

FLORA
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SERIES 3

FLORA
OF
NALLAMALAIS

Volume 2

J. L. ELLIS

BOTANICAL SURVEY OF INDIA

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ASTERACEAE (COMPOSITAE)

- 1. Flowering heads with ray florets :
 - 2. Leaves opposite :
 - 3. Peduncles above 20 cm long .. TRIDAX
 - 3. Peduncles about 10 cm long or less ;
 - 4. Leaves compound .. BIDENS
 - 4. Leaves simple :
 - 5. Leaves 3-nerved :
 - 6. Achenes slightly flattened .. WEDELIA
 - 6. Achenes linear or 3-angled .. BLAINVILLEA
 - 5. Leaves 1-nerved .. ECLIPTA
 - 2. Leaves alternate .. VICOA
- 1. Flowering heads without ray florets :
 - 7. Leaves opposite :
 - 8. Achenes dimorphic .. SYNDRELLA
 - 8. Achenes of one type .. AGERATUM
 - 7. Leaves alternate :
 - 9. Involucral bracts spinous :
 - 10. Leaves about 5 × 0.6 cm ; stems woolly-pubescent .. DICOMA
 - 10. Leaves about 10 × 10 cm ; stems hirtellous .. XANTHIUM
 - 9. Involucral bracts not spinous :
 - 11. Flowering heads globose :
 - 12. Leaves pinnatifid ; stems not winged .. GRANGEA
 - 12. Leaves not pinnatifid ; stems winged .. SPHABRANTHUS
 - 11. Flowering heads not globose :
 - 13. Flowering heads 3-5-times longer than broad :
 - 14. Leaves obovate-serrate .. NOTONIA
 - 14. Leaves ovate, elliptic-ovate or lyrate, dentate :
 - 15. Leaves lyrate, amplexicaul at base .. EMILIA
 - 15. Leaves elliptic-ovate, attenuate at base .. GYNURA
 - 13. Flowering heads as long as broad :
 - 16. Leaves 3-nerved :
 - 17. Stems glandular ; leaves glabrous .. ADENOSTEMMA
 - 17. Stems pubescent ; leaves pubescent .. LAGASCEA
 - 16. Leaves 1-nerved :
 - 18. Plants woolly-cottony-pubescent .. GNAPHALIUM
 - 18. Plants not woolly-cottony-pubescent :

- | | |
|---|------------|
| 19. Stems and branches winged | LAGGERA |
| 19. Stems and branches not winged : | |
| 20. Leaves dissected | PARTHENIUM |
| 20. Leaves not dissected : | |
| 21. Leaves linear-ovate : | |
| 22. Flowering heads in panicles ; outer involucrel bracts linear-acuminate .. | ERIGERON |
| 22. Flowering heads 1 or 2 ; outer involucrel bracts linear-spathulate .. | PULICARIA |
| 21. Leaves elliptic-ovate or orbicular obovate or lyrate : | |
| 23. Involucrel bracts as long as or longer than disk florets .. | BLUMEA |
| 23. Involucrel bracts shorter than disk florets .. | VERNONIA |

TRIDAX Linn.

Tridax procumbens Linn. Sp. Pl. 900. 1753 ; DC. Prodr. 5 : 679. 1836 ; C. B. Cl. Comp. Ind. 142. 1876 ; Hook. f. FBI 3 : 311. 1881 ; Gamble, FPM 4 : 711. 1921 ; Powell in Brittonia 17 : 47-96. 1965.

Decumbent herbs, about 30 cm high ; branches sparsely pubescent, grooved. Leaves about 4×2.5 cm, opposite, elliptic, acute at base, irregularly inciso-dentate, sparsely hirtellous on both surfaces, 3-nerved from base ; petioles 0.5 cm long. Flowers yellow, 0.8 cm long, in terminal heads 1×1 cm ; peduncles about 28 cm long ; phyllaris 0.8×0.3 cm, ovate-oblong, acuminate, densely glandular-without, paleate within, scarious-margined ; corolla yellow, generally 3-partite, tube hairy, 0.5 cm long, sparsely hairy towards base, lobes ovate, hairy without ; pappus hairy. Achenes 0.2 cm long, sericeous.

Fl. & Fr. : Throughout the year.

World distribution : A pantropic weed.

Specimens examined : Ahobilam, 29-8-1965, *Ellis* 25562 ; Bogada, 19-11-1969, *Ellis* 32527.

BIDENS Linn.

Bidens biternata (Lour.) Merr. & Sherff in Bot. Gaz. 88 : 293. 1929 ; Sherff, Genus *Bidens*, 389. 1937. *Coreopsis biternata* Lour. Fl. Cochinch.

508. 1790. *Bidens wallichii* DC. Prodr. 5 : 598. 1836. *B. pilosa* auct. non Linn. ; DC. Prodr. 5 : 597. 1836 ; C. B. Cl. Comp. Ind. 140. 1876 ; Hook. f. FBI 3 : 309. 1881 ; Gamble, FPM 4 : 709. 1921.

Erect herbs, about 50 cm high ; stems angled, grooved, striate, glabrous. Leaves up to 18 cm long, 3-5-pinnate, laterals often incisoserrate, puberulous ; petioles 4 cm long, sheathing at base. Flowers yellow, 0.3 cm long, in heads 0.8×1 cm, in terminal, branched, panicles up to 25 cm long ; outer phyllaris linear-obovate, sparingly hairy along margins and on the back, inner linear-acute, faintly hairy at top, scarious-margined ; ligulate flowers yellow ; corolla 0.3 cm long ; pappus 3-4, 0.3 cm long, retrose hairy. Achenes 0.8×0.2 cm, several, linear, quadrangular, grooved, sparsely hairy along angles.

Fl. & Fr. : Almost throughout the year.

World distribution : Pantropic.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22059 ; Diguva-metta, 17-11-1969, *Ellis* 32448.

Remarks : Sherff (*op. cit.* p. 389) has shown that the Indian plant known as *Bidens pilosa* Linn. is in fact *B. biternata*.

WEDELIA Jacq. *nom. cons.*

Wedelia urticaefolia DC. in Wt. Contrib. 18. 1834 var. *wightii* DC. Prodr. 6 : 539. 1837 ; Gamble, FPM 4 : 707. 1921. *W. urticaefolia* DC. ; Hook. f. FBI 3 : 306. 1881 ; Wt. Ic. 3 : t. 1106. 1844.

Erect herbs, about 50 cm high ; branches angled, grooved, sparsely puberulous. Leaves about 11×7 cm, opposite, ovate, acuminate, rounded to shortly acute at base, serrate or crenate-serrate, sparsely hairy, scabrous above ; petioles 4 cm long. Flowers yellow, in terminal, solitary heads 1.5×2 cm, ligulate flowers 1.3 cm long, disk flowers 0.8 cm long ; peduncles up to 9 cm long ; phyllaris 0.8×0.3 cm, obovate, hirsute without ; corolla of disk florets 0.6 cm long, lobes sparsely hirtellous without ; pappus a cup of 4 lobes. Achenes 0.3×0.2 cm, slightly flattened, sparsely hairy at top.

Fl. & Fr. : June-December.

World distribution : India, in rather dry localities of moist deciduous forests.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 29-8-1917, *Rangachari* s. n. ; Gundlabrahmeswaram, 20-7-1963, *Ellis* 16945 ; Ramanapenta, Gundlabrahmeswaram, 25-10-1964, *Ellis* 22205 ; Gundla-

brahmeswaram, 29-11-1969, *Ellis* 32672 ; Mahanandi, 23-8-1972, *Ellis* 42341.

BLAINVILLEA Cass.

Blainvillea acmella (Linn.) Philipson in *Blumea* 6 : 350. 1950. *Verbesina acmella* Linn. Sp. Pl. 901. 1753. *Blainvillea rhomboidea* Cass. in *Dict. Sci. Nat.* 5 : 29. 1823 ; Gamble, *FPM* 4 : 706. 1921. *B. latifolia* (Linn. f.) DC. in *Wt. Contr.* 17. 1834 et *Prodr.* 5 : 492. 1836 ; C. B. Cl. *Comp. Ind.* 135. 1876 ; Hook. f. *FBI* 3 : 305. 1881. *Eclipta latifolia* Linn. f. *Suppl.* 378. 1781.

Erect herbs, about 30 cm high ; branches angled, striate, puberulous. Leaves up to 13×6 cm, elliptic-ovate, acuminate, acute or rounded at base, crenate-serrate ; nerves 3 from base, softly strigose ; petioles about 3 cm long. Flowers yellow, 1 cm long, in terminal heads 0.6 cm long ; outer phyllaris 0.5×0.2 cm, ovate-acuminate, hairy near the apex without, coriaceous, inner shining ; ray florets 0.7 cm long, sparingly hairy without ; disk florets 0.4 cm long, lobes ovate, a few-haired without ; anthers not exerted ; pappus paleaceous, connate at base. Achenes 0.4 cm long, falcate, faintly transversely rugulose, minutely hairy.

Fl. & Fr. : Almost throughout the year.

World distribution : In tropics from Africa, India, Sri Lanka, Burma, Australia and South America.

Specimens examined : Pathalaganga, Srisailam, 20-10-1964, *Ellis* 22108 ; Mahanandi, 22-8-1965, *Ellis* 25480.

Remarks : Philipson (*op. cit.*) has indicated the conspecificity of *Verbesina acmella* Linn. and *Blainvillea latifolia* (Linn. f.) DC.

ECLIPTA Linn. *nom. cons.*

Eclipta prostrata (Linn.) Linn. *Mant. Pl.* 2 : 286. 1771 ; Roxb. *Fl. Ind.* 3 : 438. 1832. *Verbesina prostrata* Linn. Sp. Pl. 902. 1753. *Eclipta alba* Hassk. *Pl. Jav. Rar.* 528. 1848 ; C.B.Cl. *Comp. Ind.* 134. 1876 ; Hook. f. *FBI* 3 : 304. 1881 ; Gamble, *FPM* 4 : 705. 1921.

Erect or decumbent herbs, about 30 cm high ; stems striate, sparingly strigose. Leaves up to 9×3 cm, opposite, elliptic-ovate, acute to attenuate at base, distantly serrate, sparingly strigose on both surfaces ; basal lateral nerves prominent. Flowers white, 0.4 cm long, in axillary, 1 or 2 heads 0.5×1 cm ; peduncles about 1.8 cm long, strigose ; outer phyllaris 0.4×0.2 cm, sparsely strigose without, 3-nerved, inner linear ;

ray florets ligulate, bilobed at apices; corolla of disk florets glabrous. Achenes 0.4 cm long, flattened, faintly rugulose, a few haired at apices.

Fl. & Fr. : August-March.

World distribution : A pantropical weed.

Specimens examined : Chelama, 9-7-1963, *Ellis* 16810; Chelama, 8-12-1963, *Ellis* 18016; Srisailam, 27-3-1965, *Ellis* 23792; Mahanandi, 23-8-1972, *Ellis* 42343.

VICOA Cass.

Vicoa indica (Linn.) DC. in *Wt. Contr.* 10. 1834; DC. *Prodr.* 5 : 474. 1836; *Wt. Ic.* 3 : t. 1148. 1844; C. B. Cl. *Comp. Ind.* 127. 1876; Gamble, *FPM* 4 : 674. 1921. *Inula indica* Linn. *Sp. Pl.* ed. 2. 1236. 1762. *Vicoa auriculata* Cass. in *Ann. Sci. Nat.* ser. 1. 17 : 418. 1829; Hook. f. *FBI* 3 : 297. 1881. *V. appendiculata* DC. *Prodr.* 5 : 474. 1836; C. B. Cl. *Comp. Ind.* 127. 1876.

Herbs, up to 70 cm high; branches terete, striate, glabrous. Leaves up to 10 × 2 cm, alternate, linear-ovate, obovate, amplexicaul, auricled at base, serrulate, scabrously puberulous. Flowers 0.5 cm long, in heads 0.5 × 1 cm, in terminal, profusely branched panicles about 10 cm long; peduncles up to 4 cm long; ray florets ligulate, ligules 0.3 cm long; phyllaris 0.4 cm long, linear, sparsely hairy; corolla 0.3 cm long, glabrous; outer pappus small, inner feathery. Achenes 0.1 cm long, pubescent.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma, in dry localities.

Specimens examined : 'Kurnool Hills', 1873, *Beddome* s.n.; Chelama, 7-12-1963, *Ellis* 17963; Diguvaletta, *Ellis* 17963; Diguvaletta, 16-11-1969, *Ellis* 32399.

SYNEDRELLA Gaertn. *nom. cons.*

Synedrella nodiflora (Linn.) Gaertn. *Fruct.* 2 : 456. 1791; C. B. Cl. *Comp. Ind.* 139. 1876; Hook. f. *FBI* 3 : 308. 1881; Gamble, *FPM* 4 : 708. 1921. *Verbesina nodiflora* Linn. *Amoen. Acad.* 4 : 290. 1756.

Erect herbs, about 50 cm high; branches obtusely angled, grooved, sparsely pilose when young. Leaves up to 13 × 7 cm, ovate-lanceolate, rounded or attenuate at base, crenate-serrate, puberulous on both surfaces, bullate when old; nerves 3 at base; petioles 2 cm long, hirsute

above towards node. Flowers yellow, 0.6 cm long, in axillary and terminal clusters 1 cm across; phyllaris 0.8×0.2 cm, sparsely hairy without, glabrous within; corolla of female flowers ligulate, of bisexual flowers tubulate; anthers black. Achenes of 2 types, ray— 0.5×0.2 cm, compressed, lacerate along margins, disk—linear, 2-horned.

Fl. & Fr. : September-April.

World distribution : Tropical America, Burma and India.

Specimen examined : Diguvaletta, 16-11-1969, *Ellis* 32409.

AGERATUM Linn.

Ageratum conyzoides Linn. Sp. Pl. 839. 1753; DC. Prodr. 5 : 108. 1836; C. B. Cl. Comp. Ind. 30. 1876; Hook. f. FBI 3 : 243. 1881; Gamble, FPM 4 : 677. 1921.

Erect herbs, about 40 cm high; branches deep purple, terete, striate, hairy. Leaves about 10×5 cm, ovate, acute at base, crenate-serrate, sparsely hairy; nerves 3 from base; petioles 4 cm long. Flowers white, in heads 0.5×0.5 cm, in terminal panicles 10 cm long; phyllaris 0.4 cm long, linear-acuminate, ribbed without, sparsely puberulous along margins; pappus 0.2 cm long, ovate-caudate, scarious, puberulous along margins; corolla 0.2 cm long. Achenes 1.5 cm long, black, 4-angled, sparingly puberulous along margins.

Fl. & Fr. : Almost throughout the year.

World distribution : Pantropic.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17972; Chelama, 16-10-1964, *Ellis* 22044; Diguvaletta, 19-11-1969, *Ellis* 32541.

DICOMA Cass.

Dicoma tomentosa Cass. in Bull. Soc. Philom. 47. 1818; DC. Prodr. 7 : 36. 1838; C.B.Cl. Comp. Ind. 245. 1876; Hook. f. FBI 3 : 387. 1881; Gamble, FPM 4 : 728. 1921. *D. lanuginosa* DC. in Wt. Contr. 26. 1834; Wt. Ic. 3 : t. 1140. 1844.

Erect herbs, about 40 cm high; stems woody, terete, striate, cottony-tomentose. Leaves about 5×0.6 cm, linear-obovate, apiculate, serrulate, attenuate at base, cottony-tomentose below, sessile. Flowers white, 0.9 cm long, in axillary, solitary heads about 1.2×1.2 cm; phyllaris 1.2×0.2 cm, linear-ovate, spinous-acuminate, serrulate, white-margined, woolly-tomentose without; corolla glabrous, lobes ovate; inner pappus linear-lanceolate, palaceous, hairy at apices, midrib prominent, outer sericeous. Achenes 0.4 cm long, densely pubescent especially near the base.

Fl. & Fr. : September-December.

World distribution : Tropical Africa, India, in arid localities.

Specimens examined : Giddalur, 9-11-1906, C.A. Barber 8082 ; Diguvametta, 18-11-1969, Ellis 32491.

XANTHIUM Linn.

Xanthium strumarium Linn. Sp. Pl. 987. 1753 ; C.B.Cl. Comp. Ind. 132. 1876 ; Hook. f. FBI 3 : 303. 1881 ; Gamble, FPM 4 : 703. 1921. *X. indicum* Roxb. ex DC. in Wt. Contrib. 17. 1832 ; Wt. Ic. 3 : 1104. 1844.

Herbs, about 1 m high, monoecious ; branches angled, grooved, hirtellous. Leaves about 10 × 10 cm, alternate, broadly ovate, shallowly 3-lobed, truncate or cordate at base, irregularly serrate-dentate, roughly puberulous, palmately nerved ; petioles 6 cm long, roughly puberulous. Flowers yellowish, 0.3 cm long, in heads 0.5 cm long ; male heads globose, 0.5 × 0.5 cm ; corolla 0.3 cm long, ovate, anthers 0.1 cm long, linear, exserted ; female heads 0.6 cm long, linear, sparsely hairy without, phyllaris 0.8 × 0.4 cm, horned with hooked bristles, corolla absent, filaments monadelphous, style arms exserted ; pappus absent. Achenes 1.5 × 1 cm, 2-horned, densely covered with hooked spines, pubescent.

Fl. & Fr. : January-November.

World distribution : A waste land weed, generally along streams and rivers, tropical America, Africa, India, Sri Lanka and China.

Specimens examined : Pathalaganga, Srisaïlam, 25-3-1965, Ellis 23762 ; Ahobilam, 24-11-1969, Ellis 32613.

GRANGEA Forsk.

Grangea maderaspatana (Linn.) Poir. Encycl. Meth. Suppl. 12 : 825. 1811 ; DC. Prodr. 5 : 373. 1838 ; Wt. Ic. 3 : t. 1097. 1844 ; C.B.Cl. Comp. Ind. 37. 1876 ; Hook. f. FBI 3 : 247. 1881 ; Gamble, FPM 4 : 680. 1921. *Artemisia maderaspatana* Linn. Sp. Pl. 849. 1753.

Prostrate herbs, spreading radially, sometimes erect, about 20 cm long ; rootstocks woody ; branches striate, hirtellous-pubescent. Leaves 4 cm long, sinuately pinnatifid, lobes dentate, hirsute ; petioles 1 cm long, obscure. Flowers yellow, 0.1 cm long, in terminal, globose heads 0.7 cm across ; phyllaris 0.3 × 0.1 cm, ovate-oblong, faintly fimbriate at apices, puberulous without ; corolla 0.15 cm long, tube as long, faintly puberulous without, lobes ovate ; pappus 0.15 cm long. Achenes 0.1 cm long, slightly flattened, glandular.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India and China.

Specimens examined : Chelama, 9-7-1963, *Ellis* 16809 ; Chelama, 20-3-1965, *Ellis* 23733.

SPHAERANTHUS Linn.

Sphaeranthus indicus Linn. Sp. Pl. 1753 ; Hook. f. FBI 3 : 275. 1881 ; Gamble, FPM 4 : 691. 1921. *S. hirtus* Willd. Sp. Pl. 3 : 2395. 1803 ; DC. Prodr. 5 : 369. 1836 ; Wt. Ic. 3 : t. 1094. 1844 ; C.B.Cl. Comp. Ind. 97. 1876.

Erect herbs, about 40 cm high ; branches terete, striate, irregularly dentate-serrate-winged. Leaves up to 4.5×1.6 cm, elliptic-ovate or obovate, narrowed at base, amplexicaul, decurrent, glandular-hairy on both surfaces. Flowers pinkish purple, 0.3 cm long, in terminal, globose heads 1.3 cm across ; peduncles 4 cm long, pubescent, glandular, dentately winged ; phyllaris 0.3 cm long, ovate-acuminate ; bracts ciliate along margins ; corolla 0.3 cm long, glabrous ; anthers sagittate ; pappus absent. Achenes 0.3 cm long, compressed, softly pilose.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka, China, Malaysia and Australia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17976 ; Mahanandi, 10-12-1969, *Ellis* 32729.

NOTONIA DC.

Notonia grandiflora DC. in Wt. Contr. 24. 1834 et DC. Prodr. 6 : 442. 1837 ; C.B.Cl. Comp. Ind. 176. 1876 ; Hook.f. FBI 3 : 337. 1881 ; Gamble, FPM 4 : 717. 1921. *N. corymbosa* DC. Prodr. 6 : 442. 1837 ; Wt. Ic. 2 : t. 484. 1843.

Fleshy shrubs, about 1 m high ; stems glabrous, leaf-scars raised and prominent. Leaves up to 25×11 cm, elliptic-ovate, acute-attenuate at base, fleshy, glabrous ; petioles 0.5 cm long. Flowers white, 2.5 cm long, in heads 2.5×1.2 cm, in terminal, pedunculate corymbs 20 cm long ; phyllaris 1.5×0.4 cm, scarious-margined, parallel-nerved ; pappus ciliate ; corolla 1.8 cm long, glabrous, lobes small ; anthers linear, connectives exerted. Achenes 0.6 cm long, linear, ribbed.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka, in dry localities.

Specimen examined : Chelama, 13-7-1963, *Ellis* 16870.

EMILIA Cass.

Emilia sonchifolia (Linn.) DC. in *Wt. Contt.* 24. 1834 ; DC. *Prodr.* 6 : 302. 1836 ; C. B. Cl. *Comp. Ind.* 174. 1876 ; Hook. f. *FBI* 3 : 336. 1881 ; Gamble, *FPM* 4 : 716. 1921. *Cacalia sonchifolia* Linn. *Sp. Pl.* 835. 1753.

Erect or diffuse herbs, about 40 cm high ; stems striate, glabrous or sparsely puberulous. Leaves 8×3.5 cm, lyrate, coarsely crenate-dentate, amplexicaul at base, sessile, glabrous or sparsely puberulous. Flowers 1 cm long, pink, in heads 1×0.3 cm, in terminal racemes 15 cm long ; phyllaris 1×0.1 cm, in single row, marginally scarious, glabrous ; corolla 0.6 cm long, linear, lobes acute ; pappus ciliate, dense. Achenes 0.3 cm long, linear, flattened, hairy along margins.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka and America.

Specimen examined : Gundlabrahmeswaram, 1-4-1965, *Ellis* 23841.

GYNURA Cass. *nom. cons.*

Gynura crepidioides Benth. in Hook. *Nigr.* Fl. 438. 1849 ; Alston, *Kandy Flora*, 53, t. 283. 1938 ; Raju in *Trop. Ecol.* 7 : 171-173. 1966. *Crassocephalum crepidioides* (Benth.) Moore in *Journ. Bot.* 50 : 211. 1912 ; Belcher in *Kew Bull.* 1955 : 462. 1955 ; Steenis in *Journ. Indian bot. Soc.* 66 : 463. 1967. *Erechthites valerianifolia sensu* Gamble, *FPM* 8 : 1882. 1935 ; *sensu* Matthew in *Rec. bot. Surv. Ind.* 20 (1) : 140. 1969.

Erect herbs, about 1 m high ; stems striate, grooved, glabrous or irregularly puberulous. Leaves up to 10×5 cm, elliptic-ovate, irregularly dentate-serrate, sometimes pinnatifid, shortly petiolate. Flowers orange-red, 1.5 cm long, in drooping heads 1.8×0.8 cm, in terminal panicles about 20 cm long ; phyllaris 1×0.05 cm, marginally scarious, sparsely puberulous ; corolla 0.9 cm long, linear, lobes linear-ovate. Achenes 0.2 cm long, ribbed, sparsely hairy.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India and America.

Specimen examined : Gundlabrahmeswaram, 1-4-1965, *Ellis* 23842.

Remarks : This was introduced into India during the beginning of this century. The plants have not yet turned into weeds.

van Steenis (*op. cit.* p. 463) traces the splitting of the genus *Crassocephalum* from *Gynura* by S. Moore in 1912, and states, '...*Crassocephalum* differs from *Gynura* by the quite different tips of the style arms, by the corolla tube being not or only slightly widened at the base, and the limb of the corolla passing very gradually into the tube. For the present, I am accepting this opinion.' Thereby he has indicated that the splitting of the genus *Gynura* may not be final. In view of the confused state which still prevails on this issue, we are inclined to treat the present collection under the genus *Gynura* Cass.

ADENOSTEMMA FORST.

Adenostemma lavenia (Linn.) O. Ktze. *Rev. Gen.* 1 : 304. 1891 ; Grierson in *Handb. Fl. Ceyl.* 139. 1980. *Verbesina lavenia* Linn. *Sp. Pl.* 902. 1753. *A. viscosum* Forst. *Char. Gen.* 90. 1776 ; DC. *Prodr.* 5 : 112. 1836 ; C.B.Cl. *Comp. Ind.* 28. 1876 ; Hook. f. *FBI* 3 : 242. 1881. *A. latifolium* DC. *loc. cit.* ; Wt. *lc.* 3 : t. 1087. 1843.

Erect herbs, about 75 cm high, profusely branched ; branches striate, glandular. Leaves up to 20×10 cm, elliptic-ovate, acuminate, broadly ovate, rhomboid, abruptly attenuate at base, glabrous, dentate-serrate, obtusely dentate, often bullate ; nerves 3 from base ; petioles 2 cm long. Flowers white, in heads 0.7 cm across, in terminal, branched panicles 20 cm long, bracteate ; peduncles about 2.7 cm long ; phyllaris 0.4×0.15 cm, obovate, spathulate, glandular ; corolla 0.3 cm long, glandular ; style long, stigmas clavate. Achenes 0.4 cm long, oblong, slightly falcate, flattened at base ; pappus 3-5, clavate, rigid.

Fl. & Fr. : August-February.

World distribution : Pantropic.

Specimen examined : Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22143.

Remarks : Hooker f. (*op. cit.* pp. 242, 253) has given 7 varieties under this species, following C.B. Clarke (*op. cit.*). None of the subsequent Indian workers has followed this treatment ; the varieties have been recognised in this treatment as variants of the typical form.

LAGASCEA Cav. non. cons.

Lagascea mollis Cav. in *Anal. Cienc. Nat.* 6 : 333. 1803 ; DC. *Prodr.* 5 : 1. 1836 ; C.B.Cl. *Comp. Ind.* 131. 1876 ; Hook. f. *FBI* 3 : 302. 1881 ; Gamble, *FPM* 4 : 703. 1921.

Erect herbs, about 80 cm high ; branches terete, striate, pubescent. Leaves about 6×3 cm, elliptic-ovate, rhomboid, acuminate, acute at base, scabrous above, white-pubescent beneath. Flowers white, about 0.7 cm long, in axillary heads 1×1.5 cm ; peduncles up to 13 cm long ; phyllaris up to 1.2×0.7 cm, ovate, elliptic-ovate or obovate, 3-5-nerved ; corolla lobes 0.5 cm long, ovate, puberulous without ; anthers 0.2 cm long, connectives expanded at apices covering the bilobed stigmas. Achenes 0.4 cm long, densely pubescent ; pappus 0.2 cm long, hirsute.

Fl. & Fr. : Throughout the year.

World distribution : A native of Central America, it has become a weed in many tropical countries.

Specimen examined : Sunnipenta, 21-10-1964, *Ellis* 22143.

GNAPHALIUM Linn.

Gnaphalium indicum Linn. Sp. Pl. 852, 1753 ; DC. Prodr. 6 : 231. 1836 ; C.B.Cl. Comp. Ind. 114. 1876 ; Hook. f. FBI 3 : 289. 1881 ; Gamble, FPM 4 : 697. 1921.

Erect herbs, about 20 cm high ; branches decumbent, diffuse, woolly-pubescent, striate. Leaves up to 5×0.6 cm, obovate, spatulate, densely woolly-pubescent. Flowers white, 0.2 cm long, in heads 0.25×0.3 cm, in terminal, clustered, racemes 2.5 cm long ; phyllaris 0.2×0.05 cm, linear-ovate, scarious, woolly-pubescent without ; corolla 0.1 cm long, linear. Achenes 0.05 cm long, faintly papillose ; pappus ciliate.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, China, Japan and Australia, in dry localities.

Specimen examined : Chelama, 20-3-1965, *Ellis* 23734.

LAGGERA Sch.-Bip. ex Hochst.

Laggera alata (DC.) Sch.-Bip. ex Oliver in Trans. Linn. Soc. 29 : 94. 1875 ; Hook. f. FBI 3 : 271. 1881 ; Gamble, FPM 4 : 689. 1921. *Blumea alata* DC. Prodr. 6 : 280. 1836 ; Wt. Ic. 3 : t. 1101. 1844.

Herbs, about 1.5 m high ; stems prominently winged, striate, puberulous. Leaves about 7×2 cm, elliptic-ovate, obovate, serrulate, decurrent into a wing on the stem, coriaceous, puberulous. Flowers purplish, 0.3 cm long, in drooping heads 1×1 cm, in axillary racemes 8 cm long ; phyllaris up to 0.5×0.1 cm, hairy without, becoming glabrous towards

centre; corolla 0.8 cm long, linear, glabrous, lobes 0.1 cm long, ovate; pappus ciliate. Achenes 0.15 cm long, faintly ribbed, sparsely hairy.

Fl. & Fr. : December-April.

World distribution : Tropics from Africa, India, Sri Lanka, China, Malaysia and Philippines.

Specimen examined : Gundlabrahmeswaram, 31-3-1965, *Ellis* 23806.

PARTHENIUM Linn.

Parthenium hysterophorus Linn. Sp. Pl. 938. 1753; Roxb. Hort. Beng. 62. 1814; R. Seshagiri Rao in Journ. Bombay nat. Hist. Soc. 54 : 218. 1956; J.L. Ellis in Journ. Bombay nat. Hist. Soc. 66 : 233. 1969.

Gregarious herbs, about 50 cm high; branches grooved, sparsely hairy. Leaves up to 22 cm long, deeply dissected, puberulous; petioles 2 cm long, sheathing at base. Flowers white, 0.2 cm long, in heads 0.2×0.5 cm, in terminal panicles about 22 cm long; phyllaris about 0.15×0.2 cm, ovate-orbicular, sparsely hairy without, densely so at top, faintly serrulate along margins; corolla 0.2 cm long, glabrous; pappus 0.1 cm long, ovate. Achenes 0.2×0.1 cm, obovoid, flattened.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic weed, spreading rapidly in India.

Specimens examined : Pathalaganga, Srisailam, 12-7-1963, *Ellis* 16839; Pathalaganga, Srisailam, 4-12-1969, *Ellis* 32687; Mahanandi, 21-8-1972, *Ellis* 42316.

ERIGERON Linn.

Erigeron bonariensis Linn. Sp. Pl. 863. 1753; Burt in Kew Bull. 1948 : 371. 1948. *E. linifolius* Willd. Sp. Pl. 3 : 1955. 1804; Hook. f. FBI 3 : 245. 1881. *Conyza ambigua* DC. Fl. Fr. Suppl. 6 : 468. 1815; Gamble, FPM 4 : 683. 1921. *Erigeron ambiguus* (DC.) Sch.-Bip. in Wobb. & Berth. Phyt. Canar. sec. 2. 208. 1844.

Erect herbs, about 60 cm high; stems angled, grooved, striate, sparingly hairy. Leaves up to 10×1.5 cm, linear, obovate-spathulate, distantly dentate-serrate, pilose, sessile. Flowers white, 0.5 cm long, in heads 0.5×0.9 cm, in axillary panicles 10 cm long; outer phyllaris 0.4 cm long, linear-elliptic, scarious-margined, pilose; pappus ciliate; corolla glabrous. Achenes 0.4 cm long, sparingly hairy.

Fl. & Fr. : October-May.

World distribution : India and Sri Lanka.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16923.

PULICARIA Gaertn.

Pulicaria wightiana (DC.) C.B.Cl. Comp. Ind. 128. 1876 ; Hook. f. FBI 3 : 298. 1881 ; Gamble, FPM 4 : 702. 1921. *Callistephus wightianus* DC. Prodr. 5 : 275. 1836 ; Wt. Ic. 3 : t. 1089. 1844.

Erect herbs, about 40 cm high ; stems striate, crispately puberulous. Leaves up to 6×0.4 cm, linear-ovate, amplexicaul at base, crenate-serrate, sparsely pubescent. Flowers about 0.7 cm long, in terminal, solitary heads 1.8×0.8 cm ; peduncles about 3 cm long, rather thickened towards top ; phyllaris 0.6×0.1 cm, oblong-spathulate, pubescent, becoming glabrous and acuminate ; corolla ligulate in female, tubular in bisexual ; pappus two types—outer scaly, inner hairy ; anthers sagittate at base. Achenes 0.15 cm long, faintly ribbed, sparsely pilose or glabrous.

Fl. & Fr. : Throughout the year.

World distribution : India, in dry localities.

Specimen examined : Diguvaletta, 16-11-1969, *Ellis* 32382.

BLUMEA DC. *nom. cons.*

Blumea virens DC. in Wt. Contrib. 14. 1834 ; DC. Prodr. 5 : 439. 1836 ; C.B.Cl. Comp. Ind. 79. 1876 ; Hook. f. FBI 3 : 264. 1881 ; Gamble, FPM 4 : 687. 1921 ; Randeria in *Blumea* 10 : 272. 1960.

Erect herbs, about 70 cm high ; stems terete, striate, glabrous. Leaves up to 18×7 cm, elliptic-ovate, obovate or lyrate, cuneate-attenuate at base, crenate-serrate, sparsely puberulous. Flowers yellow, 0.5 cm long, in heads 0.5 cm long, in terminal, cymes 25 cm long ; phyllaris small, elliptic-ovate to linear-ovate, hairy along margins ; ray florets absent ; corolla 0.4 cm long, lobes linear, sparsely hairy without at apices. Achenes 0.1 cm long, sparsely hairy ; pappus 0.5 cm long, hairy.

Fl. & Fr. : December-March.

World distribution : India, Sri Lanka and Burma, in rather dry localities.

Specimens examined : Mahanandi, March 1883, *J. S. Gamble* 10939 ; Chelama, 12-12-1963, *Ellis* 18071 ; Gundlabrahmeswaram, 31-3-1965, *Ellis* 23812.

Gamble (*op. cit.* p. 687) records *Blumea fistulosa* (Roxb.) Kurz (= *B. glomerata* DC.) from "...Nallamalai forests of Kurnool...". It is surprising that it has not been collected from Nallamalais. Hence it is not treated in this enumeration.

VERNONIA Schreb. *nom. cons.*

- | | |
|--|---------------------|
| 1. Shrubs ; leaves 8 × 3 cm, ovate-lanceolate, scabrous above ; achenes glabrous | <i>V. divergens</i> |
| 1. Herbs ; leaves 6 × 4 cm, ovate, puberulous above ; achenes pubescent : | |
| 2. Herbs densely pubescent | <i>V. albicans</i> |
| 2. Herbs puberulous | <i>V. cinerea</i> |

Vernonia divergens (Roxb.) Edgew. in Journ. Asiat. Soc. Beng. 2 : 172. 1853 ; C.B.Cl. Comp. Ind. 14 : 1876 ; Hook. f. FBI 3 : 234. 1881 ; Gamble, FPM 4 : 673. 1921. *Eupatorium divergens* Roxb. Fl. Ind. 3 : 414. 1832. *Decaneuron divergens* (Roxb.) DC. Prodr. 5 : 68. 1836 ; Wt. Ic. 3 : t. 1084. 1844. *Vernonia nilgheryensis* DC. *loc. cit.* 32 ; Wt. *loc. cit.* t. 1078.

Shrubs, about 1.5 m high ; branches terete, striate, puberulous. Leaves about 8 × 3 cm, ovate-lanceolate, acute, rounded or acute at base, serrate, scabrous above, puberulous below. Flowers pinkish, 0.5 cm long, in terminal, clustered heads 0.5 × 0.4 cm, in panicles 20 cm long ; common peduncles about 8 cm long ; phyllaris 0.3 × 0.1 cm, oblong, mucronulate, puberulous near apices without ; corolla 0.3 cm long, glabrous, lobes ovate ; pappus feathery. Achenes 0.1 cm long, strongly ribbed, truncate at apices, glabrous.

Fl. & Fr. : December-February.

World distribution : India and Burma.

Specimen examined : Gundlabrahmeswaram, 30-3-1965, *Ellis* 23800.

V. albicans DC. in Wt. Contrib. 6. 1834 ; C.B.Cl. Comp. Ind. 22. 1876 ; Gamble, FPM 4 : 676. 1921. *V. cinerea* Less. *p.p.* ; Hook. f. FBI 3 : 233. 1876, *p.p.*

Erect herbs, about 40 cm high ; branches striate, pubescent. Leaves about 6 × 4 cm, ovate-lanceolate, acute-cuneate at base, crenate-dentate, densely pubescent beneath, less so above ; petioles 0.5 cm long. Flowers pink, 0.4 cm long, in heads 0.8 × 1 cm, in terminal panicles 20 cm long ; phyllaris 0.5 cm long, linear-acuminate, hairy without ; corolla 0.2 cm long, glabrous ; outer pappus short, inner feathery. Achenes 0.2 cm long, faintly angular, sericeous.

Fl. & Fr. : July-February.

World distribution : India, in dry localities.

Specimens examined : Gazulapalli, 3-8-1917, K. C. Jacob s.n. ; Chelama, 5-7-1963, Ellis 16764 ; Diguva-metta, 18-11-1969, Ellis 32503.

Vernonia cinerea (Linn.) Less. in *Linnaea* 4 : 291. 1829 ; DC. *Prodr.* 5 : 24. 1836 ; Hook. f. *FBI* 3 : 233. 1881, *p.p.* ; Gamble, *FPM* 4 : 676. 1921. *Conyza cinerea* Linn. *Sp. Pl.* 862. 1753.

Erect herbs, about 50 cm high ; branches terete, striate, pilose to glabrous. Leaves up to 5 × 2.5 cm, ovate, elliptic-ovate, abruptly acute or attenuate at base, serrate-dentate, pilose on both surfaces. Flowers purplish, 0.5 cm long, in heads 0.6 × 1 cm, in terminal, branched cymes about 20 cm long ; phyllaris up to 0.5 × 0.1 cm, mucronulate, pilose without ; corolla 0.4 cm long, glabrous, lobes ovate ; outer pappus small, cupular, inner feathery. Achenes 0.1 cm faintly angular, pubescent.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka and Australia.

Specimens examined : Chelama, 9-12-1963, Ellis 18034 ; Diguva-metta, 16-11-1969, Ellis 32396.

CAMPANULACEAE

- | | | |
|---|----|--------------|
| 1. Leaves crisped along margins ; corolla lobes equal | .. | WAHLENBERGIA |
| 1. Leaves not crisped along margins ; corolla bilabiate | | LOBELIA |

WAHLENBERGIA Schrad. ex Roth, *nom. cons.*

Wahlenbergia erecta (Roem. & Schult.) Tuyn in Steenis, *Fl. Males.* ser. 1, 6 : 113. 1960. *Dentella erecta* Roth ex Roem. & Schult. *Syst. Veg.* 5 : 25. 1819 ; Roth, *Nov. Pl. Sp.* 140. 1821. *Cephalostigma schimperii* Hochst. ex Rich. *Tent. Fl. Abyss.* 2 : 2. 1851 ; Gamble, *FPM* 4 : 738. 1921. *Wahlenbergia perotifolia* Wt. & Arn. [*Prodr.* 405. 1834, *nom. invalid.*] ex DC. *Prodr.* 7 : 434. 1839 ; Wt. *Ic.* 3 : t. 842. 1844, *nom. superfl.*

Herbs, about 30 cm high ; stems and branches quadrangular, hirsutely hairy. Leaves about 1.5 × 0.7 cm, ovate, apiculate, rounded at base, margins recurved, distantly serrulate, crisped, sparingly hirsute above and along midrib beneath. Flowers white with a pink tinge, 0.4 cm long, in axillary, paniced cymes 3 cm long ; pedicels about 1 cm long ; calyx

0.4 cm long, sparsely hirsute without, lobes linear-acuminate, coriaceous ; corolla 0.2 cm long, lobes linear. Capsules 0.4×0.2 cm, hirsute ; seeds several, minute, oval.

Fl. & Fr. : September-December.

