glabrous weed of wet places.

654. Dopatrium Ham.

Annual, slender, glabrous marsh herbs; *leaves* few, opposite, lower pairs small, upper remote, minute. *Flowers* small, solitary, axillary, violet; pedicels short or slender; bracteoles 0. *Sepals* connate in a small, 5-partite calyx; lobes narrow, imbricate.

Petals 5, connate in a 2-lipped corolla; tube slender below, dilated upwards; upper outer lip short, 2-fid; lower lip broad, 3-lobed, spreading. *Stamens* 2, upper only perfect; anthers with parallel, distinct, equal cells; lower pair of stamens represented by 2 staminodes. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style short; stigma 2-lamellate. *Fruit* a small, globose or oblong capsule, opening loculicidally, the valves carrying away the placentas. *Seeds* numerous, very small, tubercled.

1433. DOPATRIUM JUNCEUM Ham.; F. B. I. iv. 274. *Gratiola juncea* F. I. i. 142.

In all the provinces.

A weed of rice-fields and swamps.

655. Torenia Linn.

Herbs, glabrous or pubescent; *leaves* opposite, entire, crenate or serrate. *Flowers* often showy, axillary, or in terminal or pseudo-axillary racemes or umbels; bracteoles 0. *Sepals* connate in a 2-lipped or 3–5-toothed, 3–5-winged or -folded or -keeled calyx. *Petals* 5, connate in a 2-lipped corolla; tube cylindric, somewhat curved, dilated upwards; upper outer lip erect, concave or pinched, notched or 2-fid; lower larger, spreading, 3-lobed. *Stamens* 4, didynamous, 2 upper included, adnate to corolla-tube, 2 lower adnate to throat, appendaged or not at base and connivent under the upper lip; anthers in contact or connate in pairs; cells often confluent. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a linear or oblong, included, septicidal capsule; valves separating from the placentiferous dissepiment. *Seeds* many, rugose or cancellate.

Flowers axillary, solitary or 2-nate, or subumbellate at the ends of the branches:—

Longer pair of filaments toothed; calyx keeled only ..... *vagilla*

Longer pair of filaments not toothed; calyx wide-winged:—

Wings of calyx decurrent on the pedicel ..... *edentula*

Wings of calyx not decurrent on the pedicel ..... *cordifolia*

Flowers axillary and racemed at the ends of the branches, longer pair of filaments not toothed; calyx wide-winged ..... *Fournieri*

1434. TORENIA VAGANS Roxb.; F. I. iii. 96; F. B. I. iv. 277.

Chittagong.

An erect or decumbent, almost glabrous herb.

1435. TORENIA EDENTULA Griff. *T. peduncularis* F. B. I. iv. 276.
Chota Nagpur, rare.
An erect or decumbent, sparsely hairy herb.

1436. TORENIA CORDIFOLIA Roxb.; F. I. iii. 95; F. B. I. iv. 276.
Chota Nagpur, common on the higher hills.
An erect, nearly glabrous annual herb.

1437. TORENIA FOURNIERI Linden.
In gardens.
An erect, nearly glabrous annual, with showy flowers, which springs up spontaneously in garden-beds and waste places. Native of Cochin China.

656. Vandellia Linn.

Herbs, glabrous or pubescent; *leaves* opposite, often toothed, usually penninerved, rarely (*V. pyxidaria*) 3–5-nerved from base. *Flowers* small, axillary or racemose; bracteoles 0. *Sepals* 5, almost free to the base or connate in a campanulate calyx, without wings or keels. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper lip outermost, erect, concave, notched or 2-fid; lower wider, 3-lobed, spreading. *Stamens* 4, didynamous, 2 posterior adnate to corolla-tube, usually included, 2 anterior adnate to corolla-throat, with arched filaments appendaged near base; anthers in contact or connate in pairs under the upper lip; cells divaricate. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style slender; stigma 2-lamellate. *Fruit* a globose or ovoid, or long cylindric, septicidal capsule; valves separating from the placentiferous dissepiment. *Seeds* many, rugose.

*Leaves pinnately veined:—[p. 768]
†Capsule not or slightly longer than the calyx-lobes, ovate or oblong-obtuse, or orbicular:—[p. 768]
‡Calyx-segments in flower not divided beyond the middle; diffusely branching herbs:—[p. 768]
Pedicels axillary and subracemose at ends of branches, strict; leaves glabrous or sparsely hairy; calyx-lobes in fruit short, slightly exceeding the ovate-oblong capsule .....*crustacea*.
Pedicels axillary and subumbelled at ends of branches, spreading; leaves softly hairy on both sides; calyx-lobes in fruit long, sometimes free, much exceeding the oblong capsule .....*stemonoides*.

‡Calyx-segments in flower partite to the base or nearly so, lanceolate; capsule orbicular :—[p. 767]

Erect, succulent; leaves obtuse, ovate or oblong, entire or sinuate; flowers racemed :—

Glabrous; sepals shorter than capsule ..... *multiflora.*

Sparsely hirsute; sepals rather longer than capsule ..... *hirsuta.*

Diffuse, much-branched, slender, more or less clothed with spreading white hairs; leaves ovate-cordate, serrate or entire; sepals equalling the capsule ..... *scabra.*

†Capsule much longer than the calyx-lobes, ellipsoid or linear-lanceolate, acute :—[p. 767]

Calyx-segments not free to the base, more than half as long as ellipsoid capsule; erect, glabrous or puberulous herbs; leaves sessile, rounded or broadly ovate-cordate; flowers all sessile or a few shortly pedicelled ..... *sessiliflora.*

Calyx-segments free to the base, hardly half as long as linear-lanceolate capsule; diffuse, glabrous herbs; flowers long-pedicelled :—

Leaves short-petioled, ovate, obtuse or subacute, obscurely crenate; flowers axillary and in terminal racemes... *pedunculata.*

Leaves sessile, linear or linear-lanceolate, obtuse, obscurely toothed; pedicels all axillary ..... *angustifolia.*

*Leaves with 3–5 parallel nerves (as in *Ilysanthes*), quite glabrous; stems erect; sepals free to the base, lanceolate or linear, rather shorter than the ovoid-orbicular capsule [p. 767] ..... *pyxidaria.*

1438. VANDELLIA CRUSTACEA Benth.; F. B. I. iv. 279. *Torenia varians* F. I. iii. 96.

In all the provinces.

A small, branching herb.

1439. VANDELLIA STEMONOIDES Miq. *V. Hookeri* F. B. I. iv. 280.

N. Bengal; Chota Nagpur.

A small, branching herb.

1440. VANDELLIA MULTIFLORA G. Don; F. B. I. iv. 280. *Torenia multiflora* F. I. iii. 96.

Behar; C. Bengal.

A small, erect herb.

1441. VANDELLIA HIRSUTA Benth.; F. B. I. iv. 280.

N. Bengal; E. Bengal.

A small, erect herb.

1442. VANDELLIA SCABRA Benth.; F. B. I. iv. 281. *Columnea minuta* F. I. iii. 98.

N. Bengal; E. Bengal; Tippera.
A small, diffuse weed of rice-fields.

1443. VANDELLIA SESSILIFLORA Benth.; F. B. I. iv. 282.
Chota Nagpur.
A small, erect, simple or branching herb.

1444. VANDELLIA PEDUNCULATA Benth.; F. B. I. iv. 282. *Torenia diffusa* F. I. iii. 95.
N. Bengal; E. Bengal; Tippera.
A diffuse, herbaceous weed of rice-fields.

1445. VANDELLIA ANGUSTIFOLIA Benth.; F. B. I. iv. 282.
Chota Nagpur.
A diffuse herb.

1446. VANDELLIA PYXIDARIA Maxim. *V. erecta* F. B. I. iv. 281. *Gratiola integrifolia* F. I. i. 137.
In all the provinces.
A small, erect, glabrous herb.

657. Ilysanthes Raf.

Annual, glabrous, slender marsh herbs; *leaves* opposite, entire or toothed, 1–5-nerved from base. *Flowers* small, axillary, or passing into terminal racemes; pedicels in fruit often reflexed; bracteoles 0. *Sepals* 5, connate in a deeply lobed calyx; segments narrow. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper outer lip erect, concave, notched; lower larger, 3-lobed, spreading. *Stamens* only 2, upper, subincluded, perfect, adnate to corolla-tube; anthers connivent; cells divaricate, lower pair represented by 2 bilobed staminodes adnate to corolla-throat, one lobe glandular the other glabrous. *Carpels* connate in a 2-celled ovary; ovules in each cell many; style slender; stigma 2-lamellate. *Fruit* a septicidal capsule; valves entire, separating from the placentiferous septum. *Seeds* many, rugose.

1447. ILYSANTHES PARVIFLORA Benth.; F. B. I. iv. 283. *Gratiola parviflora* F. I. i. 140.
In all the provinces.
A small, erect herb.

658. Bonnaya Link & Otto.

Annual, glabrous herbs; *leaves* opposite, entire or serrate, obscurely penninerved. *Flowers* solitary, axillary, passing often into terminal racemes; bracteoles 0. *Sepals* connate in a 5-partite

calyx; segments narrow, hardly imbricate. *Petals* 5, connate in a 2-lipped corolla; tube cylindric; upper outer lip erect, concave, 2-fid; lower larger, 3-lobed, spreading. *Stamens* 2, upper only perfect, subincluded; filaments filiform; anthers connivent; cells divaricate, 2 lower represented by 2 obtuse, glandular, entire staminodes. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style slender; stigma 2-lamellate. *Fruit* a narrow, exserted, septicidal capsule; valves separating from the placentiferous dissepiment. *Seeds* many, rugose.

Leaves obovate-oblong, oblong, or oblong-lanceolate; pedicels spreading or suberect:—

Leaves sharply, closely, deeply serrate, broad:—

Erect, diffusely branched; leaves sessile, obtuse or acute; flowers ·25 in. long.....*brachiata*.

Prostrate, creeping; leaves petioled, obtuse; flowers ·75 in. long *reptans*.

Leaves distantly, shallowly serrate, narrow, acute; stem decumbent or creeping:—

Branches long, slender; flowers chiefly racemose:—

Leaves narrow-oblong; flowers ·25 in. long .....*veronicæfolia*.

Leaves lanceolate-oblong; flowers ·35 in. long *veronicæfolia* var. *verbenæfolia*.

Branches short, stout; leaves narrow-obovate; flowers mostly axillary, ·25 in. long .....*veronicæfolia* var. *grandiflora*.

Leaves narrow, linear, sessile, nearly entire; stems erect, succulent, intricately branched; flowers ·15 in. long; pedicels reflexed ...*tenuifolia*.

1448. BONNAYA BRACHIATA Link & Otto; F. B. I. iv. 284. *Gratiola serrata* F. I. i. 139.

Behar; Chota Nagpur; C. Bengal; E. Bengal.

A small, stiff herb. *Beng.* Bhumi-nim.

1449. BONNAYA REPTANS Spreng.; F. B. I. iv. 284. *Gratiola reptans* F. I. i. 140.

E. Bengal.

A prostrate, creeping herb.

1450. BONNAYA VERONICÆFOLIA Spreng.; F. B. I. iv. 285. *Gratiola veronicæfolia* F. I. i. 138.

In all the provinces.

A decumbent herb.

1450/2. Var. VERBENÆFOLIA . B. I. iv. 285. *Gratiola racemosa* F. I. i. 138.

E. Bengal; Chittagong.
A decumbent herb.

1450/3. Var. GRANDIFLORA; F. B. I. iv. 285. *Gratiola grandiflora* F. I. i. 136.
A small, suberect herb.

1451. BONNAYA TENUIFOLIA Spreng.; F. B. I. iv. 286.
Behar; C. Bengal.
A small, tufted weed of wet places.

659. Curanga Juss.

Diffuse or creeping herbs; *leaves* opposite, ovate, crenate. *Flowers* in short, terminal or pseudo-axillary racemes; bracts small, leafy; bracteoles 0. *Sepals* connate in a deeply 4-partite calyx, the upper and lower lobes very large, the lateral small, narrow. *Petals* 5, connate in a 2-lipped corolla; tube short; upper outer lip wide, arched, notched; lower lip longer, 3-fid, spreading. *Stamens* 2, upper only perfect, included, adnate to corolla-tube; anthers connate; cells divaricate, 2 lower represented by 2 clavate staminodes on corolla-throat. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style slender; stigmas 2-lamellate. *Fruit* an orbicular, septicidal capsule, enclosed in the accrescent calyx-lobes; valves separating from the wide placentiferous dissepiment. *Seeds* many, rugose.

1452. CURANGA AMARA Juss.; F. B. I. iv. 275. *Gratiola amara* F. I. i. 135,
Chittagong.
An annual, glabrous, straggling herb.

660. Microcarpæa R. Br.

A small, slender, diffuse or creeping, nearly glabrous herb; *leaves* opposite, sessile, oblong, obtuse, entire. *Flowers* minute, axillary, solitary, sessile; bracteoles 0. *Sepals* connate in a 5-fid, 5-angled, tubular calyx. *Petals* 5, connate in a shortly tubular corolla; throat wide; lobes broad, spreading, the 2 upper partially connate. *Stamens* 2, perfect; filaments filiform; anthers confluent, 1-celled; staminodes 0. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style filiform; stigma recurved, capitate. *Fruit* a small, ovoid, 2-grooved, loculicidal capsule, included in the calyx; valves separating from the placentiferous dissepiment. *Seeds* ovoid, rather few.

1453. Microcarpæa muscosa R. Br.; F. B. I. iv. 287.
N. Bengal.
A minute, tufted herb.

661. Glossostigma Arn.

Minute, glabrous, creeping herbs; *leaves* opposite or fascicled, linear or spathulate, entire. *Flowers* minute, axillary, solitary; bracteoles 0. *Sepals* connate in an obtusely 3–4-lobed, campanulate calyx. *Petals* 5, connate in a shortly tubular corolla; lobes subequal, spreading. *Stamens* 2 (in our only species) or 4; filaments filiform; anthers with diverging cells, confluent at their apices. *Carpels* connate in a perfectly or imperfectly 2-celled ovary; ovules in each cell many; style short; stigma dilated, spathulate, recurved. *Fruit* a small, loculicidal capsule, enclosed in the calyx; valves separating from a columnar, placentiferous axis. *Seeds* small, ovoid.

1454. Glossostigma spathulatum Arn.; F. B. I. iv. 288.
Behar.
A minute, tufted herb.

662. Scoparia Linn.

Herbs or undershrubs, with twiggy branches; *leaves* opposite or whorled, glabrous or pubescent, entire or toothed, punctate. *Flowers* small, white or yellow, axillary, solitary or 2-nate; bracteoles 0. *Sepals* connate in a 4–5-partite, small calyx; lobes imbricate. *Petals* 4, connate in a rotate corolla; throat densely bearded; lobes obtuse, subequal. *Stamens* 4, subequal; filaments filiform; anthers subsagittate; cells distinct, parallel or diverging. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style subclavate; stigma notched or truncate. *Fruit* a small, globose or ovoid, septicidal capsule; valves entire, membranous, margins inflexed, separating from the placentiferous dissepiment. *Seeds* many, obovoid, angled, scrobiculate.

1455. Scoparia dulcis Linn.; F. B. I. iv. 289.
In every province.
A rigid perennial.

663. Veronica Linn.

Herbs or shrubs, rarely trees; *leaves* opposite, rarely cauline or all alternate. *Flowers* solitary, axillary or in terminal or axillary

racemes; bracts usually conspicuous; bracteoles 0. *Sepals* connate in a 4–5-partite calyx, lower segments connate, uppermost lobe, if present, small. *Petals* 4–5, connate in a rotate or shortly salver-shaped corolla; lobes spreading, the lateral or one of them outermost in bud, upper and lower lobes usually narrowest. *Stamens* 2, adnate to corolla-tube by the sides of the upper lobe, exserted; anther-cells parallel or somewhat divergent, obtuse, their apices confluent. *Carpels* connate in a 2-celled ovary; ovules in each cell many or few, rarely two only; style simple; stigma subcapitate. *Fruit* a compressed or turgid, 2-grooved capsule, loculicidal, or partially septifragal or septical in dehiscence. *Seeds* many or few, ovate or globose, plano-concave or cymbiform, rugulose or smooth, occasionally winged.

Erect, succulent, usually glabrous; capsule rather compressed, laterally turgid, orbicular or broadly ovate; seeds biconvex; leaves oblong or linear-oblong, finely serrate or entire:—

Rather tall, 6–18 in. high; stems rather thick; leaves all sessile or the lowest only petioled, usually cordate at the base.....*Anagallis.*

Dwarf, 2–3 in. high; stems slender; leaves all petioled or only the upper sessile, amplexicaul .....*Anagallis* var. *punctata.*

Prostrate, not succulent, puberulous; capsule didymous; lobes globose, turgid; seeds orbicular, cupshaped; leaves petioled, ovate, cordate or orbicular, coarsely crenate-serrate .....*agrestis.*

1456. VERONICA ANAGALLIS Linn.; F. B. I. iv. 293.

N. Bengal; E. Bengal.

A succulent perennial, with stems creeping below.

1456/2. Var. PUNCTATA; F. B. I. iv. 293.

N. Bengal.

A dwarf perennial.

1457. VERONICA AGRESTIS Linn.; F. B. I. iv. 294.

C. Bengal.

An annual weed, occasionally met with in gardens in the cold weather.

664. Alectra Thunb.

Erect, rigid, usually scabrid herbs, black when dry; *leaves* opposite, or the upper or all alternate, toothed, sometimes reduced to scales. *Flowers* yellow or with brown streaks, in terminal spikes or racemes, the upper crowded, solitary in the axils of small leafy bracts; bracteoles 2. *Sepals* 5, connate in a campanu-

late, subfoliaceous calyx; lobes of limb valvate or open in bud. *Petals* 5, connate in a widish corolla; tube subglobose, campanulate or shortly funnel-shaped; limb oblique; lobes spreading, the lowest outermost. *Stamens* 4, didynamous, adnate low in the corolla-tube; anthers in contact by pairs, naked or bearded; cells parallel, bases mucronate. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style long, inflexed; stigma elongated, linguiform. *Fruit* a subglobose, loculicidal capsule; valves entire or 2-fid. *Seeds* very many, minute, linear; testa very lax, reticulate.

Leaves ovate-lanceolate or lanceolate, green; stem scaberulous; bracts longer than the sessile flowers.....*indica*.
Leaves reduced to brown scales; stem not scaberulous; bracts minute; flowers pedicelled.....*Thomsoni*.

1458. ALECTRA INDICA Benth.; F. B. I. iv. 297.
Chota Nagpur.
A herb, 6–18 in. high.

1459. ALECTRA THOMSONI Hook. f.; F. B. I. iv. 297.
Chota Nagpur.
A herb, parasitic on roots of *Strobilanthes auriculatus*; 6–18 in. high.

665. Buchnera Linn.

Annual, rigid herbs, black when dry; *leaves*, lower broad, opposite, upper narrow, alternate. *Flowers* sessile, axillary, or in bracteate spikes, 2-bracteolate. *Sepals* connate in a 5-toothed and 10-nerved, sometimes 5-ribbed, tubular calyx. *Petals* 5, connate in a slender, tubular corolla; lobes flat, subequal, spreading, the 2 uppermost inmost in bud. *Stamens* 4, didynamous, included; anthers 1-celled, vertical, dorsifixed, bases obtuse; connective sometimes mucronate. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style thickened or clavate upward; stigma entire or notched. *Fruit* an oblong, loculicidal capsule; valves entire, coriaceous, septiferous, separating from the placentas. *Seeds* very many, obovoid or oblong, reticulated.

1460. BUCHNERA HISPIDA Ham.; F. B. I. iv. 298.
Chota Nagpur.
A herb, 6–18 in. high.

666. Striga Lour.

Herbs, usually scabrid, discoloured or black when dry; *leaves*, lower opposite, upper alternate, linear, entire, rarely toothed, sometimes reduced to scales. *Flowers* axillary, or the upper in bracteate spikes; bracteoles usually 2. *Sepals* connate in a tubular, 5- or 10- or 15-ribbed, 5-toothed or 5-fid calyx. *Petals* 5, connate in a 2-lipped corolla; tube slender, abruptly incurved at or above the middle; limb spreading; upper lip inner in bud, usually short, notched or 2-fid; lower 3-fid. *Stamens* 4, didynamous, included; anthers 1-celled, vertical, dorsifixed; bases obtuse; connective sometimes mucronate. *Carpels* connate in a 2-celled ovary; ovules many in each cell; style thickened upward; stigma entire. *Fruit* an oblong or subglobose, loculicidal capsule; valves entire, firm, septiferous, separating from the placentas. *Seeds* very many, ovoid or oblong, reticulated.

Calyx 5-ribbed ..... *densiflora*
Calyx 10-ribbed ..... *lutea.*
Calyx 15-ribbed ..... *euphrasioides.*

1461. Striga densiflora Benth.; F. B. I. iv. 299.
N. Bengal.
A herb, 6–18 in. high; flowers white.

1462. Striga lutea Lour.; F. B. I. iv. 299. *Buchnera asiatica* F. I. iii. 31.
Chota Nagpur; N. Bengal; E. Bengal.
A herb, 6–12 in. high; flowers white, yellow, scarlet or purple.

1463. Striga euphrasioides Benth.; F. B. I. iv. 299. *Buchnera euphrasioides* F. I. iii. 32.
Chota Nagpur; Behar; N. Bengal; E. Bengal.
A slender herb, 6–24 in. high; flowers white.

667. Centranthera R. Br.

Annual, rigid, scabrid herbs; *leaves* opposite or the upper alternate, oblong or linear, obtuse, entire or toothed. *Flowers* axillary or in bracteate spikes or racemes; bracteoles 2. *Sepals* connate in a compressed, spathaceous calyx, split on one side, acute or acuminate, entire or shortly 3–5-lobed on the other. *Petals* 5, connate in a long, tubular, incurved corolla; limb oblique; lobes

subequal, spreading, the 2 uppermost inmost in bud. *Stamens* 4, didynamous, included; anthers in contact by pairs; cells transverse, bases spurred or mucronate, often one cell sterile. *Carpels* connate in a 2-celled ovary; ovules in each cell numerous; style simple, dilated above; stigma linguiform, acute. *Fruit* an ovoid or subglobose, loculicidal capsule; valves entire, carrying away the placentas. *Seeds* very many, oblong-cuneate; testa lax, reticulated.

Erect, hispid, hoary; leaves oblong or linear-oblong; corolla purplish *hispida.*
Diffuse, usually glabrous; leaves linear; corolla yellow .....*humifusa.*

1464. CENTRANTHERA HISPIDA R. Br.; F. B. I. iv. 301. *Digitalis stricta* F. I. iii. 99.
Behar; Tirhut; N. Bengal; E. Bengal.
A rigid annual, 1–2 feet high.

1465. CENTRANTHERA HUMIFUSA Wall.; F. B. I. iv. 301.
Chota Nagpur; Behar; N. Bengal.
A diffuse annual, with slender, spreading branches.

668. Sopubia Ham.

Erect herbs; *leaves* opposite or the upper alternate, narrow, usually laciniate. *Flowers* spicate or racemose; bracts leafy; bracteoles 2. *Sepals* 5, connate in a campanulate calyx; lobes narrow, valvate. *Petals* 5, connate in a funnel-shaped corolla; tube short, rarely exserted; throat dilated; lobes broad, spreading, subequal, the 2 upper inmost in bud. *Stamens* 4, didynamous; anthers of upper or both pairs of stamens in contact by pairs, one cell of each stamen perfect, ovoid, the other small, empty and stipitate. *Carpels* connate in a 2-celled ovary; ovules in each cell many; style simple; stigma thickened, linguiform, obtuse. *Fruit* an ovoid or oblong, loculicidal capsule; apex rounded or compressed, retuse or notched; valves entire or 2-fid, separating from the placentiferous dissepiment. *Seeds* numerous; testa rather lax.

Flowers subsessile; calyx-teeth subulate; capsule rounded at top; leaves much cut.....*delphinifolia.*
Flowers pedicelled; calyx-teeth lanceolate, acute; capsule compressed at top; leaves sparingly cut .....*stricta.*

1466. Sopubia delphinifolia G. Don; F. B. I. iv. 302; E. D. S. 2378. *Gerardia delphinifolia* F. I. iii. 99.
Chota Nagpur; Behar.
A tall, erect herb, 3–4 feet high.

1467. Sopubia stricta G. Don; F. B. I. iv. 302.
N. Bengal.
A rigid herb, 8–12 in. high.

Order XCIII. OROBANCHACEÆ.

Leafless, brown, annual, white or reddish root-parasites; stem usually simple, stout or slender, scaly. *Flowers* hermaphrodite, irregular, solitary or in spikes, or simple, rarely compound racemes; bracts large, scale-like; bracteoles 2 or 1, scale-like, or 0. *Sepals* 4 or 5, free or connate in a tubular, rarely a spathaceous calyx. *Petals* connate in a hypogynous, curved, usually distinctly 2-lipped, occasionally subequally 5-lobed corolla; upper lip often vaulted; throat usually with 2 villous folds. *Stamens* 4, didynamous, adnate to corolla-tube; anthers 1- or 2-celled, one cell often imperfect; cells frequently spurred at the base; dehiscence by slits or apical pores. *Disk* glandular or unilateral, or 0. *Carpels* 2, rarely 3, connate, 1-, rarely 2-celled; ovules many, rarely few, anatropous on 2, rarely 3 pairs of free or confluent parietal placentas, which sometimes meet, at least ultimately, in the centre of the ovary. *Fruit* a capsule, usually 1-celled, sometimes imperfectly or perfectly 2-celled; valves 2, rarely 3. *Seeds* many, rarely few, minute; testa pitted or tubercled, rarely lax and reticulated; albumen fleshy; embryo ovoid, often undivided.

Corolla-lobes all broad, subequal, spreading; anther-cells unequal ..... **Æginetia.**
Corolla 2-lipped; anther-cells equal ..... **Orobanche.**

669. Æginetia Linn.

Leafless herbs, with simple or branched, naked or scaly scapes or stems. *Flowers* few, large, solitary or corymbose; bracteoles 0. *Sepals* connate in a spathaceous calyx, split in front nearly to the base. *Petals* 5, connate in a broad, incurved, tubular, obscurely 2-lipped corolla; lobes broad, spreading, the 2 upper connate, outer in bud. *Stamens* 4, didynamous, included; anthers

with one perfect cell adnate to the filament, not spurred below, the other absent from the upper anthers, empty clavate and deflexed in the lower. *Carpels* connate in a 1-celled ovary; placentas large, 2- or more lobed, filling the cavity; ovules very many, covering the whole placental surface; style slender; stigma large, peltate. *Fruit* a partially 2-valved capsule. *Seeds* crowded, minute, pitted.

Scape slender, naked; corolla purple; placentas multifid.....*indica*.
Scape short, stout, bracteate; corolla-tube yellow; mouth blue; placentas 2-lamellate.....*pedunculata*.

1468. ÆGINETIA INDICA Roxb.; F. I. iii. 30; F. B. I. iv. 320.
Behar; Chota Nagpur.
A leafless herb.

1469. ÆGINETIA PEDUNCULATA Wall.; F. B. I. iv. 320. *Orobanche pedunculata* F. I. iii. 29.
N. Bengal.
A leafless herb, parasitic on grasses.

670. Orobanche Linn.

Scapigerous, scaly herbs; scapes or stems simple or branched, stout or slender; scales acute. *Flowers* in dense or lax or interrupted spikes or racemes; bracts scale-like; bracteoles 2 or 0. *Sepals* connate in an unequally 4-fid, antero-posteriorly 2-partite calyx; segments entire or 2-fid, with rarely a fifth lobe or segment. *Petals* 5, connate in a 2-lipped corolla; tube curved, dilated above, circumscissile below; upper lip erect, crenulate, notched or 2-fid, lower somewhat spreading, 3-lobed. *Stamens* 4, didynamous, included; anther-cells equal, parallel, bases usually mucronate. *Disk* 0 or glandular. *Carpels* connate in a 1-celled ovary; placentas 4, equidistant or paired; ovules very many; style simple; stigma funnel-shaped or peltate, or more or less laterally 2-lobed. *Fruit* a 2-valved capsule; valves often cohering with style. *Seeds* very many, small, globose.

Flowers without bracteoles; spikes dense-flowered.....*cernua*.
Flowers with 2 bracteoles; spikes usually lax-flowered .....*indica*.

1470. OROBANCHE CERNUA Lœfl.; F. B. I. iv. 325.
Behar, rare.

A stout herb, parasitic on Kohl Rabi and other *Brassicas*.

1471. Orobanche indica Ham.; F. I. iii. 27; F. B. I. iv. 326; E. D. O. 230.

In all the western and northern provinces.

A herb, parasitic on *Nicotiana*, *Papaver*, *Cannabis*, and the *Brassicas*. *Hind.* Sarso-banda, Bhatrea ghas; *Santal.* Turi sim.

Order XCIV. LENTIBULARIACEÆ.

Herbs, aquatic or palustrine. *Leaves* radical, rosulate, or, when submerged, capillary-multifid, sometimes obsolete. *Flowers* irregular, hermaphrodite, on 1–many-flowered, simple or branched scapes; bracts small, sometimes 0; bracteoles under calyx 2 or 0. *Sepals* connate in an inferior, 2–5-lobed calyx. *Petals* shortly connate in a 2-lipped, spurred corolla; upper lip usually the smaller, entire or emarginate; lower 3–5-lobed. *Stamens* 2, adnate to base of corolla, alternate with lobes of lower lip; filaments wide-curved; anther-cells ovate, transversely confluent; dehiscence longitudinal. *Carpels* 2, connate in a superior, globose, 1-celled ovary; ovules very many, on a free, basal placenta; style short; stigma unequally 2-lobed. *Fruit* a globose, 2–4-valved, or irregularly rupturing capsule. *Seeds* very many, minute; albumen 0.

671. Utricularia Linn.

Herbs, floating or palustrine, or on wet rocks; *leaves* in floating species multifid, with capillary segments, in erect or twining species entire, frequently with minute bladders. *Flowers* in simple or branched scapes, racemes few- or many-flowered; bracts and 2 bracteoles distinct. *Sepals* connate in 2-partite calyx; lobes entire or subentire, often accrescent. *Petals* 5, connate in a 2-lipped corolla; upper lip entire or emarginate; lower larger, 3–6-lobed; tube with a straight or curved spur. *Stamens* 2, adnate to base of corolla, alternate with lobes of lower lip; filaments broad; anthers ovate, 2-celled or almost 1-celled. *Carpels* connate in a globose, 1-celled ovary; ovules many, on a central placenta; style short; stigma unequally 2-lobed. *Fruit* a globose, regularly 2–4-valved or irregularly opening capsule. *Seeds* many, small; albumen 0.

Leaves submerged, divided into capillary segments, mostly interspersed with bladders; stems floating, if rooting in mud (*U. exoleta* sometimes) and the multifid capillary leaves absent, the capsule globose :—

Peduncles bearing a whorl of oblong vesicles about the middle :—

Flowers yellow ..... *stellaris.*

Flowers white with violet stripes ..... *stellaris* var. *inflexa.*

Peduncles naked or with a few obscure scales; corolla yellow :—

Peduncles rather stout; spur of corolla not longer than lower lip; flowers 3–8, from ·3–·5 in. across ..... *flexuosa.*

Peduncles slender; spur of corolla rather longer than lower lip; flowers 1–3, only ·2 in. across ..... *exoleta.*

Leaves at base of scape linear or spathulate, often disappearing before flowering; stem rooted in mud, if growing in running water, and at times emitting a few capillary leaves with bladders, the capsule not globose :—

Scales of the scape and bracts attached by their bases :—

Flowers blue or purple :—

Scapes glabrous; flowers pedicelled :—

Scapes straight; calyx-lobes acute ..... *reticulata* var. *uliginosa.*

Scapes very slender, twining; calyx-lobes obtuse ..... *scandens.*

Scapes hairy; flowers subsessile ..... *hirta.*

Flowers yellow :—

Scapes straight; pedicels in fruit recurved; calyx-lobes obtuse *bifida.*

Scapes slender, often twining; pedicels in fruit suberect; calyx-lobes acute ..... *Wallichiana.*

Scales of the scape and bracts produced backward below their point of attachment; flowers blue or sometimes white ..... *racemosa.*

1472. UTRICULARIA STELLARIS Linn. f.; F. I. i. 143; F. B. I. iv. 328.

In all the provinces.

A floating herb, with submerged leaves, the scapes alone rising from the surface of ponds and ditches. *Beng.* Jhangi.

1472/2. Var. INFLEXA; F. B. I. iv. 329.

In most of the central and eastern parts.

A floating herb, in habit like the type.

1473. UTRICULARIA FLEXUOSA Vahl; F. B. I. iv. 329. *U. fasciculata* F. I. i. 143.

In all the provinces.

A floating herb, much like but always more plentiful

than the two preceding, in similar situations. *Beng.* Jhangi.

1474. UTRICULARIA EXOLETA R. Br.; F. B. I. iv. 329. *U. biflora* F. I. i. 143.
Chota Nagpur; Behar; N. Bengal; C. Bengal.
A herb, usually floating, but sometimes stranded and rooting.

1475. UTRICULARIA RETICULATA Smith var. ULIGINOSA; F. B. I. iv. 331.
Behar; Orissa.
A small herb, in marshy places.

1476. UTRICULARIA SCANDENS Benj.; F. B. I. iv. 332.
N. Bengal.
A small herb, in marshy places; apparently rare in our provinces, and only once collected by the late Mr. Kurz.

1477. UTRICULARIA HIRTA Klein; F. B. I. iv. 332.
Chota Nagpur.
A small herb, in marshy places.

1478. UTRICULARIA BIFIDA Linn.; F. B. I. iv. 332; E. D. U. 67.
In most of the provinces.
A small herb, of marshy places. *Santal.* Arak' jhâwâr; *Beng.* Chota jhangi.

1479. UTRICULARIA WALLICHIANA Wight; F. B. I. iv. 332.
Behar; Chota Nagpur.
A small, usually twining herb, of marshy places.

1480. UTRICULARIA RACEMOSA Wall.; F. B. I. iv. 333.
Chota Nagpur; N. Bengal.
A small herb, of marshy places.

Order XCV. GESNERACEÆ.

Herbs or undershrubs. *Leaves* opposite, alternate or solitary, undivided or toothed; stipules 0. *Flowers* hermaphrodite, almost always irregular, on axillary or terminal peduncles, cymose, rarely 1-flowered; bracts small or large; bracteoles usually small. *Sepals* 5, connate in a short or longish tube; lobes valvate or open, very rarely imbricate. *Petals* connate in a tubular, short or long corolla; lobes usually 5, imbricate. *Stamens* usually didynamous, sometimes 5 fertile, often only 2 fertile; anthers 2-celled, often by early confluence 1-celled, usually conniving

or connate in pairs; dehiscence longitudinal. *Disk* annular or shortly cylindric or 0, occasionally unilateral. *Carpels* 2, connate in a 1-celled or imperfectly 2-celled ovary; ovules numerous, anatropous, on 2-fid, parietal, sometimes subconfluent placentas; style linear; stigma capitate or 2-lobed. *Fruit* a 2-valved capsule or a berry. *Seeds* numerous, small, fusiform or ovoid, smooth, sometimes tipped with a long hair; albumen scanty or 0; embryo straight.

Stamens 2; fruit a capsule not overtopped by the calyx, dehiscing loculicidally:—

Capsule linear or lanceolate; placentas deeply intruded, not bearing seeds on their inner faces:—

Capsule much exceeding the small calyx, 2-valved to the base; flowers racemose or subumbellate or solitary:—

Stigma oblique, emarginate.....**Didymocarpus.**

Stigma at length shortly 2-fid .....**Chirita.**

Capsule little longer than the rather large calyx, 4-valved to the base; flowers subcapitate.....**Tetraphyllum.**

Capsule ellipsoid or oblong, hardly exceeding the calyx; placentas bearing seeds on all sides; flowers in long racemes...**Rhynchoglossum.**

Stamens 4:—

Calyx plicate; fruit a capsule overtopped by the calyx, bursting irregularly; disk 0.....**Stauranthera.**

Calyx not plicate; fruit an indehiscent berry; disk annular **Rhynchotechum**

672. **Didymocarpus** Wall.

Stemless or erect herbs; *leaves* opposite, alternate, whorled or crowded. *Flowers* on axillary, many- or few-flowered peduncles; pedicels cymose, subumbellate or subracemose in pairs; bracts rarely conspicuous. *Sepals* connate in a small, 5-fid or 5-partite calyx; lobes narrow. *Petals* 5, connate in a tubular corolla; tube cylindric or ovoid; limb oblique or subsymmetric; lobes rounded. *Stamens* 2, anterior, perfect, with 2 or 3 rudimentary, rarely 4 perfect, adnate to corolla-tube, included; anthers connate in pairs; cells 2, soon confluent. *Disk* cylindric or 0. *Carpels* connate in narrow, sessile or stipitate, 1-celled ovary; placentas intruded and then recurved; ovules many, close-set on the margins; style long or short; stigma peltate, emarginate or unilateral, oblong, rarely 2-lobed. *Fruit* a linear, rarely lanceolate, loculicidally 2-valved or subfollicular capsule, usually ultimately 2-valved or often

4-valved; valves not twisted before opening, placentiferous, the placentas revolute and concealing the seeds. *Seeds* ellipsoid, small, smooth, minutely reticulate.

Stems none; plant very small, 1-leafed; pedicels few, short, fascicled in the leaf axil ..... *pygmæa.*
Stems distinct; leaves opposite or the 4 uppermost verticillate; peduncle long, cymes lax-flowered ..... *mollis.*

1481. DIDYMOCARPUS PYGMÆA C. B. Clarke; F. B. I. iv. 345.
Chota Nagpur.
A small, pubescent herb.

1482. DIDYMOCARPUS MOLLIS Wall.; F. B. I. iv. 350.
Chittagong.
A villous herb, 8–9 in. high.

673. Chirita Ham.

Herbs or low undershrubs; *leaves* opposite, often unequal, sometimes whorled or alternate, elliptic or ovate, rarely lanceolate. *Flowers* axillary, in many- or few-flowered cymes or on 1-flowered peduncles; bracts 2, shorter than the flowers, deciduous. *Sepals* connate in a 5-fid or 5-partite calyx; lobes acute. *Petals* 5, connate in a funnel-shaped corolla; limb 2-lipped; lobes rounded. *Stamens* 2, perfect, adnate to corolla-tube, 2–3 barren; filaments flattened, geniculate; anthers usually applied to the stigma; cells 2, divaricate, often confluent. *Carpels* connate in a linear, 1-celled ovary; placentas intruded as far as axis, then reflexed; ovules many on their margins; style short or long; stigma at first oblique, peltate, notched on lower margin; with age the upper margin produced, oblong, 2-fid. *Fruit* an elongated, linear, sessile capsule, opening loculicidally to the base; valves 2-partite the following season. *Seeds* ellipsoid, smooth, sometimes minutely umbonate; testa often striate, reticulate.

1483. CHIRITA ACUMINATA R. Br.; F. B. I. iv. 359. *Incarvillea oblongifolia* F. I. iii. 113.
Chittagong.
A herb, sometimes almost shrubby, 2–6 feet high.

674. Tetraphyllum Griff.

A tawny-villous undershrub; stems elongate, leafless or sparingly scaly below; *leaves* at the apex 4, whorled, nearly sessile, ovate,

or connate in pairs; dehiscence longitudinal. *Disk* annular or shortly cylindric or 0, occasionally unilateral. *Carpels* 2, connate in a 1-celled or imperfectly 2-celled ovary; ovules numerous, anatropous, on 2-fid, parietal, sometimes subconfluent placentas; style linear; stigma capitate or 2-lobed. *Fruit* a 2-valved capsule or a berry. *Seeds* numerous, small, fusiform or ovoid, smooth, sometimes tipped with a long hair; albumen scanty or 0; embryo straight.

Stamens 2; fruit a capsule not overtopped by the calyx, dehiscing loculicidally:—

Capsule linear or lanceolate; placentas deeply intruded, not bearing seeds on their inner faces:—

Capsule much exceeding the small calyx, 2-valved to the base; flowers racemose or subumbellate or solitary:—

Stigma oblique, emarginate.....**Didymocarpus.**

Stigma at length shortly 2-fid .....**Chirita.**

Capsule little longer than the rather large calyx, 4-valved to the base; flowers subcapitate.....**Tetraphyllum.**

Capsule ellipsoid or oblong, hardly exceeding the calyx; placentas bearing seeds on all sides; flowers in long racemes...**Rhynchoglossum.**

Stamens 4:—

Calyx plicate; fruit a capsule overtopped by the calyx, bursting irregularly; disk 0.....**Stauranthera.**

Calyx not plicate; fruit an indehiscent berry; disk annular **Rhynchotechum.**

672. **Didymocarpus** Wall.

Stemless or erect herbs; *leaves* opposite, alternate, whorled or crowded. *Flowers* on axillary, many- or few-flowered peduncles; pedicels cymose, subumbellate or subracemose in pairs; bracts rarely conspicuous. *Sepals* connate in a small, 5-fid or 5-partite calyx; lobes narrow. *Petals* 5, connate in a tubular corolla; tube cylindric or ovoid; limb oblique or subsymmetric; lobes rounded. *Stamens* 2, anterior, perfect, with 2 or 3 rudimentary, rarely 4 perfect, adnate to corolla-tube, included; anthers connate in pairs; cells 2, soon confluent. *Disk* cylindric or 0. *Carpels* connate in narrow, sessile or stipitate, 1-celled ovary; placentas intruded and then recurved; ovules many, close-set on the margins; style long or short; stigma peltate, emarginate or unilateral, oblong, rarely 2-lobed. *Fruit* a linear, rarely lanceolate, loculicidally 2-valved or subfollicular capsule, usually ultimately 2-valved or often

4-valved; valves not twisted before opening, placentiferous, the placentas revolute and concealing the seeds. *Seeds* ellipsoid, small, smooth, minutely reticulate.

Stems none; plant very small, 1-leafed; pedicels few, short, fascicled in the leaf axil ..... *pygmæa.*
Stems distinct; leaves opposite or the 4 uppermost verticillate; peduncle long, cymes lax-flowered ..... *mollis.*

1481. DIDYMOCARPUS PYGMÆA C. B. Clarke; F. B. I. iv. 345.
Chota Nagpur.
A small, pubescent herb.

1482. DIDYMOCARPUS MOLLIS Wall.; F. B. I. iv. 350.
Chittagong.
A villous herb, 8–9 in. high.

673. Chirita Ham.

Herbs or low undershrubs; *leaves* opposite, often unequal, sometimes whorled or alternate, elliptic or ovate, rarely lanceolate. *Flowers* axillary, in many- or few-flowered cymes or on 1-flowered peduncles; bracts 2, shorter than the flowers, deciduous. *Sepals* connate in a 5-fid or 5-partite calyx; lobes acute. *Petals* 5, connate in a funnel-shaped corolla; limb 2-lipped; lobes rounded. *Stamens* 2, perfect, adnate to corolla-tube, 2–3 barren; filaments flattened, geniculate; anthers usually applied to the stigma; cells 2, divaricate, often confluent. *Carpels* connate in a linear, 1-celled ovary; placentas intruded as far as axis, then reflexed; ovules many on their margins; style short or long; stigma at first oblique, peltate, notched on lower margin; with age the upper margin produced, oblong, 2-fid. *Fruit* an elongated, linear, sessile capsule, opening loculicidally to the base; valves 2-partite the following season. *Seeds* ellipsoid, smooth, sometimes minutely umbonate; testa often striate, reticulate.

1483. CHIRITA ACUMINATA R. Br.; F. B. I. iv. 359. *Incarvillea oblongifolia* F. I. iii. 113.
Chittagong.
A herb, sometimes almost shrubby, 2–6 feet high.

674. Tetraphyllum Griff.

A tawny-villous undershrub; stems elongate, leafless or sparingly scaly below; *leaves* at the apex 4, whorled, nearly sessile, ovate,

unequal-sided. *Flowers* blue, nearly sessile, in dense, subcapitate cymes; bracts elliptic. *Sepals* connate in a rather large, obscurely 2-lipped, 5-partite calyx. *Petals* 5, connate in a wide, funnel-shaped, silky corolla; lobes of limb ovate, subequal. *Stamens* 2, perfect; filaments short; anthers 2-celled, apex submucronate; cells ellipsoid, nearly parallel; dehiscence longitudinal. *Carpels* connate in an acute, ellipsoid, 1-celled ovary; placentas deeply intruded, 2-partite, lamellæ revolute; ovules many on both sides of each lamella; style linear; stigma small, obscurely 2-lobed. *Fruit* a narrowly lanceolate capsule, at length 4-valved to the base, leaving 2 ribs united to the style and 4 papery, revolute placentas. *Seeds* ellipsoid, obtuse at both ends; testa laxly reticulate, rough.

1484. TETRAPHYLLUM BENGALENSE C. B. Clarke; F. B. I. iv. 363.
Chittagong.
A tawny-villous undershrub.

675. Rhynchoglossum Bl.

Herbs, almost glabrous; *leaves* alternate, elliptic, acuminate, unequal-sided, cordate on one side, subentire or sinuate. *Flowers* in long, many-flowered racemes; bracts 0; bracteoles minute. *Sepals* connate in a 5-lobed, campanulate calyx. *Petals* 5, connate in a tubular corolla; tube cylindric; mouth contracted; limb 2-lipped; upper lip short, 2-fid, lower longer, 3-lobed. *Stamens* 2, perfect, included; anthers connivent, 2-celled; cells ellipsoid, subparallel, slits ultimately subconfluent at apex. *Carpels* connate in a 1-celled, ovoid ovary; placentas much intruded, 2-fid, the thick lamella bearing numerous ovules throughout; style linear; stigma minutely 2-lobed. *Fruit* an included, ellipsoid, membranous, loculicidally 2-valved capsule. *Seeds* narrowly ellipsoid, smooth; testa minutely reticulated.

1485. RHYNCHOGLOSSUM OBLIQUUM Bl. var. PARVIFLORA F. B. I. iv. 367.
Chota Nagpur.
A membranous, succulent herb.

676. Stauranthera Benth.

Low, succulent, pubescent herbs; *leaves* alternate or opposite, one of each pair reduced to a small auricle, falcate, elliptic, acuminate, very unequal-sided. *Flowers* in lax, peduncled, subracemose cymes; bracts small. *Sepals* 5, connate in a wide

campanulate calyx; lobes spreading, plicate-dilated at the sinuses. *Petals* 5, connate in a somewhat 2-lipped corolla; tube campanulate, spurred or gibbous at the base; lobes subequal. *Stamens* 4, perfect, subdidynamous; filaments short; anthers 2-celled, connate crosswise in a depressed cone; cells diverging at the base, dehiscing on the inside by slits, ultimately confluent at the apex. *Disk* 0. *Carpels* connate in a sessile, subglobose, 1-celled ovary; placentas deeply inflexed, 2-fid, with lobed branches, bearing ovules on both sides; style short; stigma broad, margin sublobed. *Fruit* a depressed-globose capsule, overtopped by the calyx; valves thin, chartaceous, irregularly or transversely breaking up. *Seeds* minute, obovoid, smooth; testa reticulated.

1486. Stauranthera grandiflora Benth.; F. B. I. iv. 371.
Chittagong.
A succulent, pubescent herb.

677. Rhynchotechum Bl.

Erect, simple undershrubs; young shoots tawny-silky; *leaves* opposite or lower alternate, usually large. *Flowers* in many-flowered cymes, 3-chotomous or umbellately compound, in the lower axils; bracts narrow, inconspicuous. *Sepals* 5, small, narrow, open in bud, slightly connate below. *Petals* 5, connate in a somewhat 2-lipped corolla; tube short, wide-campanulate, base subequal; upper lip 2-lobed; lower longer, 3-lobed; lobes all spreading, rounded. *Stamens* 4, didynamous, adnate to base of corolla; filaments short, linear, curved; anthers 2-celled; cells subparallel below, dehiscent on the inner face, quite confluent at the tips. *Disk* small, annular. *Carpels* connate in a sessile, ovoid ovary; placentas intruded almost to the axis of the ovary, there naked, then recurved and bearing many ovules; style linear, long; stigma small. *Fruit* a small, globose, apiculate berry, with white, shining epicarp, pulpy within. *Seeds* very small, ellipsoid, smooth.

1487. Rhynchotechum ellipticum A. DC. var. Hookeri Clarke; F. B. I. iv. 373.
Chittagong.
An erect undershrub, with thickish stems, 2–4 feet high.

Order XCVI. BIGNONIACEÆ.

Trees or shrubs, very rarely climbing, or herbs. *Leaves* opposite, very rarely alternate, compound, 1–3 times odd-pinnate, very rarely simple. *Flowers* hermaphrodite, irregular, usually showy, in racemes or panicles, usually terminal, rarely on short, lateral branches or from the old wood; bracts 0. *Sepals* connate in a 2–5-lobed calyx. *Petals* connate in a tubular-ventricose, 2-lipped corolla; lobes 5, subequal, imbricate in bud. *Stamens* 4, didynamous, with often a rudimentary and rarely a perfect fifth, inserted where the corolla-tube becomes abruptly swollen; filaments glabrous or hairy at base; anthers 2-celled, included or shortly exserted, usually connivent in pairs; cells elliptic or oblong, parallel or divarieate; dehiscence longitudinal. *Disk* usually thick or annular. *Carpels* 2, connate in a subsessile, 2-celled ovary; ovules usually many-seriate, rarely 1–2-seriate, anatropous, in 2 groups of rows in each cell; style long, glabrous; stigma elliptic, 2-lobed. *Fruit* a loculicidally or septicidally 2-valved capsule, usually elongated; septum enlarging in fruit, deciduous along with the valves; rarely indehiscent, elongated or globular. *Seeds* compressed, discoid, rarely subtrigonous, usually very prominently winged; albumen 0.

Stamens 5, perfect; leaves 2–3-pinnate; capsule septifragal, linear, compressed parallel to the septum, very large; calyx large, coriaceous, truncate; corolla-tube wide-campanulate ..... **Oroxylum**

Stamens 4, perfect:—

Capsule septifragal, linear, compressed parallel to the septum; leaves 2–3-pinnate; calyx small, cup-shaped; corolla long, slender, narrowly tubular ..... **Millingtonia.**

Capsule loculicidal; leaves 1–2-pinnate or rarely (*Tecoma* sometimes) simple; calyx large; corolla-tube short or long, much widened at the mouth:—

*Capsule not winged, cylindric or subquadrangular or compressed with sides parallel to the septum:—[p. 787]

Calyx tubular-campanulate, equally 5-toothed; capsule compressed ..... **Tecoma.**

Calyx ovoid or oblong, never equally 5-toothed; capsule round, subquadrangular, or only slightly compressed:—

Calyx spathaceous, cleft to the base on one side in flower, closed in bud; corolla-tube long or short, cylindric below, campanulate

above; lobes crisped, crenate or incised; capsule elongated, terete or somewhat compressed, nearly straight **Dolichandrone.**

Calyx not spathaceous; corolla-tube ventricose:—

Calyx irregularly, deeply 3–5-lobed in flower, closed in bud; capsule falcate or twisted ..... **Heterophragma.**

Calyx truncate or shortly, unequally lobed in flower, closed or open in bud; capsule with a thickened, spongy septum **Stereospermum.**

Capsule with double wings along the margins, oblong, compressed at right angles to the septum; calyx large, swollen, campanulate, limb 5-fid [p. 786] ..... **Pajanelia.**

678. Oroxylum Vent.

A glabrous tree; *leaves* large, opposite, 2–3-pinnate; leaflets entire, ovate. *Flowers* in long, terminal racemes. *Sepals* 5, connate in a large, coriaceous, campanulate calyx; limb truncate or obscurely toothed. *Petals* 5, connate in a large, campanulate, purplish or white corolla; lobes round, crisped, toothed, subequal. *Stamens* 5, adnate above the middle of the corolla-tube, exserted; filaments straight, 4 subequal, the fifth rather shorter; anthers 2-celled, glabrous; cells oblong, parallel. *Disk* wide. *Carpels* connate in a subsessile, 2-celled ovary, contracted below; ovules numerous, many-seriate; style long; stigma 2-lobed. *Fruit* a very large, linear capsule, compressed parallel to the septum, 2-valved, opening septifragally. *Seeds* many, thinly discoid, with broad, hyaline wing.

1488. Oroxylum indicum Vent.; F. B. I. iv. 378; E. D. O. 233. *Bignonia indica* F. I. iii. 110.

Chota Nagpur; Behar; N. Bengal; Chittagong.

A tree. *Beng.* Sona, násona, sonpatti; *Hind.* Ullu, karkath, syona; *Uriya* Phonphonia; *Kol.* Arengebang; *Santal.* Bana hatak'; *Rajbansi* Soizong.

679. Millingtonia Linn. f.

An erect tree, bark corky; *leaves* opposite, 2–3-pinnate. *Flowers* in panicles, terminal on the pendent branches. *Sepals* 5, connate in a small, campanulate, obscurely toothed calyx. *Petals* 5, connate in a white, long, slender, tubular corolla; lobes of limb subequal, ovate, acute, valvate. *Stamens* 4, didynamous, adnate near corolla-throat, shortly exserted; anthers dimidiate, of one

ovate cell, the other represented by a small hook. *Carpels* connate in a subsessile ovary; ovules few-seriate; style long; stigma 2-lobed. *Fruit* a linear capsule, compressed parallel to the septum, septifragally 2-valved. *Seeds* thinly discoid, with a broad, hyaline wing.

1489. MILLINGTONIA HORTENSIS Linn. f.; F. B. I. iv. 377; E. D. M. 550. *Bignonia suberosa* F. I. iii. 111.

Planted along roadsides and in gardens, also often occurring subspontaneously.

A tall tree. *Hind.* Akas-nim, mini-chambeli; *Uriya* Mach-mach. The Indian Cork-Tree.

680. Tecoma Linn.

Erect or scandent shrubs or small trees; *leaves* opposite or rarely alternate, pinnate or occasionally entire. *Flowers* in terminal racemes or panicles. *Sepals* 5, connate in a tubular-campanulate calyx; limb subequally toothed. *Petals* 5, connate in an orange or red, tubular-ventricose corolla; lobes of limb round, subequal. *Stamens* 4, didynamous, adnate below middle of corolla-tube; anthers glabrous or sparsely hairy; cells linear, usually parallel. *Carpels* connate in a sessile or subsessile ovary; ovules 1- or more-seriate on each placenta; style long; stigma 2-lobed. *Fruit* a linear or narrow capsule, more or less compressed at right angles to the septum; valves opening loculicidally. *Seeds* thinly discoid; wings hyaline, broad.

1490. TECOMA STANS Linn.

In gardens, general.

A shrub.

681. Dolichandrone Seem.

Glabrous or tomentose trees; *leaves* opposite, 1-pinnate. *Flowers* in terminal racemes or panicles. *Sepals* connate in a closed calyx, opening spathaceously to the base on one side. *Petals* 5, connate in a more or less tubular corolla; lobes of limb subequal, round, crisped, crenate or incised. *Stamens* 4, didynamous, included; anthers glabrous; cells oblong, more or less parallel. *Disk* thickish. *Carpels* connate in a sessile ovary; ovules many, usually many-seriate; style long; stigma 2-lobed. *Fruit* a long, subterete, or compressed capsule, loculicidaed 2-valved, imperfectly 4-celled. *Seeds* thinly discoid, with a broate wing on each side.

1491. Dolichandrone Lawii Seem.; F. B. I. iv. 380.
Behar.
A tree.

682. Heterophragma DC.

Trees; *leaves* large, 1-pinnate. *Flowers* large, in terminal, woolly panicles. *Sepals* 5, connate in an ovoid, closed calyx, in flower opening by 3–5 irregular lobes. *Petals* 5, connate in a tubular, swollen corolla, glabrous or woolly without; lobes of limb subequal, rounded. *Stamens* 4, didynamous, included; anthers glabrous; cells oblong-linear, diverging. *Disk* pulvinate. *Ovary* sessile; ovules numerous, many-seriate on each placenta; style long; stigma 2-lobed. *Fruit* an elongated, cylindric, or subcompressed capsule, falcate or twisted, loculicidally 2-valved, with a flat or 4-cornered dissepiment. *Seeds* compressed, with a membranous wing on each side.

1492. Heterophragma adenophyllum Seem.; F. B. I. iv. 381; E. D. H. 157.
E. Bengal; Chittagong; elsewhere planted.
A tree.

683. Stereospermum Cham.

Trees; *leaves* 1–2-pinnate, opposite. *Flowers* in large, lax, terminal panicles. *Sepals* connate in an ovoid calyx, closed or opening in bud, in flower with a truncate or shortly, unequally lobed limb. *Petals* 5, connate in a tubular-ventricose, yellow or pale-rose corolla; lobes of limb subequal, round, crisped, toothed or laciniate. *Stamens* 4, didynamous, included; anthers glabrous; cells linear, diverging. *Disk* pulvinate. *Carpels* connate in a sessile ovary; ovules many, 1- or more-seriate. *Fruit* an elongated, terete, subcompressed, or obscurely 4-angled capsule, loculicidally 2-valved; dissepiment thickened, subterete. *Seeds* in 1 or 2 series, compressed or subtrigonous, with a membranous wing on each side.

Leaflets glabrous; panicle branches slender, glabrous; capsule obscurely quadrangular; corolla rose with yellow lobes, under an inch long ..... *chelonoides.*

Leaflets hairy when young; panicle branches short, viscidly hairy; capsule terete; corolla purple, over an inch long ..... *suaveolens.*

1493. STEREOSPERMUM CHELONOIDES DC.; F. B. I. iv. 382; E. D. S. 2865. *Bignonia chelonoides* F. I. iii. 106.
N. Bengal, Duars; Chittagong.
A tree. *Vernac.* Pader, pander, pondair; *Beng.* Dharmar, atcapáli.

1494. STEREOSPERMUM SUAVEOLENS DC.; F. B. I. iv. 382; E. D. S. 2876. *Bignonia suaveolens* F. I. iii. 104.
Chota Nagpur; Behar; W. Bengal; N. Bengal.
A tree. *Vernac.* Paral, parur, padal.

684. Pajanelia DC.

A large, glabrous tree; *leaves* large, 1-pinnate; leaflets entire, many. *Flowers* large, in terminal, thyrsoid panicles. *Sepals* 5, connate in a large, ovoid calyx, closed in bud, swollen, campanulate in flower; limb shortly lobed. *Petals* 5, connate in a large, swollen-tubular corolla; lobes subequal, crisped. *Stamens* 4, didynamous; anthers glabrous; cells linear, divergent. *Disk* broad. *Carpels* connate in a sessile ovary; ovules many-seriate on each placenta; style long; stigma 2-lobed. *Fruit* a large, narrowly oblong, compressed, winged capsule, loculicidally 2-valved. *Seeds* compressed, with a membranous wing on each side.

1495. PAJANELIA RHEEDEI DC.; F. B. I. iv. 384; E. D. P. 17.
Chittagong.
A tree.

Order XCVII. PEDALINEÆ.

Herbs or undershrubs. *Leaves* opposite or the upper alternate, entire, toothed or lobed; stipules 0. *Flowers* irregular, solitary or rarely clustered or racemose, usually axillary; pedicels short; bracts 0 or minute. *Sepals* 4–5, slightly connate below. *Petals*, connate in a tubular-ventricose corolla; limb 5-lobed, obscurely 2-lipped; lobes imbricate. *Stamens* 4, didynamous, rarely 2. *Carpels* 2, connate in a 2-celled, rarely 1-celled ovary; ovules many or few, superposed; style filiform; stigma shortly 2-lobed. *Fruit* hard, indehiscent, or a 2-, less often a 3–4-valved capsule. *Seeds* wingless; albumen 0.

*Anther-cells divaricate; connective small; ovary 1-locular; placentas parietal; capsules hooked; racemes terminal [p. 791] .....**Martyniaceæ.**

*Anther-cells subparallel; ovary 2-locular and spuriously 4-chambered; placentas axial; capsules not hooked; flowers axillary [p. 790] **Sesamum.**

685. Martynia Linn.

Coarse herbs; annual or with perennial, tuberous roots; *leaves* alternate or opposite, pubescent, toothed or lobed. *Flowers* rather large, in short, terminal racemes; bracts small, linear or 0; bracteoles 1 or 2. *Sepals* 5, connate in a membranous, somewhat inflated calyx; limb with subequal lobes; tube sometimes spathaceously split in front. *Petals* 5, connate in a somewhat 2-lipped corolla; tube oblique or decurved at the base; lobes subequal, rounded. *Stamens* 2, anterior only perfect, adnate near base of corolla, included; anthers oblong; cells divaricate; staminodes 3. *Disk* uniform. *Carpels* connate in a 1-locular ovary; placentas 2, parietal, intruded, 2-lamellate; ovules many, 1-seriate on each lamella; style filiform; stigma 2-lobed. *Fruit* subdrupaceous, with an incurved beak; the fleshy pericarp deciduous, separating septicidally; the enlarged, persistent placentas connate with the endocarp in a hard, rough, spinescent or smooth, 4-celled body, with an empty central opening. *Seeds* many in each cell; testa thick, rugose.

1496. MARTYNIA DIANDRA Glox.; F. B. I. iv. 386; E. D. M. 308. Chota Nagpur, very common on roadsides and near villages.

A tall, coarse herb. *Hind.* Sher núi; *Beng.* Bagh nokí; *Santal.* Bag lucha.

686. Sesamum Linn.

Erect or prostrate herbs; *leaves* opposite below, alternate above, ntire, toothed, lobed or divided. *Flowers* axillary, solitary or ew and fascicled, shortly pedicelled. *Sepals* connate in a small, 5-partite calyx. *Petals* 5, connate in a 2-lipped corolla; tube ventricose; lobes rounded, those of the upper lip usually rather naller than the others. *Stamens* 4, didynamous, included; nthers sagittate; cells subparallel, distinct. *Carpels* connate in 2-celled ovary; cells soon divided into 2 chambers by the intruion of a false dissepiment from between the placentas; ovules any, 1-seriate in each chamber; style filiform; stigma 2-lobed. *Fruit* an oblong or ovoid capsule, usually 4-angled and 4-grooved, loculicidally 2-valved, 4-chambered. *Seeds* many, obliquely oblong, somewhat compressed, foveolate.

1497. SESAMUM INDICUM DC.; F. B. I. iv. 387. *S. orientale* F. I. iii. 100.

In all the provinces, cultivated for its oily seeds.

A herb, 1–2 feet high. *Vernac.* Gingli, til, rasa (*Orissa*). The Gingelly or Sesamé.

Order XCVIII. ACANTHACEÆ.

Herbs or shrubs, rarely trees. *Leaves* opposite, almost always entire, occasionally pinnately lobed; stipules 0. *Flowers* hermaphrodite, almost always irregular, in cymes, racemes, or spikes, rarely solitary; bracts large or small, occasionally 0; bracteoles usually 2, sometimes 4 under the individual flowers, free or connate in an epicalyx. *Sepals* 5 or 4, the upper abortive, free or connate below; rarely connate, multifid. *Petals* 5, connate in a 2-lipped, less often subequally 5-lobed corolla; lobes imbricate or twisted in bud. *Stamens* 4 or 2, adnate to corolla-tube; anthers 2- or 1-celled; cells sometimes remote. *Disk* often conspicuous. *Carpels* 2, connate in a superior, 2-celled ovary; ovules 1 or more in each cell, if more than one, 1-seriate or 2-seriate, anatropous; style simple, filiform or thickened below; stigma usually 2-lobed, lobes sometimes unequal. *Fruit* a loculicidal capsule, the valves often elastically recurved, the septum splitting, the seeds borne on each half. *Seeds* usually hard, attached to recurved, subacut supports (retinacula), ovoid or compressed, smooth or rugos rarely hispid; albumen 0 or (rarely) scanty.

Climbers; calyx minute, annular or 10–15-toothed; bracteoles large, subconnate as a spathaceous epicalyx; corolla-lobes twisted in bud; ovules 2, collateral in each cell; capsule beaked; seeds not supported on retinacula ..... **Thunbergia.**

Erect or prostrate, not climbing; calyx distinct; bracteoles not subconnate; if stems twining (*Acanthus volubilis*) ovules more than 2 in each cell:—

*Seeds not supported on retinacula; ovules many in each cell:—[p. 793]

†Ovules superposed in 2 rows in each cell; corolla-lobes imbricat the upper lip or two upper lobes outermost in bud; none of th leaves pinnately cut:—[p. 793]

‡Calyx 4-partite; stamens 2:—[p. 793]

Bracts rigid; peduncle of spike covered with alternate scales 793] ..... **Elytraria.**

§Bracts herbaceous; spike sessile, or if stalked the peduncle naked [p. 792] ..... **Nelsonia.**

‡Calyx 5-partite; stamens 4 [p. 792] ..... **Ebermaiera.**

†Ovules not in 2 rows in each cell; corolla-lobes contorted, twisted to the left in bud; lower leaves pinnately cut [p. 792] ... **Cardanthera.**

*Seeds supported on hard, upward curving retinacula; ovules 2, not collateral, or if more than 2 (rarely exceeding 8), superposed in one row or else arranged alternately in each cell:—[p. 792]

Corolla without upper lip, lower lip large, expanded, 3-lobed; ovules 2 in each cell:—

Anterior filaments with an excurrent process ..... **Blepharis.**

Anterior filaments without any excurrent process..... **Acanthus.**

Corolla with either 2 lips or with 5 subequal lobes:—

Corolla-lobes twisted to the left in bud:—

Ovules more than two in each cell; capsules normally with 6 or more seeds:—

Corolla distinctly 2-lipped ..... **Hygrophila.**

Corolla subequally 5-lobed:—

Bracteoles large; capsule clavate with a solid base... **Ruellia.**

Bracteoles small, narrow, or none; capsule seed-bearing throughout:—

Anthers acuminate at apex ..... **Æchmanthera.**

Anthers blunt ..... **Hemigraphis.**

Ovules 2 in each cell; capsules normally with 4 or fewer seeds; corolla usually subequally 5-lobed:—

Placentas separating elastically from the valves from the base upwards; stamens 4:—

Bracteoles very large, reticulately nerved ..... **Petalidium.**

Bracteoles none..... **Phaylopsis.**

Placentas not separating elastically from the valves:—

Anthers minutely mucronate at the base; stamens 4 **Calophanes.**

Anthers muticous:—

Corolla-tube long, slender; limb very little enlarged; only 2 stamens perfect ..... **Dædalacanthus.**

Corolla-tube short, widened gradually from near the base; perfect stamens usually 4; if corolla-tube slender below, or if perfect stamens only 2, then limb of corolla widely funnel-shaped ..... **Strobilanthes.**

Corolla-lobes imbricated in bud:—

*Ovules 3–10 in each cell; capsule normally 6- or more-seeded:—[p. 794]

Capsule compressed at right angles to the septum; seeds ovoid, hardly compressed ..... **Andrographis.**
Capsule subterete; seeds much compressed :—
Corolla-tube narrowly cylindric, slender, straight; ovary pubescent ..... **Gymnostachyum.**
Corolla-tube funnel-shaped, curved; ovary glabrous **Phlogacanthus.**

Ovules 2 or, rarely, 1 in each cell :—[p. 793]
Corolla-lobes 5, subequal :—
Anthers 1-celled, muticous; stamens 4, didynamous; outer calyx-lobes larger than the others ..... **Crossandra.**
Anthers 2-celled :—
Sepals 4, two opposite outer larger than the others; stamens, 2 only perfect, 2, sometimes 3, others rudimentary ..... **Barleria.**
Sepals 5, subequal, all small :—
Stamens 4; corolla-tube long; limb enlarged **Asystasia.**
Stamens 2 :—
Corolla-tube long, slender ..... **Eranthemum.**
Corolla-tube short; limb enlarged... **Codonacanthus.**
Corolla distinctly 2-lipped; anthers 2-celled :—
Stamens 4 ..... **Lepidagathis.**
Stamens 2 :—
Placentas not separating elastically from the valves :—
Anther-cells parallel, subequal; bracts large, imbricate; corolla-tube long, narrow ..... **Ecbolium.**
Anther-cells placed one higher up than the other :—
Anther-cells, at least the lower, with a white, basal spur-like appendage ..... **Justicia**
Anther-cells not spurred at the base :— or
Anther-cells apiculate ..... **Adhatoda**
Anther-cells muticous :— n
Bracts and bracteoles small, subequal; corol white ..... **Rhinacanthus**
Bracts larger than bracteoles, in opposite, valvate pairs; corolla rose or purple... **Peristroph**
Placentas separating elastically from the valves from th base upwards; bracts involucrate :—
Bracts arranged in unilateral spikes ..... **Rungia.**
Bracts either clustered in leaf-axils or (occasionally) laxly cymose ..... **Dicliptera.**

687. Thunbergia Linn. *f.*

Climbers; *leaves* opposite, often caudate, hastate or angular. *Flowers* axillary, solitary or paired or racemose; bracts at base of pedicels leaf-like; bracteoles large, margins connate, at least when young. *Sepals* connate in a small, annular, or 10–16-toothed calyx, or obscure. *Petals* 5, connate in a conspicuous corolla; tube swollen, curved; limb oblique, with rounded lobes, twisted to the left in bud. *Stamens* 4, didynamous, adnate near base of corolla-tube; anthers 2-celled; cells parallel, oblique, spurred or not at the base. *Disk* annular or cushion-like. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell, collateral; style long; stigma funnel-like, 2-lobed or entire, or style 2-fid with capitate stigmas. *Fruit* a capsule, globose below, suddenly narrowed to a barren, sword-shaped beak. *Seeds* 2 in each cell, ovoid or dorsally compressed, glabrous base plane or hollowed; funicle minute or conic.

Flowers axillary; calyx 10–15-toothed; seeds ovoid, excavated at the base:—

Corolla white, fragrant; petioles not winged:—

Capsule glabrous; calyx-teeth hardly longer than tube:—

Pedicels solitary in each axil; stems hairy ..... *fragrans.*

Pedicels often 2 in each axil; stems glabrous or grey-puberulous *fragrans* var. *lævis.*

Capsule villous; calyx-teeth much longer than tube..... *tomentosa.*

Corolla yellow, with a brown or claret-coloured eye; petioles winged *alata.*

Flowers racemed; calyx an almost entire ring; seeds dorsally compressed; base plane; corolla blue..... *grandiflora.*

1498. Thunbergia fragrans Roxb.; F. I. iii. 33; F. B. I. iv. 390.

N. Bengal, Duars.

A slender climber.

1498/2. Var. lævis; F. B. I. iv. 391.

Behar; W. Bengal.

A slender climber.

1499. Thunbergia tomentosa Wall.; F. B. I. iv. 391.

Chota Nagpur; Orissa.

A slender climber.

1500. Thunbergia alata Boj.; F. B. I. iv. 39.

E. Bengal, spontaneous; elsewhere often cultivated.

A slender climber.

1501. THUNBERGIA GRANDIFLORA Roxb.; F. I. iii. 34; F. B. I. iv. 392.

Behar; N. Bengal; Chittagong.

A very extensive climber. *Vernac.* Núl-lata.

688. Elytraria Vahl.

Herbs, almost stemless; *leaves* alternate, crowded, subradical. *Flowers* in close, rigid, simple or divided spikes; scapes covered by spirally imbricate bracts; bracteoles small. *Sepals* connate in a 4-partite calyx; lobes unequal, the largest sometimes 2-fid. *Petals* 5, connate in a small, 2-lipped corolla; tube linear; lobes of limb oblong, imbricate. *Stamens* 2, perfect, adnate to corolla-throat; anthers elliptic, acute; cells 2, parallel, with or without a minute, basal spur. *Disk* small. *Carpels* connate in a 2-celled ovary; ovules 6–10, superposed in each cell; style short; stigma shortly 2-lobed. *Fruit* an ellipsoid, acute capsule. *Seeds* minute, ovoid, reticulated, minutely papillose, attached by a minute hilum without retinaculum.

1502. ELYTRARIA CRENATA Vahl; F. B. I. iv. 394. *Justicia acaulis* F. I. i. 119.

Chota Nagpur.

An almost stemless herb.

689. Nelsonia R. Br.

Diffuse, softly hairy herbs; *leaves* opposite, elliptic, entire. *Flowers* in ovate or cylindric spikes; bracts ovate, glandular-villous, closely imbricate, alternate or spirally scattered; bracteoles 0. *Sepals* 4, unequal, lanceolate, shortly connate below, the larger often 2-fid. *Petals* 5, connate in a very small, purplish rose or white, 2-lipped corolla; tube slender; lobes obtuse, spreading. *Stamens* 2, adnate above middle of tube; anthers 2-celled, sub-included; cells ellipsoid, somewhat divergent, discrete, glabrous or ciliate, muticous or minutely spurred. *Carpels* connate in a 2-celled ovary; ovules 8–10 in each cell; style slender; stigma shortly 2-lobed. *Fruit* an oblong, acute capsule, seed-bearing below, barren above. *Seeds* small, round or ellipsoid, smooth, attached without retinacula.

Flowering stems trailing .....*campestris.*
Flowering stems suberect, all parts more hairy ...*campestris* var. *vestita.*

1503. NELSONIA CAMPESTRIS R. Br.; F. B. I. iv. 394. *Justicia lamifolia* F. I. i. 134.
In all the provinces.
A diffuse herb.

1503/2. Var. VESTITA F. B. I. iv. 395. *Justicia tomentosa* F. I. i. 131.
Chota Nagpur; Chittagong.
A suberect herb.

690. Ebermaiera Nees.

Herbs or dwarf undershrubs; *leaves* opposite, rarely alternate, entire or subentire. *Flowers* in terminal or pseudo-axillary, simple or compound, lax or dense racemes or spikes; bracts leafy or small; bracteoles under calyx 2, shorter than bracts. *Sepals* 5, oblong or linear, slightly connate below, subequal or one larger than the others. *Petals* 5, connate in a 2-lipped or slightly oblique corolla; tube long or short, cylindric; lobes short, spreading. *Stamens* 4, didynamous, included or rarely shortly exserted; filaments usually hirsute; anthers with 2 ovoid, discrete, muticous cells. *Disk* small. *Carpels* connate in a glabrous, 2-celled ovary; ovules numerous; style linear, glabrous; stigma once or frequently twice 2-lobed. *Fruit* a small, oblong capsule, seed-bearing throughout. *Seeds* 15–30 in each cell, small, globose or cuboid; testa hollowed; retinacula 0.

Bracts obtuse or subobtuse; flowers blue or purple, with linear markings:—

Stems erect, pubescent upwards, with leaves and branches opposite the base; corolla ·3 in. long or less, purplish with paler (rose or yellow) stripes:—

Stems viscid, with glandular, spreading hairs; leaves of upper portion of stem alternate; flowers in lax spikes, interrupted below, the lower bracts leaf-like.....*glauca* var. *spathulata*.

Stems pubescent, with adpressed, grey hairs; leaves of upper portion of stem opposite; flowers in dense, uninterrupted, cylindric spikes *polybotrya*.

Stems trailing, numerous, pubescent throughout; leaves all opposite; corolla ·5 in. long, blue, with darker (purple) stripes; heads subspherical, axillary .....*glutinosa*.

Bracts very acute:—

Bracts, bracteoles, and sepals not awned at the tips; stems decumbent

and branching at the base, then erect, longer than the branches; corolla ·3 in., white or nearly so; flowers in cylindric, thyrsoid spikes ..... *thyrsoidea.*

Bracts, bracteoles, and sepals with long, subulate, awned tips; awns of bracts ciliate; stems short, prostrate, rooting; corolla ·6 in. long, purple, with rose markings; flowers in short cylindric, or subcapitate spikes ..... *angustifolia.*

1504. EBERMAIERA GLAUCA Nees var. SPATHULATA; F. B. I. iv. 396.
N. Bengal; E. Bengal.
An erect herb, in rice-fields.

1505. EBERMAIERA POLYBOTRYA Nees; F. B. I. iv. 396.
N. Bengal.
An erect herb, in swamps.

1506. EBERMAIERA GLUTINOSA Wall.; F. B. I. iv. 396.
Tirhut; Behar; N. Bengal; C. Bengal.
A trailing herb, in rice-fields.

1507. EBERMAIERA THYRSOIDEA Nees; F. B. I. vi. 397. *Capraria diffusa* F. I. iii. 93.
Chittagong.
A suberect herb.

1508. EBERMAIERA ANGUSTIFOLIA T. And.; F. B. I. iv. 398.
Chittagong.
A prostrate herb.

691. Cardanthera Ham.

Aromatic, often viscid herbs; *leaves* opposite, the upper toothed, rarely entire; lower often pinnatifid, or if submerged pectinate. *Flowers* spiked or whorled or 1–3 together in opposite axils; bracts or bracteoles often suppressed. *Sepals* 5, narrow, often unequal, slightly connate below. *Petals* 5, connate in a 2-lipped corolla; tube nearly straight, shorter than the calyx; limb long; lobes twisted to the left; throat with a transversely plaited palate. *Stamens* 4, didynamous; anthers of posterior pair often smaller; cells parallel. *Carpels* connate in a narrow, 2-celled ovary; ovules many; style sparsely hairy. *Fruit* a sessile, narrow capsule, seed-bearing throughout. *Seeds* 40–100, small, ovoid, somewhat compressed, glandular-puberulous or glabrous; retinacula minute, conical, soft, straight.

Flowers in terminal spikes, with 4 rows of imbricating bracts...*uliginosa*.
Flowers mostly in axillary whorls, basal leaves much divided ...*triflora*.

1509. CARDANTHERA ULIGINOSA Ham.; F. B. I. iv. 403. *Ruellia uliginosa* F. I. iii. 52.
N. Bengal, swamps in Duars.
An annual erect or decumbent herb.

1510. CARDANTHERA TRIFLORA Ham.; F. B. I. iv. 405. *Ruellia triflora* F. I. iii. 52.
Behar; Tirhut; N. Bengal; C. Bengal; E. Bengal.
An annual weed, near edges of ponds and ditches.

692. Blepharis Juss.

Harsh, often rigid or prickly herbs or undershrubs; *leaves* opposite or 4-nately whorled, subentire, toothed or prickly. *Flowers* in terminal spikes or on suppressed, axillary branches, strobilate, tetrastichous or capitate and few-flowered, or axillary, 1-flowered; bracts leafy; bracteoles linear. *Sepals* 4, unequal, in opposite pairs, the inner smaller; one of the outer pair emarginate or lobed; their bases shortly connate. *Petals* 5, connate in a 2-lipped corolla, with ovoid, rigid tube; upper lip subobsolete, lower spreading, 3-lobed, purple or blue. *Stamens* 4, didynamous; filaments thick, rigid, those of anterior stamens produced beyond attachment of anthers; anthers with 1 large cell, its margins densely bearded, the other cell small or obsolete. *Disk* annular. *Carpels* connate in a glabrous, 2-celled ovary; ovules 2 in each cell; style linear; stigma shortly 2-fid. *Fruit* an oblong or ellipsoid, 2- or 4-celled capsule. *Seeds* compressed, orbicular, echinate-papillose.

Leaves acute, distinctly stalked; seeds densely covered with obtuse spines, formed of tubes, free at the tip when moistened...*boerhaaviifolia*.
Leaves obtuse, subsessile; seeds shaggy, from a covering of annular tubes, connected at their bases only .....*molluginifolia*.

1511. BLEPHARIS BOERHAAVIIFOLIA Pers.; F. B. I. iv. 478. *Acanthus maderaspatensis* F. I. iii. 33.
Behar; Chota Nagpur; Orissa.
A prostrate, wiry herb.

1512. BLEPHARIS MOLLUGINIFOLIA Pers.; F. B. I. iv. 479.
Chota Nagpur.
A prostrate, wiry, perennial herb.

693. Acanthus Linn.

Erect or twining herbs or shrubs; *leaves* pinnatifid, toothed, spinous, rarely entire. *Flowers* in terminal or pseudo-axillary, densely strobilate or interrupted spikes; bracts large, ovate, spinescent, or small; bracteoles large, lanceolate, sometimes obsolete. *Sepals* 4, shortly connate below in 2 opposite pairs, the outer the larger. *Petals* 5, connate in a 2-lipped corolla; tube short, ovoid, rigid; upper lip subobsolete, lower blue or white, elongate, obovate, shortly obtusely 3-lobed. *Stamens* 4, didynamous, shorter than the lower lip; filaments stout, narrowed, curved below the anther, not produced at apex; anthers oblong, 1-celled, bearded. *Disk* 0. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style acute at the tip; stigma shortly 2-fid. *Fruit* an ellipsoid, compressed capsule, brown, shining. *Seeds* 4, compressed, orbicular, glabrous; testa lax.

Leaves toothed or pinnatifid, spinous, holly-like, base of petiole usually spinous; bracteoles broad-lanceolate; corolla blue; stems erect ..... *ilicifolius.*

Leaves entire, not spinous, base of petiole unarmed; bracteoles 0; corolla white or rose; stems twining ..... *volubilis.*

1513. Acanthus ilicifolius Linn.; F. I. iii. 32; F. B. I. iv. 481; E. D. A. 324.

Sundribuns.

A shrub, in clumps in maritime swamps. *Beng.* Harkuch kanta, hargoza.

1514. Acanthus volubilis Wall.; F. B. I. iv. 481.

Sundribuns.

A shrub, twining among reeds in littoral swamps.

694. Hygrophila R. Br.

Herbs, occasionally spinescent; *leaves* opposite, lanceolate or obovate, entire. *Flowers* sessile, in terminal heads or axillary whorls; bracts elliptic or lanceolate; bracteoles oblong or lanceolate, shorter than calyx. *Sepals* connate in a tubular, 5-fid, rarely 4-partite calyx; lobes lanceolate or linear. *Petals* connate in a deeply 2-lipped, bluish-purple corolla, nearly glabrous; tube swollen at the apex; lips oblong, straight. *Stamens* 4, didynamous, posterior pair like the anterior or smaller or rudimentary; filaments glabrous; anthers oblong, cells equal, divaricate or

connate at the base. *Carpels* connate in a 2-celled, oblong ovary with hairy tip; ovules in each cell 4-many, rarely 2; style long, hairy; stigma simple, linear. *Fruit* a linear or narrowly oblong capsule, seed-bearing from near the base. *Seeds* numerous, rarely few, ovoid, compressed, elastically hairy; retinacula hardened, acute, curved.

Unarmed; calyx 5-toothed; seeds usually more than 8:—
Flowers in terminal, dense, oblong spikes; procumbent herbs; leaves ovate or oblong:—
Leaves glabrous or puberulous; fertile stamens 2; seeds 20 or more ..... *polysperma.*
Leaves hairy; stamens 4; anthers of posterior pair half as long as those of anterior; seeds 8–10 ..... *Serpyllum.*
Flowers in distinct, axillary whorls; herbs with erect stems, or if stems procumbent, the branches erect:—
Leaves glabrous or glabrate, lanceolate or (rarely) obovate, oblong or elliptic, acute:—
Bracteoles acute, lanceolate; calyx in flower divided half-way down; lobes linear:—
Stems erect; leaves lanceolate ..... *salicifolia.*
Stems geniculate, rooting, the branches erect; leaves obovate-oblong or elliptic ..... *salicifolia* var. *assurgens.*
Bracteoles obtuse, oblong; calyx in flower divided one-third down; lobes lanceolate ..... *quadrivalvis.*
Leaves hairy, elliptic or oblong or obovate; calyx in flower divided half-way down; lobes linear:—
Stems erect; leaves subsessile, elliptic or oblong ..... *phlomoides.*
Stems procumbent or geniculate; leaves shortly petioled, obovate ..... *phlomoides* var. *Roxburghii.*
Spinescent; calyx 4-partite; seeds 4–8; stems erect; flowers in distinct axillary whorls; leaves lanceolate, hispid ..... *spinosa.*

1515. HYGROPHILA POLYSPERMA T. And.; F. B. I. iv. 406.
In most of the provinces.
An annual herb.

1516. HYGROPHILA SERPYLLUM T. And.; F. B. I. iv. 406.
W. Behar.
A perennial herb.

1517. HYGROPHILA SALICIFOLIA Nees; F. B. I. iv. 407; E. D. H. 506.
In all the western and northern provinces.
An erect herb. *Santal.* Mathom arak'.

1517/2. Var. ASSURGENS F. B. I. iv. 407; E. D. H. 506.
E. Bengal.
A prostrate herb.

1518. HYGROPHILA QUADRIVALVIS Nees; F. B. I. iv. 408.
In all the provinces.
An erect herb.

1519. HYGROPHILA PHLOMOIDES Nees; F. B. I. iv. 408. *Ruellia hirsuta* F. I. iii. 51.
N. Bengal; Chittagong.
An erect herb.

1519/2. Var. ROXBURGHII; F. B. I. iv. 408. *Ruellia obovata* F. I. iii. 51.
Sundribuns; Chittagong.
A prostrate herb.

1520. HYGROPHILA SPINOSA T. And.; F. B. I. iv. 408; E. D. H. 508. *Ruellia longifolia* F. I. iii. 50.
In all the provinces.
An erect, spinous herb. *Hind.* Talmakhana, gokhula kanta, kanta kûlika; *Beng.* Kanta kalika, kúliakhara; *Santal.* Gokhula janum.

695. Ruellia Linn.

Herbs or undershrubs; *leaves* opposite, entire. *Flowers* sessile or subsessile, solitary or clustered or racemed; bracts 0; bracteoles large, usually exceeding the calyx. *Sepals* 5, subequal, narrow, acute, more or less connate below. *Petals* 5, connate in an oblique corolla; tube ventricose; lobes subequal, rounded, twisted to the left, spreading in flower. *Stamens* 4, didynamous; filaments glabrous or sometimes hairy at the base; anthers subequal, 2-celled; cells oblong, muticous, glabrous. *Carpels* connate in a glabrous, 2-celled ovary; ovules in each cell 3–10; style linear, hairy; stigma simple. *Fruit* a clavate, cylindric, ellipsoid capsule, solid below, seed-bearing upwards. *Seeds* large, thin, discoid, marginate, overlapping; retinacula large, strong, hooked.

*Inflorescence few-flowered, contracted; capsule markedly clavate, with long barren base; bracteoles large, leafy :— [p. 803]

†Leaves ovate; bracteoles spathulate; flowers pale grey-purple; stems prostrate or rambling; swollen part of corolla-tube twice as long as cylindric base; all parts glabrous or nearly so :— [p. 803]

Leaves subobtuse; nodes of stem short .....*prostrata.*
Leaves often acute; nodes of stem long .....*prostrata* var. *dejecta.*
†Leaves narrowly elliptic; bracteoles elliptic, acute; flowers white; stems erect; swollen part of corolla-tube not longer than cylindric base:— [p. 802]
Leaves tapering from below the middle to an acuminate tip; sepals ·5 in. long; corolla with rose or pinkish-purple marks.....*cernua.*
Leaves widest a little beyond the middle, tip sometimes obtuse, sometimes acute but not acuminate; sepals ·25 in. long; corolla pure white .....*suffruticosa.*
*Inflorescence laxly cymose, many-flowered; capsule linear-oblong, with very short barren base; bracteoles not leafy; swollen part of corolla-tube much exceeding short, cylindric base; flowers blue [p. 802] *tuberosa.*

1521. RUELLIA PROSTRATA Lamk; F. B. I. iv. 411; E. D. R. 633.
Orissa; Chota Nagpur; Behar; W. Bengal.
A much-branched, prostrate undershrub.

1521/2. Var. DEJECTA; F. B. I. iv. 412; E. D. R. 633. *Ruellia ringens* F. I. iii. 44.
In all the provinces except Chittagong.
A diffuse, rambling undershrub.

1522. RUELLIA CERNUA Roxb.; F. I. iii. 45; F. B. I. iv. 413.
Chota Nagpur.
An undershrub with woody rootstock and annual, erect stems.

1523. RUELLIA SUFFRUTICOSA Roxb.; F. I. iii. 53; F. B. I. iv. 413; E. D. R. 635.
Chota Nagpur; Behar; Tirhut; N. Bengal.
An undershrub with woody rootstock and annual stems.
Santal. Chaulia.

1524. RUELLIA TUBEROSA Linn.
C. Bengal, occasionally naturalised.
An undershrub with tuberous rootstock and annual stems. Native of America.

The linear capsule of this species makes it very unlike our native *Ruellias.*

696. Æchmanthera Nees.

Shrubs or undershrubs; *leaves* broad, elliptic, acute, crenate, often viscid. *Flowers* in sessile, close or distant clusters on the branches of a 3-chotomous or 1-sided panicle; bracts linear, as

long as calyx; bracteoles similar, smaller. *Sepals* 5, linear, subequal, connate below. *Petals* 5, connate in an almost straight corolla; tube ventricose, suddenly widened near the middle; palate with 2 hirsute lines within; lobes subequal, rounded, twisted to the left in bud. *Stamens* 4, didynamous, included; longer pair of filaments hairy, the shorter pair glabrous; anthers subsimilar, ovate or oblong, 2-celled; cells muticous; connective sometimes produced. *Carpels* connate in a 2-celled ovary, with densely hairy apex; ovules 4–6 in each cell; style sparsely hairy, thickened upwards; stigma large, simple, linear-lanceolate. *Fruit* a narrow-oblong capsule, seed-bearing throughout. *Seeds* 6–8, sometimes 12, discoid and hirsute or thicker and glabrous; retinacula strong, hooked.

1525. ÆCHMANTHÉRA TOMENTOSA Nees var. WALLICHII; F. B. I. iv. 428; E. D. A. 526.

N. Bengal, Duars; Chittagong.

A small shrub.

697. Hemigraphis Nees.

Herbs or shrubs; *leaves* opposite, toothed or subentire. *Flowers* sessile, in heads or spikes, terminal or pseudo-axillary on shortened branchlets, rarely paniculate, occasionally flowers solitary; bracts large, imbricate, each 1-flowered; bracteoles small, narrow, or obsolete. *Sepals* 5, shortly connate below, subequal, lanceolate or linear. *Petals* 5, connate in an elongated corolla; tube cylindric below, funnel-shaped or swollen above; lobes rounded, subequal, twisted to the left. *Stamens* 4, didynamous, included or nearly so; anthers oblong, 2-celled, muticous, sometimes triangular; bases acute. *Carpels* connate in a 2-celled ovary; ovules 3–8 in each cell; style long; stigma 2-lobed, one lobe linear, the other very short. *Fruit* a linear or linear-oblong capsule, seed-bearing almost from the base. *Seeds* 6–20, compressed, discoid, brown with a white margin.

Corolla-limb ventricose; longer filaments glabrous in their upper half *hirta*.

Corolla-tube narrowly funnel-shaped throughout; longer filaments densely bearded in their upper half:—

Heads looser, hairs less viscidly aromatic ..... *latebrosa*.

Heads denser, hairs more viscidly aromatic ... *latebrosa* var. *rupestris*.

1526. HEMIGRAPHIS HIRTA T. And.; F. B. I. iv. 422. *Ruellia hirta* F. I. iii. 46.
Behar; W. Bengal; C. Bengal.
A hirsute herb.

1527. HEMIGRAPHIS LATEBROSA Nees; F. B. I. iv. 423. *Ruellia pavala* F. I. iii. 47.
Behar; Chota Nagpur.
A diffuse, hirsute herb.

1527/2. Var. RUPESTRIS; F. B. I. iv. 424.
Behar.
A diffuse, viscidly pubescent herb.

698. Petalidium Nees.

Undershrubs, minutely pubescent; *leaves* ovate or narrow-oblong, entire or toothed. *Flowers* solitary, sessile or subsessile, usually crowded on shortened lateral branchlets; bracts 0; bracteoles large, ovate, reticulately veined, ultimately scarious. *Sepals* 5, linear-lanceolate, subequal, connate below, or with the 2 lower connate higher up and the calyx 4-fid. *Petals* 5, connate in a straight corolla; tube swollen from near the base; lobes rounded, twisted to the left in bud, spreading in flower. *Stamens* 4, didynamous; anthers subsimilar, 2-celled; cells parallel, spurred at the base. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style linear; stigma unequally 2-lobed. *Fruit* a clavate capsule, compressed parallel to the septum. *Seeds* 2 or 4, on placentas that separate elastically from the bottom of the capsule, carrying with them the discoid seeds.

1528. PETALIDIUM BARLERIOIDES Nees; F. B. I. iv. 416. *Ruellia bracteata* F. I. iii. 47.
Orissa; Chota Nagpur; Behar.
An undershrub.

699. Phaylopsis Willd.

Perennial prostrate herbs; *leaves* opposite, petioled, ovate, entire or obscurely crenate. *Flowers* in dense, terminal, 1-sided spikes; bracts orbicular, closely imbricate, each usually 3-flowered; bracteoles 0. *Sepals* 5, shortly connate below; one large, ovate, nerved, the others linear, bract-like. *Petals* 5, connate in a small corolla; tube slender, cylindric; lobes slightly unequal, rounded, twisted in bud, spreading in flower. *Stamens* 4, didynamous;

anthers subsimilar, 2-celled; cells parallel, short-oblong, base minutely mucronate. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style long, hairy; stigma simple, linear. *Fruit* a clavate capsule, compressed parallel to the septum. *Seeds* 4, on placentas separating elastically from the base of the capsule, raising with them the compressed, discoid seeds.

1529. PHAYLOPSIS PARVIFLORA Willd.; F. B. I. iv. 417. *Ruellia imbricata* F. I. iii. 48.

In most of the provinces.

A prostrate, much-branched herb.

700. Calophanes D. Don.

Perennial herbs; *leaves* opposite, entire, petioled. *Flowers* in axillary, short cymes or clusters; bracteoles very small, narrow. *Sepals* 5, connate in a tubular calyx; lobes subequal, lanceolate or subulate. *Petals* 5, connate in an obscurely 2-lipped, tubular corolla; lobes obtuse, twisted to the left in bud, spreading in flower. *Stamens* 4, didynamous, perfect; filaments glabrous or hairy; anthers similar, 2-celled; cells oblong, parallel, minutely mucronate or spurred below. *Carpels* connate in a glabrous, 2-celled ovary; ovules 2 in each cell; style linear, hairy; stigma simple, linear. *Fruit* an oblong capsule, narrowed below into a short, solid base. *Seeds* 4, orbicular, much compressed; retinacula strong, curved.

1530. CALOPHANES NAGCHANA Nees; F. B. I. iv. 410.

Behar; W. Bengal.

A prostrate, perennial herb. *Vernac.* Nag-chana.

701. Dædalacanthus T. And.

Perennial herbs or shrubs; *leaves* opposite, petioled, entire or obscurely toothed, lineolate from embedded raphides. *Flowers* in linear, distant or close spikes or heads; bracts usually large; bracteoles linear-lanceolate, rather shorter than calyx. *Sepals* 5 connate in a deeply lobed calyx; lobes narrow, often scarious. *Petals* 5, connate in a slender corolla; tube long, linear, widened at the mouth, or in some species from the middle; lobes ovate, spreading in flower, twisted to the left in bud. *Stamens* 2 glabrous; anthers narrowly oblong, 2-celled, muticous, exserted or almost included. *Carpels* connate in a glabrous ovary; ovules 2 in each cell; style long, sparsely hairy; stigma simple, linear.

Fruit a clavate capsule with a solid, cylindric base. *Seeds* normally 4, compressed, discoid; retinacula acute.

Spikes interrupted, narrow-linear, forming large terminal panicles; bracts obtuse ..... *strictus.*
Spikes short, uninterrupted, oblong:—
Spikes forming a close, terminal panicle; bracts elliptic, subobtuse or shortly acuminate, not ciliate ..... *nervosus.*
Spikes solitary; bracts ovate, much acuminate, ciliate ... *purpurascens.*

1531. DÆDALACANTHUS STRICTUS T. And.; F. B. I. iv. 419.
Chittagong; Tippera.
A stoutish herb, 1–3 feet high.

1532. DÆDALACANTHUS NERVOSUS T. And.; F. B. I. iv. 418; E. D. D. 4.
Tirhut; N. Bengal; Chota Nagpur; Sundribuns.
A stoutish herb, 2–6 feet high.

1533. DÆDALACANTHUS PURPURASCENS T. And.; F. B. I. iv. 420; E. D. D. 5. *Eranthemum pulchellum* F. I. iii. 111.
Behar; Chota Nagpur.
A stoutish herb, 2–4 feet high. *Hind.* Gulsham; *Beng.* Kalla-jati.

702. Strobilanthes Bl.

Shrubs or herbs; *leaves* opposite, often unequal, toothed or subentire, often with raphides. *Flowers* capitate, or in strobilate or interrupted spikes, or panicled, sessile or sometimes pedicelled; bracts and bracteoles large or small or 0, persistent or caducous. *Sepals* 5, connate in a deeply, subequally 5-fid, or sometimes 2-lipped calyx, with one lip shortly 3-toothed. *Petals* 5, connate in a straight or curved corolla; tube somewhat swollen; lobes 5, round or ovate, subequal, twisted in bud. *Stamens* 4, didynamous; anthers oblong, 2-celled, muticous. *Disk* small or elongated as a stipe to the ovary. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style linear; stigma of one long, linear arm, the other arm obsolete. *Fruit* a 2- or 4-seeded capsule. *Seeds* much compressed, glabrous or hairy; retinacula strong, curved; placentas sometimes separating elastically from the base, carrying the seeds with them.

Calyx 2-lipped to the base, one lip shortly 2-fid, the other shortly 3-fid; spikes dense, strobilate, hirsute; corolla pale-purple [p. 808]
rufescens var. *rubiginosa.*

*Calyx deeply, subequally 5-fid :— [p. 807]
Corolla yellow, hairy within ; spikes very short ; leaves elliptic or obovate, acuminate, scabrous :—
Seeds discoid, with large, glabrous areoles and numerous fine hairs near the margins ..... *scaber.*
Seeds ovate, with small, glabrous areoles, elsewhere densely hairy on all sides..... *durus.*
Corolla pale-purple :—
Leaves hairy, sessile, auriculate, serrulate ; spikes mostly terminal, linear-oblong, closely velvety ; bracts obtuse ; bracteoles 0 :—
Bracts and calyx closely velvety..... *auriculatus.*
Bracts and calyx with long, white, spreading hairs *auriculatus* var. *Edgeworthii.*
Leaves nearly glabrous, petioled, cuneate, subentire ; spikes axillary, sessile, lax, scarcely interrupted ; bracts linear-acuminate ; bracteoles cuspidate ..... *macrostegius.*

1534. STROBILANTHES RUFESCENS T. And. var. RUBIGINOSA F. B. I. iv. 430. *Ruellia comosa* F. I. iii. 43.
Chittagong.
A shrub.

1535. STROBILANTHES SCABER Nees ; F. B. I. iv. 446.
N. Bengal ; E. Bengal.
A herb.

1536. STROBILANTHES DURUS T. And. ; F. B. I. iv. 447. *S. phyllostachyus* var. *dura* F. B. I. iv. 446.
Chittagong.
A herb.

1537. STROBILANTHES AURICULATUS Nees ; F. B. I. iv. 453 ; E. D. S. 2923.
Chota Nagpur.
A shrub. *Santal.* Gadakalha, harna pakor.

1537/2. Var. EDGEWORTHII ; F. B. I. iv. 453.
N. Bengal ; Chota Nagpur.
A shrub.

1538. STROBILANTHES MACROSTEGIUS Clarke ; F. B. I. iv. 456 *S. Neesii* F. B. I. iv. 476.
Chittagong.
A large shrub.

703. Andrographis Wall.

Annual, erect, or procumbent herbs or small shrubs; *leaves* entire. *Flowers* in lax, often panicled, or dense and subcapitate, axillary and terminal racemes, sometimes reduced and 1-flowered, often unilateral; bracts small; bracteoles minute or obsolete. *Sepals* 5, narrow, shortly connate below. *Petals* 5, connate in a small, tubular, 2-lipped corolla, white or pink, with dark purple lower lip, pubescent. *Stamens* 2; filaments ciliate or setulose; anthers 2-celled, exserted; cells oblong, parallel, subequal, muticous, bearded at base. *Carpels* connate in a 2-celled, sparingly hairy ovary; ovules 3–6 in each cell; style slender; stigma shortly 2-lobed. *Fruit* an oblong-linear or elliptic capsule, compressed at right angles to septum. *Seeds* 6–12, hard, subquadrate or oblong, rugosely pitted, glabrous; retinacula lanceolate.

Capsule nearly glabrous, linear; leaves lanceolate, glabrous; racemes laxly panicled; pedicels distinct ..... *paniculata.*
Capsule hairy, elliptic; leaves oblong or subelliptic, hairy; racemes axillary; pedicels very short ..... *echioides.*

1539. Andrographis paniculata Nees; F. B. I. iv. 501; E. D. A. 1064. *Justicia paniculata* F. I. i. 117.
In all the provinces.
An erect annual. *Hind.* Kiryat, charayetah, mahatita; *Beng.* Mahatita, kálmegh.

1540. Andrographis echioides Nees; F. B. I. iv. 505. *Justicia echioides* F. I. i. 118.
Chota Nagpur; Behar; W. Bengal.
An annual herb.

704. Gymnostachyum Nees.

Herbs or undershrubs; *leaves* cauline or subradical, entire, ...ate, crenulate or toothed. *Flowers* in axillary cymes or in a ...minal panicle, often spicate or racemose, sometimes small, ...illary, subsessile or shortly pedicelled; bracts and bracteoles ...sually very small. *Sepals* 5, connate in a small, deeply divided ...lyx; lobes equal, linear-lanceolate. *Petals* 5, connate in a ...ender, 2-lipped corolla; tube narrow, cylindric; lobes subequal, elliptic-quadrate, imbricate. *Stamens* 2, nearly as long as corolla; filaments usually hairy, at least near base; anther-cells 2, sub-

equal, oblong or ovate, hairy or glabrous. *Carpels* connate in a pubescent, 2-celled ovary; ovules numerous in each cell; style slender; stigma subentire. *Fruit* a linear, pubescent or glabrous capsule. *Seeds* 16–24, ovoid, compressed, hirsute; retinacula acute.

1541. GYMNOSTACHYUM LISTERI Prain.
Chittagong.
A small undershrub, on rocky hills.

705. Phlogacanthus Nees.

Large herbs or shrubs; *leaves* entire or faintly crenate. *Flowers* in terminal thyrses or narrow panicles, rarely in axillary racemes or cymes; bracts small; bracteoles 0. *Sepals* 5, connate in a deeply lobed calyx; segments very narrow. *Petals* 5, connate in a curved corolla; tube narrowly funnel-shaped; limb more or less 2-lipped; lobes ovate or oblong, connivent, spreading or recurved in flower, imbricate in bud. *Stamens* 2, with occasionally 2 additional rudimentary; anthers 2-celled, oblong, muticous, glabrous. *Carpels* connate in a 2-celled ovary, usually glabrous; ovules 5–8 in each cell; style filiform; stigma subsimple. *Fruit* an elongated capsule, slightly 4-angled, seed-bearing from the base. *Seeds* lenticular, ovate, glabrous or densely shortly puberulous.

Flowers in dense thyrses; corolla brick-red, nearly 2 in. long, tubular, curved, hardly widened upwards ..... *curviflorus*.
Flowers in terminal, narrow panicles; corolla pink-purple, with usually yellow marks, ·5 in. long or less, abruptly incurved, much widened above *asperulus*.

1542. PHLOGACANTHUS CURVIFLORUS Nees; F. B. I. iv. 511.
Chittagong.
A stoutish undershrub.

1543. PHLOGACANTHUS ASPERULUS Nees; F. B. I. iv. 512. *Justicia vitellina* F. I. i. 115.
Chittagong.
A stoutish undershrub.

706. Crossandra Salisb.

Undershrubs; *leaves* entire or undulate, slightly toothed. *Flowers* sessile, yellow, in linear-oblong spikes; bracts imbricate, leafy; bracteoles linear. *Sepals* 5, ovate, acute, the 2 inner much

smaller, the 2 lower sometimes connate. *Petals* connate in a linear corolla, with unilateral limb; tube incurved; lobes subequal, elliptic, imbricate in bud. *Stamens* 4, didynamous; anthers 1-celled, muticous, with mucronate connective. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style linear; stigma minutely 2-lobed. *Fruit* an oblong, acute capsule. *Seeds* 4, compressed, orbicular, adpressed-lepidote, the scales of many connate hairs.

1544. Crossandra undulæfolia Salisb.; F. B. I. iv. 492. *Ruellia infundibuliformis* F. I. iii. 41.

In gardens, not infrequently. Native of the Deccan.

An undershrub.

707. Barleria Linn.

Armed or unarmed, small shrubs or undershrubs; *leaves* opposite, entire. *Flowers* showy, sessile, solitary or in dense or rather lax spikes; bracts and bracteoles large, leafy, or small or obsolete. *Sepals* 4, in opposite pairs, outer pair much the larger, the anterior sepal often emarginate, 2-lobed, or deeply 2-fid. *Petals* 5, connate in a funnel-shaped corolla; tube long or very long; lobes 5, subequal, ovate or elliptic, imbricate in bud. *Stamens* 2, perfect, with oblong, 2-celled anthers, usually 2 small, rudimentary stamens also present, occasionally with a little pollen in their cells, often a rudimentary fifth stamen added. *Disk* large, cupular, half-embracing the ovary, its margin often toothed. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style long; stigma 2-fid or subentire. *Fruit* an ovoid or oblong capsule, with 2 or 4 seeds below the middle. *Seeds* compressed, ovate, beset with wavy, silky, usually closely adpressed hairs.

Prickly bush; flowers yellow; capsule ovoid with a solid beak; seeds 2, close to the base ..... *Prionitis.*

Unarmed bushes; flowers blue or white; capsule oblong or narrow, ellipsoid; seeds 4, or if (occasionally) 2, then near the middle:—

Bracteoles 2 (bract 0), very long, linear, laxly patent, as long as the two outer, ovate, entire, scarious sepals; flowers white, 2–3 in. long *longiflora.*

Bracteoles 2 (bracts 1–2), shorter than the 2 outer sepals:—

*Outer sepals ovate-acuminate, or lanceolate, subspinescently toothed; bracteoles linear-lanceolate, toothed, much smaller than outer sepals:— [p. 812]

Flowers blue ..... *cristata.*
Flowers white ..... *cristata* var. *dichotoma.*

*Outer sepals ovate, ciliate, denticulate, strigose; bracteoles only slightly shorter than the outer sepals:— [p. 811]

Leaves subabruptly contracted, long decurrent on the petiole, glabrate above ..... *strigosa.*
Leaves gradually cuneate at base, with long hairs on the upper surface ..... *polytricha.*

1545. Barleria Prionitis Linn.; F. I. iii. 36; F. B. I. iv. 482; E. D. B. 171.
In all the western provinces.
A spinescent bush, 2–5 feet high. *Hind.* Katsareya; *Beng.* Kánta játi; *Uriya* Dasa karantod.

1546. Barleria longiflora Linn. f.; F. I. iii. 40; F. B. I. iv. 485; E. D. B. 168.
Orissa.
A shrub, 2–4 feet high.

1547. Barleria cristata Linn.; F. I. iii. 37; F. B. I. iv. 488; E. D. B. 165. *B. ciliata* F. I. iii. 38.
In every province, as is the variety.
An erect undershrub. *Beng.* Jati.

1547/2. Var. dichotoma. *B. dichotoma* F. I. iii. 39.
An erect or diffuse undershrub. *Beng.* Sada-jati.

1548. Barleria strigosa Willd.; F. I. iii. 39; F. B. I. iv. 489; E. D. B. 175.
Orissa; Chota Nagpur; N. Bengal.
A small shrub, 2–4 feet high. *Beng.* Dasi; *Santal.* Raila baha.

1549. Barleria polytricha Wall.; F. B. I. iv. 490.
Chittagong.
A small shrub, 2–4 feet high.

708. Asystasia Bl.

Herbs or undershrubs; *leaves* entire, opposite. *Flowers* opposite or alternate, usually solitary, in lax or dense, 1-sided or sub-erect, simple or compound spikes or racemes; bracts and bracteoles linear, shorter than the calyx. *Sepals* 5, connate below, equal, linear or sublanceolate. *Petals* 5, connate in a straight or incurved corolla; tube short or long, narrow or swollen or funnel-shaped; lobes subequal, imbricate in bud. *Stamens* 4, perfect, didynamous,

subequal; anthers oblong; cells parallel, approximate, base minutely spurred or submuticous. *Carpels* connate in a hirsute, 2-celled ovary; ovules 2 in each cell; style linear; stigma minutely 2-fid or subcapitate. *Fruit* an elliptic capsule with contracted, solid base. *Seeds* 4, compressed, orbicular or somewhat angular, glabrous, rugose or tubercled.

Racemes lax, few-flowered, puberulous; leaves ovate, rounded, or sometimes cuneate at base; perennial herbs; cylindric base of capsule ·3 in. long.....*gangetica.*
Racemes condensed, one-sided, less often lax, very pubescent; leaves oblong or elliptic, narrowed to both ends; undershrubs; cylindric base of capsule ·6 in. long .....*macrocarpa.*

1550. ASYSTASIA GANGETICA T. And. *A. coromandeliana* F. B. I. iv. 493. *Ruellia zeylanica* F. I. iii. 42.
Orissa, borders of Chilka lake; C. Bengal, banks of Ganges.
A procumbent, perennial weed; flowers in our provinces always blue, with pale (almost white) tube.

1551. ASYSTASIA MACROCARPA Nees; F. B. I. iv. 495.
N. Bengal, Duars.
A diffuse, rambling undershrub, flowers pink.

709. Eranthemum Linn.

Glabrous shrubs or undershrubs; *leaves* entire, rarely wide-toothed. *Flowers* subsessile, solitary or ternate in the axils of opposite bracts, or in terminal, dense or interrupted, simple or branched spikes, or pedicelled, ternate at the tips of axillary peduncles. *Sepals* 5, connate in a 5-fid or 5-partite calyx; lobes short, narrow, subequal. *Petals* 5, connate in a long corolla, with narrow, cylindric tube, rarely widened at the throat; lobes of limb spreading, flat, subequal, or the 2 upper inner, narrower. *Stamens* 2, fertile, with usually 2 posterior, small clavate staminodes; anthers ovate or oblong; cells 2, equal, parallel, discrete; connective widened. *Disk* annular or shortly cup-shaped. *Carpels* connate in a 2-celled ovary, usually glabrous; ovules 2 in each cell; style filiform; stigma entire or shortly 2-lobed. *Fruit* an oblong capsule, contracted below in a long stipe. *Seeds* normally 4, compressed, orbicular or subquadrate, smooth or rugose; retinacula acute.

Corolla pale-purple :—
Capsule pubescent.....*palatiferum.*
Capsule glabrate .....*palatiferum* var. *levicapsa.*
Corolla white .....*album.*

1552. ERANTHEMUM PALATIFERUM Nees ; F. B. I. iv. 498.
N. Bengal.
A perennial undershrub.

1552/2. Var. LEVICAPSA ; F. B. I. iv. 498.
Chittagong.
A perennial undershrub.

1553. ERANTHEMUM ALBUM Nees ; F. B. I. iv. 498. *Justicia alba* F. I. i. 116.
Chittagong.
A perennial undershrub.

710. Codonacanthus Nees.

Erect or ascending, glabrous herbs ; *leaves* membranous, entire. *Flowers* small, in pairs along one side of the rachis of simple or branched racemes ; pedicels short ; bracts and bracteoles minute. *Sepals* 5, somewhat connate below, short, narrow, subequal. *Petals* 5, connate in a short, obliquely campanulate, incurved corolla ; lobes flat, obovate or oblong, subequal, imbricate in bud. *Stamens* 2 perfect, with 2 short, clavate, posterior staminodes ; filaments adnate to middle of corolla-tube ; anthers 2-celled ; cells ovate, attached by their middle to a very small connective. *Disk* obscure. *Carpels* connate in a 2-celled ovary ; ovules 2 in each cell ; style filiform ; stigma capitate. *Fruit* an oblong capsule, contracted below in a long, solid stipe. *Seeds* normally 4, compressed, suborbicular, smooth, shining.

1554. CODONACANTHUS PAUCIFLORUS Nees ; F. B. I. iv. 500.
Chittagong.
An erect, gregarious herb.

711. Lepidagathis Willd.

Herbs or undershrubs, often pubescent ; *leaves* entire or crenate serrate. *Flowers* sessile, usually capitate, sometimes opposite and solitary ; heads terminal or axillary, almost always dense usually 1-sided, often fascicled ; bracts usually conspicuous, rarely small ; bracteoles smaller than bracts. *Sepals* connate in a deeply 5-lobed calyx, the lobes unequal, the 2 anterior often more or less

connate, and the calyx almost 4-partite. *Petals* 5, connate in a small, 2-lipped corolla; tube slender below, suddenly swollen in the middle; lower lip 3-lobed, spreading, often spotted. *Stamens* 4, didynamous; anthers 2-celled; cells oblong, muticous, parallel, or one lower, somewhat divergent. *Disk* annular. *Carpels* connate in a 2-celled ovary; ovules 2, rarely 1 in each cell; style recurved; stigma capitellate, shortly 2-lobed or entire. *Fruit* an elongated, conic, or oblong capsule. *Seeds* 4 or 2, compressed, ovate-oblong or orbicular, hairy.

Capsule 2-seeded, long-conical, scarious on the back, thin and irregularly rupturing; seeds long, ovate, with long hairs:—
Calyx-lobes lanceolate, spinescent ..... *Hamiltoniana.*
Calyx-lobes not spinescent ..... *trinervis.*
Capsule 4-seeded, oblong, early 2-valved from apex; seeds short, ovate or orbicular, with short hairs:—
Leaves entire or undulate, margined:—
Bracts striate ..... *purpuricaulis.*
Bracts not striate:—
Leaves more or less pubescent, some at least ovate:—
Lower leaves ovate, upper narrower, minutely viscid-pubescent *hyalina.*
Leaves all ovate, hairy on both sides ..... *hyalina* var. *mollis.*
Leaves glabrate, often shining, all linear-lanceolate *hyalina* var. *semiherbacea.*
Leaves crenate-serrate, margined ..... *fasciculata.*

1555. LEPIDAGATHIS HAMILTONIANA Wall.; F. B. I. iv. 516. *L. cristata* var. *rupestris* E. D. L. 273.
Behar; Chota Nagpur.
A perennial herb. *Santal.* Ot' dhompo.

1556. LEPIDAGATHIS TRINERVIS Nees; F. B. I. iv. 517.
Chota Nagpur.
A perennial herb.

1557. LEPIDAGATHIS PURPURICAULIS Nees; F. B. I. iv. 519.
Chota Nagpur.
A suberect or diffuse, perennial herb.

1558. LEPIDAGATHIS HYALINA Nees; F. B. I. iv. 521. *Ruellia dependens* F. I. iii. 49.
Behar; Chota Nagpur; Chittagong.
A suberect, perennial herb.

1558/2. Var. MOLLIS ; F. B. I. iv. 521.
N. Bengal, Duars ; Tirhut.
A suberect, perennial herb.

1558/3. Var. SEMIHERBACEA ; F. B. I. iv. 521.
N. Bengal, Duars.
A diffuse, perennial herb.

1559. LEPIDAGATHIS FASCICULATA Nees ; F. B. I. iv. 522. *Ruellia fasciculata* F. I. iii. 48.
In all the western and northern provinces.
A diffuse herb.

712. Ecbolium Kurz.

A small, nearly glabrous shrub; *leaves* entire. *Flowers* in dense, terminal spikes ; bracts large, leafy, imbricate, more or less 4-rowed ; bracteoles small, narrow. *Sepals* 5, connate below, narrow, equal. *Petals* 5, connate in a 2-lipped corolla ; tube long, almost filiform ; upper lip narrow, shortly 2-fid ; lower 3-lobed, pendent ; lobes imbricate in bud. *Stamens* 2, adnate near apex of corolla-tube ; anthers 2-celled ; cells oblong, parallel, approximate, muticous. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell ; style filiform ; stigma shortly 2-fid. *Fruit* an ovoid, compressed capsule, narrowed below into a long stipe. *Seeds* 4, or oftener 2, large, compressed, orbicular, tuberculate, scabrid.

1560. ECBOLIUM LINNEANUM Kurz var. DENTATA ; F. B. I. iv. 544. *Justicia Ecbolium* F. I. i. 114.
C. Bengal ; E. Bengal.
A small shrub. *Vernac.* Udu-jati.

713. Justicia Linn.

Herbs or shrubs ; *leaves* entire. *Flowers* sessile or subsessile, spiked or panicled, rarely solitary, usually small ; bracts large or small ; bracteoles narrow or obsolete. *Sepals* 5 or 4, narrow, slightly connate below. *Petals* 5, connate in a 2-lipped corolla ; tube as short as or shorter than the lips ; upper lip 2-lobed or subentire, lower 3-lobed ; lobes imbricate in bud. *Stamens* 2 ; filaments often dilated, hairy near the base ; anthers 2-celled ; cells oblong or round, usually more or less discrete, lower always with a white basal appendage. *Carpels* connate in a 2-celled ovary ; ovules 2 in each cell ; style filiform ; stigma shortly 2-fid. *Fruit* an ovoid or ellipsoid capsule, sometimes seed-bearing from

the base, sometimes contracted below in a cylindric, elongated stipe. *Seeds* 4, ovoid, more or less compressed, tuberculate, lepidote or glochidiate.

Calyx 5-partite; segments equal or nearly so; corolla ·5 in. long or longer; shrubs:—

Spikes continuous; bracts large, ovate or elliptic, 4-ranked, imbricate, longer than the calyx:—

Bracts white, green-nerved:—

Stems erect:—

Branches glabrous; leaves puberulous; flowers white, rose-spotted ..... *Betonica.*

Branches softly hairy; leaves hairy beneath; flowers salmon-coloured ..... *Betonica* var. *villosa.*

Stems decumbent, diffuse; flowers white, rose-spotted *Betonica* var. *ramosissima.*

Bracts green, purple-tinged; flowers white, rose-spotted ... *oreophila.*

Spikes interrupted; bracts linear, shorter than the calyx... *Gendarussa.*

Calyx sub-4-partite (fifth segment if present much smaller than the other four); corolla ·25 in. long or less; prostrate herbs:—

Leaves linear or linear-lanceolate, sessile or nearly so; bracteoles and sepals linear-oblong, obtuse, glabrous..... *quinqueangularis.*

Leaves elliptic, oblong or ovate, petioled:—

Bracteoles and sepals linear-oblong, obtuse, glabrous *quinqueangularis* var. *peploides.*

Bracteoles and sepals lanceolate, acute:—

Sepals minutely scabrous near the tips, elsewhere glabrous:—

Leaves cuneate at base, sparsely hairy..... *diffusa.*

Leaves rounded at base, closely hairy beneath *diffusa* var. *orbiculata.*

Sepals hirsute, with white hairs nearly to their bases:—

Leaves ·75–1 in. wide; spikes more than 1 in. long..... *simplex.*

Leaves ·3 in. wide; spikes less than 1 in. long *simplex* var. *serpyllifolia.*

1561. JUSTICIA BETONICA Linn.; F. I. i. 128; F. B. I. iv. 525.
In most of the provinces, but often cultivated.
An erect shrub.

1561/2. Var. VILLOSA; F. B. I. iv. 525.
Chota Nagpur.
An erect shrub.

1561/3. Var. RAMOSISSIMA; F. B. I. iv. 525. *J. ramosissima* F. I. i. 129.

In most of the provinces.
A diffuse, decumbent undershrub.

1562. JUSTICIA OREOPHILA C. B. Clarke; F. B. I. iv. 526.
Chittagong.
An erect shrub.

1563. JUSTICIA GENDARUSSA Linn. f.; F. I. i. 128; F. B. I. iv. 532; E. D. I. 116.
In all the provinces.
An erect shrub. *Hind.* Udi-sanbhálú, nili-nargandi; *Beng.* Jagat-madan.

1564. JUSTICIA QUINQUANGULARIS Koen.; F. I. i. 133; F. B. I. iv. 536.
Behar; W. Bengal; Chota Nagpur.
A prostrate herb.

1564/2. Var. PEPLOIDES; F. B. I. iv. 537.
Behar; C. Bengal; E. Bengal.
A prostrate herb.

1565. JUSTICIA DIFFUSA Willd.; F. B. I. iv. 538. *J. procumbens* F. I. i. 132; E. D. J. 120.
Chota Nagpur; Behar.
A diffuse herb.

1565/2. Var. ORBICULATA; F. B. I. iv. 538.
Chota Nagpur.
A diffuse herb.

1566. JUSTICIA SIMPLEX Don; F. B. I. iv. 539.
In most of the provinces.
A prostrate herb.

1566/2. Var. SERPYLLIFOLIA; F. B. I. iv. 539.
Chota Nagpur.
A small, prostrate herb.

714. Adhatoda Nees.

Tall shrubs; *leaves* entire. *Flowers* subsessile, several in the axils of opposite bracts, in dense, oblong thyrses at the ends of branches or fascicled in the upper axils; bracts herbaceous, oblong, longer than calyx; bracteoles similar, nearly as large as bracts. *Sepals* 5, connate in a shortly campanulate calyx; lobes lanceolate, the 2 lowest subconnate. *Petals* 5, connate in a 2-lipped corolla; tube short; upper lip galeate, subentire, lower spreading, recurved, 3-lobed; lobes imbricate. *Stamens* 2, adnate

near top of corolla-tube; anthers 2-celled; cells acute, minutely apiculate, hardly spurred. *Disk* cup-like. *Carpels* connate in a short, 2-celled ovary, usually tomentose; ovules 2 in each cell; style filiform, subclavate above; stigma entire. *Fruit* an oblong, clavate capsule, contracted below in a long, solid stipe. *Seeds* usually 1 or 2, suborbicular, compressed, rugose.

1567. Adhatoda Vasica Nees; F. B. I. iv. 540; E. D. A. 484. *Justicia Adhatoda* F. I. i. 126.

In all the provinces.

A dense shrub, 4–8 feet high, frequent in village shrubberies. *Hind.* Arusha, adhasa; *Beng.* Bakás, vásaka.

715. Rhinacanthus Nees.

Shrubs, sometimes subscandent; *leaves* entire. *Flowers* solitary or in small cymes, sessile, in dense or divaricate panicles; bracts and bracteoles small, similar, linear-lanceolate. *Sepals* 5, connate below in a small calyx; lobes linear-lanceolate. *Petals* 5, connate in a 2-lipped corolla; tube long, narrow, cylindric, hardly widened above; upper lip lanceolate, acuminate, entire or shortly 2-lobed, twisted or recurved; lower lip wide, 3-lobed. *Stamens* 2, adnate near top of corolla-tube; anthers 2-celled; cells superposed, muticous. *Disk* cup-like. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style filiform; stigma minutely 2-fid. *Fruit* a clavate capsule, contracted in a long, solid, cylindric stipe. *Seeds* 4, ovoid, somewhat compressed, glabrous, obscurely rugose or tuberculate.

Corolla-tube not exceeding an inch; panicle large, lax; calyx densely pubescent ..... *communis.*
Corolla-tube exceeding an inch; panicle rather dense; calyx nearly glabrous ..... *calcaratus.*

1568. Rhinacanthus communis Nees; F. B. I. iv. 541; E. D. B. 231. *Justicia nasuta* F. I. i. 120.

Cultivated in Orissa; Chota Nagpur; W. Bengal; C. Bengal; E. Bengal.

A small shrub. *Vernac.* Palak-jui, júi-pana.

1569. Rhinacanthus calcaratus Nees; F. B. I. iv. 541.

Chittagong.

A shrub.

716. Peristrophe Nees.

Erect, spreading herbs; *leaves* entire. *Flowers* in axillary or terminal clusters, often panicled from reduction of floral leaves; bracts 1–4 together, linear or ovate, usually longer than calyx; bracteoles linear-lanceolate, shorter than bracts. *Sepals* 5, connate below in a deeply lobed calyx; lobes equal, linear-lanceolate. *Petals* 5, connate in a 2-lipped corolla; tube slender; upper lip subentire, lower shortly 3-lobed. *Stamens* 2; filaments pubescent below; anthers 2-celled, linear or rarely ovoid; one muticous higher than the other or distant. *Disk* cup-like. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style filiform; stigma minutely 2-fid. *Fruit* an ellipsoid, stipitate capsule, usually 4-seeded, more or less pubescent. *Seeds* ovoid, compressed, glabrous, minutely glandular-papillose.

Corolla under ·5 in. long; bracts linear or linear-spathulate, acute, mucronate ..... *bicalyculata.*
Corolla over 1 in. long; bracts elliptic:—
Bracts dusky-puberulous, not ciliate ..... *tinctoria.*
Bracts hairy, ciliate ..... *fera* var. *intermedia.*

1570. Peristrophe bicalyculata Nees; F. B. I. iv. 554; E. D. P. 425. *Justicia bicalyculata* F. I. i. 126.
Chota Nagpur; Behar; W. Bengal; E. Bengal, Mymensingh.
A spreading herb. *Hind.* Atrilal; *Beng.* Nasa bhaga; *Santal.* Bange khode baha.

1571. Peristrophe tinctoria Nees; F. B. I. iv. 556; E. D. P. 427. *Justicia tinctoria* F. I. i. 123.
Cultivated.
An erect herb. *Beng.* Bet-ráng, bhatia-rang.

1572. Peristrophe fera C. B. Clarke var. intermedia; F. B. I. iv. 557.
Chittagong.
An erect herb.

717. Rungia Nees.

Erect or diffuse herbs or shrubs; *leaves* entire. *Flowers* in dense terminal or axillary, 1-sided spikes; bracts 2-rowed or 4-rowed, with 2 of the rows often flowerless, flowering bracts often with scarious margins; bracteoles like bracts or narrower. *Sepals*

connate in a small, deeply 5-lobed calyx; segments linear-lanceolate. *Petals* 5, connate in a small white or blueish 2-lipped corolla; upper lip emarginate, lower longer, 3-lobed. *Stamens* 2; anthers 2-celled; cells parallel, subequal, or oftener somewhat superposed, the lower cell muticous or with a white, basal appendage. *Disk* annular or shortly cupular. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style filiform; stigma minutely 2-fid. *Fruit* an ovoid or oblong, shortly stipitate capsule; placentas with retinacula elastically separating from base of capsule after dehiscence to scatter the seeds. *Seeds* 4, compressed, orbicular, glabrous, minutely or strongly concentrically verrucose.

Leaves all subsessile, scabrid, puberulous; bracts round, apiculate, uniform; bracteoles linear-lanceolate; spikes only imperfectly 1-sided; corolla white, with rose or purple spots ..... *repens.*
Leaves near base petioled, all nearly glabrous; bracts dimorphic, fertile ones obovate, ciliate; bracteoles elliptic, scarcely acute; spikes markedly 1-sided; corolla blueish or white, without spots:—
Barren bracts muconate, often cuspidate, fertile ones hairy, smaller than the others..... *pauiflora* var. *pectinata.*
Barren bracts ovate, acute, fertile ones nearly as large as the others; spikes very dense ..... *parviflora* var. *muralis.*

1573. RUNGIA REPENS Nees; F. B. I. iv. 549; E. D. R. 660. *Justicia repens* F. I. i. 132.
Behar; W. Bengal.
A procumbent, diffuse, branching weed.

1574. RUNGIA PARVIFLORA Nees var. PECTINATA; F. B. I. iv. 550; E. D. R. 656. *Justicia pectinata* F. I. i. 133.
In all the provinces.
A diffuse, procumbent, branching weed. *Santal.* Bir lopong arak'.

1574/2. Var. MURALIS; F. B. I. iv. 550.
Chittagong.
A small, branching weed.

718. Dicliptera Juss.

Diffuse herbs; *leaves* ovate, acute, entire or obscurely undulate. *Flowers* sessile, opposite, one of each pair usually reduced to a rudimentary calyx and bracteoles, in clustered or paniculate

cymes; bracts proper opposite, unequal, exceeding the calyx; bracteoles linear or linear-lanceolate, as long as calyx. *Sepals* 5, connate below in a short calyx-tube; lobes equal, linear-lanceolate, more or less pubescent. *Petals* 5, connate in a red or rose-pink corolla, with purple spots; tube slender; upper lip entire or emarginate; lower lip 3-lobed, recurved. *Stamens* 2; anthers 2-celled, superposed, muticous. *Disk* cup-like. *Carpels* connate in a 2-celled ovary; ovules 2 in each cell; style filiform; stigma shortly 2-fid. *Fruit* a clavate capsule, narrowed below into a solid stipe; placentas elastically separating from their base. *Seeds* ovoid, compressed, glabrous, verrucose or subpapillose-glandular.

Corolla under ·25 in. long; flowers mostly in axillary clusters; bracts glabrous except the ciliate margins; leaves ovate, acuminate *micranthes.*

Corolla ·75 in. long; flowers in terminal as well as axillary clusters; bracts thinly pubescent as well as ciliate; leaves elliptic, acute:—

Bracts obovate or cuneate, elliptic, apiculate, not acuminate *Roxburghiana.*

Bracts linear or linear-oblong, with nearly parallel margins, acuminate-cuspidate..... *Roxburghiana* var. *bupleuroides.*

1575. Dicliptera micranthes Nees; F. B. I. iv. 553.
Behar; Chota Nagpur.
A diffuse herb.

1576. Dicliptera Roxburghiana Nees; F. B. I. iv. 553; E. D. D. 410.
In all the provinces.
A herb, 1–3 feet high.

1576/2. Var. bupleuroides; F. B. I. iv. 554; E. D. D. 411.
Chittagong.
A herb, 2–3 feet high.

Order XCIX. VERBENACEÆ.

Herbs, shrubs, or trees. *Leaves* opposite or whorled; simple or digitate, very rarely pinnate; stipules 0. *Flowers* hermaphrodite or, by abortion, polygamous, almost always irregular, in cymes, racemes, or spikes, simple or, especially if cymose, compound; bracts various. *Sepals* connate in a 5- or 4-, very rarely 6–8-toothed, persistent calyx. *Petals* connate in a tubular corolla,

with a 2-lipped or subequally 5-lobed limb, occasionally lobes more than 5. *Stamens* 4, didynamous, rarely 2, very rarely 5 or 6; anthers 2-celled, distinct or rarely confluent at apex; dehiscence longitudinal. *Carpels* 2, connate in a superior, 2–4-celled, very rarely 8-celled or almost 1-celled ovary, entire or 4-lobed; ovules very variously attached, two or solitary in each cell; style terminal; stigma entire, rarely 2- or more-lobed. *Fruit* a drupe, rarely subcapsular, 2–4- or 1-celled; cells 1-seeded. *Seed* erect or pendulous; albumen 0.

Inflorescence with the lowest flowers opening first :—
  Inflorescence of dense spikes :—
    Fruit with two or one 1-seeded pyrenes :—
      Spikes capitate, ovoid or cylindric; calyx small; stamens 4; usually shrubs or undershrubs :—
        Fruit succulent or leathery, not dehiscing ..... **Lantana.**
        Fruit dry, partially dehiscent, one species herbaceous ... **Lippia.**
      Spikes long, slender; calyx long, tubular; perfect stamens 2; herbs ..... **Stachytarpheta.**
    Fruit with four 1-seeded pyrenes; calyx tubular; herbs ... **Verbena.**
  Inflorescence racemose; fruit fleshy, with two 2-seeded pyrenes **Duranta.**

Inflorescence cymose, centrifugal :—
  *Cymes lax, paniculate; trees or shrubs :— [p. 824]
    Fruit indehiscent, containing one or four pyrenes :—
      Corolla regular; stamens isomerous, equal; leaves simple :—
        Calyx small, unaltered in fruit; corolla purple or red; drupe with four 1-seeded pyrenes ..... **Callicarpa.**
        Calyx accrescent in fruit; corolla white; drupe with one 4-celled pyrene ..... **Tectona.**
      Corolla 2-lipped; stamens didynamous :—
        Drupe with one 4-celled pyrene :—
          Leaves simple, entire or toothed :—
            Flowers large, an inch long ..... **Gmelina.**
            Flowers small ..... **Premna.**
          Leaves digitate ..... **Vitex.**
        Drupe with four 1-seeded pyrenes; leaves simple :—
          Calyx campanulate or tubular or suburceolate, truncate, 5-toothed or deeply 5-fid ..... **Clerodendron.**
          Calyx rotate, widely patent, entire or obscurely 5-lobed **Holmskioldia.**
    Fruit breaking up into four valves, with one pyrene attached to

each; trees or shrubs; leaves simple; cymes axillary, dense or thyrsoid .....**Caryopteris.**

*Cymes densely capitate:— [p. 823]

Cymes 3–9-flowered; bracts of flower-head large, forming an involucre; fruit small, nearly dry; large climbers:—

Bracts 6:—

Calyx 3–8-toothed; corolla-lobes 6–16; stamens 6–16, much exserted .....**Symphorema.**

Calyx 5-toothed; corolla-lobes 5, rarely 6; stamens 5, little or not at all exserted .....**Sphenodes**

Bracts 3–4; corolla distinctly 2-lipped .....**Con**

Cymes many-flowered, densely capitate; bracts shorter than calyx; calyx 5-partite; segments concave, much imbricated; fruit rather fleshy, partially dehiscent; shrubs.....**Avicennia.**

719. Lantana Linn.

Rambling or scandent, pubescent or glabrous shrubs; branches 4-angled, sometimes prickly; *leaves* opposite, simple, petioled, crenate, often rugose. *Flowers* in peduncled, capitate, ovoid or cylindric spikes; bracts conspicuous, longer than the calyx; bracteoles 0. *Sepals* connate in a small, membranous, truncate or sinuately 4–5-toothed calyx. *Petals* 4 or 5, connate in a cylindric corolla with slender tube; lobes of limb spreading. *Stamens* 4, didynamous, included; anthers broadly oblong. *Carpels* connate in a 2-celled ovary; ovules solitary in each cell, erect from base or attached laterally close to base of cell; style short; stigma oblique, subcapitate. *Fruit* a fleshy or nearly dry drupe, with 2 bony, 1-celled pyrenes. *Seeds* without albumen; radicle inferior.

Stems not prickly; erect shrubs:—

Leaves usually opposite, sometimes ternate; branches, at least below adpressed scabrid-pubescent.....*indica*

Leaves usually ternate, sometimes opposite; branches patently hairy throughout.....*trifo*

Stems armed with recurved prickles .....*Camara*

1577. Lantana indica Roxb.; F. I. iii. 89; F. B. I. iv. 562.

In most of the provinces.

A shrub, 3–8 feet high.

1578. Lantana trifolia Linn.; F. B. I. iv. 563.

E. Bengal, Barisal; Chittagong: naturalised, native of America.

A small shrub.

1579. LANTANA CAMARA Linn.; F. B. I. iv. 562; E. D. L. 74.
In the central and eastern provinces frequently, in the western parts only occasionally naturalised.
A large climbing shrub.

720. Lippia Linn.

Shrubs or undershrubs, rarely herbs; *leaves* opposite or ternately whorled, rarely alternate, simple, entire or lobed, smooth or rugose. *Flowers* in elongated, slender, or dense spikes, or in small heads; bracts in slender spikes small, in dense spikes or heads conspicuous, wide-imbricate; bracteoles 0. *Sepals* connate in a small, membranous, ovoid, campanulate or compressed and 2-ridged calyx; limb 2-fid or 4-fid or 4-toothed. *Petals* 4–5, connate in a somewhat 2-lipped corolla; tube cylindric, straight or curved; limb oblique, upper lobe wider, emarginate or slightly 2-lobed, lower lobes wide, often retuse. *Stamens* 4, didynamous, included; anthers ovate or broadly oblong. *Carpels* connate in a 2-celled ovary; ovules in each cell solitary, erect from the base, or laterally attached near base of cell; style short; stigma obliquely subcapitate. *Fruit* small, dry, separating into two 1-seeded pyrenes. *Seeds* without albumen; radicle inferior.

Annual, creeping, minutely hairy; leaves cuneate-spathulate, serrate; peduncles rarely opposite; bracts obovate, acute.....*nodiflora*.
Perennial, erect, softly strigose; leaves ovate-oblong, crenate; peduncles mostly opposite; bracts ovate-acuminate.....*geminata*.

1580. LIPPIA NODIFLORA Rich.; F. B. I. iv. 563; E. D. L. 451.
In all the provinces.
A prostrate, much-branched herb, often rooting at the nodes. *Hind.* Bhui-okra.

1581. LIPPIA GEMINATA H. B. & K.; F. B. I. iv. 563.
In nearly every province.
A shrub, 3–8 feet high.

721. Stachytarpheta Vahl.

Herbs or shrubs, glabrous or villous; *leaves* opposite or alternate, toothed, often rugose. *Flowers* in terminal spikes, long or short, dense or rather lax, each solitary, sessile, or half-buried in the rachis in the axils of the bracts; bracts small, narrow, adpressed or ovate or lanceolate, imbricate; bracteoles 0. *Sepals*

5, connate in a tubular, membranous or herbaceous, somewhat 5-ribbed calyx; lobes equal or unequal. *Petals* 5, connate in a narrow, oblique corolla; tube cylindric; lobes of limb spreading, equal or unequal, obtuse or retuse. *Stamens* 2, anterior only perfect, adnate to middle of corolla-tube, included; anthers with ovate, vertically divaricate cells; posterior staminodes small. *Carpels* connate in a 2-celled ovary; ovules solitary in each cell, attached laterally near base of cell; style long; stigma terminal, subcapitate. *Fruit* dry, included in the calyx, separating into two hard, 1-seeded pyrenes. *Seed* erect, without albumen.

1582. STACHYTARPHETA INDICA Vahl; F. B. I. iv. 564.

In all the provinces, naturalised; often also cultivated in native gardens.

A herb, 1–2 feet high; native of America.

722. Verbena Linn.

Herbs or undershrubs, usually pubescent; *leaves* opposite or ternate, toothed or pinnatifid. *Flowers* small, in terminal, simple or corymbose spikes; bracts small; bracteoles 0. *Sepals* 5, connate in a tubular, 5-ribbed calyx; lobes short. *Petals* 5, connate in an oblique, somewhat 2-lipped corolla; tube straight or curved; lobes oblong, obtuse or retuse. *Stamens* 4, didynamous, included; anthers ovate, 2-celled; cells subparallel. *Carpels* connate in a more or less 4-lobed ovary, in flower already sometimes 4-locular; ovules 4, laterally attached near base of cell; style short; stigma obscurely 2-lobed. *Fruit* dry, included in the calyx, separating into four oblong pyrenes. *Seeds* erect, albumen none.

1583. VERBENA OFFICINALIS Linn.; F. B. I. iv. 565; E. D. v. 70

In all the provinces.

A weed in waste places.

723. Duranta Jacq.

Glabrous or tomentose shrubs; *leaves* opposite or whorled, toothed or entire. *Flowers* in long terminal, or shorter axillary racemes, alternate on the rachis, short pedicelled in the axils of small bracts; bracteoles 0. *Sepals* connate in a tubular or subcampanulate, truncate or minutely 5-toothed calyx, enlarged in fruit, embracing but free from the drupe, often narrowed at the mouth. *Petals* 5, connate in a short corolla; tube cylindric; limb oblique or not; lobes spreading. *Stamens* 4, didynamous, in-

cluded; anthers oblong; cells parallel. *Carpels* connate in a more or less completely 8-celled ovary; ovules 1 in each cell; style short; stigma oblique, unequally 4-lobed. *Fruit* a succulent drupe, enveloped in the calyx, which is open or closed at the mouth; pyrenes 4, each 2-celled and 2-seeded. *Seeds* small; albumen 0.

1584. DURANTA PLUMIERI Jacq.

In gardens and shrubberies in all the provinces, planted; occasionally also subspontaneous in village thickets in C. Bengal.

A shrub.

724. Callicarpa Linn.

Trees or shrubs; young shoots stellately hairy; *leaves* opposite or ternate, toothed or subentire. *Flowers* in axillary cymes, shorter than the leaves; bracts linear, very minute or obsolete. *Sepals* 4, connate in a very small, campanulate, minutely 4-lobed, campanulate calyx. *Petals* 4, connate in a small, subsymmetric, tubular, purple or red corolla; lobes subquadrate, spreading. *Stamens* 4, equal; anthers exserted, 2-celled, glandular. *Carpels* connate in an imperfectly 2-celled ovary; ovules 2 in each cell; style linear; stigma dilated, obscurely 2-fid. *Fruit* a small, globose drupe; pyrenes 4, or fewer by suppression, 1-seeded. *Seeds* shortly oblong; albumen 0.

Trees; leaves ovate to narrow-oblong, entire, closely, finely tomentose beneath; berries purple, ultimately black ..... *arborea.*

Shrubs; leaves crenate or serrate, rarely subentire, openly, even if densely, stellate-tomentose beneath:—

Berries purple, ultimately black; leaves broadly elliptic, crenate-serrate, densely stellate-tomentose beneath ..... *cana.*

Berries white:—

Leaves ovate or ovate-lanceolate, closely crenate, densely, persistently stellate-tomentose beneath ..... *macrophylla.*

Leaves narrow-lanceolate, serrulate or occasionally subentire, sparsely tomentose and densely, minutely gland-dotted beneath *longifolia* var. *lanceolaria.*

1585. CALLICARPA ARBOREA Roxb.; F. I. i. 390; F. B. I. iv. 567; E. D. C. 123.

Chota Nagpur; Behar; N. Bengal; Tirhut; Chittagong.

A tree, 40 feet high. *Beng.* Bormalla; *Kol.* Búndún; *Santal.* Dum kotokoi; *Uriya* Boropatri.

1586. CALLICARPA CANA Linn.; F. I. i. 392; F. B. I. iv. 568; E.D. C. 126.

Often cultivated; occasionally naturalised in C. Bengal. A large shrub; native of the Malay peninsula. *Beng.* Arusha.

1587. CALLICARPA MACROPHYLLA Vahl; F. I. i. 393; F. B. I. iv. 568; E. D. C. 133. *C. incana* F. I. i. 393.

In all the provinces.

A shrub, 3–8 feet high.

1588. CALLICARPA LONGIFOLIA Lamk var. LANCEOLARIA F. B. I iv. 570; E. D. C. 132. *C. lanceolaria* F. I. i. 395.

C. Bengal; Tippera; Chittagong.

A shrub.

725. Tectona Linn. f.

Trees; stellate-tomentose; *leaves* large, petioled, entire, opposite or whorled. *Flowers* numerous, in dichotomous cymes, disposed in large, terminal panicles; bracts small, narrow. *Sepals* connate in a campanulate, shortly 5–6-lobed calyx, in fruit enlarged, ovoid or urceolate. *Petals* 5–6, connate in a small, short, tubular corolla; limb equally lobed; lobes spreading. *Stamens* 5 or 6, adnate near base of corolla, equal, exserted; anthers oblong. *Carpels* connate in a 4-celled ovary; ovules solitary in each cell; style linear; stigma shortly 2-fid. *Fruit* a 4-celled drupe with a bony endocarp, enclosed in the calyx. *Seeds* erect, oblong; albumen 0.

1589. TECTONA GRANDIS Linn. f.; F. I. i. 600; F. B. I. iv. 570.

Orissa.

A tree, 80–120 feet high. *Vernac.* Sagun, singuru (*Orissa*). The Teak.

726. Gmelina Linn.

Trees or shrubs, unarmed or spinous, shoots usually tomentose; *leaves* opposite, entire, toothed or lobed. *Flowers* large, yellow or brownish, often tomentose, in small or panicled cymes; bracts usually narrow, rarely leafy; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; limb toothed or entire. *Petals* 5, connate in an irregular corolla; tube narrow below, swollen upwards; limb oblique; lobes equal or the 2 upper connate in a lip, and limb 4-fid. *Stamens* 4, didynamous, subexserted; anthers with oblong,

pendulous, more or less discrete cells. *Carpels* connate in a 4-celled ovary; ovules solitary in each cell; style slender; stigma shortly 2-fid. *Fruit* a succulent drupe, with undivided, 4-celled or 2-celled bony endocarp; calyx in fruit persistent. *Seeds* oblong; albumen 0; cotyledons thick.

An unarmed tree; leaves large, ovate-cordate, acute, fulvous-tomentose beneath ..... *arborea.*
A shrub, armed or not; leaves small, ovate or obovate; base not cordate, mature glabrous glaucescent beneath, with a close coating of minute glands ..... *asiatica.*

1590. GMELINA ARBOREA Linn.; F. I. iii. 84; F. B. I. iv. 581; E. D. G. 287.

Chota Nagpur; W. Bengal; C. Bengal; Chittagong.

A tree, 60 feet high. *Hind.* Kumbhar; *Beng.* Gámbár; *Uriya* Gambari; *Kol.* Gumher; *Santal.* Kasmar.

1591. GMELINA ASIATICA Linn.; F. I. iii. 87; F. B. I. iv. 582; E. D. G. 298.

Generally cultivated.

A small shrub. *Vernac.* Badhára.

727. Premna Linn.

Trees or shrubs, sometimes climbing; *leaves* opposite, entire or toothed. *Flowers* cymose, often polygamous, small, greenish or yellowish-white, the cymes corymbose or panicled, sometimes thyrsoid, pubescent; bracts small, narrow; bracteoles 0. *Sepals* 5, connate in a small, cup-shaped calyx; limb subentire or minutely 2–5-toothed, subequal or 2-lipped. *Petals* 5, connate in a small corolla; tube short; throat hairy; limb 2-lipped, 5-lobed, or subequally 4-lobed. *Stamens* 4, didynamous; anthers ovate or rounded; cells parallel or diverging. *Carpels* connate in a 2-celled or 4-celled ovary; ovules 4; style linear; stigma shortly 2-fid. *Fruit* a small drupe, embraced below by the calyx, globose or oblong-obovoid; endocarp hard, undivided, 1–4-celled and 1–4-seeded. *Seeds* oblong; albumen 0.

Calyx truncate or nearly so; leaves entire, glabrous; corymbs large, compound:—
Leaves coriaceous; calyx minutely pubescent ...*coriacea* var. *oblonga.*
Leaves membranous; calyx glabrous ..... *scandens.*
Calyx distinctly toothed or lipped:—

Calyx manifestly 2-lipped, one lip 2-toothed, the other entire :—
Leaves subobtuse, broadly oblong or ovate, undulate or coarsely toothed ; corymbs dense, minutely hairy .....*integrifolia.*
Leaves acute, ovate, entire ; corymbs compound, pubescent *longifolia.*
Calyx 5-, less often 4-toothed, indistinctly 2-lipped or uniform, the calyx-teeth subequal and similar :—
Leaves entire or nearly so, apex always acuminate ; calyx in all 5-toothed ; corymbs large, compound :—
Corymbs stellately pubescent, with no patent hairs ; leaves ovate or narrow-elliptic, entire, stellate-pubescent on the nerves *bengalensis.*
Corymbs simply pubescent :—
Leaves undulate ; calyx patently pubescent or strigose, much enlarged in fruit :—
Leaves at base cordate-ovate, with a small, central, cuneate decurrence along the petiole .....*latifolia.*
Leaves at base cuneate .....*latifolia* var. *mucronata.*
Leaves entire, setulose above, villous beneath, ovate or obovate ; calyx closely pubescent .....*flavescens.*
Leaves, when mature, toothed ; corymbs small, more or less compact :—
Calyx 4-toothed ; leaves ovate-acuminate, rather sparingly toothed ; corymbs somewhat dense, 1–2·5 in. wide .....*barbata.*
Calyx 5-toothed ; leaves elliptic or obovate, much toothed :—
Calyx-teeth minute ; leaves sharply serrate, acuminate ; corymbs globose, 2·5 in. wide ; shrubs 6–8 feet high.....*esculenta.*
Calyx-teeth distinct, ovate, obtuse ; leaves coarsely serrate, obtuse ; corymbs somewhat dense, 1·25 in. wide ; almost stemless undershrubs .....*herbacea.*

1592. PREMNA CORIACEA Clarke var. OBLONGA ; F. B. I. iv. 573.
N. Bengal, Duars.
A large, scandent shrub or small tree.

1593. PREMNA SCANDENS Roxb. ; F. I. iii. 82 ; F. B. I. iv. 573.
N. Bengal.
A large, scandent shrub or small tree.

1594. PREMNA INTEGRIFOLIA Linn. ; F. I. iii. 81 ; F. B. I. iv. 574 ; E. D. P. 1233. *P. serratifolia* F. I. iii. 77. *P. spinosa* F. I. iii. 77.
Sundribuns.

A shrub or small tree. *Hind.* Agetha, arni, ustabunda; *Beng.* Bhút-biravi, ganiari; *Uriya* Aguyábát.

1595. PREMNA LONGIFOLIA Roxb.; F. I. iii. 79; F. B. I. iv. 575; E. D. P. 1246.
Tippera; E. Bengal.
A tree. *Vernac.* Gohora.

1596. PREMNA BENGALENSIS Clarke; F. B. I. iv. 577.
E. Bengal; Chittagong.
A small tree.

1597. PREMNA LATIFOLIA Roxb.; F. I. iii. 76; F. B. I. iv. 577; E. D. P. 1239.
Behar; Chota Nagpur; Orissa.
A small, scraggy tree. *Uriya* Gondhona.

1597/2. Var. MUCRONATA; F. B. I. iv. 578; E. D. P. 1242. *P. mucronata* F. I. iii. 80.
N. Bengal.
A tree. *Hind.* Bakar, bakarcha, tumari, jhatela.

1598. PREMNA FLAVESCENS Ham.; F. B. I. iv. 578.
E. Bengal.
A shrub or small tree.

1599. PREMNA BARBATA Wall.; F. B. I. iv. 579.
Behar.
A shrub or small tree.

1600. PREMNA ESCULENTA Roxb.; F. I. iii. 80; F. B. I. iv. 580; E. D. P. 1228.
C. Bengal; E. Bengal; Chittagong: cultivated.
A branching shrub, 6–8 feet high.

1601. PREMNA HERBACEA Roxb.; F. I. iii. 80; F. B. I. iv. 581; E. D. P. 1231.
W. Bengal; Behar; Chota Nagpur; N. Bengal, Duars.
A small, almost stemless undershrub. *Beng.* Bhuijam; *Santal.* Kada-met'.

728. Vitex Linn.

Trees or shrubs; young shoots hairy or tomentose; *leaves* opposite, digitately 3–5-foliolate. *Flowers* in peduncled or sessile cymes, forming terminal and axillary or wholly axillary panicles or corymbs; bracts small, shorter or longer than calyx. *Sepals* 5, connate in a campanulate calyx; limb truncate or shortly 5-, rarely 3-toothed. *Petals* 5, connate in a 2-lipped corolla; tube

short; limb 5-lobed, central lobe of lower lip usually largest. *Stamens* 4, didynamous, usually exserted; anther-cells at first parallel, pendulous, at length divaricate, often twisted so that their bases become suberect. *Carpels* connate in a 2-celled or 4-celled ovary; ovules 4; style filiform; stigma shortly 2-fid. *Fruit* a globose or obovoid drupe, resting on the somewhat enlarged calyx; endocarp bony, 4-celled or, by suppression, 3–1-celled. *Seeds* obovate or oblong; albumen 0.

Panicles terminal, with axillary peduncles sometimes also present in the upper leaf-axils:—

Leaves beneath and panicles closely white-tomentose; flowers blue; berries black; leaves glabrate above; shrubs or small trees:—

Leaves 3-foliolate and simple; leaflets sessile, obovate or obovate-oblong, entire .....*trifolia.*

Leaves 5-foliolate and 3-foliolate; leaves petioluled, lanceolate, entire or rarely crenate .....*Negundo.*

Leaves beneath minutely pubescent or glabrate; tall trees:—

Leaves 3-foliolate, with frequently 1–2 smaller leaflets added; leaflets sessile, ovate or oblong, entire, bases of outer leaflets unequal, minutely pubescent on both sides; panicles densely corymbose, fulvous-tomentose; flowers blue.....*pubescens.*

Leaves 5-foliolate; leaflets petioluled, elliptic or oblong, entire, glabrate, with white glands above and yellow glands beneath; panicles compound, long-branched, thinly ashy-pubescent; flowers yellowish, with blue lower lip .....*heterophylla.*

Peduncles all axillary, sometimes short; leaflets petioluled; trees:—

Leaves 3-foliolate; leaflets entire, lanceolate, mature densely covered with minute yellow glands beneath; panicles long-peduncled, elongate, many-flowered, ashy puberulous; berries globose or cuboid, hardly succulent, ·2 in. across; flowers yellowish, the tips tinged with blue:—

Petiole slender, wingless, or very faintly winged .....*peduncularis.*

Petiole wide-winged .....*peduncularis* var. *Roxburghiana.*

Leaves 5-foliolate, petioles not winged; leaflets oblong or ovate, usually entire, rarely slightly serrate; corymbs divaricate; berries obovoid, succulent, large: if leaves 3-foliolate (*V. glabrata* sometimes), leaflets when mature with adpressed hairs beneath:—

Corymbs glabrous, lax; flowers sessile, white, with violet hairs inside lower lip; leaflets always 5, with patent yellowish hairs on midrib beneath otherwise glabrate; drupe ·6 in. long.....*leucoxylon.*

Corymbs puberulous, usually dense, generally short-peduncled;

flowers usually pedicelled, yellowish with purple lower lip; leaflets usually 5, sometimes 3, with minute, scattered, adpressed hairs beneath; drupe ·35–·5 in. long ..... *glabrata*.

1602. VITEX TRIFOLIA Linn. f.; F. I. iii. 69; F. B. I. iv. 583; E. D. v. 181.
C. Bengal; E. Bengal; Chittagong.
A shrub or small tree. *Vernac.* Pani-sanbhalu.

1603. VITEX NEGUNDO Linn.; F. I. iii. 70; F. B. I. iv. 583; E. D. v. 164.
Chota Nagpur; Behar; Tirhut; N. Bengal; Sundribuns.
A shrub or small tree. *Hind.* and *Beng.* Sandbhalu, nishinda; *Santal.* and *Kol.* Sinduari; *Uriya* Begunia.

1604. VITEX PUBESCENS Vahl; F. B. I. iv. 585; E. D. v. 177. *V. arborea* F. I. iii. 73.
E. Bengal; Tippera; Chittagong.
A tree, 30–50 feet high.

1605. VITEX HETEROPHYLLA Roxb.; F. I. iii. 75; F. B. I. iv. 585.
Tippera.
A large tree.

1606. VITEX PEDUNCULARIS Wall.; F. B. I. iv. 587.
Orissa; Chota Nagpur; Behar; Chittagong.
A tree, 20–40 feet high.

1606/2. Var. ROXBURGHIANA; F. B. I. iv. 587; E. D. v. 174. *V. alata* F. I. iii. 72.
Chota Nagpur; Behar; Chittagon
A considerable tree. *Beng.* Boruna, goda; *Santal.* Badu marak'; *Magh.* Krawru.

1607. VITEX LEUCOXYLON Linn. f.; F. I. iii. 74 partly; F. B. I. iv. 587. *V. saligna* F. I. iii. 75.
Orissa; on islands in the river Mahanadi; perhaps only introduced.
A considerable tree.

1608. VITEX GLABRATA R. Br.; F. B. I. iv. 588; E. D. v. 160. *V. leucoxylon* F. I. iii. 74 partly.
E. Bengal; Chittagong.
A small tree. *Beng.* Ashval, goda, horina.

729. Clerodendron Linn.

Trees or shrubs, sometimes sarmentose; *leaves* opposite, rarely 3–4-nate, simple, occasionally lobed, entire or toothed. *Flowers*

in axillary cymes or terminal panicles, often leafy below; bracts conspicuous or small; bracteoles 0. *Sepals* 5, connate in a campanulate calyx; limb truncate or 5-toothed or almost 5-partite, persistent, often accrescent, sometimes coloured. *Petals* 5, connate in a slender, cylindric, usually long, filiform corolla; limb more or less oblique; lobes spreading. *Stamens* 4, didynamous, far exserted, adnate under corolla-throat; anthers ovate or oblong; cells parallel. *Carpels* connate in an imperfectly 4-celled ovary; ovules in each cell solitary; style filiform; stigma shortly 2-fid. *Fruit* a globose, succulent, very rarely almost dry drupe, 4-grooved, and separating into 4 pyrenes, of which 1–3 may often be suppressed. *Seeds* oblong; albumen 0.

*Corolla irregularly salver-shaped, 1·5 in. long or less:—[p. 835]
Panicles axillary, or if (occasionally in *C. phlomoides*) terminal, the panicle lax, leafy below:—
Calyx minutely toothed, in fruit somewhat enlarged, subtruncate, embracing the base of the berry; fruit spongy; leaves entire:—
Leaves obovate or elliptic, subobtuse, opposite or rarely ternate; calyx in fruit closely applied to base of berry ..... *inerme.*
Leaves elliptic-acute, or linear-oblong, generally ternate; calyx in fruit subpatent ..... *neriifolium.*
Calyx lobed half-way down; lobes triangular, caudate-acuminate, in fruit more rigid, almost covering the berry; fruit somewhat succulent; leaves ovate, sinuate or serrate..... *phlomoides.*
Panicles terminal:—
Calyx subtruncate; bracts large, ·5–1·5 in. long, often coloured; leaves oblong or elliptic, acuminate:—
Leaves subsessile; calyx very shortly 5-lobed; panicle dense; leaf-margins always serrate ... . *serratum.*
Leaves very shortly petioled; calyx almost truncate; panicle open; uppermost leaves sometimes entire
serratum var. *Wallichii.*
Calyx deeply 5-lobed; bracts small:—
Panicle pendulous, lax, open; corolla pure white; berry purple; calyx divided to near the broad base; segments ovate-lanceolate; leaves narrowly obovate or lanceolate, entire ..... *nutans.*
Panicle erect; corolla tinged with pink or rose; berry black; leaves wide-ovate or subrotund:—
†Calyx large, with broadly lanceolate, acute, suberect segments; panicle open, pyramidal; leaves entire or serrulate, acuminate, base cordate or obtuse [p. 835] ... . *infortunatum.*

†Calyx small, with subulate segments; panicle compact, corymbose; leaves subcordate, rounded, acute [p. 834] .....*fragrans.*
*Corolla narrowly funnel-shaped, 3 in. long or longer; panicle terminal, elongated, lax; leaves narrowly lanceolate, subsessile, subentire [p. 834] *Siphonanthus.*

1609. CLERODENDRON INERME Gaertn.; F. I. iii. 58; F. B. I. iv. 589; E. D. C. 1377.
C. Bengal; Sundribuns.
A straggling, littoral shrub of muddy shores. *Hind.* Sang-kúpi, lan-jai; *Beng.* Ban-jai, ban-jumet, bat-raj.

1610. CLERODENDRON NERIIFOLIUM Wall.; F. B. I. iv. 589. *Volkameria neriifolia* F. I. iii. 64.
Chittagong, sea-coast.
A bushy, littoral shrub of rocky shores.

1611. CLERODENDRON PHLOMOIDES Linn. f.; F. I. iii. 57; F. B. I. iv. 590; E. D. C. 1386.
Orissa; Chota Nagpur; Behar.
A large bush. *Hind.* Urui, pirun; *Santal.* Panjot.

1612. CLERODENDRON SERRATUM Spreng.; F. B. I. iv. 592; E. D. C. 1388. *Volkameria serrata* F. I. iii. 62.
Chittagong; N. Bengal; Tirhut; Behar; Chota Nagpur.
A shrub, 2–8 feet high. *Hind.* Barangi; *Santal.* Saram lutur.

1612/2. Var. WALLICHII; F. B. I. iv. 592.
N. Bengal.
A shrub.

1613. CLERODENDRON NUTANS Wall.; F. B. I. iv. 591.
Chittagong.
A shrub, 6 feet high.

1614. CLERODENDRON INFORTUNATUM Gaertn.; F. B. I. iv. 594; E. D. C. 1380. *Volkameria infortunata* F. I. iii. 59.
Chota Nagpur; Behar; Tirhut; N. Bengal; C. Bengal; Chittagong.
A shrub, 4 feet high. *Hind.* Bhánt; *Beng.* Bhánt, ghentu; *Santal.* Kharbari, varni; *Kol.* Kulamarsal.

1615. CLERODENDRON FRAGRANS Vent.; F. B. I. iv. 589.
C. Bengal; Chittagong: escaped from cultivation. In other provinces also often cultivated.
A small shrub. Native of China.

1616. Clerodendron Siphonanthus R. Br.; F. B. I. iv. 595; E. D. C. 1394. *Siphonanthus indica* F. I. iii. 67.

In all the provinces.

A shrub, 4–7 feet high. *Hind.* Barangi; *Beng.* Bamunhatti.

730. Holmskioldia Retz.

Straggling or climbing shrubs; *leaves* opposite. *Flowers* in short cymes, in leaf-axils or aggregated at ends of branches; bracts small; bracteoles 0. *Sepals* 5, connate in a widely obconic, subtruncate, membranous red calyx. *Petals* 5, connate in an oblique corolla; tube cylindric, curved; lobes short. *Stamens* 4, didynamous; anthers ovate, exserted; cells parallel. *Carpels* connate in an obtuse or obscurely depressed ovary, becoming ultimately 4-celled; ovules 1 in each cell, laterally attached; style terminal; stigma shortly 2-fid. *Fruit* an obovoid drupe, included in the accrescent calyx, divaricately 4-lobed about half-way down; pyrenes 1–4. *Seeds* oblong; albumen 0.

1617. Holmskioldia sanguinea Retz; F. B. I. iv. 596; E. D. H. 322. *Hastingia coccinea* F. I. iii. 65. *H. scandens* F. I. iii. 66.

Chota Nagpur.

A climbing shrub.

731. Caryopteris Bunge.

Erect or rambling shrubs; *leaves* opposite, acuminate, toothed or subentire, minutely punctate, with yellow, glistening glands. *Flowers* in small, dense, many-flowered cymes, axillary or passing into a terminal thyrse; bracts small; bracteoles 0. *Sepals* 5, shortly connate in a deeply divided calyx; lobes triangular or lanceolate, somewhat accrescent. *Petals* 5, connate in a 2-lipped corolla; tube short, cylindric; limb spreading, midlobe of lower lip longer, crisped or fimbriate. *Stamens* 4, didynamous; anthers exserted; cells divaricate, confluent. *Carpels* connate in an imperfectly 4-celled ovary; ovules in each cell solitary; style filiform; stigma shortly 2-fid. *Fruit* a small, globose capsule, separating into 4 concave valves with incurved margins, retaining the seeds. *Seeds* oblong, erect; albumen 0.

1618. Caryopteris Wallichiana Schauer; F. B. I. iv. 597; E. D. C. 710/2.

Tirhut, Bettiah.

A spreading shrub.

732. Symphorema Roxb.

Scandent shrubs; *leaves* opposite, entire or toothed. *Flowers* in peduncled, capitate, 7-flowered cymes; bracts 6, oblong, involucrate, accrescent in fruit; bracteoles 0. *Sepals* connate in a short, obovoid, 4–8-lobed, somewhat accrescent calyx. *Petals* connate in a small white corolla; tube cylindric; limb 6–16-lobed; lobes subequal, narrowly oblong. *Stamens* 6–16, as many as corolla-lobes; anthers exserted, ovate cells parallel. *Carpels* connate in a 2-celled or imperfectly 4-celled ovary; ovules 4; style filiform; stigma shortly 2-fid. *Fruit* dry, included in the calyx. *Seed* solitary, erect; cotyledons fleshy.

Corolla ·25 in. long, 6–8-lobed ..... *involucratum.*
Corolla ·5 in. long, 12–16-lobed ..... *polyandrum.*

1619. Symphorema involucratum Roxb.; F. I. ii. 262; F. B. I. iv. 599; E. D. S. 3042.
Behar.
A large climber.

1620. Symphorema polyandrum Wight; F. B. I. iv. 599.
Chota Nagpur; Orissa.
A large climber.

733. Sphenodesma Jack.

Large, scandent shrubs; *leaves* opposite, entire, short-petioled. *Flowers* in capitate cymes, 3- or 7-flowered; bracts 6, oblong or obovate, involucrate; cymes more or less paniculate, the leaves at the base of the peduncles being reduced and bract-like, mostly deciduous; bracteoles 0. *Sepals* connate in a funnel-shaped, 5-toothed, rarely 4- or 6-toothed calyx, enlarged or inflated in fruit. *Petals* connate in a short, cylindric corolla; lobes 5, rarely 6, ovate-oblong or narrow-lanceolate. *Stamens* 5, included, rarely subexserted; anthers ovate. *Carpels* connate in an imperfectly 2-celled ovary; ovules 4, pendulous from the apex of the axis; style filiform; stigma shortly 2-fid or obscurely 2-lobed. *Fruit* a small, globose or obovoid drupe, more or less completely included in the calyx. *Seeds* 1, or rarely 2; cotyledons thick.

1621. Sphenodesma unguiculata Schauer; F. B. I. iv. 601.
Chittagong.
A large climber.

734. Congea Roxb.

Large climbing shrubs; *leaves* opposite, entire. *Flowers* in peduncled, capitate, 3–9-flowered cymes; bracts at base of peduncles leaf-like, coloured; cyme-bracts 3–4, elliptic or oblong, connate below. *Sepals* 5, connate in a funnel-shaped, slightly accrescent calyx; limb toothed. *Petals* connate in a short, 2-lobed corolla; tube slender, rarely much exceeding calyx; throat usually hairy; upper lip suberect, 2-lobed, lobes linear-oblong; lower lip 3-lobed, lobes shorter, pendent, obovate. *Stamens* 4, slightly didynamous; anthers exserted, ovate; cells parallel. *Carpels* connate in an imperfectly 2-celled ovary; ovules 4, pendulous from apex of axis; style filiform; stigma shortly 2-fid. *Fruit* small, obovoid, almost dry, usually 4-partite and 4-seeded.

1622. Congea tomentosa Roxb.; F. B. I. iv. 604; E. D. C. 1763.
Chittagong: sometimes cultivated in other provinces.
A large climber.

735. Avicennia Linn.

Shrubs or small trees; *leaves* coriaceous, opposite, entire. *Flowers* small, sessile, in capitate, peduncled heads of close cymes, paired in penultimate axils or terminal in 3-chotomous corymbs; bracts small. *Sepals* 5, connate in a short calyx; limb deeply lobed; lobes ovate, imbricate, unchanged in fruit. *Petals* connate in a short corolla; tube wide, cylindric, straight; limb with 4 subequal lobes, or with uppermost rather the widest. *Stamens* 4, adnate to corolla-throat; filaments subequal; anthers shortly exserted, ovate; cells parallel. *Carpels* connate in an imperfectly 4-celled ovary, central axis 4-winged; ovules 4, pendulous between the axial wings; style short or long; stigma 2-fid. *Fruit* a compressed capsule; valves two, thick, leathery. *Seed* solitary, erect; embryo imperfectly covered by its two integuments; cotyledons large, longitudinally plicate; radicle inferior, villous.

1623. Avicennia officinalis Linn.; F. B. I. iv. 604; E. D. A. 1655. *A. tomentosa* F. I. iii. 88.
Sundribuns; Chittagong.
A tree; leaves obtuse; capsule broad. *Beng.* Báen.

1624. Avicennia alba Bl. *A. officinalis* var. *alba* F. B. I. iv. 604.
Sundribuns, on river banks.
A hrub; leaves acute; capsule narrow. *Beng.* Báen.

Order C. LABIATÆ.

Herbs, rarely shrubs; usually gland-dotted; stems usually 4-angled. *Leaves* opposite or whorled; stipules 0. *Flowers* irregular, solitary, 2-nate or fascicled and axillary, or in centrifugal, spicate cymes which, by union in pairs, form false whorls; bracts small; bracteoles usually minute, opposite. *Sepals* connate in a persistent, subregular or irregular, 4–5-cleft, or distinctly 2-lipped calyx. *Petals* 5, connate in a gamopetalous, hypogynous corolla; limb 4–5-lobed or distinctly 2-lipped; lobes imbricate. *Stamens* adnate to corolla-tube, 4 didynamous, or only 2 perfect; anther-cells connate or discrete or confluent; dehiscence longitudinal. *Disk* prominent. *Carpels* 2, each 2-celled, forming a deeply 4-lobed ovary; style simple, inserted between the lobes; stigma usually 2-fid, sometimes unequally; ovules solitary in each cell, erect, anatropous. *Fruit* of 4 dry or rarely fleshy, 1-seeded nucules at the base of the calyx, sometimes 1 or more suppressed. *Seed* small, erect; albumen scanty or 0; radicle inferior.

*Ovary 4-partite; nutlets with attachment small, basilar, or slightly oblique to the outer side:—[p. 842]

†Nutlets dry:—[p. 842]

‡Stamens declinate, 4 perfect; anther-cells at length explanate, confluent:—[p. 840]

¶Attachment of nutlets quite basilar; upper lobe of calyx usually broader than the rest, and at least broader than the two anterior lobes, or if calyx-lobes subequal (*Plectranthus* often, *Hyptis* always), the stamens exserted and the lowest corolla-lobe concave:—[p. 840]

⊙Lower lip of corolla somewhat declinate, flat or very slightly concave, generally narrower, but hardly longer than the usually 4-lobed upper lip; upper lobe of calyx always widest:—[p. 840]

Calyx deflexed in fruit, with upper lobe large, ovate, recurved, its margins decurrent on the tube, the other lobes narrow, subulate:—

Corolla-tube short; stigma 2-fid.....**Ocimum.**

Corolla-tube usually long; stigma entire .....**Orthosiphon.**

Calyx suberect or declinate in fruit, the upper lobe broader than the lateral and anterior pairs, or (*Moschosma* sometimes) only broader than anterior and equalling the lateral pair, not decurrent on the tube:—

Whorls in terminal and axillary, globose or ovoid heads, with imbricate bracts; calyx suberect, upper lip widely 1-lobed, anterior and lateral lobes united in an entire or 4-toothed lower lip ..... **Acrocephalus.**

Whorls racemose or subspicate; calyx usually declinate; upper lip widely 1-lobed, with the anterior and lateral pairs not connate, subequal, smaller; or upper lip 3-lobed, with posterior and lateral lobes subconnate, and lower lip 2-lobed, with anterior lobes subconnate:—

Racemes simple; bracts conspicuous; calyx in fruit rugosely pitted near base; posterior lobe even when upper lip 3-lobed, wider than lateral lobes **Geniosporum.**

Racemes panicled; bracts small; calyx in fruit not pitted; lateral lobes, when upper lip 1-lobed, subequal with anterior lobes, when upper lip 3-lobed subequal with posterior lobe ..... **Moschosma.**

⊙Lower lip of corolla deflexed, concave, boat-shaped or saccate:—[p. 839]

Corolla with upper lip very short, obtusely 3–4-toothed; lower lip much elongated, boat-shaped:—

Calyx equally 5-toothed or somewhat 2-lipped, with 3-toothed upper and 2-toothed lower lip, or with upper lobe large, rounded, reflexed, the others narrow, subulate:—

Filaments free ..... **Plectranthus.**

Filaments connate in a sheath at their bases, round the style..... **Coleus.**

Calyx very oblique, 2-lipped, with upper lobe large, entire, inflexed, and closing calyx-mouth, the lower lip truncate, obscurely 4-toothed, or 1-lipped, slit in front, the solitary lip 5-toothed, incurved, but not quite occluding the calyx-mouth ..... **Anisochilus.**

Corolla obscurely 2-lipped, with two upper lobes flat, similar and subequal to two lateral, all about as long as the abruptly deflexed, saccate lower lip, with thickened margin and much-contracted base; calyx-teeth subequal..... **Hyptis.**

¶Attachment of nutlets slightly oblique to the outer side; calyx-lobes subequal; tube 13–15-nerved; corolla 2-lipped; upper lip 2-fid, lower 3-fid; lobes all flat, spreading; stamens included in tube [p. 839]..... **Lavandula.**

‡Stamens erect or spreading or ascending:—[p. 839]

§Stamens 4, perfect:—[p. 841]

Corolla-lobes 4 or 5, flat, subequal and similar, or the lowest

somewhat unlike the others, but limb not 2-lipped; stamens subequal, diverging; anther-cells short:—

Lobes of corolla 4; anthers 1-celled; calyx 5-nerved; teeth equal:—

Calyx 5-toothed; stamens exserted:—

Lower corolla-lobe subpatent; whorls in glomerate or paniculate or solitary, interrupted spikes; filaments bearded or naked ..... **Pogostemon.**

Lower corolla-lobe like the others; whorls in slender, dense, continuous spikes; filaments bearded **Dysophylla.**

Calyx 5-partite; segments plumose in flower, pappose in fruit; whorls in slender, cylindric spikes; stamens included or little exserted; filaments naked ... **Colebrookia.**

Lobes of corolla 5, lowest rather longer than the others; anthers, at least when young, 2-celled; calyx 10-nerved, in fruit declinate, distinctly 2-lipped ..... **Perilla.**

Corolla 2-lipped; stamens didynamous:—

Anterior pair of stamens the longer:—

Calyx 13-nerved; anthers 2-celled; cells short; upper lip of corolla not hooded:—

Calyx equally 5-toothed ..... **Micromeria.**

Calyx distinctly 2-lipped ..... **Calamintha.**

Calyx 5–10-nerved; anthers 2-celled; cells linear:—

Upper lip of corolla short, nearly flat, not woolly; stamens exserted; anther-cells of upper pair dimidiate, of lower pair parallel, transverse ..... **Anisomeles.**

Upper lip of corolla long, hooded, densely woolly:—

Anther-cells parallel; stamens more or less exserted; calyx 5-toothed; teeth spinescent ..... **Leonurus.**

Anther-cells divergent; stamens not exserted; calyx 6–10-toothed:—

Lower lip of corolla longer than the hood ... **Leucas.**

Lower lip of corolla shorter than the hood **Leonotis.**

Posterior pair of stamens the longer; calyx 15-nerved, 5-toothed; stamens not exserted ..... **Nepeta.**

§Stamens 2, anterior pair only perfect, ascending or erect; anther-cells linear, separated by an elongated connective or one cell abortive; calyx 2-lipped:—[p. 840]

÷Corolla 4-lobed; lobes subequal; anthers 2-locular; cells pendulous, parallel, stipitate on the arms of the connective; calyx 10-nerved [p. 842] ..... **Meriandra.**

÷Corolla 2-lipped, upper entire or emarginate concave, lower spreading, 3-fid; anthers dimidiate; connective transverse, linear, jointed with filament, posterior arm ascending with a fertile anther-cell, anterior horizontal or deflexed, with a fertile or empty anther-cell or naked; calyx 5-nerved [p. 841] .....**Salvia.**

†Nutlets succulent; corolla 2-lipped, upper lip hooded; anther-cells parallel, anterior pair of stamens longer [p. 839] ...**Gomphostemma.**

*Ovary 4-lobed; nutlets with a large, oblique, or lateral areola on the inner side; stamens 4, perfect, erect, exserted from the notch or fissure of the upper lip:—[p. 839]

Corolla deeply slit behind, and apparently 1-lipped, the two small upper lobes, along with the small lateral pair, springing from the contracted base of the very large lower lobe .....**Teucrium.**

Corolla distinctly 2-lipped, upper lip short, 2-lobed, notched; lateral pair of lobes very small, springing from sides of very large lower lobe **Ajuga.**

736. Ocimum Linn.

Strongly scented herbs, undershrubs, or shrubs. *Flowers* small, in 6–10-flowered whorls, spicate or racemose, tips of pedicels recurved; bracts minute, caducous. *Sepals* 5, connate in an ovoid or campanulate calyx, deflexed in fruit; upper tooth broadest, decurrent, 2 lowest teeth acuminate. *Petals* 5, connate in a 2-lipped corolla; tube short, not annulate within; upper lip subequally 4-fid; lower hardly longer, declinate, entire. *Stamens* 4, didynamous, declinate, exserted; filaments free or the lower pair connate below, naked, or the upper toothed or hairy below; anther-cells confluent. *Disk* entire or 3–4-lobed. *Carpels* connate in a 4-partite ovary; style-lobes subulate or flattened. *Fruit* of 4 dry, smooth or subrugose nutlets, mucilaginous when moist; basal scar small.

Pedicels as long as the calyx, two lower calyx-teeth longer than the upper lobe .....*sanctum.*

Pedicels shorter than the calyx:—

Bracts sessile, longer than the calyx, two lower calyx-teeth minute *gratissimum.*

Bracts petioled, shorter than the calyx; two lower calyx-teeth longer than the upper lobe:—

Corolla ·2 in. long .....*canum.*

Corolla ·4–·5 in. long:—

Flowers white, stems green .....*Basilicum.*

Flowers pink, stems purplish :—
Spikes simple .....*Basilicum* var. *purpurascens*.
Spikes thyrsoid.....*Basilicum* var. *thyrsiflora*.

1625. Ocimum sanctum Linn.; F. I. iii. 14; F. B. I. iv. 609; E. D. O. 31.
In all the provinces, cultivated.
A herb, sometimes woody at the base. *Vernac.* Tulsi.

1626. Ocimum gratissimum Linn.; F. I. iii. 17; F. B. I. iv. 608; E. D. O. 28.
Orissa; C. Bengal; E. Bengal; Chittagong.
A shrub. *Vernac.* Ram tulsi.

1627. Ocimum canum Sims; F. B. I. iv. 607; E. D. O. 26. *O. album* F. I. iii. 15.
Behar; Chota Nagpur; W. Bengal.
A herb, 1–2 feet high. *Santal.* Bharbari.

1628. Ocimum Basilicum Linn.; F. I. iii. 17; F. B. I. iv. 608; E. D. O. 18. *O. pilosum* F. I. iii. 16. *O. caryophyllatum* F. I. iii. 16.
In all the provinces, cultivated and as if wild.
A herb. *Vernac.* Babui tulsi.

1628/2. Var. purpurascens Benth.
In most of the provinces, cultivated.
A herb.

1628/3. Var. thyrsiflora Benth. *O. thyrsiflorum* F. I. iii. 15.
In most of the provinces, cultivated.
A herb.

737. Orthosiphon Benth.

Undershrubs or shrubs. *Flowers* small or medium, in 6- or fewer-flowered whorls, racemose; bracts small. *Sepals* 5, connate in an ovoid, campanulate, or tubular calyx, deflexed in fruit; upper tooth broad, membranous, margins decurrent on the tube, lateral and lower distinct or shortly connate, usually subulate. *Petals* 5, connate in a 2-lipped corolla; tube often slender, straight or incurved; upper lip 4-fid; lower entire, concave. *Stamens* 4, didynamous, declinate; filaments free, toothless; anther-cells confluent. *Disk* usually gibbous. *Carpels* connate in a 4-partite ovary; style with a minute, capitate or clavate, entire or notched stigma. *Fruit* of 4 dry, ovoid or orbicular nutlets, smooth or nearly so; basal scar small.

Stamens included :—
Corolla-tube not exceeding calyx ; leaves petioled .....*pallidus.*
Corolla-tube twice as long as calyx :—
Leaves sessile .....*rubicundus.*
Leaves petioled .....*rubicundus* var. *rigida.*
Stamens exserted ; leaves petioled ; corolla-tube thrice as long as calyx *stamineus.*

1629. ORTHOSIPHON PALLIDUS Royle ; F. B. I. iv. 613.
W. Behar, rare.
A woody, diffuse herb.

1630. ORTHOSIPHON RUBICUNDUS Benth.; F. B. I. iv. 614. *Ocimum tuberosum* F. I. iii. 18.
N. Bengal ; Behar ; Chota Nagpur.
A herb.

1630/2. Var. RIGIDA Benth. ; F. B. I. iv. 615.
Behar ; Chota Nagpur.
A herb.

1631. ORTHOSIPHON STAMINEUS Benth. ; F. B. I. iv. 615.
Chota Nagpur, rare.
A herb.

738. Acrocephalus Benth.

Annual herbs ; *leaves* small, petioled. *Flowers* very small, sessile ; whorls in terminal or axillary, globose or ovoid, dense heads, with imbricate bracts. *Sepals* 5, connate in an ovoid calyx, tubular in fruit, base gibbous ; upper lip flat, entire, lower entire or 4-toothed ; throat naked. *Petals* connate in a small, somewhat 2-lipped corolla ; tube short ; upper lip subequally 4-lobed ; lower entire, sometimes lobes all subequal. *Stamens* 4, didynamous declinate ; filaments free, toothless, included. *Disk* small, gibbous. *Carpels* connate in a 4-partite ovary ; style shortly 2-fid at tip. *Fruit* of 4 smooth, dry nutlets ; basal scar small.

1632. ACROCEPHALUS CAPITATUS Benth. ; F. B. I. iv. 611.
Chota Nagpur ; Behar ; W. Bengal ; Tirhut ; N. Bengal ; E. Bengal.
A small herb.

739. Geniosporum Wall.

Herbs. *Flowers* small or minute ; whorls many-flowered, in long, lax racemes or spikes ; bracts often coloured. *Sepals* 5,

connate in an ovoid calyx, tubular in fruit, suberect or declinate; upper tooth widest, not decurrent, lateral pair free or connate with upper, lowest pair short, free or connate. *Petals* 5, connate in a 2-lipped corolla; upper lip 4-fid; lower declinate, entire. *Stamens* 4, didynamous, declinate; filaments free, toothless. *Disk* swollen, gibbous. *Carpels* connate in a 4-partite ovary; style with short, flattened arms. *Fruit* of 4 dry, ovoid or oblong, smooth or punctulate nutlets.

1633. Geniosporum prostratum Benth.; F. B. I. iv. 610; E. D. G. 161.

Orissa, sand-dunes on coast.

A small, prostrate herb.

740. Moschosma Reichb.

Annual or perennial herbs. *Flowers* very minute; whorls 6–10-flowered, secund in axillary and terminal, paniculate racemes; bracts small. *Sepals* 5, connate in an ovoid or campanulate calyx; upper tooth or 3 upper teeth larger than the 4 or 2 lower, not decurrent; throat naked. *Petals* 5, connate in a 2-lipped corolla; upper lip 4-lobed, lobes subequal or the 2 central rather longer; lower entire, longer than upper. *Stamens* 4, didynamous, declinate; filaments free, toothless; anther-cells confluent. *Disk* uniform or somewhat swollen in front. *Carpels* connate in a 4-partite ovary; style clavate-capitate, with a 2-fid tip. *Fruit* of 4 compressed, smooth, dry nutlets; basal scar small.

1634. Moschosma polystachyum Benth.; F. B. I. iv. 612. *Ocimum polystachyum* F. I. iii. 18.

E. Bengal.

A slender, erect, annual herb.

741. Plectranthus L'Herit.

Herbs or undershrubs. *Flowers* usually small, in lax, rarely close, panicled or racemed, 6–8-flowered cymes. *Sepals* 5, connate in a usually 2-lipped calyx; lobes subequal or upper widest, enlarged in fruit. *Petals* 5, connate in a 2-lipped corolla; tube exserted, long or short, straight or decurved; throat equal or obliquely swollen; upper lip usually short, broad, 4-fid, recurved; lower much longer, entire, boat-shaped, stipitate or narrow at the base. *Stamens* 4, didynamous, declinate; filaments simple, free; anther-cells usually confluent. *Disk* usually enlarged in front.

Carpels connate in a 4-partite ovary; style subequally 2-fid. *Fruit* of 4 orbicular, ovoid or oblong, smooth granulate or punctate, dry nutlets; basal scar small.

Leaves subsessile, usually ternately whorled, lanceolate-acuminate, serrate; cymes in dense panicles; fruiting calyx cylindric; teeth subequal ..... *ternifolius.*
Leaves petioled, large, opposite, wide ovate-cordate, crenate; cymes laxly racemose; fruiting calyx 2-lipped, wide campanulate, upper large, ounded, reflexed, lower with sharp teeth ..... *incanus.*

1635. PLECTRANTHUS TERNIFOLIUS Don; F. B. I. iv. 621. *Elsholtzia Thompsoni* F. B. I. iv. 643.
Chota Nagpur; N. Bengal, submontane forests; E. Bengal, Mymensingh.
A bushy herb, 3–5 feet high.

1636. PLECTRANTHUS INCANUS Link; F. B. I. iv. 621. *P. secundus* F. I. iii. 20.
Chota Nagpur.
A large herb, not uncommon on roadsides.

742. Coleus Lour.

Herbs or undershrubs. *Flowers* in lax or close, panicled or racemed, 6–8-flowered cymes. *Sepals* 5, connate in a 2-lipped calyx, enlarged in fruit, upper lobe the widest, not decurrent. *Petals* 5, connate in a 2-lipped corolla; tube exserted, decurved; throat equal or obliquely swollen; upper lip short, broad, 4-fid recurved; lower much longer, entire, boat-shaped, stipitate narrow at base. *Stamens* 4, didynamous, declinate; filamen simple, shortly connate below in a sheath separate from the corolla; anther-cells usually confluent. *Disk* enlarged in front. *Carpels* connate in a 4-partite ovary; style subequally 2-fid. *Fruit* of 4 orbicular or ovoid, smooth, dry nutlets; basal scar small.

Calyx-throat villous within ..... *barbatus.*
Calyx-throat glabrous within :—
Corolla pale-purple; stamens shortly exserted; leaves fleshy ..... *aromaticus.*
Corolla white, with blue lower lip; stamens included; leaves membranous ..... *scutellarioides.*

1637. COLEUS BARBATUS Benth.; F. B. I. iv. 625; E. D. C. 1719.
Chota Nagpur.
A herb with tuberous rootstock.

1638. COLEUS AROMATICUS Benth.; F. B. I. iv. 625; E. D. C. 1715. *Plectranthus aromaticus* F. I. iii. 22.
In gardens in most of the provinces.
A herb, 1–3 feet high, with fleshy stems. *Vernac.* Pathor chur.

1639. COLEUS SCUTELLARIOIDES Benth.; F. B. I. iv. 626. *Plectranthus scutellarioides* F. I. iii. 21.
In gardens generally.
A slender herb, 2–3 feet high.

743. Anisochilus Wall.

Herbs or undershrubs. *Flowers* small, in dense, oblong, 4-angled or cylindric spikes; bracts caducous. *Sepals* 5, connate in a suberect calyx, inflated below the middle, 2-lipped or 5-toothed, rarely 1-lipped; upper lip entire and deflexed or short and minutely 3-lobed. *Petals* 5, connate in a 2-lipped corolla; tube slender, decurved; throat inflated; upper lip short, entire or 4-fid; lower elongated, concave. *Stamens* 4, didynamous, declinate; filaments free. *Disk* lobed. *Carpels* connate in a 4-partite ovary; style 2-fid at apex. *Fruit* of 4 ovoid, smooth, dry nutlets; basal scar small.

ru[illegible]ng calyx with the upper lip large, broad, entire, inflexed, occluding F[illegible]h; lower lip truncate.....*carnosus.*
t[illegible]alyx slit in front; mouth very oblique, but not quite occluded F[illegible]urved, 5-toothed lip .....*polystachyus.*

1640. ANISOCHILUS CARNOSUS Wall.; F. B. I. iv. 627; E. D. A. 1130. *A. eriocephalus* F. B. I. iv. 627. *Plectranthus strobiliferus* F. I. iii. 23.
Chota Nagpur; Behar.
A herb with stout, 4-angled stems, 1–2 feet high. *Hind.* Panjirí.

1641. ANISOCHILUS POLYSTACHYUS Benth.; F. B. I. iv. 639.
N. Bengal, Duars.
A herb, with strict, rigid stems, 3–9 feet high.

Carpels connate in a 4-partite ovary; style subequally 2-fid. *Fruit* of 4 orbicular, ovoid or oblong, smooth granulate or punctate, dry nutlets; basal scar small.

Leaves subsessile, usually ternately whorled, lanceolate-acuminate, serrate; cymes in dense panicles; fruiting calyx cylindric; teeth subequal ..... *ternifolius.*
Leaves petioled, large, opposite, wide ovate-cordate, crenate; cymes laxly racemose; fruiting calyx 2-lipped, wide campanulate, upper large, ounded, reflexed, lower with sharp teeth ..... *incanus.*

1635. PLECTRANTHUS TERNIFOLIUS Don; F. B. I. iv. 621. *Elsholtzia Thompsoni* F. B. I. iv. 643.
Chota Nagpur; N. Bengal, submontane forests; E. Bengal, Mymensingh.
A bushy herb, 3–5 feet high.

1636. PLECTRANTHUS INCANUS Link; F. B. I. iv. 621. *P. secundus* F. I. iii. 20.
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A large herb, not uncommon on roadsides.

742. Coleus Lour.

Herbs or undershrubs. *Flowers* in lax or close, panicled or racemed, 6–8-flowered cymes. *Sepals* 5, connate in a 2-lipped calyx, enlarged in fruit, upper lobe the widest, not decurrent. *Petals* 5, connate in a 2-lipped corolla; tube exserted, decurved; throat equal or obliquely swollen; upper lip short, broad, 4-fi recurved; lower much longer, entire, boat-shaped, stipitate narrow at base. *Stamens* 4, didynamous, declinate; filamen simple, shortly connate below in a sheath separate from the corolla; anther-cells usually confluent. *Disk* enlarged in front. *Carpels* connate in a 4-partite ovary; style subequally 2-fid. *Fruit* of 4 orbicular or ovoid, smooth, dry nutlets; basal scar small.

Calyx-throat villous within ..... *barbatus.*
Calyx-throat glabrous within :—
Corolla pale-purple; stamens shortly exserted; leaves fleshy ..... *aromaticus.*
Corolla white, with blue lower lip; stamens included; leaves membranous ..... *scutellarioides.*

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A herb with tuberous rootstock.

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Herbs or undershrubs. *Flowers* small, in dense, oblong, 4-angled or cylindric spikes; bracts caducous. *Sepals* 5, connate in a suberect calyx, inflated below the middle, 2-lipped or 5-toothed, rarely 1-lipped; upper lip entire and deflexed or short and minutely 3-lobed. *Petals* 5, connate in a 2-lipped corolla; tube slender, decurved; throat inflated; upper lip short, entire or 4-fid; lower elongated, concave. *Stamens* 4, didynamous, declinate; filaments free. *Disk* lobed. *Carpels* connate in a 4-partite ovary; style 2-fid at apex. *Fruit* of 4 ovoid, smooth, dry nutlets; basal scar small.

Fruiting calyx with the upper lip large, broad, entire, inflexed, occluding the mouth; lower lip truncate ..... *carnosus.*
Fruiting calyx slit in front; mouth very oblique, but not quite occluded by the incurved, 5-toothed lip ..... *polystachyus.*

1640. ANISOCHILUS CARNOSUS Wall.; F. B. I. iv. 627; E. D. A. 1130. *A. eriocephalus* F. B. I. iv. 627. *Plectranthus strobiliferus* F. I. iii. 23.
Chota Nagpur; Behar.
A herb with stout, 4-angled stems, 1–2 feet high. *Hind.* Panjiri.

1641. ANISOCHILUS POLYSTACHYUS Benth.; F. B. I. iv. 639.
N. Bengal, Duars.
A herb, with strict, rigid stems, 3–9 feet high.

744. Hyptis Jacq.

Herbs or shrubs. *Inflorescence* various, often capitate. *Sepals* connate in an ovoid, campanulate or tubular, subequally 5-toothed or 5-lobed calyx. *Petals* 5, connate in slightly 2-lipped corolla; tube cylindric or slightly enlarged; limb with 4 upper lobes subequal, erect or spreading; lowest lobe abruptly deflexed, saccate, contracted at the base. *Stamens* 4, didynamous, declinate; anther-cells confluent. *Disk* entire or glandular in front. *Carpels* connate in a 4-partite ovary; style shortly 2-fid or subentire at the tip. *Fruit* of 4 dry, ovoid or oblong nutlets, smooth or rugulose, sometimes slightly winged; basal scar small.

Flowers in globose heads ..... *capitata.*
Flowers in secund heads ..... *suaveolens.*

1642. Hyptis capitata Jacq.
C. Bengal, naturalised, rare.
An erect annual; introduced from America.

1643. Hyptis suaveolens Poit.; F. B. I. iv. 630.
In all the western provinces, very common.
A rigid annual, 2–4 feet high; native of America.
Vernac. Bilati tulsi.

745. Lavandula Linn.

Herbs or shrubs; leaves incised or entire. *Flowers* in 2–10-flowered whorls, collected in simple or branched spikes. *Sepals* 5, connate in an erect, ovoid-tubular, shortly, equally 5-toothed, 13–15-nerved calyx. *Petals* 5, connate in an oblique, 2-lipped, blue corolla; limb slightly enlarged; upper lip 2-fid; lower 3-partite; lobes all spreading. *Stamens* 4, didynamous, declinate, included; filaments free; anther-cells confluent. *Disk* equal. *Carpels* connate in a 4-partite ovary; style shortly 2-fid; lobes flattened. *Fruit* of 4 dry, smooth nutlets; basal scar somewhat oblique.

1644. Lavandula Burmanni Benth.; F. B. I. iv. 631.
Chota Nagpur.
A slender herb, 2–3 feet high.

746. Pogostemon Desf.

Herbs or undershrubs; *leaves* opposite, rarely ternate. *Flowers* small, in solitary or panicled spikes or contracted racemes, formed

of many dense-flowered, subcapitate cymes. *Sepals* 5, connate in a subequally toothed calyx; throat glabrous. *Petals* connate in a 4-lobed, somewhat 2-lipped corolla; lobes spreading, flat, the lowest usually longest. *Stamens* 4, subequal or slightly unequal, upper pair rather longer, straight or somewhat declinate; filaments usually bearded; anther-cells confluent. *Disk* equal, subentire. *Carpels* connate in a 4-partite ovary; style shortly 2-fid; lobes equal, subulate. *Fruit* of 4 smooth, ovoid or oblong, dry nutlets; basal scar small.

Hoary-pubescent; bracts large, ovate; spikes stout .....*plectranthoides.*
Glabrous, or if pubescent not hoary; bracts elliptic; spikes rather slender *parviflorus.*

1645. POGOSTEMON PLECTRANTHOIDES Desf.; F. B. I. iv. 632. *Mentha fruticosa* F. I. iii. 6.
In most of the provinces.
A large bush. *Beng.* Jui-lata.

1646. POGOSTEMON PARVIFLORUS Benth.; F. B. I. iv. 632; E. D. p. 1020.
Chittagong.
A stout herb.

747. Dysophylla Bl.

Herbs; *leaves* opposite or whorled. *Flowers* minute, in very dense, long spikes of many dense-flowered, whorled cymes. *Sepals* 5, connate in a very minute, ovoid, equally toothed calyx; throat naked within. *Petals* connate in a very minute, equally 4-fid corolla; tube exserted or included; upper lobe entire or 2-fid, lowest more spreading. *Stamens* 4, exserted, subequal or slightly unequal, straight or subdeclinate; filaments very long-bearded; anther-cells confluent. *Disk* equal, subentire. *Carpels* connate in a 4-partite ovary; style 2-fid; lobes equal, subulate. *Fruit* of 4 ovoid or oblong, smooth or rough, dry nutlets; basal scar small.

*Calyx-tube terete or nearly so :—[p. 850]
Leaves opposite :—
Dwarf, stout, erect, adpressed-pubescent; leaves sessile, lanceolate or narrow-oblong, entire.....*Andersoni.*
Tall, slender, erect, patently hirsute; leaves shortly petioled or sessile, oblong, serrate .....*auricularia.*
Leaves whorled :—
Leaves shortly petioled, 4 in a whorl, tomentose, subsilky or pubes-

cent, linear or linear-oblong, acute or obtuse, serrate or subentire; stems tomentose, perennial, erect, simple or branched; spikes tomentose or pubescent, often interrupted below.....*quadrifolia*.

Leaves sessile:—

Leaves revolute, margins entire, 3–6 in a whorl, linear, obtuse; stems hirsute, perennial, erect, simple; spikes villous, dense *cruciata*.

Leaves flat; stems glabrous, annual, erect, usually branched; spikes often interrupted:—

Calyx-teeth in fruit stellately spreading; leaves 4–10 in a whorl, entire or obscurely toothed; spikes tomentose or villous *verticillata*.

Calyx-teeth in fruit erect or conniving; leaves 4–6 in a whorl, serrate or subentire; spikes glabrate or pubescent:—

Taller, much-branched; stem decumbent below; calyx almost glabrous.....*crassicaulis*

Dwarf, little-branched; stem usually erect; calyx hirsute *crassicaulis* var. *pumila*.

*Calyx-tube deeply 5-grooved, with 5 elevated ridges; stems slender, erect, nearly glabrous; leaves 4 in a whorl, linear, obtuse; spikes slender, pubescent:—[p. 849]

Calyx densely pubescent all over; teeth minute, occluding the mouth in fruit; nutlet solitary; angles of fruiting calyx obtuse ...*pentagona*.

Calyx glabrous below; teeth white, villous; nutlets 4; angles of fruiting calyx acute .....*Griffithii*.

1647. DYSOPHYLLA ANDERSONI Prain.

N. Bengal, Duars.

A small, stoutish herb.

1648. DYSOPHYLLA AURICULARIA Bl.; F. B. I. iv. 638. *Mentha auricularia* F. I. iii. 4.

Chittagong.

A slender, flaccid herb, 1–2 feet high.

1649. DYSOPHYLLA QUADRIFOLIA Benth.; F. B. I. iv. 639. *Mentha quadrifolia* F. I. iii. 4.

Chittagong.

A stout undershrub, 2–4 feet high; smells of Chamomile.

1650. DYSOPHYLLA CRUCIATA Benth.; F. B. I. iv. 639.

Chota Nagpur.

A strict, stoutish herb, 1–1·5 feet high.

1651. Dysophylla verticillata Benth.; F. B. I. iv. 639. *Mentha verticillata* F. I. iii. 5.

In all the provinces.

A variable weed of rice-fields and swamps, sometimes thick-stemmed and much-branched, 2 feet high; sometimes slender and almost simple. *Beng.* Pani-kula.

1652. Dysophylla crassicaulis Benth.; F. B. I. iv. 640.

E. Bengal.

A stout-stemmed weed of rice-fields and swamps.

1652/2. Var. pumila; F. B. I. iv. 640.

N. Bengal.

A dwarf, slender weed of wet places.

1653. Dysophylla pentagona C. B. Clarke; F. B. I. iv. 641.

Chota Nagpur.

A slender, branching herb, in rice-fields, 1–1·5 feet high.

1654. Dysophylla Griffithii Hook. f.; F. B. I. iv. 641.

Orissa.

A slender, branching herb, in rice-fields, 1–1·5 feet high.

748. Colebrookia Smith.

A densely hoary shrub; *leaves* opposite or ternate, petioled, rugose, elliptic-oblong, crenulate. *Flowers* small; whorls dense-flowered, in panicled spikes; bracts connate. *Sepals* 5, connate in a very short calyx-tube; teeth long, subulate, ultimately elongated, capillary and penicillate. *Petals* connate in a small corolla; tube very short; lobes 4, subequal. *Stamens* 4, very short, included, equal, distant; anthers orbicular; cells confluent. *Disk* uniform. *Carpels* connate in a 4-partite ovary; style 2-fid; lobes subulate. *Fruit* of 4 obovoid, dry nutlets, with hairy tips; basal scar small.

1655. Colebrookia oppositifolia Sm.; F. I. iii. 26; F. B. I. iv. 642; E. D. C. 1711. *C. ternifolia* F. I. iii. 25.

Chota Nagpur.

A functionally diœcious shrub, 5–10 feet high. *Vernac.* Pansra.

749. Perilla Linn.

Herbs; *leaves* opposite. *Flowers* small; whorls 2-flowered, in secund, axillary and terminal, simple or panicled racemes; bracts small. *Sepals* 5, connate in a campanulate, 5-toothed calyx, much enlarged in fruit, gibbous at the base; limb 2-lipped; upper

lip dilated, 3-toothed; lower of 2 lanceolate-subulate teeth. *Petals* 5, connate in a short corolla, tubular below, campanulate above; 4 upper lobes equal, the lowest rather larger. *Stamens* 4, subequal, erect, distant, hardly exserted; anther-cells distinct, parallel, at length diverging. *Disk* of a large posticous gland. *Carpels* connate in a 4-partite ovary; style 2-fid; lobes equal, subulate. *Fruit* of 4 globose, coarsely reticulated, dry nutlets; basal areola small.

1656. PERILLA OCIMOIDES Linn.; F. B. I. iv. 646; E. D. P. 413.
Mentha perilloides F. I. iii. 7.
Chittagong, cultivated.
A coarse, aromatic annual, grown for its oily seeds.
Hind. Bhanjira.

750. Micromeria Benth.

Herbs or undershrubs; *leaves* usually small, entire or toothed. *Flowers* small; whorls in axillary or terminal spikes, rarely paniculate. *Sepals* 5, connate in a 13-nerved, 5-toothed or 2-lipped alyx. *Petals* 5, connate in a 2-lipped corolla; tube straight; upper lip entire or emarginate, flattish; lower spreading, 3-fid. *Stamens* 4, didynamous, the lower pair longer, ascending, incurved with diverging apices; anther-cells distinct, parallel, at length divergent; connective usually thickened. *Carpels* connate in a 4-celled ovary; style 2-lobed, the lobes equal, or the upper very short and lower recurved, flattened. *Fruit* of 4 smooth, dry, ovoid or oblong nutlets; basal scar small.

Stems tall, slender, erect, pubescent; leaves shortly petioled, obtuse; whorls subglobose, distant, in slender spikes, the lower spikes pedunculate ..... *capitellata.*

Stems short, dense, leafy, fastigiate, glabrous or very sparingly hairy; leaves sessile, subacute; whorls small, axillary, few-flowered, or flowers solitary ..... *biflora.*

1657. MICROMERIA CAPITELLATA Benth.; F. B. I. iv. 649.
Chota Nagpur.
A slender herb, 1–2 feet high, with woody rootstock.

1658. MICROMERIA BIFLORA Benth.; F. B. I. iv. 650.
Chota Nagpur.
A densely tufted, dwarf herb, with wiry branches.

751. Calamintha Moench.

Herbs or shrubs; *leaves* entire or toothed. *Flowers* small; whorls dense and axillary, or loose and panicled or spiked. *Sepals* 5, connate in a 13-nerved calyx; limb 2-lipped; upper lip 3-toothed; lower 2-fid, with narrower teeth; throat naked or villous. *Petals* 5, connate in a 2-lipped corolla; tube straight; throat villous; upper lip erect, flattish; lower spreading, 3-lobed. *Stamens* 4, didynamous, lower pair longer, ascending under upper lip; anther-cells distinct, parallel or divergent. *Carpels* connate in a 4-celled ovary; style 2-fid, the lobes equal or the lower larger. *Fruit* of 4 minute, subglobose, smooth, dry nutlets; basal scar small.

1659. Calamintha umbrosa Benth.; F. B. I. iv. 650. *Clinopodium repens* F. I. iii. 13.
Chota Nagpur.
A small, slender, decumbent herb.

752. Anisomeles R. Br.

Tall, erect, branching, coarse herbs. *Flowers* purplish, in axillary whorls or lax-flowered, branched, panicled cymes. *Sepals* 5, connate in an ovoid or tubular, straight calyx; limb equally toothed. *Petals* 5, connate in a 2-lipped corolla; tube short, annulate within; upper lip erect, entire; lower broad, 3-lobed, lobes spreading, the central emarginate. *Stamens* 4, didynamous, inserted; anthers connivent, of anterior longer pair dimidiate, 1-locular, of shorter 2-locular, the cells transverse, parallel. *Disk* equal. *Carpels* connate in a 4-partite ovary; style 2-fid at apex; lobes equal, subulate. *Fruit* of 4 ovoid, obtuse, smooth, dry nutlets; basal scar small.

Leaves sparsely or densely pubescent beneath .....*ovata.*
Leaves closely, softly woolly beneath .....*ovata* var. *mollissima.*

1660. Anisomeles ovata R. Br.; F. B. I. iv. 672; E. D. A. 1136. *Ajuga disticha* F. I. iii. 2.
Chota Nagpur; Chittagong.
A tall annual, 3–6 feet high. Smells of camphor. *Vernac.* Gobura.

1660/2. Var. mollissima Prain.
In most of the provinces.
A tall annual, 3–4 feet high.

753. Leonurus Linn.

Erect, stout, leafy herbs; *leaves* lobed. *Flowers* small, in dense-flowered, distant, axillary folds. *Sepals* 5, connate in a 5-nerved, turbinate calyx; teeth spreading, spinescent. *Petals* 5, connate in a 2-lipped corolla; tube naked or annulate within; upper lip entire, erect; lower 3-fid, midlobe obcordate. *Stamens* 4, didynamous, lower pair longer; filaments ascending; anthers connivent; cells transverse. *Disk* uniform. *Carpels* connate in a 4-partite ovary; style 2-fid; lobes equal, obtuse or subulate. *Fruit* of 4 triquetrous, smooth, dry nutlets; apices truncate; basal scar small.

1661. Leonurus sibiricus Linn.; F. B. I. iv. 678; E. D. L. 269. *L. tataricus* F. I. iii. 8.

In most of the provinces.

An annual weed in waste places, 2–6 feet high. *Vernac.* Gúma.

754. Leucas R. Br.

Herbs or undershrubs, usually woolly or villous. *Flowers* usually white; whorls axillary, usually distant. *Sepals* connate in a striate, 10-nerved calyx; mouth equal or oblique, equally or unequally 6–10-toothed. *Petals* 5, connate in a 2-lipped corolla; tube included, annulate or naked within; upper lip erect, concave, externally villous; lower lip spreading, 3-fid, midlobe very large. *Stamens* 4, didynamous, the lower pair longer; filaments ascending; anthers connivent, the cells divaricate, ultimately confluent. *Disk* entire or lobed, equal or glandular in front. *Carpels* connate in a 4-partite ovary; style subulate at apex, the posterior lobe obsolete. *Fruit* of 4 ovoid, triquetrous, obtuse, dry nutlets; basal scar small.

*Calyx-mouth oblique:— [p. 855]

Mouth of calyx split above, produced below ..... *urticifolia.*

Mouth of calyx projecting forward above:—

†Calyx-teeth very short:—[p. 855]

‡Calyx-mouth glabrous within; whorls both axillary and terminal:—[p. 855]

Perennial; hispidly hairy; bracts few, subulate; calyx-mouth wide ..... *hyssopifolia.*

Annuals; calyx-mouth contracted:—

Calyx smooth below, ribbed above; bracts long, linear, filiform *aspera.*

Calyx smooth throughout; bracts few, short ..... *linifolia.*

‡Calyx-mouth hairy within ; whorls terminal ; annuals :—[p. 854]
Whorls very large, subglobose ; bracts many, large, membranous, elliptic or linear-lanceolate, awned .....*Cephalotes.*
Whorls small ; bracts few, filiform, ciliate .....*involucrata.*
†Calyx-teeth long and slender ; bracts very slender :—[p. 854]
Teeth of calyx subequal, lanceolate, ciliate ; whorls terminal and axillary .....*nutans.*
Teeth of calyx unequal :—
Whorls all globose, axillary ; uppermost calyx-tooth longest ; leaves ovate.....*martinicensis.*
Whorls terminal, globose ; three uppermost calyx-teeth longer than the others ; leaves linear or lanceolate .....*Clarkei.*
*Calyx-mouth straight or nearly so :—[p. 854]
Calyx slightly hairy within ; teeth long, slender, ciliate ; bracts filiform, rigid, ciliate ; whorls solitary, terminal ; annual.....*stricta.*
Calyx naked within ; teeth short ; bracts minute, setaceous ; whorls numerous, axillary ; perennials :—
Whorls many-flowered ; flowers almost sessile ; leaves more or less pubescent ; calyx hairy :—
Hairs on the branches erect or spreading, not deflexed ; calyx-teeth minute.....*lanata* var. *nagpurensis.*
Hairs on the branches deflexed :—
Leaves softly velvety ; calyx woolly ; teeth very small *montana.*
Leaves more or less tomentose but not velvety ; calyx-teeth short, slender :—
Leaves adpressed-pubescent ; calyx woolly .....*mollissima.*
Leaves scaberulous, sparingly pubescent ; calyx hispid *mollissima* var. *scaberula.*
Whorls 1–2-flowered ; flowers pedicelled ; leaves almost glabrous ; calyx glabrous, teeth short, lanceolate-acuminate .....*procumbens.*

1662. LEUCAS URTICIFOLIA R. Br. ; F. B. I. iv. 680. *Phlomis urticifolia* F. I. iii. 11.
W. Behar, rare.
An annual herb.

1663. LEUCAS HYSSOPIFOLIA Benth. ; F. B. I. iv. 690.
Chota Nagpur.
A perennial herb.

1664. LEUCAS ASPERA Spreng. ; F. B. I. iv. 690 ; E. D. L. 309. *Phlomis esculenta* F. I. iii. 10.
In most of the provinces.
An annual herb. *Vernac.* Chhota hal-kúsa.

1665. Leucas linifolia Spreng.; F. B. I. iv. 690; E. D. L. 323. *Phlomis zeylanica* F. I. iii. 9.
In all the provinces.
An annual herb. *Vernac.* Hal-kúsa, gúma.

1666. Leucas Cephalotes Spreng.; F. B. I. iv. 689; E. D. L. 312. *Phlomis Cephalotes* F. I. iii. 10.
In most of the provinces.
An annual herb. *Hind.* Dhurpi ság; *Beng.* Bara hal-kúsa; *Santal.* Andia dhurup arak'.

1667. Leucas involucrata Benth. *L. zeylanica* F. B. I. iv. 689; E. D. L. 329.
Chittagong.
An annual herb.

1668. Leucas nutans Spreng; F. B. I. iv. 688.
Behar; Chota Nagpur.
A dwarf, annual herb.

1669. Leucas martinicensis R. Br.; F. B. I. iv. 688.
Chota Nagpur.
A stout, annual herb.

1670. Leucas Clarkei Hook. f.; F. B. I. iv. 688; E. D. L. 321.
Chota Nagpur.
A slender herb. *Santal.* Enga dhurup arak'; *Hind.* Dhurpi ság.

1671. Leucas stricta Benth.; F. B. I. iv. 688.
S. Orissa, sand-dunes near coast.
A slender herb.

1672. Leucas lanata Benth.; F. B. I. iv. 681 var. nagpurensis C. B. Clarke.
Chota Nagpur.
A stout herb or undershrub.

1673. Leucas montana Spreng.; F. B. I. iv. 682. *Phlomis montana* F. I. iii. 11.
Chota Nagpur; Orissa; Behar.
A slender, branching herb.

1674. Leucas mollissima Wall.; F. B. I. iv. 682; E. D. L. 327.
Behar; Chota Nagpur; W. Bengal; Orissa.
A slender, branching herb.

1674/2. Var. scaberula; F. B. I. iv. 682; E. D. L. 327.
Chota Nagpur.
A slender, branching herb. *Santal.* Gitil arak'.

1675. Leucas procumbens Desf.; F. B. I. iv. 683. *Phlomis biflora* F. I. iii. 12 partly.

C. Bengal; E. Bengal.

A slender, procumbent herb.

755. Leonotis R. Br.

Herbs or shrubs. *Flowers* rather large, scarlet or yellow; whorls axillary, densely many-flowered; bracteoles numerous, slender. *Sepals* connate in a 10-nerved calyx; tube often incurved; mouth oblique, with 8–10 rigid teeth, the upper tooth largest. *Petals* 5, connate in a 2-lipped corolla; tube exserted; upper lip long, concave, with villous crown; lower very small, spreading, concave, the midlobe largest. *Stamens* 4, didynamous, lower pair longer, ascending; anthers connivent; cells divaricate. *Disk* equal. *Carpels* connate in a 4-partite ovary; style subulate, upper lobe very short. *Fruit* of 4 oblong or ovoid, dry, triquetrous, obtuse or truncate, glabrous nutlets; basal scar small.

1676. Leonotis nepetifolia R. Br.; F. B. I. iv. 691; E. D. L. 266. *Phlomis nepetifolia* F. I. iii. 8.

In most of the provinces.

A tall, annual herb, 4–6 feet high. *Beng.* Hejurchi; *Santal.* Dare dhompo, janum dhompo.

756. Nepeta Linn.

Erect or prostrate herbs; *leaves* opposite. *Flowers* blue, yellow, or white; whorls axillary or terminal; upper leaves often reduced to bracts. *Sepals* 5, connate in a 15-nerved, equally 5-toothed calyx, or sub-2-labiate, with the 2 lower teeth narrower. *Petals* 5, connate in a 2-lipped corolla; tube not annulate within; throat enlarged; upper lip straight, notched or 2-fid; lower 3-fid, with midlobe largest. *Stamens* 4, didynamous, ascending or exserted, upper pair longer; anther-cells diverging. *Disk* uniform, or enlarged in front. *Carpels* connate in a 4-partite ovary; style shortly 2-fid; lobes subequal. *Fruit* of 4 ovoid or compressed, obtuse, dry, smooth nutlets; basal scar small or oblique.

1677. Nepeta ruderalis Ham.; F. B. I. iv. 661; E. D. N. 64. *Glechoma erecta* F. I. iii. 7.

Behar; Chota Nagpur; Tirhut.

An annual herb.

757. Meriandra Benth.

Hoary or woolly, strongly scented shrubs; *leaves* opposite, coriaceous, oblong, crenulate, rugulose above. *Flowers* small; whorls very many and dense-flowered, in large, terminal, broad, or small and paniculate, catkin-like spikes; bracts closely, strobilately imbricate. *Sepals* 5, connate in a small, ovoid, 2-lipped calyx; throat naked; upper lip concave, subentire; lower lip 2-fid. *Petals* connate in a tubular corolla, with 4-fid limb; lobes subequal, spreading, the upper entire or emarginate. *Stamens* 2 anterior only perfect; filaments short, stout, erect, distant; anthers 2-celled; cells linear, pendulous, stipitate, discrete; posterior stamens reduced to 2 usually small staminodes, but with occasionally one of the 2 provided with an imperfect anther. *Disk* uniform. *Carpels* connate in a 4-partite ovary; style shortly 2-lamellate at tip. *Fruit* of 4 ovoid-oblong, obtuse, smooth, dry nutlets; basal scar small.

1678. Meriandra bengalensis Benth.; F. B. I. iv. 653; E. D. M. 485. *Salvia bengalensis* F. I. i. 145.

In native gardens in C. Bengal.

A large, straggling shrub; native of Abyssinia. *Vernac.* Kafur-ka-pat.

758. Salvia Linn.

Herbs or shrubs. *Flowers* small, or large and showy; whorls usually racemose or spicate; bracts small or large and leafy, sometimes coloured. *Sepals* 5, connate in a 2-lipped calyx; tube cylindric or campanulate; throat naked; upper lip entire or 3-toothed, lower 2-fid. *Petals* 5, connate in a 2-lipped corolla; tube naked or annulate within; upper lip erect, entire; lower 3-lobed, lateral lobes spreading. *Stamens* 2, anterior only perfect; filaments short, articulate with the slender connective, and sometimes produced beyond the joint; anthers dimidiate; connective linear, transverse; posterior arm ascending and bearing a lineal, fertile cell; anterior arm straight or deflexed, with a fertile or empty cell or naked; posterior stamens represented by small staminodes or obsolete. *Disk* usually enlarged in front. *Carpels* connate in a 4-partite ovary; style shortly 2-fid; lobes equal, subulate, or the anterior longer, sometimes flattened. *Fruit* of 4 ovoid, triangular, smooth, dry nutlets; basal scar small.

Corolla very small, tube not exserted .....*plebeja.*
Corolla long, slender, tube far exserted .....*coccinea.*

1679. Salvia plebeja R. Br.; F. B. I. iv. 655; E. D. S. 746. *S. brachiata* F. I. i. 145.

In most of the provinces.

An annual weed. *Beng.* Koka-Buradi, Bhu-tulsi.

1680. Salvia coccinea Linn.

In gardens generally, and occasionally subspontaneous.

A slender herb, 1–2 feet high; native of S. America.

759. Gomphostemma Wall.

Perennial herbs or undershrubs, stellately pubescent or tomentose; roots often mixed with tubers. *Flowers* rather large, usually yellow; whorls 6–8-flowered, dense or lax, axillary or in terminal spikes. *Sepals* 5, connate in a 10-nerved calyx; tube campanulate; limb equally 5-toothed. *Petals* connate in a 2-lipped corolla; tube slender; throat more or less dilated, rarely annulate; upper lip hooded; lower broadly 3-fid. *Stamens* 4, didynamous, ascending, lower pair longer; anthers approximate in pairs, 2-locular; cells parallel. *Disk* uniform or slightly swollen. *Carpels* connate in a 4-partite ovary; style 2-fid; lobes subulate, nearly equal. *Fruit* of 4 or, by reduction, 3–1 glabrous or pubescent, thickly corky or fleshy drupelets; basal scar broad.

1681. Gomphostemma parviflorum Wall.; F. B. I. iv. 697.

Chittagong.

An undershrub.

760. Teucrium Linn.

Herbs or shrubs; *leaves* entire, serrate, or lobed, floral leaves often bract-like. *Flowers* usually small; whorls in 2–6-flowered axillary or terminal spikes, racemes or heads. *Sepals* 5, connate in a 10-nerved calyx; teeth equal or the upper larger. *Petals* 5, connate in a 1-lipped corolla; tube not annulate within; limb slit behind, the 2 upper and the lateral lobes cuneate or short or obsolete, lower lobe very large. *Stamens* 4, didynamous, the lower longer, exserted; anthers reniform; cells short, at length confluent. *Disk* equal. *Carpels* connate in a shortly 4-lobed ovary; style 2-fid at tip; lobes subequal. *Fruit* of 4 obovoid, rugosely reticulate nutlets; scar oblique or lateral, often extending more than half-way up the nutlet.

1682. TEUCRIUM STOLONIFERUM Roxb.; F. I. iii. 3; F. B. I. iv. 700.
N. Bengal; E. Bengal; Tippera; Chittagong.
An erect herb, 1–2 feet high.

761. Ajuga Linn.

Annual or perennial herbs, often decumbent or stoloniferous; *leaves* usually coarsely toothed. *Flowers* sessile; whorls 2–many-flowered, axillary or in terminal, leafy spikes. *Sepals* 5, connate in a 10-nerved or irregularly many-nerved calyx; teeth subequal. *Petals* connate in a 2-lipped corolla, marcescent and more or less persistent in fruit; tube often annulate within; throat slightly dilated; upper lip very short, 2-fid; lower lip spreading, midlobe usually largest, emarginate or 2-lobed. *Stamens* 4, didynamous, the lower pair longer, ascending, exserted or included; anthers 2-celled; cells diverging or divaricate, ultimately confluent. *Disk* uniform or slightly swollen. *Carpels* connate in a shortly 4-lobed ovary; style 2-fid, the lobes subulate, nearly equal. *Fruit* of 4 obovoid, rugosely reticulate nutlets; scar lateral, extending beyond the middle of the nutlet.

Corolla-tube one-half longer than the calyx ..... *macrosperma*.
Corolla-tube not, or slightly, longer than the calyx
macrosperma var. *breviflora*.

1683. AJUGA MACROSPERMA Wall.; F. B. I. iv. 704. *A. repens* F. I. iii. 3.
Chittagong.
A procumbent herb.

1683/2. Var. BREVIFLORA; F. B. I. iv. 704
Chota Nagpur.
A procumbent herb.

IV. INCOMPLETÆ.

Sepals distinct, herbaceous, rarely petaloid, imbriate or valvate, or connate in a tube with imbricate or valvate lobes. *Petals* usually 0, very rarely 1-seriate and like the sepals, more rarely 1-seriate and truly corolline, inserted on the disk or rarely adnate

to the ovary. *Torus* small, or raised and stalk-like. *Stamens* few, rarely numerous, inserted on torus or rarely on base of perianth. *Carpels* 1 or more, free or connate.

Order CI. NYCTAGINEÆ.

Herbs, shrubs, or trees. *Leaves* usually opposite, entire; stipules 0. *Flowers* hermaphrodite, rarely 1-sexual, regular, sometimes dimorphous, often disposed in terminal and axillary, panicled or corymbose cymes, rarely racemed or solitary, sometimes umbellate or capitate; bracts often involucrate, free or connate. *Perianth* usually small, petaloid, segments connate in an inferior, monophyllous, persistent tube, campanulate, funnel-shaped, or salver-shaped, often thickened below, enclosing the fruit; limb persistent or deciduous, 3–5-lobed; lobes plicate in bud. *Stamens* 8–30, hypogynous, sometimes unilateral; filaments usually unequal, inflexed in bud; anthers included or exserted, dorsifixed, didymous; dehiscence lateral, longitudinal. *Carpel* sessile or stipitate, often somewhat elongated, forming a membranous, included, 1-locular ovary; ovule solitary, basal, erect, campylotropous; style filiform or capillary or 0, involute in bud; stigma small, simple or multifid. *Fruit* membranous, indehiscent, enclosed in the coriaceous perianth-base. *Seed* erect; testa adherent; albumen soft or floury; embryo straight with conduplicate cotyledons, or incurved; radicle elongated, inferior.

Embryo hooked; radicle long; limb of perianth plicate:—
Leaves opposite; stigma capitate; herbs:—
Flowers involucrate; bracts connate ..... **Mirabilis.**
Flowers paniculate or umbellate, bracteolate ..... **Boerhaavia.**
Leaves alternate; stigma lateral; climbing shrubs; flowers in threes, attached to midribs of large, coloured bracts ..... **Bougainvillea.**
Embryo straight; radicle short; limb of perianth induplicate-valvate; flowers small, in panicled cymes ..... **Pisonia.**

762. Mirabilis Linn.

Glabrous or glandular herbs, 2–3-chotomously branched; root often tuberous; *leaves* opposite, the lower petioled, the upper sessile. *Flowers* rather large, in branched, usually dense, involucrate cymes, the involucres 1- or more-flowered, calyx-like, 5-lobed, with erect, acuminate, imbricate segments, not enlarging

1682. TEUCRIUM STOLONIFERUM Roxb.; F. I. iii. 3; F. B. I. iv. 700.
N. Bengal; E. Bengal; Tippera; Chittagong.
An erect herb, 1–2 feet high.

761. Ajuga Linn.

Annual or perennial herbs, often decumbent or stoloniferous; *leaves* usually coarsely toothed. *Flowers* sessile; whorls 2–many-flowered, axillary or in terminal, leafy spikes. *Sepals* 5, connate in a 10-nerved or irregularly many-nerved calyx; teeth subequal. *Petals* connate in a 2-lipped corolla, marcescent and more or less persistent in fruit; tube often annulate within; throat slightly dilated; upper lip very short, 2-fid; lower lip spreading, midlobe usually largest, emarginate or 2-lobed. *Stamens* 4, didynamous, the lower pair longer, ascending, exserted or included; anthers 2-celled; cells diverging or divaricate, ultimately confluent. *Disk* uniform or slightly swollen. *Carpels* connate in a shortly 4-lobed ovary; style 2-fid, the lobes subulate, nearly equal. *Fruit* of 4 obovoid, rugosely reticulate nutlets; scar lateral, extending beyond the middle of the nutlet.

Corolla-tube one-half longer than the calyx ..... *macrosperma*.
Corolla-tube not, or slightly, longer than the calyx
macrosperma var. *breviflora*.

1683. AJUGA MACROSPERMA Wall.; F. B. I. iv. 704. *A. repens* F. I. iii. 3.
Chittagong.
A procumbent herb.

1683/2. Var. BREVIFLORA; F. B. I. iv. 704
Chota Nagpur.
A procumbent herb.

IV. INCOMPLETÆ.

Sepals distinct, herbaceous, rarely petaloid, imbriate or valvate, or connate in a tube with imbricate or valvate lobes. *Petals* usually 0, very rarely 1-seriate and like the sepals, more rarely 1-seriate and truly corolline, inserted on the disk or rarely adnate

to the ovary. *Torus* small, or raised and stalk-like. *Stamens* few, rarely numerous, inserted on torus or rarely on base of perianth. *Carpels* 1 or more, free or connate.

Order CI. NYCTAGINEÆ.

Herbs, shrubs, or trees. *Leaves* usually opposite, entire; stipules 0. *Flowers* hermaphrodite, rarely 1-sexual, regular, sometimes dimorphous, often disposed in terminal and axillary, panicled or corymbose cymes, rarely racemed or solitary, sometimes umbellate or capitate; bracts often involucrate, free or connate. *Perianth* usually small, petaloid, segments connate in an inferior, monophyllous, persistent tube, campanulate, funnel-shaped, or salver-shaped, often thickened below, enclosing the fruit; limb persistent or deciduous, 3–5-lobed; lobes plicate in bud. *Stamens* 8–30, hypogynous, sometimes unilateral; filaments usually unequal, inflexed in bud; anthers included or exserted, dorsifixed, didymous; dehiscence lateral, longitudinal. *Carpel* sessile or stipitate, often somewhat elongated, forming a membranous, included, 1-locular ovary; ovule solitary, basal, erect, campylotropous; style filiform or capillary or 0, involute in bud; stigma small, simple or multifid. *Fruit* membranous, indehiscent, enclosed in the coriaceous perianth-base. *Seed* erect; testa adherent; albumen soft or floury; embryo straight with conduplicate cotyledons, or incurved; radicle elongated, inferior.

Embryo hooked; radicle long; limb of perianth plicate:—
Leaves opposite; stigma capitate; herbs:—
Flowers involucrate; bracts connate ..... **Mirabilis.**
Flowers paniculate or umbellate, bracteolate ..... **Boerhaavia.**
Leaves alternate; stigma lateral; climbing shrubs; flowers in threes, attached to midribs of large, coloured bracts ..... **Bougainvillea.**
Embryo straight; radicle short; limb of perianth induplicate-valvate; flowers small, in panicled cymes ..... **Pisonia.**

762. Mirabilis Linn.

Glabrous or glandular herbs, 2–3-chotomously branched; root often tuberous; *leaves* opposite, the lower petioled, the upper sessile. *Flowers* rather large, in branched, usually dense, involucrate cymes, the involucres 1- or more-flowered, calyx-like, 5-lobed, with erect, acuminate, imbricate segments, not enlarging

in fruit. *Perianth*-tube elongated, narrowed above the ovary; limb spreading, 5-lobed, plicate, deciduous. *Stamens* 5–6, exserted; filaments unequal, capillary, incurved, connate below in a fleshy cup; anthers didymous. *Ovary* ellipsoid or ovoid; style filiform, exserted; stigma capitellate, stipitately papillose. *Fruit* enclosed in a papery, crustaceous, or coriaceous, ribbed, persistent perianth-base; utricle obovoid, coriaceous. *Seed* with adherent testa; embryo hooked; cotyledons enclosing the scanty, floury albumen.

1684. Mirabilis Jalapa Linn.; E. D. M. 606.

Cultivated, and as an escape, in every province.

A tall herb, with showy flowers; native of America.

Hind. Gul-abbas; *Beng.* Krishno-kéli. Marvel of Peru.

763. Boerhaavia Linn.

Erect or diffuse herbs, often divaricately branched; *leaves* opposite, thickish, often in unequal pairs. *Flowers* small, panicled, umbellate, or capitate, articulate with the pedicels; bracteoles minute, often deciduous, rarely whorled and involucrate. *Perianth*-tube short or long, ovoid below, narrowed above the ovary; limb funnel-shaped, with a 5-lobed margin; lobes plicate, spreading, deciduous. *Stamens* 1 or 2–5, connate below, exserted; filaments capillary, unequal; anthers didymous. *Ovary* stipitate, oblique, narrowed to a slender style; ovule erect; stigma peltate. *Fruit* enclosed in the ovoid, turbinate or clavate, obtuse or truncate perianth-base, round, 5-ribbed, or 5-angled, with small or large sticky glands; utricle oblong. *Seed* with adherent testa; embryo hooked; cotyledons thin, broad, the outer the larger, enclosing the scanty albumen.

Flowers subcapitate; leaves entire or faintly undulate:—
Leaves white beneath; branches slender:—
Branches usually under a foot long, adpressed-pubescent .....*repens*.
Branches usually over 2 feet long, glabrous...*repens* var. *procumbens*.
Leaves green beneath; branches stout.....*repens* var. *diffusa*.
Flowers umbellate; leaves repand-sinuate .....*repanda*.

1685. Boerhaavia repens Linn.; F. B. I. iv. 709.

In all the provinces; common chiefly in the western parts.

A small, diffusely branched herb.

1685/2. Var. PROCUMBENS; F. B. I. iv. 709. *B. procumbens* F. I. i. 146.
In all the provinces; common chiefly in the central and eastern parts.
A large, diffusely branched herb.

1685/3. Var. DIFFUSA; F. B. I. iv. 709; E. D. B. 619.
Chota Nagpur; Orissa, rare.
A large, diffusely branched herb. *Vernac.* Sánt, punarnába.

1686. BOERHAAVIA REPANDA Willd.; F. B. I. iv. 709.
W. Behar.
A large, diffusely branched herb.

764. Bougainvillea Comm.

Shrubs, often climbing, usually armed with recurved or straight spines; *leaves* alternate, petioled, entire. *Flowers* bracteate, one inserted on the midrib below the middle of each bract, greenish below, rose or yellow above; bracts in threes, large, leafy, coloured. *Perianth*-tube slightly curved, narrow, fusiform below the middle, above narrow, funnel-shaped, and at length twisted; limb shortly 5–6-lobed, often crispately edged. *Stamens* 7–8, included; filaments capillary, unequal, connate below in a cup; anthers didymous. *Ovary* narrow-fusiform, stipitate; ovule solitary, erect; style short, lateral, filiform, included; stigma elongated, one-sided. *Fruit* enclosed in the coriaceous, slightly compressed, 5-ribbed perianth-base; utricle stipitate, cylindric or clavate. *Seed* with a thin testa; embryo hooked; cotyledons convolute, enclosing the albumen.

Leaves and branches glabrous; flowers appearing throughout the year; bracts magenta ..... *glabra.*
Leaves and branches softly pubescent; flowers appearing only in the dry season:—
Bracts dark magenta or purple ..... *spectabilis.*
Bracts brick or terra-cotta red ..... *spectabilis* var. *lateritia.*

1687. BOUGAINVILLEA GLABRA Choisy.
In gardens, both native and European.
A large, climbing shrub, with axillary, recurved spines; native of Brazil

1688. BOUGAINVILLEA SPECTABILIS Willd.
In gardens of European residents, common.
A large, climbing shrub, with axillary, recurved spines; native of Brazil.

1688/2. Var. LATERITIA Hort.
In gardens of European residents, rare.
A large, climbing shrub, with axillary, recurved spines; native of Brazil.

765. Pisonia Linn.

Trees or shrubs, unarmed or with axillary spines; *leaves* opposite or alternate, sessile or petioled, entire. *Flowers* small, diœcious, rarely monœcious or hermaphrodite, in panicled subsessile or peduncled cymes; bracteoles 2–3, not involucrate. ♂ *Perianth* tubular or narrow campanulate; limb 5-lobed or 5-toothed; segments induplicate-valvate, erect or spreading. *Stamens* 6–10, exserted; filaments unequal or alternately shorter and longer, filiform, connate below in a tube or ring; anthers oblong or didymous. ♀ *Perianth* oblong, usually enlarged at the base. *Ovary* elongated, ovoid, sessile; ovule solitary; style slender, included or exserted; stigma capitellate, peltate, or fimbriate. *Fruit* enclosed in the coriaceous or hardened, oblong, linear or clavate perianth-base, cylindric, compressed or 5-angled, with 5 viscid ribs or with 5 rows of viscid, stipitate glands; utricle elongated, membranous. *Seed* with a hyaline testa adnate to the pericarp; embryo straight; albumen scanty, gelatinous.

1689. PISONIA ACULEATA Linn.; F. I. ii. 217; F. B. I. iv. 711; E. D. P. 824.
Orissa.
A large climbing shrub, with axillary, recurved spines.
Beng. Baghachura; *Uriya* Hati-ankúsa.

Order CII. AMARANTACEÆ.

Herbs, rarely undershrubs, erect or with climbing branches. *Leaves* opposite or alternate; stipules 0. *Flowers* usually hermaphrodite, rarely polygamous or diœcious, small, usually in terminal, simple or panicled spikes cymes or clusters, outermost flowers of a fascicle sometimes deformed; bracts hyaline or

scarious, never leafy; bracteoles 2, scarious. *Perianth* dry, of usually 5 free or slightly connate, hyaline or scarious, persistent sepals, imbricate in bud, usually erect, equal, or the inner 2–3 smaller. *Stamens* 1–5, hypogynous or adnate to the base of the perianth, always opposite the perianth-segments, usually included; filaments rarely free, usually connate below, directly or by means of interstaminal membranous staminodes, in a hypogynous cup; anthers dorsifixed, short and didymous, or long; cells 1 or 2; dehiscence introrse, longitudinal. *Carpels* solitary or connate in an ovoid, ellipsoid, or globose 1-celled ovary, free and sometimes somewhat stipitate; ovules 1 or more, amphitropous, erect and basal, or suspended from short or long, free basal funicles; style sometimes simple or obsolete, with stigma capitellate or small, sometimes 2–3-fid, with stigmas acute, or styles 2 or 3, papillosely stigmatic on inner face, erect or recurved. *Fruit* a membranous utricle, rarely a circumscissile or irregularly rupturing capsule, very rarely a small berry, enclosed in or supported by the persistent perianth. *Seed* inverted or erect, orbicular or ovate, compressed; testa crustaceous; embryo horseshoe-shaped or annular, surrounding a floury albumen.

Leaves alternate, or, if opposite (*Ærua* sometimes), then either fasciculate and filiform, or with alternate leaves mixed with opposite ones; anthers 2-celled:—

Ovary 2–many-ovuled:—
- Fruit a berry; shrubby ..... **Deeringia.**
- Fruit membranous; herbs ..... **Celosia.**

Ovary 1-ovuled:—
- Ovules erect:—
  - Flowers 2-sexual:—
    - Flowers capitate; fruit a circumscissile utricle ..... **Allmannia.**
    - Flowers spicate; fruit a crustaceous nut ..... **Digera.**
  - Flowers 1-sexual ..... **Amarantus.**
- Ovules suspended from a basal funicle; flowers perfect; stamens with interposed staminodes ..... **Ærua.**

Leaves opposite, not fascicled; ovary 1-celled; ovules suspended from a basal funicle:—

*Anthers 2-celled:—[p. 866]

†Flowers all perfect:—[p. 866]
- Stamens with interposed staminodes ..... **Achyranthes.**
- Staminodes none ..... **Psilotrichum.**

†Flowers clustered, 1–3 perfect, surrounded by deformed ones:—[p. 865]

Stamens with interposed staminodes .....**Cyathula.**

Staminodes none .....**Pupalia.**

*Anthers 1-celled:—[p. 865]

Staminal-tube short; stigma capitate, subsessile ...**Alternanthera.**

Staminal-tube long; stigma 2-fid; style long .....**Gomphrena.**

766. Deeringia R. Br.

Climbing undershrubs; *leaves* alternate, petioled. *Flowers* small, in simple or panicled spikes, hermaphrodite or polygamo-diœcious; bracts and 2 bracteoles scarious. *Perianth*-segments 5, sepaline, membranous or herbaceous, spreading in fruit, free and equal or nearly so. *Stamens* 4 or 5; filaments connate below in a hypogynous cup; anthers broadly oblong, 2-celled. *Carpels* connate in an ovoid or subglobose, sessile or substipitate ovary; ovules many or few, with elongated funicles; styles 2 or 4, subulate, connate below, uniformly papillose throughout, or small, sessile, and capitellate. *Fruit* a small, globose berry, or a circumscissile capsule, seated on the spreading perianth. *Seeds* few or many, reniform, compressed; testa black, shining; arillus 0; embryo annular, surrounding the floury albumen; cotyledons linear; radicle descending.

1690. Deeringa celosioides R. Br.; F. I. i. 682; F. B. I. iv. 714.

Behar; Tirhut; N. Bengal; C. Bengal; E. Bengal; Chittagong.

A slender, climbing shrub. *Hind.* Latman; *Beng.* Gola mohani.

767. Celosia Linn.

Herbs, usually annual; stems sometimes woody; *leaves* alternate, usually petioled. *Flowers* hermaphrodite, in dense terminal and axillary spikes, sessile or shortly pedicelled, white or coloured; bracts scarious; bracteoles 2, scarious. *Perianth* of 5 segments, connate below, scarious, oblong or lanceolate, obtuse or acute, striate, erect in fruit. *Stamens* 5; filaments subulate or filiform, connate below in a membranous, hypogynous cup; anthers short or long, 2-celled. *Carpels* connate in a 1-celled, ovoid or subglobose or obovoid ovary; ovules 2 or more, funicles long; style 0

or short or long, sometimes elongating in fruit; stigmas simple or 2–3, subulate. *Fruit* a circumscissile capsule, ovoid or globose, acute or obtuse, sometimes corky or coriaceous. *Seeds* 2 or more, erect, lenticular; testa crustaceous, black, shining; embryo annular, surrounding the floury albumen; cotyledons linear; radicle descending or ascending.

Flowers white, glistening, ·35 in. long or larger ..... *argentea.*
Flowers pink, rose, or yellow, ·25 in. long or smaller ..... *cristata.*

1691. CELOSIA ARGENTEA Linn.; F. I. i. 678; F. B. I. iv. 714; E. D. C. 868.

In all the provinces, cultivated and as an escape.

An erect annual, 1–3 feet high. *Hind.* Debkoti, safed murgha-ka-phul; *Beng.* Swet murgha-phul; *Santal.* Sirgit arak'.

1692. CELOSIA CRISTATA Linn.; F. I. i. 679; F. B. I. iv. 715; E. D. C. 873. *C. cernua* F. I. i. 680.

In all the provinces, cultivated; occasionally as an escape.

An erect annual, 2–3 feet high. *Vernac.* Murgha-ka-phul.

768. Allmania R. Br.

Erect or diffuse herbs; *leaves* alternate, narrow, entire. *Flowers* hermaphrodite, white or greenish, in terminal and axillary, sessile or peduncled heads; bracts subherbaceous; bracteoles 2, scarious. *Perianth*-segments 5, free or nearly so, sepaline, scarious, equal, oblong-lanceolate, striate, erect in fruit. *Stamens* 5; filaments dilated at base, connate in a membranous, hypogynous cup; anthers small, linear-oblong, 2-locular. *Carpels* solitary, forming an ovoid, 1-celled ovary, narrowed into a long, straight style; ovule solitary, subsessile, erect; stigma 2-lobed. *Fruit* a compressed, subglobose, or ovoid, circumscissile capsule. *Seed* erect, subglobose; testa black, crustaceous, shining, with a basal, cup-shaped arillus; embryo annular, surrounding the copious, floury albumen; cotyledons linear; radicle inferior.

1693. ALLMANIA NODIFLORA R. Br.; F. B. I. iv. 716. *Achyranthes nodiflora* F. I. i. 678.

Chota Nagpur; Behar; Tirhut; N. Bengal.

A diffuse, dichotomously branched annual.

769. Digera Forsk.

Annual herbs with angular branches; *leaves* alternate, petioled, entire. *Flowers* in axillary, peduncled spikes, ternate, the two outer reduced to crested scales, the central perfect; bracts and 2 bracteoles subherbaceous. *Perianth* submembranous, calycine; segments 5, slightly connate below, oblong, erect, the 2 outer larger, erect in fruit. *Stamens* 5, hypogynous; filaments free, filiform; anthers didymous, 2-locular. *Carpels* forming an oblong, compressed, truncate, 1-celled ovary; ovule solitary, erect, funicle short; style filiform; stigmas 2, short, recurved. *Fruit* a subglobose, crustaceous nut, included in the perianth, slightly compressed, sides ridged. *Seed* erect, subglobose; testa brown, adnate to albumen; embryo annular; cotyledons linear; radicle descending.

1694. DIGERA ARVENSIS Forsk.; F. B. I. iv. 717; E. D. D. 420. *Achyranthes alternifolia* F. I. i. 674.

In most of the provinces.

A slender, annual field-weed, sometimes becoming perennial by waysides. *Beng.* Luta mahauria, gungatiay; *Santal.* Kari gandhari.

770. Amarantus Linn.

Annual, erect or decumbent herbs; *leaves* alternate, narrowed to the base, entire or lobed. *Flowers* small, monœcious, in axillary clusters or dense, terminal panicles; bracts herbaceous, often persistent; bracteoles 2. ♂ *Perianth* of 5, rarely 1–3 membranous, equal or nearly equal, ovate-lanceolate segments. *Stamens* 5, rarely 1–3; filaments free, subulate or filiform; anthers oblong or linear, 2-celled. ♀ *Perianth*-segments oblong or spathulate, in fruit erect, sometimes coriaceous and usually persistent. *Carpels* forming an ovoid, compressed, 1-celled ovary; ovule solitary, subsessile, erect; style short or 0; stigmas 2–3, subulate or filiform, hirsute or papillose. *Fruit* an orbicular or ovoid, compressed utricle, or a circumscissile, membranous or coriaceous capsule, with entire or 2–3-toothed apex. *Seed* erect, orbicular, compressed; testa crustaceous; embryo annular, enclosing the floury albumen; cotyledons linear; radicle inferior.

*Bracts awned or setaceous, equalling or exceeding the sepals; utricle dehiscent, circumscissile; leaves long-petioled:—[p. 869]

Stamens 5; sepals 5:—

Leaf-axils with 5 spines; stems terete; leaves ovate or oblong, obtuse; bracts setaceous; flowers in dense or lax spikes...*spinosus.*

Leaf-axils not spinous; stems striate; leaves elliptic or ovate-lanceolate; bracts acicular; spikes thyrsoid:—

Leaves acute or acuminate; bracts recurved, much exceeding the oblong-lanceolate, acuminate sepals .....*paniculatus.*

Leaves obtuse, rarely acute; bracts hardly recurved, not greatly exceeding the obovate, mucronate sepals.....*caudatus.*

Stamens 3; sepals 3; leaves obtuse or emarginate:—

Erect; flowers clustered in lower axils, and also forming a long, terminal spike; sepals long-awned, much exceeding the utricle leaves ovate, oblong, or lanceolate:—

Stems branching above the middle; yielding only one crop annually .....*gangeticus.*

Stems branching near the base; yielding several crops annually *gangeticus* var. *tristis.*

Diffuse; flowers clustered, all axillary; sepals short-awned, not greatly exceeding the utricle; leaves ovate-elliptic or deltoid-ovate *mangostanus.*

*Bracts acute, hardly awned, shorter than the sepals; utricle indehiscent or, rarely, dehiscent; leaves obtuse, rounded or notched:—[p. 868]

Stamens 3; sepals 3:—

Utricle acute at the tip, rugose, indehiscent; clusters axillary and in terminal, panicled, slender spikes:—

Leaves green .....*viridis.*

Leaves with a pale crescentic, transverse band *viridis* var. *fasciata.*

Utricle blunt at the tip:—

Utricle membranous, orbicular or broadly ovate, indehiscent:—

Procumbent; leaves small, 2-lobed; clusters all axillary *Blitum.*

Tall, succulent; leaves large, oblong or rounded; clusters axillary and in terminal, simple or lobed spikes *Blitum* var. *oleracea.*

Utricle rugose, ovoid, indehiscent or dehiscent; leaves obtuse, rarely retuse or 2-lobed; clusters all axillary .....*polygamus.*

Stamens 2; sepals 2; utricle orbicular, compressed, membranous indehiscent; clusters minute, all axillary; leaves small, linear-oblong, with rounded, obtuse, or 2-lobed tip .....*tenuifolius.*

1695. AMARANTUS SPINOSUS Linn.; F. I. iii. 611; F. B. I. iv. 718; E. D. A. 943.

In all the provinces.

An erect, spinescent herb. *Beng.* Kanta-nutia, kanta-miris; *Santal.* Janum arak'.

1696. AMARANTUS PANICULATUS Linn.; F. B. I. iv. 718. *A. frumentaceus* F. I. iii. 610; E. D. A. 925.

In most of the provinces, cultivated.

A tall, robust annual. *Santal.* Larka baha.

1697. AMARANTUS CAUDATUS Linn.; F. B. I. iv. 719; E. D. A. 921.

In the south-western parts, cultivated.

A tall, robust annual.

1698. AMARANTUS GANGETICUS Linn.; F. I. iii. 616; F. B. I. iv. 719; E. D. A. 927. *A. oleraceus* F. I. iii. 605; E. D. A. 938. *A. lanceolatus* F. I. iii. 607; E. D. A. 932. *A. atropurpureus* F. I. iii. 608; F. B. I. iv. 722; E. D. A. 919. *A. tricolor* F. I. iii. 608. *A. melancholicus* F. I. iii. 608; E. D. A. 937. *A. lividus* F. I. iii. 605; E. D. A. 933.

In all the provinces, cultivated.

An erect, stout annual, very variable in colour and shape of leaves. *Hind.* Lal-ság; *Beng.* Dengua, lal-shák, rakna-shák, lál-nati, kánka-nati, gobura-nati; *Santal.* Arak' gandhari.

The species separated by Roxburgh are all well-marked races of this variety, and some of them, but more particularly the race described in the *Flora Indica* as *A. oleraceus*, possess many more or less distinguishable and definite subraces or cultivated forms.

1698/2. Var. TRISTIS. *A. tristis* F. I. iii. 604; E. D. A. 950. *A. polygamus* F. I. iii. 603.

In most of the provinces, cultivated.

An annual herb with many prostrate branches from near the base of the stem. *Santal.* Pond-gandhari.

As variable in shape and coloration of leaves as the preceding variety, from which this mainly differs in being cut down several times, a new crop of shoots springing up, whereas the forms included under the typical plant are either taken up by the root or have the tender tops only once taken as a vegetable. The two species described in the *Flora Indica* correspond to two well-marked races, both of which, but particularly the race named *A. tristis*, include a multitude of distinguishable subraces and cultivated forms. The *A. polygamus* of Roxburgh is not the true plant of that name.

1699. AMARANTUS MANGOSTANUS Linn.; F. B. I. iv. 720; E. D. A. 934.

In most of the provinces.

A diffusely branched annual; perhaps a feral state of *A. gangeticus* var. *tristis*. *Beng.* Ság.

1700. AMARANTUS VIRIDIS Linn.; F. I. iii. 605; F. B. I. iv. 720; E. D. A. 953.

In all the provinces, a weed of cultivation.

A slender annual.

1700/2. Var. FASCIATA. *A. fasciatus* F. I. iii. 609; E. D. A. 923.

In most of the provinces.

A slender annual. *Beng.* Ban-nati, tun-tuni-nati.

1701. AMARANTUS BLITUM Linn.; F. B. I. iv. 721; E. D. A. 920.

In the western provinces.

A procumbent, annual weed.

1701/2. Var. OLERACEA; F. B. I. iv. 721.

In most of the provinces, cultivated.

A tall, succulent annual. *Beng.* Sada-natia, natiya-ság.

1702. AMARANTUS POLYGAMUS Linn.; F. B. I. iv. 721; E. D. A. 941. *A. polygonoides* F. I. iii. 602.

Behar; Tirhut; N. Bengal; C. Bengal.

A prostrate, annual weed. *Vernac.* Champa-natiya, lal-champa-natiya.

1703. AMARANTUS TENUIFOLIUS Willd.; F. I. iii. 602; F. B. I. iv. 722; E. D. A. 949.

Tirhut; Behar; C. Bengal; E. Bengal.

A prostrate, annual weed. *Beng.* Genti-nati, jélchumli.

771. Cyathula Lour.

Herbs or undershrubs; *leaves* opposite, petioled, ovate, entire. *Flowers* small, in large or small bracteate and bracteolate fascicles with 1–2 flowers perfect and the rest imperfect; fascicles spicate or capitate, reflexed in fruit; perianth-segments of the imperfect flowers ultimately converted into rigid, hooked awns; bracts ovate, concave, often aristate. *Perianth* of 5 scarious, 1-nerved sepals, acuminate or with hooked aristæ. *Stamens* 5; filaments connate below, with intervening linear, lacerate or 2-fid staminodes in a hypogynous, membranous cup; anthers oblong, 2-celled. *Carpels* forming an obovoid, 1-celled ovary; ovule

solitary, pendulous from a long, basal funicle; style simple, filiform; stigma capitellate. *Fruit* an ovoid, membranous utricle, enclosed in the perianth, its apex areolate. *Seed* inverse, oblong; testa coriaceous; embryo annular; cotyledons linear, flat; radicle erect.

1704. CYATHULA PROSTRATA Bl.; F. B. I. iv. 723. *Achyranthes prostrata* F. I. i. 674.
E. Bengal; Chittagong.
A slender, erect weed.

772. Pupalia Juss.

Herbs or undershrubs, 3-chotomously branched; *leaves* opposite, petioled, ovate or orbicular, entire. *Flowers* green, fascicled, in simple or panicled spikes; fascicles with 1 perfect flower, the rest imperfect; perianth-segments of imperfect flowers ultimately converted into stellately spreading, hooked bristles; bracts and bracteoles scarious. *Perianth*-segments of perfect flowers 5, slightly connate below, herbaceous, sepaline, almost equal, lanceolate, acuminate, 3–5-nerved. *Stamens* 5; filaments subulate, shortly connate at the base; anthers didymous, 2-locular. *Carpels* forming an ovoid, 1-celled ovary, gradually tapering into a slender style; ovule solitary, pendulous from a long, basal funicle; style simple; stigma capitellate. *Fruit* an ovoid, membranous utricle, enclosed in the perianth, its apex areolate. *Seed* inverse, lenticular, rostellate; testa thinly coriaceous; embryo annular; cotyledons linear, flat; radicle ascending.

Herbaceous, glabrous or nearly so, annual or biennial; leaves distinctly petioled; sepals laxly villous; bracts pungent.....*atropurpurea*.
Shrubby, tomentose, perennial; leaves short-petioled; sepals densely woolly; outermost bract very broad, membranous.....*lappacea*.

1705. PUPALIA ATROPURPUREA Moq.; F. B. I. iv. 723. *Achyranthes lappacea* F. I. i. 673.
Chota Nagpur; Behar; Tirhut; N. Bengal; W. Bengal.
A slender, straggling herb. *Beng.* Kuya-duya, duya-kuya.

1706. PUPALIA LAPPACEA Moq.; F. B. I. iv. 724.
Behar.
A large, straggling undershrub.

773. Psilotrichum Bl.

Herbs or shrubs, 3-chotomously branched; *leaves* opposite, entire. *Flowers* small, all hermaphrodite, in axillary, solitary or panicled spikes or heads; bracts small, hyaline; bracteoles 2, small. *Perianth* of 5 sepaline, papery segments, slightly connate below, linear or ovate, outer boat-shaped, gibbous below, ribbed. *Stamens* 5; filaments unequal, linear or subulate, connate below in a hypogynous cup; anthers 2-celled, short or long. *Carpels* forming a subglobose or oblong, 1-celled ovary; ovule solitary, pendulous from a long, basal funicle; style simple, slender; stigma capitellate or 2-fid. *Fruit* a globose or compressed utricle, enclosed in the perianth, which is often hardened at the base. *Seed* inverse, lenticular; testa coriaceous or crustaceous; embryo annular, enclosing the floury albumen; cotyledons thin, flat; radicle superior.

1707. Psilotrichum ferrugineum Moq.; F. B. I. iv. 725. *Achyranthes ferruginea* F. I. i. 675.

C. Bengal; Sundribuns.

An annual, prostrate weed. *Hind.* Lal-sirinchi; *Beng.* Rakto-sirinchi.

774. Ærua Forsk.

Erect or prostrate or climbing herbs or undershrubs; *leaves* alternate or opposite or whorled. *Flowers* minute or small, hermaphrodite or polygamous, in solitary or panicled spikes; bracts and 2 bracteoles small. *Perianth* short, sepaline, membranous or papery, 5- or rarely 4-lobed; segments equal or the outer wider, all or only the 3 inner woolly. *Stamens* 5, rarely 4; filaments subulate, connate with short or long intervening staminodes in a short, hypogynous cup; anthers 2-celled, didymous. *Carpels* forming an ovoid or subglobose, 1-celled ovary; ovule solitary, pendulous from a long, basal funicle; style short or long, simple; stigma capitellate or stigmas 2. *Fruit* a membranous utricle or circumscissile capsule with coriaceous apex. *Seed* inverse; testa coriaceous; embryo annular, surrounding the floury albumen; cotyledons linear; radicle superior.

Leaves alternate, or opposite and alternate mixed:—

Spikes in terminal panicles as well as axillary; leaves opposite and alternate mixed ..... *scandens.*

Spikes all axillary, fascicled; leaves all alternate ..... *lanata.*

Leaves filiform in opposite fascicles; spikes peduncled ..... *Monsonia.*

1708. ÆRUA SCANDENS Wall.; F. B. I. iv. 727; E. D. A. 558. *Achyranthes scandens* F. I. i. 676.
Behar; Chota Nagpur.
A climbing undershrub. *Beng.* Nuriya.

1709. ÆRUA LANATA Juss.; F. B. I. iv. 728; E. D. A. 554. *Achyranthes lanata* F. I. i. 676.
E. Bengal; Behar.
An erect or prostrate undershrub. *Beng.* Chaya.

1710. ÆRUA MONSONIA Mart.; F. B. I. iv. 728. *Achyranthes Monsonia* F. I. i. 673.
W. Bengal; Chota Nagpur.
A much-branched herb.

775. Achyranthes Linn.

Herbs, sometimes woody below; *leaves* opposite, petioled, entire. *Flowers* hermaphrodite, in slender, simple and panicled spikes, soon deflexed; bracts membranous, spinescent; bracteoles 2, diverging, spinescent. *Perianth* of 4–5 rigid, ultimately ribbed, sepaline segments, somewhat connate below, subulate-lanceolate, aristate. *Stamens* 2–5; filaments filiform, subulate, connate at the membranous base, with as many quadrate, toothed or dorsally lamellate staminodes; anthers 2-celled, oblong or didymous. *Carpels* forming an oblong, subcompressed, 1-celled ovary; ovule solitary, pendulous from a long, basal funicle; style filiform; stigma capitellate. *Fruit* an oblong or ovoid utricle; apex rounded or areolate. *Seed* inverse, oblong; testa coriaceous; embryo annular, surrounding the floury albumen; cotyledons linear or lanceolate; radicle erect.

Outer sepal long, pungent, exceeding the others; leaves elliptic-lanceolate, acuminate; an aquatic plant of swamps and river-banks...*aquatica*.
Sepals subequal:—
Bracteoles ovate, tipped with a spine as long as or longer than their blade; staminodes fimbriate:—
Leaves rather rigid, velvety tomentose or rarely glabrate, orbicular, obovate or elliptic, obtuse or acute, not acuminate; rachis of spike rigid; a weed of roadsides and waste places .....*aspera*.
Leaves membranous, large, wide-elliptic, acuminate, sparingly pubescent or glabrous; rachis of spike slender; a straggling, subscandent herb in forest undergrowth ...*aspera* var. *porphyristachya*.
Bracteoles reduced to a spine, minutely 2-auricled at the base; stami-

nodes toothed but not fimbriate; leaves membranous, large, wide-elliptic, acuminate, sparingly pubescent or glabrous; rachis of spike slender; a straggling, subscandent herb in forest undergrowth
bidentata.

1711. ACHYRANTHES AQUATICA R. Br.; F. I. i. 673; F. B. I. iv. 730; E. D. A. 381.
Tirhut; N. Bengal.
A tall, stout herb, straggling in water and rooting on the margins of ponds and river-banks.

1712. ACHYRANTHES ASPERA Linn.; F. I. i. 672; F. B. I. iv. 730; E. D. A. 382.
In all the provinces.
A coarse weed of waysides and waste places. *Hind.* Latjira, chichira; *Beng.* Apáng.

1712/2. Var. PORPHYRISTACHYA F. B. I. iv. 730.
Chota Nagpur, frequent; Chittagong.
A straggling climber in shady forests.

1713. ACHYRANTHES BIDENTATA Bl.; F. B. I. iv. 730.
Chota Nagpur, Parasnath.
A straggling climber in shady forests.

776. Alternanthera Forsk.

Herbs, usually decumbent or prostrate; *leaves* opposite, entire. *Flowers* hermaphrodite, small, white, in axillary, often clustered heads; bracts and 2 bracteoles herbaceous. *Perianth*-segments 5, sepaline, unequal, anterior and 2 posterior flattened, lateral 2 inmost, concave. *Stamens* 2–5; filaments short, connate in a short cup, with or without intervening staminodes; anthers short or long, 1-celled. *Carpels* forming an orbicular or ovoid 1-celled ovary; ovule solitary, pendulous from a long, basal funicle; stigma subsessile, capitellate, or rarely 2-fid. *Fruit* a compressed, ovoid orbicular or obcordate utricle, margins often thickened or winged. *Seed* inverse, lenticular; testa crustaceous; embryo annular, surrounding the floury albumen; cotyledons narrow; radicle superior.

1714. ALTERNANTHERA SESSILIS R. Br.; F. B. I. iv. 731; E. D. A. 877. *Achyranthes triandra* F. I. i. 678.
In all the provinces.
A prostrate herb.

777. Gomphrena Linn.

Herbs, hirsute or villous, with usually thickened nodes; *leaves* opposite, entire. *Flowers* short or long, white or coloured, hermaphrodite, usually capitate; bracts scarious; bracteoles short or long, concave, keeled winged or crested. *Perianth* compressed or not, of 5 sepaline, lanceolate, acuminate, nearly equal segments. *Stamens* 5; filaments linear, united below in a long tube, 5-fid at apex, usually with no intervening staminodes; anthers 1-celled, oblong or linear, sessile or stipitate, in the sinuses of the staminal tube. *Carpels* forming a subglobose or turbinate, 1-celled ovary; ovule solitary, pendulous from a long, basal funicle. *Fruit* a compressed utricle, ovoid or oblong. *Seed* inverse, lenticular; testa coriaceous; embryo annular, surrounding the floury albumen; cotyledons narrow or obovate; radicle superior.

1715. Gomphrena globosa Linn.; F. I. ii. 63; F. B. I. iv. 732.

In all the provinces, cultivated and as an escape.

A tall, branching, annual herb. *Vernac.* Gul-makhmal.

Order CIII. CHENOPODIACEÆ.

Annual or perennial herbs or shrubs, sometimes mealy or lepidote, occasionally fleshy. *Leaves* alternate, rarely opposite, simple, usually entire, flat or rarely semiterete or cylindric, membranous or fleshy, sometimes obsolete; stipules 0. *Flowers* small, almost always green, hermaphrodite or 1-sexual, usually regular, often dimorphic; bracts 1 or 0; bracteoles 0 or 2. *Perianth* simple, sepaline, of 3–5 free or connate segments, imbricate in bud; in ♀ flowers often 0. *Stamens* usually 5, opposite the perianth-segments, hypogynous or perigynous; filaments almost always free, occasionally with intervening staminodes; anthers didymous or sagittate, 2-locular; dehiscence longitudinal, anterior or lateral. *Disk* 0 or annular, lining the perianth-base, occasionally crenate or lobed. *Carpels* connate into a superior, 1-celled ovary, free or enclosed in the perianth-base; ovule solitary, basal or lateral, campylotropous; style terminal, short or long; stigma capitate, 2–3-lobed, or styles 2–3, or stigmas 2–5, free or slightly united, sessile. *Fruit* a small, membranous, coriaceous, or fleshy utricle, rarely a circumscissile capsule, generally enclosed in the perianth unless perianth be absent. *Seed*

erect, inverse or horizontal; testa crustaceous, coriaceous or membranous, sometimes adnate to albumen; albumen fleshy or floury or 0; embryo curved, annular or spiral.

Stem not twining; bracteoles free from the perianth; anthers erect or incurved in bud:—

Stems leafy, not jointed:—

Leaves fleshy, semiterete; embryo spiral; albumen scanty or none; flowers minute, axillary, usually 2-sexual; stamens perigynous or almost hypogynous ..... **Suæda.**

Leaves membranous, flat; embryo annular; albumen floury; stamens perigynous; flowers clustered:—

Flowers all similar, hermaphrodite:—

Perianth 5-partite, hardly altered in fruit; flowers without bracts or bracteoles ..... **Chenopodium.**

Perianth 5-lobed, the base thickened and indurated in fruit; flowers bracteate and 2-bracteolate..... **Beta.**

Flowers dissimilar, monœcious or polygamous; male florets ebracteolate, 3–5-lobed or -partite:—

Male flowers in terminal leafless spikes; sepals 4–5; females in axillary clusters, without bracteoles but with a 2–4-toothed perianth, in fruit leathery and sometimes armed with dorsal spines ..... **Spinacia.**

Male and female, or hermaphrodite and female flowers usually associated; male sepals 3–5; female perianth 0; bracteoles 2, flat, connate or not in fruit, dilated into a 2-valved covering for the utricle ..... **Atriplex.**

Stems jointed; leaves 0; flowers hermaphrodite:—

Flowers 2–6 together in the axils of the scales of sessile, cone-like spikes; perianth ovoid or pyramidal; mouth narrowed, 3–4-fid; embryo horseshoe-shaped; albumen fleshy ..... **Arthrocnemum.**

Flowers 3-nate, sunk in superposed cavities in successive joints; perianth obpyramidal; mouth wide, truncate or with 3–4 minute teeth; embryo conduplicate; albumen none ..... **Salicornia.**

[illegible] twining to the right; bracteoles 2, broad, adnate to the face of the [illegible]anth; leaves flat, membranous; anthers versatile; embryo spiral **Basella.**

778. Suæda Forsk.

Herbs or shrubs, usually of saline tracts; *leaves* fleshy, ternate, terete, rarely flattish. *Flowers* minute, axillary, hermaphrodite, rarely by abortion 1-sexual, bracteate and 2-bracteolate. *Perianth* short, globose or urceolate, 5-lobed or 5-partite; segments equal

or not, simple, gibbous, or almost winged. *Stamens* 5; filaments short, hypogynous or perigynous; anthers rather large. *Disk* large or 0. *Ovary* usually sessile, wide-based, adnate below to the perianth, ovoid or orbicular; apex rounded or truncate; ovule solitary, subsessile; style 0; stigmas 2–5, minute, subulate, recurved, papillose throughout. *Fruit* a small, membranous or spongy, included utricle; pericarp usually free from the seed. *Seed* erect, horizontal, or oblique; testa coriaceous or crustaceous; albumen 0, or scanty and 2-partite; embryo slender, somewhat spiral.

Styles 3; seeds erect.....*nudiflora.*
Styles 2; seeds usually horizontal.....*maritima.*

1716. Suæda nudiflora Moq.; F. B. I. v. 14; E. D. S. 2994.
Salsola nudiflora F. I. ii. 60.
Orissa, sea-coast.
A diffusely branched, woody, perennial undershrub.
Uriya Géria.

1717. Suæda maritima Dumort.; F. B. I. v. 14; E. D. S. 2990.
Salsola indica F. I. ii. 62.
Sundribuns, common.
An erect herb or undershrub, branching from the base.

779. Chenopodium Linn.

Annual or perennial, erect or prostrate herbs; *leaves* alternate, entire, lobed or toothed. *Flowers* minute, hermaphrodite, in axillary fascicles or cymes; bracts 0; bracteoles 0. *Perianth* usually 5-, rarely fewer-lobed; segments concave, incurved. *Stamens* 5 or fewer, hypogynous or almost perigynous; filaments sometimes connate below; anthers didymous or oblong, 2-celled. *Disk* 0 or annular. *Ovary* depressed-globose, rarely ovoid; ovule solitary, subsessile; style usually 0; stigmas 2–5, sometimes united below in a style, subulate or filiform. *Fruit* a membranous utricle, enclosed in the perianth. *Seed* horizontal, rarely erect; testa crustaceous or coriaceous; embryo nearly or quite annular, surrounding the floury albumen.

*Scentless; mealy or green or red; leaves long-petioled, rhomboid, deltoid, or lanceolate, acute or obtuse; embryo completely annular; seed keeled; stigmas 2 [p. 879] .....*album.*

*Aromatic, glandular, pale green; leaves short-petioled, oblong or lanceolate, obtuse, lower sinuate, upper entire; embryo incompletely annular; margin of seed obtuse; stigmas 5 [p. 878] .....*ambrosioides.*

1718. CHENOPODIUM ALBUM Linn.; F. I. ii. 58; F. B. I. v. 3; E. D. C. 1003. *C. viride* F. I. ii. 58. *C. laciniatum* F. I. ii. 59.

In all the provinces, cultivated, and a weed in cultivated ground.

A tall herb, 1–10 feet high. *Vernac.* Betuá-sak, chandan betu.

1719. CHENOPODIUM AMBROSIOIDES Linn.; F. B. I. v. 4; E. D. C. 1009.

In most of the provinces.

A tall, much-branched herb.

780. Beta Linn.

Succulent, glabrous herbs, with fleshy roots; *leaves* radical and alternate, subentire. *Flowers* small, hermaphrodite, ternate or fascicled, rarely solitary, axillary, or in terminal spikes or panicles; bracts distinct; bracteoles 2. *Perianth* calycine, simple, urceolate, 5-fid, adnate below to the ovary; bases of segments hardened in fruit, ribbed on the back. *Stamens* 5, perigynous; filaments subulate; anthers oblong, 2-celled. *Ovary* depressed-globose, half-inferior. *Disk* thickish, surrounding the base of the ovary; ovule subsessile; stigmas connate below in a style, free above, usually 2–3, subulate, papillose within. *Fruit* adnate below to the hardened perianth, enclosed above by the perianth-lobes; pericarp fleshy, indehiscent, not adhering to the seed. *Seed* horizontal; testa thin; embryo annular, surrounding the copious, floury albumen.

1720. BETA VULGARIS Linn.; F. B. I. v. 5. *B. benghalensis* F. I. ii. 59.

In most of the provinces, cultivated.

A herb with large tap-root. *Vernac.* Palák, palánki. The Beet.

781. Spinacia Linn.

Erect, annual, glabrous herbs; *leaves* alternate, petioled, entire sinuate or lobed. *Flowers* diœcious; males in terminal, leafless

spikes; females in axillary clusters; bracts 0; bracteoles 0. ♂ *Perianth* sepaloid, 4–5-partite; segments oblong, obtuse. *Stamens* 4 or 5, hypogynous; filaments capillary; anthers oblong, exserted, didymous. *Disk* 0. ♀ *Perianth* herbaceous, 2–4-toothed, in fruit coriaceous, enclosing the utricle, unarmed or with 2–3 dorsal spines. *Ovary* subglobose; ovule subsessile; stigmas 4 or 5, long, filiform, connate below. *Fruit* a hard, compressed utricle, adnate to and enclosed in the perianth; pericarp thin, adnate to seed. *Seed* erect, turgid; testa thin; embryo annular, s[illegible] the floury albumen; radicle inferior.

1721. SPINACIA OLERACEA Linn.; F. B. I. v. 6. [illegible]*ndra* F. I. iii. 77.

In most of the provinces, cultivated.

A succulent herb. *Vernac.* Palak, palang. Spinach.

782. Atriplex Linn.

Herbs or shrubs, usually mealy; *leaves* alternate, rarely opposite. *Flowers* small, monœcious or polygamo-diœcious, clustered, the sexes often mixed; in axillary, sessile fascicles, or in simple or panicled spikes; bracts 0; bracteoles in ♂ flowers 0, in ♀ 2, flat, accrescent, dilated in fruit, and forming a 2-valved covering to the fruit. ♂ *Perianth* 3–5-partite, sepaline; segments oblong or obovate, obtuse. *Stamens* 3–5, inserted at base of perianth; filaments free or connate below; anthers didymous. *Ovary* rudimentary or 0, rarely perfect. ♀ *Perianth* 0, rarely like that of ♂. *Disk* 0. *Ovary* ovoid or depressed-globose; ovule oblique or vertical; stigmas 2, subulate or filiform, connate below. *Fruit* a membranous utricle, rarely adnate to seed, enclosed in the enlarged bracteoles. *Seed* erect or inverted, and suspended from a long funicle, or rarely (in hermaphrodite flowers only) horizontal; embryo annular, surrounding the floury albumen.

1722. ATRIPLEX HORTENSIS Linn.; F. B. I. v. 6; E. D. A. 1606.

In most of the provinces, cultivated.

A succulent, annual herb. Orache.

783. Arthrocnemum Moq.

Fleshy, jointed, branching shrubs or herbs; *leaves* 0. *Flowers* minute, hermaphrodite, 2–3 together in the axils of scaly bracts, forming sessile, cone-like spikes; sunk in superposed and decussately opposite cavities of the internodes; bracteoles 2. *Perianth*

sepaline, simple, ovoid or angled. *Stamen* 1; anther oblong. *Ovary* ovoid, narrowed to the tip; ovule subsessile; stigmas 2, subulate. *Fruit* an ovoid, compressed utricle, with hardened pericarp, enclosed in the swollen perianth. *Seed* erect, ovoid; testa membranous; albumen fleshy; embryo dorsal, comma-shaped; radicle stout, inferior.

1723. ARTHROCNEMUM INDICUM Moq.; F. B. I. v. 12; E. D. A. 1475. *Salicornia indica* F. I. i. 85.

Sundribuns.

A prostrate, woody shrub, with ascending branches. *Beng.* Jadu palang.

784. Salicornia Linn.

Fleshy, jointed, branching shrubs or herbs; *leaves* 0. *Flowers* minute, hermaphrodite, ternate in the axils of scaly bracts, forming sessile, cone-like spikes, sunk in superposed and decussately opposite cavities of the internodes; bracteoles 2. *Perianth* sepaline, simple, obpyramidal. *Stamen* 1; anther oblong. *Ovary* ovoid, narrowed to the tip; ovule subsessile; stigmas 2, subulate. *Fruit* an ovoid, compressed utricle, with membranous pericarp, enclosed in the spongy perianth. *Seed* erect, compressed; testa hispid, with hooked hairs; albumen 0; embryo conduplicate; radicle inferior, parallel to the folds of the cotyledons.

1724. SALICORNIA BRACHIATA Roxb.; F. I. i. 84; F. B. I. v. 12; E. D. S. 527.

Sundribuns.

A prostrate, woody shrub, with ascending branches.

785. Basella Linn.

Fleshy, twining, much-branched herbs; *leaves* alternate, broad, entire. *Flowers* hermaphrodite, sessile, spicate; bracts minute, caducous; bracteoles 2, connate in a 2-lipped cup, and adnate to the perianth. *Perianth* sepaline, fleshy, 5-fid; lobes short, incurved, ultimately accrescent and berry-like. *Stamens* 5, adnate to mouth of perianth-tube; filaments short, erect in bud; anthers versatile. *Ovary* globose; ovule subsessile; styles 3; stigmas linear-clavate, papillose within. *Fruit* a globose utricle, enclosed in the fleshy perianth; pericarp thin, adnate to seed. *Seed* erect, subglobose; testa crustaceous; albumen scanty; embryo flattish, spiral; cotyledons large, thin, convolute.

spikes; females in axillary clusters; bracts 0; bracteoles 0. ♂ *Perianth* sepaloid, 4–5-partite; segments oblong, obtuse. *Stamens* 4 or 5, hypogynous; filaments capillary; anthers oblong, exserted, didymous. *Disk* 0. ♀ *Perianth* herbaceous, 2–4-toothed, in fruit coriaceous, enclosing the utricle, unarmed or with 2–3 dorsal spines. *Ovary* subglobose; ovule subsessile; stigmas 4 or 5, long, filiform, connate below. *Fruit* a hard, compressed utricle, adnate to and enclosed in the perianth; pericarp thin, adnate to seed. *Seed* erect, turgid; testa thin; embryo annular, surrounding the floury albumen; radicle inferior.

1721. SPINACIA OLERACEA Linn.; F. B. I. v. 6. *S. tetrandra* F. I. iii. 77.

In most of the provinces, cultivated.

A succulent herb. *Vernac.* Palak, palang. Spinach.

782. Atriplex Linn.

Herbs or shrubs, usually mealy; *leaves* alternate, rarely opposite. *Flowers* small, monœcious or polygamo-dioecious, clustered, the sexes often mixed; in axillary, sessile fascicles, or in simple or panicled spikes; bracts 0; bracteoles in ♂ flowers 0, in ♀ 2, flat, accrescent, dilated in fruit, and forming a 2-valved covering to the fruit. ♂ *Perianth* 3–5-partite, sepaline; segments oblong or obovate, obtuse. *Stamens* 3–5, inserted at base of perianth; filaments free or connate below; anthers didymous. *Ovary* rudimentary or 0, rarely perfect. ♀ *Perianth* 0, rarely like that of ♂. *Disk* 0. *Ovary* ovoid or depressed-globose; ovule oblique or vertical; stigmas 2, subulate or filiform, connate below. *Fruit* a membranous utricle, rarely adnate to seed, enclosed in the enlarged bracteoles. *Seed* erect or inverted, and suspended from a long funicle, or rarely (in hermaphrodite flowers only) horizontal; embryo annular, surrounding the floury albumen.

1722. ATRIPLEX HORTENSIS Linn.; F. B. I. v. 6; E. D. A. 1606.

In most of the provinces, cultivated.

A succulent, annual herb. Orache.

783. Arthrocnemum Moq.

Fleshy, jointed, branching shrubs or herbs; *leaves* 0. *Flowers* minute, hermaphrodite, 2–3 together in the axils of scaly bracts, forming sessile, cone-like spikes; sunk in superposed and decussately opposite cavities of the internodes; bracteoles 2. *Perianth*

sepaline, simple, ovoid or angled. *Stamen* 1; anther oblong. *Ovary* ovoid, narrowed to the tip; ovule subsessile; stigmas 2, subulate. *Fruit* an ovoid, compressed utricle, with hardened pericarp, enclosed in the swollen perianth. *Seed* erect, ovoid; testa membranous; albumen fleshy; embryo dorsal, comma-shaped; radicle stout, inferior.

1723. ARTHROCNEMUM INDICUM Moq.; F. B. I. v. 12; E. D. A. 1475. *Salicornia indica* F. I. i. 85.

Sundribuns.

A prostrate, woody shrub, with ascending branches. *Beng.* Jadu palang.

784. Salicornia Linn.

Fleshy, jointed, branching shrubs or herbs; *leaves* 0. *Flowers* minute, hermaphrodite, ternate in the axils of scaly bracts, forming sessile, cone-like spikes, sunk in superposed and decussately opposite cavities of the internodes; bracteoles 2. *Perianth* sepaline, simple, obpyramidal. *Stamen* 1; anther oblong. *Ovary* ovoid, narrowed to the tip; ovule subsessile; stigmas 2, subulate. *Fruit* an ovoid, compressed utricle, with membranous pericarp, enclosed in the spongy perianth. *Seed* erect, compressed; testa hispid, with hooked hairs; albumen 0; embryo conduplicate; radicle inferior, parallel to the folds of the cotyledons.

1724. SALICORNIA BRACHIATA Roxb.; F. I. i. 84; F. B. I. v. 12; E. D. S. 527.

Sundribuns.

A prostrate, woody shrub, with ascending branches.

785. Basella Linn.

Fleshy, twining, much-branched herbs; *leaves* alternate, broad, entire. *Flowers* hermaphrodite, sessile, spicate; bracts minute, caducous; bracteoles 2, connate in a 2-lipped cup, and adnate to the perianth. *Perianth* sepaline, fleshy, 5-fid; lobes short, incurved, ultimately accrescent and berry-like. *Stamens* 5, adnate to mouth of perianth-tube; filaments short, erect in bud; anthers versatile. *Ovary* globose; ovule subsessile; styles 3; stigmas linear-clavate, papillose within. *Fruit* a globose utricle, enclosed in the fleshy perianth; pericarp thin, adnate to seed. *Seed* erect, subglobose; testa crustaceous; albumen scanty; embryo flattish, spiral; cotyledons large, thin, convolute.

1725. Basella rubra Linn.; F. B. I. v. 20. *B. alba* F. I. ii. 104; E. D. B. 203.

In all the provinces, cultivated or wild.

A glabrous, much-branched, twining fleshy herb. *Vernac.* Poi, ban-poi.

Order CIV. PHYTOLACCACEÆ.

Trees, shrubs, or herbs. *Leaves* alternate, entire; stipules 0 or small or reduced to tubercles. *Flowers* hermaphrodite or 1-sexual, usually racemose, rarely axillary, racemes terminal and axillary; bracts and 2 bracteoles generally present. *Perianth* simple, herbaceous or coriaceous, rarely membranous or coloured, 4–5-partite, rarely obconic or discoid; segments imbricate, equal or unequal, oblong or orbicular, persistent. *Stamens* 4, rarely more, alternate with perianth-segments or irregularly inserted; filaments usually persistent, subulate or filiform, free or connate below; anthers deciduous, dorsifixed, 2-locular; dehiscence anterior, posterior or lateral. *Disk* hypogynous, obscure or annular. *Carpels* 1 or more, free or connate, superior; ovules solitary in each carpel, amphitropous or campylotropous; stigmas usually sessile, recurved. *Fruit* of a solitary, coriaceous, crustaceous, fleshy or samaroid carpel, or of several distinct or connate carpels, and then 1-locular or several-locular, each cell 1-seeded. *Seeds* erect, often arillate; albumen fleshy or floury; embryo peripheric.

786. Rivina Linn.

Herbs, woody below, with sulcate branches; *leaves* alternate, petioled; stipules minute, caducous. *Flowers* hermaphrodite, in axillary, rarely terminal, slender, many-flowered racemes; pedicels slender; bracts subulate; bracteoles caducous. *Perianth* corolline, 4-partite; segments subequal, obovate-oblong, obtuse, concave, unaltered in fruit. *Stamens* 4, hypogynous, alternate with perianth-segments; filaments filiform; anthers oblong, erect, dehiscing in front. *Disk* small, hypogynous. *Carpel* solitary, subglobose, compressed; ovule solitary, sessile, amphitropous; style subterminal, short, curved; stigma capitellate. *Fruit* indehiscent, compressed, subglobose; pericarp fleshy, adnate to seed. *Seed* erect, lenticular; testa crustaceous, arillus minute; embryo

annular, surrounding the scanty, floury albumen; cotyledons convolute; radicle thick.

1726. RIVINA HUMILIS Linn.; F. B. I. v. 21.

In all the provinces, cultivated, and in most of them thoroughly naturalised and as if wild.

A slender herb; native of America.

Order CV. POLYGONACEÆ.

Herbs, rarely shrubs, sometimes climbing; very rarely trees. *Leaves* alternate, rarely opposite, entire or serrulate; stipules scarious or membranous, usually sheathing the stem. *Flowers* hermaphrodite, rarely by abortion polygamous, regular, small or medium, solitary or fascicled within the bract, fascicles axillary or cymose or racemed; pedicels usually axillary; bracts cupular, ochreate or involucrate. *Perianth* simple, inferior, sepaline or petaloid; lobes or segments 3–6, free or connate, persistent, imbricate in bud. *Stamens* 5–8, rarely more or fewer, opposite the perianth-segments; filaments filiform, free or connate below in a ring; anthers 2-celled, usually versatile; cells discrete, parallel; dehiscence longitudinal. *Disk* annular, glandular, or 0. *Carpels* connate in a superior, sessile, free, 1-celled ovary, compressed or 3-gonous, rarely 4-gonous; ovule solitary, orthotropous, sessile, or at the end of a distinct funicle; styles 3 or 2, rarely 4, often short, free or somewhat connate; stigmas capitate, peltate or fimbriate. *Fruit* a small, hard nut, 3-gonous, compressed, or rarely 4-gonous, enclosed in the perianth. *Seed* erect; testa membranous; albumen copious, floury, sometimes ruminate; embryo lateral, straight, curved, or sometimes peripheric; radicle superior.

Herbs or undershrubs, erect, or, if climbing (*Polygonum* sometimes), the inflorescence not ending in tendrils:—

Perianth 4–5-, rarely 3-cleft; stigmas capitellate ..... **Polygonum.**

Perianth 6-cleft; stigmas fimbriate ..... **Rumex.**

Large climbing shrubs, the rachis of the inflorescence ending in tendrils; perianth 5-cleft ..... **Antigonon.**

787. Polygonum Linn.

Herbs, rarely undershrubs, erect, rarely climbing; *leaves* alternate, entire, rarely lobed; stipules tubular, membranous. *Flowers* hermaphrodite, small or minute, axillary or terminal, clusters

sessile or in spiciform, capitate or panicled racemes; pedicels short, usually jointed under the perianth; bracts and bracteoles membranous, ochreate. *Perianth* simple, green or coloured, 4–5-, rarely 3-cleft, the 2 outer segments usually smaller than the others. *Stamens* 5–8, rarely 1–4, perigynous; filaments filiform, usually dilated below, or alternate with the lobes of an annular or glandular disk; anthers 2-celled; cells discrete; connective small. *Ovary* compressed or 3-gonous; ovule solitary, usually stipitate; styles 2 or 3, free or slightly connate below; stigmas capitate. *Fruit* a compressed or 3-gonous nutlet, angles obtuse or acute, covered or nearly covered by the persistent perianth; pericarp usually hard, shining or dull. *Seed* albuminous; embryo lateral or excentric; radicle long; cotyledons usually small.

*Stems unarmed :—[p. 885]
Inflorescence in axillary clusters :—
Sepals all obtuse :—
Sepals short, broad :—
Flowers hidden among the stipules .....*plebejum.*
Flowers all or mostly pedicelled .....*plebejum* var. *effusa.*
Sepals narrow.....*plebejum* var. *micranthema.*
Sepals 2 outer acute :—
Leaves ·25 in. long or less.....*plebejum* var. *brevifolia.*
Leaves ·5 in. long or longer .....*plebejum* var. *elegans.*
Inflorescence terminal, racemose, spicate or capitate :—
†Inflorescence in elongated, stout or filiform racemes or spikes :—[p. 885]
‡Nutlets biconvex :—[p. 885]
Bracts hairy :—
Bracts coarsely hairy or strigose :—
Leaves ovate; petioles long, 1–4 inches .....*orientale.*
Leaves lanceolate; petioles short, less than ·5 in. long :—
Limb of ochrea truncate, ciliate, erect .....*tomentosum.*
Limb of ochrea scabrid, ciliate, spreading or recurved *limbatum.*
Bracts densely woolly.....*lanigerum.*
Bracts glabrous :—
§Bracts not ciliate :—[p. 885]
Perianth without glands; limb of ochrea not ciliate *glabrum.*
Perianth glandular; limb of ochrea shortly ciliate *lapathifolium.*

§Bracts ciliate; perianth without glands; limb of ochrea shortly ciliate [p. 884] .....*minus.*

‡Nutlets distinctly trigonous:—[p. 884]

Racemes stout, short, spicate, with closely imbricating bracts:—

Bracts hairy or strigose:—

Plant everywhere covered with stalked glands.....*viscosum.*

Plant quite without glands .....*stagninum.*

Bracts glabrous:—

Leaves tapering to the base; marginal cilia of the ochrea longer than the tube.....*barbatum.*

Leaves rounded or cordate at the base, or, if tapering, the marginal cilia of the ochrea not longer than the tube *serrulatum.*

Racemes filiform, long, with more or less distant bracts:—

Racemes decurved, interrupted, the bracts distant throughout; bracts usually glandular; cilia of the ochrea if present not as long as the tube:—

Ochrea very shortly ciliate or eciliate; bracts glandular or not .....*Hydropiper.*

Ochrea with cilia at least half as long as the tube; bracts always glandular .....*flaccidum.*

Racemes erect, strict; bracts closely imbricate above with one or two removed far below; bracts without glands; ochrea with cilia as long as the tube .....*macranthum.*

†Inflorescence compressed, capitate:—[p. 884]

Inflorescence with an involucral leaf below each head .....*alatum.*

Inflorescence without an involucral leaf.....*chinense*

*Stems armed along the angles with recurved prickles:—[p. 884]

Leaves deltoid, very long-petioled; racemes solitary, short *perfoliatum.*

Leaves lanceolate, short-petioled or sessile; racemes panicled, oblong or subglobose:—

Bracts ovate or oblong; petioles and peduncles and nerves of leaves beneath prickly, like angles of stem .....*strigosum.*

Bracts acuminate; prickles confined to stem and there sparse *pedunculare.*

1727. POLYGONUM PLEBEJUM R. Br.; F. B. I. v. 27; E. D. p. 1114.

In most of the provinces.

A prostrate, diffusely branched weed in cultivated ground. *Santal.* Raniphul.

1727/2. Var. EFFUSA F. B. I. v. 28.
N. Bengal; C. Bengal; E. Bengal.
A prostrate weed in damp places.

1727/3. Var. MICRANTHEMA F. B. I. v. 29.
E. Bengal; W. Behar.
A small, very slender weed, on sandy river-churs.

1727/4. Var. BREVIFOLIA F. B. I. v. 28.
Chota Nagpur; Behar; W. Bengal.
A prostrate weed, with stout rootstock and branches, in dry places.

1727/5. Var. ELEGANS F. B. I. v. 29. *P. elegans* F. I. ii. 291.
In all the provinces.
A prostrate, perennial herb, in dry, uncultivated ground.

1728. POLYGONUM ORIENTALE Linn.; F. B. I. v. 30. *P. pilosum* F. I. ii. 286.
C. Bengal; N. Bengal; E. Bengal; Tippera; Chittagong.
A tall annual, 3–10 feet high, with fistulous branches, in damp places. *Beng.* Bara-pani-mirich.

1729. POLYGONUM TOMENTOSUM Willd.; F. I. ii. 287; F. B. I. v. 30.
E. Bengal; Chittagong.
A stout annual, prostrate below; in ditches and swamps.

1730. POLYGONUM LIMBATUM Meisn.; F. B. I. v. 30.
Chota Nagpur; N. Bengal; E. Bengal.
A stout annual, prostrate below; in ditches and swamps.

1731. POLYGONUM LANIGERUM R. Br.; F. B. I. v. 35. *P. lanatum* F. I. ii. 285.
N. Bengal; E. Bengal.
A stout annual, prostrate below; in ditches and swamps: perhaps also perennial. *Beng.* Shwet-pani-mirich.

1732. POLYGONUM GLABRUM Willd.; F. I. ii. 287; F. B. I. v. 34; E. D. P. 1091.
In all the provinces.
An erect annual, with reddish stem; in ditches and swamps. *Santal.* Sauri arak', jióti.

1733. POLYGONUM LAPATHIFOLIUM Linn.; F. B. I. v. 35. *P. mutans* F. I. ii. 285.
Behar.
An erect annual.

1734. POLYGONUM MINUS Huds.; F. B. I. v. 36.

E. Bengal; Chittagong.

A slender annual; in ditches and marshes.

1735. POLYGONUM VISCOSUM Ham.; F. B. I. v. 36.

Chittagong.

A slender or stout annual; in damp places.

1736. POLYGONUM STAGNINUM Ham.; F. B. I. v. 37.

In all the provinces.

A simple or branched annual; in damp places.

1737. POLYGONUM BARBATUM Linn.; F. B. I. v. 37; E. D. P. 1084. *P. rivulare* F. I. ii. 290.

In all the provinces.

A stout annual; in damp places. *Beng.* Bekh-unjubaz.

1738. POLYGONUM SERRULATUM Lagasc.; F. B. I. v. 38. *P. flaccidum* F. I. ii. 291.

C. Bengal; E. Bengal.

A stout annual; in swamps and ditches. *Beng.* Panimirich.

1739. POLYGONUM HYDROPIPER Linn.; F. B. I. v. 39; E. D. P. 1095.

In all the provinces.

A stoutish annual; in wet places. *Beng.* Packúrmul.

1740. POLYGONUM FLACCIDUM Meisn.; F. B. I. v. 39. *P. tenellum* F. I. ii. 289.

N. Bengal; C. Bengal; E. Bengal; Chittagong.

A flaccid, branching annual; in ditches and swamps.

1741. POLYGONUM MACRANTHUM Meisn.; F. B. I. v. 40. *P. barbatum* F. I. ii. 289.

E. Bengal, in the Jheels.

A tall, erect herb; in deep marshes.

1742. POLYGONUM ALATUM Ham.; F. B. I. v. 41.; E. D. P. 1076.

Chota Nagpur, Parasnath.

A procumbent annual; on hillsides.

1743. POLYGONUM CHINENSE Linn.; F. I. ii. 289; F. B. I. v. 44. *P. cymosum* F. I. ii. 289.

Chota Nagpur; Tippera; Chittagong.

A rambling shrub, 4–5 feet high; on hillsides.

1744. POLYGONUM PERFOLIATUM Linn.; F. I. ii. 288; F. B. I. v. 46.

E. Bengal.

A scandent, prickly perennial.

1745. Polygonum strigosum R. Br.; F. B. I. v. 47. *P. horridum* F. I. ii. 291.
N. Bengal, Duars; Tippera; Chittagong.
A scandent, prickly herb.

1746. Polygonum pedunculare Wall.; F. B. I. v. 48.
N. Bengal, Duars; Chittagong.
A scandent, sparingly prickly herb.

788. Rumex Linn.

Perennial or annual herbs, rarely shrubs; *leaves* mostly radical or cauline, alternate, entire or toothed; stipules hyaline, ochraceous, often ultimately disappearing. *Flowers* hermaphrodite or, by abortion, monœcious, in axillary clusters or in whorls, arranged in simple or panicled racemes; pedicels jointed; bracts ochreate; bracteoles 0. *Perianth* simple, sepaline; segments 6, rarely 4, the inner accrescent, entire or toothed, midrib or disk often enlarged or tubercled. *Stamens* 6; filaments short; anthers oblong. *Carpels* connate in a 3-gonous ovary; ovule solitary; styles 3; stigmas fimbriate. *Fruit* a small nut, enclosed in the usually enlarged, inner perianth-segments; angles acute. *Seed* erect; embryo lateral, nearly straight; cotyledons linear or oblong.

Flowers hermaphrodite; styles terminal; inner sepals coriaceous in fruit; leaves never hastate :—
Inner fruiting sepals narrow-margined, hardly toothed :—
Bases of leaves always narrowed into the petioles gradually, tips usually acute; flowers distinctly pedicelled; perianth in fruit brow *maritimus.*
Bases of leaves always cordate, with a contraction just beyond, tip always obtuse; flowers short-pedicelled; perianth in fruit nearly black, much larger ..... *nigricans.*
Inner fruiting sepals with wide, much-toothed wings ..... *dentatus.*
Flowers monœcious; styles arising from inner angles of ovary; ir ate, sepals membranous and reticulate in fruit; leaves hastate..... *vesicari a.*

1747. Rumex maritimus Linn.; F. B. I. v. 59; E. D. R. 64. *R. acutus* F. I. ii. 208.
N. Bengal; C. Bengal; E. Bengal.
An erect annual, 1–4 feet high, in marshy places. *Hind.* Jal-palam; *Beng.* Ban-palang.

1748. Rumex nigricans Hook. f.; F. B. I. v. 59.

Behar; Tirhut; N. Bengal.

An erect annual, ·5–1·5 feet high, in uncultivated places.

1749. RUMEX DENTATUS Linn.; F. B. I. v. 59; E. D. R. 639.

In most of the provinces.

An annual herb, 1–2 feet high, in waste places.

1750. RUMEX VESICARIUS Linn.; F. I. ii. 209; F. B. I. v. 51; E. D. R. 650.

Behar; Tirhut; occasionally cultivated.

An annual, pale green, glabrous herb, ·5–1 foot high. *Vernac.* Chúka-sak, chúka-palang.

789. Antigonon Endl.

Large climbers, herbaceous above, woody below; *leaves* alternate, cordate or deltoid, with stem-clasping petioles; stipules minute or obsolete. *Flowers* medium, rather showy, fascicled in the axils of a small bract; fascicles in terminal or subterminal racemes, the rachis often ending in a tendril; pedicels short, jointed. *Perianth* simple, of 5 corolline segments, persistent, membranous-scarious in fruit, the 2 outer crispate, wide-cordate, the third semi-cordate, crispate on outer, even on inner edge, the two inner oblong. *Stamens* 7–8; filaments filiform, connate below in a short cup with intervening teeth; anthers ovate. *Ovary* 3-gonous; ovule solitary, at first pendulous from a long funicle, at length erect; styles 3, short; stigmas capitate or peltate. *Fruit* a sharply 3-gonous nut, enclosed in the persistent perianth. *Seed* subglobose, rather deeply 3–6-lobed; albumen ruminate; embryo somewhat excentric; cotyledons narrow-oblong.

1751. ANTIGONON LEPTOPUS Endl.

In gardens generally.

A large climber with showy panicles of pink flowers.

Order CVI. ARISTOLOCHIACEÆ.

Herbs or shrubs, often climbing, usually more or less fœtid. *Leaves* alternate, entire or lobed; stipules 0. *Flowers* hermaphrodite, often large, usually lurid, terminal axillary or lateral, solitary racemose or cymose; bracts large, small, or 0. *Perianth* simple, more or less adnate below to the ovary, often irregular, 3-lobed or tubular; lobes valvate. *Stamens* 6 or more, adnate 1- or 2-seriately to the top of ovary or round the style; anthers erect; cells

parallel; dehiscence dorsal. *Carpels* connate in a 4–6-celled ovary; placentas parietal, free or meeting at the axis; ovules many, anatropous; style columnar; stigma lobed. *Fruit* a capsule or a berry. *Seeds* many; albumen copious, fleshy; embryo minute.

790. Aristolochia Linn.

Prostrate or climbing, perennial herbs or shrubs; *leaves* alternate, entire or lobed, often with the stipule-like leaf of an undeveloped bud in the axil. *Perianth* corolline; tube inflated below, then contracted, hairy within; limb dilated, oblique, 1–2-lipped. *Stamens* 6, rarely 5 or more than 6, adnate 1-seriately above the ovary, the filaments or connectives not distinguishable from the style; anthers adnate to the column; dehiscence extrorse. *Carpels* connate in a more or less perfectly 6-locular, rarely 5- or 4-locular, inferior ovary; placentas parietal or intruded, or conniving or connate in the axis; ovules many, 2-seriate; style or column short, thick, dividing above into 3 or 6, rarely more, obtuse or linear short lobes. *Capsule* lantern-like, opening septicidally or through the placentas by 6, rarely 5, valves. *Seeds* usually many, horizontal, often covered by the remains of the placenta; albumen fleshy; embryo minute.

Leaves and branches glabrous; column 6-lobed; flowers axillary:—
Leaves glaucous beneath, margin undulate, reniform or very wide-cordate; flowers solitary; peduncle with a large orbicular bract; lip of corolla erect, linear, with revolute edges, and villous with purple hairs ..... *bracteata*.
Leaves green beneath, margin flat; bracts small:—
Flowers 1–3; bract opposite base of peduncles; lip of corolla short, oblong, obtuse, glabrous; leaves linear to obovate-oblong; base cuneate, rounded, or shallow-cordate ..... *indica*.
Flowers numerous, in racemose, puberulous cymes; lip of corolla villous, linear, obtuse, as long as tube; leaves large, deeply cordate, or the upper narrow, sagittate-lanceolate ..... *Tagala*.
Leaves, at least beneath, and branches pubescent; column 3-lobed; flowers chiefly in villous cymes on the old wood; mouth of perianth square, with purple border ..... *saccata*.

1752. Aristolochia bracteata Retz; F. I. iii. 490; F. B. I. v. 75; E. D. A. 1395.
W. Behar, very rare.

A slender, decumbent perennial. *Hind.* Kiramar, gandan, gandati; *Uriya* Paniri.

1753. ARISTOLOCHIA INDICA Linn.; F. I. iii. 489; F. B. I. v. 75; E. D. A. 1398.

In nearly all the provinces.

A shrubby, twining perennial. *Beng.* and *Hind.* Isharmal; *Santal.* Bhedi janetet.

1754. ARISTOLOCHIA TAGALA Cham. & Schlecht. *A. acuminata* F. I. iii. 489. *A. Roxburghiana* F. B. I. v. 79.

N. Bengal; Chittagong.

A shrubby, twining perennial.

1755. ARISTOLOCHIA SACCATA Wall.; F. B. I. v. 76.

Chittagong.

A stout, lofty, woody climber, with corky, fissured bark.

Order CVII. PIPERACEÆ.

Herbs or shrubs, usually aromatic. *Leaves* alternate or opposite or whorled, often gland-dotted; stipules 0 or 2, connate or adnate to petiole. *Flowers* minute, hermaphrodite or 1-sexual, in axillary or terminal, catkin-like spikes, subtended by a peltate bract. *Perianth* 0. *Stamens* 2–6, rarely 7–8, hypogynous; anthers often jointed on the filaments; cells sometimes confluent; dehiscence longitudinal. *Carpels* 3–4, forming a sessile or rarely stipitate ovary, free or connate at the base, each carpel many-ovuled, less often ovary 1-locular, 1-ovuled; ovules orthotropous; stigmas discrete on the free carpels or ovary-lobes, or terminal on the undivided ovary, occasionally solitary, sessile, terminal; simple or penicillate. *Fruit* small, indehiscent in the 1-celled species, or of cocci or follicles in the several-carpelled. *Seeds* globose, ovoid, or oblong; testa thin; albumen copious, floury; embryo enclosed in an amniotic cavity at the end of the albumen remote from the hilum; cotyledons minute or obsolete; radicle superior.