World distribution : India and Sri Lanka.

Specimens examined : 'Kurnool Hills', 1870, *R. H. Beddome* s.n. ; Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32635.

LOBELIA Linn

- | | |
|--|----------------------|
| 1. Stems winged ; seeds ellipsoid ; 2 anthers bristly at apices . . . | <i>L. heyneana</i> |
| 1. Stems not winged ; seeds triangular ; all anthers bristly at apices | <i>L. alsinoides</i> |

Lobelia heyneana Roem. & Schult. Syst. 5 : 50. 1819 ; Winner in Ann. Nat. Mus. Wien 56 : 344. 1848 ; Santapau in Rec. bot. Surv. Ind. 16 (1) : 139. 3rd ed. 1967. *L. trialata* Buch.-Ham. in DC. Prodr. 7 : 360. 1838 ; C. B. Cl. in Hook. f. FBI 4 : 425. 1881 ; Gamble, FPM 4 : 736. 1921.

Erect herbs, up to 20 cm high ; branches 3-winged, glabrous. Leaves 2×1.5 cm, ovate, abruptly cuneate at base, serrate, glabrous ; petioles very short. Flowers bluish-pink with maroon markings on lower lip, 0.4 cm long, axillary, solitary ; pedicels 1.5 cm long ; calyx 0.5 cm long, glabrous, lobes 0.2 cm long, linear ; corolla 0.2 cm long, 2-lipped, glabrous ; anthers connate, lower two bristly at apices ; stigmas 2-lobed. Capsules 0.5 cm long, ellipsoid ; seeds several, minute, ellipsoid, smooth.

Fl. & Fr. : October-December.

World distribution : India and Malaysia.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22166.

L. alsinoides Lamk. Encycl. 3 : 588. 1791. *L. trigona* Roxb. [Hort. Beng. 85. 1814 ex] Fl. Ind. 1 : 506. 1832 ; DC. Prodr. 7 : 359. 1838 ; C. B. Cl. in Hook. f. FBI 3 : 423. 1881 ; Gamble, FPM 4 : 736. 1921.

Herbs, erect or decumbent, about 40 cm long ; stems weak, triangular, glabrous. Leaves about 1.2×1.2 cm, ovate-orbicular, rounded or acute at base, crenate-serrate, sessile. Flowers blue, 0.8 cm long, solitary, axillary ; pedicels up to 3 cm long ; calyx 0.8 cm long, glabrous, lobes linear-acuminate ; corolla 0.3 cm long, 2-lipped, glabrous, lobes ovate-elliptic ; filaments glabrous, anthers connate, all bristly at apices ; style

cylindric, stigmas 2-lobed. Capsules 0.5 cm long; seeds numerous, minute, triangular.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Chelama, 8-12-1963, *Ellis* 18018.

PLUMBAGINACEAE

PLUMBAGO Linn.

Plumbago zeylanica Linn. Sp. Pl. 151. 1753; DC. Prodr. 12 : 692. 1848; C.B.Cl. in Hook. f. FBI 3 : 480. 1882; Gamble, FPM 4 : 744. 1921; Steenis, Fl. Males. ser. 1. 4(2) : 109. 1949.

Scandent herbs, about 40 cm high; branches slightly zig-zag, striate, glabrous. Leaves about 10×5 cm, ovate, elliptic-ovate, rounded or acute or attenuate at base, or dilate and vaginate, shortly petiolate. Flowers white, about 2.5 cm long, in terminal, branched spikes 15 cm long; calyx 1.5 cm long, tubular, stipitately glandular without; corolla 2.5 cm long, glabrous, lobes 0.5 cm long, oblong; stamens 5, antipetalous, filaments dilated; style as long as tube, stigmas shortly branched. Capsules 0.5 cm long, linear-oblong; seed 1, linear-oblong.

Fl. & Fr. : July-December.

World distribution : Tropics from India to Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17935; Srisailam, 21-10-1964, *Ellis* 22148; Upper Ahobilam, 22-11-1969, *Ellis* 32585.

MYRSINACEAE

EMBELIA Burm. f. *nom. cons.*

Embelia villosa Wall. in Roxb. Fl. Ind. 2 : 289. 1824; DC. Prodr. 8 : 85. 1844; Gamble, FPM 4 : 753. 1921. *E. robusta* C.B.Cl. in Hook. f. FBI 3 : 515. 1881, *p.p.*

Shrubs, about 1 m high; branches woody, terete, rusty-tomentose when young, lenticellate. Leaves 8×5 cm, obovate, orbicular-oblong, abruptly acuminate, minutely serrulate, puberulous beneath and along nerves above; lateral nerves prominent below; petioles 1.5 cm long. Flowers greenish-brown, 0.2 cm, in axillary racemes 3 cm long, shortly pedicellate; calyx 0.1 cm long, lobes ovate, sparsely puberulous without and along margins; corolla 0.2 cm long, ovate, glandular-papillose within

and along margins; anthers exerted; ovary glabrous. Drupes 0.3×0.3 cm, globose; seed 1.

Fl. & Fr. : July-October.

World distribution : India, Sri Lanka and Burma.

Specimens examined : Chelama, 21-7-1963, *Ellis* 16938; Rollapenta, 16-8-1972, *Ellis* 42269.

Remarks : After studying the herbarium specimens in MH and CAL and the present collections C. B. Clarke (*loc. cit.*) is followed who in turn had agreed with Kurz's opinion, saying that '...it appears impossible to separate *E. villosa* on the one side from *E. robusta*, on the other from *E. ferruginea*'; this issue requires a monographic study of all the taxa.

SAPOTACEAE

- | | | |
|--|----|-----------|
| 1. Leaves acuminate; lateral nerves prominent; fruits about 1×1.2 cm | .. | MADHUCA |
| 1. Leaves emarginate; lateral nerves not prominent; fruits about 3×2 cm | .. | MAMILKARA |

MADHUCA J. F. Gmel.

Madhuca indica J. F. Gmel. *Syst. Nat.* 2 : 799. 1791; Merrill in *Journ. Arnold Arb.* 29 : 190. 1948. *Bassia latifolia* Roxb. *Pl. Corom.* 1 : 20. 1795; DC. *Prodr.* 8 : 198. 1848; C.B.Cl. in *Hook. f. FBI* 3 : 544. 1882; Brandis, *Indian Trees*, 426. 1906; Gamble, *FPM* 4 : 763. 1921.

Trees, about 30 m tall; branches terete, bark suberous, cracked, laticiferous, brown-pubescent or tomentose when young. Leaves up to 15×9 cm, confined to ends of branchlets, elliptic-acuminate, acute or rounded at base; lateral nerves parallel; petioles about 3.5 cm long, brown-pubescent. Flowers pale yellow, about 6 cm long, in terminal fascicles 10 cm across; pedicels 3.5 cm long, brown-pubescent; calyx 1.2 cm long, brown-tomentose without, densely so within, lobes acute; corolla 0.7 cm long, fleshy, lobes many; stamens many, anthers pubescent at back; ovary hairy, style about 2 cm long, exerted. Berries 3×2 cm, ovoid; seeds 3-4, flattened.

Fl. & Fr. : March-May.

World distribution : India and Burma, in dry deciduous forests.

Specimen examined : Chelama, 19-3-1965, *Ellis* 23729.

MANILKARA Adanson *emend.* Gilly, *nom. cons.*

1. Flowers 0.4×0.3 cm ; pedicels up to 0.8 cm long .. *M. hexandra*
 1. Flowers 0.8×1 cm ; pedicels up to 3.5 cm long .. *M. roxburghiana*

Manilkara hexandra (Roxb.) Dubard in Ann. Mus. Col. Marseil. ser. 3. 23 : 9. 1915. *Mimusops hexandra* Roxb. Pl. Corom. 1 : 16. 1795 ; DC. Prodr. 8 : 204. 1848 ; C.B.Cl. in Hook. f. FBI 3 : 549. 1882 ; Brandis, Indian Trees, 425. 1906 ; Gamble, FPM 4 : 766. 1921. *M. indica* DC. *op. cit.* 205 ; Wt. Ic. 4 : t. 1587. 1850.

Trees, about 20 m tall ; branches terete, puberulous when young, bark pale and fissured, laticiferous. Leaves up to 10×6 cm, oblong emarginate, rounded or obtuse at base, coriaceous ; lateral nerves parallel ; petioles about 2 cm long. Flowers pale green, 0.4 cm long, axillary, solitary or clustered ; pedicels 0.8 cm long ; calyx 0.2 cm long, lobes 6, ovate, rusty-pubescent without and along margins ; corolla 0.15 cm long, lobes about 18, outer linear, inner oblanceolate ; stamens 6, anthers apiculate, filaments connate with fimbriate-staminodes, attached to corolla-tube ; ovary hairy, style thick. Berries 0.8×0.5 cm ; seed 1.

Fl. & Fr. : July-February.

World distribution : India and Sri Lanka, in dry deciduous forests.

Specimens examined : Chelama, 13-7-1963, *Ellis* 16869 ; Mahanandi, 8-12-1969, *Ellis* 32719.

M. roxburghiana (Wt.) Dubard in Ann. Mus. Col. Marseil. ser. 3.23 : 10. 1915. *Mimusops roxburghiana* Wt. Ic. 4 : t. 1588. 1850 ; C.B.Cl. in Hook. f. FBI 3 : 766. 1882 ; Brandis, Indian Trees, 425. 1906 ; Gamble, FPM 4 : 766. 1921.

Trees, about 15 m tall ; rusty-tomentose in young branches, bark wrinkled in older branches. Leaves up to 8×5.5 cm, elliptic-oblong, emarginate, rounded at base, coriaceous ; nerves parallel, prominent ; petioles 2 cm long. Flowers white, 0.8 cm long, axillary, solitary or clustered ; pedicels about 3.5 cm long ; calyx 0.7 cm long, brown-pubescent without, lobes 0.6 cm long, ovate ; corolla 0.7 cm long, outer linear, inner oblanceolate, glabrous ; stamens 6-8, fimbriate-staminodes alternating with fertile ones, filaments connate, attached to corolla-tube ; ovary hairy, style thick, glabrous. Berries 1×1.2 cm, globose, rather depressed at top.

Fl. & Fr. : March-December.

World distribution : India, in dry localities.

Specimen examined : Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23750.

EBENACEAE

DIOSPYROS LINN.

- | | |
|---|-----------------------|
| 1. Leaves about 16×6 cm ; fruits about 2.5×2.5 cm | <i>D. melanoxyton</i> |
| 1. Leaves about 5×3 cm ; fruits about 0.8×0.8 cm | <i>D. chloroxyton</i> |

Diospyros melanoxyton Roxb. Pl. Corom. 1 : 36. 1795 ; C.B.Cl. in Hook. f. FBI 3 : 564. 1882 ; Hiern, Monogr. Eben. 159. 1873 ; Brandis, Indian Trees, 432. 1906 ; Gamble, FPM 5 : 772. 1923. *D. dubia* Wall. ; Wt. Ic. 4 : t. 1223. 1850. *D. tuperu* Buch.-Ham. in Trans. Linn. Soc. 15 : 111. 1827 ; Hiern, *op. cit.* 158 ; C.B.Cl. *op. cit.* 563.

Trees, about 15 m tall ; brown-tomentose in young branches, bark in older stems cracked. Leaves up to 16×6 cm, subopposite, obtuse, orbicular, obtuse or rounded at base, brown-tomentose when young, coriaceous ; petioles 1 cm long, puberulous. Flowers unisexual, axillary ; male—0.5 cm long, in simple cymes 1.5 cm long, bracteate ; calyx lobes ovate, pubescent ; stamens about 16, anthers acuminate ; female—0.6 cm long, solitary ; calyx accrescent in fruits ; staminodes about 10 ; ovary pubescent, style bifid. Fruits about 2.5×2.5 cm, globose, pericarp hard ; seeds a few, flattened.

Fl. & Fr. : March-October.

World distribution : India and Sri Lanka, in dry deciduous forests.

Specimens examined : 'Kurnool Dt.', no date, R.H. Beddome s.n. ; Srisailam, 26-3-1965, Ellis 23775.

Remarks : There has been some confusion about the status of *Diospyros tomentosa* and *D. melanoxyton*. Brandis (*op. cit.* p. 433), though distinguishing both *D. tomentosa* and *D. melanoxyton* Roxb. has spoken of these as follows : '...In my F. Fl. I united 17 and 18, and I doubt whether they are really distinct.' Duthie [*Fl. Up. Gang. Pl.* 1 : 469. rep. ed. 1960 (1903)] treats *D. tomentosa* Roxb. as a distinct species. Gamble (*op. cit.* p. 772) treats these species separately. Haines [*Bot. Bihar and Orissa* 2 : 545. rep. ed. 1961 (1924)] treats *D. tomentosa* Roxb. as synonymous to *D. melanoxyton* Roxb.

The present studies indicate that apparently *D. tomentosa* Roxb. appears to have larger leaves. How far this quantitative character is supported by other features requires a monographic study.

D. chloroxyton Roxb. Pl. Corom. 1 : 38. 1795 ; Hiern, Monogr. Eben. 233. 1873 ; C.B.Cl. in Hook. f. FBI 3 : 540. 1882 ; Brandis, Indian Trees, 430. 1906 ; Gamble, FPM 5 : 776. 1923. *D. capitulata* Wt. Ic. 4 : tt. 1224, 1588 *bis.* 1850.

Trees, about 10 m tall; pubescent in branchlets, branchlets often modified into thorns, bark in older stems fissured. Leaves about 5 × 3 cm, alternate, oblong-obovate, oblong or rounded at base, densely pubescent beneath, less so above; petioles 0.4 cm long, pubescent. Flowers unisexual, 0.5 cm long, white, axillary, sessile, bracteate; male—6-7, clustered, calyx lobes 0.2 cm long, orbicular-ovate, densely pubescent without; corolla lobes 4, 0.5 cm long, obovate, hairy at back along midrib, accrescent in fruits; stamens many, anthers acute; female—solitary, calyx and corolla larger than male flowers; staminodes about 8; ovary glabrous, styles 4. Berries about 0.8 × 0.8 cm, globose, glabrous; seeds 2-3, flattened.

Fl. & Fr. : July-February.

World distribution : India, in dry deciduous forests.

Specimens examined : Diguvametta, 4-11-1906, *C. A. Barber* 8040; Chelama, 6-7-1963, *Ellis* 16777; Maddipenta, Eastern Nallamalais, 11-8-1972, *Ellis* 42230; Diguvametta, 16-11-1969, *Ellis* 32400.

OLEACEAE

- | | | |
|---|----|-----------|
| 1. Trees; fruits capsular, about 6 × 3 cm, loculicidally dehiscent | .. | SCHREBERA |
| 1. Scandent shrubs or small shrubs; fruits of indehiscent berries, about 0.8 × 0.5 cm | .. | JASMINUM |

SCHREBERA Roxb. *nom. cons.*

Schrebera swietenoides Roxb. Pl. Corom. 2 : 1. 1798; DC. Prodr. 8 : 675. 1844; C. B. Cl. Hook. f. FBI 3 : 604. 1882; Brandis, Indian Trees, 444. 1906; Gamble, FPM 5 : 792. 1923.

Trees, about 15 m tall; young branches glabrous, lenticellate. Leaves compound, about 32 cm long, imparipinnate; leaflets up to 13 × 60 cm, about 7, ovate-elliptic, acuminate, rounded or obtuse or attenuate at base; petiolules 1 cm long. Flowers pale yellow, 1 cm long, in terminal, branched cymes 25 cm long, bracteate; calyx 0.3 cm long, puberulous, lobes 0.1 cm long, ovate; corolla 0.8 cm long, tube 0.5 cm long; stamens included in tube; ovary glabrous, style filiform, stigmas bifid. Capsules about 6 × 3 cm, woody, speckled with white spots, loculicidally dehiscent; seeds several, 3 × 1.2 cm, winged.

Fl. & Fr. : April-October.

World distribution : India and Burma, in dry tracts of deciduous forests.

Specimen examined: Ramanapenta, Gundlabrahmeswaram, 31-3-1965, *Ellis* 23828.

JASMINUM Linn.

- | | | |
|--|----|-----------------------|
| 1. Leaves trifoliolate | .. | <i>J. auriculatum</i> |
| 1. Leaves simple : | | |
| 2. Leaves about 11 × 8 cm, rounded or truncate at base | | <i>J. malabaricum</i> |
| 2. Leaves about 7 × 2.5 cm, obtuse or acute at base | .. | <i>J. rigidum</i> |

Jasminum auriculatum Vahl, *Symb. Bot.* 3 : 1. 1794 ; DC. *Prodr.* 8 : 309. 1844 ; Wt. *Ic.* 2 : t. 700. 1843 ; C. B. Cl. in Hook. f. *FBI* 3 : 600. 1882 ; Brandis, *Indian Trees*, 451. 1906 ; Gamble, *FPM* 5 : 790. 1923.

Shrubs, often scandent ; juvenile branchlets pubescent, terete. Leaves trifoliolate, up to 6 cm long ; terminal leaflet 5.5 × 3.5 cm, laterals 1 × 0.5 cm, sparsely puberulous, more so along nerves. Flowers white, 1.5 cm long, in terminal, branched cymes 3 cm across ; pedicels puberulous ; calyx 0.2 cm long, sparsely puberulous without, lobes small, ovate ; corolla tube 1 cm long, lobes 5-7, elliptic, 0.8 cm long ; stamens 2, included ; style glabrous, stigmas thickened, cylindric. Berries 0.5 × 0.5 cm, globose, ripening black ; seed 1.

Fl. & Fr. : August-February.

World distribution : India and Sri Lanka, in dry localities.

Specimens examined : Diguvametta, 1-11-1906, *C. A. Barber* 8025 ; Mahanandi, 22-8-1965, *Ellis* 25496 ; Diguvametta, 18-11-1969, *Ellis* 32490 ; Bairanidokku, 12-8-1972, *Ellis* 42241.

J. malabaricum Wt. *Ic.* 4 : t. 1250. 1850 ; C. B. Cl. in Hook. f. *FBI* 3 : 594. 1882 ; Brandis, *Indian Trees*, 450. 1906 ; Gamble, *FPM* 5 : 789. 1923.

Scandent shrubs ; branches purplish, terete. Leaves simple, about 11 × 8 cm, ovate, shortly caudate-acuminate, rounded or almost truncate at base, glabrous, chartaceous ; petioles 2 cm long, jointed just above the base. Flowers white, about 2 cm long, in terminal, trichotomous cymes 8 × 22 cm, bracteate ; calyx 0.7 cm long, puberulous without, lobes linear, tube 0.2 cm long ; corolla 2 cm long, glabrous, lobes about 8, 1 cm long, linear, acute ; stamens included, anthers 0.3 cm long, linear, connectives produced ; style glabrous, stigmas linear. Berries 0.7 × 0.4 cm, ovoid, ripen black ; seed 1.

Fl. & Fr. : February-August.

World distribution : Peninsular India.

Specimen examined : Rollapenta, 16-8-1972, *Ellis* 42270.

Remarks : Since its publication this species is said to have been confined to Western Ghats. The present collection, therefore, is a first record of its occurrence in the Eastern Ghats.

Jasminum rigidum Zenk. Pl. Ind. Coimb. 5, t. 6 ; DC. Prodr. 8 : 305. 1844 ; Wt. Ic. 4 : 1247. 1850 ; C. B. Cl. in Hook. f. FBI 3 : 598. 1882 ; Gamble, FPM 5 : 790. 1923.

Erect or scandent shrubs ; branches terete, glabrous. Leaves up to 7×3.5 cm, ovate-elliptic, obtuse or acute at base, basal 2 ovate-elliptic, glabrous, shining, gland-dotted beneath, coriaceous ; lateral nerves running parallel to margins ; petioles 0.3 cm long. Flowers white, 2.5 cm long, in axillary cymes 4 cm across, bracteate ; calyx 0.7 cm long, puberulous, tube 0.2 cm long, lobes linear ; corolla 2.3 cm long ; tube 2 cm long, rather inflated at tip, lobes 1.8×0.5 cm, ovate ; stamens included, anthers 0.4 cm long ; ovary glabrous. Fruits 0.5 cm long, bilobed, shining ; seed 1 in each cell, hemispherical.

Fl. & Fr. : February-July.

World distribution : India and Burma, in dry deciduous forests.

Specimens examined : 'Kurnool', without date, *Beddome* s.n. ; Rollapenta, February 1887, *J. S. Gamble* 18706 ; Gundlabrahmeswaram, 30-3-1965, *Ellis* 23797.

APOCYNACEAE

- | | | |
|--|----|--------------|
| 1. Climbing shrubs | .. | ICHNOCARPUS |
| 1. Erect herbs, shrubs, or trees : | | |
| 2. Herbs | .. | CATHARANTHUS |
| 2. Shrubs or trees : | | |
| 3. Stems thorny | .. | CARISBA |
| 3. Stems not thorny : | | |
| 4. Stamens included at base of corolla tube ;
calyx lobes linear-ovate, acuminate | | HOLARRHENA |
| 4. Stamens exerted ; calyx lobes ovate,
ovate-oblong | .. | WRIGHTIA |

ICHNOCARPUS R. Br. *nom. cons.*

Ichnocarpus frutescens (Linn.) R. Br. in Mem. Wern. Soc. 1 : 62. 1809 ; Aiton in Hort. Kew. ed. 2. 2 : 69. 1811 ; Hook. f. FBI 3 : 669.

1882 ; Brandis, Indian Trees, 464. 1906 ; Gamble, FPM 5 : 820. 1923 ; Wt. Ic. 2 : t. 420. 1843. *Apocynum frutescens* Linn. Sp. Pl. 213. 1753.

Climbing shrubs over tall trees ; juvenile branches rusty-tomentose. Leaves up to 11 × 5 cm, ovate, elliptic-acuminate, obovate, shortly acuminate, obtuse, rounded or acute at base, coriaceous, generally glabrous. Flowers white with a tinge of orange, 0.3 cm long, in axillary and terminal, paniculate cymes up to 27 cm long, bracteate ; calyx 0.1 cm long, lobes ovate, sparsely hairy without ; corolla 0.5 cm long, tube slightly inflated at base, lobes 0.3 cm long, linear-ovate, twisted at maturity, pubescent above and at throat ; stamens included, anthers cohering ; disk 4-lobed ; ovary hairy. Follicles about 14 cm long, cylindrical ; seeds 2 cm long, linear, comose at apices.

Fl. & Fr. : September-March.

World distribution : Tropics from India, Sri Lanka, Burma, Malaysia and Australia.

Specimens examined : Krishnanandi, Mahanandi, 24-8-1965, *Ellis* 25528 ; Diguvametta, 17-11-1969, *Ellis* 32436 ; Krishnanandi, Mahanandi, 21-8-1972, *Ellis* 42318.

CATHARANTHUS G. DON

- | | |
|---|-------------------|
| 1. Corolla lobes about 0.3 × 0.2 cm ; leaves elliptic-acuminate | <i>C. pusilla</i> |
| 1. Corolla lobes about 2 × 1.5 cm ; leaves obovate-oblong, emarginate | <i>C. roseus</i> |

Catharanthus pusillus (Murr.) G. Don, Gen. Syst. 4 : 95. 1837. *Vinca pusilla* Murr. in Nov. Comm. Soc. Reg. Sc. Gott. 3 : 66. 1773 ; Hook. f. FBI 3 : 640. 1882. *Lochnera pusilla* (Murr.) K. Schum. in Engler & Prantl, Pflanzenf. 4(2) : 145. 1895 ; Gamble, FPM 5 : 809. 1923.

Erect herbs, about 35 cm high ; branches terete, grooved. Leaves opposite, about 6.5 × 1.5 cm, elliptic-acuminate, acute or obtuse at base, faintly scabrous along margins. Flowers white, 1 cm long, axillary, solitary or in pairs ; calyx 0.6 cm long, lobes caudate-acuminate ; corolla tube 0.8 cm long, inflated at top, lobes 0.3 × 0.2 cm, ovate ; stamens included ; disk of 2 glands ; ovary glabrous, style filiform. Follicles black, 5.5 cm long, cylindrical, ribbed ; seeds many, black, 0.3 cm long, muricately ribbed.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka, in dry tracts.

Specimens examined: Giddalur, 9-11-1906, C. A. Barber 8083 ; Srisailam, 20-10-1964, Ellis 22113 ; Srisailam, 5-12-1969, Ellis 32700.

Catharanthus roseus (Linn.) G. Don, Gen. Syst. 4 : 95. 1837. *Lochnera rosea* (Linn.) Reichenb. Consp. Reg. Veg. 1828 ; Gamble, FPM 5 : 809. 1923. *Vinca rosea* Linn. Syst. ed. 10. 944. 1759 ; Hook. f. FBI 3 : 640. 1882.

Erect herbs, about 50 cm high ; branches terete, striate, glabrous. Leaves opposite, about 6×3 cm, obovate-oblong, emarginate, apiculate, obtuse or acute or attenuate at base, chartaceous ; lateral nerves prominent ; petioles up to 0.4 cm long, 2-glandular at base ; stipules laciniate. Flowers white and pink, about 3 cm across, axillary, solitary or in pairs ; calyx 0.5 cm long, lobes linear ; corolla tube 2.5 cm long, pilose within, lobes about 2×1.5 cm ; stamens included ; ovary softly pilose, style filiform, stigmas capitate ; disk of 2 linear glands. Follicles up to 3 cm long, cylindric, grooved ; seeds 8-10, 0.2 cm long, longitudinally striate, muriculate.

Fl. & Fr. : Throughout the year.

World distribution : A native of West Indies, run wild in many countries including India, Malaysia etc.

Specimen examined : Srisailam, 20-10-1964, Ellis 22114.

Remarks : The plants are medicinally important and are being exploited for extraction of an alkaloid which is used in high blood pressure.

CARISSA Linn. *nom. cons.*

Carissa spinarum Linn. Mant. Pl. 2 : 559. 1771 ; DC. Prodr. 8 : 332. 1844 ; Hook. f. FBI 3 : 631. 1882, *p.p.* ; Gamble, FPM 5 : 805. 1923. *C. hirsuta* Roth, Nov. Sp. Pl. 128. 1821 ; Gamble, *loc. cit.* 805. *C. spinarum* Linn. var. *hirsuta* (Roth) Hook. f. *op. cit.* 634. 1882. *C. diffusa* Roxb. Fl. Ind. 21. 1832 ; Wt. Ic. 2 : t 427. 1843. *C. villosa* Roxb. ; Wt. Ic. 2 : t. 437. 1843.

Erect or rarely subscaudent shrubs ; juvenile branches puberulous, zig-zag ; thorns 2 cm long, straight. Leaves of 2 sizes, the thorn-borne larger than intermediate ones, about 4×3 cm, ovate-oblong, orbicular, emarginate, or apiculate, obtuse or acute at base, slightly puberulous, coriaceous ; lateral nerves prominent, arched near margins ; petioles 0.1 cm long. Flowers white, about 2 cm long, in terminal cymes about 3 cm long, bracteate ; calyx 0.2 cm long, puberulous, lobes ovate-acuminate ; corolla tube 1 cm long, inflated above, lobes 0.6×0.3 cm, ovate-oblong ; stamens included ; style glabrous. Berries about 1×1 cm, ovoid ; seeds 4.

Fl. & Fr. : March-August.

World distribution : India, Sri Lanka and Burma, in dry deciduous forests.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16871.

Remarks : Haines [*Bot. Bihar & Orissa*, 2 : 560-561, rep. ed. 1961 (1922)] has described 2 forms, *diffusa* and *scandens*, depending mainly on the habit—whether dwarf or scandent. The present studies in the field and in MH and CAL reveal that they are but one variable taxon. Haines (*op. cit.* p. 560) states, 'The two following forms may be distinct species, but are more probably one depending upon locality, whether in the open or with other forest growth, and especially upon the prevalence or otherwise of browsing.' In addition, Duthie [*Fl. Up. Gang. Pl.* 1 : 483, rep. ed. 1960 (1903)] and Cooke [*Fl. Pres. Bombay* 2 : 187, rep. ed. 1958 (1904)] are followed in treating *C. hirsutum* Roth under *C. spinarum* Linn., because except for the puberulous nature which appears to be due to the prevailing environmental conditions, there is no other qualitative character to separate the two taxa. Gamble (*op. cit.*), however, has recognised it at a specific level.

HOLARRHENA R. Br.

Holarrhena antidysenterica (Roth) Wall. ex A. DC. Prodr. 8 : 413. 1844; Hook. f. *FBI* 3 : 644. 1882; Brandis, *Indian Trees*, 459. 1906; Gamble, *FPM* 5 : 811. 1923. *Echites antidysenterica* Roth, *Nov. Sp. Pl.* 138. 1821; Wt. *lc.* 4 : t. 1297. 1848. *Chonemorpha antidysenterica* (Roth) G. Don, *Gen. Syst.* 4 : 76. 1837-38; Wt. *lc.* 2 : 439. 1843.

Large shrubs or small trees, about 4 m tall; juvenile branches slightly flattened, glabrous, rarely puberulous. Leaves up to 26 × 12 cm, opposite, elliptic, acuminate, obtuse or rounded sometimes unequally so at base, faintly wavy along margins, glabrous or puberulous; lateral nerves parallel; petioles 0.5 cm long. Flowers white, 1.5 cm long, in branched cymes 6 cm long and 10 cm across, bracteate; pedicels 0.5 cm long; calyx 0.4 cm long, sparsely pubescent without, lobes 0.3 cm long, unequal, linear-ovate; corolla tube about 1 cm long, ciliate without, lobes 1 × 0.5 cm, oblong-orbicular; stamens included; style filiform, stigmas slightly bifid. Follicles about 33 cm long, linear, white-speckled; seeds about 1 cm long, silky-hairy at apices.

Fl. & Fr. : March-September.

World distribution : India, Malaysia, in dry deciduous forests.

Specimens examined : 'Kurnool', date not given. *Beddome s.n.* :

Chelama, 4-7-1963, *Ellis* 16796 ; Gundlabrahmeswaram, 20-7-1963, *Ellis* 16907 ; Mahanandi, 21-8-1965, *Ellis* 25427 ; Ahobilam, 22-11-1969, *Ellis* 32558 ; Mahanandi, 21-8-1972, *Ellis* 42311.

WRIGHTIA R. Br.

- | | |
|-------------------------------------|---------------------|
| 1. Follicles connate throughout | <i>W. tomentosa</i> |
| 1. Follicles connate only at apices | <i>W. tinctoria</i> |

Wrightia tomentosa (Roxb.) Roem. & Schult. 4 : 414. 1819 ; A. DC. Prodr. 8 : 404. 1844 ; Wt. Ic. 2 : t. 443. 1843 ; Hook. f. FBI 3 : 653. 1882 ; Brandis, Indian Trees, 461. 1906 ; Gamble, FPM 5 : 816. 1923 ; Ngan in Ann. Miss. bot. Gardn. 52 : 142. 1965. *Nerium tomentosum* Roxb. Fl. Ind. 2 : 6. 1824. *Wrightia wallichii* A. DC. *op. cit.* 405. 1844 ; Wt. Ic. 4 : t. 1296. 1850.

Trees, about 8 m tall ; branches smooth, pubescent, exuding yellow latex. Leaves up to 13 × 5 cm, ovate-elliptic, apex acute or caudate, acute at base, brown-pubescent beneath, puberulous above ; lateral nerves parallel ; petioles 0.3 cm long, pubescent. Flowers pale yellow, 2 cm long, in terminal, dichotomously branched cymes about 10 cm long, bracteate ; calyx 0.3 cm long, lobes oblong, puberulous without ; corolla tube 0.5 cm long, lobes 1 cm long, oblong, puberulous ; corona linear, glabrous ; anthers 0.7 cm long, sagittate, pubescent without ; stigmas ovoid. Follicles 25 cm long, grooved in the centre, speckled with white spots ; seeds several, 0.8 cm long, silky hairy at base.

Fl. & Fr. : July-September.

World distribution : India, Sri Lanka and Burma, in dry deciduous forests.

Specimens examined : Diguvaletta, 3-11-1906, C.A. Barber 8035 ; Giddalur, 11-11-1906, C.A. Barber 8095 ; Chelama, 5-7-1963, *Ellis* 16761 ; Gundlabrahmeswaram, 20-7-1963, *Ellis* 16907 ; Upper Ahobilam, 29-8-1965, *Ellis* 25552 ; Upper Ahobilam, 22-11-1969, *Ellis* 32566 ; Rollapenta, 14-8-1972, *Ellis* 42257.

W. tinctoria R. Br. in Mem. Wern. Soc. 1 : 74. 1809 ; Wt. Ic. 2 : t. 444. 1843 ; A. DC. Prodr. 8 : 406. 1845 ; Hook. f. FBI 3 : 653. 1882 ; Brandis, Indian Trees, 461. 1906 ; Gamble, FPM 5 : 815. 1923 ; Ngan in Ann. Miss. bot. Gardn. 52 : 143. 1965. *W. rothii* G. Don, Gen. Syst. Gard. Bot. 4 : 86. 1838 ; Wt. Ic. 4 : t. 1319. 1850. *W. tinctoria* R. Br. var. *rothii* (G. Don) Hook. f. *loc. cit.* ; Gamble, *op. cit.* 816. *W. tinctoria* R. Br. subsp. *rothii* (G. Don) Ngan, *op. cit.* p. 144.

Trees, about 10 m tall ; branches glabrous to puberulous. Leaves

10×3 cm, elliptic-acuminate, acute at base, glabrous; petioles 0.2 cm long. Flowers white, 1.2 cm across, in dichotomously branched, terminal cymes 8 cm long, bracteate; calyx 0.1 cm long, glabrous, lobes ovate, ciliolate along margins; corolla tube 0.1 cm long, lobes 1×0.2 cm, linear-obovate, spatulate; corona scales fimbriate; stamens 0.6 cm long, filaments 0.1 cm long, anthers tapering at apex, sagittate, hairy within, less so without; ovary and style hairy, stigmas dilated. Follicles about 25 cm long, cylindric, joined at apex; seeds several, about 1.3 cm long, striated, silky-hairy at base.

Fl. & Fr. : May-October.

World distribution : India, Sri Lanka and Burma, in dry deciduous forests.

Specimens examined : 'Kurnool', 1885, *J.S. Gamble* s.n.; Ahobilam, 24-11-1969, *Ellis* 32612; Krishnanandi, Mahanandi, 21-8-1972, *Ellis* 42313.

Remarks : P.T. Ngan (*op. cit.* p. 144) recognises *rothii* and the varietal treatment of Hooker f. (*op. cit.*) but at a subspecific status. The varietal status of *rothii* has also been recognised by J.S. Gamble (*op. cit.*). On the other hand, Duthie [*Fl. Up. Gang. Pl.* 1 : 489. rep. ed. 1960 (1903)] and Cooke [*Fl. Pres. Bombay* 2 : 200. rep. ed. 1958 (1904)] have sunk it under the *typica*. The present studies in the field and in MH and CAL lend support to the treatment of Duthie and Cooke, in treating the taxon, *rothii* under the *typica*.

ASCLEPIADACEAE

- | | |
|--|--------------|
| 1. Erect shrubs | CALOTROPIS |
| 1. Twining herbs or shrubs : | |
| 2. Plants leafless | SARCOSTEMMA |
| 2. Plants with leaves : | |
| 3. Flowers 1.5 cm across, fleshy | HOLOSTEMMA |
| 3. Flowers 1 cm across, or less, not fleshy : | |
| 4. Follicles echinate | PERGULARIA |
| 4. Follicles smooth : | |
| 5. Follicles about 16×4 cm : | |
| 6. Flowers in panicles; corolla tube 0.5 cm long | MARSDENIA |
| 6. Flowers in umbels; corolla tube 0.1 cm long | WATTAKAKA |
| 5. Follicles up to 10×1.5 cm : | |
| 7. Inflorescences 2 at each node | GYMNEMA |
| 7. Inflorescences solitary at each node : | |
| 8. Flowers in umbellate cymes : | |
| 9. Pedicels 0.8 cm long | LEPTADENIA |
| 9. Pedicels 0.3 cm long | .. OIANTHUS |
| 8. Flowers in racemose cymes | .. TYLOPHORA |

CALOTROPIS R. Br.

Calotropis gigantea (Linn) R. Br. in Aiton, Hort. Kew. ed 2.2 : 78. 1811 ; Hook. f. FBI 4 : 17. 1883 ; Gamble, FPM 5 : 832. 1923 ; Santapau & Irani in Univ. Bombay bot. Mem. No. 4 : 17. 1960 (1962). *Asclepias gigantea* Linn. Sp. Pl. 214. 1753.

Erect shrubs, rarely trees, about 2 m tall ; branches ash-coloured, striate, fugaciously cottony-pubescent. Leaves about 17 × 12 cm, obovate, acute or shortly acuminate, rounded and cordate at base, coriaceous, white-tomentose beneath, less so above, subsessile. Flowers pinkish-purple, about 1.8 × 2 cm, in lateral, umbellate cymes 4 × 7 cm, bracteate ; peduncles about 8 cm long ; pedicels about 3.5 cm long ; calyx lobes about 0.3 × 0.2 cm, ovate, glandular within ; corolla lobes 1 × 0.6 cm, ovate, tube 0.5 cm long, coriaceous ; corona lobes 5, laterally compressed, curved, shorter than staminal column, puberulous at back ; stamens inserted at base of corolla, anthers membranous, inflexed, pollinia one in each cell ; ovary 2-carpelled, style slender, stigmas pentagonal. Follicles in pairs, about 10 × 4 cm, ovoid, cottony-pubescent ; seeds several, 0.7 × 0.5 cm, flattened, comose at apices.

Fl. & Fr. : March-December.

World distribution : India, Sri Lanka, Burma, South China and Malaysia, in fallow land.

Specimens examined : Sunnipenta, Srisailam, 5-12-1969, *Ellis* 32705 ; Maddipenta, Eastern Nallamalais, 11-8-1972, *Ellis* 42226.

SARCOSTEMMA R. Br.

Sarcostemma intermedium Decaisne in DC. Prodr. 8 : 538. 1844 ; Hook. f. FBI 4 : 27. 1883 ; Gamble, FPM 5 : 838. 1923 ; Santapau & Irani in Bombay Univ. bot. Mem. No. 4 : 77. 1960(1962). *S. viminalis* Wt. Contrib. 59. 1837 et Ic. 4 : t. 1281. 1850 (non R. Br.)

Trailing shrubs ; branches terete, jointed, glabrous. Leaves absent. Flowers white, 0.5 cm across, in terminal and lateral umbels about 2 cm across ; pedicels 0.8 cm long, puberulous ; calyx lobes 0.1 × 0.1 cm, ovate, puberulous without ; corolla lobes 0.5 cm long, linear-ovate ; corona lobes about 10, rather fleshy, outer attached to the base of staminal column ; pollinia clavate, caudicles long ; ovary glabrous, style exerted. Follicles about 6 cm long, tapering ; seeds many, 0.6 × 0.3 cm, oblong, rounded and irregularly toothed at base, flattened, puberulous, comose at apices.

Fl. & Fr. : December-August.

World distribution : India, in arid tracts.

Specimen examined : Mahanandi, 10-12-1969, *Ellis* 32735.

HOLOSTEMMA R. Br.

Holostemma annulare (Roxb.) K. Schum. in Engler, *Pflanzenf.* 4(2) : 250. 1895 ; Gamble, *FPM* 5 : 834. 1923 ; Santapau & Irani in *Univ. Bombay bot. Mem.* No. 4 : 53. 1960 (1962) *Asclepias unularia* Roxb. *Fl. Ind.* 2 : 37. 1832. *Holostemma rheedei* Wall. *Pl. Asiat. Rar.* 2 : 51. 1831 ; ; *Wt. Ic.* 2 : t. 597. 1843 ; Decaisne in *DC. Prodr.* 8 : 532. 1844 ; *Hook. f. FBI* 4 : 21. 1883.