Anther-cells distinct; fruit fairly conspicuous; stigmas 3–5, confluent **Piper.**

Anther-cells confluent; fruit minute; stigma usually penicillate **Peperomia.**

791. Piper Linn.

Shrubs, rarely herbs, erect or scandent, often glandular or aromatic; branches with swollen nodes; *leaves* entire, often oblique; stipules various. *Flowers* diœcious, very rarely hermaphrodite, minute, spiked, each in the axil of a bract, with or without 2 lateral bracteoles; bracts peltate or cupular and adnate to rachis, sometimes decurrent, with or without raised margins; bracteoles when present forming low ridges on each side of the flower, or connate and semi-lunar. *Perianth* 0. *Stamens* 2–4, rarely 5 or more; filaments short; anthers 2-celled; cells parallel distinct, or terminal divaricate, distinct or confluent. *Carpels* connate in a 1-celled ovary; ovule solitary, erect; style short, conic, beaked, or 0; stigmas 2–5. *Fruit* a small ovoid or globose, 1-seeded berry. *Seed* usually globose; testa thin; albumen floury within, with hardened periphery.

Fruits small, in dense, cylindric spikes; bracts orbicular, peltate:—
Leaves 3–5-nerved at the very obliquely cordate base, with 3–5 pairs of alternate nerves along the midrib above; stems stout, climbing; leaves all very shortly petioled .....*Chaba.*
Leaves 5–7-nerved from the equal or sometimes slightly oblique base, or (*P. sylvaticum* occasionally) with the inner pair of nerves leaving the midrib a little above the base:—
Leaves all petioled:—
Leaves firmly coriaceous, 5–7-nerved, ovate-oblong or ovate-cordate, basal lobes often unequal; petioles rather long, those of the upper leaves never less than ·5 in. .....*Betle.*
Leaves thinly membranous; basal lobes always equal:—
Leaves long-petioled (petioles of lower leaves 2–4 in. long), 5–7-nerved, wide-ovate; base deep-cordate; stems and branches flaccid, succulent; a low creeper .....*sylvaticum.*
Leaves short-petioled (petioles of lower leaves never exceeding ·5 in. long), 3–5-nerved, ovate-oblong, oblong, or linear-oblong, base rounded or faintly cordate; stems and branches thin rigid; a bushy climber .....*peepuloides.*
Leaves 7-nerved, the lower long-petioled (petioles 1–3 in. long), ovate-cordate, basal lobes equal; the upper sessile, stem-clasping, narrower basal lobes often unequal .....*longum.*
Fruits larger, in loose, interrupted spikes; leaves all petioled (petioles ·5–2 in. long), coriaceous, elliptic or oblong or rounded; base never cordate, often slightly oblique, 3–9-nerved from above the base:—

Bracts orbicular-peltate, margin free all round; leaves 5–7-nerved; shrubby ..... *Hamiltonii.*

Bracts and bracteoles more or less adnate to the rachis; scandent:—

Bracts of female spike forming a short hemispheric cup beneath the ovary; bracteoles forming a semilunar ridge above the ovary; leaves 5–9-nerved ..... *nigrum.*

Bracts of female spike adnate to rachis, with slightly raised, decurrent margins, which are confluent with bracteoles on either side of the ovary; leaves 3–5-nerved ..... *rhytidocarpum.*

1756. PIPER CHABA Hunter; F. I. i. 156; F. B. I. v. 83; E. D. p. 797.

Cultivated generally.

A stout climber, with flexuous branches. *Hind.* Chab, chava; *Beng.* Choi.

1757. PIPER BETLE Linn.; F. I. i. 158; F. B. I. v. 85; E. D. p. 775.

Cultivated.

A stout climber. *Vernac.* Pán, támbuli.

1758. PIPER SYLVATICUM Roxb.; F. I. i. 156; F. B. I. v. 84; E. D. p. 821.

E. Bengal.

A low creeper. *Beng.* Pahari pípal.

1759. PIPER PEEPULOIDES Roxb.; F. I. i. 157; F. B. I. v. 83.

Chittagong.

A slender bush. *Vernac.* Pípal.

1760. PIPER LONGUM Linn.; F. I. i. 156; F. B. I. v. 83; E. D. p. 805.

N. Bengal; E. Bengal; C. Bengal; Behar.

A slender creeper with erect flowering shoots. *Beng.* Pipla, pipla-mul; *Hind.* Pipul-mul; *Santal.* Ralli.

1761. PIPER HAMILTONII C. DC.; F. B. I. v. 88.

N. Bengal; Chittagong.

A shrub, creeping below.

1762. PIPER NIGRUM Linn.; F. I. i. 150; F. B. I. iv. 90; E. D. p. 811.

Generally cultivated.

A climber. *Vernac.* Gul-mirich, kala-mirich.

1763. PIPER RHYTIDOCARPUM Hook. f.; F. B. I. v. 92.

Chittagong.

A climber.

792. Peperomia Ruiz & Pav.

Annual or perennial herbs, generally succulent; *leaves* opposite or whorled, less often alternate, quite entire, pellucid-punctate; stipules 0. *Flowers* minute, hermaphrodite, sessile or sunk in the rachis, often whorled, erect, bracteate, in terminal or leaf-opposed, rarely axillary, solitary or fascicled spikes; bracts sessile, sometimes peltately attached. *Perianth* 0. *Stamens* 2; filaments very short; anther-cells confluent. *Carpels* forming a small obtuse or acute or beaked 1-celled ovary; ovule solitary, erect; stigma lateral or terminal, usually penicillate. *Fruit* a minute, indehiscent, almost dry berry or nutlet; pericarp thin. *Seed* minute; testa membranous; albumen floury.

Leaves coriaceous, 4-nately whorled, orbicular .....*reflexa.*
Leaves thinly membranous, opposite, ovate-acute .....*pellucida.*

1764. PEPEROMIA REFLEXA A. Dietr.; F. B. I. v. 99.
Chota Nagpur.
A small, tufted herb, with stoutish, densely branched stems.

1765. PEPEROMIA PELLUCIDA Kunth.
C. Bengal, naturalised.
A succulent, slender, annual herb, recently introduced, but now extremely abundant.

Order CVIII. MYRISTICACEÆ.

Evergreen trees, often stellate-tomentose. *Leaves* alternate, entire, often pellucid-dotted; stipules 0. *Flowers* small, diœcious, regular, cymose, fascicled, umbelled, or panicled; bracteoles persistent or caducous. *Perianth* simple, inferior, coriaceous, deciduous; lobes usually 3, sometimes 2 or 4, connate below valvate in bud. ♂ *Stamens* monadelphous, 3–18, less oft 30–45; anthers usually sessile, ovate or linear, 2-celled, adna dorsally to a central, vertical, cylindric or angled, sessile or stalke column, free from each other or connate, less often attached by their bases without or with short filaments to the edge of a peltate, stipitate disk; dehiscence always extrorse; rudimentary pistil 0. ♀ *Staminodes* 0, or very rare. *Ovary* free, sessile at base of perianth, 1-celled; ovule solitary, basal, erect, anatropous;

stigma usually sessile, capitate discoid or lobed. *Fruit* more or less fleshy or thickly coriaceous, often splitting into 2, sometimes into 4 valves. *Seed* erect, with a fleshy or membranous, entire, lobed or laciniate, often apically induplicate, usually coloured, often aromatic arillus; testa usually thick; albumen copious, hard, ruminate; embryo very small, basal; cotyledons divaricate, flat or corrugated; radicle inferior, short.

793. **Myristica** Linn.

KNEMA Bl.

Large, evergreen trees; *leaves* alternate, entire, lanceolate; stipules 0. *Flowers* small, diœcious, regular; males pedicelled, in clusters of 3–15 from short, axillary tubercles; pedicels with a persistent bracteole usually near the middle; females axillary, solitary or clustered. *Perianth* usually 3-lobed. ♂ *Staminal* column peltate, disk-like, flat or concave, rarely convex, usually stalked; anthers discrete, ovate, usually sessile, attached by their bases or by short filaments from edge of disk, spreading horizontally from the column with dehiscence downwards, or suberect with dehiscence outwards. *Fruit* more or less fleshy, usually 2-lobed in dehiscence; arillus usually shortly laciniate.

Leaves a foot long or longer .....*longifolia.*
Leaves under a foot long.....*longifolia* var. *erratica.*

1766. MYRISTICA LONGIFOLIA Wall.; F. B. I. v. 110; E. D. M. 901.
Chittagong.
A lofty tree.

1766/2. Var. ERRATICA F. B. I. v. 110; E. D. M. 901. *M. linifolia* F. I. iii. 847.
Chittagong.
A lofty tree.

Order CIX. LAURINEÆ.

Erect, aromatic trees or shrubs, usually evergreen. *Leaves* alternate, rarely opposite or deciduous, gland-dotted; stipules 0; very rarely (*Cassytha*) leafless, parasitic climbers. *Flowers* regular, small, hermaphrodite or 1-sexual, in axillary cymes, clusters, panicles, or racemes; bracts deciduous, often involucrate,

792. Peperomia Ruiz & Pav.

Annual or perennial herbs, generally succulent; *leaves* opposite or whorled, less often alternate, quite entire, pellucid-punctate; stipules 0. *Flowers* minute, hermaphrodite, sessile or sunk in the rachis, often whorled, erect, bracteate, in terminal or leaf-opposed, rarely axillary, solitary or fascicled spikes; bracts sessile, sometimes peltately attached. *Perianth* 0. *Stamens* 2; filaments very short; anther-cells confluent. *Carpels* forming a small obtuse or acute or beaked 1-celled ovary; ovule solitary, erect; stigma lateral or terminal, usually penicillate. *Fruit* a minute, indehiscent, almost dry berry or nutlet; pericarp thin. *Seed* minute; testa membranous; albumen floury.

Leaves coriaceous, 4-nately whorled, orbicular .....*reflexa.*
Leaves thinly membranous, opposite, ovate-acute .....*pellucida.*

1764. Peperomia reflexa A. Dietr.; F. B. I. v. 99.
Chota Nagpur.
A small, tufted herb, with stoutish, densely branched stems.

1765. Peperomia pellucida Kunth.
C. Bengal, naturalised.
A succulent, slender, annual herb, recently introduced, but now extremely abundant.

Order CVIII. MYRISTICACEÆ.

Evergreen trees, often stellate-tomentose. *Leaves* alternate, entire, often pellucid-dotted; stipules 0. *Flowers* small, diœcious, regular, cymose, fascicled, umbelled, or panicled; bracteoles persistent or caducous. *Perianth* simple, inferior, coriaceous, deciduous; lobes usually 3, sometimes 2 or 4, connate below valvate in bud. ♂ *Stamens* monadelphous, 3–18, less often 30–45; anthers usually sessile, ovate or linear, 2-celled, adnate dorsally to a central, vertical, cylindric or angled, sessile or stalked column, free from each other or connate, less often attached by their bases without or with short filaments to the edge of a peltate, stipitate disk; dehiscence always extrorse; rudimentary pistil 0. ♀ *Staminodes* 0, or very rare. *Ovary* free, sessile at base of perianth, 1-celled; ovule solitary, basal, erect, anatropous;

stigma usually sessile, capitate discoid or lobed. *Fruit* more or less fleshy or thickly coriaceous, often splitting into 2, sometimes into 4 valves. *Seed* erect, with a fleshy or membranous, entire, lobed or laciniate, often apically induplicate, usually coloured, often aromatic arillus; testa usually thick; albumen copious, hard, ruminate; embryo very small, basal; cotyledons divaricate, flat or corrugated; radicle inferior, short.

793. Myristica Linn.

KNEMA Bl.

Large, evergreen trees; *leaves* alternate, entire, lanceolate; stipules 0. *Flowers* small, diœcious, regular; males pedicelled, in clusters of 3–15 from short, axillary tubercles; pedicels with a persistent bracteole usually near the middle; females axillary, solitary or clustered. *Perianth* usually 3-lobed. ♂ *Staminal* column peltate, disk-like, flat or concave, rarely convex, usually stalked; anthers discrete, ovate, usually sessile, attached by their bases or by short filaments from edge of disk, spreading horizontally from the column with dehiscence downwards, or suberect with dehiscence outwards. *Fruit* more or less fleshy, usually 2-lobed in dehiscence; arillus usually shortly laciniate.

Leaves a foot long or longer .....*longifolia.*
Leaves under a foot long.....*longifolia* var. *erratica.*

1766. MYRISTICA LONGIFOLIA Wall.; F. B. I. v. 110; E. D. M. 901.
Chittagong.
A lofty tree.

1766/2. Var. ERRATICA F. B. I. v. 110; E. D. M. 901. *M. linifolia* F. I. iii. 847.
Chittagong.
A lofty tree.

Order CIX. LAURINEÆ.

Erect, aromatic trees or shrubs, usually evergreen. *Leaves* alternate, rarely opposite or deciduous, gland-dotted; stipules 0; very rarely (*Cassytha*) leafless, parasitic climbers. *Flowers* regular, small, hermaphrodite or 1-sexual, in axillary cymes, clusters, panicles, or racemes; bracts deciduous, often involucrate,

sometimes 0. *Perianth* inferior or occasionally somewhat adnate to the ovary; tube short, sometimes enlarging in fruit; lobes of limb usually 6, rarely 4, 2-seriate; lobes of each series imbricate, rarely subvalvate, all similar, small, herbaceous or petaloid and equal, or the outer rarely smaller, very rarely larger than the inner, occasionally one or more lobes abortive, or one or more additional lobes present. *Stamens* usually a multiple of the perianth-lobes in 2–4 series on the tube; filaments flattened, inner or some or all the filaments often 2-glandular at the base; anthers erect, 2-celled or 4-celled; cells dehiscing by recurving, at length deciduous, valvular flaps. *Carpels* forming a sessile, 1-celled ovary at the base of the perianth-tube; ovule solitary, anatropous, pendulous from apex of cell; style terminal; stigma simple or discoid or dilated. *Fruit* a dry or fleshy berry, situated on the often thickened peduncle, naked or rarely enclosed in or adnate to the perianth-tube. *Seed* pendulous; testa membranous; albumen 0; cotyledons plano-convex, fleshy; radicle minute, superior.

*Shrubs or trees; inflorescence lax :—[p. 897]

Anthers of the two outermost rows opening inwards, of the third row opening outwards by valves; flowers hermaphrodite :—

Anthers all 2-celled :—

Perianth-tube persistent, enclosing the fruit, its lobes 6, subequal **Cryptocarya.**

Perianth-tube altogether deciduous :—

Perianth-lobes 5, subequal; pedicels not thickened in fruit; staminodes ovate or cordate ..... **Beilschmiedia.**

Perianth-lobes 6, the 3 outer much the shorter; pedicels much enlarged in fruit; staminodes minute or absent ..... **Dehaasia.**

Anthers all 4-celled :—

Perianth in fruit with deciduous lobes, but wholly or partly persistent tube, if lobes persistent the leaves opposite and 3-nerved from the base ..... **Cinnamomum.**

Perianth in fruit altogether persistent; leaves alternate and penninerved :—

Lobes of perianth reflexed in fruit ..... **Machilus.**

Lobes of perianth erect in fruit ..... **Phœbe.**

Anthers of all the rows opening inwards by valves, 4-celled; flowers dicœcious :—

Flowers clustered, enclosed in densely imbricating bracts **Actinodaphne.**

Flowers umbellate, the umbels involucrate ..... **Litsea.**

*Parasitic, leafless, twining herbs; inflorescence compact; anthers of the two outermost rows opening inwards, of the third row opening outwards by valves, all 2-celled [p. 896] ..... **Cassytha.**

794. Cryptocarya R. Br.

Evergreen trees or shrubs; *leaves* alternate, rarely subopposite, 3-nerved from base or penninerved. *Flowers* small, hermaphrodite, in axillary and subterminal panicles. *Perianth*-tube turbinate or ovoid, ultimately narrowed at the top; lobes of limb 6, subequal. *Stamens* 9 perfect, those of two outer series with eglandular filaments and with anthers introrsely 2-celled; of third series with 2-glandular filaments and anthers extrorsely 2-celled; of fourth series replaced by stipitate staminodes. *Ovary* sessile at base of perianth, enclosed in the tube; style shortly exserted; stigma obtuse or discoid. *Fruit* wholly enclosed in the perianth-tube and sometimes adnate to it; tube accrescent, hardened or rather fleshy, smooth or ribbed, the mouth occluded, the limb deciduous or more or less persistent; pericarp proper membranous or hard. *Seed* with a membranous testa, often scarcely separable from pericarp.

1767. Cryptocarya floribunda Nees. *C. amygdalina* F. B. I. v. 118 in part; E. D. C. 2242.
N. Bengal, Duars; Chittagong.
A tree.

795. Beilschmiedia Nees.

Evergreen trees or shrubs; *leaves* alternate or opposite, penni-nerved. *Flowers* small, hermaphrodite, fascicled or panicled. *Perianth*-tube short; lobes of limb 5, subequal. *Stamens* 9 perfect, those of two outer series with eglandular filaments and with anthers introrsely 2-celled; of third series with 2-glandular filaments and with anthers extrorsely 2-celled; of fourth series in[illegible]placed by ovoid or cordate staminodes. *Ovary* sessile, free from of[illegible]rianth, narrowed into the style; stigma obtuse. *Fruit* an [illegible]blong, ovoid, or globose berry; pedicel not or slightly thickened; [illegible]erianth quite deciduous. *Seed* with membranous testa.

1768. Beilschmiedia Roxburghiana Nees; F. B. I. v. 121; E. D. B. 426. *Laurus bilocularis* F. I. ii. 311.
Tippera.
A deciduous tree. *Vernac.* Serai-guti.

sometimes 0. *Perianth* inferior or occasionally somewhat adnate to the ovary; tube short, sometimes enlarging in fruit; lobes of limb usually 6, rarely 4, 2-seriate; lobes of each series imbricate, rarely subvalvate, all similar, small, herbaceous or petaloid and equal, or the outer rarely smaller, very rarely larger than the inner, occasionally one or more lobes abortive, or one or more additional lobes present. *Stamens* usually a multiple of the perianth-lobes in 2–4 series on the tube; filaments flattened, inner or some or all the filaments often 2-glandular at the base; anthers erect, 2-celled or 4-celled; cells dehiscing by recurving, at length deciduous, valvular flaps. *Carpels* forming a sessile, 1-celled ovary at the base of the perianth-tube; ovule solitary, anatropous, pendulous from apex of cell; style terminal; stigma simple or discoid or dilated. *Fruit* a dry or fleshy berry, situated on the often thickened peduncle, naked or rarely enclosed in or adnate to the perianth-tube. *Seed* pendulous; testa membranous; albumen 0; cotyledons plano-convex, fleshy; radicle minute, superior.

*Shrubs or trees; inflorescence lax :—[p. 897]

Anthers of the two outermost rows opening inwards, of the third row opening outwards by valves; flowers hermaphrodite :—

Anthers all 2-celled :—

Perianth-tube persistent, enclosing the fruit, its lobes 6, subequal **Cryptocarya.**

Perianth-tube altogether deciduous :—

Perianth-lobes 5, subequal; pedicels not thickened in fruit; staminodes ovate or cordate ..... **Beilschmiedia.**

Perianth-lobes 6, the 3 outer much the shorter; pedicels much enlarged in fruit; staminodes minute or absent ..... **Dehaasia.**

Anthers all 4-celled :—

Perianth in fruit with deciduous lobes, but wholly or partly persistent tube, if lobes persistent the leaves opposite and 3-nerved from the base ..... **Cinnamomum.**

Perianth in fruit altogether persistent; leaves alternate and penninerved :—

Lobes of perianth reflexed in fruit ..... **Machilus.**

Lobes of perianth erect in fruit ..... **Phœbe.**

Anthers of all the rows opening inwards by valves, 4-celled; flowers dioecious :—

Flowers clustered, enclosed in densely imbricating bracts **Actinodaphne.**

Flowers umbellate, the umbels involucrate ..... **Litsea.**

*Parasitic, leafless, twining herbs; inflorescence compact; anthers of the two outermost rows opening inwards, of the third row opening outwards by valves, all 2-celled [p. 896] ..... **Cassytha.**

794. Cryptocarya R. Br.

Evergreen trees or shrubs; *leaves* alternate, rarely subopposite, 3-nerved from base or penninerved. *Flowers* small, hermaphrodite, in axillary and subterminal panicles. *Perianth*-tube turbinate or ovoid, ultimately narrowed at the top; lobes of limb 6, subequal. *Stamens* 9 perfect, those of two outer series with eglandular filaments and with anthers introrsely 2-celled; of third series with 2-glandular filaments and anthers extrorsely 2-celled; of fourth series replaced by stipitate staminodes. *Ovary* sessile at base of perianth, enclosed in the tube; style shortly exserted; stigma obtuse or discoid. *Fruit* wholly enclosed in the perianth-tube and sometimes adnate to it; tube accrescent, hardened or rather fleshy, smooth or ribbed, the mouth occluded, the limb deciduous or more or less persistent; pericarp proper membranous or hard. *Seed* with a membranous testa, often scarcely separable from pericarp.

1767. Cryptocarya floribunda Nees. *C. amygdalina* F. B. I. v. 118 in part; E. D. C. 2242.
N. Bengal, Duars; Chittagong.
A tree.

795. Beilschmiedia Nees.

Evergreen trees or shrubs; *leaves* alternate or opposite, penni-nerved. *Flowers* small, hermaphrodite, fascicled or panicled. *Perianth*-tube short; lobes of limb 5, subequal. *Stamens* 9 perfect, those of two outer series with eglandular filaments and with anthers introrsely 2-celled; of third series with 2-glandular filaments and with anthers extrorsely 2-celled; of fourth series replaced by ovoid or cordate staminodes. *Ovary* sessile, free from perianth, narrowed into the style; stigma obtuse. *Fruit* an oblong, ovoid, or globose berry; pedicel not or slightly thickened; perianth quite deciduous. *Seed* with membranous testa.

1768. Beilschmiedia Roxburghiana Nees; F. B. I. v. 121; E. D. B. 426. *Laurus bilocularis* F. I. ii. 311.
Tippera.
A deciduous tree. *Vernac.* Serai-guti.

796. Dehaasia Bl.

Evergreen trees; *leaves* alternate, often fascicled at the ends of the branches, penninerved. *Flowers* small, hermaphrodite, in axillary, peduncled panicles. *Perianth*-tube very short; lobes of limb 6, those of outer series much smaller than those of inner. *Stamens* 9 perfect, those of two outer series with eglandular filaments and with anthers introrsely 2-celled; those of third with 2-glandular filaments and with anthers extrorsely 2-celled; fourth series represented by minute staminodes or sometimes quite obsolete. *Ovary* sessile, free from perianth, narrowed to a short style; stigma obtuse. *Fruit* an oblong berry, resting on a much accrescent, coloured pedicel; perianth quite deciduous. *Seed* with membranous testa.

1769. Dehaasia Kurzii King; F. B. I. v. 125.

Chittagong.

An evergreen tree. *Vernac.* Modon-mosto, bágráj.

797. Cinnamomum Bl.

Evergreen trees or shrubs; *leaves* opposite or alternate, usually 3-nerved. *Flowers* small, hermaphrodite or, by abortion, polygamous, in axillary and subterminal panicles; female flowers usually rather larger and sometimes with fewer parts. *Perianth*-tube short; lobes of limb 6, subequal. *Stamens* 9 perfect or, by abortion, fewer; those of two outer series with eglandular filaments and introrsely 4-celled anthers; of third row with filaments glandular, glands subsessile or stalked, anthers extrorsely 4-celled, less often 2-celled; of fourth row replaced by shortly stipitate, cordate or sagittate staminodes. *Ovary* sessile, free from the perianth, narrowed into a style; stigma discoid or obscurely 3-lobed. *Fruit* a berry, resting on the spreading, more or less enlarged perianth, with wholly or partly deciduous segments, less often persistent and entire. *Seed* with thin testa.

*Buds naked or with very small scales; leaves opposite, 3-nerved; a[illegible] of principal nerves without pits:—[p. 899]

Perianth-lobes deciduous in fruit; stamens and ovary villous...*Tamala*

Perianth-lobes rounded, persistent in fruit; stamens and ova[illegible] sparsely hairy or glabrous:—

Leaves 8–12 in. long, secondary nervation very faint ...*obtusifolium*.

Leaves 5–7 in. long, distinctly reticulate beneath .....*zeylanicum*.

*Buds enclosed in large, orbicular, concave, silky, caducous, imbricating scales; leaves alternate, penninerved; axils of principal nerves pitted; perianth-lobes wholly deciduous [p. 898] ..... *Camphora.*

1770. Cinnamomum Tamala Fr. Nees; F. B. I. v. 128; E. D. c. 1183. *Laurus Cassia* F. I. ii. 297.
Tippera; cultivated in C. Bengal, N. Bengal, and E. Bengal.
A medium tree. *Beng.* Tej-pat; *Hind.* Tálispatra, Tez-pat.

1771. Cinnamomum obtusifolium Nees; F. B. I. v. 128; E. D. c. 1165. *Laurus obtusifolia* F. I. ii. 302.
Chittagong.
A large tree. *Beng.* Ram tej-pat, kinton; *Magh.* Krowai.

1772. Cinnamomum zeylanicum Breyn; F. B. I. v. 131; E. D. c. 1196. *Laurus Cinnamomum* F. I. ii. 295.
Planted, but very rarely.
A small tree; native of Ceylon. *Vernac.* Dálchini. Cinnamon.

1773. Cinnamomum Camphora F. Nees; F. B. I. v. 134; E. D. c. 1154.
Planted, rather commonly.
A medium tree; native of China. *Vernac.* Kaphur (*from the Chinese name*). Camphor.

798. Machilus Nees.

Evergreen trees; *leaves* alternate or clustered at ends of branchlets, penninerved. *Flowers* small, hermaphrodite, in axillary panicles. *Perianth*-tube short or obsolete; lobes of limb 6, subequal, persistent and spreading or reflexed in fruit. *Stamens* 9 perfect, those of two outer series with eglandular filaments and anthers all introrsely 4-celled; of third row with filaments 2-glandular at base, glands stipitate, anthers extrorsely 4-celled; of fourth row replaced by stipitate, cordate staminodes. *Ovary* sessile, narrowed into the style; stigma discoid. *Fruit* a globose or ovoid berry, seated on the persistent perianth. *Seed* with thin testa.

†Nerves of leaves 6–8 pairs, very stout; leaves when young tomentose or pubescent beneath [p. 900] ..... *villosa.*

†Nerves of leaves 8–10 pairs, very slender; leaves when young finely silky beneath :—[p. 899]

Leaves when adult quite glabrous beneath ..... *Gamblei.*
Leaves persistently finely pubescent beneath, and hairy along the midrib ..... *bombycina.*

1774. MACHILUS VILLOSA Hook. f.; F. B. I. v. 140, 860. *Laurus villosa* F. I. ii. 310.
N. Bengal, Duars; Chittagong.
A large tree.

1775. MACHILUS GAMBLEI King; F. B. I. v. 138, 860.
N. Bengal, Duars; Cooch Behar.
A small tree.

1776. MACHILUS BOMBYCINA King; F. B. I. v. 861.
Chittagong.
A small tree.

799. Phœbe Nees.

Evergreen shrubs or trees; *leaves* alternate or scattered or clustered at ends of branchlets, penninerved. *Flowers* small, hermaphrodite or polygamous, in axillary and subterminal panicles. *Perianth*-tube short; lobes of limb 6, subequal, erect and accrescent in fruit and clasping the base of the berry. *Stamens* 9 perfect, those of the two outer series with filaments eglandular and anthers introrsely 4-celled; of the third series with filaments 2-glandular and anthers extrorsely 4-celled; of fourth row replaced by cordate or sagittate staminodes. *Ovary* sessile, narrowed into the style; stigma discoid. *Fruit* an ellipsoid or oblong berry, its base clasped by the hardened perianth-segments. *Seed* with thin testa.

Leaves, shoots, and perianth quite glabrous ..... *lanceolata.*
Leaves, shoots, and perianth pubescent ..... *paniculata.*

1777. PHŒBE LANCEOLATA Nees; F. B. I. v. 141. *Laurus lanceolaria* F. I. ii. 309.
Tirhut, Bettiah, on the northern frontier; Chittagong.
An evergreen tree.

1778. PHŒBE PANICULATA Nees; F. B. I. v. 142.
Chittagong.
An evergreen tree.

800. Actinodaphne Nees.

Evergreen shrubs or trees; *leaves* almost whorled, rarely scattered or opposite, penninerved or 3-nerved. *Flowers* small, diœcious, in axillary or lateral, dense, sessile or peduncled, bracteate fascicles or umbels; bracts imbricating, caducous. *Perianth*-tube short; lobes of limb 6, subequal. ♂ *Stamens* 9 perfect, or sometimes only 6; filaments of two outer rows eglandular; of third row 2-glandular, sometimes the third series obsolete; anthers of all three series introrsely 4-locular. *Ovary* reduced and empty or obsolete. ♀ *Staminodes* 9. *Ovary* free; style longish, slender; stigma dilated. *Fruit* a berry, resting on the enlarged, hardened, flat, spreading or concave perianth-tube. *Seed* with thin testa.

1779. Actinodaphne angustifolia Nees; F. B. I. v. 152.

N. Bengal, Duars; Chittagong.

An evergreen tree.

801. Litsæa Lamk.

Evergreen, rarely deciduous, trees or shrubs; *leaves* alternate, rarely opposite or nearly so, penninerved, rarely 3-nerved; buds naked or scaly. *Flowers* small, diœcious, umbellate or capitate; umbels 4–6-, rarely more-flowered, sessile or short-peduncled; peduncles clustered, rarely solitary, axillary or in scars of fallen leaves, sometimes racemose or fascicled on common peduncles; bracts involucrate, 4–6, rarely more to an involucre, concave, coriaceous or membranous. *Perianth*-tube ovoid, campanulate, or very short; lobes of limb 6 or 4, rarely fewer or more, equal or unequal, sometimes small, in a few obsolete. ♂ *Stamens* 9 or 12 in 3-merous, 6 in 2-merous flowers, sometimes by abortion fewer than 6, rarely more than 12; of the two outer series with usually eglandular filaments; of the third row and, if present at all, of the fourth row, with 2-glandular filaments; anthers of all rows introrsely 4-celled, or occasionally with the lower cells of anthers of the third row lateral. *Ovary* minute empty, or obsolete, very rarely perfect. ♀ *Staminodes* 9 or 12, or in 2-merous flowers 6. *Ovary* enclosed in perianth-tube or free; style short or long; stigma usually irregularly lobed. *Fruit* a drupe or berry, resting on the unchanged perianth or partly clasped at the base by the often much enlarged, discoid or cupular perianth-tube. *Seed* with thin testa.

Leaves penninerved :—
Perianth-segments incomplete or absent; fruit globose, on a small, thickened perianth-tube; leaves alternate :—
Leaves thin, oblong, sparingly pubescent beneath .....*sebifera*.
Leaves chartaceous, ovate-acute, rather closely tomentose beneath *sebifera* var. *glabraria*.
Perianth-segments distinct, usually 6, occasionally 5 only :—
Perianth-tube not enlarging in fruit :—
Leaves opposite or a few also alternate, thin, short-petioled, narrow, acute or acuminate, glaucous beneath .....*lancifolia*.
Leaves all alternate, chartaceous, long-petioled, broad, obtuse or apiculate, tomentose beneath .....*polyantha*.
Perianth-tube enlarged, disciform or cupular in fruit; leaves alternate, lanceolate, acute or acuminate :—
Umbels all solitary or fascicled, axillary :—
Leaves grey-hoary, rarely glabrous beneath; nerves 8–15 pairs; stamens villous; umbels clustered *salicifolia* var. *laurifolia*.
Leaves nearly or quite glabrous beneath; nerves 15–30 pairs; stamens sparingly hairy; umbels almost always solitary, rarely clustered.....*angustifolia*.
Umbels in racemes, male racemes 5–7 in. long, female shorter; leaves quite glabrous beneath :—
Racemes glabrous; fruit longer than broad, almost enclosed in the slightly 3-cleft, urceolate perianth-tube .....*nitida*.
Racemes pubescent; fruit subglobose, seated on the entire cup-shaped perianth-tube .....*Panamonga*.
Leaves 3-nerved, alternate or subverticillate; perianth-segments deciduous, usually 4 :—
Umbels in sessile clusters .....*zeylanica*.
Umbels in solitary or binate racemes .....*Clarkei*

1780. LITSÆA SEBIFERA Pers.; F. B. I. v. 157; E. D. L. 48. *Tetranthera laurifolia* F. I. iii. 823. *T. apetala* F. I. iii. 819.
In most of the provinces.
An evergreen tree, 20–50 feet high. *Hind.* Garbi-jaun, singraf; *Beng.* Kukur-chita, ratún, garur.

1780/2. Var. GLABRARIA F. B. I. v. 158.
In all the provinces.
An evergreen tree, 20–50 feet high.

1781. LITSÆA LANCIFOLIA Hook. f.; F. B. I. v. 159.

Chittagong.

A small evergreen tree or bush.

1782. LITSÆA POLYANTHA Juss.; F. B. I. v. 162; E. D. L. 474. *Tetranthera monopetala* F. I. iii. 821.

In all the provinces.

An evergreen tree, 20–40 feet high. *Hind.* Meda, kat medh; *Beng.* Bara kukur-chita; *Santal.* Pojo.

1783. LITSÆA SALICIFOLIA Hook. f. var. LAURIFOLIA F. B. I. v. 168; E. D. L. 481.

N. Bengal; C. Bengal; E. Bengal; Sundribuns; Chittagong.

An evergreen bush or small tree. *Vernac.* Súm, digloti.

1784. LITSÆA ANGUSTIFOLIA Wall.; F. B. I. v. 169.

Chittagong.

An evergreen bush or small tree.

1785. LITSÆA NITIDA Hook. f.; F. B. I. v. 174.

Chota Nagpur, Singhbhum.

A tall timber tree.

1786. LITSÆA PANAMONJA Hook. f.; F. B. I. v. 175.

Chittagong.

A large evergreen tree. *Vernac.* Panamonja.

1787. LITSÆA ZEYLANICA C. & Fr. Nees; F. B. I. v. 178; E. D. L. 493.

Chittagong.

A small tree.

1788. LITSÆA CLARKEI Prain. *Actinodaphne* ? sp. F. B. I. v. 154.

Chittagong.

A small tree.

802. **Cassytha** Linn.

Filiform, twining green parasites, adhering to the host by suckers; *leaves* of minute scales or 0. *Flowers* small, hermaphrodite, sometimes dimorphic, spicate or capitate or racemose; bracteoles 3. *Perianth*-tube short and globose, or in the same species as long as limb and turbinate; lobes of limb 6, the outer three smaller. *Stamens* 9 or 6 perfect; of the first series with eglandular filaments and introrsely 2-celled anthers; of the second series like the first, or sometimes reduced to staminodes; of the third row with 2-glandular filaments and extrorsely 2-celled

anthers; of the fourth row replaced by sessile or stipitate staminodes. *Ovary* globose, in flower free, in fruit closely covered by the enlarged perianth; stigma subsessile, small or capitate. *Fruit* a small drupe, enclosed in the succulent perianth-tube and crowned by the perianth-limb. *Seed* with thin testa; cotyledons ultimately confluent.

1789. CASSYTHA FILIFORMIS Linn.; F. I. ii. 314; F. B. I. v. 188; E. D. C. 805.

Behar; Chota Nagpur; W. Bengal; Sundribuns; Chittagong.

A twining, leafless parasite, stems green. *Hind.* Amarbeli; *Beng.* Akás-bel; *Santal.* Alag-jari.

Order CX. PROTEACEÆ.

Trees or shrubs, rarely herbs. *Leaves* alternate or scattered, rarely subopposite or whorled, usually coriaceous, entire, toothed or pinnatisect; stipules 0. *Flowers* racemose, spicate or rarely solitary, hermaphrodite, regular oblique or irregular; bracts small, caducous or subobsolete, or imbricate, persistent in fruit, strobilate; bracteoles 0, rarely 2. *Perianth* inferior; segments 4, at first valvately connate in a tube with gibbous base, tips free, recurved. *Stamens* 4, inserted on or opposite the perianth-segments; anthers erect, adnate to filaments; dehiscence longitudinal, introrse. *Disk* replaced by 4 free or connate, hypogynous scales alternate with filaments, sometimes 0. *Carpels* forming a free, sessile or stipitate, 1-celled, often oblique or excentric ovary; ovules solitary, paired, or several 2-seriate; style terminal, tip thickened; stigma terminal or lateral. *Fruit* a nut or drupe, indehiscent or ultimately opening on the inner edge or at the tip, or a follicle or capsule with often thickly coriaceous valves. *Seeds* solitary or paired or few, flattened or thick; testa membranous or coriaceous, sometimes winged; albumen 0; embryo with compressed or fleshy, often unequal cotyledons.

803. Helicia Lour.

Trees or large shrubs; *leaves* alternate, entire or toothed. *Flowers* medium or rather long, in terminal and axillary racemes, hermaphrodite, regular, pedicelled and in pairs; bracts small,

caducous or 0. *Perianth*-tube slender; limb hardly wider than tube, straight, ovate or oblong; segments revolute when flower opens. *Stamens* 4, opposite perianth-segments; filaments short; anthers oblong; connective shortly appendaged. *Disk* hypogynous, of 4 scales, free, or confluent and cupular or annular. *Ovary* sessile; ovules 2, basal or lateral, and attached below the middle; style long, straight, with slightly thickened tip; stigma terminal. *Fruit* a subglobose, hard nut. *Seeds* solitary, subglobose or 2, hemispheric; testa rugose or veined.

1790. HELICIA EXCELSA Bl.; F. B. I. v. 191. *Rhopala excelsa* F. I. i. 363.

Chittagong.

A large tree.

Order CXI. THYMELÆACEÆ.

Shrubs or small trees, with tough, fibrous bark. *Leaves* alternate or opposite, simple, quite entire. *Flowers* hermaphrodite or, by abortion, polygamous or rarely dicœcious, in axillary or terminal heads, umbels, clusters or racemes. *Perianth* regular, often corolline, tubular or campanulate; limb 4–5-lobed; segments imbricate in bud, often with 1 or 2 scales at the base. *Stamens* as many or twice as many as lobes of perianth, rarely half as many as lobes, adnate to perianth-tube, those opposite the lobes usually attached above the alternate ones; filaments short, rarely as long as anthers; anthers erect, 2-locular; cells parallel; dehiscence longitudinal. *Disk* hypogynous, annular, cup-shaped, scaly or obsolete. *Carpels* forming a superior 1-, rarely 2-celled, very rarely 4–5-celled ovary; ovules anatropous, solitary in each cell, pendulous from near its apex; style short or long, terminal or excentric; stigma capitate. *Fruit* a small berry, drupe, or nut, rarely a loculicidal capsule. *Seed* solitary, or one in each cell, pendulous or lateral; testa crustaceous, rarely membranous, with a distinct membranous tegmen; albumen fleshy, copious, or 0; embryo straight; cotyledons fleshy, usually thick; radicle short, superior.

*Fruit indehiscent; ovary 1-celled, 1-ovuled; shrubs; leaves opposite:— [p. 906]

†Stamens 8, 2-seriate; filaments short; disk of linear scales; perianth-lobes 4, without any scales [p 906] ..... **Wikstrœmia.**

†Stamens 10; filaments filiform, exserted; disk none; perianth-lobes 5, with 10 linear scales, united in pairs above the stamens [p. 905] **Linostoma.**

*Fruit a loculicidal capsule; ovary 2-celled, each cell 1-ovuled; trees; leaves alternate; stamens 10; disk none; perianth-lobes 5, with 5 scales, connate at their bases above the stamens [p. 905] .....**Aquilaria.**

804. Wikstræmia Endl.

Shrubs, rarely trees; *leaves* opposite, rarely alternate. *Flowers* hermaphrodite, shortly racemed or spicate at ends of branches; bracts 0. *Perianth*-tube slender, long; lobes 4, spreading, naked at the base. *Stamens* 8, 2-seriate, included or shortly exserted; filaments very short; anthers oblong; connective inconspicuous. *Disk* hypogynous, of 4 or 2, rarely 1 scale. *Ovary* sessile or subsessile, villous, 1-celled; ovule solitary, pendulous; style short; stigma large, globose. *Fruit* fleshy, with a deciduous perianth, or almost dry and enclosed in the persistent perianth-base; pericarp fleshy or membranous. *Seed* with crustaceous testa; albumen scanty or 0; cotyledons fleshy.

1791. Wikstræmia viridiflora Meissn. *W. indica* var. *viridiflora* F. B. I. v. 195.

Chittagong.

A shrub.

805. Linostoma Wall.

Shrubs, laxly branched and sometimes climbing; *leaves* opposite or subopposite. *Flowers* hermaphrodite, in dense cymes, forming globose heads; bracts on the peduncle usually 2, subopposite, ultimately enlarging and coloured. *Perianth*-tube cylindric, ultimately turgid at the base; lobes 5, spreading; scales or glands on the perianth-throat 10, free or connate in pairs at their base. *Stamens* 10, adnate to perianth-tube below the scales; filaments short, filiform, exserted; anthers ovoid or oblong; connective narrow. *Disk* 0. *Ovary* sessile, usually villous, 1-celled; style filiform; stigma capitate, penicillate. *Fruit* ovoid, dry, hard or corky, included or not in the inflated perianth-base. *Seed* with membranous testa, often adnate to the perianth; albumen 0; cotyledons fleshy.

1792. Linostoma decandrum Wall.; F. B. I. v. 198. *Nectandra decandra* F. I. ii. 425.

Chittagong.

An erect, evergreen shrub. *Vernac.* Herenda.

806. Aquilaria Lamk.

Trees; *leaves* alternate, nerves slender, parallel. *Flowers* hermaphrodite, pedicelled, in subsessile, axillary and terminal umbellules; bracts 0. *Perianth* campanulate; lobes 5, broad, spreading; scales on the perianth-throat 5, densely pilose, connate below in a short ring. *Stamens* 10, adnate to perianth-throat; anthers subsessile, oblong; connective broad. *Disk* 0. *Carpels* connate in a subsessile, villous ovary, perfectly or imperfectly 2-celled; style obsolete; stigma large, subsessile. *Fruit* a compressed, oblanceolate or obovate, loculicidal capsule; pericarp coriaceous, or hard and woody. *Seeds* ovoid with a long tail; testa crustaceous; tegmen thick; albumen 0.

1793. Aquilaria Agallocha Roxb.; F. I. ii. 422; F. B. I. v. 199; E. D. A. 1251.

Tippera.

A large evergreen tree. *Vernac.* Agar, agaru.

Order CXII. ELÆAGNACEÆ.

Shrubs or trees, with a copious covering of silvery or brown scales. *Leaves* alternate or opposite, quite entire; stipules 0. *Flowers* small, regular, hermaphrodite or diœcious, solitary or fasciculately spiked or racemed in leaf-axils or on leafless nodes; bracts small, deciduous. *Perianth* in hermaphrodite or female flowers tubular, narrowed above the ovary and persistent below, deciduous above; limb 2–4-lobed, rarely truncate, in male flowers reduced to a 2–4-lobed limb. *Stamens* in ♀ adnate to perianth-throat, in ♂ flowers to perianth-base, 4 alternate with or 8, both opposite to and alternate with perianth-lobes; filaments free, usually short; anthers oblong, 2-locular; cells parallel, contiguous; dehiscence longitudinal. *Staminodes* in ♀ 0. *Carpel* forming a free, sessile, 1-locular ovary in base of perianth; ovule solitary, erect, basal, anatropous; style terminal, linear or dilated above, oblique; stigma lateral. *Fruit* a nut, closely covered by the thickened, berry-like perianth-base; pericarp membranous. *Seed* erect; testa hard; albumen scanty or 0; embryo straight; cotyledons thick, fleshy; radicle inferior, very short.

807. Elæagnus Linn.

Trees or shrubs, often silvery, with a scaly or stellate tomentum; *leaves* alternate, petioled, entire. *Flowers* hermaphrodite, axillary,

shortly petioled, usually solitary or 2–3-nate, sometimes fascicled on short, leafless, or leafy branchlets; bracts 0. *Perianth* with oblong or globose, persistent base, narrowed above the ovary, then funnel-shaped or campanulate, yellow or white within, deciduous, limb valvately 4-lobed, often with a prominent ring above the constriction within. *Stamens* 4, adnate to corolla-throat; filaments short. *Ovary* 1-celled; style linear, included, slightly dilated above; stigma lateral. *Fruit* with a thin pericarp, enclosed in the persistent, accrescent, berried, or rarely dry perianth-base, toughened within. *Seed* with hard, shining testa; albumen 0 or very scanty.

1794. ELÆAGNUS LATIFOLIA Linn.; F. B. I. v. 202; E. D. E. 48. *E. conferta* F. I. i. 440.

N. Bengal; E. Bengal; Chittagong.

A much-branched, scandent shrub. *Beng.* Guara; *Magh.* Kamboong.

Order CXIII. LORANTHACEÆ.

Evergreen, semi-parasitic shrubs. *Leaves* usually opposite, coriaceous, entire, sometimes absent; stipules 0. *Flowers* hermaphrodite or 1-sexual, racemose spicate or capitate or fascicled; bracts usually scale-like; bracteoles usually 2. *Perianth* simple or double. *Sepals*, or simple perianth when sepaloid, adnate to the ovary, in ♂ flowers solid or obsolete; limb annular or cupular, entire or shortly toothed. *Petals*, or simple perianth-segments when petaloid 3–6, rarely 2, valvate, free or more or less connate in a tube or in a sheath, split on upper side. *Stamens* as many as and opposite the corolla-lobes, usually adnate to them; filaments filiform; anthers usually 2-locular; dehiscence longitudinal or sometimes by pores. *Disk* epigynous or in ♂ flowers within the stamens, fleshy and rather prominent, or 0. *Staminodes* in ♀ flowers, and rudimentary *ovary* in ♂ flowers rarely present. *Carpels* forming an inferior ovary, at first apparently solid, at length 1-celled; ovule solitary, adnate throughout to the ovarian walls; style short or long; stigma simple. *Fruit* a 1-seeded berry or drupe. *Seed* adnate throughout to the pericarp; albumen fleshy; embryo straight; radicle superior.

Flowers hermaphrodite ..... **Loranthus.**
Flowers 1-sexual ..... **Viscum.**

808. **Loranthus** Linn.

Semi-parasitic shrubs, usually on trees, rarely terrestrial; *leaves* opposite, less often alternate, usually thick and fleshy or coriaceous, mostly penninerved, but nerves, except midrib, obscure. *Flowers* hermaphrodite, usually coloured, spicate racemose or cymose, axillary or on old nodes, rarely terminal; bracts concave or oblique, cupular; bracteoles 2, free or connate with bract, or 0. *Perianth* double. *Sepals* connate in a tube, adnate to ovary; limb short, truncate or 4–6-toothed or obsolete. *Petals* 4–6, valvate, free or more or less connate in a tube with spreading tips, or in a sheath split behind; tube naked or with 5 conniving scales at the base. *Stamens* 4–6, adnate to the petals; filaments filiform or thickened; anthers ovate-oblong or linear, adnate or versatile; cells parallel; dehiscence longitudinal, lateral or introrse. *Disk* 0. *Ovary* inferior, 1-celled; ovule solitary; style columnar, filiform or, rarely, twisted; stigma entire, terminal, obtuse or capitate. *Fruit* a berry or drupe, globose ovoid or oblong. *Seed* adnate to pericarp; testa 0; albumen copious fleshy, or 0; embryo usually fleshy; cotyledons 2 or 4.

*Flowers bracteate but not bracteolate:—[p. 910]

†Bracts scale-like; flowers in spikes, racemes, or short-peduncled fascicles:—[p. 910]

Corolla of 4–6 free petals; anthers continuous with filaments, distinctly 2-celled:—

Flowers under an inch long; petals 4–5; buds straight, clavate, angled below; anthers oblong:—

Flowers glabrous, in erect, strict, stout axillary spikes longer than the leaves; petals 5, rarely 4; bud suddenly inflated and 5-angled at the base; style jointed in the middle, thick below; calyx-limb obscurely toothed.....*pentapetalus.*

Flowers rusty-pubescent, 1–2 pairs in short, axillary racemes; petals 4; bud swollen, 4-angled below the middle; style slender; calyx-limb entire.....*ligustrinus.*

Flowers over an inch long; petals 6; buds curved, acute, slender; anthers slender, twice as long as filaments; racemes longer than the leaves, very stout, curved, sparse-flowered; style filiform *heteranthus.*

Corolla gamopetalous, 4–5-lobed or -partite, usually split above; anther-cells indistinct; flowers almost always mealy or scurfy:—

Corolla-tube 4-cleft, always split above; calyx hardly produced

above the ovary; flowers in axillary, solitary or clustered fascicles, rarely subracemose; leaves mealy or scurfy on lower and usually also on upper surface :—

Fruit papillose, clavate, contracted into a pedicel, with a thick, annular base; leaves cinnamon-scurfy with a stellate tomentum below, glabrous above .....*thelocarpus.*

Fruit not papillose :—

Fruit mealy, clavate; young shoots and leaves covered with flocculent, white, fugacious, mealy tomentum; flowers in solitary or fascicled, long-pedicelled, subracemose fascicles, scurfy-white-tomentose .....*pulverulentus.*

Fruit tomentose, pyriform; young shoots and leaves covered with short, soft, rusty or white scurfy tomentum :—

Leaves over 3 in. wide, large, orbicular or broad-ovate, base cordate or rounded, copiously tomentose beneath; petioles rather long .....*cordifolius.*

Leaves under 3 in. wide; base cuneate or rounded, rarely subcordate, shortly adpressed-tomentose or glabrate beneath :—

Adult leaves persistently white- or rusty-tomentose beneath; fascicles short-peduncled; petioles distinct, short or long .....*Scurrula.*

Adult leaves glabrous beneath :—

Fascicles short-peduncled; petioles none
Scurrula var. *bengalensis.*

Flowers subracemose; petioles distinct
Scurrula var. *graciliflora.*

Corolla-tube 5-fid or 5-cleft; calyx distinctly produced above the ovary; flowers in long or short racemes; leaves glabrous :—

Corolla 5-fid; lobes short; tube split above; calyx cupular, truncate; racemes long, slender, glabrous or, rarely, puberulous *longiflorus.*

Corolla equally 5-cleft to the middle; lobes long, linear; racemes short, densely scurfy .....*pentandrus.*

†Bracts large, leafy, 4, ovate, involucrate, much wider than flower; flowers fascicled, sessile, laxly villous; calyx-limb 4-lobed; corolla equally 5-cleft to the middle [p. 909].....*involucratus.*

*Flowers bracteate and also bracteolate, racemose; bracts small, short; than the ovary; bracteoles 2, connate in a cup; all parts quite glabrous; calyx-limb entire; corolla oblong, 5–6-angled below; lobes equal, linear-spathulate, as long as the tube :—[p. 909]

Fruit ellipsoid; corolla always 6-cleft.....*ampullaceus.*

Fruit globose; corolla usually 6-, sometimes 5-cleft .....*globosus.*

1795. LORANTHUS PENTAPETALUS Roxb.; F. I. i. 553, ii. 190; F. B. I. v. 206.
Chittagong.
A stout, glabrous branch-parasite.

1796. LORANTHUS LIGUSTRINUS Wall.; F. B. I. v. 207.
Chittagong.
A stout, puberulous root-parasite.

1797. LORANTHUS HETERANTHUS Wall.; F. B. I. v. 208.
Chittagong.
A robust, almost glabrous branch-parasite; leaves alternate.

1798. LORANTHUS THELOCARPUS Hook. f.; F. B. I. v. 211.
Chittagong.
A stout branch-parasite.

1799. LORANTHUS PULVERULENTUS Wall.; F. B. I. v. 211.
N. Bengal, Duars.
A robust branch-parasite.

1800. LORANTHUS CORDIFOLIUS Wall.; F. B. I. v. 209.
Behar; Chota Nagpur.
A stout branch-parasite.

1801. LORANTHUS SCURRULA Linn.; F. I. i. 550, ii. 186; F. B. I. v. 208.
Chota Nagpur; Behar; W. Bengal; N. Bengal; Chittagong.
A large, bushy branch-parasite.

1801/2. Var. BENGALENSIS F. B. I. v. 209.
C. Bengal; E. Bengal; Sundribuns.
A large, bushy branch-parasite.

1801/3. Var. GRACILIFLORA F. B. I. v. 209.
Chittagong.
A large, bushy branch-parasite.

1802. LORANTHUS LONGIFLORUS Desr.; F. B. I. v. 214; E. D. L. 549. *L. bicolor* F. I. i. 548, ii. 185.
In all the provinces.
A large, bushy branch-parasite. *Hind.* Bándá; *Santal.* Banda; *Beng.* Bura-manda.

1803. LORANTHUS PENTANDRUS Linn.; F. B. I. v. 216.
Chittagong.
A stoutish branch-parasite.

1804. LORANTHUS INVOLUCRATUS Roxb.; i. 552, ii. 188.

Chittagong.

A slender, bushy branch-parasite.

1805. LORANTHUS AMPULLACEUS Roxb.; F. I. i. 552, ii. 189; F. B. I. v. 220.

Chittagong.

A bushy branch-parasite.

1806. LORANTHUS GLOBOSUS Roxb.; F. I. i. 550, ii. 187; F. B. I. v. 220.

In all the provinces.

A bushy branch-parasite. *Beng.* Chhota-manda.

809. Viscum Linn.

Shrubs, semi-parasitic on trees; *leaves* opposite, flat and thick, or reduced to small scales or teeth. *Flowers* diœcious or monœcious, fascicled or rarely solitary in axils or on nodes, rarely terminal, fascicles sometimes stalked; bracts usually small; bracteoles 2, free or connate, rarely obsolete. *Perianth*-tube in ♂ flowers short, solid, in ♀ flowers adnate to ovary; limb 3–4-lobed; lobes usually deciduous. *Stamens* 3–4; anthers broad, sessile, adnate to perianth-lobes; cells confluent; dehiscence introrse by numerous pores. *Ovary* in ♀ flower inferior, 1-celled; ovule solitary; stigma sessile or subsessile, large, pulvinate. *Fruit* a succulent berry, with soft, viscid mesocarp. *Seed* adnate to pericarp; albumen copious, fleshy; embryo enclosed in the albumen, sometimes 2 embryos present, terete.

Branches leafy:—

Leaves obliquely ovate or falcate, acute or acuminate .....*monoicum*.

Leaves equally obovate, or elliptic- to linear-oblong, obtuse...*orientale*.

Branches leafless .....*articulatum*.

1807. VISCUM MONOICUM Roxb.; F. I. iii. 763; F. B. I. v. 224; E. D. v. 154.

Chota Nagpur; Behar; W. Bengal; C. Bengal; Sundrbuns.

A large, parasitic shrub. *Hind.* Kuchle-ka-malang; *Santal.* Pet chamra banda.

1808. VISCUM ORIENTALE Willd.; F. B. I. v. 224; E. D. v. 156. *V. verticillatum* F. I. iii. 764.

Chota Nagpur; Behar; E. Bengal; Chittagong.

Vernac. Banda.

1809. VISCUM ARTICULATUM Burm.; F. B. I. v. 226; E. D. v. 152. *V. opuntioides* F. I. iii. 764.

Chota Nagpur.

A pendulous branch-parasite. *Hind.* Pan, púdú; *Santal.* Katkom janga.

Order CXIV. SANTALACEÆ.

Trees, shrubs or herbs, usually semi-parasitic on roots. *Leaves* alternate or opposite, entire, sometimes scale-like or 0; nerves inconspicuous; stipules 0. *Flowers* hermaphrodite or 1-sexual, regular, usually small or inconspicuous, in simple or compound cymes; bracts sometimes leafy, usually small; bracteoles 2, free or connate, subopposite, sometimes 1 or both obsolete. *Perianth* simple, green or coloured, superior or inferior; limb 3–8-toothed, -lobed or -partite; lobes with often a tuft of hairs behind anthers, usually valvate. *Stamens* as many as and opposite the perianth-lobes, adnate above, rarely on, the perianth-base; filaments filiform or wide; anthers 2-celled; dehiscence longitudinal, introrse or lateral. *Disk* epigynous or perigynous. *Carpels* connate in a 1-locular ovary usually, at least ultimately, inferior; ovules 2–3, adnate to or pendulous from a central column, rarely solitary and basal; style usually short; stigma entire or 3–6-lobed. *Fruit* a nut or drupe. *Seed* globose or ovoid, smooth, rugose or sulcate; testa thin or obsolete; albumen copious, fleshy; embryo usually terete; radicle superior.

810. Santalum Linn.

Trees or shrubs; *leaves* glabrous, coriaceous, opposite, rarely alternate. *Flowers* hermaphrodite, axillary or in terminal, 3-chotomous, paniculate cymes; bracts minute. *Perianth*-tube campanulate or ovoid, adnate to the base of the ovary; limb 4-, rarely 5-lobed; lobes valvate, with a tuft of hairs on the face. *Stamens* 4 or 5, adnate to base of perianth-lobes; filaments slender, short; anthers ovate; cells parallel. *Disk* of fleshy, spathulate scales, projecting between the stamens. *Ovary* at first free, ultimately half-inferior; ovules 2–3, inserted below the summit of a long, acuminate, free central column, reflexed; style elongate; stigma 2–3-lobed. *Fruit* a subglobose drupe, annulate on the top by the deciduous perianth; endocarp rugose. *Seed* subglobose;

albumen copious; embryo linear, terete, straight or nearly so in the centre of the albumen; radicle exceeding cotyledons.

1810. SANTALUM ALBUM Linn.; F. I. i. 442; F. B. I. v. 231; E. D. S. 790.

W. Bengal; Chota Nagpur.

A small evergreen tree. *Vernac.* Chandan.

Order CXV. EUPHORBIACEÆ.

Herbs, shrubs, or trees, often with milky juice. *Leaves* alternate or opposite, rarely divided or compound; stipules usually small, caducous or persistent, occasionally large, rarely connate in a bud-protecting sheath; glands sometimes present at apex of leaf-stalk or base of leaf-blade. *Flowers* usually small, often minute, always 1-sexual; inflorescence various, usually composite, sometimes (*Euphorbia*) of single, naked, 1-stamened florets within a perianth-like involucre surrounding a solitary pistil, more often the main-inflorescence centripetal, axillary, or racemose, the subdivisions cymose, sometimes wholly cymose in terminal, dichotomous panicles, or reduced to simple clusters or solitary florets; bracts usually solitary, small, scale-like, sometimes enlarged or 2–3 connate and forming an involucre; bracteoles often 2 within each bract, or numerous in the more open cymes. *Perianth* often small, sometimes obsolete, often dissimilar in the two sexes, usually simple, calycine, with segments valvate or imbricate, sometimes calycine and 2-seriate, imbricate, with segments all similar or occasionally dissimilar, rarely double, the inner then of 4–5 small scale-like or very rarely conspicuous petals, longer than calyx-segments and generally contorted-imbricate. ♂ *Torus* sometimes forming an intrastaminal disk or with disk-glands or -lobes alternate with stamens of the outer series. *Stamens* very various, sometimes solitary or fewer than, sometimes as many as the sepals or petals, often indefinite, in a few very many; filaments free or connate; anthers 2-celled, often didymous; dehiscence longitudinal, transverse or porous. *Rudiment* of ovary present or absent. ♀ *Sepals* usually rather larger and less connate than in males. *Petals* sometimes smaller and less often present than in males. *Disk* hypogynous, entire, or of discrete glands or 0. *Staminodes* often present but rarely constant. *Carpels* connate in a sessile or stipitate ovary, usually 3, rarely 2, sometimes

several; ovules 1–2 in each carpel, pendulous from the inner angle of the cell, funicle often thickened; styles as many as the carpels, free or united and entire or divided; stigmas usually on the inner face of the styles or style-arms. *Fruit* usually a capsule of three 2-valved and 1–2-seeded cocci separating from a persistent axis, or a drupe with 1–3 cells, or of one or more combined nuts. *Seeds* laterally attached at or above the middle of the cells, with or without an arillus or caruncle at the hilum; albumen fleshy; embryo straight, enclosed in the albumen; cotyledons flat, leafy, and radicle superior; rarely albumen 0 and cotyledons fleshy.

Flowers aggregate-monœcious, many males consisting of each a solitary pedicelled stamen, surrounding a single central, 3-carpelled, pedicelled female, all enclosed in a pseudo-calycine involucre; perianth proper none, or rarely of 1–3 minute scales at the joint between pedicel and flower; cells of ovary 1-ovuled; herbs, shrubs, or trees with milky juice:—

Involucre regular, campanulate or turbinate, or slightly irregular; glands free and alternate with segments of involucre .....**Euphorbia.**

Involucre oblique, irregular, slipper-shaped, declinate, produced into a spur, glandular within .....**Pedilanthus.**

Flowers diœcious or separate-monœcious; perianth of sepals almost always present, occasionally also with a corolla; stamens 1–2-seriate or all in the centre of the flower:—

*Stamens of the outer or only series opposite the sepals, or if stamens all in centre of flower, the cells of the 2-many-carpelled ovary each 2-ovuled; petals when present always minute; sepals 1–2-seriate; inflorescence always lateral or axillary:—[p. 917]

Leaves compound, 3-foliolate, alternate; trees, diœcious; flowers of both sexes panicled; sepals 5, imbricate; petals 0; stamens of male 5; ovary of female 3–4-carpelled; fruit a berry .....**Bischofia.**

Leaves simple, entire or rarely (*Cyclostemon* sometimes) serrulate, alternate or rarely subopposite:—

†Male flowers in axillary fascicles or solitary axillary:—[p. 917]

‡Corolla of 5, rarely 6, scale-like petals:—[p. 916]

Calyx-lobes or -segments 5, valvate; stamens 5; filaments united in a column; trees or shrubs:—

Ovary 2-celled; fruit indehiscent; flowers monœcious or diœcious .....**Bridelia.**

Ovary 3-celled; fruit dehiscent; flowers monœcious **Cleistanthus.**

Calyx of 5–6 imbricate sepals; stamens 3–6, free or only

slightly connate at the base; ovary 3-celled; fruit dehiscent; monœcious or diœcious .....**Actephila.**

‡Corolla absent in both sexes; sepals imbricate:—[p. 915]

Styles in the female confluent in a long or short column or cone faintly toothed at the apex; calyx 4–6-lobed or -toothed; disk none in either sex; anthers 3–8, connate in an ellipsoid or oblong, sessile column, with linear cells; trees or shrubs, monœcious or diœcious .....**Glochidion.**

Styles separate or, if partly connate, the style-arms and stigmas free:—

Styles or style-arms slender:—

Rudimentary pistil in male flower well marked; disk present in both sexes; stamens 3–5, free, exserted, alternating with glands of disk; sepals 5; fruit dry or fleshy, with 6 cocci; shrubs, diœcious.....**Flueggea.**

Rudiment of pistil not present in male flower; stamens usually connate, if free (*Phyllanthus* § *Cicca*), fruit fleshy, with a 3–4-celled, bony endocarp:—

Disk none in either sex, or if present (*Agyneia*), then only in the male flowers; stamens 3; filaments united in a column:—

Fruit a capsule with three 2-valved carpels; anthers sessile at apex of column; disk present in male flowers; herbs, monœcious.....**Agyneia.**

Fruit of 3–6 indehiscent cocci; disk absent from flowers of both sexes:—

Anthers sessile on angles of column; calyx of male 6-lobed, spreading; of female 6-cleft, persistent; small shrubs or undershrubs, monœcious **Sauropus.**

Anthers adnate to whole length of column; calyx of male turbinate or hemispheric; lobes much inflexed; of female short, 6-lobed; shrubs or small trees, monœcious .....**Breynia.**

Disk present in both sexes, or if absent (*Phyllanthus* § *Emblica*), then only so from male flowers; stamens partly united, or free; fruit dehiscent, or separating into cocci, or indehiscent; herbs, shrubs, or trees, monœcious .....**Phyllanthus.**

Styles much dilated; fruit indehiscent:—

§Stamens 2–3; ovary 2–3-celled; drupe 1-seeded; trees, usually diœcious [p. 917] .....**Putranjiva.**

§Stamens 4 or more ; ovary 2–4-celled ; drupe 2–4-seeded ; trees, diœcious ; leaves sometimes crenulate [p. 916]
Cyclostemon.

†Male flowers in axillary spikes, racemes, or panicles ; stamens free round a rudimentary pistillode ; anthers didymous ; fruit indehiscent ; trees or shrubs, diœcious, rarely monœcious :—[p. 915]

Seeds without an arillus :—

Ovary 1-celled ; drupe small, rugose, somewhat compressed ; flowers of both sexes in slender racemes or spikes ; trees or shrubs, diœcious ; stamens 2–5, inflexed in bud...**Antidesma.**

Ovary 2-celled ; drupe coriaceous, not compressed, 2-1-seeded ; flowers of male in dense, catkin-like spikes ; of female clustered ; trees, diœcious or (rarely) monœcious ; stamens 1–5 ; filaments capillary.....**Aporosa.**

Seeds with an arillus ; ovary 2–3-celled ; flowers in racemes ; capsule fleshy, often rupturing irregularly, but not truly dehiscent ; trees, diœcious, rarely monœcious ; stamens 4–8 ; filaments short .....**Baccaurea.**

*Stamens of the outer or only series alternate with the sepals, or if stamens all central, the cells of the 2–3-, rarely 4-carpelled ovary each 1-ovuled ; petals, if present, often exceeding the sepals ; inflorescence axillary or terminal :—[p. 915]

¶Flowers in terminal spikes, racemes, or panicles, almost always androgynous ; petals present, at least in the male flowers, or if absent from both sexes (*Manihot*), then with a large hypogynous disk in both male and female flowers, and stamens definite, 2-seriate, marginal :— [p. 918]

⊙Flowers in 2–3-chotomously cymose panicles ; stamens erect ; leaves always digitately lobed :—[p. 918]

Calyx imbricate in bud, regularly 5-lobed ; fruit dry, capsular ; each carpel 2-valved :—

Stamens 10, inserted in two series round the lobes of a hypogynous disk ; petals none in either sex ; shrubs or trees, flowers diœcious, occasionally monœcious .....**Manihot.**

Stamens many, the outer 5 in a series opposite the petals, the rest in a column in centre of flower ; petals 5 ; shrubs or small trees, flowers monœcious, the central ones female
Jatropha.

Calyx irregularly valvate, rupturing into 2–3 lobes ; fruit a drupe ; stamens 8–20, the outer 5 in a series opposite petals, the rest free in centre of flower ; trees, flowers monœcious or diœcious.....**Aleurites.**

⊙Flowers in androgynous spikes or racemes; stamens inflexed in bud with anthers reversed, many, inserted on the hairy receptacle; fruit dry, capsular, each carpel 2-valved; leaves penninerved or 3- or more-nerved from the base; trees or shrubs, flowers monœcious [p. 917] ..... **Croton.**

¶Flowers in axillary clusters, spikes, racemes or panicles, or if terminal then with disk absent at least from male flower, and usually from both, with (*Mallotus* sometimes, *Ricinus*) the stamens indefinite, central, or (*Excœcaria* sometimes, *Sapium*, *Sebastiania*) with stamens definite, 1-seriate;—

Petals present in male flower; filaments straight; ovary 3-celled; fruit capsular:—

Sepals imbricate; disk developed in both sexes; stamens 15–30, free; shrubs or trees; flowers monœcious, in usually 1-sexual racemes, rarely a female at base of male raceme; males small, fascicled, female solitary ..... **Codiæum.**

Sepals valvate; disk in male obscure; stamens 5–15, connate below; diffuse herbs; flowers monœcious; males crowded in upper part of raceme, females solitary, pedicelled **Chrozophora.**

Petals none in either sex:—

Sepals imbricate, 4–6, free:—

Flowers in both sexes in axillary clusters; diœcious, erect trees or large shrubs:—

Stamens 10–60, crowded in centre of flower; filaments filiform; disk obsolete, pistillode 0; capsule thickly leathery **Gelonium.**

Stamens 5–20, combined below in a slender column round a long pistillode; disk prominent; capsule dry; endocarp woody ..... **Chætocarpus.**

Flowers in both sexes in clusters on numerous axillary racemes or panicles; monœcious or diœcious small, erect shrubs; stamens 10–30; central filaments free or a few united; anther-cells adnate throughout to a broad connective; pistillode 0; disk present; capsule dry, crustaceous **Baliospermum.**

Sepals or calyx-segments valvate, or, occasionally, calyx obsolete; flowers in axillary, rarely terminal spikes, racemes, or panicles:—

Calyx in male flower unequally 4-toothed, in female 5-toothed, closed in bud; trees, diœcious; flowers small, in long, simple spikes or racemes, all axillary; males clustered, females soli-

tary in the bracts; stamens 6–10, central; filaments short; anthers didymous, equally 4-locellate; pistillode 0; styles connate; fruit indehiscent ..... **Endospermum.**

Calyx in male flower partite to the base, closed in bud, or, if 3–5-lobed or -toothed, open in bud :—

‡Calyx of male flower closed in bud, usually membranous, oblong, ovoid or globose, splitting valvately to the base into 3–5 concave sepals, the sepals of female flowers sometimes imbricate :—[p. 920]

§Styles distinct, usually long, entire, 2-fid, multifid or papillose-fimbriate; erect herbs or trees, or erect, rarely climbing shrubs; fruit capsular, rarely drupaceous :—[p. 920]

*Filaments free :—[p. 920]

Anther-cells 2, united only by their bases; stamens many or few; herbs or shrubs :—

Styles undivided, spreading, fringed, short; flowers usually dicœcious; disk of 3 hypogynous scales ..... **Claoxylon.**

Styles filiform, long, laciniate or fimbriate; flowers monœcious, males minute, ebracteate, females at base of male spikes or in separate spikes, usually with a large bract; disk 0 **Acalypha.**

Anther-cells oblong-parallel or globose, laterally attached to the connective; trees or shrubs :—

Anther-cells 2; stamens many :—

Leaves opposite; flowers rather large, dicœcious; males in lax, lateral racemes, one to each bract, females solitary, on a long peduncle or racemose; anther-cells oblong; fruit drupaceous; disk never present ..... **Trewia.**

Leaves alternate or opposite; flowers small or minute, monœcious or dicœcious, in axillary or terminal, simple or panicled spikes or racemes; anther-cells globose on the sides of a usually widened connective; fruit capsular; disk sometimes present in female flowers ..... **Mallotus.**

Anthers 3–4-locellate, the cells globose; stamens many or few; disk 0; trees or shrubs; leaves alternate; fruit capsular :—

Styles very long, 2-fid; flowers monœcious or

diœcious; males in long axillary racemes, females 1–2 on a long axillary peduncle **Cleidion.**

Styles entire, short or long; flowers usually diœcious, in axillary racemes or branched panicles; males many, clustered, females solitary or few under each bract; bracts often large **Macaranga.**

*Filaments connate in bundles or branched; disk 0; fruit capsular:—[p. 919]

Flowers diœcious, male and female in axillary or infra-axillary spikes; shrubs with lanceolate, penni-nerved leaves; seed with a thin, fleshy coat **Homonia.**

Flowers monœcious, in terminal, subpanicled racemes, upper male crowded, lower female; tree-like, annual herbs, with palmate, serrate-lobed leaves; seeds with a firm coat .....**Ricinus.**

§Styles connate; twining herbs with alternate leaves; racemes always axillary, androgynous; stamens always 1-seriate; disk 0 or obscure; fruit always capsular:—[p. 919]

Styles connate below, spreading above; male calyx 3–5-partite; stamens 1–3; seeds with a firm coat...**Tragia.**

Styles united below in a fleshy column, incurved above; male calyx 3-partite; stamens 3; seeds with a fleshy coat .....**Cnesmone.**

‡Calyx of male flower open in bud; styles entire, free or shortly connate at the base; stamens always 1-seriate; disk 0; trees, shrubs, or erect herbs; leaves alternate:—[p. 919]

Trees or shrubs; stamens 3; filaments free:—

Calyx 2–3-lobed; flowers monœcious, in terminal, simple or panicled spikes or racemes; males several, females solitary in each bract; females in lower pa[illegible] of spike or in separate spikes; fruit fleshy or pulp[illegible] rarely woody .....**Sapium**

Calyx deeply 3-partite; flowers in lateral axillary [illegible] terminal, spiciform, unisexual (diœcious or monœcious) or androgynous racemes or spikes; males 1–3 in each bract, 2-bracteolate; females at the base of raceme or in separate racemes; fruit crustaceous.....**Excœcaria.**

Herbs; stamens 2–4; filaments connate at the base;

male calyx minute; flowers monœcious, in slender terminal, axillary, or lateral racemes; males minute, 1–3 in each bract; females solitary at base of raceme or lower and long-pedicelled on the stem; fruit crustaceous
Sebastiania.

811. Euphorbia Linn.

Herbs, shrubs, or small trees; stems slender, leafy, or thick, fleshy, and sometimes leafless or nearly so; *leaves* below or all alternate, or upper or all opposite, entire or rarely toothed; stipules various; juice copious, milky, usually acrid. *Flowers* combined in an inflorescence of many male florets surrounding a solitary female, within a small, 4–5-lobed, turbinate or campanulate, regular perianth-like involucre; lobes of involucre with thick glands at the sinuses, the glands with often a petaloid, spreading, white or coloured limb; bracts below the cymes or involucres opposite; bracteoles within perianth under the male florets setaceous or 0. *Perianth* 0, or of minute scales. ♂ *Stamen* solitary; filaments jointed on a pedicel; anther 2-celled, erect; cells usually subglobose, opening longitudinally. ♀ *Carpels* 3, connate in a 3-celled ovary on an ultimately exserted pedicel in the centre of the involucre; ovules in each cell solitary; styles 3, free or connate; stigmas simple or 2-fid. *Fruit* a capsule of three 2-valved cocci, separating elastically from a persistent axis and dehiscing ventrally or both ventrally and dorsally. *Seeds* albuminous; cotyledons broad, flat.

*Perennial shrubs or small trees; leaves scattered, at least below; glands of the involucre without any petaloid appendage:—[p. 922]

†Stems thick and fleshy; leaves all green, alternate, deciduous, floral none:—[p. 922]

Stem reduced to a longish, stout, cylindric underground stock, 6–10 in. long; leaves all radical, subsessile, obovate or oblanceolate; cymes after leaves from the crown of the stock .....*fusiformis.*

Stem above ground well developed:—

‡Branches ascending, armed with paired, short, stipulary thorns:—[p. 922]

Styles 2-cleft; branches prominently 3-, sometimes 4–6-angled, the angles fleshy, sinuately repand; leaves few, small, very deciduous .....*antiquorum.*

Styles simple, thickened at the base; branches terete or slightly 5-angled; leaves many, large, 6–12 in. long:—

Branches with stipular thorns arising from thick, subconfluent tubercles arranged in 5 more or less regular rows; leaves subterminal, ovate-oblong or subspathulate, acute...*neriifolia*.
Branches with stipular thorns arising from low, distant tubercles, spirally arranged on the cylindric branches; leaves scattered, linear- or obovate-oblong, rounded at apex *Nivulia*.

‡Branches spreading, unarmed, cylindric, scattered or whorled or clustered; leaves few, small, linear-oblong, or none; styles 2-lobed, short, recurved [p. 921] .....*Tirucalli*.

†Stems slender, woody, unarmed; branches bare below; leaves above persistent, the lower alternate, green, the upper floral opposite, brightly coloured, crimson or occasionally white [p. 921] .....*pulcherrima*.

*Annual herbs with slender, erect, ascending or prostrate stems and branches, leafy throughout:—[p. 921]

Leaves alternate below and opposite above, or all alternate except the uppermost floral leaves:—

Floral leaves surrounding the involucres parti-coloured at their bases; glands of the involucre without any appendage; erect herbs with petioled leaves:—

Leaves of stem alternate in the lower, opposite in the upper part, ovate-oblong, acute, entire or obscurely toothed; floral leaves narrower, green towards apex, pale near the base .....*geniculata*.
Leaves of stem all alternate, ovate-oblong, sinuate-repand; floral leaves similar but opposite, green towards apex, scarlet, crimson, or rose near the base .....*heterophylla*.

Floral leaves green:—

Leaves exstipulate, all sessile, linear-lanceolate, subacute, entire; floral leaves 2, shorter and broader; glands of the involucre two-horned, without a petaloid appendage .....*dracunculoides*.
Leaves stipulate, all long-petioled, rounded or ovate or oblong entire or repand, upper elliptic or lanceolate; glands of the involucre with a petaloid appendage.....*graminea*.

Leaves all opposite, oblique or unequal at the base, stipulate, or stipules absent the leaf attachments connected by a transverse, intrapetiolar line:—

§Glands of the involucre with a prominent membranous, petaloid limb; erect or decumbent, branching herbs:—[p. 923]

¶Floral leaves distichous, secund, imbricating and concealing the involucres; erect, dichotomously branching herbs:—[p. 923]

Glabrous; stipules small, fimbriate; limb of involucral glands entire .....*cornioides*.

Hirsute with long, flexuous hairs; stipules short, subulate; limb of glands pectinate ..... *cristata.*

¶[Floral leaves not distichously imbricating, 2 or solitary, entire, glabrous; stem-leaves obtuse, serrulate towards apex, glabrous or sparsely pubescent:—[p. 922]

Seeds more or less furrowed..... *hypericifolia* var. *indica.*

Seeds papillose..... *hypericifolia* var. *parviflora.*

§Glands of the involucre narrowly winged or wingless:—[p. 922]

Erect or ascending herbs; leaves of stem hispid, with copious crisped hairs, distinctly nerved, ·75–1·5 in. long; floral leaves minute ..... *pilulifera.*

Prostrate herbs; leaves all small, nerveless, ·15–·3 in. long:—

Leaves crenulate; stems usually hispidly hairy; capsules pubescent; seeds furrowed ..... *thymifolia.*

Leaves entire or serrate at the wide end only:—

Leaves entire; stems hispid; capsules hispid; seeds pitted *granulata.*

Leaves sometimes serrate at the wide end; stems usually glabrous; capsules glabrous; seeds smooth ..... *microphylla.*

1811. EUPHORBIA FUSIFORMIS Ham.; F. B. I. v. 257. *E. acaulis* F. I. ii. 472.

Tirhut; N. Bengal.

A dwarf, glabrous plant, with only the scarred tip of the buried stem showing aboveground.

1812. EUPHORBIA ANTIQUORUM Linn.; F. I. ii. 468; F. B. I. v. 255; E. D. E. 496.

A hedge-plant in all the provinces.

A small tree, 15–25 feet high. *Hind.* Tidhara-sehnd; *Beng.* Bajvaran; *Santal.* Etkec'; *Uriya* Dokana-siju.

1813. EUPHORBIA NERIIFOLIA Linn.; F. B. I. v. 255; E. D. E. 520. *E. ligularia* F. I. ii. 465.

Orissa, in rocky places, wild; occasionally planted near villages in all the western provinces.

A small tree, 15–20 feet high. *Beng.* Mansa-sij; *Hind.* Sehnd.

1814. EUPHORBIA NIVULIA Ham.; F. B. I. v. 255; E. D. E. 527. *E. nereifolia* F. I. ii. 467.

In villages, cultivated.

A small tree, 20–25 feet high. *Beng.* Sij.

1815. EUPHORBIA TIRUCALLI Linn.; F. I. ii. 470; F. B. I. v. 254; E. D. E. 553.
A hedge-plant in most of the provinces, now quite naturalised in the western parts.
A small tree, 12–20 feet high; native of Africa. *Hind.* Sehnd; *Beng.* Lanka-sij; *Santal.* Siju.

1816. EUPHORBIA PULCHERRIMA Willd.; F. B. I. v. 239; E. D. E. 536.
Cultivated in European gardens.
A favourite shrub on account of its showy floral leaves. Poinsettia; native of America.

1817. EUPHORBIA GENICULATA Ortega; F. B. I. v. 239.
In gardens, occasionally.
An annual herb.

1818. EUPHORBIA HETEROPHYLLA Linn.
In gardens generally, and often also subspontaneous in waste places in C. Bengal.
An annual, bushy herb.

1819. EUPHORBIA DRACUNCULOIDES Lamk; F. I. ii. 474; F. B. I. v. 263; E. D. E. 505.
Tirhut; Behar; W. Bengal; Chota Nagpur.
An annual herb, in cultivated ground. *Beng.* Jychi, Chagul-puputi; *Santal.* Parwa.

1820. EUPHORBIA GRAMINEA Jacq.
C. Bengal, naturalised.
An annual herb. A recently introduced American weed, not yet very common.

1821. EUPHORBIA ZORNIOIDES Boiss.; F. B. I. v. 246.
W. Behar, rare.
An annual herb, in cultivated ground.

1822. EUPHORBIA CRISTATA Heyne; F. B. I. v. 247.
W. Behar, rare.
An annual herb, in cultivated ground.

1823. EUPHORBIA HYPERICIFOLIA Linn. var. INDICA F. B. I. v. 250; E. D. E. 512. *E. uniflora* F. I. ii. 473.
In all the provinces.
A weed of waste places and fields.

1823/2. Var. PARVIFLORA F. B. I. v. 250. *E. parviflora* F. I. ii. 472.
W. Bengal; Orissa.
A weed of waste places and fields.

1824. EUPHORBIA PILULIFERA Linn.; F. B. I. v. 250; E. D. E. 531. *E. hirta* F. I. ii. 472.

In all the provinces.

A very common annual weed of waste places, fields, and gardens. *Hind.* Dudhi; *Beng.* Bara-kerui; *Santal.* Pusi-toa.

1825. EUPHORBIA THYMIFOLIA Burm.; F. I. ii. 473; F. B. I. v. 252; E. D. E. 549.

In all the provinces.

A prostrate weed of waste places. *Hind.* Chhota-dudhi; *Beng.* Swet-kerui.

1826. EUPHORBIA GRANULATA Forsk.; F. B. I. v. 252; E. D. E. 508.

Chota Nagpur.

A prostrate weed. *Santal.* Kantha arak'.

1827. EUPHORBIA MICROPHYLLA Heyne; F. B. I. v. 252; E. D. E. 518. *E. Chamæsyce* F. I. ii. 473.

Tirhut; Behar; N. Bengal; W. Bengal.

A prostrate weed of waste places. *Beng.* Chota-kerui; *Santal.* Dudhia-phul.

812. Pedilanthus Neck.

Shrubs; branches somewhat fleshy; *leaves* of stem alternate, floral leaves opposite; stipules various; juice copious, milky, acrid. *Flowers* combined in an inflorescence of many male florets surrounding a solitary female, within a conspicuous, slipper-shaped, 5-lobed, irregular, perianth-like involucre, with a large, sometimes coloured posterior appendage; glands within the appendage 2–6 or 0; bracteoles under the male florets setaceous or 0. *Perianth* 0, or of minute scales. ♂ *Stamens* solitary; filament very short, jointed on a pedicel; anther 2-celled; cells subglobose, opening longitudinally. ♀ *Carpels* 3, connate in a 3-celled ovary, sessile on its pedicel; ovules in each cell solitary; styles connate in a longish column; stigmas short, free, entire or 2-fid. *Fruit* a capsule of three 2-valved, often keeled or horned cocci, separating elastically from a persistent axis. *Seeds* albuminous; cotyledons broad, flat.

1828. PEDILANTHUS TITHYMALOIDES Poit.; F. B. I. v. 239.

A hedge plant, especially in the central and eastern provinces; introduced.

A succulent shrub. *Vernac.* Belati-sij.

813. Bischofia Bl.

A large tree; *leaves* alternate, 3-foliolate; leaflets often crenate. *Flowers* minute, diœcious, in axillary or lateral panicled racemes; males scattered or clustered, females longer pedicelled. ♂ *Sepals* 5, concave, obtuse, imbricate, hooded over the anthers. *Petals* 0. *Disk* 0. *Stamens* 5; filaments short; anthers large; cells parallel. *Pistillode* short, broad. ♀ *Sepals* 5, ovate, caducous. *Staminodes* 5, small or obsolete. *Carpels* connate in an exserted, 3–4-celled ovary; ovules 2 in each cell; styles long, linear, stout, entire, stigmatic throughout on inner face. *Fruit* a globose, fleshy berry, with 3–4 cells lined with a parchment-like, 2-valved endocarp. *Seeds* turgidly oblong; testa crustaceous; albumen fleshy; cotyledons broad, flat; radicle straight, elongate.

1829. Bischofia javanica Bl.; F. B. I. v. 345; E. D. B. 520. *Andrachne trifoliata* F. I. iii. 728.

N. Bengal, Duars; Chota Nagpur; in other provinces sometimes planted.

A medium tree, 30–50 feet high. *Hind.* Kein.

814. Bridelia Willd.

Shrubs or trees; *leaves* alternate, quite entire, sometimes with strong, straight nerves, and prominent cross veins. *Flowers* monœcious or diœcious, small or minute, in axillary or spicate clusters, sessile or shortly pedicelled; bracts small, scale-like. ♂ *Car-*
numerous. *Perianth* double. *Calyx*-segments 5, valvate. *Pet*[illegible]g hairs;
5, short, scale-like, stalked or spathulate. *Disk* broad, pulvinate or stipi-
or adnate to calyx-tube. *Stamens* 5; filaments connate below in
a column which bears a terminal pistillode, free and spreading above; anther-cells 2, parallel. ♀ few or solitary. *Calyx*-segments narrower than in ♂. *Disk* double, the inner forming a membranous, central, truncate cone, often enclosing the young ovary. *Carpels* connate in a 2-celled, rarely 3-celled, glabrous ovary; ovules 2 in each cell; styles free or shortly united below, forked or subentire. *Fruit* a small drupe with 1–2 usually single-seeded cocci or pyrenes. *Seed* with usually fleshy, sometimes membranous albumen; cotyledons thin or fleshy.

*Flowers diœcious; leaves deciduous, coriaceous, elliptic, oblong, ovate or obovate, rounded or obtuse, margin faintly crenulate, 3–5 in. long; nerves 15–20 pairs, strong, straight, parallel; calyx in fruit hardly altered; drupe pisiform; erect trees:—[p. 927]

Shoots and leaves beneath glabrous; branches with stoutish, more or less persistent spines ..... *retusa*.
Shoots and leaves beneath tomentose; branches with a few sharp spines which disappear with age ..... *retusa* var. *Roxburghiana*.

*Flowers monœcious; leaves persistent; nerves more or less arching:—
[p. 926]

Leaves glabrous beneath or only very slightly tomentose, not glaucous, margins repand or sinuate; calyx in fruit unaltered; drupe fusiform; erect shrubs or small trees, with short trunk and spreading branches:—
Leaves 2–3 in. long; nerves 6–10 pairs..... *montana*.
Leaves 4–7 in. long; nerves 10–15 pairs..... *montana* var. *communis*.
Leaves pubescent or tomentose beneath, or if at length glabrous then glaucous beneath:—
Subscandent shrubs; calyx in fruit distinctly enlarged; spikes and clusters usually subtended by long, stipular bracts; leaves subcoriaceous, elliptic, obovate or orbicular-oblong, obtuse or acute, margins entire or undulate or repand, 2–8 in. long; nerves 6–9 pairs, slender; drupe oblong ..... *stipularis*.
Erect trees or shrubs; leaves thin; nerves 8–12 pairs; stipular bracts, if present, small; calyx in fruit unaltered:—
Leaves elliptic, obovate or oblong, acute or acuminate, tawny-pubescent beneath, 3–8 in. long; flowers pubescent; calyx-lobes lanceolate; petals of male 3-lobed, of female obovate; drupe oblong *pubescens*.
Leaves lanceolate or linear-lanceolate, acute or obtuse, undulate, 1–3 in. long, glaucous and finely pubescent, but soon glabrescent beneath; flowers glabrous; calyx-lobes ovate-acute; petals of male obtuse, of female rounded or crenate; drupe globose..... *tomentosa*.

Ever[illegible] petiole[illegible] axill[illegible]

1830. Bridelia retusa Spreng.; F. B. I. v. 268; E. D. B. 868. *B. spinosa* F. I. iii. 735.
In all the western provinces.
A considerable tree. *Hind.* Káj, kája; *Kol.* Karika; *Santal.* Kadrupala.

1830/2. Var. Roxburghiana F. B. I. v. 268. *B. crenulata* F. I. iii. 734.
In most of the provinces, except the Sundribuns and Chittagong.
A considerable tree.

1831. Bridelia montana Willd.; F. I. iii. 735. *B. Hamiltoniana* F. B. I. v. 271.
Behar.
A shrub.

813. Bischofia Bl.

A large tree; *leaves* alternate, 3-foliolate; leaflets often crenate. *Flowers* minute, dicœcious, in axillary or lateral panicled racemes; males scattered or clustered, females longer pedicelled. ♂ *Sepals* 5, concave, obtuse, imbricate, hooded over the anthers. *Petals* 0. *Disk* 0. *Stamens* 5; filaments short; anthers large; cells parallel. *Pistillode* short, broad. ♀ *Sepals* 5, ovate, caducous. *Staminodes* 5, small or obsolete. *Carpels* connate in an exserted, 3–4-celled ovary; ovules 2 in each cell; styles long, linear, stout, entire, stigmatic throughout on inner face. *Fruit* a globose, fleshy berry, with 3–4 cells lined with a parchment-like, 2-valved endocarp. *Seeds* turgidly oblong; testa crustaceous; albumen fleshy; cotyledons broad, flat; radicle straight, elongate.

1829. Bischofia javanica Bl.; F. B. I. v. 345; E. D. B. 520. *Andrachne trifoliata* F. I. iii. 728.

N. Bengal, Duars; Chota Nagpur; in other provinces sometimes planted.

A medium tree, 30–50 feet high. *Hind.* Kein.

814. Bridelia Willd.

Shrubs or trees; *leaves* alternate, quite entire, sometimes with strong, straight nerves, and prominent cross veins. *Flowers* monœcious or dicœcious, small or minute, in axillary or spicate clusters, sessile or shortly pedicelled; bracts small, scale-like. ♂ numerous. *Perianth* double. *Calyx*-segments 5, valvate. *Petals* 5, short, scale-like, stalked or spathulate. *Disk* broad, pulvinate or adnate to calyx-tube. *Stamens* 5; filaments connate below in a column which bears a terminal pistillode, free and spreading above; anther-cells 2, parallel. ♀ few or solitary. *Calyx*-segments narrower than in ♂. *Disk* double, the inner forming a membranous, central, truncate cone, often enclosing the young ovary. *Carpels* connate in a 2-celled, rarely 3-celled, glabrous ovary; ovules 2 in each cell; styles free or shortly united below, forked or subentire. *Fruit* a small drupe with 1–2 usually single-seeded cocci or pyrenes. *Seed* with usually fleshy, sometimes membranous albumen; cotyledons thin or fleshy.

*Flowers dicœcious; leaves deciduous, coriaceous, elliptic, oblong, ovate or obovate, rounded or obtuse, margin faintly crenulate, 3–5 in. long; nerves 15–20 pairs, strong, straight, parallel; calyx in fruit hardly altered; drupe pisiform; erect trees:—[p. 927]

Shoots and leaves beneath glabrous; branches with stoutish, more or less persistent spines ..... *retusa.*

Shoots and leaves beneath tomentose; branches with a few sharp spines which disappear with age ..... *retusa* var. *Roxburghiana.*

*Flowers monœcious; leaves persistent; nerves more or less arching :— [p. 926]

Leaves glabrous beneath or only very slightly tomentose, not glaucous, margins repand or sinuate; calyx in fruit unaltered; drupe fusiform; erect shrubs or small trees, with short trunk and spreading branches:—

Leaves 2–3 in. long; nerves 6–10 pairs..... *montana.*

Leaves 4–7 in. long; nerves 10–15 pairs..... *montana* var. *communis.*

Leaves pubescent or tomentose beneath, or if at length glabrous then glaucous beneath :—

Subscandent shrubs; calyx in fruit distinctly enlarged; spikes and clusters usually subtended by long, stipular bracts; leaves subcoriaceous, elliptic, obovate or orbicular-oblong, obtuse or acute, margins entire or undulate or repand, 2–8 in. long; nerves 6–9 pairs, slender; drupe oblong ..... *stipularis.*

Erect trees or shrubs; leaves thin; nerves 8–12 pairs; stipular bracts, if present, small; calyx in fruit unaltered :—

Leaves elliptic, obovate or oblong, acute or acuminate, tawny-pubescent beneath, 3–8 in. long; flowers pubescent; calyx-lobes lanceolate; petals of male 3-lobed, of female obovate; drupe oblong *pubescens.*

Leaves lanceolate or linear-lanceolate, acute or obtuse, undulate, 1–3 in. long, glaucous and finely pubescent, but soon glabrescent beneath; flowers glabrous; calyx-lobes ovate-acute; petals of male ... tuse, of female rounded or crenate; drupe globose..... *tomentosa.*

Ever... petiole... axill...

1830. BRIDELIA RETUSA Spreng.; F. B. I. v. 268; E. D. B. 868. *B. spinosa* F. I. iii. 735.

In all the western provinces.

A considerable tree. *Hind.* Káj, kája; *Kol.* Karika; *Santal.* Kadrupala.

1830/2. Var. ROXBURGHIANA F. B. I. v. 268. *B. crenulata* F. I. iii. 734.

In most of the provinces, except the Sundribuns and Chittagong.

A considerable tree.

1831. BRIDELIA MONTANA Willd.; F. I. iii. 735. *B. Hamiltoniana* F. B. I. v. 271.

Behar.

A shrub.

1831/2. Var. COMMUNIS. *B. montana* F. B. I. v. 269; E. D. B. 863.
N. Bengal; Tirhut; Chota Nagpur.
A small tree. *Hind.* Kargualia.

1832. BRIDELIA STIPULARIS Bl.; F. B. I. v. 270; E. D. B. 873. *B. scandens* F. I. iii. 736.
In all the provinces.
A scandent shrub. *Beng.* Harinhára; *Uriya* Gaurkassi.

1833. BRIDELIA PUBESCENS Kurz; F. B. I. v. 270.
N. Bengal, Duars.
A considerable tree.

1834. BRIDELIA TOMENTOSA Bl.; F. B. I. v. 271; E. D. B. 875. *B. lanceæfolia* F. I. iii. 737.
In all the provinces.
A large shrub or small tree. *Beng.* Mindri, sirai.

815. Cleistanthus Hook. f.

Trees or shrubs; *leaves* alternate, bifarious, entire. *Flowers* monœcious, small or minute, in axillary clusters or spikes, all sessile or the females shortly pedicelled. ♂ Segments of *calyx* 5, valvate. *Petals* 5, short, scale-like, stalked or spathulate. *Disk* broad, entire or sinuate. *Stamens* 5; filaments connate below in a central column, bearing a pyramidal or 3-lobed pistillode, free and spreading above; anther-cells parallel. ♀ *Calyx* less deeply lobed than in ♂, cupular under the ovary. *Disk* double, the inner conic or turbinate, more or less enclosing the young ovary. *Ovary* ovate or *pels* connate in a 3-celled ovary, usually covered with lon[illegible]low in ovules 2 in each cell; styles 3, free, 2-fid. *Fruit* a sessile [illegible]ading tate, subglobose or depressed capsule, with three 2-valved cocc[illegible] *Seeds* without arillus or caruncle; albumen copious or scanty; cotyledons thin or fleshy, often folded.

Leaves broad with apex rounded or retuse; flowers silky; ovary glabrous; capsule obscurely 3-lobed; seeds globose.....*collinus*.
Leaves narrower with apex bluntly acuminate or caudate; flowers sparsely hairy; ovary hirsute with long erect hairs; capsule deeply 3-lobed; seeds obovoid, plano-convex .....*patulus*.

1835. CLEISTANTHUS COLLINUS Benth.; F. B. I. v. 274. *Lebideriopsis orbicularis* E. D. L. 219. *Cluytia collina* F. I. iii. 732.
Behar; Chota Nagpur; Orissa.

A small tree; fruit extremely poisonous. *Hind.* Garrar, garari; *Uriya* Karada; *Kol.* Parasu; *Santal.* Kargalli.

1836. CLEISANTHUS PATULUS Muell.-Arg.; F. B. I. v. 279. *Cluytia patula* F. I. iii. 783.

Orissa.

A tree with dense horizontal branches.

816. Actephila Bl.

Trees or shrubs; *leaves* alternate, usually large, quite entire stipules deciduous. *Flowers* monœcious or casually diœcious, in axillary clusters, males several, short-pedicelled, females solitary or few, longer pedicelled. ♂ *Perianth* usually double. *Sepals* 5–6, subequal, or the inner rather larger, imbricate. *Petals* 5–6, small, scale-like, or 0. *Disk* broad, entire or 5-lobed. *Stamens* 3–6, inserted on the disk; filaments free or nearly so; anther-cells parallel. *Pistillode* 3-cleft. ♀ *Perianth* as in male. *Carpels* connate in a 3-celled ovary, sessile on the 5-lobed disk; ovules 2 in each cell; styles short, free or connate, entire or 2-fid. *Fruit* a hard, loculicidal capsule of three 2-valved cocci. *Seeds* usually solitary in a coccus, large, 3-gonous; arillus or caruncle 0; testa thin, brittle; albumen scanty or 0; cotyledons fleshy, plicate or corrugate.

1837. ACTEPHILA EXCELSA Muell.-Arg.; F. B. I. v. 282.

Chittagong.

A small tree or large shrub.

817. Glochidion Forst.

Evergreen trees or shrubs; *leaves* alternate, bifarious, shortly petioled, entire. *Flowers* small, monœcious or diœcious, in axillary clusters; perianth simple. ♂ *Sepals* 6, rarely 5, spreading, in 2 series, imbricate. *Petals* 0. *Disk* 0. *Stamens* connate in an ellipsoid or oblong, sessile column; anthers 3–8, sometimes more; cells linear; dehiscence extrorse; connectives produced as free points or connate in an umbonate head. *Pistillode* 0 or minute and hidden between the anthers. ♀ *Sepals* 6, short, free and imbricate or shortly connate, tubular and unequally toothed or cleft. *Petals* 0. *Disk* 0. *Carpels* connate in a 3–15-celled ovary; ovules 2 in each cell; styles connate in a globose, columnar, conic or subclavate column, lobed or toothed at the tip. *Fruit* a capsule of 3 or more 2-valved cocci, often with twice as many lobes as cells, globose or orbicular and depressed or intruded at the base and apex, crowned by the often enlarged style; cocci

1831/2. Var. COMMUNIS. *B. montana* F. B. I. v. 269; E. D. B. 863.
N. Bengal; Tirhut; Chota Nagpur.
A small tree. *Hind.* Kargualia.

1832. BRIDELIA STIPULARIS Bl.; F. B. I. v. 270; E. D. B. 873. *B. scandens* F. I. iii. 736.
In all the provinces.
A scandent shrub. *Beng.* Harinhára; *Uriya* Gaurkassi.

1833. BRIDELIA PUBESCENS Kurz; F. B. I. v. 270.
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A considerable tree.

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In all the provinces.
A large shrub or small tree. *Beng.* Mindri, sirai.

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Leaves broad with apex rounded or retuse; flowers silky; ovary glabrous; capsule obscurely 3-lobed; seeds globose ..... *collinus.*
Leaves narrower with apex bluntly acuminate or caudate; flowers sparsely hairy; ovary hirsute with long erect hairs; capsule deeply 3-lobed; seeds obovoid, plano-convex ..... *patulus.*

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Behar; Chota Nagpur; Orissa.

A small tree; fruit extremely poisonous. *Hind.* Garrar, garari; *Uriya* Karada; *Kol.* Parasu; *Santal.* Kargalli.

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Orissa.

A tree with dense horizontal branches.

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Trees or shrubs; *leaves* alternate, usually large, quite entire stipules deciduous. *Flowers* monœcious or casually dicœcious, in axillary clusters, males several, short-pedicelled, females solitary or few, longer pedicelled. ♂ *Perianth* usually double. *Sepals* 5–6, subequal, or the inner rather larger, imbricate. *Petals* 5–6, small, scale-like, or 0. *Disk* broad, entire or 5-lobed. *Stamens* 3–6, inserted on the disk; filaments free or nearly so; anther-cells parallel. *Pistillode* 3-cleft. ♀ *Perianth* as in male. *Carpels* connate in a 3-celled ovary, sessile on the 5-lobed disk; ovules 2 in each cell; styles short, free or connate, entire or 2-fid. *Fruit* a hard, loculicidal capsule of three 2-valved cocci. *Seeds* usually solitary in a coccus, large, 3-gonous; arillus or caruncle 0; testa thin, brittle; albumen scanty or 0; cotyledons fleshy, plicate or corrugate.

1837. ACTEPHILA EXCELSA Muell.-Arg.; F. B. I. v. 282.

Chittagong.

A small tree or large shrub.

817. Glochidion Forst.

Evergreen trees or shrubs; *leaves* alternate, bifarious, shortly petioled, entire. *Flowers* small, monœcious or dicœcious, in axillary clusters; perianth simple. ♂ *Sepals* 6, rarely 5, spreading, in 2 series, imbricate. *Petals* 0. *Disk* 0. *Stamens* connate in an ellipsoid or oblong, sessile column; anthers 3–8, sometimes more; cells linear; dehiscence extrorse; connectives produced as free points or connate in an umbonate head. *Pistillode* 0 or minute and hidden between the anthers. ♀ *Sepals* 6, short, free and imbricate or shortly connate, tubular and unequally toothed or cleft. *Petals* 0. *Disk* 0. *Carpels* connate in a 3–15-celled ovary; ovules 2 in each cell; styles connate in a globose, columnar, conic or subclavate column, lobed or toothed at the tip. *Fruit* a capsule of 3 or more 2-valved cocci, often with twice as many lobes as cells, globose or orbicular and depressed or intruded at the base and apex, crowned by the often enlarged style; cocci

coriaceous or crustaceous; epicarp separable or not. *Seeds* hemispheric or laterally compressed; testa crustaceous, with often a succulent coat; albumen copious, fleshy; cotyledons flat.

Anthers always 4 or more than 4:—

Capsule depressed-globose, distinctly lobed, base and apex intruded; leaves glabrous or nearly so:—

Ovary and capsule 10–15-celled; style a low, very broad, shallow glabrous cone with a hollowed apex; leaves purplish, glaucous beneath; anthers 4–12 ..... *multiloculare.*

Ovary and capsule 6–8-celled; style conical from a thick base, as long as ovary, tomentose, 5–6-lobed, truncate; leaves green beneath; anthers 4–6 ..... *lanceolarium.*

Capsule globose, obscurely lobed, not deeply intruded at base and apex; leaves beneath densely, softly white- or rusty-tomentose; style shortly conical; capsule 6-celled ..... *hirsutum.*

Anthers 3, or if (*G. assamicum* occasionally) 4–5, then the style short, columnar, and the leaves quite glabrous:—

Leaves glabrous beneath:—

Capsule faintly 4-lobed; anthers 3, sometimes 4 or 5; style columnar; leaves purplish beneath ..... *assamicum.*

Capsule deeply 8–12-lobed; anthers always 3; style subglobose, very large, entire; leaves green beneath ..... *sphærogynum.*

Leaves sparsely pubescent or tomentose beneath; anthers always 3; capsule depressed, distinctly lobed:—

Male and female flowers both shortly pedicelled, or the females subsessile; style stout, enlarged at the truncate, toothed tip; ovary 4–7-celled; capsules almost sessile, pubescent, 4–7-celled and 4–7-lobed ..... *velutinum.*

Male flowers shortly, female always more distinctly pedicelled; style slender, clavate, truncate; ovary 4–5-celled; capsules distinctly pedicelled, glabrous or puberulous, 4–5-celled and 8–10-lobed *Heyneanum.*

1838. GLOCHIDION MULTILOCULARE Muell.-Arg.; F. B. I. v. 307. *Bradleia multilocularis* F. I. iii. 696.

Tirhut; N. Bengal; E. Bengal; Chittagong; Chota Nagpur, Parasnath, rare.

An evergreen tree.

1839. GLOCHIDION LANCEOLARIUM Dalz.; F. B. I. v. 308; E. D. G. 238. *Bradleia lanceolaria* F. I. iii. 697.

Chota Nagpur; Behar; W. Bengal; Chittagong.

A tree, 25–30 feet high. *Vernac.* Anguti.

1840. GLOCHIDION HIRSUTUM Muell.-Arg.; F. B. I. v. 311. *Bradleia hirsuta* F. I. iii. 699.
N. Bengal, Duars; Chittagong.
A shrub.

1841. GLOCHIDION ASSAMICUM Hook. f.; F. B. I. v. 319.
Tirhut; N. Bengal; E. Bengal; Chittagong.
A small, spreading tree.

1842. GLOCHIDION SPHÆROGYNUM Kurz; F. B. I. v. 317.
Chittagong.
A small tree with weeping branches.

1843. GLOCHIDION VELUTINUM Wight; F. B. I. v. 322; E. D. G. 240.
Tirhut; N. Bengal, Duars; Chota Nagpur.
A tree, 20–30 feet high.

1844. GLOCHIDION HEYNEANUM Wight; F. B. I. v. 323.
N. Bengal; E. Bengal; Chittagong.
A tree, 30–40 feet high.

818. Flueggea Willd.

Shrubs, unarmed or spiny; *leaves* small, alternate, distichous, entire. *Flowers* diœcious, minute, pedicelled, axillary; males many, clustered, females subsolitary; perianth simple. ♂ *Sepals* 5, almost petaloid, imbricate. *Petals* 0. *Disk* of 5 or 4 or 3 glands alternate with stamens. *Stamens* 5, rarely 4 or 3; filaments free; anthers erect; cells parallel; dehiscence longitudinal. *Pistillode* 2–3-fid. ♀ *Sepals* as in male. *Petals* 0. *Disk* flat, annular, toothed. *Carpels* connate in 3-celled, rarely 1- or 2-celled ovary; ovules 2 in each cell; styles free, recurved, 2-fid. *Fruit* globose, coriaceous, or outside fleshy, bursting irregularly or separating into distinct, 2-valved cocci. *Seeds* triquetrous, with convex backs and acute faces; testa crustaceous; albumen scanty; embryo curved; cotyledons flat, broad.

1845. FLUEGGEA MICROCARPA Bl.; F. B. I. v. 328. *Phyllanthus virosus* F. I. iii. 659. *P. retusus* F. I. iii. 657.
In all the provinces.
A deciduous large shrub, or "tree-weed."

819. Agyneia Vent.

Annual or perennial, glabrous herbs; stems diffuse, often angular or compressed; *leaves* small, alternate, entire. *Flowers* monœcious, minute; males in axillary clusters, females larger,

solitary; perianth simple; bracts usually numerous, stipuliform. ♂ *Sepals* 6, gland-dotted, thickened except the white, membranous margins. *Disk* 6-lobed. *Stamens* 3, central, connate; anthers subsessile on the column; cells parallel; dehiscence extrorse. *Pistillode* 0. ♀ *Sepals* 6, acute, not margined. *Disk* 0. *Carpels* connate in an ovoid, truncate, 3-celled ovary; ovules 2 in each cell; styles very short, sunk in the top of the ovary, 2-fid. *Fruit* a capsule, splitting into three 2-valved cocci. *Seeds* slender, curved, with an elongated hilum; albumen copious, fleshy; cotyledons flat, broad.

1846. AGYNEIA BACCIFORMIS A. Juss.; F. B. I. v. 285. *Phyllanthus bacciformis* F. I. iii. 661.

C. Bengal; Sundribuns.

A glabrous annual or biennial herb.

820. Sauropus Bl.

Small shrubs or undershrubs; *leaves* alternate, distichous, membranous, quite entire; stipules minute. *Flowers* monœcious, minute, axillary, clustered or solitary; perianth simple; pedicels distinct. ♂ *Sepals* connate in a disk-like, urceolate or turbinate, 6-lobed or 6-cleft calyx; mouth small, with superficial thickenings that meet round the stamens. *Petals* 0. *Disk* 0. *Stamens* 3; filaments connate in a short, truncate, 3-gonous column; anthers sessile on the angles; cells linear or subglobose, parallel; dehiscence extrorse. *Pistillode* 0. ♀ *Sepals* connate in a 6-cleft, accrescent calyx. *Petals* 0. *Disk* 0. *Carpels* connate in an ovoid or globose, 3-celled ovary, with rounded or concave apex; ovules 2 in each cell; styles 3, very short, spreading, 2-fid or 2-partite. *Fruit* globose or depressed, fleshy or coriaceous, 6-valved or breaking up irregularly, containing 6 indehiscent 3-gonous, crustaceous or bony cocci. *Seeds* with fleshy albumen; embryo straight or nearly so; cotyledons flat, broad.

1847. SAUROPUS QUADRANGULARIS Muell.-Arg.; F. B. I. v. 335. *Phyllanthus rhamnoides* F. I. iii. 663.

Behar; Chota Nagpur.

A dwarf, glabrous undershrub.

821. Breynia Forst.

Shrubs or small trees; *leaves* small, alternate, petioled, entire, often distichous. *Flowers* monœcious, minute, axillary; perianth simple; pedicels distinct, solitary, or the males fascicled, the fas-

cicle rarely replaced by a short raceme. ♂ *Sepals* connate in a turbinate or hemispheric calyx, with limb truncate, margin often thickened and lobulate opposite the minute, inflexed, and rounded lobes. *Petals* 0. *Disk* 0. *Stamens* 3; filaments connate in a column; anthers slender, adnate to whole length of column; cells linear, parallel, distinct. *Pistillode* 0. ♀ *Sepals* connate in a coriaceous hemispheric, turbinate, campanulate or rotate calyx; limb broadly, shortly 6-lobed, often much accrescent and disciform in fruit. *Petals* 0. *Disk* 0. *Staminodes* 0. *Carpels* connate in a 3-celled ovary, fleshy above, globose, or truncate or depressed at the top; ovules 2 in each cell; styles 3, sessile or connate in a short column, each 2-fid or 2-lobed; or stigmas 3, simple, minute, and immersed in a cavity at top of ovary. *Fruit* globose or depressed, more or less succulent, indehiscent or with a 6-valved pericarp enclosing 3–6 imperforate, indehiscent cocci. *Seeds* with membranous testa; hilum without caruncle; albumen fleshy; cotyledons broad; radicle long.

Calyx of female greatly enlarged in fruit .....*patens.*
Calyx of female slightly enlarged in fruit.....*rhamnoides.*

1848. BREYNIA PATENS Benth.; F. B. I. v. 329. *Phyllanthus patens* F. I. iii. 667.

Tirhut; N. Bengal; Chittagong; Chota Nagpur; Orissa.

A shrub or small tree.

1849. BREYNIA RHAMNOIDES Muell.-Arg.; F. B. I. v. 330; E. D. B. 858. *Phyllanthus Vitis-Idæa* F. I. iii. 665.

In most of the provinces.

A shrub or small tree. *Beng.* Kali sitki.

822. Phyllanthus Linn.

Herbs, shrubs, or trees; *leaves* 2-farious or distichous, alternate, uite entire, the branchlets with their leaves often resembling nnate leaves; stipules usually narrow or 0. *Flowers* small, ionœcious, axillary or on old nodes, males usually many, fascicled, ubsessile or pedicelled, rarely few or solitary, females in the same or in distinct axils, longer pedicelled, solitary or few; perianth simple. ♂ *Sepals* 4–6, free or very shortly connate, imbricate and more or less distinctly 2-seriate. *Disk* glandular, rarely (§ *Emblica* ♂) 0. *Stamens* 3, rarely (§ *Cicca*) 4, or (§ *Kirganelia*) 5, in centre of flower; filaments connate or free; anthers 2-celled, oblong or didymous, rarely reniform; cells parallel or diverging;

dehiscence extrorse, vertical or transverse. *Pistillode* 0. ♀ *Sepals* as in male. *Petals* 0. *Disk* glandular. *Carpels* connate in 3-celled, rarely (§ *Cicca* sometimes and § *Kirganelia*) 4-more-celled ovary; ovules 2 in each cell; styles free or connate, usually 2-fid, with slender arms, rarely dilated. *Fruit* of 3 crustaceous or coriaceous, rarely bony, 2-valved cocci, with or without a separable coriaceous, rarely (§ *Emblica*) fleshy epicarp, sometimes (§ *Kirganelia*) a 4–8-celled berry or (§ *Cicca*) a drupe with a 3–4-celled bony endocarp. *Seeds* 3-gonous; testa crustaceous; hilum without strophiole; albumen fleshy; cotyledons flat or flexuous.

*Sepals 5–6 in both sexes; stamens either 5 or 3; styles 3:—[p. 935]
Stamens 5 in 2 series, the three inner filaments connate; anthers erect, slits vertical; styles very minute; stigmas 2-lobed; fruit a 4–8-celled berry; cells 2-seeded, the seeds superposed, one pendulous from apex, another from middle of cell (§ *Kirganelia*); a shrub with slender branches; leaves distichous, 1–2 in. long ..... *reticulatus*.
Stamens 3; filaments united in a short or long column, rarely (§ *Euphyllanthus* sometimes) free and recurved:—
Anthers erect, slits vertical; connective usually produced:—
Fruit large, fleshy, with 3 bony, 2-valved cocci; styles united below, each twice bifid; disk absent from male flower (§ *Emblica*); a tree; leaves very small, closely pinnately set on the slender branchlets..... *Emblica*.
Fruit a capsule of 3 crustaceous, 2-valved cocci; styles once bifid, free; disk present in flowers of both sexes (§ *Paraphyllanthus*):—
A shrub; leaves linear-oblong, ·2–·25 in. long, obtuse or apiculate, very shortly petioled, close-set, distichous; nerves obscure; stipules minute, setaceous..... *Lawii*.
Herbs; leaves subsessile or sessile, glaucous beneath; nerves distinct; stipules peltate:—
Leaves scattered, ·25–1 in. long, cuneately obovate; sepals broad, green with white margins ..... *maderaspatensis*
Leaves distichously imbricate, close-set, ·2–·6 in. long, oblong or linear-oblong; sepals ciliolate..... *urinaria*.
Anthers didymous or reniform; cells subglobose, slits very short, so that when the cells are confluent the dehiscence seems transverse; filaments more or less united, rarely free and recurved; fruit a capsule of 3 crustaceous or thin-walled, 2-valved cocci; styles free or connate below, once bifid (§ *Euphyllanthus*):—
Stipules peltate, subsagittate; annual or perennial herbs or undershrubs with compressed branches and distichous leaves ·3–1 in.

long, subsessile, from linear to oblong-obovate, elliptic or rounded, obtuse, acute or apiculate .....*simplex.*

Stipules simple, not peltate :—

Flowers springing from short peduncles, clothed with decussately imbricating, entire bracts; biennial undershrubs, 2–3 feet high; leaves distichous, with red margins; sepals of both sexes wide-ovate, acute .....*pendulus.*

Flowers axillary, short-pedicelled or subsessile; leaves green above, glaucous beneath :—

Flowers very short-pedicelled or subsessile; anthers sessile on a short column; styles minute, very short, free, 2-lobed; seeds with equal, slender ribs; sepals of male flower orbicular, of female obovate-oblong; disk-glands of male minute ...*Niruri.*

Flowers all distinctly though shortly pedicelled; filaments short, free; styles short, reflexed, with recurved arms; seeds with irregular ribs; sepals of both sexes obovate-oblong; disk glands of male flower stellately lobed .....*debilis.*

*Sepals 4 (rarely 5–6) in both sexes; stamens 4, free; anthers oblong and slits vertical; styles 4, free; fruit fleshy, with a 3–4-celled, bony endocarp (§ *Cicca*); a deciduous tree with robust, bare, large branches, and slender, leafy branchlets; leaves pinnately distichous, 2–3 in. long [p. 934] *distichus.*

1850. PHYLLANTHUS RETICULATUS Poir.; F. B. I. v. 288; E. D. P. 663. *P. multiflorus* F. I. iii. 664.

In all the provinces.

A large subscandent shrub. *Vernac.* Panjuli.

1851. PHYLLANTHUS EMBLICA Linn.; F. I. iii. 671; F. B. I. v. 289; E. D. P. 632.

Chota Nagpur; Behar; Tirhut; N. Bengal.

A deciduous tree with flaky bark. *Vernac.* Amla, aonhla; *Kol.* Aura; *Santal.* Meral.

1852. PHYLLANTHUS LAWII Grah.; F. B. I. v. 290.

Behar; Chota Nagpur; W. Bengal.

A shrub, along river-banks.

1853. PHYLLANTHUS MADERASPATENSIS Linn.; F. I. iii. 654; F. B. I. v. 292; E. D. P. 654. *P. obcordatus* F. I. iii. 656.

W. Behar, rare.

An annual herb. *Hind.* Kanocha.

1854. PHYLLANTHUS URINARIA Linn.; F. I. iii. 660; F. B. I. v. 293; E. D. P. 673.

In all the provinces.

A herb, usually annual, sometimes perennial. *Hind.* and *Beng.* Hazar mani; *Santal.* Badar, shapni.

1855. PHYLLANTHUS SIMPLEX Retz; F. I. iii. 654; F. B. I. v. 295; E. D. P. 668.

In all the provinces.

A herb or undershrub. *Santal.* Tanda meral.

1856. PHYLLANTHUS PENDULUS Roxb.; F. I. iii. 663; F. B. I. v. 298.

W. Bengal.

A biennial undershrub, 2–3 feet high.

1857. PHYLLANTHUS NIRURI Linn.; F. I. iii. 659; F. B. I. v. 298; E. D. P. 657.

In all the provinces.

An annual weed. *Hind.* Jar-amla; *Beng.* and *Uriya* Bhui-amla.

1858. PHYLLANTHUS DEBILIS Ham.; F. B. I. v. 299.

Orissa; Chota Nagpur; Behar; Tirhut; N. Bengal.

An annual or perennial herb or undershrub.

1859. PHYLLANTHUS DISTICHUS Muell.-Arg.; F. B. I. v. 304; E. D. P. 627. *P. longifolius* F. I. iii. 672.

In gardens in most of the provinces.

A deciduous tree, 20–30 feet high. *Beng.* Noari, loda, hariphul; *Uriya* Narkuli; *Hind.* Chalmeri.

823. Putranjiva Wall.

Trees; *leaves* evergreen, entire or serrulate, penninerved and reticulate. *Flowers* monœcious or (in our species) diœcious, axillary, pedicelled, males clustered, females subsolitary; perianth simple. ♂ *Sepals* connate in an unequally 3–6-lobed calyx; lobes imbricate. *Petals* 0. *Disk* 0. *Stamens* 2–4 in the centre of the flower; filaments free or partially connate; anthers erect; cells parallel. *Pistillode* 0. ♀ *Calyx* as in male. *Petals* 0. *Disk* 0. *Carpels* connate in an ovoid, 2–3-celled ovary; ovules 2 in each cell; styles short, spreading, dilated into broad, fleshy arms. *Fruit* an ovoid or globose drupe; endocarp hard, 1-celled. *Seed* solitary, ovoid; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1860. PUTRANJIVA ROXBURGHII Wall.; F. B. I. v. 336; E. D. P. 1433. *Nageia Putranjiva* F. I. iii. 766.

In all the provinces, wild or planted.

An evergreen tree, 30–40 feet high. *Hind.* and *Beng.* Jia-puta, putranjiva; *Santal.* Pitoj.

824. Cyclostemon Bl.

Trees; *leaves* alternate, coriaceous, entire or crenulate, base often unequal. *Flowers* dioecious, axillary, pedicelled, clustered; perianth simple. ♂ *Sepals* 4–6, broad, imbricate, the buds globose. *Petals* 0. *Disk* globose or depressed. *Stamens* many or few, inserted round the disk; filaments short, free; anthers erect; cells parallel. *Pistillode* 0, or minute. ♀ *Calyx* as in male. *Petals* 0. *Disk* annular or 0. *Carpels* connate in a 2–4-celled ovary; ovules 2 in each cell; style elongate or 0; stigmas dilated, fleshy, or connate in a peltate disk. *Fruit* subglobose or ovoid, indehiscent; pericarp thick, hard, 2-celled. *Seeds* solitary in each cell; albumen fleshy; cotyledons broad, flat.

Leaves broadly elliptic or ovate-oblong, abruptly obtusely caudate-acuminate, 2–3 in. long; female flowers long-pedicelled .....*eglandulosus.*
Leaves elliptic-oblong or linear-oblong, acute or obtuse, 4–6 in. long; female flowers very short-pedicelled.....*assamicus.*

1861. Cyclostemon eglandulosus Kurz; F. B. I. v. 341. *Hopea eglandulosa* F. I. ii. 611.
Tippera; Chittagong.
An evergreen tree, 40–50 feet high.

1862. Cyclostemon assamicus Hook. f.; F. B. I. v. 342.
Chittagong; Sundribuns; N. Bengal, Duars.
An evergreen tree, 25–30 feet high. *Beng.* Ban-bokal.

825. Antidesma Linn.

Trees or shrubs; *leaves* alternate, entire; stipules narrow. *Flowers* dioecious, small or minute, in slender, axillary or terminal, simple or branched spikes or racemes; perianth simple. ♂ *Sepals* connate in a 3–5-, rarely 6–8-lobed or partite calyx. *Petals* 0. *Disk* entire or lobed. *Stamens* 2–5, rarely more, inserted on or around the disk, often irregularly; filaments inflexed in bud; anthers lunate or didymous; cells globose, approximate or discrete; connective thickened. *Pistillode* minute, clavate or globose, rarely 2-fid, glabrous or hairy, occasionally obsolete. ♀ *Calyx* as in males. *Disk* usually annular or cushion-like. *Carpels* usually forming a 1-celled ovary; ovules 2, pendulous; stigmas 2–4, usually short, 2-fid or 2-partite. *Fruit* a small drupe, more or less compressed, crowned by the sublateral or

terminal stigmas. *Seed* small; albumen fleshy; cotyledons broad, flat.

Ovary tomentose or pubescent; leaves 2–3 in. long, obtuse, orbicular, obovate or oblong, tomentose or glabrous beneath, dull above; flowers sessile; calyx 5–7-partite; stamens 4–7.....*Ghæsembilla*.

Ovary glabrous:—

Male flowers sessile, female flowers shortly pedicelled:—

Calyx cupular, male very shortly 4-lobed, female truncate; leaves 3–6 in. long, elliptic, oblong-lanceolate, obovate or oblanceolate, obtuse or acute or acuminate, glabrous, shining above; stamens 3 *Bunius*.

Calyx of 3–4 orbicular, villous sepals; leaves 3–5 in. long, elliptic, oblong or oblong-lanceolate, acuminate, more or less pubescent on both surfaces or dull glabrous above; stamens 3–4 .....*velutinum*.

Male flowers as well as female distinctly pedicelled:—

Calyx spreading, obtusely 4-lobed or 4-toothed; leaves 1–5 in. long, obovate-oblong, obovate-elliptic or -lanceolate, obtuse or acute or acuminate, dull glabrous above, glabrous or slightly pubescent beneath; stamens 2, very rarely 3.....*diandrum*.

Calyx of 4 broadly ovate sepals; leaves 3–12 in. long, obovate-oblong or obovate-elliptic or -lanceolate, caudate-acuminate, shining and glabrous above except the tomentose midrib; stamens 3–4 *acuminatum*.

1863. ANTIDESMA GHÆSEMBILLA Gaertn.; F. B. I. v. 357; E. D. A. 1219. *A. paniculatum* F. I. iii. 770. *A. pubescens* F. I. iii. 770.

In all the provinces.

A small tree. *Beng.* Khudi jamb, timtóa; *Hind.* Umtoa.

1864. ANTIDESMA BUNIUS Spreng.; F. B. I. v. 358; E. D. A. 1212. *Stilago Bunius* F. I. iii. 758.

Tirhut, northern parts; N. Bengal, Duars; Chota Nagpur, Parasnath.

A small evergreen tree.

1865. ANTIDESMA VELUTINUM Tul.; F. B. I. v. 361.

Chittagong.

An evergreen tree, 25–30 feet high.

1866. ANTIDESMA DIANDRUM Roth; F. B. I. v. 361; E. D. A. 1215. *Stilago diandra* F. I. iii. 759.

In most of the provinces.

A large bush or small tree. *Hind.* Aamari; *Beng.* Multa; *Uriya* Nuniari.

1867. ANTIDESMA ACUMINATUM Wall.; F. B. I. v. 363.
N. Bengal, Duars, common; Chota Nagpur, rare.
A large shrub, growing near watercourses.

826. Aporosa Bl.

Trees; *leaves* alternate, entire or rarely sinuate-toothed, coriaceous; stipules small, rarely leafy. *Flowers* diœcious or very rarely (not in our species) monœcious, minute; males in axillary, catkin-like spikes, females sessile or short-pedicelled, in short bracteate spikes, the bracts concave and imbricating. ♂ *Sepals* usually 4, sometimes 3 or 5–6, membranous, imbricate. *Petals* 0. *Disk* 0. *Stamens* 2–5 in the centre of the flower; filaments free, capillary; anthers didymous. *Pistillode* minute or 0. ♀ *Sepals* larger than in male. *Petals* 0. *Disk* 0. *Carpels* connate in a 2-celled, rarely a 3-celled ovary; ovules 2 in each cell; stigmas small, short, plumose, simple or 2–4-cleft, spreading and recurved, rarely elongate and 2-partite. *Fruit* an ellipsoid, ovoid, or globose capsule, opening irregularly or partially 2–4-valved from the base upwards; epicarp thin or thick and spongy or fleshy; endocarp thin, often separable; cells glabrous or hairy within, especially on the septum. *Seeds* oblong or suborbicular; albumen fleshy; cotyledons broad, flat.

Leaves dark green; male bracts tomentose; cells of fruit very hairy within ..... *Wallichii.*
Leaves pale green; male bracts glabrous; cells of fruit glabrous within *aurea.*

1868. APOROSA WALLICHII Hook. f.; F. B. I. v. 350.
Chittagong.
A large tree. *Beng.* Kokra.

1869. APOROSA AUREA Hook. f.; F. B. I. v. 351.
Chittagong.
A medium or small tree. *Beng.* Kokra.

827. Baccaurea Lour.

Evergreen trees; *leaves* alternate, entire, rarely crenate-serrate, penninerved. *Flowers* diœcious, rarely monœcious in different spikes or racemes on the same tree; spikes or racemes simple or panicled; perianth simple; male flowers usually very small.

♂ *Sepals* 4–5, usually unequal, imbricate. *Petals* 0. *Disk* 0, or obscure, glandular. *Stamens* 4–8; filaments short, free; anthers small, didymous. *Pistillode* pubescent, orbicular, sessile or stipitate, rarely in an irregular cleft column. ♀ *Sepals* 4–6, linear or oblong, much larger than in males. *Petals* 0. *Disk* 0. *Carpels* connate in a 2–5-celled, ovoid or globose ovary; ovules 2 in each cell; stigmas 2–5, small, sessile, free or connate in a short style, each 2-lobed or 2-cleft, arms wide or narrow, papillose, rarely connate in one peltate stigma. *Fruit* a tardily dehiscent capsule, ovoid, globose, obovoid or fusiform, 2–4-celled; pericarp thick or thin, coriaceous, crustaceous or woody. *Seeds* broad, usually dorsally compressed or flattened; testa with a thick, fleshy covering; albumen fleshy or hard; cotyledons broad, flat.

1870. Baccaurea sapida Muell.-Arg.; F. B. I. v. 371; E. D. B. 4. *Pierardia sapida* F. I. ii. 254.

N. Bengal, Duars; E. Bengal; Tippera.

An evergreen tree, 40–50 feet high. *Vernac.* Látká.

828. Manihot Adans.

Tall herbs or shrubs, rarely trees; *leaves* alternate, petioled, entire or digitate; segments entire or lobed, free or united. *Flowers* monœcious, in terminal or axillary, simple or somewhat paniculate, rather lax racemes, males short-pedicelled, females lower in the raceme, longer pedicelled; perianth simple; bracts, small, or large and leafy, entire or fimbriate. ♂ *Sepals* connate in a usually coloured, campanulate or urceolate calyx, limb more or less lobed; lobes imbricate, contorted. *Petals* 0. *Disk* glandular or lobed. *Stamens* 10, 2-seriate, attached between the disk-glands or lobes; filaments free, slender; anthers oblong; cells parallel, contiguous. *Pistillode* 0, or 3-fid. ♀ *Sepals* as in males. *Petals* 0. *Disk* hypogynous, entire or glandular. *Carpels* connate in a 3-celled ovary; ovule in each cell solitary; styles shortly connate below, spreading above, dilated or lobed. *Fruit* a capsule, separating into three 2-valved cocci. *Seeds* ovoid or oblong; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1871. Manihot utilissima Pohl; F. B. I. v. 239; E. D. M. 216.

N. Bengal, Duars, cultivated in clearings.

A tall, herbaceous plant with tuberous root; native of S. America. Cassava, Tapioca.

829. Jatropha Linn.

Herbs, shrubs, or trees, often glandular or prickly; *leaves* alternate, entire or digitately lobed or pinnate; stipules often ciliate. *Flowers* monœcious, in terminal cymes, the central flowers in the cyme or in its forks usually female; perianth usually double. ♂ *Sepals* 5, often coloured, imbricate. *Petals* 5, contorted, free or connate. *Disk* entire or of 5 glands. *Stamens* numerous; filaments all connate, or those of the outer series free; anthers erect, ovate or oblong; cells parallel, contiguous. *Pistillode* 0. ♀ *Calyx* as in the male. *Petals* often absent. *Carpels* connate in a 2–4-celled ovary; ovules solitary in each cell; styles connate below, 2-fid above; lobes entire or again 2-lobed. *Fruit* a capsule of 2–4 2-valved cocci; endocarp crustaceous or hard. *Seeds* ovoid or oblong; testa crustaceous; albumen fleshy; cotyledons broad, flat.

Flowers scarlet or purple; petals united at their bases only, glabrous; margins of stipules capillary-multifid:—

Leaves palmately multifid; lobes narrow, usually lobulate, sometimes entire, glabrous, eglandular as are the bracts, sepals, and stipules; petiole smooth ..... *multifida.*

Leaves palmately 3–5-lobed; lobes widened in the middle, glandular toothed; bracts, sepals, and stipules glandular; petiole glandular-muriculate ..... *gossypifolia.*

Flowers yellow; petals united to the middle; tube of male villous within; stipules entire; leaves with 5 or 3 palmate angular lobes, or occasionally entire ..... *Curcas.*

1872. Jatropha multifida Linn.; F. B. I. v. 383.

In gardens and near temples, general.

A large shrub. Native of S. America.

1873. Jatropha gossypifolia Linn.; F. B. I. v. 383. *J. glandulifera* E. D. J. 52.

In all the provinces, in waste places.

A small shrub, a common weed of roadsides. Native of Brazil. *Beng.* Lal-bherenda.

1874. Jatropha Curcas Linn.; F. I. iii. 686; F. B. I. v. 338; E. D. J. 41.

In all the provinces, cultivated and in village thickets.

A large shrub or small tree. *Vernac.* Bág-bherenda. Physic Nut.

830. Aleurites Forst.

Trees with simple or stellate pubescence; *leaves* alternate, long-petioled, entire or 3–7-lobed, digitately 3–7-nerved from the base; petiole 2-glandular at apex. *Flowers* monœcious or subdiœcious, in lax terminal, panicled cymes; perianth double. ♂ *Sepals* connate in a closed calyx, bursting irregularly into 2–3 valvate lobes. *Petals* 5, exceeding the calyx. *Stamens* 8–20 on a conical torus, the outermost 5 alternating with small glands and opposite the petals; filaments short or long, all free; anthers erect, adnate; cells parallel. *Pistillode* 0. ♀ *Perianth* as in male. *Disk* obscure, or of 5 glands, alternate with petals. *Carpels* connate in a 2–5-celled ovary; ovules solitary in each cell; styles with 2 stout, linear arms. *Fruit* a large drupe with a hard, 1–5-celled stone. *Seed* with a thick, woody testa; albumen thick, hard; embryo straight; cotyledons broad, flat.

1875. Aleurites moluccana Willd.; F. B. I. v. 384; E. D. A. 737. *A. triloba* F. I. iii. 629.

In gardens, especially in C. Bengal.

An evergreen tree, 40–60 feet high. *Vernac.* Akrót.

831. Croton Linn.

Trees or shrubs, rarely herbs; *leaves* alternate, rarely opposite or whorled, 2-glandular at the base. *Flowers* monœcious, rarely (not in our species) diœcious, solitary or clustered on the rachis of a terminal raceme; bracts small. ♂ *Sepals* connate in a 5-partite, rarely 4–6-partite calyx; segments imbricate or subvalvate. *Petals* 5, rarely 4–6, never exceeding, sometimes smaller than the calyx. *Disk* of 4–6 glands, opposite the sepals. *Stamens* many, inserted on the hairy receptacle; filaments free, inflexed in bud, at length straight; anthers adnate; cells parallel. *Pistillode* 0. ♀ *Sepals* usually more ovate than in males, rarely accrescent in fruit. *Petals* smaller than sepals or obsolete. *Disk* annular or of 4–6 glands opposite the sepals. *Carpels* connate in a 3-celled, rarely 2–4-celled ovary; ovules solitary in each cell; style usually slender, 2–4-cleft. *Fruit* a subequally 6-valved capsule, or of three separating, 2-valved cocci. *Seeds* smooth; caruncle small; testa crustaceous; albumen copious; cotyledons broad.

*Inflorescence and young leaves lepidote; leaves penninerved, oblong, elliptic-oblong or elliptic-lanceolate, when old quite glabrous; stamens 10–12:—[p. 943]

Capsule globose, ·35 in. long; leaves serrate or closely repand-toothed *oblongifolius.*

Capsule ovoid, 1–1·5 in. long; leaves entire or remotely repand-toothed *Joufra.*

*Inflorescence and leaves never lepidote; leaves palmately nerved from the base; stamens 15–30:—[p. 942]

Leaves 3–5-nerved, ovate-cordate, stellately hairy; branches and racemes densely, scurfily stellately hairy; stamens 18–30; capsule scabridly rusty-pubescent ..... *caudatus.*

Leaves 3-nerved, ovate-acuminate, very thin, glabrous; branches and racemes glabrous, except the stellately hairy female flowers; stamens 15–20; capsule glabrous or slightly hispid..... *Tiglium.*

1876. CROTON OBLONGIFOLIUS Roxb.; F. I. iii. 685; F. B. I. v. 386; E. D. C. 2180.

In all the provinces.

A small, deciduous tree. *Vernac.* Chucka.

1877. CROTON JOUFRA Roxb.; F. I. iii. 685; F. B. I. v. 387; E. D. C. 2175.

Chittagong.

A small, deciduous tree. *Vernac.* Joufra.

1878. CROTON CAUDATUS Geisel; F. B. I. v. 388; E. D. C. 2171. *C. drupaceus* F. I. iii. 683.

In most of the provinces.

A scandent or subscandent shrub. *Beng.* Nan bhantúr.

1879. CROTON TIGLIUM Linn.; F. I. iii. 682; F. B. I. v. 393; E. D. C. 2192.

Cultivated in most of the provinces.

A small evergreen tree. *Vernac.* Jayapala, jeypal.

832. Codiæum Juss.

Glabrous shrubs or trees; *leaves* alternate, entire, penninerved. *Flowers* monœcious, in usually 1-sexual racemes; males small, pedicelled; females larger, solitary, rarely a female at the base of the male racemes; perianth double. ♂ *Sepals* 3–6, usually 5, membranous, imbricate, free or connate below. *Petals* 5 or 6, smaller than sepals. *Disk* of 5–6 glands, alternate with petals. *Stamens* 15–30, crowded on a low torus; filaments free; anthers erect, on the margins of a large connective; cells at length confluent at the apex. *Pistillode* 0. ♀ *Sepals* connate in a 5-lobed calyx. *Petals* 0. *Disk* subentire. *Carpels* connate in a 3-celled

830. Aleurites Forst.

Trees with simple or stellate pubescence; *leaves* alternate, long-petioled, entire or 3–7-lobed, digitately 3–7-nerved from the base; petiole 2-glandular at apex. *Flowers* monœcious or subdiœcious, in lax terminal, panicled cymes; perianth double. ♂ *Sepals* connate in a closed calyx, bursting irregularly into 2–3 valvate lobes. *Petals* 5, exceeding the calyx. *Stamens* 8–20 on a conical torus, the outermost 5 alternating with small glands and opposite the petals; filaments short or long, all free; anthers erect, adnate; cells parallel. *Pistillode* 0. ♀ *Perianth* as in male. *Disk* obscure, or of 5 glands, alternate with petals. *Carpels* connate in a 2–5-celled ovary; ovules solitary in each cell; styles with 2 stout, linear arms. *Fruit* a large drupe with a hard, 1–5-celled stone. *Seed* with a thick, woody testa; albumen thick, hard; embryo straight; cotyledons broad, flat.

1875. Aleurites moluccana Willd.; F. B. I. v. 384; E. D. A. 737. *A. triloba* F. I. iii. 629.

In gardens, especially in C. Bengal.

An evergreen tree, 40–60 feet high. *Vernac.* Akrót.

831. Croton Linn.

Trees or shrubs, rarely herbs; *leaves* alternate, rarely opposite or whorled, 2-glandular at the base. *Flowers* monœcious, rarely (not in our species) diœcious, solitary or clustered on the rachis of a terminal raceme; bracts small. ♂ *Sepals* connate in a 5-partite, rarely 4–6-partite calyx; segments imbricate or subvalvate. *Petals* 5, rarely 4–6, never exceeding, sometimes smaller than the calyx. *Disk* of 4–6 glands, opposite the sepals. *Stamens* many, inserted on the hairy receptacle; filaments free, inflexed in bud, at length straight; anthers adnate; cells parallel. *Pistillode* 0. ♀ *Sepals* usually more ovate than in males, rarely accrescent in fruit. *Petals* smaller than sepals or obsolete. *Disk* annular or of 4–6 glands opposite the sepals. *Carpels* connate in a 3-celled, rarely 2–4-celled ovary; ovules solitary in each cell; style usually slender, 2–4-cleft. *Fruit* a subequally 6-valved capsule, or of three separating, 2-valved cocci. *Seeds* smooth; caruncle small; testa crustaceous; albumen copious; cotyledons broad.

*Inflorescence and young leaves lepidote; leaves penninerved, oblong, elliptic-oblong or elliptic-lanceolate, when old quite glabrous; stamens 10–12:—[p. 943]

Capsule globose, ·35 in. long; leaves serrate or closely repand-toothed *oblongifolius.*

Capsule ovoid, 1–1·5 in. long; leaves entire or remotely repand-toothed *Joufra.*

*Inflorescence and leaves never lepidote; leaves palmately nerved from the base; stamens 15–30:—[p. 942]

Leaves 3–5-nerved, ovate-cordate, stellately hairy; branches and racemes densely, scurfily stellately hairy; stamens 18–30; capsule scabridly rusty-pubescent ..... *caudatus.*

Leaves 3-nerved, ovate-acuminate, very thin, glabrous; branches and racemes glabrous, except the stellately hairy female flowers; stamens 15–20; capsule glabrous or slightly hispid..... *Tiglium.*

1876. CROTON OBLONGIFOLIUS Roxb.; F. I. iii. 685; F. B. I. v. 386; E. D. C. 2180.

In all the provinces.

A small, deciduous tree. *Vernac.* Chucka.

1877. CROTON JOUFRA Roxb.; F. I. iii. 685; F. B. I. v. 387; E. D. C. 2175.

Chittagong.

A small, deciduous tree. *Vernac.* Joufra.

1878. CROTON CAUDATUS Geisel; F. B. I. v. 388; E. D. C. 2171. *C. drupaceus* F. I. iii. 683.

In most of the provinces.

A scandent or subscandent shrub. *Beng.* Nan bhantúr.

1879. CROTON TIGLIUM Linn.; F. I. iii. 682; F. B. I. v. 393; E. D. C. 2192.

Cultivated in most of the provinces.

A small evergreen tree. *Vernac.* Jayapala, jeypal.

832. Codiæum Juss.

Glabrous shrubs or trees; *leaves* alternate, entire, penninerved. *Flowers* monœcious, in usually 1-sexual racemes; males small, pedicelled; females larger, solitary, rarely a female at the base of the male racemes; perianth double. ♂ *Sepals* 3–6, usually 5, membranous, imbricate, free or connate below. *Petals* 5 or 6, smaller than sepals. *Disk* of 5–6 glands, alternate with petals. *Stamens* 15–30, crowded on a low torus; filaments free; anthers erect, on the margins of a large connective; cells at length confluent at the apex. *Pistillode* 0. ♀ *Sepals* connate in a 5-lobed calyx. *Petals* 0. *Disk* subentire. *Carpels* connate in a 3-celled

ovary; ovules solitary in each cell; styles entire, elongate, slender, incurved. *Fruit* a globose capsule of three 2-valved, parchment-like cocci. *Seeds* strophiolate; testa shining, crustaceous; albumen fleshy; cotyledons broad, flat.

1880. CODIÆUM VARIEGATUM Bl.; F. B. I. v. 390. *Croton bractiferus* F. I. iii. 680.

In gardens everywhere.

An evergreen shrub with brightly coloured, variegated leaves. "Croton" of English denizens.

833. Chrozophora Neck.

Diffuse, densely hispid or stellately tomentose herbs or under-shrubs; *leaves* alternate, sinuate-toothed or lobed, wavy or plicate, 2-glandular at the base. *Flowers* monœcious, in sessile, axillary, bracteate racemes; perianth double; males crowded in upper part of raceme, females solitary, pedicelled; bracts one under each flower. ♂ *Sepals* connate in a globose or ovoid calyx, splitting in 5 valvate segments. *Petals* 5, short. *Disk* obscure. *Stamens* 5–15; filaments connate below in a column in 1–3 series; anthers oblong; cells parallel, contiguous. *Pistillode* 0. ♀ *Sepals* 5, narrow. *Petals* very narrow, sometimes setaceous or obsolete. *Disk* of 5 short, broad glands, alternate with petals. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles 2-fid, erect or spreading. *Fruit* a capsule of 3 hispid, tomentose or lepidote, 2-valved, almost fleshy cocci. *Seeds* without strophiole; testa shining; albumen fleshy; cotyledons broad, flat.

1881. CHROZOPHORA PLICATA A. Juss.; F. B. I. v. 409; E. D. C. 2211. *Croton plicatus* F. I. iii. 681.

In most of the provinces.

A coarse annual weed. *Hind.* Souballi; *Beng.* Khúdi okra; *Santal.* Pango nari.

834. Gelonium Roxb.

Evergreen glabrous shrubs or small trees; branches with stipular lines at the nodes; *leaves* alternate, rarely opposite, pellucid-dotted, entire or serrate; stipules connate, sheathing, caducous. *Flowers* dioecious, small, in sessile or shortly peduncled axillary clusters; perianth simple. ♂ *Sepals* 5, orbicular, concave, imbricate. *Petals* 0. *Disk* obsolete. *Stamens* 10–60, crowded on a convex receptacle; filaments filiform, free; anthers oblong,

dorsifixed; cells parallel; dehiscence introrse. *Pistillode* 0. ♀ *Sepals* 5–6, narrower than in the males, imbricate. *Petals* 0. *Disk* cup-shaped, rarely enlarged and with staminodes. *Carpels* connate in a 2–4-celled ovary; ovules solitary in each cell; styles minute, depressed, reniform semi-lunar or 2-fid. *Fruit* a tardily dehiscing capsule, globose or 3–4-angled or 2–4-lobed, fleshy or coriaceous or crustaceous. *Seeds* subglobose, arillate; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1882. GELONIUM MULTIFLORUM A. Juss.; F. B. I. v. 459; E. D. G. 158. *G. fasciculatum* F. I. iii. 832.

Orissa; Chota Nagpur; N. Bengal; C. Bengal; E. Bengal; Chittagong.

A tree, 30–40 feet high. *Hind.* Ban naringa.

835. Chætocarpus Thw.

Shrubs or trees; *leaves* alternate, coriaceous, entire, penninerved. *Flowers* diœcious, small, in axillary clusters; perianth simple. ♂ *Sepals* 4–5, imbricate. *Petals* 0. *Disk* entire or 4–10-lobed. *Stamens* 5–20; filaments combined below in a slender column, spreading above; anthers oblong, dorsifixed; cells parallel. *Pistillode* 3-fid, villous, crowning the staminal column. ♀ *Calyx* as in the males. *Petals* 0. *Disk* entire or lobed. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles distinct, incurved, 2-partite. *Fruit* a subglobose capsule of 3 spiny or tubercled, 2-valved cocci; endocarp hard. *Seeds* ovoid or subglobose, with a large 2-lobed, coloured caruncle; testa black, shiny, crustaceous; albumen fleshy; cotyledons broad, flat.

1883. CHÆTOCARPUS CASTANOCARPUS Thwaites; F. B. I. v. 460; E. D. C. 987. *Adelia castanicarpa* F. I. iii. 848.

Chittagong.

An evergreen tree. *Beng.* Búlkokra.

836. Baliospermum Bl.

Erect shrubs; *leaves* alternate, sinuately lobed or toothed, penninerved or 3–5-nerved from base; base 2-glandular. *Flowers* monœcious or (not in our species) diœcious, small, paniculate or racemose; perianth simple. ♂ *Sepals* 4–5, forming a globose calyx, membranous, orbicular, concave, imbricate. *Petals* 0. *Disk* of 4–6 glands. *Stamens* 10–30; filaments slender, free; anthers terminal; cells adnate throughout to the broad connec-

tive; dehiscence at first introrse, the chinks ultimately lateral. *Pistillode* 0. ♀ *Sepals* 5–6, lanceolate, entire or toothed, sometimes accrescent in fruit. *Petals* 0. *Disk* entire. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles longish, stout, 2-fid or 2-partite; stigmas smooth. *Fruit* of three 2-valved, crustaceous cocci. *Seeds* ovoid; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1884. Baliospermum axillare Bl.; F. B. I. v. 461. *B. montanum* E. D. B. 28. *Croton polyandrum* F. I. iii. 682.
Chota Nagpur; Behar; Tirhut; N. Bengal; Chittagong.
A leafy, stout undershrub. *Beng.* Dánti, hakún.

837. Endospermum Benth.

Trees; *leaves* entire, alternate, petioled, coriaceous, ovate, cordate or truncate, often subpeltate, 3–5-nerved at base; apex of petiole with usually 2 tumid glands. *Flowers* diœcious, small, in long axillary or lateral simple spikes or racemes; perianth simple; males clustered, subsessile on the rachis; females solitary, pedicelled in the bracts. ♂ *Sepals* 4, connate in a globose, shortly and unequally valvately lobed calyx. *Disk* shortly lobed. *Stamens* 6–10, on a convex or conical receptacle; filaments short; anthers didymous, equally 4-celled and 4-valved. *Pistillode* minute or obsolete. ♀ *Sepals* connate in a 5-toothed calyx. *Petals* 0. *Disk* obscure. *Carpels* connate in a 2–3-celled ovary; ovules solitary in each cell; styles connate, forming a flat, spreading, entire or 3-lobed disk. *Fruit* didymous, separating into 2 indehiscent cocci, or indehiscent and 2–3-lobed; endocarp crustaceous; columella 0. *Seeds* globose; testa reticulately rugose.

1885. Endospermum chinense Benth.; F. B. I. v. 458.
Chittagong.
A tree.

838. Claoxylon A. Juss.

Evergreen trees or shrubs, rarely annual herbs; *leaves* alternate, usually long-petioled, oblong, entire, or sinuately toothed, usually penninerved. *Flowers* diœcious or (in our species) monœcious, small, in axillary or lateral spikes or racemes. ♂ *Sepals* connate in a subglobose calyx; limb 3–4-lobed; lobes valvate. *Petals* 0. *Disk* 0. *Stamens* numerous, rarely few, inserted on or around a central receptacle, with or without intermixed glands or long,

linear, ciliate scales; filaments free; anthers erect; cells connate at base only but not confluent, free above and erect; dehiscence extrorse. *Pistillode* 0. ♀ *Calyx* as in the males. *Petals* 0. *Disk* 0 or of 3 petal-like, hypogynous scales, alternate with the carpels. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles short, rarely long, entire, fringed, spreading. *Fruit* a capsule of three 2-valved cocci, or indehiscent and coriaceous. *Seeds* subglobose, with or without an arillus; testa crustaceous; albumen fleshy; seeds broad, flat.

1886. Claoxylon Mercurialis Thwaites; F. B. I v. 42. *Tragia Mercurialis* F. I. iii. 576.

Behar.