Extensive twiners ; branches laticiferous, faintly angled, striate, glabrous or sparingly puberulous. Leaves about 15 × 11 cm, ovate-oblong, abruptly acuminate, cordate at base with large sinuses, glabrous or faintly puberulous along nerves and nervules, glandular above near petiole ; petioles up to 7 cm long. Flowers pale pink, 1.5 cm across, in lateral cymes 8 cm long, bracteate ; calyx lobes 0.4 × 0.4 cm, ciliate along margins ; corolla 1 × 0.6 cm, ovate, coriaceous ; corona truncate, winged ; staminal column 1 cm long, anthers horny at back ; pollinia linear, caudicles black ; ovary glabrous. Follicles 10 × 4 cm, ovoid, tapering above, glabrous ; seeds 0.9 × 0.4 cm, winged, comose at apices.

Fl. & Fr. : July-December.

World distribution : India, Sri Lanka, Burma and China, in moist deciduous forests.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16753 ; Mahanandi, 21-8-1965, *Ellis* 25431.

PERGULARIA Linn.

Pergularia daemia (Forsk.) Chiov. *Result. Sci. Misc. Stefan. Paoli Somal. Ital.* 1 : 115. 1916 ; Santapau & Irani in *Bombay Univ. bot. Mem.* No. 4 : 74. 1960 (1962). *Asclepias daemia* Forsk. *Fl. Aeg.-Arab.* 51. 1775. *Pergularia extensa* (R. Br.) N. E. Brown in *Dyer, Fl. Cap.* 4 : 758. 1908 ; Gamble, *FPM* 5 : 837. 1923. *Daemia extensa* R. Br. in *Mem. Wern. Soc.* 1 : 50. 2nd ed. 1811 ; Decaisne in *DC. Prodr.* 8 : 544. 1844 ; *Wt. Ic.* 2 : t. 596. 1843 ; *Hook. f. FBI* 4 : 20. 1883.

Extensive climbing herbs ; branches terete, striate, hispidly tomentose to puberulous. Leaves about 10 × 10 cm, orbicular-ovate, abruptly acuminate, cordate at base with large sinuses, faintly puberulous, more so along margins, glandular above near petiole ; petioles about 6 cm long. Flowers pale green, 0.9 × 0.8 cm. in corymbs up to 18 cm long, bracteate ; pedicels 3 cm long ; calyx lobes 0.2 cm long, hirsute without, tube 0.1 cm long ;

corolla lobes 0.5×0.3 cm, ovate, ciliate, corona in 2 series, outer membranous, inner covering stamens; pollinia flattened; ovary glabrous, style exerted. Follicles paired, up to 6×1.2 cm, tapering at apices, echinate, softly hirsute; seeds many, 0.8×0.4 cm, ovate, flattened, tomentose, comose at apices.

Fl. & Fr. : July-March.

World distribution : Tropics from Africa, Afghanistan, India and Sri Lanka.

Specimens examined : Giddalur, 9-11-1906, *C.A. Barber* 8075; Chelama, 7-12-1963, *Ellis* 17933.

Remarks : Santapau & Irani (*op. cit.*) have concurred with N. E. Brown's (in *Kew Bull.* 1907 : 323-325. 1907) conclusions where he had re-established the genus, *Pergularia sensu* Linnaeus (non *alior. auct.*), stating, '....I propose to re-establish the genus in the sense that Linnaeus intended. But as it seems clear that Linnaeus combined two species under the name *P. tomentosa*, I propose to retain the name for the tomentose-leaved plant only.'

MARSDENIA R. Br.

Marsdenia tenacissima (Roxb.) Moon. Cat. Pl. Ceylon, 21. 1824; Wt. & Arn. Contrib. 41. 1834 et Ic. 2 : t. 590. 1843; Hook. f. FBI 4 : 35. 1883; Gamble, FPM 5 : 845. 1923; Santapau & Irani, in Univ. Bombay bot. Mem. No. 4 : 62. 1960 (1962). *Asclepias tenacissima* Roxb. Pl. Corom. 3 : 45, t. 240. 1819.

Twining shrubs; branches terete, brown-pubescent. Leaves up to 32×30 cm, ovate-orbicular, acuminate, cordate at base, velvety-puberulous; petioles up to 12 cm long. Flowers pale green, 0.8 cm long, in interpetiolar, repeatedly branched, paniculate cymes 8 cm long, bracteate; calyx lobes 0.2×0.15 cm, oblong-orbicular, pubescent without; corolla lobes 5, 0.6 cm long, spatulate, pubescent without, tube short; corona lobes 5, flattened; stamens epipetalous at base, anthers covering style; pollinia reniform; ovary glabrous. Follicles about 16×4 cm, ovoid, brown-tomentose; seeds several about 1×0.4 cm, ovate, silky-pubescent.

Fl. & Fr. : May-January.

World distribution : Tropics from India, Sri Lanka, Burma and Malaysia, in rather dry tracts.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17939; Ischegundum, Eastern Nallamalais, 9-8-1972, *Ellis* 42222.

WATTAKAKA Hassk.

Wattakaka volubilis (Linn. f.) Stapf in Curtis, Bot. Mag. sub. t. 8976. 1923; H. Huber in Rev. Handb. Fl. Ceylon, 1 (1): 53. 1972. *Asclepias volubilis* Linn. f. Suppl. 170. 1781. *Dregea volubilis* (Linn. f.) Benth. ex Hook. f. FBI 4: 46. 1883; Santapau & Irani in Bombay Univ. bot. Mem. No. 4: 42. 1960 (1962). *Marsdenia volubilis* (Linn. f.) Cooke, Fl. Pres. Bombay 2: 231. rep. ed. 1958 (1904); Gamble, FPM 5: 846. 1923.

Twining shrubs; branches terete, striate, lenticellate, glabrous. Leaves up to 10×8 cm, ovate, shortly acuminate, rounded, truncate or shortly cordate at base, minutely puberulous or glabrous, glandular above near the petiole; petioles up to 4 cm long. Flowers pale green, 0.5×1 cm, in umbels 4 cm across, bracteate; pedicels about 2 cm long, sparsely puberulous; calyx lobes 0.1 cm long, ovate; corolla lobes 0.5×0.3 cm, ovate-orbicular, oblong, glabrous, ciliolate along margins, tube short; corona lobes 5; staminal column 0.2 cm long, anthers attached to style apex. Follicles 10×5 cm, divaricate, tapering at tips; seeds 1.4×0.8 cm, flattened, comose at apices.

Fl. & Fr.: May-January.

World distribution: India, Sri Lanka and Malaysia.

Specimens examined: Gazulapalli, 4-9-1971, *Rangachari* s.n.; Chelama, 9-7-1963, *Ellis* 16787; Ramanapenta, Gundlabrahmeswaram, 31-8-1965, *Ellis* 23827.

Remarks: The treatment of Huber (*op. cit.*) is followed in treating the plant collected under *Wattakaka* Hassk. Earlier, N. E. Brown (in Dyer, *Fl. Trop. Afr.* 4: 417. 1907) had merged *Dregea* in *Marsdenia*. Bullock (in *Kew Bull.* 1956: 512. 1956) treats *Dregea* and *Marsdenia* separately.

GYMNEMA R. Br.

Gymnema sylvestre (Retz.) R. Br. ex Schult. in Roem. & Schult. Syst. Veg. 6: 57. 1819; Wt. Ic. 2: t. 349. 1843; Decaisne in DC. Prodr. 8: 621. 1844; Hook. f. FBI 4: 29. 1883; Gamble, FPM 5: 839. 1923; Santapau & Irani in Bombay Univ. bot. Mem. No. 4: 47. 1960 (1962).

Twining herbs or shrubs; branches terete, pubescent. Leaves about 6×3 cm, ovate-elliptic, shortly acuminate, rounded and cordate at base, pubescent beneath, less so above; petioles 1.2 cm long. Flowers yellow, 0.2×0.3 cm, in 2 lateral, corymbose cymes about 1.2 cm across at each node; pedicels 0.3 cm long; peduncles 0.5 cm long; calyx lobes

0.1×0.1 cm, ovate-oblong, pilose without; corolla lobes 0.1 cm long, ovate, tube 0.1 cm long, glabrous; corona lobes 5, fleshy; staminal column 0.2 cm long, anthers erect; caudicles short; ovary glabrous. Follicles 1, 7×0.8 cm, beaked at apex; seeds 0.5×0.3 cm, bordered, comose at apices.

Fl. & Fr.: September-March.

World distribution: Tropics from Africa, India and Sri Lanka, in dry localities.

Specimen examined: Chelama, 8-12-1963, *Ellis* 17992.

LEPTADENIA R. Br.

Leptadenia reticulata (Retz.) Wt. & Arn. in Wt. Contr. 47. 1834; Decaisne in DC. Prodr. 8 : 628. 1844; Wt. Ic. 2 : t. 350. 1843; Hook. f. FBI 4 : 63. 1883; Gamble, FPM 5 : 850. 1923; Bullock in Kew Bull. 1955 : 271. 1955; Santapau & Irani in Bombay Univ. bot. Mem. No. 4 : 60. 1960 (1962). *Cynanchum reticulatum* Retz. Obs. 2 : 15. 1871.

Twining herbs; juvenile branches puberulous, striate. Leaves up to 9×4 cm, ovate-lanceolate, acuminate, rounded to truncate at base, puberulous, glandular above near petiole; petioles 2 cm long. Flowers pale yellow, 0.2×0.3 cm, in single, lateral, umbellate cymes about 1.2 cm across, bracteate; pedicels 0.8 cm long; peduncles about 1 cm long; calyx lobes 0.15×0.1 cm, ovate, pubescent without; corolla lobes 0.2 cm long, pubescent without, tube glabrous; corona of 2 rows, epipetalous, fleshy; staminal column short, anthers covering the style; pollinia ovoid, caudicles rather long; ovary glabrous. Follicles about 6.5×1.2 cm, tapering at apices; seeds 1 cm long, comose at apices.

Fl. & Fr.: March-December.

World distribution: India, Sri Lanka, Burma and Malaysia.

Specimen examined: Diguvaletta, 7-8-1972, *Ellis* 42168.

OIANTHUS Benth.

Oianthus disciflorus Hook. f. in Fl. Brit. Ind. 4 : 49. 1883; Cooke, Fl. Pres. Bombay 2 : 236. rep. ed. 1958 (1905).

Twining undershrubs; branches striate, almost glabrous. Leaves about 28×11 cm, pale beneath, ovate, acuminate, rounded or cordate at base, glabrous or faintly puberulous, glandular above near the petiole; nerves 7 from base; petioles up to 5 cm long, striate, puberulous. Flowers pale yellow, 0.5 cm across, in lateral umbellate cymes 1 cm across; calyx lobes 0.15 cm long, faintly puberulous, tube very short; corolla 0.5 cm

across, lobes 0.5 cm long; disciform corona adhering to the staminal column, cupular; staminal column small; pollinia 1 in each cell; stigmas conical. Capsules 9.5×0.8 cm, tapering at tips; seeds linear, comose at apices.

Fl. & Fr. : May-October.

World distribution : Peninsular India.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22187.

Remarks : Gamble has not recorded this species from the areas covered in his Flora. Santapau and Irani (in *Univ. Bombay bot. Mem.* No.4 : 66. 1960) state, '...apparently endemic in North Kanara', for they themselves have not collected this species. The present collection, therefore, is a new record for the Eastern Ghats.

TYLOPHORA R. Br.

Tylophora macrantha (Wt.) Hook. f. *Fl. Brit. Ind.* 5 : 40. 1883 ; Gamble, *FPM* 5 : 842. 1923. *T. fasciculata* Buch.-Ham. var. *macrantha* Wt. *Contrib.* 50. 1834 ; Decaisne in *DC. Prodr.* 8 : 608. 1844.

Twining herbs, often decumbent; branches terete, striate, tomentose with recurved hairs. Leaves about 6×4 cm, ovate-obtuse, acute, acuminate, rounded or acute at base, puberulous; petioles about 1.5 cm long. Flowers green with red tinge, 0.3 cm long, in lateral racemose cymes 2 cm long, bracteate; pedicels 0.4 cm long; peduncles 0.8 cm long; calyx lobes 0.15 cm long, ovate-acuminate, pilose, tube very short; corolla lobes 0.2 cm long, ovate-lanceolate, tube 0.1 cm long; corona lobes 5, ovoid; staminal column 0.15 cm long, pollinia small; ovary glabrous. Follicles 4×1 cm, tapering; seeds flattened, bordered, comose at apices.

Fl. & Fr. : August-December.

World distribution : India and Burma.

Specimens examined : Diguvametta, 11-8-1921, *C.E.C. Fischer* 4657 ; Ahobilam, 23-11-1969, *Ellis* 32604 ; Mahanandi, 23-8-1972, *Ellis* 42332.

PERIPLOCACEAE

- | | |
|---|-------------|
| 1. Twining shrubs; lateral nerves parallel | CRYPTOLEPIS |
| 1. Twining herbs; lateral nerves not parallel | HEMIDESMUS |

CRYPTOLEPIS R. Br.

Cryptolepis buchmanii Roem. & Schult. *Syst. Veg.* 6 : 409. 1819 ; *Wt. Ic.* 2 : t. 494. 1843 ; Hook. f. *FBI* 4 : 5. 1883 ; Gamble, *FPM*

5 : 326. 1923 ; Santapau & Irani in Univ. Bombay bot. Mem. No. 4 : 91. 1960 (1962). *Nerium reticulatum* Roxb. [Hort. Beng. 19. 1814 ex.] Fl. Ind. 2 : 8. 1821. *Cryptolepis reticulata* (Roxb.) Schum. in Pflanzenf. 4 (2) : 219. 1895.

Climbing shrubs ; branches terete, bark wrinkled, lenticellate, glabrous. Leaves about 16×8 cm, glaucous beneath, elliptic-acuminate, obovate, shortly acuminate, obtuse or rounded at base ; lateral nerves parallel ; petioles 0.8 cm long, from thickened pads. Flowers pale yellow, 1 cm long, in axillary, branched cymes 3.5 cm long, bracteate ; calyx lobes 0.2 cm long, ovate, tube short ; corolla lobes 0.4 cm long, linear-lanceolate, twisted to left, tube 0.1 cm long ; corona lobes 5, clavate, fleshy ; anthers and connectives cover stigma ; pollen grains granular ; stigmas pentagonal. Follicles up to 12 cm long, tapering at tips ; seeds several, about 0.9 cm long, linear, silky comose at apices.

Fl. & Fr. : April-December.

World distribution : India, Sri Lanka, Burma and China, in dry localities.

Specimen examined : Diguvametta, 8-8-1972, *Ellis* 42206.

HEMIDESMUS R. Br.

Hemidesmus indicus (Linn.) Schult. in Roem. & Schult. Syst. Veg. 6 : 126. 1819 ; Wt. Ic. 2 : t. 594. 1843 ; Decaisne in DC. Prodr. 8 : 494. 1844 ; Hook. f. FBI 4 : 5. 1883 ; Gamble, FPM 5 : 825. 1923 ; Santapau & Irani in Univ. Bombay bot. Mem. No. 4 : 96. 1960 (1962). *Periploca indica* Linn. Sp. Pl. 211. 1753.

var. *indicus*. Twining or prostrate herbs ; branches generally purplish-red, angled, glabrous, faintly puberulous, lenticellate ; rootstocks woody, aromatic. Leaves variable, up to 12×3 cm, linear-acuminate, elliptic-ovate, obovate, oblong, shortly apiculate, emarginate, rounded or obtuse or acute at base, margins excurved, coriaceous, glabrous ; petioles 0.2 cm long. Flowers yellow, 0.3×0.2 cm, in axillary, clustered, racemose cymes up to 3 cm long, bracteate ; calyx lobes 0.12×0.1 cm, ovate, sparsely ciliate along margins, tube very short ; corolla about 0.5 cm across, ovate-oblong, coriaceous, tube short ; coronal scales 5 ; stamens epipetalous below, anthers connate covering stigma ; pollen-masses granular ; stigmas 5-gonous. Follicles up to 22 cm long, divaricate, tapering ; seeds 0.8 cm long, linear, comose at apices.

Fl. & Fr. : July-February.

World distribution : India and Sri Lanka, in dry localities.

Specimen examined : Diguvaletta, 18-11-1969, *Ellis* 32498.

var. *pubescens* (Wt. & Arn.) Hook. f. *Fl. Brit. Ind.* 4 : 5. 1883 ; Gamble, *FPM* 5 : 825. 1923. *Hemidesmus pubescens* Wt. & Arn. *Contrib.* 63. 1834 ; Wt. *IC.* 4 : t. 1320. 1850.

Except for the pubescence seen on branchlets and leaves beneath and on inflorescences, it agrees in all other characters with the typical variety.

Specimens examined : Gazulapalli, 10-9-1917, *Rangachari* s. n. ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22194 ; Mahanandi, 22-8-1972, *Ellis* 42328.

SPIGELIACEAE

MITREOLA Linn. ex Schaeffer

Mitreola petiolata (J. F. Gmel.) Torr. & Gray, *Fl. N. Amer.* 2 : 45. 1841 ; DC. *Prodr.* 9 : 8. 1845 ; Heine in *Kew Bull.* 23 : 251. 1961 ; Leenhouts in Steenis, *Fl. Males.* ser. 1. 6 : 959. 1972 ; Leeuwenberg. in *Med. Land. Wag.* 74. 23 : 7. 1974. *Cynoctonum petiolatum* J. F. Gmel. *Syst. Nat.* 2 : 443. 1791. *C. mitreola* (Linn.) Britton in *Mem. Torr. bot. Club* 5 : 258. 1894 ; Leenhouts in Steenis, *Fl. Males.* ser. 1. 6 : 375. 1962 ; Heine in *Kew Bull.* 17 : 172. 1963. *Ophiorrhiza mitreola* Linn. *Sp. Pl.* 150. 1753. *Mitreola oldenlandioides* Wall. ex DC. *Prodr.* 9 : 9. 1845 ; C. B. Cl. in Hook. f. *FBI* 4 : 79. 1883 ; Gamble, *FPM* 5 : 863. 1923. *M. paniculata* Wall. ex G. Don, *Gen. Syst.* 4 : 171. 1838 ; DC. *Prodr.* 9 : 9. 1845.

Erect herbs, up to 40 cm high ; branches 4-angled, faintly winged. Leaves about 6 × 3 cm, ovate, abruptly attenuate at base, glabrous, faintly puberulous along margins ; petioles short ; stipules short, ovate. Flowers white, 0.2 cm long, in axillary and terminal, dichotomously branched cymes about 10 cm long, secund, bracteate ; pedicels short ; calyx 0.1 cm long, lobes 5, ovate, tube short ; corolla lobes 5, 0.2 cm long ; stamens epipetalous at base ; ovary subglobose, style divided up to base. Capsules 3.5 × 3.5 cm, divergently 2-horned, compressed, softly puberulous ; seeds numerous, minute, ellipsoid.

Fl. & Fr. : September-December.

World distribution : Tropics from West Africa, India, Burma, Malaysia and North Australia, extending up to tropical America.

Specimen examined : Chelama, 7-12-1963, *Ellis* 17978.

Remarks : Leeuwenberg (*op. cit.* pp. 1 & 2) has discussed at length the history of the genus, *Mitreola* Linn. (*Opera Varia* 214. 1758) and states (p. 2), '...Britton (1894) rejected *Mitreola* as genus name but

used the earliest epithet for the first species known, resulting in the new combination *Cynoctonum mitreola*... This state of affairs should be considered in connection with the fact that many authors did not know Linnaeus *Opera Varia* (1758)... In fact, it was a reprint of his *Syst. Nat.* ed. 4. 1744. Recently Dandy (1967) considered the *Opera Varia* of interest and saw them that they received international recognition. This resulted in the reinstalment of *Mitreola* as a genus...'

STRYCHNACEAE

STRYCHNOS Linn.

- | | | |
|---|----|---------------------|
| 1. Leaves generally orbicular ; nerves 3-5 from base ; fruits about 5 cm across | .. | <i>S. nuxvomica</i> |
| 1. Leaves ovate ; nerves 3 from above the base ; fruits 1.5 cm across | | <i>S. potatorum</i> |

Strychnos nuxvomica Linn. Sp. Pl. 189. 1753 ; DC. Prodr. 9 : 15. 1845 ; C.B. Cl. in Hook. f. FBI 4 : 90. 1883 ; Brandis, Indian Trees, 473. 1906 ; Gamble, FPM 5 : 868. 1923 ; Bisset *et al.* in Lloydia 36 : 179-201. 1973.

Trees, about 20 m tall ; branches glabrous, lenticellate, nodes swollen. Leaves about 13 × 10 cm, elliptic-ovate, acuminate, orbicular, rounded at base, coriaceous, glabrous ; nerves 3-5 from base ; petioles 1 cm long. Flowers pale white, 1.2 cm long, in axillary and terminal, branched cymes 4 cm long, bracteate ; calyx 0.2 cm long, lobes ovate, puberulous ; corolla tube 1 cm long, pilose within, lobes 0.2 cm long, oblong ; anthers epipetalous near throat ; ovary glabrous, style linear, stigmas globose. Fruits about 5 × 5 cm, globose ; seeds 3-4, 1 cm across, flattened.

Fl. & Fr. : May-October.

World distribution : India, Sri Lanka and Burma, in dry deciduous forests.

Specimens examined : Dornal, February 1887, *Gamble* 18694 ; Basavapuram, March 1883, *J.S. Gamble* 10918 ; Chelama, 18-3-1965, *Ellis* 23709 ; Ahobilam, 31-8-1965, *Ellis* 25593.

S. potatorum Linn. f. Suppl. 148. 1781 ; DC. Prodr. 9 : 15. 1845 ; C.B.Cl. in Hook. f. FBI 4 : 90. 1883 ; Brandis, Indian Trees, 474. 1906 ; Gamble, FPM 5 : 868. 1923 ; Bisset *et al.* in Lloydia 36 : 179-201. 1973.

Trees, about 10 m tall ; bark furrowed. Leaves up to 14 × 7 cm, elliptic-ovate, acuminate, rounded or acute at base, coriaceous ; lower 2 lateral nerves above the base, prominent, arched. Flowers white, 0.5 cm

long, in axillary cymes 1 cm long, bracteate; calyx 0.1 cm long, lobes acute or acuminate; corolla puberulous without, pilose within, tube 0.3 cm long, lobes ovate; anthers slightly exerted; ovary glabrous, style as long as corolla, stigmas globose. Berries about 1.5 cm across; seeds 1-2, slightly flattened.

Fl. & Fr. : April-October.

World distribution : India, Sri Lanka and Burma, in dry localities.

Specimens examined : Gazulapalli, 3-9-1917, *K. C. Jacob* 14988; Srisaillam, 20-10-1964, *Ellis* 22098; Mahanandi, 22-8-1965, *Ellis* 25476; Diguvaletta, 18-11-1969, *Ellis* 32499.

A. W. Hill (in *Kew Bull.* 1917 : 194, 1917) records *Strychnos cinnamomea* Thwaites var. *wightii* A. W. Hill, whose present name, according to Bisset *et al.* (in *Taxon* 20 : 537-543, 1971 and *Lloydia* 36 : 179-201, 1973), being *S. wallichiana* Steudl ex DC., from 'Nallay Mallays' (*Beddome* 5303). However, it is not collected from Nallamalais during the present tours of Nallamalais.

MENYANTHACEAE

NYMPHOIDES Seguiet

Nymphoides cristatum (Roxb.) O. Ktze. *Rev. Gen. Pl.* 429, 1891; Santapau in *Bull. bot. Surv. Ind.* 3 : 20, 1961. *Menyanthes cristata* Roxb. *Pl. Corom.* 2 : 3, t. 105, 1798. *Limnanthemum cristatum* (Roxb.) Griseb. *Gen. & Spec. Gent.* 342, 1839; DC. *Prodr.* 9 : 139, 1845; C. B. Cl. in *Hook. f. FBI* 4 : 131, 1883; Gamble, *FPM* 5 : 883, 1923.

Aquatic, floating herbs; stems runner-like or petiole-like; roots fibrous at nodes. Floating leaves about 8×8 cm, orbicular, obscurely sinuate, cordate at base, glabrous, minutely scaberulous; petioles about 1 cm long. Flowers white, about 2×3 cm, in axillary, solitary clusters; pedicels about 4 cm long; calyx tube 0.2 cm long, lobes 0.3 cm long, spatulate-ovate; corolla 0.8 cm long, lobes glabrous, longitudinally crested in the middle; stamens about 6, filaments short; ovary glabrous, style short, stigmas 2-lobed. Capsules 0.5×0.4 cm, ovoid; seeds 0.2×0.2 cm, many, muriculate.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from India, Sri Lanka, China, Malaysia and Philippines.

Specimens examined : Srisaillam, 12-7-1963, *Ellis* 16848; Srisaillam, 6-12-1969, *Ellis* 32717.

Remarks: The Menyanthaceae are with leaves alternate, corolla induplicate-valvate, and aquatic plants, whereas the Gentianaceae are with leaves opposite, corolla involute or imbricate and terrestrial plants. That the Menyanthaceae and Gentianaceae are to be treated as separate families has gained support by morphological and anatomical investigations of Lindsey (in *Amer. Journ. Bot.* 25 : 480-485, 1938). The genus *Nymphoides* is therefore treated under the Menyanthaceae.

GENTIANACEAE

- | | |
|--|------------|
| 1. Flowers in axillary, sessile clusters | ENICOSTEMA |
| 1. Flowers in terminal, pedicellate, paniced cymes : | |
| 2. Ovary 1-celled ; corolla irregular | CANSCORA |
| 2. Ovary 2-celled ; corolla regular | EXACUM |

ENICOSTEMA Bl. *nom. cons.*

Enicostema axillare (Lamk.) A. Raynal in *Adansonia* ix : 75. 1969. *Gentiana axillaris* Lamk. *Ill. Gen.* 1(2) : 487. 1793, non Rafinesque, 1828, nec (F.W. Schmidt, 1794) Reichenb. 1828. *Enicostema hyssopifolium* (Willd.) Verdoorn in *Bothalia* 16 : 135. 1968. *Exacum hyssopifolium* Willd. *Sp. Pl.* 1, 2 : 640. 1798. *Adenema hyssopifolium* G. Don, *Gen. Syst.* iv : 201. 1837 ; *Wt. Ic.* 2 : t. 600. 1843. *Exacum littorale* Bl. *Bijdr.* 14 : 848. 1826 ; Griseb. in DC. *Prodr.* 9 : 66. 1845 ; C. B. Cl. in Hook. *f. FBI* 4 : 101. 1883 ; Gamble, *FPM* 5 : 875. 1923. *E. verticillatum auct.* (non Linn.).

Erect or decumbent herbs, up to 30 cm high ; branches quadrangular, glabrous, angles rather scaberulous. Leaves up to 11 × 1.5 cm, opposite, linear-oblong, spatulate, attenuate and slightly vaginate at base, glabrous, margins faintly scabrous. Flowers white, 0.8 cm long, in axillary clusters, bracteate ; calyx 0.3 cm long, tube 0.1 cm long, lobes marginally white, unequal, oblong, ovate, acuminate, scaberulous along margins ; corolla lobes 0.2 cm long, linear-oblong, tube 0.5 cm long ; stamens 5, epipetalous, filaments scaly at base ; ovary glabrous, stigmas ovoid. Capsules 0.3 cm long ; seeds several, reticulate.

Fl. & Fr. : March-December.

World distribution : Tropics from Africa, India, Sri Lanka and Malaysia.

Specimens examined : Nandyal, March 1883, *J. S. Gamble* 10878 ; Ramanapenta, Gundlabrahmeswaram, 26-8-1917, *K.C. Jacob* 14959 ; Chelama, 8-7-1963, *Ellis* 16783 ; Chelama, 9-12-1963, *Ellis* 18036 ;

Mahanandi, 23-8-1965, *Ellis* 25509 ; Ahobilam, 23-11-1969, *Ellis* 32594 ; Diguvametta, 8-8-1972, *Ellis* 42207.

CANSCORA Lamk.

- | | | |
|--|----|---------------------|
| 1. Branches prominently winged, as also the calyx | .. | <i>C. decussata</i> |
| 1. Branches faintly winged ; calyx not winged : | | |
| 2. Upper leaves prominent, rounded at base ;
pedicels filiform | .. | <i>C. diffusa</i> |
| 2. Upper leaves not prominent, narrowed at
base ; pedicels rather thick | | <i>C. decurrens</i> |

Canscora decussata (Roxb.) Roem. & Schult. Syst. Veg. 3 : 229. 1818 ; DC. Prodr. 9 : 64. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 104. 1883 ; Gamble, FPM 5 : 879. 1923. *Pladera decussata* Roxb. Fl. Ind. 1 : 418. 1820.

Erect herbs, about 30 cm high ; branches 4-winged, decussate. Leaves opposite, about 3 × 1 cm, ovate-elliptic, acute, acuminate, obtuse at base, sessile ; nerves 3 from base. Flowers pale pink or white, 1.5 cm long, bracteate ; pedicels about 2 cm long, winged ; calyx tube 0.1 cm long, prominently nerved, lobes 0.2 cm long, acuminate ; corolla lobes 0.5 cm long, oblong, tube 1 cm long ; stamens 4, one fertile and larger ; ovary glabrous, style linear, stigmas 2-lobed. Capsules about 1.3 cm long, linear ; seeds several, minute.

Fl. & Fr. : August-March.

World distribution : Tropics from Africa, India, Sri Lanka and Burma.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22190.

C. diffusa (Willd.) R. Br. Prodr. 451. 1810 ; DC. Prodr. 9 : 64. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 103. 1883 ; Gamble, FPM 5 : 878. 1923. *Exacum diffusum* Willd. Sp. Pl. 1 : 637. 1798. *Canscora lawii* Wt. Ic. 4 : t. 1327. 1850.

Erect herbs, about 40 cm high ; branches faintly 4-angled. Leaves of 2 types ; upper up to 2.5 × 1 cm, ovate, rounded at base, sessile, nerves 3 from base, reticulations prominent, lower up to 4 × 2 cm, elliptic-ovate, acute at base, sessile, nerves 3 from base. Flowers pale pink, about 1 cm long, bracteate ; pedicels filiform ; calyx lobes 0.1 cm long, ovate-acuminate, tube 0.7 cm long ; corolla 1 cm long, lobes oblong ; stamens 4, one placed at a higher level ; ovary glabrous. Capsules 0.6 cm long ; seeds numerous, small, reticulate-rugose.

Fl. & Fr. : September-April.

World distribution : Tropics from Africa, India, Sri Lanka, Burma and Malaysia.

Specimens examined : Basavapuram, March 1883, *J. S. Gamble* 10852 ; Gundlabrahmeswaram, 27-10-1964, *Ellis* 22222.

Conscora decurrens Dalz. in *Kew Journ. Bot.* 2 : 136. 1850 ; C. B. Cl. in *Hook. f. FBI* 4 : 103. 1883 ; *Gamble, FPM* 5 : 878. 1923.

Erect herbs, about 20 cm high ; branches quadrangular, faintly winged. Leaves 1.5×0.5 cm, ovate, attenuate at base, glabrous ; basal lateral nerves prominent running up to apex. Flowers pale pink, 1 cm long, in terminal, branched cymes about 13 cm long, bracteate ; pedicels about 2 cm long ; calyx lobes 0.1 cm long, ovate, caudate, tube 0.4 cm long ; corolla 0.8 cm long, lobes oblong ; stamens 4, filaments short, anthers ovate ; ovary pubescent at top, style glabrous, stigmas bilobed. Capsules cylindric ; seeds numerous, small, reticulate.

Fl. & Fr. : November-March.

World distribution : India, along stream-banks.

Specimen examined : Chelama, 7-12-1963, *Ellis* 17975.

EXACUM Linn.

- | | | |
|---|----|------------------------|
| 1. Leaves 3-nerved from base ; calyx faintly winged on back | .. | <i>E. pedunculatum</i> |
| 1. Leaves 5-nerved from base ; calyx prominently winged on back | .. | <i>E. petiolare</i> |

Exacum pedunculatum Linn. *Sp. Pl.* 112. 1753 ; *Wt. Ic.* 2 : t. 336. 1843 ; *Griseb. in DC. Prodr.* 9 : 46. 1845 ; C. B. Cl. in *Hook. f. FBI* 4 : 97. 1883 ; *Gamble, FPM* 5 : 874. 1923.

Erect herbs, about 25 cm high ; branches teretely quadrangular. Leaves up to 4×1.2 cm, elliptic-ovate, or linear-elliptic, acute at base, glabrous ; nerves 3 from base ; petioles short. Flowers pale violet, about 0.8 cm long, in terminal, paniced cymes up to 15 cm long, bracteate ; pedicels about 1 cm long ; calyx lobes 0.2 cm long, ovate-acuminate, winged on back ; corolla lobes 0.4 cm long, ovate, tube 0.3 cm long ; stamens 4, anthers 0.3 cm long, cordate at base ; ovary glabrous, style slightly exerted. Capsules 0.3 cm across, ovoid, glabrous ; seeds numerous, reticulate.

Fl. & Fr. : November-March.

World distribution : Tropics from India, Sri Lanka, Burma and Malaysia.

Specimens examined : Nandyal, February 1889, *J. S. Gamble* 18889 ; Nandyal, February 1953, *Rajasekara Mudaliar* s.n. ; Chelama, 8-12-1963, *Ellis* 18004 ; Velgode Range, 26-11-1969, *Ellis* 32619.

Exacum petiolare Griseb. in DC. Prodr. 9 : 46. 1845 ; Wt. Ic. 4 : t. 1324 (2). 1850 ; C. B. Cl. in Hook. f. FBI 4 : 98. 1883 ; Gamble, FPM 5 : 874. 1923. *E. pedunculatum* Linn. var. *petiolare* (Griseb). Trim. Fl. Ceyl. 3 : 182. 1893 ; Cooke, Fl. Pres. Bombay 2 : 253. rep. ed. 1958 (1905).

Erect herbs, about 20 cm high ; branches obtusely quadrangular, faintly winged along margins. Leaves about 4 × 2.5 cm, ovate, acuminate, abruptly acuminate at base ; nerves 5 from base ; petioles 0.5 cm long. Flowers pale blue. 0.7 cm long, in terminal cymes 4 cm long. the central solitary ; pedicels of lateral cymes 1 cm long, the central 1.5 cm long ; bracts small ; calyx 0.4 cm long, prominently winged on the lobes and tube, slightly accrescent and strongly parallel-nerved in fruiting ; corolla 0.7 cm long, lobes oblong ; stamens 5, anthers linear-oblong ; ovary glabrous. Capsules 0.5 × 0.4 cm, ovoid ; seeds numerous, minute, rugose.

Fl. & Fr. : August-December.

World distribution : India.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22193.

BORAGINACEAE

1. Herbs :

2. Erect herbs ;

- | | | |
|---|----|-------------|
| 3. Flowers in racemes about 20 cm long | .. | CYNOGLOSSUM |
| 3. Flowers solitary or in cymes about 8 cm long | | TRICHODESMA |

2. Decumbent or prostrate herbs ;

- | | | |
|-------------------------------|----|---------------|
| 4. Flowers solitary, axillary | | COLDENIA |
| 4. Flowers in terminal cymes | .. | HELIOTROPIMUM |

1. Shrubs or trees :

- | | | |
|--|----|---------|
| 5. Calyx accrescent in fruit ; drupes about 1 × 0.8 cm | .. | CORDIA |
| 5. Calyx not accrescent in fruit ; drupes about 0.4 × 0.3 cm | .. | EHRETIA |

CYNOGLOSSUM Linn.

Cynoglossum zeylanicum (Vahl ex Hornem) Thunb. ex Lehm. Neue Schrif. Naturf. Ges. Halle 3 (2) : 20. 1817 ; Kazmi in Journ. Arn. Arb.

52 : 344, 1971. *Anchusa zeylanica* Vahl ex Hornem. Enum. Hafn. 3. 1807. *Cynoglossum denticulatum* A. DC. var. *zeylanicum* (Hornem.) C. B. Cl. in Hook. f. FBI 4 : 157. 1883 ; Gamble, FPM 5 : 900. 1923. *C. meeboldii* Brand, Fedde Repert. 14 : 323. 1916 : Santapau in Rec. bot. Surv. Ind. 16 (1) : 166. 3rd ed. 1967.

Erect herbs, about 80 cm high ; branches terete, sparsely adpressedly hirsute, woody at base. Leaves up to 20 × 8 cm, elliptic-ovate, obtuse, obtuse or acute at base, sparingly pubescent, scabrous ; petioles up to 7 cm long ; nerves prominent, lateral ones joining to form a marginal nerve till the tip. Flowers blue, 0.2 cm long, in axillary and terminal scorpioid cymes about 20 cm long, ebracteate, shortly pedicellate ; calyx lobes 0.1 cm long, ovate, pilose without ; corolla 0.4 cm long, lobes obtuse ; stamens 5, filaments short ; ovary 4-lobed, style and stigmas glabrous. Nutlets 4, flattened, margins raised, glochidiate.

Fl. & Fr. : September-February.

World distribution : India, in dry localities.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22172 ; Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32628.

TRICHODESMA R. Br. *nom. cons.*

- | | |
|-------------------------------|-------------------------|
| 1. Leaves amplexicaul at base | <i>T. sedgwickianum</i> |
| 1. Leaves attenuate at base | <i>T. zeylanicum</i> |

Trichodesma sedgwickianum S. P. Banerjee in Bull. bot. Soc. Bengal. 16 : 10. 1962. *T. amplexicaul* DC. Prodr. 10 : 172. 1846 ; sensu Sedgwick in Rec. bot. Surv. Ind. 6 : 347. 1919 (non Roth) ; Gamble FPM 5 : 898. 1923. *T. amplexicaul* sensu C. B. Cl. in Hook. f. FBI 4 : 153. 1883. *p.p.* ; Brand in Engler, Pflanzenr. 78 : 39-40. 1921. *p.p.*

Erect herbs, about 50 cm high ; branches terete, setose-pubescent when young, becoming hirtellous in older. Leaves up to 8 × 3 cm, elliptic-oblong to linear-oblong, obtuse or rounded or amplexicaul at base, sessile, scabrous with bulbous-based hairs above, scabrous below only along nerves. Flowers white, maroon-speckled near throat, 1 × 0.8 cm, axillary, solitary ; pedicels about 2.2 cm long, hirsute ; calyx about 1 cm long, accrescent in fruits, lobes ovate-acuminate, hastate at base, hirtellous along margins and midrib without ; corolla 1.2 cm long, 3 dorsal lobes smaller than 2 ventral, mucronulate, pilose within ; anthers connivent, pennicillate, densely hairy at back of tips ; ovary 4-lobed, glabrous, Nutlets 0.5 × 0.3 cm ; seeds ovoid.

Fl. & Fr. : April-October.

World distribution : India, in arid localities of deciduous forests.

Specimens examined : Way to Ahobilam, 29-8-1965, *Ellis* 25548 ; Krishnanandi, Mahanandi, 21-8-1972, *Ellis* 42315.

Trichodesma zeylanicum (Linn.) R. Br. Prodr. 496. 1810 ; DC. Prodr. 10 : 173. 1846 ; C. B. Cl. in Hook. f. FBI 4 : 154. 1883 ; Gamble, FPM 5 : 899. 1923. *Borago zeylanica* Linn. Mant Pl. 202. 1768.

Erect herbs, about 70 cm high ; branches striate, puberulous, sparsely hirsute. Leaves about 9 × 2.5 cm, elliptic-acuminate, attenuate at base, puberulous and scabrous above with white-bulbous-based hairs, pubescent beneath, sessile. Flowers pale blue with red streaks near throat, about 1 cm long, in terminal, paniculate cymes about 8 cm long ; pedicels about 3 cm long, hirsute ; calyx lobes 0.5 cm long, acuminate, tube 0.5 cm long, accrescent in fruit, densely pubescent without, sparsely so within ; corolla about 1.2 cm long, lobes short acuminate, tube 0.7 cm long ; stamens 5, anthers densely hairy without, connectives coiled above ; ovary glabrous. Nutlets 0.4 × 0.2 cm, white, ovoid, polished without, faintly rugose within.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Malaysia and Australia.

Specimens examined : Diguvametta, 28-10-1906, *C. A. Barber* 8003 ; Diguvametta, 16-11-1969, *Ellis* 32383.

COLDENIA Linn.

Coldenia procumbens Linn. Sp. Pl. 125, 1753 ; DC. Prodr. 9 : 558. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 144. 1883 ; Gamble, FPM 5 : 892. 1923.

Prostrate herbs ; branches radially spreading about 40 cm long, pilose ; roots woody. Leaves up to 2 × 1 cm, obovate, oblong, acute at base, dentate, densely hairy with crisped hairs ; nerves and nervules prominently impressed above. Flowers white, 0.2 cm long, axillary, solitary ; calyx 0.2 cm long, ovate, densely pilose ; corolla lobes small, tube short ; stamens 5, epipetalous ; ovary puberulous. Drupes 0.4 × 0.4 cm, ovoid, with persistent styles, puberulous, separating into 4, 1-seeded pyrenes ; seeds single in each locule.

Fl. & Fr. : January-July.

World distribution : Tropics from Africa, India, Sri Lanka, Burma, China, Australia and America, occurring generally on drying ponds and along banks of rivers.

Specimens examined : Chelama, 9-7-1963 *Ellis* 16801.

HELIOTROPIMUM Linn.

1. Calyx lobes equal ; nutlets marginate, tuberculate
plants densely pubescent *H. supinum*
1. Calyx lobes unequal ; nutlets not marginate, densely pubescent ; plants not densely pubescent *H. ovalifolium*

Heliotropium supinum Linn. Sp. Pl. 130. 1753 ; DC. Prodr. 9 : 533. 1845 ; Wt. Ic. 4 : t. 1387. 1850 ; C.B.Cl. in Hook. f. FBI 4 : 149. 1883 ; Gamble, FPM 5 : 895. 1923 ; Kazmi in Journ. Arn. Arb. 51 : 180. 1970. *H. supinum* Linn. var. *malabarica* (Retz.) C.B.Cl. loc. cit. *H. malabaricum* Retz. Obs. Bot. 4 : 24. 1786.

Prostrate herbs ; branches densely pubescent. Leaves about 2 × 1.2 cm, ovate, obtuse, emarginate, obtuse or rounded at base, crenate, densely pubescent ; nerves impressed above ; petioles about 0.5 cm long. Flowers white, 0.4 cm long, in terminal, branched, scorpioid cymes about 8 cm long ; calyx 0.2 cm long, lobes ovate, densely pubescent without, pilose within ; corolla 0.4 cm long, pubescent without, lobes oblong, tube dilated below, constricted above ; stamens 5, epipetalous ; ovary with stigma conical. Nutlets 0.3 × 0.3 cm, generally 3, marginate, tuberculate.

Fl. & Fr. : October-April.

World distribution : Tropics from Africa, India and Sri Lanka, in drying, clayey localities.

Specimen examined : Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23764.

H. ovalifolium Forsk. Fl. Aegypt.-Arab. 38. 1775 ; Hook. f. FBI 4 : 150. 1883 ; Gamble, FPM 5 : 896. 1923 ; Kazmi in Journ. Arn. Arb. 51 : 80. 1970 *H. coromandelianum* Retz. Obs. Bot. 2 : 9. 1810 ; Wt. Ic. 4 : t. 1388. 1850.

Erect or decumbent herbs, about 30 cm high ; branches pubescent ; rootstocks woody. Leaves about 4 × 2 cm, oblong, attenuate at base ; petioles about 1.5 cm long. Flowers white, 0.2 cm long, in terminal, branched, scorpioid cymes about 8 cm long ; calyx lobes 5, about 0.2 cm long, one broader and ovate, others spathulate, pilose without ; corolla 0.2 cm long, pubescent without and at throat ; stamens epipetalous, filaments short ; ovary with pubescent stigmas. Nutlets 4, 0.1 × 0.1 cm, not marginate, densely pubescent.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Burma and Australia.

Specimen examined : Chelama, 9-7-1963, *Ellis* 16798.

CORDIA Linn.

- | | |
|---|---------------------|
| 1. Calyx glabrous without ; inflorescences up to 15 cm long | <i>C. dichotoma</i> |
| 1. Calyx densely tomentose without ; inflorescences up to 4 cm long | <i>C. monoica</i> |

Cordia dichotoma Forst. f. Prodr. 18. 1786 ; Merr. Enum. 3 : 373. 1924 ; Johnston in Journ. Arn. Arb. 32 : 8. 1951 ; Santapau in Rec. bot. Surv. Ind. 26(1) : 163, 3rd rev. ed. 1967. *C. obliqua* Willd. Phytogr. 4, t. 4. 1794 ; C.B.Cl. in Hook. f. FBI 4 : 137. 1883, *p.p.* ; Gamble, FPM 5 : 887. 1923. *C. myxa auct pl.* (non Linn). *C. latifolia* Roxb. Fl. Ind. 1 : 588. 1820.

Trees, about 10 m tall ; young branches glabrous. Leaves about 9×5 cm, ovate, abruptly acuminate, equally or unequally obtuse or rounded at base, entire or faintly dentate, chartaceous to coriaceous, glabrous or sparsely puberulous, especially in the axils of nerves ; nerves and nervules prominent ; petioles up to 3 cm long. Flowers white, 0.2 cm long, in axillary and terminal, divaricately branched, peduncled cymes about 15 cm long, ebracteate, polygamous ; calyx lobes ovate, pilose within, accrescent in fruits, prominently nerved ; corolla lobes oblong, tube 0.3 cm long ; stamens adnate to corolla tube, filaments hairy at base ; ovary glabrous, style branched. Drupes 1 cm long, ovoid, 1-seeded.

Fl. & Fr. : February-May.

World distribution : Arid tropics from Egypt, India, Sri Lanka, China, Malaysia and Australia.

Specimen examined : Chelama, 18-3-1965, *Ellis* 23706.

C. monoica Roxb. Pl. Corom. 1 : 43, t. 58. 1795 ; DC. Prodr. 9 : 479. 1845 ; C.B.Cl. in Hook. f. FBI 5 : 137. 1883 ; Gamble, FPM 5 : 888. 1923. *C. polygama* Roxb. Fl. Ind. 11 : 237. 1824 ; DC. *op. cit.* 480.

Trees, about 8 m tall ; young branches rusty-tomentose. Leaves up to 12×8 cm, ovate, elliptic-ovate, obovate, acuminate, acute, obtuse or rounded at base, entire or dentate, scabrous, tomentose beneath ; petioles 1.5 cm long, rusty-tomentose. Flowers white, 0.5 cm long, in close, corymbose cymes 4 cm long ; calyx 0.7 cm long, densely brown-tomentose without, irregularly lobed ; corolla tube 0.5 cm long, lobes 0.2 cm long, linear-spathulate ; stamens exerted, filaments glabrous ; ovary glabrous, style branched, stigmas 2-lobed. Drupes 1×0.8 cm, ovoid, longitudinally striated.

Fl. & Fr. ; August-December.

World distribution : India and Sri Lanka, in dry deciduous forests.

Specimen examined : Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22139.

EHRETIA* Linn.

- | | | |
|---|----|-----------------------|
| 1. Leaves about 3.5 × 1.5 cm, sessile or subsessile | .. | <i>E. microphylla</i> |
| 1. Leaves about 10 × 5 cm, petiolate : | | |
| 2. Leaves glabrous | | <i>E. laevis</i> |
| 2. Leaves puberulous | | <i>E. pubescens</i> |

Ehretia microphylla Lamk. III. 2 : 425. 1792 ; Gamble, FPM 2 : 891. 1923. *E. buxifolia* Roxb. Pl. Corom. 1 : 42, t. 57. 1795 ; DC. Prodr. 9 : 590. 1845 ; C.B.Cl. in Hook. f. FBI 4 : 144. 1883 ; Brandis, Indian Trees, 481. 1906. *Carmona retusa* (Vahl) Masamune in Trans. nat. Hist. Soc. Taiwan 30 : 61. 1940 ; Backer & Bakh. f. Fl. Java 2 : 459. 1965. *Cordia retusa* Vahl, Symb. Bot. 2 : 42. 1791. *Carmona microphylla* (Lamk.) G. Don, Gen. Syst. 4 : 391. 1837 ; Johnston in Journ. Arn Arb. 32 : 17. 1951.

Shrubs, about 1 m high ; branches terete, sparsely puberulous when young. Leaves about 3.5 × 1.5 cm, several, obovate, oblong, sometimes crenately serrate, cuneate at base, margins excurved, hirtellous with white bases ; petioles 0.1 cm long. Flowers pale yellow, about 0.4 cm long, solitary or in 2-flowered cymes about 2 cm long ; peduncles sparsely hirtellous ; calyx 0.3 cm long, hirsute without, lobes 0.2 cm long, obovate, tube 0.1 cm long ; corolla 0.4 cm long, lobes oblong, sparsely hirsute along the middle without ; stamens exserted ; ovary glabrous, style bifid from base. Drupes 0.4 × 0.3 cm, ovoid, faintly rugose ; pyrene 1.

Fl. & Fr. : August-February.

World distribution : Tropics from India, Sri Lanka, China and Malaysia, in dry localities.

Specimens examined : Diguvaletta, 18-11-1969, *Ellis* 32519.

Remarks : Johnston (*op. cit.*) gives the following characters, among others, for the segregation of *Carmona* Cav. from *Ehretia* Linn. : (a) endocarp does not divide in half along the dorso-ventral axis, (b) the absence of sterile cavities interposed in the pairs of fertile cavities, (c) style very deeply cut or almost divided.

*The genus *Ehretia* sometimes is treated under the Ehretiaceae, an elevation in the familial status from a subfamilial level. However, here it is treated under the broad circumscription of the family, Boraginaceae.

Ehretia laevis Roxb. Pl. Corom. 1 : 42, t. 56. 1795 ; DC. Prodr. 9 : 505. 1846 ; C. B. Cl. in Hook. f. FBI 4 : 142. 1883 ; Brandis, Indian Trees, 481. 1906 ; Gamble, FPM 5 : 891. 1923 ; Johnston in Journ. Arn. Arb. 32 : 107. 1951.

Trees, about 8 m tall ; branches pale. Leaves about 10 × 5 cm, ovate, acuminate, acute or obtuse at base rather unequally, coriaceous ; nerve-innovations pubescent ; petioles about 1 cm long. Flowers white, 0.4 cm long, in axillary and extra-axillary, branched, corymbose cymes about 5 cm long ; pedicels 0.1 cm long ; calyx 0.2 cm long, lobes small, oblong, puberulous without ; corolla lobes 0.2 cm long, ovate, tube 0.1 cm long ; stamens exserted ; ovary glabrous, style bilobed at apex. Drupes 0.3 × 0.5 cm, bilobed with 2 pyrenes in each.

Fl. & Fr. : Throughout the year.

World distribution : Middle East, India, Sri Lanka, China and Australia.

Specimens examined : 'Kurnool', no date, ? *Beddome* s. n. ; Mantralakanama. Feb. 1887, *J. S. Gamble* 18693 ; Mahanandi, Krishnanand, 8-12-1969, *Ellis* 32722.

E. pubescens Benth. in Royle, III. 306. 1836 ; DC. Prodr. 9 : 597. 1845 ; Gamble, FPM 5 : 891. 1923. *E. laevis* Roxb. var. *pubescens* (Benth) C. B. Cl. in Hook. f. FBI 4 : 142. 1883.

Trees, about 3 m tall ; branches terete, densely pubescent when young. Leaves 4.5 × 3 cm, ovate-acuminate, obtuse, rounded at base, pubescent ; petioles up to 0.7 cm long, pubescent. Flowers white, 0.4 cm long ; calyx lobes 0.2 cm long, linear-lanceolate, villous without or strigose near tips without ; tube short ; corolla 0.4 cm long, oblong, sparsely ciliolulate along margins ; anthers faintly puberulous, filaments shorter than anthers ; ovary glabrous, styles 2 from base. Drupes 0.3 × 0.5 cm, bilobed, with 2 pyrenes in each.

Fl. & Fr. : August-November.

World distribution : India, in dry localities.

Specimens examined : Srisailam, 12-7-1963, *Ellis* 16826 B ; Srisailam, 20-10-1964, *Ellis* 22104 ; Duguvametta, 6-8-1972, *Ellis* 42142.

Remarks : The present work follows Gamble (*op. cit.*) who in turn had followed Bentham (*op. cit.*) and DeCandolle (*op. cit.*) in treating this taxon at a specific status. C. B. Clarke (*op. cit.*) treats it as a variety, followed by Haines [*Bot. Bihar & Orissa* 2 : 605. rep. ed. 1961 (1922)]. Duthie [*Fl. Up. Gang. Pl.* 1 : 431. rep. ed. 1960 (1903)] treats

it as a synonym under *E. laevis* Roxb. The present studies at MH and CAL, in addition to field observations, indicate that this taxon, though variable and Clarke's 6 varieties are the outcome of this variability, yet its pubescent nature and leaf sizes are constant enough for treating it at a specific status.

CONVOLVULACEAE

- 1. Fruits indehiscent :
 - 2. Leaves broader than long RIVEA
 - 2. Leaves as broad as long or longer than broad ARGYREIA
- 1. Fruits dehiscent :
 - 3. Flowers in umbellate cymes JACQUEMONTIA
 - 3. Flowers in racemose cymes :
 - 4. Prostrate or decumbent herbs EVOLVULUS
 - 4. Climbers or creepers :
 - 5. Corolla tube uniformly enlarged from base to apex, the 5 bands or plicate condition not clearly marked MERREMIA
 - 5. Corolla tube not uniformly enlarged from base to apex, the 5 bands or plicate condition on corolla clearly marked IPOMOEA

RIVEA Choisy

Rivea hypocrateriformis (Lamk.) Choisy, Convol. Orient. in Mem. Soc. Phys. Genev. 6 : 408. 1834 et in DC. Prodr. 9 : 326. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 184. 1883 ; Gamble, FPM 5 : 903. 1923. *Convolvulus hypocrateriformis* Lamk. Encycl. 3 : 561. 1792.

Climbing shrubs ; stems terete, white-tomentose. Leaves about 7×9 cm, broadly ovate, apiculate, rounded, cordate or shallowly truncate at base, sericeous beneath ; petioles up to 6 cm long. Flowers white, 7 cm long, solitary ; pedicels about 2.5 cm long ; sepals 1.2×0.8 cm, accrescent in fruits, oblong, pubescent without ; corolla tube up to 5.5 cm long, lobes 1.5 cm long, orbicular-ovate, plicate ; stamens included, anthers linear, filaments villous at base ; ovary glabrous, style slender, stigmas 2. Fruits 1.5×1.5 cm, globose, shining, indehiscent ; seeds about 4, glabrous.

Fl. & Fr. : July-February.

World distribution : India, in dry deciduous forests.

Specimens examined : Diguvarmetta, 4-11-1906, C. A. Barber 8042 ; Chelama, 5-7-1963, Ellis 16747 ; Jabakulavagu, Mahanandi, 22-8-1965, Ellis 25494 ; Ahobilam, 24-11-1969, Ellis 32608.

ARGYREIA Lour.

1. Leaves sericeous below :
- | | | |
|---|----|---------------------|
| 2. Bracts caudate-acuminate, up to 4 × 2 cm | .. | <i>A. nervosa</i> |
| 2. Bracts elliptic, up to 2.5 × 1 cm | | <i>A. bracteata</i> |
1. Leaves hirsute or puberulous below :
- | | | |
|--|----|------------------|
| 3. Sepals densely sericeous without, up to 1.5 cm long | .. | <i>A. setosa</i> |
| 3. Sepals puberulous on both surfaces, about 5.5 cm long | .. | <i>A. cymosa</i> |

Argyrea nervosa (Burm. f.) Boj. Hort. Maurit. 224. 1837 ; Ooststr. in *Blumea* 3 : 364. 1943 ; Santapau in *Journ. Bombay nat. Hist. Soc.* 47 : 351. 1947. *Convolvulus nervosus* Burm. f. *Fl. Ind.* 48. 1768. *Argyrea speciosa* Sweet, Hort. Brit. 289. 1827 ; C. B. Cl in Hook. f. *FBI* 4 : 185. 1883 ; Gamble, *FPM* 5 : 907. 1923.

Climbing shrubs ; branches densely tomentose. Leaves about 30 × 25 cm, ovate, cordate at base, glabrous above, white-silky-tomentose beneath ; lateral nerves about 12 pairs, prominent ; petioles about 20 cm long, white-tomentose. Flowers pinkish-blue with purple centre, about 8 × 4 cm, in clustered cymes 7 cm across ; peduncles about 18 cm long, tomentose ; bracts 4 × 2 cm, caudate-acuminate, puberulous without ; sepals 1 × 0.8 cm, coriaceous, tomentose without ; corolla 6 × 3 cm, pilose without, lobes oblong, tube 1.5 cm long ; stamens 5, hairy at base ; ovary glabrous ; stigmas 2-lobed. Berries 0.8 × 0.8 cm, ovoid ; seeds 4.

Fl. & Fr. : July-December.

World distribution : Mauritius Island, India, Sri Lanka and China.

Specimens examined : Srisailam, 15-7-1963, *Ellis* 16878 ; Peddachama, Eastern Nallamalais, 18-8-1972, *Ellis* 42300.

A. bracteata Choisy, *Convolv. Orient.* in *Mem. Soc. Phys. Genev.* 6 : 39. 1834 ; DC. *Prodr.* 9 : 328. 1845 ; C. B. Cl. in Hook. f. *FBI* 4 : 188. 1883 ; Gamble, *FPM* 5 : 907. 1923.

Climbing shrubs ; branches terete, tomentose or puberulous. Leaves about 10 × 10 cm, ovate-oblong, cordate at base, glabrous or sparsely hairy above, densely sericeous below ; petioles about 5 cm long, tomentose. Flowers pink, about 5 × 3 cm, in axillary, clustered cymes ; peduncles about 10 cm long ; bracts about 2.5 × 1 cm, elliptic, densely sericeous without, sparingly puberulous within ; sepals 1 × 0.5 cm, ovate-acuminate, sparsely hairy without ; corolla lobes 1 cm long, acuminate, tube 3 cm long, pilose without ; stamens 5, filaments hairy at base ; ovary glabrous, style filiform, stigmas 2-lobed. Berries 1.5 × 1.5 cm, ovoid ; seeds 4.

Fl. & Fr. : July-January.

World distribution : Peninsular India, in dry tracts.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 28-8-1917, Rangachari 14965 ; Gundlabrahmeswaram, 20-7-1963, Ellis 16917 ; Rollapenta, 14-8-1972, Ellis 42210.

Argyrea setosa (Roxb.) Choisy, Convolv. Orient. in Mem. Soc. Phys. Genev. 6 : 425. 1833 et in DC. Prodr. 9 : 332. 1845 ; Ooststr. in Blumea 5 : 383. 1943. *Lettsomia setosa* Roxb. [Hort. Beng. 13. 1814 ex] Fl. Ind. 1 : 490. 1820 ; Wt. Ic. 4 : t. 1360. 1850 ; C. B. Cl. in Hook. f. FBI 4 : 194. 1883 ; Gamble, FPM 5 : 910. 1923.

Climbing shrubs ; stems terete, strigosely hairy. Leaves up to 15×15 cm, ovate, abruptly acuminate, cordate at base, strigosely hairy beneath, glabrous above ; petioles about 8 cm long. Flowers pale pink, 3 cm long, in axillary, branched cymes about 10 cm across, bracteate ; peduncles about 22 cm long ; sepals 1.5×1.2 cm, oblong-orbicular, densely sericeous without, glabrous within ; corolla tube 2 cm long, constricted at base where it is glabrous, tube densely pubescent, lobes shallow ; stamens included ; ovary glabrous. Berries 1×1 cm, ovoid ; seeds 4.

Fl. & Fr. : October-January.

World distribution : India, Sri Lanka, Burma, in dry deciduous forests.

Specimens examined : Chelama, 9-12-1963, Ellis 18030 ; Gundlabrahmeswaram, 30-11-1969, Ellis 32680.

A. cymosa (Roxb.) Sweet, Hort. Brit. 289. 1827 ; Choisy in DC. Prodr. 9 : 333. 1846 ; Wt. Ic. 3 : t. 839. 1844 ; C. B. Cl. in Hook. f. FBI 4 : 190. 1883 ; Gamble, FPM 5 : 908. 1923. *Lettsomia cymosa* Roxb. [Hort. Beng. 13. 1814 ex] Fl. Ind. 1 : 492. 1820.

Climbing herbs ; branches terete, puberulous, leaves about 13×13 cm, broadly ovate, cordate at base, puberulous below ; petioles about 10 cm long. Flowers pale purple, about 6 cm long, 3 cm across, bracteate, in branched, cymose clusters 4 cm across ; peduncles 20 cm long ; bracts 1.5×1 cm, oblong, puberulous ; sepals broadly ovate, puberulous, 2 inner narrower ; corolla lobes shallow, tube 5 cm long ; stamens 5, filaments dilated below ; ovary glabrous, stigmas puberulous. Berries 1.5×1.5 cm, ovoid ; seeds 4.

Fl. & Fr. : November-January.

World distribution : Peninsular India and Philippines.

Specimen examined : Ahobilam, 22-11-1969, Ellis 32573.

JACQUEMONTIA Choisy

Jacquemontia paniculata (Burm. f.) Hallier f. in Bot. Jahrb. 16 : 541. 1893 ; Gamble, FPM 5 : 926. 1923 ; Ooststr. in Blumea 3 : 269. 1939 et in Steenis, Fl. Males. ser. I. 4 (4) : 432. 1953. *Ipomoea paniculata* Burm. f. Fl. Ind. 50. 1768. *Convolvulus paniculatus* O. Ktze. Rev. Gen. 440. 1891. *C. parviflorus* Vahl, Symb. Bot. 3 : 29. 1794. (non Desr. 1789, nec Salisb. 1796) ; C. B. Cl. in Hook. f. FBI 4 : 220. 1883. *Jacquemontia umbellata* Boj. Hort. Maurit. 229. 1837 ; Choisy in DC. Prodr. 9 : 397. 1845.

Climbing herbs ; stems faintly angled, grooved, glabrescent when young. Leaves up to 7×5 cm, ovate, caudate-acuminate, rounded or cordate to truncate at base, glabrous ; petioles about 3 cm long, pubescent. Flowers pale pink, 0.8 cm long, in umbellate cymes about 3 cm across, bracteate ; peduncles up to 4 cm long ; sepals 0.6 cm long, unequal, ovate-acuminate, pilose ; corolla 0.8 cm long, lobes shallow ; stamens included, filaments dilated below, hairy at base ; ovary glabrous, stigmas filiform. Capsules 0.5×0.4 cm, ovoid, shining ; seeds about 4, black, angled, slightly winged along angles, verruculose.

Fl. & Fr. : November-January.

World distribution : Tropics from East Africa, India, Sri Lanka, Malaysia and Australia.

Specimens examined : Chelama, 9-12-1963, *Ellis* 18043 ; Bogada, 19-11-1969, *Ellis* 32525.

Evolvulus Linn.

Evolvulus alsinoides (Linn.) Linn. Sp. Pl. ed. 2. 392. 1762 ; DC. Prodr. 9 : 447. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 220. 1883 ; Gamble, FPM 5 : 923. 1923 ; Ooststr. in Blumea 3 : 74. 1938 et in Steenis, Fl. Males. ser. I. 4 (4) : 395. 1953. *Convolvulus alsinoides* Linn. Sp. Pl. 157. 1753.

Prostrate herbs, stems running to about 60 cm, shaggy ; rootstocks woody. Leaves about 2×1.2 cm, alternate, elliptic-ovate, apiculate, obtuse at base, softly pilose or glabrous ; petioles 0.2 cm long. Flowers violet, 0.4 cm long, in axillary cymes 3.5 cm long, bracteate ; peduncles filiform ; sepals 0.3 cm long, shaggy ; corolla 0.5 cm long, softly sparsely pilose ; stamens included, filaments adnate to corolla tube, filiform ; ovary glabrous, styles 2 from base, each in turn bifid, stigmas linear. Capsules 0.3×0.3 cm, globose, 4-valved ; seeds 4, black, smooth.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimens examined : Chelama, 10-12-1963, *Ellis* 18058 ; Mahanandi, 22-8-1965, *Ellis* 25467 ; Mahanandi, 8-12-1969, *Ellis* 32720.

MERREMIA Dennst. *emend.* Hallier f.

- | | | |
|---|----|----------------------|
| 1. Leaves digitately compound | | <i>M. aegyptia</i> |
| 1. Leaves simple : | | |
| 2. Leaves auricled at base, sessile | .. | <i>M. tridentata</i> |
| 2. Leaves not auricled at base, petiolate : | | |
| 3. Stems terete, smooth, wingless | .. | <i>M. hederacea</i> |
| 3. Stems terete but 3-5-winged | .. | <i>M. turpethum</i> |

Merremia aegyptia (Linn.) Urban, *Symb. Antill.* 4 : 505. 1910 ; Gamble, *FPM* 5 : 928. 1923 ; Ooststr. in *Blumea* 3 : 327. 1939 et in Steenis, *Fl. Males. ser. I.* 4(4) : 448. 1953. *Ipomoea aegyptia* Linn. *Sp. Pl.* ed. 2. 223. 1762. *I. pentaphylla* Jacq. *Coll.* 2 : 297. 1788 ; C. B. Cl. in Hook. f. *FBI* 4 : 202. 1883. *Merremia pentaphylla* (Linn.) Hallier f. in *Bot. Jahrb.* 16 : 552. 1893. *Convolvulus pentaphyllus* Linn. *Sp. Pl.* ed. 2. 223. 1762. *Batatas pentaphylla* (Linn.) Choisy in *Mem. Soc. Phys. Genev.* 6 : 436. 1833 et in DC. *Prodr.* 9 : 339. 1845.

Twining herbs ; stems hirsute, striate. Leaves digitate ; leaflets 5, up to 10×5 cm, oblanceolate, abruptly acuminate, acute at base, patently hairy ; petioles about 10 cm long, patently hairy. Flowers white, 2 cm long, in axillary cymes 6 cm long, bracteate ; pedicels about 2 cm long, patently hairy ; peduncles about 23 cm long ; sepals 1.5×1 cm, ovate, caudate, hirsute ; corolla 2.5 cm long, lobes shallow ; stamens included, anthers twisted ; ovary glabrous. Capsules 1.8×1.5 cm, globose, 4-valved ; seeds 4, black.

Fl. & Fr. : October-March.

World distribution : Pantropic ; an escape from cultivation.

Specimens examined : Giddalur, 9-11-1906, C. A. Barber 8077 ; Chelama, 8-12-1963, *Ellis* 18028 ; Diguvametta, 16-11-1969, *Ellis* 32389.

Remarks : Haines [*Bot. Bihar & Orissa* 2 : 621. rep. ed. 1961 (1922-1924)] is highly sceptical of Hallier f.'s splitting of the genus *Ipomoea* Linn., into several genera, stating that it is artificial. He supports C.B. Clarke's earlier treatment in *Fl. Brit. Ind.* He includes *Pharbitis* Choisy, *Batatas* Choisy, *Operculina* S. Manso, *Aniseia* Choisy, and *Merremia* Dennst. ex Hallier f. under *Ipomoea* Linn., and separates only *Calonyction* Choisy, *Mina* Cerv., and *Quomoclit* Moench. Ooststroom (*op. cit.*) treats

Ipomoea Linn., including under it *Quamoclit*, *Batatas*, *Pharbitis* and *Calonyction*.

In the present study van Ooststroom [in Steenis, *Fl. Males.* ser. I. 4(4) : 448. 1953] is followed.

The other point of interest is regarding the combination, *Merremia aegyptia*; Gamble (*op. cit.*) accredits it to T. Cooke, stating that he made it 'in note'. The combination, however, was not made by Cooke; he had just pointed that Hallier f. should have taken the oldest epithet, *aegyptia*. The combination was definitely made by Urban in 1910, in accordance with Article 33 of the Botanical Code (1975).

Merremia tridentata (Linn.) Hallier f. in Bot. Jahrb. 16 : 552. 1893.
Convolvulus tridentatus Linn. Sp. Pl. 157. 1753.

Remarks: van Ooststroom [in *Blumea* 3 : 315-317. 1939 and in Steenis, *Fl. Males.* ser. I. 4(4) : 445-446. 1953] recognises 2 subspecies, viz. *ssp. tridentata* and *ssp. hastata* (Desr.) Ooststr.; the latter had been treated at specific level by C. B. Clarke (*op. cit.* p. 205), and Haines [*Bot. Bihar & Orissa* 2 : 625. rep. ed. 1961 (1924)] though under *Ipomoea* Linn. Duthie [*Fl. Up. Gang. Pl.* 1 : 550. rep. ed. 1960 (1903)], Cooke [*Fl. Bombay Pres.* 2 : 306. rep. ed. 1958 (1906)], and Gamble (*op. cit.* pp. 928-929) treat them under *Merremia*. How far these two are distinct requires a more comprehensive geographical population study of both the taxa before definite prognostication can be made. Here van Ooststroom is followed in the treatment of these two taxa.

ssp. tridentata C. B. Cl. in Hook. f. FBI 4 : 205. 1883; Gamble, FPM 5 : 928. 1923; Ooststr. in *Blumea* 3 : 315. 1939, et in Steenis, *Fl. Males.* ser. I. 4 (4) : 445. 1953.

Prostrate herbs; stems running to about 40 cm long, angled, grooved; rootstocks rather woody. Leaves about 1.3 cm long, linear or broadly obovate, acute, obtuse or trident at apices, obtuse or hastate-auricled at base, sessile; midrib prominent below. Flowers pale yellow, axillary, solitary, bracteate; pedicels about 1.7 cm long; sepals 0.5 cm long, broadly obovate-caudate; corolla 1.2 cm long, lobes shallow; stamens included; ovary glabrous. Capsules 0.4 cm long, ovoid; seeds 4, black.

Fl. & Fr. : February-April.

World distribution : Africa, India, Sri Lanka, Malay Peninsula, in very dry condition, on rocky substratum.

Specimen examined : Srisailam, 13-3-1963, Ellis 16859.

ssp. *hastata* (Desr.) Ooststr. in *Blumea* 3 : 317. 1939 et in Steenis, *Fl. Males. ser. I.* 4 (4) : 445. 1953. *Convolvulus hastatus* Desr. in Lamk. *Encycl.* 3 : 542. 1789, (non Forsk. 1775). *Merremia hastata* Hallier f. in *Bot. Jahrb.* 16 : 552. 1893 ; Gamble, *FPM* 5 : 929. 1923. *Ipomoea angustifolia sensu* C. B. Cl. in Hook. f. *FBI* 4 : 205. 1883, (non Jacq.).

Twining herbs ; branches running to 50 cm long, angled, grooved. Leaves 4 cm long, linear-ovate, or shorter and broadly ovate, apiculate, auricled and dentate at base, sessile. Flowers pale yellow with maroon centre, solitary, or in few-flowered cymes about 7 cm long, bracteate ; sepals 0.7 cm long, caudate-acuminate ; corolla up to 2 cm long ; stamens included, filaments sparsely hairy ; ovary glabrous. Capsules 0.5 cm long, globose ; seeds 4, grey, glabrous.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from East Africa, India, Sri Lanka, Malaysia and Australia.

Specimens examined : Srisailam, 16-7-1963, *Ellis* 16900 ; Diguvametta, 16-11-1969, *Ellis* 32426.

Merremia hederacea (Burm. f.) Hallier f. in *Bot. Jahrb.* 18 : 118. 1894 ; Ooststr. in *Blumea* 3 : 302. 1939 et in Steenis, *Fl. Males. ser. I.* 4 (4) : 441. 1953. *Evolvulus hederaceus* Burm. f. *Fl. Ind.* 77. 1768. *Ipomoea chryseides* Ker- Gawl in *Bot. Reg. t.* 270. 1818 ; *Wt. Ic.* 1 : t. 157. 1840 ; C. B. Cl. in Hook. f. *FBI* 4 : 206. 1883. *Merremia chryseides* Hallier f. in *Bot. Jahrb.* 16 : 552. 1893 ; Gamble, *FPM* 5 : 929. 1923.

Climbing herbs ; stems terete, angled, grooved, sparsely puberulous. Leaves up to 4.5 × 4 cm, ovate-acuminate, obscurely 3-lobed, cordate at base, irregularly dentate, sparsely hairy on either side of midrib near the petiole ; petioles about 4 cm long. Flowers yellowish with tube white, 0.6 cm long, in axillary, racemose cymes 3.5 cm long, bracteate ; peduncles about 9 cm long ; sepals 0.5 cm long, obtuse, oblong, concave, mucronulate ; corolla 0.6 cm long, lobes shallow ; stamens slightly exserted, filaments hairy ; ovary glabrous. Capsules 0.5 cm long, ovoid, transversely wrinkled ; seeds 4, glabrescent.

Fl. & Fr. : October-February.

World distribution : Tropics from Africa, India, Sri Lanka, Burma, Southern China, Malaysia and Australia.

Specimen examined : Ahobilam, 23-11-1969, *Ellis* 32589.

M. turpethum (Linn.) Shah & Bhatt in *Journ. Bombay nat. Hist. Soc.* 74 : 567. 1977 (1978). *Convolvulus turpethum* Linn. *Sp. Pl.* 155.

1753. *Ipomoea turpethum* (Linn.) R. Br. Prodr. 485. 1810; C. B. Cl. in Hook. f. FBI 4 : 212. 1883. *Operculina turpethum* (Linn.) S. Manso, Enum. Subst. Bras. 16. 1836; Ooststr. in Blumea 3 : 362. 1939 et in Steenis, Fl. Males. ser. I. 4 (4) : 456. 1953; Gamble, FPM 5 : 929. 1923.

Climbing shrubs; stems terete or faintly angled, 3-5-winged, glabrescent. Leaves about 10×10 cm, broadly ovate or lanceolate, entire, angled or lobed, rounded, cordate or hastate at base, sparsely puberulous; petioles about 6.5 cm long, angled, faintly winged. Flowers white, 4 cm long, solitary or in axillary, a few-flowered cymes 8 cm long, bracteate; sepals 2×1 cm, accrescent in fruits, unequal, oblong-apiculate, tomentose without; corolla 3×3 cm; stamens included, filaments sparsely hairy below; ovary glabrous, style filiform, stigma biglobular. Capsules about 2×2 cm, globose; seeds 4, finely reticulate.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from East Africa, India, Sri Lanka, Malaysia and Australia.

Specimen examined : Krishnanandi, Mahanandi, 9-12-1969, Ellis 32727.

IPOMOEA Linn.

1. Leaves entire :
 2. Inflorescences axillary :
 3. Sepals obtuse-orbicular :
 4. Flowers 4 cm long *I. illustris*
 4. Flowers up to 2 cm long .. *I. staphylina*
 3. Sepals acuminate .. *I. eriocarpa*
 2. Inflorescences terminal .. *I. hederifolia*
1. Leaves variously lobed :
 5. Plants creeping :
 6. Flowers about 1 cm long .. *I. coptica*
 6. Flowers about 7.5 cm long .. *I. diversifolia*
 5. Plants climbers :
 7. Climbing shrubs; leaves 25×25 cm .. *I. digitata*
 7. Climbing herbs; leaves 7×10 cm .. *I. pestigridis*

Ipomoea illustris (C. B. Cl.) Prain, Beng. Pl. 735. 1903; Ooststr. in Blumea 3 : 566. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 485. 1953. *I. campanulata* auctt. (non Linn.); Choisy in DC. Prodr. 9 : 359. 1845; Wt. Ic. 4 : t. 1375. 1850; C. B. Cl. in Hook. f. FBI 4 : 211. 1883;

Gamble, FPM 5 : 917. 1923. *I. campanulata* Linn. var. *illustris* C. B. Cl. l. c. 211.

Climbing shrubs ; branches terete, wrinkled, striate, puberulous when young. Leaves about 15×13 cm, ovate-orbicular, abruptly acuminate, cordate at base, glabrous ; lateral nerves parallel ; petioles up to 8 cm long. Flowers pink, 4 cm long, 4 cm across, in axillary, paniculate cymes about 10 cm long ; peduncles about 5 cm long ; sepals 1×0.8 cm, orbicular-oblong, tomentose, accrescent ; corolla 4 cm long, lobes prominent ; stamens included ; ovary glabrous. Capsules 1.5×1.3 cm, ovoid ; seeds 4, sericeous.

Fl. & Fr. : October-February.

World distribution : India, Sri Lanka, Malaysia and Philippines.

Specimen examined : Gundlabrahmeswaram, 27-10-1964, Ellis 2227.

Remarks : Austin, D. F., D. A. Pavell, and D. H. Nicolson (in *Brittonia* 30 : 195-196, 1978) have advocated for *Ipomoea illustris* Linn. giving way to *I. campanulata* Linn. by lectotypifying it. Interestingly, Ooststroom (*op. cit.* p. 485) points that Linnaeus' epithet is conspecific with *Thespesia lampas* (Linn.) Soland. and therefore C. B. Clarke's varietal epithet, at specific level, needs to be taken up as was done by Prain.

Ipomoea staphylina Roem. & Schult. Syst. Veg. 4 : 249. 1819 ; C. B. Cl. in Hook. f. FBI 4 : 210. 1883 ; Gamble, FPM 5 : 917. 1923.

Straggling or climbing shrubs ; branches terete, glabrous. Leaves up to 11×10 cm, ovate-lanceolate, rounded or truncate or cordate at base, glabrous ; petioles about 8 cm long. Flowers white, 1.7×2 cm, in axillary, paniculate cymes 17 cm long, bracteate ; sepals 0.4×0.3 cm, orbicular-oblong, glabrous ; corolla tube 1.5 cm long, lobes 0.5 cm long ; stamens included, filaments hairy at base ; ovary glabrous. Capsules 0.5×0.4 cm, ovoid ; seeds 4, sericeous.

Fl. & Fr. : December-March.

World distribution : India and Malay Peninsula.

Specimen examined : Ramanapenta, Gundlabrahmeswaram, 28-11-1969, Ellis 32622.

I. eriocarpa R. Br. Prodr. 484. 1810 ; Choisy in DC. Prodr. 9 : 369. 1845 ; C. B. Cl. in Hook. f. FBI 4 : 204. 1883 ; Ooststr. in Blumea 3 : 490. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 462. 1953. *I. hispida* Roem. & Schult. Syst. Veg. 4 : 238. 1819 (non Zuccagni, 1809) ; Gamble, FPM 5 : 915. 1923. *I. sessiliflora* Roth, Nov. Pl. Sp. 116. 1821 ; Wt. Ic. 1 : t. 169. 1840.

Climbing herbs; branches slender, grooved, puberulous. Leaves about 8×5 cm, ovate-acuminate, rounded and cordate at base, softly, sparsely pilose; petioles about 8 cm long. Flowers pink, 0.6 cm long, in axillary, subsessile cymes 2 cm across, bracteate; sepals about 0.5×0.2 cm, ovate-acuminate, densely pubescent without, glabrous within at base; corolla 0.5 cm long, densely pubescent in parts without on the tube and at tips of lobes, glabrous within; stamens included; ovary pubescent. Capsules 0.5×0.5 cm, ovoid, pubescent; seeds 4, minutely reticulate.

Fl. & Fr. : November-January.

World distribution : Tropics from Africa, India, Malaysia and North Australia.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18007; Srisailam, 21-10-1964, *Ellis* 22124; Diguvametta, 16-11-1969, *Ellis* 32386.

Ipomoea hederifolia Linn. Syst. Nat. ed. 10. 925. 1759; O'Donnell in Lilloa 29 : 45. 1959; Santapau in Rec. bot. Surv. Ind. 16(1) : 169. 3rd rep., ed. 1967. *I. angulata* Lamk. Tab. Encycl. 1 : 464. 1791; Ooststr. in Blumea 3 : 553. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 481. 1953. *I. phoenicea* Roxb. Fl. Ind. 2 : 92. 1824. *I. coccinea sensu* C. B. Cl. in Hook. f. FBI 4 : 199. 1883, (*non* Linn.). *Quamoclit phoenicea* Choisy in Mem. Soc. Phys. Genev. 6 : 433. 1833; Gamble, FPM 5 : 918. 1923. *Q. coccinea* Moench. Hort. Marb. 453. 1795; Choisy in DC. Prodr. 9 : 335. 1845.