An annual herb.

839. Acalypha Linn.

Shrubs or herbs; *leaves* alternate, toothed or crenate, rarely entire, penninerved or 3–5-nerved. *Flowers* monœcious, minute, in axillary or terminal racemes, or the females 1–2 in a peduncled, solitary bract, or casually dicœcious; perianth simple; males without bracts, females often at the base of large, accrescent, leafy bracts, low on the male spikes or on separate spikes. ♂ *Sepals* 4, valvate, more or less connate in a membranous calyx. *Petals* 0. *Disk* 0. *Stamens* usually 8, sometimes numerous, on a convex receptacle; filaments short, free; anther-cells distinct, divaricate, often at length twisted or flexuous. *Pistillode* 0. ♀ *Sepals* 3–4, minute, imbricate. *Petals* 0. *Disk* 0. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles filiform, often very long and laciniate or fimbriate. *Fruit* a small capsule of 3 minute, 2-valved, crustaceous cocci. *Seeds* subglobose; testa crustaceous; albumen fleshy; cotyledons broad, flat.

Bracts rather shorter than capsules, 1-flowered, toothed .....*fallax.*
Bracts longer than capsules:—
Bracts distant, broad, 3–5-flowered, truncate, crenate .....*indica.*
Bracts crowded, 1–2-flowered, with many nerves ending in long, subulate, hispid teeth .....*ciliata.*

1887. Acalypha fallax Muell.-Arg.; F. B. I. v. 416.

C. Bengal.

An annual weed, 6–18 in. high, recently introduced to our area, but now quite common, especially near Calcutta.

1888. Acalypha indica Linn.; F. I. iii. 675; F. B. I. v. 416; E. D. A. 306.

N. Bengal; C. Bengal; E. Bengal.

An annual weed, 1–3 feet high. *Vernac.* Khokli.

1889. Acalypha ciliata Forsk.; F. I. iii. 676; F. B. I. v. 417; E. D. A. 303.

Behar.

An annual weed, 1–2 feet high.

840. Trewia Linn.

Soft-wooded trees; *leaves* opposite, broadly ovate or orbicular; base cordate, 3–5-nerved; margins entire. *Flowers* dioecious, rather large, developed before the leaves; perianth simple; males in lax lateral racemes, one to each bract, females solitary, long-peduncled or racemose. ♂ *Sepals* connate in a globose calyx, separating into 3–4 broad, concave, often reflexed segments. *Petals* 0. *Disk* 0. *Stamens* numerous, on a concave receptacle; filaments free; anthers dorsifixed, oblong, the cells parallel, contiguous. *Pistillode* 0. ♀ *Sepals* 3–5, broad, imbricate, caducous. *Petals* 0. *Disk* 0. *Carpels* connate in a 2–4-celled ovary; ovules solitary in each cell; styles connate below, long, terete, entire, papillose throughout. *Fruit* fleshy, 2–4-celled, indehiscent or dehiscing loculicidally; endocarp crustaceous. *Seeds* ovoid; testa hard; albumen fleshy; cotyledons broad, flat.

1890. Trewia nudiflora Linn.; F. I. iii. 837; F. B. I. v. 423; E. D. T. 525.

N. Bengal; C. Bengal; E. Bengal; Sundribuns; Chittagong.

A large, deciduous tree. *Hind.* Kamhasa, gamhar; *Beng.* Pitáli; *Uriya* Monda; *Kol.* Gara lohadaru.

841. Mallotus Lour.

Trees or shrubs; *leaves* opposite or alternate, entire, toothed or 3-lobed, penninerved or 3–7-nerved, sometimes peltate, often gland-dotted beneath, and sometimes with glandular spaces at the base above. *Flowers* dioecious or monoecious, small or minute, in axillary or terminal, simple or branched spikes or racemes; perianth simple; males fascicled, females solitary in the bracts. ♂ *Sepals* connate in a globose or ovoid, 3–5-partite calyx; lobes valvate. *Petals* 0. *Disk* 0. *Stamens* numerous, crowded on the

flat or convex receptacle; filaments free; anthers small, dorsi-fixed; cells globose or shortly oblong, parallel, adnate to the wide connective, often discrete. *Pistillode* 0 or minute. ♀ *Sepals* connate in a spathaceous or valvately 3–6-lobed or -partite calyx. *Petals* 0. *Disk* 0 or small. *Carpels* connate in a 2–4-celled ovary ovules solitary in each cell; styles free or connate below, spreading or recurved above, entire, plumose or papillose. *Fruit* a capsule of 2–3, arely 4, 2-valved, tubercled, echinate, paleaceous or smooth cocci. *Seeds* ovoid, oblong, or globose; testa crustaceous; albumen fleshy; cotyledons broad, flat.

Capsules hairy and prickly or muricate; trees:—

Leaves distinctly peltate, orbicular or triangular-ovate, acuminate or caudate, membranous, base 7–9-nerved, simply pubescent above, softly stellately hairy and glandular beneath; racemes terminal, erect capsules 3-coccous, hairy and prickly .....*Roxburghianus.*

Leaves narrowly peltate or truncate, broadly ovate or orbicular or triangular-ovate, acuminate, coriaceous; base 3–5-nerved, adpressed stellately, or scurfily white- or rusty-tomentose beneath; racemes in axillary and terminal, pyramidal panicles; capsules 3–4-coccous, muricate, and with soft, short, white, tomentose processes.....*albus.*

Capsules unarmed; leaves 3-nerved at base:—

Capsules 2-coccous, velvety-tomentose; leaves beneath softly stellate-tomentose, above glabrous or scaberulously stellate, glandular on both sides; nerves 3 pairs above the basal; a large, scandent shrub *repandus.*

Capsules 3-coccous, densely covered with red, resinous glands; leaves beneath subglaucous and covered with red, resinous glands, above glabrous; nerves 4–7 pairs above the basal; a small evergreen tree *philippinensis.*

1891. MALLOTUS ROXBURGHIANUS Muell.-Arg.; F. B. I. v. 428; E. D. M. 87. *Rottlera peltata* F. I. iii. 828.

Behar, Sontal Pergunnahs; Chittagong.

An evergreen shrub. *Beng.* Nim pûteli.

1892. MALLOTUS ALBUS Muell.-Arg.; F. B. I. v. 429; E. D. M. 66. *Rottlera alba* F. I. iii. 829. *R. tetracocca* F. I. iii. 826.

Chittagong; E. Bengal; Tippera.

A small evergreen tree, 30–40 feet high. *Vernac.* Marleya.

1893. MALLOTUS REPANDUS Muell.-Arg.; F. B. I. v. 442. *Rottlera dicocca* F. I. iii. 829.

In all the provinces.

A large, scandent shrub, stem weak, sometimes 60–80 feet long. *Vernac.* Akus, nan bhantúr.

1894. MALLOTUS PHILIPPINENSIS Muell.-Arg.; F. B. I. v. 442; E. D. M. 71. *Rottlera tinctoria* F. I. iii. 827.

In all the provinces.

A small evergreen tree, 20–30 feet high. *Vernac.* Kamala; *Santal.* Rora.

842. Cleidion Bl.

Glabrous trees; *leaves* alternate, usually sinuate-toothed, penni-nerved. *Flowers* monœcious or diœcious, small; males in long, axillary racemes; females 1–2, on a long, axillary peduncle; perianth simple. ♂ *Sepals* connate in a globose calyx, splitting into 3–4 valvate segments. *Petals* 0. *Stamens* numerous, in a globose mass on a common receptacle; filaments free; anthers dorsifixed and 4-celled or 2-celled, the cells transversely didymous on a wide connective. *Pistillode* 0. ♀ *Sepals* 3–5, imbricate. *Petals* 0. *Carpels* connate in a 2–3-celled ovary; ovules solitary in each cell; styles 2–3-fid, connate below, arms long, filiform. *Fruit* a capsule of 1–3, 2-valved cocci. *Seeds* subglobose; testa coriaceous; albumen fleshy; cotyledons broad, flat.

1895. CLEIDION JAVANICUM Bl.; F. B. I. v. 444; E. D. C. 1348.

Chittagong.

An evergreen tree.

843. Macaranga Thouars.

Trees or shrubs; *leaves* alternate, often large and peltate, entire or lobed, more or less glandular beneath, 3–5-nerved at base. *Flowers* usually diœcious, in axillary racemes or panicles; perianth simple; males many, clustered, females one or few to each bract; bracts often large, entire or toothed. ♂ *Sepals* 3–5, valvate, forming a minute globose or obovoid calyx. *Petals* 0. *Disk* 0. *Stamens* central, sometimes 1–3, oftener 10–30; filaments short, free; anthers terminal, short, 2-celled and 4-valved, or 3-celled and 3-valved. *Pistillode* 0. ♀ *Sepals* connate in a 2–4-lobed calyx. *Petals* 0. *Disk* 0. *Carpels* connate in a 2–6-celled, rarely by abortion 1-celled ovary; ovules in each cell solitary; styles entire, short or long. *Fruit* a small capsule of 1–5 naked or echinate, 2-valved cocci, often glandular or with a waxy coat. *Seeds* glo-

bose; testa crustaceous or bony; albumen fleshy; cotyledons broad, flat.

Floral bracts of male panicles very small, not concealing the clusters of flowers; capsule didymous, black, with scattered yellow glands; stamens 6 or more ..... *denticulata*.
Floral bracts of male panicles broad, toothed, concealing the clusters of flowers; capsule globose, densely glandular, with the persistent stigma at one side; stamens 2–5 ..... *peltata*.

1896. MACARANGA DENTICULATA Muell.-Arg.; F. B. I. v. 446; E. D. M. 9.
Chittagong.
A small evergreen tree, with entire, deltoid-ovate, peltate leaves. *Beng.* Burna; *Magh.* Pawaing.

1897. MACARANGA PELTATA Muell.-Arg. *M. Roxburghii* F. B. I. v. 448; E. D. M. 15. *Osyris peltata* F. I. iii. 755.
Orissa, Khurdas.
A small evergreen, resinous tree.

844. Homonoia Lour.

Rigid shrubs; *leaves* alternate, narrow entire, or short and toothed, glandular-lepidote. *Flowers* usually dioecious, in many- or few-flowered axillary spikes or from the old wood; perianth simple. ♂ *Sepals* connate in a globose calyx, splitting into 3 valvate lobes. *Petals* 0. *Disk* 0. *Stamens* many, in a dense, globose cluster of repeatedly branching filaments; anthers with subglobose cells, sessile on the filament-branches, divaricate; connective obscure. *Pistillode* 0. ♀ *Sepals* 5–8, narrow, imbricate, unequal, caducous. *Petals* 0. *Disk* 0. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; style entire, spreading, papillose. *Fruit* a small capsule of 3 smooth, 2-valved cocci. *Seeds* ovoid; testa crustaceous, hard, with a thin, fleshy coat; albumen fleshy; cotyledons broad, flat.

1898. HOMONOIA RIPARIA Lour.; F. B. I. v. 455; E. D. H. 339. *Adelia neriifolia* F. I. iii. 849.
Chota Nagpur; N. Bengal; Chittagong.
An evergreen shrub, on rocky river-banks and in river-beds.

845. Ricinus Linn.

A tall, glabrous, glaucous annual, sometimes shrubby or tree-like; *leaves* alternate, broad, palmately lobed; lobes 7 or more,

serrate. *Flowers* monœcious, large, in terminal, subpaniculate racemes; perianth simple; males higher up, crowded, females below. ♂ *Sepals* connate in a membranous calyx, splitting into 3–5 valvate segments. *Petals* 0. *Disk* 0. *Stamens* very many; filaments connate and repeatedly branched; anthers with distinct, distant, subglobose, divergent cells. *Pistillode* 0. ♀ *Sepals* connate in a spathaceous, caducous calyx. *Petals* 0. *Disk* 0. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles short or long, spreading, often very large, entire, 2-fid or 2-partite, penicillate or papillose. *Fruit* a capsule of three 2-valved cocci. *Seeds* oblong; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1899. Ricinus communis Linn.; F. I. iii. 689; F. B. I. v. 457; E. D. R. 369.

In fields, native gardens, and village thickets everywhere.

An evergreen bush or small tree. *Beng.* Bherenda; *Uriya* Gab; *Hind.* Arend; *Santal.* Eradom. The Castor-oil plant, apparently originally introduced from Africa.

846. Tragia Linn.

Perennial, usually twining or climbing herbs, hispid with pungent hairs; *leaves* alternate, simple or palmately 3-lobed, serrate, cordate and 3–5-nerved at base. *Flowers* monœcious, in terminal and leaf-opposed, androgynous racemes; perianth simple; males uppermost in the racemes, females below, few. ♂ *Sepals* connate in a globose or obovoid, valvately 3–5-lobed calyx. *Petals* 0. *Disk* 0 or obscure. *Stamens* 1–3, rarely many; filaments free or connate; anthers ovate or oblong; cells contiguous, parallel. *Pistillode* minute, 3-fid, or 0. ♀ *Sepals* 6, imbricate, entire or pinnatifid, often enlarged, hardened, and stellately spreading in fruit. *Petals* 0. *Disk* 0. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles connate in a column at base, free, spreading, entire above. *Fruit* a capsule of three 2-valved cocci; endocarp crustaceous. *Seeds* globose; testa crustaceous, albumen fleshy; cotyledons broad, flat.

1900. Tragia involucrata Linn.; F. I. iii. 576; F. B. I. v. 465; E. D. T. 509.

In most of the provinces.

A perennial evergreen twiner. *Beng.* Bichati; *Hind.* Barhanta; *Santal.* Sengel sing.

847. Cnesmone Bl.

Climbing, villous shrubs; *leaves* alternate, oblong from a broadly cordate base, margin toothed; stipules wide, persistent. *Flowers* monœcious, in terminal or leaf-opposed, androgynous racemes; perianth simple; male flowers uppermost, lower female; bracteoles 2. ♂ *Sepals* connate in a globose calyx, splitting into 3 valvate lobes. *Petals* 0. *Disk* 0. *Stamens* 3, alternate with calyx-lobes; filaments stout, free; anthers dorsifixed; connective thick, produced into a reflexed lamina; cells subparallel, discrete. *Pistillode* obscure or 0. ♀ *Sepals* 3, enlarging in fruit. *Petals* 0. *Disk* 0. *Carpels* connate in a strigose, short, 3-celled ovary; ovules solitary in each cell; styles or stigmatic arms 3, connate at the base in a fleshy mass, free, incurved above and fimbriate within. *Fruit* a 3-dymous capsule, separating into three 2-valved cocci. *Seeds* globose; testa crustaceous, with a fleshy coat; albumen fleshy; cotyledons broad, flat.

1901. Cnesmone javanica Bl.; F. B. I. v. 466.

E. Bengal.

An evergreen, perennial twiner.

848. Sapium P. Br.

Trees and shrubs; *leaves* alternate, entire serrate or toothed, penninerved; petiole often 2-glandular at the apex. *Flowers* monœcious, in terminal, simple or branched spikes or racemes; perianth simple; males above, several in each bract, females in lower part of spikes or in separate spikes, solitary in the bracts. ♂ *Sepals* connate in a membranous calyx, shortly 2–3-lobed or toothed, or splitting to the base into 2–3 valvate segments. *Petals* 0. *Disk* 0. *Stamens* 2 or 3; filaments free; anthers with ovoid, distinct but contiguous, parallel cells. *Pistillode* 0. ♀ *Sepals* connate in a 3-fid or 3-partite calyx. *Petals* 0. *Disk* 0. *Carpels* connate in a 2–3-celled ovary; ovules solitary in each cell; styles free or connate at the base, spreading and recurved, entire. *Fruit* a crustaceous capsule, fleshy or pulpy, rarely woody, ultimately loculicidally 3-valved. *Seeds* globose; strophiole 0; usually long-attached to the columella; testa crustaceous; albumen fleshy; cotyledons broad, flat.

Spikes androgynous; evergreen trees:—
Leaves short-petioled, serrate, green beneath; fruit a woody, globose, tardily dehiscing capsule, 1 in. wide; spikes solitary ..... *indicum*.
Leaves long-petioled, entire, glaucous beneath:—
Leaves ovate or ovate-lanceolate; fruit indehiscent, berry-like, globose, ·35–·5 in. wide; spikes panicled ..... *baccatum*.
Leaves orbicular-ovate or subrhombic; fruit a dehiscent capsule as large as a pea; spikes solitary ..... *sebiferum*.
Spikes 1-sexual, solitary; leaves deciduous, long-petioled, serrate, green beneath; capsule ·5 in. wide, tardily dehiscent ..... *insigne*.

1902. SAPIUM INDICUM Willd.; F. I. iii. 662; F. B. I. v. 471; E. D. S. 833.
Sundribuns.
A glabrous, evergreen tree. *Beng.* Hurua, batul.

1903. SAPIUM BACCATUM Roxb.; F. I. iii. 694; F. B. I. v. 470; E. D. S. 830.
Chittagong.
A glabrous, evergreen tree.

1904. SAPIUM SEBIFERUM Roxb.; F. I. iii. 693; F. B. I. v. 470; E. D. S. 842.
Cultivated occasionally, especially in the northern parts.
A small, glabrous tree. *Beng.* Mom-china.

1905. SAPIUM INSIGNE Benth.; F. B. I. v. 471; E. D. S. 838.
Chittagong.
A stout, deciduous tree. *Hind.* Lendwa.

849. Excœcaria Linn.

Glabrous trees or shrubs, with acrid, milky juice; *leaves* alternate or opposite, entire or subserrate. *Flowers* diœcious or monœcious, minute, in lateral, axillary or terminal, 1-sexual or androgynous racemes or spikes; perianth simple; ovules 1–3 in each bract, each 2-bracteolate; females at base of racemes or in separate racemes; rachis with large glands beneath or at side of bracts. ♂ *Sepals* 3, rarely 2, small, subequal. *Petals* 0. *Disk* 0. *Stamens* 3; filaments free; anthers didymous; cells globose, distinct but contiguous. *Pistillode* 0. ♀ *Sepals* connate in a 3-fid or 3-partite calyx. *Petals* 0. *Disk* 0. *Carpels* connate in a 3-celled ovary; ovules solitary in each cell; styles stout, shortly connate below, spreading and recurved above, entire. *Fruit* a capsule of three cocci, separating from the columella, with elas-

tically twisted valves. *Seeds* globose or subglobose; strophiole 0; testa crustaceous; albumen fleshy; cotyledons broad, flat.

1906. Excœcaria Agallocha Linn.; F. I. iii. 756; F. B. I. v. 472; E. D. E. 593.

Sundribuns.

A small, poisonous evergreen tree. *Beng.* Géngwa, géo ghéria; *Uriya* Gnua.

850. Sebastiania Spreng.

Shrubs, rarely herbs; *leaves* alternate, penninerved. *Flowers* monœcious, in terminal, axillary, and lateral, slender racemes; perianth simple; males minute, 1–3 in each bract, females solitary or at the base of the raceme. ♂ *Sepals* connate in a minute, membranous, unequally 5-lobed or 5-partite calyx. *Petals* 0. *Disk* 0. *Stamens* 2–4; filaments short, free or nearly so; anther-cells contiguous, but distinct, parallel. *Pistillode* 0. ♀ *Sepals* connate in a 3-lobed or 3-partite calyx. *Petals* 0. *Disk* 0. *Carpels* connate in an exserted, 3-celled ovary; ovules solitary in each cell; styles free or connate at the base, entire, revolute or spreading. *Fruit* a globose capsule of 3 cocci, separating from a columella; endocarp crustaceous. *Seeds* oblong or subglobose, strophiolate; testa smooth; albumen fleshy; cotyledons broad, flat.

1907. Sebastiania Chamælea Muell.-Arg.; F. B. I. v. 475. *Tragia chamælea* F. I. iii. 577.

Behar; Chota Nagpur.

An erect, slender, much-branched weed.

Order CXVI. URTICACEÆ.

Herbs, shrubs, or trees. *Leaves* alternate, rarely opposite, often oblique; stipules lateral, distinct or intrapetiolar connate, often sheathing the bud. *Flowers* cymose or clustered, minute, uni-sexual or rarely polygamous, often crowded on the surface of a fleshy, flat, concave or globose receptacle, sometimes hollow and closed; bracts usually small or 0, sometimes 2–4 or more involucrate; bracteoles usually small or 0, sometimes conspicuous. *Perianth* simple, calycine, regular or irregular, equally or unequally toothed, lobed or partite, segments imbricate or valvate,

Disk hypogynous, obscure, or 0. ♂ *Stamens* as many as and opposite the perianth-lobes, sometimes adnate to their base, very rarely fewer or rather more; filaments free or rarely connate at base; anthers ovate or oblong, basifixed or dorsifixed near base; cells 2, distinct; dehiscence longitudinal, extrorse, lateral, or introrse. *Pistillode* small or 0. ♀ *Staminodes* very rare. *Carpels* 2, one fertile, one sterile, connate in a superior, rarely inferior, 1-celled ovary, or carpel solitary; ovule solitary or rarely with a second abortive ovule; style often excentric, simple or 2-fid, with stigmatic arms, or stigma sessile, plumose, or penicillate. *Fruit* simple, indehiscent, a drupe or samara, or of free achenes, or compound in a confluent mass of perianths and pericarps. *Seed* erect, lateral, or pendulous; testa membranous; albumen copious, scanty, or 0; embryo straight or curved.

*Plants with watery juice :—[p. 957]
Anthers in bud erect; style 2-fid; ovule pendulous :—
Flowers usually 2-sexual or polygamous; ovule anatropous; trees with penninerved leaves :—
Fruit dry, wide-winged; leaves deciduous; flowers appearing when branches are bare :—
Leaves serrate; perianth campanulate; cotyledons flat...**Ulmus.**
Leaves entire; perianth cleft to the base; cotyledons folded **Holoptelea.**
Fruit a drupe; leaves persistent; stipules free :—
Male sepals imbricate; cotyledons broad .....**Celtis.**
Male sepa induplicate-valvate; cotyledons narrow.....**Trema.**
Flowers dioecious; ovule obcampylotropous; herbs with digitate leaves.....**Cannabis.**
Anthers in bud reversed; stamens inflexed; style undivided or 0; ovule erect, orthotropous :—
Leaves and stems beset with stinging hairs; herbs with alternate leaves and connate stipules :—
Ovary oblique; style obliquely ovoid or linear, hooked, with sometimes 2 basal arms .....**Fleurya.**
Ovary straight; stigma subulate, papillose.....**Girardinia.**
Leaves and stems with no stinging hairs :—
†Female perianth 3–5-partite, or obsolete; stigma penicillate; flowers in cymes or clustered on a fleshy receptacle :—[p. 957]
Leaves opposite; flowers cymose or capitellate.....**Pilea.**
Leaves alternate; flowers on a fleshy receptacle; female perianth very small or none .....**Elatostema.**

†Female perianth tubular, shortly toothed or subentire, enclosing the achene :—[p. 956]

Fruiting perianth dry, membranous; stigma filiform :—

Shrubs; stigma persistent ..... **Bœhmeria.**

Herbs; stigma jointed, deciduous ..... **Pouzolzia.**

Fruiting perianth more or less fleshy :—

Ovary free; stigma penicillate; leaves narrow **Sarcochlamys.**

Ovary adnate; leaves broad :—

Stigma sessile, subpeltate, ciliate ..... **Villebrunea.**

Stigma penicillate ..... **Debregeasia.**

*Plants with milky juice :—[p. 956]

Anthers in bud reversed; stamens inflexed; ovule pendulous, anatropous; shrubs or trees :—

Style undivided, elongated; male flowers spicate, female in globose heads; achenes stipitate; dioecious trees ..... **Broussonetia.**

Style 2-fid or 2-partite :—

Female sepals fleshy in fruit and enclosing the achenes; flowers numerous, both male and female spicate, or male spicate and female subcapitate ..... **Morus.**

Female sepals not fleshy; female flowers few or solitary :—

Male flowers racemose; bracts minute; female sepals very short **Taxotrophis.**

Male flowers subcapitate :—

Bracts of male flowers many, large; female sepals foliaceous **Phyllochlamys.**

Bracts of male flowers 2; female sepals coriaceous, clasping the ovary ..... **Streblus.**

Anthers in bud erect; style undivided or 2-fid; flowers 1-sexual :—

Ovule erect, orthotropous; flowers in 1-sexual heads; climbing shrubs ..... **Conocephalus.**

Ovules pendulous, anatropous, or somewhat amphitropous :—

Flowers all exposed :—

Inflorescence elongated; flowers monœcious, male in cylindric spikes, female in racemes; small trees ..... **Balanostreblus.**

Inflorescence contracted in globose or oblong heads :—

Flowers dioecious, in small, naked, globose heads; stamens 4; scandent, spinescent shrubs ..... **Cudrania.**

Flowers monœcious, in large, oblong heads; stamen 1; erect, unarmed trees ..... **Artocarpus.**

Flowers monœcious or dioecious on the inner walls of a closed receptacle; trees or erect climbing shrubs ..... **Ficus.**

851. Ulmus Linn.

Trees; *leaves* deciduous, alternate, distichous, penninerved, margins serrate; stipules lateral, scarious. *Flowers* polygamous or hermaphrodite, males without rudimentary ovary, in fascicles or short racemes, axillary or at scars of the previous year's shoots, which are scaly but leafless. *Perianth* simple, calycine, loosely campanulate, usually 5-fid; lobes imbricate. *Stamens* 4–8, usually 5; filaments erect, ultimately exserted; anthers glabrous. *Ovary* sessile or stipitate, compressed; ovule solitary, pendulous; style short, 2-fid or 2-partite, arms stigmatic within for their whole length. *Fruit* dry, indehiscent, samaroid and flat, the nucleus expanded as an orbicular, obcordate or obovate, reticulate wing. *Seed* flat; albumen 0; cotyledons flat, equal; radicle small, superior.

1908. Ulmus lancifolia Roxb.; F. I. ii. 66; F. B. I. v. 480; E. D. U. 2.

Chittagong.

A tree, 70 feet high.

852. Holoptelea Planch.

Trees; *leaves* deciduous, alternate, distichous, penninerved, margins entire; stipules lateral, scarious. *Flowers* polygamous or hermaphrodite, males without rudimentary ovary, in fascicles at scars of previous year's shoots, which are scaly but leafless. *Perianth* simple, calycine, 4–8-partite; lobes imbricate, often unequal. *Stamens* 4–8, usually 7 or 8; filaments erect, ultimately exserted; anthers hairy. *Ovary* stipitate, compressed; ovule solitary, pendulous; style short, 2-fid, arms stigmatic within for their whole length. *Fruit* dry, indehiscent, samaroid and flat, the nucleus expanded as an obliquely ovate, reticulate wing. *Seed* flat; albumen 0; cotyledons longitudinally complicate; radicle small, superior.

1909. Holoptelea integrifolia Planch.; F. B. I. v. 481.

Ulmus integrifolia F. I. ii. 68.

Orissa; Chota Nagpur; Behar; W. Bengal.

A large, spreading tree. *Hind.* Papri, chilmil.

853. Celtis Linn.

Trees or shrubs, sometimes evergreen; *leaves* alternate, ovate, entire or serrate, bifarious, base 3-nerved; stipules lateral, free.

Flowers small, polygamous, cymose, male and androgynous cymes usually at the base of shoots, female in the upper axils; perianth simple. *Sepals* 4 or 5, imbricate. *Petals* 0. *Stamens* 4 or 5, short, in bud erect, inserted round a woolly torus. *Ovary* sessile; ovule pendulous; style central, arms simple or lobed, plumose. *Fruit* a small ovoid or globose drupe; endocarp hard, smooth or rugose. *Seed* with membranous testa; albumen scanty or 0; embryo curved; cotyledons broad, inflexed, flat or replicate, surrounding the upcurved radicle.

Drupes solitary, globose or ovoid, apex obtuse .....*tetrandra.*
Drupes racemed, ovate, narrowed to the apex .....*cinnamomea.*

1910. CELTIS TETRANDRA Roxb.; F. I. ii. 63; F. B. I. v. 482; E. D. C. 900.
Orissa; Behar; N. Bengal, Duars; Chittagong.
A tree.

1911. CELTIS CINNAMOMEA Lindl.; F. B. I. v. 482; E. D. C. 893.
Chittagong.
A tree.

854. Trema Lour.

Shrubs or trees; *leaves* alternate, serrate, base 3–7-nerved; stipules lateral, caducous. *Flowers* monœcious, subdiœcious or polygamous, in small axillary cymes; perianth simple. ♂ *Sepals* 4–5, induplicate-valvate or subimbricate. *Petals* 0. *Stamens* 4–5, erect in bud. *Pistillode* small or 0. ♀ *Sepals* as in male when stamens are present, flat and subimbricate if stamens 0. *Petals* 0. *Ovary* sessile; ovule pendulous; style central, 2-armed, arms linear. *Fruit* a small, straight, ovoid or subglobose drupe, usually tipped by the style; endocarp hard. *Seed* small; testa membranous; albumen fleshy; cotyledons narrow; radicle ascending.

Leaves distinctly unequal at base, softly pubescent beneath:—
Branchlets closely or sparingly adpressed-pubescent; leaves beneath silvery silky with adpressed pubescence, above scabrid; cymes lax, spreading, usually longer than the petioles.....*orientalis.*
Branchlets villous or tomentose, with spreading pubescence; leaves beneath silky-tomentose, velvety or villous, above scabrid or pubescent; cymes dense, compact, longer than the petioles .....*amboinensis.*
Leaves almost equal at base, very scabrid on both surfaces; branchlets stout, scabridly hairy; cymes compact, males about equalling the petioles.....*politoria.*

1912. Trema orientalis Bl.; F. B. I. v. 484; E. D. T. 522. *Celtis orientalis* F. I. ii. 65.

In all the provinces.

A small, rapidly growing "tree-weed." *Beng.* Chikun.

1913. Trema amboinensis Bl.; F. B. I. v. 484; E. D. T. 520. *Celtis tomentosa* F. I. ii. 66.

Chota Nagpur; N. Bengal, Duars; Chittagong.

A small tree, much like the preceding. *Santal.* Jhâwâr.

1914. Trema politoria Planch.; F. B. I. v. 484.

Chota Nagpur.

A small tree.

855. Cannabis Linn.

A tall, erect annual; *leaves* opposite below, alternate above, upper 1–3-, lower 5–11-partite, penninerved; lobes lanceolate, serrate; stipules 2, lateral. *Flowers* small, diœcious, males in axillary, panicled cymes, females in axillary racemes; bracts in females convolute, leafy. ♂ *Sepals* 5, imbricate. *Petals* 0. *Stamens* 5, erect in bud; filaments filiform; anthers oblong. *Pistillode* 0. ♀ *Perianth* hyaline, embracing base of ovary within the embracing bract. *Staminodes* 0. *Ovary* sessile, of 2 carpels, 1 fertile, 1 sterile, 1-locular; ovule pendulous, reversed campylotropous; style central, arms 2, filiform, caducous. *Fruit* a somewhat compressed, crustaceous nut. *Seed* somewhat flattened; albumen 1-lateral, fleshy; embryo curved; cotyledons broad, thick, subequal; radicle incumbent, upcurved.

1915. Cannabis sativa Linn.; F. I. iii. 772; F. B. I. v. 487.

Cultivated in the Khurdas of Orissa and in the Ganja mahals of N. Bengal (Rajshahi division); elsewhere a prohibited plant, though occurring as a roadside weed in most of the provinces; only the female plant is cultivated.

A tall, erect, annual woody herb. *Vernac.* Bhang, siddhi, gânjá.

856. Fleurya Gaud.

Annual herbs with stinging hairs; *leaves* alternate, toothed, 3-nerved; stipules connate in opposite pairs, or 0. *Flowers* monœcious or (not in our species) diœcious, clustered, clusters in solitary, axillary cymes or spikes, 1-sexual or androgynous; bracts

few. ♂ *Sepals* 4 or 5, ovate-lanceolate, subvalvate or imbricate. *Petals* 0. *Stamens* 4 or 5, inflexed in bud. *Pistillode* globose or clavate. ♀ *Sepals* 4, free, imbricate, or connate in a 4-lobed, cup-shaped calyx, equal or unequal, with the upper hooded and the anterior minute or obsolete. *Ovary* oblique; ovule solitary, erect; style obliquely ovoid or linear, ultimately hooked, sometimes with 2 basal arms. *Fruit* an oblique, compressed, membranous, exserted achene. *Seed* with very scanty albumen; cotyledons broad.

1916. Fleurya interrupta Gaud.; F. B. I. v. 549. *Urtica interrupta* F. I. iii. 585.

Behar; C. Bengal; very occasional.

An annual weed with stinging hairs. *Vernac.* Lal bichiti.

857. Girardinia Gaud.

Herbs or undershrubs with stout, stinging hairs; *leaves* alternate, 3-nerved, entire or lobed, serrate; stipules connate, foliaceous. *Flowers* dicœcious or (in our species) monœcious, clustered, clusters in simple or panicled spikes or heads, armed with stinging hairs; perianth simple. ♂ *Sepals* 4 or 5, valvate. *Petals* 0. *Stamens* 4 or 5, inflexed in bud; filaments free. *Pistillode* globose or cup-shaped. ♀ *Sepals* connate in a tubular-ventricose, 2–3-toothed perianth, ultimately splitting, spathaceous. *Ovary* straight; ovule solitary, erect; stigma subulate, papillose. *Fruit* a broad, compressed achene, with thickish pericarp, resting on the perianth. *Seed* with membranous testa; albumen scanty; cotyledons broad.

1917. Girardinia zeylanica Decaisne. *G. heterophylla* var. *zeylanica* F. B. I. v. 551. *Urtica heterophylla* F. I. iii. 586; E. D. G. 213.

Chota Nagpur.

A tall, stout herb or undershrub, with very stout, stinging hairs. *Vernac.* Bichua, chichr.

858. Pilea Lindl.

Herbs, rarely undershrubs; *leaves* opposite, those of a pair equal or unequal, entire or serrate, 3-nerved at base or very rarely penninerved; stipules connate, intrapetiolar. *Flowers* minute, monœcious or dicœcious, in long- or short-peduncled, dichotomously branching, axillary cymes; bracts small or 0. ♂ *Sepals* 2–4, free

or connate in a cupular calyx, often gibbous or horned dorsally. *Petals* 0. *Stamens* 2–4. *Pistillode* conical or oblong. ♀ *Sepals* 3, rarely 4, very small and unequal, dorsal longest, sometimes gibbous or hooded. *Staminodes* minute or scale-like or 0. *Ovary* straight; ovule erect; stigma sessile, penicillate. *Fruit* an ovoid or oblong, compressed, membranous or crustaceous achene, sometimes clasped at the base by the persistent sepals. *Seed* erect; testa thin; albumen very scanty; cotyledons broad.

Stout undershrubs; leaves 3-nerved, nerves and cross nervules strong *smilacifolia*.

Minute annual herbs; leaves penninerved but nerves very obscure *microphylla*.

1918. PILEA SMILACIFOLIA Wedd.; F. B. I. v. 553; E. D. P. 725.
Chittagong.
A woody undershrub, stems robust.

1919. PILEA MICROPHYLLA Liebm. *P. muscosa* F. B. I. v. 551. *Urtica minima* F. I. iii. 585.
C. Bengal; E. Bengal.
A very minute weed, extremely common on little used roadways and paths and on damp walls. The Gunpowder plant.

859. Elatostema Forst.

Herbs or undershrubs; *leaves* alternate, or sometimes with a minute leaf subopposed to the normal leaf, distichous, sessile or subsessile, usually very oblique and inequilateral, 3-nerved from the base or shortly above it; stipules lateral or intrapetiolar. *Flowers* very minute, monœcious or diœcious, crowded on sessile or peduncled, 1-sexual, usually involucrate receptacles; bracts of the involucre rounded, oblong or ovate, outer at times with a dorsal spur or horn, bases nearly free or more or less confluent in a fleshy circular or lobed disk, the tips projecting from its margin, rarely the margin entire; bracteoles densely crowded, those of ♂ heads usually oblong, of ♀ heads spathulate; florets often in clusters in the heads, each cluster surrounded by a partial bract and the head then lobulate. ♂ *Sepals* 4 or 5, 2 or more usually tubercled or spurred on the back. *Stamens* 4 or 5, inflexed in bud. *Pistillode* minute. ♀ *Sepals* 3–5, very minute, much shorter than the ovary, persistent. *Staminodes* minute or 0.

Ovary straight; ovule erect; stigma penicillate. *Fruit* a minute, ellipsoid or fusiform, usually ribbed achene, subtended by the very minute perianth. *Seed* with a membranous testa; albumen usually 0; cotyledons ovate or semi-cylindric.

Leaves small, short, sharply serrate nearly throughout, tips rounded; male receptacles sessile ..... *reptans.*
Leaves large, tips acuminate or caudate:—
Male receptacles sessile or subsessile:—
Leaves serrate from beyond the middle forwards..... *rupestre.*
Leaves quite entire ..... *sesquifolium.*
Male receptacles peduncled; leaves crenate or serrate:—
Peduncles stout; stems tomentose upwards..... *papillosum.*
Peduncles slender, short; stems quite glabrous ..... *Clarkei.*

1920. ELATOSTEMA REPTANS Hook. f.; F. B. I. v. 567.
Chittagong.
A herb with slender, creeping stems, rooting throughout their length.

1921. ELATOSTEMA RUPESTRE Wedd.; F. B. I. v. 564.
Chittagong.
A herb with stout, rigid, erect stems.

1922. ELATOSTEMA SESQUIFOLIUM Hassk.; F. B. I. v. 564.
Chittagong.
A branching undershrub or shrub, 2–6 feet high.

1923. ELATOSTEMA PAPILLOSUM Wedd.; F. B. I. v. 569.
Chittagong.
A herb with stout, erect stems.

1924. ELATOSTEMA CLARKEI Hook. f.; F. B. I. v. 569.
E. Bengal, Mymensingh.
A herb with creeping base, erect above.

860. Boehmeria Jacq.

Shrubs or small trees; *leaves* alternate or opposite, toothed, base 3-nerved; stipules free or rarely connate, deciduous. *Flowers* monœcious or diœcious, both sexes in axillary or spiked, racemed or panicled clusters; bracts small, scarious. ♂ *Sepals* 3–5, connate in a valvately lobed or partite calyx. *Stamens* 3–5, inflexed in bud. *Pistillode* clavate or globose. ♀ *Sepals* connate in a tubular, 2–4-toothed calyx, sometimes angled or winged or ventricose in fruit. *Ovary* included; ovule erect; stigma filiform, per-

sistent. *Fruit* a crustaceous achene, at first closely covered by the perianth, ultimately free. *Seed* with a thinly membranous testa; albumen copious or scanty; cotyledons ovate.

Flower clusters axillary; leaves all alternate ..... *malabarica.*
Flower clusters in simple or paniculate spikes:—
Leaves all alternate, scabrid above, snow-white except the nerves beneath ..... *nivea.*
Leaves mostly opposite, pubescent, tomentose, scaberulous or glabrate on both surfaces, green beneath..... *scabrella.*

1925. BOEHMERIA MALABARICA Wedd.; F. B. I. v. 575; E. D. B. 574.
Chittagong.
An erect shrub or small tree.

1926. BOEHMERIA NIVEA Hook. & Arn.; F. B. I. v. 576; E. D. B. 576. *Urtica tenacissima* F. I. iii. 590.
N. Bengal, cultivated.
A shrub with herbaceous shoots. *Beng.* Kankhúra.
The Rhea plant.

1927. BOEHMERIA SCABRELLA Gaud. *B. platyphylla* Don var. *scabrella* F. B. I. v. 578; E. D. B. 612. *Urtica scabrella* F. I. iii. 581.
Orissa; Chota Nagpur; N. Bengal.
A shrub.

861. Pouzolzia Gaud.

Herbs, undershrubs, or shrubs; *leaves* alternate, or the lower, rarely all, opposite, usually entire, 3-nerved at base, smaller upwards, with the uppermost often reduced to bracts; stipules free, often persistent. *Flowers* minute, usually monœcious, in 1-sexual or androgynous clusters, sessile in axils of leaves or bracts, individual florets pedicelled; bracteoles small. ♂ *Sepals* connate in a 4–5-partite or -lobed, rarely 3-partite calyx; lobes valvate, with concave or abruptly inflexed tips and transversely plicate backs. *Stamens* 4 or 5, rarely 3. *Pistillode* clavate or oblong. ♀ *Sepals* connate in a tubular perianth, often beaked; mouth contracted, 2–4-toothed. *Ovary* included; ovule erect; stigma filiform, jointed to apex of ovary, soon deciduous. *Fruit* a small achene with brittle, shining pericarp, enclosed in but usually free from the marcescent perianth. *Seed* with membranous testa; albumen very scanty or 0; cotyledons ovate.

Lobes of the male perianth convex or gibbous on the back :—
Leaves opposite or alternate, nerves 1 pair above the basal, sparingly branched; stamens 4, rarely 5 :—
Leaves mostly alternate, base cuneate .....*indica.*
Leaves mostly opposite, base rounded .....*indica* var. *alienata.*
Leaves all alternate, nerves many, branching; stamens always 5 *auriculata.*
Lobes of the male perianth abruptly inflexed about the middle, transversely folded at the flexure, hence the buds truncate; leaves with 3 simple primary nerves running nearly or quite to leaf-apex :—
Stem terminating in a bracteate spike .....*pentandra.*
Stem not running out into a bracteate spike .....*hirta.*

1928. POUZOLIA INDICA Gaud.; F. B. I. v. 581. *Urtica suffruticosa* F. I. iii. 584.
In most of the provinces.
A perennial herb.

1928/2. Var. ALIENATA Wedd.; F. B. I. v. 581. *Urtica alienata* F. I. iii. 582.
In all the provinces.
A perennial herb.

1929. POUZOLZIA AURICULATA Wight; F. B. I. v. 582.
Chota Nagpur.
A tall perennial herb.

1930. POUZOLZIA PENTANDRA Benn.; F. B. I. v. 583; E. D. p. 1214. *Urtica pentandra* F. I. iii. 583.
Orissa; Chota Nagpur.
A tall, stout annual, 2–3 feet high. *Hind.* Piparisari.

1931. POUZOLZIA HIRTA Hassk.; F. B. I. v. 586.
Chota Nagpur.
A slender, decumbent, or suberect herb.

862. Sarcochlamys Gaud.

A shrub; *leaves* alternate, petioled, narrow, toothed, finely rugose, 3-nerved at base, white beneath; stipules connate at base, intrapetiolar. *Flowers* dioecious, clustered, male clusters in rather slender, more or less interrupted, female clusters in stouter, cylindric, almost continuous axillary spikes; bracteoles minute. ♂ *Sepals* 5, connate in a 5-partite perianth; lobes imbricate, somewhat concave. *Stamens* 5. *Pistillode* small. ♀ *Sepals* connate in an ovoid, campanulate perianth, with constricted, unequally

4-lobed limb, ultimately accrescent, gibbous, with the mouth pushed to one side. *Ovary* oblique; ovule erect; stigma small, sessile, penicillate. *Fruit* an oblique achene, enclosed in the fleshy perianth; pericarp membranous. *Seed* with hard testa; albumen obsolete; cotyledons ovate.

1932. SARCOCHLAMYS PULCHERRIMA Gaud.; F. B. I. v. 588; E. D. S. 869. *Urtica pulcherrima* F. I. iii. 588.

E. Bengal, Mymensingh; Tippera; Chittagong.

An evergreen large shrub or small tree.

863. Villebrunea Gaud.

Trees or shrubs; *leaves* petioled, alternate, entire or crenulate, penninerved or 3-nerved at base; stipules partly connate, intrapetiolar. *Flowers* diœcious, densely, capitately fascicled, fascicles solitary or laxly cymose; bracts small or linear; bracteoles sometimes connate, cupular. ♂ *Sepals* 4, connate in a 4-partite perianth, segments ovate-acute, valvate or slightly imbricate, subglobose in bud. *Stamens* 4. *Pistillode* obovate-clavate. ♀ *Sepals* connate in a tubular perianth, adnate to the ovary; mouth narrowed, minutely toothed. *Ovary* erect, covered by the adherent perianth; ovule erect; stigma sessile, small or discoid, with penicillate margin. *Fruit* a crustaceous achene, closely adnate to the slightly fleshy perianth. *Seed* straight, often acuminate; testa thinly membranous; albumen distinct or scanty; cotyledons ovate or broad.

1933. VILLEBRUNEA INTEGRIFOLIA Gaud.; F. B. I. v. 589; E. D. v. 133.

Chittagong.

An evergreen tree. *Vernac.* Ban rhea.

864. Debregeasia Gaud.

Shrubs; *leaves* alternate, petioled, serrate-crenate, 3-nerved; stipules connate, intrapetiolar, 2-fid. *Flowers* monœcious or diœcious, in dense, globose, panicled or spicate, sessile clusters; bracts of male clusters scarious. ♂ *Sepals* connate in a 4-partite, rarely 3- or 5-partite perianth; lobes valvate. *Stamens* 4, rarely 3 or 5. *Pistillode* glabrous or woolly at base. ♀ *Sepals* connate in an ovoid or obovoid perianth, with narrowed and minutely toothed mouth, succulent in fruit. *Ovary* straight, included; ovule erect; stigma sessile, penicillate. *Fruit* an achene, at first

adnate to fleshy perianth. *Seed* with membranous testa; albumen copious or scanty; cotyledons short, broad.

1934. DEBREGEASIA DENTATA Hook. f.; F. B. I. v. 591.
Chittagong.
A much-branched bush, 10 feet high.

865. Broussonetia Vent.

Trees or shrubs; juice milky; *leaves* alternate, serrate or lobed; stipules lateral, deciduous. *Flowers* diœcious, males in solitary, cylindric spikes, females in solitary, axillary heads, mixed with persistent bracts. ♂ *Sepals* connate in a 4-fid or 4-partite perianth; lobes valvate. *Stamens* 4, inflexed in bud. *Pistillode* minute. ♀ *Sepals* connate in an ovoid or tubular, 3–4-toothed, persistent perianth. *Ovary* included, stipitate; ovule pendulous; style subulate, 2-partite. *Fruit* of many exserted, stipitate achenes, aggregated in small heads, surrounded by the bracts and perianths, fleshy below, crustaceous above. *Seed* with thin testa, adnate to endocarp; albumen scanty; cotyledons oblong, equal; radicle incumbent, ascending.

1935. BROUSSONETIA PAPYRIFERA Vent.; F. B. I. v. 490; E. D. B. 883.
Planted occasionally, and wherever planted springing up spontaneously.
A tree; native of Burma, Malaya, and Polynesia. The Paper Mulberry.

866. Morus Linn.

Trees or shrubs; juice milky; *leaves* alternate, entire, toothed or 3-lobed, base 3–5-nerved; stipules small, lateral, caducous. *Flowers* monœcious or diœcious, spicate, male spikes elongated, catkin-like, female long cylindric, or short oblong or subglobose. ♂ *Sepals* 4, imbricate. *Stamens* 4, inflexed in bud. *Pistillode* turbinate. ♀ *Sepals* 4, decussate-imbricate, accrescent and succulent in fruit. *Ovary* included, straight; ovule pendulous; style central, 2-partite or 2-fid. *Fruit* of achenes enclosed in the succulent perianths, which are aggregated in berry-like spikes or heads. *Seed* subglobose; albumen copious, fleshy; embryo incurved; cotyledons oblong, equal; radicle ascending.

*Female spikes short, ovoid [p. 968] ..... *indica.*

*Female spikes long, cylindric:—[p. 967]
Leaves cuspidate ..... *lævigata.*
Leaves rounded at the top ..... *lævigata* var. *viridis.*

1936. MORUS INDICA Linn.; F. I. iii. 596; F. B. I. v. 492; E. D. M. 757.
Cultivated for silkworm feeding, on high ground, in Behar, Tirhut, and N. Bengal.
A shrub or small tree. *Vernac.* Tút, Tutri.

1937. MORUS LÆVIGATA Wall.; F. B. I. v. 492; E. D. M. 772.
Cultivated in Behar and Tirhut.
A medium tree. *Vernac.* Tút.

1937/2. Var. VIRIDIS F. B. I. v. 493.
Cultivated in Behar.
A medium tree. *Vernac.* Tút.

867. Taxotrophis Bl.

Armed trees or shrubs; spines axillary; *leaves* alternate, penninerved; stipules small, connate, caducous. *Flowers* dicœcious; males in short spikes, racemes, or follicles, females 1–4 on a long peduncle. ♂ *Sepals* 4, valvate. *Stamens* 4, inflexed in bud. *Pistillode* dilated at apex. ♀ *Sepals* 4, imbricate, persistent and shorter than the fruit. *Ovary* ovoid, at first straight, ultimately oblique; ovule pendulous; style 2-partite, at length lateral. *Fruit* obliquely subglobose, fleshy on one side and at the base, thin at the apex. *Seed* oblique; albumen 0; cotyledons broad, fleshy, corrugate; radicle ascending.

1938. TAXOTROPHIS ZEYLANICA Thw.; F. B. I. v. 488.
N. Bengal, Duars.
A small evergreen tree.

868. Phyllochlamys Bur.

Armed trees or shrubs; spines axillary; juice milky; *leaves* alternate, penninerved; stipules lateral, free. *Flowers* dicœcious; males in short, axillary, involucrate spikes or clusters; females solitary, peduncled. ♂ *Sepals* connate below in a 3–4-partite perianth; lobes ovate, imbricate. *Stamens* 3 or 4, inflexed in bud. *Pistillode* dilated at apex. ♀ *Sepals* 3 or 4, accrescent and leafy in fruit. *Ovary* at first straight, ultimately very oblique; ovule pendulous; style 2-partite, at length lateral. *Fruit* small, shorter than the sepals, obliquely globose or ovoid, somewhat

fleshy below, apex thin and umbonate. *Seed* oblique; albumen scanty; embryo globose, one cotyledon large and 2-fid, enclosing the other; radicle ascending.

1939. PHYLLOCHLAMYS SPINOSA Bur.; F. B. I. v. 488. *Trophis spinosa* F. I. iii. 762.

Orissa.

A small, gnarled, evergreen tree.

869. Streblus Lour.

Shrubs or trees; juice milky; *leaves* alternate, penninerved, scabrid; stipules small, subulate. *Flowers* axillary, dicœcious, very rarely monœcious, males in peduncled heads or spikes, females bracteate, solitary or 2–4 together. ♂ *Sepals* 4, imbricate. *Stamens* 4, inflexed in bud. *Pistillode* dilated at apex. ♀ *Sepals* 4, imbricate, embracing the ovary. *Ovary* straight, retuse; ovule pendulous; style central, arms very long. *Fruit* membranous, straight, subglobose, laxly covered by the persistent perianth. *Seed* globose, with membranous testa; albumen 0; embryo globose, one cotyledon very large, embracing the smaller and the ascending radicle.

1940. STREBLUS ASPER Lour.; F. B. I. v. 489; E. D. S. 2912. *Trophis aspera* F. I. iii. 761.

In all the provinces.

A rigid shrub or gnarled tree. *Hind.* Sehora; *Beng.* Shiora; *Santal.* Sahra; *Uriya* Sahuda.

870. Conocephalus Bl.

Large climbing shrubs; *leaves* alternate, simple, quite entire, penninerved and sometimes also 3-nerved at base; stipules intrapetiolar, connate. *Flowers* dicœcious, in axillary, usually cymose heads. ♂ *Sepals* connate in a 4-lobed or 4-partite perianth, segments valvate. *Stamens* 3 or 4, erect in bud. *Pistillode* small. ♀ *Sepals* connate in an oblong, 4-lobed perianth. *Ovary* included; ovule erect, orthotropous; style undivided; stigma linear, oblique or recurved. *Fruit* an included achene. *Seed* erect; testa membranous; albumen scanty or 0; embryo straigh' cotyledons fleshy or thin, equal; radicle superior, short.

1941. CONOCEPHALUS SUAVEOLENS Bl.; F. B. I. v. 545. *Urtica naucleiflora* F. I. iii. 592.

N. Bengal, Duars; Chittagong.

An extensive climber. *Vernac.* Dolia sát.

lobed, serrate or toothed; stipules clothing the bud, caducous. *Flowers* minute, 1-sexual, monœcious, very rarely diœcious, on the inner walls of a fleshy receptacle, the mouth of which is closed by imbricate bracts; florets often mixed with bracteoles, of four forms: male, female, gall and, rarely, neuter; receptacles sometimes 1-sexual, but usually androgynous, the males nearest the mouth; males, females, and galls may occur in same receptacle, or males and galls may be in one set, females and neuters in another, or males and galls in one set, females only in another. ♂ *Sepals* connate in a 2–6-fid or -partite perianth. *Stamens* 1 or 2, rarely 3–6, erect in bud. Neuters; *Sepals* as in males. ♀ *Sepals* as in males, or imperfect or obsolete. *Ovary* straight or oblique; ovule pendulous; style excentric; stigma entire or 2-armed, acute or obtuse. Gall florets; *Sepals* as in females. *Ovary* containing pupa of a *Hymenopterous* insect; style short, often dilated upwards. *Fruit* an enlarged, hollow, cup-shaped, closed receptacle, its inner wall studded with crustaceous or fleshy achenes. *Seed* pendulous; testa membranous; albumen scanty; embryo curved; cotyledons equal or unequal; radicle ascending.

Pseudo-hermaphrodite, male flowers with one stamen and a rudimentary pistil in one series of receptacles; fertile female flowers in a different series (§ *Palæomorphe*):—

Stipules at least twice as long as the petioles, subulate, more than an inch long; leaves with apices abruptly caudate; female perianth gamophyllous ..... *subulata.*

Stipules not longer than the petioles:—

Stipules ·3–·5 in. long, ovate-lanceolate; female perianth partite to the base:—

Leaves elongate, ovate-lanceolate, acuminate, minutely tubercled beneath; nerves lucid ..... *gibbosa* var. *cuspidifera.*

Leaves broad, rhomboid, scabrid on both surfaces; nerves opaque ..... *gibbosa* var. *parasitica.*

Stipules very minute, subulate; leaves ovate-elliptic, abruptly caudate; female perianth gamophyllous ..... *urophylla.*

Unisexual or asexual, male flowers without rudimentary pistils:—

*Male, gall, and fertile female flowers in the same receptacle (§ *Urostigma*):—[p. 975]

†Petioles ·25–1·5 in. long, rarely (*F. bengalensis* occasionally) as much as 2 in. long, and then with petiole stout, stiff, and leaf horizontal, rigid; receptacles in pairs, axillary or from scars of fallen leaves:—[p. 974]

‡Receptacles sessile or rarely (*F. glabella* sometimes) with short peduncles ·1–·2 in. long:—[p. 974]

Stipules always rather longer than the petioles:—

Leaves broadly elliptic or subobovate elliptic, apex shortly cuspidate; petiole ·75–1·5 in.; stipules 1–1·75 in. long; young parts and leaves beneath at first puberulous; base of leaf 3–5-nerved, rounded.....*altissima* var. *laccifera*.

Leaves narrowly elliptic or oblanceolate, apex obtuse; petiole ·5–·75 in., stipules ·75–1 in. long; all parts glabrous; base of leaf faintly 3-nerved, cuneate .....*obtusifolia*.

Stipules never longer than the petioles, rarely (*F. bengalensis*, *F. retusa*) equalling the petioles, usually considerably shorter:—

Receptacle large, ·75 in. across or more; leaves acute:—

Leaves less than 5 in. long; lateral nerves very numerous, primary and secondary subequal, all slender, close, straight; petiole ·5–1 in., stipules ·5 in. long; all parts glabrous; receptacles ·75 in. across, with small basal bracts

Benjamina var. *comosa*.

Leaves 5–8 in. long; lateral primary nerves 12–20 pairs, prominent below, much stronger than secondary, somewhat ascending, base 7–9-nerved; petiole ·75–1·25 in., stipules ·25–·5 in. long; young shoots rusty-tomentose; receptacles 1·25 in. across, with large basal bracts

mysorensis var. *subrepanda*.

Receptacles smaller, ·5 in. across or less:—

Leaves obtuse, puberulous beneath when young, at length glabrous; young shoots grey-pubescent; basal nerves 3–7, primary lateral about 5 pairs, much stronger than secondary; petiole ·5–1·5, rarely 2 in. long, stipules ·5–1 in. long; receptacle ·4–·5 in. long, basal bracts large

bengalensis.

Leaves sharp-pointed:—

Leaf-base rounded or somewhat cordate, 5–7-nerved, persistently tomentose beneath; young shoots and receptacles rusty-grey pubescent; primary lateral nerves about 5 pairs, much stronger than secondary; petiole ·75–1 in. long, stipules ·3–·5 in. long; receptacle ·5 in. across, basal bracts large .....*tomentosa*.

Leaf-base cuneately narrowed towards the petiole, 3-nerved, glabrous beneath; primary lateral nerves hardly appreciably stronger than secondary; receptacle smooth, ·3 in. across, basal bracts small:—

Receptacles blueish-purple, sessile or with short peduncles ·1–·2 in. long; leaves obovate oblong or oblanceolate; primary lateral nerves 7–10 pairs; young parts pubescent or glabrous; petiole ·75–1 in., stipules ·3 in. long ..... *glabella.*

Receptacles yellowish or reddish; primary lateral nerves of leaves 5–6 pairs; all parts glabrous; petiole ·25–·5 in., stipules ·25–·5 in. long:—

Leaves subrotund, 3–4 in. long ..... *retusa.*

Leaves ovate- or rhomboid-elliptic, 2–3 in. long *retusa* var. *nitida.*

‡Receptacles on distinct, slender peduncles, ·25–·5 in. long; leaves elliptic-oblong or ovate-lanceolate or oblanceolate, rather narrowly acuminate, base narrowed; primary lateral nerves 7–10 pairs, stronger than the secondary:—[p. 973]

Petiole rather long, ·75–1·25 in., stipules glabrous, ·5–·75 in. long; receptacle ·25 in. across, with 3 basal bracts... *glaberrima.*

Petiole short, ·25–·5 in., stipules pubescent, ·5 in. long; receptacle ·5–·75 in. across, without basal bracts but with 3 small free bracts low down on the peduncle ..... *nervosa.*

†Petioles rarely less than 2 in., usually 2·5 in. long or longer; if 1·5–2 in. long (*F. infectoria* only) the petiole slender and flexible, and the leaf pendent, aspen-like:—[p. 972]

Leaves 5–7-nerved at the base, broadly ovate; stipules glabrous:—

Apex of leaf narrowed into a tail half as long as the main portion of the lamina; base rounded or truncate, rarely cordate; stipules minute; petiole 3–4 in. long; receptacles sessile *religiosa.*

Apex of leaf narrowed into a cusp only one-fifth the length of main portion of lamina; stipules large, ·5–1 in. long:—

Base of leaf truncate or slightly narrowed into the petiole, basal nerves 5, with rarely 2 small lateral ones; receptacles sessile, always in pairs, axillary or from leaf-scars; petiole 2·5–3·5 in. long ..... *Rumphii.*

Base of leaf truncate-emarginate to deeply cordate; basal nerves always 7, all strong; receptacles usually shortly peduncled in pairs or groups from tubercles most below the leaves; petiole 2–6 in. long ..... *Arnottiana.*

Leaves 3-nerved at the base, apex abruptly narrowed into a short tail:—

Petiole 2·5–4 in. long; stipules pubescent, ·3 in. long; leaves broadly elliptic or ovate-rounded; primary lateral nerves 8–12

pairs; receptacles sessile, in groups of 2–4 from axils of fallen leaves; sepals of male flowers connate .....*geniculata.*
Petiole 1·5–2 in. long; stipules glabrous, ·5 in. long, ovate or ovate-oblong; primary lateral nerves 5–7 pairs; receptacles in axillary pairs; sepals of male flowers free :—
Leaves almost membranous, base emarginate, subcordate or slightly narrowed; receptacles sessile, ·25 in. across
infectoria.
Leaves coriaceous, base broad, rounded, emarginate or subcordate; receptacles pedicelled, ·35–·45 in. across
infectoria var. *Lambertiana.*

*Male and gall-flowers in one set of receptacles, fertile female flowers in another set :—[p. 972]

§Flowers in male receptacles with one stamen :—[p. 976]

*Receptacles in part if not wholly axillary :—[p. 976]

Small shrubs creeping on the ground or over rocks, or if erect shrubs, then the leaves always all alternate; leaves alternate, more or less ovate or oblong; receptacles only in leaf-axils or from axils of scars of fallen leaves (§ *Sycidium*) :—
Receptacles usually solitary by abortion of one of a pair, all axillary peduncled; leaves with irregularly toothed or repand margin, base rounded, truncate or cordate, 3–5-nerved :—
Petioles under an inch long, less than half the length of the more or less scabrid lamina :—
Leaves variously broad and lobed, or broad or narrow and unlobed on the same plant.....*heterophylla.*
Leaves all rather narrow, never lobed
heterophylla var. *scabrella.*
Petioles over an inch long, quite half the length of the more or less hairy lamina or longer; leaves lobed or not lobed..... *heterophylla* var. *repens.*
Receptacles in axillary pairs or clustered; leaves with cuneate, 3-nerved base :—
A scandent or creeping, rarely erect shrub; receptacles sometimes clustered, always subsessile; leaves narrowly oblong, elliptic or lanceolate, abruptly caudate, entire or subsinuately toothed .....*rostrata.*
A small, erect tree; receptacles always in axillary pairs and peduncled; leaves oblong to elliptic, obovate or lanceolate, acute or cuspidate, entire .....*lepidosa.*
Erect or spreading shrubs or trees; leaves some, if not all, opposite; receptacles both in the axils of leaves or of scars of

fallen leaves, and tubercles on the stem and older branches, or on short, leafless branches from the old wood in the same individual (§ *Covellia* in part) :—

Erect small trees or shrubs; leaves sparse, sometimes all opposite, sometimes all alternate, rather broad, more or less ovate or oblong, to ovate- or obovate-lanceolate; receptacles never ribbed, sometimes axillary, sometimes clustered on the stems and branches :—

All parts glabrous except the young shoots, which are beset with a few stiff, adpressed hairs; stipules scarious; receptacles dimorphous, in some individuals all axillary and short peduncled, in others all fascicled on stem and large branches and long peduncled, the last usually containing only fertile female flowers.....*fistulosa.*

All parts more or less hispid-pubescent; stipules membranous, often in whorls of 4 on leafless fruit-bearing branches; receptacles all similar, in some individuals all axillary, in others all on branches from stem near the root, in still others occupying both situations; leaves usually all opposite, but in some individuals all quite alternate...*hispida.*

Spreading shrubs; leaves crowded, always all opposite, narrowly lanceolate or oblanceolate, young parts densely but deciduously hirsute; receptacles 8–10-ribbed, solitary by abortion of one of a pair, in the axils of leaves or of fallen leaves, or on short, leafless branches from the old wood .....*laminosa.*

¶Receptacles confined to specialised branches bearing scales, but very rarely leaves, issuing from the base of the stem near the ground and from the larger branches; small, erect trees with alternate leaves (§ *Covellia* in part) :—[p. 975]

Fruit-bearing branches short, much ramified; receptacles long peduncled, nearly smooth; leaves broadly ovate, equal or very slightly unequal at the base; petioles long, 1·5–6 in. *conglobata*

Fruit-bearing branches long, little branched; receptacles short peduncled, hispid; leaves long, rather narrowly lanceolate, very unequally subauriculate, cordate at the base; petiole short, ·3–·6 in. .....*Cunia.*

§Flowers in male receptacles almost always with 2 stamens, rarely (*F. lævis*) with sometimes 2, sometimes 3 stamens, or (*F. variegata* sometimes 2 stamens, sometimes 1 stamen; if with 1 stamen the receptacles on tubercles on stem and branches, but never in leaf axils nor on specialised branches near the base of the stem :—[p. 975]

⊙Receptacles all axillary or occasionally (*F. ramentacea*) both

axillary and from small scaly tubercles in the leaf-axils, or in the axils of scars below the leaves (§ *Eusyce*) :—[p. 978]

÷ Scandent or creeping and rooting shrubs :—[p. 978]

Leaves dimorphous, those of the receptacle-bearing, spreading, non-rooting branches distinctly petioled, 2·5–3 in. long, larger than those of the barren, clinging, and rooting branches which are 1 in. or less in length, and have very short petioles ; receptacles solitary, axillary, pyriform, 2 in. long, 1·5 in. across *pumila.*

Leaves all similar or subsimilar :—

Leaves almost sagittately cordate at the 5–7-nerved base, the narrow sinus and subauricled lobes as long as the petiole, elliptic ovate or oblong, acute, 5–10 in. long ; nerves silky beneath ; stipules ·75–1·3 in. as long as the petioles ; receptacles short-peduncled, solitary or in pairs, ·3–·5 in. across ; branches rooting at the nodes ..... *criniervia.*

Leaves cuneate or rounded at base, or if cordate the sinus very wide and shallow : —

Receptacles on peduncles as long as their width, solitary or subsolitary by abortion of one of an axillary pair :—

Leaves orbicular or broadly ovate, or elliptic, cuspidate, 4–7 in. long, base rounded to cordate, 5–7-nerved, usually glabrous ; petioles 1·5–2·5 in., stipules ·3–·5 in. long ; receptacles ·5–1 in. across ; peduncles ·6–1 in. long ; an epiphytic climber, becoming ultimately a small tree ..... *lævis.*

Leaves ovate or elliptic ovate, acute or subacute, 2–3·5 in. long, base rounded, strongly 3-nerved, subscabrid ; petioles ·25–·5 in., stipules ·25 in. long ; receptacles ·3 in. across ; peduncles ·3–·5 in. long ; scandent, often rooting at the nodes ..... *scandens.*

Receptacles sessile or subsessile, on peduncles shorter than their own diameter ; leaves ovate-elliptic or oblong, rarely lanceolate :—

Receptacles usually solitary, always axillary ; leaves 1·25–6 in. long, base 3-nerved ; petiole ·2–·5 in. long, never exceeding the ·5 in. long stipules ; a creeper or lofty climber ..... *foveolata.*

Receptacles partly solitary or paired axillary, or in clusters from axillary or rameal, small, scaly tubercles ; leaves 2·5–8 (sometimes on young shoots 11) in. long, base 5–7-nerved ; petiole ·75–1·3 in. long, always

exceeding the ·5 in. long stipules; a large, epiphytic climber, becoming at length a tree .....*ramentacea.*

÷Erect shrubs or small trees:—[p. 977]

Leaves polymorphous, ovate, elliptic, rounded or oblong-lanceolate, 5–12 in. long, acuminate, entire, serrate or lobed, base rounded or cordate, 3–7-nerved; stipules ovate-lanceolate, usually shorter than petiole, ·3–1 in. long; receptacles globose with ♀, ovoid with ♂ and gall-flowers, ·75–1 in. long, sessile or subsessile .....*hirta.*

Leaves similar, linear-lanceolate or oblong-lanceolate, 3–4 in. long, acute, entire, base cuneate, 3-nerved; stipules subulate, about as long as petiole, ·25–·5 in. long; receptacles pyriform, ·5–·75 in. long, on peduncles ·35–·5 in. long *pyriformis* var. *ischnopoda.*

⊙Receptacles all in fascicles from the stem and branches, very rarely (*F. glomerata* occasionally) also a few in axillary pairs (§ *Neomorphe*); all peduncled:—[p. 976]

Receptacles 2·5 in. across or larger; leaves broadly ovate or rounded, 5–15 in. long, base rather deep cordate, 5–7-nerved; stipules ·5–1 in., always shorter than the petioles, 1–4 in. long *Roxburghii.*

Receptacles 1·25 in. across or smaller; leaves not or only slightly cordate at the base:—

+Stipules ·5–·8 in. long, always shorter than the petioles; leaves ovate or elliptic to oblong or broadly lanceolate, 4–8 in. long; considerable trees:—[p. 979]

Receptacles 4–6-grooved, sometimes warted, on tubercles on on short, leafless branches on the stem and large branches; leaves acute, coarsely serrate, base rounded or subcuneate, 3–5-nerved; petiole 1·5–3·5 in. .....*pomifera.*

Receptacles smooth; leaves acuminate; petiole 1–2 in.:—

Leaves 5-nerved at the rounded, notched, or slightly cordate base, margins subrepand or denticulate; receptacles all on tubercles on stem and branches ...*variegata.*

Leaves 3-nerved at the obtuse, rarely cuneate base, margins entire; receptacles on short, very scaly branches from the stem and large branches:—

Receptacles subglobose, some of them occasionally in axillary pairs .....*glomerata.*

Receptacles pyriform:—

Leaves ovate to obovate *glomerata* var. *Chittagonga.*

Leaves oblong-lanceolate ...*glomerata* var. *elongata.*

+Stipules ·5 in. long, always as long as the petiole, ·35-·5 in. long; leaves narrow, lanceolate, 4–8 in. long, base cuneate, 3-nerved; receptacles warted; a much-branched, glabrous shrub [p. 978] ..... *lanceolata.*

1948. FICUS SUBULATA Bl.; F. B. I. v. 497. *F. acuminata* F. I. iii. 538.
Chittagong.
A straggling or semi-scandent, diœcious shrub.

1949. FICUS GIBBOSA Bl. var. CUSPIDIFERA King; F. B. I. v. 497; E. D. F. 171.
Chittagong.
A tree.

1949/2. Var. PARASITICA King; F. B. I. v. 497. *F. Ampelos* F. I. iii. 553. *F. sclerophylla* F. I. iii. 546.
Chota Nagpur; Behar; W. Bengal; Orissa.
A tree.

1950. FICUS UROPHYLLA Wall.; F. B. I. v. 498.
Chittagong.
An erect shrub or small tree.

1951. FICUS ALTISSIMA Bl. var. LACCIFERA F. B. I. v. 504; E. D. F. 118. *F. laccifera* F. I. iii. 545.
Chittagong.
A large, spreading tree, with few aerial roots. *Vernac.* Kathal bat.

1952. FICUS OBTUSIFOLIA Roxb.; F. I. iii. 546; F. B. I. v. 507; E. D. F. 228.
Chittagong.
A large tree, epiphytic when young. *Magh.* Daté.

1953. FICUS BENJAMINA Linn. var. COMOSA Kurz; F. B. I. v. 508; E. D. F. 145. *F. comosa* F. I. iii. 552.
Chota Nagpur; Chittagong: often planted elsewhere.
A large, spreading tree, with drooping branches and few aerial roots. *Hind.* Jili; *Santal.* Sunonijar.

1954. FICUS MYSORENSIS Bl. var. SUBREPANDA King; F. B. I. v. 508; E. D. F. 223.
Chittagong.
A large, spreading tree, with few aerial roots.

1955. FICUS BENGALENSIS Linn.; F. B. I. v. 499; E. D. F. 129. *F. indica* F. I. iii. 539.

Generally planted, but also appearing spontaneously on tombs and other buildings.

A large tree, with rooting branches, the roots forming accessory trunks. *Hind.* Bor, bargat; *Beng.* Bar, but; *Uriya* Boru; *Santal.* Baré; *Kol.* Bai. The Banyan.

1956. FICUS TOMENTOSA Roxb.; F. I. iii. 550; F. B. I. v. 501.
Chota Nagpur; Behar.
A large, spreading tree, emitting aerial roots from the branches.

1957. FICUS GLABELLA Bl. var. AFFINIS King; F. B. I. v. 511.
Chittagong.
A tree.

1958. FICUS RETUSA Linn.; F. B. I. v. 511; E. D. F. 253.
Chota Nagpur; Behar.
A large, wide-spreading tree.

1958/2. Var. NITIDA King; F. B. I. v. 511. *F. Benjamina* F. I. iii. 550.
In most of the provinces.
A large, spreading tree, with some aerial roots. *Beng.* Kamrup, zir; *Kol.* Butisa; *Santal.* Sunumjon.

1959. FICUS GLABERRIMA Bl.; F. B. I. v. 506. *F. angustifolia* F. I. iii. 554.
Chittagong.
A tall tree.

1960. FICUS NERVOSA Roth; F. B. I. v. 512.
Chota Nagpur, Singhbhum; Chittagong.
A tree.

1961. FICUS RELIGIOSA Linn.; F. I. iii. 547; F. B. I. v. 513.
In all the provinces.
A large tree, almost always at first epiphytic or commencing life on buildings. *Hind.* Pipal; *Beng.* Asvattha; *Santal.* Hesak; *Uriya* Jari; *Kol.* Hesar, pipar. The Pipal.

1962. FICUS RUMPHII Bl.; F. B. I. v. 512; E. D. F. 265. *F. cordifolia* F. I. iii. 548.
In all the provinces.
A large tree, usually at first epiphytic. *Hind.* Khabar; *Beng.* Gaiasvattha; *Kol.* Sumanpipar; *Santal.* Sunamjor.

1963. FICUS ARNOTTIANA Miq.; F. B. I. v. 513.

Behar; Chota Nagpur; N. Bengal.
A small tree or large shrub.

1964. FICUS GENICULATA Kurz; F. B. I. v. 516.
Chittagong.
A large tree.

1965. FICUS INFECTORIA Roxb.; F. I. iii. 550; F. B. I. v. 515; E. D. F. 216.
N. Bengal; Tirhut; Chota Nagpur; Chittagong.
A small deciduous tree. *Hind.* Pilkhan, pakur; *Beng.* Pakur; *Kol.* Basweza.

1965/2. Var. LAMBERTIANA King; F. B. I. v. 516.
Chota Nagpur.
A deciduous tree.

1966. FICUS HETEROPHYLLA Linn. f.; F. I. iii. 532; F. B. I. v. 518; E. D. F. 194.
Tirhut; N. Bengal; E. Bengal.
A scabrid or pubescent, creeping shrub, growing usually near water. *Beng.* Gaori-sheora, ghoti-sheora.

1966/2. Var. SCABRELLA King; F. B. I. v. 519. *F. scabrella* F. I. iii. 532.
N. Bengal; E. Bengal; Chittagong.
A scabrid, creeping shrub. *Beng.* Ballam-dumar.

1966/3. Var. REPENS King; F. B. I. v. 519. *F. repens* F. I. iii. 535.
N. Bengal; C. Bengal; E. Bengal; Chittagong.
A pubescent, creeping shrub, near banks of ponds and ditches. *Beng.* Bhui-dumar.

1967. FICUS ROSTRATA Lamk.; F. B. I. v. 520. *F. radicans* F. I. iii. 536.
Chittagong.
A scandent or creeping, rarely erect shrub. *Vernac.* Pura ruha.

1968. FICUS LEPIDOSA Wall.; F. B. I. v. 522.
Chittagong.
A small erect tree.

1969. FICUS FISTULOSA Reinw.; F. B. I. v. 525.
Chittagong.
A shrub or small tree.

1970. FICUS HISPIDA Linn. f.; F. B. I. v. 522; E. D. F. 202. *F. oppositifolia* F. I. iii. 561. *F. dæmonum* F. I. iii. 562.

In all the provinces.

A shrub or small tree. *Hind.* Kagsha, konea-dumbar *Beng.* Dumar, kak-dumar; *Santal.* Sita pordóh.

1971. Ficus laminosa Hardw.; F. I. iii. 531. *F. squamosa* F. I. iii. 531. *F. sæmocarpa* F. B. I. v. 523.

Tirhut, Bettiah; N. Bengal, Duars.

A low shrub, in beds of rocky or sandy streams.

1972. Ficus conglobata King; F. B. I. v. 522.

Chittagong.

A small tree.

1973. Ficus Cunia Ham.; F. I. iii. 561; F. B. I. v. 523; E. D. f. 156.

In most of the provinces.

A low tree. *Hind.* Khewnau, khurkur; *Beng.* Dumar, jajya-dumar; *Santal.* Horpodo.

1974. Ficus pumila Linn.

In many of the provinces, planted to take the place of ivy as a creeper on walls.

A clinging creeper; native of Japan and China. The Ivy-Fig.

As grown on walls, the receptacle-bearing branches are usually kept trimmed off.

1975. Ficus crininervia Miq.; F. B. I. v. 529.

Chittagong.

A clinging creeper.

1976. Ficus lævis Bl.; F. B. I. v. 526. *F. vagans* F. I. iii. 537.

Chittagong.

A small tree, often epiphytic.

1977. Ficus scandens Roxb.; F. I. iii. 536. F. B. I. v. 526. *F. fruticosa* F. I. iii. 533. *F. hederacea* F. I. iii. 538.

Chota Nagpur; Chittagong.

A large rooting climber. *Beng.* Parkat dumar.

1978. Ficus foveolata Wall.; F. B. I. v. 528; E. D. f. 168.

Chittagong.

A very large climber.

1979. Ficus ramentacea Roxb.; F. I. iii. 547; F. B. I. v. 528.

Chittagong.

A large epiphytic climber, at length a tree.

1980. Ficus hirta Vahl; F. I. iii. 531; F. B. I. v. 531. *F. hirsuta* F. I. iii. 528.

N. Bengal, Duars.

A shrub or small tree, deciduously strigose or hirsute. *Beng.* Ban-dumar, khana-dumar, dangra.

1981. FICUS PYRIFORMIS Hook. & Arn. var. ISCHNOPODA King; F. B. I. v. 533.

Chittagong.

A shrub.

1982. FICUS ROXBURGHII Wall.; F. B. I. v. 534; E. D. F. 260. *F. macrophylla* F. I. iii. 566.

Orissa; Chota Nagpur; Chittagong.

A small, spreading tree. *Hind.* Timla; *Kol.* Kotang; *Magh.* Sapai.

1983. FICUS POMIFERA Wall.; F. B. I. v. 535; E. D. F. 235.

Chittagong.

A tall tree.

1984. FICUS VARIEGATA Bl.; F. B. I. v. 535. *F. racemifera* F. I. iii. 560.

Chittagong.

A tall, spreading tree.

1985. FICUS GLOMERATA Roxb.; F. I. iii. 558; F. B. I. v. 535; E. D. F. 179. *F. goolerea* F. I. iii. 538.

Chota Nagpur; W. Bengal; C. Bengal.

A tree. *Beng.* Gular; *Hind.* Jayga-dumar, yajna-dumar; *Kol.* and *Santal.* Loa; *Uriya* Dimeri.

1985/2. Var. CHITTAGONGA King; F. B. I. v. 536.

Chittagong.

A tree.

1985/3. Var. ELONGATA King; F. B. I. v. 536.

Chittagong.

A tree.

1986. FICUS LANCEOLATA Ham.; F. I. iii. 557; F. B. I. v. 536.

Chittagong; Chota Nagpur.

A much-branched shrub, fruit very palatable.

Order CXVII. JUGLANDEÆ.

Trees usually large, wood hard, juice watery or resinous. *Leaves* alternate, unequally pinnate; stipules 0. *Flowers* monœcious; perianth 0 or simple; males in catkins, females in erect or pen-

dulous, fewer-flowered spikes; bracts distinct. ♂ *Perianth* 0 or of 3–6 scales on the margins of the bract. *Stamens* 2 or more on the bract; anther-cells parallel; filaments short. *Pistillode* usually 0. ♀ *Perianth* adnate to ovary, shortly free above, 4-toothed or shortly 4-lobed, sessile on the rachis in the axil of a bract, often 2-bracteolate. *Ovary* inferior, 1-locular; ovule solitary, basal, erect, orthotropous; style short, 2-fid, arms stigmatic within. *Fruit* a drupe or nut, naked or clothed by the marcescent bract and bracteoles; pericarp fleshy or succulent; endocarp hard, bony, or crustaceous, sometimes dehiscent, with sinuously inflexed inner walls, and with 2–4 basal pits within. *Seed* basifixed, 2–4-lobed at the base; albumen 0; cotyledons equal, sinuous or subfoliaceous and contorted; radicle superior.

875. Engelhardtia Leschen.

Trees; *leaves* large pinnate, leaflets entire or serrate, usually glandular-punctate beneath; stipules 0. *Flowers* monœcious; males in slender, simple or branched, erect or pendulous lateral spikes, females in pendulous spikes. ♂ *Perianth* connate with the simple, lobed, or laciniate, usually very unequal bracts or scales, sometimes irregularly 4-lobed at the margin. *Stamens* 4–12, subsessile on the scales. ♀ *Perianth* adnate to ovary, solitary and sessile on a 3–4-lobed bract; limb 4-lobed or -toothed. *Ovary* inferior, 1-locular; ovule erect, anatropous; stigmas 2, short sessile, or long laciniate. *Fruit* a small, globose nut, adnate to the much-enlarged, scarious, 3-lobed, reticulately nerved bract, with mid-lobe exceeding the lateral; epicarp or calyx-tube thin, glandular or hirsute; endocarp 2-valved. *Seed* 2–4-lobed at the base; cotyledons rugosely folded or crumpled.

Leaflets petiolulate ..... *spicata.*
Leaflets sessile ..... *acerifolia.*

1987. Engelhardtia spicata Bl.; F. B. I. v. 595; E. D. E. 210. *Juglans pterococca* F. I. iii. 631 partly.
Chittagong.
A large tree. *Hind.* Silapoma; *Beng.* Bolas.

1988. Engelhardtia acerifolia Bl.; F. B. I. v. 596.
Chittagong.
A large tree.

Order CXVIII. CASUARINEÆ.

Trees or shrubs; branches woody, branchlets subherbaceous, green, cylindric, grooved, jointed, the internodes ending in a short sheath of connate, subulate scales. *Flowers* diœcious; males in terminal spikes of short, superposed, toothed cups; females in ovoid or globose heads, bracteate and 2-bracteolate. ♂ *Sepals* 1 or 2, concave, circumscissile at the base. *Stamen* solitary, inflexed in bud; anther large. ♀ *Perianth* 0. *Ovary* minute, 1-celled; ovules 2, collateral, semi-anatropous; style 2-fid, arms filiform, stigmatic to the base. *Fruit* an oblong or cylindric cone, formed of the enlarged, hardened bracts and bracteoles, making together 2-valved cavities enclosing the achenes; achenes with terminal wings tipped by the style. *Seed* by abortion solitary, laterally attached; testa membranous; albumen 0; cotyledons flat, equal; radicle very short, superior.

876. Casuarina Forst.

The only genus. Characters, those of the order.

1989. CASUARINA EQUISETIFOLIA Forst; F. B. I. v. 598. *C. muricata* F. I. iii. 519.

Chittagong, coast. Elsewhere often planted.

A very tall tree. *Beng.* Belati-jau. Beef-wood.

Order CXIX. CUPULIFERÆ.

Trees or shrubs. *Leaves* simple, alternate, penninerved, serrate-toothed or entire, rarely lobed; stipules free, often fugacious. *Flowers* minute, monœcious; males in erect or pendulous catkins or spikes, or rarely cymosely capitate; females spiked, capitate or solitary; bracts sometimes involucrate. ♂ *Sepals* 1–5, free or connate, sometimes obsolete. *Stamens* 2–20, on a hairy receptacle or adnate to the base of the sepals. ♀ *Sepals* connate in a perianth with minute limb, adnate to the ovary, or 0. *Carpels* connate in a 2–3-, rarely 4–6-celled ovary; ovules pendulous, anatropous, solitary or 2 collateral; styles or style-arms as many as the cells. *Fruit* a nut, included within or in the axil of often greatly enlarged, sometimes involucrate bracts. *Seed* pendulous, usually by abortion solitary; albumen 0; cotyledons plano-convex, sometimes rugose or ruminate; radicle superior.

Involucre of many imbricating or zonally connate, adpressed bracts, usually open at the top, if closed unarmed; nut solitary .....**Quercus.**
Involucre entire, closed at the top, armed externally with clusters of spines; nuts 1–4.....**Castanopsis.**

877. Quercus Linn.

Trees or shrubs, deciduous or evergreen; *leaves* simple, alternate, entire, toothed or lobed, penninerved; stipules fugacious. *Flowers* small, monœcious, spicate; males in pendulous or erect spikes, bracts small; females erect, bracts involucrate; spikes usually 1-sexual, rarely androgynous. ♂ *Sepals* connate in a campanulate, 4–7-lobed or -partite perianth. *Stamens* 6–12; filaments slender; anthers erect, ovate; cells contiguous; dehiscence longitudinal. *Pistillode* small, hairy, or 0. ♀ *Sepals* connate in a perianth-tube, adnate to the ovary, enclosed in imbricate bracts; limb very minute, lobed or toothed. *Staminodes* minute or 0. *Ovary* after fertilisation more or less perfectly 3-celled, rarely 4–5-celled; ovules in each cell 2; styles 3–5, short. *Fruit* an ovoid, globose, or depressed 1-celled nut, seated on or enclosed in and attached by its broad base or by its whole surface to an involucre of imbricating, hardened bracts. *Seeds* 1 or 2; testa membranous; albumen 0; cotyledons plano-convex, thick, fleshy, smooth, grooved, lobed, or ruminate; radicle minute.

Male spikes lax-flowered, pendulous, deciduous, simple: bracts of the shallow, cupular involucre connate in concentric belts; leaves serrate towards the apex .....*velutina.*
Male spikes dense-flowered, erect, stout, more or less persistent, simple or paniculately branched; leaves always quite entire:—
Involucre cupular, open, upper part of nut uncovered:—
Bracts of the involucre imbricate, with tips free:—
Leaves elliptic-lanceolate, 7–12 in. long, rounded-cuneate in lower fifth; nut abruptly contracted to the apex .....*acuminata.*
Leaves lanceolate, 5–7 in. long, gradually cuneate in lower third; nut gradually narrowed from middle towards apex
spicata var. *Chittagonga.*
Bracts of the involucre connate in concentric belts .....*Thomsoni.*
Involucre closed at the apex, concealing the nut, zoned with 3–4 broad, wavy, often interrupted ridges .....*lanceæfolia.*

1990. Quercus velutina Lindl.; F. B. I. v. 606.

Chittagong.

A deciduous tree, 60–80 feet high.

1991. QUERCUS ACUMINATA Roxb.; F. I. iii. 636; F. B. I. v. 607; E. D. Q. 6.

Chittagong.

A large timber tree. *Vernac.* Kanta gola batana.

1992. QUERCUS SPICATA Smith var. CHITTAGONGA F. B. I. v. 609.

Chittagong.

A small tree.

1993. QUERCUS THOMSONI Miq.; F. B. I. v. 615; E. D. Q. 85. *Q. turbinata* F. I. iii. 636.

Chittagong.

A tree, 80–100 feet high, wood only of use as fuel. *Vernac.* Bansua batana.

1994. QUERCUS LANCEÆFOLIA Roxb.; F. I. iii. 634; F. B. I. v. 616; E. D. Q. 52.

Chittagong.

A small or large tree, timber useful. *Vernac.* Shingra.

878. Castanopsis Spach.

Trees, rarely shrubs, deciduous or evergreen; *leaves* simple, alternate, entire, toothed or lobed, penninerved; stipules fugacious. *Flowers* small, monœcious, spicate; males in erect spikes, bracts small; females erect, bracts involucrate; spikes usually 1-sexual, very rarely androgynous. ♂ *Sepals* connate in a campanulate, 5–6-lobed or -partite perianth. *Stamens* usually 10–12; filaments slender; anthers small; dehiscence longitudinal. *Pistillode* small, hairy. ♀ *Sepals* connate in an urceolate perianth, adnate to the ovary, enclosed in imbricate bracts; limb very shortly 6-lobed. *Ovary* after fertilisation 3-celled; ovules in each cell 2; styles usually 3, linear. *Fruit* of 1–4 nuts, covered by the closed fruiting involucre, beset with clusters of spines or tubercles, often irregularly dehiscent. *Seeds* usually by abortion solitary in each nut; testa membranous; albumen 0; cotyledons thick, fleshy, equal; radicle minute.

*Outer wall of involucre concealed by the crowded subulate spines:—

[p. 988]

Leaves sinuate-toothed or serrate, finely pubescent beneath, nerves 15–20 pairs ..... *indica.*

Leaves entire, glabrous on both sides, nerves 10–12 pairs... *castanicarpa.*

*Outer wall of involucre not completely concealed by the substellately branched spines, disposed in irregular ridges; leaves with 6–10 pairs of nerves:—[p. 987]

Leaves always entire, glabrous; branches of the spines not longer than their bases, whole spine never exceeding ·25 in., rarely as long ..... *armata*.

Leaves usually entire, sometimes serrate towards apex, usually finely pubescent beneath, sometimes quite glabrous; branches of the spines always longer than their bases, whole spine never under ·25 in. long, rarely so short:—

Spines ·25–·35 in. long ..... *tribuloides* var. *ferox*.

Spines ·4–·5 in. long ..... *tribuloides* var. *longispina*.

1995. CASTANOPSIS INDICA A. DC.; F. B. I. v. 620; E. D. C. 812. *Quercus serrata* F. I. iii. 641.
Chittagong.
A small or large tree.

1996. CASTANOPSIS CASTANICARPA Spach.; F. B. I. v. 621. *Quercus castanicarpa* F. I. iii. 640.
Chittagong.
A large evergreen tree.

1997. CASTANOPSIS ARMATA Spach.; F. B. I. v. 622. *C. tribuloides* E. D. C. 818 partly. *Quercus armata* F. I. iii. 640.
Tippera; Chittagong.
A considerable timber tree. *Vernac.* Kanta lal batana (*Chittagong*); Singhara (*Tippera*).

1998. CASTANOPSIS TRIBULOIDES A. DC. var. FEROX King; F. B. I. v. 623. *Quercus ferox* F. I. iii. 639.
Chittagong.
A medium tree, 40–60 feet high.

1998/2. Var. LONGISPINA King; F. B. I. v. 623.
Chittagong.
A considerable tree.

Order CXX. SALICINEÆ.

Trees or shrubs. *Leaves* deciduous, alternate, 3–5-nerved at the base; stipules free. *Flowers* diœcious, in catkins, one under each bract; bracteoles 0. *Perianth* 0. *Disk* of 1 or more scales or glands, or cup-shaped. ♂ *Stamens* 2 or more; filaments free or connate; anthers ovate or oblong; dehiscence longitudinal.

♀ *Ovary* sessile or stipitate, 1-celled; ovules few or many, on 2–4 subbasal or parietal placentas, erect, anatropous; style short or 0; stigmas short, notched or lobed. *Fruit* an ovoid or lanceolate, 2–4-valved capsule. *Seeds* few or many, funicle with a tuft of long, silky hairs; albumen 0; cotyledons plano-convex; radicle short, inferior.

879. Salix Linn.

Trees or shrubs, sometimes small and prostrate; *leaves* usually narrow or small, entire or serrulate, penninerved; stipules various. *Flowers* small, dicœcious, sessile, in erect, usually dense catkins; bracts small, entire or rarely toothed. *Perianth* 0. *Disk* of 2 scales, anterior and posterior, or of one posterior scale, fleshy or glandular. ♂ *Stamens* 2, rarely 3 or more; filaments filiform, free, rarely united, and resembling one filament with 2 anthers; anthers usually small. ♀ *Ovary* sessile or stipitate; placentas 2; ovules on each 2-seriate, usually 4–8; style usually short, with 2 short, retuse or 2-fid arms. *Fruit* a 2-valved capsule. *Seeds* with penicillate funicle; albumen 0; cotyledons plano-convex; radicle inferior.

1999. SALIX TETRASPERMA Roxb.; F. I. iii. 573; F. B. I. v. 626; E. D. S. 579.

Chota Nagpur; Behar; Tirhut; N. Bengal; W. Bengal. A small tree, 20–40 feet high. *Hind.* Baishi, bet; *Beng.* Pani jomá; *Kol.* Nachal; *Santal.* Gada sigrik.

Order CXXI. CERATOPHYLLEÆ.

Slender, fragile, branched, submerged herbs. *Leaves* whorled, dichotomously cleft into filiform, minutely toothed lobes; stipules 0. *Flowers* minute, monœcious, axillary, sessile. ♂ *Perianth* or involucre of 6–12 narrow, subvalvate, 2-fid segments. *Stamens* 20–30; filaments very short; anthers erect, extrorse; connective truncate or 2-toothed at apex; dehiscence longitudinal. ♀ *Perianth* of the male. *Ovary* sessile, ovoid, 1-celled; ovule solitary, pendulous, orthotropous; style subulate, stigmatic on one side. *Fruit* a small coriaceous, ovoid or ellipsoid, somewhat compressed nutlet, terminating in a long, subulate style, with a spur projecting from above the base on either side. *Seed* pendulous; testa membranous; albumen 0; embryo straight; cotyledons thick; radicle short, inferior; plumule many-leaved.

880. Ceratophyllum Linn.

The only genus. Characters those of the order.

2000. CERATOPHYLLUM DEMERSUM Linn.; F. B. I. v. 639. *C. verticillatum* F. I. iii. 624.

In all the provinces, in ponds and ditches.

A submerged aquatic of still waters. *Beng.* Jhangi.

V. GYMNOSPERMEÆ.

Perianth 0 or rarely (*Gnetaceæ*) 2-lobed or utricular. *Flowers* always 1-sexual. *Stamens* few or many. *Ovary* and style 0; ovules naked; cotyledons 2 or sometimes 3 or more.

Order CXXII. GNETACEÆ.

Trees or shrubs; branches jointed at the nodes. *Leaves* opposite, large and green, or minute scale-like; stipules 0. *Flowers* monœcious or diœcious, in axillary or terminal spikes or cones; bracts close-set or distant. ♂ *Sepals* 2–4, forming a valvately 2-lobed or spathaceous perianth. *Stamens* connate in a column of the united filaments; anthers 2–8, subglobose, 1–3-celled, sessile or subsessile on the column. ♀ *Ovule* erect, with 2–3 coats, of which one is produced into a styliform tube with a discoid mouth. *Seed* dry or drupe-like; albumen copious or scanty; embryo straight; cotyledons adpressed; radicle long, superior.

881. Gnetum Linn.

Evergreen climbing shrubs or erect trees; branches jointed; *leaves* opposite, entire, penninerved. *Flowers* monœcious or diœcious, whorled in the axils of the cupular bracts of axillary or terminal, solitary or panicled spikes, often surrounded by jointed hairs. ♂ *Perianth* narrowly clavate, entire or valvately 2-fid. *Stamens* adnate to base of perianth; filaments connate in a column exserted from the mouth of the perianth; anther-cells 2, distinct, sessile on the top of the column, opening by terminal slits. ♀ *Ovule* ovoid or globose, the inner integument produced

as a slender, exserted tube, with often a toothed or fimbriate mouth. *Seed* drupe-like.

Male bracts closely imbricated; seeds usually silvery scaly, the stipes stout, never exceeding ·25 in., usually much shorter .....*scandens.*
Male bracts hardly imbricated; seeds glabrous, the stipes slender, ·25–·35 in. long .....*funiculare.*

2001. GNETUM SCANDENS Roxb.; F. I. iii. 518; F. B. I. v. 642; E. D. G. 310.
Chittagong; Chota Nagpur, Singbhum.
A large diœcious climber.

2002. GNETUM FUNICULARE Bl.; F. B. I. v. 643.
Chittagong.
A large diœcious climber.

Order CXXIII. CONIFERÆ.

Trees or shrubs; wood-cells studded with disks. *Leaves* usually alternate, rigid, linear or subulate, rarely broad, solitary or fascicled in membranous sheaths. *Flowers* monœcious or diœcious; males in deciduous catkins, females solitary or in cones. *Perianth* 0. ♂ *Stamens* many; filaments connate in a globose, ovoid, oblong or cylindric column, seated on the scales of the catkin; anthers 1- or more-celled, shortly stipitate or sessile round the axis of the column. ♀ *Ovules* 1 or more, sessile, naked, orthotropous, on a scale (open carpel) which is free or adnate to the scale (bract) of a cone. *Seeds* often winged; testa thick or thin; albumen dense, fleshy; embryo axial, straight; cotyledons 2 or more; radicle terete, often attached to a crumpled, thread-like suspensor.

Scales of the female cone very few, spirally crowded; ovules 1 under each scale, reversed; leaves large .....**Podocarpus.**
Scales of the female cone opposite in several series; ovules 2 or more on each scale, erect; leaves very small .....**Thuya.**

882. Podocarpus L'Herit.

Evergreen trees or shrubs; *leaves* opposite or alternate, scattered and linear, or distichous or broad and oblong, with a midrib or with parallel nerves; or dimorphic, some scale-like and imbricate, others distichous, linear, or subulate on the same branch. *Flowers* monœcious or diœcious; males solitary, fas-

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The only genus. Characters those of the order.

2000. CERATOPHYLLUM DEMERSUM Linn.; F. B. I. v. 639. *C. verticillatum* F. I. iii. 624.

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A submerged aquatic of still waters. *Beng.* Jhangi.

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as a slender, exserted tube, with often a toothed or fimbriate mouth. *Seed* drupe-like.

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A large diœcious climber.

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Scales of the female cone opposite in several series; ovules 2 or more on each scale, erect; leaves very small ..... **Thuya.**

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Evergreen trees or shrubs; *leaves* opposite or alternate, scattered and linear, or distichous or broad and oblong, with a midrib or with parallel nerves; or dimorphic, some scale-like and imbricate, others distichous, linear, or subulate on the same branch. *Flowers* monœcious or diœcious; males solitary, fas-

cicled, or spicate, with imbricate bracts; females solitary, or few and spicate, bract large. ♂ *Anthers* sessile, spirally crowded on the column; cells 2, parallel, slits extrorse or lateral; connective with an apical claw or appendage. ♀ *Bract* forming a peduncle to the fleshy, ovuliferous scale; *ovule* solitary, adnate to the scale, reflexed. *Seed* small, globose or ovoid, seated on an enlarged, fleshy peduncle, composed of scale and bract; testa hard, often fleshy externally; albumen fleshy; cotyledons 2.

2003. PODOCARPUS NERIIFOLIA Don; F. B. I. v. 649; E. D. P. 1006.

Chittagong.

A glabrous evergreen tree, 30–50 feet high.

883. Thuya Linn.

Evergreen trees or shrubs; *leaves* small, opposite, scale-like, adpressed, imbricate in 4 series, all subequal, or often on the branchlets flattened, with the lateral series keeled, the facial series rather smaller. *Flowers* monœcious; males terminal, solitary; females in ovoid or oblong cases. ♂ *Anthers* decussately opposite, shortly stipitate on the column; cells 2–4, subglobose, slits subbasal. ♀ *Bracts* decussately opposite, many-seriate, 1 or rarely 2 lowest pairs, and 1 or rarely 2 inmost pairs empty, intermediate 1–8 pairs fertile, each adnate within to the ovuliferous scale; *ovules* 2–3, rarely 5 at the base of the scale, erect. *Fruit* an ovoid or oblong cone, scales coriaceous, long persisting. *Seeds* 2–3, rarely 4–5; testa coriaceous, oblong, expanded or not into lateral narrow or wide wings; albumen fleshy; cotyledons usually 2.

2004. THUYA ORIENTALIS Linn. *Thuja orientalis* F. I. iii. 653; F. B. I. v. 644. *Biota orientalis* E. D. B. 518.

Often planted.

A small tree.

Order CXXIV. CYCADACEÆ.

Shrubs or small trees, with a thick, simple, rarely forking stock, and a terminal crown of leaves, or stemless, with leaves arising from a simple or branched rhizome. *Leaves* in alternate series of short, coriaceous scales, and of palm-like, pinnately, rarely 2–3-pinnately divided leaves, with membranous or coriaceous pinnæ. *Flowers* diœcious; males in one or more terminal cones, formed of numerous fleshy, flat, or variously peltate scales, crowded

beneath with 1-celled *anthers;* females of flat carpellary leaves (*carpophylls*) crowded round apex of stem, or in cones of flat or thickened, variously peltate scales. *Ovules* large, orthotropous, sessile, either erect in notches on either margin of the carpophyll, or solitary and inverted on either side of the peltate scales. *Seeds* large, drupe-like, outer coat more or less fleshy, inner crustaceous or bony; albumen copious, fleshy, ultimately horny, and with one or more embryonic cavities; embryo usually single by abortion, slender; radicle superior, attached to the corrugate suspensory cord; cotyledons 2.

884. Cycas Linn.

Shrubs or trees, with a simple or rarely branched, cylindric caudex, clothed with the woody bases of the petioles; *leaves* in terminal crowns, linear oblong, pinnately divided; segments linear, 1-nerved, quite entire, involute in bud, lowest often reduced to spines. Male cones apparently terminal, peduncled; scales cuneate, closely imbricate; apex often long-acuminate; *anthers* ellipsoid, in groups of 3–5. Female *carpophylls* many, crowded round apex of stem, densely woolly, adpressed in an apparently terminal cone, then spreading, elongate, flattened, dilated above in an entire, crenate, or pectinate blade. *Ovules* 1–5, in notches on either side of the stalk of the carpophyll, distant, alternate or opposite, nearly erect. *Seeds* ellipsoid or globose.

Margins of leaf-segments flat:—
Margins of carpophyll-blade pectinate ..... *pectinata.*
Margins of carpophyll-blade spinous-toothed ..... *Rumphii.*
Margins of leaf-segments revolute ..... *revoluta.*

2005. Cycas pectinata Griff.; F. B. I. v. 657; E. D. C. 2534.
Chittagong.
A small, palm-like tree.

2006. Cycas Rumphii Miq.; F. B. I. v. 657; E. D. C. 2538. *C. circinalis* F. I. iii. 744.
In gardens, occasionally.
A small, palm-like tree; native of the Andamans and Malaya.

2007. Cycas revoluta Thunb.; F. I. iii. 746; F. B. I. v. 656 E. D. C. 2537.
In gardens, frequently.
A small, palm-like tree; native of Japan.

VI. MONOCOTYLEDONES.

Sepals and *petals* usually similar, forming a generally 2-seriate, rarely 1-seriate perianth, rarely perianth 0. *Stamens* 1–2-seriate. *Carpels* usually connate. *Floral* segments in each series usually 3, sometimes 2, rarely 4 or more, or more rarely variously reduced. *Embryo* with one cotyledon. Herbs, rarely shrubs or trees, or with rhizomes produced in shrubby or arboreous stocks or culms; vascular bundles scattered in the ground tissue. *Leaves* parallel-veined, the veins sometimes united by transverse nerves; veins rarely pinnate or palmate and reticulated.

Order CXXV. HYDROCHARIDEÆ.

Aquatic, usually submerged herbs. *Leaves* radical, clustered; or cauline, alternate or opposite; lamina undivided. *Flowers* regular, monœcious or dicecious, rarely 2-sexual, enclosed in an entire or 2-leafed spathe; females solitary; perianth superior. *Sepals* 3, green or petaloid. *Petals* membranous or 0. ♂ *Stamens* 3–12, 1–4-seriate; anthers 2-celled. ♀ *Carpels* connate in an inferior, 1-celled ovary; placentas 3–6, parietal or intruded, sometimes almost meeting in the axis; ovules numerous on each placenta, anatropous or orthotropous; styles or style-arms 3–12. *Fruit* globose or ovoid, dry or pulpy, rarely dehiscent. *Seeds* few or many; albumen 0; embryo smooth or lineate.

Stems branching, leafy; leaves small; spathes small, sessile :—
Leaves whorled; styles undivided; ovules anatropous.....**Hydrilla.**
Leaves scattered; styles cleft; ovules orthotropous ...**Lagarosiphon.**
Stems none, or with stolons only, or a creeping rootstock :—
Leaves all long and narrow, sessile; male scapes several-flowered :—
Perianth single.....**Vallisneria.**
Perianth double.....**Blyxa.**
Leaves mostly or all petioled :—
Ovary beakless; fruit wingless; leaves all petioled; male scapes several-flowered.....**Hydrocharis.**
Ovary beaked; fruit winged; the submerged leaves narrow, the others long-petioled; flowers solitary.....**Ottelia.**

885. **Hydrilla** Rich.

A submerged, leafy herb; *leaves* short, usually opposite below, 3–4-nately whorled above. *Flowers* dicœcious; males short-pedi-

celled, solitary in a subglobose, muricate spathe; females sessile, 1–2, in a tubular, 2-toothed spathe. ♂ *Sepals* 3, ovate or obovate, green. *Petals* 3, oblong or cuneiform. *Stamens* 3; anthers large, reniform, opening elastically. *Pistillode* minute. ♀ *Sepals* 3, linear, green. *Petals* 3, narrow. *Carpels* 3, connate in a 1-celled ovary, produced beyond the spathe in a filiform beak; ovules anatropous; styles 2–3, linear, undivided; stigmas fimbriate. *Fruit* subulate, smooth or muricate. *Seeds* 2–3, oblong; testa shortly produced at each end.

2008. HYDRILLA VERTICILLATA Casp.; F. B. I. v. 659; E. D. H. 484. *Serpicula verticillata* F. I. iii. 578. *Vallisneria verticillata* F. I. iii. 751.

In all the provinces.

A submerged, leafy, dicœcious herb. *Vernac.* Jhangi, kureli.

886. Lagarosiphon Harv.

Submerged herbs; *leaves* scattered, fascicled or subverticillate, the lower opposite, serrulate. *Flowers* dicœcious; males minute, many, in an ovoid, 2-fid, axillary, sessile spathe; females solitary, sessile, in a narrow, oblong spathe. *Sepals* 3, petaloid. *Petals* 3, rather shorter. ♂ *Stamens* 3, perfect, opposite the sepals; filaments short; anthers ovate, with often 2–3 staminodes. *Pistillode* 0. ♀ *Staminodes* 0. *Carpels* 3, connate in an oblong ovary, prolonged into a filiform beak; ovules many, orthotropous; styles 3, stout, notched. *Fruit* ovoid, oblong, or linear; pericarp membranous. *Seeds* numerous, covered with a thin pulp.

2009. LAGAROSIPHON ROXBURGHII Benth.; F. B. I. iii. 659. *Vallisneria alternifolia* F. I. iii. 750.

In all the provinces.

A submerged, leafy, dicœcious herb. *Beng.* Rasna-jhangi.

887. Vallisneria Linn.

A submerged, tufted, stemless, stoloniferous herb; *leaves* very long, linear. *Flowers* dicœcious; males many, minute, in an ovoid, 3-lobed, shortly peduncled spathe; females solitary, in a tubular, 3-toothed spathe, terminal on a very long, filiform, spiral scape. *Sepals* 3. *Petals* 0. ♂ *Stamens* 1–3; filaments thickish; anthers didymous. *Pistillode* 0. ♀ *Staminodes* 3, each 2-fid. *Carpels* connate in a narrow ovary, not produced upwards; ovules numerous;

stigmas 3, broad, notched. *Fruit* linear, included in the spathe. *Seeds* numerous, oblong; testa membranous, slightly narrowed to the base.

2010. VALLISNERIA SPIRALIS Linn.; F. B. I. iii. 660; E. D. v. 14. *V. spiraloides* F. I. iii. 750.

In all the provinces.

A submerged, stoloniferous, dioecious herb. *Hind.* Syala.

888. Blyxa Thouars.

Annual submerged, tufted, scapigerous herbs; *leaves* linear, acute, entire or minutely serrulate. *Flowers* hermaphrodite or dioecious; scapes long or short; males several, in a tubular, 2-toothed spathe, long-peduncled; hermaphrodite or females solitary, sessile, within a tubular, 2-toothed spathe. *Sepals* 3, linear. *Petals* 3, linear, longer than sepals. ♂ *Stamens* normally 3-seriate, often with 1, sometimes more than 1, reduced to a staminode; anthers narrow, erect. *Pistillodes* 3, slender. ♀ *Staminodes* 0, or minute. *Carpels* 3, connate in a very slender, linear, 1-celled, beaked ovary; placentas parietal; ovules many; style very short; stigmas 3, filiform. ♀ *Stamens* 1–3-seriate, 3–9. *Carpels* 3, connate in a normal ovary. *Fruit* linear, enclosed in the ribbed, narrow, ventricose spathe; pericarp membranous. *Seeds* very many, oblong, within a thin, mucilaginous testa, smooth or tubercled, often tailed.

Leaves not serrulate:—

Flowers dioecious; stamens of male flower 8; seeds distinctly tubercled, shortly tailed ..... *Roxburghii.*

Flowers hermaphrodite:—

Stamens 9; seeds faintly tubercled, without tails ..... *Griffithii.*

Stamens 3; seeds spinescent, with long tails ..... *echinosperma.*

Leaves serrulate; flowers hermaphrodite; stamens 3; seeds sparsely tubercled, tails short or 0 ..... *oryzetorum.*

2011. BLYXA ROXBURGHII Rich.; F. B. I. v. 660. *Vallisneria octandra* F. I. iii. 752.

In most of the provinces.

A submerged, tufted, aquatic annual. *Hind.* Syala.

2012. BLYXA GRIFFITHII Planch.; F. B. I. v. 661.

E. Bengal; Chittagong.

A submerged, tufted, aquatic annual.

2013. Blyxa echinosperma Hook. f.; F. B. I. v. 661.
E. Bengal; Tippera.
A submerged, tufted, aquatic annual.

2014. Blyxa oryzetorum Hook. f.; F. B. I. v. 661.
Tirhut; Behar; Chota Nagpur.
A submerged, tufted annual, in rice swamps.

889. Hydrocharis Linn.

...atic, floating herbs; *leaves* orbicular or reniform, entire. ...*ers* monœcious; males 2–3 in a peduncled, 2-foliate spathe; ...males solitary in the spathe. *Sepals* 3, herbaceous. *Petals* 3, white, membranous. ♂ *Stamens* 6 or 9, with 6 or 3 staminodes; filaments forked; anther-cells basifixed. ♀ *Staminodes* 6, paired. *Carpels* connate in a 6-celled ovary; ovules numerous; stigmas 6, linear, 2-fid. *Fruit* an ovoid or oblong, fleshy berry, 6-locular. *Seeds* numerous; testa pulpy, filled with spiral vessels; embryo ovoid.

2015. Hydrocharis cellulosa Buch.-Ham. *H. Morsus-Ranæ* F. B. I. v. 662 partly.
Tirhut; N. Bengal; C. Bengal.
A floating herb.

890. Ottelia Pers.

Submerged or partially floating herbs; *leaves* radical, crowded, the submerged narrow, the floating long-petioled, ovate-lanceolate, oblong or cordate. *Flowers* solitary, hermaphrodite, sessile within a tubular, long-peduncled spathe. *Sepals* 3, linear or oblong. *Petals* 3, larger, obovate or orbicular, with fleshy basal appendages. *Stamens* 6–15, 2–5-seriate; anthers erect. *Carpels* connate in an oblong, beaked, almost 6-celled ovary; ovules many; placentas diffuse; styles 6, linear, 2-fid. *Fruit* oblong, enclosed in the spathe, 3–6-winged. *Seeds* many, oblong; testa pulpy.

2016. Ottelia alismoides Pers.; F. B. I. v. 662. *Damasonium indicum* F. I. ii. 216.
In all the provinces.
A submerged or partly floating aquatic. *Beng.* Parmikalla.

Order CXXVI. BURMANNIACEÆ.

Erect herbs, annual or with a perennial rootstock, simple or sparingly branched. *Leaves* linear, chiefly radical or reduced to

scales. *Flowers* hermaphrodite, regular, solitary, terminal or unilaterally spicate or racemose on a forked rachis, with a bract opposite each. *Perianth* superior, corolline, persistent, 6-lobed or 6-cleft, or rarely 3-lobed; lobes valvate. *Stamens* 3 or 6, included, adnate to perianth-tube or throat; filaments very short or 0; anthers 2-celled; cells distinct; dehiscence transverse or longitudinal. *Carpels* 3, connate in an inferior ovary, 3-celled with axial placentas, or 1-celled with 3 parietal placentas; ovules many, minute; style simple; stigmas usually 3, short. *Fruit* a loculicidal capsule, or opening vertically. *Seeds* many, minute, reticulate; albumen 0; embryo homogeneous.

891. Burmannia Linn.

Annual herbs; stem simple or divided; *leaves* ensiform, acuminate, radical, sometimes reduced to scales or obsolete. *Flowers* regular, hermaphrodite, solitary or few or several, secund on the branches of a forked cyme. *Perianth* segments 2-seriate, connate in a winged or angled tube; segments of outer series 3, of inner also 3, smaller, sometimes obsolete. *Stamens* 3, sessile or subsessile; anther-cells short, separated by a broad connective, crested dorsally; dehiscence transverse. *Carpels* 3, connate in a 3-celled ovary; ovules many; style short; stigma 3-lobed. *Fruit* a capsule, tipped by the persistent perianth, more or less 3-winged, opening loculicidally between the wings or sometimes rupturing transversely. *Seeds* minute, oblong or subglobose; testa thin, reticulate or striate, usually closely adpressed, sometimes lax and produced at both ends of seed.

2017. Burmannia cœlestis Don; F. B. I. v. 665. *B. triflora* F. I. ii. 117.

Chota Nagpur; Behar; Tirhut; N. Bengal; Chittagong.
A slender weed of damp places.

Order CXXVII. ORCHIDACEÆ.

Herbs, very rarely shrubby, usually either terrestrial, often tuberous-rooted, with annual, herbaceous, simple stems, leafy or leafless, and with solitary or spicate or racemose flowers, or epiphytes with perennial stems or branches, usually leafy, variously thickened, and often forming a pseudobulb, flowering from the top sides or base of the pseudobulb; bracts usually

present. *Flowers* often showy, hermaphrodite, irregular. *Perianth* superior, of 6 free or variously connate segments, 2-seriate; 3 outer (*sepals*) more or less similar, the 2 lateral sometimes connate in a short or long sac or spur-like base (*mentum*); 3 inner (*petals*) dissimilar, the 2 lateral alike and often resembling the sepals, the remaining petal (*lip*) usually very differently shaped. *Stamens* adnate to style and forming with it a column opposite the lip; hers usually 1, sometimes 2, on the front, top, or back of the mn, and free or adnate to it, 2-celled or, by subdivision, elled, top of the column sometimes produced towards the lip into a beak (*rostellum*); pollen-grains usually coherent in each cell into 1, 2, or 4 pairs of oblong or globose or pyriform waxy or powdery masses (*pollinia*), which are free or adnate by pairs or fours immediately, or by a stalk (*caudicle*) to a gland. *Carpels* 3, connate in an inferior, 1-celled, usually linear or twisted ovary; ovules very many, minute; stigma, one or two viscid spots on the top or concave face of the column, opposite the lip and below the anther; rarely discoid and above the two anthers. *Fruit* a capsule, usually opening by 3 or 6 longitudinal fissures, rarely fleshy and subindehiscent. *Seeds* very many, minute, with a lax hyaline testa enclosing a homogeneous nucleus.

*Ovary and fruit 1-celled; seeds minute; sepals and petals usually very unlike the modified lip:—[p. 1003]

†Anther single:—[p. 1003]

‡Pollinia waxy:—[p. 1002]

§Pollinia free, or those of each cell held together at the base by a viscid appendage, not attached by their bases or by a caudicle to the rostellum:—[p. 1001]

¶Pollinia 4:—[p. 1000]

Leaves sessile, equitant, fleshy, congested on short or distichous on elongated stems, with the vaginal portion much shorter than the main leaf; inflorescence terminal; flowers minute, racemose or spicate; column very short, with no appendages or foot; epiphytic herbs.....**Oberonia.**

Leaves membranous or coriaceous or chartaceous, not equitant, or if, very rarely (*Dendrobium* § *Aporum*), equitant and fleshy, the flowers axillary and the vaginal part of the leaf nearly or quite as long as the main portion, and with the column prolonged below into a foot:—

Terrestrial herbs; leaves membranous, rarely (*Liparis* sometimes) coriaceous, usually sessile; inflorescence ter-

minal; flowers rather small, in racemes or spikes; column prolonged below as a foot:—

Lip with basal auricles; column very short, with broad arms ..... **Microstylis.**

Lip without basal auricles; column long, with callosities or wings or both; rostellum sometimes double **Liparis.**

Epiphytic, occasionally casually epigæal, but never truly terrestrial herbs; leaves chartaceous or coriaceous; column more or less prolonged below as a foot:—

Stems solitary or cæspitose, or composed of discrete pseudobulbs basally attached on a short or long rhizome:—

Flowers from the stems or pseudobulbs terminal or axillary, solitary or on few-flowered peduncles, or in few- or many-flowered racemes, usually large and showy; stems cæspitose with leaves chartaceous or coriaceous, more than 2, rarely a creeping rhizome with distant pseudobulbs and binary or solitary apical leaves; pollinia all subequal, always free; lip rarely mobile ..... **Dendrobium.**

Flowers from lateral scapes rising from the base of the pseudobulbs or from the rhizome between them, solitary or in heads, umbels, or racemes; leaves solitary and coriaceous or binary and chartaceous, usually from the apices of pseudobulbs on a generally prolonged rhizome, but occasionally the rhizome and less often the pseudobulbs inconspicuous or absent; pollinia free or occasionally attached by their bases to a small sphere of translucent tissue, the inner pair always smaller than the outer:—

Lateral sepals markedly exceeding the dorsal; flowers (in our species) umbellate... **Cirrhopetalum.**

Lateral sepals not greatly exceeding the dorsal:—

Lateral sepals alongside or under the lip; flowers (in our species) racemose or spicate **Bulbophyllum.**

Lateral sepals spreading; flowers solitary... **Trias.**

Stem jointed, composed of elongated pseudobulbs strung on a woody core; leaves solitary or binary, chartaceous ..... **Pholidota.**

¶ Pollinia 8:—[p. 999]

Epiphytic herbs, pseudobulbous or not; leaves chartaceous,

coriaceous or fleshy; inflorescence lateral or terminal, racemose or capitate; column short or long, prolonged below as a foot; pollinia subequal, all cohering or cohering by fours to a common membrane .....**Eria.**

Terrestrial herbs, pseudobulbous or not; leaves membranous or chartaceous, plicate; inflorescence axillary or scapose; column long above, not prolonged below as a foot:—

Leaves linear from a long, slender pseudostem; lip sessile on the base of the column, saccate but not spurred; flowers and leaves not contemporaneous .....**Pachystoma.**

Leaves elliptic-oblong or lanceolate from a short, stout pseudostem; lip adnate to the base of the column; flowers contemporaneous with leaves:—

Sepals free; lip gibbous or spurred; column not prolonged into a foot .....**Phajus.**

Sepals connate in a broad, fleshy cup; lip not spurred; column prolonged into a large foot ...**Acanthephippium.**

§Pollinia attached singly or in pairs or by fours through one or, rarely, two caudicles to a stigmatic gland:—[p. 999]

⊙Anther terminal:—[p. 1002]

Pollinia 8, attached by fours to a granular caudicle; terrestrial herbs; leaves chartaceous, plicate .....**Calanthe.**

Pollinia 2:—

Terrestrial herbs, with pseudobulbous stems; flowers in peduncled racemes; leaves chartaceous or membranous, plicate:—

Lip distinctly 3-lobed, saccate or spurred at base; inflorescence strict .....**Eulophia.**

Lip obscurely 3-lobed, wide ventricose at base, but not spurred; inflorescence at first decurved .....**Geodorum.**

Epiphytic herbs:—

Stem pseudobulbous; leaf solitary .....**Thecostele.**

Stem not pseudobulbous; leaves several:—

Stems very short; leaves closely clustered, flat, fleshy, and pendulous; lip spurred, with forked appendages on its disk .....**Doritis.**

Stems more or less elongated; leaves coriaceous and flat or fleshy and terete:—

Lip not spurred; leaves terete .....**Luisia.**

Lip spurred, adnate to the column or to its foot:—

÷Column prolonged into a long foot; spur with no callus or septum within:—[p. 1002]

Lip jointed to the foot .....**Ornitharium.**
Lip not jointed to the foot.....**Ærides.**

÷Column with little or no foot; lip not jointed :—[p. 1001]

Spur with neither calli nor septum within :—

Spur compressed laterally, deep, pubescent at the mouth; side-lobes none...**Rhynchostylis.**

Spur not compressed, long, narrow, cylindric, or wide, funnel-shaped, or short, saccate, rarely (one *Vanda*) reduced to a gibbous swelling, and then the leaves flat :—

Side-lobes of lip usually large; spur wide, infundibuliform, glabrous at the mouth; if side-lobes of lip small then the spur also subobsolete; flowers large; caudicle of pollinia very broad .....**Vanda.**

Side-lobes of lip small or none; mouth naked or fimbriate; spur narrow, cylindric, or short, wide saccate; flowers small; caudicle very narrow.....**Saccolabium.**

Spur within partially or completely occluded by calli :—

Spur occluded by a dorsal scale or by calli on the anterior and posterior walls, but without a septum .....**Cleisostoma.**

Spur within partially occluded by calli, and divided by a vertical, antero-posterior septum into two lateral chambers .....**Sarcanthus.**

⊙Anther dorsal; pollinia 4 in 2 pairs, with 2 very long caudicles tapering to a minute gland; epiphytic herbs [p. 1001] **Camarotis.**

‡Pollinia powdery, granular, or in small masses :—[p. 999]

Anther terminal; pollinia 2 or 4, cohering by their sides without either gland or caudicle :—

Large, leafy, epiphytes with coriaceous leaves .....**Vanilla.**

Small, terrestrial, erect herbs :—

Saprophytic, leafless herbs, with sepals and petals united into a 5-toothed, 2-labiate tube.....**Didymoplexis.**

Green herbs, with sepals and petals free; leaf solitary after the flower from a separate tuber, rarely contemporaneous and from the same tuber .....**Pogonia.**

Anther posticous, vertical but inverted; pollinia 2, or 4 in two pairs, attached occasionally directly but usually by one or by two caudicles to a solitary gland; terrestrial herbs :—

Stigma single, anticous; pollinia 2, or 4 in two pairs:—
Pollinia narrow, clavate, 2, produced and united below to a single caudicle, inserted on a long, narrow gland; leaves plicate, chartaceous or subcoriaceous:—
Lip spurred or saccate, and with no claw .....**Tropidia.**
Lip long-clawed, not spurred or saccate.....**Corymbis.**
Pollinia short, clavate, inserted directly on the gland; leaves flat, membranous:—
Pollinia 2, lip saccate at the base, the sac usually setose or tubercled within .....**Goodyera.**
Pollinia 4; lip not saccate or spurred .....**Spiranthes.**
Stigmas 2, lateral, distant; pollinia 2, bipartite; lip sessile; leaves flat, membranous:—
Base of lip produced as a long spur.....**Vrydagzynea.**
Base of lip saccate but not spurred .....**Zeuxine.**
†Anthers 2, each with 1 perfect cell; cells sessile on the column, remote or contiguous, always discrete, the outer empty; pollinia 2, sometimes 2-partite, adnate with or without caudicles to separate glands; leaves flat, membranous; terrestrial herbs [p. 999] .....**Habenaria.**
*Ovary and fruit 3-celled; seeds conspicuous; sepals, petals, and lip similar; anthers 2, each with both cells perfect; terrestrial herbs with narrow, subcoriaceous, strongly nerved leaves [p. 999] .....**Apostasia.**

892. **Oberonia** Lindl.

Epiphytic herbs, with usually very short, often tufted stems; *leaves* coriaceous or fleshy, usually ensiform, always distichous and equitant. *Flowers* minute, numerous, sometimes whorled, in a long, erect or deflexed, spicate or racemose inflorescence, expanding centrifugally. *Sepals* subequal, ovate or oblong. *Petals* as wide as or narrower than the sepals; *lip* larger than the sepals, sessile, rarely entire, usually lobed and often erose, the hypochile more or less concave, or with a nectar-secreting pit near its base. *Column* very short, stout, rarely winged. *Anther* terminal or incumbent; pollinia 4, cohering in pairs, waxy.

Petals broad, ovate or obovate-oblong:—
Lip oblong or subquadrate, with small, rounded, or tooth-like side-lobes, its tip with 2 small lobes separated by a wide sinus.....*Falconeri.*
Lip 3-lobed, erose, with large, rounded side-lobes and a 2-fid mid-lobe .....*Gammiei.*
Petals narrow, linear; lip oblong, with filiform lateral lobes near the narrow base, and two terminal lobes, short, parallel, acute, the sinus with a wide lobule.....*rufilabris.*

2018. Oberonia Falconeri Hook. f.; F. B. I. v. 678.
Behar; Chota Nagpur.
A small epiphyte, leaves 1–2 in. long.

2019. Oberonia Gammiei King & Pantl.
Sundribuns.
A small epiphyte, leaves 3–6 in. long.

2020. Oberonia rufilabris Lindl.; F. B. I. v. 683.
N. Bengal, Duars.
A small epiphyte, leaves 1–1·5 in. long.

893. Microstylis Nutt.

Terrestrial, rarely epiphytic, pseudobulbous herbs; *leaves* one or more, membranous, plicate, continuous with their sheaths. *Flowers* small, resupinate, in terminal racemes. *Sepals* spreading or recurved, subequal. *Petals* narrower than the sepals, but of about the same length; *lip* adnate to the base of the column, usually flat, the basal lobes large, sagittate and produced upwards, or cup-shaped with small lobes, or without basal lobes, the apex emarginate, 2–3-lobed, erose or entire. *Column* usually very short, sometimes rather long, with two short, spreading arms. *Anther* subterminal, 2-locular; pollinia 4, ovoid or obovoid, waxy.

Side-lobes of lip not auricled; leaves 3 or more:—
Racemes dense; lip ovate, with a 3-lobed apex ..... *congesta.*
Racemes laxer; lip reniform, pectinate ..... *Rheedei.*
Side-lobes of lip auricled; leaves 2..... *Cardoni.*

2021. Microstylis congesta Reichb. f.; F. B. I. v. 689. *Malaxis plicata* F. I. iii. 456.
Chota Nagpur, Parasnath, Sirguja.
A succulent herb, stem stoutish, 2–6 in. high.

2022. Microstylis Rheedei Wight; F. B. I. v. 690.
Chota Nagpur, Sirguja.
A herb, with stoloniferous stems.

2023. Microstylis Cardoni Prain.
Chota Nagpur
A small herb; flowers white.

894. Liparis Rich.

Terrestrial or epiphytic, pseudobulbous herbs; *leaves* one or more, membranous or coriaceous, continuous with the sheath or

thickened and jointed at the base. *Flowers* small, in terminal racemes, resupinate or not. *Sepals* spreading or recurved, the margins usually revolute. *Petals* much narrower than the sepals; *lip* adnate to the base of the column, usually broad, flat, or deflexed from the middle, sometimes concave, often with calli near the base. *Column* elongate, often arched, usually winged near the apex and tumid or dilated and compressed at the base. *Anther* terminal; pollinia 4, waxy.

Scape cylindric ridged and fluted; ridges several .....*bituberculata.*
Scape trigonous .....*paradoxa.*

2024. LIPARIS BITUBERCULATA Lindl.; F. B. I. v. 696
Chota Nagpur.
A soft, tall herb.

2025. LIPARIS PARADOXA Reichb. f.; F. B. I. v. 697.
E. Bengal, Mymensingh; Chota Nagpur; Chittagong.
A soft herb, stems 6–8 in. high.

895. Dendrobium Swartz.

Epiphytic herbs; pseudobulbs short and fleshy or elongated and stem-like, usually tufted; *leaves* sessile, never plicate, bases sheathing. *Flowers* solitary or in fascicles or racemes, often large and showy. *Sepals* subequal, the lateral pair obliquely adnate to the foot of the column, and forming with it a sac or mentum. *Petals* usually like the sepals; *lip* sessile or clawed at the base, adnate to and incumbent on the foot of the column; side-lobes erecting the column, or spreading, or absent; the terminal lobe [illegible] or narrow, flat, convex, concave or saccate, its disk sometimes lamellate. *Column* short, its foot long or short, with usually a nectar-secreting depression or cavity at its extremity, the apex angled or 2-toothed. *Anther* 2-celled; pollinia 4, equal in length, sometimes in free pairs, but usually all slightly coherent, the 4 never all quite free, ovoid or oblong, slightly compressed, waxy.

Leaves equitant, fleshy, distichous, lanceolate or ovate-lanceolate, acute; flowers axillary, very shortly pedicelled; mentum longer than the sepals; lip cuneate-oblong, obscurely 3-lobed, margins crisped; flowers ·5 in. long, uniformly greenish-yellow ..... *anceps.*
Leaves never equitant nor fleshy:—

Stems pseudobulbous, erect, oblong or clavate-cylindric; leaves 2, terminal, opposite, coriaceous, short, orbicular, or elliptic obtuse; flowers solitary, terminal between the leaves; mentum large, obtuse, incurved; lip oblong or ovate-oblong, with 2 rounded, crisped, terminal lobes; flowers 1 in. long, white .....*pumilum*.

Stems not or rarely pseudobulbous, pendent or erect, slender or stout, terete or clavate; leaves more than 2, scattered along the stem, chartaceous or coriaceous, persistent or deciduous:—

Flowers small, in short terminal racemes; stems slender, much-branched; leaves linear-lanceolate, acuminate, chartaceous, very deciduous; mentum very short, rounded; lip very small, narrow, side-lobes narrow, tips obtuse, mid-lobe shorter, ovate, rugose; flowers ·3 in. long, yellow .....*herbaceum*.

Flowers lateral on the stem, if terminal (*D. formosum* sometimes) large and showy; stems stout or slender, little branched, or usually not branching:—

Stems with 2-3 internodes above the base much swollen into a fusiform, tuberous section, elsewhere slender, rigid, and polished; leaves linear-oblong, obtuse or emarginate, subpersistent; mentum short, incurved, obtuse, longer than the lateral sepals; lip obcordate from a narrow base, with rounded side-lobes and small rounded mid-lobe; flowers ·5 in. long, solitary axillary, or on bracteate tubercles at the upper nodes, white with pink veins on the lip .....*podagraria*.

Stems uniformly terete or clavate, or sometimes with the apices of each internode swollen, short or long, slender or stout, never much dilated as a fusiform tuber just above the base:—

Flowers small, dingy yellow, with red specks on the lip, ·3 in. long, crowded on a short-sheathed peduncle; mentum urceolate; lip wide-cuneate, truncate, with small, acute, spreading side-lobes, and a small, fleshy, caruncled mid-lobe; leaves linear-lanceolate, coriaceous, obliquely 2-fid; stems clavate or fusiform .....*bicameratum*.

Flowers large and showy, in lateral, rarely (*D. formosum* sometimes) terminal pairs fascicles, or racemes, rarely solitary; mentum never urceolate:—

*Mentum at least half as long as the dorsal sepal:— [p. 1007]

Flowers from leafy stems very large, white, with yellow on the lip; mentum half as long as dorsal sepal; lip obovate, entire .....*formosum*.

Flowers from leafless stems medium; sepals and petals greenish, sometimes pinkish near the tips; lip oblong,

acute, fringed, marked with purplish veins; mentum more than half as long as dorsal sepal.....*macrostachyum.*

*Mentum less than half as long as dorsal sepal:—[p. 1006]

†Stems terete or slightly compressed, cylindric or subfusiform, but not clavate:—[p. 1008]

‡Lip either trumpet-shaped or explanate, the margin not incurved:—[p. 1008]

§Flowers from leafless stems, 2-nate, rarely solitary, sometimes in 3–6-flowered racemes, always white or more or less marked with purple or mauve:—[p. 1008]

*Internodes cylindric; lip more or less trumpet-shaped, the basal portion convolute, the anterior portion expanded as a more or less open, recurved or cucullate mouth;—[p. 1008]

Stems slender, pendulous, terete, cylindric; leaves chartaceous, acute or acuminate:—

Lip longer than broad; leaves linear-lanceolate; flowers in pairs, white or pink, 1·5 in. across; bracts very large; sepals lanceolate, acute; petals ovate; lip with a broad, purple, single or double blotch, elliptic-oblong from a cuneate base, obtusely lobed, recurved, pubescent *transparens.*

Lip as broad as long or broader; sepals linear-oblong, subacute:—

Lip deep-purple within, with a broad white ring inside the purple margin; mouth large, orbicular, from a wide base, margin recurved; petals broadly elliptic; leaves linear-lanceolate; flowers 1–5 on a very large, bracted, short peduncle, each 2–2·5 in. wide .....*lituiflorum.*

Lip pale-yellow; mouth cucullate, not recurved, from a tubular base; petals oblong; leaves lanceolate; flowers 2–3 on a short, small, bracted peduncle, each 1–2 in. across *Pierardi.*

Stems stoutish, erect or suberect; leaves narrow, thinly coriaceous:—

⊙Stems terete, cylindric; leaves acute; flowers 1–3-nate on the leafless stems, waxy white flushed with pink, on pink pedicels; each flower under 2 in. wide [p. 1008] .....*crepidatum.*

⊙Stems slightly compressed, subfusiform; leaves obliquely retuse at the apex; flowers 3–3·5 in. wide:—[p. 1007]

Sepals linear-oblong; petals obovate, neither undulated nor twisted, both uniformly magenta; lip trumpet-shaped, with clear yellow tube and magenta entire limb, racemes 2–3-flowered ..... *regium.*

Sepals and petals both oblong, undulated and twisted, pale purple; lip cucullate, pale yellow, with dilated, everted, erose limb; racemes 3–6-flowered..... *tortile.*

¶Internodes turbinate, each swollen at the top; stem stout, decurved; leaves linear-lanceolate, chartaceous; flowers 1-3-nate, stout-pedicelled, white or the tips purple, 2–2·5 in. across; sepals linear-oblong, subacute; petals broad-oblong; lip orbicular, subcordate, with a yellow disk [p. 1007]... *pendulum.*

§Flowers from the leafy stems orange-yellow or with a deep reddish-brown or blood-red blotch on the disk of the lip; leaves thinly coriaceous; stems more or less pendulous:—[p. 1007]

Flowers 2-nate, on a leaf-opposed peduncle; sepals oblong, obtuse; petals larger, quite entire; lip with a convolute claw and orbicular, concave blade, margin revolute, erose; flowers 3 in. wide *ochreatum.*

Flowers in 7–12-flowered, pendulous racemes; sepals and erose petals subequal; lip with a truncate base and orbicular, explanate blade, margin equally and deeply fringed; flowers 2–3 in. wide ..... *fimbriatum.*

‡Lip calceolar, hemispheric, with incurved, fimbriate margin; stems erect, terete; leaves ovate-oblong, coriaceous; flowers 2·5–3·5 in. wide, in 6–15-flowered racemes from the leafy stems, golden-yellow, cream-coloured, or pinkish-white [p. 1007] ..... *moschatum.*

†Stems distinctly clavate; leaves towards apex oblong-lanceolate, coriaceous; flowers many, in loose, lateral, slender decurved racemes; flowers 1·5–2·5 in. wide:—[p. 1007]

÷Stems grooved; leaves 2–8, with 2-fid apices; flowers golden-yellow, lip orange, streaked or blotched with red, orbicular, margin pectinately fringed [p. 1009] *chrysotoxum.*

÷ Stems 4-angled; leaves 3–5, acute; flowers white or pale rose, the lip with an orange disk, oblong, margin villously fringed [p. 1008] .....*palpebræ.*

2026. DENDROBIUM ANCEPS Swartz; F. I. iii. 487; F. B. I. v. 724.
Sundribuns.
An epiphyte with flattened stems.

2027. DENDROBIUM PUMILUM Roxb.; F. I. iii. 479 in part; F. B. I. v. 713.
Chittagong.
An epiphyte, with tufted, grooved pseudobulbs, 1–1·5 in. long.

2028. DENDROBIUM HERBACEUM Lindl.; F. B. I. v. 719.
Chota Nagpur.
A pendulous epiphyte, with much-branched stems, 2–3 feet long.

2029. DENDROBIUM PODAGRARIA Hook. f.; F. B. I. v. 728.
Chittagong.
An epiphyte, with rigid, branched stems, 1–3 feet long, much swollen just above the base.

2030. DENDROBIUM BICAMERATUM Lindl.; F. B. I. v. 729.
Chota Nagpur, Parasnath; Orissa.
An epiphyte, with rigid, fusiform or clavate stems, 1–1·5 feet long.

2031. DENDROBIUM FORMOSUM Roxb.; F. I. iii. 485; F. B. I. v. 721.
Chota Nagpur; Chittagong.
A stout, tufted epiphyte; stems 1–1·5 feet; leaf-sheaths pubescent; flowers 3–5 in. across.

2032. DENDROBIUM MACROSTACHYUM Lindl.; F. B. I. v. 735.
Chota Nagpur.
A pendulous epiphyte, with slender stems, 8–15 in. long.

2033. DENDROBIUM TRANSPARENS Wall.; F. B. I. v. 738.
Chota Nagpur; Chittagong.
A pendulous epiphyte, with stems 1–1·5 feet long.

2034. DENDROBIUM LITUIFLORUM Lindl.; F. B. I. v. 740.
Chittagong.
A pendulous epiphyte, with stems 1–2 feet long.

2035. DENDROBIUM PIERARDI Roxb.; F. I. iii. 482; F. B. I. v. 738.

Sundribuns; Chittagong.
A pendulous epiphyte, with stems 2–3 feet long.

2036. DENDROBIUM REGIUM Prain.
Chota Nagpur.
An erect or suberect epiphyte, stems 9–18 in. long.

2037. DENDROBIUM CREPIDATUM Lindl.; F. B. I. v. 740.
Chota Nagpur.
An erect epiphyte, with stems 6–15 in. long.

2038. DENDROBIUM TORTILE Lindl.; F. B. I. v. 744.
Chittagong.
An epiphyte, with rigid, subcompressed, stoutish stems, ·5–1 foot long.

2039. DENDROBIUM PENDULUM Roxb.; F. I. iii. 484; F. B. I. v. 741.
Chittagong.
A pendulous epiphyte, with turbinate internodes, stems 1–2 feet long.

2040. DENDROBIUM OCHREATUM Lindl.; F. B. I. v. 747.
Chittagong.
A pendent epiphyte, with short, stout stems, 6–9 in. long.

2041. DENDROBIUM FIMBRIATUM Hook.; F. B. I. v. 745.
Chittagong; Chota Nagpur, Sirguja.
A pendulous epiphyte, stems 4–5 feet long, a little swollen at the very base.

2042. DENDROBIUM MOSCHATUM Wall. *D. calceolaria* F. B. I. v. 744.
Chittagong; Chota Nagpur.
An epiphyte, with erect, stoutish stems, 3–5 feet long.

2043. DENDROBIUM CHRYSOTOXUM Lindl.; F. B. I. v. 750.
Chittagong.
An erect epiphyte, stems 3–15 in. long.

2044. DENDROBIUM PALPEBRÆ Lindl.; F. B. I. v. 750.
Chittagong.
An erect epiphyte, stems 6–9 in. long.

896. Cirrhopetalum Lindl.

Epiphytic herbs; with usually a creeping rhizome, but sometimes tufted; pseudobulbs 1-, rarely 2-leaved; *leaves* when solitary usually coriaceous and persistent, when geminate usually

membranous and deciduous. *Flowers* usually in whorled umbels, sometimes capitate, rarely racemose, often dorsally compressed, on scapes rising from the base of a pseudobulb. *Sepals* dorsal, short, concave, rarely half as long as the lateral, usually much shorter; lateral usually much elongated and acuminate, oblique, often connate by their inner edges, their bases adnate to the sides of the column or of its foot. *Petals* shorter than the dorsal sepal; *lip* small, tumid, usually entire, always shorter than the dorsal sepal, jointed to the end of the foot of the column and more or less mobile. *Column* short, its apex with 2, rarely 4, tooth-like appendages, the foot more or less produced. *Anther* 2-locular; pollinia 4, waxy, cohering in one mass and sometimes attached by their lower ends to a mass of viscid tissue, the two inner usually small and lamelliform.

Flowers usually solitary; lateral sepals 3–4 in. long, linear-lanceolate with filiform tips; dorsal sepal and petals with apical tufts of purple spathulate paleæ; column with 2 decurved arms; pseudobulbs ovoid ..... *ornatissimum.*
Flowers many, umbelled; lateral sepals under 1 in. long, subfalcate, obtuse; dorsal sepal and petals ciliate; column unarmed; pseudobulbs globose ..... *Roxburghii.*

2045. CIRRHOPETALUM ORNATISSIMUM Reichb. f.; F. B. I. v. 773.
Chota Nagpur.
An epiphyte, with ovoid pseudobulbs.

2046. CIRRHOPETALUM ROXBURGHII Lindl.; F. B. I. v. 774. *Ærides radiatum* F. I. iii. 476.
Sundribuns.
An epiphyte, with small, subglobose pseudobulbs.

897. Bulbophyllum Thouars.

Epiphytic herbs; pseudobulbs from a creeping rhizome, rarely 0; *leaves* solitary, coriaceous, and persistent, rarely binary, membranous, and deciduous. *Flowers* on scapes from the rhizome usually close to pseudobulbs, racemose, spicate, capitate, umbelled or solitary. *Sepals* subequal or the lateral rather longer than dorsal, and free or connate under the lip. *Petals* usually smaller than dorsal sepal. *Lip* articulate with foot of column, mobile, small, usually much recurved. *Column* very short; apex often 2-aristate. *Anther* 2-celled; pollinia 4, the two inner smaller, rarely obsolete.

2047. BULBOPHYLLUM TRISTE Reichb. f.; F. B. I. v. 768. *B. micranthum* F. B. I. v. 768.

Chota Nagpur, Sirguja.

A small 2-foliate epiphyte, leafless when in flower.

898. Trias Lindl.

Small pseudobulbous, epiphytic herbs; *leaves* solitary on the pseudobulbs coriaceous. *Flowers* solitary, on lateral scapes. *Sepals* subequal, spreading, 7-nerved, lateral adnate to the foot of the column. *Petals* small, oblong or linear; *lip* small, coriaceous or fleshy, jointed to the foot of the column, inflexed, incumbent, mobile. *Column* short, broad, tip winged or toothed or angled. *Anther* erect, caducous, 2-celled, produced into a long horn; pollinia 4, waxy, subcoherent in pairs in each cell.

2048. TRIAS OBLONGA Lindl.; F. B. I. v. 780.

Sundribuns.

An epiphyte, with small, subglobose pseudobulbs.

899. Pholidota Lindl.

Epiphytic herbs, with jointed, often branching stems, with pseudobulbous internodes or with tufted pseudobulbs; *leaves* in pairs or solitary, membranous, many-nerved. *Flowers* small, subglobose, expanding from above downwards, racemose on ebracteate peduncles, terminal or from the base of the pseudobulb, usually drooping and distichous, floral bracts large, persisting. *Sepals* concave. *Petals* narrower than sepals; *lip* more or less cymbiform and saccate, usually without side-lobes. *Column* short, the apex shortly hooded or winged. *Anther* more or less subglobose; pollinia 4, waxy, subglobose or clavate, cohering in pairs to one or two membranes.

2049. PHOLIDOTA IMBRICATA Lindl.; F. B. I. v. 845. *Cymbidium imbricatum* F. I. iii. 460.

Chittagong; Chota Nagpur.

A pendent epiphyte, with pseudobulbs 1–3 in. long, each with a petioled leaf, 6–12 in. long.

900. Eria Lindl.

Epiphytic, usually pseudobulbous herbs; pseudobulbs often elongated and stem-like; *leaves* very variable. *Flowers* never large, rarely showy, often pubescent or tomentose, in racemes,

spikes, or heads, or on 1–2-flowered pedicels. *Sepals* free from each other, adnate to the elongated foot of the column, and forming with it a short or long, and spur-like or saccate mentum. *Petals* like sepals; *lip* sessile on the foot of the column and incumbent. *Column* short and straight, or long and little curved. *Anther* imperfectly 4-celled or 8-celled; pollinia 8, waxy, pyriform or broadly obovoid, attached in fours by their bases to a granular membrane, or occasionally all attached together to a single viscus.

Flowers glabrous externally:—

Plants very small, not exceeding 2 in. in height; scapes from among the leaves; bracts minute; leaves submembranous, apiculate ..... *muscicola.*

Plants never less than 4 in. in height; scapes from below the leaves; bracts large; leaves firm, obliquely 2-fid ..... *bractescens.*

Flowers woolly externally; plants never less than 9 in. in height; scapes from base of pseudobulbs; leaves firm, acuminate ..... *flava.*

2050. ERIA MUSCICOLA Lindl.; F. B. I. v. 789.
Chota Nagpur.
A small epiphyte, pseudobulbs subglobose, crowded, about ·5 in. long, nodes 1–2.

2051. ERIA BRACTESCENS Lindl.; F. B. I. v. 796.
Chittagong.
An epiphyte, with crowded, oblong, pseudobulbous stems of 2–3 nodes, 1–1·5 in. long.

2052. ERIA FLAVA Lindl.; F. B. I. v. 801.
Chota Nagpur.
An epiphyte, with large, flattened, pseudobulbous stems of 4–6 nodes, 3–5 in. long.

901. Pachystoma Lindl.

Terrestrial herbs, with rather thick rootstocks; *leaves* solitary or in pairs, following the flowers, long, narrow, many-nerved. *Flowers* rather small, puberulous, white or pale purple, in racemes on long, pale scapes, with striate, clasping sheaths. *Sepals* unequal, the dorsal blunt, the lateral subacute. *Petals* narrow, spathulate; *lip* sessile on the footless column, erect, with oblong, acute side-lobes, and a small, terminal lobe. *Column* short, its apex dilated. *Anther* dorsal; pollinia 8, waxy, pyriform, adhering to a single membrane.

2047. Bulbophyllum triste Reichb. f.; F. B. I. v. 768. *B. micranthum* F. B. I. v. 768.

Chota Nagpur, Sirguja.

A small 2-foliate epiphyte, leafless when in flower.

898. Trias Lindl.

Small pseudobulbous, epiphytic herbs; *leaves* solitary on the pseudobulbs coriaceous. *Flowers* solitary, on lateral scapes. *Sepals* subequal, spreading, 7-nerved, lateral adnate to the foot of the column. *Petals* small, oblong or linear; *lip* small, coriaceous or fleshy, jointed to the foot of the column, inflexed, incumbent, mobile. *Column* short, broad, tip winged or toothed or angled. *Anther* erect, caducous, 2-celled, produced into a long horn; pollinia 4, waxy, subcoherent in pairs in each cell.

2048. Trias oblonga Lindl.; F. B. I. v. 780.

Sundribuns.

An epiphyte, with small, subglobose pseudobulbs.

899. Pholidota Lindl.

Epiphytic herbs, with jointed, often branching stems, with pseudobulbous internodes or with tufted pseudobulbs; *leaves* in pairs or solitary, membranous, many-nerved. *Flowers* small, subglobose, expanding from above downwards, racemose on ebracteate peduncles, terminal or from the base of the pseudobulb, usually drooping and distichous, floral bracts large, persisting. *Sepals* concave. *Petals* narrower than sepals; *lip* more or less cymbiform and saccate, usually without side-lobes. *Column* short, the apex shortly hooded or winged. *Anther* more or less subglobose; pollinia 4, waxy, subglobose or clavate, cohering in pairs to one or two membranes.

2049. Pholidota imbricata Lindl.; F. B. I. v. 845. *Cymbidium imbricatum* F. I. iii. 460.

Chittagong; Chota Nagpur.

A pendent epiphyte, with pseudobulbs 1–3 in. long, each with a petioled leaf, 6–12 in. long.

900. Eria Lindl.

Epiphytic, usually pseudobulbous herbs; pseudobulbs often elongated and stem-like; *leaves* very variable. *Flowers* never large, rarely showy, often pubescent or tomentose, in racemes,

spikes, or heads, or on 1–2-flowered pedicels. *Sepals* free from each other, adnate to the elongated foot of the column, and forming with it a short or long, and spur-like or saccate mentum. *Petals* like sepals; *lip* sessile on the foot of the column and incumbent. *Column* short and straight, or long and little curved. *Anther* imperfectly 4-celled or 8-celled; pollinia 8, waxy, pyriform or broadly obovoid, attached in fours by their bases to a granular membrane, or occasionally all attached together to a single viscus.

Flowers glabrous externally:—

Plants very small, not exceeding 2 in. in height; scapes from among the leaves; bracts minute; leaves submembranous, apiculate ..... *muscicola.*

Plants never less than 4 in. in height; scapes from below the leaves; bracts large; leaves firm, obliquely 2-fid ..... *bractescens.*

Flowers woolly externally; plants never less than 9 in. in height; scapes from base of pseudobulbs; leaves firm, acuminate ..... *flava.*

2050. ERIA MUSCICOLA Lindl.; F. B. I. v. 789.
Chota Nagpur.
A small epiphyte, pseudobulbs subglobose, crowded, about ·5 in. long, nodes 1–2.

2051. ERIA BRACTESCENS Lindl.; F. B. I. v. 796.
Chittagong.
An epiphyte, with crowded, oblong, pseudobulbous stems of 2–3 nodes, 1–1·5 in. long.

2052. ERIA FLAVA Lindl.; F. B. I. v. 801.
Chota Nagpur.
An epiphyte, with large, flattened, pseudobulbous stems of 4–6 nodes, 3–5 in. long.