Climbing herbs; branches terete, faintly grooved, puberulous. Leaves about 10×7 cm, ovate-acuminate, apiculate, cordate at base, angular, obscurely to deeply 3-lobed; petioles about 4 cm long. Flowers red, 4 cm long, in lateral and terminal cymes about 25 cm long; pedicels about 1 cm long; calyx 0.4 cm long, lobes ovate, awned at back; corolla about 4 cm long, lobes shallow; ovary glabrous. Capsules about 0.7×0.7 cm; seeds 4, densely hairy or glabrescent.

Fl. & Fr. : September-January.

World distribution : Tropics from Africa, India, China, Japan, Malaysia and extending up to South America.

Specimen examined : Chelama, 7-12-1963, *Ellis* 17960.

I. coptica (Linn.) Roth ex Roem. & Schult Syst. Veg. 4 : 208. 1819; Ooststr. in Blumea 3 : 544. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 479. 1953. *Convolvulus copticus* Linn. Mant. 2 : 559. 1771. *Ipomoea dissecta* Willd. Phytogr. 5, t. 2. 1794; Choisy in DC. Prodr. 9 : 384. 1845; C. B. Cl. in Hook. f. FBI 4 : 200. 1883; Gamble, FPM 5 : 918. 1923.

Trailing herbs; branches about 20 cm long, angled, grooved, glabrous; rootstocks prominent. Leaves about 3 cm long, highly variable, digitate, segments highly dissected, generally the central elliptic, acute at base, irregularly serrate, pseudo-stipulate; petioles short. Flowers white, about 1 cm long, in axillary cymes 2 cm long, bracteate; peduncles about 3 cm long, angled; sepals 0.5 cm long, oblong, verruculose on back, abruptly acuminate; corolla about 1.2 cm long, lobes shallow; stamens included; ovary glabrous. Capsules about 1×0.8 cm, ovoid; seeds about 3, puberulous.

Fl. & Fr. : September-February.

World distribution : Tropics from Africa, India, Malaysia and North Australia, in dry localities.

Specimen examined : Mahanandi, 10-12-1969, *Ellis* 32730.

Ipomoea diversifolia R. Br. Prodr. 487. 1810; Ooststr. in Blumea 3 : 545. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 479. 1953. *I. laciniata* (Dalz.) C. B. Cl. in Hook. f. FBI 4 : 200. 1883; Gamble, FPM 5 : 918. 1923. *Pharbitis laciniata* Dalz. in Hook. Kew Journ. Bot. 3 : 178. 1851.

Climbing or creeping herbs; branches angled, striate, glabrous; rootstocks woody. Leaves about 5 cm across, digitately lobed, lobes ovate, obovate, orbicular, or laciniate, linear, acute or obtuse at base, crenate-serrate or serrate, glabrous. Flowers pale purple, 7.5×3 cm, solitary or in cymes about 3.5 cm long, axillary, bracteolate, pseudo-stipulate; sepals about 0.7×0.4 cm, unequal, elliptic, apiculate, glabrous; corolla tube 5 cm long, lobes 3 cm long, shallow; stamens included; ovary glabrous. Capsules 1×0.8 cm, oblong; seeds about 6, puberulous.

Fl. & Fr. : July-November.

World distribution : India, Malaysia, Philippines and Northeast Australia.

Specimen examined : Gundlabrahmeswaram, 30-11-1969, *Ellis* 32681.

I. digitata Linn. Sp. Pl. ed. 10. 924. 1759; C. B. Cl. in Hook. f. FBI 4 : 202. 1883; Choisy in DC. Prodr. 9 : 389. 1845; Ooststr. in Blumea 3 : 558. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 483. 1953. *I. paniculata sensu* R. Br. Prodr. 486. 1810 (*non* Burm. f.); Gamble, FPM 5 : 918. 1923.

Shrubby climbers; branches terete, glabrous, grooved. Leaves about 25×25 cm, palmately divided, cordate at base; lobes 5-7, ovate-acuminate, mucronulate, glabrous. Flowers pale pink, about 6×2.5 cm, in axillary

cymes 4 cm across ; pedicels faintly muriculate ; peduncles 7 cm long ; sepals 0.8 cm long, oblong-orbicular, concave, coriaceous ; corolla glabrous, lobes shallow ; stamens included, filaments hairy at base ; ovary glabrous. Capsules 1 × 1 cm, ovoid ; seeds 4, black, woolly.

Fl. & Fr. : July-December.

World distribution : Pantropic.

Specimen examined : Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22137.

Remarks : Apparently a garden escape.

Ipomoea pestigridis Linn. Sp. Pl. 162. 1753 ; DC. Prodr. 9 : 363. 1845 ; Wt. Ic. 3 : t. 836. 1844 ; C. B. Cl. in Hook. f. FBI 4 : 204. 1883 ; Gamble, FPM 5 : 917. 1923 ; Ooststr. in Blumea 3 : 504. 1940 et in Steenis, Fl. Males. ser. I. 4(4) : 467. 1953.

Climbing herbs ; branches grooved with spreading hairs. Leaves 7 × 10 cm, palmately 5-7-lobed almost to base ; lobes ovate, abruptly acuminate, narrowed at base, shaggy ; petioles about 11 cm long, sparsely pubescent with spreading hairs. Flowers white, about 2 cm long, sessile, in axillary heads 2 cm across ; bracts about 1.5 × 0.7 cm, elliptic-acuminate, densely shaggy ; sepals 0.4 cm long, slightly unequal, lanceolate, hairy ; corolla about 3 cm long, lobes shallow ; stamens included, filaments glabrous ; ovary glabrous. Capsules 0.8 × 0.6 cm, ovoid ; seeds 4, tomentose.

Fl. & Fr. : July-December.

World distribution : Tropics from East Africa, India, Sri Lanka and Malaysia.

Specimens examined : Cheiama, 16-10-1964, *Ellis* 22050 ; Diguva-metta, 16-11-1969, *Ellis* 32395.

SOLANACEAE

- | | | |
|--|----|----------|
| 1. Flowers about 16 cm long ; fruits capsular, spinescent | | DATURA |
| 1. Flowers less than 1.5 cm long ; fruits of berries, not spinescent : | | |
| 2. Calyx accrescent and inflated in fruits | .. | PHYSALIS |
| 2. Calyx not accrescent, nor inflated in fruits | .. | SOLANUM |

DATURA Linn.

Datura metel Linn. Sp. Pl. 179. 1753 ; C. B. Cl. in Hook. f. FBI 4 : 243. 1883 ; Safford in Journ. Wash. Acad. Sci. 11 (8) : 178-179. 1921 ;

Gamble, FPM 5 : 941. 1923 ; Santapau in Journ. Bombay nat. Hist. Soc. 47 : 657. 1948. *D. fastuosa* Linn. Syst. Nat. 2 : 932. ed. 10. 1759 ; Dunal in DC. Prodr. 8 : 542. 1844 ; Gamble, *loc. cit.* p. 941. *D. fastuosa* var. *alba* (Nees) C. B. Cl. *loc. cit.* 243. *D. alba* Nees in Trans. Linn. Soc. 17 : 73. 1834.

Robust herbs, about 1 m high ; branches purplish-black, zig-zag, angled or terete, faintly puberulous or glabrous. Leaves about 17×14 cm, broadly ovate, 5-8-shallowly lobed, unequal at base, glabrous ; petioles about 7 cm long. Flowers purple without and white within, about 16 cm long, 6 cm across, axillary ; pedicels 1 cm long ; calyx tube about 5.5 cm long, puberulous without, lobes 1 cm long, acuminate ; corolla lobes shallow, tube about 14 cm long ; stamens as long as corolla tube, anthers elongated ; ovary softly tuberculate, stigmas club-shaped. Capsules about 5 cm across, globose, spinous-tuberculate, seated on a circuncised orbicular calyx ; seeds many, flattened.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka and Malaysia.

Specimens examined : Chelama, 12-12-1963, *Ellis* 18068 ; Bogada, 19-11-1969, *Ellis* 32533.

Remarks : Rather a rare plant.

Santapau (*op. cit.* pp. 657-658) has discussed at length the nomenclature of this taxon, quoting Safford's work ; Safford (*op. cit.*) had said, '...That the white and purple forms of the various forms of this single or double forms of the single or double flowered plants should all be referred to one species by Linnaeus is justified by the best modern authorities on East Indian Botany ; but that the name *D. fastuosa* should be adopted for the species and the previously established type (*D. metel*) reduced to a synonym, as in *Trimen's Handbook of the Flora of Ceylon*, is inexcusable...'.
 .

PHYSALIS Linn.

Physalis minima Linn. Sp. Pl. 183. 1753 ; Dunal in DC. Prodr. 8 : 445. 1844, *p.p.* ; C. B. Cl. in Hook. f. FBI 4 : 238. 1883 ; Gamble, FPM 5 : 939. 1923.

Erect herbs, about 40 cm high ; branches zig-zag, striate, grooved, puberulous in young ones. Leaves about 7×4 cm, ovate-acuminate, elliptic, coarsely dentate, rounded at base, faintly puberulous or glabrous, sparsely hirsute ; petioles about 5 cm long, grooved, puberulous. Flowers

yellow, 0.6 cm long, axillary, solitary; pedicels 0.9 cm long; calyx tube 0.3 cm long, lobes 0.2 cm long, accrescent and inflated in fruits, sparsely pilose without, puberulous along margins; stamens included; ovary glabrous. Berries about 1 × 1 cm, globular; seeds several, compressed, finely muriculate.

Fl. & Fr. : July-January.

World distribution : Tropics in Africa, India and Australia.

Specimen examined : Mahanandi, 23-8-1965, *Ellis* 25519.

Remarks : The plant is highly variable with regard to the amount of pubescence and size of leaves.

SOLANUM Linn.

- | | |
|--|----------------------|
| 1. Herbs, about 60 cm high; berries up to 1.5 × 1.5 cm : | |
| 2. Herbs prickly | <i>S. surattense</i> |
| 2. Herbs not prickly | .. <i>S. nigrum</i> |
| 1. Shrubs, about 1.5 m high; berries 2.5 × 3 cm | .. <i>S. incanum</i> |

Solanum surattense Burm. f. *Fl. Ind.* 57. 1768; Santapau in *Bull. bot. Surv. Ind.* 3 : 20. 1961; Venkatarreddi in *Bull. bot. Surv. Ind.* 11 : 209. 1969. *S. xanthocarpum* Schrad. & Wendl. *Sert. Hanov.* 1 : 8. 1795; Dunal in *DC. Prodr.* 8 : 302. 1844; C. B. Cl. in *Hook. f. FBI* 4 : 236. 1883; Gamble, *FPM* 5 : 938. 1923; Santapau in *Journ. Bombay nat. Hist. Soc.* 47 : 653. 1948. *S. jacquini* Willd.; *Wt. Ic.* 4 : t. 1401. 1840. *S. mecanii* Santapau, *loc. cit.* 654.

Diffuse or erect herbs, about 30 cm high; branches terete, very prickly, woody at base; rootstocks woody. Leaves about 10 × 5 cm, deeply sinuate, very prickly, stellate-hairy on both surfaces; petioles about 2 cm long. Flowers bluish pink, 1 cm long, in extra-axillary, 3-5-flowered cymes 6 cm long; pedicels about 1.4 cm long; calyx lobes 0.3 cm long, accrescent in fruits, spinescent, tube 0.2 cm long; corolla 1 cm long, stellate-pubescent without, lobes shallow; anthers elongated, dehiscent apically, glabrous. Berries 1.5 × 1.5 cm, globose; seeds several, flattened, alveolate.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Pacific Islands, in dry localities.

Specimens examined : Ahobilam, 29-8-1965, *Ellis* 25550; Ahobilam, 23-11-1969, *Ellis* 32596.

Solanum nigrum Linn. Sp. Pl. 186. 1753 ; Dunal in DC. Prodr. 8 : 150. 1844 ; Gamble, FPM 5 : 936. 1923 ; C. B. Cl. in Hook. f. FBI 4 : 229. 1883. *S. rubrum* Mill. Gard. Dict. ed. 8. n. 4. 1768, (*non* Linn. 1767) ; Wt. Ic. 2 : t. 344. 1840.

Erect herbs, about 60 cm high ; branches zig-zag, glabrescent, sparsely hirtellous. Leaves about 10×4 cm, elliptic-acuminate, coarsely dentate or entire, attenuate at base, sparsely hirtellous ; petioles short. Flowers about 0.3×0.3 cm, in extra-axillary umbels 1.5 cm across ; pedicels about 1 cm long ; peduncles 2 cm long ; calyx lobes 0.1 cm long, oblong-orbicular, puberulous without, tube short ; corolla lobes 0.1 cm long, ovate, puberulous without, tube 0.1 cm long ; anthers longer than filaments ; ovary 0.1 cm long, style pubescent. Berries 0.5×0.5 cm, globose ; seeds many, alveolate.

Fl. & Fr. : October-April.

World distribution : A cosmopolitan weed.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17937 ; Bogada, 19-11-1969, *Ellis* 32530.

S. incanum Linn. Sp. Pl. 188. 1753 ; Dunal in DC. Prodr. 8 : 368. 1844 ; C. B. Cl. in Hook. f. FBI 4 : 235. 1883, *p. p.* *S. coagulans* Forsk. Fl. Aegypt.-Arab. 47. 1775. *S. melongena sensu* C. B. Cl. *loc. cit.* 235. *p. p.* (*non* Linn.). *S. melongena* var. *insanum* (Linn.) Prain ; Gamble, FPM 5 : 937. 1923. *S. insanum* Linn. Mant. Pl. 1 : 46. 1768.

Shrubs, about 1.5 m high ; branches prickly, densely to sparsely stellate-pubescent. Leaves about 14×6 cm, ovate, rounded, oblong, acute, equal or unequal at base, sinuately lobed along margin, prickly along veins, stellate-puberulous above, densely so beneath ; petioles about 2.5 cm long, tomentose, prickly. Flowers violet, 1.5 cm across, in lateral racemes about 7 cm long ; calyx lobes 1 cm long, tube 0.5 cm long, densely pubescent without ; corolla 1 cm long, densely tomentose without, lobes ovate ; stamens included, anthers puberulous halfway down ; ovary pubescent, style glabrous, stigmas pubescent. Berries 2.5 × 3 cm, globose ; seeds several alveolate.

Fl. & Fr. : January-May.

World distribution : South and Tropical Africa, Middle East and India.

Specimen examined : Maddipenta, Eastern Nallamalais, 11-8-1972, *Ellis* 42228.

SCROPHULARIACEAE

- | | | |
|---|----|--------------|
| 1. Corolla tube curved at top : | | |
| 2. Corolla lobes 5, unequal or subequal | .. | BUCHNERA |
| 2. Corolla 2-lipped | .. | STRIGA |
| 1. Corolla tube not curved : | | |
| 3. Corolla 3 cm long | .. | SOPUBIA |
| 3. Corolla less than 1.5 cm long : | | |
| 4. Calyx polysepalous or nearly so ; corolla rotate, lobes 4, pilose without | .. | SCOPARIA |
| 4. Calyx gamosepalous, tubular ; corolla bilabiate or 5-lobed, lobes glabrous without : | | |
| 5. Leaves glandular-punctate or pellucid-dotted, at least on lower surface : | | |
| 6. Styles dilated at apex, stigmas entire or bilobed | .. | BACOPA |
| 6. Style slender, stigmas 2-lamellate | .. | LIMNOPHILA |
| 5. Leaves without glands or pellucid dots : | | |
| 7. Anther cells parallel ; corolla yellow | .. | LINDENBERGIA |
| 7. Anther cells divergent ; corolla white, bluish-purple or pink | .. | LINDERNIA |

BUCHNERA Linn.

Buchnera hispida Buch.-Ham. in D. Don, Prodr. 91. 1825 ; Benth. in DC. Prodr. 10 : 496. 1845 ; Wt. Ic. 4 : t. 1413. 1850 ; Hook. f. Fl. Bor. 4 : 298. 1884 ; Gamble, FPM 6 : 966. 1924.

Erect herbs, about 50 cm high ; branches sparingly hirsute. Leaves about 3.5 × 1.5 cm, upper often much linear and larger, elliptic-ovate, acute at base, sparsely hirtellous, sessile. Flowers violet, 1 cm long, in terminal racemes about 40 cm long, bracteate ; calyx 0.6 cm long, hirtellous without, lobes 0.1 cm long ; corolla lobes 0.1 cm long, unequal or subequal, tube 0.9 cm long, hairy within ; stamens included, didynamous, anthers dorsifixed ; ovary glabrous, style dilated above stigma entire. Capsules 0.5 cm long ; seeds numerous, minute, angled.

Fl. & Fr. : September-January.

World distribution : Tropics from Africa, India and Sri Lanka.

Specimen examined : Chelama, 8-12-1963, Ellis 17997.

STRIGA Lour.

- | | | |
|---|----|------------------------|
| 1. Leaves about 1.2 cm long ; plants reddish ; calyx lobes 1-ribbed | .. | <i>S. gesnerioides</i> |
| 1. Leaves about 5 cm long ; plants greenish ; calyx lobes 3-ribbed | .. | <i>S. angustifolia</i> |

Striga gesnerioides (Willd.) Vatke in Oest. Bot. Zeitschr. 25 : 11. 1875 ; Pennell in Acad. nat. Sci. Phil. Mon. 5 : 97. 1943 ; Santapau in Journ. Bombay nat. Hist. Soc. 49 : 42. 1950 ; Saldanha in Bull. bot. Surv. Ind. 5 : 68. 1963. *Buchnera gesnerioides* Willd. Sp. Pl. 3 : 338. 1800. *Striga orobanchioides* (R. Br. ex Endl.) Benth. in Hook. Comp. Bot. Mag. 1 : 361, t. 19. 1836 et in DC. Prodr. 10 : 501. 1846 ; Wt. Ic. 4 : t. 1414. 1850 ; Hook. f. FBI 4 : 299. 1884 ; Gamble, FPM 6 : 967. 1924.

Erect herbs, about 45 cm high, parasitic on roots of other plants ; stems reddish, striate, puberulous. Leaves scaly, about 1.2×0.3, linear, scaberulous, sessile. Flowers white with a pink tinge, 1 cm long, in terminal spikes about 18 cm long, bracteate, bracteolate ; calyx 0.4 cm long, lobes short, acuminate, hirsute along margins, 1-ribbed ; corolla 0.6 cm long, lobes obtuse, hairy within, tube incurved at top ; stamens 4, didynamous, anthers 1-celled ; ovary glabrous, style dilated above. Capsules 0.6×0.4 cm, ellipsoid ; seeds numerous, reticulate.

Fl. & Fr. : October-July.

World distribution : Africa, Middle East, India and Sri Lanka.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22048 ; Abobilam, 23-11-1969, *Ellis* 32595.

S. angustifolia (D. Don) Saldanha in Bull. bot. Surv. Ind. 5 : 70. 1963. *Buchnera angustifolia* D. Don, Prodr. 91. 1825. *Striga euphrasioides* (Benth.) Benth. in Hook. Compd. Bot. Mag. 1 : 364. 1836 et in DC. Prodr. 10 : 503. 1846 ; Wt. Ic. 3 : t. 855. 1844 ; Hook. f. FBI 4 : 299. 1884 ; Gamble, FPM 6 : 568. 1924.

Erect herbs, about 35 cm high ; stems grooved, striate, hirtellous ; parasitic on roots of other plants. Leaves about 5×0.3 cm, linear, hirtellous, sessile. Flowers white, 1.5 cm long, axillary, in spikes 25 cm long ; calyx lobes 0.6 cm long, acuminate, hirtellous without, 3-ribbed from base, tube 0.2 cm long ; corolla 1.7 cm long, tube 1.2 cm long, hairy, curved at top, lobes unequal, obtuse ; stamens didynamous, anthers 1-celled ; ovary glabrous. Capsules 0.6 cm long ; seeds numerous, striate.

Fl. & Fr. : August-December.

World distribution : India.

Specimens examined : Chelama, 17-10-1964, *Ellis* 22070 ; Jabakulavagu, Mahanandi, 22-8-1965, *Ellis* 25493 ; Diguvametta, 18-11-1969, *Ellis* 32508.

SOPUBIA Buch.-Ham. ex D. Don

Sopubia delphinifolia (Linn.) G. Don, Gen. Syst. 4 : 560. 1837 ; Benth.

in DC. Prodr. 10 : 522. 1846 ; Hook. f. FBI 4 : 302. 1884 ; Gamble, FPM 6 : 970. 1924. *Gerardia delphinifolia* Linn. Cent. Pl. 2 : 21. 1756.

Erect herbs, about 60 cm high ; branches grooved, striate, scaberulous. Leaves up to 5 cm long, pinnatisect, filiform, scaberulous. Flowers pink, 3 cm long, in axillary racemes about 4 cm long ; bracts leafy ; bracteoles 2 ; calyx lobes 0.6 cm long, linear, scaberulous, tube 0.6 cm long ; corolla 3 cm long, tube infundibuliform, lobes 5, spreading, orbicular ; stamens didynamous, one anther cell stipitate, filaments sparsely hairy ; ovary glabrous, style filiform, stigmas thickened. Capsules 0.6 cm long, ovoid ; seeds numerous, small, striate.

Fl. & Fr. : September-November.

World distribution : India and Sri Lanka, in swampy localities.

Specimens examined : 'Kurnool', 1856, *Dr. Drew* s.n. ; Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22126.

SCOPARIA Linn.

Scoparia dulcis Linn. Sp. Pl. 116. 1753 ; Benth. in DC. Prodr. 10 : 431. 1846 ; Hook. f. FBI 4 : 289. 1884 ; Gamble, FPM 6 : 964. 1924.

Erect herbs, about 40 cm high ; stems angled. Leaves up to 4×1.8 cm, often whorled, ovate, cuneate at base, serrate, punctate. Flowers white, 0.5 cm long, axillary, solitary or two ; pedicels about 0.7 cm long ; calyx polysepalous, lobes elliptic-ovate, hairy along margins, tube 0.2 cm long ; corolla 0.2 cm long, densely pilose without, pubescent within at throat, lobes unequal ; stamens 4, filaments filiform ; ovary glabrous, style rather thick, stigmas thick. Capsules 0.3×0.3 cm, ovoid, enclosed in persistent calyx ; seeds many, scrobiculate.

Fl. & Fr. : April-November.

World distribution : A native of tropical America ; a pantropic weed.

Specimens examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16928 ; Gundlabrahmeswaram, 30-11-1969, *Ellis* 32678.

BACOPA Aubl. *nom. cons.*

Bacopa monnieri (Linn.) Pennell in Proc. Acad. nat. Sci. 98 : 94. 1946. *Lysimachia monnieri* Linn. Cent. Pl. 2 : 9. 1756. *Herpestis monniera* (Linn.) H.B.K. Nov. Gen. et. Sp. 2 : 366. 1817 ; Benth. in DC. Prodr. 5 : 10. 1836 ; Hook. f. FBI 4 : 272. 1884 ("monniera"). *Moniera cuneifolia* Michaux, Fl. Bor. Amer. 2 : 22. 1803 ("Monniera") ; Gamble, FPM 5 : 953. 1923.

Procumbent herbs ; branches glabrous, rooting at nodes. Leaves about 2×0.6 cm, oblong-obovate, spathulate, acute at base, sessile. Flowers pale blue, 0.6 cm long, axillary, solitary, pedicels 1.5 cm long ; outer calyx lobes 0.5×0.3 cm, inner linear ; corolla 0.8 cm long, lobes orbicular ; stamens included, didynamous ; ovary glabrous, style dilated at apex, stigmas entire or bilobed. Capsules 0.4×0.3 cm, ovoid ; seeds numerous, striated.

Fl. & Fr. : Throughout the year.

World distribution : Cosmopolitan.

Specimen examined : Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23763.

LIMNOPHILA R. Br. *nom. cons.*

- | | |
|---|------------------|
| 1. Leaves of one type, up to 7×4 cm | <i>L. rugosa</i> |
| 1. Leaves of two types, up to 2×0.5 cm | <i>L. indica</i> |

Limnophila rugosa (Roth) Merr. Interpr. Rumph. Herb. Amb. 466, 1917 ; Raizada in Indian For. 5 : 26. 1958 ; Subramanyam, Aquat. Angiosp. 29. 1962 ; Philcox in Kew Bull. 24 : 135. 1970. *Herpestis rugosa* Roth, Nov. Sp. Pl. 290. 1821. *Limnophila roxburghii sensu* Hook. f. FBI 4 : 265. 1884 ; Gamble, FPM 2 : 951. 1923 (*non* G. Don).

Herbs, in marshy places; about 80 cm high, strongly aromatic ; stems weak, decumbent, glabrous to sparsely puberulous. Leaves about 7×4 cm, ovate, elliptic-oblong, obovate, cuneate at base, crenate-serrate, rugose, bullate in older leaves, glandular, sparsely hirtellous ; petioles about 1 cm long. Flowers violet with tube yellow within and reddish without, 1 cm long, solitary or in axillary clusters about 1.5 cm across, bracteate, sometimes shortly peduncled ; calyx lobes 0.5 cm long, upper largest, acuminate, sparsely hirtellous, glandular, tube 0.1 cm long ; corolla about 1 cm long, sparsely glandular without, villous within, posterior lobe broader ; stamens didynamous ; ovary glabrous. Capsules 0.5 cm long, ellipsoid ; seeds black, numerous, angular.

Fl. & Fr. : August-January.

World distribution : India, China and Pacific Islands.

Specimen examined : Rollapenta, 14-8-1972, *Ellis* 42250.

L. indica (Linn.) Druce in Rep. bot. Exch. Club Brit. Is. 3 : 420. 1914 ; Pennell in Acad. nat. Sci. Phil. Monogr. 5 : 26. 1943 ; Subramanyam, Aquat. Angiosp. 30. 1962 ; Philcox in Kew Bull. 24 : 115. 1970. *Hottonia indica* Linn. Syst. Nat. ed. 10. 919. 1759. *Limnophila*

gratioloides R. Br. Prodr. 442. 1810; Benth. Scroph. Ind. 25. 1831 et in DC. Prodr. 10 : 389. 1845; Hook. f. FBI 4 : 271. 1885; Gamble, FPM 5 : 952. 1923.

Amphibious, perennial herbs; aerial stems about 10 cm long, faintly angled, glandular, submerged stems much longer, glabrous. Aerial leaves about 2×0.5 cm, verticillate or opposite, obovate, linear-obovate, acute at base, crenate-serrate, glandular, submerged leaves about 2 cm long, verticillate, pinnatisect lobes becoming capillary. Flowers white to pale pink, about 1 cm long, axillary, solitary; pedicels 0.3 cm long; calyx lobes 0.2 cm long, acuminate, tube 0.2 cm long; corolla 0.8 cm long; filaments of 2 types—2 longer and 2 shorter; ovary glabrous, stigmas lamellate. Capsules 0.3×0.3 cm, ovoid; seeds black, numerous, angular.

Fl. & Fr. : May-February.

World distribution : Tropics from Africa, India, Sri Lanka, China, Malaysia and Australia.

Specimens examined : Srisailam, 12-7-1963, *Ellis* 16836; Chelama, 7-12-1963, *Ellis* 17974; Diguva-metta, 16-11-1969, *Ellis* 32385.

LINDENBERGIA Lehm.

Lindenbergia muraria (Roxb. ex D. Don) Bruhl in Journ. Dept. Sci. Calcutta Univ. 2. Bot. 27. 1920. *Stemodia muraria* Roxb. ex D. Don, Prodr. 89. 1825. *Lindenbergia indica* Vatke in Oestr. Bot. Zeitschi. 25 : 10. 1875. *L. urticaefolia* Lehm. in Link & Otto, Ic. Pl. Rar. Berol. 95, t. 48. 1828; Benth. in DC. Prodr. 10 : 377. 1846; Hook. f. FBI 4 : 262. 1884; Gamble, FPM 5 : 948. 1923.

Erect or decumbent herbs, about 30 cm high, in crevices of dripping wall; branches weak, pubescent. Leaves about 5×2 cm, ovate-oblong, obtuse at base, crenate-serrate, sparsely pubescent; petioles about 0.8 cm long. Flowers yellow, about 1.5 cm long, axillary, solitary or two; calyx 0.4 cm long, pubescent, lobes ovate; corolla 1.3 cm long, 2-lipped, sparsely pubescent without, densely so within; stamens didynamous, anther cells parallel; ovary hairy. Capsules 0.4 cm long, patently hairy; seeds numerous, minute, faintly striated.

Fl. & Fr. : March-September.

World distribution : Middle East, India and Burma.

Specimens examined : Gundlabrahmeswaram, 27-10-1964, *Ellis* 22216; Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23754.

LINDERNIA Allioni

[S. K. Mukerjee (1945) in his revision of the Indo-Burmese species of *Lindernia* has traced the history of the circumscription of the genus, *Lindernia* and subscribes to the broader circumscription of the genus which includes *Vandellia* Linn., *Ilysanthes* Raf., and *Bonnaya* Link & Otto, following Pennell (1935). Here Pennell and Mukerjee are followed.]

- | | | |
|---|----|---------------------|
| 1. Leaves sharply serrate ; capsules linear, longer than calyx | .. | <i>L. ciliata</i> |
| 1. Leaves crenate-serrate ; capsules ovoid, as long as calyx : | | |
| 2. Branches and leaves sparsely hirsute ; margin of leaves excurved | .. | <i>L. pusilla</i> |
| 2. Branches and leaves glabrous ; margin of leaves not excurved | .. | <i>L. crustacea</i> |

Lindernia ciliata (Colsm.) Pennell in Brittonia 2 : 182. 1936 ; Mukerjee in Journ. Indian bot. Soc. 24 : 129. 1945 ; Philcox in Kew Bull. 22 : 42. 1968. *Gratiola ciliata* Colsm. Prodr. Desc. Grah. 14. 1793. *Bonnaya brachiata* Link & Otto, Ic. Pl. Select. 25, t. 11. 1820 ; Benth. in DC. Prodr. 10 : 420. 1846 ; Hook. f. FBI 4 : 284. 1884. *Ilysanthes serrata* (Roxb.) Urban in Ber. Deutsch. Bot. Ges. 2 : 436. 1884 ; Gamble, FPM 5 : 962. 1923. *Gratiola serrata* Roxb. Fl. Ind. 1 : 139. 1820. *Vandellia brachiata* (Link & Otto) Haines, Bot. Bihar & Orissa 632. 1922. *V. ciliata* (Colsm.) Yamazaki in Journ. Jap. Bot. 30 : 176. 1955. *Lindernia brachiata* (Link & Otto) Biswas in Sp. Publ. bot. Soc. Bengal 1 : 36. 1950.

Erect herbs, about 10 cm high ; branches angled, grooved, glabrous. Leaves up to 3 × 1 cm, oblong, ovate, obtuse, auricled at base, sharply crenate-serrate. Flowers white with a blue patch at base, 0.5 cm long, in terminal racemes 4 cm long, bracteate ; calyx lobes 0.3 cm long, linear-acuminate ; corolla 0.4 cm long, shortly exerted ; stamens 2, upper fertile, lower sterile ; ovary glabrous, style filiform, stigmas 2-lamellate. Capsules 1.3 cm long, linear-oblong ; seeds numerous, minute, rugose.

Fl. & Fr. : July-September.

World distribution : India, Sri Lanka, China, Malaysia and Philippine Islands.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22171 ; Mahanandi, 23-8-1965, *Ellis* 25507 ; Diguvaletta, 19-11-1969, *Ellis* 32542.

L. pusilla (Willd.) Boldingh, Zakfl. Landboustr. 165. 1916 ; Merrill in Philip. Journ. Sci. Bot. 11 : 312. 1917 ; Philcox in Kew Bull. 22 : 41.

1968. *Gratiola pusilla* Willd. Sp. Pl. 1 : 105. 1797. *Vandellia scabra* Benth. Scroph. Ind. 36. 1835 ; DC. Prodr. 10 : 414. 1846 ; Hook. f. FBI 4 : 281. 1884 ; Gamble, FPM 5 : 962. 1923. *Lindernia hirta* (Cham. & Schlect.) Pennell in Journ. Arnold Arb. 24 : 250. 1943 ; Mukerjee in Journ. Indian bot. Soc. 24 : 131. 1945. *Torenia hirta* Cham. & Schlect. in Linnaea 2 : 571. 1827.

Diffuse herbs, up to 8 cm high ; branches angled, sparsely pubescent. Leaves about 1×1 cm, ovate, cordate at base, crenate-serrate, margin excurved, sparsely hirsute, sessile. Flowers white, 0.5 cm long, axillary and terminal, solitary or two ; pedicels 1.5 cm long ; calyx 0.3 cm long, linear-lanceolate, hirsute without ; corolla 0.5 cm long, bilobed, tube 0.4 cm long ; stamens 4, didynamous, slightly exerted, anther cells divaricate ; ovary glabrous, style slender, stigmas bilamellate. Capsules 0.2×0.2 cm, ovoid ; seeds numerous, minute, rugose.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka, China and Malaysia.

Specimens examined : Sunnipenta, Srisailam, 15-7-1963, *Ellis* 16892 ; Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22127.

Lindernia crustacea (Linn.) F. Mueller, Cens. Aust. Pl. 97. 1882 ; Pennell in Brittonia 2 : 182. 1936 ; Mukerjee in Journ. Indian bot. Soc. 24 : 130. 1945 ; Philcox in Kew Bull. 22 : 42. 1968. *Capraria crustacea* Linn. Mant. Pl. 1 : 87. 1767. *Vandellia crustacea* (Linn.) Benth. Scroph. Ind. 35. 1835 et in DC. Prodr. 10 : 413. 1846 ; Wt. Ic. 3 : t. 863. 1844 ; Hook. f. FBI 4 : 279. 1884 ; Gamble, FPM 5 : 959. 1923.

Diffuse herbs, about 14 cm high ; branches decumbent, angled, glabrous. Leaves about 1.5×1.5 cm, ovate, cordate at base, crenate-serrate, shortly petiolate. Flowers pale pink, 0.6 cm long, in axillary or terminal, single or few-flowered racemes 2 cm long ; pedicels about 2 cm long ; calyx 0.4 cm long, lobes short, few-haired without along midrib ; corolla 0.7 cm long ; stamens 4, didynamous, filaments slender, appendaged at base, anther cells divaricate ; ovary glabrous, stigmas bilamellate. Capsules 0.2×0.2 cm, ovoid ; seeds numerous, minute, rugose.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Malaysia.

Specimen examined : Diguvametta, 17-11-1969, *Ellis* 32459.

LENTIBULARIACEAE

UTRICULARIA Linn.

- | | | |
|--------------------------------|----|---|
| 1. Aquatic herbs | .. | <i>U. exoleta</i> |
| 1. Marshy, terrestrial herbs : | | |
| 2. Twining plants | | <i>U. scandens</i> |
| 2. Erect plants | .. | <i>U. reticulata</i> var. <i>parviflora</i> |

Utricularia exoleta R. Br. Prodr. 430. 1810 ; C. B. Cl. in Hook. f. FBI 4 : 329. 1884 ; Gamble, FPM 6 : 980. 1924 ; Santapau in Journ. Bombay nat. Hist. Soc. 49 : 218. 1950 ; Gandhi in Saldanha & Nicolson, Fl. Hassan Dt. 564. 1976 ; Taylor in Steenis, Fl. Males. ser. I. 8 (2) : 294. 1977. *U. biflora* Roxb. Fl. Ind. 1 : 144. 1820 (*non* Lamk.). *U. gibba* Linn. ssp. *exoleta* (R. Br.) Taylor in Mitt. Bot. Staatssamml. München 4 : 101. 1961 et in Kew Bull. 18 : 204. 1964.

Aquatic, floating herbs ; stolons branched, trap-bearing. Leaves minute, sparingly dissected, lobes capillary, some modified into traps ; traps obliquely ovoid, mouth lateral, truncate, ciliate. Flowers yellow, 0.3 cm long, in terminal racemes 4 cm long, bracteate, pedicellate ; calyx 0.2 cm long, tube small ; corolla 0.3 cm long, spur obtusely conical. Capsules 0.3 × 0.3 cm, globose ; seeds numerous, minute, crenately winged.

Fl. & Fr. : February-March.

World distribution : Africa, India, Sri Lanka, Malaysia and North Australia.

Specimens examined : Sunnipentavagu, Srisailam, 13-7-1963, *Ellis* 16849 ; Pathajaganga, Srisailam, 25-3-1965, *Ellis* 23759 ; Srisailam, 27-3-1965, *Ellis* 23788.

U. scandens Benj. in Linnaea 20 : 309. 1847 ; Taylor in Dansk. Bot. Ark. 23 : 531. 1968 et in Steenis, Fl. Males. ser. I. 8(2) : 283. 1977. *U. wallichii* Wt. Ic. 4 (4) : 9, t. 1572. 1850 (*non* Benj. 1845) ; C. B. Cl. in Hook. f. FBI 4 : 332. 1884 ; Gamble, FPM 6 : 982. 1924. *U. scandens* Benj. ssp. *scandens* P. Taylor in Hutch. & Dalz. Fl. West Trop. Africa ed. 2, 2 : 378. 1963 et in Kew Bull. 18 : 46. 1964.

Marshy, terrestrial herbs, up to 18 cm in length, twining ; stolons capillary, branched. Leaves 1 cm long, linear-spathulate, attenuate at base ; traps on stolons and leaves, very small, glandular at mouth. Flowers yellow, 0.7 cm long ; pedicels about as long as the calyx ; calyx 0.3 cm long, upper longer than lower, persistent ; corolla ± 1 cm long, upper lip much shorter and narrower than the upper calyx lobe, emarginate or

shortly bifid, spur curved ; anther cells connate, filaments linear ; ovary glabrous. Capsules 0.2×0.2 cm, enclosed by calyx, globose ; seeds numerous, minute, reticulate.

Fl. & Fr. : Throughout the year.

World distribution : Africa and India.

Specimen examined : Sunnipentavagu, Srisailam, 15-7-1963, Ellis 16896.

Utricularia reticulata Sm. var. *parviflora* Santapau in Kew Bull. 1948 : 491. 1949.

Marshy, terrestrial herbs, erect or scandent, about 10 cm long ; stolons filiform, glabrous. Leaves 1 cm long, linear-oblong ; traps oblique. Flowers blue, 0.6 cm long, bracteate, pedicellate ; pedicels filiform, 0.5 cm long, winged in fruits ; calyx 2.5 cm long, broadly ovate, lobes of upper slightly broader than lower, acute, accrescent, about 0.6×0.4 cm ; corolla 0.8 cm broad, labellum bullate at base ; stamens included ; ovary glabrous. Capsules 0.5 cm long ; seeds numerous, minute, striate.

Fl. & Fr. : July-December.

World distribution : Peninsular India.

Specimens examined : Sunnipentavagu, Srisailam, 15-7-1963, Ellis 16893 ; Sunnipentavagu, Srisailam, 21-10-1964, Ellis 22128.

Remarks : Santapau (*loc. cit.*) states, 'A gregarious, small, scandent herb, growing in association with the typical species, but without intermediate stages between the two. It cannot be said that the general reduction of the plant and all its parts in relation to the typical species is due to soil conditions, as both plants were found growing on the same type of soil and in general exposed to the same climatic conditions...'

BIGNONIACEAE

- | | | |
|---|----|---------------|
| 1. Leaves 2-3-pinnate, about 1.75 m long ; calyx 2.5 cm long, almost truncate | .. | OROXYLUM |
| 1. Leaves one-pinnate, about 40 cm long ; calyx less than 1.5 cm long, spathaceous or lobed : | | |
| 2. Calyx spathaceous | .. | DOLICHANDRONE |
| 2. Calyx 3-5-lobed | .. | STEREOSPERMUM |

OROXYLUM Vent.

Oroxylum indicum (Linn.) Vent. Dec. Nov. 8. 1808 ; C.B.Cl. in Hook. f. FBI 4 : 378. 1884 ; Brandis, Indian Trees, 496. 1906 ; Gamble,

FPM 6 : 994. 1924 ; Steenis, Malayan Bignoniaceae, in Rem. Trav. bot. Neerl. 24 : 816. 1927 et in Fl. Males. ser. I. 8(2) : 128. 1977 ; Chatterjee in Bull. bot. Soc. Bengal 2 : 75. 1948. *Bignonia indica* Linn. Sp. Pl. 625. 1753. *Calosanthos indica* (Linn.) Bl. Bijdr. 761. 1825 ; DC. Prodr. 9 : 177. 1845 ; Wt. Ic. 4 : t. 1337. 1850.

Trees, about 5 m tall ; bark lenticellate. Leaves about 1.75 m long, 2-3-pinnate ; petioles striated ; leaflets 11 × 6 cm, ovate-acuminate, unequally rounded or acute at base, rather coriaceous, glandular, puberulous on nerves beneath ; petiolules 1.5 cm long, grooved above ; flowers dark pinkish-purple without and yellowish-green within, 8 cm long, 6 cm across, in terminal, erect racemes about 60 cm long ; pedicels about 3.5 cm long, calyx 2.5 cm long, almost truncate or lobes small, crisped ; corolla tube 3.5 cm long, lobes oblong, crisped ; stamens slightly exerted, anthers 0.8 cm long ; ovary glabrous ; style filiform, stigmas 2-lobed. Capsules 45 × 1.5 cm, flattened ; seeds 1.3 cm long, numerous, broadly winged.

Fl. & Fr. : June-December.

World distribution : India, Sri Lanka, Burma, Malaysia and Indonesia.

Specimens examined : Mantralakanama, February 1887, *J. S. Gamble* 18708 ; Gundlabrahmeswaram, 29-11-1969, *Ellis* 32675 ; Rollapenta, Mantralakanama, 14-8-1972, *Ellis* 42244.

DOLICHANDRONE (Fenzl) Seem. *nom. cons.*

- | | | |
|--|----|-------------------|
| 1. Leaflets 8 × 5 cm, pubescent beneath ; capsules almost straight | .. | <i>D. arcuata</i> |
| 1. Leaflets 3 × 2.5 cm, puberulous beneath ; capsules falcate | .. | <i>D. falcata</i> |

Dolichandrone arcuata (Wt.) C. B. Cl. in Hook. f. Fl. Brit. Ind. 4 : 380. 1885 ; Brandis, Indian Trees, 493. 1906 ; Sprague in Kew Bull. 1919 : 307. 1919 ; Chatterjee in Bull. bot. Soc. Bengal 2 : 66. 1948. *Spathodea arcuata* Wt. Ic. 4 : t. 1340. 1848.

Trees, about 15 m tall ; young branches tomentose. Leaves 15 cm long, imparipinnate ; rachises grooved, tomentose ; leaflets 5, about 8 × 5 cm, ovate, acuminate or rounded, rounded or unequally obtuse at base, tomentose beneath, coriaceous ; petioles 0.6 cm long ; Flowers white or pale yellow, 7 cm long ; calyx 1.5 cm long, spathaceous, bent at apex, glabrous ; corolla tube 5 cm long, narrow, lobes crenately crisped ; stamens 4, didynamous, included ; ovary glabrous. Capsules about 30 cm long, compressed ; seeds flattened, winged.

Fl. & Fr. : January-October.

World distribution : Peninsular India.

Specimens examined : Chelama, 6-7-1963, *Ellis* 16779 ; Ahobilam, 22-11-1969, *Ellis* 32507 ; Rollapenta to Pecharavu, 16-8-1972, *Ellis* 42268.

Remarks : Sprague (*loc. cit.*) states, 'Beddome's specimen from the Kurnool hills referred to *D. arcuata* by Clarke and Brandis may possibly belong to this species, but the material is insufficient to determine it with certainty. It has velvety-pubescent 5-foliolate leaves, and reniform lateral leaflets, with petiolules 7-10 mm long.'

Dolichandrone falcata (Koen. ex Roxb.) Seem. in Journ. Bot. 381. 1870 ; C. B. Cl. in Hook. f. FBI 4 : 380. 1885, *p.p.* ; Brandis, Indian Trees, 493. 1906 ; Sprague in Kew Bull. 1919 : 308. 1919 ; Gamble, FPM 6 : 996. 1924 ; Chatterjee in Bull. bot. Soc. Bengal 2 : 66. 1948. *Bignonia falcata* Koen. ex Roxb. Fl. Ind. 3 : 103. 1832. *Dolichandrone lawii* Seem, *op. cit.* 310 ; C. B. Cl. *loc. cit.* ; Brandis, *loc. cit.* *D. falcata* var. *lawii* (Seem.) Gamble, FPM 6 : 996. 1924 ; D. Chatterjee, *op. cit.* 67. 1948.

Trees, 5 m tall ; young branches pubescent. Leaves 10 cm long, 5-7-foliolate, rachises puberulous ; leaflets about 3 × 2.5 cm, terminal the largest, obovate, retuse, faintly apiculate, obtuse at base, puberulous ; petiolules short. Flowers white, 3 cm long, in terminal, a few-flowered, corymbs 5 cm long ; calyx 1.5 cm long, spathaceous, curved with mucro at tip, pubescent ; corolla lobes 2 cm across, crisped, tube 2 cm long ; stamens 4, didynamous, included ; ovary glabrous. Capsules about 40 × 2 cm, flattened, falcate, puberulous ; seeds 1.5 × 0.8 cm, winged.

Fl. & Fr. : March-June.

World distribution : India, in dry localities, especially on rocky substratum.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18019 ; Velgode, 26-11-1969, *Ellis* 32614.

Remarks : Sprague (*op. cit.* p. 308) had not treated *D. lawii* Seem. at the varietal level in the sense of the Code ; it has been accredited to him. He states, '*Dolichandrone lawii* appears to be merely a glabrous form of *D. falcata*, as suggested by Brandis. The variation in the indumentum is not correlated with the degree of curvature of the capsule.' Chatterjee (*op. cit.* p. 67) accredits it to Haines, '...It was Haines who first treated this plant as a variety....' But Haines [*Bot. Bihar & Orissa* p. 690. rep. ed. 1961 (1924)] states, 'This is considered by Brandis and also by Sprague (vide Kew Bulletin, 1919, *Dolichandrone* and *Markhamia*) as

merely a glabrous form of *D. falcata* and so also it appears to me.' It was in fact Gamble (*op. cit.* p. 996) who accepted it definitely at varietal level. The present studies indicate that the variety, *lawii* cannot stand, for pubescence in this taxon is a variable character.

STEREOSPERMUM Cham.

- | | |
|---|----------------------------|
| 1. Leaflets abruptly, shortly acuminate ;
flowers 2.5 cm long ; fruits cylindric | <i>S. chelonoides</i> |
| 1. Leaflets caudate-acuminate ; flowers
1.5 cm long ; fruits subquadrangular | . . . <i>S. personatum</i> |

Stereospermum chelonoides (Linn. f.) A. P. DC. *Bibl. Univ. Geneve* II. 17 : 125. 1838, *pro comb. excl. ref.* Rheede, t. 26 et *Prodr.* 9 : 210. 1845, *pro basio.* ; Haines in *Kew Bull.* 1922 : 121. 1922 ; Santisuk in *Kew Bull.* 28 : 176. 1973, (*non auct. al.*) ; Steenis, *Fl. Males. ser. I.* 8(2) : 147. 1977. *Bignonia chelonoides* Linn. f. *Suppl.* 282. 1781, *pro typ. excl. ref.* Rheede, (*non auct. al.*). *B. suaveolens* Roxb. *Fl. Ind.* 3 : 104. 1832. *Stereospermum suaveolens* A. DC. *Prodr.* 9 : 211. 1845 ; *Wt. Ic.* 4 : t. 1342. 1850 ; C. B. Cl. in *Hook. f. FBI* 4 : 382. 1885 ; Brandis, *Indian Trees*, 495. 1906 ; Gamble, *FPM* 6 : 998. 1924 ; Steenis, *Malayan Bignoniaceae in Recu. Trav. bot. Neerl.* 24 : 948. 1937 ; D. Chatterjee in *Bull. bot. Soc. Bengal* 2 : 71. 1948.

Trees, about 20 m tall ; young branches puberulous, bark exfoliates into scales. Leaflets about 3 pairs, terminal largest, 15×8 cm, elliptic-oblong, orbicular, abruptly acuminate, unequally obtuse to rounded at base, puberulous ; nerves and reticulations prominent. Flowers pale pink, 2.5 cm long, in large, paniced cymes about 40 cm long, bracteolate ; calyx tube 0.6 cm long, lobes 0.2 cm long, puberulous ; corolla lobes 1 cm long, orbicular, tube 2 cm long, puberulous without, more so within ; stamens 4, didynamous ; disk cupular ; ovary glabrous, style filiform, stigmas 2. Capsules about 25 cm long, cylindric ; seeds 0.5 cm long, winged at back, wings 1 cm long.

Fl. & Fr. : February-May.

World distribution : India and Burma.

Specimen examined : Ramanapenta, Gundlabrahmeswaram, 31-3-1965, *Ellis* 23829.

Remarks : Steenis (*op. cit.* p. 948) erroneously cites specific epithet from G. Don's 'Gen. Syst. 4 : 244.' which dates from 1837, whereas Roxburgh's was published in 1832.

Stereospermum colais (Dillw.) Mabblerly in *Taxon* 27 : 553. 1978. *Bignonia colais* [Buch.-Ham. ex] Dillw. *Rev. Ref. Hort. Mal.* 28. 1839. *Stereospermum personatum* (Hassk.) Chatterjee in *Bull. bot. Soc. Bengal* 2 : 70. 1948 ; Santisuk in *Kew Bull.* 28 : 178. 1973 ; Steenis, *Fl. Males.* ser. I. 8(2) : 148. 1977. *Dipterosperma personatum* Hassk. in *Flora* 25(2) : 28. 1842. *Stereospermum chelonoides* A. DC. *Bibl. Univ. Geneve* II. 17 : 125. 1838 et *Prodr.* 9 : 210. 1845 ; C. B. Cl. in *Hook. f. FBI* 4 : 382. 1885, p.p. *S. tetragonum* A. DC. *Prodr.* 9 : 210. 1845 ; Haines, *Bot. Bihar & Orissa* 2 : 687. rep. ed. 1961 (1924) ; Gamble, *FPM* 6 : 998. 1924.

Trees, about 15 m tall ; young branches striate, faintly puberulous. Leaves about 20 cm long ; rachises angled, grooved, faintly puberulous ; leaflets 9×3.5 cm, in 3 pairs, elliptic-caudate or acuminate, rounded at base, glabrous. Flowers yellow, 1.5 cm long, in cymose panicles 20 cm long, bracteolate ; calyx 0.5 cm long, puberulous without, lobes small ; corolla 1.5 cm long, puberulous, lobes glabrous or ciliate ; stamens included, didynamous ; ovary glabrous ; disk cupular. Capsules about 70 cm long, subquadrangular, curved ; seeds 0.5 cm long, winged.

Fl. & Fr. : April-July.

World distribution : India.

Specimens examined : Mahanandi, 21-8-1965, *Ellis* 25442 ; Mahanandi, 21-8-1972, *Ellis* 42309.

PEDALIACEAE

SESAMUM Linn.

Sesamum indicum Linn. *Sp. Pl.* 634. 1753 ; DC. *Prodr.* 9 : 256. 1845 ; C. B. Cl. in *Hook. f. FBI* 4 : 387. 1885 ; Gamble, *FPM* 6 : 1002. 1923 ; S. S. Rajan in *Wealth of India*, 9 : 278. 1972.

Erect herbs, about 70 cm high ; branching often from base, puberulous. Leaves up to 10×6 cm, lanceolate, lower pedatisect, glabrous above, puberulous beneath. Flowers pinkish-purple, about 2.5 cm long, axillary, solitary or in racemes about 4 cm long ; pedicels glandular at base ; calyx 0.3 cm long, 5-partite, puberulous ; corolla 2.5 cm long, ventricose, faintly gibbous at base, 2-lipped ; stamens 4, didynamous, included ; ovary glabrous, style filiform, stigma 2-lobed ; disk annular. Capsules 1.5 cm long, quadrangular, shortly beaked, pubescent, dehiscing about halfway down ; seeds black, compressed, glabrous, oily.

Fl. & Fr. : July-October.

World distribution : A native of tropical Africa, cultivated extensively in India for edible oil.

Specimen examined : Chelama, 16-10-1964, *Ellis* 22027.

MARTYNIACEAE

MARTYNIA Linn. emend. Stapf

Martynia annua Linn. Sp. Pl. 618. 1753 ; R. H. Hevly in Taxon 18 : 527-534. 1969. *M. diandra* Glox. Obs. Bot. 14, t. 1. 1785 ; C. B. Cl. in Hook. f. FBI 4 : 386. 1885 ; Gamble, FPM 6 : 1002. 1923.

Erect herbs, about 15 cm high ; stems glandular-pubescent. Leaves about 20×15 cm, deltoid-ovate, cordate at base, sinuately lobed, minutely dentate, glutinously sticky. Flowers pink, darkly spotted on the lobes, yellow-spotted on the lower lip, often drooping, about 2.5 cm long, in racemes 6 cm long ; bracts and bracteoles petaloid ; stamens 2. Fruits about 2 cm long, woody, anteriorly strongly 2-hooked.

Fl. & Fr. : July-November.

World distribution : A native of tropical America, introduced into India, growing on rubbish-heaps and waste lands.

Specimens examined : Mahanandi, 24-8-1965, *Ellis* 25532 ; Digu-vametta, 16-11-1969, *Ellis* 32430.

ACANTHACEAE

- | | | |
|--|----|---------------|
| 1. Scapigerous herbs | .. | ELYTRARIA |
| 1. Nonscapigerous herbs or shrubs : | | |
| 2. Retinaculae absent ; leaves non lineolate : | | |
| 3. Stamens 2 ; calyx segments 4 | .. | NELSONIA |
| 3. Stamens 4 ; calyx segments 5 | .. | STAUROGYNE |
| 2. Retinaculae present ; leaves lineolate : | | |
| 4. Calyx segments 4 : | | |
| 5. Marshy plants, generally spinous | | HYGROPHILA |
| 5. Terrestrial, nonmarshy plants, generally not spinous : | | |
| 6. Leaves 4 at each node | .. | BLEPHARIS |
| 6. Leaves 2 at each node : | | |
| 7. Bracts and bracteoles prominently scarious margined ; flowers secund | | RUNGIA |
| 7. Bracts and bracteoles nor or faintly scarious margined ; flowers not secund : | | |
| 8. Seeds smooth, appressedly sericeous | .. | BARLERIA |
| 8. Seeds tuberculate, glabrous | .. | ROSTELLULARIA |
| 4. Calyx segments 5 : | | |
| 9. Stamens 2 : | | |
| 10. Stems rather sharply angled : | | |

- | | | |
|--|----|----------------|
| 11. Capsules clavate with cylindric stalk | | PERISTROPHE |
| 11. Capsules linear-oblong or elliptic,
not stalked | | ANDROGRAPHIS |
| 10. Stems terete or faintly angled : | | |
| 12. Corolla with upper lip much reduced | | RHINACANTHUS |
| 12. Corolla with upper lip and lower lip
almost equal : | | |
| 13. Seeds hairy | .. | RHAPHIDOSPORA |
| 13. Seeds tuberculate : | | |
| 14. Anther cells parallel, not
spurred at base | | DICLIPTERA |
| 14. Anther cells disposed one
higher than other, lower
prominently spurred | .. | JUSTICIA |
| 9. Stamens 4 : | | |
| 15. Corolla 2-lipped : | | |
| 16. Bracts and bracteoles sharply mucronate | .. | LEPIDAGATHIS |
| 16. Bracts and bracteoles not spinous | .. | DYSCHORISTE |
| 15. Corolla 5-lobed : | | |
| 17. Capsules clavate with solid, cylindric base : | | |
| 18. Seeds many ; bracts green | .. | DIPTERACANTHUS |
| 18. Seeds about 4 ; bracts greenish white | .. | ERANTHEMUM |
| 17. Capsules linear, without solid base | | HEMIGRAPHIS |

ELYTRARIA L. C. Rich. *nom. cons.*

Elytraria acaulis (Linn. f.) Lindau in Engler & Prantl, Pflanzenf. 4 : 289. 1896 ; Gamble, FPM 6 : 1009. 1924. *Justicia acaulis* Linn. f. Suppl. 84. 1781. *Tubiflora acaulis* (Linn. f.) O. Ktze. Rev. Gen. 1 : 500. 1891 ; Cooke, Fl. Pres. Bombay 2 : 420. rep. ed. 1958 (1905). *Elytraria crenata* Vahl, Enum. 1 : 106. 1805 ; C.B. Cl. in Hook. f. FBI 4 : 394. 1885.

Scapigerous herbs, about 10 cm high ; stems densely pubescent. Leaves up to 16 × 5 cm, oblong-obovate, acute at base, crenate-dentate, shortly petiolate. Flowers white, 0.4 cm long, in branched scapes about 20 cm long ; bracts 0.6 × 0.4 cm, ovate-acuminate, aristate, glabrous without, densely ciliate within ; calyx lobes 0.4 cm long, unequal, linear-acuminate to broadly ovate, hairy at apex, tube 0.1 cm long, rather horned at base ; corolla 0.2 cm long, lobes ovate, tube 0.3 cm long ; stamens slightly exerted ; ovary glabrous, stigma 2-lobed. Capsules 0.5 cm long, ovoid ; seeds reticulate ; retinaculae absent.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka, Burma and Central America.

Specimens examined: Nandyal, March 1883, *J. S. Gamble* 10877; Chelama, 4-7-1963, *Ellis* 16719; Ahobilam, 29-8-1965, *Ellis* 25555; Diguvametta, 19-11-1969, *Ellis* 32550; Mahanandi, 22-8-1972, *Ellis* 42323.

NELSONIA R. Br.

Nelsonia canescens (Lamk.) Spreng. Syst. 1: 42. 1824; Nees in DC. Prodr. 11: 67. 1847. *Justicia canescens* Lamk. Encycl. 1: 41. 1791. *Nelsonia brunnelloides* (Lamk.) O. Ktze. Rev. Gen. Pl. 493. 1891, p.p.; Lindau in Engler & Prantl, Pflanzenf. 4: 289. 1896. *Justicia brunnelloides* Lamk. loc. cit. 40. *Nelsonia campestris* R. Br. Prodr. 481. 1810; C.B.Cl. in Hook. f. FBI 4: 394. 1885; Gamble, FPM 6: 1010. 1924; Santapau in Univ. Bombay bot. Mem. No. 2: 11. 1961 (1962). *N. tomentosa* Nees in Wall. Pl. Asiat. Rar. 3: 79. 1832 et in DC. Prodr. 11: 65. 1847.

Herbs, about 10 cm high; branches prostrate-decumbent, glabrescent, villous when young. Leaves of 2 types, larger 22×6 cm, elliptic-oblong, attenuate at base, sparsely pubescent along nerves, upper smaller and sessile; petioles 2.5 cm long. Flowers pink, 0.5 cm long, in axillary and terminal spikes 5 cm long; bracts 0.4×0.3 cm, ovate, ciliate; calyx lobes 0.4 cm long, linear-elliptic, densely ciliate, prominently 3-nerved; corolla 0.4 cm long, lobes linear-elliptic, prominently 2-lipped; stamens 2, included, anther cells rather spurred at base; ovary glabrous, stigma shortly 2-lobed. Capsules 0.5 cm long, linear-ovate, glabrous; seeds 8, confined to lower end, granular.

Fl. & Fr.: January-April.

World distribution: Pantropic.

Specimen examined: Gundlabrahmeswaram, 30-3-1965, *Ellis* 23798.

STAUROGYNE Wall.

Staurogyne glauca (Nees) O. Ktze. Rev. Gen. Pl. 497. 1891; Gamble, FPM 6: 1011. 1924. *Ebermaiera glauca* Nees in DC. Prodr. 11: 73. 1847; Wt. Ic. 4: t. 1488 1850; C.B.Cl. in Hook. f. FBI 4: 395. 1885.

Erect herbs, about 40 cm high; stems terete, glandular-pubescent. Leaves about 4×2 cm, obovate, obtuse, spatulate, attenuate at base, glabrescent, almost sessile. Flowers pale violet, 0.8 cm long, axillary, solitary, or in spikes 7 cm long; bracts 1.5 cm long, spatulate; bract-oles about 1 cm long; calyx segments 5, 0.5 cm long, subequal, glandular; corolla 0.8 cm long, slightly curved, puberulous without; stamens 4, included, filaments puberulous; ovary glabrous. Capsules 0.8 cm long, glabrous; seeds about 10, papillate.

Fl. & Fr. : November-March.

World distribution : India and Burma.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18017 ; Srisailam, 25-3-1963, *Ellis* 23760.

Remarks : Bremekamp (in *Proc. Kon. Ned. Akad. Wet. ser. C.* 56 : 541-546, 1953 and in *Nova Guinea, New ser.* 8 : 129-155, 1957) treats the genus, *Staurogyne* Wall. under the Scrophulariaceae. Airy Shaw (1973, *Dict. Fl. Pl. and Ferns*, 8th ed. p. 1095) states about this genus thus : 'Acanthaceae or Scrophulariaceae...The genus is almost exactly intermediate between the two families.' Till the problem is finally resolved this genus is placed under the Acanthaceae.

HYGROPHILA R. Br.

Hygrophila auriculata (Schum.) Heine in *Kew Bull.* 16 : 172, 1962. *Barleria auriculata* Schum. in Schum. & Thonn. *Beskr. Guin. Pl.* 285, 1827. *Asteracantha longifolia* (Linn.) Nees in Wall. *Pl. Asiat. Rar.* 3 : 90, 1832 et in DC. *Prodr.* 11 : 247, 1847 ; *Wt. Ic.* 2 : t. 449, 1843 ; Gamble, *FPM* 6 : 1015, 1924 ; Santapau in *Univ. Bombay bot. Mem.* No. 2 : 17, 1951 (1952) ; Subramanyam, *Aquat. Angios.* 39, 1962. *Barleria longifolia* Linn. *Cent. Pl.* 2 : 22, 1756. *Hygrophila spinosa* T. Anders. in Thwaites, *Enum. Pl. Zeyl.* 225, 1860 et in *Journ. Linn. Soc.* 7 : 22, 1863 ; C.B. Cl. in Hook. f. *FBI* 4 : 408, 1885.

Erect, marshy herbs, about 60 cm high ; stems subquadrangular, sparingly hirsute, bearing six long, sharp, axillary thorns at nodes. Leaves 16 × 1.8 cm, in whorls of 6, outer pair largest, linear-lanceolate, attenuate at base, sparsely hirsute, sessile. Flowers purplish, 4 cm long, in axillary whorls 6 cm across ; calyx lobes 1 cm long, linear-lanceolate, ciliate along margins ; corolla tube 2 cm long, sparsely puberulous without, lobes 1 cm long, unequal ; stamens included, didynamous ; style slender, pubescent, stigma simple. Capsules 0.8 cm long, linear-oblong ; seeds 4, on retinaculæ, flattened.

Fl. & Fr. : Almost throughout the year.

World distribution : Central & South Africa, India and Sri Lanka.

Specimens examined : 'Kurnool' no date, *Beddome* s.n. ; Diguvaletta, 18-11-1969, *Ellis* 32509.

BLEPHARIS Juss.

- | | | |
|------------------------------|----|---------------------------|
| 1. Leaves about 11 × 4.5 cm | .. | <i>B. maderaspatensis</i> |
| 1. Leaves about 2.3 × 0.8 cm | .. | <i>B. molluginifolia</i> |

Blepharis maderaspatensis (Linn.) Heyne ex Roth, Nov. Sp. Pl. 320. 1821. *Acanthus maderaspatensis* Linn. Sp. Pl. 892. 1753. *Blepharis boerhaaviaefolia* Pers. Syn. Pl. 2: 180. 1806; Nees in DC. Prodr. 11: 266. 1847; Wt. Ic. 2: t. 458. 1843; C. B. Cl. in Hook. f. FBI 4: 478. 1885; Gamble, FPM 6: 1013. 1924.

Prostrate or decumbent herbs; stems running up to 50 cm, pubescent, rooting at nodes. Leaves about 11×4.5 cm, unequal, 4 in a whorl, elliptic, ovate, acute at base, distantly toothed, puberulous, sessile. Flowers white with yellow centre, 2 cm long, 1–3, in sessile clusters; bracts 1×0.3 cm, about 8 in pairs, oblong-spathulate, glochidiate-spinous toothed, sparsely pubescent without, prominently 3-nerved; calyx segments 1.5 cm long, linear-elliptic, scarious, inner smaller, innermost pair smallest, densely retrorsely pubescent within; corolla 2 cm long, upper lip small, lower broad, 3-lobed, tube horny; stamens 4, didynamous, included, filaments flattened, horny, anthers marginally pubescent on one side; ovary glabrous, stigma 2-lobed. Capsules 0.5×0.3 cm, ovoid; seeds 2, flattened, echinate.

Fl. & Fr.: August-February.

World distribution: Tropics in Central & South Africa, India, Sri Lanka and Burma, in dry localities.

Specimens examined: Nandyal, 25-8-1917, *Rangachari* 15004; Rudravaram, 7-9-1917, *Rangachari* 15005; Chelama, 7-12-1963, *Ellis* 17984.

B. molluginifolia Pers. Syn. Pl. 2: 180. 1807; C. B. Cl. in Hook. f. FBI 4: 479. 1885; Gamble, FPM 6: 1013. 1924.

Prostrate herbs; stems running to about 30 cm, hispid. Leaves 2.3×0.8 cm, 4 at nodes, ovate, obovate, spathulate, linear-elliptic, acute at base, hispid, sessile. Flowers pale violet, 1 cm long, axillary, solitary; bracts and bracteoles about 4 pairs, up to 0.7×0.3 cm, oblong-obovate, glochidiate-spinous, toothed, puberulous without, prominently 3-nerved; calyx 1×0.3 cm, linear-ovate, scarious, mucronate, 3-nerved; corolla 0.7 cm long, 2-lipped, upper small, lower 3-lobed, pubescent, tube horny; stamens 4, didynamous, anthers pubescent; ovary glabrous. Capsules 0.5 cm long, oblong; seeds 4, flattened, orbicular, echinate, on retinaculæ.

Fl. & Fr.: September-December.

World distribution: India and Sri Lanka, in very dry localities of deciduous forests.

Specimen examined: Ahobilam, 23-11-1969, *Ellis* 32593.

RUNGIA Nees

- | | | |
|-------------------------|----|----------------------|
| 1. Bracts dimorphic | .. | <i>R. parviflora</i> |
| 1. Bracts not dimorphic | | <i>R. repens</i> |

Rungia parviflora Nees in Wall. Pl. Asiat. Rar. 3 : 110. 1832 et in DC. Prodr. 11 : 469. 1847, excl. syn. ; C. B. Cl. in Hook. f. FBI 4 : 550. 1885 ; Gamble, FPM 6 : 1071. 1924 ; Santapau in Univ. Bombay bot. Mem. No. 2 : 76. 1951 (1952).

Erect or decumbent herbs, about 10 cm high ; stems pubescent in lines. Leaves about 6×2.5 cm, ovate-elliptic, obtuse, acute at base, sparsely puberulous, cystoliths parallel to midrib ; petioles about 2 cm long. Flowers violet, 0.5 cm long, in terminal and axillary spikes 1.2 cm long ; bracts dimorphic, infertile ones 0.5 cm long, arranged in two rows, ovate, cuspidate, scarious-margined, sparsely hairy, fertile ones orbicular, scarious-margined, bifid at apex, pubescent ; calyx lobes 0.4 cm long, linear, sparsely pubescent ; corolla 0.5 cm long, 2-lipped, upper ovate, lower obovate, 3-lobed ; stamens slightly exerted, anther cells 2, parallel, lower cell spurred ; ovary glabrous, style filiform, stigma bifid. Capsules 0.5 cm long, ovoid, flattened ; seeds 4, flattened, orbicular, concentrically ridged.

Fl. & Fr. : November-March.

World distribution : India and Sri Lanka.

Specimens examined : "Nallamalais", March 1883, *J.S. Gamble* 10945 ; Chelama, 7-12-1963, *Ellis* 17956.

R. repens (Linn.) Nees in Wall. Pl. Asiat. Rar. 3 : 110. 1832 et in DC. Prodr. 11 : 472. 1847 ; Wt. Ic. 2 : t. 465. 1843 ; C. B. Cl. in Hook. f. FBI 4 : 549. 1885 ; Gamble, FPM 6 : 1070. 1924. *Justicia repens* Linn. Sp. Pl. 15. 1753.

Erect or decumbent herbs about 30 cm high ; stems zig-zag, slightly angled, glabrous. Leaves about 5.5×2.5 cm, ovate-elliptic, acuminate, obtuse or acute at base, minutely lineolate ; petioles 0.5 cm long. Flowers pale violet, 1 cm long, in terminal spikes about 15 cm long ; bracts 0.8×0.8 cm, broadly ovate, prominently scarious-margined, ciliate ; bracteoles 0.5 cm long, ovate-acuminate, puberulous ; calyx lobes 0.5 cm long, linear-ovate, puberulous ; corolla 0.7 cm long, pubescent, upper lip notched, lower 3-lobed ; stamens slightly exerted, lower anther cell spurred. Capsules 0.6×0.4 cm, ovoid, flattened, pubescent ; seeds 4, concentrically rugose, on retinaculæ.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18010 ; Velgode, 26-11-1969, *Ellis* 32617.

BARLERIA Linn.

- | | | |
|---|----|----------------------|
| 1. Herbs spinescent | .. | <i>B. prionitis</i> |
| 1. Herbs not spinescent : | | |
| 2. Corolla tube about 8 cm long ;
plants stellate-pubescent | .. | <i>B. longiflora</i> |
| 2. Corolla tube about 4 cm long ;
plants not stellate-pubescent : | | |
| 3. Flowers in secund spikes ;
leaves about 20 × 10 cm | .. | <i>B. strigosa</i> |
| 3. Flowers not in secund spikes ;
leaves up to 13 × 8 cm : | | |
| 4. Outer calyx lobes ovate, entire ;
leaves tomentose | | <i>B. tomentosa</i> |
| 4. Outer calyx lobes ovate-lanceolate,
spinous-ciliate along margin ; leaves
faintly puberulous | .. | <i>B. cristata</i> |

Barleria prionitis Linn. Sp. Pl. 636. 1753 ; Nees in DC. Prodr. 11 : 237. 1847 ; C. B. Cl. in Hook. f. FBI 4 : 482. 1885 ; Gamble, FPM 6 : 1058. 1924 ; Santapau in Univ. Bombay bot. Mem. No. 2 : 57. 1951(1952).

Erect herbs, about 60 cm high ; branches lineolate. Leaves about 10 × 4 cm, elliptic-ovate, oblong-lanceolate, attenuate at base, lineolate ; petioles small. Flowers yellow, about 2.5 cm long, in axillary, divaricate spikes about 8 cm long, bracteate, bracteolate ; calyx lobes 1.5 × 0.4 cm, ovate-cuspidate ; corolla lobes 1 cm long, pubescent without, tube 2.5 cm long ; stamens 4, 2 long and 2 short, filaments glabrous ; ovary glabrous except near top where it is pubescent, style filiform, stigma faintly bifid. Capsules 1.5 cm long, oblong ; seeds 4, flattened.

Fl. & Fr. : October-May.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimens examined : Srisailam, 20-10-1964, *Ellis* 22093 ; Diguva-metta, 16-11-1969, *Ellis* 32412.

B. longiflora Linn. f. Suppl. 229. 1781 ; Nees in DC. Prodr. 11 : 235. 1847 ; C.B.Cl. in Hook f. FBI 4 : 485. 1885 ; Gamble, FPM 6 : 1059. 1924.

Erect herbs, about 80 cm high ; stems tomentose. Leaves 4 × 3 cm, ovate, rounded at base, densely stellate-pubescent below, less so above ;

petioles 1.2 cm long. Flowers white, axillary, solitary or in simple, secund spikes; bracts 2 cm long, linear; two outer calyx lobes 2.5×1.6 cm, ovate, finely crenulate, scarious, reticulately veined, sparsely pubescent, two inner 0.4×0.2 cm, ovate-caudate, scarious; corolla tube 8 cm long, lobes 1 cm long, ovate; stamens 2 long and 2 short, included; ovary glabrous except at top. Capsules 1.8 cm long, oblong, beaked; seeds 4, flattened, sericeous.

Fl. & Fr. : September-March.

World distribution : India, in dry localities.

Specimens examined : Srisailam, 21-10-1964, *Ellis* 22153; Srisailam, 5-12-1969, *Ellis* 32696.

Barleria strigosa Willd. Sp. Pl. 3 : 379. 1800; Nees in DC. Prodr. 11 : 226. 1847; C.B.Cl. in Hook. f. FBI 4 : 489. 1885; Gamble, FPM 6 : 1061. 1924.

Shrubs, about 1 m high; stems terete, strigose. Leaves about 20×10 cm, broadly ovate, acuminate, abruptly attenuate at base, sparsely ciliolate; petioles about 4 cm long. Flowers pale blue, 5 cm long, in axillary and terminal dense spikes about 10 cm across, secund, bracteate, bracteolate; bracts about 3×2 cm, ovate, rounded at base, denticulate, strigosely hairy along margins; outer calyx lobes 0.5×0.2 cm, ovate, inner linear, pubescent; corolla lobes 4 cm across, tube 3 cm long; stamens 2 long and 2 short, included; ovary glabrous. Capsules 2 cm long, ovoid, beaked; seeds 4, flattened, sericeous.

Fl. & Fr. : September-March.

World distribution : India and Burma, often cultivated.

Specimens examined : Mantralakanama, February 1887, *Gamble* 18725; Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22133; Diguvametta, 17-11-1969, *Ellis* 32447.

B. tomentosa Roth, Nov. Pl. Sp. 314. 1821; Nees in DC. Prodr. 11 : 233. 1847; C.B.Cl. in Hook. f. FBI 4 : 485. 1885; Gamble, FPM 6 : 1059. 1924.

Suffrutescent herbs, about 60 cm high; stems tomentose. Leaves 3×2.5 cm, ovate, rounded or obtuse at base, tomentose; petioles 1 cm long. Flowers pale pink, 4.5 cm long, in axillary clusters of 2-3-flowers, bracteate, bracteolate; calyx lobes white, 0.5 cm long, linear-ovate, reticulately nerved, tube 0.1 cm long; corolla lobes 1 cm long, orbicular, tube 3.5 cm long; stamens 4, two shorter, included; ovary glabrous,

style filiform. Capsules 1 cm long, obovoid, beaked ; seeds 4, pubescent, flattened.

Fl. & Fr. : July-January.

World distribution : Peninsular India, in dry localities.

Specimen examined : Ahobilam, 22-11-1969, *Ellis* 32584.

Barleria cristata Linn. Sp. Pl. 636. 1753 ; Nees in DC. Prodr. 11 : 229. 1847 ; Wt. Ic. 2 : t. 453. 1843 ; C.B.Cl. in Hook. f. FBI 4 : 488. 1885 ; Gamble, FPM 6 : 1060. 1924.

Erect herbs, about 50 cm high ; branches sparsely hairy. Leaves about 13 × 8 cm, highly variable, elliptic-ovate or oblong, linear-oblong, faintly puberulous, lineolate ; petioles about 3 cm long. Flowers pink, blue or white, about 4 cm long, in axillary, clustered spikes 6 cm across, bracteate, bracteolate ; calyx segments 1.5 × 1 cm, lanceolate, bristly-toothed along margins, glandular hairy, prominently nerved, inner narrower ; corolla lobes 0.8 cm long, orbicular, tube 3 cm long, pubescent ; stamens included ; ovary glabrous. Capsules 1.3 × 0.5 cm, ovoid, acute at apex, flattened ; seeds 4, flattened.

Fl. & Fr. : October-January.

World distribution : India and Burma.

Specimens examined : Chelama, 9-12-1963, *Ellis* 18039 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22177 ; Ahobilam, 23-11-1969, *Ellis* 32602.

Barleria gibsoni Dalz. is said to be present in 'Nallamalai Hills of Kurnool,...' according to Gamble (*op. cit.*). As this species has not been collected from Nallamalais in the recent tours, it has not been taken up for a detailed study.

ROSTELLULARIA Reichenb.

- | | | |
|--|----|---------------------------------------|
| 1. Bracts and bracteoles hirsute ; calyx very broad at base, suddenly acuminate at apex | | <i>R. crinita</i> |
| 1. Bracts and bracteoles puberulous or pubescent ; calyx linear-oblong or ovate : | | |
| 2. Cystoliths on leaves wavy or straight, oriented almost parallel to midrib in the centre and transverse along the margin | .. | <i>R. prostrata</i> |
| 2. Cystoliths on leaves minute, straight, oriented in an ascending direction from the midrib : | | |
| 3. Capsules puberulous ; plants decumbent or erect | | <i>R. vahlii</i> |
| 3. Capsules glabrous ; plants decumbent or prostrate | .. | <i>R. vahlii</i> var. <i>rupicola</i> |

Rostellularia crinita Nees in Wall. Pl. Asiat. Rar. 3 : 101. 1832 et in DC. Prodr. 11 : 373. 1847. *Justicia micrantha* [Wall. Cat. 2449. 1830] ex C. B. Cl. in Hook. f. FBI 4 : 536. 1885 ; Gamble, FPM 6 : 1080. 1924.

Erect herbs, about 25 cm high ; stems grooved, crisped-hairy. Leaves 3.5×2.2 cm, ovate, elliptic-ovate or obtuse at base, lineolate, cystoliths irregularly ascending from midrib. Flowers pink, 0.6 cm long, in terminal spikes 3.5 cm long ; bracts and bracteoles 0.7 cm long, linear, distantly hirsute at right angles to margins ; calyx 0.7 cm long, prominently broadly scarious-margined at base, suddenly acuminate at apex, distantly ciliate at top ; corolla 0.6 cm long, 2-lipped ; stamens slightly exerted, anthers 2-celled, lower prominently spurred ; ovary glabrous, style filiform, stigma bifid. Capsules 0.4 cm long, clavate, puberulous at tips ; seeds 4, tuberculate, slightly flattened, sometimes corrugated.

Fl. & Fr. : Throughout the year.

World distribution : Peninsular India.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 28-8-1917, Rangachari 14966 ; Chelama, 5-7-1963, Ellis 16741 ; Mahanandi, 23-8-1965, Ellis 25524 ; Diguvametta, 16-11-1969, Ellis 32410.

R. prostrata (C. B. Cl.) R. B. Majumdar in Bull. bot. Soc. Bengal 25 : 75. 1971. *Justicia diffusa* Willd. var. *prostrata* Roxb. ex C. B. Cl. in Hook. f. FBI 4 : 538. 1885. *Justicia prostrata* (C. B. Cl.) Gamble, FPM 6 : 1081. 1924.

Prostrate or decumbent herbs, sometimes erect ; stems often rooting at nodes, grooved, puberulous or glabrous. Leaves up to 5.5×1.5 cm, elliptic-ovate, obtuse, orbicular, acute at base, cystoliths parallel to midrib and transverse near margin. Flowers pink, 0.5 cm long, in terminal spikes 5 cm long ; bracts 0.3 cm long, linear-ovate, ciliate along margin ; calyx lobes 0.4 cm long, ovate, scarious ; corolla 0.5 cm long, glabrous, 2-lipped ; stamens exerted, lower anther cell spurred ; ovary glabrous, style filiform, stigma bifid. Capsules 0.4 cm long, clavate, puberulous ; seeds 4, ovoid, tuberculate.

Fl. & Fr. : Throughout the year.

World distribution : India.

Specimens examined : Ahobilam, 31-8-1965, Ellis 25595 ; Diguvametta, 18-11-1969, Ellis 32489.

R. vahlii (Roth) Nees in Wall. Pl. Asiat. Rar. 3 : 102. 1832 et in DC. Prodr. 11 : 376. 1847. *Justicia vahlii* Roth, Nov. Sp. Pl. 14. 1821 ;

Gamble, FPM 6 : 1081. 1924. *J. diffusa* Willd? var. *vahlII* (Roth) C. B. Cl. in Hook. f. FBI 4 : 538. 1885.