901. Pachystoma Lindl.

Terrestrial herbs, with rather thick rootstocks; *leaves* solitary or in pairs, following the flowers, long, narrow, many-nerved. *Flowers* rather small, puberulous, white or pale purple, in racemes on long, pale scapes, with striate, clasping sheaths. *Sepals* unequal, the dorsal blunt, the lateral subacute. *Petals* narrow, spathulate; *lip* sessile on the footless column, erect, with oblong, acute side-lobes, and a small, terminal lobe. *Column* short, its apex dilated. *Anther* dorsal; pollinia 8, waxy, pyriform, adhering to a single membrane.

2053. PACHYSTOMA SENILE Reichb. f.; F. B. I. v. 812.
Tirhut; N. Bengal, frequent; C. Bengal, very rare.
An erect, terrestrial herb; leaf solitary; scape 8–15 in.; rhizome 1–2 in. long, often intimately associated with roots of grasses.

902. Phajus Lour.

Terrestrial, less often epiphytic herbs, usually large, pseudobulbous or not; *leaves* membranous, usually plicate. *Flowers* large, showy, in a raceme, on a scape rising from the base of the stem or pseudobulb, or from the axil of a leaf, or at the apex of the stem. *Sepals* subequal, erect, rarely spreading. *Petals* like sepals; *lip* adnate to the base of the footless column, erect, gibbous or spurred. *Column* long. *Anther* incompletely 4-celled; pollinia 8, waxy, attached in fours to a granular membrane.

Scapes terminating the leafy stems; pseudobulbs 0.....*albus*.
Scapes from the side of the pseudobulbs:—
Scapes less than 6 in. long .....*nanus*.
Scapes more than 18 in. long.....*Wallichii*.

2054. PHAJUS ALBUS Lindl.; F. B. I. v. 818. *Limodorum bracteatum* F. I. iii. 466.
Chota Nagpur.
A tufted herb, with stout stems, 6–18 in. high.

2055. PHAJUS NANUS Hook. f.; F. B. I. vi. 192.
N. Bengal, Duars, in grassy savannahs.
A dwarf terrestrial herb.

2056. PHAJUS WALLICHII Lindl.; F. B. I. v. 816.
Chota Nagpur.
A tall terrestrial herb.

903. Acanthephippium Bl.

Terrestrial herbs, with large pseudobulbous stems, shortly leafy above; *leaves* thickly membranous, plicate, petiolate, few. *Flowers* large, fleshy, few, in a short, lateral, sheathed raceme. *Sepals* fleshy, connate, the lateral pair also adnate to the foot of the column, and together forming a wide, cupular mentum. *Petals* erect, narrowed, included in the sepaline cup; *lip* small, stipitate at end of foot, mobile, with broad, incurved lateral, and a small, triangular mid-lobe. *Column* short, stout, with a long foot. *Anther* 2-celled; pollinia 8, cohering by means of a granular mass.

2057. ACANTHEPHIPPIUM STRIATUM Lindl.; F. B. I. v. 816.
Chota Nagpur.
A large, terrestrial herb, with longish, obpyriform pseudobulbs; flowers 1·25 in. long.

904. Calanthe Lindl.

Terrestrial, usually pseudobulbous herbs; spurious stems various in length, often tall, sometimes absent; *leaves* membranous, more or less elliptic-oblong, plaited. *Flowers* usually rather large, sometimes small, in erect racemes, on scapes usually from amongst the leaves and axillary, or from the side of the stem or pseudobulb. *Sepals* subequal, usually spreading, rarely connivent, more or less lanceolate or oblong. *Petals* usually narrower than the sepals; *lip* variously adnate to the column, either to its base or to its whole length, usually 3-lobed, the apical lobe often 2-fid, the disc usually lamellate. *Column* short, sometimes dilated at the base or apex. *Anther* usually conical, with an acuminate lip, 2-celled; pollinia 8, waxy, clavate or elliptic, often unequal, cohering in fours to a granular caudicle, or the whole 8 inserted on a single caudicle and attached to a gland.

2058. CALANTHE ANGUSTA Lindl.; F. B. I. v. 849. *C. odora* F. B. I. v. 853.
N. Bengal, Duars.
A terrestrial herb, with short, thickened stem; scape 6–18 in. high; flowers white, sweet-scented.

905. Eulophia R. Br.

Terrestrial, glabrous herbs, with fleshy tubers or rhizomes, rarely pseudobulbous; *leaves* appearing along with or after the flowers, long, narrow, usually plicate. *Flowers* racemed, rarely panicled, on a tall, erect, sheathed, usually lateral scape. *Sepals* free, spreading, subequal. *Petals* like sepals or nearly so; *lip* adnate to the base of the column or to its foot, base saccate or with a short spur, usually 3-lobed; the lateral lobes erect and embracing the column; the disc usually ridged or crested. *Column* with or without a foot, its apex entire and often oblique, its margins sometimes winged or lobed. *Anther* terminal, sometimes with two apical processes, its lip often toothed, 2-celled; pollinia 2, globose, attached by a caudicle to the flat gland of the rostellum.

Flowers and leaves appearing almost simultaneously; column not produced into a foot:—

Pseudobulbs large, green, above ground; leaves grass-like; bracts small; scape often branching ..... *graminea.*

Pseudobulbs 0, roots tuberous, buried; leaves elliptic; bracts large; scape unbranched ..... *bracteosa.*

Flowers appearing long before leaves; scape unbranched:—

Column not produced into a foot ..... *campestris.*

Column produced into a foot:—

Lateral sepals inserted on the spur of the lip ..... *nuda.*

Lateral sepals inserted on the foot of the column, free from the spur of the lip or nearly so:—

Flowers purplish-brown ..... *bicarinata.*

Flowers lemon-yellow ..... *flava.*

2059. EULOPHIA GRAMINEA Lindl.; F. B. I. vi. 2.

C. Bengal; E. Bengal; Chittagong.

A terrestrial herb, with a conspicuous green pseudobulb.

2060. EULOPHIA BRACTEOSA Lindl.; F. B. I. vi. 3.

N. Bengal, Duars; Chittagong.

A terrestrial herb, with a sheathed stem, 4–6 in. long.

2061. EULOPHIA CAMPESTRIS Wall.; F. B. I. vi. 4; E. D. E. 467. *Limodorum ramentaceum* F. I. iii. 467.

Tirhut; N. Bengal; Chittagong.

A terrestrial herb; scape 6–18 in. long, rising from a deformed tuber. *Beng.* Sang-misri; *Santal.* Bonga taini.

2062. EULOPHIA NUDA Lindl.; F. B. I. vi. 5.

Chota Nagpur.

A terrestrial herb, with a large tuber; scape 1–3 feet high.

2063. EULOPHIA BICARINATA Hook. f.; F. B. I. vi. 6.

N. Bengal, Duars.

A terrestrial herb; scape 1–3 feet long, rising from a large tuber.

2064. EULOPHIA FLAVA Hook. f.; F. B. I. vi. 7.

Chota Nagpur.

A tall, robust herb, with large yellow flowers; scape 2–5 feet long.

906. Geodorum Jacks.

Terrestrial herbs, with underground, subglobose rhizomes; *leaves* elliptic, plicate, their sheaths forming a pseudo-stem. *Flowers* rather crowded and narrow, forming a decurved, corymbose raceme on a stout, erect, sheathed scape from the base of the pseudo-stem. *Sepals* equal, oblong, subacute, erect. *Petals* as long as the sepals, but broader and blunt; *lip* sessile on the base of the column, broadly ventricose at the callus-bearing base; lateral lobes 0, apical broad, rounded, 2-fid or emarginate. *Column* less than half the length of the lip. *Anther* broad, 2-celled; pollinia 2, broadly and dimidiately ovoid, attached by a tapering, slender caudicle to a small orbicular gland.

Lip not saccate, white with pink lines or faintly uniformly flushed with pink; disk not yellow.....*dilatatum*
Lip deeply saccate, more or less streaked with purple or red; disk yellow *citrinum*.

2065. Geodorum dilatatum R. Br.; F. B. I. vi. 17. *G. purpureum* F. B. I. vi. 16 partly. *Limodorum recurvum* F. I. iii. 469.
Chota Nagpur; Behar; W. Bengal; C. Bengal.
A terrestrial herb.

2066. Geodorum citrinum Jacks.; F. B. I. vi. 17.
Chittagong.
A terrestrial herb.

907. Thecostele Reichb. f.

Epiphytic, pseudobulbous herbs; *leaf* solitary, short-petioled on each pseudobulb. *Flowers* racemed, on slender basal scapes. *Sepals* subequal, broad. *Petals* narrower than sepals; *lip* connate with the foot of the column, 3-lobed, its base forming with the foot a ventricose tube, perforate in front; side-lobes small, erect; mid-lobe entire or 3-lobulate, velvety. *Column* slender, arched, with incurved, apical wings. *Anther* 2-celled; pollinia 2, subglobose, separately stipitate on a scale-like gland.

2067. Thecostele alata Par. & Reichb. f. *T. Zollingeri* F. B. I. vi. 19. *Cymbidium alatum* F. I. iii. 459.
Chittagong.
A pseudobulbous epiphyte.

908. Doritis Lindl.

Epiphytic herbs with short stems; pseudobulbs 0; *leaves* flat, coriaceous. *Flowers* medium, in loose racemes, on erect or pendulous peduncles, axillary or from the side of the stem. *Sepals* wide-spreading. *Petals* like sepals; *lip* adnate by its base to the sides of the long foot of the column, and forming a conical sac, with the lateral and terminal lobes at its mouth. *Column* narrowly winged; foot long. *Anther* 2-celled; pollinia 2, attached by a flat caudicle to a small triangular gland.

2068. Doritis Wightii Benth.; F. B. I. vi. 32.

Chittagong; Chota Nagpur.

A leafy epiphyte, with broad, tortuous, tufted roots.

909. Luisia Gaud.

Epiphytic herbs, with rigid, sheathed, usually erect, sometimes pendulous stems, woody below; *leaves* terete, fleshy, distant, spreading. *Flowers* usually small, dull-coloured, in short, extra-axillary spikes, with stout rachis; floral bracts short, scarious, persistent. *Sepals* subequal, or the dorsal depressed, smaller. *Petals* equal to sepals or much longer, spreading; *lip* sessile on the base of the column, with a distinct saccate, concave or flat hypochile, and a decurved, broad and ridged, entire or crenate, undulate, more or less blunt epichile. *Column* stout, much shorter than the lip; stigma usually large. *Anther* broad, 2-celled; pollinia 2, ovoid or subglobose, attached to a subquadrate or elongate gland. *Capsule* narrow, ridged, suberect.

*Petals not much longer than the lateral sepals:—[p. 1019]

Sepals and petals pale yellowish-green, rarely with a few purple lines; lip with a saccate hypochile, constricted at its junction with epichile:—

Lip not longer than sepals or petals; epichile subreniform, notched at apex, green; hypochile green with purple spots; column purple; slender plants; leaves never exceeding 2·5 in. long; flowers very small, ·15 in. long ..... *inconspicua.*

Lip longer than sepals and petals; stoutish plants; leaves never less than 3 in. long:—

Epichile broadly cordate, tapering to the subtruncate, minutely emarginate apex; flowers ·4 in. long; whole lip dark purple with faint green lines ..... *trichorrhiza.*

Epichile rhomboid, with broad, subtruncate apex; flowers ·25 in. long; whole lip uniformly purple ..... *teretifolia.*

Sepals green externally, rose-purple within; petals rose-purple, with

green base and apex ; lip with almost flat hypochile, hardly constricted at base of wide ovate epichile.....*brachystachys.*
*Petals twice to thrice as long as the lateral sepals [p. 1018].....*volucris.*

2069. Luisia inconspicua Hook. f. *Saccolabium inconspicuum* F. B. I. vi. 56.
Chota Nagpur, Manbhum.
A small, slender epiphyte.

2070. Luisia trichorrhiza Bl.; F. B. I. vi. 23.
Chota Nagpur, Sirguja.
A rather stout-stemmed epiphyte.

2071. Luisia teretifolia Gaud.; F. B. I. vi. 22. *Cymbidium triste* F. I. iii. 461.
Sundribuns; Chittagong.
A rather stout-stemmed epiphyte.

2072. Luisia brachystachys Bl.; F. B. I. vi. 23.
E. Bengal; Sundribuns.
A slender epiphyte.

2073. Luisia volucris Lindl.; F. B. I. vi. 25. *L. Grovesii* F. B. I. vi. 25.
Chittagong.
A rather stout-stemmed epiphyte.

910. Ornitharium Lindl.

Epiphytic herbs ; stems long, leafy ; *leaves* coriaceous, narrow-oblong, with notched tips. *Flowers* rather small, in long, pendulous, extra-axillary racemes. *Sepals* oblanceolate ; the dorsal connivent, the lateral spreading. *Petals* oblanceolate, spreading. *Lip* jointed to the foot of the column, fleshy, spur-like, with a narrow cavity and with minute side-lobes and an apical lobe at its mouth ; cavity without callus or septum. *Anther* depressed, shortly beaked ; *pollinia* 2, ovoid-globose ; caudicle lanceolate ; gland small.

2074. Ornitharium striatulum Lindl. *Ærides suaveolens* F. I. iii. 473. *Sarcochilus suaveolens* F. B. I. vi. 33.
Chittagong.
A slender, pendulous epiphyte.

911. Ærides Lour.

Epiphytic herbs with leafy stems ; *leaves* coriaceous, terete or linear. *Flowers* usually numerous and showy, in decurved

racemes, sometimes solitary; floral bracts minute. *Sepals* broad, spreading; lateral adnate to base or foot of column. *Petals* like sepals; *lip* adnate to column, spurred; side-lobes large or small, sometimes obsolete; mid-lobe larger than side-lobes, or smaller and incurved. *Column* short, with a short or long foot; rostellum short, or long and 2-fid. *Anther* 2-celled, beaked or not; pollinia 2, globose, sulcate, with a short or long caudicle attached to a gland.

Side-lobes of lip very small; mid-lobe large:—
Spur short, straight; mid-lobe of lip hastate-ovate, tip rounded; racemes rather dense, rarely branched .....*multiflorum*.
Spur slender, uncinate; mid-lobe of lip broad, obtuse or retuse, margins undulate; racemes lax, often branched .....*maculosum*.
Side-lobes of lip larger than the incurved mid-lobe; racemes rather lax, opening both centrifugally and centripetally .....*odoratum*.

2075. ÆRIDES MULTIFLORUM Roxb.; F. I. iii. 475; F. B. I. vi. 44.
Chota Nagpur, common; N. Bengal.
A showy epiphyte.

2076. ÆRIDES MACULOSUM Lindl.; F. B. I. vi. 45.
Chota Nagpur, rare.
A showy epiphyte.

2077. ÆRIDES ODORATUM Lour.; F. B. I. vi. 47. *Æ. cornutum* F. I. iii. 472.
Chota Nagpur, not common.
A showy epiphyte.

912. Rhynchostylis Bl.

Epiphytic herbs with elongated, stout, leafy stems; *leaves* very coriaceous, truncately or bluntly 2-lobed at the tip. *Flowers* showy, numerous, in pendulous, cylindric racemes. *Sepals* broad, obtuse, spreading. *Petals* rather narrower than sepals; *lip* adnate to the short foot of the column, the hypochile forming a deep, wide, compressed, pubescent sac without side-lobes; the epichile obovate, acute, concave, with erect margins. *Column* short, stout, dilated at base, foot very short; stigma small. *Anther* terminal, rounded; pollinia 2, elliptic, adnate by a slender long caudicle to the small, oblong gland.

2078. RHYNCHOSTYLIS RETUSA Bl.; F. B. I. vi. 32. *Ærides guttatum* F. I. iii. 471.

Chota Nagpur; N. Bengal.
A showy epiphyte, with dense, usually long racemes.

913. Vanda R. Br.

Epiphytic herbs, with leafy stems; *leaves* thickly coriaceous or fleshy, flat and keeled, or terete. *Flowers* large and often very showy, axillary, in simple, lax or dense racemes, or sometimes solitary; floral bract much shorter than the ovary. *Sepals* spreading or connivent, narrowed at the base. *Petals* like sepals; *lip* large, with its base usually saccate or spurred; side-lobes large or small, rarely obsolete, adnate to the short foot of the column or to the sides of the sac or spur; apical lobe fleshy, its disc usually ridged or lamellate, sometimes carunculate. *Column* short, stout, with a short foot or footless. *Anther* 2-celled, rostellum small; pollinia 2, didymous, globose ovoid or wide-ovoid; caudicle short and broad or long and geniculate; gland usually large.

Leaves terete; flowers 3–4 in. wide; mid-lobe of lip 2-fid .....*teres.*
Leaves flat; mid-lobe of lip with a truncate, 2-lobed tip :—
Flowers less than an inch across, yellow except the blue fleshy ridges on the lip .....*parviflora.*
Flowers 1·5–2 in. across; sepals and petals greenish with brown nerves; mid-lobe of lip violet .....*Roxburghii.*

2079. Vanda teres Lindl.; F. B. I. vi. 49. *Dendrobium teres* F. I. iii. 485.
E. Bengal; Tippera; Chittagong.
A large, much-branched epiphyte.

2080. Vanda parviflora Lindl.; F. B. I. vi. 50.
Chota Nagpur.
An epiphyte, stem 4–6 in. long.

2081. Vanda Roxburghii Br.; F. B. I. vi. 52; E. D. v. 17. *Cymbidium tessalatum* F. I. iii. 462. *C. tessaloides* F. I. iii. 463.
In nearly every province.
An epiphyte, stem 1–2 feet long. *Hind.* Vanda, rasna; *Beng.* Nái, rasna; *Santal.* Daré banki.

914. Saccolabium Bl.

Epiphytic herbs; *leaves* coriaceous, flat or conduplicate, often keeled. *Flowers* in leaf-opposed or supra-axillary racemes, corymbs, umbels or panicles; floral bracts very short. *Sepals*

adnate to column, subequal, spreading or reflexed. *Petals* like sepals; *lip* sessile on the footless column, forming a cylindric or saccate spur, with an open lumen, or rarely with a horizontal septum, with or without small lateral lobes, the apical lobe small, often hairy. *Column* short, broad, truncate. *Anther* 1-celled or incompletely 2-celled; pollinia 2, entire or 2-partite.

Flowers in panicles :—
Panicles longer than the leaves, many-branched .....*ochraceum*.
Panicles shorter than the leaves, few-branched .....*longifolium*.
Flowers in dense, subumbellate corymbs, with simple peduncles :—
Spur rounded, saccate; mid-lobe of lip wide-ovate or rounded *præmorsum*.
Spur conical; mid-lobe of lip narrow-ovate .....*papillosum*.

2082. SACCOLABIUM OCHRACEUM Lindl.; F. B. I. vi. 62.
Sundribuns.
An epiphyte, stem 1–2 feet; peduncle 9–12 in.

2083. SACCOLABIUM LONGIFOLIUM Hook. f.; F. B. I. vi. 62.
Sundribuns.
A stout epiphyte; peduncle 6–7 in.

2084. SACCOLABIUM PRÆMORSUM Hook. f.; F. B. I. vi. 62. *Cymbidium præmorsum* F. I. iii. 465.
Chota Nagpur.
A small epiphyte; peduncle 1–2 in.

2085. SACCOLABIUM PAPILLOSUM Lindl.; F. B. I. vi. 63.
Chota Nagpur; W. C. and E. Bengal; Sundribuns; Chittagong.
An epiphyte, stem 2–3 feet; peduncle 1–2 in.

915. Cleisostoma Bl.

Epiphytic herbs, stems more or less elongated; *leaves* coriaceous or fleshy, flat or semi-terete. *Flowers* in leaf-opposed racemes or panicles. *Sepals* adnate to column, subequal, spreading. *Petals* like sepals; *lip* sessile on the footless column, the base with a large saccate or funnel-shaped spur, sometimes dilated at the apex, its lumen more or less occluded by 2 calli, of which the posterior is frequently 2-fid, and also sometimes by a dorsal scale, but never septate; the lateral lobes small or obsolete; the apical lobe thickened, concave. *Column* short, thick, footless. *Anther* depressed; pollinia 2, often 2-fid; caudicle single.

Flowers in branched panicles ; spur occluded by 2 calli and with a dorsal scale.....*ramosum.*
Flowers in simple racemes ; spur occluded by 2 calli only ...*micranthum.*

2086. Cleisostoma ramosum Hook. f. ; F. B. I. vi. 72.
C. Bengal ; Sundribuns.
A small epiphyte, stem 1–3 in. ; flowers panicled.

2087. Cleisostoma micranthum King & Pantl. *Saccolabium micranthum* F. B. I. vi. 59.
Chota Nagpur.
A small epiphyte, stem 3–8 in. ; flowers racemed.

916. Sarcanthus Lindl.

Epiphytic herbs ; stems usually elongated ; *leaves* fleshy, terete or flat. *Flowers* in extra-axillary racemes or panicles. *Sepals* subequal, spreading or reflexed, or the dorsal concave and connivent over the column. *Petals* smaller than the sepals, spreading ; *lip* adnate to the base of the column or to its foot, rarely jointed, the base with a funnel-shaped spur sometimes dilated at its apex, the lumen more or less occluded by calli on its anterior and posterior walls, and always divided into two lateral compartments by a vertical, antero-posterior septum ; lateral lobes small, more or less triangular and acute ; apical lobe small, triangular or hastate. *Column* short, stout, often with a foot as long as or longer than itself. *Anther* depressed ; pollinia 2, bifid.

Leaves terete .....*appendiculatus.*
Leaves flat or channelled :—
Leaves few, sparse, narrowly linear-lanceolate, acuminate ; racemes slender, peduncled.....*secundus.*
Leaves many, subimbricate, oblong, amplexicaul, obtusely 2-lobed ; spikes short, stout, sessile .....*insectifer.*

2088. Sarcanthus appendiculatus Hook. f. ; F. B. I. vi. 67.
Sundribuns.
A slender, rigid epiphyte.

2089. Sarcanthus secundus Griff. ; F. B. I. vi. 67.
Chittagong.
An epiphyte.

2090. Sarcanthus insectifer Reichb. f. ; F. B. I. vi. 68.
Behar ; Chota Nagpur ; Sundribuns ; Chittagong.
A scandent epiphyte.

917. Camarotis Lindl.

Epiphytic herbs; stems elongated; *leaves* distant, coriaceous, keeled, obliquely 2-fid at the tip. *Flowers* numerous, in lax, extra-axillary racemes. *Sepals* subequal, spreading or reflexed. *Petals* like sepals; *lip* sessile on the column, forming a thick-walled sac, its lumen narrowed by 2 calli, and partially or completely divided by a septum into an upper and lower chamber; side-lobes small, obscure; apical lobe small, thick, concave, entire, sometimes nearly obsolete. *Column* twisted, footless; rostellum very long, narrow-subulate, curved, twisted to one side. *Anther* dorsal, depressed; pollinia 4, in two pairs, attached by their bases to a long, narrow caudicle, tapering to a minute gland.

Flowers purple; lip without side-lobes; sac with an included spine *rostrata.*

Flowers cream-white; lip with large, rounded side-lobes; sac with an exserted spine ..... *pallida.*

2091. Camarotis rostrata Reichb. f. *Ærides rostratum* F. I. iii. 474. *Sarcochilus purpureus* F. B. I. vi. 36.
Chittagong.
An epiphytic herb, stem 2–3 feet long.

2092. Camarotis pallida Lindl. *Ærides pallidum* F. I. iii. 475. *Sarcochilus Roxburghii* F. B. I. vi. 36.
Tippera; Chittagong.
An epiphytic herb, stem 2–3 feet long.

918. Vanilla Swartz.

Climbing, rooting, branched shrubs; stems terete or angled; *leaves* subsessile, coriaceous or fleshy, sometimes 0. *Flowers* usually large, on short, axillary peduncles. *Sepals* subequal, spreading. *Petals* like sepals; *lip* with its base adnate to the column, which is embraced by its broad, convolute limb. *Column* long. *Anther* incumbent, its cells separate; pollinia granular. *Capsule* long, fleshy.

2093. Vanilla Parishii Reichb. f.; F. B. I. vi. 90.
Chittagong, forest near Burkal.
A climbing, rooting, leafy epiphyte.

919. Didymoplexis Griff.

Terrestrial, leafless, saprophytic herbs, with tuberous roots. *Scape* simple, bearing a scanty raceme of white flowers, the

pedicels in fruit greatly elongating. *Sepals* connate by their margins with the *petals* to form a short, 4- or 5-toothed tube, the dorsal sepal with the petals forming an upper, 3-lobed lip, the lateral sepals a lower, entire, or 2-fid lip; *lip* proper shorter than the perianth-tube, inserted on the very short foot of the column, rather broad, its disk dotted with many minute calli. *Column* long, nearly straight, narrowly winged in the upper part and 3-toothed at the tip; stigma broad. *Anther* 2-celled, depressed; pollinia 4, unequal, in 2 pairs, powdery. *Capsules* elliptic, tumid, ridged, with long, accrescent pedicels.

2094. DIDYMOPLEXIS PALLENS Griff.; F. B. I. vi. 122.

N. Bengal; C. Bengal.

A saprophyte, with branching and tuberous roots; in shady thickets.

920. Pogonia Juss.

Terrestrial, uni-foliate, tuberous herbs; tuber giving off below the surface of the ground two or three stolons, each producing at its tip a tuber smaller than that of the parent; *leaf* broadly cordate or orbicular, strongly plicate, from the same tuber as the flowers, but usually subsequent to the appearance of the flower-scape, occasionally contemporaneous with flowers. *Flowers* solitary, few, or several racemose, often pendulous, on scapes rising from the tuber. *Sepals* subequal, narrow, connivent or spreading. *Petals* like sepals; *lip* sometimes slightly saccate at the base, adnate to the base of the column, rather narrow, the lower portion convolute round the column; the lateral lobes small, usually triangular; the apical lobe flat, ovate or orbicular, entire or fimbriate. *Column* elongate, clavate upwards, the stigma anticous, oblong or orbicular. *Anther* more or less incumbent, substipitate; pollinia 2 or 4, elongate, powdery, often coherent, without caudicle or gland.

* Scapes very few-(1–3-)flowered :—[p. 1026]

Lip without side-lobes, slightly emarginate at the apex; sepals and petals narrowly oblanceolate; flowers 1–3 ..... *plicata.*

Lip 3-lobed, the side-lobes falcate :—

Terminal lobe of lip acuminate; sepals and petals narrowly oblanceolate; flowers 2..... *juliana.*

Terminal lobe of lip obovate-obtuse; sepals and petals linear; flower solitary ..... *falcata.*

*Scapes many-flowered (ending in a 7–15-flowered raceme); lip 3-lobed, the side-lobes obtuse :—[p. 1025]

Leaf 7–9-nerved, the margin not waved; mid-lobe of lip ovate-acute, crenate, white with red or purple veins ..... *carinata.*

Leaves 18- or more-nerved, the margin waved :—

Mid-lobe of lip ovate-acute, crenate, pure white ..... *flabelliformis.*

Mid-lobe of lip suborbicular, yellowish with purple veins ..... *Scottii.*

2095. POGONIA PLICATA Lindl.; F. B. I. vi. 119. *Epipactis plicata* F. I. iii. 454.

C. Bengal, in thickets.

A small terrestrial herb, flowering stem 4–6 in.

2096. POGONIA JULIANA Wall.; F. B. I. vi. 119. *Epipactis juliana* F. I. iii. 453.

N. Bengal; E. Bengal.

A small terrestrial herb, flowering stem 3–5 in.

2097. POGONIA FALCATA King & Pantl.

N. Bengal, Duars.

A small terrestrial herb, flowering stem 1·5–2·5 in.

2098. POGONIA CARINATA Lindl.; F. B. I. vi. 121. *Epipactis carinata* F. I. iii. 452.

N. Bengal; C. Bengal; E. Bengal; Chota Nagpur.

A terrestrial herb, flowering stem 6–12 in. high.

2099. POGONIA FLABELLIFORMIS Lindl.; F. B. I. vi. 121.

Behar, Rajmahal hills; Chota Nagpur.

A terrestrial herb, flowering stem 6–12 in. high.

2100. POGONIA SCOTTII Reichb. f.; F. B. I. vi. 120.

Chittagong.

A terrestrial herb, flowering stem 18 in. high.

921. Tropidia Lindl.

Terrestrial herbs with erect, often branching stems; *leaves* with sheathing petioles, glabrous, membranous, plicate, usually many-nerved. *Flowers* small, resupinate, in terminal or leaf-opposed bracteate spikes. *Sepals* connivent, the lateral pair more or less connate, the odd sepal free. *Petals* like sepals but usually smaller; *lip* superior, adnate to the column, cymbiform or produced into a cylindric, blunt spur, oblong; side-lobes obsolete; apical lobe reflexed, the disk with short or long intramarginal ridges or lamellæ. *Column* short or long; the rostellum very long, erect, often 2-fid; stigma single, anticous. *Anther* erect, dorsal, acute

or acuminate, the cells contiguous; pollinia 2, granular or sectile, narrow-clavate or cylindric, grooved or 2-fid, adnate by a single, long, slender caudicle to a narrow gland. *Capsule* cylindric-clavate.

2101. TROPIDIA CURCULIGOIDES Lindl.; F. B. I. vi. 93.
Chittagong.
A terrestrial herb, stem 1–2 feet high.

922. Corymbis Thouars.

Terrestrial, rigid, erect herbs, with tall, leafy stems and fibrous roots; *leaves* broad, sheathing, plicate. *Sepals* narrow. *Petals* like sepals, and at first connate with them in a tube, with the tips of all five alone free, ultimately all quite free and spreading; *lip* parallel to column and adnate to its base, narrowly linear, channelled; side-lobes obsolete, apex abruptly dilated and decurved. *Column* long, but not equalling the perianth, straight, terete, with a clavate, 2-auriculate tip and a 2-fid rostellum; stigma single, anticous, 2-lobed. *Anther* dorsal, vertical, 2-celled, with an acuminate lip; pollinia long, narrow, deeply grooved, tapering slightly to the thin caudicle; gland peltate. *Capsule* linear or fusiform.

2102. CORYMBIS VERATRIFOLIA Bl.; F. B. I. vi. 91.
Chittagong.
A rigid terrestrial herb, stem 4 feet high.

923. Goodyera R. Br.

Terrestrial, leafy herbs, stem decumbent below; *leaves* usually rather thick, with wide sheaths, and often also distinct petioles. *Flowers* small, numerous, in terminal, sometimes secund, spikes or racemes. *Sepals* subequal, often pubescent outside; lateral pair free, subconnivent or spreading; dorsal concave. *Petals* like dorsal sepal, and forming with it a hood over the column; *lip* adnate to base of column, entire, saccate or cymbiform at the base; apical lobe small, usually acute or decurved; basal sac with setæ, calli or ridges inside, rarely smooth. *Column* short, with projecting rostellum; stigma anticous, undivided. *Anther* usually pyriform, with a long, erect beak; pollinia 2, clavate, sessile on a large or small gland.

2103. GOODYERA PROCERA Hook.; F. B. I. vi. 111.
Chittagong, at Demagri; Chota Nagpur.
A tall herb, 10–30 in. high, very leafy below.

924. Spiranthes Rich.

Terrestrial, leafy herbs, with tuberous or fibrous roots; *leaves* linear. *Flowers* small, secund, in spiral spikes. *Sepals* subequal, the lateral pair gibbous at the base. *Petals* like dorsal sepal, sometimes connate with sepals to form an erect hood; *lip* erect, entire or 3-lobed, the base concave but neither saccate nor spurred, the disk bearing lamellæ or calli. *Column* short, terete; stigma single, broad, anticous; rostellum erect obtuse, or elongate and 2-fid. *Anther* erect, 2-celled; pollinia 4, united in pairs, sessile on a small gland.

2104. SPIRANTHES AUSTRALIS Lindl.; F. B. I. vi. 102.

N. Bengal, Duars, in grassy savannahs; Chittagong.

A slender or stoutish terrestrial herb, 6–18 in. high. This species has been found near Chittagong, floating in ponds at sea-level.

925. Vrydagzynea Bl.

Terrestrial, leafy herbs, stem creeping below, roots fibrous; *leaves* petioled, ovate. *Flowers* small, suberect, spicate. *Sepals* free, dorsal rather smaller than lateral. *Petals* like dorsal sepal, and with it forming a hood over the column; *lip* included, sessile at the base of the column, membranous, concave, entire; spur large, inflated, exserted beyond the base of the sepals, with 2 stipitate calli in its lumen. *Column* short, inappendiculate, stigmatic lobes lateral; rostellum short. *Anther* short; cells distant; pollinia 2, sessile on a large gland.

2105. VRYDAGZYNEA VIRIDIFLORA Hook. f.; F. B. I. vi. 96.

E. Bengal.

A leafy, terrestrial herb.

926. Zeuxine Lindl.

Terrestrial herbs, with succulent, glabrous stems; *leaves* membranous, sometimes withering at flowering-time. *Flowers* small, in racemes or spikes. *Sepals* subequal, the lateral pair free, the dorsal concave. *Petals* like dorsal sepal, and with it forming a hood to the column; *lip* adnate to base of column, cymbiform or saccate, the apical lobe shortly clawed or sessile, divided into two oblong, subquadrate, more or less truncate, diverging lobules, or entire, or with narrow, decurved lobules; the basal sac with calli or laminæ within. *Column* very short, its anterior face with

lamellar or conical processes; stigmas two, lateral, distinct. *Anther* membranous, sometimes ridged, its cells contiguous; pollinia pyriform, attached by an oblong gland to the erect rostellum.

Leaves linear, sessile; apical lobe of lip suborbicular, erose; lip not longer than sepals; pollinia sessile on an oblong gland .....*sulcata.*
Leaves ovate, petioled; apical lobe of lip winged; lip longer than sepals:—
Lip twice as long as sepals, wings of terminal lobe elongated, toothed; pollinia adnate for two-thirds of their length to the linear appendage of the gland.....*longilabris.*
Lip a little longer than the sepals, wings of terminal lobe entire:—
Petals subrotund, dimidiate, abruptly apiculate on one side; pollinia obovoid, bifid, attached to a broad, oblong caudicle .....*nervosa.*
Petals subobliquely elliptic, acute; pollinia clavate, subsessile on the narrowly elliptic gland .....*affinis.*

2106. ZEUXINE SULCATA Lindl.; F. B. I. vi. 106; E. D. Z. 188.
Pterygodium sulcatum F. I. iii. 452.
In all the provinces, in open, grassy places.
An erect, terrestrial, grassy herb, 2–16 in. long, varying with the length of the grasses among which it grows.
Beng. Swet-huli.

2107. ZEUXINE LONGILABRIS Benth.; F. B. I. vi. 107.
C. Bengal; E. Bengal; Chittagong.
An erect, terrestrial herb, 10–15 in. long.

2108. ZEUXINE NERVOSA Benth.; F. B. I. vi. 108.
N. Bengal, Duars; E. Bengal, Mymensingh; Tippera.
An erect, terrestrial herb, stem stoutish, 8–9 in. long.

2109. ZEUXINE AFFINIS Benth.; F. B. I. vi. 108.
N. Bengal, in *Sál* forests.
An erect, terrestrial herb, stem slender, 6–12 in. long.

927. Habenaria Willd.

Terrestrial, leafy herbs, with undivided or lobed tubers, or fleshy root fibres; *leaves* flat, with sheathing bases. *Flowers* small or large, in racemes or spikes. *Sepals* subequal, the lateral pair spreading, reflexed or deflexed, or sometimes erect. *Petals* smaller or larger than the sepals, entire or 2-cleft, often connivent with the dorsal sepal to form a hood over the column; *lip* adnate to

base of column, entire, 3-lobed or 3-partite, its base spurred. *Column* short, usually broad; stigmas 2, distant, or conjoined across the face. *Anther*-cells adnate to the front of the column, discrete, rarely touching, parallel or divergent below, their bases often prolonged into tubes containing the caudicles; staminodes rugulose, one on the outer side of each anther-cell; pollinia 2, clavate or pyriform, usually grooved, sometimes 2-partite; caudicles long or short or obsolete; glands exposed, flat and discoid or elliptic and globular, or elongate with truncate ends.

*Flowers green, white or yellow, small or large, in the axils of bracts in terminal racemes; lip 3-partite or 3-lobed :—[p. 1032]

Petals 2-partite; lip 3-partite, with filiform segments; lateral sepals spreading or deflexed; spur as long as the ovary; racemes many-flowered; stem leafy upwards; flowers greenish :—

Sepals with filiform tips nearly or quite as long as their blades; bracts membranous, not longer than the ovary; spur filiform ..... *stenopetala.*

Sepals acute but not filiform at their tips; bracts subfoliaceous, as long as the flowers or longer; spur subclavate ..... *digitata.*

Petals entire :—

†Side-lobes of lip petaloid, much wider than the narrow, linear mid-lobe; racemes lax, few-flowered; flowers white :—[p. 1031]

Lip not longer than the sepals; side-lobes truncate, the outer margin pectinate to the middle; spur twice as long as the ovary; petals small; stem tall, leafy upwards; leaves ovate-oblong; flowers large ..... *Susannæ.*

Lip much exceeding the sepals; stem short :—

Stem leafy upwards; side-lobes of lip longer than the mid-lobe :—

Spur thickened at the tip, not longer than the ovary; petals shorter than the dorsal sepal; side-lobes of lip semi-oblong, outer margin crenate; leaves short, sheathing, oblong; flowers large ..... *triflora.*

Spur slender, twice as long as the ovary; petals as long as the dorsal sepal; side-lobes of lip semicircular, entire; leaves long, linear; flowers medium ..... *longifolia.*

Stem scapigerous; scape slender; flowers medium; leaves radical; side-lobes of lip not or hardly exceeding the mid-lobe :—

Spur thickened below the middle, several times as long as the ovary; sepals broad, obtuse; petals oblong-lanceolate; acuminate ..... *longicalcarata.*

Spur slender, as long as the ovary; sepals small; petals linear-lanceolate ..... *plantaginea.*

†Side-lobes of lip never wider than the mid-lobe; racemes many-flowered, usually dense :—[p. 1030]

Spur filiform, fusiform or long clavate, as long or, rarely (*H. affinis* only), at least half as long as the ovary and then filiform; lateral sepals spreading deflexed or reflexed, larger than the petals :—

Tubes of the anther-cells very long; flowers white; lateral sepals very gibbous; spur equalling or exceeding the ovary; stem leafy upwards; segments of lip very long, subequal, filiform ..... *commelinifolia.*

Tubes of the anther-cells very short; flowers usually green or greenish-yellow :—

Leaves 4 or more than 4, clustered towards the middle or at the base of the stem :—

Bracts as long as or longer than the ovary; lateral segments of lip narrower than the central linear lobe :—

Spur longer than the ovary, very slender, involute; lateral segments of lip filiform, longer than mid-lobe *furcifera.*

Spur not longer than the ovary; lateral segments of lip slender but not filiform, not longer than mid-lobe :—

Spur slender, incurved, only half as long as the ovary; leaves green throughout, placed near the middle of the stem ..... *affinis.*

Spur stout, fusiform, nearly or quite as long as the ovary; leaves with narrow yellowish margins, placed near the base of the stem ..... *marginata.*

Bracts much shorter than the ovary; segments of lip subequal, linear; spur as long as the ovary, thickened below; leaves green throughout, placed near the base of the stem *viridiflora.*

Leaves 2, rarely 3, radical, closely adpressed to the ground, orbicular-cordate; bracts shorter than the ovary; spur as long as the ovary, inflated, acute; segments of lip all filiform, the lateral longer than central..... *diphylla.*

Spur small, globose, ellipsoid, or shortly clavate, not one-fourth the length of the ovary; lateral sepals narrower than the petals, erect or ascending parallel to the dorsal sepal and petals, and with these forming a hood to the column; leaves clustered about the middle of the stem; bracts as long as or longer than the ovary :—

Spikes elongated, dense, many-flowered; stems stout; lip 3-fid,

without a claw; side-lobes slender, rather narrower than the mid-lobe; flowers greenish-yellow :—

Lip not longer than the obtuse lateral sepals; bracts never quite as long as the flowers, which do not exceed ·3 in. in diameter ..... *goodyerioides.*

Lip somewhat exceeding the linear-lanceolate, lateral sepals; bracts as long as or longer than the flowers, which are not less than ·6 in. across ..... *constricta.*

Spikes lax-flowered; flowers usually many, sometimes few, small, yellow; stems slender; lip with a concave claw and a broadly, obtusely, equally 3-fid lamina ..... *Lawii.*

*Flowers pale-purple, large, in the axils of sheathing leaves; lip entire, broad, petaloid; spur conical, funnel-shaped; lateral sepals ascending [p. 1030] ..... *Galeandra.*

2110. HABENARIA STENOPETALA Lindl.; F. B. I. vi. 134.
Orissa; Chota Nagpur; E. Bengal, Mymensingh.
A stoutish herb, 1–2 feet high.

2111. HABENARIA DIGITATA Lindl.; F. B. I. vi. 134.
E. Bengal; Chota Nagpur.
A leafy herb, 1–2 feet high.

2112. HABENARIA SUSANNÆ R. Br.; F. B. I. vi. 137.
Chota Nagpur.
A tall, leafy herb, 3–5 feet high; flowers 3–4 in. across.

2113. HABENARIA TRIFLORA Don; F. B. I. vi. 142.
Chota Nagpur, Singhbhum, on banks of muddy streams; E. Bengal, Mymensingh.
A leafy herb, with rather slender stems, 8–12 in. high; flowers 1·5–2 in. across.

2114. HABENARIA LONGIFOLIA Ham.; F. B. I. vi. 141.
N. Bengal, Nathpur in Purnea.
A slender herb, 10–18 in. high.

2115. HABENARIA LONGICALCARATA A. Rich.; F. B. I. vi. 141.
Chota Nagpur, Sirguja.
A subscapigerous herb, 10–18 in. high.

2116. HABENARIA PLANTAGINEA Lindl.; F. B. I. vi. 141. *Orchis platyphyllos* F. I. iii. 450.
Behar; Chota Nagpur; C. Bengal, rare.
A slender herb, 8–12 in. high.

2117. HABENARIA COMMELINIFOLIA Wall.; F. B. I. vi. 143. *Orchis commelinifolia* F. I. iii. 451.

Chota Nagpur.
A strong herb, 2–3 feet high.

2118. HABENARIA FURCIFERA Lindl.; F. B. I. vi. 149.
Orissa; Chota Nagpur; E. Bengal.
A stoutish herb, 1–1½ feet high.

2119. HABENARIA AFFINIS Wight; F. B. I. vi. 149.
Chota Nagpur.
A stoutish herb, 1–2 feet high.

2120. HABENARIA MARGINATA Colebr.; F. B. I. vi. 150.
Chota Nagpur; Behar; W. Bengal; C. Bengal.
A small herb, scape 4–10 in. high.

2121. HABENARIA VIRIDIFLORA R. Br.; F. B. I. vi. 150.
E. Bengal.
A slender herb, scape 4–14 in. high.

2122. HABENARIA DIPHYLLA Dalz.; F. B. I. vi. 151.
E. Bengal, Dacca; Chota Nagpur.
A very slender herb, scape 4–10 in.; leaves close to ground.

2123. HABENARIA GOODYERIOIDES Don; F. B. I. vi. 161.
Chota Nagpur; Chittagong.
A stout herb, 1–2 feet high.

2124. HABENARIA CONSTRICTA Hook. f.; F. B. I. vi. 161.
Chittagong; Chota Nagpur.
A stout herb, 2–3 feet high.

2125. HABENARIA LAWII Hook. f.; F. B. I. vi. 162.
Chota Nagpur, Parasnath.
A short, slender herb, 6–10 in. high.

2126. HABENARIA GALEANDRA Benth.; F. B. I. vi. 163.
Chota Nagpur.
A short, slender, leafy herb, 6–8 in. high; flowers pale-purple.

928. Apostasia Bl.

Terrestrial herbs, with short rootstock and rigid, leafy stems; *leaves* narrow, nerves strong. *Flowers* small, in terminal or axillary, simple or panicled, often decurved spikes. *Perianth* 2-seriate, of 6 equal, free, spreading or recurved segments. *Stamens* 2 perfect, lateral, epigynous, the posterior replaced by a staminode or obsolete; filaments very short; anthers narrow, erect, 2-celled; cells parallel. *Carpels* 3, connate in a completely

3-celled ovary; style short; stigma terminal, discoid. *Fruit* a linear, 3-locular capsule. *Seeds* large.

2127. APOSTASIA NUDA R. Br.; F. B. I. vi. 175.

Chittagong.

A rigid, leafy herb, 10–12 in. high; panicles decurved.

Order CXXVIII. SCITAMINEÆ.

Herbs, often large, frequently with a pseudostem of convolute leaf-sheaths, rarely with a woody caudex. *Leaves* radical or cauline, usually membranous; sheaths generally large, clasping the stem; petiole short or 0; lamina with strong central vein; secondary nerves pinnate, close, parallel. *Flowers* hermaphrodite, rarely 1-sexual, irregular, solitary or spicate; bracts membranous or herbaceous; bracteoles membranous, sometimes 0. *Perianth* 2-seriate, superior; outer segments 3, calycine, rarely petaloid, free and imbricate or connate in an entire, toothed or spathaceous tube; inner segments petaloid, connate in a long or short corolla-tube, free or adnate to the petaloid staminodes; limb 3-partite, the segments free or connate. *Stamens* only 1 perfect, the remainder replaced by petaloid staminodes, or 5 perfect, with the sixth imperfect or obsolete; anthers linear, 2-celled, rarely of one cell on the margin of a petaloid connective. *Carpels* connate in a 3-celled, rarely 2-celled or 1-celled, inferior ovary; style usually slender, with 2 short stylodes crowning the ovary; stigma usually entire or subentire; ovules many, rarely few, anatropous, axial, rarely parietal. *Fruit* a loculicidally 3-valved capsule, or indehiscent and membranous or fleshy, usually crowned by the remains of the perianth. *Seeds* often arillate; albumen floury; embryo small.

*Stamen only one perfect, others reduced to staminodes or 0:—[p. 1036]

†Anther 2-celled; calyx tubular or spathaceous; style slender, embraced below the stigma by the anther; placentas many-ovuled; embryo central, straight:—[p. 1035]

Ovary 1-celled; placentas 3, parietal; corolla-tube long; stigma turbinate:—

Scape leafless; flowers lilac ..... **Mantisia.**

Stem leafy; flowers yellow ..... **Globba.**

Ovary 3-celled; placentas axial:—

Lateral staminodes broad :—

Connective not spurred at the base; corolla-tube long, slender :—

Filament short :—

Connective broad, crested ; stigma turbinate ...**Kæmpferia.**

Connective not crested ; stigma subglobose ...**Gastrochilus.**

Filament long, narrow ; connective very narrow, not crested ; stigma subglobose .....**Hedychium.**

Connective spurred at the base; corolla-tube funnel-shaped ; stigma 2-lipped, the lips ciliate ; bracts forming a cone-like spike .....**Curcuma.**

Lateral staminodes small or 0, rarely narrow and adnate to the lip ; corolla-tube cylindric :—

Flowers in a dense, cone-like spike :—

Anther-cells divaricate, on a short, arcuate filament, with or without a petaloid crest ; stigma small subglobose, or larger and gibbous on the back ; spikes almost always produced direct from the rootstock, rarely from the top of a leafy spike **Amomum.**

Anther-cells contiguous, parallel :—

Filament short ; connective produced as a narrow appendage as long as anther ; stigma small, subglobose ; spikes usually produced direct from the rootstock, sometimes at the top of a leafy stem .....**Zingiber.**

Filament forming with the produced connective an oblong, petaloid process, with the contiguous linear anther-cells placed in its middle ; stigma with a semilunar pit ciliate round the margin ; spikes usually at the top of leafy stems, rarely produced direct from the rootstock .....**Costus.**

Flowers in racemes or panicles at the top of leafy stems ; filament long ; anther-cells divergent at apex ; stigma subglobose .....**Alpinia.**

†Anther 1-celled, laterally adnate to a petaloid filament ; calyx of free sepals :—[p. 1034]

Staminal tube with 5 subsimilar, slightly unequal petaloid segments, the 1-celled anther adnate to one of the smaller segments ; ovary 3-celled ; placentas many-ovuled ; style flattened ; stigma terminal, capitate ; embryo straight .....**Canna.**

Staminal tube very irregular, 5–6-lobed, 1 or 2 lobes lateral and 1 (*lip*) anterior, with 3 or 2 lobes dorsal, of which 2 or 1 are hood-like and another bears the anther-cell ; placentas 1-ovuled ; stigma oblique, dilated or 2-labiate ; embryo curved :—

Ovary apparently 1-celled and 1-ovuled, with 2 small, rudimentary empty cells; stem leafy, with a terminal, few-flowered inflorescence and convolute sheathing bracts ..... **Maranta.**

Ovary 3-celled, 3-ovuled:—

Stems leafy, with terminal, panicled, scattered flowers; panicle with convolute, deciduous sheathing bracts at the forks and deciduous bracteoles ..... **Clinogyne.**

Stems with broad, solitary leaves, and lateral, clustered heads of flowers; bracts and bracteoles persistent ..... **Phrynium.**

*Stamens 5 perfect, free, the sixth imperfect or absent; stigma more or less distinctly 6-lobed:—[p. 1034]

Sepals free; petals long, narrow, free; capsule loculicidally 3-valved; leaves distichous ..... **Ravenala.**

Sepals united in a split, spathaceous tube; corolla short, included, enveloping the stamens and style; fruit fleshy, indehiscent; leaves spiral ..... **Musa.**

929. **Mantisia** Sims.

Leafy herbs; rootstock creeping; stem short; *leaves* oblong-lanceolate, caudate. *Flowers* laxly panicled on a short scape, sheathed below; bracts membranous, coloured. *Sepals* connate in a short, campanulate, obtusely 3-lobed calyx. *Petals* 3, connate in a corolla with slender tube; lobes subequal, ovate; dorsal erect, concave. *Stamen* 1 perfect; filament long, curved; anther-cells linear-oblong, broadly winged; lateral staminodes at or below the middle of the exserted filament, slender, spathulate or subulate; lip deflexed, 2-fid. *Carpels* 3, connate in a 1-celled ovary; style filiform, lying in a groove on the filament; stigma turbinate; placentas parietal; ovules numerous. *Fruit* a globose capsule dehiscing at the apex. *Seeds* many, minute, oblong.

Staminodes linear, subulate ..... *saltatoria.*
Staminodes with a narrow claw and flattened, petaloid blade... *spathulata.*

2128. MANTISIA SALTATORIA Sims; F. B. I. vi. 200. *Globba subulata* F. I. i. 81.

Chittagong.

A herb with perennial rootstock and annual leafy stem 1–2 feet high; panicle 3–6 in.

2129. MANTISIA SPATHULATA Schult.; F. B. I. vi. 201. *Globba spathulata* F. I. i. 83.

Chittagong.

A herb very like the preceding, but panicles larger and more branched.

930. Globba Linn.

Herbs with creeping rhizomes and erect stems; *leaves* oblong or oblong-lanceolate. *Flowers* in terminal panicles, rarely in spikes; bracts usually deciduous; buds often replaced by bulbils. *Sepals* connate in a funnel-shaped, 3-lobed calyx. *Petals* 3, connate in a corolla with tube longer than the calyx; lobes ovate, subequal. *Stamen* 1 perfect; filament long, incurved, with 2 dorsal appendages; anther oblong; connective simple, winged or spurred, produced beyond the cells; lateral staminodes petaloid, contiguous to the corolla-segments; lip deflexed. *Carpels* 3, connate in a 1-celled ovary; ovules many, on 3 parietal placentas; style filiform, lying in a groove of the filament; stigma turbinate. *Fruit* a globose capsule, tardily dehiscent. *Seeds* many, small, ovoid, with a small, white, lacerate arillus.

Anther not winged:—
Leaves glabrous beneath ..... *orixensis.*
Leaves finely pubescent beneath ..... *ophioglossa.*
Anther winged on each side by a bifid, quadrate membrane..... *bulbifera.*

2130. Globba orixensis Roxb.; F. I. i. 78; F. B. I. vi. 201.
Chota Nagpur; Behar; E. Bengal, Mymensingh.
A herb with perennial rootstock and annual leafy stems, 1–2 feet high.

2131. Globba ophioglossa Wight; F. B. I. vi. 202.
Chota Nagpur.
A herb with leafy stems, 2–3 feet high.

2132. Globba bulbifera Roxb.; F. I. i. 78; F. B. I. vi. 206.
Chota Nagpur.
A herb with leafy stems, 1 foot high; lower bracts bulbiferous.

931. Kæmpferia Linn.

Herbs with short stems or stemless; rootstock often tuberous; *leaves* few. *Flowers* spiked, on radical scapes or at the apex of the leafy stem. *Sepals* 3, connate in a short, cylindric calyx, which splits spathaceously. *Petals* 3, connate in a corolla with a long, slender tube; lobes equal, usually spreading. *Stamen* 1

perfect; filament short, arcuate; anthers 2-celled; cells discrete, on a wide connective, produced above as a petaloid crest, not spurred below; lateral staminodes broad, petaloid; lip broad, usually 2-fid. *Carpels* 3, connate in a 3-celled ovary; ovules many, on 3 axial placentas; style long, filiform; stigma turbinate. *Fruit* an oblong capsule with thin pericarp. *Seeds* subglobose, with a small, lacerate arillus.

Leaves contemporary with the flowers, sessile :—

Leaves suborbicular; corolla segments lanceolate; staminodes obovate-cuneate; lip white with lilac throat ..... *Galanga.*

Leaves lanceolate; corolla segments long, linear; staminodes oblong; lip lilac ..... *angustifolia.*

Leaves petioled, not produced till flowering is over, oblong; corolla segments long, linear; staminodes oblong, acute; lip lilac or reddish *rotunda.*

2133. KÆMPFERIA GALANGA Linn.; F. I. i. 15; F. B. I. vi. 219; E. D. K. 3.

In gardens in most of the provinces.

A stemless herb, leaves 3–6 in. long, spreading flat on the ground. *Hind.* Chandra múla; *Beng.* Chandu múla, humúla.

2134. KÆMPFERIA ANGUSTIFOLIA Roscoe; F. I. i. 17; F. B. I. vi. 219; E. D. K. 1.

N. Bengal.

A stemless herb, leaves many, ascending, 6–8 in. long, an inch or less wide. *Vernac.* Kanjan-bura, mud nirbisha.

2135. KÆMPFERIA ROTUNDA Linn.; F. I. i. 16; F. B. I. vi. 222; E. D. K. 8.

Chota Nagpur, Parasnath; Chittagong: elsewhere cultivated.

A stemless herb; leaves erect, with short, channelled petioles; blade 12 in. long, 3–4 in. wide. *Vernac.* Bhui-champa.

932. Gastrochilus Wall.

Perennial herbs; rootstock creeping or 0; root fibres cylindric or slender; stem long or short or 0; *leaves* oblong, acute. *Flowers* solitary or in spikes, often secund; bracts imbricate. *Sepals* 3, connate in a short, spathaceous calyx. *Petals* 3, con-

nate in a slender corolla-tube; lobes equal, connivent, linear-oblong, ascending. *Stamen* 1 perfect; filament very short; anther-cells parallel; connective neither crested nor spurred; lateral staminodes petaloid, broader than the corolla-lobes, oblanceolate-oblong; lip oblong, longer than the corolla-lobes, entire. *Carpels* 3, connate in an oblong, 3-celled ovary; ovules few or many, superposed on axial placentas; style filiform; stigma subglobose. *Fruit* an oblong capsule. *Seeds* ovoid, with a small basal arillus.

2136. GASTROCHILUS LONGIFLORA Wall.; F. B. I. vi. 217.

Chota Nagpur.

A stemless herb, with perennial rootstock; leaves tufted, 3–4 together; petiole long, erect, channelled.

933. Hedychium Koenig.

Herbs with perennial, horizontal, tuberous rootstocks; root-fibres hardly thickened; stem elongated, leafy; *leaves* distichous, oblong or lanceolate. *Flowers* usually in terminal spikes; bracts oblong, subcoriaceous, 1- or more-flowered. *Sepals* 3, connate in a tubular, 3-dentate calyx. *Petals* 3, connate in a corolla with long, slender tube; lobes equal, linear, spreading. Perfect *stamen* 1; filament long, slender; anther-cells contiguous; connective not produced; lateral staminodes linear or oblong-cuneate; lip large, 2-fid. *Carpels* 3, connate in a 3-celled ovary; ovules many, superposed on axial placentas; style long, filiform; stigma subglobose. *Fruit* a globose, 3-valved capsule. *Seeds* many, small, with a lacerate arillus.

Flowers white or nearly so :—

Lip broad, shallowly 2-fid, distinctly clawed; stamen as long as or rather longer than the lip; flowers white or yellowish .....*coronarium*.

Lip narrow, 2-partite, segments narrow; stamen longer than the lip :—

Flower greenish-white; filament bright red; stamen half as long again as the lip .....*gracile*.

Flower pure white; filament whitish; stamen twice as long as the lip.....*thyrsiforme*.

Flower brick-red; lip orbicular, deeply 2-fid; stamen twice as long as the lip .....*coccineum* var. *angustifolia*.

2137. HEDYCHIUM CORONARIUM Koenig; F. I. i. 10; F. B. I. vi. 225.

perfect; filament short, arcuate; anthers 2-celled; cells discrete, on a wide connective, produced above as a petaloid crest, not spurred below; lateral staminodes broad, petaloid; lip broad, usually 2-fid. *Carpels* 3, connate in a 3-celled ovary; ovules many, on 3 axial placentas; style long, filiform; stigma turbinate. *Fruit* an oblong capsule with thin pericarp. *Seeds* subglobose, with a small, lacerate arillus.

Leaves contemporary with the flowers, sessile:—
Leaves suborbicular; corolla segments lanceolate; staminodes obovate-cuneate; lip white with lilac throat ..... *Galanga.*
Leaves lanceolate; corolla segments long, linear; staminodes oblong; lip lilac ..... *angustifolia.*
Leaves petioled, not produced till flowering is over, oblong; corolla segments long, linear; staminodes oblong, acute; lip lilac or reddish *rotunda.*

2133. KÆMPFERIA GALANGA Linn.; F. I. i. 15; F. B. I. vi. 219; E. D. K. 3.
In gardens in most of the provinces.
A stemless herb, leaves 3–6 in. long, spreading flat on the ground. *Hind.* Chandra múla; *Beng.* Chandu múla, humúla.

2134. KÆMPFERIA ANGUSTIFOLIA Roscoe; F. I. i. 17; F. B. I. vi. 219; E. D. K. 1.
N. Bengal.
A stemless herb, leaves many, ascending, 6–8 in. long, an inch or less wide. *Vernac.* Kanjan-bura, mud-nirbisha.

2135. KÆMPFERIA ROTUNDA Linn.; F. I. i. 16; F. B. I. vi. 222; E. D. K. 8.
Chota Nagpur, Parasnath; Chittagong: elsewhere cultivated.
A stemless herb; leaves erect, with short, channelled petioles; blade 12 in. long, 3–4 in. wide. *Vernac.* Bhui-champa.

932. Gastrochilus Wall.

Perennial herbs; rootstock creeping or 0; root fibres cylindric or slender; stem long or short or 0; *leaves* oblong, acute. *Flowers* solitary or in spikes, often secund; bracts imbricate. *Sepals* 3, connate in a short, spathaceous calyx. *Petals* 3, con-

nate in a slender corolla-tube; lobes equal, connivent, linear-oblong, ascending. *Stamen* 1 perfect; filament very short; anther-cells parallel; connective neither crested nor spurred; lateral staminodes petaloid, broader than the corolla-lobes, oblanceolate-oblong; lip oblong, longer than the corolla-lobes, entire. *Carpels* 3, connate in an oblong, 3-celled ovary; ovules few or many, superposed on axial placentas; style filiform; stigma subglobose. *Fruit* an oblong capsule. *Seeds* ovoid, with a small basal arillus.

2136. GASTROCHILUS LONGIFLORA Wall.; F. B. I. vi. 217.
Chota Nagpur.
A stemless herb, with perennial rootstock; leaves tufted, 3–4 together; petiole long, erect, channelled.

933. Hedychium Koenig.

Herbs with perennial, horizontal, tuberous rootstocks; root-fibres hardly thickened; stem elongated, leafy; *leaves* distichous, oblong or lanceolate. *Flowers* usually in terminal spikes; bracts oblong, subcoriaceous, 1- or more-flowered. *Sepals* 3, connate in a tubular, 3-dentate calyx. *Petals* 3, connate in a corolla with long, slender tube; lobes equal, linear, spreading. Perfect *stamen* 1; filament long, slender; anther-cells contiguous; connective not produced; lateral staminodes linear or oblong-cuneate; lip large, 2-fid. *Carpels* 3, connate in a 3-celled ovary; ovules many, superposed on axial placentas; style long, filiform; stigma subglobose. *Fruit* a globose, 3-valved capsule. *Seeds* many, small, with a lacerate arillus.

Flowers white or nearly so :—
Lip broad, shallowly 2-fid, distinctly clawed; stamen as long as or rather longer than the lip; flowers white or yellowish .....*coronarium*.
Lip narrow, 2-partite, segments narrow; stamen longer than the lip :—
Flower greenish-white; filament bright red; stamen half as long again as the lip .....*gracile*.
Flower pure white; filament whitish; stamen twice as long as the lip.....*thyrsiforme*.
Flower brick-red; lip orbicular, deeply 2-fid; stamen twice as long as the lip .....*coccineum* var. *angustifolia*.

2137. HEDYCHIUM CORONARIUM Koenig; F. I. i. 10; F. B. I. vi. 225.

Chota Nagpur; Behar; N. Bengal; Chittagong.
A tall herb, leafy stem 4–6 feet high. *Beng.* Gorackhnatha, dulala-champa.

2138. HEDYCHIUM GRACILE Roxb.; F. I. i. 14; F. B. I. vi. 229.
Chittagong.
A tall herb, leafy stems 2–3 feet high.

2139. HEDYCHIUM THYRSIFORME Ham.; F. B. I. vi. 230.
Chittagong.
A tall, leafy herb; leaves 3–4 in. wide.

2140. HEDYCHIUM COCCINEUM Ham. var. ANGUSTIFOLIA Bak.; F. B. I. vi. 231. *H. angustifolium* F. I. i. 13.
Chittagong.
A tall, leafy herb; leaves 1·5–2 in. wide. *Beng.* Bhuiada.

934. Curcuma Linn.

Stemless herbs with tuberous rootstocks, bearing sessile and long-stipitate tubers; *leaves* usually oblong, often very large. *Flowers* in dense, compound spikes, vernal or æstival and preceding, or autumnal and contemporaneous with, the leaves, crowned by a coma of enlarged, coloured bracts; lower bracts ovate, membranous, enclosing several bracteolate fugitive flowers, which open in succession. *Sepals* 3, connate in a short, cylindric, minutely toothed calyx. *Petals* 3, connate in a corolla with funnel-shaped tube; lobes usually ovate or oblong, the upper longer and somewhat concave. *Stamen* 1 perfect; filament short; anthers uncrested, with contiguous cells spurred at the base; lateral staminodes oblong, petaloid, connate with the filament; lip orbicular, with a deflexed tip. *Carpels* 3, connate in a 3-celled ovary; ovules numerous, on axial placentas; style filiform; stigma 2-lipped, the lobes ciliate. *Fruit* a tardily dehiscent, globose, membranous, 3-valved capsule. *Seeds* ovoid or oblong, usually arillate.

•Flowering spike lateral, apart from and usually appearing earlier than the leafy spike:—[p. 1041]
Rootstock small, emitting only fleshy fibres, terminating in pale, oblong, pendulous tubers; sheaths of the pseudostem pale-green; flowers longer than the bracts, appearing in the early rains, with or only shortly before the green leaves.....*angustifolia*.
Rootstock large, with sessile palmate tubers as well as fleshy fibres,

that may or may not terminate in oblong, pendulous tubers; flowers appearing in the hot weather, usually distinctly anterior to the leaves :—

Leaves uniformly green in all their parts; flowers not longer than the bracts :—

Spikes short, few-flowered, with barren pink apical coma as long as the green, fertile base; leaves glabrous beneath; flowers as long as the bracts; tubers pale-straw coloured or white inside *leucorrhiza.*

Spikes long, many-flowered, with barren apical purple coma shorter than the green (faintly pink towards margins of its bracts) fertile base; leaves silky beneath; flowers shorter than the bracts; tubers yellow inside ..... *aromatica.*

Leaves or their sheaths more or less tinged or clouded with purple or red, glabrous beneath; apical purple barren coma shorter than fertile base, the bracts of which are pinkish towards their margins :—

Leaves with a large, persistent, purple cloud down the centre of the blade; flowers not longer than the bracts, the sheaths of the pseudostem and the leaf-stalks green :—

Tubers yellow within ..... *Zedoaria.*

Tubers bluish-grey within ..... *cæsia.*

Leaf-sheaths and sheaths of the pseudostem red or rusty-red; flowers longer than the bracts :—

Leaves with a faint rusty tinge down the centre of their upper surface, that passes off as the blade matures, elsewhere bright-green; barren apical coma bright-red; fertile bracts all tinged with rusty-red; tubers pale yellow ..... *ferruginea.*

Leaves with dark-red midrib beneath, blade above uniform dark-green; barren apical coma pale-pink; fertile bracts uniform pale-green; tubers pearly white ..... *rubescens.*

*Flowering spike central, rising in the late rains in the middle of a previously formed tuft of leaves :— [p. 1040]

Barren apical coma small, faintly pink; fertile bracts pale-green; rootstock large, ovoid; sessile tubers thick, cylindric :—

Tubers deep orange-yellow within ..... *longa.*

Tubers pale-yellow within ..... *Amada.*

Barren apical coma reddish; fertile bracts green, tinged with red; rootstock small, oblong, with many subglobose tubers at ends of fibres; sessile tubers 0 ..... *reclinata.*

2141. CURCUMA ANGUSTIFOLIA Roxb.; F. I. i. 31; F. B. I. vi. 210; E. D. C. 2385.

W. Behar, Soane Valley; Tirhut.
A small herb; spikes 6–12 in.; leaves narrow, 1–1·5 feet long. *Hind.* Tikhur.

2142. CURCUMA LEUCORRHIZA Roxb.; F. I. i. 30; F. B. I. vi. 212; E. D. C. 2431.
Behar.
A large herb; spikes 1 foot; leaves broad, 3–4 feet long. *Beng.* Tikhur.

2143. CURCUMA AROMATICA Salisb.; F. B. I. vi. 210; E. D. C. 2407. *C. Zedoaria* F. I. i. 23.
Cultivated and as if wild in most of the provinces.
A large herb; spikes 1 foot; leaves broad, large. *Vernac.* Jangli-haldi, ban haldi. Wild Turmeric.

2144. CURCUMA ZEDOARIA Roscoe; F. B. I. vi. 210; E. D. C. 2499. *C. Zerumbet* F. I. i. 20.
Chittagong, wild; elsewhere generally cultivated.
A large herb; spikes 1 foot; leaves large, broad. *Vernac.* Kachúra.

2145. CURCUMA CÆSIA Roxb.; F. I. i. 26; F. B. I. vi. 212; E. D. C. 2422.
W. Bengal; Behar; Chota Nagpur.
A large herb; spikes 1 foot; leaves large, 3 feet long. *Beng.* Nilkantha, kala haldi.

2146. CURCUMA FERRUGINEA Roxb.; F. I. i. 27; F. B. I. vi. 213.
C. Bengal; Behar.
A large herb; spike 8–10 in.; leaves large, 4–5 feet long.

2147. CURCUMA RUBESCENS Roxb.; F. I. i. 28; F. B. I. vi. 213; E. D. C. 2497.
C. W. and E. Bengal; Chota Nagpur.
A large herb; spike 5–6 in.; leaves large, 4–5 feet long.

2148. CURCUMA LONGA Linn.; F. I. i. 32; F. B. I. vi. 214; E. D. C. 2433.
In all the provinces, cultivated; perhaps wild in Chota Nagpur.
A large herb; leaves 2–3 feet long. *Vernac.* Haldi. Turmeric.

2149. CURCUMA AMADA Roxb.; F. I. i. 33; F. B. I. vi. 213; E. D. C. 2381.
In the western provinces, wild; cultivated in these and all the other provinces.

A large herb; leaves 2–3 feet long. *Hind.* Am-haldi; *Beng.* Am-ada. Amada or Mango Ginger.

2150. CURCUMA RECLINATA Roxb.; F. I. i. 36; F. B. I. vi. 214.
Chota Nagpur, Singhbhum; on shady banks.
A smallish herb; leaves 6–8 in. long.

935. Amomum Linn.

Herbs with elongate, leafy stems, and perennial, extensive rootstocks; *leaves* usually oblong-lanceolate. *Flowers* in dense spikes, direct from the rootstock; bracts imbricate. *Sepals* 3, connate in a cylindric, 3-toothed calyx. *Petals* 3, connate in a corolla with cylindric tube; lobes oblong or linear-oblong, the upper often broader and more convex. *Stamen* 1 perfect; filament short, arcuate; anther 2-celled; cells divaricate, sometimes hairy, often with a petaloid crest; lateral staminodes minute or obsolete; lip broad or ligulate. *Carpels* 3, connate in a 3-celled ovary; ovules many, superposed; placentas axial; style filiform; stigma small subglobose, or larger and dorsally gibbous. *Fruit* indehiscent or bursting irregularly, sometimes beaked or winged or echinate. *Seeds* globose or truncate.

Anther not crested; lip narrow, margins incurved; spike oblong *linguiforme.*

Anther crested; lip broad; spike globose:—
Anther-crest small, subquadrate; capsule globose .....*dealbatum.*
Anther-crest large, trifid, with rounded lobes; capsule oblong, trigonous *aromaticum.*

2151. AMOMUM LINGUIFORME Benth.; F. B. I. vi. 235. *Alpinia linguiforme* F. I. i. 75.
N. Bengal.
A herb, with a stout rhizome and a leafy stem, 4–6 feet high.

2152. AMOMUM DEALBATUM Roxb.; F. I. i. 43; F. B. I. vi. 239; E. D. A. 967.
E. Bengal; Tippera; Chittagong; Behar; Chota Nagpur.
A herb, with a leafy stem, 4–5 feet high.

2153. AMOMUM AROMATICUM Roxb.; F. I. i. 45; F. B. I. vi. 241; E. D. A. 965.
N. Bengal.
A herb, with a leafy stem, 2–4 feet high. *Vernac.* Mórang-hachi.

936. Zingiber Adans.

Herbs with elongated, leafy stems, and horizontal, tuberous rootstocks; *leaves* oblong-lanceolate. *Flowers* in spikes, usually radical, less often terminal, very rarely lateral on the leafy stems; peduncle short or long; bracts persistent, usually 1-flowered. *Sepals* 3, connate in a cylindric, shortly 3-lobed calyx. *Petals* 3, connate in a corolla with cylindric tube; lobes lanceolate, the upper concave. *Stamen* 1 perfect; filament short; anther 2-celled; cells contiguous, with a narrow crest as long as themselves; lateral staminodes 0, or adnate to the obovate-cuneate lip. *Carpels* 3, connate in a 3-celled ovary; ovules many, superposed; placentas axial; style filiform; stigma small, subglobose. *Fruit* an oblong capsule, tardily dehiscent. *Seeds* large, globose, arillate.

Spike produced direct from the rootstock :—
  Spike very short and dense; leaves pubescent beneath :—
    Lip spotted and streaked with red; corolla-lobes red.....*rubens*.
    Lip whitish, unspotted; corolla-lobes whitish.....*roseum*.
  Spike terminating an elongated peduncle beset with sheathing, scarious bracts :—
    Leaves pubescent beneath; bracts reddish, ovate; lip and stamen yellowish-white; corolla-lobes white.....*Casumunar*.
    Leaves glabrous beneath; bracts green :—
      Bracts ovate; corolla-lobes white; lip and stamen pale-yellow *Zerumbet*.
      Bracts suborbicular, cuspidate; corolla-lobes green; lip and stamen purple .....*officinale*.
Spike terminal on the leafy stem; corolla-lobes and lip pale-yellow :—
  Spike sessile on the mouth of the sheaths of the upper leaves *capitatum*.
  Spike on a stem prolonged somewhat beyond the sheaths of the upper leaves; taller and larger in all its parts than the type *capitatum* var. *elata*.

2154. Zingiber rubens Roxb.; F. I. i. 53; F. B. I. vi. 243.
N. Bengal.
A herb, with stout, leafy stems, 6–8 feet high.

2155. Zingiber roseum Roxb.; F. I. i. 50; F. B. I. vi. 244.
Behar; W. Bengal; Orissa; Chota Nagpur.
A herb, with slender, leafy stems, 3–4 feet high.

2156. ZINGIBER CASUMUNAR Roxb.; F. I. i. 49; F. B. I. vi. 248; E. D. Z. 199.
Cultivated and as if wild in most of the provinces.
A herb, with rather stout, leafy stems, 4–6 feet high. *Vernac.* Ban-ada.

2157. ZINGIBER ZERUMBET Smith; F. I. i. 48; F. B. I. vi. 247; E. D. Z. 225.
Cultivated and as if wild in most of the provinces.
A herb, with rather stout, leafy stems, 3–4 feet high. *Vernac.* Maha bari bach, nar kachúr.

2158. ZINGIBER OFFICINALE Roscoe; F. I. i. 47; F. B. I. vi. 246; E. D. Z. 201.
Cultivated sparingly.
A herb, with slender, leafy stems, 3–4 feet high, very rarely found in flower. *Vernac.* Ada, adrak.

2159. ZINGIBER CAPITATUM Roxb.; F. I. i. 55; F. B. I. vi. 248.
Chota Nagpur.
A herb, with slender, leafy stems, 2–3 feet high. *Hind.* Jangli-adrak.

2159/2. Var. ELATA Bak.; F. B. I. vi. 249. *Z. elatum* Roxb.; F. I. i. 57.
In most of the provinces.
A herb, with rather stout, leafy stems, 4–5 feet high.

937. Costus Linn.

Herbs with long, leafy stems; rootstock tuberous, horizontal; *leaves* oblong, with broad sheaths. *Flowers* in dense, globose or ovoid, usually terminal heads. *Sepals* 3, connate in a short, funnel-shaped calyx, with ovate teeth. *Petals* 3, connate in a corolla with short tube; lobes large, oblong, subequal. *Stamen* 1 perfect; filament forming with the connective an oblong, petaloid process, with the contiguous linear anther-cells situated in its middle; lateral staminodes minute or obsolete; lip large, obovate, with incurved margins. *Carpels* 3, connate in a 3-celled ovary; ovules many, superposed; placentas axial; style filiform; stigma with a semi-lunar, marginally ciliate foveola. *Fruit* a globose or ovoid capsule, tardily opening on one side between the ribs. *Seeds* obovoid or subglobose; arillus short.

2160. COSTUS SPECIOSUS Smith; F. I. i. 58; F. B. I. vi. 249; E. D. C. 2013.

In all the provinces, except the Sundribuns.
A herb, with stout, leafy stems, 6–9 feet high. *Beng.* and *Hind.* Kúst, kéu ; *Santal.* Orop.

938. Alpinia Linn.

Herbs with tall, leafy stems, and horizontal rootstocks ; *leaves* oblong or lanceolate. *Flowers* in terminal racemes or panicles ; bracteoles large, sometimes enveloping the buds. *Sepals* 3, connate in a loosely tubular, 3-toothed calyx. *Petals* 3, connate in a corolla with cylindric tube, rarely exceeding calyx ; lobes linear-oblong or oblong, the upper broader and more convex than lateral. *Stamen* 1 perfect ; filament flattened ; anther-cells diverging at the top, occasionally with an orbicular crest ; lateral staminodes minute or obsolete ; lip spreading, often orbicular, with incurved margins, sometimes with 2 subulate processes at the base of the claw. *Carpels* 3, connate in a 3-celled ovary ; ovules few or many on each placenta ; style filiform ; stigma subglobose. *Fruit* usually a dry or fleshy berry. *Seeds* globose or angled.

Buds enclosed in large membranous bracteoles; racemes terminal, simple ; ovules many in each cell of ovary ; lip with a white margin, centre variegated red and yellow :—
Bracteoles green ..... *bracteata.*
Bracteoles white ..... *malaccensis.*
Buds not enclosed in large bracteoles :—
Racemes simple or slightly branched ; ovules many in each cell of ovary ; lip oblong, white, spotted with red and yellow, with a short claw..... *calcarata.*
Racemes in compound terminal panicles ; ovules few (usually 2) in each cell of ovary :—
Lip with no claw ; orbicular, yellowish with red lines and dots *conchigera.*
Lip with a long claw :—
Lip obovate, white with lilac veins ; capsule orange-red *Galanga.*
Lip cuneate-emarginate, pink ; capsule black..... *Allughas.*

2161. Alpinia bracteata Roxb. ; F. I. i. 63 ; F. B. I. vi. 255.
Tippera.
A large herb ; leafy stems 3–6 feet high.

2162. Alpinia malaccensis Roscoe ; F. I. i. 64 ; F. B. I. vi. 255.
N. Bengal, Duars ; Chittagong.
A very large herb ; leafy stems 8–10 feet high.

2163. Alpinia calcarata Roscoe; F. I. i. 69; F. B. I. vi. 254; E. D. A. 851.

In gardens, frequent.

A herb; leafy stems 2–4 feet high.

2164. Alpinia conchigera Griff.; F. B. I. vi. 253.

Chittagong.

A herb; leafy stems 3–4 feet high.

2165. Alpinia Galanga Sw.; F. I. i. 59; F. B. I. vi. 253; E. D. A. 853.

In gardens, frequent.

A herb; leafy stems 6–7 feet high. *Vernac.* Kulanjan.

2166. Alpinia Allughas Roscoe; F. I. i. 61; F. B. I. vi. 253; E. D. A. 849.

N. Bengal; C. Bengal; E. Bengal; Sundribuns.

A herb; leafy stems 5–6 feet high. *Beng.* Taro, taruko.

939. Canna Linn.

Tall herbs, with simple, leafy stems and perennial rootstocks; *leaves* large, oblong, acute. *Flowers* in lax, terminal, simple or branched racemes; bracts small, ovate. *Sepals* 3, small, oblong or lanceolate. *Petals* 3, connate in a corolla with cylindric tube; lobes lanceolate, equal. *Stamens*, 1 partially perfect, all connate below in a cylindric, corolla-like tube; lobes unequal, all petaloid, one with a 1-celled anther adnate to one of its edges, the others similar but larger and sterile. *Carpels* 3, connate in a 3-celled ovary; ovules numerous in each cell; style adnate below to the staminal tube, free above; stigma capitate. *Fruit* globose, echinate, indehiscent or tardily rupturing. *Seeds* large, globose; embryo straight.

2167. Canna indica Linn. var. orientalis F. B. I. vi. 260. *C. indica* F. I. i. 1; E. D. C. 321.

In gardens in all the provinces, and in most of them as an escape.

A herb; stems 3–4 feet high. *Vernac.* Sabha-jaya; sarba-jaya.

940. Maranta Linn.

Herbs with short or tall, leafy stems, and a tuberous or creeping rootstock; *leaves* more or less distinctly petioled on the sheaths, ovate. *Flowers* in laxly dichotomous, rarely subsimple, terminal

cymes; bracts narrow, spathaceous; bracteoles 0. *Sepals* 3, narrow, subequal. *Petals* 3, connate in a corolla with cylindric tube; lobes subequal. *Stamens*, 1 partially perfect, connate below in a corolla-like tube; lobes petaloid, one having a single marginal anther-cell, the rest unequal, 1 or 2 lateral large, one hood-like, sometimes with an empty anther-cell; the lip large or small, crested. *Carpels* 3, two becoming obsolete and forming a 1-locular, 1-ovuled ovary, with 2 small, empty locules; style adnate to staminal tube; stigma oblique, wide, almost 2-lipped. *Fruit* indehiscent, ovoid-oblong, or somewhat 3-cornered, more or less oblique; pericarp fleshy. *Seed* erect; arillus green outside, scarious within; embryo curved.

2168. MARANTA ARUNDINACEA Linn.; E. D. M. 267.

Occasionally planted.

A herb, with leafy stems. The rootstock yields Arrow-root starch. *Vernac.* Tikhur. Arrowroot.

941. Clinogyne Salisb.

Shrubs with leafy, cane-like stems, copiously, dichotomously branched; rootstock tuberous or woody; *leaves* oblong or oblong-lanceolate. *Flowers* in pairs in lax-flowered, terminal panicles; bracts long, firm, narrow. *Sepals* 3, short. *Petals* 3, conniving but hardly connate in a tube below, their tips spreading. *Stamens*, 1 perfect, all connate in a corolla-like tube, segments petaloid, unequal, one with a single, marginally attached anther-cell. *Carpels* 3, connate in a 3-celled ovary; ovules 1 in each cell; style adnate below to the staminal tube, free, hooked above; stigma capitate. *Fruit* indehiscent, 1–3-seeded. *Seeds* subglobose; arillus lacerate; embryo curved.

2169. CLINOGYNE DICHOTOMA Salisb.; F. B. I. vi. 258. *Phrynium dichotomum* F. I. i. 2; E. D. P. 625.

E. Bengal; Chittagong.

A shrub, 12–15 feet high. *Beng.* Mukta-pati, pati-pati, madar-pati.

942. Phrynium Willd.

Herbs with creeping rootstocks; *leaves* large, oblong, radical; petioles long, simulating stems. *Flowers* in compound spikes, produced from side of petiole or direct from rootstock; bracts 2-more-flowered. *Sepals* 3, narrow. *Petals* 3, connate in a

corolla with cylindric tube; lobes linear-oblong, subequal, spreading. *Stamens*, 1 perfect, all connate in a corolla-like tube below; lobes petal-like, unequal, one bearing a single marginal anther-cell. *Carpels* 3, connate in a 3-locular ovary; ovules 1 in each cell or rarely 2 of the cells empty; style adnate below to the staminal-tube, free, hooked above; stigma capitate. *Fruit* globose, indehiscent or tardily rupturing. *Seeds* 1–3, erect; arillus short, fleshy; embryo curved.

Flowers purple; spikes lateral, rarely terminal, globose; bracts oblong, with incurved, scarious, at length bristly tips .....*capitatum.*
Flowers white or yellow; spikes always lateral :—
Spikes oblong; bracts oblong, with obtuse, minutely toothed tips; fruit usually 3-seeded .....*imbricatum.*
Spikes globose; bracts lanceolate, acute; fruit usually 1-seeded *parviflorum.*

2170. PHRYNIUM CAPITATUM Willd.; F. I. i. 8; F. B. I. vi. 259.
Chota Nagpur; N. Bengal, Duars.
A rigid herb; leaves large, oblong. *Vernac.* Kudali.

2171. PHRYNIUM IMBRICATUM Roxb.; F. I. i. 6; F. B. I. vi. 259.
Chittagong.
A rigid herb; leaves large, oblong. *Vernac.* Pituli-pata.

2172. PHRYNIUM PARVIFLORUM Roxb.; F. I. i. 7; F. B. I. vi. 259.
Chota Nagpur.
A herb, with perennial, tuberous rootstock.

943. Ravenala Adans.

Stem short or long and tree-like, marked with annular leaf-scars; *leaves* large, close-set, distichously fan-like; petioles long, concave below, hardly sheathing. *Flowers* many, large, short-pedicelled, shortly racemose within large, boat-shaped, spathe-like bracts, distichously spreading, on axillary scapes or peduncles. *Sepals* 3, long, narrow, the central rather wider than the lateral, keeled. *Petals* 3, the outermost shorter than the others, subcomplicate, lateral like sepals but rather smaller. *Stamens* 5, rather shorter than petals; anthers linear, 2-locular, much exceeding their filaments. *Carpels* 3, connate in a 3-celled ovary; ovules numerous in each cell; style long, filiform; stigma oblong-clavate, shortly 6-toothed. *Fruit* an oblong or ovoid-trigonous, loculicidally 3-valved capsule. *Seeds* numerous; arillus fimbriate.

2173. RAVENALA MADAGASCARIENSIS Sonnerat ; F. B. I. vi. 198.
Occasionally planted.
A small tree, with distichous, plantain-like leaves, and a woody stem ; native of Madagascar. *Beng.* Panthopadop. The Traveller's Tree.

944. Musa Linn.

Tree-like herbs, with thick stems, composed of convolute leaf-sheaths ; *leaves* very large, oblong. *Flowers* in an erect or decurved, subterminal spike, practically 1-sexual, the lower female, the upper male ; bracts large, spathaceous, ovate or orbicular. *Sepals* connate in a spathaceous, 3–5-lobed calyx. *Petals* connate in a unilateral corolla, as long as the calyx, convolute round stamens and style. *Stamens* 5 perfect, the sixth rudimentary or obsolete ; filaments stout, filiform ; anthers linear, erect, 2-celled. *Carpels* 3, connate in a 3-locular ovary ; ovules many, superposed ; style filiform from a thickened base ; stigma globose, 6-lobed. *Fruit* oblong or fusiform, trigonous, fleshy, indehiscent. *Seeds* subglobose or angled by pressure, in cultivated forms often obsolete.

Stems stout, over 8 feet high ; bracts many-flowered ; petal shorter than the calyx ; fruit usually edible, pulpy :—
Cultivated, fruit with seeds very few or none :—
Fruit with soft, sweet pulp, edible uncooked .....*sapientum*.
Fruit with firm pulp, only edible when cooked
sapientum var. *paradisiaca*.
Wild, fruit with many seeds, pulp firm.....*sapientum* var. *sylvestris*.
Stems slender, under 6 feet high ; bracts few-flowered ; petal as long as calyx ; fruit firm, not edible .....*ornata*.

2174. MUSA SAPIENTUM Linn. ; F. B. I. vi. 262 ; E. D. M. 811.
In all the provinces, cultivated.
A tree-like herb ; stems 8–12 feet high. *Beng.* Kantalikela. The Banana.

2174/2. Var. PARADISIACA F. B. I. vi. 262.
In all the provinces, generally cultivated.
A tree-like herb ; stems 15–20 feet high. *Beng.* Kachkela. The Plantain.

2174/3. Var. SYLVESTRIS. *M. sapientum* F. I. i. 663.
Chota Nagpur ; Chittagong.

A tree-like herb; stems 8–12 feet high. *Vernac.* Kela. The Wild Plantain.

2175. MUSA ORNATA Roxb.; F. I. i. 666. *M. rosacea* F. B. I. vi. 263.

Chittagong; Chota Nagpur, Singbhum.

A small, shrub-like herb, 3–5 feet high. *Vernac.* Ramanigi-kela.

Order CXXIX. BROMELIACEÆ.

Herbs, usually epiphytic; stem usually very short, rarely elongated and leafy. *Leaves* generally densely tufted at the base of the stem, often rigid and with spiny edges. *Flowers* regular, hermaphrodite, spicate or paniculate, terminal, rarely lateral; peduncle often elongate and covered with bract-like scales; bracts often large, coloured, imbricate, sometimes small, flowers in each solitary, or several fascicled or spiked; bracteoles spathiform. *Perianth* 2-seriate, outer series of 3 sepals, free or rarely connate below; inner series of 3 petals with connate or connivent claws and erect or spreading laminæ. *Stamens* 6, attached within base of corolla; filaments free, or 3 opposite sepals free, 3 opposite petals more or less adnate to corolla, or all adnate; anthers linear, rarely oblong, versatile or basifixed, 2-celled; dehiscence longitudinal. *Carpels* 3, connate in an inferior or half-superior, 3-locular ovary; ovules many, axial, anatropous; style long filiform, or short; stigmas 3, short or linear. *Fruit* dry or fleshy, crowned by the calyx or the whole persistent perianth, indehiscent or capsular. *Seeds* oblong, ovate, or linear; testa membranous; albumen copious, floury; embryo small, situated in a small pit or groove near the hilum.

945. Ananassa Adans.

Herbs with short, leafy stems; *leaves* long, with spinous-serrate edges. *Flowers* in a terminal, cone-like, very dense, globose or oblong spike, solitary, sessile, or embedded in the axil of each bract, only the subspinescent tips of the bracts projecting, the uppermost bracts empty, more or less leafy, often forming a viviparous coma. *Sepals* 3, wide-acuminate, closely imbricate, free above the ovary. *Petals* 3, erect, slightly imbricate, slightly adnate below to the filaments, often with 2 minute, basal scales.

Stamens 6; 3 alternate with petals, filaments free or slightly adnate by their edges to the petals; 3 opposite and adnate below to the petals; anthers linear. *Carpels* 3, connate in an inferior, 3-celled, fleshy ovary, embedded in the thick rachis; ovules in each cell several, horizontal or pendulous; style filiform; stigmas linear. *Fruit* fleshy, embedded in the fleshy receptacle, the whole forming with the bracts, rachis, and receptacles a cone-like, fleshy syncarp. *Seeds* few, ovoid or oblong, somewhat compressed; testa thinly coriaceous; embryo minute, partially embedded in the albumen.

2176. ANANASSA SATIVA Linn.; E. D. A. 1045.

Sparingly planted.

A tufted, stemless herb, with a dense, capitate, spiral inflorescence. *Vernac.* Ananas. The Pine-Apple.

Order CXXX. HÆMODORACEÆ.

Perennial herbs, glabrous or finely woolly; rootstock short, tuberous, with usually fascicled root-fibres. *Leaves* usually radical, often distichous, narrow-linear or subensiform, with equitant sheaths; nerves parallel. *Flowers* hermaphrodite, regular or nearly so, in terminal spikes, racemes, or panicles. *Perianth* corolline, persistent, 2-seriate; lobes 6, imbricate or induplicate-valvate. *Stamens* 6, opposite or more or less adnate to the perianth-lobes, all perfect or 1–3 reduced to staminodes, or only 3 opposite the inner perianth-lobes; filaments filiform, discrete or connate in a ring below; anthers ovate, oblong, or linear, often sagittate, erect or versatile; dehiscence longitudinal or rarely porous. *Carpels* 3, connate in a perfectly or ultimately, by absorption of septa, imperfectly 3-celled ovary, inferior, half-inferior, or almost superior, with only the wide base adnate to the perianth; ovules 1 or more, attached to inner angle of cells; style filiform, rarely short or obsolete; stigma simple or 3-notched. *Fruit* a superior or nearly superior, loculicidal capsule, or an inferior, indehiscent berry or capsule tipped by the perianth. *Seeds* in each cell many, few, or single, sometimes solitary in the whole fruit, globose, oblong, angular, or flattened; embryo small, only partially enclosed in the fleshy albumen.

Filaments connate in a ring, closing the mouth of the perianth; ovary

inferior, with a free, conical apex; stigma subsessile, 3-lobed; ovules in each cell 2 or more ..... **Peliosanthes.**
Filaments adnate to perianth-lobes, filiform, not connate; ovary superior; style filiform; stigma simple; ovules in each cell solitary **Sansevieria.**

946. Peliosanthes Andr.

Herbs with horizontal rootstocks; *leaves* narrow, linear or lanceolate, subplicately nerved. *Flowers* small, racemose, on erect scapes; bracts scarious. *Perianth* superior; lobes 6, subequal, spreading, connate below in a short, campanulate tube. *Stamens* 6; filaments very short, connate in a ring, almost closing the mouth of the perianth-tube; anthers subsessile; dehiscence linear, introrse. *Carpels* 3, connate in an inferior, 3-celled ovary, with a conical, free apex; ovules 2 or more in each cell, erect, basal, anatropous; stigma subsessile, 3-lobed. *Fruit* an imperfect berry. *Seeds* few, bursting through the pericarp during ripening, and resting on the base of the withered perianth, the tube of which is fleshy or succulent; embryo incompletely embedded in the base of the hard, fleshy albumen.

Bracts many-flowered ..... *Teta.*
Bracts 1-flowered ..... *violacea.*

2177. Peliosanthes Teta Andr.; F. B. I. vi. 265. *Teta viridiflora* F. I. ii. 165.
Chittagong.
A scapigerous herb, with a rather large rootstock.

2178. Peliosanthes violacea Wall.; F. B. I. vi. 266.
Chittagong.
A scapigerous herb, with a rather large rootstock.

947. Sansevieria Thunb.

Stout herbs with a short, often stoloniferous rootstock; *leaves* narrow, cartilaginous, flat or terete; nerves hidden; sheaths equitant, short. *Flowers* racemose, on stout scapes; pedicels articulate, fascicled; bracts scarious. *Perianth*-segments 6, connate in a slender, usually long tube; lobes narrow. *Stamens* 6, adnate to the bases of the perianth-lobes; filaments filiform; anthers dorsifixed. *Carpels* 3, connate in a 3-celled ovary, adnate by its broad base to the perianth-tube, elsewhere free; ovules solitary, erect in each cell. *Fruit* membranous, indehiscent.

Seeds 1–3, globose, ripening outside the pericarp, all large or 1 or 2 imperfect; testa lax, fleshy or succulent; embryo partially enclosed in the fleshy albumen.

Leaves grooved or flat on the upper surface beyond the sheath, and with only a short conical tip :—

Leaves narrowly linear-ensiform, semi-terete, channelled above; flowers ·5 in. long ..... *Roxburghiana.*

Leaves rather wide-ensiform, flat, not channelled above; flowers about an inch long ..... *trifasciata.*

Leaves quite cylindric, smooth or sulcate except at the short, sheathing base; flowers about ·75 in. long ..... *cylindrica.*

2179. Sansevieria Roxburghiana Schult. f.; F. B. I. vi. 271. *S. zeylanica* F. I. ii. 161; E. D. S. 785.

Very frequently cultivated.

A herb, with tufted, linear-ensiform, fleshy, rigid leaves.

Vernac. Murva, murba, murga. Indian Bowstring Hemp.

This species is apparently indigenous in India, but is not wild within our area.

2180. Sansevieria trifasciata Hort.

Often cultivated; sometimes as an escape.

A herb, with tufted, linear-lanceolate leaves.

Closely related to W. African Bowstring Hemp (*S. guineensis*, but with narrower, more definitely maculated leaves.

2181. Sansevieria cylindrica Bo.

Occasionally cultivated.

A herb, with tufted, cylindric, pointed leaves.

Order CXXXI. IRIDEÆ.

Perennial herbs; rootstock woody, creeping or stoloniferous, or short, corm-like; stems herbaceous, solitary or fascicled, sometimes short or 0. *Leaves* narrow, often distichous and equitant. *Flowers* in a simple or branched inflorescence, terminal or from the axil of a floral leaf; bracts, outer spathaceous, inner 2. *Perianth* superior, petaloid; segments 6, 2-seriate, imbricate. *Stamens* 3, epigynous, or adnate to the outer perianth-segments; anthers ovate, oblong, or linear; dehiscence longitudinal, extrorse or lateral. *Carpels* 3, connate in an inferior, 3-celled ovary;

ovules many, anatropous, 2-seriate on the inner angles of each cell; style simple; stigmas 3, simple or petaloid or variously cleft. *Fruit* a trigonous, loculicidal, 3-celled capsule. *Seeds* few or many, rarely solitary in each cell, globose, angular or flattened; testa thin or coriaceous; embryo embedded in the horny albumen.

Bulb tunicate; stem below the inflorescence simple, leafless; flowers few in the axils of narrow spathes, congested in the axil of a terminal floral leaf ..... **Cipura.**

Rhizome creeping; stem leafy; leaves ensiform, equitant; flowers in 2-3-chotomously branched panicles; floral leaves under the primary branches green, spathaceous, under the upper branches scarious **Belamcanda.**

948. Cipura Aubl.

Herbs with a tunicate bulb; stem below the inflorescence slender, leafless; radical *leaves* few, narrow, or wider and plicate. *Flowers* in narrow, fascicled spathes, sessile or shortly peduncled in the axil of a long, terminal, floral leaf, each flower pedicelled, and few or solitary in the axils of individual spathes. *Perianth* petaloid; tube very short; segments rather broad, flat, clawed or not, the outer 3 spreading, inner 3 smaller and more erect. *Stamens* 3, adnate to base of outer perianth-segments; filaments free, filiform; anthers oblong-linear. *Carpels* 3, connate in a 3-celled ovary; ovules many in each cell; style filiform, its arms longer than anthers, petaloid at their tips or almost throughout, entire or ciliolate. *Fruit* an ovoid or oblong, obtuse or truncate, loculicidally 3-valved capsule exserted from the spathe. *Seeds* globose or narrowed.

2182. Cipura paludosa Aubl.

C. Bengal; quite naturalised in thickets near Calcutta. A grassy herb, with a plicate floral leaf and white flowers; native of America.

949. Belamcanda Adans.

Herbs with creeping rootstocks and erect, leafy stems; *leaves* ensiform, equitant. *Flowers* pedicelled, many in each spathe, in a dichotomously branched inflorescence with green, spathe-like, floral leaves under the main branches, the upper spathes membranously scarious; bracts scarious, opposite the pedicels *Perianth* petaloid; tube very short, rather wide; segments 6,

oblong, spreading, subequal. *Stamens* 3, inserted at base of perianth-tube; filaments filiform; anthers linear, basifixed. *Carpels* 3, connate in an obovoid, 3-locular ovary; ovules in each cell numerous; style filiform, with elongated arms, their tips reniform, stigmatic. *Fruit* an obovoid, membranous, loculicidal capsule, the valves 3, reflexed, leaving the seed-bearing axis free and persistent. *Seeds* subglobose; testa lax, shining, fleshy within.

2183. BELAMCANDA CHINENSIS Leman; F. B. I. vi. 277. *Morea chinensis* F. I. i. 170.

In gardens in all the provinces.

A herb, with creeping rootstock and erect, leafy stems. *Beng.* Dasbaha, dasbichandi.

Order CXXXII. AMARYLLIDACEÆ.

Perennial herbs, rarely undershrubs or shrubs; rootstock a bulb, tuber, or corm, rarely an erect stock. *Leaves* radical, few or many. *Flowers* few, sometimes solitary, on terminal, leafless scapes, often umbellate; bracts membranous or coloured, rarely herbaceous, the outer under the umbel 1–3, rarely many, involucrate; occasionally the inflorescence racemose or paniculate with scattered bracts. *Perianth* regular or irregular, 2-seriate, 6-lobed or -partite; tube long, short, or 0, sometimes with a corona on the limb. *Stamens* 6, adnate to bases of perianth-segments, rarely epigynous; filaments free or connate; anthers erect or versatile. *Carpels* 3, connate in an inferior, 3-celled ovary; ovules many, anatropous, 2-seriate on inner angles of cells; style slender; stigma simple or 3-cleft. *Fruit* inferior, usually a loculicidal capsule, rarely fleshy and bursting irregularly. *Seeds* few or many; albumen fleshy, enclosing the small embryo.

Leaves large, thick, and fleshy, densely clustered at the top of a rootstock or a short, simple stem, spiny at the tip and usually armed along the edge; scape long, terminal, simple or branching towards the apex:—

Inflorescence simple spicate, or compound thyrsoid; stamens longer than perianth; filaments filiform or flattened at base; style filiform **Agave.**

Inflorescence laxly paniculate; stamens shorter than perianth; filaments thickened at base; style thickened in the middle .....**Furcræa.**

Leaves thin and flat or, if somewhat fleshy, unarmed:—

Rootstock tuberous; leaves strongly nerved, flat or plicate; flowers spicate or racemose, very rarely subumbellate; perianth yellow, not showy:—

Fruit opening at the top as a circumscissile or 3-valved capsule; ovary not produced above the crown into a stipe supporting the perianth ..... **Hypoxis.**

Fruit indehiscent; often the ovary produced into a stipe between the crown and the base of the perianth-lobes ..... **Curculigo.**

Rootstock a tunicated bulb; leaves not strongly nerved, flat, smooth, thinly fleshy; flowers at the apex of a scape, usually umbellate, occasionally solitary; perianth white or pink, not yellow, large and showy:—

Filaments attached to perianth-lobes but not connate:—

Scapes 1-flowered ..... **Zephyranthes.**

Scapes umbellate ..... **Crinum.**

Filaments united towards their base by an intervening petaloid membrane ..... **Pancratium.**

950. Agave Linn.

Shrubby herbs, with a usually short, woody stock; *leaves* large, thick and fleshy, densely clustered at the top of a rootstock or short, simple stem; with spiny tip, and usually spinous-serrate edges. *Flowers* solitary, geminate, or fascicled on a large, simple, or thyrsoid, pole-like scape; bracts rather small. *Perianth*-tube somewhat funnel-shaped; lobes 6, linear, erect or spreading. *Stamens* 6, adnate to base of and longer than perianth-lobes; filaments filiform throughout or with flattened, membranous bases; anthers dorsifixed. *Carpels* 3, connate in a globose, ovoid, or oblong, often fleshy ovary, more or less beaked above, 3-locular below the beak; ovules many, 2-seriate in each loculus; style conical, filiform; stigma 3-dymous or 3-lobed. *Fruit* an erect, globose, ovoid, or oblong-cylindric, loculicidal, coriaceous capsule. *Seeds* many, flattened obliquely, cuneate; testa black. Fruit sometimes replaced by viviparous bulbils.

2184. Agave Cantula Roxb.; F. I. ii. 167. *A. americana* F. B. I. vi. 277; E. D. A. 603.

In most of the provinces, as a hedge near villages.

A large, tufted, fleshy-leaved, almost stemless shrub; leaves with spinous tips and edges. *Vernac.* Kantala.

951. Furcræa Vent.

Shrubby herbs, with a short or occasionally tall, woody stock;

leaves large, thick and fleshy, densely clustered at the top of stem, with spiny tip and entire or spinous-serrate edges. *Flowers* solitary or 2–3-nately fascicled on a large, paniculately branched, pole-like scape; bracts small. *Perianth* subrotate; tube very short, 6-partite almost to the base; lobes oblong-oval, equal, spreading. *Stamens* 6, adnate to base of and shorter than perianth-lobes; filaments thickened below the middle, apices shortly subulate; anthers dorsifixed, their bases shortly 2-lobed. *Carpels* 3, connate in an oblong, 3-locular ovary, often narrowed to a beak above; ovules many, 2-seriate in each loculus; style columnar, thickened below the middle with 3 prominent angles; stigma small, faintly 3-lobed, ciliolate. *Fruit* an oblong or ovoid, 3-cornered, loculicidally 3-valved capsule. *Seeds* many, flattened. Fruit often replaced by viviparous bulbils.

2185. FURCRŒA GIGANTEA Vent.; E. D. F. 749.

Tirhut; not infrequent as a hedge plant.

A large, short-stemmed shrub, with tufted, fleshy leaves with spinous tips, and unarmed or sparingly armed edges.

952. Hypoxis Linn.

Herbs with a tuberous rootstock or a tunicate, membranous, or fibrous corm; *leaves* narrow, radical, strongly nerved. *Flowers* solitary or racemose or umbellate; bracts small linear, or obsolete. *Perianth* rotate, persistent, 6-partite, sessile on the top of the inferior ovary. *Stamens* 6, adnate to base of and shorter than perianth-segments; filaments short; anthers erect, dorsifixed. *Carpels* 3, connate in an inferior, 3-celled ovary; ovules many, 2-seriate in each loculus; style short, columnar; stigmas 3, erect, stout, distinct or connate. *Fruit* a globose or oblong capsule, tipped by the perianth, opening by 3 valves or circumscissile. *Seeds* subglobose; testa crustaceous, shining, beaked at the tip.

2186. HYPOXIS AUREA Lour.; F. B. I. vi. 277.

Chota Nagpur.

A small, dicœcious herb, with black, tubercled seeds.

953. Curculigo Gaertn.

Herbs, sometimes large, with a tuberous rootstock or a tunicate, reticulate-fibrous corm; *leaves* often large, lanceolate and plicate, or linear and flat. *Flowers* often 1-sexual, spicate, racemose or

subcapitate. *Perianth* 6-partite, separated from the inferior ovary by a short or long, solid stipe, bearing the rotate limb. *Stamens* 6, adnate to base of perianth-lobes; filaments short; anthers linear, erect, shorter than perianth, attached basally or between 2 basal lobes. *Carpels* 3, connate in a 3-locular, beaked ovary, beak short or long; ovules in each cell 2 or more, with a distinct, often long funiculus; style short, columnar; stigmas 3, oblong, erect, adpressed. *Fruit* a somewhat succulent, indehiscent berry. *Seeds* subglobose; testa crustaceous, black, often beaked. Lower flowers usually 2-sexual, with upper flowers often male.

Perianth-limb sessile or nearly so on the top of the ovary; large, stout herbs, with flowers in subcapitate racemes on scapes projecting beyond the leaf-sheaths ..... *recurvata.*
Perianth-limb at the apex of the long, slender beak of the ovary; slender herbs, with flowers in distichous spikes on scapes hidden by the leaf-sheaths ..... *orchioides.*

2187. CURCULIGO RECURVATA Dryand.; F. I. ii. 145; F. B. I. vi. 278.
N. Bengal, Duars; Chota Nagpur, Sirguja.
A large herb; leaves over 1·5 feet long.

2188. CURCULIGO ORCHIOIDES Gaertn.; F. I. ii. 144; F. B. I. vi. 279; E. D. C. 2375.
Tirhut; Behar; W. and C. Bengal; Chota Nagpur.
A slender herb; leaves ·5–1·5 in. long. *Hind.* Múshali; *Beng.* Tala muli; *Uriya* Talmuli.

954. Zephyranthes Herb.

Herbs with tunicate bulbs; *leaves* few, linear or lorate, appearing with or after the flowers. *Flower* solitary, pedicelled or rarely sessile within an entire or 2-fid, spathe-like bract at the top of a long, fistular scape. *Perianth* funnel-shaped, straight or somewhat declinate; tube short or long, dilated upwards; lobes 6, equal or somewhat unequal, narrowed at the base, suberect above. *Stamens* 6, adnate to perianth-throat, equal or 3 somewhat shorter than the others, erect or somewhat declinate; anthers linear, dorsifixed. *Carpels* 3, connate in a 3-celled ovary; ovules many, 2-seriate in each loculus; style filiform, usually declinate above; stigma more or less 3-fid. *Fruit* a subglobose or depressed capsule, ultimately 3-dymous or 3-lobed, loculicidally 3-valved. *Seeds* oblong, angular or flattened; testa black.

2189. ZEPHYRANTHES TUBISPATHA Herb.; F. B. I. vi. 277.

In many of the provinces, in gardens and sometimes naturalised.

A bulbous herb; native of Peru.

955. Crinum Linn.

Herbs, sometimes large, with tunicate bulbs; *leaves* long, ensiform or lorate. *Flowers* large, umbellate, sessile or short-pedicelled, within 2 spathe-like bracts at the top of a long, solid scape; bracteoles linear. *Perianth* funnel-shaped or almost salver-shaped; tube long, straight or incurved, cylindric or with enlarged mouth; lobes 6, linear-lanceolate or narrowly oblong, recurved or spreading or conniving. *Stamens* 6, adnate to throat of perianth-tube; filaments free, filiform, declinate or diverging; anthers linear or oblong-linear, dorsifixed. *Carpels* 3, connate in a 3-celled ovary; ovules in each loculus few or many, sometimes only 2; style filiform; stigma very small, subcapitate. *Fruit* an irregularly subglobose, membranous or coriaceous capsule, bursting irregularly. *Seeds* few, large, rounded, with a thick testa and very copious albumen.

Perianth-tube straight, erect; lobes stellately patent; stamens spreading:—

Leaves 5 in. wide or wider; umbels 15–50-flowered; perianth-tube 3–4 in. long, equalling the linear lobes; neck of the very large bulb 4 in. or more across.....*asiaticum.*

Leaves 2 in. wide or less; umbels 6–12-flowered; neck of the bulb 2·5 in. or less across:—

Bulb with a fusiform, stoloniferous base; perianth-tube 2·5–3 in. long, equalling the linear lobes, which considerably exceed the stamens.....*defixum.*

Bulb not stoloniferous; perianth-tube 3·5–4 in. long; lobes lanceolate, about as long as the stamens:—

Leaves acuminate; perianth-lobes 2–3 in. long, shorter than the tube .....*amœnum.*

Leaves obtuse or subacute; perianth-lobes 3·5–4 in. long, about as long as the tube .....*pratense.*

Perianth-tube curved, declinate; lobes ascending; stamens declinate:—

*Leaves 3–5 in. wide, obtuse, margin scabrous, hardly waved; perianth-lobes oblong, almost white; anthers grey [p. 1061].....*latifolium.*

*Leaves 1·5–2 in. wide, linear-lanceolate, margin smooth, distinctly undulate; perianth-lobes lanceolate, pinkish; anthers brown [p. 1060] *latifolium* var. *zeylanica*.

2190. CRINUM ASIATICUM Linn.; F. B. I. vi. 280. *C. toxicarium* F. I. ii. 134. *C. asiaticum* var. *toxicaria* E. D. C. 2062.
Sundribuns; Chittagong, on the coast: elsewhere cultivated.
A very large herb. *Beng.* Bara kanur.

2191. CRINUM DEFIXUM Ker; F. B. I. vi. 281; E. D. C. 2068, 2072. *C. asiaticum* F. I. ii. 127.
W. Bengal; C. Bengal; E. Bengal; Chota Nagpur.
A large herb. *Beng.* Sukh-darshan. *Santal.* Sikyom baha.

2192. CRINUM AMŒNUM Roxb.; F. I. ii. 127; F. B. I. vi. 282; E. D. C. 2061.
N. Bengal, Duars.
A large herb.

2193. CRINUM PRATENSE Herb.; F. B. I. vi. 282. *C. longifolium* F. I. ii. 130.
N. Bengal; C. Bengal.
A large herb.

2194. CRINUM LATIFOLIUM Linn.; F. I. ii. 137; F. B. I. vi. 283. *C. zeylanicum* E. D. C. 2075.
In gardens generally; wild in Orissa and perhaps in Chota Nagpur.
A large herb. *Beng.* Sukh-darshan.

2194/2. Var. ZEYLANICA Herb. *C. zeylanicum* F. I. ii. 138.
In gardens; perhaps wild in Orissa.
A large herb.

956. Pancratium Linn.

Herbs with tunicate bulbs; *leaves* linear or lanceolate, often 2-farious. *Flowers* large, solitary or umbellate, sessile or pedicelled within 1 or 2 membranous spathes; bracteoles few, linear, hyaline. *Perianth* funnel-shaped; tube usually long, widened at the mouth; lobes 6, narrow, suberect, subequal. *Stamens* 6, shorter than perianth, adnate to the throat; filaments filiform, but connate below in a petaloid, membranous cup, the edge of which between the free filaments may be toothed or lobed; anthers oblong or shortly linear, dorsifixed. *Carpels* 3, connate

2189. ZEPHYRANTHES TUBISPATHA Herb.; F. B. I. vi. 277.

In many of the provinces, in gardens and sometimes naturalised.

A bulbous herb; native of Peru.

955. Crinum Linn.

Herbs, sometimes large, with tunicate bulbs; *leaves* long, ensiform or lorate. *Flowers* large, umbellate, sessile or short-pedicelled, within 2 spathe-like bracts at the top of a long, solid scape; bracteoles linear. *Perianth* funnel-shaped or almost salver-shaped; tube long, straight or incurved, cylindric or with enlarged mouth; lobes 6, linear-lanceolate or narrowly oblong, recurved or spreading or conniving. *Stamens* 6, adnate to throat of perianth-tube; filaments free, filiform, declinate or diverging; anthers linear or oblong-linear, dorsifixed. *Carpels* 3, connate in a 3-celled ovary; ovules in each loculus few or many, sometimes only 2; style filiform; stigma very small, subcapitate. *Fruit* an irregularly subglobose, membranous or coriaceous capsule, bursting irregularly. *Seeds* few, large, rounded, with a thick testa and very copious albumen.

Perianth-tube straight, erect; lobes stellately patent; stamens spreading:—

Leaves 5 in. wide or wider; umbels 15–50-flowered; perianth-tube 3–4 in. long, equalling the linear lobes; neck of the very large bulb 4 in. or more across.....*asiaticum.*

Leaves 2 in. wide or less; umbels 6–12-flowered; neck of the bulb 2·5 in. or less across:—

Bulb with a fusiform, stoloniferous base; perianth-tube 2·5–3 in. long, equalling the linear lobes, which considerably exceed the stamens.....*defixum.*

Bulb not stoloniferous; perianth-tube 3·5–4 in. long; lobes lanceolate, about as long as the stamens:—

Leaves acuminate; perianth-lobes 2–3 in. long, shorter than the tube .....*amœnum.*

Leaves obtuse or subacute; perianth-lobes 3·5–4 in. long, about as long as the tube .....*pratense.*

Perianth-tube curved, declinate; lobes ascending; stamens declinate:—

*Leaves 3–5 in. wide, obtuse, margin scabrous, hardly waved; perianth-lobes oblong, almost white; anthers grey [p. 1061].....*latifolium.*

*Leaves 1·5–2 in. wide, linear-lanceolate, margin smooth, distinctly undulate; perianth-lobes lanceolate, pinkish; anthers brown [p. 1060] *latifolium* var. *zeylanica.*

2190. CRINUM ASIATICUM Linn.; F. B. I. vi. 280. *C. toxicarium* F. I. ii. 134. *C. asiaticum* var. *toxicaria* E. D. C. 2062.
Sundribuns; Chittagong, on the coast: elsewhere cultivated.
A very large herb. *Beng.* Bara kanur.

2191. CRINUM DEFIXUM Ker; F. B. I. vi. 281; E. D. C. 2068, 2072. *C. asiaticum* F. I. ii. 127.
W. Bengal; C. Bengal; E. Bengal; Chota Nagpur.
A large herb. *Beng.* Sukh-darshan. *Santal.* Sikyom baha.

2192. CRINUM AMŒNUM Roxb.; F. I. ii. 127; F. B. I. vi. 282; E. D. C. 2061.
N. Bengal, Duars.
A large herb.

2193. CRINUM PRATENSE Herb.; F. B. I. vi. 282. *C. longifolium* F. I. ii. 130.
N. Bengal; C. Bengal.
A large herb.

2194. CRINUM LATIFOLIUM Linn.; F. I. ii. 137; F. B. I. vi. 283. *C. zeylanicum* E. D. C. 2075.
In gardens generally; wild in Orissa and perhaps in Chota Nagpur.
A large herb. *Beng.* Sukh-darshan.

2194/2. Var. ZEYLANICA Herb. *C. zeylanicum* F. I. ii. 138.
In gardens; perhaps wild in Orissa.
A large herb.

956. Pancratium Linn.

Herbs with tunicate bulbs; *leaves* linear or lanceolate, often 2-farious. *Flowers* large, solitary or umbellate, sessile or pedicelled within 1 or 2 membranous spathes; bracteoles few, linear, hyaline. *Perianth* funnel-shaped; tube usually long, widened at the mouth; lobes 6, narrow, suberect, subequal. *Stamens* 6, shorter than perianth, adnate to the throat; filaments filiform, but connate below in a petaloid, membranous cup, the edge of which between the free filaments may be toothed or lobed; anthers oblong or shortly linear, dorsifixed. *Carpels* 3, connate

in a 3-celled ovary; ovules many, 2-seriate in each loculus; style long, filiform; stigma small, capitate. *Fruit* a considerable, subglobosely 3-cornered, loculicidally 3-valved capsule. *Seeds* many, angular; testa thick, lax, black.

Scape stout, as long as leaves or longer; spathes 2; perianth-throat dilated, tube cylindric; staminal cup obconic, with a 2-fid tooth between each pair of filaments ..... *verecundum.*
Scape compressed, shorter than the leaves; spathes 3–4; perianth-throat not dilated, tube trigonous; staminal cup funnel-shaped, erose, but not toothed between each pair of filaments ..... *biflorum.*

2195. PANCRATIUM VERECUNDUM Ait.; F. B. I. vi. 285.
N. Bengal, Duars.
A bulbous herb.

2196. PANCRATIUM BIFLORUM Roxb.; F. I. ii. 125; F. B. I. vi. 285.
Chota Nagpur.
A bulbous herb.

Order CXXXIII. TACCACEÆ.

Perennial herbs; rootstock tuberous or creeping. *Leaves* radical, large, long-petioled, undivided and costate, or pinnately lobed and reticulate veined. *Flowers* regular, hermaphrodite, densely umbellate at the apex of a long, leafless scape; outer bracts few, usually 4, leafy and broad, forming an involucre, sometimes coloured; inner bracts under the pedicels many, long, filiform, pendent. *Perianth* usually lurid, corolline or subherbaceous, superior, urceolate or subcampanulate, 2-seriately 6-lobed; lobes of outer series sometimes the larger. *Stamens* 6, adnate to perianth-tube or to base of perianth-lobes, included; filaments very short, dilated or appendaged laterally at the base, and inflexed, cucullate above the anthers, with 2 ribs or horns on the inner face; anthers sessile under the hood; cells 2; dehiscence longitudinal. *Carpels* 3, connate in an inferior, 3-cornered, 1-locular ovary, with 3 parietal placentas; ovules many, anatropous or almost amphitropous on each placenta; style short, columnar, usually 3-cornered, included; stigmas 3, often petaloid, broad, 2-fid and inflexed like an umbrella above the style. *Fruit* globose, ovoid, turbinate, or oblong, 3–6-ribbed, forming an indehiscent berry, or rarely a 3-valved capsule. *Seeds* many, ovoid, com-

pressed, longitudinally many-striate; albumen hard, solid, cartilaginous or granular; embryo minute, embedded in the albumen.

957. Tacca Forst.

Characters those of the order; fruit always indehiscent.

Leaves 3-partite, segments 2–3-fid or irregularly lobed or cut; bracts of the involucre usually more than 4 ..... *pinnatifida.*
Leaves entire; bracts of the involucre 4, in two pairs:—
Petiole and scape rough; inner pair of bracts of the involucre petioled, exceeding the outer sessile pair ..... *integrifolia.*
Petiole and scape smooth; both pairs of bracts sessile, subequal *lævis.*

2197. TACCA PINNATIFIDA Forst.; F. I. ii. 172; F. B. I. vi. 287; E. D. T. 15.
Behar; Chota Nagpur; Chittagong; elsewhere sometimes cultivated.
A large herb, with a globose, tuberous rootstock. *Santal.* Dhai.

2198. TACCA INTEGRIFOLIA Ker; F. B. I. vi. 287. *T. aspera* F. I. ii. 169.
Chittagong.
A herb, with oblong rootstock.

2199. TACCA LÆVIS Roxb.; F. I. ii. 171; F. B. I. vi. 288.
Tippera; Chittagong.
A herb, with oblong rootstock. *Vernac.* Moti munda.

Order CXXXIV. DIOSCOREACEÆ.

Large, slender, climbing, rarely shorter and procumbent herbs, with usually a thick, fleshy, tuberous, underground rootstock, rarely a cluster of tuberous roots, sometimes the tuber epigæal, and then often woody. *Leaves* alternate or opposite, simple or compound, costate and reticulate; petioles often angled and twisted at the base, sometimes articulate. *Flowers* small, usually a-sexual, spicate or racemose, diœcious or monœcious in separate spikes, regular; bracts small, often minute, sometimes obsolete; male racemes simple or paniculate, female simple, sometimes reduced to 1–2-flowers; perianth superior, regular, 2-seriately 6-lobed. ♂ *Perianth* campanulate or rotate, deeply 6-fid, or

urceolate with narrow mouth and short, spreading lobes. *Stamens* 6, adnate to base of perianth, all perfect, or 3 reduced to staminodes, or only 3 with no staminodes; filaments free or connate in a short column below, incurved or recurved above; anthers small, 2-celled, globose, oblong, or didymous, or the cells discrete on the tips of branches of the filament. *Pistillode* thick, columnar, 3-fid or entire or obsolete. ♀ *Perianth* smaller than in male, 6-fid or 6-partite, persistent. *Staminodes* 3 or 6 or 0. *Carpels* 3, connate in an inferior, 3-cornered, 3-locular ovary; ovules 2, superposed, pendulous in each cell, anatropous or subamphitropous; styles 3, very short; stigmas entire or 2-fid, recurved. *Fruit* a berry or a 3-valved capsule. *Seeds* flat or globose; albumen fleshy, rather hard; embryo minute, enclosed in the albumen.

958. Dioscorea Linn.

Herbs with slender, twining, rarely procumbent stems; tuber solitary, often large, underground or, rarely, epigæal, very rarely tubers clustered and long-peduncled at base of stem; *leaves* alternate or sometimes opposite, entire or lobed or digitately 3–9-foliolate. *Flowers* always 1-sexual, usually diœcious. ♂ *Perianth* campanulate, rotate, or urceolate; lobes short, spreading. *Stamens* 6, free round a pistillode or connate in a central column; or 3, alternate with 3 staminodes; or 3 without staminodes; anthers small; cells contiguous or discrete. *Pistillode* thick, fleshy, or 0. ♀ *Perianth* segments 6, free, small. *Staminodes* 6 or 3 or 0. *Carpels* 3, connate in a 3-quetrous, 3-locular, inferior ovary; ovule 2 in each cell, superposed, laterally attached near the apex; style 3, short; stigmas terminal, entire or 2-fid, reflexed above the style. *Fruit* a 3-cornered, loculicidal capsule, the angles prominent, laterally flattened, almost winged. *Seeds* compressed, sometimes with a unilateral samaroid or a circular, membranous wing, sometimes wingless; albumen compressed, fleshy or hard, 2-laminate; embryo between the laminæ with a suborbicular cotyledon.

*Stems twining to the left:—[p. 1065]

†Leaves compound; capsules longer than broad; seeds winged at the base only:—[p. 1065]

Leaflets digitately 3–5-nerved, always 3.....*dæmona*.

Leaflets pinnately veined:—

Leaflets sparsely pubescent or glabrous beneath, usually 5, often 3, rarely 7 ..... *pentaphylla.*
Leaflets softly grey-tomentose beneath, 3, rarely 4, in lower leaves; upper leaves irregularly 2-foliolate, or 2–3-lobed, or entire *tomentosa.*

†Leaves all simple :—[p. 1064]
Capsules longer than broad; seeds winged at base only; sepals narrow-oblong or lanceolate, subvalvate :—
Stem with axillary bulbils smooth ..... *bulbifera* var. *sativa.*
Stem with axillary bulbils warted :—
Stem terete, or faintly angled but not winged *bulbifera* var. *pulchella.*
Stem with 10–15 small, crispate, longitudinal wings *bulbifera* var. *crispata.*
Capsules broader than long; seeds winged all round :—
Leaves glabrous, hastate- or subdeltoid-cordate, without stipular thorns ..... *deltoidea* var. *sikkimensis.*
Leaves pubescent, reniform- or orbicular-cordate, with sharp stipular thorns :—
Tubers numerous, subequal; spiny roots 0 ..... *fasciculata.*
Tubers few, unequal, mixed with many fibrous roots of which the uppermost are spinous ..... *fasciculata* var. *spinosa.*

*Stem twining to the right; leaves all simple; capsule broader than long; seeds winged all round :—[p. 1064]
Leaves softly tomentose, with cartilaginous margins ..... *anguina.*
Leaves quite glabrous, their margins not cartilaginous :—
Stems terete or compressed, smooth or faintly angled :—
Rachis of flower-spikes straight :—
Leaves green beneath; pistillode large, globose ..... *aculeata.*
Leaves glaucescent beneath; pistillode minute :—
Perianth-segments firm, thick; upper leaves often with bases shallow-cordate or subtruncate ..... *nummularia.*
Perianth-segments herbaceous; all the leaves deep-cordate *nummularia* var. *belophylla.*
Rachis of flower-spikes zigzag ..... *Hamiltoni.*
Stems 4-gonous, winged or strongly angled :—
Tubers white or yellowish-white without and within :—
Tubers oblong or tapering ..... *alata.*
Tubers globose ..... *alata* var. *globosa.*
Tubers purple outside, oblong :—
Skin purple but flesh white ..... *alata* var. *rubella.*
Skin and flesh both purple ..... *alata* var. *purpurea.*

2200. DIOSCOREA DÆMONA Roxb.; F. I. iii. 805; F. B. I. vi. 289; E. D. D. 500.
In most of the provinces.
A large climber.

2201. DIOSCOREA PENTAPHYLLA Linn.; F. I. iii. 806; F. B. I. vi. 289; E. D. D. 522. *D. triphylla* F. I. iii. 805.
In all the provinces.
A considerable climber. *Hind.* Kanta-alu.

2202. DIOSCOREA TOMENTOSA Koenig; F. I. iii. 805; F. B. I. vi. 289; E. D. D. 537.
Orissa, Angul.
A rather small climber.

2203. DIOSCOREA BULBIFERA Linn. var. SATIVA. *D. sativa* F. B. I. vi. 295; E. D. D. 534.
Very rarely cultivated.
A considerable climber. The Otaheite Potato.

2203/2. Var. PULCHELLA. *D. pulchella* F. I. iii. 801. *D. bulbifera* E. D. D. 494.
General, but chiefly in the eastern provinces.
A climber. *Vernac.* Rát-alu; *Santal.* Ato sang.

2203/3. Var. CRISPATA. *D. crispata* F. I. iii. 802; F. B. I. vi. 296; E. D. D. 499.
In all the western provinces.
A climber. *Hind.* Zamin-kand; *Santal.* Piska.

2204. DIOSCOREA DELTOIDEA Wall.; F. B. I. vi. 291; E. D. D. 503: var. SIKKIMENSIS.
N. Bengal, Duars.
A small climber.

2205. DIOSCOREA FASCICULATA Roxb.; F. I. iii. 801; F. B. I. vi. 296; E. D. D. 507.
Cultivated, especially in the northern provinces.
A small climber. *Beng.* Susni-alu.

2205/2. Var. SPINOSA. *D. aculeata* F. I. iii. 800; E. D. D. 481. *D. spinosa* F. B. I. vi. 291.
Cultivated generally but sparingly.
A large climber. *Hind.* and *Beng.* Mou-alu.

2206. DIOSCOREA ANGUINA Roxb.; F. I. iii. 803; F. B. I. vi. 293; E. D. D. 488.
Chota Nagpur; N. Bengal; E. Bengal.
A large climber. *Beng.* Kukur-alu.

2207. DIOSCOREA ACULEATA Linn.; F. B. I. vi. 296. *D. glabra* E. D. D. 510. *D. Wallichii* F. B. I. vi. 295.
Chota Nagpur; Chittagong: cultivated.
A considerable climber. The Chinese Yam.

2208. DIOSCOREA NUMMULARIA Lamk; F. I. iii. 803: E. D. D. 515. *D. glabra* F. I. iii. 804; F. B. I. vi. 294.
In all the provinces, never cultivated.
A large climber. *Beng.* Shora-alu; *Santal.* Alto sang.

2208/2. Var. BELOPHYLLA Voigt (sp.). *D. sagittata* E. D. D. 532. *D. glabra* F. B. I. vi. 294 partly.
Chota Nagpur, Parasnath.
A large climber; probably, as Voigt suggests, quite distinct specifically from *D. nummularia*.

Roxburgh has himself left a note in the Calcutta Library indicating that his *D. glabra* and *D. nummularia* are the same species.

2209. DIOSCOREA HAMILTONI Hook. f.; F. B. I. vi. 295 partly.
Chota Nagpur; N. Bengal; E. Bengal; Chittagong.
A considerable climber.

This is most nearly related, of the uncultivated species, to *D. alata*; it differs by its much narrower leaves which always become brownish when dry, and by its much larger capsules.

2210. DIOSCOREA ALATA Linn.; F. I. iii. 797; F. B. I. vi. 296; E. D. D. 484. *D. Hamiltoni* F. B. I. vi. 295 partly.
Generally cultivated.
A large climber. *Beng.* Khám; Khám-alu.

2210/2. Var. GLOBOSA. *D. globosa* F. I. iii. 797; F. B. I. vi. 296; E. D. D. 513.
Generally cultivated.
A large climber. *Beng.* Chupri-alu; *Santal.* Bengo nári.

2210/3. Var. RUBELLA. *D. rubella* F. I. iii. 798; F. B. I. vi. 297; E. D. D. 530.
Generally cultivated.
A large climber. *Beng.* Guraniya-alu.

2210/4. Var. PURPUREA. *D. purpurea* F. I. iii. 799; F. B. I. vi. 297; E. D. D. 526.
Generally cultivated.
A large climber. *Vernac.* Lal-guraniya; rakto-guraniya-alu.

Order CXXXV. ROXBURGHIACEÆ.

Herbs with twining, rarely erect stems from a perennial rootstock. *Leaves* alternate or opposite, petioled, 3–more-nerved; cross veins parallel. *Flowers* hermaphrodite, regular, on axillary, filiform, 1-flowered or few- and lax-flowered peduncles. *Perianth* inferior or half-superior, petaloid; segments or lobes 4, 2-seriate, subequal. *Stamens* 4, at the base of the perianth or almost hypogynous; filaments rather thick, free or connate below; anthers dorsifixed; cells 2, parallel or divergent; dehiscence longitudinal, introrse. *Carpels* 2, connate in a superior or half-inferior, 1-locular ovary; ovules 2 or more, erect or pendulous; stigma terminal, sessile, small, entire or didymous. *Fruit* a capsule, at length separating into 2 valves. *Seeds* oblong; testa coriaceous; embryo long, in the axis of the hard albumen.

959. Stemona Lour.

Herbs with twining stems; root of fleshy tubers; *leaves* opposite, alternate, or whorled, ovate, 3–9-costate. *Flowers* solitary, or few and subracemose. *Perianth* segments 4, lanceolate, many-nerved, inferior. *Stamens* 4, subhypogynous, more or less connate in a ring; anthers linear, erect; connective produced in a very long, linear-lanceolate, erect appendage. *Carpels* 2, connate in a free, compressed, 1-locular ovary; ovules 2 or more, erect; funicles long or short; stigma small, sessile, pointed. *Fruit* an ovoid or oblong, compressed, few-seeded, 2-valved capsule. *Seed* erect, ovoid or oblong, terete, grooved, beaked; funicle bearded; testa thick; embryo rather long; radicle close to the hilum.

2211. Stemona tuberosa Lour.; F. B. I. vi. 298. *Roxburghia gloriosoides* F. I. ii. 234.

Orissa; Chittagong.

A considerable climber.

Order CXXXVI. LILIACEÆ.

Herbs, very rarely shrubs or small trees, with fibrous roots or a creeping rootstock, or a bulb or corm. *Leaves* cauline or radical, sometimes 0. *Flowers* hermaphrodite, rarely by abortion 1-sexual, axillary or terminal, solitary or geminate or umbellate, spicate, racemose or paniculate or fascicled; bracts usually small, scarious,

sometimes, when the flowers umbellate, spathe-like. *Perianth* herbaceous or petaloid, usually 6-merous in 2 series, rarely 4- or 8- or 10-merous, imbricate, rarely valvate in bud, inferior, free or rarely slightly adnate to base of ovary. *Stamens* 6, rarely 3 or fewer, hypogynous or adnate to the perianth; filaments free or connate; anthers oblong or linear, often dorsifixed; dehiscence longitudinal, rarely terminal and porous. *Carpels* 3, connate in a superior, 3-celled ovary; ovules 2 or more from inner angles of cells, anatropous or rarely orthotropous; style usually simple, often long, rarely short or 0, or styles 3. *Fruit* a capsule or berry, usually 3-celled, rarely 1-celled. *Seeds* 1 or more, globose or flattened; albumen horny or fleshy; embryo small, terete.

Shrubs with perennial stems above ground; fruit berry-like:—

Stems leafless, slender, usually straggling; leaves replaced by linear or acicular cladodes; flowers solitary, fascicled, or racemose **Asparagus.**

Stems leafy:—

Leaves distinctly 3–5-nerved and reticulately veined, disposed at intervals along the generally climbing stem; flowers in umbels **Smilax.**

Leaves closely, numerously parallel-nerved, usually clustered at the apex of a short or long, generally erect caudex:—

Each cell of the ovary 1-ovuled..... **Dracæna.**

Each cell of the ovary 4- or more-ovuled ..... **Cordyline.**

Herbs with annual stems or scapes, rising usually from perennial underground rootstocks, corms, or bulbs, rarely (*Asphodelus*) the plant wholly annual:—

*Underground perennial stem large in proportion to the roots:—[p. 1070]

Perennial stem a creeping rootstock; annual aerial stem erect, leafy; leaves broad; fruit a berry ..... **Disporum.**

Perennial stem compact, not creeping; fruit a loculicidal capsule:—

Aerial annual stem climbing, leafy; leaves broad, with tendril-like tips; perianth large, showy, its segments distinct; rootstock tuber-like, irregular, naked..... **Gloriosa.**

Aerial annual stems or scapes erect; leaves narrow; rootstock a globose, coated corm or bulb:—

Perennial stem a solid corm covered with brown sheaths; annual stem leafy, with scattered linear or ensiform leaves; flowers solitary or corymbose ..... **Iphigenia.**

Perennial stem a tunicated bulb; annual scape simple, naked; leaves radical:—

Flowers racemose on the scape, not surrounded by an involucre of bracts :—

Seeds subglobose ; perianth stellate .....**Scilla.**

Seeds flattened ; perianth campanulate .....**Urginea.**

Flowers umbellate or capitate at the top of the scape, at firs enclosed in a spathe-like involucre of membranous bracts **Allium.**

*Underground perennial stem very small or (*Asphodelus* sometimes) none ; root-fibres large, numerous, usually some or all fleshy or tuberous ; leaves radical ; fruit a loculicidal capsule :—[p. 1069]

Flowers small ; perianth-segments distinct ; ovules few :—

Each cell of the ovary 2-ovuled ; capsule triquetrous ; leaves semiterete ; plant often wholly annual .....**Asphodelus.**

Each cell of the ovary 4- or more-ovuled ; capsule deeply 3-lobed, the lobes flattened ; leaves flat .....**Chlorophytum.**

Flowers very large, showy ; perianth funnel-shaped ; each cell of the ovary many-ovuled ; capsule triquetrous ; leaves linear **Hemerocallis.**

960. Asparagus Linn.

Undershrubs ; stems erect, straggling, or climbing, terete, grooved, or angled ; rootstock stout, creeping ; *leaves* minute, scale-like, with tufts of needle-like or flattened axillary cladodes. *Flowers* hermaphrodite, rarely 1-sexual, small or minute, axillary, solitary, fascicled or racemose, pendulous ; pedicels jointed ; bracts minute or obsolete. *Perianth* petaloid, 6-partite, campanulate. *Stamens* 6, adnate to base of perianth-lobes ; filaments free ; anthers oblong. *Carpels* 3, connate in a sessile, 3-gonous, 3-celled ovary ; ovules 2 or more in each cell ; style columnar, short and thick or long and slender ; stigmas 3, short, recurved. *Fruit* a globose, pulpy berry. *Seeds* few or, by abortion, solitary, subglobose ; testa black, fragile ; embryo dorsal ; albumen hard.

Racemes as long as or (usually) longer than the slender, divaricate, falcate cladodes, channelled beneath and only twice as long as the longest spines .....*racemosus.*

Racemes distinctly (usually considerably) shorter than the strong, suberect, strict triquetrous cladodes, which many times exceed the uniform slightly recurved spines.....*acerosus.*

2212. Asparagus racemosus Willd. ; F. I. ii. 151 ; F. B. I. vi. 316 ; E. D. A. 1575.

In most of the provinces.

A tall, climbing, much-branched undershrub. *Hind.* Sada-bori, shakakul; *Beng.* Satamuli.

2213. Asparagus acerosus Roxb.; F. I. ii. 150; F. B. I. vi. 317.
N. Bengal; Chittagong.
A climbing, much-branched undershrub.

961. Smilax Linn.

Climbing shrubs, rarely erect herbs; *leaves* alternate, rarely opposite, persistent, 3–5-nerved and reticulate; petiole with usually 2 tendrils above its base. *Flowers* small, umbellate, diœcious. *Perianth* of 6 free, incurved or recurved, subequal segments. ♂ *Stamens* 6 or more, free from the base of the perianth; filaments erect, free, short or long; anthers oblong, 2-celled, didymous, with contiguous cells or with cells discrete on a forked connective. *Pistillode* 0. ♀ *Staminodes* filiform, 6 or 3. *Carpels* 3, connate in a 3-gonous 3-celled ovary; ovules in each cell 2, orthotropous, pendulous; style short or 0; stigmas 3, stout, recurved. *Fruit* a globose berry. *Seeds* by abortion solitary globose, or oftener 2 hemispheric, rarely 3; albumen horny; embryo small.

Umbels 2–3, very rarely more, alternate on a common peduncle :—
Petiole stout, always narrowly sheathing but not auriculate below the middle ..... *macrophylla.*
Petiole rather slender, with 2 large, thickly coriaceous, indistinctly reticulate auricles below the middle..... *Roxburghiana.*
Umbels 7–20, ternate or whorled on a common peduncle; petiole stout, with, in all except the uppermost leaves, 2 large, leafy, distinctly reticulate auricles below the middle..... *prolifera.*

2214. Smilax macrophylla Roxb.; F. I. iii. 793; F. B. I. vi. 310; E. D. S. 2252. *S. retusa* F. I. iii. 793. *S. ovalifolia* F. I. iii. 794.
Chota Nagpur; W. Bengal; Chittagong.
A large, prickly climber. *Hind.* Jangli aushbah; *Beng.* Kumarika; *Santal.* Atkir.

2215. Smilax Roxburghiana Wall.; F. B. I. vi. 311.
Chota Nagpur, Parasnath; Chittagong.
A large, prickly climber.

2216. Smilax prolifera Roxb.; F. I. iii. 795; F. B. I. vi. 312; E. D. S. 2258. *S. laurifolia* F. I. iii. 793.
In all the provinces.
A large, prickly climber.

962. Dracæna Linn.

Shrubs, sometimes climbing, or small trees; *leaves* alternate or crowded and subterminal, sessile or petioled, many-nerved, costate or not. *Flowers* in terminal racemes, panicles, heads or umbels; bracts small. *Perianth* corolline, campanulate, funnel-shaped, or tubular, 6-cleft; lobes narrow. *Stamens* 6, adnate to base of perianth-tube; filaments filiform or flattened; anthers versatile. *Carpels* 3, connate in a 3-celled ovary; ovules solitary, erect in each cell; style filiform; stigma capitate. *Fruit* a globose, didymous, or 3-lobed berry. *Seeds* globose or angled; testa thickened; albumen horny; embryo small.

Stems erect; leaves very broadly, shortly petioled; flowers in fascicles; berry orange-red ..... *spicata.*
Stems ascending, weakly branched; leaves narrowly, distinctly petioled; flowers 2–3-nate; berry cherry-red ..... *terniflora.*

2217. Dracæna spicata Roxb.; F. I. ii. 157; F. B. I. vi. 328.
Chittagong.
A stout shrub or small tree.

2218. Dracæna terniflora Roxb.; F. I. ii. 159; F. B. I. vi. 328.
Chittagong.
A straggling shrub.

963. Cordyline Commers.

Shrubs with slender stems and crowded, subterminal, sessile or petioled *leaves*, subcoriaceous and many-nerved. *Flowers* small, paniculate, short-pedicelled; bracts small. *Perianth* corolline, tubular or narrowly campanulate, 6-cleft; lobes narrow. *Stamens* 6, adnate to base of perianth-tube; filaments filiform or flattened; anthers versatile. *Carpels* 3, connate in a short, 3-celled ovary; ovules in each cell 4–16; style filiform; stigma capitate or shortly 3-lobed. *Fruit* a globose or 3-lobed dry berry. *Seeds* in each loculus several or, by abortion, solitary, obovoid or somewhat compressed; testa black, shining; embryo nearly as long as the albumen.

2219. Cordyline terminalis Kunth; F. B. I. vi. 331. *Dracæna ferrea* F. I. ii. 156.
In gardens everywhere.
A shrub. The garden "Dracæna."

964. Disporum Salisb.

Herbs with erect, angular, leafy stems, rising from a creeping rootstock; *leaves* sessile or subsessile, strongly nerved. *Flowers* in terminal or axillary, few-flowered umbels; pedicels decurved. *Perianth* narrowly campanulate, deciduous; lobes petaloid, subequal, free, erect or spreading at tips, their bases saccate or spurred. *Stamens* 6, hypogynous; filaments filiform or flattened; anthers dorsifixed; dehiscence extrorse. *Carpels* 3, connate in a 3-celled ovary; ovules 2–6 in each cell; style long or short; stigmas 3, short. *Fruit* a fleshy, pisiform, black berry. *Seeds* few, subglobose; testa brown; albumen horny; embryo small.

2220. Disporum pullum Salisb.; F. B. I. vi. 360.

Chota Nagpur, Parasnath.

A herb, annual leafy stems 2–4 feet high.

965. Gloriosa Linn.

Climbing herbs with leafy stems, springing from a naked, tuberous rootstock; *leaves* alternate, opposite, or 3-nately whorled, lanceolate, strongly nerved, with a long, spiral, tendril-like apex. *Flowers* large, showy, axillary, solitary; pedicels reflexed. *Perianth* petaloid, persistent; segments 6, subequal, spreading or reflexed, margins often undulate. *Stamens* 6, hypogynous; filaments filiform; anthers linear, dorsifixed, versatile; dehiscence extrorse. *Carpels* 3, connate in a 3-celled ovary; ovules in each cell numerous; style filiform, deflexed, with 3 subulate arms stigmatic within. *Fruit* a large, coriaceous, septicidal capsule. *Seeds* subglobose; testa spongy, wing-like; embryo cylindric.

2221. Gloriosa superba Linn.; F. I. ii. 143; F. B. I. vi. 358; E. D. G. 243.

In most of the provinces.

A climbing herb, the leaves with cirrhate tips; rootstock a chain of tuber-like joints, budding from the convex upper side. *Hind.* Langúli, kulhari, kaliari; *Beng.* Bisha-languli, ulat-chandal; *Santal.* Siric' samano.

966. Iphigenia Kunth.

Herbs with small, tunicate corms, and erect, leafy, slender stems; *leaves* few, scattered, linear, the upper bract-like. *Flowers* small, erect, solitary or corymbose. *Perianth* petaloid, 6-partite,

stellately spreading, deciduous; segments equal, narrow, clawed. *Stamens* 6, hypogynous; filaments short, flat; anthers oblong, versatile, introrsely attached. *Carpels* 3, connate in a sessile, 3-celled ovary; ovules in each cell numerous; styles 3, shortly connate below, free above, linear, recurved, stigmatic within. *Fruit* a loculicidal capsule. *Seeds* subglobose; testa thin, brown, adpressed; albumen fleshy; embryo small.

2222. IPHIGENIA INDICA Kunth; F. B. I. vi. 357; E. D. I. 340.

Chota Nagpur; Behar; W. Bengal.

A herb, 3–10 in. high, with a globose, perennial corm. *Santal.* Chutia chandbol.

967. Scilla Linn.

Herbs with tunicate bulbs; *leaves* radical, linear lorate or oblong. *Flowers* racemose, on a simple, leafless scape; bracts small. *Perianth* petaloid, persistent, stellate or campanulate; segments 6, subequal, often recurved. *Stamens* 6, adnate at or near base of perianth-lobes; filaments usually filiform; anthers ovate or oblong; dehiscence introrse. *Carpels* 3, connate in a 3-celled ovary; ovules in each cell usually few, often 2; style filiform; stigma small, capitate. *Fruit* a globose, 3-lobed, loculicidal capsule; cells 1–2-seeded. *Seeds* obovoid or subglobose; testa thin, black; embryo shorter than the firm albumen.

2223. SCILLA INDICA Bak.; F. B. I. vi. 348; E. D. S. 968.

Chota Nagpur; Behar.

A small, bulbous herb; flowers appearing with the leaves. *Beng.* Safedi-khus.

968. Urginea Steinh.

Herbs with tunicate bulbs; *leaves* radical, linear or lorate. *Flowers* racemose, on a long, leafless scape, often appearing before the leaves; pedicels short or long, articulate; bracts small. *Perianth* petaloid, campanulate; segments 6, subequal. *Stamens* 6, adnate at or near base of perianth-lobes, included; filaments filiform thickened at the base; anthers oblong or linear; dehiscence introrse. *Carpels* 3, connate in a sessile, 3-celled, often 3-gonous ovary; ovules in each cell numerous; style filiform; stigma somewhat thickened. *Fruit* an oblong, 3-quetrous, loculicidal capsule.

Seeds usually many in each cell, compressed; testa black, marginally winged; embryo rather large; albumen fleshy.

2224. URGINEA INDICA Kunth; F. B. I. vi. 347. *Scilla indica* F. I. ii. 147.

Behar; Chota Nagpur.

A bulbous herb; flowers appearing before the leaves. *Vernac.* Kanda, kandé, jangli-piyaj, ban-piyaj.

969. Allium Linn.

Herbs with tunicate bulbs; odour characteristic, fœtid or pungent; *leaves* radical, usually narrow, often fistular, sheath short or long, and enveloping the scape below. *Flowers* rather small, several or many in a terminal umbel, enclosed at first by 2, rarely 3, membranous bracts, sometimes more or less connate, at the top of a simple, leafless scape; pedicels not articulate; occasionally the flowers replaced by bulbils. *Perianth* subcalycine, of 6 persistent segments, free or slightly connate below, subequal, campanulate or stellate. *Stamens* 6, inserted at or near the base of the perianth-lobes; filaments free, filiform, or somewhat dilated below, or sometimes connate at the base; anthers oblong; dehiscence introrse. *Carpels* 3, connate in a sessile or shortly stipitate, more or less perfectly 3-celled ovary; ovules usually 2, rarely 3–6 in each carpel; style filiform; stigma minute. *Fruit* a membranous, loculicidal capsule. *Seeds* few, compressed; testa black; albumen fleshy; embryo rather large.

Leaves fistular :—

Leaves basal only; heads dense, with flowers only .....*ascalonicum.*

Leaves subdistichous; heads dense, with flowers and bulbils.....*Cepa.*

Leaves flat :—

Heads bearing flowers only; bulb long, cylindric, simple :—

Heads lax; filaments simple, linear.....*tuberosum.*

Heads dense; filaments 2-toothed .....*Ampeloprasum.*

Heads lax, bearing both flowers and bulbils; bulb short, compound *sativum.*

2225. ALLIUM ASCALONICUM Linn.; F. I. ii. 142; F. B. I. vi. 337; E. D. A. 767.

Cultivated.

A bulbous herb. *Beng.* Gandhan, piyaj. The Shallot.

2226. ALLIUM CEPA Linn.; F. I. ii. 142; F. B. I. vi. 337; E. D. A. 769.

Cultivated.

A bulbous herb. *Hind.* Piyaj; *Beng.* Piyaj, palandu. The Onion.

2227. ALLIUM TUBEROSUM Roxb.; F. I. ii. 141; F. B. I. vi. 343; E. D. A. 786.

Cultivated.

A bulbous herb. *Beng.* Banga gandina. The Indian Leek.

2228. ALLIUM AMPELOPRASUM Linn.; F. B. I. vi. 337. *A. Porrum* F. I. ii. 141; E. D. A. 775.

Cultivated.

A bulbous herb. *Beng.* Gandina, paru. The Leek.

2229. ALLIUM SATIVUM Linn.; F. I. ii. 142; F. B. I. vi. 337; E. D. A. 779.

Cultivated.

A bulbous herb. *Vernac.* Lasun. Garlic.

970. Asphodelus Linn.

Annual or perennial herbs, with slender or fleshy root-fibres; *leaves* radical, linear, 3-cornered or terete and fistular. *Flowers* small, racemose on the simple or sparingly branched leafless scape; pedicels jointed, solitary in the axils of the small, scarious bracts. *Perianth* petaloid, marcescent; segments 6, free or shortly connate below. *Stamens* 6, hypogynous, shorter than perianth-lobes, erect or somewhat declinate; filaments wide-based, enclosing the ovary, flattened or filiform above; anthers oblong or almost linear, versatile, the filament inserted in a pit on the back of the connective. *Carpels* 3, connate in a 3-celled ovary; ovules 2, collateral in each cell; style filiform; stigma somewhat 3-lobed. *Fruit* a globose, 3-quetrous, loculicidal capsule, with rugose partitions. *Seeds* usually solitary in each cell of capsule; testa black, usually rugose; albumen cartilaginous; embryo rather large.

2230. ASPHODELUS TENUIFOLIUS Cav.; F. B. I. vi. 332. *A. clavatus* F. I. ii. 148.

In the western and central provinces.

An annual weed.