Erect or decumbent herbs, 30 cm high ; stems grooved, lineolate. Leaves up to 8×1 cm, linear, elliptic, or ovate, acute at base, sparsely hairy ; cystoliths minute, ascending from midrib. Flowers pale pink, 0.5 cm long, in terminal spikes up to 10 cm long ; bracts and bracteoles 0.4 cm long, linear-ovate, puberulous, ciliate along margins, marginally scarious ; calyx 0.4 cm long, linear, scarious, ciliate ; corolla 0.5 cm long, 2-lipped, sparsely hairy without ; stamens exerted, lower anther cell spurred ; ovary puberulous, style slender, stigma slightly bifid. Capsules 0.5 cm long, clavate, puberulous ; seeds slightly flattened, tuberculate.

Fl. & Fr. : Throughout the year.

World distribution : India, in dry localities.

Specimens examined : Srisailam, 12-7-1963, *Ellis* 16825 & *Ellis* 16842 ; Chelama, 7-12-1963, *Ellis* 17944 ; Ahobilam, 29-8-1965, *Ellis* 25545 ; Diguvametta, 17-11-1969, *Ellis* 32452 ; Mahanandi, 23-8-1972, *Ellis* 42330.

Rostellularia vahlII (Roth) Nees var. *rupicola* *Ellis* in Bull. bot. Surv. Ind. 11 : 436-437. 1969 (1972).

This variety is allied to the *typica* from which it differs in having, (i) prostrate habit, (ii) cystoliths on leaves rather sparse and irregularly placed, (iii) capsules glabrous and (iv) leaves sessile and linear.

Fl. & Fr. : Throughout the year.

World distribution : Peninsular India.

Specimens examined : Srisailam, 12-7-1963, *Ellis* 16842 ; Srisailam, 5-12-1969, *Ellis* 32698.

PERISTROPHE Nees

Peristrophe bicalyculata (Retz.) Nees in Wall. Pl. Asiat. Rar. 3 : 113. 1832 et in DC. Prodr. 11 : 496. 1847 ; C. B. Cl. in Hook. f. FBI 4 : 554. 1885 ; Gamble, FPM 6 : 1084. 1924. *Dianthera bicalyculata* Retz. in Vet. Acad. Handl. 297. 1775.

Herbs, about 1 m high ; stems weak, often decumbent, angled, grooved, sparsely hirsute. Leaves about 7×4 cm, ovate-acuminate, rounded at base, sparsely hirsute, ciliate along margins ; petioles 1 cm long. Flowers pink, 1.5 cm long, in terminal and axillary cymes in dichotomously branched panicles 15 cm long ; bracts 2, 1 cm long, unequal, the larger linear-obovate or spatulate ; bracteoles 4, linear-

acuminate; calyx lobes linear-acuminate, softly puberulous; corolla 1.5 cm long, 2-lipped, upper obtuse, lower 3-lobed, pubescent without, tube 0.6 cm long; filaments dilated, glabrous, anthers 2-celled, one slightly higher; ovary glabrous, style filiform, stigma bifid. Capsules 1 cm long, clavate, ciliate at top, stalk cylindrical; seeds 4, flattened, orbicular, papillate.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, Afghanistan, India and Burma, generally in waste land.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17936; Diguva-metta, 16-11-1969, *Ellis* 32391.

ANDROGRAPHIS Wall.

1. Plants erect :

2. Calyx about 0.3 cm long; capsules 1 cm long *A. paniculata*

2. Calyx about 1.5 cm long; capsules 2 cm long .. *A. echloides*

1. Plants procumbent .. *A. nallamalayana*

Andrographis paniculata (Burm. f.) Nees in Wall. Pl. Asiat. Rar. 3 : 116. 1832 et in DC. Prodr. 11 : 515. 1847; C. B. Cl. in Hook. f. FBI 4 : 501. 1885; Gamble, FPM 6 : 1048. 1924; Wt. Ic. 2 : t. 518. 1843. *Justicia paniculata* Burm. f. Fl. Ind. 9. 1767.

Erect herbs, about 80 cm high; branches subquadrangular, grooved, puberulous. Leaves about 7×3 cm, oblong, linear, obtuse at base, sparsely puberulous, sessile. Flowers pink, about 0.5 cm long, in terminal, paniculate racemes about 7 cm long, bracteate; calyx 0.3 cm long, segments linear, puberulous; corolla 0.5 cm long, 2-lipped, upper 2-toothed, lower 3-toothed, sparsely puberulous without; stamens exerted, anthers pubescent at base, filaments dilated; ovary glabrous, style filiform, stigmas bifid. Capsules 2 cm long, linear-elliptic, sparsely pubescent, recurving during dehiscence; seeds about 8, on retinaculæ pitted.

Fl. & Fr. : July-December.

World distribution : India and Sri Lanka.

Specimens examined : 'Kurnool', 6-9-1899, *A. W. B. Higgens* s.n. (? *C. A. Barber* 802 !); Srisailam, 13-7-1963, *Ellis* 16862; Ahobilam, 29-8-1965, *Ellis* 25549; Diguva-metta, 17-11-1969, *Ellis* 32453; Diguva-metta, 7-8-1972, *Ellis* 42176.

Andrographis echioides (Linn.) Nees in Wall. Pl. Asiat. Rar. 3 : 117. 1832 et in DC. Prodr. 11 : 505. 1847 ; Wt. Ic. 2 : t. 467. 1843 ; C. B. Cl. in Hook. f. FBI 4 : 505. 1885 ; Gamble, FPM 6 : 1051. 1924. *Justicia echioides* Linn. Sp. Pl. 16. 1753.

Erect herbs, about 40 cm high ; stems subquadrangular, hairy. Leaves 7×2.5 cm, elliptic-ovate, obtuse at base, sparsely hairy, sessile. Flowers white, 1.5 cm long, in axillary, secund racemes 7 cm long, bracteolate ; calyx segments 1.2 cm long, linear, hairy, tube short ; corolla lobes sparsely pubescent, tube glabrous, gibbous above ; stamens exerted, filaments dilated, anther cells bearded at base ; ovary puberulous, style slender, stigma bifid. Capsules 1 cm long, elliptic, rather flattened ; seeds 4, rugose, pitted.

Fl. & Fr. : July-December.

World distribution : India and Sri Lanka.

Specimens examined : 'Kurnool', 6-9-1899, C. A. Barber 802 ! (A. W. B. Higgens ?) ; Srisailam, 13-7-1963, Ellis 16862 ; Diguvametta, 17-11-1969, Ellis 32452 ; Diguvametta, 7-8-1972, Ellis 42178.

Remarks : C. P. Sreemadhavan (in *Phytologia* 15 : 270-271. 1967 and *Ibid.* 16 : 466. 1968) has described a new genus, *Indoneestiella* Sreemadhavan (= *Neesiella* Sreemadhavan) mainly dependent on the number of seeds—4 in *Andrographis echioides* (Linn.) Nees and many in others. How far he is justified in splitting of a rather homogeneous taxon into two genera, albeit quoting an earlier opinion of Nees (1832), requires to be substantiated by other disciplines of Botany. Till such a work is available *Andrographis echioides* is retained in *Andrographis* Wall.

A. nallamalayana Ellis in Bull. bot. Surv. Ind. 8 : 362. 1966.

Procumbent herbs, ± 50 cm long ; rootstocks woody ; stems radiate from woody rootstock, quadrangular. Leaves about 7.5×3 cm, obovate, elliptic-ovate, depending on season smaller and oblong, attenuate at base, sessile. Flowers white, 1.2 cm long, in terminal and axillary racemes 6 cm long, pedicellate, bracteate ; calyx 1.7 cm long, lobed till base, segments puberulous-glandular without, puberulous within ; corolla bilabiate, pubescent-glandular without, glabrous within except near base ; stamens 2, filaments winged, anthers maroon, densely bearded at base ; ovary puberulous, style slender, stigma slightly bifid. Capsules 1.5 cm long, elliptic-oblong, sparsely glandular ; seeds 4-6, rugose.

Fl. & Fr. : Throughout the year.

World distribution : Peninsular India.

Specimens examined : Diguvaletta, 11-8-1921, *C. E. C. Fischer* 4658 ; Chelama, 4-7-1963, *Ellis* 16709 ; Chelama, 18-3-1965, *Ellis* 23715 ; Ahobilam, 29-8-1965, *Ellis* 25545 ; Ahobilam, 23-11-1969, *Ellis* 32592.

RHINACANTHUS Nees

Rhinacanthus nasuta (Linn.) Kurz in Journ. Asiat. Soc. Bengal 39 : 1179. 1870. *Justicia nasuta* Linn. Sp. Pl. 16. 1753. *R. communis* Nees in Wall. Pl. Asiat. Rar. 3 : 109. 1832 et in DC. Prodr. 11 : 442. 1847 ; Wt. Ic. 2 : t. 464. 1843 ; C. B. Cl. in Hook. f. FBI 4 : 541 : 1885 ; Gamble, FPM 6 : 1083. 1924.

Undershrubs, about 1 m high ; stems erect or decumbent, terete, grooved, puberulous when young. Leaves up to 18 × 10 cm, elliptic-acuminate, acute at base, glabrescent, lineolate ; petioles 2 cm long. Flowers white, 3 cm long, in cymes, in axillary and terminal, divaricate, panicles about 15 cm long, bracteate, bracteolate ; bracts often foliaceous ; calyx lobes 0.4 cm long, linear, puberulous ; corolla 1 cm long, lobes 5, upper lip with 2 small, lower lip with 3-lobed, ciliate without ; stamens 2, epipetalous, exserted ; ovary glabrous, style sparsely pubescent. Capsules 2.5 cm long, clavate, pubescent ; seeds 4, flattened, tuberculate.

Fl. & Fr. : October-April.

World distribution : Tropics in Africa, India, Sri Lanka and Malaysia.

Specimens examined : 'Nallamalais', March 1883, *J.S. Gamble* 10955 ; Chelama, 7-12-1963, *Ellis* 17942 ; Chelama, 17-10-1964, *Ellis* 22082 ; Bogada, 19-11-1969, *Ellis* 32524.

RHAPHIDOSPORA Nees

Rhaphidospora glabra (Koen. ex Roxb.) Nees in Wall. Pl. Asiat. Rar. 3 : 115. 1832 et in DC. Prodr. 11 : 499. 1847 ; Wt. Ic. 4 : t. 1554. 1850. *Justicia glabra* Koen. ex Roxb. Fl. Ind. 1 : 132. 1820 ; C.B.Cl. FBI 4 : 535. 1885 ; Gamble, FPM 1081. 1924.

Erect or decumbent herbs, about 80 cm high ; stems grooved, glabrous. Leaves about 11 × 8 cm, ovate-acuminate, obtuse at base, glabrous ; petioles up to 5 cm long. Flowers white, 0.8 cm long, in axillary and terminal, dichotomously branched cymes up to 10 cm long, bracteate, bracteolate ; calyx lobes 0.4 cm long, linear, acute, puberulous, tube short ; corolla 0.8 cm long, 2-lipped, puberulous without ; stamens 2, epipetalous, exserted, lower anther cell spurred ; ovary puberulous. Capsules 1.2 cm long, clavate, pubescent ; seeds 4, flattened, densely brown-villous.

Fl. & Fr. : Throughout the year.

World distribution : Mauritius Islands, India, Sri Lanka and Malaysia.

Specimens examined : Gazulapalli, 8-11-1906, C. A. Barber 8067 ; Ahobilam, 22-11-1969, Ellis 32588.

DICLIPTERA Juss. *nom. cons.*

Dicliptera cuneata Nees in Wall. Pl. Asiat. Rar. 3 : 111. 1832 et in DC. Prodr. 11 : 481. 1847 ; Wt. Ic. 4 : t. 1552. 1850 ; C.B.Cl. in Hook. f. FBI 4 : 552. 1885 ; Gamble, FPM 6 : 1073. 1924.

Erect herbs, about 60 cm high ; branches grooved, glabrous. Leaves about 10×5 cm, ovate-acuminate, obtuse or rounded or acute at base, sparsely puberulous, lineolate ; petioles 4 cm long. Flowers pink, 1.5 cm long, in axillary and terminal, umbellate cymes 1.8 cm across, pedicellate ; bracts small ; bracteoles spatulate, faintly puberulous, 3-nerved ; calyx lobes 0.3 cm long, linear, puberulous, tube 0.1 cm long ; corolla lobes 0.7 cm long, sparsely pubescent without, tube 0.7 cm long ; stamens 2, anther cells parallel ; ovary glabrous, styles slender, stigmas bifid. Capsules 0.6 cm long, puberulous ; seeds 4, flattened, tuberculate.

Fl. & Fr. : Throughout the year.

World distribution : India, in moist deciduous forests.

Specimen examined : Srisailam, 23-6-1965, Ellis 23779.

C. B. Clarke (*op. cit.* p. 551) has described a new species, viz. *Dicliptera beddomei* from 'Nallamays (in Kurnool), *Beddome*'. Gamble (*op. cit.* p. 1073) records it from 'Deccan, Nallamalai Hills of Kurnool (Beddome).' It is rather intriguing that it has not been collected from Nallamalais. There are no herbarium specimens of this species at MH or CAL. Through the kind courtesy of the Director, Kew Herbarium, a photograph of the Type Specimen has been seen. Though the photograph is very good, it is not possible to make out the significant differences from *Dicliptera cuneata* Nees. Therefore, *Dicliptera beddomei* C.B.Cl. has not been taken up for a detailed study.

JUSTICIA Linn.

1. Bracts white with green venation
1. Bracts green

J. betonica
J. glauca

Justicia betonica Linn. Sp. Pl. 15. 1753 ; C.B.Cl. in Hook. f. FBI 4 : 525. 1885 ; J. S. Gamble, FPM 4 : 1078. 1924.

Shrubs, about 1 m high ; young branches glabrescent. Leaves about 10×6 cm, ovate-acuminate, rounded and suddenly attenuate at base, entire or subcrenulate ; petioles 1 cm long. Flowers white, 2.5 cm long, in terminal spikes about 5 cm long ; bracts and bracteoles 1.2×0.5 cm, white with green nerves, ovate, glabrous ; calyx lobes 0.4 cm long, linear, pubescent, tube 0.1 cm long ; corolla 2 cm long, 2-lipped, upper 2-lobed, lower 3-lobed, tube 1.5 cm long ; stamens 2, slightly exerted, lower anther cell spurred ; ovary pubescent. Capsules 1.5 cm long, clavate, pubescent ; seeds 4, tuberculate.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka and Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17968 ; Ahobilam, 29-8-1965, *Ellis* 25553 ; Diguva-metta, 17-11-1969, *Ellis* 32433.

Justicia glauca Rottler in Ges. Nat. Fr. Neue Schr. 4 : 219. 1802 ; C. B. Cl. in Hook. f. FBI 4 : 529. 1885 ; Gamble, FPM 6 : 1079. 1924. *Adhatoda orixensis* (Roxb.) Nees in DC. Prodr. 11 : 400. 1847. *Gendarussa orixensis* (Roxb.) Nees in Wall. Pl. Asiat. Rar. 3 : 104. 1832. *Justicia orixensis* Roxb. Fl. Ind. 1 : 132. 1820. *Gendarussa tranquebariensis* Wt. Ic. 2 : t. 462. 1843 (*non* Nees).

Erect herbs, about 60 cm high ; stems terete, grooved, puberulous. Leaves up to 9×3 cm, ovate, elliptic, obtuse at base ; petioles 2 cm long. Flowers white, 0.7 cm long, in terminal and axillary spikes 20 cm long ; bracts 1×0.8 cm, oblong-orbicular, generally hairy along margins ; calyx lobes 0.4 cm long, linear, scarious, sparsely puberulous, tube short ; corolla lobes 0.5 cm long, pubescent without, tube 0.5 cm long, glabrous ; stamens 2, slightly exerted, lower anther cell spurred at base, filaments hairy near attachment ; ovary glabrous, style sparsely hairy. Capsules 0.9 cm long, clavate, glabrous ; seeds 4, tuberculate.

Fl. & Fr. : July-March.

World distribution : India, in dry localities.

Specimens examined : Gazulapalli, 3-9-1917, *Rangachari* 14986 ; Chelama, 5-7-1963, *Ellis* 16748 ; Scisailam, 6-12-1969, *Ellis* 32711 ; Mahanandi, 22-8-1972, *Ellis* 42321.

Remarks : It has been rather difficult to assign this species to any particular genus as could be judged by placement of this under *Gendarussa* Nees (Nees, 1832) and later under *Adhatoda* Miller (Nees, 1847) by Nees

himself. Earlier, Roxburgh (*Fl. Ind.* 1820) had treated it under *Justicia* Linn. From the available work on this species and studies at MH and CAL and from field studies regarding its gross morphology, it is treated here under *Justicia* Linn., in a broad sense. A monographic study on the genus, *Justicia* Linn., will throw new light on its delimitations.

LEPIDAGATHIS Willd.

- | | |
|---|---------------------|
| 1. Flowers confined to base of stems in cushion of clusters | <i>L. subarmata</i> |
| 1. Flowers in terminal and axillary paniced spikes | <i>L. cuspidata</i> |

Lepidagathis subarmata (C. B. Cl.) Gamble, FPM 6 : 1067. 1924. *L. mitis* Dalz. var. *subarmata* C. B. Clarke in Hook. f. FBI 4 : 516. 1885.

Undershrubs, about 15 cm high ; stems radiating in all directions from woody rootstocks, decumbent, puberulous. Leaves 2.5×0.7 cm, linear-ovate, obovate-oblong, obovate, glabrous, scabrous on nerves beneath ; nerves 5-6 from base. Flowers pink with maroon streaks near throat, 0.5 cm long, in clustered, cushion-like spikes at base of stems, 5 cm across ; bracts 0.5 cm long, obtuse, mucronate, densely sericeous ; calyx 0.5 cm long, lower lobes connate almost to top, densely sericeous ; corolla 1 cm long, 2-lipped, upper 2-fid, lower 3-lobed ; stamens 4, didynamous ; ovary glabrous. Capsules 0.5 cm long, flattened ; seeds 2, flattened, faintly rugose.

Fl. & Fr. : October-January.

World distribution : Peninsular India.

Specimen examined : Chelama, 7-12-1963, *Ellis* 17941.

L. cuspidata Nees in Wall, Pl. Asiat. Rar. 3 : 97. 1832 et in DC. Prodr. 11 : 258. 1847 ; C. B. Cl. in Hook. f. FBI 4 : 519. 1885 ; Gamble, FPM 6 : 1067. 1924.

Erect undershrubs, about 90 cm high ; stems terete, densely puberulous. Leaves about 10×2 cm, linear-elliptic, acuminate, mucronate, acute at base, glabrescent. Flowers white with purple spots, 1.5 cm long, in terminal and axillary paniced spikes about 20 cm long ; bracts ovate-mucronate, pubescent, 3-nerved from base, hairy ; bracteoles 1-nerved ; calyx 0.5 cm long, lobes unequal, linear, spinous-mucronate ; corolla white, 1 cm long, densely pubescent ; stamens 4, included, filaments glabrous, anther cells bearded ; ovary glabrous, style pubescent. Capsules 0.4 cm long, oblong, glabrous ; seeds 4, compressed, pubescent.

Fl. & Fr. : March-June.

World distribution : India, in dry localities.

Specimen examined : 'Streams', 'Nallamalais', March 1882, *Gamble* 10917.

Remarks : It is rather surprising that *Lepidagathis cuspidata* Nees has not been collected during the present tours of Nallamalais. The collections of Gamble are in excellent condition at CAL.

DYSCHORISTE Nees

Dyschoriste vagans (Wt.) O. Ktze. Rev. Gen. Pl. 486. 1891 ; *Gamble*, FPM 6 : 1023. 1924. *Calophanes vagans* Wt. Ic. 4 : t. 1526. 1850 ; C.B. Cl in Hook. f. FBI 4 : 411. 1885.

Decumbent herbs, about 60 cm high ; stems angled, glabrescent. Leaves about 8×4 cm, elliptic-ovate, acuminate, acute at base, glabrescent, lineolate ; petioles 1 cm long. Flowers purplish, 1.5 cm long, in axillary, a few-flowered, peduncled racemes 2 cm long, bracteate ; calyx lobes 0.7 cm long, linear-acuminate, puberulous, tube 0.4 cm long ; corolla lobes 0.5 cm long, obtuse, tube 1.5 cm long, suddenly expanded above, pubescent without ; stamens 4, didynamous, anthers spurred at base ; ovary glabrous, style pubescent. Capsules 1 cm long ; seeds 4, flattened, pubescent.

Fl. & Fr. : November-March.

World distribution : India.

Specimens examined : 'Kurnool Hill', no date, *Beddome* s.n. ; 'Kurnool Mountains', 1870, *R. H. Beddome* s.n. ; Chelama, 8-12-1263, *Ellis* 17996 ; Ahobilam, 23-11-1969, *Ellis* 32603.

DIPTERACANTHUS Nees

- | | | |
|---|----|----------------------|
| 1. Herbs procumbent ; capsules puberulous | .. | <i>D. prostratus</i> |
| 1. Herbs erect ; capsules glabrous | | <i>D. patulus</i> |

Dipteracanthus prostratus (Poir.) Nees in Wall. Pl. Asiat. Rar. 3 : 81. 1832 et in DC. Prodr. 3 : 81. 1847. *Ruellia prostrata* Poir. in Lamk. Encycl. 6 : 349. 1804 ; C. B. Cl. in Hook. f. FBI 4 : 412. 1885 ; *Gamble* FPM 6 : 1017. 1924.

Procumbent herbs, about 40 cm high, often rooting at nodes ; stems grooved, faintly puberulous. Leaves about 6×4 cm, ovate, rounded, obtuse or acute at base, sparsely pubescent ; petioles 2 cm long. Flowers pale blue, 2 cm long, axillary, solitary ; bracteoles 2 cm long, foliolar, ovate-orbicular ; calyx lobes 0.4 cm long, linear, pubescent, tube 0.1 cm long ; corolla lobes 0.5 cm long, orbicular, tube 1.5 cm long, ciliate

without ; stamens 4, didynamous, filaments pubescent at base ; ovary glabrous. Capsules 1.8×0.5 cm, ovoid, puberulous ; seeds many, flattened, thin, hirtellous, bearded along margins.

Fl. & Fr. : August-March.

World distribution : East Africa, India and Sri Lanka.

Specimens examined : Chelama, 12-12-1963, *Ellis* 18077 ; Chelama, 17-10-1964, *Ellis* 22064 ; Ahobilam, 29-8-1965, *Ellis* 25547.

Dipteracanthus patulus (Jacq.) Nees in Wall. Pl. Asiat. Rar. 3 : 82. 1832 et in DC. Prodr. 11 : 126. 1847 ; Wt. Ic 4 : t. 1505. 1850. *Ruellia patula* Jacq. Misc. Bot. 2 : 358. 1781 ; C. B. Cl. in Hook. f. FBI 4 : 412. 1885 ; Gamble, FPM 6 : 1017. 1924.

Erect herbs, about 60 cm high ; stems puberulous. Leaves up to 4×3 cm, ovate, obtuse, orbicular, acute or obtuse at base, crenulate, pubescent ; petioles about 2 cm long. Flowers pinkish, 3.5 cm long, axillary, solitary, sessile ; bracts about 1.8 cm long, oblong-spathulate ; calyx lobes 0.6 cm long, linear-ovate, pubescent, tube 0.1 cm long ; corolla lobes 0.5 cm long, orbicular, tube 4 cm long, pubescent without ; stamens 4, included, filaments glabrous, anther cells 2, parallel ; ovary glabrous. Capsules 1.5 cm long, ovoid, beaked, glabrous ; seeds many, orbicular, flattened, thin, pubescent along margins.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka and Burma.

Specimen examined : Srisailam, 12-7-1963, *Ellis* 16821.

ERANTHEMUM Linn.

Eranthemum purpurascens Nees in Wall. Pl. Asiat. Rar. 3 : 106. 1832 et in DC. Prodr. 11 : 447. 1847 ; Gamble FPM 6 : 1025. 1924. *Daedalacanthus purpurascens* (Nees) T. Anders. in Journ. Linn. Soc. 9 : 188. 1867 ; C. B. Cl. in Hook. f. FBI 4 : 420. 1885. *Eranthemum pulchellum* (Roxb.) Roxb. Fl. Ind. 1 : 111. 1824 (non Andr.). *Justicia pulchella* Roxb. Pl. Corom. 2 : 41, t. 177. 1805.

Shrubs, about 1 m high ; stems quadrangular, grooved, puberulous. Leaves 20×10 cm, elliptic-ovate, obovate, acuminate, attenuate at base, rather coriaceous ; lateral nerves and reticulations prominent ; petioles 2 cm long. Flowers blue, 3 cm long, in terminal racemes 8 cm long ; peduncles up to 25 cm long ; common bracts 4×2 cm, ovate-acuminate, individual bracts greenish-white, ovate-acuminate, prominently nerved ; bracteoles 0.5 cm long, linear ; calyx lobes 0.2 cm long, acuminate, tube

0.5 cm long; corolla lobes 0.8 cm long, puberulous without, tube 1.5 cm long; stamens 2 fertile, 2 staminodes, slightly exerted; ovary glabrous. Capsules 1 cm long, glabrous; seeds 4, orbicular, flattened, on retinaculae.

Fl. & Fr. : October-July.

World distribution : India and Sri Lanka.

Specimens examined : Mantralakanama, Feb. 1887, *J. S. Gamble* 18724; Gundlabrahmeswaram, 31-3-1965, *Ellis* 23820.

HEMIGRAPHIS Nees

Hemigraphis latebrosa (Roth) Roxb. Fl. Ind. 3 : 46. 1832; Nees in DC. Prodr. 11 : 723. 1847; Wt. Ic. 4 : t. 1504. 1850; C. B. Cl. in Hook. f. FBI 4 : 423. 1885; Gamble, FPM 6 : 1018. 1924. *Ruellia latebrosa* Heyne ex Roth, Nov. Pl. Sp. 307. 1821.

Erect herbs, about 40 cm high; stems faintly angled, striate, hairy. Leaves up to 7.5 × 4.5 cm, ovate-acuminate, rounded and suddenly attenuate at base, dentate, sparsely hairy, lineolate; petioles about 4 cm long. Flowers pale blue, 1.5 cm long, in axillary, shortly peduncled cymes 1 cm across; bracts about 1.7 cm long, ovate-acuminate, ciliate; calyx lobes 0.6 cm long, linear-acute, scarious, prominently ciliate at top, tube 0.1 cm long; corolla lobes 0.1 cm long, tube 0.6 cm long, ciliate within; stamens 4, didynamous, included; ovary hairy, style sparsely hairy. Capsules 0.7 cm long, pubescent above; seeds about 6, flattened, laciniate along margins.

Fl. & Fr. : January-July.

World distribution : India, in dry localities.

Specimen examined : Chelama, 12-12-1963, *Ellis* 18072.

Remarks : Many varieties have been described under *Hemigraphis latebrosa* (Roth) Roxb., viz. *rupestris* (Heyne ex T. Anders.) C. B. Cl., *beddomei* C. B. Cl., *ebracteata* (Dalz.) Cooke, *incana* Gamble, *heyneana* Brem. etc. From a study of herbarium specimens at MH and CAL, it appears, that these varieties may not stand as they imperceptibly merge with one another. Santapau (in *Univ. Bombay bot. Mem.* 2 : 25-28. 1951) too is rather sceptical about the varieties, for he states, '...I find it very difficult to distinguish between these three plants, i.e. *H. latebrosa* vars. *heyneana*, *ebracteata* and *H. rupestris*! (p. 27), A monographer's pronouncement is required about this.

THUNBERGIACEAE

1. Calyx truncate or obscurely 5-toothed ; leaves sessile
 1. Calyx several-toothed ; leaves-petiolate

MEYENIA
 THUNBERGIA

MEYENIA Nees

Meyenia hawtayneana (Wall.) Nees in Wall. Pl. Asiat. Rar. 3 : 78. 1832 et in DC. Prodr. 11 : 60. 1847 ; Wt. Ic. 4 : t. 1487. 1850 ; Gamble, FPM 6 : 1009. 1924. *Thunbergia hawtayneana* Wall. Tent. Fl. Nap. 49. 1826 ; C. B. Cl. in Hook. f. FBI 4 : 391. 1884.

Trailing herbs, sometimes erect, up to 30 cm high ; stems angled, grooved, glabrous. Leaves about 7×4 cm, ovate, apiculate, cordate at base, coriaceous, sessile ; reticulations prominent. Flowers violet, yellowish at throat, 4.5 cm long, solitary, axillary ; pedicels about 2.5 cm long ; bracteoles 3×1 cm long, foliaceous, ovate-acuminate ; calyx 0.1 cm long, truncate or obscurely 5-toothed ; corolla lobes orbicular, spreading, tube enlarging at throat ; stamens 4, didynamous, anthers spurred at base ; ovary glabrous, style slender, stigma 2-lobed. Capsules 3.5×2 cm, conical with broadened base ; seeds 4 ; retinaculæ absent.

Fl. & Fr. : March-August.

World distribution : India, in rocky substratum.

Specimens examined : Gundlabrahmeswaram, 2-4-1965, *Ellis* 23846 ; Diguvametta, 9-8-1972, *Ellis* 42221.

THUNBERGIA Retz. *nom. cons.*

Thunbergia fragrans Roxb. Pl. Corom. 1 : 47. 1795 ; Nees in Wall. Pl. Asiat. Rar. 3 : 77. 1832 et in DC. Prodr. 11 : 57. 1847 ; C. B. Cl. in Hook. f. FBI 4 : 390. 1884 ; Gamble, FPM 6 : 1007. 1924.

Climbing herbs ; stems striate, glabrous to hirsute-pubescent. Leaves about 7×4 cm, ovate-acuminate, rounded or cordate at base, shallowly lobed, coriaceous, scabrous, puberulous ; petioles 2 cm long. Flowers white with yellow centre, 6 cm long, axillary, solitary ; bracteoles 2.5×1 cm, ovate-acuminate ; pedicels 3-10 cm long ; calyx 0.3 cm long, many-toothed, puberulous ; corolla lobes 2 cm long, orbicular, tube 2.5 cm long ; stamens 4, didynamous, anther cells spurred at base or not ; ovary glabrous, style slender, stigma 2-lobed. Capsules about 2.5 cm long, conical, basally broadened ; seeds 4, globose, retinaculæ absent.

Fl. & Fr. : April-December.

World distribution : India, Sri Lanka, Malaysia and Philippines.

Specimens examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16911 ; Gundlabrahmeswaram, 1-12-1969, *Ellis* 32684.

Remarks : C. B. Clarke (*op. cit.*) has reported 3 varieties under *Thunbergia fragrans* Roxb. Gamble (*op. cit.* p. 1008), in addition, has described a new variety, *hispida*. However, all these varieties show variations, and the present study both in the field and in herbaria at MH and CAL reveals that these varieties cannot stand. With this broad circumscription only the present understanding of the taxon has been envisaged.

VERBENACEAE

1. Prostrate herbs	PHYLA
1. Erect or scandent shrubs and trees :	
2. Leaves simple :	
3. Scandent shrubs ; bracts foliaceous	.. SYMPHOREMA
3. Erect shrubs and trees ; bracts foliaceous or not :	
4. Drupes 1 cm across, densely stellate-pubescent	TECTONA
4. Drupes less than 0.5 cm across, puberulous :	
5. Leaves dentate-serrate	CLERODENDRUM
5. Leaves entire or crenate-serrate :	
6. Stems prickly	.. LANTANA
6. Stems not Prickly :	
7. Corolla 1 cm or more long	.. GMELINA
7. Corolla less than 0.5 cm long	PREMNA
2. Leaves 3-5-foliolate	VITEX

PHYLA Lour.

Phyla nodiflora (Linn.) Greene in *Pittonia* 4 : 46. 1899 ; Santapau in *Rec. bot. Surv. Ind.* 16(1) : 211. 3rd rep. ed. 1967. *Verbena nodiflora* Linn. *Sp. Pl.* 20. 1753. *Lippia nodiflora* (Linn.) Michaux, *Fl. Bor. Amer.* 2 : 14. 1803 ; Schauer in *DC. Prodr.* 11 : 585. 1847 ; *Wt. Ic.* 4 : t. 1463. 1850 ; C. B. Cl. in *Hook. f. FBI* 4 : 563. 1885 ; Gamble, *FPM* 6 : 1088. 1924.

Creeping herbs, up to 50 cm in length ; stems terete, glabrous, rooting at nodes. Leaves 2×0.8 cm, opposite or ternate, obtusate, serrate at apices, strigose on both surfaces. Flowers white, 0.4 cm long, in axillary, oblong spikes about 0.9 cm long ; calyx small, 4-lobed, membranous, hairy ; corolla 2-lipped, upper 2-lobed, lower 3-lobed ; tube cylindrical, slightly curved, 0.1 cm long ; stamens 4, didynamous, included, anther cells parallel ; ovary glabrous, style short, stigma capitate. Drupes 0.1 cm across ; pyrenes 2.

Fl. & Fr. : Throughout the year.

World distribution : Warm-temperate regions of Mediterranean, tropics comprising India, Sri Lanka, Malaysia, Australia and America.

Specimen examined : Krishnanandi, Mahanandi, 21-8-1972, *Ellis* 42319.

SYMPHOREMA Roxb.

Symphorema involucratum Roxb. Pl. Corom. 2 : 46, t. 186. 1798 ; Wt. Ic. 2 : t. 362. 1843 ; C. B. Cl. in Hook. f. FBI 4 : 599. 1885 ; Gamble, FPM 6 : 1104. 1924.

Climbing shrubs ; stems terete, striate, densely brown-tomentose. Leaves 7×5 cm, ovate, orbicular, rounded at base, crenate-serrate, dentate, densely tomentose beneath, less so above. Flowers white, 0.5 cm long, in pedunculate capitate cymes about 2 cm across ; bracts 2.5×1 cm, oblong-obovate, spatulate, puberulous, reticulations prominent ; calyx lobes 6, 0.4 cm long, ovate, tube 0.2 cm long, pubescent without ; stamens about 6, exserted ; ovary glabrous. Drupes 0.5×0.5 cm, oblong, enclosed in persistent calyx ; seed 1, fleshy.

Fl. & Fr. : March-May.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23758.

Remarks : Sometimes placed in the Symphoremataceae in a restricted sense, dependent on its having free-central placentation.

Gamble (*op. cit.* p. 1104) reports *Symphorema polyandrum* Wt. from '...Nallamalai Hills of Cuddapah and Kurnool (Beddome, Gamble) ; ...' This species has not been collected during the present tour of Nallamalais ; nor are there herbarium specimens in MH or CAL collected from Nallamalais.

TECTONA Linn. f. *nom. cons.*

Tectona grandis Linn. f. Suppl. 151. 1781 ; Schauer in DC. Prodr. 11 : 629. 1847 ; C. B. Cl. in Hook. f. FBI 4 : 571. 1885 ; Brandis, Indian Trees, 505. 1906 ; Gamble, FPM 6 : 1092. 1924.

Trees, about 30 m tall ; young branches angled, stellate-tomentose, Leaves 40×30 cm, elliptic, acute or acuminate, cuneate at base, densely tomentose beneath ; transverse nerves prominent. Flowers white, 0.5 cm

long, in terminal, paniculate cymes about 30 cm long; bracts foliar towards base; calyx lobes not equal, 0.4 cm long, ovate, accrescent in fruits, prominently nerved; corolla 0.5 cm long, tube 0.2 cm long; stamens 5, exserted, anther cells parallel; ovary glabrous, style slender, stigma bifid. Drupes 1.5×1.5 cm, enclosed in accrescent calyx, densely stellate-hirsute; endocarp bony.

Fl. & Fr. : July-September.

World distribution : India, Burma and Malaysia.

Specimens examined : Chelama, 8-7-1963, *Ellis* 16782; Mahanandi, 22-8-1965, *Ellis* 25484.

CLERODENDRUM Linn.

Clerodendrum serratum (Linn.) Moon, Cat. 46. No. 382. 1824; Schauer in DC. Prodr. 11 : 664. 1847; Wt. Ic. 4 : t. 1472. 1850; C. B. Cl. in Hook. f. FBI 4 : 592. 1885; Gamble, FPM 6 : 1100. 1924. *Volkameria serrata* Linn. Mant. Pl. 90. 1767.

Shrubs, about 2 m high; stems subquadrangular, brown-tomentose when young. Leaves up to 27×13 cm, opposite and ternate, elliptic-acuminate, attenuate or acute or obtuse at base, deeply crenate-serrate, glabrescent; petioles short. Flowers pale violet, about 1 cm long, in axillary, dichotomous cymes 7 cm long, disposed in terminal panicles about 25 cm long, shortly pedicellate; bracts 3.5×1.5 cm, ovate-acuminate, serrate, foliaceous; calyx 0.3 cm long, shortly lobed, puberulous without; corolla about 1 cm long, curved, lobes suborbicular, ciliate along margins; stamens much exserted, filaments densely pubescent at base; ovary glabrous, style slender, stigma bifid. Drupes 4×7 cm, obovoid, 4-lobed; pyrenes 1 in each lobe.

Fl. & Fr. : July-November.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16946; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22184; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32648; Rollapenta, 14-8-1972, *Ellis* 42259.

Remarks : This is remarkably a moist deciduous plant of Nalliamalais.

LANTANA Linn.

Lantana camara Linn. Sp. Pl. 627. 1753, var. *aculeata* (Linn.) Moldenke in Torrey 34 : 9. 1934. *Lantana aculeata* Linn. Sp. Pl. 627.

1753 ; C. B. Cl. in Hook. f. FBI 4 : 562. 1885 ; Gamble, FPM 6 : 1087. 1924.

Straggling shrubs, about 1.5 cm high ; stems with recurved prickles, sparingly hirsute, angled, grooved. Leaves up to 11×6 cm, ovate-acuminate, abruptly acuminate at base, crenate-serrate, strigose ; petals 2 cm long. Flowers orange-yellow, 1 cm long, in capitate heads 2 cm across ; bracts 0.7 cm long, ovate-acuminate, hirtellous ; calyx 0.2 cm long, lobes rather small ; corolla tube 1 cm long, lobes oblong, hirtellous without ; stamens 4, didynamous, anther cells parallel ; ovary glabrous, style short, stigma capitate. Drupes 0.3 cm across, globose, dehiscing into two 1-seeded pyrenes.

Fl. & Fr. : Throughout the year.

World distribution : A pantropic weed.

Specimen examined : Rollapenta, 16-8-1972, *Ellis* 42283.

GMELINA Linn.

- | | |
|--|-----------------------|
| 1. Leaves about 27×12 cm ; plants not thorny | <i>G. arborea</i> |
| 1. Leaves about 3×2.5 cm ; plants thorny | .. <i>G. asiatica</i> |

Gmelina arborea Roxb. [Hort. Beng. 46, 1814 ex] Pl. Corom. 3 : 41, t, 246. 1815 ; Schauer in DC. Prodr. 11 : 680, 1847 ; Wt. Ic. 4 : t. 1470. 1850 ; C. B. Cl. in Hook. f. FBI 4 : 581. 1885 ; Brandis, Indian Trees 509. 1906 ; Gamble, FPM 6 : 1097. 1924.

Trees, about 10 m tall ; young branches brown-pubescent. Leaves about 27×12 cm, ovate-acuminate, acute, obtuse or truncate at base, glabrous above, tomentose beneath ; petioles up to 8 cm long. Flowers pale brown with lower petal yellow, about 4 cm long, in cymes disposed in terminal racemes about 12 cm long ; bracts 1 cm long, linear ; corolla densely pubescent without, lobes unequal, oblong, tube about 1 cm long ; stamens 4, didynamous, included, anther cells parallel ; ovary glabrous, style slender, stigma bifid. Drupes about 1.5 cm across, ovoid ; endocarp bony.

Fl. & Fr. : March-July.

World distribution : India, Sri Lanka, Burma, Malay Peninsula and Philippines.

Specimen examined : Chelama, 20-3-1965, *Ellis* 23736.