971. Chlorophytum Ker.

Herbs with a short, hard rootstock, emitting many fascicled roots, often thick and fleshy or tuber-like; *leaves* radical, clus-

tered, often broad, rarely linear or lorate. *Flowers* laxly racemed on a simple or branching leafless scape; pedicels usually fascicled in the axils of small scarious or larger membranous bracts. *Perianth* petaloid, marcescent or persistent, rarely deciduous; lobes free, rotate. *Stamens* 6, hypogynous, free, or the 3 inner adnate to perianth-lobes, included; filaments filiform, often widened above the middle; anthers oblong or linear; dehiscence introrse, the filament inserted in a small pit on the back of the connective. *Carpels* 3, connate in a sessile, 3-quetrous, 3-celled ovary; ovules 4 or more in each cell; style filiform; stigma small. *Fruit* a coriaceous, truncate, 3-quetrous, often 3-lobed, loculicidal capsule. *Seeds* broad, usually compressed, rugose, not angular; testa black; albumen rather hard; embryo often curved, rather large.

Root-fibres fleshy, cylindric; leaves usually contracted near the base into a short petiole .....*arundinaceum.*
Root-fibres partly cylindric, partly tuberous; leaves rarely contracted near the base .....*tuberosum.*

2231. CHLOROPHYTUM ARUNDINACEUM Bak.; F. B. I. vi. 333.
Chota Nagpur; Behar.
A herb.

2232. CHLOROPHYTUM TUBEROSUM Bak.; F. B. I. vi. 334. *Anthericum tuberosum* F. I. ii. 149.
Behar; W. Bengal.
A herb.

972. Hemerocallis Linn.

Showy herbs, with fleshy root-fibres and a short rootstock; *leaves* long, narrow, often grass-like, strongly ribbed and many-nerved. *Flowers* large, suberect, orange-yellow, in a few-flowered panicle, terminating a long, terete, naked scape; bracts scarious, deciduous. *Perianth* funnel-shaped; segments 6, connate below in a tube, free and recurved above, the 3 inner rather the larger. *Stamens* 6, adnate to mouth of corolla-tube, exserted; filaments filiform, declinate; anthers linear-oblong, the connective with a dorsal pit for the tip of the filament; dehiscence introrse. *Carpels* 3, connate in a subsessile, oblong, obtusely 3-cornered, 3-celled ovary; ovules in each cell numerous; style filiform, declinate; stigma small, capitate. *Fruit* a coriaceous, oblong or subglobose,

3-cornered, transversely rugose, shortly loculicidal, 3-valved capsule. *Seeds* usually few, ovoid, angular; testa black, shining, membranous; albumen fleshy; embryo cylindric.

2233. HEMEROCALLIS FULVA Linn.; F. B. I. vi. 326.

In gardens generally.

A showy herb, with paniculate scapes, 2–3 feet high.

Order CXXXVII. PONTEDERIACEÆ.

Marsh herbs or fresh-water aquatics, erect or floating. *Leafy* stems 1-foliate, springing from the buried rootstock or from the joints of the floating stem; basal leaf long-petioled, blade floating or upraised. *Flowers* hermaphrodite, slightly irregular, racemed or spicate, rarely fascicled or paniculate at the ends of 1-leafed stems or branches, sessile or rarely peduncled; bract under the inflorescence spathe-like; bracts under the flowers minute or obsolete. *Perianth* inferior, petaloid, marcescent, usually tubular; lobes 6, sub-2-seriate, similar, or the 3 inner smaller. *Stamens* 6 or 3, unequally adnate to perianth-tube or base of perianth-lobes, usually declinate, the upper shorter; filaments free; anthers oblong or rarely ovate, dorsally or basally adnate; cells 2, parallel, distinct; dehiscence introrse, longitudinal or porous. *Carpels* 3, connate in a superior, 3-celled ovary, placentas axial; or 1-celled, placentas parietal, each placenta with many 2-seriate ovules, sometimes only one in each cell fertile, anatropous, pendulous or suspended; style filiform or columnar; stigma terminal, entire or lobed. *Fruit* a dry, membranous, loculicidally 3-valved capsule, rarely indehiscent. *Seeds* ovoid or oblong, small; testa longitudinally ribbed; albumen floury or hard; embryo central, cylindric.

973. Monochoria Presl.

Aquatic herbs; rootstock short or long, creeping, clothed with leaf-sheaths; *leaves* radical and solitary at the top of the emerging stem or branches, radical long-petioled, cauline rather shorter-petioled, all cordate-ovate, sagittate or lanceolate. *Flowers* in a raceme, sessile within the axil of the cauline leaf, and fasciculately long-pedicelled, or peduncled and subspicately short-pedicelled; spathe complicate below the raceme. *Perianth* campanulate; tube 0; lobes 6, distinct, subequal. *Stamens* 6, adnate to base of

perianth-lobes or hypogynous, one usually largest, with its filament toothed on one side; anthers basifixed; dehiscence by a terminal, ultimately elongated slit. *Carpels* 3, connate in an ovoid, sessile, 3-celled ovary; ovules in each cell many; style filiform; stigma minutely 2-lobed. *Fruit* an oblong, membranous, loculicidal capsule. *Seeds* many, ovoid, obtuse, many-costate; embryo cylindric, in the centre of the floury albumen.

Rootstock elongated, creeping; leaves hastate, sagittate, or cordate; flowers long-pedicelled, subumbellate or racemose.....*hastæfolia.*
Rootstock short, suberect; flowers short-pedicelled, subspicate:—
Leaves ovate or ovate-cordate; flowers rather numerous.....*vaginalis.*
Leaves linear or narrowly ovate; flowers few
vaginalis var. *plantaginea.*

2234. MONOCHORIA HASTÆFOLIA Presl; F. B. I. vi. 362. *Pontederia hastata* F. I. ii. 121. *P. sagittata* F. I. ii. 124. *P. dilatata* F. I. ii. 123.
In all the provinces.
An aquatic herb.

2235. MONOCHORIA VAGINALIS Presl; F. B. I. vi. 363. *Pontederia vaginalis* F. I. ii. 121.
N. Bengal; E. Bengal.
An aquatic herb. *Beng.* Nukha.

2235/2. Var. PLANTAGINEA Solms-Laubach; F. B. I. vi. 363. *Pontederia plantaginea* F. I. ii. 123.
In all the provinces.
A small aquatic herb.

Order CXXXVIII. XYRIDEÆ.

Rigid, cæspitose herbs. *Leaves* radical, linear or subulate. *Flowers* hermaphrodite, somewhat irregular, sessile in the rigid, dark-brown, imbricating bracts of a terminal head or spike, on a simple, naked scape. *Perianth* inferior, 2-seriate. *Sepals* 2, lateral, small, like bracteoles, dorsal larger, embracing corolla, or absent, all caducous. *Petals* 3, connate in a slender, short or long tube; lobes 3, equal, spreading. *Stamens* 3 perfect, shorter than corolla-lobes, and attached near their bases; filaments short, filiform; anthers oblong, dorsally attached; cells 2, parallel or divergent below; dehiscence longitudinal; staminodes 3, alternate

with corolla-lobes, or 0. *Carpels* 3, connate in a 1-locular or imperfectly 3-locular ovary; placentas 3, each many-ovuled, basal and confluent, or parietal; ovules anatropous; style terminal, entire or with 3 stigmatic arms. *Fruit* a capsule, loculicidally 3-valved, or with a circumscissile top. *Seeds* many, linear; testa longitudinally striate; albumen floury; embryo minute.

974. Xyris Linn.

Characters those of the order.

Leaves flat, loriform, obtuse, 1–2 feet long ..... *indica.*
Leaves narrowly linear, acute, 3–8 in. long ..... *pauciflora.*

2236. Xyris indica Linn.; F. I. i. 179; F. B. I. vi. 364; E. D. x. 23.

Tirhut; N. Bengal; Orissa, Khurda.

A tufted, aquatic herb. *Vernac.* Dabi-duba, chiné-ghas.

2237. Xyris pauciflora Willd.; F. B. I. vi. 365.

In most of the provinces.

A small, tufted, aquatic herb.

Order CXXXIX. COMMELINACEÆ.

Herbs, prostrate or erect, rarely climbing, very rarely shrubby. *Leaves* costate, with sheathing bases; nerves parallel. *Flowers* more or less irregular, hermaphrodite or, by abortion, polygamous, often cymose; cymes scorpioid, straight, or reduced to one flower, sometimes paniculate, often enclosed in spathe-like bracts; floral bracts usually small, opposite the pedicels, or obsolete, sometimes herbaceous and distichously imbricate. *Perianth* inferior, 6-partite, 2-seriate; outer segments 3, herbaceous, often persistent, inner segments 3, petaloid, free or connate below in a tube, spreading above, marcescent. *Stamens* 6, adnate to base of perianth-segments, all perfect or 2 or more reduced to staminodes; filaments often bearded with jointed hairs; anthers oblong or globose, often dissimilar; dehiscence introrse longitudinal, or apical porous; cells sometimes discrete. *Carpels* 3, or sometimes 2, connate in a 3- or 2-celled, superior ovary; ovules solitary or few, orthotropous on the inner angles of the cells; style terminal; stigma small. *Fruit* a loculicidal capsule, or indehiscent, with a thin, fragile, or a succulent pericarp. *Seeds* angled; testa

smooth or rugose; albumen floury; embryo minute, remote from the hilum.

Stamens 3 perfect, with 1–3 staminodes :—
Cymes solitary, enclosed in spathaceous bracts .....**Commelina.**
Cymes paniculate, naked .....**Aneilema.**
Stamens 6 perfect :—
Petals united below in a tube; cymes scorpioid, axillary or terminal, with large, imbricating, 2-seriate, spathaceous bracteoles, rarely in exposed racemes or included axillary fascicles .....**Cyanotis.**
Petals free :—
Cymes capitate .....**Forrestia.**
Cymes secund, in terminal or axillary, thyrsoid panicles...**Floscopa.**

975. **Commelina** Linn.

Herbs, usually slender and creeping below; *leaves* ovate, lanceolate, or linear, with lax sheaths, petioled or not. *Flowers* in usually 2-fid cymes, emerging at one time from a terminal, complicate, or funnel-shaped or hooded spathe; flowers of the upper cyme-branch small, deciduous, of the lower fertile; fruiting pedicel and capsule retracted within the spathe. *Sepals* 3, membranous, the 2 inner often connate below. *Petals* 3, longer than sepals, one larger than the others and often clawed. *Stamens* 3 perfect, with 2–3 imperfect; anthers oblong, one usually larger than the others. *Carpels* 3, one sometimes abortive, connate in a 3-celled, rarely a 2-celled ovary; ovules of 2 cells 1 or 2, the third cell, if present, 1-ovuled or empty; style simple. *Fruit* a loculicidal capsule, the posterior cell sometimes indehiscent or obsolete, or the 2 anterior cells empty, indehiscent and connate as a ligulate body, from which the posterior cell falls away. *Seeds* elliptic or angular; testa reticulate, pitted or rugose.

*Anterior pair of cells of the ovary 2-ovuled; posterior cell 1-ovuled or obsolete :—[p. 1082]
†Capsule 3-celled, the two anterior cells loculicidally dehiscent, and each usually 2-seeded; the posterior cell keeled, 1-seeded, and deciduous, at length dehiscent :—[p. 1082]
‡Leaves lanceolate; spathes complicate, the margins free or connate only at the very base :—[p. 1082]
§Seeds reticulate, cylindric; branches of cyme 1–3-flowered; spathe sometimes cordate at base [p. 1082].....*nudiflora.*

§Seeds smooth, truncate at one end; spathe always rounded at base:—[p. 1081]

Branches of cyme equal, 1–2-flowered; seeds appendaged, globose at the unflattened end ..... *salicifolia.*

Branches of cyme unequal, upper 2–4-flowered, lower 1–2-flowered; seeds without appendages, subacute at the unflattened end ..... *Hasskarlii.*

‡Leaves elliptic-ovate, obtuse; spathe turbinate; capsule always 5-seeded; seeds rugose [p. 1081] ..... *bengalensis.*

†Capsule 1-celled, with 2 superposed seeds truncate and appendaged at both ends, or with 1 subglobose seed; leaves linear; spathes deeply cordate at the base [p. 1081] ..... *attenuata.*

*All the cells of the ovary 1-ovuled:—[p. 1081]

Capsule 3-celled, subequally 3-valved; seeds free in the cells, ellipsoid, compressed, lead-grey with often mottled edges; leaves lanceolate *obliqua.*

Capsule 2-celled, or if 3-celled (*C. appendiculata* sometimes) then only 2-valved, the dorsal cell being indehiscent and the seed being adnate to the cell:—

Leaves linear or narrowly lanceolate, nearly glabrous; capsule often with a smaller, indehiscent, dorsal cell; seeds oblong, smooth, blackish, appendaged at both ends ..... *appendiculata.*

Leaves large, widely lanceolate, subscabridly pubescent; capsule always 2-celled; seeds ellipsoid, rugose, straw-coloured, pubescent *suffruticosa.*

2238. COMMELINA NUDIFLORA Linn.; F. B. I. vi. 369; E. D. C. 1755. *C. cæspitosa* F. I. i. 174.

Throughout the western and northern provinces.

A creeping herb, rooting at the nodes.

2239. COMMELINA SALICIFOLIA Roxb.; F. I. i. 172; F. B. I. vi. 370; E. D. C. 1759.

In most of the provinces.

A diffuse, slender herb, with long internodes. *Hind.* Jalpipari; *Beng.* Pani-kanchira; *Santal.* Bir kana arak'.

2240. COMMELINA HASSKARLII Clarke; F. B. I. vi. 370.

In most of the provinces.

A much-branched herb.

2241. COMMELINA BENGHALENSIS Linn.; F. I. i. 171; F. B. I. vi. 370; E. D. C. 1748.

In all the provinces.

A creeping herb, rooting at the lower nodes. *Hind.* and *Beng.* Kanchira; *Santal.* Kana arak'.

2242. COMMELINA ATTENUATA Koenig; F. B. I. vi. 372.
Chota Nagpur; Behar.
A tufted herb, with much-branched, slender stems.

2243. COMMELINA OBLIQUA Ham.; F. B. I. vi. 372; E. D. C. 1756. *C. communis* F. I. i. 171.
In all the provinces.
A tall, branching herb; stems 2–3 feet high. *Vernac.* Jata-kanchira.

2244. COMMELINA APPENDICULATA Clarke; F. B. I. vi. 374.
N. Bengal; E. Bengal.
A diffusely branched herb, 1–3 feet high.

2245. COMMELINA SUFFRUTICOSA Bl.; F. B. I. vi. 374; E. D. C. 1761.
In most of the provinces.
A stout, branching herb. *Santal.* Daré orsa.

976. Aneilema R. Br.

Herbs with simple or branched stems, roots often tuberous; *leaves* usually alternate, sometimes all radical, occasionally clustered under the inflorescence. *Flowers* in axillary and terminal panicles; bracts not spathaceous; bracteoles small. *Sepals* 3, membranous, free. *Petals* 3, obovate, equal. *Stamens* 2 or 3; filaments naked or bearded; anthers oblong, one usually smaller or larger than the others; staminodes 2–4, rarely with minute anthers. *Carpels* connate in a sessile, 2–3-celled ovary; ovules in each cell solitary, two, or more. *Fruit* a loculicidal capsule. *Seeds* 1 or more in each cell, with a thick, hard, rugose or pitted testa.

*Cells of the ovary with 2 or more than 2 ovules, those of the capsule with 2 or more seeds:—[p. 1084]

†Seeds 1-seriate in each cell; flowers in terminal or subterminal panicles:—[p. 1084]

‡Cells of the ovary with 3 or more ovules, of the capsule 3–7-seeded:—[p. 1084]

Panicles terminating an erect, leafless scape with large, sheathing bracts; leaves all radical, narrowly ensiform; root tuberous; seeds 3–6 in each cell ..... *scapiflorum.*

Panicles terminating leafy stems:—

Root tuberous; tubers slender; stem stout, erect; leaves large, narrowly oblong or ensiform; panicles large; seeds 3–4 in each cell.....*lineolatum.*

Root fibrous; stems slender, decumbent; leaves small, oblong, sessile, auricled; panicles small, leafy below; seeds 3–7 in each cell .....*spiratum*

‡Cells of ovary with 2 ovules, of capsule 2-seeded; panicles subterminal, rarely axillary; leaves linear or lanceolate [p. 1083] *nudiflorum.*

†Seeds 2-seriate (16 or more) in each cell; pedicels axillary or terminal; stem stout, sparingly branched, creeping and rooting at the nodes, leafy; leaves linear-oblong [p. 1083] .....*Hamiltonianum.*

*Cells of the ovary 1-ovuled, those of the capsule 1-seeded; pedicels 1–3 in the axils of distant lanceolate bracts; stem decumbent, slender, rooting at lower nodes; leaves long, linear; root fibrous [p. 1083]...*vaginatum.*

2246. ANEILEMA SCAPIFLORUM Wight; F. B. I. vi. 375; E. D. A. 1122. *Commelina scapiflora* F. I. i. 175.

Tirhut; Chota Nagpur, Parasnath.

A tufted herb; leaves 4–10 in. long. *Hind.* Siyah-musli; *Beng.* Kureli.

2247. ANEILEMA LINEOLATUM Kunth; F. B. I. vi. 376. *Commelina herbacea* F. I. i. 175.

Chota Nagpur.

A stout, leafy herb.

2248. ANEILEMA SPIRATUM R. Br.; F. B. I. vi. 377. *Commelina nana* F. I. i. 173.

In all the provinces.

A common field weed.

2249. ANEILEMA NUDIFLORUM R. Br.; F. B. I. vi. 378. *Commelina nudiflora* F. I. i. 173.

Orissa; Chota Nagpur; Sundribuns, sea-face.

A slender, diffusely branched herb. *Beng.* Kanduli.

2250. ANEILEMA HAMILTONIANUM Wall.; F. B. I. vi. 380.

Chota Nagpur; Tirhut; N. Bengal.

A sparingly branched weed of wet places.

2251. ANEILEMA VAGINATUM R. Br.; F. B. I. vi. 381.

In most of the provinces.

A weed of wet places.

977. Cyanotis Don.

Herbs, prostrate or creeping; *leaves* small. *Flowers* in axillary and terminal scorpioid cymes, formed of large, imbricate, 2-seriate,

secund, foliaceous, falcate bracteoles, the petals and stamens alone exserted, rarely also the corolla-tube exserted; sometimes the flowers in exposed racemes or fascicled in the ochreate leaf-sheath. *Sepals* 3, subequal, free or connate below. *Petals* 3, subequal, with orbicular limb, often connate below in a tube. *Stamens* 6, all perfect, subequal, hypogynous or epipetalous; filaments usually bearded, often inflated towards apex; anthers oblong. *Carpels* 3, connate in a 3-celled ovary; ovules 2, collateral, one erect, the other pendulous in each cell. *Fruit* a 3-celled, loculicidal capsule. *Seeds* usually 2 in each cell, superposed, cubical or pyramidal, usually rugose.

Flowers in cymes, enclosed in 2-seriate, falcate, imbricating bracteoles:—
Roots fibrous; stem and branches slender; leaves ovate-oblong, glabrous or with spreading hairs .....*cristata.*
Roots tuberous; stem and branches stout; radical leaves ensiform, cauline lanceolate, hirsute .....*tuberosa* var. *adscendens.*
Flowers axillary, enclosed in the sheaths of the leaves; bracteoles small, slender, not imbricating .....*axillaris.*

2252. CYANOTIS CRISTATA Schult. f.; F. B. I. vi. 385. *Tradescantia imbricata* F. I. ii. 120.
Chota Nagpur.
A slender, branching herb.

2253. CYANOTIS TUBEROSA Schult. f. var. ADSCENDENS Clarke; F. B. I. vi. 386. *C. tuberosa* E. D. C. 2525. *Tradescantia tuberosa* F. I. ii. 119.
Chota Nagpur.
A creeping herb, with proliferous, rooting nodes. *Santal.* Merom chunchi, hodo jereng arak'.

2254. CYANOTIS AXILLARIS Roem. & Schult.; F. B. I. vi. 388; E. D. C. 2522. *Tradescantia axillaris* F. I. ii. 118.
In all the provinces.
A common field weed. *Hind.* Soltraj.

978. Forrestia Rich.

Erect herbs with simple stems, creeping or rooting below; *leaves* broad, with tubular sheaths, persisting after the fall of the blade. *Flowers* sessile, bracteate, in subsessile, crowded, capitate or globose fascicles of dense cymes. *Sepals* 3, subequal. *Petals*

3, subequal. *Stamens* 6, all perfect; filaments bearded; anthers ovoid. *Carpels* 3, connate in a 3-celled ovary; cells all 2-ovuled, or the lateral cells 2-ovuled, the dorsal 1-ovuled. *Fruit* a subglobose, oblong or ellipsoid, 3-valved, loculicidal capsule. *Seeds* solitary, or 2 superposed in each cell, oblong, rugose.

2255. FORRESTIA HOOKERI Hassk.; F. B. I. vi. 384.

Chittagong.

A stout, erect herb; stem unbranched, rooting near base.

979. Floscopa Lour.

Herbs with erect or subscandent stems; *leaves* lanceolate, medium or large. *Flowers* in terminal or axillary panicles of secund but not scorpioid cymes; bracts minute. *Sepals* 3, oblong, free. *Petals* 3, free, obovate. *Stamens* 6 all perfect, or 5 perfect 1 obsolete, hypogynous; filaments filiform, glabrous. *Carpels* connate in a 2-celled ovary; ovules solitary in each cell. *Fruit* a compressed or didymous, loculicidal, 2-celled capsule; pericarp crustaceous, shining. *Seeds* in each cell solitary, hemispheric.

2256. FLOSCOPA SCANDENS Lour.; F. B. I. vi. 390. *Tradescantia paniculata* F. I. ii. 119.

Chota Nagpur; N. Bengal, Duars; Chittagong.

An erect or subscandent herb.

Order CXL. FLAGELLARIEÆ.

Shrubs with long, usually climbing, leafy stems. *Leaves* many-nerved or plicate, usually long, with sheathing bases. *Flowers* small, regular, hermaphrodite or diœcious, in terminal panicles; bracts often lanceolate; bracteoles minute or 0. *Perianth* inferior, persistent; segments 6, free, small, imbricate, sub-2-seriate, dry or subpetaloid. *Stamens* 6, hypogynous; filaments free, filiform; anthers ovate or oblong, basifixed; cells 2, parallel; dehiscence longitudinal, introrse. *Carpels* 3, connate in a superior, 3-celled ovary; ovules in each cell solitary, anatropous, adnate to axis; style short, with 3 stigmatic arms, or styles 3, distinct, linear or depressed. *Fruit* a small berry or a drupe, with 1–3 pyrenes. *Seeds* laterally attached; testa membranous or thick; albumen floury; embryo lenticular.

980. **Flagellaria** Linn.

A climbing shrub, with long, slender stems; *leaves* many, lanceolate, with tendril-like tips; nerves many, parallel. *Flowers* many, small, hermaphrodite, fascicled or spicate along the branches of a terminal panicle; bracts small, scale-like. *Perianth* subpetaloid; segments 6, ovate, obtuse. *Stamens* 6, hypogynous. *Carpels* 3, connate in a 3-celled ovary; ovules solitary, laterally affixed; style divided nearly to the base into 3 subentire or 2-partite stigmatic arms. *Fruit* a small globose or ovoid drupe, with a thin, succulent exocarp, and a bony, 1–2-seeded endocarp. *Seed* globose or ovoid; testa adpressed, membranous.

2257. FLAGELLARIA INDICA Linn.; F. I. ii. 154; F. B. I. vi. 391.

Sundribuns; Chittagong.

A lofty reed-like climber, with cirrhose leaf-tips. *Hind.* Harcharal; *Beng.* Ban-chanda.

Order CXLI. JUNCACEÆ.

Erect, perennial, rarely annual herbs; stems tufted or with a creeping rootstock. *Leaves* flat, terete, or reduced to sheaths. *Flowers* hermaphrodite, regular, in axillary or terminal cymes, usually small; bracts small, scarious, green or white membranous, or brown coriaceous. *Perianth* inferior, persistent; segments or lobes 6, more or less 2-seriate, free or connate below in a very short tube, persistent, imbricate. *Stamens* usually 6, adnate to base of perianth-lobes or hypogynous, occasionally the 3 of the inner series absent; filaments filiform; anthers basifixed. *Carpels* 3, connate in a 3-celled or 1-celled superior ovary; ovules 3, basilar in 1-celled ovaries, numerous on inner angles of cells in 3-celled ovaries, anatropous. *Fruit* a 1–3-celled, loculicidally 3-valved capsule. *Seeds* erect; testa membranous, often produced at each end; albumen dense; embryo small, near hilum.

981. **Juncus** Linn.

Perennial, rarely annual, glabrous herbs; stems simple under the inflorescence; *leaves* radical or few near base of stem, linear or terete or reduced to sheaths. *Flowers* small, usually clustered in fascicles or 2-fid cymules, either sessile capitate, or unequally peduncled paniculate, the whole inflorescence terminal or subter-

minal on the scape-like stems, with 1–3 leafy bracts. *Perianth* with 6 glume-like segments, free, lanceolate or oblong, often with scarious edges, the 3 outer keeled or with a thickened midrib. *Stamens* 6, rarely 3, hypogynous or nearly so; anthers oblong or linear, erect; dehiscence longitudinal, introrse. *Carpels* 3, connate in a 1-celled, or an imperfectly or perfectly 3-celled ovary; ovules many on each placenta; style filiform; stigmatic arms 3, filiform, often spirally twisted. *Fruit* a capsule, dehiscing by 3 valves with mesial placentas, or rarely by 3 valves leaving the placentas persistent or connate in a central column. *Seeds* small, ovoid; testa striate, reticulate or transversely lineate; embryo small, near the base of the fleshy albumen.

Annual; leaves not septate; stems copiously branched; cymes scattered, few-flowered; lateral flowers 6-androus, terminal 3-androus *bufonius.*

Perennial; leaves indistinctly, distantly septate; cymes terminal; flowers densely clustered in small heads; flowers all 3-androus *prismatocarpus.*

2258. JUNCUS BUFONIUS Linn.; F. B. I. vi. 392.
N. Bengal; Tirhut.
A local weed, near ditches.

2259. JUNCUS PRISMATOCARPUS R. Br.; F. B. I. vi. 395.
N. and W. Bengal; Tirhut.
A common weed, in very wet places.

Order CXLII. PALMEÆ.

Shrubs, sometimes climbing, or trees, solitary or gregarious, naked or prickly; stems simple, rarely branched above. *Leaves* alternate, usually crowded at apex of stem, plicate in bud, pinnatisect or palmate, rarely entire or 2-pinnatisect; petiole sheathing. *Flowers* small, hermaphrodite or 1-sexual, usually 3-bracteolate, in branched spikes or panicles, enclosed in one or more large, sheathing spathes. *Perianth* inferior, 2-seriate; segments in each series 3, usually all free, imbricate or valvate. *Stamens* usually 6, 2-seriately inserted opposite the perianth-segments, sometimes 3, opposite outer series of segments, occasionally many at the base of the perianth, usually included; filaments free or connate, subulate or filiform, rarely flattened; anthers versatile, 2-locular;

dehiscence lateral or extrorse. *Carpels* 3, connate in a 3–1-celled ovary, or free; ovules in each carpel 1–2, anatropous, adnate to wall, base or top of cell; stigmas 3, usually sessile. *Fruit* a 1–3-celled drupe or hard berry, or of 1–3 ripe carpels; pericarp smooth, rough, or clothed with downward-imbricating, shining scales. *Seeds* erect or laterally attached, rarely pendulous; raphe usually branching all over the testa; albumen horny or bony, equable or ruminate; embryo small, in a cavity near the surface of the albumen.

Leaves flabelliform, fan-like or orbicular; inflorescence interfoliar; fruit not clothed with scales:—

Monocarpic palms, flowering once and then dying; flowers hermaphrodite, in pyramidal panicles; fruit small ..... **Corypha.**

Polycarpic palms, flowering year after year:—

Flowers hermaphrodite, scattered, small; fruits small:—

Ovary of 3 triangular carpels; spadix sparingly branched or simple ..... **Licuala.**

Ovary of 3 globose carpels; spadix loosely panicled ... **Livistona.**

Flowers diœcious; males small, sunk in cavities of thickened, catkin-like branches; female very large; fruit large, 8 in. across **Borassus.**

Leaves pinnate:—

*Fruit not clothed with scales; stems erect, unarmed; neither the leaf-rachis nor the spadix produced as an armed flagellum:—[p. 1090]

Leaves twice pinnatisect, the segments very obliquely dimidiate-flabelliform; spadix interfoliar but followed progressively downwards by alternately male and female infrafoliar spadices... **Caryota.**

Leaves completely or partially once pinnatisect:—

†Spadix interfoliar, flowering while the leaf in the axil of which it is formed is still green; leaves completely pinnatisect:—[p. 1090]

‡Segments of leaves with reduplicate sides:—[p. 1090]

Leaf-segments oblong, irregularly toothed; base cuneate, 1-costate; nerves flabellate; fruit small ..... **Wallichia.**

Leaf-segments linear; nerves parallel; fruit large:—

Dwarf palms with prostrate, branching, buried stock; spadix with male flowers on lateral, catkin-like branches; female in a globose, terminal head; fruit a spherical mass of hexagonal 1-celled and 1-seeded ripe carpels..... **Nipa.**

Tall palms with erect, unbranched stem; spadix with scattered female flowers alone or between two males near the bases and with close-set males towards the tips of the

minal on the scape-like stems, with 1–3 leafy bracts. *Perianth* with 6 glume-like segments, free, lanceolate or oblong, often with scarious edges, the 3 outer keeled or with a thickened midrib. *Stamens* 6, rarely 3, hypogynous or nearly so; anthers oblong or linear, erect; dehiscence longitudinal, introrse. *Carpels* 3, connate in a 1-celled, or an imperfectly or perfectly 3-celled ovary; ovules many on each placenta; style filiform; stigmatic arms 3, filiform, often spirally twisted. *Fruit* a capsule, dehiscing by 3 valves with mesial placentas, or rarely by 3 valves leaving the placentas persistent or connate in a central column. *Seeds* small, ovoid; testa striate, reticulate or transversely lineate; embryo small, near the base of the fleshy albumen.

Annual; leaves not septate; stems copiously branched; cymes scattered, few-flowered; lateral flowers 6-androus, terminal 3-androus *bufonius.*

Perennial; leaves indistinctly, distantly septate; cymes terminal; flowers densely clustered in small heads; flowers all 3-androus *prismatocarpus.*

2258. JUNCUS BUFONIUS Linn.; F. B. I. vi. 392.
N. Bengal; Tirhut.
A local weed, near ditches.

2259. JUNCUS PRISMATOCARPUS R. Br.; F. B. I. vi. 395.
N. and W. Bengal; Tirhut.
A common weed, in very wet places.

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dehiscence lateral or extrorse. *Carpels* 3, connate in a 3–1-celled ovary, or free; ovules in each carpel 1–2, anatropous, adnate to wall, base or top of cell; stigmas 3, usually sessile. *Fruit* a 1–3-celled drupe or hard berry, or of 1–3 ripe carpels; pericarp smooth, rough, or clothed with downward-imbricating, shining scales. *Seeds* erect or laterally attached, rarely pendulous; raphe usually branching all over the testa; albumen horny or bony, equable or ruminate; embryo small, in a cavity near the surface of the albumen.

Leaves flabelliform, fan-like or orbicular; inflorescence interfoliar; fruit not clothed with scales:—

Monocarpic palms, flowering once and then dying; flowers hermaphrodite, in pyramidal panicles; fruit small .....**Corypha.**

Polycarpic palms, flowering year after year:—

Flowers hermaphrodite, scattered, small; fruits small:—

Ovary of 3 triangular carpels; spadix sparingly branched or simple .....**Licuala.**

Ovary of 3 globose carpels; spadix loosely panicled ...**Livistona.**

Flowers dicœcious; males small, sunk in cavities of thickened, catkin-like branches; female very large; fruit large, 8 in. across **Borassus.**

Leaves pinnate:—

*Fruit not clothed with scales; stems erect, unarmed; neither the leaf-rachis nor the spadix produced as an armed flagellum:—[p. 1090]

Leaves twice pinnatisect, the segments very obliquely dimidiate-flabelliform; spadix interfoliar but followed progressively downwards by alternately male and female infrafoliar spadices...**Caryota.**

Leaves completely or partially once pinnatisect:—

†Spadix interfoliar, flowering while the leaf in the axil of which it is formed is still green; leaves completely pinnatisect:—[p. 1090]

‡Segments of leaves with reduplicate sides:—[p. 1090]

Leaf-segments oblong, irregularly toothed; base cuneate, 1-costate; nerves flabellate; fruit small .....**Wallichia.**

Leaf-segments linear; nerves parallel; fruit large:—

Dwarf palms with prostrate, branching, buried stock; spadix with male flowers on lateral, catkin-like branches; female in a globose, terminal head; fruit a spherical mass of hexagonal 1-celled and 1-seeded ripe carpels.....**Nipa.**

Tall palms with erect, unbranched stem; spadix with scattered female flowers alone or between two males near the bases and with close-set males towards the tips of the

branches; fruit a large, ovoid, terete or trigonous nut with a fibrous husk ..... **Cocos.**

‡Segments of leaves with induplicate sides [p. 1089] ... **Phœnix.**

†Spadix infrafoliar, flowering after the fall of the leaf in the axil of which it is formed; leaf-segments towards apex of leaf more or less confluent as a plaited limb :—[p. 1089]

Male flowers one on each side of a female along the branches of the spadix ..... **Pinanga.**

Male flowers minute, solitary or 2-nate towards tips of spadix-branches; female flowers larger, solitary ..... **Areca.**

*Fruit clothed with reflexed, shining, closely adpressed, imbricating scales; stems climbing, rarely erect, armed; leaf-rachis or spadix or sheath produced as an armed flagellum :—[p. 1089]

Spathes tubular, persistent ..... **Calamus.**

Spathes open, usually cymbiform, dehiscent ..... **Dæmonorops.**

982. Corypha Linn.

Tall, stout, unarmed palms, flowering after about forty years, and dying after once flowering and fruiting; *leaves* huge, orbicular or lunate, flabellately multifid; petiole spinous. *Flowers* small, hermaphrodite, on a very large, terminal, erect, pyramidally paniculate spadix; spathes many, tubular. *Sepals* connate in a cupular, 3-fid calyx. *Petals* 3, connate below in a stipe, ovate, acute, imbricate or subvalvate. *Stamens* 6; filaments subulate; anthers dorsifixed. *Carpels* 3, connate in a 3-lobed and 3-celled ovary; ovules basilar, erect in each cell; style short, subulate; stigma minute. *Fruit* of 1–3 globose, fleshy drupes, with basilar styles. *Seeds* erect, globose or oblong; albumen equable; embryo spiral.

Trunk distinctly spirally ridged, obscurely annulate; plaits of the leaf narrow; panicle obtusely pyramidal, only one-fifth or one-sixth the length of the stem ..... *elata.*

Trunk obscurely spirally ridged, distinctly annulate; plaits of the leaf broad; panicle sharply pyramidal, from one-fourth to one-third the length of the stem ..... *umbraculifera.*

2260. Corypha elata Roxb.; F. I. ii. 176; F. B. I. vi. 428.

Bengal generally, but only cultivated.

A tall, straight tree, 60–70 feet high. *Beng.* Bajur.

2261. Corypha umbraculifera Linn.; F. I. ii. 177; F. B. I.

vi. 428; E. D. C. 1995. *C. Talliera* F. I. ii. 174; F. B. I. vi. 428; E. D. C. 2006.

Bengal occasionally, and always cultivated.

A tall, straight tree, 60–80 feet high. *Beng.* Tali.

983. Licuala Thunb.

Low, rarely tall palms; stems annulate; *leaves* more or less orbicular or flabellate, plicate, deeply partite; petiole usually spinous. *Flowers* usually small, scattered, hermaphrodite, on interfoliar, simple or branched, glabrous, tomentose or scurfy spadices, sheathed by tubular, coriaceous, persistent spathes; bracts and bracteoles obscure or 0. *Sepals* 3, connate in a tubular or cupular calyx, with 3-fid mouth. *Petals* 3, connate below in a corolla with coriaceous, valvate lobes. *Stamens* 6; filaments subulate; anthers cordate. *Carpels* 3, truncate, free or nearly so; ovules in each carpel solitary, erect; styles simple, filiform. *Fruit* of small drupes, with terminal styles. *Seeds* erect, globose, free, often hollowed on the ventral face; albumen equable; embryo dorsal.

2262. Licuala peltata Roxb.; F. I. ii. 179; F. B. I. vi. 430; E. D. L. 343.

Chittagong.

A gregarious shrub; stems 8–15 feet high. *Beng.* Kurud, kurkuti.

984. Livistona R. Br.

Tall palms with annulate stems; *leaves* orbicular, flabellately plicate, split to the middle into slender, 2-fid, narrow lobes; petiole long, with spinous margins. *Flowers* minute, hermaphrodite, loosely panicled on interfoliar, long-peduncled spadices, erect in flower, pendulous in fruit; spathes many, sheathing, tubular. *Sepals* 3, rounded, imbricate. *Petals* connate in a coriaceous, 3-lobed corolla; lobes valvate. *Stamens* 6; filaments subulate, connate below in a ring; anthers cordate. *Carpels* 3, nearly free; ovules erect, basilar; styles short, free or connate. *Fruit* of 1 to 3 globose, oblong or ellipsoid drupes, with the style subterminal. *Seeds* erect, ventral face hollowed; albumen equable; embryo dorsal.

Divisions of the leaves very deeply 2-partite ..... *chinensis.*
Divisions of the leaves very shortly 2-toothed ..... *speciosa.*

2263. LIVISTONA CHINENSIS R. Br.; F. B. I. vi. 434.
Cultivated frequently.
A small tree, 20–30 feet high; native of China.

2264. LIVISTONA SPECIOSA Kurz; F. B. I. vi. 435; E. D. L. 500.
Chittagong.
A tall tree, 50–70 feet high. *Magh.* Thau.

985. Borassus Linn.

Tall palms; trunk stout, unarmed; *leaves* terminal, fan-shaped, plicately multifid; petiole spinous; ligule short. *Flowers* diœcious; peduncle sheathed with open spathes. ♂ *Flowers* small, mixed with scale-like bracts, 2-seriately secund on small spikelets, and protruding one by one from the cavities of the stout, cylindric branches of a very large, simply branched spadix, as the rachis of the spikelet elongates. *Perianth* glumaceous; segments imbricate, 2-seriate, outer 3 narrowly cuneate, tips inflexed, truncate, inner 3 shorter, obovate-spathulate. *Stamens* 6; anthers subsessile, oblong. *Pistillodes* 3, setaceous. ♀ *Flowers* globose, larger, few, solitary, scattered on the branches of a sparingly branched spadix. *Perianth* fleshy, greatly accrescent, 2-seriate; outer series 3, reniform, imbricate; inner 3 smaller, convolute. *Staminodes* 6–9. *Carpels* 3–4, connate in a globose, entire or 3–4-partite, 3–4-celled ovary; ovules erect, basilar; stigmas 3, sessile, recurved. *Fruit* a large, subglobose drupe, with 1–3 obcordate, fibrous pyrenes; pericarp thinly fleshy; stigmas terminal. *Seeds* oblong, with a 3-lobed apex; testa adnate to the pyrene; albumen hollow, equable; embryo subapical.

2265. BORASSUS FLABELLIFER Linn.; F. B. I. vi. 482. *B. flabelliformis* F. I. iii. 790; E. D. B. 663.
Cultivated in all the provinces except Chota Nagpur; often subspontaneous near villages.
A tree, 60–70 feet high. *Vernac.* Tal, tari.

986. Caryota Linn.

Tall palms, soboliferous or simple, flowering from the upper leaf-sheaths and then successively downwards, alternately male and androgynous; trunk naked or sheathed; *leaves* few, very large, twice pinnatisect; lobules very obliquely, dimidiately flabelliform or cuneiform, premorse or rounded at the tip, their bases swollen at the point of attachment. *Flowers* monœcious,

solitary and male, or ternate with the central female, on the slender, pendulous branches of interfoliar, short-peduncled, much fastigiately branched spadices; spathes 3–5, incomplete, tubular; bracteoles wide. ♂ *Flowers* symmetric. *Sepals* 3, rounded, imbricate. *Petals* 3, linear-oblong, valvate. *Stamens* numerous; filaments short; anthers long. ♀ *Flowers* subglobose. *Sepals* 3, rounded, imbricate. *Petals* 3, rounded, valvate. *Carpels* 3, connate in a 3-celled ovary; ovules erect; stigma sessile, 3-lobed. *Fruit* globose, 1–2-seeded; stigma terminal. *Seeds* erect; albumen ruminate; embryo dorsal.

Trunk solitary, or if with a few basal soboli these much smaller and shorter than the primary stem; spadix 8–10 feet long; pulp of fruit pungent ..... *urens.*

Trunk always accompanied by many or few basal soboli, almost or quite as large as the primary stem; spadix 4–5 feet long; pulp of fruit bland *mitis.*

2266. CARYOTA URENS Linn.; F. I. iii. 625; F. B. I. vi. 422; E. D. C. 711.

Generally planted, especially in the northern provinces; wild in Eastern Tirhut and N. Bengal.

A tree, 30–50 feet high. *Hind.* Mari; *Uriya* Salopa; *Beng.* Gol sago.

2267. CARYOTA MITIS Lour.; F. B. I. vi. 423.

Occasionally planted or self-sown, but chiefly in and near European centres; perhaps wild in Southern Chittagong.

A small tree, 15–25 feet high; native of Burma, Andamans, Malaya.

987. Wallichia Roxb.

Soboliferous palms; *leaves* pinnatisect, leaflets linear or oblong, irregularly toothed, base cuneate, 1-ribbed, secondary nerves flabellate. *Flowers* monœcious or polygamous, on interfoliar, much-branched spadices; spathes many, tubular, clothing the peduncle of the spadix, upper large, cymbiform. ♂ *Flowers* very dense, symmetric. *Sepals* 3, connate in a cylindric or cupular, membranous, truncate calyx. *Petals* 3, connate in a cylindric, deeply 3-lobed corolla; lobes oblong, valvate. *Stamens* 6, adnate to corolla-tube; filaments short; anthers large. *Pistillode* 0. ♀ *Flowers* smaller, more loosely disposed, subglobose. *Sepals* 3,

orbicular, coriaceous, imbricate. *Petals* 3, triangular, valvate. *Staminodes* few or 0. *Carpels* connate in a 2–3-celled, stipitate ovary; ovules subbasilar; stigmas conic. *Fruit* ovoid-oblong, 1–3-celled. *Seeds* 1–3, erect, plano-convex; albumen equable; embryo dorsal.

Female flowers crowded, 2-bracted; male corolla twice as long as the calyx, mouth of calyx quite entire; female corolla shorter than the ovary *densiflora.*

Female flowers distant, 3-bracted; male corolla half as long as the calyx, mouth of calyx 3-toothed; female corolla about twice as long as the ovary *caryotoides.*

2268. WALLICHIA DENSIFLORA Mart.; F. B. I. vi. 419; E. D. W. 5.
Chittagong.
A stemless or short-stemmed palm.

2269. WALLICHIA CARYOTOIDES Roxb.; F. B. I. vi. 419; E. D. W. 6. *Wrightia caryotoides* F. I. iii. 621.
Chittagong.
A stemless or short-stemmed palm.

988. Nipa Wurmb.

Dwarf, gregarious palms of tidal swamps; stock branched; *leaves* pinnatisect; segments lanceolate, plicate. *Flowers* monœcious, on terminal, branched, erect spadices; males on the lateral, catkin-like branches; females in a globose, terminal head, drooping in fruit; spathes numerous, sheathing. ♂ *Flowers* minute, mixed with setaceous bracteoles. *Sepals* 3, linear, glumaceous, with broad, truncate, inflexed tips. *Petals* 3, glumaceous, smaller. *Stamens* 3; filaments connate in a column; anthers basifixed, linear. *Pistillode* 0. ♀ *Flowers* much larger than males. *Perianth* of 6 similar, displaced segments. *Staminodes* 0. *Carpels* 3, their apices free, each with an oblique, stigmatic line; ovules 3, erect. *Fruit* a large, globose, agglomerate mass of many obovoid, hexagonal, 1-celled and 1-seeded ripe carpels with pyramidal tips and infra-apical stigmas; pericarp fleshy, mixed with fibres; endocarp spongy and farinaceous. *Seed* erect, grooved on one side; testa coriaceous, viscid within and adnate to the endocarp; hilum broad; albumen hollow, equable; embryo obconic, basilar.

2270. NIPA FRUTICANS Wurmb.; F. I. iii. 650; F. B. I. vi. 424; E. D. N. 163.

Sundribuns; Chittagong, coast.
A stemless palm, with branching rootstock. *Beng.* Golpati, gulga, gabua.

989. Cocos Linn.

Unarmed palms; *leaves* tufted, pinnatisect; segments linear. *Flowers* monœcious, on simply panicled, erect, but ultimately drooping spadices, the branches bearing scattered female flowers, often between two males, near their bases, with close-set males above; spathes 2 or more, the lower short, the upper fusiform or clavate; bracts various. ♂ *Flowers* unsymmetric; *perianth*-segments coriaceous, 2-seriate; outer series 3, small, valvate; inner 3 oblong, acute, valvate. *Stamens* 6; filaments subulate; anthers linear, erect. *Pistillode* minute or 0. ♀ *Flowers* usually much larger than males, ovoid; *perianth* greatly accrescent; outer 3 segments imbricate; inner 3, shorter, convolute, with imbricate tips. *Disk* 0 or annular. *Carpels* 3, connate in a 3-celled ovary; ovules usually solitary, subbasilar; style short; stigmas recurved. *Fruit* large, ovoid, terete or 3-gonous, with a terminal style and a single seed; pericarp thick, fibrous; endocarp hard, with 3 basal eyes, the remains of the 3 ovarian cells. *Seed* connate with endocarp; albumen solid or hollow or merely lining the endocarp with a thick, hard coat; embryo opposite one basal eye.

2271. Cocos NUCIFERA Linn.; F. I. iii. 614; F. B. I. vi. 482; E. D. C. 1520.
Cultivated.
A tree, 40–80 feet high. *Vernac.* Nariyal, narikel, dáb. The Coco-Nut.

990. Phœnix Linn.

Tall or short, simple or soboliferous palms; *leaves* pinnatisect; segments lanceolate or ensiform, with margins induplicate. *Flowers* diœcious, small, yellowish, coriaceous, on usually several branched, interfoliar, erect or drooping spadices; spathe basilar, complete, coriaceous. ♂ *Sepals* 3, connate in a cupular, 3-toothed calyx. *Petals* 3, obliquely ovate, valvate. *Stamens* 6; filaments short, subulate; anthers erect, dorsifixed. *Pistillode* minute or 0. ♀ *Sepals* 3, connate in a globose, accrescent calyx. *Petals* 3, rounded, imbricate. *Staminodes* 6, free or connate in a 6-toothed

cup. *Carpels* 3, free; ovules erect; stigmas sessile, uncinate. *Fruit* oblong, terete, 1-seeded, with a terminal stigma, a fleshy pericarp, and a membranous endocarp. *Seed* oblong, ventrally grooved; albumen equable or subruminate; embryo dorsal or subbasilar.

Stems solitary; embryo of the seed ventral; inland species :—
Stems elongated, clothed with persistent bases of leaf-stalks :—
Stems slender, 25–50 feet high; leaves 10–15 feet long; ripe fruits orange-yellow ..... *sylvestris.*
Stem very stout, 15–20 feet high; leaves 3–5 feet long; ripe fruits brown ..... *robusta.*
Stems very short or none ..... *acaulis.*
Stems soboliferous, 8–25 feet high; embryo of seed basilar; species confined to muddy maritime swamps ..... *paludosa.*

2272. PHŒNIX SYLVESTRIS Roxb.; F. I. iii. 787; F. B. I. vi. 425; E. D. P. 588.
Generally cultivated, sometimes subspontaneous.
A tall, graceful tree, when not cut for tapping. *Vernac.* Khajúr.

2273. PHŒNIX ROBUSTA Hook. f.; F. B. I. vi. 427.
Chota Nagpur, Parasnath.
A stout-stemmed, thick-set tree.

2274. PHŒNIX ACAULIS Buch.; F. I. iii. 783; F. B. I. vi. 426; E. D. P. 551.
Behar; Chota Nagpur, eastern edge of the plateau, very common.
A stemless, dwarf palm. *Hind.* Pind Khajúr.

2275. PHŒNIX PALUDOSA Roxb.; F. I. iii. 789; F. B. I. vi. 427; E. D. P. 582.
Sundribuns.
A gregarious, soboliferous palm. *Beng.* Hital.

991. Pinanga Bl.

Slender palms, with erect, annulate stems; *leaves* pinnatisect, with the upper segments confluent. *Flowers* monœcious, androgynous, ternate, a female between two males, the clusters in 2 or 4 or 6 series, on infrafoliar spadices; spathe solitary. ♂ *Flowers* obliquely 3-quetrous. *Sepals* 3, acute, keeled, not imbricate. *Petals* 3, ovate or lanceolate, valvate. *Stamens* 6 to many; anthers subsessile, basifixed, erect. ♀ *Flowers* much smaller

than males, ovoid or globose. *Sepals* 3, orbicular, imbricate. *Petals* 3, orbicular, wide-imbricate. *Carpels* connate in a 1-celled ovary; ovule basilar, erect; stigmas 3. *Fruit* ovoid or ellipsoid, with fibrous pericarp. *Seed* ovoid or ellipsoid; albumen ruminate; embryo basilar.

2276. PINANGA GRACILIS Bl.; F. B. I. vi. 407. *Areca gracilis* F. I. iii. 619; E. D. A. 330.

Chittagong.

A slender, graceful palm; stems 8–20 feet high. *Beng.* Gua supari.

992. Areca Linn.

Slender palms with erect, annulate stems; *leaves* pinnatisect, distal segments confluent. *Flowers* monœcious, on branched, infrafoliar spadices; spathes 3 or more, caducous, the lowest complete, the upper often bract-like; males many, solitary or 2-nate, distichous or secund; females near bases of branches, solitary. ♂ *Flowers* minute, compressed or 3-quetrous. *Sepals* 3, small. *Petals* 3, obliquely lanceolate, valvate. *Stamens* 3 or 6; anthers basifixed, erect. ♀ *Flowers* much larger than males; perianth accrescent. *Sepals* 3, orbicular, imbricate. *Petals* 3, orbicular, imbricate below, their tips acute, valvate. *Carpels* connate in a 1-celled ovary; ovule basal, erect; stigmas 3, sessile. *Fruit* ovoid or oblong, with stigmas terminal. *Seed* with a small, truncate base; albumen ruminate; embryo basilar.

Trunk solitary, tall, 40 feet or more in height; stamens 6; fruit ovoid ..... *Catechu.*

Trunk sending out basal offshoots, 25 feet or less in height; stamens 3; fruit ellipsoid ..... *triandra.*

2277. ARECA CATECHU Linn.; F. I. iii. 615; F. B. I. vi. 405; E. D. A. 1294.

Cultivated generally in the central and eastern parts.

A tall, slender, graceful tree. *Vernac.* Supari. The Betel Nut.

2278. ARECA TRIANDRA Roxb.; F. I. iii. 617; F. B. I. vi. 406.

Chittagong.

A graceful, tufted palm. *Beng.* Ban-gua.

993. Calamus Linn.

Armed, erect, or scandent, tufted palms; *leaves* alternate, pin-

natisect; segments acuminate; nerves parallel; rachis often produced as an armed flagellum; sheath armed, produced into a ligule or ochrea, with or without a lateral, armed flagellum. *Flowers* small, polygamo-dicœcious, in usually distichous, often scorpioid spikelets, solitary, either male or female or both in the axils of the bracteoles of axillary usually much elongated and much-branched spadices, sometimes produced as a flagellum; spathes tubular or open, persistent, sheathing the peduncle and branches of the spadix, and passing into bracts and bracteoles. ♂ *Sepals* 3, connate in a cupular, 3-toothed calyx. *Petals* 3, acute, coriaceous, valvate. *Stamens* 6; filaments short; anthers dorsifixed. ♀ *Flowers* slightly accrescent, fruiting pedicelliform or explanate. *Sepals* connate in a tubular, 3-toothed calyx. *Petals* 3, connate in a tubular, 3-fid corolla; lobes valvate. *Staminodes* connate in a cup. *Carpels* connate in an incompletely 3-celled ovary, clothed with retrorse scales; ovules basilar, erect; style short or long; stigmas 4. *Fruit* globose or ellipsoid; style terminal; pericarp thin, clothed with adpressed, deflexed, closely imbricate, shining scales. *Seed* subglobose or oblong, smooth or pitted; albumen equable or ruminate; embryo ventral or basal.

Stems erect, stout, tufted; leaflets almost equidistant, their margins and midrib beneath remotely ciliolate; petiole and rachis of leaf below armed with half-whorls of flat, straight, pale spines .....*erectus*.

Stems climbing, usually slender:—

*Rachis of leaf not flagelliferous; leaf-sheath flagelliferous:—[p. 1099]

Leaflets fascicled, or if discrete (*viminalis* var. *fasciculata* sometimes) not equidistant:—

Leaflets few, in opposite groups of 3–5 on each side of the slender rachis, 3–7-costate; costæ very slender, more or less setose above; short petiole and rachis armed with short, hooked spines...*gracilis*.

Leaflets numerous, inequidistant or fascicled, all 3-costate; costæ beneath and margins spinulose; petiole and rachis armed with scattered, long, straight spines.....*viminalis* var. *fasciculata*.

Leaflets discrete, equidistant, all 3-costate; all the costæ setose above, usually the median only below (in *C. Guruba* the leaflets sometimes quite naked on both surfaces):—

Leaflets very many, approximate; short petiole margined with straight spines; rachis with one row of short, recurved spines below.....*tenuis*.

Leaflets few, alternate; long, slender petiole and rachis armed

with long, brown, recurved and short conical spines below and on the margins ..... *Guruba.*

*Rachis of leaf flagelliferous; leaf-sheath not flagelliferous; leaflets few, large, scattered or 2-nate, elliptic or elliptic-lanceolate, 3–9-costate, tips setose, margins aculeolate; costæ naked on both sides; rachis stout, variously armed with scattered spines [p. 1098] *latifolius.*

2279. Calamus erectus Roxb.; F. I. iii. 774; F. B. I. vi. 438; E. D. C. 73.

Chittagong.

A densely tufted rattan; stems 12–18 feet high. *Beng.* Kadañ bent; *Magh.* Kadam kring.

2280. Calamus gracilis Roxb.; F. I. iii. 781; F. B. I. vi. 453; E. D. C. 81.

Chittagong.

A very slender climber; stems hardly thicker than a quill. *Beng.* Mapuri bent; *Magh.* Kraipang.

2281. Calamus viminalis Willd. var. fasciculata Becc.; F. B. I. vi. 444. *C. fasciculatus* F. I. iii. 779; E. D. C. 77.

In most of the provinces.

A scrambling or climbing rattan, with stoutish stems; common in village thickets. *Beng.* Bara bent.

2282. Calamus tenuis Roxb.; F. I. iii. 780; F. B. I. vi. 447; E. D. C. 114.

E. Bengal; Sundribuns.

A very slender climber; stems not much thicker than a quill. *Beng.* Sanchi bent, bandhari bent; *Magh.* Kring.

2283. Calamus Guruba Ham.; F. B. I. vi. 449; E. D. C. 83.

Chittagong.

A tall, slender, climbing rattan.

2284. Calamus latifolius Roxb.; F. I. iii. 775 F. B. I. vi. 455; E. D. C. 89.

Chittagong.

A large climber. *Beng.* Korak bent; *Magh.* Sain.

994. Dæmonorops Bl.

Armed, tufted, scandent palms; *leaves* alternate, pinnatisect; segments acuminate; nerves parallel; rachis produced as an armed flagellum; sheath armed. *Flowers* small, polygamous or diœcious, in usually distichous, often scorpioid spikelets, solitary,

either a male or a female, or both in axil of each bracteole of axillary usually much elongated, branched spadices, sometimes produced as a flagellum; spathes cymbiform, the outer at first enclosing the inner, soon deciduous. ♂ *Sepals* 3, connate in a cupular, 3-toothed calyx. *Petals* 3, acute, coriaceous, valvate. *Stamens* 6; filaments short; anthers dorsifixed. ♀ *Flowers* somewhat accrescent, distinctly pedicelliform. *Sepals* connate in a tubular, 3-toothed calyx. *Petals* 3, connate in a tubular, 3-fid corolla; lobes valvate. *Staminodes* connate, cupular. *Carpels* connate in an imperfectly 3-celled ovary, clothed with retrorse scales; ovules basilar, erect; style short or long; stigmas 3. *Fruit* globose or ellipsoid; style terminal; pericarp thin, clothed with adpressed, deflexed, closely imbricate, shining scales. *Seed* subglobose or oblong, smooth or pitted; albumen equable or ruminate; embryo ventral or basal.

2285. Dæmonorops Jenkinsianus Mart.; F. B. I. vi. 462. *Calamus Jenkinsianus* E. D. C. 88.

E. Bengal; Tippera; Chittagong.

A very stout-stemmed, climbing rattan.

Leaflets equidistant, all 3-costate; costæ above all very sparsely setose with long bristles, the central only below, margins setulose; petiole rachis and flagellum with many marginal and dorsal hooked spines or 3–5-fid claws.

Order CXLIII. PANDANEÆ.

Trees or shrubs, sometimes scandent, with stilted or climbing aerial roots. *Leaves* usually 3-farious, narrow, acuminate, coriaceous, with margins and keels usually spinously toothed. *Flowers* diœcious, small, crowded or catkin-like, simple or branched; axillary spadices clothed with leafy spathes; *perianth* 0; bracts and bracteoles 0. ♂ *Stamens* numerous; filaments free or connate; anthers erect, basifixed. *Pistillode* small or obsolete. ♀ *Staminodes* small or 0. *Carpels* solitary, free or connate in phalanges of 2 or more; ovules solitary and suberect or many and parietal; stigmas subsessile, papillose. *Fruit* a globose or oblong mass of free or connate, 1- or more-celled, woody or fleshy angular drupes. *Seeds* minute; testa striated; albumen hard and fleshy; embryo minute.

995. Pandanus Linn. f.

Characters those of the order.

Carpels not united in groups :—

Male flowers of free stamens with short filaments; a much-branched bush; leaves 4–6 feet long, marginal spinules usually distant, all strongly incurved; flowers fœtid .....*fœtidus.*

Male flowers of numerous anthers umbellate on the connate filaments :—

A tree; stem 30–40 feet high, 6 in. thick, erect, sparingly dichotomously branched above; leaves 15–20 feet long, marginal spinules large, the lower incurved; aerial roots few, basal .....*furcatus.*

A dwarf shrub; stem 2–3 feet long, ·5 in. thick, prostrate; leaves 1·5–2 feet long, marginal spinules small, distant.....*minor.*

Carpels connate in groups; male flowers of numerous stamens with connate filaments; flowers sweet-scented; a bush or small tree, much-branched from the base, with numerous aerial roots; leaves 3–5 feet long, marginal spinules small, ascending.....*fascicularis.*

2286. PANDANUS FŒTIDUS Roxb.; F. I. iii. 742; F. B. I. vi. 483.

C. Bengal; E. Bengal; in village thickets and hedges.

A bush, with no proper stem. A common hedge-plant. *Hind.* Keor-kanta; *Beng.* Keiya-kanta, kotki-kanta.

2287. PANDANUS FURCATUS Roxb.; F. I. iii. 744; F. B. I. vi. 484; E. D. P. 21.

Chittagong.

A tree, 30–40 feet high.

2288. PANDANUS MINOR Ham.; F. B. I. vi. 485.

Chittagong.

A dwarf shrub, 2–3 feet high.

2289. PANDANUS FASCICULARIS Lam.; F. B. I. vi. 485. *P. odoratissimus* F. I. iii. 738; E. D. P. 26.

In all the provinces; in village thickets and hedges; also near temples; Sundribuns, wild.

A stemless, much-branched bush, or a small tree with suberect stem, 10–12 feet high. *Hind.* Keora, gagandhul; *Beng.* Keiya, keori, kewa-kanta.

Order CXLIV. TYPHACEÆ.

Aquatic or palustrine, perennial herbs. *Leaves* linear, erect or floating, sheathing below; nerves parallel. *Flowers* small or

minute, monœcious or, by abortion, diœcious, densely crowded in globose or cylindric, 1-sexual, bracteate spikes, of which the upper are males; bracteoles 0. *Perianth* of membranous green scales or slender hairs. ♂ *Stamens* 1–7; filaments free or connate; anthers basifixed, erect, cuneate or linear-oblong; dehiscence longitudinal; connective sometimes produced. *Pistillode* 0. ♀ *Ovary* superior; 1–2-celled; cells 1-ovuled; ovules pendulous from apex; styles free, short or long, persistent, laterally papillosely stigmatic. *Fruit* small, membranous or drupaceous. *Seeds* pendulous; albumen fleshy or floury; embryo axial, cylindric, radical end thickened, plumule in a lateral slit.

996. Typha Linn.

Marsh herbs; *leaves* erect, spongy. *Flowers* small, in very dense, superposed, cylindric spikes, often intermixed with dilated-tipped hairs. *Perianth* of capillary hairs, or in the male flowers obsolete. *Stamens* 1 or more, tip of connective thickened. *Ovary* often reduced to a hair with clavate tip, long-stalked, narrowed into a capillary style, with a clavate or filiform stigma. *Fruit* very minute; pericarp membranous, indehiscent or follicular. *Seed* with striate testa; albumen floury.

Leaves trigonous above the sheath; pollen 4-globate .....*elephantina*.
Leaves semi-cylindric above the sheath; pollen simple .....*angustata*.

2290. Typha elephantina Roxb.; F. I. iii. 566; F. B. I. vi. 489.
N. Bengal; C. Bengal; E. Bengal.
A tall bulrush, 8–12 feet high. *Beng.* Hoglá.

2291. Typha angustata Chaub. & Bory; F. B. I. vi. 489. *T. angustifolia* F. I. iii. 567; E. D. T. 864.
In most of the provinces.
A tall bulrush, 6–10 feet high. *Hind.* Pater; *Beng.* Kam, hoglá.

Order CXLV. AROIDEÆ.

Herbs, usually glabrous, very rarely armed, with watery, acrid or milky juice, stemless or with a short stock or corm or tuber, or shrubs with sympodial branches, climbing by aerial roots. *Leaves* in shrubby species alternate, distichous or spiral; in herbaceous few clustered or solitary, radical, sometimes appearing without or after the flowers; petiole with sheathing base, lamina entire or

lobed or pinnate or perforate, often with cataphyllaries at base of leaf-sheaths. *Flowers* 1-sexual or hermaphrodite, sessile on a *spadix*, which is more or less completely enclosed in a green or coloured *spathe*, when 1-sexual rarely dicœcious, more often monœcious, with males towards apex and females at base of spadix, often with neuters between, and sometimes with neuters above the males. *Perianth* absent or of a few scales, rarely cupular or urceolate. *Stamens* in hermaphrodite flowers 4–8, in males 1 or more, distinct or confluent; anthers 2–4-celled, free, or (in confluent stamens) connate by means of the thickened connective; cells discrete or contiguous, free or buried in the connective and opening by a terminal pore, or dorsally attached and opening by a terminal pore, rarely by a longitudinal chink; pollen globose or ellipsoid, powdery or conglomerate. *Carpels* connate in a sessile, 1–3-celled ovary; ovules in each cell one or more, basilar, apical, axial, or parietal; style short or long; stigma discoid or lobed. *Fruit* of many small, free or connate berries or drupes, adnate to the spadix. *Seeds* in each drupe or berry 1 or few, small or large, rarely many, usually embedded in a mucilaginous pulp; albumen usually copious, fleshy, rarely hard, sometimes scanty or 0; embryo axial, or if albumen absent thick, with the plumule in a lateral slit.

*Flowers 1-sexual, monœcious, rarely (*Arisæma* often) dicœcious:—[p. 1104]

Water or marsh plants; leaves entire; barren appendage none; ovules orthotropous:—

Floating, stemless, aquatic herbs; leaves sessile, obovate-cuneate, in a rosette-like tuft; base stoloniferous ..... **Pistia.**

Submerged aquatic or palustrine herbs; leaves tufted from a buried, creeping rootstock ..... **Cryptocoryne.**

Terrestrial herbs:—

†Leaves and scapes rising directly from a tuber-like, hypogeal corm, the leaves usually more or less lobed, sect or partite; if leaves entire (*Typhonium* sometimes) not peltate; connective narrower than anther-cells:—[p. 1104]

‡Spadix with a barren terminal appendage:—[p. 1104]

Male flowers stipitate; flowers often dicœcious; leaves 3-partite or pedatisect or segments whorled; ovules orthotropous **Arisæma.**

Male flowers sessile or nearly so; flowers always monœcious:—

Flowers and leaves present together; leaves undivided or more or less 3-lobed or pedati-partite; males and females remote; neuters present above the females and sometimes below the males; ovules orthotropous .....**Typhonium.**

Flowers appearing without the leaves :—

Males and females remote; neuters present above the females; leaves pedatipartite; edges of spathe connate below; ovules orthotropous .....**Sauromatum.**

Males and females contiguous or nearly so; neuters wanting; leaves 3-sect; segments pinnatifid; edges of spathe free; ovules anatropous .....**Amorphophallus.**

‡Spadix without a barren appendage; males and females separated by a belt of fusiform, pearly-white neuters; flowers appearing without the leaves; leaves 3-sect; segments pinnatifid; ovules anatropous [p. 1103].....**Plesmonium.**

†Leaves and scapes rising from a short caudex, prolonging a hypogæal rhizome, or if rising direct from a tuber-like, hypogæal corm, the leaves peltate and undivided; connective wider than anther-cells; flowers and leaves present together :—[p. 1103]

Leaves peltate :—

Spadix with a barren appendage, not adnate at its base to the spathe :—

Ovules few, basal.....**Alocasia.**

Ovules many, parietal .....**Colocasia.**

Spadix without an appendage; ovules many, parietal :—

Spadix quite free from the spathe.....**Remusatia.**

Spadix at base and female inflorescence partially adnate to the spathe .....**Steudnera.**

Leaves not peltate; spadix without an appendage ...**Aglaonema.**

*Flowers hermaphrodite, rarely a few 1-sexual; spadix without an appendage :—[p. 1103]

Perianth wanting; epiphytic, climbing herbs :—

Berries free; ovules solitary, basal .....**Scindapsus.**

Berries confluent; ovules many, parietal .....**Rhaphidophora.**

Perianth of 4–6 segments present; ovules solitary in each cell :—

Spadix flowering upwards; ovary 3-celled; ovule from inner angle of each cell; epiphytic climbers, unarmed.....**Pothos.**

Spadix flowering downwards; ovary 1-celled; ovule pendulous from apex of cell; rigid, prickly, terrestrial or palustrine herbs ...**Lasia.**

997. **Pistia** Linn.

Aquatic, floating, gregarious, stemless, stoloniferous herbs,

leaves sessile, obovate-cuneate, together forming an erect cup. *Spathe* small, shortly stalked, tubular below, open above; *spadix* adnate to the back of the tube of spathe, free above. ♂ *Inflorescence* of a few sessile, connate stamens below the apex of the spadix; cells opening by vertical slits. *Neuters* minute, connate in a ring below the males. ♀ *Inflorescence* a solitary, ovoid-conic, 1-celled *ovary;* ovules numerous, basal or subparietal, orthotropous; style conic; stigma discoid. *Fruit* membranous, few-seeded. *Seeds* oblong or obovoid; testa ultimately rugose; albumen copious, floury; embryo minute, apical, cuneiform.

2292. PISTIA STRATIOTES Linn.; F. I. iii. 131; F. B. I. vi. 497; E. D. P. 874.

In all the provinces; in ponds.

A floating, stemless, stoloniferous herb. *Hind.* Jalkhumbi; *Beng.* Tákápáná; *Uriya* Baujhaughé.

998. Cryptocoryne Fisch.

Aquatic or marsh herbs; stem short or 0 or a creeping root-stock; *leaves* narrow or broad. *Spathe* tubular, with margins connate and a transverse septum within below. *Spadix* very slender, its tip adnate to septum of spathe. ♂ *Inflorescence* cylindric. *Stamens* 1–2, distinct; anthers short, sessile, truncate, cells 2, with conical, perforate tips; pollen vermiform. ♀ *Inflorescence* a single whorl of connate, 1-celled, many-ovuled *ovaries*, with a few neuters; ovules erect, orthotropous; styles short, recurved. *Fruit* a fleshy syncarp of connate, coriaceous, 2-valved, many-seeded carpels, the valves stellately spreading. *Seeds* oblong; testa rugose; albumen copious; embryo axial; plumule sometimes germinating in the fruit.

Tube of the spathe narrow, longer than the limb:—
Limb of spathe densely fimbriate, not twisted.....*ciliata.*
Limb of spathe glabrous and tube both closely twisted ...*retrospiralis.*
Tube of spathe shorter than the strongly twisted, internally transversely lamellate limb .....*spiralis.*

2293. CRYPTOCORYNE CILIATA Fisch.; F. B. I. vi. 492. *Ambrosinia ciliata* F. I. iii. 491.

C. and E. Bengal, in muddy creeks and ditches.

A tuberous, stoloniferous, usually submerged herb. *Beng.* Kerali.

2294. Cryptocoryne retrospiralis Kunth; F. B. I. vi. 493. *Ambrosinia retrospiralis* F. I. iii. 492.

In most of the provinces.

A narrow-leaved, usually submerged herb.

2295. Cryptocoryne spiralis Fisch.; F. B. I. vi. 494. *Ambrosinia spiralis* F. I. iii. 492.

In all the provinces.

A small, grass-like herb, on the edges of ponds and ditches, submerged during the rains only.

999. Arisæma Mart.

Tuberous herbs, with leaves and flowers contemporaneous; *leaves* 1–3, trisect or pedate or verticillately 5- or more-sect. *Flowers* 1-sexual, diœcious, rarely monœcious. *Spathe* deciduous, tube convolute; limb often acuminate or tailed, usually incurved; *spadix* included or exserted, always with a barren appendage, which is often long and filiform. ♂ *Flowers* numerous, stipitate; *anthers* 2–5, oblong or subglobose; cells distinct or confluent; dehiscence by pores or chinks. ♀ *Flowers* densely crowded; *ovary* ovoid, oblong, or subglobose, 1-celled; ovules 2 or more, basilar, orthotropous; style short or 0; stigma discoid. *Neuters* 0, or few subulate, above the males or the females or on the appendage. *Fruits* of 1- or few-seeded berries. *Seeds* ovoid or globose; testa rather thick; albumen copious; embryo axial.

2296. Arisæma tortuosum Schott; F. B. I. vi. 502; E. D. A. 1381. *Arum curvatum* F. I. iii. 506.

Chota Nagpur, Parasnath.

A 2–3-foliate herb; leaves pedatisect.

1000. Typhonium Schott.

Tuberous herbs; *leaves* entire, 3–5-lobed or pedatisect. *Flowers* monœcious; tube of *spathe* short, convolute, with a constricted mouth, persistent; limb ovate-oblong, lanceolate or linear, deciduous; *spadix* exserted, with a long, smooth, barren appendage; male and female inflorescences remote, with neuters above the females, and sometimes also below the males. ♂ *Stamens* 1–3; anthers subsessile; cells contiguous, opening by pores or chinks; pollen globose. ♀ *Carpels* forming an ovoid or oblong-ovoid, 1-celled ovary; placenta basilar; ovules 1–2, erect; stigma sessile. *Fruit* of ovoid, 1–2-seeded berries. *Seeds* globose; albumen copious; embryo axial.

Leaves pedately 5–7-sect or -partite; petioles green; limb of spathe broadly ovate, much refracted at base, not twisted at lip; appendage cylindric, white, not longer than limb of spathe .....*Listeri.*

Leaves cordate or hastate, entire, 3-lobed or sub-3-partite:—

Neuters above the females long, filiform, curved; leaves broader than long; petioles green; appendage cylindric, expanded at the base, not longer than limb of spathe; limb of spathe acute, not twisted at the tip nor refracted at the base:—

Leaves hastately 3-lobed or sub-3-partite, rarely (in young plants) almost entire; limb of spathe broadly ovate, dark red-purple, rarely pale-pink within; neuters numerous, closely matted and interlaced:—

Appendage bright red; neuters pink .....*trilobatum.*

Appendage pure white; neuters greenish .....*Schottii.*

Leaves cordate, entire; limb of spathe narrow ovate, green with brown streaks and spots within; neuters very few, often 2-fid, greenish-white with pink tips; appendage pale red .....*inopinatum.*

Neuters above the females short and stout; appendage longer than limb of spathe:—

Neuters many, close set, deflexed, imbricate, acute, yellow; leaves broader than long, hastately 3-lobed or sub-3-partite; petioles mottled with purple; limb of spathe broadly ovate, red-purple within, refracted at base and twisted at tip; appendage stipitate, truncate at base, very slender, cylindric, dark purple, much exceeding limb of spathe.....*Roxburghii.*

Neuters few, scattered, horizontal, those above females cochleate with concavity downwards, pink, obtuse, those below males subulate; leaves longer than broad, sagittate, hastate, cordate, ovate-oblong or lanceolate; petiole green; limb of spathe narrowly lanceolate, with long, slender tail; appendage not stipitate, conical, lobate at base, rather stout, angular and fluted, greenish-yellow, slightly exceeding limb of spathe .....*cuspidatum.*

2297. TYPHONIUM LISTERI Prain.

Chittagong.

A tuberous herb.

2298. TYPHONIUM TRILOBATUM Schott; F. B. I. vi. 509; E. D. T. 883. *Arum orixense* F. I. iii. 503.

Orissa; Chota Nagpur; C. Bengal; E. Bengal; Chittagong.

A tuberous herb, common among grass in thickets.

Beng. Ghet-kachhu, ghekul.

2299. TYPHONIUM SCHOTTII Prain.

C. Bengal, with the preceding, of which it may prove to be a variety.

A tuberous herb, local, but plentiful where it occurs.

2300. TYPHONIUM INOPINATUM Prain.

C. Bengal, introduced.

A tuberous herb; a native, as now appears, of Upper Burma.

Plentiful and rapidly spreading in thickets in and about the Royal Botanic Gardens. This was never in cultivation; how it may have been introduced is unknown, but the introduction would seem to have been recent.

2301. TYPHONIUM ROXBURGHII Schott. *T. Mottleyanum* F. B. I. vi. 510. *Arum trilobatum* F. I. iii. 505.

C. Bengal, introduced.

A tuberous herb; native of Malaya.

Accidentally introduced into the Royal Botanic Gardens a century ago, where it occurs along with the three preceding species, but more locally and rarely than they. Unlike the others, this seems not yet to have spread beyond the limits of these gardens.

2302. TYPHONIUM CUSPIDATUM Bl.; F. B. I. vi. 511. *Arum flagelliforme* F. I. iii. 502.

C. Bengal; E. Bengal, in open, grassy places.

A tuberous herb.

More widely spread but at the same time less plentiful than any of the four preceding species.

1001. Sauromatum Schott.

Tuberous herbs; flowers preceding the leaves; *leaf* solitary, pedatipartite, long-petioled. *Flowers* monœcious; *spathe* shortly peduncled, its tube cylindric, short, the margins connate below; limb very long, narrow, open, reflexed; *spadix* sessile, very long, with a slender, barren appendage as long as the spathe; male and female inflorescences short, widely distant, dense-flowered, with a few large, clavate neuters close above the females. ♂ *Anthers* sessile, subcompressed, 4-lobed; cells contiguous, opposite, obovate-oblong, opening by terminal pores; connective at length prominent. ♀ *Ovary* oblong, 1-celled, rounded at the apex; ovules 1–2, erect, basal; style very short or 0. *Fruit* of obpyra-

midal, 1-seeded, substipitate berries. *Seed* globose or somewhat convex, with an obconic strophiole; albumen copious; embryo axial.

2303. SAUROMATUM GUTTATUM Schott; F. B. I. vi. 502; E. D. S. 902. *Arum sessiliflorum* F. I. iii. 507.
Chota Nagpur; Tirhut.
A herb, with large, globose tuber.

1002. Amorphophallus Bl.

Tuberous herbs; *leaves* (not appearing on tubers that are in flower) solitary, 3-partite; segments pinnatisect. *Flowers* monœcious; *spathe* with an open or convolute, funnel-shaped or campanulate limb; *spadix* exserted or included; appendage large, short or long; inflorescence cylindric, dense-flowered; males and females contiguous; neuters 0. ♂ *Stamens* 2–4; anthers sessile; cells oblong; pores apical. ♀ *Ovaries* globose, 1–4-celled; ovules in each cell solitary, subbasal, anatropous; style short or long; stigma entire or 2–4-lobed. *Fruit* of clustered, subglobose, or obovoid berries. *Seeds* without albumen; embryo macropodous.

Leaf not bulbiferous; segments green-edged; petiole warted; spathe within more or less purple, campanulate; appendage dark purple, large, sinuously lobed; style much longer than the ovary:—
Appendage irregularly amorphous.....*campanulatus.*
Appendage subregularly pyramidal.....*campanulatus* var. *Blumei.*
Leaf bulbiferous; segments purple-edged; petiole smooth; spathe within rose-pink, wide-turgid; appendage rose-pink, smooth or slightly warted, narrowly conoid; style none.....*bulbifer.*

2304. AMORPHOPHALLUS CAMPANULATUS Bl.; F. B. I. vi. 513; E. D. A. 996. *Arum campanulatum* F. I. iii. 509.
In all the provinces, both wild and cultivated.
A herb with large, globose, usually much-warted tubers
The Ól of native cultivators.

2304/2. Var. BLUMEI Prain. *A. Rex* F. B. I. vi. 514 partly.
In many of the provinces, cultivated only.
A herb with large, depressed, globose, hardly warted tubers. The Bombay Ól of native cultivators.

The description of *A. Rex* in the F. B. I. is of this plant, which is probably hardly entitled to specific rank. The Andaman plant referred to in the F. B. I. as *A. Rex* is the true *A. Rex*, it has a

green spathe pale yellow within and a pale brown appendage; its petiole is not warted.

2305. AMORPHOPHALLUS BULBIFER Bl.; F. B. I. vi. 515; E. D. A. 995. *Arum bulbiferum* F. I. iii. 510.
Chota Nagpur; N. Bengal, Duars; C. Bengal; E. Bengal.
A herb, with depressed, globose tuber. *Beng.* Amla-bela.

1003. Plesmonium Schott.

Tuberous herbs; *leaves* (not appearing on tubers that are in flower) solitary, 3-partite; segments pinnatisect. *Flowers* monœcious; *spathe* with an open, funnel-shaped limb; *spadix* included; appendage 0 or very small; *inflorescence* cylindric, rather lax-flowered; males and females distant, with large, obovoid, pearl-like or turbinate neuters interposed, and, when a short appendage exists, with small, slender neuters scattered over it. ♂ *Stamens* 2–4; anthers sessile; cells oblong; pores apical confluent. ♀ *Ovaries* globose, 1–3-celled; ovules in each cell solitary, sub-basilar, anatropous; style short; stigma 2–3-lobed. *Fruit* of clustered, red, ovoid berries. *Seeds* without albumen; embryo macropodous.

2306. PLESMONIUM MARGARITIFERUM Schott; F. B. I. vi. 518. *Arum margaritifer* F. I. iii. 512.
Chota Nagpur; C. Bengal; E. Bengal.
A herb; tubers very white, usually warted.

1004. Alocasia Schott.

Herbs, usually tall and coarse; rootstock tuberous or forming a short, stout, suberect or erect caudex; flowers and leaves coetaneous; *leaves* with stout petioles, sheathing below; lamina ovate-cordate, often distinctly peltate. *Flowers* monœcious; *spathe* on a stout, axillary peduncle, its tube thick, more or less fleshy, accrescent, persistent, the mouth constricted; limb erect, deciduous; *spadix* shorter than the spathe, stout or slender; male and female inflorescences with usually interposed, flat neuters; appendage cylindric or subulate. ♂ *Stamens* 3–8, connate in an obpyramidal column, with angular, flattened apex; anthers linear-oblong; dehiscence apical, porous. ♀ *Ovary* ovoid or oblong, 1-locular or partially 3–4-locular above; ovules few, orthotropous, erect, basilar; style long, short, or 0; stigma

cushion-like, 3–6-lobed. *Fruit* of clustered, obovoid or ellipsoid, few-seeded berries, included in the persistent tube of the spathe. *Seeds* subglobose; funicle short; testa thick, smooth; albumen copious; embryo axial.

Leaves not or very slightly peltate :—
Leaves ovate-cordate; lower nerves approximate, subpalmate ..... *cucullata.*
Leaves sagittate-cordate; nerves pinnate ..... *indica.*
Leaves distinctly peltate, the basal lobes connate; nerves pinnate :—
Basal lobes of leaves united for less than half their length :—
Leaves broadly ovate; basal lobes rounded, connate for only one-tenth their length ..... *macrorrhiza.*
Leaves ovate-lanceolate; basal lobes acute or obtuse but not rounded, connate for one-third to one-fourth their length..... *fornicata.*
Basal lobes of leaves connate for three-fourths their length; leaves elongate-rhomboid, caudate-acuminate, contracted opposite the basal lobes ..... *acuminata.*

2307. ALOCASIA CUCULLATA Schott; F. B. I. vi. 525; E. D. A. 807. *Arum cucullatum* F. I. iii. 501.
E. Bengal, cultivated; Tippera.
A stout herb; stock suberect, 1–2 feet, with many soboli.

2308. ALOCASIA INDICA Schott; F. B. I. vi. 525; E. D. A. 809. *Arum indicum* F. I. iii. 498.
In all the provinces, cultivated.
A stout herb; stock suberect, large, 3–8 feet long, 3–8 in. thick, with few soboli. *Hind.* Man kandu; *Beng.* Man kachhu.

2309. ALOCASIA MACRORRHIZA Schott; F. B. I. vi. 526. *A. odora* E. D. A. 813. *Arum odorum* F. I. iii. 499.
In all the provinces, cultivated.
A very stout herb; stock suberect, very large, 6–16 feet long, 6–16 in. thick.

2310. ALOCASIA FORNICATA Schott; F. B. I. vi. 526; E. D. A. 808. *Arum fornicatum* F. I. iii. 501.
In all the provinces.
A stout herb; stock suberect, 1–3 feet.

2311. ALOCASIA ACUMINATA Schott; F. B. I. vi. 527.
Chittagong.
A stout herb; stock horizontal.

1005. Colocasia Linn.

Herbs, usually tall and coarse, sometimes small and handsome, with tuberous rhizomes or a short, stout caudex; leaves and flowers appearing simultaneously; *leaves* with stout petioles, sheathing below; lamina peltate, ovate-cordate. *Flowers* monœcious; *spathe* on a stout axillary peduncle; tube thick, accrescent, persistent, with constricted mouth; limb erect, deciduous; *spadix* shorter than the spathe, stout or slender; male and female inflorescence with usually interposed, flat neuters; appendage cylindric or subulate. ♂ *Stamens* 3–8, connate in an obpyramidal column, with angular, flattened apex; anthers linear-oblong; dehiscence apical, porous. ♀ *Ovary* ovoid, 1-celled; ovules many, on usually 3 parietal placentas, orthotropous; stigma sessile, discoid. *Fruit* of small obconic or oblong berries. *Seeds* oblong, sulcate; albumen copious; embryo axial.

Leaves with a bronze margin; spathe dark yellow .....*nymphæifolium.*
Leaves not bronze-margined; spathe pale yellow .....*Antiquorum.*

2312. Colocasia nymphæifolia Kunth. *C. Antiquorum* F. B. I vi. 523 partly. *Arum nymphæifolium* F. I. iii. 495.
In all the provinces, wild.
A stout herb. *Beng.* Sar-kachhu.

2313. Colocasia Antiquorum Schott; F. B. I. vi. 523 partly; E. D. C. 1731. *Arum Colocasia* F. I. iii. 494.
In all the provinces, both wild and cultivated.
A stout herb. *Beng.* Kachhu.

1006. Remusatia Schott.

Herbs with tuberous rhizomes, emitting long, radical, slender shoots, clothed with small bulbils; flowers preceding the solitary *leaf*, with rather short petiole and entire, peltate lamina. *Flowers* monœcious; *spathe* coriaceous, short-stalked; tube convolute, ovoid, accrescent over the fruit; limb broad or narrow, erect or spreading and reflexed, deciduous; *spadix* very short, sessile; male and female inflorescence with interposed neuters; appendage 0. ♂ with neuters forming a clavate mass of densely packed, angular, flat-topped florets, the individual *stamens* with a fleshy connective bearing 2–3 small anther-cells, opening by terminal slits. ♀ florets forming a short, cylindric inflorescence; *ovary*

ovoid, 1-celled ; placentas parietal, each with many orthotropous ovules ; stigma sessile, discoid. *Fruit* of small, clustered berries. *Seeds* small ; albumen copious ; embryo axial.

2314. Remusatia vivipara Schott ; F. B. I. vi. 521. *Arum viviparum* F. I. iii. 496.

Chota Nagpur, Parasnath.

A tuberous herb, with numerous bulbiliferous shoots.

1007. Steudnera C. Koch.

Herbs with a short caudex, often clothed with fibrous remains of old sheaths ; *leaves* long-petioled, ovate, peltate. *Flowers* monœcious ; *spathes* on axillary peduncles, shortly convolute at the base ; limb ovate-lanceolate, expanded, reflexed, marcescent or deciduous ; *spadix* very short, dense-flowered ; male inflorescence capitate or clavate, rarely conical, female usually adnate below to the spathe ; appendage 0. ♂ *Stamens* 3–6, connate in a peltate body with a flat, crenulate crown ; anther-cells globose ; dehiscence porous, apical. ♀ *Ovaries* often mixed with clavate staminodia, subglobose, 1-celled ; stigma 4–5-lobed ; placentas parietal ; ovules many, orthotropous. *Fruit* of small clustered berries. *Seeds* albuminous ; embryo axial.

2315. Steudnera virosa Prain. *S. colocasioides* F. B. I. vi. 520. *Colocasia virosa* F. B. I. vi. 524 ; E. D. C. 1738. *Calla virosa* F. I. iii. 517.

Chittagong.

A stout herb, with a distinct stock. *Beng.* Bish kachhu.

1008. Aglaonema Schott.

Herbs with an erect or prostrate stock ; *leaves* ovate or oblong ; petiole sheathing at base ; lamina ovate, oblong, or subdeltoid, not peltate. *Flowers* monœcious ; *spathe* subtubular to cymbiform ; *spadix* stipitate, equalling or shorter than the spathe ; male and female inflorescence usually contiguous, with rarely neuters interposed ; appendage 0. ♂ *Stamens* 2–4, distinct, subclavate ; anthers short ; cells remote, with apical pores. ♀ *Ovaries* few, 1- or rarely 2-celled ; ovules solitary, subbasilar, anatropous in each cell ; stigma small or large, discoid or cupular. *Fruit* of few capitate berries. *Seeds* solitary ; albumen 0.

*Nerves of leaf numerous, close, parallel, all uniform, very slender ; stem scandent [p. 1114] ..... *Clarkei.*

*Nerves unequal, primary much stronger than the intermediate or secondary; stock elongate, nodose [p. 1113] .....*Hookerianum.*

2316. AGLAONEMA CLARKEI Hook. f.; F. B. I. vi. 529.
Chittagong.
A scandent herb.

2317. AGLAONEMA HOOKERIANUM Schott; F. B. I. vi. 529.
Chittagong.
A stout herb.

1009. Scindapsus Schott.

Robust, climbing shrubs; tissues with acicular needles; stems rooting at the nodes; *leaves* ovate, oblong, or oblong-lanceolate; petiole sheathing, geniculate, sheath often accrescent. *Flowers* hermaphrodite, all fertile; *spathe* cymbiform, thick, soon deciduous; *spadix* shorter than the spathe, sessile, cylindric, dense-flowered. *Perianth* 0. *Stamens* 4; filaments widish, flattened, thickened at the tips; anthers terminal; cells oblong, parallel or divaricate, dehiscing by lateral slits. *Ovary* prismatic or obpyramidal, 1-locular, top flattened; ovule solitary, anatropous, basilar; stigma sessile, linear-oblong, depressed. *Fruit* of clustered, fleshy, obpyramidal berries, but with apex coriaceous and ultimately separating. *Seed* more or less reniform, with an arillate base; testa hard; albumen 0; embryo horseshoe-shaped.

2318. SCINDAPSUS OFFICINALIS Schott; F. B. I. vi. 541; E. D. S. 970. *Pothos officinalis* F. I. i. 431.
In all the provinces.
A large, epiphytic climber. *Hind.* and *Beng.* Gajpipal; *Santal.* Daré jhapak.

1010. Rhaphidophora Schott.

Robust, climbing shrubs; tissues with acicular needles; stems sending down long aerial roots; *leaves* large, distichous, often oblique, perforate or pinnately lobed, rarely entire; petiole sheathing, geniculate. *Flowers* hermaphrodite or polygamous by abortion, with a few female florets; *spathe* cymbiform, thick, soon deciduous; *spadix* included, thick, cylindric, dense-flowered. *Perianth* 0. *Stamens* 4 or 5; filaments linear, flattened, narrowed at the tips; anthers small; cells oblong, divergent, dehiscing by extrorse slits. *Ovary* obpyramidal or prismatic, 1- or imperfectly

2-locular, top flattened; ovules many, anatropous, parietal or on the edges of the partial septa; stigma rounded or oblong, terminating a short, conical style. *Fruit* a cluster of cohering berries, but with apices coriaceous and often ultimately separating conjointly. *Seed* narrow; testa thin; albumen copious; embryo axial.

2319. Rhaphidophora Hookeri Schott; F. B. I. vi. 546.
Chittagong.
A lofty, epiphytic climber.

1011. Pothos Linn.

Shrubs with climbing and rooting branches; *leaves* distichous, obliquely linear to ovate, blade sometimes obsolete; petiole winged or leaflike, sheathing at the base. *Flowers* hermaphrodite, all fertile; peduncles axillary or infra-axillary, leafy or sheathed or naked; *spathe* small, ovate or concave; *spadix* shorter than spathe, stipitate. *Perianth* of 6 segments, with hooded tips. *Stamens* 6; filaments short or long, linear or dilated; anthers terminal; cells ellipsoid; dehiscence by extrorse chinks. *Ovary* ovoid, oblong, or depressed, 3-locular; ovules solitary, anatropous in each cell, adnate to inner angles; stigma sessile, hemispheric. *Fruit* of ellipsoid or obovoid, 1–3-seeded berries. *Seeds* ellipsoid, often compressed; testa rather thick; albumen 0.

2320. Pothos scandens Linn.; F. I. i. 430; F. B. I. vi. 551.
N. Bengal; Chittagong.
An extensive, epiphytic climber.

1012. Lasia Lour.

Stout, spinous, aquatic or marsh herbs; rootstock branched; petiole long, prickly; *leaf*-blade hastate, entire or pedately lobed and cut; petiole and nerves beneath prickly. *Flowers* hermaphrodite, all fertile; *spathe* very long, narrow, fleshy, twisted; base convolute, deciduous; *spadix* short, cylindric, dense-flowered, flowering centrifugally. *Perianth* segments 4–6, obovate; tips truncate, incurved. *Stamens* 4–6; filaments short, flat; anthers with parallel cells, dehiscing by extrorse slits. *Ovary* ovoid, 1-celled; ovule solitary, pendulous from apex of cell; style stout; stigma depressed. *Fruit* a cluster of 6-sided, obpyramidal berries, with warted or muricate tips. *Seeds* compressed, rugose; albumen 0.

2321. LASIA HETEROPHYLLA Schott; F. B. I. vi. 550. *L. spinosa* E. D. L. 84. *Pothos heterophylla* F. I. i. 437. *P. Lasia* F. I. i. 438.

In most of the provinces.

A stout, intensely prickly marsh plant. *Beng.* Kanta-kachhu; *Santal.* Kanta saru.

Order CXLVI. LEMNACEÆ.

Small or minute, gregarious, aquatic herbs, scale-like or globular, rootless or with capillary roots, propagated by buds or bulbils, rarely by seed; fronds smooth above, spongy below. *Flowers* monœcious, 1–3, naked or enclosed in a membranous spathe. *Perianth* absent. ♂ *Stamens* 1 or 2; anthers 1- or 2-celled, the cells superposed; dehiscence by transverse slits. ♀ *Ovary* sessile, 1-locular, narrowed into a funnel-shaped style; stigma simple; ovules 1–7, basal, erect or horizontal. *Fruit* a minute, flask-shaped utricle, indehiscent or opening by circumscissile dehiscence. *Seeds* erect or horizontal, 1–7; testa coriaceous; albumen fleshy, or absent; embryo cylindric, axial.

Fronds flat, with one or more roots, bearing the flowers in marginal clefts; anthers 2-celled; filaments slender.....**Lemna.**
Fronds minute, granular, rootless, proliferous, bearing the flowers on the upper side; anthers 1-celled, sessile.....**Wolffia.**

1013. Lemna Linn.

Herblets, with roots rising from the sides or base of the frond. *Flowers* in marginal clefts of the frond, at first enclosed in a small spathe. ♂ *Florets* in pairs, one of each pair opening before the other. *Stamen* solitary; filaments filiform or enlarged in the middle, recurved; anthers 2-locular, globose; cells dehiscing by transverse slits; pollen muricate. ♀ *Floret* solitary, close to male. *Ovary* 1–7-ovuled; ovules anatropous, semi-anatropous, or orthotropous. *Fruit* a 1–7-seeded utricle. *Seeds* erect or horizontal; embryo conic or ovoid.

*Rootlet solitary:—[p. 1117]

Fronds asymmetric, obovate or obovate-oblong; seed erect
paucicostata.

Fronds symmetric, young hastate, persisting, the others set crosswise to the young, oblanceolate, tip serrate; seed horizontal.....*trisulca.*

*Rootlets several:—[p. 1116]
Rootlets many; fronds herbaceous, broadly obovate or orbicular, 7-nerved ..... *polyrrhiza.*
Rootlets few, 2–5; fronds membranous, ovate or oblong, 3–5-nerved *oligorrhiza.*

2322. LEMNA PAUCICOSTATA Hegelm.; F. B. I. vi. 556.
In most of the provinces.
A minute, annual, floating herb.

2323. LEMNA TRISULCA Linn.; F. B. I. vi. 557. *L. cruciata* F. I. iii. 566.
In the central and eastern provinces.
A minute, annual, floating herb.

2324. LEMNA POLYRRHIZA Linn.; F. B. I. vi. 557. *L. orbiculata* F. I. iii. 565.
In the central and eastern provinces.
A minute, annual, floating herb.

2325. LEMNA OLIGORRHIZA Kurz; F. B. I. vi. 557.
C. Bengal, and perhaps elsewhere.
A minute, annual, floating herb.

1014. Wolffia Hork.

Very minute herblets, flattish, globose, or conically produced below, rootless. *Florets* inserted in a groove on the upper surface of the plant; spathe 0. ♂ *Floret* solitary. *Stamen* solitary; filament short or long; anther globose, 1-celled; pollen smooth. ♀ *Floret* solitary, close to the male. *Ovary* globose or ovoid; ovule solitary, orthotropous. *Fruit* a spherical utricle. *Seed* globose, erect; testa thick; albumen scanty.

Fronds subglobose ..... *arrhiza.*
Fronds flat above, conical beneath ..... *microscopica.*

2326. WOLFFIA ARRHIZA Wimm.; F. B. I. vi. 557. *Lemna globosa* F. I. iii. 565.
In most of the provinces.
A minute, floating, annual herb.

2327. WOLFFIA MICROSCOPICA Kurz; F. B. I. vi. 558.
C. Bengal.
A minute, floating, annual herb.

Order CXLVII. ALISMACEÆ.

Aquatic or marsh herbs; usually erect, sometimes floating. *Leaves* radical or clustered at nodes of floating stems, entire, petioled, often pellucid-dotted or -lineolate. *Flowers* pedicelled, hermaphrodite, monœcious, or polygamous, rarely diœcious, in umbelled or paniculate whorls, white or pink, rarely blue or yellow; bracts 3 or more, membranous; bracteoles small. *Perianth* 2-seriate; the outer whorl of 3 herbaceous, the inner whorl petaloid, rarely obsolete. *Stamens* 6 or more, rarely 3, hypogynous or perigynous; anthers erect, basifixed, 2-celled; dehiscence by lateral or dorsal longitudinal slits. *Carpels* 3–6, or more, 1-celled, sessile or stipitate on a flat or raised receptacle; style long or short, rarely 0, subterminal or ventral; stigma simple; ovules 1 or more in each carpel; placentas on the inner angle, rarely ovule solitary and basilar. *Fruit* of small achenes or follicles, the ripe carpels free or connate at the base only, usually tipped by the style and stigma, very rarely each carpel circumscissile at the base. *Seeds* small or minute; albumen 0; embryo straight or conduplicate.

Fruit indehiscent, of 3 or more achenes; ovules and seeds solitary :—
Stamens few, 6–9; receptacle flat :—
Flowers hermaphrodite ..... **Alisma.**
Flowers polygamous ..... **Limnophyton.**
Stamens usually many, rarely as few as 6; receptacle globose or oblong; flowers 1-sexual or polygamous ..... **Sagittaria.**
Fruit dehiscent, of 6–7 follicles; stamens 8–12; flowers hermaphrodite; ovules and seeds numerous ..... **Butomopsis.**

1015. Alisma Linn.

Herbs, scapigerous, stemless, palustrine, perennial; *leaves* lanceolate, cordate or sagittate. *Flowers* hermaphrodite, in umbellate or panicled whorls, white or pink; scapes short or long; receptacle flat. *Sepals* 3, herbaceous, persistent. *Petals* 3, membranous, deciduous. *Stamens* 2–3-seriate, 6 or 9; filaments filiform. *Carpels* few or many; receptacle small; stigma small, terminal; ovule solitary, anatropous, basilar. *Fruit* of few or many, compressed or turgid, coriaceous or hard achenes. *Seeds* erect, basilar; testa membranous; embryo horseshoe-shaped.

Leaves linear, ovate-lanceolate or subcordate, 5–7-nerved; achenes membranous, compressed ..... *Plantago.*
Leaves 11–17-nerved; achenes hard, turgid :—
Leaves coriaceous, orbicular-cordate or reniform, with rounded lobes and rounded or emarginate apex ..... *reniforme.*
Leaves membranous, broadly ovate-cordate, with acute lobes and a narrow sinus ..... *oligococcum.*

2328. ALISMA PLANTAGO Linn.; F. B. I. vi. 559; E. D. A. 757.
Tirhut; N. Bengal.
A scapigerous herb of marshes.

2329. ALISMA RENIFORME Don; F. B. I. vi. 560.
N. Bengal; C. Bengal; E. Bengal.
A scapigerous herb of pools and marshes.

2330. ALISMA OLIGOCOCCUM F. Muell.; F. B. I. vi. 560.
C. Bengal, rare.
A scapigerous herb of pools and marshes.

1016. Limnophyton Miq.

Herbs, scapigerous, stemless, palustrine, perennial; juice milky; *leaves* sagittate, erect. *Flowers* polygamous, male and hermaphrodite, in panicled whorls, white; scapes stout; receptacle flat. *Sepals* 3, herbaceous, persistent. *Petals* 3, membranous, deciduous. *Stamens* 2-seriate, 6, largest in the male flowers; filaments subfiliform, compressed. *Carpels* 15–20, obsolete in male flowers; receptacle small; stigma small, on a ventral style; ovule solitary, anatropous, basilar. *Fruit* of several compressed or turgid, hard achenes. *Seeds* erect, basilar; testa membranous; embryo horseshoe-shaped.

2331. LIMNOPHYTON OBTUSIFOLIUM Miq.; F. B. I. vi. 560. *Sagittaria obtusifolia* F. I. iii. 646.
C. Bengal; W. Bengal; Orissa.
A scapigerous herb of pools and marshes.

1017. Sagittaria Linn.

Herbs, usually perennial, aquatic, stemless; *leaves* long-petioled, elliptic-cordate or sagittate. *Flowers* 1-sexual or polygamous, in paniculate or spicate whorls; scape erect, stout or slender; receptacle globose or oblong. *Sepals* 3, herbaceous, persistent. *Petals* 3, membranous, deciduous, white. *Stamens* in male flowers about 24, with only staminodes in the female flowers, or 6–10 in the

male flowers, with 9–12 in the hermaphrodite; filaments filiform, compressed. *Carpels* very many, crowded on the large, globose or oblong receptacle, flattened laterally; style ventral or apical; stigma papillose; ovary solitary, basilar. *Fruit* a globose or oblong head of flattened, crested or winged achenes. *Seed* erect, basilar; testa thin; embryo horseshoe-shaped.

Leaves rising above the surface of the water, hastate or sagittate; stamens about 24 in ♂, reduced to staminodia in the ♀ florets *sagittifolia.*

Leaves floating, broadly ovate, deep cordate, obtuse; stamens 6–10 in ♂, 9–12 in ♀ florets ..... *guayanensis.*

2332. SAGITTARIA SAGITTIFOLIA Linn.; F. I. iii. 645; F. B. I. vi. 561; E. D. S. 510.

Chota Nagpur; Behar; Tirhut; N. Bengal.

A scapigerous herb of pools and marshes. *Beng.* Muya-muya, chhoto-kut.

2333. SAGITTARIA GUAYANENSIS H. B. K.; F. B. I. vi. 561. *S. cordifolia* F. I. iii. 647.

In all the provinces.

A scapigerous herb of pools and marshes.

1018. Butomopsis Kunth.

Annual, erect, scapigerous, palustrine herbs; juice milky; *leaves* radical, elliptic-acute. *Flowers* hermaphrodite, umbelled on a scape, longer than the leaves; whorls sometimes superposed, bracteate. *Sepals* 3, herbaceous, persistent. *Petals* 3, membranous, deciduous, white, larger than the sepals. *Stamens* usually 9, hypogynous, 6 outer in pairs opposite sepals, sometimes one of a pair obsolete; 3 inner single opposite petals, sometimes one or more replaced by a pair; filaments filiform; anthers oblong. *Carpels* 6–9, whorled on a flat receptacle, sessile, shortly connate below, 1-locular; style short; stigma somewhat external at apex of style; ovules many, small, on reticulate, parietal placentas, ascending, anatropous. *Fruit* of 6–7 erect, membranous follicles. *Seeds* minute, parietal, very numerous, smooth; embryo conduplicate, horseshoe-shaped.

2334. BUTOMOPSIS LANCEOLATA Kunth.; F. B. I. vi. 562. *Butomus lanceolatus* F. I. ii. 315.

In all the provinces.

An annual herb of marshes and rice-fields; juice milky.

Order CXLVIII. NAIADACEÆ.

Herbs, palustrine, stemless, scapigerous, with a tuberous or creeping rootstock; or aquatic and submerged or floating, with elongated, branched stem. *Leaves* erect or submerged or floating, sheathing at the base. *Flowers* hermaphrodite or 1-sexual, green, inconspicuous, in spikes, racemes, or terminal or axillary peduncled spadices; bracts small or 0. *Perianth* absent or of 3–4 inferior, valvate segments, or tubular and very delicate. *Stamens* 1–6, hypogynous, free in the hermaphrodite flowers, solitary or connate in male flowers; anthers basifixed, erect, 2-locular or reduced to one anther-cell. *Carpels* 1–6, each 1- or more-ovuled; style long or short; stigmas usually simple, sometimes 2–3, capillary; ovule erect or pendulous. *Fruit* of 1 or more 1- or several-seeded utricles, achenes, follicles, or small drupes. *Seeds* erect, pendulous, or laterally peltate; testa coriaceous or somewhat fleshy; albumen 0; embryo fleshy, straight.

Flowers hermaphrodite; style short or 0; stigma discoid or decurrent on the ovary:—

Perianth of sepals present; carpels sessile:—

Sepals 1–3, white or pink, membranous; stamens 6 or more **Aponogeton.**

Sepals 4, green, herbaceous; anthers 4, sessile..... **Potamogeton.**

Perianth wanting; carpels stipitate; anthers 2, sessile ..... **Ruppia.**

Flowers 1-sexual; stamen solitary:—

Style long, slender; stigma oblique, peltate; achenes 2–9, sessile or stalked; male perianth wanting, female perianth cupular, hyaline **Zanichellia.**

Style wanting; stigmas 2–4, slender; achene solitary, sessile; male perianth double, an outer inflated or 4-fid tube and an inner hyaline; female perianth wanting, or hyaline and adherent to carpel..... **Naias.**

1019. Aponogeton Thunb.

Herbs, scapigerous, with tuberous rootstocks, aquatic; *leaves* oblong, floating or submerged. *Flowers* bi-sexual, on long scapes, bearing solitary or geminate, often unilateral spikes, the spikes when young enclosed in a conical, soon deciduous sheath. *Perianth* of 1–3 equal or unequal, pink or white segments, or obsolete. *Stamens* 6 or more; filaments subulate, unequal, persistent; anthers didymous. *Carpels* 3–6, each 2- or more-ovuled; style

short; stigma discoid or decurrent, persistent; ovules basilar, anatropous. *Fruit* of 3 or more coriaceous follicles. *Seeds* erect; embryo straight.

Leaves floating, oblong, 3–5-nerved, opaque; sepals 2, pink or white, shorter than the three follicles:—

Cross-nervules of leaves distinct; follicles smooth, 4–8-seeded *monostachyon.*

Cross-nervules of leaves obsolete; follicles echinate, 2-seeded *echinatum.*

Leaves submerged, linear-oblong to lanceolate, 3–7-nerved, translucent; cross-nervules distinct; sepals 1–3, white, longer than the 3–4 smooth, 1–2-seeded follicles ..... *crispum.*

2335. APONOGETON MONOSTACHYON Linn. f.; F. I. ii. 210; F. B. I. vi. 564; E. D. A. 1242.

In all the provinces.

An aquatic herb. *Hind.* Jhechu.

2336. APONOGETON ECHINATUM Roxb.; F. I. ii. 210; F. B. I. vi. 564.

C. Bengal.

An aquatic herb.

2337. APONOGETON CRISPUM Thunb.; F. B. I. vi. 564. *A. undulatum* F. I. ii. 211.

Tirhut; N. Bengal; C. Bengal; E. Bengal.

An aquatic herb.

1020. Potamogeton Linn.

Herbs, aquatic, submerged, with creeping rootstock; *leaves* submerged or floating, opposite or alternate, entire or toothed, with intrafoliaceous stipules. *Flowers* small, hermaphrodite, spicate on a scape, rising from a membranous spathe; bracts 0. *Perianth* of 4 concave, green, valvate segments. *Stamens* 4; anthers sessile on the perianth-segments, didymous, the cells opening by extrorse slits. *Carpels* 4, sessile, 1-celled and 1-ovuled; stigma subsessile or decurrent on a style, persistent; ovule campylotropous, adnate to inner angle of carpel. *Fruit* of small, coriaceous or spongy drupelets. *Seed* subreniform; embryo straight.

*Upper leaves floating:—[p. 1123]

†Floating leaves large, coriaceous; submerged leaves lanceolate, membranous [p. 1123] ..... *indicus.*

†Floating leaves small, herbaceous; submerged leaves linear [p. 1122] *javanicus.*

*Leaves all submerged:—[p. 1122]
Leaves lanceolate, membranous:—
Leaves semiamplexicaul at base, crisped and serrulate, 3-nerved *crispus.*
Leaves truncate or cuneate at base, not crispate, many-nerved *mucronatus.*

Leaves narrowly linear or filiform:—
Stipules adnate to leaf-sheaths.....*pectinatus.*
Stipules free.....*pusillus.*

2338. POTAMOGETON INDICUS Roxb.; F. I. i. 452; F. B. I. vi. 565.
In all the provinces.
A very common aquatic herb.

2339. POTAMOGETON JAVANICUS Hassk.; F. B. I. vi. 566.
Tirhut; N. Bengal.
A somewhat rare aquatic herb.

2340. POTAMOGETON CRISPUS Linn.; F. B. I. vi. 566; E. D. P. 1194. *P. tuberosus* F. I. i. 453.
In all the provinces.
A common aquatic herb.

2341. POTAMOGETON MUCRONATUS Presl.; F. B. I. vi. 567.
N. Bengal; E. Bengal.
A very rare aquatic herb.

2342. POTAMOGETON PECTINATUS Linn.; F. B. I. vi. 567.
Tirhut; N. Bengal; E. Bengal.
A common aquatic herb.

2343. POTAMOGETON PUSILLUS Linn. *P. pusillus* sub-sp. *flabellata* F. B. I. vi. 567.
Behar.
An aquatic herb, exceedingly rare in our area.

1021. Ruppia Linn.

Herbs of brackish swamps, with slender, submerged, branched stems; *leaves* long, filiform, with stipule-like sheaths. *Flowers* minute, hermaphrodite, 2–6 together within a leaf-sheath, on an ultimately elongating, straight or spirally twisted peduncle. *Perianth* 0. *Stamens* 2; anthers sessile, 2-celled. *Carpels* 4, 1-ovuled; stigma sessile; ovule pendulous. *Fruit* of 4 stipitate, ovoid, obtuse or beaked achenes. *Seed* uncinate; embryo straight.

2344. RUPPIA ROSTELLATA Koch; F. B. I. vi. 568.
C. Bengal; E. Bengal; Sundribuns.
A submerged aquatic, plentiful in brackish water.

1022. Zanichellia Linn.

Herbs, aquatic, usually in brackish water, with slender root-stock and stem; *leaves* linear, with stipular sheaths. *Flowers* minute, monœcious, both sexes in one membranous sheath. ♂ *Perianth* 0. *Stamen* solitary; filament slender; anther linear, 2–3-celled. ♀ *Perianth* cupular, hyaline. *Carpels* 2–9, sessile; style long, slender; stigma oblique, peltate, crenate; ovule solitary, pendulous, orthotropous. *Fruit* of sessile or stipitate, reniform, crested achenes, usually 4 in number. *Seed* pendulous; testa thin; embryo subcylindric, with the cotyledonary end folded twice on itself.

2345. ZANICHELLIA PALUSTRIS Linn. sub-sp. PEDICELLATA Hook. f.; F. B. I. vi. 568.
Chota Nagpur; Behar.
A submerged aquatic, not very common in our area.

1023. Najas Linn.

Herbs; aquatic, submerged; stems branched, filiform, smooth or muricate; *leaves* opposite, alternate, or whorled, linear, entire or toothed. *Flowers* 1-sexual, monœcious or dicœcious, minute, axillary. ♂ *Perianth* double, outer tubular or inflated, entire or 4-fid, inner hyaline. *Stamen* solitary, adnate to inner perianth-tube, apiculate or cuspidate, 1–4-locular. ♀ *Perianth* 0, or hyaline and adnate to carpel. *Carpel* solitary, sessile, 1-ovuled; stigmas 2–4, slender; ovule basilar, erect, anatropous. *Fruit* an oblong achene. *Seed* erect; testa very thin; embryo straight.

Dicœcious; leaf-teeth large, few, back of leaf and internodes with similar teeth; anther 4-locular ..... *marina*.
Monœcious; leaf-teeth rather numerous, back of leaf usually without teeth:—
*Male and female flowers in a spathe; leaf-teeth long; anther 4-locular [p. 1125] ..... *indica*.
*Male flowers only in a sheath:—[p. 1125]
†Anther 1-locular:—[p. 1125]
Flowers solitary; areolæ on testa broader than long ..... *minor*.
Flowers aggregated; areolæ on testa as long as broad ... *Kurziana*.

†Anther 4-locular :—[p. 1124]
Beak of sheath lacerate.....*lacerata.*
Beak of sheath entire .....*foveolata.*
*Male and female flowers alike unprovided with a sheath; anther 4-locular [p. 1124] .....*graminea.*

2346. NAJAS MARINA Linn. *N. major* F. B. I. vi. 569.
E. Bengal.
A slender herb.

2347. NAJAS INDICA Cham. *N. minor* F. B. I. vi. 569 in part.
Behar; C. Bengal.
A slender herb.

2348. NAJAS MINOR All.; F. B. I. vi. 569. *N. dichotoma* F. I. iii. 749.
C. Bengal; E. Bengal.
A slender herb.

2349. NAJAS KURZIANA Rendle.
N. Bengal.
A slender herb.

2350. NAJAS LACERATA Rendle.
C. Bengal.
A slender herb.

2351. NAJAS FOVEOLATA A. Br.
In most of the provinces, common.
A slender herb.

2352. NAJAS GRAMINEA Del.; F. B. I. vi. 569.
In all the provinces, common.
A slender herb.

Order CXLIX. ERIOCAULEÆ.

Annual or perennial, scapigerous, palustrine, rarely aquatic herbs. *Leaves* narrow, with sheathing bases; veins parallel. *Flowers* minute, usually white, 1-sexual, densely aggregated in a solitary globose or hemispheric head at the apex of a peduncle with a tubular basal sheath; heads androgynous, rarely 1-sexual, with an involucre of short, scarious or chartaceous bracts; the florets often more or less hoary with short white hairs, and closely packed on a flat, convex, hemispheric, or conical receptacle, each solitary in the axil of a cuneiform bracteole, which equals or

exceeds its flower, and is dorsally hoary near the apex. ♂ *Flowers* stipitate. *Sepals* 3, free or connate, hyaline, deciduous, rarely 2 or 0. *Petals* 3, connate in a stipitate, funnel-shaped, minutely 3-lobed corolla, one lobe sometimes longer than the others. *Stamens* 6 or fewer, inserted at the base of the corolla; filaments short, often unequal; anthers didymous, 2-celled, usually black. *Pistillode* 0. ♀ *Flowers* sessile or stipitate. *Sepals* 3, rarely 2, 1 or 0, unequal, usually concave, deciduous. *Petals* 3, unequal, broad or narrow, persistent, with often a black spot on the limb, forming a corolla sessile on the calyx or stipitate. *Ovary* superior, sessile or stipitate, globose, 3-lobed and 3-celled; cells each with 1 pendulous ovule; style rather short; stigmas 3, erect, filiform. *Fruit* a small, membranous, 3-celled, loculicidal capsule. *Seeds* very minute, oblong or ellipsoid, smooth, striated, or ribbed; albumen floury; embryo minute.

1024. Eriocaulon Linn.

Characters those of the order.

Aquatic; stem submerged, elongated, branched, densely leafy, upper branches floating; leaves capillary ..... *Capillus-Naiadis.*

Marsh, rice-field, or terrestrial herbs; stem very short or none:—

Involucral and floral bracts both glabrous:—

Receptacle glabrous or nearly so; leaves subulate:—

Involucral bracts sub-2-seriate, cuneate, spreading, shining; floral scarious, obovoid, tip truncately rounded; sepals in flowers of both sexes 2..... *truncatum.*

Involucral bracts oblong, obtuse, passing gradually into the oblong-lanceolate, subacute floral, all scarious; sepals in male flower 3, in female 2–1 or wanting..... *Sieboldianum.*

Receptacle more or less villous; leaves ensiform; bracts all scarious, hyaline, involucral oblong-obtuse, passing into the cuneate-obovate, densely imbricate floral; sepals in male flower 2, in female 3 *oryzetorum.*

Involucral bracts alone glabrous, floral bearded or pubescent; receptacle villous:—

*Perennial; rootstock elongated, slender or stout; leaves ensiform or broadly subulate:—[p. 1127]

†Female flowers distinctly pedicelled:—[p. 1127]

‡Involucral bracts erect or spreading, never reflexed; head hemispheric, grey; leaves pale grey-green, opaque [p. 1127] *luzulifolium.*

‡Involucral bracts at length reflexed under the globose grey or snow-white heads; leaves reddish, often semitranslucent [p. 1126]..... *quinqueangulare.*

†Female flowers almost sessile; involucral bracts reflexed; heads dark-grey, globose; leaves grey-green, opaque [p. 1126] *trilobum.*

*Annual, tufted, dwarf; leaves subulate, often recurved; involucral bracts erect or stellately spreading, pale, shining; heads obconic [p. 1126] ..... *xeranthemum.*

2353. ERIOCAULON CAPILLUS-NAIADIS Hook. f.; F. B. I. vi. 572.
N. Bengal; C. Bengal; E. Bengal.
A submerged aquatic herb.

2354. ERIOCAULON TRUNCATUM Ham.; F. B. I. vi. 578. *Leucocephala spathacea* F. I. iii. 613.
In all the provinces.
A herb of rice-fields and marshy ground.

2355. ERIOCAULON SIEBOLDIANUM Sieb. & Zucc.; F. B. I. vi. 577.
In most of the provinces.
A herb of rice-fields and marshy ground.

2356. ERIOCAULON ORYZETORUM Mart.; F. B. I. vi. 579.
Chota Nagpur.
A weed of rice-fields.

2357. ERIOCAULON LUZULIFOLIUM Mart.; F. B. I. vi. 582.
In all the provinces.
A herb of rice-fields and wet places.

2358. ERIOCAULON QUINQUEANGULARE Linn.; F. B. I. vi. 582. *Leucocephala graminifolia* F. I. iii. 612.
In all the provinces.
A herb of rice-fields and wet places. *Beng.* Guri.

2359. ERIOCAULON TRILOBUM Ham.; F. B. I. vi. 583.
In all the provinces.
A herb of rice-fields and wet places.

2360. ERIOCAULON XERANTHEMUM Mart.; F. B. I. vi. 584.
Chota Nagpur; N. Bengal.
An annual, terrestrial, tufted herb.

Order CL. CYPERACEÆ.

Perennial, rarely annual herbs; roots fibrous; stem cylindric or 3-cornered, usually simple. *Leaves* trisichous, rarely 0, mostly crowded at the base of the stem, upper fewer, sheathing below; the

sheaths tubular and more or less closed, or those of the lower leaves split to the base; ligule 0 or a faint prolongation of the mouth of the sheath opposite the blade. *Flowers* minute, hermaphrodite or 1-sexual, in the axils of glumes of a spikelet (*Cypereæ*) or of the glume-like bracts of a spike; spikelets of *Cypereæ*, spikes of remaining tribes, composed of small, imbricating, distichously or spirally imbricating scales (*glumes* or *bracts*), disposed in fascicles, panicles, or spikes, or solitary. *Perianth* 0 or of 6 or more hypogynous bristles or scales, rarely (*Carex*) a utricle enclosing the ovary. *Stamens* 1–3; filaments flattened; anthers basifixed, linear. *Ovary* 1-celled; style short or long; stigmas 2–3; ovule 1, basal, erect, anatropous. *Fruit* a compressed or trigonous nut. *Seed* erect, free; embryo minute within the base of the floury albumen.

Ovary and fruit enclosed in a bottle-shaped utricle with an entire or notched or shortly slit mouth ..... **Carex.**

Ovary and fruit not enclosed in an utricle :—

Spikelets with a terminal ♀ flower and with two basal opposite ♂ glumes :—

Spikes corymbose; style 2-fid..... **Hypolytrum.**

Spikes in an oblong panicle; style 3-branched ..... **Scirpodendron.**

Spikelets with the terminal flower not ♀ :—

Spikelets 1-sexual or with a basal ♀ flower and 1 or more ♂ or empty glumes; fruit stipitate, bony; scales or bristles 0 :—

Glumes entire, with one median vein ..... **Scleria.**

Glumes 3-fid, with 5–7 strong veins ..... **Diplacrum.**

Spikelets with the lower glumes always empty, intermediate glumes ♀ and uppermost ♂ or imperfect or empty :—

Intermediate ♀ glumes few, not more numerous than the 2-more lowest empty; uppermost empty and thinner than the intermediate glumes :—

Style 2-fid; hypogynous bristles usually 6 ..... **Rhynchospora.**

Style 3-fid; hypogynous bristles 0..... **Cladium.**

Intermediate ♀ glumes usually many, always more numerous than the 1–2 lowest empty; uppermost ♂ or imperfect or empty, but similar to the intermediate glumes (CYPEREÆ) :—

*Flowering glumes distichous; scales or bristles 0 :—[p. 1129]

†Style 2-fid :—[p. 1129]

Rachilla of spikelet deciduous ..... **Kyllinga.**

Rachilla of spikelet persistent :—

Fruit compressed laterally .....**Pycreus.**
Fruit compressed dorsally.....**Juncellus.**
†Style 3-fid, very rarely (*Cyperus* § *Anosporum*) subentire and then casually 2-lobed; fruit trigonous:—[p. 1128]
Rachilla of spikelet persistent .....**Cyperus.**
Rachilla of spikelet deciduous:—
Fruit-bearing glumes not winged; fruit broadish **Mariscus.**
Fruit-bearing glumes winged on the keel; fruit narrow **Courtoisia.**
*Flowering glumes spirally arranged:—[p. 1128]
Base of style constricted or articulate above the fruit:—
Stem leafless; hypogynous bristles usually present **Eleocharis.**
Stem leafy at base; bristles 0:—
Style base persistent, or if deciduous not leaving a tumour on the fruit:—
Glumes separable from the rachilla .....**Fimbristylis.**
Glumes persistent on the rachilla .....**Echinolytrum.**
Style-base deciduous, leaving a tumour on the fruit **Bulbostylis.**
Base of style passing gradually into the fruit:—
Hypogynous scales 2, hyaline, antero-posterior, undivided **Lipocarpha.**
Hypogynous scales 1–7, or 0, when 2 (*Scirpus* rarely) then setaceous and lateral:—
Hypogynous scales 6, divided to the base into linear segments.....**Eriophorum.**
Hypogynous scales when present undivided:—
Leaves hairy; hypogynous scales 6 or 3 or 0 **Fuirena.**
Leaves glabrous; hypogynous scales 7–1 or 0 **Scirpus.**

1025. **Carex** Linn.

Perennial, glabrous, rarely pubescent, grassy sedges; stems leafy, chiefly at the base. *Spikelets* solitary or few, one terminal, the others lower down, rarely all clustered in terminal or axillary panicles or compound spikes, 1-sexual or androgynous, the lower spikelets female, with a few male at the base or top, very rarely dicœcious, uppermost often wholly male. *Scales* many, imbricate all round the rachilla, persistent or deciduous. *Flowers* solitary

in the scales. ♂ *Stamens* 2–3; anthers linear, obtuse. ♀ *Ovary* compressed or 3-quetrous, enclosed in an urceolate, 2-toothed utricle; style slender; stigmas 2–3, protruding from the utricle. *Fruit* a minute, coriaceous, compressed or 3-gonous nut, included in the utricle.

Spikes short (·5 in. or less), narrow, very numerous, compoundly paniculately arranged:—
- Glumes distinctly aristate; beak of utricle half as long as its body:—
  - Inflorescence brown ..... *indica.*
  - Inflorescence pale straw-coloured ..... *stramentitia.*
- Glumes minutely or not mucronate:—
  - Beak of utricle half as long as its body or longer *cruciata* var. *nagporensis.*
  - Beak of utricle one-third as long as its body or shorter:—
    - Glumes ovate-acute ..... *plebeja.*
    - Glumes ovate-obtuse ..... *filicina* var. *microgyna.*

Spikes longer (1 in. long or more), few, distant, racemosely arranged:—
- Spikes 3 or fewer, very remote, slender ..... *speciosa.*
- Spikes 4–8, distant, cylindric, rather stout ..... *Wallichiana.*

2361. CAREX INDICA Linn.; F. B. I. vi. 714.
N. Bengal, Duars.
A herb; stems 2–2·5 feet; leaves ·5 in. wide.

2362. CAREX STRAMENTITIA Booth; F. B. I. vi. 717.
Chota Nagpur, Parasnath.
A herb; stems 2–3 feet; leaves ·5–·7 in. wide.

2363. CAREX CRUCIATA Wahl. var. NAGPORENSIS Clarke; F. B. I. vi. 716.
Chota Nagpur, Parasnath.
A herb; stems 2–3 feet; leaves narrow, or up to ·5 in. wide.

2364. CAREX PLEBEJA Clarke; F. B. I. vi. 718.
Chota Nagpur.
A herb, 1–2 feet high; leaves narrow.

2365. CAREX FILICINA Nees var. ? MICROGYNA Clarke; F. B. I. vi. 718.
Chittagong.
A herb, 1–1·5 feet high; leaves very narrow.

2366. CAREX SPECIOSA Kunth; F. B. I. vi. 729.
Behar; Chota Nagpur.
A tough but slender herb, 1–2 feet high.

2367. CAREX WALLICHIANA Presc. ; F. B. I. vi. 747.
N. Bengal.
A herb, 6 in. to 2·5 feet high.

1026. Hypolytrum L. C. Rich.

Stout, perennial herbs, with woody rootstock and very stout root-fibres ; stem erect, trigonous, leafy ; *leaves* long, narrow, linear or ensiform, coriaceous, widest about the middle, 3-veined. *Spikelets* small, ovoid or subglobose, in broad, subumbellate panicles, with stout, spreading, bracteolate branches, or the panicle contracted into a compact, lobed head ; bracts leaf-like ; bracteoles coriaceous. *Glumes* 2, opposite, basal, each with a ♂ flower, spreading in fruit, persistent ; rarely empty glumes interposed between basal males and terminal female ; bristles 0. *Stamens* solitary ; filaments elongate. *Ovary* terminal, flattened, turbinate, beaked ; style continuous with the ovary, persistent ; stigmas 2, filiform. *Fruit* a rounded or obtusely angled nut, with thick, hard endocarp, beaked or not.

The spikelet of *Hypolytrum* usually resembles a single flower, composed of 1 bract, 2 bracteoles, 2 stamens, and a pistil.

2368. HYPOLYTRUM LATIFOLIUM L. C. Rich. ; F. B. I. vi. 678.
Tunga diandra F. I. i. 184.
N. Bengal, Duars ; Chittagong.
A stout herb, 1–3 feet high, in moist undergrowth.

1027. Scirpodendron Kurz.

Stout herbs, with woody rhizome ; stems ending in an oblong panicle ; radical *leaves* very long, with serrate edges, narrowed to both ends. *Flowers* in ellipsoid, clustered spikes of many spikelets. *Spikelets* of 8–11 glumes beyond the bracteole, the lowest pair opposite, navicular, 1-androus ; the uppermost three falsely whorled, narrow, thin, empty ; intermediate 3–6 1-androus or sterile. *Style* long, linear, continuous below with the ovary, above 3-branched. *Fruit* a large, bony, dusky, obtuse nut, coarsely longitudinally 6-ribbed.

2369. SCIRPODENDRON COSTATUM Kurz ; F. B. I. vi. 684.
Sundribuns.
A coarse herb of muddy, littoral forests.

1028. Scleria Berg.

Perennial, rarely annual, erect, leafy herbs; stems trigonous; *leaves* narrow or broad. *Spikelets* dimorphic, androgynous or male and female, solitary or clustered on the branches of a panicle, mixed with hyaline scales, rarely spicate or capitate; bracts often foliaceous; bracteoles usually filiform; *glumes* 1-veined. ♂ or androgynous *spikelets* narrow; *glumes* many, 5–6, lower distichous, intermediate convolute, membranous, enclosing many narrowly linear hyaline scales; *stamens* 1–3; anthers narrowly linear, cuspidate; *ovary* sterile or 0. ♀ *Spikelets* shorter, broader, 1-flowered; *glumes* 3 or more, distichous, the lower 2–3 empty, the next above fertile, the upper empty; disk annular, rarely obscure, often enlarged and lobed in fruit; *ovary* minute; style slender; stigmas 3. *Fruit* a globose or oblong nutlet, usually white and polished, smooth or sculptured.

Bisexual spikelets numerous:—

Roots fibrous; spikelets glomerately disposed in a thin, slender spike *pergracilis.*

Rootstock horizontal, woody; spikelets in a thin, straggling panicle *lithosperma.*

Bisexual spikelets none or very few:—

Slender plants with fibrous roots:—

Lobes of the disk-margin stout, lanceolate, acute or subulate, rusty brown ..... *biflora.*

Lobes of the disk-margin thin, short, ovate, pale ..... *tessellata.*

Robust plants with thick, woody, horizontal rhizome:—

Sheaths of middle stem-leaves usually distinctly winged; leaves all scattered:—

Stems slender; panicle thin; partial panicles lax, with few spikelets; 2–4 feet high ..... *hebecarpa.*

Stems stout; panicle thick; partial panicles rigid, with numerous spikelets; 6–9 feet high ..... *elata.*

Sheaths of middle stem-leaves three-cornered but not winged; leaves just below the bracts pseudo-ternate or opposite *sumatrensis.*

2370. Scleria pergracilis Kunth; F. B. I. vi. 685.
Behar; W. Bengal; Chota Nagpur.
A slender herb, 1–1·5 feet high.

2371. Scleria lithosperma Sw.; F. B. I. vi. 685. *S. tenuis* F. I. iii. 574.

Chota Nagpur.
A slender herb, 1·5–3 feet high.

2372. SCLERIA BIFLORA Roxb.; F. I. iii. 573; F. B. I. vi. 687.
N. Bengal; E. Bengal.
A slender herb, 1–2 feet high.

2373. SCLERIA TESSELLATA Willd.; F. B. I. vi. 686.
In most of the provinces.
A slender herb, 1–2 feet high.

2374. SCLERIA HEBECARPA Nees; F. B. I. vi. 689.
Behar; Chota Nagpur.
A slender herb, 2–3 feet high.

2375. SCLERIA ELATA Thw.; F. B. I. vi. 690. *S. lithosperma* F. I. iii. 574.
A robust herb, 6–9 feet high.

2376. SCLERIA SUMATRENSIS Retz; F. B. I. vi. 693. *S. setigera* F. I. iii. 575.
Sundribuns; Chittagong.
A stout herb, 4–6 feet high.

1029. Diplacrum R. Br.

Small, tufted, glabrous, annual herbs, with leafy stems; *leaves* linear. *Spikelets* in small, dense, axillary clusters at the mouths of the leaf-sheaths, minute and 1-sexual. ♂ *Spikelets* 1–2-flowered; *glumes* about 3, narrow, membranous. *Stamens* 1–2; anthers minute. ♀ *Spikelets* 1-flowered; *glumes* 4, distichous, 2 lower cymbiform, empty, upper oblong, 3-lobed, many-veined, side-lobes short, incurved, mid-lobe stout, subulate; disk obscurely 3-lobed; *ovary* minute; style slender; stigmas 3. *Fruit* a globose nut.

2377. DIPLACRUM CARICINUM R. Br. *Scleria caricina* F. B. I. vi. 668.
N. Bengal; Chittagong.
A slender herb, 3–8 in. high.

1030. Rynchospora Vahl.

Tall herbs; stems simple, leafy throughout or rarely at the base only, stout or slender; *leaves* narrow, often filiform. *Spikelets* small, ovoid, capitate or corymbose, or subumbellate or panicled, with 1 or 2 bisexual flowers; bracts various. *Glumes* imbricate round the rachilla, membranous or coriaceous, 1-veined, 3 or 4 lower shorter, empty, the next 1 or 2 fruiting, the uppermost

empty; hypogynous bristles 0 or 6, rarely fewer, scabrid, with upturned teeth. *Stamens* 1–3; anthers linear. *Ovary* rounded; style slender, glabrous, with conical base; stigmas 2. *Fruit* an ovoid or subglobose, turgidly 2-convex, smooth or transversely waved nut, crowned by the conical, much enlarged, often very long and persistent style-base.

Spikelets in a single terminal head; leaves all basal .....*Wallichiana.*
Spikelets in paniculately disposed corymbs:—
Corymbs several, close, with many spikelets.....*aurea.*
Corymbs few, loose, with few spikelets .....*Hookeri.*

2378. RYNCHOSPORA WALLICHIANA Kunth; F. B. I. vi. 668.
E. Bengal.
A tufted herb, ·5–2 feet high.

2379. RYNCHOSPORA AUREA Vahl; F. B. I. vi. 670. *Schoenus articulatus* F. I. i. 184.
N. Bengal; C. Bengal; Chittagong.
A stout herb, 2–3 feet high.

2380. RYNCHOSPORA HOOKERI Boeck.; F. B. I. vi. 671.
N. Bengal; E. Bengal.
A slender herb, 1–2 feet high.

1031. Cladium P. Br.

Stout, perennial herbs, glabrous or with minutely hairy inflorescence; stems round or compressed, leafy or leafless; *leaves* when present equitant or trigonous near the apex or flat. *Spikelets* panicled, often in sessile clusters at the angles of zigzag branches, small; flowers 1–7, axillary, the lowest of each spikelet perfect, fruiting. *Glumes* 4–11, imbricate on all sides, the lowest 1–4, usually 2–3, empty, often smaller than the following 1–3, with perfect flowers; uppermost glumes male or sterile; hypogynous bristles slender, small or obsolete. *Stamens* 3 or 2. *Ovary* globose; style linear; base dilated; stigmas 3, long. *Fruit* a small nut; style-base fused with its substance; beak large pyramidal, or small umbonate, or indistinct.

2381. CLADIUM RIPARIUM Benth. var. CRASSA Clarke; F. B. I. vi. 675.
Sundribuns.
A stout herb; stems 6 feet high.

1032. Kyllinga Rottb.

Perennial herbs, tufted or with a creeping rootstock; stem trigonous; *leaves* narrow, chiefly radical. *Spikelets* minute, densely packed on short, sessile, oblong or globose, solitary or ternate, involucrate spikes; rachis short, naked after the fall of the spikelets, or squarrosely covered with the more or less persistent lowest glumes; bracts leaflike; spikelets green, strongly laterally compressed, 1–2-flowered; rachilla very minute, disarticulating above the two lowest glumes. *Glumes* 4, distichous; I. hyaline, lanceolate; II. orbicular or lanceolate, much shorter than III., variously veined; III. and IV. much the largest, often green and speckled with brown, subequal, or upper longest, unequal-sided, keeled; keel rarely winged, apiculate or strongly cuspidate. *Stamens* 1–3; anthers long or short. *Ovary* suborbicular; style long or short; base not swollen; stigmas 2 capillary. *Fruit* a strongly laterally compressed, smooth nut, sometimes apiculate by the persistent style-base.

Nut-bearing glume winged in upper half of keel; rhizome creeping, elongated ..... *monocephala.*
Nut-bearing glume not winged in upper half of keel:—
Rhizome creeping, elongated ..... *brevifolia.*
Rhizome very short:—
Nut yellow-brown when ripe ..... *triceps.*
Nut black when ripe ..... *cylindrica.*

2382. KYLLINGA MICROCEPHALA Rottb.; F. B. I. vi. 588.
In all the provinces.
A small herb; stem ·3–2 feet high; rhizome 4–10 in. long.

2383. KYLLINGA BREVIFOLIA Rottb.; F. B. I. vi. 588.
In all the provinces.
A small herb; stem ·3–2 feet high; rhizome 4–10 in. long.

2384. KYLLINGA TRICEPS Rottb.; F. B. I. vi. 587.
In most of the provinces.
A small herb, ·3–1 foot high.

2385. KYLLINGA CYLINDRICA Nees; F. B. I. vi. 588.
Chota Nagpur, Parasnath; Chittagong.
A small herb, ·3–1 foot high.

1033. Pycreus Beauv.

Perennial, rarely annual, glabrous herbs, with rootstock creeping or 0; *leaves* towards base of stem, sometimes reduced to sheaths. *Spikelets* in globose or umbelled heads or spikes; involucrate bracts 1 or more, foliaceous, with bracteoles under the secondary divisions of the inflorescence; rachilla of spikelets persistent, not disarticulating towards the base, sometimes with membranous wings derived from persisting glume-bases. *Glumes* distichous, the two lowest empty, those above 2-sexual, all nearly equal, deciduous from below upwards, the uppermost 1–3 sterile or empty; hypogynous scales or bristles 0. *Stamens* 1–2; anthers linear or oblong. *Ovary* laterally compressed; style rather short; stigmas 2. *Fruit* a strongly laterally compressed nut.

Outer superficial cells of the nut longitudinally oblong:—
Spikelets ·1 in. wide, pale straw-coloured ..... *stramineus.*
Spikelets ·2 in. wide, dark straw-coloured ..... *latespicatus.*
Outer superficial cells of the nut subquadrate, hexagonal:—
Stem decumbent and leafy in its lower part ..... *sanguinolentus.*
Stem erect, leafy only at the very base:—
* Stamens 2 or 1; stems short, slender, usually tufted; roots fibrous:—
Nut obovate; stamen usually one only ..... *nitens.*
Nut ellipsoid or oblong; stamens 2:—
Nut apiculate:—
Glumes close-set ..... *capillaris.*
Glumes loosely imbricate ..... *capillaris* var. *stricta.*
Nut truncate:—
Nut with the faces concave:—
Glumes close-set ..... *polystachyus.*
Glumes loosely imbricate ..... *ferrugineus.*
Nut with faces concave or very flat ..... *sulcinux.*
Stamens 3; stems rather stout; rhizome generally elongated *angulatus.*

2386. PYCREUS STRAMINEUS Clarke; F. B. I. vi. 589.
E. Bengal, Mymensingh; Orissa.
A slender herb.

2387. PYCREUS LATESPICATUS Clarke; F. B. I. vi. 590.
Chota Nagpur; W. Bengal.
A slender herb.

2388. PYCREUS SANGUINOLENTUS Nees; F. B. I. vi. 590. *Cyperus cruentus* F. I. i. 196.
N. Bengal; C. Bengal; E. Bengal.
A slender herb, with creeping rootstock.

2389. PYCREUS NITENS Nees; F. B. I. vi. 591. *Cyperus punctatus* F. I. i. 193.
In all the provinces.
An annual herb, with short, tufted stems.

2390. PYCREUS CAPILLARIS Nees; F. B. I. vi. 591. *Cyperus capillaris* F. I. i. 194.
Chota Nagpur.
A slender herb, with tufted stems.

2390/2. Var. STRICTA Clarke; F. B. I. vi. 592. *Cyperus strictus* F. I. i. 200.
Chota Nagpur; Chittagong.
A slender herb, with tufted stems.

2391. PYCREUS POLYSTACHYUS Beauv.; F. B. I. vi. 592. *Cyperus polystachyus* F. I. i. 193.
C. Bengal; Sundribuns.
A tufted herb.

2392. PYCREUS FERRUGINEUS Clarke; F. B. I. vi. 593.
Chittagong.
A tufted herb.

2393. PYCREUS SULCINUX Clarke; F. B. I. vi. 593.
N. Bengal, Duars; E. Bengal, Mymensingh.
A tufted herb.

2394. PYCREUS ANGULATUS Nees; F. B. I. vi. 593.
N. Bengal.
A stout herb.

1034. Juncellus Clarke.

Perennial or annual, glabrous herbs; *leaves* mostly towards the base of the stem. *Spikelets* in globose or umbelled heads or spikes; involucrate bracts 1 or more, leafy, with bracteoles under the secondary divisions of the inflorescence; rachilla of spikelets persistent, not disarticulating towards the base, sometimes with membranous wings derived from the persisting glume-bases. *Glumes* distichous, the two lowest empty, those above 2-sexual, all nearly equal, deciduous from below upwards, the uppermost 1 or 2 sterile or empty; hypogynous scales or bristles 0. *Stamens*

1–2; anthers linear or oblong. *Ovary* ovoid; style distinct; stigmas 2. *Fruit* a plano-convex, dorsally compressed nut.

Stem with an umbellate inflorescence ..... *inundatus.*
Stem with a capitate inflorescence ..... *pygmæus.*

2395. JUNCELLUS INUNDATUS Clarke; F. B. I. vi. 595. *Cyperus inundatus* F. I. i. 201; E. D. C. 2601.
C. Bengal; Sundribuns.
A stout herb. *Vernac.* Pati.

2396. JUNCELLUS PYGMÆUS Clarke; F. B. I. vi. 596. *Cyperus squarrosus* F. I. i. 190.
In all the provinces.
A dwarf, annual herb.

1035. Cyperus Linn.

Perennial, rarely annual, glabrous herbs; rootstock creeping, short or long, or 0; *leaves* all towards base of stem, or sometimes a few cauline, occasionally the leaves reduced to sheaths. *Spikelets* in solitary or umbelled heads or spikes of linear or oblong spikelets; with one or more leafy, involucrate bracts, and with bracteoles under the secondary divisions of the inflorescence; rachilla persistent, not disarticulating towards the base, sometimes with membranous wings derived from the persisting glume-bases. *Glumes* distichous; the lowest two empty, those above 2-sexual, all nearly equal, deciduous from below upwards, the uppermost 1–3 sterile or empty; hypogynous scales or bristles 0. *Stamens* 3, rarely 2; anthers linear or oblong. *Ovary* compressed; style short or long or obsolete; stigmas 3, rarely 2. *Fruit* a trigonous or triquetrous nut.

Floating in still water; nut corky below :—
Inflorescence capitate; styles long, undivided or obscurely 3–2-toothed stamens 3–2 ..... *Cephalotes.*
Inflorescence umbellate; style branches linear-lanceolate; stamens 3 *platystylis.*

Rooting in soil or mud; nut not corky at base; inflorescence usually umbellate, very rarely capitate; style branches linear :—
*Spikelets digitate or clustered, not spicate or racemose :—[p. 1139]
†Annuals, or if perennial (*C. Haspan*) the roots fibrous, the rhizome not woody, and the stamens often 2; inflorescence umbellate, or if reduced to a single head the stamens usually 1, rarely 2 :—[p. 1139]

Glumes more or less mucronate; stems slender:—
Mucro of glume erect; nut less than half as long as body of glume; stamen 1; stems slender ..... *amabilis.*
Mucro of glume recurved; nut half as long as body of glume; stamens 2–1 ..... *cuspidatus.*
Glumes not mucronate:—
Nut marble-white, plano-convex, very obtuse; annual, stems slender; inflorescence always umbellate; stamen 1, rarely 2 *flavidus.*
Nut brownish, trigonous, rounded at top:—
Nut nearly as long as obovate-truncate glume; annual, stems medium; umbels sometimes reduced to a single head; stamen 1, rarely 2 ..... *difformis.*
Nut considerably shorter than glume:—
Glumes subtriangular at tip; annual, stems slender; umbels contracted or reduced to a single head; stamen 1, rarely 2 ..... *silletensis.*
Glumes obtuse; stems medium or slender; flowering in first season, but often biennial or perennial, with a short or long rhizome; inflorescence always umbellate; stamens 2–3 ..... *Haspan.*
†Perennials with a woody rootstock; stamens usually 3:—[p. 1138]
Inflorescence of one head:—
Rhizome very short; rootlets wiry; stems slender, close-set, nodose at base:—
Stems closely 1-seriate; spikelets 8–12 in a lax head; nut black; style nearly as long as nut ..... *niveus.*
Stems cæspitose, with one dense, globose, white head; nut with white reticulations; style much shorter than nut; stamen 1 ..... *leucocephalus.*
Rhizome creeping; rootlets thick; stems rather stout, solitary, distant, subterete above ..... *arenarius.*
Inflorescence decompoundly umbellate:—
Glumes in fruit rather distant ..... *diffusus.*
Glumes in fruit tightly packed ..... *pubisquama.*
ikelets spicately, rarely subracemosely disposed; stamens usually
-[p. 1138]
achilla of spikelets not prominently or at all winged:—[p. 1140]
Annuals with tufted stems:—[p. 1140]
Glumes with midrib prolonged into a distinct mucro or bristle; nut about one-third the length of the glume:—[p. 1140]
Glumes boat-shaped, keel acute, excurrent as a hardly

1–2; anthers linear or oblong. *Ovary* ovoid; style distinct; stigmas 2. *Fruit* a plano-convex, dorsally compressed nut.

Stem with an umbellate inflorescence ..... *inundatus.*
Stem with a capitate inflorescence ..... *pygmæus.*

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C. Bengal; Sundribuns.
A stout herb. *Vernac.* Pati.

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Floating in still water; nut corky below :—
Inflorescence capitate; styles long, undivided or obscurely 3–2-toothed stamens 3–2 ..... *Cephalotes.*
Inflorescence umbellate; style branches linear-lanceolate; stamens 3 ..... *platystylis.*

Rooting in soil or mud; nut not corky at base; inflorescence usually umbellate, very rarely capitate; style branches linear :—
*Spikelets digitate or clustered, not spicate or racemose :—[p. 1139]
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Mucro of glume erect; nut less than half as long as body of glume; stamen 1; stems slender ..... *amabilis.*
Mucro of glume recurved; nut half as long as body of glume; stamens 2–1 ..... *cuspidatus.*
Glumes not mucronate:—
Nut marble-white, plano-convex, very obtuse; annual, stems slender; inflorescence always umbellate; stamen 1, rarely 2 *flavidus.*
Nut brownish, trigonous, rounded at top:—
Nut nearly as long as obovate-truncate glume; annual, stems medium; umbels sometimes reduced to a single head; stamen 1, rarely 2 ..... *difformis.*
Nut considerably shorter than glume:—
Glumes subtriangular at tip; annual, stems slender; umbels contracted or reduced to a single head; stamen 1, rarely 2 ..... *silletensis.*
Glumes obtuse; stems medium or slender; flowering in first season, but often biennial or perennial, with a short or long rhizome; inflorescence always umbellate; stamens 2–3 ..... *Haspan.*
†Perennials with a woody rootstock; stamens usually 3:—[p. 1138]
Inflorescence of one head:—
Rhizome very short; rootlets wiry; stems slender, close-set, nodose at base:—
Stems closely 1-seriate; spikelets 3–12 in a lax head; nut black; style nearly as long as nut ..... *niveus.*
Stems cæspitose, with one dense, globose, white head; nut with white reticulations; style much shorter than nut; stamen 1 ..... *leucocephalus.*
Rhizome creeping; rootlets thick; stems rather stout, solitary, distant, subterete above ..... *arenarius.*
Inflorescence decompoundly umbellate:—
Glumes in fruit rather distant ..... *diffusus.*
Glumes in fruit tightly packed ..... *pubisquama.*
‡ikelets spicately, rarely subracemosely disposed; stamens usually
ii -[p. 1138]
ex tachilla of spikelets not prominently or at all winged:—[p. 1140]
‡Annuals with tufted stems:—[p. 1140]
¶Glumes with midrib prolonged into a distinct mucro or bristle; nut about one-third the length of the glume:—[p. 1140]
Glumes boat-shaped, keel acute, excurrent as a hardly

recurved mucro; nut obovoid, obtuse; spikes short, of 3–10 spikelets ..... *compressus.*

Glumes ovate-lanceolate, many-striate, acuminate into a recurved bristle; nut oblong or narrowly obovoid; umbel nearly simple or reduced to one head ..... *aristatus.*

¶Glumes muticous or scarcely apiculate; nut nearly as long as glume; spikelets long, spicate or subracemose; stamens 2–3 [p. 1139] ..... *Iria.*

§Perennials with woody rhizome and often long stolons:—[p. 1139]

Spikelets compressed:—

Secondary umbels condensed into rigid square or oblong, compound spikes ..... *Babakensis.*

Secondary umbels corymbose:—

Corymbs close-set:—

Rachis of spike scabrous-pilose ..... *pilosus.*

Rachis of spike nearly glabrous ... *pilosus* var. *polyantha.*

Corymbs lax:—

Rachis of spike glabrous ..... *procerus.*

Rachis of spike scabrous-pilose *procerus* var. *lasiorrhachis.*

Spikelets spicate:—

Leaves long (over 6 in.) often equalling the stem:—

Rhizome very short, woody ..... *Thomsoni.*

Rhizome stoloniferous:—

Mature spikelets patent; glumes obtuse ..... *distans.*

Mature spikelets collapsing, tufted; glumes often minutely mucronate ..... *nutans.*

Leaves short (6 in. or less), rarely as much as half the length of the stem; stem terete ..... *malaccensis.*

‡Rachilla of spikelets distinctly winged:—[p. 1139]

⊙Leaves short, rarely half as long as the stem:—[p. 1141]

+Glumes approximate, closely imbricate; stolons long; spikelets spicate:—[p. 1141]

Stems slender, grass-like; stolons very slender; spikelets pale straw-coloured ..... *scariosus.*

Stems stout, rush-like; stolons stout:— *tylis.*

÷Spikelets pale straw-coloured; bracts very short, usually half as long as the umbel-rays:—[p. 1141] 139]

Bracts subturgid and ovate at base, margins curved; stem when dry almost always with distinct false joints about half an inch apart ..... *articulatus.*

Bracts not ovate at base; margins when dry recurved; stem without any false joints ..... *tegetiformis.*

÷Spikelets rusty-brown; bracts at least half as long as umbel-rays, often longer, not ovate at base; stem usually somewhat articulate when dry [p. 1140] .....*corymbosus.*

+Glumes remote, in fruit scarcely imbricating; stolons 0; rhizome short, woody; wings of rachilla caducous:—[p. 1140]

Spikelets spicate:—

Stem slender, grass-like; wing of rachilla narrow, hyaline *macer.*

Stem stout, rush-like; wing of rachilla strong.....*tegetum.*

Spikelets compressed; stem slender for its height, grass-like; wing of rachilla strong .....*Zollingeri.*

⊙Leaves long, almost always more than half as long as stem or longer; bracts always long:—[p. 1140]

Rhizome stoloniferous:—

Stem at base nodosely thickened, and suddenly contracted into a wiry rhizome .....*rotundus.*

Stem at base bulbous, woody .....*tuberosus.*

Rhizome not stoloniferous:—

Anthers not crested:—

Wings of rachilla persistent:—

Spikes digitate, hardly peduncled; spikelets dull-yellow or -brown.....*radiatus.*

Spikes, at least some, peduncled; spikelets bright-yellow or -brown:—

Ripe spikelets ascending .....*exaltatus.*

Ripe spikelets rigidly patent.....*exaltatus* var. *dives.*

Wings of rachilla deciduous .....*digitatus.*

Anthers with crests half as long as their cells or longer *platyphyllus.*

2397. CYPERUS CEPHALOTES Vahl; F. B. I. vi. 597. *C. monocephalus* F. I. i. 188. *Kyllinga monocephala* E. D. K. 47.

N. Bengal.

A glabrous sedge, floating in tanks. *Beng.* Gothubi, nirtroba.

2398. CYPERUS PLATYSTYLIS R. Br.; F. B. I. vi. 598.

Behar; Tirhut; N. Bengal; E. Bengal; Chittagong.

A glabrous sedge, floating in tanks.

2399. CYPERUS AMABILIS Vahl; F. B. I. vi. 598.

Chota Nagpur.

A glabrous, cæspitose sedge, 2–8 in. high.

2400. CYPERUS CUSPIDATUS H. B. & K.; F. B. I. vi. 598.

In most of the provinces.

A glabrous, small sedge; stems ·25–6 in. high.

2401. Cyperus flavidus Retz; F. I. i. 200; F. B. I. vi. 600.

In all the provinces.

A slender, annual sedge, living about three months, common in rice-fields.

2402. Cyperus difformis Linn.; F. I. i. 195; F. B. I. vi. 599.

In all the provinces.

A glabrous sedge, 4–20 in. high. *Beng.* Behua.

2403. Cyperus silletensis Nees; F. B. I. vi. 600.

E. Bengal.

A slender or medium sedge, 4–12 in. high.

The F. B. I. gives Bengal as a locality for *C. pulcherrimus*, on the authority of specimens collected by Wallich. What Wallich *says*, however, is "Bengal Inf.?" and as no one else has collected the plant in Bengal, it is possibly not a Bengal species. It is very near *C. silletensis*; dried examples are easily distinguished by the crisped incurved top of the glume.

2404. Cyperus Haspan Linn.; F. I. i. 210; F. B. I. vi. 600; E. D. C. 2600.

In many of the provinces.

A glabrous, slender, or medium sedge; rhizome long, creeping, but plant often flowering in first season; common, especially in dibbled rice-fields.

2405. Cyperus niveus Retz; F. I. i. 191; F. B. I. vi. 601; E. D. C. 2610.

Chota Nagpur; N. Bengal; C. Bengal.

A glabrous sedge, the woody rhizome made up almost wholly of the nodose bases of the 1-seriate stems. *Santal.* Birmutha.

2406. Cyperus leucocephalus Retz; F. B. I. vi. 602.

Behar; W. Bengal.

A glabrous sedge; stems nodose at base, tufted ms 3 *stylis.* isually short, woody rootstock.

2407. Cyperus arenarius Retz; F. B. I. vi. 602.

Orissa, sea-coast at Poorce.

A glabrous sedge, with subterete, rather distant stems on a slender, divided, creeping rootstock.

2408. Cyperus diffusus Vahl; F. B. I. vi. 603.

N. Bengal; E. Bengal; Chittagong.
A glabrous sedge; stems 8–30 in.; rhizome short; roots wiry.

2409. CYPERUS PUBISQUAMA Steud.; F. B. I. vi. 604.
Chittagong.
A glabrous sedge; stems 2–3 feet high.

2410. CYPERUS COMPRESSUS Linn.; F. I. i. 194; F. B. I. vi. 605; E. D. C. 2584.
In most of the provinces.
A glabrous sedge, usually small; stems tufted, 2–16 in. high. *Beng.* Chancha.

2411. CYPERUS ARISTATUS Rottb.; F. I. i. 190; F. B. I. vi. 606.
Chota Nagpur; C. Bengal.
A small sedge, with small, simple umbels or solitary heads; glumes ending in a long, recurved bristle.

2412. CYPERUS IRIA Linn.; F. I. i. 201; F. B. I. vi. 606; E. D. C. 2603.
In most of the provinces.
A glabrous, short-lived sedge, in rice-fields; stems cæspitose, 4–20 in. high. *Beng.* Bara chancha.

2413. CYPERUS BABAKENSIS Steud.; F. B. I. vi. 610.
E. Bengal, Mymensingh; Tirhoot.
A large, glabrous sedge.

2414. CYPERUS PILOSUS Vahl; F. B. I. vi. 609.
Chota Nagpur; W. Bengal; C. Bengal; E. Bengal.
A tall sedge, glabrous except the rachilla of spikes.

2414/2. Var. POLYANTHA Clarke; F. B. I. vi. 610.
E. Bengal, Mymensingh.
A tall, glabrous sedge.

2415. CYPERUS PROCERUS Rottb.; F. I. i. 203; F. B. I. vi. 610.
C. Bengal; E. Bengal; Sundribuns.
A tall, glabrous sedge.

415/2. Var. LASIORRHACHIS Clarke; F. B. I. vi. 610.
Chota Nagpur; W. Bengal.
A tall sedge, glabrous except the rachilla of spikes.

5. CYPERUS THOMSONI Boeck.; F. B. I. vi. 608.
N. Bengal; E. Bengal.
A stout, glabrous sedge; stems 12–20 in. high.

2417. CYPERUS DISTANS Linn. f.; F. I. i. 207; F. B. I. vi. 607.
C. Bengal; E. Bengal; Chittagong.

A glabrous sedge; stems usually 1–3 feet high. *Beng.* Pani-malanga.

2418. CYPERUS NUTANS Vahl; F. B. I. vi. 607.
In most of the provinces.
A large sedge, usually 2–4 feet high.

2419. CYPERUS MALACCENSIS Lamk; F. B. I. vi. 608; E. D. C. 2609. *C. incurvatus* F. I. i. 196. *C. Pangorei* F. I. i. 202.
C. Bengal; E. Bengal; Sundribuns.
A tall, glabrous, rush-like sedge; stems 1·5–3 feet high. *Beng.* Chumati pati.

2420. CYPERUS SCARIOSUS R. Br.; F. B. I. vi. 612; E. D. C. 2617. *C. pertenuis* F. I. ii. 198.
Sundribuns.
A slender, glabrous sedge, 1·5–3 feet high. *Vernac.* Nágar-motha.

2421. CYPERUS ARTICULATUS Linn.; F. B. I. vi. 611. *C. nudus* F. I. i. 187 (not 209).
C. Bengal; E. Bengal; Orissa.
A tall, glabrous, rush-like sedge; stems 3–6 feet high.

2422. CYPERUS TEGETIFORMIS Roxb.; F. B. I. vi. 612; E. D. C. 2622. *C. nudus* F. I. i. 209 (not 187).
C. Bengal; E. Bengal; Sundribuns; Chittagong.
A tall, glabrous, rush-like sedge; stems 1·5–3 feet high. *Beng.* Gola-methi; *Santal.* Sura.

2423. CYPERUS CORYMBOSUS Rottb.; F. B. I. vi. 612; E. D. C. 2585. *C. seminudus* F. I. i. 187.
Tirhut; W. Bengal; C. Bengal; E. Bengal.
A tall, glabrous, rush-like sedge; stems 2–3 feet high. *Beng.* Gola-methi.

2424. CYPERUS MACER Clarke; F. B. I. vi. 613.
Chittagong.
A slender, glabrous sedge; stems 2–3 feet high.

2425. CYPERUS TEGETUM Roxb.; F. I. i. 208; F. B. I. vi. [illegible] E. D. C. 2624.
Chota Nagpur; Behar; N. Bengal.
A glabrous, rush-like sedge; stems 3 feet high. *Beng.* Mudar-ktai.

2426. CYPERUS ZOLLINGERI Steud.; F. B. I. vi. 613.
N. Bengal; E. Bengal; Chittagong.
A glabrous sedge; stems 1·5–3 feet high.

2427. CYPERUS ROTUNDUS Linn.; F. I. i. 197; F. B. I. vi. 614; E. D. C. 2612.

In all the provinces.

A slender, glabrous sedge; stolons thickening into black, woody, ovoid tubes; a very troublesome weed. *Beng.* Motha; *Oraon* Utru-banda; *Santal.* Tandi, suraj; *Mundari* Batha-bijir.

2428. CYPERUS TUBEROSUS Rottb.; F. I. i. 199; F. B. I. vi. 616.

C. Bengal.

A slender, glabrous sedge, much resembling the preceding, but with more slender umbel-rays and spikelets.

2429. CYPERUS RADIATUS Vahl; F. B. I. vi. 617. *C. verticillatus* F. I. i. 206.

N. Bengal; C. Bengal; E. Bengal; Sundribuns; Chittagong.

A glabrous sedge; stems 1–3 feet high. *Beng.* Burethi.

2430. CYPERUS EXALTATUS Retz; F. B. I. vi. 617; E. D. C. 2597. *C. umbellatus* F. I. i. 205. *C. alopecuroides* F. I. i. 208.

In most of the provinces.

A large, glabrous sedge; stems 3–6 feet high.

2430/2. Var. DIVES Clarke; F. B. I. vi. 617.

Sundribuns; Chittagong.

A large, glabrous sedge; stems 4–6 feet high.

2431. CYPERUS DIGITATUS Roxb.; F. I. i. 205; F. B. I. vi. 618.

E. Bengal.

A glabrous sedge; stem 1·5–4·5 feet high.

2432. CYPERUS ELATUS Linn. var. ? MACRONUX Clarke; F. B. I. vi. 618.

Tippera.

A tall sedge, 5–6 feet high; keel of leaves beneath scabrous, cutting.

1036. Mariscus Vahl.

Perennial, rarely annual herbs; rootstock creeping or 0; *leaves* few or all towards the base of the stem, sometimes a few cauline. *Spikelets* in globose or umbelled heads or spikes; involucrate bracts 1 or more, foliaceous, with bracteoles under the secondary divisions of the inflorescence; rachilla of spikelets disarticulating above the 2 lowest glumes. *Glumes* distichous;

lowest glume broadly ovate, many-veined, persistent on the rachilla, the next above shorter, broader, also many-veined, often deciduous with the spikelet; upper glumes 1 or more, much longer, 2-sexual, 3-veined on the keel. *Stamens* 3. *Ovary* ovoid; style short; stigmas 3, capillary. *Fruit* a trigonous nut.

Base of stem oblong, thickened by the turgid, membranous, coloured sheaths; stolons 0; umbels contracted into a dense head.....*Dregeanus.*
Base of stem not oblong or thickened by leaf-sheaths :—
Rachilla of spikelet only breaking up at the node above the two lowest empty glumes :—
Annual, slender; glumes elliptic, with a long, recurved mucro; spikelets bearing 4 or more nuts .....*squarrosus.*
Perennials :—
Umbels simple; lowest glume of spikelet very acute, aristate; spikelets bearing 1–2, rarely 3 or 4 nuts :—
Rhizome emitting slender stolons :—
Spikes dense; spikelets all 1-flowered .....*paniceus.*
Spikes loose; spikelets 1–3-, but usually 2-flowered *tenuifolius.*
Rhizome short; stolons 0; spikelets in fruit patent at right angles :—
Spikelets with 2–4 black nuts; umbels contracted into 1 head *cyperinus* var. *bengalensis.*
Spikelets with 1–2 chestnut-brown nuts; umbels 1–5 in. in diameter.....*Sieberianus.*
Umbels compound; glumes all obtuse; tall plants with somewhat spongy stems and leaves :—
Spikelets oblong or subovoid, bearing 3–6 nuts .....*albescens.*
Spikelets subulate, bearing 4–14 nuts .....*microcephalus.*
Rachilla of spikelets, which bear several nuts, finally breaking up into as many joints, each carrying 1 nut; perennial; stolons 0; rhizome very short .....*ferax.*

2433. MARISCUS DREGEANUS Kunth; F. B. I. vi. 620. *Cyperus dubius* F. I. i. 189.
C. Bengal, rare.
A glabrous herb, 4–16 in. high; stems rather sl as 3 *stylis.* sually
Beng. Chhota-guthubi.

2434. MARISCUS SQUARROSUS Clarke; F. B. I. vi. 623.
In most of the provinces.
A glabrous, tufted herb; stems 3–8 in. high.

2435. MARISCUS PANICEUS Vahl; F. B. I. vi. 620.
C. Bengal.
A glabrous, slender, stoloniferous herb; stems 4–12 in.

2436. MARISCUS TENUIFOLIUS Schrad.: F. B. I. vi. 622.
Behar.
A glabrous, slender, stoloniferous herb; stems 6–12 in.

2437. MARISCUS CYPERINUS Vahl var. BENGALENSIS Clarke; F. B. I. vi. 621.
N. Bengal.
A stoutish herb; stems 1–2 feet high.

2438. MARISCUS SIEBERIANUS Nees; F. B. I. vi. 622. *Kyllinga umbellata* F. I. i. 182.
N. Bengal; C. Bengal; E. Bengal.
A stoutish, glabrous herb; stems 1–2·5 feet high. *Beng.* Bara-Guthubi.

2439. MARISCUS ALBESCENS Gaud.; F. B. I. vi. 623.
Sundribuns; Orissa.
A stout, coarse-leaved herb; stems 1–3 feet high.

2440. MARISCUS MICROCEPHALUS Presl.; F. B. I. vi. 624. *Cyperus spinulosus* F. I. i. 203.
In most of the provinces.
A stout herb; stems 1–3 feet high.

2441. MARISCUS FERAX Clarke; F. B. I. vi. 624
C. Bengal; E. Bengal.
A glabrous herb; stems 12–20 in. high.

1037. Courtoisia Nees.

Herbs, with erect, simple stems, leafy only near the base; *leaves* grass-like. *Spikelets* compressed, in globose spikes; rachilla disarticulating above the two lowest glumes. *Glumes* persistent; I. and II. empty; 1–3 above them hermaphrodite, nut-bearing, winged on the keel; uppermost sterile or empty. *Stamens* 1; anthers oblong. *Ovary* ovoid; style short, persistent; stigmas 2, linear, longer than style. *Fruit* a trigonous nut, with acute apex, continuous with the style.

2442. COURTOISIA CYPEROIDES Nees; F. B. I. vi. 625. *Kyllinga cyperoides* F. I. i. 182.
Chota Nagpur; N. Bengal; C. Bengal; E. Bengal.
A glabrous, annual sedge; stems tufted, 3–16 in.

1038. Eleocharis R. Br.

Glabrous erbs; stems tufted, simple, erect, embraced below by one or more cylindric, membranous, truncate sheaths; *leaves* obsolete, or rarely a herbaceous or membranous limb on the sheath. *Spikelets* solitary, terminal, ovoid or cylindric, many-flowered. *Glumes* imbricate around the rachilla, membranous or coriaceous, lowest usually empty, bract-like, but not longer than the spikelet, uppermost empty, the remainder 2-sexual; hypogynous bristles 8 or fewer, rarely absent, retrorsely scabrous or spinulose. *Stamens* 3–1; anthers linear or linear-oblong, uncrested, muticous or with an acicular tip. *Ovary* orbicular-ovoid; style with a swollen base; stigmas 2–3, filiform or flattened. *Fruit* a plano-convex or trigonous nut, crowned by the persistent, much-swollen, pyriform, conical or depressed style-base.

Glumes subrigid, smooth or striate but not keeled, concolorous; stems usually stout; style 2–3-fid :—

Nut smooth; glumes oblong, obtuse; stems terete, when dry transversely septate ..... *plantaginea.*

Nut longitudinally striate; stems subtriquetrous under the spikelet, not septate :—

Spikelet acute; glumes ovate, subacute ..... *fistulosa.*

Spikelet obtuse; glumes obovate, subtruncate ..... *spiralis.*

Glumes membranous, usually 1–3-nerved, with a green keel; stems usually slender :—

Style 2-fid; nut compressed :—

Roots fibrous; rhizome short or 0 :—

Bristles glistening white ..... *atropurpurea.*

Bristles brown or rusty ..... *capitata.*

Rhizome creeping; bristles brown-rusty ..... *palustris.*

Style 3-fid; nut trigonous or obovoid; roots fibrous :—

Nut smooth; spikelets dense; bristles 6, or 5 or 4, brown; rhizome 0 *congesta.*

Nut coarsely, prominently cancellate; spikelets small, few-flowered; bristles 6, pale; rhizome 0, or distinct ..... *Chætaria 3 stylis.*

2443. Eleocharis plantaginea R. Br.; F. B. I. vi. 625. *Scirpus plantagineus* F. I. i. 212. *S. tumidus* F. I. i. 215.

In most of the provinces.

A slender or stout, rush-like sedge, 1–3 feet high.

2444. Eleocharis fistulosa Schult.; F. B. I. vi. 626. *Scirpus acutangulus* F. I. i. 213. *S. medius* F. I. i. 213.

Chota Nagpur; N. Bengal; C. Bengal.
A stout, rush-like sedge, 1–3 feet high.

2445. ELEOCHARIS SPIRALIS R. Br.; F. B. I. vi. 627. *Scirpus spiralis* F. I. i. 212.
Sundribuns.
A stout, rush-like sedge, 2–4 feet high.

2446. ELEOCHARIS ATROPURPUREA Kunth; F. B. I. vi. 627. *Scirpus atropurpureus* F. I. i. 219.
Behar; Tirhut; N. Bengal.
A slender herb, 2–6 in. high.

2447. ELEOCHARIS CAPITATA R. Br.; F. B. I. vi. 627. *Scirpus capitatus* F. I. i. 215.
Behar; W. Bengal; C. Bengal.
A slender herb, 2–14 in. high.

2448. ELEOCHARIS PALUSTRIS R. Br.; F. B. I. vi. 628.
Tirhut; Behar; C. Bengal.
A medium or stoutish herb, 4–20 in. high.

2449. ELEOCHARIS CONGESTA Don; F. B. I. vi. 630.
Chota Nagpur.
A slender herb, 4–16 in. high.

2450. ELEOCHARIS CHÆTARIA Roem. & Schult.; F. B. I. vi. 629. *Cyperus setaceus* F. I. i. 185.
N. Bengal, Duars; Cooch Behar.
A very slender herb; stems usually 1–4 in., occasionally 6–10 in. high.

1039. Fimbristylis Vahl.

Annual or perennial herbs; *leaves* towards the base of the stem, rarely reduced to sheaths, narrowly linear or filiform. *Spikelets* terete, angular or compressed, many-flowered, bracteate, in a terminal, umbellate or capitate inflorescence; bracts long or short. *Glumes* imbricate spirally round the rachilla, or the lower glumes [illegible]hous, glabrous, very rarely pubescent, deciduous, the lower [illegible]d sometimes the upper empty, the others 2-sexual; hypobristles 0. *Stamens* 1–3; filaments flat; anthers linear, [illegible]Styler acute or subulately tipped. *Ovary* obovoid, somewhat flattened or trigonous; style long, base dilated, flattened or slender, glabrous, pubescent, or villous, wholly deciduous; stigmas 2 in the flattened, 3 in the trigonous ovaries, usually filiform and

clongate. *Fruit* an obovoid, biconvex or trigonous, very rarely cylindric nut, the deciduous style leaving no scar on the nut.

Lower glumes of the spikelet distichous or subdistichous; upper fertile glumes spirally disposed; spikelets not clustered :—

Spikelets pale; nut large, triquetrous; base much narrowed *monostachya.*

Spikelets brown; nut small, obovoid, base not much narrowed :—

Nut subacutely three-cornered; glumes submucronate with scarious margins, often glandular upwards; stamens usually 2 .....*fusca.*

Nut obtusely three-cornered; glumes subobtuse, densely minutely hairy; stamens often 3.....*disticha* var. *Kurzii.*

Lower glumes of the spikelet imbricate on all sides like the upper :—

*Style 2-fid; nut 2-convex :—[p. 1151]

Stems with only one spikelet, or if more than one (*F. polytrichoides* sometimes) the nut brownish-black :—

Nut linear-oblong, curved, reticulate, straw-coloured ...*tetragona.*

Nut obovoid, obtuse :—

Nut transversely wavy or wrinkled .....*acuminata.*

Nut smooth, reticulate :—

Spikelets not exceeding one-third inch .....*polytrichoides.*

Spikelets about one-half inch long *polytrichoides* var. *halophila.*

Stems with more than one spikelet, or if with only one (often so in *F. schœnoides* and *F. sub-bispicata*) the nut white :—

†Spikelets all solitary, rarely (often so in *F. rigidula*) paired, and then subglobose; or some clustered (occasionally in *F. diphylla* and often in *F. spathacea*), but then (*F. diphylla*) with the nut longitudinally striate on each face or (*F. spathacea*) with the nut dusky :—[p. 1151]

Stems with few, sometimes only one spikelet; glumes obtuse, not incurved at apex; nut smooth, white :—

Spikelets ovoid, ·3–·6 in. long.....*schœnoides.*

Spikelets cylindric, ·8–1 in. long .....*subbispicata.*

Stems with many spikelets (in depauperated specimens casually few or only one spikelet may occur, but then either the glu[illegible]s 3 are acute, mucronate, or aristate; or the nut is longitudi[illegible]*ylis.* striate, or if smooth is dusky; if nut smooth and pale, s[illegible]ally glumes obtuse, then these incurved at apex) :—

Style-base with many long, pendent hairs; glumes shortly aristate, squarrose or subsquarrose; umbel compound *squarrosa.*

Style-base shortly hairy or glabrous :—

Nut conspicuously longitudinally striate :—
Spikelets angular from the acute keels of the glumes *dichotoma.*
Spikelets terete ..... *diphylla.*
Nut smooth :—
Gynophore very prominent, obpyramidal, its tip dilated, distinguishable from the nut..... *podocarpa.*
Gynophore not prominent nor distinguishable from the nut :—
Rhizome horizontal, woody ; spikelets very obtusely ellipsoid or subglobose, many of them paired *rigidula.*
Rhizome very short or 0, or plants annual ; spikelets cylindric or acutely ellipsoid or ovoid, always solitary :—
Glumes acute, not incurved ; spikelets slightly angular from the keeled glumes ; umbels lax :—
Annual ; more or less pubescent ; nut straw-coloured ..... *æstivalis.*
Perennial ; nearly glabrous ; nut finally black *fuscinux.*
Glumes obtuse, incurved ; spikelets subterete ; umbels usually contracted :—
Nut pale ; spikelets always solitary..... *ferruginea.*
Nut dusky ; spikelets sometimes clustered as well as solitary, sometimes subcapitate ..... *spathacea.*

†Spikelets, at least some of them, clustered, never subglobose ; nut transversely waved or smooth, never longitudinally striate, and pale or brownish-yellow, not dusky :—[p. 1150]
Stems with only one head ; spikelets linear, cylindric, grey or whitish ; nut pale, smooth, or obscurely transversely wavy *argentea.*
Stems with clusters of spikelets in subumbellate corymbs :—
Spikelets both solitary and clustered, linear-lanceolate, rusty green ; nut yellow-brown, squamose-tuberculate *Hookeriana.*
Spikelets from 2–6 in a cluster, ellipsoid-oblong, silvery-grey ; nut pale, smooth ..... *sericea.*

*Style 3-fid ; nut more or less trigonous ; sometimes (*F. globulosa*) only the lowest flowers in a spike have the style 3-fid, the others having it 2-fid :—[p. 1150]

‡Spikelets all, or nearly all, solitary :—[p. 1152]

Umbels with few spikelets, never more than 20; nut never trabeculate :—

Glumes navicular, adpressed, ovate-acuminate; spikelets ellipsoid, becoming cylindric-lanceolate, usually 7–9; style longer than the nut :—

Glumes submucronate .....*tenera* var. *oxylepis.*

Glumes not mucronate; leaves obtuse ...*tenera* var. *obtusata.*

Glumes concave, incurved, obtuse; spikelets obtusely cuboid ellipsoid, usually 20, often fewer, sometimes only 1–2; style not exceeding the nut, in the upper flowers 2-fid .....*globulosa.*

Umbels compound and supradecompound, with very many spikelets, 50 to 150 or more; if few (occasionally 5–15 in *F. quinqueangularis*) the nut trabeculate :—

Nut slenderly trabeculate, the outermost cells being transversely oblong; spikelets under ·25 in. long :—

Spikelets ellipsoid-lanceolate, subacute, 6–14-flowered *quinqueangularis.*

Spikelets globose or subcylindric, obtuse, many-flowered *miliacea.*

Nut never trabeculate; spikelets ·25 in. long, or longer :—

Bracts 2; spikelets very slender, under ·1 in. in diameter *complanata.*

Bracts 4–5; spikelets ellipsoid, ·15 in. in diameter *Thomsonii.*

‡Spikelets all, or nearly all, clustered, usually 2–5 to a cluster; glumes ovate-obtuse, with broad, scarious margins [p. 1151] *junciformis.*

2451. FIMBRISTYLIS MONOSTACHYA Hassk.; F. B. I. vi. 649; E. D. F. 283. *Scirpus schœnoides* F. I. i. 221.

In most of the provinces.

A glabrous, tufted herb; stems 2–16 in. *Beng.* Marmari; *Santal.* Nanha bindi mutha.

2452. FIMBRISTYLIS FUSCA Benth.; F. B. I. vi. 649.

W. Bengal.

A slender, glabrous herb; stems 12 in.

2453. FIMBRISTYLIS DISTICHA Boeck. var. KURZII Clarke; F. B. I. vi. 651.

N. Bengal.

A slender, annual herb; stems 4–10 in.

2454. FIMBRISTYLIS TETRAGONA R. Br.; F. B. I. vi. 631.

Chota Nagpur; Behar; Tirhut; N. Bengal.
A glabrous, tufted herb; stems 4–24 in.

2455. FIMBRISTYLIS ACUMINATA Vahl; F. B. I. vi. 631. *Scirpus scaber* F. I. i. 220.
N. Bengal; C. Bengal; E. Bengal.
A slender, glabrous herb; stems 4–12 in.

2456. FIMBRISTYLIS POLYTRICHOIDES Vahl; F. B. I. vi. 632.
C. Bengal; Sundribuns.
A slender, glabrous herb; stems 1·5–8 in.

2456/2. Var. HALOPHILA Kurz; F. B. I. vi. 632.
Sundribuns.
A glabrous herb; stems 8–12 in.

2457. FIMBRISTYLIS SCHOENOIDES Vahl; F. B. I. vi. 634. *Scirpus monostachyus* F. I. i. 219. *S. bispicatus* F. I. i. 220.
In most of the provinces.
A glabrous, tufted herb; stems 4–12 in. *Beng.* Kesarimalanga.

2458. FIMBRISTYLIS SUB-BISPICATA Nees & Meyer; F. B. I. vi. 634.
Orissa, coast; Sundribuns, sea-face.
A glabrous, tufted herb; stems 8–20 in.

2459. FIMBRISTYLIS SQUARROSA Vahl; F. B. I. vi. 635.
In most of the provinces.
A slender annual; stems 2–8 in.

2460. FIMBRISTYLIS DICHOTOMA Vahl; F. B. I. vi. 635. *Scirpus pallescens* F. I. i. 229.
In all the provinces.
A tufted, annual herb; stems 2–10 in.

2461. FIMBRISTYLIS DIPHYLLA Vahl; F. B. I. vi. 636. *Scirpus diphyllus* F. I. i. 227. *S. miliaceus* F. I. i. 224. *S. brevifolius* F. I. i. 226. *S. arvensis* F. I. i. 224. *S. glomeratus* F. I. i. 224.
In all the provinces.
A tufted herb; stems 1–24 in. *Beng.* Bara nirbishi.

2462. FIMBRISTYLIS PODOCARPA Nees; F. B. I. vi. 638.
Chota Nagpur; E. Bengal.
A tufted herb; stems 12–24 in.

2463. FIMBRISTYLIS RIGIDULA Nees; F. B. I. vi. 640.
E. Bengal.
A perennial herb; stems 4–16 in., closely 1-seriate on a woody rhizome.

2464. Fimbristylis æstivalis Vahl; F. B. I. vi. 637. *Scirpus æstivalis* F. I. i. 227.
In all the provinces.
An annual, pubescent or puberulous herb; stems 2–10 in.

2465. Fimbristylis fuscinux Clarke; F. B. I. vi. 638.
N. Bengal, Duars.
A tufted herb; stems 8–20 in.

2466. Fimbristylis ferruginea Vahl; F. B. I. vi. 638. *Scirpus globulosus* F. I. i. 217. *S. tristachyus* F. I. i. 221.
In all the provinces.
A tufted herb; stems 8–30 in.

2467. Fimbristylis spathacea Roth; F. B. I. vi. 640. *Scirpus strictus* F. I. i. 226.
Orissa.
A rigid, tufted herb; stems 4–16 in.

2468. Fimbristylis argentea Vahl; F. B. I. vi. 640. *Scirpus argenteus* F. I. i. 223.
W. Bengal; C. Bengal.
A slender, tufted annual; stems 4–8 in.

2469. Fimbristylis Hookeriana Boeck.; F. B. I. vi. 641.
Chota Nagpur.
A slender, tufted annual; stems 4–10 in.

2470. Fimbristylis sericea R. Br.; F. B. I. vi. 641.
Orissa, coast.
A rigid, perennial herb; stems 4–8 in.

2471. Fimbristylis tenera Roem. & Sch. var. oxylepis Steud.; F. B. I. vi. 642.
C. Bengal.
A slender, tufted herb; stems 8–12 in.

2471/2. Var. obtusata Clarke; F. B. I. vi. 642.
C. Bengal.
A slender, tufted herb, 8–12 in. high.

2472. Fimbristylis globulosa Kunth; F. B. I. vi. 644.
C. Bengal.
A glabrous, tufted herb; stems 8–16 in.

2473. Fimbristylis quinqueangularis Kunth; F. B. I. vi. 644. *Scirpus quinqueangularis* F. I. i. 229. *S. pentagonus* F. I. i. 218.
In all the provinces.
A glabrous, variable annual; stems 8–24 in.

2474. FIMBRISTYLIS MILIACEA Vahl; F. B. I. vi. 644. *Scirpus tetragonus* F. I. i. 228.
In all the provinces.
A glabrous, annual herb; stems 8–24 in. *Beng.* Bara javani.

2475. FIMBRISTYLIS COMPLANATA Link; F. B. I. vi. 646.
C. Bengal; Sundribuns.
A glabrous herb; stems 8–24 in., flattened under the umbel.

2476. FIMBRISTYLIS THOMSONII Boeck.; F. B. I. vi. 646.
Chota Nagpur; N. Bengal, Duars.
A glabrous herb; stems 8–24 in.

2477. FIMBRISTYLIS JUNCIFORMIS Kunth; F. B. I. vi. 647.
Tirhut; N. Bengal; Chota Nagpur.
A glabrous herb; stems 4–16 in. *Santal.* Bindi muthi.

1040. Echinolytrum Desv.

Annual herbs, densely tufted, small, with capillary root-fibres; *leaves* shorter than the stem, capillary; sheath glabrous. *Spikelets* globose or ovoid, in simple or compound umbels, with filiform, spreading rays, green; bracts capillary. *Glumes* minute, densely imbricating, squarrosely spreading, oblong, membranous, with a stout midrib ending in a long, stout, scaberulous awn as long as itself, recurved and persistent. *Stamens* 1 or 2; anthers linear, subacute. *Ovary* linear-oblong; style filiform, glabrous, usually deciduous, sometimes persistent; stigmas 2, capillary. *Fruit* a linear-oblong, biconvex, straight or slightly incurved nut, the faces quite smooth, the sides with few or many, stoutly stipitate, capitate glands, rarely naked; base of style slightly swollen; style sometimes persistent on the nut.

2478. ECHINOLYTRUM DIPSACEUM Desv. *Scirpus minimus* F. I. i. 219. *Fimbristylis dipsacea* F. B. I. vi. 635.
In most of the provinces.
A tufted, annual herb, 1–6 in. high.

1041. Bulbostylis Kunth.

Annual herbs, with very slender stems, leafy at the base only; *leaves* very narrow, filiform or capillary. *Spikelets* small, crowded in a terminal head, or umbellate; bracts short. *Glumes* few or many, imbricate all round the rachilla, 1–2 lowest and often the

uppermost empty; hypogynous bristles 0. *Stamens* 1–3; anthers linear, obtuse or apiculate. *Ovary* obovoid; style slender, glabrous; stigmas 3. *Fruit* an obovoid, obtuse, trigonous, smooth nut, crowned by the persistent style-base.

Spikelets clustered in a globose head; nut obscurely reticulate or porose-punctate:—
Stem glabrous; spikelets 3–20 ..... *barbata.*
Stem hairy; spikelets about 10 in a subspinescent head... *subspinescens.*
Spikelets solitary, in a simple or compound umbel; nut transversely undulate ..... *capillaris* var. *trifida.*

2479. BULBOSTYLIS BARBATA Kunth; F. B. I. vi. 651. *Scirpus monander* F. I. i. 222.
In most of the provinces.
A small, tufted annual, with bristle-like stems, 2–10 in.

2480. BULBOSTYLIS SUBSPINESCENS Clarke; F. B. I. vi. 652.
Orissa, coast.
A small, tufted, pubescent annual; stems rigid, curved, 4 in.

2481. BULBOSTYLIS CAPILLARIS Kunth var. TRIFIDA Clarke; F. B. I. vi. 652.
Behar; W. Bengal.
A small, tufted annual, with slender stems, 4–10 in.

1042. Lipocarpha R. Br.

Glabrous, erect herbs; stems slender, leafy towards the base only; *leaves* very narrow, gradually passing into an open sheath. *Spikelets* short, terete, sessile, in small, terminal heads of 3–7, with long, slender bracts; flowers many, hermaphrodite. *Glumes* very many, minute, densely imbricate, cuneate-spathulate, glabrous, 1-veined, not keeled, at length deciduous; rachilla stout, terete, naked; hypogynous bristles 0; scales 2, oblong, membranous, strongly veined, white, hyaline, convolute, completely enveloping the nut. *Stamen* solitary; anther small. *Ovary* ovoid; style short; stigmas 3. *Fruit* a narrowly oblong, trigonous nut, apiculate or with a terminal, conical top.

Spikelets pale or tawny, concolorous; nut much shorter than the squamellæ; style half as long as nut or longer ..... *argentea.*
Spikelets purplish or, if pale, purple-spotted; nut nearly as long as the squamellæ; style less than half the length of the nut..... *sphacelata.*

2482. Lipocarpha argentea R. Br.; F. B. I. vi. 667. *Tunga lævigata* F. I. i. 183.
In all the provinces.
A glabrous herb; stems 4–24 in.

2483. Lipocarpha sphacelata Kunth; F. B. I. vi. 667. *Tunga triceps* F. I. i. 183.
Chota Nagpur; Behar; W. Bengal.
A glabrous herb; stems 4–24 in.

1043. Eriophorum Linn.

Glabrous herbs; stems leafy only near the base; *leaves* many, long, linear. *Spikelets* with many perfect flowers, in compound umbels. *Glumes* imbricate on all sides; hypogynous bristles 6, divided nearly to the base into ligulate, comose segments. *Stamens* 3 or 2 or 1, on the anterior side of the ovary. *Ovary* ovoid; style slender, glabrous, usually short; stigmatic branches 3, casually 2 or 4, long. *Fruit* a sessile, trigonous, smooth, dusky nut with narrowed apex.

2484. Eriophorum comosum Wall.; F. B. I. vi. 664; E. D. E. 323.
Chittagong.
A robust, glabrous herb.

1044. Fuirena Rottb.

Annual or perennial, glabrous or pubescent, leafy herbs; *leaves* linear-lanceolate; sheaths entire, with an annular membrane at the mouth. *Spikelets* many-flowered, sessile, in dense, axillary peduncled, and terminal clusters; many flowers ☿. *Glumes* imbricate round the rachilla, orbicular or obovate-oblong, membranous, with a stout, 3-veined keel, ending in a cusp or stout, scabrid awn; hypogynous bristles 3, minute, or 0; hypogynous scales 3, enclosing the nut, stipitate, quadrate, strongly 3-veined, glabrous or ciliate. *Stamens* 2–3. *Ovary* 3-gonous; style slender; stigmas 3. *Fruit* a trapezoid, trigonous nut, narrowed and stipitate below, with a long or short beak or cusp above, angles acute, sides smooth, pale; style finally deciduous.

Annual; clusters of spikelets 1–3, approximate; petals clawed, with subquadrate heads.....*glomerata*.
Perennial, with creeping, woody, stoloniferous rhizome; spikelets often many, in an elongated panicle; petals subsessile, obovoid .....*umbellata*.

2485. FUIRENA GLOMERATA Lamk; F. B. I. vi. 666. *F. ciliaris* F. I. i. 180.

In most of the provinces.

A hairy, less often glabrate, annual herb; stems 4–16 in., the inflorescence, at least, always pubescent.

2486. FUIRENA UMBELLATA Rottb.; F. B. I. vi. 666.

In most of the provinces.

A hairy, perennial herb; stems 8–16 in.

1045. Scirpus Linn.

Glabrous herbs, often tall, leafless, or leafy at the base only, very rarely all along the stem; stem terete, trigonous, or triquetrous. *Spikelets* sessile or pedicelled, terete, many-flowered, oblong or ovoid, usually in lateral or terminal clusters, rarely solitary. *Glumes* spirally imbricate round a stout or slender rachilla, the two lowest and a few uppermost empty; hypogynous bristles 0 or 2–7, retrorsely scabrid or rarely plumose. *Stamens* 1–3; anthers linear. *Ovary* obovoid; style slender, base not dilated; stigmas 2–3, slender. *Fruit* an obovoid or trigonous nut; style leaving no excrescence on the nut.

Stems tall, 2–7 feet high, solitary, with leaf-bearing nodes in the upper part; bristles various, 3, sometimes 5, or often 0 ..... *chinensis.*

Stems if leafy (*S. kyllingioides* and *S. Michelianus*) low (not exceeding 10 in.) and tufted, if tall only leafy near the base:—

Small, tufted herbs, with very slender stems; bristles 0:—

Style 3-fid; perennial; stem leafy, 4–10 in.; style or style-branches long ..... *kyllingioides.*

Style 2-fid, rarely (*S. Michelianus* sometimes) 3-fid; annuals:—

Stem leafy, 1–8 in.; style as long as nut ..... *Michelianus.*

Stems with few short leaves near the base; styles hardly one-fourth the nut:—

Stem slender, with few spikelets; glumes narrow-obovate, long-caudate..... *squarrosus.*

Stem setaceous, with one spikelet; glumes obovate, obtuse *Isolepis.*

Large or middle-sized herbs; stems leafy only near the base, characteristically rush-like; bristles often present under the nut:—

*Style 3-fid, or if 2-fid (*S. erectus* sometimes) the nut transversely wavy; glumes entire:—[p. 1159]

Nut smooth; very large plants, with stems 3–9 feet high, and

large, compound corymbs of many solitary spikelets; bristles usually 6, sometimes small or obsolete :—

Bristles 6 or fewer, scabrid or setose with short unicellular hairs *grossus.*

Bristles always 6, villous or subplumose with many multicellular hairs ..... *grossus* var. *Kysoor.*

Nut transversely wavy; plants with stems never exceeding 2·5 feet, and with spikelets clustered in a single, lateral, dense head, rarely (*S. supinus* var. *uninodis*) in umbels with few short rays :—

Stems terete :—

Glumes distinctly keeled and spikelets angular; nut triquetrous; bristles 0 :—

Spikelets 7–1, in a single lateral head; stems 2–12 in. *supinus.*

Spikelets umbellate, on 3–1 rays, rarely an inch long; stems 4–12 in..... *supinus* var. *uninodis.*

Glumes faintly or not keeled and spikelets terete :—

Nut plano-convex; bristles 6–5, rarely 0; style sometimes 2-fid; glumes ovate, concave, incurved; stem 2–12 in. *erectus.*

Nut triquetrous; bristles 0; style always 3-fid :—

Stems very spongy, transversely septate when dry; glumes slightly keeled, not inflated in fruit ... *articulatus.*

Stems medium or slender, not articulate; glumes many-ribbed, broad, inflated in fruit ..... *quinquefarius.*

Stems triquetrous; bristles 5–6; spikelets terete; nut triquetrous ..... *mucronatus.*

*Style 2-fid; bristles always present; nut smooth; glumes notched at top; stems trigonous :—[p. 1158]

Spikelets capitate, 3–1, large (about an inch long), ovoid-lanceolate; bristles 4, scabrous, not plumose ..... *maritimus* var. *affinis.*

Spikelets umbellate, mostly solitary, on the ultimate rays of the lateral umbel, never exceeding ·6 in. long :—

Bristles 3, sometimes 2, rigid, scabrous, with short, white, reflexed teeth, not plumose ..... *triqueter* var. *segregata.*

Bristles usually 4 or more, ligulate, often broadly; plumose by spreading, moniliform hairs ..... *littoralis.*

2487. SCIRPUS CHINENSIS Munro; F. B. I. vi. 662.

Chittagong.

A tall, glabrous club-rush; stems 2–7 feet high.

2488. SCIRPUS KYLLINGIOIDES Boeck.; F. B. I. vi. 662.
Chotá Nagpur.
A small, glabrous herb; stems tufted, slender, 4–10 in.

2489. SCIRPUS MICHELIANUS Linn.; F. B. I. vi. 662. *Cyperus diffusus* F. I. i. 189.
In most of the provinces.
A small, tufted, glabrous annual; stems slender, 1–8 in. *Beng.* Chota-gotubi.

2490. SCIRPUS SQUARROSUS Linn.; F. I. i. 222; F. B. I. vi. 663.
In most of the provinces.
A small, tufted, glabrous annual; stems slender, 2–16 in. *Beng.* Guri.

2491. SCIRPUS ISOLEPIS Boeck.; F. B. I. vi. 663.
Behar; Chota Nagpur.
A small, setaceous, glabrous annual; stems ·5–4 in.

2492. SCIRPUS GROSSUS Linn. f.; F. I. i. 231; F. B. I. vi. 659.
Chota Nagpur; Tirhut; N. Bengal; E. Bengal.
A large club-rush; stem 3–9 feet high.

2492/2. Var. KYSOOR Clarke; F. B. I. vi. 660. *S. Kysoor* F. I. i. 230; E. D. S. 977.
Chota Nagpur; Tippera.
A large club-rush; stems 3–10 feet high. *Beng.* Kesúr.

2493. SCIRPUS SUPINUS Linn.; F. I. i. 217; F. B. I. vi. 655.
In most of the provinces.
A glabrous herb; stems 2–12 in.

2493/2. Var. UNINODIS Clarke; F. B. I. vi. 656. *S. mucronatus* F. I. i. 216.
N. Bengal.
A glabrous herb; stems 4–12 in.

2494. SCIRPUS ERECTUS Poir.; F. B. I. vi. 656. *S. juncoides* F. I. i. 216.
In all the provinces.
A glabrous herb; stems 2–12 in.

2495. SCIRPUS ARTICULATUS Linn.; F. I. i. 214; F. B. I. vi. 656. *S. subarticulatus* F. I. i. 215. *S. incurvatus* F. I. i. 214.
In all the provinces.
A glabrous herb; stem 4–30 in. *Beng.* Pappati chickha.

2496. SCIRPUS QUINQUEFARIUS Ham.; F. B. I. vi. 657.
W. Bengal.
A glabrous herb; stem 2–12 in.

2497. SCIRPUS MUCRONATUS Linn.; F. B. I. vi. 657. *S. triangulatus* F. I. i. 217.

In all the provinces.

A glabrous herb; stem 8–30 in.

2498. SCIRPUS MARITIMUS Linn. var. AFFINIS Roth; F. B I. vi. 659. *S. strobilinus* F. I. i. 219.

N. Bengal; C. Bengal; E. Bengal.

A club-rush, with stems 1·5–2·5 feet high.

2499. SCIRPUS TRIQUETER Linn. var. SEGREGATA Clarke; F. B. I. vi. 658.

Sundribuns.

A stoutish club-rush; stems 1–3 feet high.

2500. SCIRPUS LITTORALIS Schrad.; F. B. I. vi. 659. *S. pectinatus* F. I. i. 218.

Sundribuns.

A stoutish club-rush; stems 1·5–3 feet high.

Order CLI. GRAMINEÆ.

Erect, decumbent, or creeping herbs, rarely (*Bambuseæ*) shrubs or trees; stems terete or compressed, jointed, with often hollow internodes. *Leaves* distichous, simple, usually long and narrow, entire, parallel-veined, with a sheathing base distinct from the blade, and rarely an interposed petiole; sheath split to the base or very rarely, entire, with often a transverse, hyaline, erect ligule at the apex of the sheath and facing the blade. *Inflorescence* terminal, rarely also from the upper sheaths, consisting of spicate, racemed, capitate or panicled spikelets. *Spikelets* composed of 3 or more alternate distichous glumes, of which the two lowest are normally empty, and the remainder, if more than one, are disposed on a rachilla, and are all or some of them flowering; within and opposite to each flowering glume an erect, narrow, 2-nerved palea, its margins infolded towards the glume and at its base embracing the flower. *Flowers* hermaphrodite or 1-sexual. *Perianth* of 2, rarely 3 or 6, minute lodicules, sometimes absent. *Stamens* 3, rarely 1, 2, or 6, very rarely many, hypogynous; filaments capillary; anthers versatile, fugacious; cells 2, parallel; dehiscence longitudinal; connective obsolete; pollen globose. *Carpels* forming an entire, 1-celled ovary; styles 2, rarely 3, free or con-

nate at the base, usually elongate and exserted from the apex or sides of the spikelets, clothed with simple or branched stigmatic hairs; ovule erect, anatropous. *Fruit* a seed-like grain, free within the flowering glume and palea, or adnate to either or both; pericarp very thin, rarely thicker and separable from the seed. *Seed* erect; albumen copious, floury; embryo minute, outside the albumen at the base of the seed; cotyledon shield-shaped with an erect, conical plumule, and a descending conical radicle on its face.

*Mature spikelets separating entirely from their pedicels or falling with them, spikelets similar or differing in sex and structure, perfect spikelets with 2 heteromorphous florets, the upper ♀, the lower ♂ or barren; rachilla not continued beyond the upper floret:—[p. 1165]

†Spikelets in usually continuous spikes, racemes, or panicles; glumes herbaceous or membranous, the lower smaller, sometimes very small or suppressed; lower flowering glume generally resembling the outer glumes in structure and nervation; the upper firmer, at length rigid, often papery to crustaceous, awnless or rarely mucronate:—[p. 1163]

Shrubs; flowers dioecious ..... **Spinifex.**

Herbs; flowers not dioecious:—

‡Spikelets 2-flowered; upper 2-sexual, lower male or neuter, rarely (*Isachne*) both fertile:—[p. 1163]

Mature spikelets surrounded singly or in clusters by an involucre of naked or plumose bristles which falls along with the spikelets **Pennisetum.**

Mature spikelets falling entire and singly from the tips of their pedicels:—

Spikelets subtended by an involucel of bristles..... **Setaria.**

Spikelets not subtended by bristles:—

Branches of the panicle produced beyond the uppermost spikelets; leaves flat; glume I. minute, hyaline **Chamæraphis.**

Branches of the panicle not produced beyond the uppermost spikelets, or if so produced (*Panicum* sometimes) leaves plicate:—

Glumes 4, all very minute; spikelets very numerous and small, crowded on the capillary branches of a very large panicle ..... **Thysanolæna.**

Glumes 4, all distinct or 3 distinct and 1 minute or obsolete:—

§Lowest glume distinct:—[p. 1163]

Glumes I. and II. separately deciduous; spikelets subglobose, panicled ..... **Isachne.**

Glumes I. and II. not separately deciduous :—

Lowest glume, at least, subulate-aristate; spikelets fascicled or solitary on a simple axis or on the branches of a panicle ..... **Oplismenus.**

Lowest glume not subulate-aristate :—

Glume II. fimbriate; glume III. with a deep-cleft pale and a male flower ..... **Axonopus.**

Glume II. not fimbriate; glume III. with a 2-nerved or hyaline rudimentary pale or quite empty ..... **Panicum.**

§Lowest glume very minute or 0 :—[p. 1162]

Lowest glume minute but usually present; glume III. with generally a minute pale, its nerves straight, prominent ..... **Digitaria.**

Lowest glume absent; glume II. (= glume III. of *Digitaria*) empty, its marginal nerves curved :—

Spikelets not thickened at the base..... **Paspalum.**

Spikelets thickened at the base ..... **Eriochloa.**

‡Spikelets 1-flowered :—[p. 1162]

Spikelets articulate on their pedicels and deciduous from them :—

Glumes I. and II. minute or setaceous; III. and IV. chartaceous..... **Oryza.**

Glumes I. and II. absent; III. and IV. membranous :—

Glumes broad, outer not awned ..... **Leersia.**

Glumes narrow, outer awned ..... **Hygrorrhiza.**

Spikelets deciduous with their pedicels :—

Spikelets fascicled all round a slender rachis, falling in clusters of 2–4; outer glume echinate ..... **Tragus.**

Spikelets not clustered, falling singly; glumes not echinate :—

Glumes long-awned..... **Perotis.**

Glumes not awned ..... **Zoysia.**

†Spikelets usually in pairs, one sessile, the other pedicelled, or the terminal 3-nate, or solitary, on the axis of a usually spike-like raceme; outer glumes more or less rigid and firmer than the flowering glumes, the lower always longer than the florets; flowering glumes membranous, often hyaline, that of the upper floret often awned or reduced to an awn :—[p. 1162]

¶Spikelets all similar :—[p. 1164]

+Spikelets solitary, secund on a filiform or flattened, inarticulate rachis [p. 1164] ..... **Dimeria.**

+Spikelets in open or contracted panicles:—[p. 1163]
Racemes of spikelets in compound panicles:—
Panicle spiciform, silky; rachis tough .....**Imperata.**
Panicle much branched, open, silky; rachis fragile:—
Spikelets awnless.....**Saccharum.**
Spikelets awned.....**Erianthus.**
Racemes of spikelets 2-nate, digitate, or approximate on a short main-axis.....**Pollinia.**
*Spikelets dissimilar:—[p. 1163]
+Spikelets of each pair differing in sex and structure or (*Ophiurus*) spikelets solitary, not secund:—[p. 1165]
Spikelets sunk in pits of an articulate, fragile rachis:—
Sessile spikelets solitary in each internode of the spike:—
Sessile spikelet unaccompanied by an upper spikelet or the pedicel of one .....**Ophiurus.**
Sessile spikelet accompanied by a dissimilar pedicelled spikelet:—
Glume I. globose, inflated, pitted .....**Manisuris.**
Glume I. smooth:—
Glume I. ovate-oblong .....**Rottboellia.**
Glume I. caudate.....**Vossia.**
Sessile spikelets 2, opposite in each internode.....**Mnesithea.**
Spikelets not sunk in nodes of the rachis:—
Spikelets 3, a sessile 2-flowered and 2 pedicelled, enclosed in a peduncled spathe on a short, 1-nodal, inarticulate rachis **Apluda.**
Spikelets many or few on a plurinodal, inarticulate rachis:—
Spikelets many, 2-nate, rarely solitary, in spiciform racemes, solitary, 2-nate or digitate or approximate in a short main-axis; lower floret of the sessile spikelet male:—
Margin of glume I. of sessile spikelet inflexed **Ischæmum.**
Margin of glume I. of sessile spikelet not inflexed:—
Spikelets all awned:—
Spikelets 2-awned.....**Pogonatherum.**
Spikelets 1-awned:—
Leaves lanceolate; spikelets 2-flowered **Apocopis.**
Leaves cordate; spikelets 1-flowered...**Arthraxon.**
Spikelets 2-nate, with only the upper spikelet awned **Lophopogon.**
Spikelets in compound panicles or spiciform racemes, variously disposed; 2-nate, rarely 3-nate; lower floret of

all the spikelets empty; upper usually awned or reduced to an awn:—

Spikelets in alternating pairs or the lower solitary:—

Sessile spikelets more than 2, usually many; inflorescence usually elongate ..... **Andropogon.**

Sessile spikelets 2 only; inflorescence very short **Pseudanthistiria.**

Spikelets dimorphic, the 4 lower sessile forming an involucre round the upper:—

Rachis articulate above the involucrant spikelets **Anthistiria.**

Rachis articulate below the involucrant spikelets **Iseilema.**

÷Spikelets forming a spicate, monœcious inflorescence, male and female spikelets on different spikes, or if on the same spike with the females at the base of the spike, those of both sexes very large, never awned, and always very unlike:—[p. 1164]

Fruiting spikelets densely crowded on a cylindric, spongy rachis, the grain exposed ..... **Zea.**

Fruiting spikelets lax; rachis slender, the grain concealed:—

Fruiting spikelet with glume I. transformed into a crustaceous, polished, nut-like envelope to the other glumes and the grain **Polytoca.**

Fruiting spikelet enclosed in the stony, polished, nut-like bract ..... **Coix.**

*Mature spikelets breaking up, leaving the persistent or subpersistent glumes on the pedicel, or if falling entire, not composed of two heteromorphous florets:—[p. 1162]

†Herbs; blades rarely (*Centotheca*) transversely veined and not articulate on the sheath:—[p. 1167]

‡Spikelets not inserted in notches or pits of a simple rachis:—[p. 1167]

§Spikelets panicled, or if spicate not secund:—[p. 1167]

⊙Spikelets 1-flowered; rachilla not, or rarely, produced beyond the floret; awns when present twisted:—[p. 1166]

Glume III. hardened in fruit and tightly clasping the grain; awns usually 3-fid ..... **Aristida.**

Glumes all membranous; awns if present simple:—

×Spikelets laterally compressed:—[p. 1166]

Glumes I. and II. awned, firm ..... **Polypogon.**

Glumes I. and II. not awned, membranous:—

Pericarp of grain adherent to seed ..... **Agrostis.**

Pericarp of grain loose ..... **Sporobolus.**

× Spikelets very narrow, terete; glumes finely acuminate or awned [p. 1165] ..... **Garnotia.**

⊙ Spikelets 2- or more-flowered :—[p. 1165]

Rachilla not continued beyond the upper floret :—

Spikelets not awned, elongated between the flowering glumes but not penicillately hairy ..... **Cœlachne.**

Spikelets awned :—

Florets 2, dissimilar, the lower awnless male or barren **Arundinella.**

Florets 2 to many, similar except the uppermost, which are gradually reduced..... **Eriachne.**

Rachilla continued beyond the upper floret, or if not continued (*Phragmites*) then elongated between the flowering glumes and penicillately hairy :—

Spikelets awned, with the awn twisted..... **Avena.**

Spikelets not awned, or if awned, with the awn not twisted :—

Leaves tesselately nerved; fruiting glumes with reflexed, submarginal bristles ..... **Centotheca.**

Leaves parallel-nerved; fruiting glumes without submarginal bristles :—

Spikelets very minute, in globose clusters on an elongated, simple rachis ..... **Elytrophorus.**

Spikelets conspicuous, not in globose clusters :—

Flowering glumes 1–3-nerved :—

Spikelets penicillate, with long, silky hairs on the flowering glumes or the callus or both, paniculate; lowest flowering glume sometimes male or neuter :—

Rachilla glabrous; flowering glumes dorsally hairy beyond the middle..... **Arundo.**

Rachilla hirsute :—

Flowering glumes glabrous ..... **Phragmites.**

Flowering glumes penicillate with long hairs **Triraphis.**

Spikelets not penicillate with long, silky hairs; many-flowered :—

Outer glumes shorter than lowest flowering glume; grain very minute, terete... **Eragrostis.**

Outer glumes longer than lowest flowering glume; grain broad, concave... **Myriostachya.**

Flowering glumes 5- or more-nerved; spikelets panicled ..... **Bromus.**

§Spikelets 2-seriate and secund on an inarticulate spike or on the spiciform branches of a panicle :—[p. 1165]
Spikelets on the long, spiciform branches of a panicle :—
Flowering glumes 3-toothed.....**Diplachne.**
Flowering glumes entire or simply aristate.....**Leptochloa.**
Spikelets in simple, digitate, or simply racemed spikes :—
Spikelets in pedicelled, deciduous, articulate clusters **Gracilea.**
Spikelets not clustered :—
Spikelets 1-flowered :—
Spikelets awnless :—
Spikes solitary, terminal .....**Michrochloa.**
Spikes digitate .....**Cynodon.**
Spikelets awned ; spikes solitary, spicate or racemed **Chloris.**
Spikelets 2- or more-flowered :—
Spikelets crowded on a solitary spike .....**Tripogon.**
Spikelets in numerous spikes :—
Spikes digitate or whorled .....**Eleusine.**
Spikes racemed on a long rachis .....**Dinebra.**
‡Spikelets inserted in notches or pits of a simple rachis :—[p. 1165]
Spikelets solitary at the nodes of the spikes :—
Plane of the spikelets radial to the rachis .....**Oropetium.**
Plane of the spikelets tangential to the rachis .....**Triticum.**
Spikelets 2 or more, collected in fascicles at the nodes of the spikes **Hordeum.**
†Shrubs ; blades transversely veined, articulate on sheath :—[p. 1165]
Pericarp thin, adnate to the seed :—
Flaments free .....**Bambusa.**
Filaments connate :—
Spikelets many-flowered ; pales always 2-keeled...**Gigantochloa.**
Spikelets few-flowered ; pales of upper flowers 0 or glume-like **Oxytenanthera.**
Pericarp fleshy or crustaceous, adnate to the seed :—
¶Pales always 2-keeled :—[p. 1168]
Spikelets 2- or more-flowered, only one usually fertile ; usually capitate on the branches of the panicle :—
Ovary hirsute at top ; pericarp crustaceous...**Dendrocalamus.**
Ovary glabrous at top ; pericarp fleshy .....**Melocalamus.**
Spikelets 1-flowered :—
Spikelets loosely spicate on the branches of the panicle **Teinostachyum.**
Spikelets crowded in globose heads .....**Cephalostachyum.**

¶ Pales 0, or glume-like :—[p. 1167]
Spikelets very minute ; fruit small.....**Dinochloa.**
Spikelets conspicuous ; fruit very large .....**Melocanna.**

1046. **Spinifex** Linn.

Diœcious, gregarious, much-branched, rigid, littoral bushes ; stem and branches woody ; *leaves* long, rigid, involute. *Inflorescence* of large, terminal, globose, bracteate heads, with radiating spikes ; the ♂ with many spikelets in each spike, ♀ with only one. ♂ *Spikelets* 1–2-flowered, distichous, articulate on short pedicels. *Glumes* 4, papery, acute, strongly veined ; I. and II. empty ; III. paleate, empty or 3-androus ; IV. thinly coriaceous, paleate, 3-androus ; the paleæ of III. and IV. acuminate, as long as their glumes ; *anthers* linear. ♀ *Spikelets* narrower than the males, erect, lanceolate, 1-flowered. *Glumes* acute or acuminate, strongly veined ; I. longest ; III. empty ; IV. thin, dorsally compressed ; paleæ linear-oblong, acuminate ; *lodicules* 2, large, connate below, strongly veined ; *styles* long, connate below ; stigmas long, shortly penicillate, exserted at the top of the glume. *Grain* clavate, tipped by the long, rigid style, free within the hardened glume and palea.

2501. SPINIFEX SQUARROSUS Linn. ; F. B. I. vii. 63 ; E. D. S. 2580.
Orissa ; sand-dunes.
A squarrose, gregarious shrub.

1047. **Pennisetum** Pers.

Annual or perennial grasses ; *leaves* narrow. *Inflorescence* spiciform ; racemes of involucellate clusters of shortly pedicelled spikelets, articulate on a simple rachis, the involucels composed of unequal, scabrid or plumose, simple or branched bristles. *Spikelets* 1–6 on each involucel, persistent on their pedicels, 1–2-flowered, ovoid. *Glumes* 3 or 4 ; I. small or 0 ; II. and III. subequal, 5–7-veined, awned or not, II. rarely absent ; III. paleate or not, ♂ or empty ; IV. sessile, coriaceous, 2-sexual or ♀ ; *lodicules* 2 ; *stamens* 3 ; anthers linear ; *styles* long, free or connate below. *Grain* oblong, free within the hardened glume and palea.

Anther-cells with bearded tips .....*typhoideum.*
Anther-cells not bearded :—

Bristles of the involucel ciliate.....*parviflorum.*
Bristles of the involucel, at least the inner, copiously ciliate:—
Perennial; rachis of spike hairy.....*orientale.*
Annual; rachis of spike glabrous:—
Bristles densely villous .....*pedicellatum.*
Bristles sparsely ciliate:—
Spikes 4 in. long or less, under 1 in. diameter .....*setosum.*
Spikes over 4 in. long, 1 in. in diameter .....*borbonicum.*

2502. PENNISETUM TYPHOIDEUM Rich.; F. B. I. vii. 82; E. D. P. 384. *Panicum spicatum* F. I. i. 283.
Cultivated in the western provinces.
A tall, erect, annual grass, 3–6 feet high. *Vernac.* Bajra; *Santal.* Lendha.

2503. PENNISETUM PARVIFLORUM Trin.; F. B. I. vii. 86.
Chota Nagpur.
An erect, annual grass.

2504. PENNISETUM ORIENTALE Rich.; F. B. I. vii. 86.
Chota Nagpur, Parasnath.
An erect or ascending annual grass.

2505. PENNISETUM PEDICELLATUM Trin.; F. B. I. vii. 86.
Behar; Chota Nagpur.
An annual, branching grass, 1–3 feet high.

2506. PENNISETUM SETOSUM Rich.; F. B. I. vii. 87. *Panicum barbatum* F. I. i. 282. *P. holcoides* F. I. i. 285.
Chota Nagpur; Behar; W. Bengal; Orissa.
A stout, annual, often fastigiately branching grass. *Beng.* Swati.

2507. PENNISETUM BORBONICUM Kunth; F. B. I. vii. 88.
C. Bengal.
A tall, stout, annual grass.

1048. Setaria Beauv.

Annual, erect grasses, with fibrous roots; stem simple or slightly branched; nodes glabrous; *leaves* linear, finely acuminate, flat; ligule a ridge of hairs. *Spikelets* 1–2-flowered, awnless, clustered on the short branches of a spiciform or narrowly pyramidal panicle, articulate on very short pedicels, bearing a persistent, unilateral involucel of few or many scabrid or barbed bristles (reduced branchlets). *Glumes* 4, membranous, 3–5-veined; I. half as long as III. or shorter; II. shorter than IV.; III. as long as IV.,

orbicular-oblong, usually paleate, male or neuter, the palea hyaline; IV. sessile, coriaceous or crustaceous, broadly ovoid, acute, dorsally very convex, smooth or rugulose, sides incurved; 2-sexual, 3-androus; *styles* distinct. *Grain* oblong, free within the hardened glume and palea.

Bristles smooth or with barbs erect or spreading :—
Panicle spiciform, cylindric :—
Barbs of bristles 0 or minute ..... *italica*.
Barbs of bristles strong, spreading or erect :—
Glumes III. and IV. dissimilar :—
Glume IV. strongly rugose ..... *glauca*.
Glume IV. faintly rugose ..... *glauca* var. *parviflora*.
Glumes III. and IV. subsimilar, large..... *glauca* var. *macrocarpa*.
Panicle more or less lobed or with elongate branches ..... *intermedia*.
Bristles with barbs deflexed ..... *verticillata*.

2508. SETARIA ITALICA Beauv.; F. B. I. vii. 78; E. D. S. 1212. *Panicum italicum* F. I. i. 302.
Cultivated.
An annual grass, 2–5 feet high. *Vernac.* Kangu, kangui, kora; *Santal.* Erba; *Uriya* Tangun.

2509. SETARIA GLAUCA Beauv.; F. B. I. vii. 78; E. D. S. 1207. *Panicum glaucum* F. I. i. 285.
In all the provinces.
An annual grass. *Hind.* Bandra, bandri; *Beng.* Pingi-natchi; *Santal.* Kukra.

2509/2. Var. PARVIFLORA Munro; F. B. I. vii. 79.
In the western provinces.
A small annual grass.

2509/3. Var. MACROCARPA Hook. f.; F. B. I. vii. 79.
W. Bengal; Behar.
An annual grass.

2510. SETARIA INTERMEDIA Roem. & Schult.; F. B. I. vii. 79; E. D. S. 1210.
In all the provinces.
An annual grass.

2511. SETARIA VERTICILLATA Beauv.; F. B. I. vii. 80; E. D. S. 1223. *Panicum verticillatum* F. I. i. 301.
In all the provinces.
An annual grass. *Beng.* Dora-byara; *Santal.* Birkauni; *Beng.* Silnaja.

1049. Chamæraphis R. Br.

Glabrous marsh or aquatic grasses; *leaves* narrowly linear-lanceolate. *Spikelets* 1–2-flowered, subsessile and subsecund on the branches of a simple panicle, which are produced as awn-like bristles beyond the ultimate spikelet, obscurely articulate but persistent on their short, obconic pedicels, narrowly lanceolate, terete, green. *Glumes* 4; I. very small, suborbicular, hyaline, white, veinless; II. and III. membranous, green, narrowly lanceolate, II. acuminate, 9–11 veined, longer than III., the tip subulate or awned; III. acuminate, 7-veined, paleate, male, the palea smaller than the glume, hyaline, the veins obscure; IV. much smaller than III., stoutly stipitate, female, oblong or ovate-oblong, acute, flat, thinly coriaceous, veinless, the palea as broad as the glume, veinless, acute; *lodicules* cuneate; *stamens* 3; anthers very short; *styles* free; stigmas laterally exserted; hairs scattered. *Grain* minute, oblong, compressed, free in the coriaceous glume and hyaline palea.

Stems stoutish; spikelets on branches of panicle few :—
Leaves longish; spikelets ·25 in. or longer
spinescens var. *Brunoniana*.
Leaves very short; panicle contracted; spikelets under ·25 in.
spinescens var. *depauperata*.
Stems slender; spikelets on branches of panicle many, very small
gracilis.

2512. Chamæraphis spinescens R. Br. var. Brunoniana Hook. f.; F. B. I. vii. 62.
E. Bengal; Sundribuns.
A floating, aquatic grass.

2512/2. Var. depauperata Hook. f.; F. B. I. vii. 62.
Behar.
A floating, aquatic grass.

2513. Chamæraphis gracilis Hack.; F. B. I. vii. 62.
C. Bengal; E. Bengal; Chittagong.
A floating, aquatic grass.

1050. Thysanolæna Nees.

A large, glabrous grass; stems solid; *leaves* broad, flat. *Spikelets* very minute, numberless, 1-flowered, jointed on very short pedicels and subsecund on the very numerous, crowded, long,

filiform, compound, suberect branches and branchlets, which form a very large, effuse, pyramidal panicle. *Glumes* 4; I. and II. minute, concave, obtuse, awnless, and nerveless, I. shortest; III. much longer, epaleate, empty, coriaceous, acuminate, 1-nerved, hardening; IV. rather shorter, membranous, oblong, acute, clothed with white, erect hairs; palea short, truncate; *stamens* 2–3; anthers short; *styles* free. *Grain* very minute, free within the hardened glumes.

2514. THYSANOLÆNA AGROSTIS Nees; F. B. I. vii. 61. *T. acarifera* E. D. T. 420. *Agrostis maxima* F. I. i. 317. *Melica latifolia* F. I. i. 328.

Chota Nagpur; Behar; N. Bengal, Duars; Chittagong.

A tall, handsome grass. *Santal.* Karsar.

1051. Isachne R. Br.

Perennial grasses; *leaves* ovate- or linear-lanceolate. *Spikelets* small or minute, loosely paniculate, not or obscurely articulate with the pedicel, subglobose or obovoid, 1–2-flowered. *Glumes* 4, the two lower often separately deciduous, thinly coriaceous or membranous, strongly veined; I. and II. subequal, convex, empty; III. and IV. both paleate, equal, and both convex or III. larger and flatter; III. ♂ or neuter; IV. jointed and often stipitate on the very short rachilla, hemispheric, ♀ or ☿; *lodicules* most minute; *stamens* 3, rarely 4–6; *styles* 2, free; stigmas short, feathery, exserted at the top of the spikelet. *Grain* free within the hardened glume and palea.

Panicle ovoid or pyramidal ..... *australis.*
Panicle small, lax-flowered ..... *miliacea.*

2515. ISACHNE AUSTRALIS R. Br.; F. B. I. vii. 24.

Chota Nagpur; N. Bengal, Duars.

A grass, with creeping stem below.

2516. ISACHNE MILIACEA Roth; F. B. I. vii. 25. *Panicum patens* F. I. i. 305.

N. Bengal.

A slender grass, prostrate throughout.

1052. Oplismenus Beauv.

Slender grasses; stems creeping below, branching; branches ascending, leafy; *leaves* ovate-lanceolate, thin, flat; margins

scaberulous; base narrow, auricled on one side; ligule a ridge of long hairs. *Spikelets* 1-flowered, sessile or subsessile, solitary or 2-nate, articulating at the base, secund on a terminal spike or on a raceme of spikes, subterete, awned. *Glumes* 4; I. and II. empty, both usually awned, awns straight, I. shorter than III., 3–5-veined; II. as long as or shorter than IV., 5–7-veined; III. as long as IV. or longer, 7–9-veined, paleate or not, empty; IV. sessile, lanceolate, acute or acuminate, thinly coriaceous, terete, smooth, white, shining, paleate, 2-sexual, margins broadly incurved, palea 2-keeled; *lodicules* minute; *anthers* 3, linear; *styles* free; stigmas exserted at the top of the glume. *Grain* oval-oblong, free within the hardened glume and palea.

Awns stout, smooth, obtuse ..... *compositus.*
Awns capillary, minutely scaberulous ..... *Burmanni.*

2517. Oplismenus compositus Beauv.; F. B. I. vii. 66. *Panicum lanceolatum* F. I. i. 294.

In most of the provinces.

A tall, branching grass.

2518. Oplismenus Burmanni Beauv.; F. B. I. vii. 68. *Panicum Burmanni* F. I. i. 295.

A small, diffuse grass. *Uriya* Kan-guria.

1053. Axonopus Beauv.

Perennial grasses; *leaves* subradical. *Spikelets* in whorled or digitate, terminal spikes, solitary or 2-nate, awned, 2-flowered, articulate on their short pedicels, erect. *Glumes* 4; I. shorter than III., hyaline, acuminate or aristulate, veins 3, lateral arching to join the median below the tip; II. as long as IV., ovate or ovate-lanceolate, empty, acuminate or awned, 5-veined, the lateral veins villous, marginal; III. as long as IV., ovate-oblong, 5-veined, paleate, ♂, palea very small, 2-partite, segments auricled; IV. sessile, ☿, oblong, narrowed into a slender, terminal awn, thinly coriaceous, dorsally flattened, quite smooth, margins glabrous or pubescent, narrowly incurved, the palea oblong, 2-keeled, the lobes auricled; *lodicules* flabelliform; *stamens* 3; anthers linear; *styles* free; stigmas linear, laterally exserted, shortly penicillate. *Grain* oblong, free within the hardened glume and palea.

Leaves ovate or ovate-lanceolate; spikes subverticillate ..... *cimicinus.*
Leaves long, linear; spikes few, subdigitate ..... *semialatus.*

2519. AXONOPUS CIMICINUS Beauv.; F. B. I. vii. 64. *Panicum cimicinum* F. I. i. 291.
In most of the provinces.
A tufted grass.

2520. AXONOPUS SEMIALATUS Hook. f.; F. B. I. vii. 64.
Chota Nagpur.
A densely tufted grass.

1054. Panicum Linn.

Annual or perennial grasses; *leaves* broad or narrow, flat or rarely plicate; ligule 0 or of hairs. *Spikelets* small, 1–2-flowered, terete or dorsally or laterally compressed, solitary or 2-nate, often secund, articulate on their pedicels and deciduous, rarely awned. *Glumes* 4; I. and II. empty, I. smallest and fewest-veined; II. and III. usually subequal, oblong, ovate or lanceolate; III. usually neuter, paleate or not; IV. coriaceous or papery, sometimes shortly stipitate, convex, 5–7-veined, paleate, 2-sexual, the palea usually as long as the glumes, membranous; *lodicules* 2, cuneate; *stamens* 3; *styles* distinct; stigmas exserted near the top of the spikelet. *Grain* free, but tightly embraced by the hardened glume and palea, oblong, ellipsoid or lanceolate.

*Spikelets dorsally compressed or subterete:—[p. 1176]
†Inflorescence racemose of simple, rarely branched spikes bearing secund spikelets:—[p. 1175]
‡Rachis of spikes broad and flat:—[p. 1175]
Spikelets 2-seriate:—
Spikelets villous ..... *Isachne.*
Spikelets glabrous:—
Spikes shorter than the internodes ..... *flavidum.*
Spikes longer than the internodes:—
Glume IV. granulate ..... *punctatum.*
Glume IV. smooth ..... *fluitans.*
Spikelets 3–5-seriate; glume III. cuspidate or awned:—
Stems stout, erect; leaves broad:—
Raceme of spikes erect:—
Glume III. awned ..... *Crus-galli.*
Glume III. only cuspidate ... *Crus-galli* var. *frumentaceum.*
Raceme of spikes drooping; glume III. awned *Crus-galli* var. *stagninum.*
Stems slender, decumbent; leaves narrow; glume III. only cuspidate ..... *colonum.*

‡Rachis of spikes narrow and filiform, terete or angular :—[p. 1174]
Glume I. much shorter than glume III. :—
Spikelets approximate or imbricate, or if distant (*P. ramosum* sometimes) glume IV. distinctly rugulose :—
Glume I. veinless or 1-veined, about ¼ the length of glume III. *prostratum.*
Glume I. 5-veined, from ¼–½ as long as glume III. :—
Stems 6–8 feet long or longer, usually in jhils and ponds; nodes densely bearded; glume IV. obtuse .....*muticum.*
Stems 2–3 feet long or shorter, never floating :—
Glume IV. shortly awned or apiculate :—
Glume IV. only apiculate .....*ramosum.*
Glume IV. shortly, abruptly awned :—
Angles of rachis pubescent; spikelets over ·15 in. in length .....*javanicum.*
Angles of rachis scaberulous; spikelets under ·15 in. in length .....*setigerum.*
Glume IV. ellipsoid, with obtuse, rounded tip *distachyum.*
Spikelets distant; glume IV. very minutely rugulose :—
Leaves long, narrow; sheaths glabrous; glume IV. obtuse *remotum.*
Leaves short, cordate-lanceolate; sheaths with margins ciliate; glume IV. apiculate .....*Kurzii.*
Glume I. more than half as long as glume III. .....*oryzoides.*
†Inflorescence of spiciform or effuse panicles :—[p. 1174]
Glume II. only half as long as IV.; panicle broad, with long branches .....*nodosum.*
Glume II. as long as glume IV. or longer :—
§Panicles narrow, spiciform, or if effuse, glumes II. and III. very strongly veined :—[p. 1176]
Glumes II. and III. 3–5-veined :—
Inflorescence a narrow, fastigiate, rarely effuse panicle *auritum.*
Inflorescence a spiciform panicle .....*Myurus.*
Glumes II. and III. 7–9-veined; inflorescence spiciform :—
Glume I. very minute; spikelets lanceolate .....*interruptum.*
Glume I. half as long as III.; spikelets gibbous :—
Panicle 4 in. long or less :—
Spikes 2 in. long or under; cylindric .....*indicum.*
Spikes 2–4 in. long, slender.....*indicum* var. *gracile.*
Panicle 5–8 in. long.....*myosuroides.*

§Panicles broad, effuse :—[p. 1175]
Leaves flat :—
Glume I. nearly as long as III. .....*ovalifolium.*
Glume I. much shorter than III. :—
Annuals :—
Glume I. less than half as long as III. :—
Spikelets ·2 in. long .....*miliaceum.*
Spikelets ·1–·15 in. long :—
Nodes of stem glabrous :—
Leaves hairy : cultivated.....*miliare.*
Leaves glabrous : wild .....*psilopodium.*
Nodes of stem bearded.....*cæsium.*
Glume I. about three-fourths the length of III. :—
Glume III. 7–9-veined.....*trypheron.*
Glume III. 3–5-veined .....*humile.*
Perennials :—
Glume IV. rugulose.....*maximum.*
Glume IV. smooth :—
Glume I. not one-fourth of III., nerveless :—
Ligule a coriaceous ridge .....*repens.*
Ligule of fine, erect hairs.....*proliferum.*
Glume I. more than one-fourth the length of III., 5–7-nerved :—
Glume III. epaleate .....*montanum.*
Glume III. paleate .....*sarmentosum.*
Leaves plicate :—
Glume I. half as long as III. or longer, 5-nerved ...*plicatum.*
Glume I. less than half as long as III. :—
Glume I. orbicular, 3-nerved ; glume II. apiculate *flavescens.*
Glume I. minute, membranous ; glume II. ovate-oblong, obtuse.....*rhachitrichum.*
*Spikelets laterally compressed ; inflorescence a contracted panicle [p. 1174] .....*trigonum*

2521. PANICUM ISACHNE Roth ; F. B. I. vii. 28.
Behar ; Chota Nagpur.
A slender, much-branched grass.

2522. PANICUM FLAVIDUM Retz ; F. B. I. vii. 28 ; E. D. P. 50. *P. brizoides* F. I. i. 293.
In most of the provinces.
A leafy, branching grass, with compressed stem. *Uriya* Bilai nangi.

2523. PANICUM PUNCTATUM Burm.; F. B. I. vii. 29. *P. fluitans* F. I. i. 293.
In all the provinces.
A perennial, glabrous grass of marshes and ditches. *Beng.* Peti-nar.

2524. PANICUM FLUITANS Retz. *P. paspaloides* F. B. I. vii. 30.
Orissa, Chilka Lake.
A perennial, glabrous grass of marshes and ditches.

2525. PANICUM CRUS-GALLI Linn.; F. B. I. vii. 30; E. D. P. 48. *P. hispidulum* F. I. i. 303.
In most of the provinces, but not common.
An annual grass of wet places and rich soil. *Beng.* Bara-Shama.

2525/2. Var. STAGNINUM Trim. *P. stagninum* F. I. i. 295. *P. Crus-Galli* E. D. P. 48 partly.
In all the provinces, very common.
A tall, stout grass of wet places. *Beng.* Dul.

2525/3. Var. FRUMENTACEUM Trim.; F. B. I. vii. 31. *P. frumentaceum* F. I. i. 304; E. D. P. 53.
In the northern and western provinces, cultivated.
A tall, stout grass. *Beng.* Shama; *Uriya* Samu.

2526. PANICUM COLONUM Linn.; F. B. I. vii. 32; E. D. P. 45. *P. cuspidatum* F. I. i. 298.
In all the provinces.
A slender, annual grass. *Hind.* Sanwal; *Santal.* Sama.

2527. PANICUM PROSTRATUM Lamk; F. B. I. vii. 33; E. D. P. 72.
In all the provinces.
A rather slender, annual grass; stems creeping and rooting below.

2528. PANICUM MUTICUM Forsk.; F. B. I. vii. 34.
C. Bengal.
An introduced grass, cultivated in marshes and wet places. *Beng.* Nar-dul.

2529. PANICUM RAMOSUM Linn.; F. B. I. vii. 36. *P. umbrosum* F. I. i. 297. *P. Helopus* E. D. P. 57 partly.
Tirhut; Behar; Chota Nagpur.
A decumbent, branching grass. *Santal.* Mota gundli.

2530. PANICUM JAVANICUM Poir.; F. B. I. vii. 35. *P. hirsutum* F. I. i. 300. *P. Helopus* E. D. P. 57 partly.
Behar; W. Bengal.
An annual, decumbent grass. *Hind.* Jal-ganti.

2531. PANICUM SETIGERUM Retz; F. I. i. 299; F. B. I. vii. 36. *P. Helopus* E. D. P. 57 partly.
C. Bengal.
A slender, prostrate, straggling grass. *Beng.* Bara jalganti.

2532. PANICUM DISTACHYUM Linn.; F. B. I. vii. 37.
In most of the provinces.
A branched straggling and creeping grass. *Santal.* Nari.

2533. PANICUM REMOTUM Retz; F. B. I. vii. 38.
Orissa.
A branched, decumbent, flaccid grass.

2534. PANICUM KURZII Hook. f.; F. B. I. vii. 38.
C. Bengal; E. Bengal; Chota Nagpur.
An annual, decumbent, flaccid grass.

2535. PANICUM ORYZOIDES Sw. *P. latifolium* F. B. I. vii. 39.
E. Bengal.
A rather stout, creeping grass.

2536. PANICUM NODOSUM Kunth; F. B. I. vii. 43.
E. Bengal.
A slender, leafy grass.

2537. PANICUM AURITUM Presl.; F. B. I. vii. 40.
N. Bengal; E. Bengal.
A tall, stout, perennial grass.

2538. PANICUM MYURUS H. B. K.; F. B. I. vii. 39. *P. serrulatum* F. I. i. 307.
In most of the provinces.
A leafy grass, with stems spongy below; in marshes and ponds. *Hind.* Dhamsiria.

2539. PANICUM INTERRUPTUM Willd.; F. I. i. 286; F. B. I. vii. 40.
Orissa; Chota Nagpur; N. Bengal; E. Bengal.
A glabrous, perennial grass of wet places and ponds. *Beng.* Nardula.

2540. PANICUM INDICUM Linn.; F. I. i. 281; F. B. I. vii. 41.
In all the provinces.
An annual, tufted grass.

2540/2. Var. GRACILE Hook. f.; F. B. I. vii. 42.
Tirhut; N. Bengal.
A slender, flaccid, annual grass.

2541. PANICUM MYOSUROIDES R. Br.; F. B. I. vii. 42. *P. curvatum* F. I. i. 286.
In most of the provinces.
An erect or shortly creeping, slender grass.

2542. PANICUM OVALIFOLIUM Poir.; F. B. I. vii. 44. *P. brevifolium* F. I. i. 306.
Chittagong.
A slender, decumbent, leafy grass.

2543. PANICUM MILIACEUM Linn.; F. I. i. 310; F. B. I. vii. 45; E. D. P. 63.
Tirhut; Behar, cultivated.
An annual, tufted grass. *Vernac.* Cheena.

2544. PANICUM MILIARE Lamk; F. I. i. 309; F. B. I. vii. 46; E. D. P. 67.
Chota Nagpur, cultivated.
A tufted annual grass. *Beng.* Gondula; *Santal.* Gandli.

2545. PANICUM PSILOPODIUM Trin.; F. B. I. vii. 46.
In all the western provinces, but rare.
A slender, tufted, annual grass.

2546. PANICUM CÆSIUM Nees; F. B. I. vii. 48.
Behar, Rajmahal; E. Bengal.
A stout, erect, annual grass.

2547. PANICUM TRYPHERON Schult.; F. B. I. vii. 47. *P. tenellum* F. I. i. 306.
In most of the provinces.
An annual tufted grass.

2548. PANICUM HUMILE Nees; F. B. I. vii. 48.
In every province.
A dwarf, slender, tufted annual grass.

2549. PANICUM MAXIMUM Jacq.; F. B. I. vii. 49. *P. jumentorum* E. D. P. 59.
Occasionally cultivated.
A tall, stout, erect, leafy grass.

2550. PANICUM REPENS Linn.; F. B. I. vii. 49. *P. uliginosum* F. I. i. 308.
In all the provinces.
A perennial grass of sandy or marshy places. *Beng.* Baranda; *Uriya* Pani dal.

2551. PANICUM PROLIFERUM Lamk; F. B. I. vii. 50. *P. paludosum* F. I. i. 307.

In all the provinces.
A matted grass, floating on ponds and ditches. *Beng.* Borati, kalas-nar, dalakri ghas.

2552. PANICUM MONTANUM Roxb.; F. I. i. 313; F. B. I. vii. 53.
Chota Nagpur; Behar; Chittagong.
A rigid, broad-leafed perennial grass.

2553. PANICUM SARMENTOSUM Roxb.; F. I. i. 308; F. B. I. vii. 54.
N. Bengal, Duars; Chittagong.
A long, branched, scandent perennial grass.

2554. PANICUM PLICATUM Lamk; F. B. I. vii. 55. *P. nervosum* F. I. i. 311.
Chota Nagpur, on Parasnath.
A tall, erect, perennial grass.

2555. PANICUM FLAVESCENS Sw.; F. B. I. vii. 56. *P. costatum* F. I. i. 312.
C. Bengal, common.
A slender, rather flaccid perennial grass. *Beng.* Banspati ghas.

2556. PANICUM RHACHITRICHUM Hochst.; F. B. I. vii. 56.
Chota Nagpur.
A slender, rather flaccid, tufted annual grass.

2557. PANICUM TRIGONUM Retz; F. I. i. 305; F. B. I. vii. 56.
C. Bengal.
A perennial, decumbent, wiry grass.

1055. Digitaria Lamk.

Perennial or annual grasses; *leaves* linear or lanceolate. *Spikelets* 1-flowered, in digitate or racemose spikes, jointed on the pedicel but not thickened at the base, awnless. *Glumes* normally 4, the lowest sometimes absent or present in the same species; I. a minute, nerveless scale or obsolete; II. and III. membranous, epaleate, as long as IV., or II. sometimes shorter than III.; IV. flowering, paleate, coriaceous, smooth, shining, the palea coriaceous, with inflexed margins; *stamens* 3; *styles* 2, free; stigmas plumose, exserted near apex of spikelet. *Grain* oblong, compressed, free, but tightly enclosed between the hardened glume and the palea.

*Spikelets ·1 in. long or longer:—[p. 1181]
†Rachis slender, narrowly winged or wingless:—[p. 1181]

Spikelets with bearded glumes .....*sanguinalis* var. *ciliaris.*
Spikelets with glumes glabrous or nearly so :—
Erect stout or slender grasses :—
Rachis wingless, trigonous .....*sanguinalis* var. *pruriens.*
Rachis with wings about as wide as midrib
sanguinalis var. *extensa.*
Prostrate or creeping, much-branched, small grasses ; rachis with wings hardly as wide as midrib.....*sanguinalis* var. *debilis.*
†Rachis broad, green, with wings 2–3 times as wide as midrib [p. 1180]
sanguinalis var. *Rottleri.*
*Spikelets ·05–·07 in. long only :—[p. 1180]
Pedicel of upper spikelet not longer than spikelet :—
Spikelets subsilky, with slender hairs .....*longiflora.*
Spikelets subtomentose, with clavellate hairs.....*Royleana.*
Pedicel of upper spikelet twice as long as the spikelet .....*pedicellaris.*

2558. DIGITARIA SANGUINALIS Scop. var. CILIARIS. *Panicum ciliare* F. I. i. 290. *Paspalum sanguinale* var. *ciliaris* F. B. I. vii. 15. *Panicum sanguinale* var. *ciliaris* E. D. P. 79.
In all the provinces.
A rather tall, slender grass. *Beng.* Makur-jali.

2558/2. Var. PRURIENS. *Paspalum sanguinale* var. *pruriens* F. B. I. vii. 15.
C. Bengal.
A slender, erect grass.

2558/3. Var. EXTENSA. *Panicum ægyptiacum* F. I. i. 289. *Paspalum sanguinale* var. *extensa* F. B. I. vii. 15. *Panicum sanguinale* E. D. P. 77.
In all the provinces.
A slender, erect grass.

2558/4. Var. DEBILIS. *Paspalum sanguinale* var. *debilis* F. B. I. vii. 16.
C. Bengal.
A dwarf, tufted grass.

2558/5. Var. ROTTLERI. *Paspalum sanguinale* var. *Rottleri* F. B. I. vii. 16.
In all the provinces.
A dwarf, tufted grass.

2559. DIGITARIA TENUIFLORA Beauv. *Milium filiforme* F. I. i. 314. *Paspalum longiflorum* F. B. I. vii. 17.

In all the provinces.

A small, tufted grass. *Hind.* Kanka-juriya.

2560. DIGITARIA ROYLEANA Prain. *Paspalum Royleanum* F. B. I. vii. 18.

In all the provinces.

A slender, tufted grass.

2561. DIGITARIA PEDICILLARIS Prain. *Paspalum pedicillare* F. B. I. vii. 19. *Milium sanguinale* F. I. i. 315.

In the western and northern provinces.

A slender, tufted grass. *Beng.* Chiri-chira.

1056. Paspalum Linn.

Annual or perennial grasses; *leaves* lanceolate or ovate-lanceolate. *Spikelets* 1-flowered, awnless, in digitate, racemose, or panicled spikes, jointed on the pedicel but not thickened at the base. *Glumes* 3, or occasionally 2, corresponding to glumes II.–IV. or glumes III. and IV. of *Digitaria* and *Panicum* (glume I. [of *Panicum*, &c.] absent); II. membranous, epaleate, as long as IV. (flowering glume) or shorter, sometimes obsolete; III. membranous, as long as flowering glume, epaleate; IV. (flowering glume) paleate, coriaceous, smooth, shining, the palea coriaceous, with inflexed margins; *stamens* 3; *styles* 2, free; stigmas plumose, exserted from near the top of the spikelet. *Grain* oblong, compressed, free, but tightly enclosed between the hardened glume and the palea.

Rachis as wide as the spikelets:—
Spikelets glabrous or nearly so ..... *scrobiculatum.*
Spikelets ciliate with long hairs..... *conjugatum.*
Rachis narrower than the distichous spikelets ..... *distichum.*

2562. PASPALUM SCROBICULATUM Linn.; F. I. i. 278; F. B. I. vii. 10; E. D. P. 332. *P. Kora* F. I. i. 278. *P. longifolium* F. I. i. 280.

In all the provinces.

An annual grass; sometimes poisonous. *Hind.* Kodo, kodaka; *Beng.* Khodoá dhan; *Santal.* Janhe; *Uriya* Kodus.

2563. PASPALUM CONJUGATUM Berg.; F. B. I. vii. 11.

C. Bengal; E. Bengal.

An annual grass.

2564. PASPALUM DISTICHUM Linn.; F. B. I. vii. 12. *P. longiflorum* F. I. i. 279.

Sundribuns.

A perennial grass, with creeping and rooting stem.

1057. Eriochloa H. B. & K.

Annual or perennial grasses; *leaves* flat, lanceolate or ovate-lanceolate. *Spikelets* 1-flowered, aristulate, secund on the spiciform branches of a raceme or panicle, the base thickened and articulate on the thickened apex of the short pedicel. *Glumes* 3 (glume I. [of *Panicum*, &c.] absent); II. and III. subequal, membranous, epaleate; IV. (flowering glume) paleate, rather shorter, apiculate, hardening in fruit; *lodicules* truncate; *stamens* 3; anthers linear; *styles* 2, free; stigmas plumose, subapically exserted. *Grain* oblong, free between the hardened glume and the palea.

2565. ERIOCHLOA POLYSTACHYA H. B. & K.; F. B. I. vii. 20; E. D. 287. *Milium ramosum* F. I. i. 316.

In most of the provinces.

A large grass; stems ascending from a creeping base.

1058. Oryza Linn.

Tall, annual or perennial grasses; *leaves* long, narrow, flat. *Spikelets* 1-flowered, loosely arranged on the branches of an elongate or rarely spiciform panicle, disarticulating below the glumes, laterally strongly compressed, awned or not, thickened at the base. *Glumes* 1–3; I. and II. very minute, subulate or obsolete; III. dimidiate-oblong, coriaceous or chartaceous, hard, keeled, 5-veined, the lateral vein forming a thickened margin to the glume, awnless or with a short or long, straight, terminal, scabrid awn, articulate on the glume; palea linear, as long as the glume, 3-veined, coriaceous, with membranous margins; *lodicules* 2, entire or 2-lobed; *stamens* 6; anthers linear; *styles* short, free; stigmas laterally exserted from glume. *Grain* narrowly oblong, compressed, closely covered by or adnate to glume and palea.

*Margins of leaves not spinulose; glume III. not winged :—[p. 1184]

†Spikelets over ·25 in. long; ligule long :—[p. 1184]

‡Ovary normal, solitary :—[p. 1184]

Spikelets over ·3 in. long, awned or not.....*sativa*.

Spikelets about ·3 in. long, always long awned ...*sativa* var. *fatua*.

‡Ovaries 2 or more, usually 3–5, sometimes 6 or 7 [p. 1183] ...*sativa* var. *plena.*

†Spikelets under ·25 in. long; ligule short:—[p. 1183]

Glumes tesselately punctulate, setulose .....*latifolia.*

Glumes granulate, glabrous .....*granulata.*

*Margins of leaves spinulose-serrate; glume III. dorsally winged, quite smooth; ligule very short [p. 1183].....*coarctata.*

2566. ORYZA SATIVA Linn.; F. I. ii. 200; F. B. I. vii. 92; E. D. O. 258.

In all the provinces, cultivated.

An annual crop. *Vernac.* Dhan, chawal; *Santal.* Uri. "Rice."

2566/2. Var. FATUA.

Orissa; Sundribuns; W. Bengal; N. Bengal.

An annual grass of watery places. "Wild Rice."

2566/3. Var. PLENA.

Chittagong.

An annual crop. "Double Rice."

There are many cultivated forms, some with long awns, others with short awns (*sativa* var. *submutica*) or none (*sativa* var. *denudata*). The most remarkable is the form known as "Double Rice" (var. *plena*), with 2–7 ovaries.

2567. ORYZA LATIFOLIA Desv.; F. B. I. vii. 93.

Behar.

A tall, tufted grass; stems sometimes 6 feet high.

2568. ORYZA GRANULATA Nees & Arn.; F. B. I. vii. 93; E. D. O. 255.

Behar; Chota Nagpur.

A slender, tufted grass; stems 2–3 feet high. *Santal.* Horo.

2569. ORYZA COARCTATA Roxb.; F. I. ii. 206; F. B. I. vii. 93.

Sundribuns, very common.

An erect grass; stems 4–6 feet, from a creeping root-stock. *Beng.* Dhani, harakata.

1059. Leersia Sw.

Tall, perennial, slender marsh grasses; *leaves* narrow, flat. *Spikelets* 1-flowered, in slender, contracted panicles, articulate below the glume, strongly laterally compressed. *Glume* solitary,

dimidiate, oblong, thinly chartaceous, keeled, awnless, the keel pectinately ciliate, 3-veined or 5-veined, the lateral veins forming the thickened margins of the glume; palea linear, as long as the glume, rigid; margins membranous, 3-veined, dorsally ciliate; *lodicules* 2; *stamens* 6; *styles* 2, short, free; stigmas plumose, laterally exserted from the glume. *Grain* narrowly oblong, free within the glume and palea.

2570. Leersia hexandra Sw.; F. B. I. vii. 94; E. D. L. 247. *L. ciliata* F. I. ii. 207.

In all the provinces.

A weak, floating grass; stems 12–30 feet long.

1060. Hygrorhiza Nees.

A floating, glabrous grass; stems stoutish, diffusely branched, rooting in dense masses at the nodes; branches short, erect, leafy; *leaves* oblong, obtuse. *Spikelets* few, erect, 1-flowered, jointed on the pedicels but tardily dehiscent, lanceolate, long-awned, on the few wide-spreading branches of a short-peduncled panicle. *Glume* solitary, thinly chartaceous, narrowed to an erect, scaberulous awn, strongly 5-veined, the veins scabrid, ciliate, lateral marginal; palea much narrower, 3-veined, acuminate, with ciliate keel; *lodicules* minute, suborbicular; *stamens* 6; anthers long, very slender; *styles* 2, free; stigmas feathery, laterally protruded. *Grain* oblong, narrowed at the base, obtuse, free within the glume and palea.

2571. Hygrorhiza aristata Nees; F. B. I. vii. 95; E. D. H. 513. *Leersia aristata* F. I. ii. 207.

In most of the provinces.

A glabrous, floating grass. *Vernac.* Jangli dal.

1061. Tragus Haller.

A small, perennial, rigid, densely tufted, depressed grass; stem short, leafy; *leaves* small, subdistichously imbricate, flat, ciliate. *Spikelets* in terminal spikes, binate on very short pedicels that are articulate with the rachis, 1-flowered. *Glumes* 3; I. very minute, hyaline; II. cymbiform, oblong-lanceolate, thickly coriaceous, empty, strongly 5-ribbed; margins membranous, inflexed, closely embracing III., the ribs armed with long, stout spines with hooked tips; III. 2-sexual, oblong-lanceolate, acuminate, dorsally compressed, thin, scaberulous, sides incurved; palea nearly as

long as the glume; *lodicules* minute, subquadrate; *stamens* 3; anthers short, broad; *styles* 2, free, very long, exserted at apex of glume; stigmas long, penicillate. *Grain* linear-oblong, free within the glume and the palea.

2572. TRAGUS RACEMOSUS Scop.; F. B. I. vii. 97. *Lappago biflora* F. I. i. 281.

W. Bengal.

A low, rigid, perennial grass.

1062. Perotis Ait.

A small, densely tufted, rigid grass, with wiry roots; stem erect or ascending; *leaves* very short, ovate or ovate-lanceolate, pungently acuminate, ciliate. *Spikelets* minute, terete, 1-flowered, articulate on the very short pedicels of a spiciform raceme. *Glumes* 3; I. and II. empty, equal, linear-oblong, membranous, with a strong midrib produced into a very long capillary awn; III. minute, hyaline, ovate-lanceolate, 1-veined; palea smaller, oblong, hyaline, veinless; *lodicules* 2, quadrate; *stamens* 3; anthers short; *styles* very short, connate at the base, laterally exserted; stigmas very short, plumose. *Grain* terete, linear, subacute, as long as and free within the glumes.

2573. PEROTIS LATIFOLIA Ait.; F. I. i. 233; F. B. I. vii. 98.

In all the provinces.

A slender grass, with leafy stem and crinite spike.

1063. Zoysia Willd.

A small, rigid, glabrous grass, with a long, wiry rootstock, emitting short, erect, leafy branches, ending in solitary, peduncled, spiciform racemes; *leaves* distichous, subulate, concave, pungent. *Spikelets* ovoid, laterally compressed, 1-flowered, articulate on very short, stout pedicels, adpressed to a rigid, inarticulate rachis, with concave facets opposite the spikelets. *Glumes* 2; I. empty, rigidly coriaceous, margins closely adpressed, tip membranous, veins 0; II. much smaller than and completely enclosed in I., ovate-lanceolate, hyaline, 1-veined; palea linear-oblong, hyaline; *lodicules* 0; *stamens* 3; anthers long; *styles* very long, connate below; stigmas plumose, exserted at top of spikelet. *Grain* oblong, free within the glume and palea.

2574. ZOYSIA PUNGENS Willd.; F. B. I. vii. 99.

Sundribuns, on the sea-face.

A small, much-branched, rigid, glabrous grass.

1064. Dimeria R. Br.

Erect, slender, annual or perennial grasses; *leaves* narrow. *Spikelets* 1-flowered, sessile, articulate on very short pedicels, laterally much compressed, solitary, secund, bifarious, in solitary, 2-nate or digitate, slender spikes, with inarticulate, terete, angular or flattened rachis; callus of spikelets short or long, bearded. *Glumes* 4; I. and II. usually divaricate in flower, empty; I. coriaceous, linear, sides complicate, dorsally rounded; II. as long as I. or longer, papery, oblong, margins hyaline, sides complicate, dorsally keeled, keel sometimes winged; III. much shorter, linear or oblanceolate, empty, hyaline, ciliate, palea 0; IV. hyaline, complicate, oblong, 2-fid, awned in the sinus; awn capillary, with a short column; palea minute or 0; *lodicules* 0, or very small; *stamens* 2; anthers long or short; *styles* short, distinct; stigmas short, laterally exserted. *Grain* linear, compressed.

Rachis flexuous; spikelets less than ·1 in. long.....*ornithopoda.*
Rachis nearly straight; spikelets exceeding ·1 in. long .....*connivens.*

2575. Dimeria ornithopoda Trin.; F. B. I. vii. 104. *Andropogon filiformis* F. I. i. 256.
Orissa; Chota Nagpur.
A much-branched, leafy, annual grass.

2576. Dimeria connivens Hack.; F. B. I. vii. 104.
Chota Nagpur.
A slender, annual grass.

1065. Imperata Cyrill.

Erect, perennial grasses; stem leafy; internodes solid; *leaves* narrow. *Spikelets* 1-flowered, in spiciform, subcylindric, silvery-silky panicles, with very short, filiform, inarticulate branches and rachises, all alike and 2-sexual, narrow, terete, hidden among very long hairs, rising from small callus and from outer glumes, 2-nate a sessile and a pedicelled, articulate at the base, fugacious. *Glumes* 4; I. and II. subequal, membranous, dorsally rounded, or II. obscurely keeled, 3–5-veined at the base; I. ovate-lanceolate, tip hyaline, obtuse; II. acuminate; III. and IV. very short, erose; palea minute, hyaline; *lodicules* 0; *stamens* 1–2; *styles* connate below; stigmas very long, narrow, exserted at the top of the spikelets. *Grain* oblong, small, free.

long as the glume; *lodicules* minute, subquadrate; *stamens* 3; anthers short, broad; *styles* 2, free, very long, exserted at apex of glume; stigmas long, penicillate. *Grain* linear-oblong, free within the glume and the palea.

2572. TRAGUS RACEMOSUS Scop.; F. B. I. vii. 97. *Lappago biflora* F. I. i. 281.

W. Bengal.

A low, rigid, perennial grass.

1062. Perotis Ait.

A small, densely tufted, rigid grass, with wiry roots; stem erect or ascending; *leaves* very short, ovate or ovate-lanceolate, pungently acuminate, ciliate. *Spikelets* minute, terete, 1-flowered, articulate on the very short pedicels of a spiciform raceme. *Glumes* 3; I. and II. empty, equal, linear-oblong, membranous, with a strong midrib produced into a very long capillary awn; III. minute, hyaline, ovate-lanceolate, 1-veined; palea smaller, oblong, hyaline, veinless; *lodicules* 2, quadrate; *stamens* 3; anthers short; *styles* very short, connate at the base, laterally exserted; stigmas very short, plumose. *Grain* terete, linear, subacute, as long as and free within the glumes.

2573. PEROTIS LATIFOLIA Ait.; F. I. i. 233; F. B. I. vii. 98.

In all the provinces.

A slender grass, with leafy stem and crinite spike.

1063. Zoysia Willd.

A small, rigid, glabrous grass, with a long, wiry rootstock, emitting short, erect, leafy branches, ending in solitary, peduncled, spiciform racemes; *leaves* distichous, subulate, concave, pungent. *Spikelets* ovoid, laterally compressed, 1-flowered, articulate on very short, stout pedicels, adpressed to a rigid, inarticulate rachis, with concave facets opposite the spikelets. *Glumes* 2; I. empty, rigidly coriaceous, margins closely adpressed, tip membranous, veins 0; II. much smaller than and completely enclosed in I., ovate-lanceolate, hyaline, 1-veined; palea linear-oblong, hyaline; *lodicules* 0; *stamens* 3; anthers long; *styles* very long, connate below; stigmas plumose, exserted at top of spikelet. *Grain* oblong, free within the glume and palea.

2574. ZOYSIA PUNGENS Willd.; F. B. I. vii. 99.

Sundribuns, on the sea-face.

A small, much-branched, rigid, glabrous grass.

1064. Dimeria R. Br.

Erect, slender, annual or perennial grasses; *leaves* narrow. *Spikelets* 1-flowered, sessile, articulate on very short pedicels, laterally much compressed, solitary, secund, bifarious, in solitary, 2-nate or digitate, slender spikes, with inarticulate, terete, angular or flattened rachis; callus of spikelets short or long, bearded. *Glumes* 4; I. and II. usually divaricate in flower, empty; I. coriaceous, linear, sides complicate, dorsally rounded; II. as long as I. or longer, papery, oblong, margins hyaline, sides complicate, dorsally keeled, keel sometimes winged; III. much shorter, linear or oblanceolate, empty, hyaline, ciliate, palea 0; IV. hyaline, complicate, oblong, 2-fid, awned in the sinus; awn capillary, with a short column; palea minute or 0; *lodicules* 0, or very small; *stamens* 2; anthers long or short; *styles* short, distinct; stigmas short, laterally exserted. *Grain* linear, compressed.

Rachis flexuous; spikelets less than ·1 in. long.....*ornithopoda.*
Rachis nearly straight; spikelets exceeding ·1 in. long .....*connivens.*

2575. Dimeria ornithopoda Trin.; F. B. I. vii. 104. *Andropogon filiformis* F. I. i. 256.
Orissa; Chota Nagpur.
A much-branched, leafy, annual grass.

2576. Dimeria connivens Hack.; F. B. I. vii. 104.
Chota Nagpur.
A slender, annual grass.

1065. Imperata Cyrill.

Erect, perennial grasses; stem leafy; internodes solid; *leaves* narrow. *Spikelets* 1-flowered, in spiciform, subcylindric, silvery-silky panicles, with very short, filiform, inarticulate branches and rachises, all alike and 2-sexual, narrow, terete, hidden among very long hairs, rising from small callus and from outer glumes, 2-nate a sessile and a pedicelled, articulate at the base, fugacious. *Glumes* 4; I. and II. subequal, membranous, dorsally rounded, or II. obscurely keeled, 3–5-veined at the base; I. ovate-lanceolate, tip hyaline, obtuse; II. acuminate; III. and IV. very short, erose; palea minute, hyaline; *lodicules* 0; *stamens* 1–2; *styles* connate below; stigmas very long, narrow, exserted at the top of the spikelets. *Grain* oblong, small, free.

2577. IMPERATA ARUNDINACEA Cyrill.; F. B. I. vii. 106; E. D. I. 51. *Saccharum cylindricum* F. I. i. 234.

In all the provinces.

An erect, perennial grass. *Hind.* Dábh; *Beng.* Ulu.

1066. Saccharum Linn.

Tall, perennial grasses; *leaves* narrow, flat. *Spikelets* minute, awnless, 1-flowered, all similar, 2-sexual, articulate at the base, disposed in large, silky, much and densely branched panicles, with spreading, at length erect, articulate, capillary, usually fragile branches and spikes; sessile spikelets deciduous with the internode and pedicel; callus bearded with very long hairs. *Glumes* 4; I. and II. subequal, membranous or subcoriaceous, I. oblong or lanceolate, dorsally flat or convex, margins incurved or inflexed, 1–2-veined at each flexure, keels not winged or scaberulous, II. concave, dorsally rounded or obscurely keeled; III. hyaline, oblong; IV. various or obsolete, awnless, with palea minute or 0; *lodicules* cuneate or irregular; *stamens* 3; *styles* and stigmas short, laterally exserted. *Grain* oblong or subglobose.

Stem solid; rachis of spike fragile; spikelets of each pair one sessile one pedicelled:—

Stem silky below the panicle:—

Hairs white, those of callus fine, many times longer than spikelets ..... *spontaneum.*

Hairs purple, those of callus rigid, hardly, if at all, longer than spikelets ..... *Narenga.*

Stem glabrous below the panicle:—

Glume I. dorsally villous:—

Panicle laxly spreading ..... *arundinaceum.*

Panicle closer subfastigiate ..... *arundinaceum* var. *ciliaris.*

Glume I. glabrous ..... *officinarum.*

Stem fistular; rachis of spike tenacious; spikelets of a pair both pedicelled ..... *fuscum.*

2578. SACCHARUM SPONTANEUM Linn.; F. I. i. 235; F. B. I. vii. 118. *S. canaliculatum* F. I. i. 246.

In all the provinces.

A tall, erect, perennial grass, 5–20 feet high, with a stout rootstock.

2579. SACCHARUM NARENGA Ham.; F. B. I. vii. 120.

Chota Nagpur; Behar; Tirhut; N. Bengal.

A tall, slender grass; stems 6–8 feet high.

2580. Saccharum arundinaceum Retz; F. B. I. vii. 119; E. D. S. 4. *S. exaltatum* F. I. i. 245. *S. procerum* F. I. i. 243.
N. Bengal, Duars; E. Bengal.
A tall, erect, perennial grass; stems 15–20 feet high. *Beng.* Teng.

2580/2. Var. ciliaris. *S. Munja* F. I. i. 246. *S. Sara* F. I. i. 244. *S. ciliare* E. D. S. 6.
W. Bengal; Behar; Tirhut.
A tall, erect, perennial grass; stems 10–12 feet high. *Vernac.* Sara, sarkanda. The Munj Grass.

2581. Saccharum officinarum Linn.; F. I. i. 237; F. B. I. vii. 118; E. D. S. 30. *S. sinense* F. I. i. 237.
In most of the provinces, cultivated.
A tall, erect perennial grass, with solid, juicy stem. *Vernac.* Akh, ganna. Sugar-cane.

2582. Saccharum fuscum Roxb.; F. I. i. 236; F. B. I. vii. 120; E. D. S. 25.
E. Bengal.
A stout, erect perennial; stems 5–8 feet high. *Beng.* Khuri; *Hind.* Khilut.

1067. Erianthus Michx.

Tall, perennial grasses; *leaves* flat, narrow. *Spikelets* 1-flowered, all similar, 2-sexual, awned, articulate at the base, a sessile and a pedicelled, arranged in large, silky, much and closely branched panicles with articulate, usually fragile, filiform branches and spikes; sessile spikelets deciduous with the internode and pedicel; callus bearded with very long hairs. *Glumes* 4; I. and II. subequal, membranous or subcoriaceous, I. oblong or lanceolate, dorsally flat or convex, margins incurved or inflexed, 1–2-veined at each flexure, keels not winged or scaberulous, II. concave, dorsally rounded or obscurely keeled; III. hyaline, oblong; IV. shortest, awned; palea minute or obsolete; *lodicules* cuneate or irregular; *stamens* 3; *styles* and stigmas short, laterally exserted. *Grain* oblong or sublobose.

Lower branches of the panicle much shorter than rachis.....*longisetosus.*
Lower branches of the panicle almost as long as the rachis ...*fastigiatus.*

2583. Erianthus longisetosus Anderss.; F. B. I. vii. 124.
Chittagong.
A stout, erect grass; stems 6–8 feet high.

2584. ERIANTHUS FASTIGIATUS Nees; F. B. I. vii. 125.
Chota Nagpur; N. Bengal, Duars; Chittagong.
An erect grass; stems 2–8 feet high.

1068. Pollinia Trin.

Annual or perennial grasses; *leaves* usually narrow. *Spikelets* 2-nate, a sessile and pedicelled, rarely both pedicelled, 1-flowered, or the sessile 2-flowered, arranged on more or less hirsute or silky spikes, with articulate, more or less fragile rachis, the internodes and pedicels usually slender; callus short, bearded; spikes solitary or 2-nate, shortly racemed or fascicled. *Glumes* 4; I. and II. subequal, chartaceous or coriaceous; I. dorsally flat or concave, rarely convex, margins incurved or inflexed, 2-keeled or winged above; II. as long as I., ovate-lanceolate, acuminate, keeled, 1–3-veined; III. hyaline, paleate or not; IV. hyaline, 2-cleft, awned in the sinus, awn slender, column brown; palea very short; *lodicules* obliquely truncate; *stamens* 3, rarely 2, linear; *styles* short; stigmas long, very narrow. *Grain* oblong.

Leaf-base not conspicuously constricted above the sheath :—
Stems erect; glume I. as long as glume II. :—
Glume II. of sessile spikelets awned .....*articulata.*
Glume II. of sessile spikelets not awned .....*argentea.*
Stems decumbent below; glume I. shorter than glume II. ...*Cumingii.*
Leaf-base conspicuously constricted and subpetioled above the sheath *ciliata.*

2585. POLLINIA ARTICULATA Trin.; F. B. I. vii. 109.
Chota Nagpur; Behar; W. Bengal; N. Bengal; E. Bengal, Mymensingh.
An erect, tufted grass, 1–2 feet high.

2586. POLLINIA ARGENTEA Trin.; F. B. I. vii. 111. *Andropogon tristachyus* F. I. i. 256.
Chota Nagpur; Behar; W. Bengal; C. Bengal.
An erect, tufted grass, 2–3 feet high.

2587. POLLINIA CUMINGII Nees; F. B. I. vii. 114.
N. Bengal, Duars; Chota Nagpur.
A slender, tufted grass.

2588. POLLINIA CILIATA Trin.; F. B. I. vii. 116.
Chota Nagpur, Parasnath.
A much-branched, straggling grass.

1069. Ophiurus Gaertn.

Annual or perennial tall grasses; stems solid, branching upwards, leafy; *leaves* linear-lanceolate. *Spikelets* 2-flowered, solitary and sessile in the excavate joints, with concave tops, of solitary or fascicled, terete, fragile spikes, with no trace of an upper spikelet and with no awn. *Glumes* 4; I. thickly coriaceous, convex, obtuse; II. almost membranous, concave, keeled; III. elliptic, obtuse, hyaline, faintly 2-nerved, margins infolded, paleate, male; IV. as long as III., oblong, obtuse, 2-sexual; palea narrow; *lodicules* 2, cuneate; *stamens* 3; anthers linear; *styles* and stigmas small, not exserted. *Grain* oblong, free.

2589. Ophiurus corymbosus Gaertn. f.; F. B. I. vii. 160. *Rottboellia corymbosa* F. I. i. 355.

N. Bengal, Duars.

An erect, perennial grass, 5–6 feet high; base of stem tuberous.

1070. Manisuris Sw.

Annual, erect, slender, leafy grasses; *leaves* flat, base cordate, amplexicaul. *Spikes* small, terete, axillary and terminal, shortly peduncled; rachis green, ultimately fragile, glabrous, with short, broad internodes, excavate opposite the sessile spikelets; *spikelets* minute, in very dissimilar pairs, a sessile 2-sexual, and a pedicelled male or neuter, the pedicel adnate or closely adpressed to the rachis. *Sessile spikelet: glumes* 4; I. globose, hollow, coarsely pitted with a ventral orifice, appressed to the cavity of the rachis, coriaceous, at length crustaceous, callus tumid, glabrous; II. minute, oblong, coriaceous, 1-veined, closing the orifice of I.; III. and IV. very minute, hyaline, convolute and together forming a conical envelope to the stamens and ovary, III. orbicular, IV. smaller, broadly oblong; *lodicules* subquadrate; *anthers* minute; connective very short; *ovary* globose; styles and stigmas short. *Pedicelled spikelet: glumes* 2, green; I. orbicular, flat, margined with a broad, hyaline, ciliate wing, veins 5–7, very wide; II. laterally compressed, cymbiform, 5–7-veined, keel with a dorsal, ciliate wing; III. and IV. usually obsolete. *Grain* oblong.

2590. Manisuris granularis Linn. f.; F. I. i. 352; F. B. I. vii. 159; E. D. M. 232.

In all the provinces.

An erect, annual, much-branched grass. *Hind.* Trinpali.

1071. Rottboellia Linn. *f.*

Annual or perennial grasses, usually tall; stems leafy; *leaves* narrow, flat. *Spikes* solitary, racemose or subpaniculate; rachis articulate; internodes terete or compressed, each bearing a pair of dissimilar, awnless spikelets, a lower 1–2-flowered, usually 2-sexual, sunk in a cavity of the internode, and an upper pedicelled, male or neuter, with the pedicel free or adnate to the side of the internode. *Glumes* 4; I. coriaceous, ovate or oblong, flat or convex, closing the mouth of the cavity, margins narrowly incurved; II. very thin, 1–3-veined; III. hyaline, paleate or not, neuter; IV. hyaline, paleate, 2-sexual; *lodicules* quadrate or cuneate; *stamens* 3; anthers linear; *styles* rather distant at the base and stigma short. *Pedicelled* upper *spikelet* smaller than sessile; *glume* I. usually herbaceous; II.–IV. much as in sessile spikelets. *Grain* oblong, compressed.

Spikes panicled, lower whorled, peduncled ..... *Zea.*
Spikes solitary or fascicled :—
  Spikes compressed; rachis not fragile :—
    Glume II. of pedicelled spikelet acuminate or shortly awned, 7–9-nerved ..... *compressa.*
    Glume II. of pedicelled spikelet long-awned, 1–3-nerved ... *protensa.*
  Spikes more or less cylindric; rachis fragile :—
    Glume I. of sessile spikelet broadly winged ..... *Clarkei.*
    Glume I. of sessile spikelet hardly winged..... *exaltata.*

2591. Rottboellia Zea Clarke; F. B. I. vii. 152.
N. Bengal, Duars.
A tall, stout grass, 6–8 feet high.

2592. Rottboellia compressa Linn. f.; F. I. i. 354; F. B. I. vii. 153.
In most of the provinces.
A branching, leafy grass. *Beng.* Pansheru.

2593. Rottboellia protensa Hack.; F. B. I. vii. 153.
N. Bengal; E. Bengal; C. Bengal.
A leafy grass, decumbent below.

2594. Rottboellia Clarkei Hack.; F. B. I. vii. 156.
Chota Nagpur.
A small annual grass.

2595. Rottboellia exaltata Linn. f.; F. I. i. 354; F. B. I. vii. 156.

In most of the provinces.

A short, erect grass, 6–10 feet high, with thick, spongy stems below. *Beng.* Bara-swati.

1072. Vossia Wall. & Griff.

A gigantic floating grass; stems thick, spongy; *leaves* linear, hispidulous. *Spikes* terminal, solitary or 2-nate, rarely 3–6-nate, stout; rachis narrow, compressed, flexuous, jointed; *spikelets* 2-flowered, imbricate 2-nate, longer than the subexcavate joints, one sessile, with a very broad callus, the other smaller, pedicelled. *Glumes* 4; I. very broad, ovate, flattened, coriaceous, smooth, narrowed into a long, rigid green tail; II. papery, ovate-lanceolate, acute, 3-nerved, keeled above; III. hyaline, 2-nerved, paleate, male; IV. hyaline, oblong, 3-nerved, tip ciliate, palea 2-nerved; *lodicules* large, toothed; *stamens* 3; anthers long; *styles* distinct; stigmas short. *Grain* narrow, free.

2596. Vossia cuspidata Griff. *V. procera* F. B. I. vii. 151. *Ischæmum cuspidatum* F. I. i. 324.

E. Bengal, Jheels.

A gigantic floating grass.

1073. Mnesithea Kunth.

A slender, erect, perennial grass; *leaves* narrow. *Spikes* solitary, slender; rachis articulate, fragile; internodes terete, ribbed, all except a few upper with 2 equal and similar spikelets, sunk in subopposite oblong cavities, separated by a hyaline, often evanescent septum, and with sometimes a minute glume of a third spikelet on the upper margin of the internode; *sessile spikelets* 1-flowered, nearly as long as internodes. *Glumes* 4; I. closing the mouth of the cavity, obliquely oblong, obtuse, thinly coriaceous, smooth, margins narrowly incurved; II. and III. as long as I., oblong, obtuse, hyaline, III. paleate or not, empty; IV. rather smaller, oblong, obtuse, 2-sexual, palea shorter than the glume; *lodicules* 0; *stamens* 3; anthers linear; *ovary* minute; styles 1 stigmas very small, not exserted. *Upper spikelet* seen only the upper, 1-flowered internodes; pedicel confluent with the of the internode, its margins with 2 ribs; *glume* I. very minute, orbicular or broadly ovate, flat, green; II. very narrow or 0. *Grain* narrowly oblong, compressed.

2597. Mnesithea lævis Kunth. *Rottboellia perforata* F. I. i. 356; F. B. I. vii. 158.

In all the provinces.
A slender, erect grass, 2–4 feet high. *Beng.* Kurki.

1074. Apluda Linn.

A tall, slender, perennial grass; stems leafy, geniculately ascending or subscandent, branched; *leaves* narrow, flat, more or less petioled; upper sheaths spathiform. *Spikes* deformed, in a leafy panicle, each in a spathiform bract; base of spikes rounded, often utricular, bearing in front a sessile, 2-sexual spikelet, prolonged above the base into 2 flat, linear, truncate, parallel arms, one terminated by a solitary, minute glume, the other by the upper spikelet. *Glumes* of both spikelets 4; I. and II. empty, III. and IV. delicately membranous; glume I. of lower spikelet largest, anticous, linear-oblong, coriaceous, rigid; II. thinner, tumid, beaked, dorsally gibbous, 7-veined; III. oblong, acute, 3-veined, 3-androus or neuter; IV. short, quadrate, deeply 2-fid, awned in the sinus, female or bisexual; palea of III. linear, 2-veined, of IV. minute, ovate. *Upper spikelet* dorsally compressed; glume I. oblong, acute, many-veined, herbaceous, margins narrowly incurved; II. chartaceous, ovate-lanceolate, acuminate, 3-veined; III. and IV. oblong, 1-veined, III. 3-androus, IV. female or imperfectly 2-sexual; paleæ of III. and IV. as in lower spikelets; *lodicules* 2, cuneate; *stamens* 3; anthers linear; *styles* short, free; stigmas short, penicillate. *Grain* oblong, subcompressed.

Glume IV. rarely awned, II. dorsally gibbous; keel above the gibbosity depressed ..... *varia* subsp. *mutica.*
Glume IV. awned, II. dorsally less gibbous ..... *varia* subsp. *aristata.*

2598. Apluda varia Hack. subsp. mutica Hack.; F. B. I. vii. 150. *A. geniculata* F. I. i. 325.
N. Bengal; C. Bengal; E. Bengal; Sundribuns.
A leafy, perennial grass.

2598/2. Subsp. aristata Hack.; F. B. I. vii. 150. *A. aristata* F. I. i. 324; E. D. A. 1232.
In all the western provinces.
A leafy, perennial grass. *Vernac.* Goroma.

1075. Ischæmum Linn.

Annual or perennial grasses; *leaves* narrow. *Spikes* solitary, digitate or fascicled, articulate; internodes of rachis and pedicels

of upper spikelets trigonous, hollowed ventrally; *spikelets* 2-nate, one sessile, one pedicelled, each often 2-flowered, a male and a female or 2-sexual, deciduous with the internode, the pedicelled spikelet usually dissimilar from the sessile, sometimes conform. *Sessile spikelet: glumes* 4; I. and II. subequal, coriaceous or papery, awnless or II. awned, I. ovoid-oblong or oblong-lanceolate, convex, with smooth sides, more or less nodose below the middle and more or less marginally winged and veined above it, the sides broadly or narrowly incurved, II. lanceolate, acuminate, concave; III. nearly as long as I., usually membranous, acute or acuminate, with a narrow, lanceolate, acuminate, 2-veined palea, usually centrally opaque and rigid marginally, with broad, inflexed, hyaline wings, 3-androus, rarely empty; IV. hyaline, deeply 2-cleft, 3-veined, awned, the awn geniculate, smooth or nearly so, with a brown, twisted column, dorsally inserted at the sinus; palea narrow, hyaline; *lodicules* cuneate or quadrate; *stamens* 3; anthers linear; *styles* long; stigmas short. *Pedicelled spikelet* with pedicel half as long as sessile spikelet or shorter; *glume* I. often dimidiate-ovate, flattened and wide-winged; glume IV. usually oblong, obtuse or minutely 2-lobed, very rarely awned. *Grain* free.

*Spikes 2-3, rarely more; veins of glume I. obscure:—[p. 1196]
Margins of glume I. narrowly inflexed or incurved from base to apex:—
Leaves rounded at the base:—
Pedicel of the upper spikelet less than one-third the length of the lower spikelet; base of stem not woolly:—
Glume I. of sessile spikelet with nodulose margins *aristatum* subsp. *imberbe.*
Glume I. of sessile spikelet closely, transversely ridged *rugosum.*
Pedicel of the upper spikelet more than one-third the length of the lower spikelet; base of stem woolly ..... *angustifolium.*
Leaves broad, hastate or deep cordate at the base:—
Glume I. of sessile spikelet glabrous ..... *semisagittatum.*
Glume I. of sessile spikelet villous..... *conjugatum.*
Margins of glume I. of sessile spikelet broadly incurved below the middle:—
Keel of glume II. winged above the middle ..... *ciliare.*
Keel of glume II. not winged:—

Stem stout, suberect ..... *hirtum.*
Stem slender, creeping below ..... *timorense.*
*Spike solitary; veins of glume I. strongly raised [p. 1195] ..... *laxum.*

2599. ISCHÆMUM ARISTATUM Linn. subsp. IMBERBE Hack.; F. B. I. vii. 127.
C. Bengal.
A rather stout, perennial grass.

2600. ISCHÆMUM RUGOSUM Salisb.; F. I. i. 320; F. B. I. vii. 127; E. D. I. 503.
In all the provinces.
A coarse, tufted, annual grass. *Beng.* Moraro; *Santal.* Marudi.

2601. ISCHÆMUM ANGUSTIFOLIUM Hack.; F. B. I. vii. 129; E. D. I. 494.
Chota Nagpur; Behar; Tirhut.
A tufted, perennial grass, 2–3 feet high. *Vernac.* Bhabar, sabai; *Santal.* Bachkom.

2602. ISCHÆMUM SEMISAGITTATUM Roxb.; F. I. i. 320; F. B. I. vii. 130.
C. Bengal.
A slender, flaccid, leafy, annual grass.

2603. ISCHÆMUM CONJUGATUM Roxb.; F. I. i. 321; F. B. I. vii. 131.
C. Bengal.
A slender, prostrate, leafy, annual grass.

2604. ISCHÆMUM CILIARE Retz; F. B. I. vii. 133; E. D. I. 497. *I. geniculatum* F. I. i. 322.
Chota Nagpur; Orissa.
A tufted, leafy grass.

2605. ISCHÆMUM HIRTUM Hack.; F. B. I. vii. 135.
Chota Nagpur.
A stout, suberect grass.

2606. ISCHÆMUM TIMORENSE Kunth; F. B. I. vii. 136. *I. tenellum* F. I. i. 323.
E. Bengal.
A slender, decumbent grass.

2607. ISCHÆMUM LAXUM R. Br.; F. B. I. vii. 136; E. D. I. 499.
W. Bengal; Behar; Chota Nagpur.
A tufted perennial, with short, stout, creeping rootstock.

1076. Pogonatherum Beauv.

Slender, perennial grasses; stem leafy upwards, branches rigid; *leaves* narrow, suberect. *Spikes* solitary, on long, flexuous peduncles, plumose from the slender awns; rachis at length fragile; internodes short; *spikelets* very small, subterete, 2-nate, 1–2-flowered, a sessile 2-sexual, and pedicelled male or neuter or rarely 2-sexual; callus bearded with long, fine hairs. *Glumes* 3 or 4, all membranous and hyaline, obscurely veined or veinless; I. oblong, truncate, dorsally rounded; II. longer, ovate, keeled, 2-fid and awned in the sinus, awn much longer than spikelet, slightly twisted; III. nearly as long as II., not awned, usually absent from pedicelled spikelet; IV. about half as long as II., bifid and awned in the sinus like glume II.; palea broadly oblong, not keeled; *lodicules* obsolete; *stamens* 1 or 2; anthers long; *ovary* narrow; styles short, free; stigmas very long, exserted at the top of the spikelet, shortly hairy. *Grain* narrow, gibbously obovate, compressed, acute.

Stems rarely under a foot, usually longer; glume II. ciliate; stamens usually 2; leaves pale green ..... *saccharoideum.*
Stems never a foot long; glume II. glabrous or nearly so; stamens usually solitary; leaves bright green ..... *crinitum.*

2608. Pogonatherum saccharoideum Beauv.; F. B. I. vii. 141.
Orissa; Chota Nagpur; W. Bengal; N. Bengal; Chittagong.
A densely tufted grass, with spreading stems, 12–18 in. long.

2609. Pogonatherum crinitum Trin.; F. B. I. vii. 141. *Andropogon monandrus* F. I. i. 260.
Chittagong.
A densely tufted grass, with erect stems, 6–9 in. high.

1077. Apocopis Nees.

Annual or perennial grasses; stems slender; *leaves* narrow, flat. *Spikes* solitary or 2–3-nate, compressed; rachis firm, not readily disarticulating; internodes very short, slender and villous; *spikelets* secund, closely imbricate in 2 series, solitary, sessile, 1–2-flowered, the lowest 2–4 in the spike imperfect, neuter; callus very short, acute, bearing the long capillary, ciliate pedicel of an obsolete upper spikelet. *Glumes* 4; I. very large, cuneately

obovate or obcordate, papery below, membranous above, more or less villous, with pale brown or yellow hairs, 7–9-veined below the apex, margins incurved at the base only; II. as long as I., much narrower, membranous, oblong-ovate, truncate, 3-veined, sides broadly incurved; II. oblong, similar to its hyaline palea, their tips broadly truncate and ciliolate, male or neuter; IV. 2-sexual, linear, 2-toothed, 1-veined, hyaline, shortly awned, the awn slender, twisted; palea half as long as glume, quadrately oblong, veinless, truncate, tip ciliolate; *lodicules* 0; *stamens* 2 or 3; anthers linear; *ovary* narrow; styles 2, very short; stigmas long, slender, exserted at apex of spikelet. *Grain* very small, narrowly oblong.

Perennial; glume IV. oblong, 2-fid; awn short or 0 .....*Royleanus.*
Annual; glume IV. linear, entire or 2-toothed; awn long.....*Wightii.*

2610. Apocopis Royleanus Nees; F. B. I. vii. 142.
N. Bengal, Duars.
A simple, slender grass, 1–2 feet high.

2611. Apocopis Wightii Nees; F. B. I. vii. 142.
Chota Nagpur.
A low, tufted grass.

1078. Arthraxon Beauv.

Annual or perennial slender grasses; stems decumbent, creeping and branching below; *leaves* short, broad, base cordate, sheaths shorter than the internodes. *Spikes* 2-nate, digitate or fascicled; rachis very slender, articulate, fragile; *spikelets* 1-flowered, secund, sessile, solitary or with an imperfect pedicelled spikelet, laterally compressed, deciduous with the internode; callus bearded. *Glumes* 4; I. lanceolate or linear-lanceolate, acute, thin or subcoriaceous, more or less muriculate or aculeate, margins hardly incurved; II. narrower, lanceolate, acuminate, chartaceous, keeled; III. hyaline, paleate, empty; IV. hyaline, awned or mucronate, 2-sexual, awn dorsal; palea minute or 0; *lodicules* 2, cuneate or quadrate; *stamens* 3, 2, or 1; *styles* short; stigmas laterally exserted. *Grain* linear or narrowly fusiform.

Stamens 3; anthers large, nearly as long as glume IV.; marginal nerves of glume I. armed with very strong, curved teeth .....*lanceolatus.*
Stamens 2 or 3; anthers much shorter than glume IV.; glume I. echinulate or scaberulous on the nerves but not toothed :—
*Glume II. aristiform in the upper third :—[p. 1199]

Joints of rachis glabrous .....*ciliaris.*
Joints of rachis, at least the upper, ciliate .....*ciliaris* var. *colorata.*
*Glume II. linear, acute [p. 1198] .....*microphyllus.*

2612. ARTHRAXON LANCEOLATUS Hochst.; F. B. I. vii. 143. *Andropogon lanceolatus* F. I. i. 257.
Chota Nagpur, Parasnath.
A tall, much-branched grass, suberect or subscandent.

2613. ARTHRAXON CILIARIS Beauv.; F. B. I. vii. 146.
Chota Nagpur; Behar.
A weak-stemmed, tufted grass.

2613/2. Var. COLORATA F. B. I. vii. 146.
Chota Nagpur, Parasnath.
A weak-stemmed, tufted grass.

2614. ARTHRAXON MICROPHYLLUS Hochst.; F. B. I. vii. 147.
In most of the provinces.
A dwarf, weak-stemmed, tufted grass.

1079. Lophopogon Hack.

Small, perennial, densely tufted grasses; *leaves* very narrow. *Spikes* very short, solitary, 2-nate or fascicled on the ends of capillary branches; rachis very fragile; joints short, slender, with cupular tips; *spikelets* small, similar or not, 1–2-flowered, 2–3-nate, one sessile; callus conical, villous. *Glumes* 4; I. and II. chartaceous, I. oblong, broadly truncate, irregularly 3–4-toothed, 7-nerved, dorsally convex; II. longer than I., lanceolate, narrowed into a straight awn, 3–5-nerved, hispidly villous on the sides and with tufts of hairs on the back below the middle; III. hyaline, oblong-lanceolate, acute or aristulate, ciliolate, 1-nerved, with 1–2 stamens or neuter, palea linear, 2-nerved; IV. nearly as long as III., female or hermaphrodite and 2-androus, linear-oblong, 2-fid, lobes setiform and margins hispidulous, the cleft with a tortuous awn longer than the glumes; palea 2-nerved, small, quadrate, lobulate; *lodicules* 0; *stamens* 1–2, with narrow anthers; *styles* connate below; stigmas very long. *Grain* narrow.

2615. LOPHOPOGON KINGII Hook. f.; F. B. I. vii. 149.
Behar.
A small, densely tufted grass, with subcorymbosely branched stems.

1080. Andropogon Linn.

Annual or perennial grasses of very varied habit; *leaves* usually

narrow. *Spikes* solitary, 2-nate, digitate, fascicled or panicled, sometimes (§ *Cymbopogon*) reduced to 3 spikelets; rachis articulate, more or less fragile; *spikelets* in alternate pairs, a sessile hermaphrodite and a pedicelled male or neuter, one or more lowest in the spike sometimes neuter and differing in form from the upper. *Sessile spikelets* 1-flowered; callus long or short; *glumes* 3 or 4; I. coriaceous or papery, 2-keeled, awnless; II. thinner, concave, keeled, rarely shortly awned; III. hyaline, neuter or absent; IV. hyaline, awned, often reduced to the dilated base of the awn, 2-sexual; palea small or 0; *lodicules* 2, cuneate; *stamens* 3, 2, or 1, usually 3; *styles* short or long; stigmas laterally exserted. *Pedicelled spikelets* usually smaller than sessile; *glume* IV. awnless. *Grain* free.

*Internodes of the spike deeply cupped at the apex :—[p. 1201]

Sessile spikelets of the lowest pairs differing from those above them in sex and form; spikes 2-nate, each pair with a spathaceous bract (§ *Cymbopogon*) :—

Joints of spikes and pedicels of upper spikelets copiously villous on the sides and back; hairs more or less concealing the sessile spikelets *Iwarancusa.*

Joints of spikes and pedicels of upper spikelets villous or ciliate on the sides, dorsally glabrous or nearly so; hairs not concealing the sessile spikelets :—

Leaf-base broad, cordate ..... *Schoenanthus.*

Leaf-base narrow, not cordate :—

Glume I. dorsally flat or with shallow depressions or concave towards the base :—

Spathes less than 1 in. long ..... *Nardus.*

Spathes 1 in. long or longer ..... *Nardus* var. *grandis.*

Glume I. dorsally deeply concave below the middle, with a boss at the base of the cavity ..... *Gidarba.*

Sessile spikelets of all the pairs alike in sex and form throughout the spike; peduncles of spikes enclosed in spathiform leaf-sheaths but with no spathaceous bract under the spike :—

Spikes solitary on the peduncle :—

Pedicelled spikelets smaller than the sessile (§ *Schizachyrium*) :—

Leaves divaricate; spathes spreading ..... *brevifolius.*

Leaves and spathes erect ..... *exilis.*

Pedicelled spikelets longer than the sessile (§ *Diectomis*) *fastigiatus.*

Spikes 2 or more on a common peduncle (§ *Arthrolepis*) ..... *apricus.*

*Internodes of the spike truncate at the apex, but not cupped :—[p. 1200]
†Sessile spikelets of all the pairs alike in sex and form :—[p. 1202]
Peduncles of solitary spikes enclosed in spathiform leaf-sheaths (§ *Hypogynium*) ..... *foveolatus.*
Peduncles of spikes not enclosed in spathiform leaf-sheaths :—
Pedicels of upper spikelets and joints of rachis slender, strongly compressed, with thickened margins and a translucent centre (§ *Amphilophis*) :—
Spikes small, of 1–3, rarely 4 pairs of spikelets, often reduced to 3 spikelets, a sessile and 2-pedicelled ; panicles pyramidal, with capillary rachis and branches :—
Herbaceous ; erect stems, simple or subsimple ; leaves linear, hardly narrowed at base, with sheaths closed *micranthus* var. *villosula.*
Suffruticose ; sarmentose stems much-branched ; leaves lanceolate, much narrowed at base, with lower sheaths open *assimilis.*
Spikes with numerous pairs of spikelets :—
Spikes 3–7, digitately subfascicled, the lower longer than the rachis of the inflorescence ; glume I. coriaceous, distinctly subperforately pitted ..... *pertusus.*
Spikes usually very many, paniculate, rarely few racemose, the lower spikes shorter than the rachis of the inflorescence ; glume I. thin :—
Glume I. not pitted ..... *intermedius.*
Glume I. shallowly pitted ..... *intermedius* var. *punctatus.*
Pedicels of upper spikelets and joints of rachis terete, subterete, angular or laterally compressed, the centre not diaphanous :—
†Spikes with several or many pairs of spikelets ; tips of branches of panicle not bearded :—[p. 1202]
Glume I. not muricate ; internodes of spikes terete or subterete :—
Branches of panicle bearing spikelets close down to the rachis (§ *Pseudamphilophis*) ..... *fascicularis.*
Branches of panicle naked below (§ *Sorghum*) :—
Rachis of spike tenacious ..... *Sorghum.*
Rachis of spike fragile :—
Spikelets softly silky, with pale, rarely dark hairs *halepensis.*
Spikelets villous, with rufous or purplish hairs *serratus.*
Glume I. with muricate sides ; internodes of spikes laterally compressed (§ *Vetiveria*) ..... *squarrosus.*

‡Spikes with 3 spikelets; tips of branches of panicle bearded (§ *Chrysopogon*) :—[p. 1201]

Pedicels of upper spikelets at least half as long as the sessile spikelets :—

Pedicels of upper spikelets scaberulous; sessile spikelets ·15 in. long ..... *aciculatus.*

Pedicels of upper spikelets villous with long hairs; sessile spikelets ·25 in. long :—

Leaves glabrous on both surfaces..... *lancearius.*

Leaves scaberulous beneath ..... *Hamiltoni.*

Pedicels of upper spikelets less than half as long as the sessile spikelets :—

Pedicels with villous margins; callus short, hairy *monticola* var. *Trinii.*

Pedicels villous only at their tips; callus long, villous only at its base ..... *polyphyllus.*

†Sessile spikelets of the lower pairs of the spike differing from the upper in sex (usually neuter) and more or less in form :—[p. 1201]

Lower pairs of spikelets markedly unlike the upper; upper sessile spikelets cylindric; spikes solitary (§ *Heteropogon*) *contortus.*

Lower pairs of spikelets not very unlike the upper; upper sessile spikelets dorsally compressed (§ *Dichanthium*) :—

Spikelets subdistichous; spikes usually solitary :—

Nodes of the stem bearded; sessile spikelets pale, pedicelled spikelets dark ..... *Clarkei.*

Nodes of the stem beardless; sessile and pedicelled spikelets concolorous..... *caricosus.*

Spikelets subspiral; spikes usually corymbose or subdigitately fascicled; nodes of the stem bearded; sessile and pedicelled spikelets concolorous :—

Glume I. of sessile spikelets uniformly beset with tubercle-based hairs ..... *annulatus.*

Glume I. of sessile spikelets with a row of tubercle-based hairs below the tip ..... *annulatus* var. *papillosus.*

Glume I. of sessile spikelets glabrous or loosely hairy *annulatus* var. *Bladhii.*

2616. ANDROPOGON IWARANCUSA Jones; F. I. i. 275; F. B. I. vii. 203. *A. laniger* E. D. A. 1093 partly.

Behar and Tirhut, cultivated.

A tufted grass, with an annulate, creeping rootstock. *Vernac.* Ibharankusha, kurankusha.

2617. ANDROPOGON SCHOENANTHUS Linn.; F. B. I. vii. 204; E. D. A. 1117. *A. Martini* F. I. i. 277.
Chota Nagpur; Behar; W. Bengal; E. Bengal, Mymensingh.
A tall, erect grass, 3–6 feet high. *Hind.* Rúsa ghas; *Beng.* Agya-ghas.

2618. ANDROPOGON NARDUS Linn.; F. B. I. vii. 206. *A. Schoenanthus* F. I. i. 274. *A. citratus* E. D. A. 1079.
Cultivated in most of the provinces.
A tall, erect grass, 3–6 feet high. *Beng.* Gandhabena.

2618/2. Var. GRANDIS Hack.; F. B. I. vii. 206.
Behar; Tirhut; N. Bengal.
A tall, erect grass, 8–15 feet high.

2619. ANDROPOGON GIDARBA Ham.; F. B. I. vii. 208.
Behar.
An erect, slender grass, 4–6 feet high.

2620. ANDROPOGON BREVIFOLIUS Sw.; F. B. I. vii. 165; E. D. A. 1078. *A. parviflorus* F. I. i. 274.
In most of the provinces.
A glabrous, flaccid, geniculate, annual grass.

2621. ANDROPOGON EXILIS Hochst.; F. B. I. vii. 166.
W. Bengal; Behar; Chota Nagpur.
An erect, slender, annual grass.

2622. ANDROPOGON FASTIGIATUS Sw.; F. B. I. vii. 167.
Behar; Chota Nagpur.
An erect or decumbent, perennial grass.

2623. ANDROPOGON APRICUS Trin.; F. B. I. vii. 169.
Chota Nagpur.
A tall, strict, slender grass.

2624. ANDROPOGON FOVEOLATUS Del.; F. B. I. vii. 168. *A. strictus* F. I. i. 260.
W. Bengal; Behar; Chota Nagpur.
A densely tufted grass of dry places.

2625. ANDROPOGON MICRANTHUS Kunth. var. VILLOSULA Hack.; F. B. I. vii. 179.
Chota Nagpur, Parasnath.
An erect or suberect grass, with stems 2–3 feet high.

2626. ANDROPOGON ASSIMILIS Steud.; F. B. I. vii. 179.

Chota Nagpur; Behar; N. Bengal.

A sarmentose grass, with stems 2–12 feet long.

2627. ANDROPOGON PERTUSUS Willd.; F. I. i. 258; F. B. I. vii. 173; E. D. A. 1114.

In all the western provinces.

A small, tufted, annual or perennial grass. *Santal.* Kada chandi ghás.

2628. ANDROPOGON INTERMEDIUS R. Br.; F. B. I. vii. 175.

In all the western provinces.

A stoutish perennial grass; stems 3–5 feet high.

2628/2. Var. PUNCTATUS F. B. I. vii. 176. *A. glaber* F. I. i. 266. *A. punctatus* F. I. i. 264.

E. Bengal; N. Bengal; C. Bengal; Chota Nagpur.

A stoutish perennial grass; stems 3–5 feet high. *Beng.* Gandha-gurana.

2629. ANDROPOGON FASCICULARIS Roxb.; F. I. i. 265; F. B. I. vii. 177.

Chota Nagpur; Behar; Orissa.

A slender, annual grass; stems 2–3 feet high.

2630. ANDROPOGON SORGHUM Brot.; F. I. i. 273; F. B. I. vii. 183. *Sorghum saccharatum* E. D. S. 2405. *S. vulgare* E. D. S. 2424.

Cultivated in the northern and western provinces.

A tall, annual grass. *Vernac.* Juar (the grain-yielding), Deo-dhan.

2631. ANDROPOGON HALEPENSIS Brot.; F. B. I. vii. 182. *A. laxus* F. I. i. 271. *A. miliaceus* F. I. i. 272. *Sorghum halepense* E. D. S. 2394.

In the northern and central provinces.

A tall, stout or slender, perennial grass. *Hind.* Baru; *Beng.* Kála-múcha.

2632. ANDROPOGON SERRATUS Thunb.; F. B. I. vii. 185.

Behar; Chota Nagpur.

A tall, erect, perennial grass.

2633. ANDROPOGON SQUARROSUS Linn. f.; F. B. I. vii. 186. *A. muricatus* F. I. i. 265; E. D. A. 1097.

In most of the provinces.

A densely tufted grass; stems 2–5 feet high. *Vernac.* Bena, khas-khas; *Santal.* Sirom.

2634. ANDROPOGON ACICULATUS Retz; F. I. i. 262; F. B. I. vii. 188; E. D. A. 1073.
In all the provinces.
A creeping grass; stems branched below, erect above. *Beng.* Chora-kanta.

2635. ANDROPOGON LANCEARIUS Hook. f.; F. B. I. vii. 190.
Behar; Chota Nagpur.
A tall grass, with leafy stems, 2–4 feet high.

2636. ANDROPOGON HAMILTONI Hook. f.; F. B. I. vii. 190.
Behar.
A tall grass, with leafy stems, 2–4 feet high.

2637. ANDROPOGON MONTICOLA Schult. var. TRINII Hook. f.; F. B. I. vii. 193.
Behar; Chota Nagpur.
A tufted grass, with suberect stems, 1–3 feet high.

2638. ANDROPOGON POLYPHYLLUS Hack.; F. B. I. vii. 194.
Chota Nagpur.
A stiff, erect grass, with stems 2–3 feet high.

2639. ANDROPOGON CONTORTUS Linn.; F. I. i. 253; F. B. I. vii. 199; E. D. A. 1090.
Orissa; Chota Nagpur; Behar; W. Bengal: in C. Bengal rare, and probably introduced only.
A densely tufted, erect or decumbent grass; stems 1–5 feet long.

2640. ANDROPOGON CLARKEI Hack.; F. B. I. vii. 197.
Chota Nagpur, Parasnath.
A slender, annual grass; stems 1–1·5 feet high.

2641. ANDROPOGON CARICOSUS Linn.; F. B. I. vii. 196. *A. serratus* F. I. i. 253.
In most of the provinces.
An erect or decumbent, large or small grass. *Beng.* Detara, detta.

2642. ANDROPOGON ANNULATUS Forsk.; F. B. I. vii. 196. *A. scandens* F. I. i. 258.
In all the provinces.
A geniculately ascending, large or small grass. *Beng.* Loari.

2642/2. Var. PAPILLOSUS Hook. f.; F. B. I. vii. 197.
Chota Nagpur, Parasnath.
A geniculately ascending, rather large grass.

2642/3. Var. Bladhii Hack.; F. B. I. vii. 197. *A. Bladhii* F. I. i. 259; E. D. A. 1076.
In most of the provinces.
A geniculately ascending, small or large grass.

1081. Pseudanthistiria Hook. f.

Annual grasses; *leaves* long, narrow. *Spikes* many, short, crowded in panicled fascicles, each with a spathiform bract, inarticulate; *spikelets* in each spike usually one sessile, bisexual, with one pedicelled male, and a second sessile, bisexual, with two pedicelled male. *Sessile* 2-sexual *spikelets* with short callus; *glume* I. chartaceous, 7-veined, margins incurved below the middle; II. lanceolate, 3-veined, membranous; III. small, quadrate; IV. the narrow hyaline base of a long capillary, geniculate awn; *lodicules* cuneate. *Pedicelled* male *spikelets* on slender pedicels; *glume* I. thin, about 9-veined, margins narrowly incurved; II. 3-veined; III. very small, oblong; *stamens* 3; anthers linear; *styles* short; stigmas short, exserted. *Grain* small.

2643. Pseudanthistiria heteroclita Hook. f.; F. B. I. vii. 219. *Anthistiria heteroclita* F. I. i. 249.
C. Bengal.
A slender, geniculate grass.

1082. Anthistiria Linn.

Tall, annual or perennial grasses; *leaves* long, narrow. *Spikes* many, short, crowded in spathaceous, paniculate fascicles, each in a spathiform bract; rachis of spike articulate above the four lower spikelets; *spikelets* 7–9, dimorphic, 4 whorled or nearly so, male or neuter, awnless, forming an involucre round the jointed rachis, with either one sessile, 2-sexual, and 2 pedicelled spikelets, or two superposed 2-sexual spikelets, the lower with 1, the upper with 2 pedicelled spikelets. *Spikelets of the involucre* longest, sessile; callus 0; *glumes* 3; I. oblong-lanceolate, acuminate, flattened, sometimes thickened at the base, margins narrowly incurved and keels narrowly winged; II. membranous, 3-nerved; III. hyaline, 1-nerved; *anthers*, if present, large. *Sessile* 2-sexual or female *spikelets* much smaller, narrowly oblong, subterete, obtuse; callus rigidly bearded; *glume* I. coriaceous, margins strongly incurved; II. as long as I., linear, hyaline, 3-nerved, dorsally chartaceous, sides broadly incurved, membranous; III. very small, hyaline,

without palea; IV. the narrow or flattened base of a long, geniculate awn; palea 0; *lodicules* cuneate; *anthers* small. *Pedicelled spikelets* like the involucrant but narrower, male or neuter, with glabrous pedicels, no callus, and with keels of glume I. not winged; *stamens* 3; *styles* 2, short, spreading from the base; stigmas long, slender, variously exserted. *Grain* narrow, 2-convex.

Involucrant spikelets truly verticillate :—
Annual; spikes in globose or fan-shaped fascicles .....*ciliata.*
Perennials :—
Spikes in globose or fan-shaped fascicles .....*imberbis.*
Spikes in small, dense, distinctly peduncled heads forming a long, narrow panicle.....*strigosa.*
Involucrant spikelets in closely superposed pairs :—
Spikelets hirsute, with golden yellow hairs; bisexual spikelets 1, rarely 2 in each spike; awn 1·5–4 in. long .....*gigantea* var. *arundinacea.*
Spikelets hirsute, with rufous hairs; bisexual spikelets 2 or 3 in each spike; awn ·5 in. long .....*gigantea* var. *caudata.*

2644. ANTHISTIRIA CILIATA Linn. f.; F. B. I. vii. 213. *A. scandens* F. I. i. 248.
In all the western provinces, common.
A stout grass, 4–6 feet high.

2645. ANTHISTIRIA IMBERBIS Retz; F. B. I. vii. 211. *A. ciliata* F. I. i. 247; E. D. A. 1188.
Chota Nagpur, rare.
A stout grass, 4–6 feet high.

2646. ANTHISTIRIA STRIGOSA Ham.; F. B. I. vii. 214.
Behar; N. Bengal; E. Bengal, Mymensingh.
A stout, erect grass; stems 3–4 feet high.

2647. ANTHISTIRIA GIGANTEA Cav. var. ARUNDINACEA Hack.; F. B. I. vii. 217. *A. arundinacea* F. I. i. 251; E. D. A. 1186.
N. Bengal; E. Bengal.
A tall grass, 10–16 feet high.

2647/2. Var. CAUDATA Hack.; F. B. I. vii. 217.
Chota Nagpur; N. Bengal, Duars.
A tall grass, 8–12 feet high.

1083. Iseilema Hack.

Small annual or perennial grasses; *leaves* long, narrow. *Spikes* many, short, crowded in fascicles of short spikes in the axils of

spathiform bracts; rachis of spike articulated on the top of its peduncle below the lowest spikelets; *spikelets* dimorphic, the lower 4 truly whorled, male or neuter, forming an involucre round the inarticulate rachis, bearing a sessile 2-sexual and 2 pedicelled male or neuter spikelets. *Spikelets of the involucre* pedicelled; pedicels short, flattened, glabrous or bearded at the base; *glumes* 3; I. and II. oblong-lanceolate, I. 3–5-nerved, II. 3-nerved; III. hyaline, 1-nerved; lodicules cuneate, retuse. *Sessile spikelet* 2-sexual, narrowed into a slender stipe; *glume* I. truncate or 2-fid at tip; II. hyaline; III. absent or very small; IV. an awn longer than spikelet. *Pedicelled spikelets* on long, slender pedicels; *stamens* 3; *styles* 2, short, spreading from the base; stigmas long, slender, exserted at the apex of the spikelet. *Grain* oblong, compressed.

Keel and submarginal nerves of the spathes granulate or tubercled ..... *Wightii.*

Keel and submarginal nerves of the spathes smooth ..... *laxum.*

2648. Iseilema Wightii Anderss.; F. B. I. vii. 218; E. D. I. 488. *Anthistiria prostrata* F. I. i. 250.
Chota Nagpur; Behar; N. Bengal.
A decumbent, perennial grass.

2649. Iseilema laxum Hack.; F. B. I. vii. 218; E. D. I. 487.
Orissa; W. Bengal; Behar.
A decumbent, perennial grass.

1084. Zea Linn.

A tall, stout, annual, monœcious grass; *leaves* broad, flat. *Spikelets* 1-sexual, males in terminal, racemed spikes, females in solitary, axillary, stout, sheathed spikes, with a thick, inarticulate, spongy rachis. ♂ *Spikelets* 2-flowered, 2-nate, a sessile and a pedicelled at each of the alternating teeth of the inarticulate rachis; *glumes* 4, acute; I. and II. subequal, membranous, empty, I. enclosing the hyaline paleate III. and IV.; *lodicules* fleshy; *stamens* 3; anthers linear. ♀ *Spikelets* 1-flowered, sessile, densely crowded in many series on the thick, cylindric rachis; *glumes* 4, membranous; I. and II. very broad, obtuse or marginate; III. hyaline, paleate, empty; IV. hyaline, often 2-fid; *lodicules* 0; *ovary* obliquely-ovoid, plano-convex; style very long, 2-fid, with papillose arms. *Grain* large, subglobose or flattened, surrounded by the marcescent glumes.

2650. Zea Mays Linn.; F. I. iii. 568; F. B. I. vii. 102; E. D. z. 50.

Cultivated.

A tall, annual, monœcious grass. *Vernac.* Butta, makai; *Santal.* Jondra.

1085. Polytoca R. Br.

Tall, stout, erect, branching, perennial, monœcious grasses; stems spongy; nodes bearded; flowering branches fascicled; *leaves* long, flat. *Spikes* solitary or panicled, male only, or the upper male, the lower female; rachis jointed; spikelets geminate, a sessile and a pedicelled. ♂ *Spikelets* lanceolate, 2-flowered; *glumes* 4; I. many-nerved, 2-keeled; II. 5–7-nerved; III. and IV. hyaline, paleate, 3-androus; *anthers* very long; *lodicules* cuneate. ♀ *Spikelets* imbricate, the pedicelled imperfect, its pedicel confluent with the rachis; *glumes* of sessile spikelet 4; I. oblong, coriaceous, margins inflexed, embracing the rachis, at length crustaceous; II. thin, acuminate; III. hyaline, epaleate; IV. hyaline, paleate, fertile; staminodes 0; *lodicules* 0; *ovary* minute; styles long; stigmas slender. *Grain* very small, orbicular, enclosed in the hardened outer glumes.

Inflorescences mostly compound; male spikelets terminal, superposed, hairy; female 3–7 .....*bracteata.*
Inflorescences all of simple, bisexual spikes; spikelets glabrous...*barbata.*

2651. Polytoca bracteata R. Br.; F. B. I. vii. 101. *Coix heteroclita* F. I. iii. 572.

N. Bengal, Duars; E. Bengal, Mymensingh.

A tall, usually stout grass, 3–5 feet high.

2652. Polytoca barbata Stapf; F. B. I. vii. 102. *Coix barbata* F. I. iii. 569.

In most of the provinces.

A tall grass, 3–5 feet high. *Beng.* Gungar.

1086. Coix Linn.

Tall, leafy, monœcious grasses; stem branching, spongy within; *leaves* long, flat, wide. *Spikes* many, axillary and terminal; lower spikelets solitary, female, enclosed in an ultimately hardened, polished, nut-like bract, through the apex of which the pedicelled male portion of the spike protrudes. ♂ *Spikelets* 2–3-nate at each

node of the rachis, one sessile and 1 or 2 pedicelled, lanceolate; *glumes* 4; I. and II. subequal, empty, rigid or herbaceous, I. keeled along the inflexed margins; III. and IV. hyaline, paleate, 3-androus or empty. ♀ *Spikelets* ovoid, acuminate; *glumes* 4; I. chartaceous; II.–IV. successively thinner, IV. paleate; staminodes minute; *lodicules* 0; *ovary* ovoid; styles 2, free, slender. *Grain* orbicular, ventrally furrowed, enclosed in the hardened, globose, ovoid or cylindric involucre.

Stems erect:—

Male spikelets 3 or 2, with 1 imperfect; glume I. narrowly winged *Lachryma-Jobi.*

Male spikelets many, 3-nate at internodes, often forming long, cylindric, drooping spikes; glume I. broadly winged .....*gigantea.*

Stems floating; male spikelets many, in cylindric, drooping spikes *aquatica.*

2653. Coix Lachryma-Jobi Linn.; F. I. iii. 568; F. B. I. vii. 100; E. D. C. 1686.

In most of the provinces.

A stout, perennial grass; stems 3–5 feet high. *Hind.* Sankru; *Beng.* Gurgar, kunch; *Santal.* Jargadi; *Kol.* Danghoi.

2654. Coix gigantea Roxb.; F. I. iii. 569; E. D. C. 1683. *C. Lachryma-Jobi* var. *gigantea* F. B. I. vii. 100.

Chota Nagpur; Behar; Orissa.

A stout, erect perennial; stems 15 feet high. *Beng.* Danga gurgar.

2655. Coix aquatica Roxb.; F. I. iii. 571; F. B. I. vii. 100.

C. Bengal; E. Bengal.

A large, floating grass; stems 50–100 feet long.

1087. **Aristida** Linn.

Annual or perennial, tufted grasses; *leaves* flat or convolute. *Spikelets* panicled, 1-flowered, not articulate on their pedicels, laterally compressed; rachilla not produced beyond the flowering glume. *Glumes* 3; I. and II. very narrow, long, 1-veined, keeled, persistent, with or without a terminal awn; III. very narrow, cylindric, coriaceous, convolute, acuminate, 3-veined, tipped by 3 very long capillary awns, occasionally the side awns short or obsolete; callus long, articulate at the base; palea minute, convo-

lute round ovary and grain; *lodicules* 2, long, narrow, hyaline; *stamens* 3; anthers long, narrow; *styles* free, short; stigmas penicillate, laterally exserted. *Grain* long, narrow, cylindric, free in the convolute glume.

Awn of glume III. tripartite from the base :—
Glumes I. and II. not awned :—
Panicle very slender; spikelets, without the awn, only ·1 in. long *Cumingiana.*
Panicle contracted; spikelets, without the awn, ·25–·3 in. long *Adscenscionis.*
Glumes I. and II. long-awned; panicle contracted; spikelets without the awn ·5–6 in. long ..... *setacea.*
Awn of glume III. with a twisted column, and simple or with 2 very short branches; glumes I. and II. short-awned; panicle effuse ... *redacta.*

2656. ARISTIDA CUMINGIANA Trin. & Rupr.; F. B. I. vii. 224.
Chota Nagpur.
A dwarf, annual grass.

2657. ARISTIDA ADSCENSCIONIS Linn.; F. B. I. vii. 224. *A. depressa* F. I. i. 351; E. D. A. 1383.
In all the western provinces.
A tufted, annual or perennial, wiry grass.

2658. ARISTIDA SETACEA Retz; F. I. i. 349; F. B. I. vii. 225; E. D. A. 1385.
Orissa; Chota Nagpur; Behar.
A stout, erect, perennial grass, 3–4 feet high.

2659. ARISTIDA REDACTA Stapf; F. B. I. vii. 227.
Chota Nagpur; Behar; W. Bengal.
A tufted, annual grass.

1088. Polypogon Desf.

Annual or perennial, soft, erect grasses; *leaves* flat. *Spikelets* minute, 1-flowered, articulate on the pedicels, laterally compressed, densely crowded on the short branches of a spiciform, silky panicle; rachilla not produced beyond flowering glume, naked. *Glumes* 3; I. and II. empty, linear-oblong, keeled, pubescent and ciliate, ending in long capillary awns; III. much shorter, articulate at the base, hyaline, truncate, awned; palea as long as the glume, hyaline, truncate, 2-veined; *stamens* 1–3; anthers short; *styles* free, distant at their bases, short; stigmas narrowly plumose. *Grain* obovoid, clavate, free within the glume.

Panicle spiciform, oblong or cylindric; awns more than twice as long as the glumes ..... *monspeliensis.*
Panicle lobed; awns less than twice as long as glumes
littoralis var. *Higegaweri.*

2660. POLYPOGON MONSPELIENSIS Desf.; F. B. I. vii. 245. *Phleum crinitum* F. I. i. 313.
Chota Nagpur; Tirhut; N. Bengal.
An annual, tufted grass.

2661. POLYPOGON LITTORALIS Sm. var. HIGEGAWERI Hook. f.; F. B. I. vii. 246.
N. Bengal, rare; on sandbanks and in gravelly river-beds: grain probably carried down from the hills.
An annual, tufted grass.

1089. Agrostis Linn.

Perennial, rarely annual grasses; *leaves* usually flat. *Spikelets* small, 1-flowered, in effuse or contracted panicles, with capillary, whorled branches, not articulate on their pedicels; rachilla not produced beyond the flowering glume. *Glumes* 3; I. and II. equal or unequal, keeled, 1-, rarely 3-nerved; III. membranous, 5-nerved, truncate, glabrous, awned or not, awn dorsal; callus glabrous or with a few minute hairs; palea nearly as long as its glume or shorter or 0, 2-nerved or nerveless; *lodicules* 2; *stamens* 3. *Grain* free within the glume.

2662. AGROSTIS BRACHIATA Munro; F. B. I. vii. 256.
Behar.
A tall, slender grass.

1090. Sporobolus R. Br.

Perennial, less often annual, glabrous grasses, erect or prostrate or creeping; *leaves* narrow, flat or convolute. *Spikelets* 1-flowered, small or minute, in effuse or contracted panicles, articulate on their pedicels; rachilla not produced beyond the palea. *Glumes* 3, usually membranous, 1-veined or veinless; I. and II. empty, unequal, separately caducous; III. not articulate at the base, ovate or oblong, obtuse or acute; callus very short, glabrous; palea as long as the glume and of similar texture, broadly oblong, often dorsally narrowly inflexed along the median line, with a vein-like, ventral ridge along which the palea splits; *lodicules* very minute or 0; *stamens* 2–3; anthers short or long; *styles*

2, free; stigmas very short; hairs simple. *Grain* oblong, obovoid, or pyriform, free within glume and palea, with a loose, hyaline pericarp.

Glumes I. and II. both shorter than glume III. :—
Panicle very narrow, its branches short :—
Spikelets ·05–·06 in. long ..... *diander.*
Spikelets ·1 in. long ..... *indicus.*
Panicle broad, its branches very long ..... *Wallichii.*
Glume I. shorter than both II. and III., II. nearly or quite as long as III. :—
Panicle contracted ..... *tremulus.*
Panicle open, effuse :—
Keels of glumes I. and II. ciliate ..... *pulchellus.*
Keels of glumes I. and II. not ciliate ..... *coromandelianus.*

2663. SPOROBOLUS DIANDER Beauv.; F. B. I. vii. 247; E. D. S. 2668. *Agrostis diandra* F. I. i. 317.
In all the provinces.
A slender grass; stems 1–3 feet high. *Beng.* Bena-joni.

2664. SPOROBOLUS INDICUS R. Br.; F. B. I. vii. 247; E. D. S. 2670.
Chota Nagpur; Behar.
A stoutish grass; stems 2–3 feet high.

2665. SPOROBOLUS WALLICHII Munro; F. B. I. vii. 248.
Behar.
A stoutish grass; stems 3–4 feet high.

2666. SPOROBOLUS TREMULUS Kunth; F. B. I. vii. 250. *Agrostis tenacissima* F. I. i. 316.
W. Bengal; C. Bengal; Sundribuns.
A small, stoloniferous grass; stems 2–6 in., erect or prostrate.

2667. SPOROBOLUS PULCHELLUS R. Br.; F. B. I. vii. 252.
Chota Nagpur; Behar.
A slender, annual grass.

2668. SPOROBOLUS COROMANDELIANUS Kunth; F. B. I. vii. 252. *Agrostis coromandelianus* F. I. i. 316.
Orissa.
A tufted, annual grass, with many stems, spreading from the root.

1091. Garnotia Brogn.

Erect, perennial, rarely annual grasses; stems stout or slender; *leaves* flat or convolute. *Spikelets* paniculate, very small, narrow, terete, 1-flowered, solitary or 2-nate, jointed on their pedicels; rachilla not produced beyond the palea. *Glumes* 3; I. and II. subequal, lanceolate, acute, acuminate or awned, strongly 3-veined, empty; III. as long as II., lanceolate, acuminate or awned, thinly coriaceous or membranous, quite smooth, faintly 1-veined, paleate, 2-sexual, tip acute or minutely 2-dentate, awn rarely jointed, sometimes geniculate, slender, scaberulous; palea as long as the glume, linear lobes minutely auricled at the base; *lodicules* 2; *stamens* 3; anthers linear; *styles* free; stigmas with simple hairs, laterally exserted. *Grain* linear or oblong, dorsally compressed, free within the glume and palea.

2669. Garnotia stricta Brogn.; F. B. I. vii. 243; E. D. G. 142.
Chota Nagpur, Parasnath.
A tufted grass; stems 1–3 feet.

1092. Cœlachne R. Br.

Slender, flaccid, leafy, glabrous marsh grasses; stem erect, ascending or creeping below; *leaves* linear-lanceolate, flat or convolute. *Spikelets* small, in panicles or interrupted spiciform racemes, 2-flowered, not articulate on their pedicels; lower flower perfect, upper female; rachilla not articulate at the base, elongated and slender between the flowering glumes, but not prolonged beyond the upper. *Glumes* 4; I. and II. membranous, orbicular or broadly oblong, empty, persistent, faintly veined, II. largest; III. and IV. flowering, persistent on the rachilla, thinly coriaceous, veins faint or 0; III. cymbiform, dorsally rounded, margins strongly incurved; palea of similar consistence, ovate, keel or veins 0 or very obscure, the margins strongly incurved below; IV. much smaller, flat or concave, keels of palea hispidly ciliate; *lodicules* 2, very minute; *stamens* 3; anthers long, narrow; *styles* free, short; stigmas densely penicillate. *Grain* fusiform or oblong, nearly terete, free within the glumes.

2670. Cœlachne pulchella R. Br. var. spicata Hook. f.; F. B. I. vii. 271.
Chota Nagpur.
A short, stout, suberect grass of marshy spots.

1093. Arundinella Raddi.

Annual or perennial, erect grasses; *leaves* narrow. *Spikelets* panicled, terete, jointed on their pedicels, or with glumes I. and II. separately deciduous, 1–2-flowered, with the upper flower always female; rachilla not or shortly produced between the three lower glumes. *Glumes* 4, membranous, chartaceous or thinly coriaceous; I. and II. empty, strongly veined, acute or acuminate; II. longer than I.; III. shorter than II., faintly 3–7-nerved, paleate, male or neuter, rarely 2-sexual; IV. much shorter than III. and thinner, paleate female or 2-sexual, sessile, disarticulating at the naked or bearded base, awnless or 1–3-awned, if 3-awned the two lateral awns capillary, straight, the median geniculate, with a straight or twisted column; palea of III. and IV. linear or oblong, 2-keeled, flaps more or less conspicuously dilated or auricled at base; *lodicules* 2, minute; *stamens* 3; anthers linear-oblong; *styles* 2, free or shortly connate below; stigmas short, laterally exserted. *Grain* very small, oblong, compressed, loose in the membranous glume IV. and palea and closely embraced by these.

Awns to glume IV. three, the lateral short, capillary ..... *setosa.*
Awn to glume IV. solitary or 0:—
Glume IV. with awn twice as long as the spikelet:—
Spikelets very small, less than ·1 in. long; awn-base slightly twisted *tenella.*
Spikelets more than ·1 in. long; column of awn distinctly twisted *brasiliensis.*
Glume IV. with awn 0 or short and hardly exserted:—
Panicle elongated, contracted, strict; awn to glume IV. 0 or very short and not twisted ..... *Wallichii.*
Panicle large, corymbiform, upper branches longer than rachis; awn to glume IV. very shortly exserted, with base twisted *Clarkei.*

2671. ARUNDINELLA SETOSA Trin.; F. B. I. vii. 70.
Chota Nagpur; Behar; W. Bengal.
A rather tall, perennial, tufted grass.

2672. ARUNDINELLA TENELLA Nees; F. B. I. vii. 71.
Chota Nagpur; Behar.
A soft, erect, leafy, annual grass.

2673. ARUNDINELLA BRASILIENSIS Raddi; F. B. I. vii. 73. *Holcus nervosus* F. I. i. 318.

Chota Nagpur, Sirguja; N. Bengal, Duars.
A stout, perennial grass.

2674. ARUNDINELLA WALLICHII Nees; F. B. I. vii. 75. *Panicum strictum* F. I. i. 303.
Chota Nagpur; N. Bengal.
A stout, erect, perennial grass, 1–3 feet high. *Beng.* Ganga bena.

2675. ARUNDINELLA CLARKEI Hook. f.; F. B. I. vii. 75.
N. Bengal, Duars.
A tall, stout grass, 6–8 feet high.

1094. Eriachne R. Br.

Slender, erect, tufted, usually perennial grasses, with fibrous roots; *leaves* very narrow, margins convolute. *Spikelets* panicled, laterally compressed, 2-flowered; flowers both perfect, not articulate on the pedicels; rachilla 0. *Glumes* 4; I. and II. empty, chartaceous, lanceolate, many-veined, persistent, bases distant; III. and IV. equal and similar, narrowly lanceolate, coriaceous, villous, ending above in an awn and below in a long, villous, acute callus, articulate at base of glume II.; palea as long as glume, coriaceous and villous, margins strongly incurved, ending in two diverging awns; *lodicules* minute, oblong, truncate, emarginate; *stamens* 3; anthers minute, didymous; *ovary* narrow; styles short, their bases distant; stigmas penicillate with simple hairs. *Grain* linear, narrowed to the acute base, plano-convex, with a keel along the flattened face, firmly enclosed in the thickened glume and palea.

2676. ERIACHNE PALLESCENS R. Br.; F. B. I. vii. 269.
Chittagong.
A rigid, densely tufted grass; stems 1–2 feet high.

1095. Avena Linn.

Annual or perennial grasses; *leaves* flat. *Spikelets* paniculate, terete or laterally compressed, 2- or more-flowered, not articulate on their pedicels; rachilla articulate at the base. *Glumes* 4, dorsally rounded; I. and II. empty, unequal, thin, persistent, awnless; flowering glumes bisexual or the uppermost male or neuter, 5–9-veined, dorsally awned, awn geniculate, column twisted; palea 2-keeled; *lodicules* 2; *stamens* 3; *ovary* hairy at the apex; styles very short; stigmas penicillate with simple hairs. *Grain* fusiform, furrowed.

2677. AVENA SATIVA Linn.; F. B. I. vii. 275; E. D. A. 1639.
Cultivated sparingly.
A tall, annual grass. *Hind.* Jai. The Oat.

1096. Centotheca Desv.

Tall, leafy, perennial grasses; *leaves* broadly oblong or lanceolate, veins trabeculate. *Spikelets* 1–3-flowered, alternate and secund on the long, spiciform capillary branches of a lax, subsimple panicle, not articulate at the base, laterally compressed, all perfect or one or more upper neuter; rachilla slender, articulate at the base and between the flowering glumes, not produced beyond the uppermost. *Glumes* I. and II. distant at their insertions, ovate-oblong, empty, persistent, 3-veined, II. largest; flowering glumes broadly ovate, obtuse, apiculate, dorsally rounded, 7-veined, naked, or the upper usually bearing above the middle, soft, erect, at length deflexed, tubercle-based spines; palea narrow, keels ciliolate; *lodicules* 0; *stamens* 2–3; anthers linear; *styles* short, free; stigmas narrow; hairs short. *Grain* ovoid, acute, terete, free within the glumes.

2678. CENTOTHECA LAPPACEA Desv.; F. B. I. vii. 332. *Melica diandra* F. I. i. 327. *M. refracta* F. I. i. 327.
N. Bengal, Duars; E. Bengal, Mymensingh.
A stout, erect grass, 1–3 feet high.

1097. Elytrophorus Beauv.

An annual, erect, glabrous grass; *leaves* very narrow, flat. *Spikelets* very minute, sessile, in globose clusters, crowded together in long, cylindric, continuous or interrupted, catkin-like spikes, or rarely on the short, spike-like branches of a very contracted raceme, many of the spikelets imperfect, or reduced to empty glumes, strongly laterally compressed, not articulate at the base, 4–6-flowered; rachilla very short, articulate at the base and between the flowering glumes, but not beyond the upper. *Glumes* I. and II. subequal, lanceolate, aristately acuminate, empty, hyaline, 1-veined, glabrous or ciliate, keeled, flowering glumes rather longer, ovate, long-awned, strongly 3-veined, margins ciliate, uppermost neuter; palea shorter than the glume, very broad, truncately 3-lobed, lobes ciliate, keels distant, winged, smooth; *lodicules* 2, obliquely oblong; *stamens* 1–3; anthers minute; *styles* free, long; stigmatic hairs very short. *Grain*

minute, fusiform or narrowly oblong, free; pericarp loose at both ends.

2679. ELYTROPHORUS ARTICULATUS Beauv.; F. B. I. vii. 306.
Chota Nagpur; W. Bengal; E. Bengal, Mymensingh.
An erect, annual grass.

1098. Arundo Linn.

Tall, stout, perennial grasses; *leaves* flat. *Spikelets* few-flowered, in large, decompound panicles, laterally compressed; flowers mostly 2-sexual; rachilla jointed at the base and between the flowering glumes, glabrous or shortly hairy. *Glumes* 6 or more; I. and II. subequal, empty, narrow, acute or acuminate, glabrous, scarious, persistent, 2-nerved; flowering glumes lanceolate, acuminate or 2-fid, with a short awn, 3-nerved, dorsally hairy all over below the middle; palea hyaline, 2-nerved; *lodicules* 2, obovate; *stamens* 3; *ovary* glabrous; styles distinct; stigmas plumose. *Grain* oblong.

2680. ARUNDO DONAX Linn.; F. B. I. vii. 302; E. D. A. 1538. *A. bengalensis* F. I. i. 347. *A. bifaria* F. I. i. 348.
Behar; W. Bengal; C. Bengal.
A tall, stout, perennial grass; stem 6–10 feet high. *Beng.* Gaba-nál.

1099. Phragmites Trin.

Tall, perennial grasses; *leaves* long. *Spikelets* 3–7-flowered, in decompound panicles, not jointed on the pedicels, laterally subcompressed; rachilla jointed between the flowering glumes and above glume III., silkily penicillate, with very long hairs, not produced beyond the flowering glumes. *Glumes* all glabrous; I. and II. unequal, oblong-lanceolate, 3-nerved, membranous, persistent; III. much longer, narrowly oblong-lanceolate, acute, 3-nerved, male or neuter, persistent; flowering glumes subulate-lanceolate, subaristate, hyaline; palea much shorter than glume; *lodicules* 2, obtuse; *stamens* 1–3; *styles* 2, terminal, distinct; stigmas plumose. *Grain* oblong, terete.

Pedicels glabrous ..... *Karka.*
Pedicels villous with silky hairs ..... *Karka* var. *cincta.*

2681. PHRAGMITES KARKA Trin.; F. B. I. vii. 304. *P. Roxburghii* E. D. P. 617. *Arundo Karka* F. I. i. 348.

In most of the provinces.

A tall, stout, perennial grass. *Hind.* Nál.

2681/2. Var. CINCTA Hook. f.; F. B. I. vii. 305.

Sundribuns.

A tall, stout, perennial grass. *Beng.* Narkul, *Hind.* nál.

1100. Triraphis R. Br.

A tall, perennial, leafy grass; *leaves* long, flat. *Spikelets* small, 4–8-flowered, in an effuse, decompound panicle, lowest flowering glume sometimes glabrous, epaleate, neuter; rachilla shortly bearded below the flowering glumes, jointed at the base above the neuter glume when present and between the flowering glumes. *Glumes* all membranous; I. and II. unequal, empty, lanceolate, 1-nerved; flowering glumes elongate, subulate, more or less recurved, ending in a very slender tip, with 2 setaceous points and a scabrid, interposed awn, 3-nerved, lateral nerves submarginal, penicillate with long hairs; palea oblong, keels scaberulous; *lodicules* 2, obovate or cuneate; *stamens* 3; anthers long, linear; *ovary* shortly stipitate, oblong; styles terminal; stigmas feathery. *Grain* linear, terete, loose in the glume.

2682. TRIRAPHIS MADAGASCARIENSIS Hook. f.; *Neyraudia madagascariensis* F. B. I. vii. 305.

N. Bengal, Duars; Chittagong.

A tall, perennial, leafy grass, 6–15 feet high.

1101. Eragrostis Beauv.

Annual or perennial, usually slender, glabrous grasses; stem erect or ascending; *leaves* narrow. *Spikelets* many-flowered, in open or contracted panicles, rarely spicate, on a simple, terminal rachis, not articulate at the base, strongly laterally compressed, ovate-oblong or linear; rachilla produced and articulate or not between the glumes, but never beyond the terminal one. *Glumes* many, closely, distichously imbricate, thin, dorsally rounded or keeled, awn 0; I. and II. much shorter than the spikelet, empty, I. rarely 3-veined, separately deciduous; flowering glumes 3-veined, lateral veins not reaching the mid-vein; callus 0; palea deciduous with the glume or persistent on the rachilla, keels smooth, scabrid or ciliate; *lodicules* 2, very minute or 0; *stamens* 1–3; anthers long or short; *styles* distinct; stigmas penicillate, laterally exserted. *Grain* very minute, free in the glume and palea.

*Spikelets panicled :—[p. 1221]

Rachilla of spikelets more or less jointed and breaking up from above downwards :—

Panicle spiciform ; rachis bearded at the nodes; margins of the flowering glumes ciliate :—

Flowering glumes cuspidately acuminate ; panicle cylindric, compact ..... *ciliata.*

Flowering glumes obtuse; panicle oblong, often lobed or lax-flowered ..... *coarctata.*

Panicle open ; margins of the flowering glumes ciliate :—

Grain ovoid ; stamens 3 :—

Empty glumes unequal, I. distinctly shorter than II. :—

Panicle open ; branches capillary ; nodes bearded *tenella* var. *plumosa.*

Panicle narrow, contracted, flaccid ; rachis glabrous *tenella* var. *riparia.*

Empty glumes subequal, I. hardly, if at all, shorter than II. :—

Stem and rachis of panicle viscid below ...*tenella* var. *viscosa.*

Stem and rachis of panicle not viscid *tenella* var. *breviculmis.*

Grain obovoid ; stamens 2 :—

Panicle-branches not divaricate ; spikelets 6-flowered or more :—

Pseudo-whorls short and dense ; panicle narrow *interrupta* var. *Koenigii.*

Pseudo-whorls open :—

Panicle linear-oblong; branches 1–2 in. ; spikelets 10–14-flowered .....*interrupta* var. *diarrhena.*

Panicle effuse ; branches 2–5 in. ; spikelets 6–10-flowered *interrupta* var. *diplachnoides.*

Panicle-branches divaricate ; spikelets 6-flowered or fewer *interrupta* var. *tenuissima.*

Rachilla of spikelets tough, persistent ; flowering glumes usually falling away from its base upwards :—

†Spikelets peduncled :—[p. 1221]

Spikelets flat, elliptic-ovate to oblong, ·2 in. wide or wider ; lateral nerves of flowering glumes very prominent, straight, almost percurrent ; paleæ deciduous with their glumes.....*amabilis.*

Spikelets less compressed, linear or linear-oblong, under ·2 in. wide ; lateral nerves less prominent ; when spikelets compressed or lateral nerves prominent then with paleæ persistent :—

‡Spikelets more or less fascicled on the primary or secondary branches or shortly peduncled in narrow racemes :—[p. 1221]

Leaves glaucous; grain oblong .....*gangetica.*
Leaves not glaucous; grain globose or nearly so :—
Spikelets less than ·25 in. long .....*stenophylla.*
Spikelets ·25 in. long or longer .....*elongata.*
‡Spikelets not fascicled, long-peduncled, more or less divaricate when ripe :—[p. 1220]
Leaf-margins glandular :—
Glume II. 3-nerved; glume I. 1–3-nerved .....*major.*
Glume II. as well as glume I. always 1-nerved.....*minor.*
Leaf-margins eglandular; glumes I. and II. 1-nerved :—
Spikelets versatile, 1 in. long or longer, narrow-linear; branches of panicle solitary.....*tremula.*
Spikelets small, ·25 in. long or less :—
Perennial; mouth of leaf-sheath naked; branches of panicle solitary or 2-nate .....*tenuifolia.*
Annual; mouth of leaf-sheath bearded; branches of panicle usually more or less whorled .....*pilosa.*
†Spikelets sessile and jointed on the very short, densely crowded branchlets of a tall, narrow, raceme-like panicle, deciduous, acute, much compressed, imbricate and secund [p. 1220] .....*cynosuroides.*
•Spikelets distichously spreading, secund in a long, simple, terminal spike :—[p. 1220]
Leaves more or less puberulous above :—
Upper surface of leaves with tufts of hairs on the surface below the middle .....*nardoides.*
Upper surface of leaves uniformly puberulous.....*coromandeliana.*
Leaves glabrous above .....*brachyphylla.*

2683. ERAGROSTIS CILIATA Nees; F. B. I. vii. 313. *Poa ciliata* F. I. i. 334.
Chota Nagpur.
An erect or ascending, perennial grass; stems 2–4 feet.

2684. ERAGROSTIS COARCTATA Stapf; F. B. I. vii. 313.
Chota Nagpur; Behar; N. Bengal; Chittagong.
A tufted, perennial grass; stems 4–18 in. high. *Uriya* Ghira nanja, pita-chura, kuti; *Hind.* Jinkua.

2685. ERAGROSTIS TENELLA Roem. & Schult. var. PLUMOSA Stapf; F. B. I. vii. 315. *E. plumosa* E. D. E. 263. *Poa plumosa* F. I. i. 337.
In all the provinces.
A slender, graceful, annual grass.

2685/2. Var. RIPARIA Stapf; F. B. I. vii. 315.

Orissa, sea-coast.
A slender, graceful, annual grass.

2685/3. Var. VISCOSA Stapf; F. B. I. vii. 315. *Poa viscosa* F. I. i. 336.
Chota Nagpur; Behar; N. Bengal.
A slender, annual grass. *Santal.* Ich koic'.

2685/4. Var. BREVICULMIS Stapf; F. B. I. vii. 316.
C. Bengal; Orissa.
A dwarf, prostrate, annual grass.

2686. ERAGROSTIS INTERRUPTA Beauv. var. KOENIGII Stapf; F. B. I. vii. 316. *E. nutans* E. D. E. 259. *Poa interrupta* F. I. i. 335.
In all the provinces.
A tall, perennial grass.

2686/2. Var. DIARRHENA Stapf; F. B. I. vii. 316. *Poa diandra* F. I. i. 336.
C. Bengal.
A tall, perennial grass.

2686/3. Var. DIPLACHNOIDES Stapf; F. B. I. vii. 316.
Behar; Chota Nagpur; Orissa.
A tall, stout, branching, perennial grass.

2686/4. Var. TENUISSIMA Stapf; F. B. I. vii. 316. *E. tenella* E. D. E. 265. *Poa tenella* F. I. i. 337.
In most of the provinces.
A slender, graceful, perennial grass.

2687. ERAGROSTIS AMABILIS Wight & Arn.; F. B. I. vii. 317. *Poa unioloides* F. I. i. 339.
In most of the provinces.
A rather slender annual; stems ·5–1·5 feet. *Beng.* Koni.

2688. ERAGROSTIS GANGETICA Steud. *E. elegantula* F. B. I. vii. 318. *Poa gangetica* F. I. i. 340.
In all the provinces.
A tall, suberect, perennial grass; stems 1–3 feet high.

2689. ERAGROSTIS STENOPHYLLA Hochst.; F. B. I. vii. 318. *E. Brownei* E. D. E. 248. *Poa elegans* F. I. i. 338.
In all the provinces.
A slender, graceful, annual or subperennial grass.

2690. ERAGROSTIS ELONGATA Jacq.; F. B. I. vii. 319.
Chota Nagpur; Chittagong.
A stiff, tufted, perennial grass.

2691. Eragrostis major Host; F. B. I. vii. 320. *E. megastachya* E. D. E. 257. *Poa flexuosa* F. I. i. 339.
In all the western provinces.
A stoutish, much-branched, annual grass.

2692. Eragrostis minor Host; F. B. I. vii. 321.
In most of the provinces.
A densely tufted, annual grass.

2693. Eragrostis tremula Hochst.; F. B. I. vii. 320. *E. rhachitricha* E. D. E. 267. *Poa multiflora* F. I. i. 338.
In all the western provinces.
A densely tufted, annual grass.

2694. Eragrostis tenuifolia Hochst.; F. B. I. vii. 322.
Chota Nagpur.
An erect, slender, branched perennial.

2695. Eragrostis pilosa Beauv.; F. B. I. vii. 323; E. D. E. 261. *Poa punctata* F. I. i. 338.
In most of the provinces.
A tufted, annual grass.

2696. Eragrostis cynosuroides Beauv.; F. B. I. vii. 324; E. D. E. 252. *Poa cynosuroides* F. I. i. 333.
In most of the provinces.
A tall, stout, stoloniferous, perennial grass. *Beng.* Kusha; *Hind.* Dáb.

2697. Eragrostis nardoides Trin.; F. B. I. vii. 326. *E. bifaria* E. D. E. 246.
Chota Nagpur, Parasnath.
A tufted, perennial grass, with filiform stems.

2698. Eragrostis coromandeliana Trin.; F. B. I. vii. 326.
Behar; Chota Nagpur.
A tufted, stoutish, perennial grass.

2699. Eragrostis brachyphylla Stapf; F. B. I. vii. 327.
Behar.
A densely tufted, perennial grass, with slender stems.

1102. Myriostachya Hook. f.

A tall, stout, perennial, glabrous marsh grass; rootstock thick, spongy; roots vermiform, with branched, capillary fibres; *leaves* mainly radical, very long, flat. *Spikelets* very many, laterally much compressed, 4–20-flowered, distichously racemed on the short, crowded, filiform branches of a narrow, erect, long, thyrsi-

form panicle with a stout rachis, shortly pedicelled, not articulate on the pedicels, but pedicels articulate on the branches; rachilla very stout, shortly produced between the flowering glumes but not beyond the uppermost neuter glume. *Glumes* all coriaceous and persistent, I. and II. empty, subequal, 1-veined, lanceolate, tapering into rigid awns; flowering glumes quite glabrous, ovate-lanceolate, 3-veined, narrowed into short, very stout, scabrid awns, keel smooth; callus very short; palea chartaceous, as long as the glume, acuminate, 2-toothed, keels ciliate; *lodicules* very minute; *stamens* 3; anthers linear-oblong; *ovary* globose; styles short, distant at the base; stigmas long-penicillate, laterally exserted. *Grain* obliquely ovoid, subterete.

2700. Myriostachya Wightiana Hook. f.; F. B. I. vii. 327.
Sundribuns.
A tall, stout, perennial grass. *Beng.* Nalai.

1103. Bromus Linn.

Annual or perennial grasses; *leaves* narrow, usually flat. *Spikelets* many-flowered, panicled, laterally compressed; uppermost flowers usually imperfect; rachilla jointed below the flowering glumes, not produced beyond the uppermost glume. *Glumes* many, I. and II. unequal, empty, acuminate, 1–5-nerved, persistent; flowering glumes acuminate or shortly cleft; I. very rarely 3-awned, median awn erect or recurved, sometimes twisted towards the base; palea 2-fid or 2-toothed, keels scabrid or ciliate; *lodicules* 2, oblong or lanceolate, entire or cleft; *stamens* 3; *ovary* oblong or cuneiform, crown more or less enlarged and hairy or villous; styles short, usually inserted ventrally below the tip of the ovary; stigmas plumose. *Grain* linear-oblong, usually concavo-convex and adherent to the palea.

2701. Bromus himalaicus Stapf; F. B. I. vii. 358.
E. Bengal, Mymensingh.
A perennial grass, with short rootstock; stems 2–2·5 feet high.

1104. Diplachne Beauv.

Tall, tufted grasses; *leaves* flat or convolute, narrow; stems erect or ascending. *Spikelets* many-flowered, sessile, 1-seriate on the slender, spiciform branches of a contracted, subsimple, erect panicle, not articulate at the base, strongly laterally compressed;

rachilla articulate between the flowering glumes, not produced beyond the uppermost neuter. *Glumes* many; I. and II. unequal, obtuse, membranous, 1-nerved, persistent; flowering glumes rather longer, oblong, 1–3-nerved, tip 2–4-toothed, mucronate or awned; palea linear; *lodicules* 2, wide-cuneate; *stamens* 3; anthers short; *styles* short, distinct, with distant bases and short, plumose, laterally exserted stigmas. *Grain* oblong, stipitate, concavo-convex, free in the glumes.

2702. Diplachne fusca Beauv.; F. B. I. vii. 329. *Poa procera* F. I. i. 332.

Sundribuns; C. Bengal.

A tall, tufted, perennial grass; stems 3–5 feet high.

1105. Leptochloa Beauv.

Tall, slender, annual grasses; *leaves* flat or involute. *Spikelets* very minute, compressed, 1–many-flowered, sessile or shortly pedicelled, alternate and unilateral on the very slender, spike-like branches of a lax panicle, not jointed at the base; rachilla produced between the flowering glumes, but not beyond the upper, articulate at the base. *Glumes* 3–8, membranous; I. and II. unequal, oblong or lanceolate, 1-nerved; flowering glumes 1–6, all perfect, or the upper neuter, ovate, subacute or obtuse, 3-nerved, awnless, the veins often ciliate, the lateral veins submarginal; palea nearly as long as glume, 2-keeled; *lodicules* 2, cuneate; *stamens* 3; anthers short; *styles* free; stigmas short, plumose, laterally exserted. *Grain* subglobose, oblong, obovoid or trigonous, closely invested by, and sometimes adnate to, the glume and palea.

Spikelets 2–3-flowered ..... *filiformis.*
Spikelets 4–6-flowered ..... *chinensis.*

2703. Leptochloa filiformis Roem. & Schult.; F. B. I. vii. 298. *Aira filiformis* F. I. i. 326.

In all the provinces.

A slender, ascending, annual grass.

2704. Leptochloa chinensis Nees; F. B. I. vii. 299; E. D. L. 300. *Poa chinensis* F. I. i. 332.

A slender, erect or suberect, annual grass.

1106. Gracilea Koen.

Small, tufted grasses; *leaves* short. *Spikelets* 2-flowered, collected in turbinate fascicles, which are secund, sessile, and articu-

late on a slender spike; spikelets not articulate at base; callus absent; rachilla usually produced beyond the upper glume, filiform, scaberulous. *Glumes* 4; I. and II. elongate-subulate, rigid, ciliate at base, and ending in rigid, scabrid awns, persistent, collateral at base and laterally attached to base of spikelet, I. without II., with rather wide, hyaline margins; III. bisexual, chartaceous, ovate-oblong, cymbiform, shortly awned, 3-nerved; palea as long as glume, 2-cuspidate, keels scaberulous; *lodicules* minute, cuneiform, truncate; IV. like III. but much smaller, bicuspidate, male; sometimes an imperfect flower of two empty glumes at end of rachilla; *stamens* 3; anthers of ♀ large, of ♂ small; *styles* free; stigmas slender, with short, simple hairs, laterally exserted. *Grain* linear-oblong, free within the glumes.

2705. GRACILEA ROYLEANA Hook. f.; F. B. I. vii. 284.

Behar.

A densely tufted, slender, annual grass.

1107. Microchloa R. Br.

Slender, perennial grasses; *leaves* filiform, convolute. *Spikelets* very narrow, 1-flowered, minute, 2-seriate, unilateral on a solitary, terminal, filiform, curved spike, not jointed at the base, awnless; rachilla jointed at the base, not produced beyond glume III. *Glumes* 3; I. and II. empty, membranous, 1-nerved, keeled, persistent; III. very small, oblong, hyaline, awnless; palea as long as glumes, keels ciliate; *lodicules* 2, truncate; *stamens* 3; anthers linear; *styles* distinct. *Grain* oblong, fusiform, glabrous, free within the hyaline glume and palea.

2706. MICROCHLOA SETACEA R. Br.; F. B. I. vii. 283. *Rottboellia setacea* F. I. i. 257.

C. Bengal; W. Bengal; Chota Nagpur.

A tufted, slender, perennial grass.

1108. Cynodon Pers.

Perennial, glabrous, creeping grasses; *leaves* narrow, flat. *Spikelets* minute, 1-flowered, sessile, unilateral, 2-seriate and imbricate in slender, strict, digitate spikes, not articulate at the base, laterally compressed. *Glumes* 3, awnless; I. and II. empty, ovate, stoutly 1-veined, persistent or separately deciduous; III. articulate at the base by a minute, glabrous callus, broader, membranous, 3-nerved; palea as long as glume, 2-nerved; *lodicules* 2,

short; *stamens* 3; anthers short, thick; *styles* distinct, short, their bases contiguous; stigmas short, plumose, laterally exserted. *Grain* oblong, free within the glumes.

2707. CYNODON DACTYLON Pers.; F. B. I. vii. 288; E. D. C. 2558. *Panicum dactylon* F. I. i. 289.

In all the provinces.

A slender, perennial, creeping grass. *Vernac.* Dúbh.

1109. Chloris Sw.

Annual or perennial grasses; *leaves* flat or convolute. *Spikelets* 1-flowered, 2-seriate, unilateral, on solitary, geminate, fascicled, digitate or whorled, terminal, erect or radiating spikes, not jointed at the base; rachilla jointed at the base, sometimes produced beyond glume III. and bearing one or more empty glumes. *Glumes* normally 3; I. and II. empty, membranous, 1-nerved, persistent, acute, mucronate, or glume II. awned; III. flowering, broad or narrow, awned, concave, 3-nerved, acute obtuse or 2-fid, articulate at base; callus short, bearded; palea rather shorter, 2-nerved, complicate; *lodicules* 2, minute, when the produced rachilla bears empty glumes these small, epaleate and imperfect; *stamens* 3; anthers small; *styles* free; stigmas laterally exserted. *Grain* narrow, free.

Spikelets 1-flowered, with no rudiment of a second; rachis of spike flattened.....*pallida.*

Spikelets 1-flowered, the rachilla produced beyond the flowering glumes; rachis of spike terete or angular :—

Rachilla bearing one or two awns beyond the flower :—

Annual; spikes 1·5–2 in. long, alternate on the apex of stem *delicatula.*

Perennial; spikes 4–6 in. long, whorled.....*incompleta.*

Rachilla bearing one to three reduced empty glumes beyond the flower :—

Spikelets 2-awned .....*virgata.*

Spikelets 3–4-awned :—

Rachis scaberulous; spikelets 3-awned .....*barbata.*

Rachis glabrous :—

Spikelets 3-awned.....*polystachya.*

Spikelets 4-awned .....*montana.*

2708. CHLORIS PALLIDA Hook. f.; F. B. I. vii. 289.

Behar; Chota Nagpur.

A slender, filiform, annual grass.

2709. CHLORIS DELICATULA Clarke; F. B. I. vii. 290.
Chota Nagpur.
An erect, slender, wiry, annual grass.

2710. CHLORIS INCOMPLETA Roth; F. B. I. vii. 290. *Melica digitata* F. I. i. 326.
N. Bengal; Behar; Orissa.
A tall, perennial grass; stems 2–3 feet high or higher.

2711. CHLORIS VIRGATA Sw.; F. B. I. vii. 291.
In most of the provinces.
A stoutish, branching grass, decumbent below.

2712. CHLORIS BARBATA Sw.; F. I. i. 331; F. B. I. vii. 292; E. D. C. 1026.
In most of the provinces.
A stoutish, erect grass, geniculate or creeping below.

2713. CHLORIS POLYSTACHYA Roxb.; F. I. i. 330; F. B. I. vii. 292. *C. Roxburghiana* E. D. C. 1028.
W. Bengal, rare.
A slender, ascending grass.

2714. CHLORIS MONTANA Roxb.; F. I. i. 329; F. B. I. vii. 292.
W. Behar, rare.
An erect or geniculately ascending grass.

1110. Tripogon Roth.

Slender, densely tufted grasses; stems erect, leafy below; *leaves* usually convolute. *Spikelets* many-flowered; flowers all, except 1–2 terminal, perfect, 2-seriate and unilateral, on a very slender, terminal spike, not jointed at the base; rachilla produced between the glumes, jointed at the base. *Glumes* many; I. and II. unequal, distantly superposed, 1-nerved, empty, persistent; I. usually lodged in a furrow of the rachis, and toothed or lobed on one side; II. entire or notched below the mucronate or apiculate tip; flowering glumes ovate, dorsally convex, 2-fid and awned in the cleft, or 4-fid with the outer lobes awned, the inner lobes membranous and rarely awned, awns all straight; callus short, bearded; palea broad or narrow, complicate, truncate, keels ciliate; *lodicules* 2, cuneate; *stamens* 3; anthers large, linear-oblong; *styles* very short, distant at the base; stigmas short, plumose. *Grain* very narrow, free in the glumes.

Awn as long as or longer than its glume.....*capillatus*.
Awn shorter than its glume.....*Jacquemontii*.

2715. TRIPOGON CAPILLATUS Jaub. & Spach; F. B. I. vii. 285.
Chota Nagpur, Parasnath.
A slender, densely tufted grass.

2716. TRIPOGON JACQUEMONTII Stapf; F. B. I. vii. 287.
Chota Nagpur, Tributary States.
A slender, filiform, tufted grass.

1111. Eleusine Gaertn.

Annual or perennial grasses; *leaves* long or short. *Spikelets* 3–12-flowered; flowers all perfect except the terminal, sessile, 2–3-seriate and secund, forming digitate, capitate, or whorled spikes, laterally compressed, not jointed at the base; rachilla continuous between the flowering glumes. *Glumes* few or many, keeled; I. and II. shorter than the flowering glumes, subequal or unequal, persistent; I. lanceolate; II. lanceolate, acute or acuminate, or broadly ovate, or didymous with a short, stout, recurved awn; flowering glumes like the empty, 3-nerved; palea complicate, strongly 2-keeled; *lodicules* 2, cuneate; *stamens* 3; anthers short; *styles* short, free; stigmas slender, laterally exserted. *Grain* small, free; pericarp hyaline, loose or vanishing; seed rugose.

Spikelets pointing forwards at an acute angle with the rachis of the spike:—
Glumes I. and II. with entire tips:—
Stems 1–2 feet high; grain oblong: wild.....*indica.*
Stems 2–5 feet high; grain globose: cultivated .....*Coracana.*
Glumes I. and II. with notched tips .....*verticillata.*
Spikelets erect at right angles to the rachis of the spike.....*ægyptiaca.*

2717. ELEUSINE INDICA Gaertn.; F. I. i. 345; F. B. I. vii. 293; E. D. E. 186.
In all the provinces.
An annual grass, with a soft, stout stem, 1–2 feet high.
Hind. Mal-ankuri.

2718. ELEUSINE CORACANA Gaertn.; F. I. i. 342; E. D. E. 170.
In all the provinces, cultivated.
An annual crop. *Beng.* Marna; *Santal.* Kodé.

2719. ELEUSINE VERTICILLATA Roxb.; F. I. i. 346; F. B. I. vii. 295; E. D. E. 190.
Behar.

An annual grass, with an erect, stout, or slender stem, 1–3 feet high.

2720. ELEUSINE ÆGYPTIACA Desf.; F. I. i. 344; F. B. I. vii. 295; E. D. E. 166.

In all the provinces.

An erect or prostrate annual grass. *Hind.* Makra; *Uriya* Kákhuriya; *Santal.* Suntu-bukrui.

1112. Dinebra Jacq.

An annual, leafy grass; *leaves* flat. *Spikelets* 2–3-flowered, 2-seriate, secund and imbricating on short, slender, spreading or deflexed spikes, collected in narrow, pyramidal racemes, not jointed at the base; rachilla slender, jointed at the base, produced beyond the flowering glumes and bearing an imperfect glume. *Glumes* 4–5; I. and II. empty, persistent, much longer than III. and IV., lanceolate, awned, 1-nerved, keeled; II. one-fourth longer than I.; III. and IV. very small, broadly ovate, subacute, hyaline, 1-nerved; palea hyaline, shorter than the glume, linear-oblong, obtuse, keels finely ciliolate; *lodicules* 2, minute; *stamens* 3; anthers minute, didymous; *styles* free, short; stigmas exserted at apex of glume, shortly penicillate. *Grain* narrow-ovoid, obscurely trigonous.

2721. DINEBRA ARABICA Jacq.; F. B. I. vii. 297; E. D. D. 445. *Eleusine calycina* F. I. i. 346.

Western Behar.

An annual, tufted, leafy grass; stems 1–3 feet high.

1113. Oropetium Trin.

A dwarf, densely tufted, erect, annual grass; *leaves* short, filiform. *Spikelets* very minute, 1-flowered, half-immersed in the alternating, distichous cavities of the rachis of a simple, slender, curved, inarticulate spike, sessile, not articulate on the rachis; rachilla articulate at the base, bearded, not produced beyond the flowering glume. *Glumes* 3; I. very minute, hyaline, empty, persistent; II. linear-lanceolate, rigid, recurved in fruit, tip obtuse or emarginate; III. flowering, concealed by glume II., which closes the cavity in which III. is hidden, sessile, oval, hyaline, 1-nerved, tip scabrulous; callus very short, bearded with silky hairs; palea as long as glume, keels contiguous, slender, smooth; *lodicules* very minute, obliquely cuneiform; *stamens* 3; anthers oblong;

styles short, their bases distant; stigmas plumose, laterally exserted. *Grain* obovoid, terete, smooth, brown, free in the glume, with 2-mucronate apex.

2722. Oropetium Thomæum Trin.; F. B. I. vii. 366. *Rottboellia Thomæa* F. I. i. 357.

Behar.

A dwarf, densely tufted, erect annual.

1114. Triticum Linn.

Annual or biennial grasses; *leaves* flat. *Spikelets* few-flowered, tumid, sessile, distichously spicate, solitary, with their sides opposite cavities in the articulate or inarticulate rachis; upper flower male or neuter. *Glumes* rigid, often unequal-sided; I. and II. empty, obtuse or shortly awned, few-nerved, persistent; flowering glumes oblong or ventricose, dorsally rounded or keeled above, awnless or 1–3-awned, 5–9-nerved, lateral nerves not conniving with the central; keels of the palea ciliate; *lodicules* entire, ciliate; *stamens* 3; *styles* very short. *Grain* grooved ventrally, often hairy, free or adnate to palea.

2723. Triticum vulgare Vill.; F. B. I. vii. 367. *T. hybernum* F. I. i. 359. *T. æstivum* F. I. i. 359. *T. sativum* E. D. T. 634.

Cultivated generally in the western parts; sparingly in N. Bengal and E. Bengal.

A tall, annual grass. *Vernac.* Gehum, giyun, gom. Wheat.

1115. Hordeum Linn.

Erect, annual, rarely perennial grasses; *leaves* flat. *Spikelets* 1-flowered, 2–3-nate in the hollows at the nodes of a simple, cylindric spike, the lateral often imperfect; rachilla jointed at the base of the flowering glume and produced above it, with sometimes an imperfect glume. *Glumes* 3; I. and II. narrow, empty, rigid, persistent, the outer of each cluster of spikelets often [illegible]er resembling an involucre; III. dorsally rounded, 5-nerved [illegible]narrowed into an erect or recurved awn; palea 2-keeled; *lodicules* 2, ciliate; *stamens* 3; *styles* very short. *Grain* grooved in front, tip usually villous, adherent to the palea or free.

2724. Hordeum vulgare Linn.; F. B. I. vii. 371; E. D. H. 373. *H. hexastichon* F. I. i. 358.

Cultivated in the western parts.
An erect, annual grass. *Vernac.* Jao, jab. Barley.

1116. Bambusa Schreb.

Shrubs or trees, usually large and cæspitose, rarely climbing; stem-sheaths broad, blade often triangular; *leaves* short-petioled, not tesselate by nervules, but sometimes so by pellucid glands; sheaths variously auricled. *Spikelets* 1–many-flowered, generally disposed in a large, leafless panicle, bearing heads on spiciform branches, or in leafy panicles or in panicled spikes. *Lower glumes* 1–4, empty or bulbiferous; *flowering glumes* ovate-lanceolate, uppermost imperfect; palea 2-keeled; *lodicules* 2 or 3, membranous, ciliate, rarely obsolete; *stamens* 6, free; *ovary* oblong or obovate, tip hairy; styles short or long; stigmas 2–3. *Grain* oblong or linear-oblong, furrowed on one side; pericarp thin, adherent.

Shrubby; stems not spinous; blade of stem-sheaths linear .....*nana.*
Arborescent :—
Stems not spinous :—
Ligules narrow, obscure; blade of stem-sheaths triangular or reniform, with cordate base .....*Tulda.*
Ligules distinct :—
Ligule of stem-sheaths broad, toothed; of leaves broadly triangular, membranous; blade of stem-sheaths 2-morphic, lower short, wide, ciliate with rounded top, upper short, triangular ...*Balcooa.*
Ligule of stem-sheaths toothed or fimbriate; of leaves short and ciliate; blade of stem-sheaths triangular, with rounded base *vulgaris.*
Stems spinous .....*arundinacea.*

2725. Bambusa nana Roxb.; F. I. ii. 199; F. B. I. vii. 390; E. D. B. 133.
Cultivated.
A dwarf, shrubby bamboo, 6–10 feet high; native of China. *Beng.* Chhota bans.

2726. Bambusa Tulda Roxb.; F. I. ii. 193; F. B. I. vii. [illegible] close, E. D. B. 144.
C. Bengal; E. Bengal; Chittagong; Orissa.
A gregarious bamboo, 20–70 feet high. *Hind.* Peka; *Beng.* Tulda, djowa, mitenga, matela bans.

2727. BAMBUSA BALCOOA Roxb.; F. I. ii. 196; F. B. I. vii. 391; E. D. B. 129.

Tirhut; N. Bengal; C. Bengal; E. Bengal.

A large bamboo; stems 50–70 feet high. *Beng.* Balku, balkua.

2728. BAMBUSA VULGARIS Schrad.; F. B. I. vii. 391; E. D. B. 149.

Cultivated.

A large bamboo; stems somewhat remote, 20–50 feet high; native of Malaya. *Beng.* Basini bans.

2729. BAMBUSA ARUNDINACEA Willd.; F. I. ii. 191; F. B. I. vii. 395; E. D. B. 118. *B. spinosa* F. I. ii. 198; E. D. B. 139.

In most of the provinces.

A tall, thickset bamboo; stems 80–100 feet high. *Hind.* Bans, kattang, magar bans, nál bans; *Beng.* Bans, behar bans; *Kol.* Katanga; *Santal.* Mat.

1117. Gigantochloa Kurz.

Trees or large, climbing shrubs; stems simple below; stem-sheaths usually stiff, hairy above, auricled; *leaves* long. *Spikelets* few, in heads on the long, spiciform branches of a compound panicle. *Lower glumes* 2–3, empty; *flowering glumes* like the empty; palea of all the flowering glumes 2-keeled, the keels ciliate; *lodicules* 1–3, sometimes obsolete; *stamens* 6; filaments connate in a short, thick, at length elongated, membranous tube; *ovary* hairy; stigmas 1–3, hirsute. *Grain* usually oblong, or linear and furrowed; pericarp membranous.

2730. GIGANTOCHLOA MACROSTACHYA Kurz; F. B. I. vii. 399; E. D. G. 212.

Chittagong.

An evergreen bamboo; stems 30–50 feet high.

1118. Oxytenanthera Munro.

Trees or large, climbing shrubs; rootstock stout, usually creeping or stoloniferous; stem-sheaths strigose, blade decurrent; *leaves* large or small, shortly petioled. *Spikelets* elongate, cylindric or conical, 1–3-flowered, with terminal flower usually fertile, capitate or whorled in few or many heads on the branches of a large panicle. *Empty glumes* 1–3; *flowering glumes* elongate,

mucronate; palea of lower flowers 2-keeled, of uppermost convolute, with keel obscure or obsolete; *lodicules* obsolete; *stamens* 6; filaments connate in an ultimately elongated, membranous tube; *ovary* ovoid; style slender; stigmas 1–3, more or less plumose. *Grain* elongated, beaked, smooth.

Stem-sheaths 10–12 in. long, by 9–10 in. wide ..... *auriculata.*
Stem-sheaths 6 in. long and broad ..... *nigro-ciliata.*

2731. OXYTENANTHERA AURICULATA Prain. *Bambusa auriculata* F. B. I. vii. 396. *Gigantochloa auriculata* E. D. G. 211.
Chittagong.
An evergreen bamboo; stems 40–50 feet high.

2732. OXYTENANTHERA NIGRO-CILIATA Munro; F. B. I. vii. 401; E. D. O. 610.
Orissa; Chittagong.
An evergreen bamboo; stems 30–40 feet high.

1119. Dendrocalamus Nees.

Trees, unarmed; rootstocks densely branching; *leaves* shortly petioled, transverse nervules replaced by pellucid glands. *Spikelets* in globose clusters on the long branches of a compound panicle, ovate, 2–6-flowered. *Empty glumes* 2–3, ovate, acute, many-nerved; *flowering glumes* like the empty; palea of lower flowers keeled, of upper dorsally rounded, ciliate; *lodicules* rare; *stamens* 6; filaments free; *ovary* hairy above, often depressed; stigma usually simple. *Grain* small; pericarp coriaceous or crustaceous.

Stem-sheaths with a narrow ligule; spikelets crowded, hard, spinescent, in spicate heads:—
Spikelets coarsely hairy; anthers apiculate ..... *strictus.*
Spikelets softly silky; anthers obtuse ..... *sericeus.*
Stem-sheaths with a broad, serrate, and often fimbriate ligule; spikelets few, in small heads, many of them sterile ..... *longispathus.*

2733. DENDROCALAMUS STRICTUS Nees; F. B. I. vii. 404; E. D. D. 292. *Bambusa stricta* F. I. ii. 193.
Behar; Chota Nagpur; Orissa.
A close-set bamboo; stems 20–50 feet high, often solid.
Hind. Bans kaban, bans khurd, kopar; *Beng.* Karail; *Kol.* Mathan, saring, burumat; *Santal.* Burumat.

2734. DENDROCALAMUS SERICEUS Munro; F. B. I. vii. 404; E. D. D. 291.
Chota Nagpur, Parasnath.
A close-set bamboo; stems 20–50 feet high.

2735. DENDROCALAMUS LONGISPATHUS Kurz; F. B. I. vii. 407; E. D. D. 286.
Chittagong.
A large bamboo, leafy above only; stems 60 feet.

1120. Melocalamus Benth.

Shrubby; stems semi-scandent from a stout rootstock; stem-sheaths hard, cylindric, auricled; *leaves* large, petioled, transverse nervules 0. *Spikelets* in dense heads, very small, in large panicles; rachilla continuous and produced beyond the upper glume. *Empty glumes* 2, broad, obtuse, many-nerved; *flowering glumes* 2, bisexual, but only one fertile; palea very broad, cymbiform, membranous; *lodicules* 3, large, ciliate; *stamens* 6; filaments short, free; anthers obtuse; *ovary* glabrous; style short; stigmas 2–3, plumose. *Grain* very large, depressed-globose; pericarp tough; seed large, fleshy.

2736. MELOCALAMUS COMPACTIFLORUS Benth.; F. B. I. vii. 409.
Tippera; Chittagong.
A semi-scandent bamboo; stems 25–100 feet long, spreading and arching over tall trees.

1121. Teinostachyum Munro.

Shrubs or small trees; stems thin, arching; stem-sheaths usually thin; *leaves* variable. *Spikelets* in bracteate whorls, arranged in spiciform panicles on leafy branches, long, narrow, many-flowered; upper and lower flowers imperfect. *Empty glumes* 1–2, mucronate; *flowering glumes* similar, with longer mucros; palea convolute, its keels ciliate; *lodicules* 3, 3–9-nerved; *stamens* 6; filaments free, slender; anthers obtuse or obtusely apiculate; *ovary* ovoid or depressed-globose; apex produced, enclosing the style; stigmas 2–3, plumose. *Grain* ovoid, acuminate, beaked; pericarp crustaceous.

Stem-sheaths auricled ..... *Griffithii.*
Stem-sheaths not auricled ..... *Dullooa.*

2737. TEINOSTACHYUM GRIFFITHII Munro; F. B. I. vii. 410.
Chittagong.
A rather small bamboo; stems 25–50 feet high, slender, subscandent.

2738. TEINOSTACHYUM DULLOOA Gamble; F. B. I. vii. 411.
N. Bengal; Tippera; Chittagong.
A rather small, subscandent bamboo; stems 20–30 feet high. *Vernac.* Dulhua.

1122. Cephalostachyum Munro.

Shrubs with slender, straight stems; stem-sheaths auricled; *leaves* shortly petioled. *Spikelets* in terminal, globose heads in a panicle of bracteate heads, 1-flowered, elongate; rachilla produced beyond the flowering glumes. *Empty glumes* 2–3, broad, chaffy, many-nerved, usually long-awned; *flowering glumes* more membranous, convolute, awns shorter; palea thin, many-nerved, keels 2, approximate; *lodicules* 3, 3–5-nerved; *stamens* 6, free; anthers long; *ovary* stipitate, ovoid, narrowed into a long, thickened style; stigmas 2–3, plumose. *Grain* oblong, beaked; pericarp separable.

2739. CEPHALOSTACHYUM PERGRACILE Munro; F. B. I. vii. 413; E. D. C. 930.
Chota Nagpur.
A large, deciduous bamboo; stems 30–40 feet high.

1123. Dinochloa Buese.

Large evergreen climbers; stems zigzag, usually covered with persistent sheaths; nodes with a broad, leathery ring left by the sheath; stem-sheaths thick, loosely clasping, base wrinkled; *leaves* large, rather soft, transverse nervules represented by pellucid glands. *Spikelets* 1-flowered, very many, minute, in subglobose, sessile heads on short branchlets, forming a large, compound panicle; rachilla inarticulate, not produced. *Empty glumes* 1–4, broad, very obtuse, upper gradually larger; *flowering glumes* similar; palea convolute, not keeled, as long as or longer than the glume; *lodicules* 0; *stamens* 6, free, short; *ovary* ovoid, glabrous; style short. *Grain* ovoid, acuminate.

2740. DINOCHLOA M'CLELLANDI Kurz; F. B. I. vii. 415; E. D. D. 448.
Chittagong.
A large, climbing bamboo; stems 100 feet long.

1124. Melocanna Trin.

Trees, unarmed; stems solitary, distant on the branches of the rootstock; stem-sheaths short, brittle, shortly auricled; blade very long; *leaves* broad, petioled, smooth. *Spikelets* 2–3, fascicled in bracts in the axils of 1-seriate spikes, arranged in a large, compound panicle, acuminate, with 1 fertile and 1 or more sterile flowers. *Empty glumes* indefinite, acuminate, mucronate, striate; *flowering glumes* similar; palea like its glume, convolute, not keeled; *lodicules* 2, narrow; *stamens* 5–7, free or irregularly connate; *ovary* glabrous; style elongate; stigmas 2–4, shortly hairy. *Fruit* very large, pyriform, long beaked, with a very thick pericarp; *seed* with large embryo and no albumen.

2741. Melocanna bambusoides Trin.; F. B. I. vii. 417; E. D. M. 425. *Bambusa baccifera* F. I. ii. 197.

Chittagong.

An evergreen bamboo; stems discrete, solitary on branches of the rootstock, 50–70 feet high. *Beng.* Muli, metunga, bish.

B.—CRYPTOGAMIA.

VII.—FILICES.

Herbs, rarely shrubs or trees; stock short or long, erect or creeping, often scaly; *fronds* simple or variously, often much, lobed or cut; in bud usually circinate, very rarely erect. *Sporangia* 1-celled, usually membranous and dorsal, rarely marginal, surrounded by a complete or incomplete jointed elastic ring, sometimes with the ring confined to the apex of the capsule so as to form a longitudinally striated crown, opening vertically; rarely the ring obsolete or absent; the sporangia clustered in *sori* of defined but varied form, with or without a covering indusium; occasionally the sporangia spicate or paniculate, rarely laxly scattered; sometimes the sporangia sunk in a many-celled, fleshy or corky receptacle of variable form, opening by pores or clefts on the upper surface. *Spores* minute, variable in form, all of one kind.

Order CLII. GLEICHENIACEÆ.

Herbs, often climbing; caudex mostly creeping; stem often dichotomous; *fronds* rigid, generally large and dichotomously divided, frequently bearing axillary bulbils; vernation circinate. *Sori* dorsal, with few (2–10) sporangia that are surrounded by a broad, transverse, complete ring, and open vertically; *indusium* absent.

1125. Gleichenia Smith.

Herbs, usually rigid; caudex usually creeping; *fronds* rarely simple, generally dichotomously branched, often proliferous at the axils of the forks, the pinnæ deeply pinnatifid, with small, concave segments, suborbicular or pectinate, with elongated lobes. *Sori* of few sessile sporangia, usually 2–4, rarely 5–10, situated on a lower exterior veinlet.

2742. Gleichenia linearis Bedd.; F. I. C. 4.

Chittagong; Chota Nagpur.

A large, rigid, dichotomously divided climbing fern.

Order CLIII. POLYPODIACEÆ.

Herbs, rarely trees; caudex erect or creeping; *fronds* herbaceous or coriaceous, rarely membranous; vernation circinate. *Sori* dorsal or marginal, with many sporangia, included or not in a covering indusium, usually pedicelled, more or less completely surrounded by a jointed, vertical elastic ring, and usually bursting transversely.

Trees; sori without an indusium ..... **Alsophila.**

Herbs:—

*Sori furnished with an indusium:—[p. 1239]

Fronds delicately membranous, transparent; indusium apical on a vein, tubular ..... **Trichomanes.**

Fronds herbaceous or coriaceous, opaque:—

†Sori marginal or submarginal:—[p. 1239]

‡Indusium opening apically towards edge of frond:—[p. 1239]

Sori discrete; indusium apical or subapical on a vein **Davallia.**

Sori in a continuous or subcontinuous, marginal or submarginal line; indusium double, inner valve membranous **Lindsaya.**

‡Indusium opening inwardly towards midrib of frond :—[p. 1238]
Sporangia on the under side of the indusium, which consists of the intucked margin of the frond .....**Adiantum.**
Sporangia not on the under side of the indusium :—
Veins supporting sori on their receptacles passing more or less transversely from midrib to margin :—
Sori terminal or nearly so on distinct veins, globose and, at least at first, discrete.....**Cheilanthes.**
Sori on a slender, filiform receptacle in the axis of the indusium, connecting several to many veins, linear and continuous :—
Segments of fronds very small and narrow, the receptacle connecting the apices of few veins ...**Onychium.**
Segments of fronds conspicuous, the receptacle connecting the apices of many veins .....**Pteris.**
Veins supporting sori 2–3, longitudinal, nearly parallel both to midrib and margin .....**Ceratopteris.**
†Sori remote from margin of frond :—[p. 1238]
Indusium linear or oblong :—
Fronds simple or variously once or oftener pinnate :—
Indusium membranous, parallel and close to and opening towards midrib .....**Blechnum.**
Indusium divergent from midrib, single and opening towards midrib, or double and opening both towards midrib and margin of leaf .....**Asplenium.**
Fronds palmately flabellate.....**Actinopteris.**
Indusium reniform :—
Pinnæ mostly divided, not articulate and not white-dotted above **Nephrodium.**
Pinnæ always simple, articulate at base, with white, cretaceous dots above .....**Nephrolepis.**
*Sori without an indusium :—[p. 1238]
§Sori on the back of the lobes confined to the veins :—[p. 1240]
Sori round or very slightly oblong .....**Polypodium.**
Sori linear :—
¶Veins not all soriferous :—[p. 1240]
Sori generally distributed on the soriferous veins :—
Sori on the main-veins only .....**Gymnogramme.**
Sori on the transverse connecting veinlets only **Meniscium.**
Sori circumscribed to a marginal or submarginal line parallel to midrib and margin of frond :—

Fronds all similar, grassy .....**Vittaria.**
Fronds dimorphic.....**Drymoglossum.**
¶ Veins freely anastomosing, all soriferous [p. 1239] **Hemionitis.**
§Sori not confined to the veins but spread over the whole under surface of the fertile frond [p. 1239] .....**Acrostichum.**

1126. Alsophila R. Br.

Tree ferns, with tall caudex; *fronds* decompoundly pinnate; veins simple, forked or pinnate, not anastomosing. *Sori* globose, dorsal, on a vein or at the forking of a vein; sporangia numerous, often compact, generally on an elevated receptacle, often villous, obovate, with a broad, vertical or suboblique, elastic ring; *indusium* absent.

Segments of fronds subfalcate, linear-oblong, entire or distantly crenate, when fertile often contracted; veins forked and often 3-branched *glauca.*
Segments of fronds triangular or rounded, rarely ovate, serrate; veins all simple .....*glabra.*

2743. ALSOPHILA GLAUCA J. Sm.; F. I. C. 12.
Chittagong.
A lofty tree-fern.
2744. ALSOPHILA GLABRA Hook.; F. I. C. 14.
Chota Nagpur; Chittagong.
A tall tree-fern.

1127. Trichomanes Smith.

Small, often minute herbs, growing on moist tree-trunks and rocks; caudex often long, filiform, creeping; *fronds* delicately membranous, simple or compound, costate; veins simple or branching, never anastomosing. *Sori* marginal, always terminating a vein, more or less sunk in the frond; *indusium* tubular, like the frond in texture, the mouth truncate or winged, or faintly 2-lipped; receptacle filiform, elongate, often considerably exserted beyond the mouth of the indusium; *sporangia* confined nearly to the base of the receptacle, orbicular, imbricate, subpeltate, compressed, surrounded by a complete transverse ring, and opening vertically.

Caudex a wide-creeping, slender, tomentose rhizome .....*pyxidiferum.*
Caudex tufted with strong, wiry roots.....*javanicum.*

2745. TRICHOMANES PYXIDIFERUM Linn.; F. I. C. 42. *T. campanulatum* F. I. 763 (Ed. C. B. C.).
Chittagong.
A creeping, villous filmy-fern.

2746. TRICHOMANES JAVANICUM Bl.; F. I. C. 44.
Chittagong.
A tufted, rather wiry filmy-fern.

1128. Davallia Smith.

Herbs, with usually wide-creeping, scaly rootstock; *fronds* very variously divided, small or large, herbaceous or coriaceous; veins always free. *Sori* marginal or submarginal, globose or elongated either laterally or vertically; *indusium* apical on the veins, always free at the apex, the sides variously free or united.

Indusium attached by a wide base, with the sides free :—
Rhizome more or less hypogæal, fibrillose.....*multiflora.*
Rhizome epigæal, stout, scaly :—
Scales narrow, lanceolate; indusium evanescent .....*daræformis.*
Scales broad, obtuse .....*pulchra.*
Indusium subcyathiform, attached by sides as well as base :—
Rhizome stout; fronds subcoriaceous, hairy on the rigid, prominent veins .....*strigosa.*
Rhizome rather slender; fronds herbaceous; hairy throughout the under side; veins neither rigid nor prominent .....*Speluncæ.*

2747. DAVALLIA MULTIFLORA Roxb.; F. I. 761 (Ed. C. B. C.). *Leucostegia immersa* F. I. C. 51.
Chota Nagpur.
A creeping fern, with stout, usually buried rhizome.

2748. DAVALLIA DARÆFORMIS Sw.
Chittagong.
A creeping fern, with finely cut fronds.

2749. DAVALLIA PULCHRA Don. *Leucostegia pulchra* F. I. C. 52.
Chota Nagpur.
A creeping fern, with finely cut fronds.

2750. DAVALLIA STRIGOSA Sw. *Microlepia strigosa* F. I. C. 67.
Chittagong.
A tall fern, with lanceolate, 2-pinnate fronds.

2751. DAVALLIA SPELUNCÆ Bak. *D. pilosa* F. I. 761 (Ed. C. B. C.). *Microlepia Speluncæ* F. I. C. 67.

Chittagong.

A tall fern, with ovate or deltoid, 3–4-pinnate fronds.

1129. **Lindsaya** Dryand.

Ferns, with more or less creeping rhizomes; *fronds* with usually unilateral, rarely equilateral pinnæ; veins free, rarely anastomosing. *Sori* marginal or submarginal, placed at the apex of and uniting 2 or more veins; *indusium* double, opening outwardly, the inner valve membranous, the outer formed of the more or less modified margin of the frond.

Pinnæ unilateral; veins free:—
Rhizome short; pinnæ fewer than 40 pairs, their upper edge slightly lobed or nearly entire ..... *cultrata.*
Rhizome long, creeping; pinnæ 40 or more pairs, their upper edge lobulate-crenate ..... *repens.*
Pinnæ equilateral, lanceolate to linear-acuminate; veins freely anastomosing ..... *ensifolia.*

2752. LINDSAYA CULTRATA Swartz; F. I. C. 72. *L. odorata* F. I. 760 (Ed. C. B. C.).
Chittagong.
A short-creeping fern; rhizome slender.

2753. LINDSAYA REPENS Thw.; F. I. C. 74. *Vittaria resecta* F. I. 760 (Ed. C. B. C.).
N. Bengal, Duars.
A wide-creeping fern; rhizome slender.

2754. LINDSAYA ENSIFOLIA Sw. *Schizoloma ensifolia* F. I. C. 80.
Chittagong.
A creeping fern, with stout rhizome.

1130. **Adiantum** Linn.

Ferns, with tufted roots or a creeping rootstock; *fronds* with pinnæ unilateral; veins free. *Sori* marginal, from globose to linear, usually many and discrete, sometimes continuous and confluent; *indusium* the same in shape as the sorus, formed of the reflexed margin of the frond, bearing the sporangia on its under surface, and opening towards the midrib or stalk of the frond.

Stipes naked, polished; pinnæ with rounded, more or less lobed upper edge, subdimidiate ..... *lunulatum.*
Stipes tomentose; pinnæ with deeply, often repeatedly cut upper edge, dimidiate ..... *caudatum.*

2755. ADIANTUM LUNULATUM Burm.; F. I. C. 82; E. D. A. 506. *Pteris lunulata* F. I. 758 (Ed. C. B. C.).

In all the provinces.

A tufted, wiry, simply pinnate "Maiden-Hair" Fern. *Vernac.* Káli-jhant.

2756. ADIANTUM CAUDATUM Linn.; F. I. 760 (Ed. C. B. C.); F. I. C. 83; E. D. A. 501.

In all the provinces.

A tufted, wiry, simply pinnate "Maiden-Hair" Fern.

1131. Cheilanthes Swartz.

Herbs, usually densely tufted; *fronds* subcoriaceous or membranous, 3–4-pinnatifid, often powdered beneath and white or yellowish; veins free. *Sori* terminal or nearly so on the veins, at first small, subglobose, ultimately more or less confluent; *indusium* formed of the reflexed and modified margin of the frond, roundish and distinct or more or less confluent, but never wholly continuous.

Fronds submembranous, not powdered beneath:—

Roots tufted; rachis not winged; pinnules lanceolate, acuminate or acute, pinnatifid below, with acute teeth ..... *varians.*

Rootstock shortly creeping; rachis winged above; pinnules elliptic, oblong or oblong-lanceolate, subpinnatifid or crenate, with broad, blunt teeth ..... *tenuifolia.*

Fronds subcoriaceous, white and powdery beneath; roots tufted ..... *farinosa.*

2757. CHEILANTHES VARIANS Wall.; F. I. C. 91.

N. Bengal, Duars; E. Bengal, Mymensingh; Tippera; Chittagong.

A small, graceful, tufted fern.

2758. CHEILANTHES TENUIFOLIA Swartz; F. I. C. 92; E. D. C. 996.

Chota Nagpur; Behar; N. Bengal; E. Bengal; Chittagong.

A small, annual, graceful fern. *Santal.* Nanha, dodhari.

2759. CHEILANTHES FARINOSA Kaulf.; F. I. C. 92. *Pteris bicolor* F. I. 758 (Ed. C. B. C.).

Chota Nagpur.

A small "Silver-Fern."

1132. Onychium Kaulf.

Tufted herbs; *fronds* ovate, alternately decompound, the ulti-

mate pinnules linear, small, almost entirely covered by the fructification. *Sori* situated on a continuous linear receptacle connecting the apices of several veins; *indusium* parallel with the margins of the segments, linear, opposite, depressed over the sori, the edge almost or quite reaching the midrib.

Stipes naked .....*auratum.*
Stipes scaly at the base .....*japonicum.*

2760. ONYCHIUM AURATUM Kaulf.; F. I. C. 96. *Pteris daucifolia* F. I. 759 (Ed. C. B. C.).
E. Bengal; Tippera; Chittagong.
A handsome "Golden-Fern."

2761. ONYCHIUM JAPONICUM Kunze; F. I. C. 96.
Chittagong.
A handsome "Golden-Fern."

1133. Pteris Linn.

Herbs, small or large, tufted or with a creeping rhizome; *fronds* very various in size, shape, and division, but with the margin of the indusium never reaching or even approximating to the midrib of the pinnæ; veins free or variously anastomosing. *Sori* marginal, linear, continuous, situated on a slender, filiform receptacle in the axis of the involucre, connecting the apices of numerous veins; *indusium* in shape like the sorus, usually membranous, at first completely covering it, ultimately more or less spreading, opening towards the midrib.

*Veins mostly free:—[p. 1245]
†All the veins quite free:—[p. 1245]
Lowest pinnæ linear, undivided, margins of pinnæ entire:—
Stipes tufted, roughish, woolly when young, harsh when old *longifolia.*
Stipes single, from an elongated caudex, smooth *longifolia* var. *vittata.*
Lowest pinnæ more or less divided, at least on some fronds:—
‡Lowest fertile pinnæ usually merely forked or 3-fid:—[p. 1245]
Margins of at least the sterile pinnæ spinulose-serrate ...*cretica.*
Margins of the pinnæ never spinulose:—
§Margins of sterile pinnæ undulate, crisped or crenulate; veinlets passing horizontally outwards from midrib [p. 1245] *pellucida.*

§Margins of sterile, lateral pinnæ pinnately lobed, sharply toothed; veins diverging somewhat obliquely from the midrib [p. 1244] .....*ensiformis.*

‡Lowest fertile pinnæ again pinnately divided :—[p. 1244]

Lower pinnæ pinnatifid unilaterally to outside, rarely equally to both sides, simply pinnate.....*semipinnata.*

Lower pinnæ twice or oftener pinnately divided :—

Rachis and costæ naked.....*quadriaurita* var. *Blumeana.*

Rachis and costæ setigerous .....*quadriaurita* var. *setigera.*

†Lowest veins from base of midrib of each segment uniting at their tips with corresponding veins from base of adjacent midribs to form a series of long loops along the midrib of each pinna, the other veins all free :—[p. 1244]

Free veins extending to the margins of each segment.....*biaurita.*

Free veins stopping short of the undulate-crenate margins of the segment .....*geminata.*

*Veins all copiously anastomosing [p. 1244] .....*ludens.*

2762. PTERIS LONGIFOLIA Linn.; F. I. C. 106. *P. amplexicaulis* F. I. 758 (Ed. C. B. C.).

In all the provinces.

A tufted fern.

2762/2. Var. VITTATA. *P. vittata* F. I. 757 (Ed. C. B. C.).

Sundribuns.

A fern, with shortly creeping rhizome.

2763. PTERIS CRETICA Linn.; F. I. C. 106.

C. Bengal, often cultivated, sometimes as if wild.

A tufted fern; fronds sometimes variegated.

2764. PTERIS PELLUCIDA Presl; F. I. C. 106.

Chota Nagpur; Behar; E. Bengal.

A tufted fern.

2765. PTERIS ENSIFORMIS Burm.; F. I. C. 107.

Chittagong.

A tufted fern.

2766. PTERIS SEMIPINNATA Linn.; F. I. C. 109. *P. dimidiata* F. I. 758 (Ed. C. B. C.).

Chittagong.

A graceful, tufted fern.

2767. PTERIS QUADRIAURITA Retz var. SETIGERA F. I. C. 111.

Chittagong.

A large, handsome fern.

2767/2. Var. BLUMEANA F. I. C. 112. *P. quadriaurita* F. I. 759 (Ed. C. B. C.).
Chittagong.
A very large, handsome fern.

2768. PTERIS BIAURITA Linn. *Campteria biaurita* F. I. C. 116.
In most of the provinces.
A large, handsome fern.

2769. PTERIS GEMINATA Wall. *Campteria Kleiniana* F. I. C. 116.
Chota Nagpur; Orissa; Chittagong.
A large, handsome fern.

2770. PTERIS LUDENS Wall. *P. multifida* F. I. 758 (Ed. C. B. C.). *Doryopteris ludens* F. I. C. 120.
Orissa; Chittagong.
A small fern; rhizome creeping, fronds dimorphic.

1134. Ceratopteris Brogn.

A succulent, annual, tufted herb of wet places; *fronds* dimorphic, decompound, the barren pinnæ broad, lobed, the fertile linear; veins anastomosing. *Sori* situated on two or three veins running longitudinally down the fertile pinnæ, nearly parallel with both midrib and edge; *sporangia* scattered on the receptacles, sessile, subglobose, with a ring variously complete, partial or obsolete; *indusium* consisting of the reflexed margins of the frond, those of the two sides meeting against the midrib.

2771. CERATOPTERIS THALICTROIDES Brogn.; F. I. C. 123. *Pteris succulenta* F. I. 759 (Ed. C. B. C.).
In all the provinces.
A herbaceous, succulent weed of wet places.

1135. Blechnum Linn.

Rigid herbs, with usually a stout, suberect or erect caudex, rarely twining; *fronds* usually with numerous, linear, nearly contiguous pinnæ on each side, rarely somewhat dimorphic, very rarely simple or 2-pinnate; veins usually free. *Sori* linear, continuous or nearly so, parallel with and usually contiguous to the midrib; *indusium* membranous, distinct from the margin of the frond and opening towards the midrib.

2772. BLECHNUM ORIENTALE Linn.; F. I. C. 132. *B. moluccanum* F. I. 757 (Ed. C. B. C.).
Chota Nagpur; Chittagong.

A large fern, with a stout, scaly caudex and pinnate fronds.

1136. Asplenium Linn.

Herbs, tufted or with creeping rootstock; *fronds* very variously simple, pinnate or 2–more-pinnatifid, herbaceous or coriaceous; veins usually free, sometimes connected at their apices by a marginal vein or, less often, anastomosing towards the margin or throughout the extent of the frond. *Sori* attached to the veins, dorsal or submarginal, linear or oblong, usually oblique with reference to the midrib, generally straight, occasionally curved; *indusium* plane or tumid, similar in shape to the sorus, single and opening toward the midrib, or double and opening outward as well.

*Veins passing from midrib to margin without anastomosing:—[p. 1248]
Veins connected at their apices by an intramarginal line parallel with the edge of the simple frond; indusium simple, linear:—
Midrib rounded throughout on the back; sori reaching about halfway to margin of frond ..... *Nidus.*
Midrib rounded and prominent only below; sori reaching from midrib nearly to margin of frond ..... *Simonsianum.*
Veins free:—
Indusium simple, opening towards midrib:—
Indusium straight, linear or oblong:—
Fronds once pinnate:—
Pinnæ narrowed suddenly to the base on the upper side, the inner edge almost parallel with main-rachis, the lower side obliquely truncate; sori in long, irregular lines, reaching nearly to the margin ..... *falcatum.*
Pinnæ with two-thirds of the lower side cut away; sori neither reaching midrib nor margin ..... *unilaterale.*
Fronds with pinnæ cut nearly or quite to the rachis in the lower part, with stalked, ovate-rhomboid, deeply toothed lobes *laciniatum* var. *depauperata.*
Indusium more or less curved:—
Fronds 2-pinnatifid, 1·5–2 in. wide ..... *drepanophyllum.*
Fronds 3–4-pinnatifid, 6–12 in. wide:—
Fronds finely 3-pinnate, 4-pinnatifid *Filix-fœmina* var. *pectinata.*
Fronds coarsely 2-pinnate, 3-pinnatifid *Filix-fœmina* var. *parasnathensis.*
Indusium double, opening outwards as well as towards midrib:—
†Fronds simple, entire or nearly so [p. 1248] ..... *lanceum.*

†Fronds more or less pinnately divided :—[p. 1247]
Fronds simply pinnate in the lower half to three-fourths :—
Pinnæ entire or nearly so.....*bantamense.*
Pinnæ divided two-thirds towards rachis into oblong, slightly toothed lobes .....*japonicum.*
Fronds copiously 2-pinnate :—
Sori linear, beginning near midrib but falling well short of the margin ; indusium often only double on the lower sori *polypodioides.*
Sori short, oblong, only near midrib, often sori with single and with double indusium irregularly mixed...*multicaudatum.*

•Veins freely anastomosing :—[p. 1247]
Indusium single, opening towards midrib ; veins free in half of frond nearest midrib, copiously anastomosing in the half nearest the margin of the frond .....*Finlaysonianum.*
Indusium double, opening both towards midrib and margin of frond ; veins anastomosing copiously throughout.....*esculentum.*

2773. ASPLENIUM NIDUS Linn. ; F. I. 755. *Thamnopteris Nidus* F. I. C. 137.
Chittagong.
A tufted, cup-shaped "Bird's-Nest Fern."

2774. ASPLENIUM SIMONSIANUM Hook. *Thamnopteris Simonsiana* F. I. C. 141.
Chittagong.
A tufted, cup-shaped "Bird's-Nest Fern."

2775. ASPLENIUM FALCATUM Lamk ; F. I. C. 150. *A. monanthemoides* F. I. 755 (Ed. C. B. C.).
Sundribuns ; C. Bengal ; E. Bengal ; Chittagong.
A small, tufted fern.

2776. ASPLENIUM UNILATERALE Lamk ; F. I. C. 152.
Chittagong.
A small, tufted fern.

2777. ASPLENIUM LACINIATUM Don var. DEPAUPERATA Clarke ; F. I. C. 154.
Chota Nagpur, Parasnath.
A small, tufted fern.

2778. ASPLENIUM DREPANOPHYLLUM Bak. *Athyrium falcatum* F. I. C. 164.
Chota Nagpur, Parasnath.
A small, tufted fern.

2779. Asplenium Filix-fœmina Bernh. var. pectinata Wall.; F. I. C. 169.
Chota Nagpur.
A graceful, tufted fern.

2779/2. Var. parasnathensis Clarke; F. I. C. 170.
Chota Nagpur, Parasnath.
A small, tufted fern.

2780. Asplenium lanceum Thunb. *Diplazium lanceum* F. I. C. 174.
Chittagong.
A small, creeping fern, with simple fronds.

2781. Asplenium bantamense Bak. *Diplazium bantamense* F. I. C. 177.
Chittagong.
A small, creeping fern.

2782. Asplenium japonicum Thunb. *Diplazium japonicum* F. I. C. 180.
Chittagong.
A suberect or creeping fern.

2783. Asplenium polypodioides Mett. *Diplazium polypodioides* F. I. C. 184.
Chittagong.
A large fern, with an erect, stout caudex.

2784. Asplenium multicaudatum Wall. *A. woodwardioides* F. I. 756 (Ed. C. B. C.). *Diplazium umbrosum* var. *multicaudata* F. I. C. 190.
Chittagong.
A large fern, with an erect, stout caudex.

2785. Asplenium Finlaysonianum Wall. *Hemidictyum Finlaysonianum* F. I. C. 195.
Chittagong.
A tufted fern.

2786. Asplenium esculentum Presl; E. D. A. 1582. *Anisogonium esculentum* F. I. C. 192.
In most of the provinces.
A large fern, with an erect, stout caudex.

1137. **Actinopteris** Link.

A small, graceful, tufted herb; *fronds* with long stipe, orbicular, flabellate-palmate. *Sori* linear-elongate, submarginal; *indusium*

in shape like the sorus, folded over it, placed one on each side of the narrow segments of the frond, opening towards the midrib.

2787. ACTINOPTERIS DICHOTOMA Bedd.; F. I. C. 197; E. D. A. 448.

W. Behar; Chota Nagpur.

A small, densely tufted fern, resembling a miniature palm; in dry, rocky places, and on old walls.

1138. Nephrodium Rich.

Herbs, tufted or creeping, small or large; *fronds* very variously subsimple or pinnate or decompound, membranous or herbaceous or subcoriaceous in texture; veins free, simple or forked, or variously united or anastomosing. *Sori* subglobose, dorsal or terminal on the smaller veins; *indusium* reniform-cordate, attached by the sinus, firm and herbaceous, less often membranous, occasionally obsolete or evanescent over some sori.

When the indusium is obsolete or evanescent over a whole frond the species is apt to be referred to *Polypodium*, from which genus it is then no longer distinguishable.

Veins all quite free:—

Fronds simply or, rarely, partially twice pinnate:—

Veins simple; fronds simply pinnate:—

Stipe without auricles below the frond:—

Pinnæ caudate at the tip.....*calcaratum* var. *ciliata*.

Pinnæ obtuse at the tip .....*calcaratum* var. *sericea*.

Stipe with auricles below the frond .....*calcaratum* var. *falciloba*.

Veins forked; fronds sometimes partially 2-pinnate .....*cochleatum*.

Fronds 3–4-pinnate .....*crenatum*.

Veins more or less confluent:—

*Veinlets of contiguous groups united, but with no general and copious anastomosis:—[p. 1251]

†Veins of the same group not uniting among themselves, union confined to the veinlets of contiguous groups; fronds large, pinnate:—[p. 1251]

‡Rhizome wide-creeping:—[p. 1251]

Lower pinnæ hardly if at all reduced .....*pteroides*.

Lower pinnæ conspicuously reduced:—

Rachis and lower surface of fronds densely pubescent; sori subterminal .....*unitum*.

Rachis and lower surface of fronds naked or nearly so; sori in rows midway between midrib and edge of lobe .....*aridum*.

‡Caudex erect or suberect :—[p. 1250]

Pinnæ entire or slightly lobed, so that most of the veinlets of contiguous groups unite :—

Sori close to the midrib :—

Fronds firmly herbaceous or subcoriaceous, punctate-dotted on both sides ..... *urophyllum.*

Fronds thinly papery, not punctate-dotted ..... *amboinense.*

Sori medial or nearly so ..... *pennigerum.*

Pinnæ cut half-way down to the rachis, so that only the lower veinlets of contiguous groups unite :—

Lobes bluntly subfalcate ; fronds usually more or less pilose on both sides ; sori distant from the midrib ..... *molle.*

Lobes oblong, not subfalcate ; fronds usually only pubescent on the veins ; sori medial or nearly so :—

Stem and rachis scaly ; lobes of frond subacute ; sori slightly nearer the margin than the midrib ..... *crinipes.*

Stem and rachis naked or slightly pilose, not scaly ; lobes of frond square cut and crenated at the apex ; sori slightly nearer the midrib than the margin ..... *truncatum.*

†Veins of the same group more or less uniting among themselves along with union of veinlets of contiguous groups :—[p. 1250]

Stipes tufted, copiously beset with black, linear-subulate scales ; fronds pinnate, with pinnatifid apex, about a foot long ; secondary union of veinlets not always present in fertile fronds *membranifolium.*

Stipes 2–3 feet long, shortly hirsute, without scales, on a stout, subarborescent caudex with scaly crown ; fronds 2–3-pinnate, sometimes 6 feet long ..... *Leuzeanum.*

*Veinlets forming a copious and general anastomosis, with usually some free included veinlets in their areolæ ; sori copious, irregularly scattered :—[p. 1250]

§Fronds with distinct areolæ formed by strongish transverse, secondary veinlets uniting main-veins, enclosing in their meshes smaller netted veinlets, or simple or forked veins, or both :—[p. 1252]

Stipes and rachis narrowly winged nearly or quite to the base (fronds pinnately lobed), scattered on a creeping rhizome ; areolæ enclosing both netted veinlets and simple or forked free veins :—

Sori small, scattered on the netted veinlets..... *vastum.*

Sori large, nearly always terminal on free veinlets ... *decurrens.*

Stipes and rachis not winged (fronds once-pinnate), scaly near the base ; areolæ copious, with many free, included veinlets :—

*Stipes tufted, on a suberect rhizome ; terminal pinna lobed or pinnatifid ; sori usually large :—[p. 1252]

Sori almost always at the apex of free veinlets, rarely on the netted veins.....*variolosum.*
Sori on the netted veins :—
Stipes and rachis yellow or brown.....*polymorphum.*
Stipes and rachis polished, black-purple .....*Simonsii.*
¶Stipes solitary, erect, on a wide-creeping rhizome ; terminal pinna entire ; sori small [p. 1251].....*heterosorum.*
§Fronds with main-veins tolerably distinct to the edge but no strongish, transverse veins forming primary areolæ, the intervening secondary areolæ enclosing simple free veins ; stipes tufted ; fronds usually more or less twice-pinnate, sometimes thrice-pinnate ; sori rather large, both on free and netted veinlets [p. 1251] ...*cicutarium.*

2788. NEPHRODIUM CALCARATUM Hook. var. CILIATA Bedd. *Lastræa calcarata* var. *ciliata* F. I. C. 235.
Chittagong.
A tufted fern, with erect, stout caudex.

2788/2. Var. SERICEA Bedd. *Lastræa calcarata* var. *sericea* F. I. C. 237.
Chittagong.
A tufted fern, with erect, stout caudex.

2788/3. Var. FALCILOBA Bedd. *Lastræa calcarata* var. *falciloba* F. I. C. 237. *Polypodium parasiticum* F. I. 753 (Ed. C. B. C.).
Chota Nagpur ; E. Bengal ; Chittagong.
A tufted fern.

2789. NEPHRODIUM COCHLEATUM Don. *Lastræa Filix-mas* var. *cochleata* F. I. C. 250.
Chota Nagpur ; Chittagong.
A handsome, tufted fern.

2790. NEPHRODIUM CRENATUM Bedd. *Lastræa crenata* F. I. C. 258.
Chota Nagpur, Parasnath.
A handsome, tufted fern.

2791. NEPHRODIUM PTEROIDES J. Sm. ; F. I. C. 269.
Orissa.
A wide-creeping fern.

2792. NEPHRODIUM UNITUM Sieb. ; F. I. C. 268. *Polypodium unitum* F. I. 752 (Ed. C. B. C.).
C. Bengal ; E. Bengal ; Chittagong.
A common fern of swampy ground. *Beng.* Pankakrul.

2793. NEPHRODIUM ARIDUM Bak.; F. I. C. 272. *Polypodium semisagittatum* F. I. 753 (Ed. C. B. C.).
Chota Nagpur; N. Bengal; E. Bengal; Sundribuns; Chittagong.
A tufted fern of wettish places.

2794. NEPHRODIUM UROPHYLLUM Bedd.; F. I. C. 274.
Chittagong.
A short-creeping fern; fronds 4 feet long.

2795. NEPHRODIUM AMBOINENSE Bak. *N. molle* var. *amboinensis* F. I. C. 278.
Chittagong.
A short-creeping fern; fronds 2–3 feet long.

2796. NEPHRODIUM PENNIGERUM Hook.; F. I. C. 277.
Chittagong.
A tufted fern, with erect caudex.

2797. NEPHRODIUM MOLLE Desv.; F. I. C. 277.
In all the provinces.
A tufted fern.

2798. NEPHRODIUM CRINIPES Hook.; F. I. C. 279.
Chittagong.
A large, tufted fern.

2799. NEPHRODIUM TRUNCATUM Presl; F. I. C. 280.
Chota Nagpur; Chittagong.
A tufted fern; fronds 2 feet long.

2800. NEPHRODIUM MEMBRANIFOLIUM Presl. *Pleocnemia membranifolia* F. I. C. 225. *Polypodium pilosum* F. I. 753 (Ed. C. B. C.).
Chittagong.
A tufted fern; fronds about a foot long.

2801. NEPHRODIUM LEUZEANUM Hook. *Pleocnemia Leuzeana* F. I. C. 228.
Chittagong.
A large fern with shrubby caudex; fronds up to 6 feet long.

2802. NEPHRODIUM VASTUM Bak. *Aspidium vastum* F. I. C. 213.
Tippera; Chittagong.
A creeping fern, with large, scattered fronds 2–4 feet long.

2803. NEPHRODIUM DECURRENS Bak. *Aspidium decurrens* F. I. C. 219.

Chittagong.

A creeping fern, with large fronds 3 feet long.

2804. NEPHRODIUM VARIOLOSUM Bak. *Aspidium variolosum* F. I. C. 216.

Chota Nagpur; E. Bengal; Tippera; Chittagong.

A tufted fern; fronds 2–3 feet long.

2805. NEPHRODIUM POLYMORPHUM Bak. *Aspidium polymorphum* F. I. C. 218.

Chittagong.

A tufted fern; fronds 1–4 feet long.

2806. NEPHRODIUM SIMONSII Bak. *Aspidium Simonsii* F. I. C. 218.

Chittagong.

A tufted fern; fronds 1–4 feet long.

2807. NEPHRODIUM HETEROSORUM Bak. *Aspidium heterocarpum* F. I. C. 219.

Chittagong.

A tall, gregarious, creeping fern, in wet places; fronds 6 feet high.

2808. NEPHRODIUM CICUTARIUM Bak. *Aspidium cicutarium* F. I. C. 220. *Asplenium cicutarium* F. I. 756 (Ed. C. B. C.).

Chota Nagpur; Orissa.

A large, tufted fern.

1139. Nephrolepis Schott.

Herbs, with wiry, tufted stipes from a short or long, wiry root-stock, often emitting wiry fibres; *fronds* simply pinnate, with the pinnæ articulating at the base and often deciduous from old fronds, each pinna with white, crustaceous dots on the upper surface; veins all free. *Sori* round, arising from the apex of the upper branch of a vein, generally submarginal; *indusium* reniform or roundish.

Sori about half-way between the midrib and the margin; pinnæ crowded, usually imbricating, with a large, crenated, basal auricle on upper side, and with a rounded or cordate, lower basal angle ..... *cordifolia.*

Sori submarginal; pinnæ close, with a narrow basal auricle on upper side, and a smaller rounded one below:—

Rhizome suberect ..... *exaltata.*

Rhizome climbing, sometimes 50 feet long ..... *volubilis.*

2809. NEPHROLEPIS CORDIFOLIA Presl ; F. I. C. 282. *Polypodium flagelliferum* F. I. 751 (Ed. C. B. C.).
C. Bengal ; E. Bengal.
A tufted, wiry fern ; fronds up to 2 feet long.

2810. NEPHROLEPIS EXALTATA Schott ; F. I. C. 282. *N. acuta* F. I. C. 284.
Chittagong.
A tufted, wiry fern ; fronds up to 3 feet long.

2811. NEPHROLEPIS VOLUBILIS J. Sm. ; F. I. C. 284.
Chittagong.
A long, climbing fern, extending over trees to 50 feet or more.

1140. Polypodium Linn.

Herbs, with stems continuous with the caudex or articulating at point of junction with the rhizome ; *fronds* very various in size, form, and division, sometimes entire, often variously lobed or pinnate, uniform or diverse in form or texture or both ; veins free or variously anastomosing. *Sori* on the back of the lobes, round or rarely oblong, never more than twice as long as broad, medial or terminal on the veins ; *indusium* absent.

Stems continuous with the caudex, and sori always medial on the veins :—

Veins free ; fronds 3-pinnate, large :—

Caudex erect ; stipes scaly, not pilose ; fronds up to 15–20 feet long ; sori medial ..... *ornatum.*

Rhizome wide-creeping ; stipe viscous-pubescent ; fronds up to 4 feet long ; sori towards but not on the apices of the veins *punctatum.*

Veins confluent :—

Veins pinnate, with the lower veinlets of contiguous groups joining ; the remaining veins free ; fronds pinnate ; pinnæ with distinctly lobed margins :—

Stipe spreading ; frond usually decumbent, elongating and rooting at the tip, and copiously branched from the axils ; pinnæ bluntly lobed ; veinlets free, 6–10 a side ..... *proliferum.*

Stipe erect ; frond not rooting or branched ; pinnæ acutely, falcately lobed ; veinlets 15–20 a side ..... *multilineatum.*

Veins copiously anastomosing ; fronds distinctly dimorphic *chattagramicum.*

Stems articulating at the point of junction with the rhizome ; sori generally terminal on the veinlets ; veins anastomosing :—

Areolæ uniform, bounded by parallel, straight or curved, transverse veinlets connecting the primary veins, which run distinctly from midrib to edge; areolæ containing 2 or more sori, the contained free veinlets all directed towards the edge; fronds simple, their under surface matted with thin, adpressed, woolly or cottony tomentum :—

Stipes distant; fronds dimorphic; sori in 5–6 series .....*adnascens.*

Stipes aggregated; fronds uniform; sori in 8–10 series ...*stigmosum.*

Areolæ irregular, fine and copious; the free veinlets spreading in various directions; sori generally on the back of united veinlets; fronds not felted or cottony beneath :—

Fronds simple :—

Main-veins obscure in the thick substance of the frond, not distinct to the edge of the frond.....*simplex.*

Main-veins distinct nearly or quite to the edge of the frond :—

Texture thin, membranous; main-nerves distinct; sori large, mostly in 2 rather irregular rows near the main-veins *membranaceum.*

Texture firm, thickly herbaceous or subcoriaceous :—

Main-veins distinct; sori large :—

Main-veins passing quite to the edge; sori irregularly 1–3-rowed .....*ovatum.*

Main-veins branching and becoming lost before they quite reach the edge; sori in one irregular row, often confluent *hemionitideum.*

Main-veins very fine; sori small, very copious and irregularly scattered, often only towards apex of frond .....*irioides.*

Fronds more or less lobed or divided :—

Fronds uniform, all fertile, or if some wholly or partly sterile, the sterile portion in consistence like the fertile :—

Fronds with distinct midrib or rachis, not divided into two halves; rachis winged :—

Fronds 3-fid or pinnatifid, with 2 lobes on each sides, rarely some fronds subentire; the end lobe always larger than the lateral .....*pteropus.*

Fronds deeply pinnatifid, with 2–6 lobes on each side, rarely only 3-fid; the end lobe similar to the lateral .....*dilatatum.*

Fronds flabellately divided into two halves, each deeply lobed from the circumference in the direction of the base ...*Wallichii.*

Fronds diverse, with either the base of the ordinary frond or with a separate frond sterile, lyrate-pinnatifid, brownish in colour and rigid in texture like a sere oak-leaf :—

Sterile frond the basal portion of the fertile.....*coronans.*

Sterile frond distinct from the fertile .....*quercifolium.*

2812. POLYPODIUM ORNATUM Wall. *Phegopteris ornata* F. I. C. 294.
Chittagong.
A large, handsome fern; fronds up to 20 feet long.

2813. POLYPODIUM PUNCTATUM Thunb. *Phegopteris punctata* F. I. C. 295.
Chittagong.
A handsome fern; fronds up to 4 feet long.

2814. POLYPODIUM PROLIFERUM Roxb.; F. I. 752 (Ed. C. B. C.). *Goniopteris prolifera* F. I. C. 296.
Chota Nagpur; N. Bengal; C. Bengal; E. Bengal.
A spreading fern, often rooting at the tips of the fronds.
Beng. Dapu.

2815. POLYPODIUM MULTILINEATUM Wall. *Nephrodium moulmeinense* F. I. C. 275.
Chota Nagpur; Chittagong.
An erect fern; fronds up to 4 feet long.

2816. POLYPODIUM CHATTAGRAMICUM Clarke. *Dictyopteris chattagramica* F. I. C. 299.
Chittagong.
A small, rather handsome fern.

2817. POLYPODIUM ADNASCENS Sw. *P. pertusum* F. I. 750 (Ed. C. B. C.). *Niphobolus adnascens* F. I. C. 325.
Chota Nagpur; N. Bengal; C. Bengal; E. Bengal; Chittagong; Sundribuns.
A small creeping, epiphytic fern, with simple fronds.

2818. POLYPODIUM STIGMOSUM Sw. *P. tomentosum* F. I. 750 (Ed. C. B. C.). *Niphobolus stigmosus* F. I. C. 328.
Chota Nagpur.
A small epiphytic fern, with entire, simple fronds.

2819. POLYPODIUM SIMPLEX Sw. *Pleopeltis simplex* F. I. C. 347.
Chota Nagpur.
A small fern, with thick, simple fronds.

2820. POLYPODIUM MEMBRANACEUM Don. *Pleopeltis membranacea* F. I. C. 355.
Chota Nagpur.
A small fern, with thin, simple fronds.

2821. POLYPODIUM OVATUM Wall. *P. phylliditis* F. I. 750 (Ed. C. B. C.). *Pleopeltis ovata* F. I. C. 354.
Chittagong.
A small, wide-creeping fern, with entire fronds.

2822. Polypodium hemionitideum Wall. *Pleopeltis hemionitidea* F. I. C. 358.
Chittagong.
A creeping fern, with entire fronds.

2823. Polypodium irioides Lamk. *P. glabrum* F. I. 750 (Ed. C. B. C.). *Pleopeltis punctata* F. I. C. 357.
Orissa; C. Bengal; E. Bengal; Sundribuns.
A tufted, parasitic fern, with entire fronds. *Beng.* Chittea bora.

2824. Polypodium pteropus Bl. *Pleopeltis pteropus* F. I. C. 359.
Chittagong.
A smallish fern of marshy places.

2825. Polypodium dilatatum Wall. *Pleopeltis dilatata* F. I. C. 367.
Chittagong.
A considerable fern.

2826. Polypodium Wallichii R. Br. *Dipteris Wallichii* F. I. C. 334.
Chittagong.
A flabellately 2-partite, epiphytic fern.

2827. Polypodium coronans Wall. *Drynaria coronans* F. I. C. 338.
Chittagong.
A large fern, with rather rigid fronds.

2828. Polypodium quercifolium Linn.; F. I. 750 (Ed. C. B. C.). *Drynaria quercifolia* F. I. C. 343.
C. Bengal; E. Bengal; Sundribuns; Chittagong.
An epiphytic fern, with rigid fronds. *Beng.* Gurur.

1141. Gymnogramme Desv.

Herbs, with wide-creeping rhizomes; *fronds* entire, jointed on the rhizome; veins copiously anastomosing, with free, included veinlets. *Sori* arising from the veins over the under surface of the frond, linear or linear-oblong, simple or forked; *indusium* absent.

2829. Gymnogramme Hamiltoniana Hook. *Sellignea Hamiltoniana* F. I. C. 390.
Chittagong.
A fern, rather like *Polypodium ovatum*, but with elongated sori.

1142. Meniscium Schreb.

Herbs, with tufted stipes or creeping rhizome ; *fronds* simple or pinnate ; veins pinnate, the lowest veinlets of a group joining the corresponding veinlets of contiguous groups. *Sori* oblong or linear, on the connivent, transverse veinlets ; *indusium* absent.

2830. MENISCIUM TRIPHYLLUM Sw. ; F. I. C. 397.

N. Bengal, Duars ; Chittagong.

A gregarious, wide-creeping fern.

1143. Vittaria Sm.

Herbs, usually epiphytic ; rhizome short or elongated ; *fronds* simple, narrow, grassy ; veins free. *Sori* in continuous marginal or slightly intramarginal lines ; *indusium* absent.

2831. VITTARIA ELONGATA Sw. ; F. I. C. 404. *Pteris angustifolia* F. I. 757 (Ed. C. B. C.).

C. Bengal ; E. Bengal ; Sundribuns ; Chittagong.

An epiphytic grassy fern, with a creeping rhizome.

1144. Dymoglossum Presl.

Small, epiphytic, creeping ferns, with dimorphic, articulate *fronds*, sterile ovate or oblong, fertile linear ; veins obscure, anastomosing ; areolæ with copious, free veinlets. *Sori* linear, scarcely immersed, central or submarginal, often ultimately confluent and nearly covering under surface of frond ; *indusium* absent.

2832. DRYMOGLOSSUM PILOSELLOIDES Presl ; F. I. C. 411. *Pteris piloselloides* F. I. 757 (Ed. C. B. C.).

Sundribuns ; Chittagong.

A small, creeping epiphyte, with dimorphic fronds.

1145. Hemionitis Linn.

Small, terrestrial ferns, with usually tufted stipes, not articulating with caudex ; *fronds* simple, pinnatifid or pinnate ; veins copiously anastomosing. *Sori* continuous along all the veins of the fertile fronds ; free veinlets in the areolæ rare, when present these also soriferous ; *indusium* absent.

2833. HEMIONITIS ARIFOLIA Bedd. ; F. I. C. 413. *H. cordifolia* F. I. 756 (Ed. C. B. C.).

In most of the provinces.

A small, tufted fern, with cordate-hastate fronds. *Beng.* Chakuliya.

1146. Acrostichum Linn.

Herbs, with tufted stipes or a creeping rhizome; *fronds* variously simple or pinnate, usually dimorphic; veins free or anastomosing. *Sori* spread in a layer over the whole surface of the frond or its upper pinnæ, occasionally over both surfaces and not confined to the veins only; *indusium* absent.

Veins free; barren fronds simply pinnate; fronds dimorphic :—
Pinnæ rigid, coriaceous, pungent-serrate; veins fine, close ...*palustre.*
Pinnæ herbaceous, deep-crenate, with a seta in the sinus between each pair of crenatures; veins more open.....*appendiculatum.*
Veins anastomosing copiously :—
Main-veins distinct nearly or quite to the margin; tip of barren frond often proliferous; fronds dimorphic :—
Barren frond simple or with only 1–3 pairs of pinnæ ...*flagelliferum.*
Barren frond with many pairs of pinnæ .....*costatum.*
Main-veins falling short of the margin, or indistinct, or obsolete :—
Barren fronds entire; fronds dimorphic, acute :—
Main-veins raised but falling considerably short of the margin of the frond .....*lanceolatum.*
Main-veins none .....*axillare.*
Barren fronds pinnate; sterile and fertile fronds subsimilar; pinnæ obtuse; areolæ without free veinlets .....*aureum.*

2834. Acrostichum palustre Bedd. *A. scandens* E. D. A. 443. *Pteris scandens* F. I. 758 (Ed. C. B. C.). *Stenochlæna palustre* F. I. C. 421.
C. Bengal; E. Bengal; Sundribuns; Chittagong.
A large, scandent fern.

2835. Acrostichum appendiculatum Willd. *A. scetacoonense* F. I. 749 (Ed. C. B. C.). *Polybotrya appendiculata* var. *Hamiltoniana* F. I. C. 424.
Chittagong.
A tufted fern; fronds simply pinnate, sometimes proliferous.

2836. Acrostichum flagelliferum Wall. *Gymnopteris flagellifera* F. I. C. 433.
Chittagong.
A creeping fern, with woody, scaly rhizome.

2837. Acrostichum costatum Wall. *Gymnopteris costata* F. I. C. 438.
Chittagong.

A short-creeping fern, with woody rhizome.

2838. ACROSTICHUM LANCEOLATUM Hook. *Gymnopteris variabilis* var. *lanceolata* F. I. C. 429.

Chittagong.

A wide-creeping fern, with woody rhizome.

2839. ACROSTICHUM AXILLARE Cav. *Gymnopteris variabilis* var. *axillaris* F. I. C. 430.

E. Bengal.

A wide-climbing fern, with entire fronds.

2840. ACROSTICHUM AUREUM Linn.; F. I. C. 440. *A. emarginatum* F. I. 749 (Ed. C. B. C.).

C. Bengal; E. Bengal; Sundribuns; Chittagong.

A common fern of tidal marshes.

Order CLIV. SCHIZÆACEÆ.

Herbs, often climbing; *fronds* palmate or pinnate; veins free; vernation circinate. *Sori* lateral, with 2-valved sporangia that are crowned by a complete opercular ring, and open down the sides.

Tufted herbs with simple or forked fronds .....**Schizæa.**
Climbing herbs with scandent fronds.....**Lygodium.**

1147. Schizæa Sm.

Small, tufted herbs; *fronds* simple or forked; veins free. *Sporangia* sessile, in 2–4 rows, on one side of close, distichous spikes, that form separate fertile segments at tips of fronds.

2841. SCHIZÆA DIGITATA Sw.; F. I. C. 452.

Chittagong.

A small fern, with tufted stipes; fertile spikes 6–15.

1148. Lygodium Sw.

Climbing herbs, with wide-twining stems; *fronds* scandent; pinnæ conjugate, palmately lobed, pinnatifid, or pinnate; veins free, forked. *Sporangia* solitary or casually paired in the axils of large, imbricated, clasping indusia, that form spikes either on separate pinnæ or in lax rows along the margins of leafy ones.

Barren fronds when fully developed palmate or 2-partite into 2 palmate lobes .....*circinatum.*
Barren fronds pinnate:—
Fronds simply pinnat sterile pinnæ about twice as long as broad,

margin subentire; fertile deltoid, scarcely longer than broad, with square base and rounded sides.....*microphyllum.*
Fronds stipitate-pinnate, with pinnæ lobed or subpalmate or again pinnate, margin serrulate or lobed; fertile with sori protruding from margin and sterile both several times longer than broad:—
Pinnæ with serrulate margins; lamina of the fertile always more or less leafy .....*flexuosum.*
Pinnæ smaller, with finely cut margins; lamina of fertile often so much contracted as to be evanescent .....*japonicum.*

2842. LYGODIUM CIRCINATUM Sw.; F. I. C. 455. *Ophioglossum furcatum* F. I. 748 (Ed. C. B. C.).
Chittagong.
A graceful, climbing fern.

2843. LYGODIUM MICROPHYLLUM R. Br.; F. I. C. 455. *Ophioglossum filiforme* F. I. 748 (Ed. C. B. C.).
N. Bengal; Chittagong.
A graceful, climbing fern.

2844. LYGODIUM FLEXUOSUM Sw.; F. I. C. 457. *Ophioglossum scandens* F. I. 748 (Ed. C. B. C.).
Chota Nagpur; Behar; Chittagong.
A graceful, climbing fern. *Beng.* Bhut-raj; *Santal.* Nanjom rehet'.

2845. LYGODIUM JAPONICUM Sw.; F. I. C. 457. *Ophioglossum flexuosum* F. I. 748 (Ed. C. B. C.).
C. Bengal, occasional.
A very slender and graceful, climbing fern.

Order CLV. MARATTIACEÆ.

Usually large herbs; *fronds* pinnate or palmate, often with basal, fleshy, stipule-like auricles, texture thick; veins free or anastomosing; vernation circinate. *Sori* marginal or dorsal; *sporangia* without any ring, opening by a slit down one side or by a pore at the apex; usually joined together in concrete synangia, sometimes only contiguous but discrete.

Sporangia sessile, contiguous but discrete, arranged in bands near the edge of the pinnæ; fronds 2-pinnate; veins free.....**Angiopteris.**
Sporangia concrete, in raised, circular, dorsal masses with hollow centre; fronds palmate; veins anastomosing .....**Kaulfussia.**

1149. Angiopteris Hoffm.

Large, shrubby ferns; *fronds* very large, 2-pinnate, with two fleshy, persistent, stipuliform appendages; the base of the stipes clavate, spuriously articulate with axis; pinnæ and pinnules articulate with rachis; veins simple or forked, free. *Sporangia* sessile, very close together but not concrete, arranged in a linear-oblong or boat-shaped band near the edge of the frond.

2846. Angiopteris evecta Hoffm.; F. I. C. 460. *Marattia pinnata* F. I. 763 (Ed. C. B. C.).

Chota Nagpur; Chittagong.

A huge fern, with thick caudex; fronds 6–20 feet long.

1150. Kaulfussia Bl.

Herbs; *fronds* long, stipitate, ternate or digitate, with two short, fleshy, stipuliform appendages, lobes of frond elliptic, main-veins costate; veinlets copiously anastomosing, with free, included veinlets. *Sori* dorsal, scattered, copious. *Sporangia* sessile, 10–15, quite concrete, in raised circular masses hollow in the centre, with the oblong apertures on their inner face.

2847. Kaulfussia æsculifolia Bl.; F. I. C. 462.

Chittagong.

A fern, 2–3 feet high.

Order CLVI. OPHIOGLOSSACEÆ.

Herbs, small or medium, usually terrestrial, occasionally epiphytic; *fertile frond* rising from the base of the sterile, spicate or racemose or paniculate; *sterile frond* entire, digitate or pinnate; veins free or anastomosing; vernation erect. *Sporangia* deeply 2-valved, opening laterally nearly to base, without a ring.

Sterile frond simple, rarely palmately lobed ..... **Ophioglossum.**
Sterile frond digitate ..... **Helminthostachys.**

1151. Ophioglossum Linn.

Small herbs, usually terrestrial, rarely epiphytic; *sterile frond* simple, entire, rarely palmate; veins reticulated; *fertile* usually at the base of the sterile, upraised, rarely as if distinct direct from the corm. *Sporangia* sessile, arranged in two rows to form a narrow, close spike.

Sterile division of frond ovate or ovate-oblong, herbaceous, placed generally about the middle.....*vulgatum.*
Sterile division of frond cordate, membranous, placed generally somewhat below the middle.....*reticulatum.*

2848. OPHIOGLOSSUM VULGATUM Linn.; F. I. C. 464.
Chota Nagpur.
A small, herbaceous "Adder's Tongue."

2849. OPHIOGLOSSUM RETICULATUM Linn.; F. I. C. 465. *O. cordifolium* F. I. 747 (Ed. C. B. C.).
Behar; N. Bengal; C. Bengal.
A small, membranous "Adder's Tongue." *Beng.* Ektir.

1152. Helminthostachys Kaulf.

Herbs, terrestrial; *fronds* stipitate; sterile segments foliaceous, digitate; fertile upraised and rising from base of leafy segments; veins forked, free. *Sporangia* in small, crested clusters, that form a long, loose spike.

2850. HELMINTHOSTACHYS ZEYLANICA Hook.; F. I. C. 467. *Osmunda zeylanica* F. I. 748 (Ed. C. B. C.).
Behar; C. Bengal; E. Bengal; Sundribuns.
A stipate fern, with thick, fleshy, creeping rhizome. *Beng.* Ekbir.

VIII.—RHIZOCARPEÆ.

Herbs, sometimes annual, floating, fugacious; sometimes perennial, with a filiform rhizome. *Sporangia* of two kinds, in the same or in different membranous conceptacles, which are single with no outer covering, or several together in a dehiscent, coriaceous, outer conceptacle. *Macrosporangia* with a single macrospore; *microsporangia* with numerous microspores.

Order CLVII. SALVINIACEÆ.

Fugacious, floating, annual, aquatic herbs; stems simple or branched, giving off sessile or short-petioled *leaves* on the upper side, and copious root-fibres downwards. *Conceptacles* usually single, always membranous and indehiscent, and containing sporangia of only one kind. *Macrosporangia* containing a single

macrospore, from which a rudimentary prothallus is produced. *Microsporangia* containing numerous microspores.

Leaves entire, with complicated anastomosing venation ; microsporangia free within the conceptacle ..... **Salvinia.**
Leaves small, deeply lobed, each lobe 1-nerved only ; microsporangia aggregated within the conceptacle in massulæ with a membranous cuticle **Azolla.**

1153. **Salvinia** Schreb.

Fugacious, annual, aquatic herbs, with slender, floating stems bearing short-petioled or sessile leaves on the upper side, and short, conceptacle-bearing branches and much-branched, feathery root-fibres on the lower side; *leaves* small, simple, with a distinct midrib running from base to apex, and a close erecto-patent, secondary nervation connected by a few looped veins. *Conceptacles* globose, membranous, indehiscent, seated in clusters on short branches of the floating stem, 1–2 of each cluster containing 10 or more turbinate macrosporangia, each with a single macrospore, several of each cluster containing very many globose microsporangia, much smaller than the macrosporangia, each with many minute microspores. *Sporangia* of both kinds borne on a much-branched, filamentous receptacle.

Fronds horizontal, flat ..... *natans.*
Fronds suberect, with infolded edges ..... *cucullata.*

2851. SALVINIA NATANS Hoffm. *S. verticillata* F. I. 745 (Ed. C. B. C.).
N. Bengal; Tirhut.
A small, floating, annual herb.

2852. SALVINIA CUCULLATA Roxb. ; F. I. 745 (Ed. C. B. C.).
In all the provinces.
A small, floating, annual herb.

1154. **Azolla** Lamk.

Fugacious, annual, aquatic herbs ; stems copiously branching ; *leaves* sessile, minute, densely imbricating, deeply-lobed, each lobe with a single midrib; root-fibres on the lower side copious, simple or feathery, solitary or fascicled. *Conceptacles* in the axils of the leaves of two kinds: one larger, membranous, globose, containing numerous microspores, aggregated in massulæ, covered by a membranous cuticle, and borne on a branched, filiform recep-

tacle; the other smaller, ovoid, containing a single macrospore, crowned by few or many float-corpuscles, and with a calyptrate cap pushed off as the archegonium develops.

2853. AZOLLA PINNATA R. Br. *Salvinia imbricata* F. I. 745 (Ed. C. B. C.).

In all the provinces.

A small, floating, annual herb.

Order CLVIII. MARSILEACEÆ.

Aquatic or subaquatic herbs, with wide-spreading, slender rhizomes; *leaves* singly or in tufts from its nodes, submerged or with floating or emergent blades. *Conceptacles* double, outer coriaceous and dehiscent, inner membranous and indehiscent, containing both kinds of sporangia. *Macrosporangia* containing a single macrospore, from which a rudimentary prothallus is produced. *Microsporangia* containing numerous microspores.

1155. Marsilea Linn.

Aquatic or subaquatic herbs, with a slender, creeping rhizome; *leaves* singly or in tufts from its nodes, each with a slender petiole and four sessile, equal, spreading, deltoid-cuneate or oblanceolate, floating or emergent leaflets, with flabellate, anastomosing veins. *Conceptacles* oblong or globose, coriaceous, in axils of leaves or on leaf-stalks, ultimately dehiscent along ventral suture into two valves, and emitting a mucilaginous, placental cord, bearing at intervals numerous oblong-cylindric sori with a membranous coat, each sorus with many microsporangia, containing numerous microspores and a few macrosporangia with solitary macrospores.

Pedicels adnate to the base of the petioles .....*quadrifoliata.*
Pedicels quite free from the petioles.....*minuta.*

2854. MARSILEA QUADRIFOLIATA Linn.; E. D. M. 306.

In most of the provinces.

An aquatic herb, at the edges of ponds. *Beng.* Susnishak; *Santal.* Chatom arak'.

2855. MARSILEA MINUTA Linn. *M. quadrifolia* F. I. 745 (Ed. C. B. C.).

In all the provinces.

An aquatic herb, at the edges of ponds.

IX.—EQUISETINEÆ.

Herbs; *leaves* small in proportion to the stems, whorled, not circinate, the fertile peltate forming a spike at the apex of the stem. *Sporangia* all similar on the inner face of the peltate leaves. *Spores* many, free, each with 4 hygroscopic filaments, clubbed at the end, developing as a rule diœcious lobed prothalli. *Antheridia* at apex of lobes; *archegonia* on fleshy upper surface near base of prothallus.

Order CLIX. EQUISETACEÆ.

Herbs; rootstock widely creeping, hypogæal, jointed and sheathed at the nodes, often branched and bearing tubercles; stem erect, cylindric, with a distinct central hollow, occluded at the nodes, strongly ribbed, with air-spaces in the walls under the ribs; cuticle loaded with silica; the nodes articulate and sheathed, sheath toothed, the teeth as many as the stem-ribs; stems usually all similar, sometimes dimorphic (barren and fertile) often with regularly whorled branches. *Leaves* 0. *Spikes* obtuse or apiculate. *Sporangia* all similar, oblong, dehiscing down inner face, 6–9 uniseriately disposed round the under side of the margin of stalked, peltate receptacles, conically arranged at apex of stem. *Spores* very many, free, smooth, globose, each with 4 clubbed, spirally curled, hygroscopic filaments; germinating on the ground as lobed, usually diœcious, prothallia.

1156. Equisetum Linn.

The only genus; characters those of the order.

Spikes obtuse, shortly stalked; stomata with openings on level of epidermis; branches copious, densely whorled; stems erect .....*diffusum.*
Spikes apiculate, subsessile; stomata with openings hidden in the epidermis; branches sparse; stems semi-scandent .....*debile.*

2856. EQUISETUM DIFFUSUM Don.
N. Bengal, Duars.
A herb, 1–2 feet high.

2857. EQUISETUM DEBILE Roxb.; F. I. 745 (Ed. C. B. C.); E. D. E. 241.
Chota Nagpur.

A semi-scandent herb, 3–10 feet long. *Santal.* Buru kathom charec'.

X.—LYCOPODINEÆ.

Herbs; *leaves* small in proportion to the stem, not whorled, circinate, the fertile not peltate, with sporangia in their axils. *Spores* sometimes all of one kind, producing prothalli which are 2-sexual, at others of two different kinds; macrosporangia and microsporangia both developing rudimentary prothalli, which remain attached to the spore; those of the macrospores bearing archegonia, those of the microspores bearing antheridia with antherozoids.

Order CLX. LYCOPODIACEÆ.

Herbs, with fibrous roots; rootstock none or, if present, trailing; stems produced, erect or creeping, alternately dichotomously forked with a central bundle of vascular tissue; *leaves* small, simple, 1-nerved, entire or serrated, usually uniform and multifarious; vernation circinate. *Sporangia* axillary along the stem or aggregated in terminal spikes in the axils of specialised bracts, uniform, compressed or turbinate, 1–3-valved, 1–3-celled. *Spores* uniform, globose, granulate, without elaters, usually with 3 radiating lines from the apex, rarely with a single line; on the ground giving rise to a fleshy prothallus.

Leaves many, crowded; sporangia orbicular, compressed, 1-celled, 2-valved ..... **Lycopodium.**
Leaves few, distant, rudimentary; sporangia turbinate, 3-celled, 3-valved **Psilotum.**

1157. Lycopodium Linn.

Herbs, with erect or prostrate, copiously branching stems; *leaves* small, crowded, 1-nerved, usually uniform and multifarious. *Sporangia* coriaceous, reniform-orbicular, compressed, 1-celled, dehiscing by a slit down apex from end to end, placed free and singly in the axils of unaltered leaves all down the stem or aggregated in terminal, bracteate spikes. *Spores* with 3 lines radiating from the apex.

Sporangia in the axils of unaltered leaves all down the stem...*Hamiltonii*.
Sporangia in the axils of bracts unlike the stem-leaves and aggregated into distinct terminal spikes:—

Stems more or less pendulous, dichotomously forked from the base; epiphytic .....*Phlegmaria*.
Stems erect, unbranched near the base; terrestrial .....*cernuum*.

2858. LYCOPODIUM HAMILTONII Spreng.
Chota Nagpur.
A small, densely tufted herb, 3–12 in. long.

2859. LYCOPODIUM PHLEGMARIA Linn.; F. I. 746 (Ed. C. B. C.).
Sundribuns.
A pendulous, dichotomously branched epiphyte, 6 in. to 2 feet long.

2860. LYCOPODIUM CERNUUM Linn.; F. I. 746 (Ed. C. B. C.).
Chittagong.
A terrestrial, erect herb; stems sometimes 3 feet high.

1158. Psilotum Sw.

Herbs, with wiry, short-creeping rootstocks; stems simple below, copiously, dichotomously branching upwards; *leaves* minute, laxly arranged, 3-farious or 2-farious. *Sporangia* rigidly coriaceous, turbinate, with umbilicate tips, 3-lobed, 3-celled, splitting vertically down the centre of each cell, placed singly in the axils of the rudimentary leaves all down the branches. *Spores* oblong, somewhat curved, 1-ribbed.

2861. PSILOTUM TRIQUETRUM Sw.
E. Bengal; Sundribuns.
A small, erect or suberect herb, 6 in. to 2 feet high.

Order CLXI. SELAGINELLACEÆ.

Herbs, with copiously branching stems, the ultimate divisions usually flabellately dichotomous, trailing, suberect, or scandent; root-fibres confined to base or extending to upper nodes, more or less quadrangular, with the faces angled or flat; the nodes at times articulate; *leaves* small, 1-veined, rarely all alike, usually tetrastichous and dimorphic, more or less oblique, the two rows of the lower plane larger and spreading, those of the upper ascending, adpressed to stem and imbricating. *Spikes* usually tetrastichous,

often square, the bracts usually similar, but sometimes dimorphic like the leaves. *Sporangia* of two kinds, minute, orbicular, laterally compressed, membranous, 1-celled, inserted in the angles of bracts to form dense spikes at the ends of leafy branches; microsporangia many, splitting across the apex in the wide diameter; *microspores* dust-like, very numerous; macrosporangia few and confined to base of spike, usually also 2-valved, containing 4 or fewer macrospores; *macrospores* globose, chalky-white, with 3 radiating ribs from the apex, developing a minute female prothallus which remains permanently attached to the spore.

1159. Selaginella Spring.

Characters those of the order.

Ordinary leaves all similar, multifarious; bracts uniform .....*rupestris.*
Ordinary leaves of two kinds, tetrastichous and spreading in two planes, those of the upper plane smaller and somewhat ascending:—
Bracts uniform; stems erect, persistent, simple below, decompound and frond-like above .....*pentagona.*
Bracts of two kinds like the leaves, but the smaller bracts in the same plane as the larger leaves; stems decumbent, fugacious, the branches simple or little compound .....*proniflora.*

2862. SELAGINELLA RUPESTRIS Spring.
Chota Nagpur.
A densely tufted herb.

2863. SELAGINELLA PENTAGONA Spring.
Behar; Chota Nagpur; Orissa.
An ascending or erect herb; stems 1–1·5 feet long.

2864. SELAGINELLA PRONIFLORA Bak. *Lycopodium imbricatum* F. I. 747 (Ed. C. B. C.).
In most of the provinces.
A small, prostrate, fugacious herb; stems 1–4 in. long. *Beng.* Hatajhera.

V. APPENDIX.

1. Clematis Linn.

Flowers in axillary panicles; achenes with long, feathery tails; sepals spreading from the base; filaments glabrous; flowers 1–1·5 in. across, purple ..... *smilacifolia.*

2*. Clematis smilacifolia Wall.; F. B. I. i. 3.
Orissa.
A large, woody climber.

50. Cleome Linn.

Leaves compound; stamens 6 ..... *aspera.*

77*. Cleome aspera Koen.; F. B. I. i. 169. *C. diffusa* F. I. iii. 129.
Orissa.
An annual herb, 6–15 in. high.

52. Capparis Linn.

Flowers numerous; corymbs simple; fruit as large as a cherry ..... *Roxburghii.*

83*. Capparis Roxburghii DC.; F. B. I. i. 176. *C. corymbosa* F. I. ii. 569.
Orissa.
A large woody climber.

93. Abutilon Gaertn.

Leaves cordate and stems very hispid; carpels 20..... *hirtum.*

156*. Abutilon hirtum G. Don. *A. graveolens* var. *hirta* F. B. I. i. 327.
W. Bengal; C. Bengal; Sundribuns.
An erect, woody herb. *Beng.* Jhampi, kanghani.

Order XXIV. STERCULIACEÆ.

Flowers hermaphrodite; petals present, deciduous; mature carpels con joined, inflated and membranous .....**106*. Kleinhovia.**

106*. Kleinhovia Linn.

A tree, with simple palmi-nerved, ovate, acuminate, entire leaves. *Flowers* in terminal, lax, cymose panicles; bracteoles small, ensiform. *Sepals* 5, deciduous. *Petals* 5, deciduous, pink, unequal, margins involute, upper with rather longer claws. *Stamens* connate in a column, above swollen into a 5-fid, campanulate cup, with 3 extrorse, 2-celled anthers to each lobe; anther-cells divergent. *Ovary* within the staminal cup, of 5 1-celled, connate carpels opposite the sepals; styles connate; stigmas 5, free; ovules 2 in each cell. *Fruit* an inflated, pyriform, membranous, loculicidally 5-valved capsule. *Seeds* 1–2 in each cell, sometimes abortive in one or more of the cells; testa tubercled; albumen scanty or obsolete; embryo with convolute cotyledons and radicle next the hilum.

205*. Kleinhovia Hospita Linn.; F. I. iii. 141; F. B. I. i. 364.
C. Bengal, in gardens near Calcutta, introduced from the Moluccas; Sundribuns, wild.
A tree, 50 feet high. *Beng.* Bola.

108. Pterospermum Schreb.

Capsule obscurely 5-angled; peduncles as long as petioles...*Heyneanum.*

208*. Pterospermum Heyneanum Wall.; F. B. I. i. 369.
Orissa.
A medium tree.

117. Grewia Linn.

Inflorescence not paniculate; drupe fleshy, wrinkled; leaves 3-nerved, nearly glabrous; fruit pilose, hardly lobed .....*orientalis.*

233*. Grewia orientalis Linn.; F. I. ii. 586; F. B. I. i. 384.
Orissa.
A suberect or scandent shrub.

133. Zanthoxylum Linn.

Leaflets wide-crenate, with glandular sinuses .....*Budrunga.*
Leaflets entire .....*Rhetsa.*

270*. Zanthoxylum Rhetsa DC.; F. B. I. i. 495; E. D. Z. 35.
Fagara Rhetsa F. I. i. 417.

Orissa, common.
A considerable tree.

143. Paramignya Wight.

Spines short; ovary 5-celled ..... *citrifolia.*
Spines long; ovary 3–4-celled ..... *longispina.*

284*. Paramignya longispina Hook. f.; F. B. I. i. 511.
Sundribuns.
A thorny undershrub. *Beng.* Ban nimbu.

154. Melia Linn.

Leaves twice or thrice pinnate; flowers greenish-white ..... *dubia.*

298*. Melia dubia Cav.; F. B. I. i. 545; E. D. M. 412. *M. superba* F. I. ii. 396.
Orissa, common.
A large tree. *Uriya* Máhánim, bátara.

162. Carapa Aubl.

Roots without vertical rootsuckers ..... *obovata.*
Roots with vertical rootsuckers ..... *moluccensis* var. *gangetica.*

312*. Carapa moluccensis Lamk. var. gangetica.
Sundribuns, rare.
A tall tree. *Beng.* Pussur.

184. Zizyphus Juss.

Cymes axillary; all parts glabrous ..... *glabra.*

346*. Zizyphus glabra Roxb.; F. I. i. 614.
Chittagong.
A scandent shrub; nearest to *Z. xylopyra.*

Order XLIII. ANACARDIACEÆ.

Leaves simple; parts of flower not altered in fruit; carpels solitary; stamens 3–5; leaves opposite; sepals valvate..... **203*. Bouea.**

203*. Bouea Meisn.

Trees; *leaves* opposite, petioled, coriaceous, quite entire; stipules 0. *Flowers* small, polygamous, in axillary and terminal panicles; pedicels jointed; bracts deciduous. *Calyx* 3–5-partite; segments valvate. deciduous. *Petals* 3–5, imbricate; disk very small. *Stamens* 3–5, inserted just inside the disk, all fertile.

Ovary sessile, 1-locular; style terminal, short; stigma unequally 3-lobed; ovule solitary, ascending from wall of chamber. *Fruit* a fleshy drupe with a thin, fibrous stone. *Seed* suberect; testa thin; albumen 0; embryo with fleshy cotyledons and a short, inferior radicle.

396*. Bouea burmanica Griff.; F. B. I. ii. 21. *Mangifera oppositifolia* F. I. i. 640.

E. Bengal, cultivated; Sundribuns, among vestiges of abandoned settlements.

A tree; native of Burma. *Beng.* Meriám, uriám.

235. Dolichos Linn.

Style filiform; pods recurved, few-seeded:—

Pods hirsute; flowers 1–3, fascicled: annual.....*biflorus.*
Pods glabrous; flowers 2–8, racemose: perennial .....*falcatus.*

505*. Dolichos falcatus Klein; F. I. iii. 311; F. B. I. ii. 211.

Orissa.

A slender climber; not tuberous.

255. Dalbergia Linn. f.

Pod thin and flattened except opposite the seed; stamens in 2 lateral phalanges of 5 filaments each; bracts and bracteoles inconspicuous, deciduous; pods coriaceous opposite the seeds, gradually narrowed to a stipe, only 2–3 times as long as broad, veined opposite the seeds; a tree; calyx-teeth as long as tube; panicles compact; standard without a basal callosity .....*paniculata.*

565*. Dalbergia paniculata Roxb.; F. I. iii. 227; F. B. I. ii. 236; E. D. D. 53.

Orissa, common.

A handsome tree. *Uriya* Bábúklia.

D. lanceolaria Linn. f. is known in Orissa as *Angária.*

274. Indigofera Linn.

Leaves compound; leaflets 17–21, membranous, opposite except the terminal; stems and pods almost glabrous; flowers large; pods straight, 8–12-seeded, sutures not thickened .....*pulchella.*

643*. Indigofera pulchella Roxb.; F. I. iii. 382.

Orissa.

A slender, straggling shrub.

This species, of which specimens do not appear to have been collected since Roxburgh's original description was written, and his original figure, published by Wight, was drawn, was rediscovered in December, 1902, by Mr. J. H. Lace: it proves to be exceedingly distinct from *I. arborea*, with which it is customary to associate it.

Order LI. HALORAGEÆ.

Stamens 4; leaves dentate, whorled.....**318. Myriophyllum.**
Stamen solitary; leaves entire, opposite .....**318*. Callitriche.**

318*. Callitriche Linn.

Annual, slender, glabrous herbs of wet places, branches sometimes submerged or floating; *leaves* opposite, linear- or obovate-spathulate, entire; upper often rosulate. *Flowers* very small, axillary, 1-sexual, usually monœcious, sometimes ♂ and ♀ in one axil and simulating a hermaphrodite flower; bracteoles white, membranous, linear-oblong, fugitive. *Perianth* 0 in either sex. ♂ *Stamen* solitary. ♀ *Carpels* 4, connate in a 4-ridged, 4-celled ovary; styles 2, elongate, stigmatic throughout; ovules solitary, pendulous in each cell. *Fruit* a coriaceous nut, at length breaking up into 4 1-seeded cocci. *Seed* pendulous, cylindric, oblong; testa membranous; albumen fleshy; embryo axial, cylindric.

755*. CALLITRICHE STAGNALIS Scop.; F. B. I. ii. 434.

Chota Nagpur, Sirguja.

A small, annual water-weed, very rare in our area.

321. Bruguiera Lamk.

Peduncles 1-flowered; calyx-lobes more than 8, in fruit as long as the tube.....*gymnorhiza.*
Peduncles many-flowered; calyx-lobes not more than 8, in fruit much shorter than the tube .....*parviflora.*

760*. BRUGUIERA PARVIFLORA W. & A.; F. B. I. ii. 438. *Rhizophora parviflora* F. I. ii. 641.

Sundribuns.

A shrub or small tree; not recorded from the Sundribuns since Roxburgh obtained it thence.

353. Trapa Linn.

Fruit with 2 angles spinescent .....*bispinosa.*
Fruit with all 4 angles spinescent .....*natans.*

847*. TRAPA NATANS Linn.; F. B. I. ii. 590. *T. quadrispinosa* F. I. i. 451.
Chittagong.
A floating aquatic.

355. Homalium Jacq.

Stamens in fascicles of 3 opposite each petal .....*Schlichii.*
Stamens solitary opposite each petal.....*nepalense.*

851*. HOMALIUM NEPALENSE Benth.; F. B. I. ii. 596.
Chota Nagpur, Singbhum.
A tree.

419. Randia Linn.

Flowers in fascicled cymes, with triangular, coriaceous, connate bracteoles; corolla-tube shorter than the lobes; berry pisiform; shrubs armed with straight spines .....*malabarica.*

980*. RANDIA MALABARICA Lamk; F. B. I. iii. 111. *Posoqueria fragrans* F. I. i. 717.
Orissa.
An erect shrub, with very pale-green leaves.

423. Webera Schreb.

Corolla-tube short, with a campanulate limb, tube and limb longer than the lobes; ovules solitary in each cell of ovary .....*campaniflora.*
Corolla-tube and limb uniform, wide-cylindric, not longer than the lobes; ovules 2 in each cell of ovary .....*corymbosa.*

984*. WEBERA CORYMBOSA Willd.; F. I. i. 696; F. B. I. iii. 102; E. D. W. 22.
Orissa.
A large shrub. *Uriya* Jhanjauka.

Order LXXVI. PRIMULACEÆ.

Corolla-lobes contorted; capsule dehiscing irregularly or by valves; leaves alternate or opposite or whorled .....**Lysimachia.**

516*. Lysimachia Linn.

Annual or perennial erect, procumbent, or creeping herbs; *leaves* entire alternate opposite or whorled. *Flowers* solitary, axillary, or in bracteate racemes or spikes, yellow, white, or pink.

Sepals connate in a 5–6-partite calyx. *Petals* 5–6, connate in a rotate or funnel-shaped corolla. *Stamens* 5–6, adnate to bases of corolla-lobes; filaments free or connate at base by a membrane or ridge; anthers included. *Carpels* connate in a subglobose ovary; style filiform, persistent; ovules numerous. Fruit a subglobose or globose capsule, opening by valves or bursting irregularly. *Seeds* many, trigonous or plano-convex.

1151*. LYSIMACHIA PEDUNCULARIS Wall.; F. B. I. iii. 504.
Chota Nagpur, Singbhum, in damp forests.
A small annual herb, with alternate leaves and long peduncled flowers.

This species, hitherto only known from Burma, was collected in Singbhum by Mr. H. H. Haines in December, 1902.

549. Vinca Linn.

Leaves obovate; flowers large, showy ..... *rosea.*
Leaves lanceolate-acuminate; flowers very small ..... *pusilla.*

1212*. VINCA PUSILLA Murr.; F. B. I. iii. 640. *V. parviflora* F. I. ii. 1.
Behar; Chota Nagpur.
An erect, pale-green, annual herb.

632. Argyreia Lour.

Leaves hairy above, grey primrose-pubescent beneath; bracts all similar, orbicular, persistent, leafy ..... *cymosa.*

1376*. ARGYREIA CYMOSA Sweet; F. B. I. iv. 190. *Lettsomia cymosa* F. I. i. 492.
Orissa, common.
A climber, on hedges.

657. Ilysanthes Raf.

Corolla twice as long as calyx ..... *parviflora.*
Corolla 3–4 times as long as calyx ..... *hyssopioides.*

1447*. ILYSANTHES HYSSOPIOIDES Benth.; F. B. I. iv. 283.
Chota Nagpur, Sirguja.
A slender, erect herb.

681. Dolichandrone Seem.

Corolla not exceeding 2·5 in. long ..... *Lawii.*
Corolla 5–6 in. long ..... *Rheedei.*

1491*. Dolichandrone Rheedei Seem.; F. B. I. iv. 379.
Sundribuns.
A tree, 50 feet high. *Beng.* Gorshingiah.

826. Aporosa Bl.

Leaves dark-green; male bracts glabrous, ciliate .....*Roxburghii.*

1869*. Aporosa Roxburghii Baill.; F. B. I. v. 347. *A. dioica* E. D. A. 1245. *Alnus dioica* F. I. iii. 580.
Orissa.
A tree, 20–30 feet high.

895. Dendrobium Swartz.

Leaves not equitant; stems pseudobulbous, tufted; leaves herbaceous, linear; flowers small, on several erect, dense-flowered scapes ..*pygmæum.*

2027*. Dendrobium pygmæum Lindl.; F. B. I. v. 717.
Chota Nagpur.
A small, tufted epiphyte.

958. Dioscorea Linn.

Stems twining to the right; leaves simple, opposite, with cartilaginous margins, glabrous or slightly pubescent; capsule broader than long; seeds winged all round .....*oppositifolia.*

2206*. Dioscorea oppositifolia Linn.; F. I. iii. 292; F. B. I. vi. 292; E. D. D. 517.
Orissa.
A large, unarmed climber.

1054. Panicum Linn.

Spikelets laterally compressed; inflorescence a contracted panicle;—
Panicle-branches glabrous; spikelets hispidulous .....*trigonum.*
Panicle-branches usually with slender hairs; spikelets glabrous
vilipes.

2560*. Panicum pilipes Nees & Arn.; F. B. I. vii. 57.
N. Bengal, Duars; Orissa.
A perennial, geniculately ascending, creeping grass.

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B. Bengali; *H.* Hindi; *K.* Kol; *M.* Magh, Mundari; *O.* Oraon; *R.* Rajbansi; *S.* Santal; *U.* Uriya; *V.* Vernacular (language uncertain).

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