G. asiatica Linn. Sp. Pl. 626. 1753 ; Schauer in DC. Prodr. 11 : 679, 1847 ; C. B. Cl. in Hook. f. FBI 4 : 582. 1885 ; Gamble, FPM 6 : 1098. 1924.

Shrubs or small trees, about 3 m tall; rarely scandent; stems terete, glabrous, often transformed into thorns. Leaves about 3 × 2.5 cm, ovate-oblong, sometimes 3-lobed, acute at base, glabrous; petioles 1 cm long. Flowers yellow, 4.5 cm long, in terminal racemes 10 cm long, bracteate; pedicels small; calyx 0.5 cm long, cupular, shortly 4-lobed, pubescent without; corolla tube 2.5 cm long, lobes obtuse; stamens 4, didynamous, anther cells parallel; ovary glabrous. Drupes 1 cm across, obovoid; endocarp bony.

Fl. & Fr. : Almost throughout the year.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimens examined : Diguvaletta, 6-8-1972, *Ellis* 42163.

PREMNA Linn. *nom. cons.*

- | | |
|----------------------------------|----------------------|
| 1. Petioles about 10 cm long | <i>P. hamiltonii</i> |
| 1. Petioles about 5 cm long : | |
| 2. Plants stellate-pubescent | <i>P. tomentosa</i> |
| 2. Plants not stellate-pubescent | <i>P. latifolia</i> |

Premna hamiltonii Ellis in Bull. bot. Surv. Ind. 22 : 193. 1980 (1982).
P. flavescens Buch.-Ham. ex C. B. Cl. in Hook. f. FBI 4 : 578. 1885, (non Juss.) ; Gamble, FPM 6 : 1096. 1924.

Trees, about 10 m tall; young branches striate, puberulous-tomentose. Leaves about 20 × 10 cm, ovate, elliptic-acuminate, rounded or obtuse at base, sparsely puberulous above, tomentose beneath; petioles about 10 cm long; transverse nervules prominent. Flowers pale green, 0.3 cm long, in cymes, in terminal panicles 15 cm long, rachises puberulous; calyx 0.15 cm long, 2-lipped, puberulous without, accrescent, lobes unequal, ovate; corolla 0.2 cm long, 2-lipped; stamens 4, didynamous, included, anther cells parallel; ovary glabrous, style filiform, stigma faintly bifid. Drupes 0.4 cm long, globose; endocarp of 1 pyrene.

Fl. & Fr. : July-September.

World distribution : India.

Specimens examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16952 ; Rollapenta, 14-8-1972, *Ellis* 42246.

P. tomentosa Willd. Sp. Pl. 3 : 314. 1800; Schauer in DC. Prodr. 9 : 634. 1847; Wt. Ic. 4 : t. 1468. 1850; C. B. Cl. in Hook. f. FBI 4 : 576. 1885; Gamble, FPM 6 : 1096. 1924.

Trees, about 10 m tall ; young branches densely stellate-tomentose. Leaves about 17×12 cm, ovate-acuminate, rounded or obtuse or acute at base, glabrescent above, densely so beneath ; petioles up to 5 cm long. Flowers 0.5 cm long, in cymes, in terminal panicles up to 10 cm long, bracteate ; calyx 0.3 cm long, densely tomentose without, lobes shallowly ovate ; corolla 0.5 cm long, lobes ovate, tomentose without ; stamens 4, didynamous, included ; ovary tomentose. Drupes 0.5×0.5 cm, globose, ripening purple ; pyrene 1, rugose.

Fl & Fr. : February-August.

World distribution : India and Sri Lanka.

Specimens examined : Basavapuram, March 1883, *J. S. Gamble* 10919 ; Chelama, 4-7-1963, *Ellis* 16727 ; Chelama, 21-3-1965, *Ellis* 23743 ; Mahanandi, 21-8-1965, *Ellis* 25468 ; Diguvametta, 6-8-1972, *Ellis* 42149.

Premna latifolia Roxb. [Hort. Beng. 46. 1814 ex] Fl. Ind. 3 : 76. 1832, var. *mollissima* (Roth) C. B. Cl. in Hook. f. FBI 4 : 578. 1885 ; Gamble, FPM 6 : 1096. 1924. *P. mollissima* Roth, Nov. Sp. Pl. 287. 1821 ; Schauer in DC. Prodr. 11 : 638. 1847.

Trees, about 8 m tall ; young branches terete, striate, pubescent. Leaves about 5.5×4 cm, ovate, obtuse, rounded or obtuse at base, pubescent ; petioles 1.3 cm long. Flowers white, 0.3 cm long, in cymes, in terminal corymbs about 4 cm long, bracteate ; calyx 1.5 cm long, lobes 5, almost equal, pubescent without ; corolla 0.3 cm long, densely pubescent without, lobes ovate, tube 0.2 cm long ; stamens 4, didynamous, exerted, anther cells parallel ; ovary glabrous, stigma bilobed. Drupes 0.3×0.3 cm, globose, endocarp rugose.

Fl. & Fr. : May-October.

World distribution : Peninsular India.

Specimens examined : Diguvametta, 28-10-1906, *C. A. Barber* 8012 ; Srisailam, 12-7-1963, *Ellis* 16826A ; Ahobilam, 29-8-1965, *Ellis* 25551.

VITEX Linn.

- | | | |
|--|----|---------------------|
| 1. Leaflets sessile ; flowers in clustered cymes | .. | <i>V. altissima</i> |
| 1. Leaflets petiolate ; flowers in simple cymes | . | <i>V. leucoxylo</i> |

Vitex altissima Linn. f. Suppl. 294. 1781 ; Schauer in DC. Prodr. 11 : 685. 1847 ; Wt. Ic. 4 : t. 1466. 1850 ; C. B. Cl. in Hook. f. FBI 4 : 584. 1885 ; Gamble, FPM 6 : 1102. 1924. *V. alata* Heyne ex Roth, Nov. Sp. Pl. 316. 1821 ; C. B. Cl. *loc. cit.*

Trees, about 15 m tall; young branches angled, brown-pubescent. Leaves 3-foliolate; common petioles up to 7 cm long, often winged; leaflets 16×5 cm, elliptic-acuminate, acute at base, puberulous below, sessile; nerves and reticulations prominent below. Flowers pale pink, 0.4 cm long, in clustered cymes, in terminal panicles about 25 cm long; bracts small; calyx 0.1 cm long, pubescent without, lobes ovate; corolla 0.4 cm long, obscurely 2-lipped, lobes ovate, pubescent on both surfaces; stamens 4, didynamous, exserted; ovary glabrous, style slender, stigma bifid. Drupes 0.5 cm across, globose, subtended by accrescent calyx, puberulous; endocarp bony; seeds 4, oblong.

Fl. & Fr. : April-October.

World distribution : Peninsular India and Sri Lanka.

Specimens examined : Gazulapalle, 11-9-1917, *Rangachari* s.n. ; Upper Ahobilam, 29-8-1965, *Ellis* 25554.

Vitex leucoxyton Linn. f. *Suppl.* 293. 1781; Schauer in DC. *Prodr.* 11 : 692. 1847, *p. p.* ; C. B. Cl. in Hook. f. *FBI* 4 : 487. 1885; Gamble. *FPM* 6 : 1103. 1924. *Wallrothia leucoxyton* (Linn. f.) Roth, *Nov. Sp. Pl.* 319. 1821; Wt. *Ic.* 4 : t. 1467. 1850.

Trees, about 10 m tall; young branches glabrous. Leaves 3-5-foliolate; common petioles about 10 cm long; leaflets about 15×4 cm, glaucous beneath, elliptic-ovate, acuminate, acute at base, coriaceous, puberulous along nerves below; reticulations prominent. Flowers white, 0.7 cm long, in cymes, in axillary, dichotomously branched panicles 13 cm long, bracteate; calyx 0.3 cm long, puberulous, lobes shallowly ovate; corolla white, 0.7 cm long, 2-lipped, pubescent without, a few purple-haired within; ovary glabrous, stigma 2-lobed. Drupes 1.2×0.8 cm, obovoid, seated on orbicular calyx; seeds 4, oblong.

Fl. & Fr. : March-June.

World distribution : India and Sri Lanka.

Specimens examined : 'Nallamalais', March 1883, *Gamble* 10935; Chelama, 18-3-1965, *Ellis* 23727.

NYCTANTHACEAE

NYCTANTHES Linn.

Nyctanthes arbortristis Linn. *Sp. Pl.* 6. 1753; DC. *Prodr.* 8 : 314. 1844; C. B. Cl. in Hook. f. *FBI* 3 : 603. 1882; Gamble, *FPM* 5 : 792. 1923.

Trees, about 6 m tall ; branches quadrangulār, scaberulous, especially along angles. Leaves about 14×7 cm, elliptic-acuminate, rounded at base, scabrous-puberulous ; nerves prominent beneath ; petioles 0.5 cm long. Flowers white, 1.5 cm across, in terminal and axillary, dichotomous cymes 1 cm long ; peduncles about 2 cm long ; calyx 0.8 cm long, sparsely pubescent, lobes small ; petals white, spreading, tube 1.5 cm long, orange-coloured ; ovary glabrous, style slender, stigma bifid ; stamens 2, filaments very short. Capsules 1.5×1.5 cm, orbicular, flattened, notched or shortly apiculate at apex ; seeds 1 cm across, flattened, glabrous.

Fl. & Fr. : May-December.

World distribution : India, Siam and Malaysia.

Specimens examined : Diguvaletta, 11-11-1906, *C. A. Barber* 8096 ; Gundlabrahmeswaram, 20-7-1963, *Ellis* 16940 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22192 ; Diguvaletta, 17-11-1969, *Ellis* 32455.

Remarks : B. C. Kundu and Anima De (in *Bull. bot. Surv. Ind.* 10 : 397-408. 1968) have discussed at length the position of the genus *Nyctanthes* Linn. after working on cytology, general anatomy, wood anatomy, floral anatomy, palynology, etc. of the genus. Their findings support that the genus is rightly placed in a separate family, Nyctanthaceae. Hutchinson (1973) and Airy Shaw (*Kew Bull.* 1952 : 271-272. 1953), however, treat it under the Verbenaceae. R. N. Kapil and R. S. Vani (in *Phytomor.* 16 : 553-563. 1967) on embryological evidence, have shown that the genus *Nyctanthes* should be retained in the Oleaceae. Kundu and De (*op. cit.*) suggest that '... The proper phylogenetic position of Nyctanthaceae seems to be in between Strychnaceae and Oleaceae under the order Loganiales of Hutchinson.'

LABIATAE (LAMIACEAE)

- | | | |
|--|----|--------------|
| 1. Calyx lobes densely plumose in fruits ;
plants suffrutescent, about 2.5 m high | .. | COLEBROOKEA |
| 1. Calyx lobes not plumose in fruits ;
plants herbaceous, up to 1.5 m high : | | |
| 2. Inflorescences capitate | .. | ACROCEPHALUS |
| 2. Inflorescences spicate, verticillate or whorled : | | |
| 3. Flowers scarlet red or orange | .. | LEONOTIS |
| 3. Flowers white, purplish or pink : | | |
| 4. Flowers in long racemes : | | |
| 5. Stigmas 2-fid : | | |
| 6. Calyx lobes erect | .. | OCIMUM |
| 6. Calyx lobes deflexed | | ANISOCHILUS |

- | | |
|--|-------------|
| 5. Stigma entire | ORTHOSIPHON |
| 4. Flowers in whorls or verticillasters or a few-flowered umbels : | |
| 7. Calyx 5-toothed, straight : | |
| 8. Inflorescences umbellate | .. HYPTIS |
| 8. Inflorescences verticillate | ANISOMRLES |
| 7. Calyx 6-10-toothed, slightly falcate | LEUCAS |

COLEBROOKEA Smith

Colebrookea oppositifolia Smith, Exot. Bot. 2 : 111, t. 115. 1805-07 ; Benth. in DC. Prodr. 12 : 158. 1848 ; Hook. f. FBI 4 : 642. 1885 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14 (1) : 84. 1940 ; Gamble, FPM 6 : 11. 1924.

Shrubs, about 2 m high ; stems subquadrangular, grooved, woolly-pubescent. Leaves about 20×6 cm, generally ternate, elliptic-acuminate, attenuate at base, crenate-serrulate, densely pubescent beneath, less so above ; petioles 1.5 cm long. Flowers pale green, 0.5 cm long, in clusters, along branched panicles about 12 cm long, bracteate ; calyx about 0.5 cm long, segments subulate, becoming feathery in fruits, tube small ; corolla 0.2 cm long, lobes 4 ; stamens exerted in male flowers, included in female flowers, filaments glabrous, anthers globose ; ovary glabrous, 4-partite, style bifid. Nutlets small, obovoid, densely pubescent.

Fl. & Fr. : November-March.

World distribution : India, Burma and China, generally in moist deciduous forests.

Specimens examined : Gundlabrahmeswaram, 31-3-1965, *Ellis* 23822 ; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32642.

ACROCEPHALUS Benth.

Acrocephalus indicus (Burm. f.) O. Ktze. Rev. Gen. Pl. 511. 1891 ; Gamble, FPM 6 : 1115. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14 (1) : 29. 1940. *Prunella indica* Burm. f. Fl. Ind. 130. 1768. *Acrocephalus capitatus* (Roth) Benth. in Wall. Pl. Asiat. Rar. 2 : 18. 1831, et in DC. Prodr. 12 : 47. 1848 ; Hook. f. FBI 4 : 611. 1885. *Ocimum capitatum* Roth, Nov. Pl. Sp. 276. 1821.

Erect herbs, about 40 cm high ; stems quadrangular, grooved, sparsely hairy. Leaves about 4×1 cm, elliptic-obtuse or acute, cuneate at base, crenate-serrate, sparsely puberulous, glandular beneath ; petioles up to 2 cm long. Flowers white, purplish at tips of lobes, 0.4 cm long,

in terminal, capitate heads about 1.5 cm long, bracteate; calyx 0.9 cm long, 2-lipped, upper entire, spathulate, lower 3-lobed, hirtellous along margin, sparsely hairy without, prominently 3-veined; corolla 1.5 cm long, upper lip 4-lobed, lower entire; stamens 4, didynamous, included, filaments slender; ovary 4-partite, style filiform, stigma bifid. Nutlets 0.1 cm long, ellipsoid.

Fl. & Fr. : September-December.

World distribution : Afghanistan, India, Burma, China and Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17977; Diguvametta, 17-11-1969, *Ellis* 32444.

LEONOTIS (Pers.) R. Br.

Leonotis nepetaefolia (Linn.) R. Br. in Aiton Hort. Kew. 3 : 409. ed. 2. 1811; Benth. in DC. Prodr. 12 : 535. 1848; Wt. Ic. 3 : t. 867. 1844; Hook. f. FBI 4 : 691. 1885; Gamble, FPM 6 : 1155. 1924; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 185. 1940. *Phlomis nepetaefolia* Linn. Sp. Pl. 586. 1753.

Suffrutescent herbs, about 2 m high; stems sharply quadrangular, grooved, puberulous. Leaves up to 13 × 10 cm, ovate, acute or obtuse or abruptly cuneate at base, crenate-serrate or dentate, puberulous on both surfaces; petioles about 4 cm long. Flowers scarlet, 2.5 cm long, in many-flowered, globose verticillasters 6 cm across; bracts 0.5 cm long, spinous-lobed; calyx tube 2 cm long, upper portion pubescent, lower sparsely pubescent or glabrous, mouth oblique, teeth about 9, spinous; corolla 2 cm long, 2-lipped, densely scarlet red-pubescent without, glabrous within except for three rows of hairs; stamens 4, didynamous, included, anthers with cells divergent, filaments dilated; disks equal; ovary 4-partite. Nutlets 0.3 cm long, obliquely truncate.

Fl. & Fr. : October-January.

World distribution : Tropics of America, Africa, India, Sri Lanka and Malaysia, in waste lands and on garbage heaps.

Specimens examined : Diguvametta, 15-11-1906, *C. A. Barber* 8111; Chelama, 7-12-1963, *Ellis* 17934; Diguvametta, 16-11-1969, *Ellis* 32394.

OCIMUM Linn.

Ocimum sanctum Linn. Mant. Pl. 1 : 85. 1767; Benth. in DC. Prodr. 12 : 38. 1848; Hook. f. FBI 4 : 609. 1885; Gamble, FPM 6 : 1111. 1924; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 19. 1940.

Erect herbs, about 40 cm high; stems striate, sparsely pubescent, woody at base. Leaves about 3 × 2 cm, elliptic-ovate or oblong, obtuse or acute at base, serrate, pubescent; petioles 1 cm long, pubescent, glandular. Flowers white, 0.5 cm long, in interrupted spikes, in whorls about 1 cm across; spikes 10 cm long, terminal; pedicels about 0.3 cm long; calyx 0.2 cm long, accrescent in fruits, sparsely hirsute, prominently reticulate, upper lip obovate, lower 4-toothed, awned; corolla 0.5 cm long, upper lip pubescent; stamens 4, didynamous, exserted, filaments hairy at base, anthers 1-celled; ovary glabrous, 4-partite, style filiform, stigma 2-fid. Nutlets 0.3 cm long, ovoid, smooth.

Fl. & Fr. : Throughout the year.

World distribution : Middle East, India, Sri Lanka, Malaysia and Australia.

Specimen examined : Bairanidokku, Eastern Nallamalais, 12-8-1972, Ellis 42233.

ANISOCHILUS Wall.

Anisochilus carnosus (Linn.) Wall. Pl. Asiat. Rar. 2 : 18. 1831; Benth. in DC. Prodr. 12 : 81. 1848; Hook. f. FBI 4 : 627. 1885; Gamble, FPM 6 : 1126. 1924; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 58. 1940. *Lavandula carnosa* Linn. Amoen. Acad. 10 : 56, t. 3. 1756.

Erect herbs, about 40 cm high; stems bluntly 4-angled; glabrescent. Leaves about 10 × 10 cm, ovate, obtuse or orbicular, cordate or obtuse at base, crenate-dentate, puberulous, rather coriaceous; petioles about 10 cm long. Flowers violet, 0.5 cm long, in terminal spikes about 4 cm long; bracts 0.2 cm long, ovate, puberulous, ciliate along margins, glandular; calyx 0.8 cm long, 2-lipped, upper deflexed, entire, lower truncate; corolla 0.8 cm long, pubescent without, tube narrow, upper lip erect, lower concave; stamens 4, didynamous, filaments glabrous; ovary 4-partite, glabrous, style slender, stigma bifid. Nutlets 4, 0.2 cm long, ovoid, compressed.

Fl. & Fr. : October-December.

World distribution : India, Sri Lanka and Burma, in dry tracts.

Specimens examined : Way to Pathalaganga, Srisailam, 20-10-1964, Ellis 22116; Srisailam, 6-12-1969, Ellis 32715.

Remarks : Duthie [*Fl. Upper Gang. Pl.* 2 : 104. rep. ed. 1960 (1903)] treats *Anisochilus eriocephalus* Benth. as synonymous to *A. carnosus* (Linn.) Wall. This has not been followed by subsequent workers

like Gamble, Mukerjee and others ; both the taxa are kept as distinct species. From the present studies it is apparent that though they appear to be one and the same, some characters separate them.

ORTHOSIPHON Benth.

- | | | |
|--|----|---------------------|
| 1. Calyx densely villous within at throat | .. | <i>O. diffusus</i> |
| 1. Calyx glabrous within : | | |
| 2. Leaves about 5 × 3.5 cm, ovate | .. | <i>O. glabratus</i> |
| 2. Leaves about 1.5 × 0.8 cm, oblong-orbicular | .. | <i>O. pallidus</i> |

Orthosiphon diffusus (Benth.) Benth. in DC. Prodr. 12 : 50. 1848 ; Hook. f. FBI 4 : 613. 1885 ; Gamble, FPM 6 : 1113. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 22. 1940. *Ocimum diffusum* Benth. [Wall. Cat. 2718. 1831 ex] in Wall. Pl. Asiat. Rar. 2 : 14. 1831. *O. diffusus* Benth. var. *hispida* Hook. f. *loc. cit.*

Erect herbs, about 30 cm high ; stems terete, striate, strigose. Leaves 2 × 1.5 cm, obtuse, orbicular, obtuse or rounded at base, strigose above, more so below especially on the nerves, coriaceous ; petioles 0.6 cm long, villous. Flowers pink, 0.8 cm long, in whorls along terminal racemes 15 cm long ; bracts 0.2 × 0.2 cm, ovate ; calyx 0.5 cm long, 2-lipped, upper spatulate, lower acute 3-lobed, hairy without, densely so near the throat within ; corolla 0.6 cm long, glabrous without, hairy within on tube ; stamens included, 4, didynamous, filaments glabrous, anther cells parallel, ovary glabrous, 4-partite, style filiform, stigma capitate. Nutlets 0.2 cm long, oblong, smooth.

Fl. & Fr. : May-December.

World distribution : Peninsular India, in dry tracts.

Specimens examined : Chelama, 9-7-1963, *Ellis* 16790 ; Lukki, Eastern Nallamalais, 9-8-1972, *Ellis* 42216.

Remarks : Hooker f.'s var. *hispidus* described under *O. diffusus* Benth. is treated by Gamble (*op. cit.*) as a variant of the *typica* ; this has also been the treatment of S. K. Mukerjee (*loc. cit.*). The present studies lend support for the same treatment.

O. glabratus Benth. in Wall. Pl. Asiat. Rar. 2 : 14. 1831 et in DC. Prodr. 12 : 50. 1848 ; Gamble, FPM 6 : 1114. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 24. 1940. *O. tomentosus* Benth. var. *glabrata* (Benth.) Hook. f. FBI 4 : 614. 1885.

Erect herbs, about 30 cm high ; stems subquadrangular, grooved,

pubescent in lines ; root stocks woody. Leaves 5×3.5 cm, ovate-acuminate, obtuse at base, crenate-dentate, sparsely hirtellous on nerves beneath, glandular ; petioles 2 cm long. Flowers white, 1 cm long, in whorls, along terminal spikes about 15 cm long ; pedicels 0.3 cm long ; bracts 0.2 cm long, ovate, recurved ; calyx 0.5 cm long, accrescent in fruits, 2-lipped, upper oblong, lower 3-lobed, prominently awned, glabrescent ; corolla 1 cm long, glabrous ; stamens 4, didynamous, included, filaments glabrous ; ovary 4-partite, glabrous, style slender, stigma capitate. Nutlets 0.3 cm long, ovoid, glabrous.

Fl. & Fr. : March-September.

World distribution : India and Sri Lanka.

Specimens examined : Chelama, 4-7-1963, *Ellis* 16710 ; Vishnunandi, Mahanandi, 21-8-1965, *Ellis* 25404.

Orthosiphon pallidus Royle ex Benth. in Hook. Bot. Misc. 3 : 370. 1833 et in DC. Prodr. 12 : 50. 1848 ; Hook. f. FBI 4 : 613. 1885 ; Gamble, FPM 6 : 1113. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 23. 1940.

Erect herbs, about 20 cm high ; stems quadrangular, sparsely puberulous, woody at base. Leaves 1.5×0.8 cm, oblong, orbicular, cuneate at base, glabrous, sparsely puberulous along nerves, glandular. Flowers white, 0.5 cm long, in distantly disposed whorls along terminal racemes 6 cm long ; pedicels 0.3 cm long, puberulous ; bracts 0.1×0.1 cm, ovate, recurved ; calyx 0.4 cm long, accrescent in fruits, 2-lipped, upper orbicular, lower 3-lobed, awned, puberulous, prominently reticulate ; corolla 0.5 cm long, upper lip shorter than lower ; stamens 4, didynamous, included ; ovary 4-partite, glabrous, style slender, stigma bifid. Nutlets 0.2 cm long, ovoid, flattened, smooth.

Fl. & Fr. : May-October.

World distribution : Middle East, Baluchistan and India.

Specimen examined : Mahanandi, 23-8-1965, *Ellis* 25515.

HYPTIS Jacq. *nom. cons.*

Hyptis suaveolens (Linn.) Poit. in Ann. Mus. Par. 7 : 472, t. 29. 1806 ; Benth. in DC. Prodr. 12 : 126. 1848 ; Hook. f. FBI 4 : 630. 1885 ; Gamble, FPM 6 : 1129. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14(1) : 63. 1940. *Ballota suaveolens* Linn. Syst. Nat. ed. 10. 1100. 1759.

Erect herbs, about 60 cm high ; stems quadrangular, sparsely

glandular-hirsute. Leaves about 8×6 cm, broadly ovate, rounded at base, dentate-serrulate, sparsely hispid, glandular beneath. Flowers pale blue, about 1.2 cm long, secund in axillary umbels 2 cm long, sometimes solitary, bracteate, pedicellate, pedunculate; calyx lobes 0.4 cm long, unequal, tube 0.5 cm long, accrescent in fruits, sparsely hispid without, densely so at throat within, prominently ribbed; corolla 2-lipped, upper erect, spreading, lower deflexed, hairy without, densely so within; stamens 4, didynamous, slightly exserted, anther cells parallel, filaments glabrous; ovary 4-partite, style slender, stigmas bifid. Nutlets 4, oblong, smooth, raphe white.

Fl. & Fr. : Throughout the year.

World distribution : Native of tropical America, a weed from Africa, India, Sri Lanka, Indonesia and Malaysia.

Specimen examined : Chelama, 12-12-1963, *Ellis* 18080.

ANISOMELES R. Br.

Anisomeles indica (Linn.) O. Ktze. *Rev. Gen. Pl.* 512. 1891; Gamble, *FPM* 6 : 1140. 1923; S. K. Mukerjee in *Rec. bot. Surv. Ind.* 14(1) : 152. 1940; Backer & Bakh. f. *Fl. Java* 2 : 624. 1965. *Nepeta indica* Linn. *Sp. Pl.* 799. 1753. *Anisomeles ovata* R. Br. in Aiton *Hort. Kew.* 3 : 364, ed. 2. 1811; Benth. in *DC. Prodr.* 12 : 455. 1848; Wt. *Ice* 2 : t. 672. 1843; Hook. f. *FBI* 4 : 672. 1885. *Epimeredi indicus* (Linn.) Rothm. in Fedde, *Repert.* 53 : 12. 1944.

Robust herbs, about 1 m high; stems quadrangular, pubescent. Leaves up to 10×7 cm, ovate, truncate or cordate at base, crenate-serrate, puberulous; petioles 3 cm long. Flowers pale purple, 1.8 cm long, in axillary clusters or in terminal spikes about 5 cm long, bracteate; calyx 0.5 cm long, hirsute without, lobes equal, tube 0.2 cm long, pilose within; corolla 1.8 cm long, upper lip rounded, lower 3-lobed, densely hairy within at throat; stamens 4, didynamous, exserted, anther cells 2 in upper, parallel, 1 in lower; ovary glabrous, 4-partite, style filiform, bifid. Nutlets 4, flattened, smooth.

Fl. & Fr. : October-March.

World distribution : Mauritius Islands, India and Malay Peninsula.

Specimens examined : Giddalur, 9-11-1906, *C. A. Barber* 8080; Chelama, 8-12-1963, *Ellis* 18029; Diguvaletta, 17-11-1969, *Ellis* 32482.

Remarks : On the genus, *Epimeredi* Adans., Bakhuizen f. (*op. cit.* p. 624) states, '...I doubt whether *Epimeredi* Adans. and *Anisomeles*

R. Br. are congeneric. The specimens in Herb. Adanson (Paris) are a mixture and in my opinion *Anisomeles* is not represented !

LEUCAS R. Br.

- | | | |
|---|----|---|
| 1. Leaves ovate, about 10×8 cm, crenate-dentate | .. | <i>L. mollissima</i>
var. <i>scaberula</i> |
| 1. Leaves linear-elliptic, up to 8×1.3 cm, entire
or distantly serrulate : | | |
| 2. Leaf margins excurved ; corolla 1 cm long | .. | <i>L. stricta</i> |
| 2. Leaf margins not excurved ; corolla 2 cm long | | <i>L. aspera</i> |

Leucas mollissima Wall. ex Benth. in Pl. Asiat. Rar. 1 : 62. 1830, var. *scaberula* Hook. f. FBI 4 : 682. 1885 ; Gamble, FPM 6 : 1151. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14 (1) : 184. 1940.

Straggling herbs, about 1.5 m long ; stems quadrangular, striate, puberulous with deflexed hairs. Leaves about 10×8 cm, ovate, rounded or obtuse at base, crenate-dentate, pubescent ; petioles about 2.5 cm long, pubescent. Flowers white, about 1.3 cm long, in verticillasters 2 cm across ; bracts about 1 cm long, linear ; calyx 0.8 cm long, villous without and halfway down within, teeth about 9, 0.1 cm long, erect ; corolla 1 cm long, upper hooded, densely silky-pubescent, lower glabrous ; stamens 4, didynamous, included, lower longer, filaments glabrous, anthers parallel ; ovary glabrous, 4-partite, style slender, entire. Nutlets 0.2 cm long, obovoid, trigonous, smooth.

Fl. & Fr. : October-January.

World distribution : India and Burma.

Specimens examined : Gundlabrahmeswaram, 25-10-1964, *Ellis* 22203 ; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32649.

L. stricta Wall. [Cat. 2045. 1829] ex Benth. in Wall. Pl. Asiat. Rar. 1 : 61. 1830 et in DC. Prodr. 12 : 531. 1848 ; Hook. f. FBI 4 : 688. 1885 ; Gamble, FPM 6 : 1150. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14 (1) : 170. 1940.

Erect herbs, about 40 cm high ; stems quadrangular, grooved, sparsely hirtellous. Leaves about 5×0.8 cm, linear-elliptic, ovate, attenuate at base, margin excurved, coriaceous, hirsute, glandular beneath, subsessile. Flowers white, 1.5 cm long, in verticillasters about 2 cm across ; bracts 0.5 cm long, linear, sparsely hirsute ; calyx 0.7 cm long, pubescent without, densely hirsute near mouth, mouth oblique, teeth 0.1 cm long, spinous ; corolla 1 cm long, 2-lipped, upper densely pubescent without,

lower sparsely hirsute ; stamens 4, didynamous, included, anthers parallel ; ovary 4-partite, glabrous, style slender, bifid at top. Nutlets 0.3 cm long, triangular, glabrous.

Fl. & Fr. : Throughout the year.

World distribution : India and Burma, in dry localities.

Specimens examined : Chelama, 15-10-1964, *Ellis* 22017 ; Ahobilam, 28-8-1965, *Ellis* 25537.

Leucas aspera (Willd.) Spreng. Syst. 2 : 743. 1825 ; DC. Prodr. 12 : 532. 1848 ; Hook. f. FBI 4 : 690. 1885 ; Gamble, FPM 6 : 1150. 1924 ; S. K. Mukerjee in Rec. bot. Surv. Ind. 14 (1) : 166. 1940. *Phlomis aspera* Willd. in Link., Enum. Hort. Berol. 2 : 112. 1822.

Erect herbs, about 40 cm high ; stems subquadrangular, grooved, pubescent in juvenile ones. Leaves up to 8 × 1.3 cm, linear-elliptic, ovate-elliptic, acute at base, distantly serrate, hirtellous, glandular. Flowers white, about 1.4 cm long, in verticillasters about 2 cm across ; bracts about 1.5 cm long, pubescent at top, glabrous below without, glabrous within, ribbed, mouth oblique, teeth 8-9 ; corolla about 2 cm long, 2-lipped, upper densely pubescent near the mouth, lower glabrous, faintly lobed ; stamens 4, didynamous, included, anthers parallel ; ovary 4-partite, style slender, bifid at top. Nutlets 0.2 cm long, oblong, smooth.

Fl. & Fr. : Throughout the year.

World distribution : Mauritius Islands, India, Sri Lanka and Malaysia.

Specimen examined : Ahobilam, 23-11-1969, *Ellis* 32597.

NYCTAGINACEAE

1. Flowers about 4.5 cm long
1. Flowers up to 1.2 cm long

.. MIRABILIS
BOERHAVIA

MIRABILIS Linn.

Mirabilis jalapa Linn. Sp. Pl. 177. 1753 ; Gamble, FPM 7 : 1164. 1925 ; Stemmerik in Steenis, Fl. Males. ser. I. 6 (3) : 451. 1964.

Herbs about 60 cm high ; stems succulent, subquadrangular, faintly grooved, striate. Leaves up to 15 × 6 cm, ovate-acuminate, cordate at base, cystoliths present ; petioles 4 cm long. Flowers pink, 4.5 cm long, in terminal cymes 3 cm across ; bracts about 1 × 0.5 cm, oblong ; calyx 0.6 cm long, ovate, glabrous ; stamens about 5, exerted, filaments

glabrous, anther cells parallel; ovary glabrous, style filiform, stigma small. Fruits 1 cm across, globose, sculptured; seeds about 5.

Fl. & Fr. : Throughout the year.

World distribution : A native of South America, introduced in the gardens; generally wild as escapes.

Specimen examined : Bogada, 18-11-1969, *Ellis* 32457.

BOERHAVIA Linn.

- | | | |
|--|----|---------------------|
| 1. Flowers 0.2 cm long; fruits 0.2 cm long | .. | <i>B. diffusa</i> |
| 1. Flowers 1.2 cm long; fruits 0.6 cm long | .. | <i>B. chinensis</i> |

Boerhavia diffusa Linn. Sp. Pl. 3. 1753; Hook. f. FBI 4 : 709. 1885; Gamble, FPM 7 : 1162. 1925; Stemmerik in Steenis, Fl. Males. ser. I. 6(3) : 454. 1964. *B. repens* Linn. loc. cit. *B. repens* Linn. var. *diffusa* Hook. f. & var. *procumbens* (Roxb.) Hook. f. loc. cit. *B. procumbens* Roxb. Fl. Ind. 1 : 146. 1820.

Procumbent or trailing herbs; stems terete, striate, puberulous; rootstocks woody. Leaves in unequal pairs, larger about 3.5×3.5 cm, broadly ovate, cordate at base, smaller 1.5×1.5 cm, ovate-orbicular, puberulous; petioles 1.5 cm long. Flowers pale pink, 0.2 cm long, in umbels in axillary and terminal panicles 8 cm long, bracteate, bracteolate; calyx 0.2 cm long, limb campanulate, 5-lobed, pale pink; stamens 5, slightly exerted, filaments glabrous; ovary glabrous, style slender, stigma small. Fruits 0.6 cm long, enclosed in turbinate, ribbed, glandular perianth tube; seed with adherent testa.

Fl. & Fr. : April-October.

World distribution : Pantropic.

Specimens examined : 'Dupad', Kurnool Dt., February 1887, *J. S. Gamble* 18667; Nandyal, 25-8-1917, *K. C. Jacob* 15004; Rudravaram, 7-9-1917, *K. C. Jacob* 15005; Chelama, 7-12-1963, *Ellis* 17984.

B. chinensis (Linn.) Aschers. & Schweinf. Beitr. Fl. Aeth. 1 : 167. 1867; Stemmerik in Steenis, Fl. Males. ser. I. 6(3) : 455. 1964; Druce in Rep. Bot. Exch. Cl. Brit. Isles 3 : 415. 1913 (1914). *Valeriana chinensis* Linn. Sp. Pl. 33. 1753. *Boerhavia repanda* Willd. Sp. Pl. 1 : 22. 1797; Wt. Ic. 3 : t. 874. 1844; Choisy in DC. Prodr. 13 : 1, 455. 1848; Hook. f. FBI 4 : 709. 1885; Gamble, FPM 7 : 1163. 1925.

Decumbent herbs, extending up to 2 m long; stems terete, striate, sparsely hirtellous. Leaves about 7×6 cm, broadly ovate, repandly

lobulate, cordate at base, glabrous ; petioles 2.5 cm long. Flowers pink, 1.2 cm long, in axillary umbels 3 cm across, bracteate ; pedicels 1.6 cm long ; peduncles 8 cm long ; calyx 0.6 cm long, campanulate, lobes 5, emarginate ; stamens 5, slightly exerted, filaments glabrous, equal ; ovary glabrous, style slender, stigma small. Fruits 0.6 cm long, enclosed in turbinate, ribbed, glandular perianth-tube ; seed with adherent testa.

Fl. & Fr. : Throughout the year.

World distribution : Baluchistan, India, Sri Lanka, Burma, China and Australia.

Specimens examined : Dupad, Kurnool Dt., February 1887, *Gamble* 18675 ; Rudravaram, 7-9-1917, *K. C. Jacob* 14997 ; Diguvaletta, 16-11-1969, *Ellis* 32393.

Remarks : Recently, R. D. Meikle (in *Notes Roy. Bot. Gardn. Edinb.* 36 : 235-249. 1978) has treated *Boerhavia chinensis* under *Commicarpus* Standley, following Heimerl in Engler's *Pflanzenf. ed. 2.* 16c : 117. 1934 as *C. chinensis* (Linn.) Heimerl.

AMARANTHACEAE

- 1. Inflorescences in axillary clusters of spikes :
 - 2. Plants prostrate or clambering, sometimes decumbent .. ALTERNANTHERA
 - 2. Plants erect :
 - 3. Leaves opposite .. NOTHOSAERVA
 - 3. Leaves alternate .. AERVA
- 1. Inflorescences in terminal spikes :
 - 4. Leaves opposite :
 - 5. Mature flowers directed downwards ; bracts and bracteoles smooth in fruits .. ACHYRANTHES
 - 5. Mature flowers not directed downwards ; bracts and bracteoles of staminodes hooked .. PUPALIA
 - 4. Leaves alternate :
 - 6. Inflorescences globular .. ALLMANIA
 - 6. Inflorescences elongate :
 - 7. Spikes spinous .. AMARANTHUS
 - 7. Spikes not spinous .. CBLOSIA

ALTERNANTHERA Forsk.

- 1. Clambering, prostrate herbs ; bracts and bracteoles spinous .. *A. pungens*
- 1. Erect or decumbent herbs ; bracts and bracteoles not spinous .. *A. sessilis*

Alternanthera pungens Kunth in H. B. K. Nov. Gen. & Sp. Pl. 2 : 206. 1818; Meville in Kew Bull. 1958 : 174. 1958; Townsend in Handb. Ceylon, p. 47. 1980. *A. repens* (Linn.) Link, Enum. Pl. Hort. 1 : 154. 1821 (non Gmelin, 1791). *Achyranthes repens* Linn. Sp. Pl. 205. 1753. *Alternanthera achyrantha* (Linn.) Sweet, Hort. Suburb. Lond. 48. 1818. *A. echinata* Smith in Rees, Cyclop. Suppl. 10. 1819. *Illecebrum achyrantha* Linn. Sp. Pl. ed. 2. 299. 1762.

Clambering herbs, running up to 60 cm or more; stems slightly grooved, ciliate, often rooting at nodes. Leaves about 2.5×1.5 cm, oblong-orbicular, obovate, glabrous or sparsely hirsute. Flowers yellow, 0.3 cm long; bracteoles 0.3 cm long, ovate-lanceolate, acuminate, spinous, glumaceous; perianth 0.4 cm long, horny, ventral lanceolate, coarsely serrulate at apex, densely hairy laterally at base, dorsal 2 joined at base, prominently spinous-mucronate, marginally sparsely pubescent at base; stamens 5, included, filaments connate at base, glabrous, anthers 1-celled; ovary glabrous, style small, stigma capitate. Utricles 0.1×0.1 cm, flattened, brown, shining.

Fl. & Fr. : June-November.

World distribution : Pantropic, a native of America.

Specimen examined : Bogada, 19-11-1969, *Ellis* 32531.

A. sessilis (Linn.) R. Br. ex DC. Cat. Pl. Hort. Monspel. 77. 1813; Wt. Ic. 2 : t. 727. 1843; Moq. in DC. Prodr. 13 (2) : 357. 1849; Hook. f. FBI 4 : 731. 1885; Backer in Fl. Males. ser. I. 4 (2) : 92. 1959. *Gomphrena sessilis* Linn. Sp. Pl. 225. 1753. *Alternanthera triandra* Lamk. Encycl. 1 : 95. 1783; Gamble, FPM 7 : 1179. 1925.

Erect or decumbent herbs; stems subquadrangular, grooved, sparsely hirsute especially in grooves and near nodes. Leaves up to 4×0.8 cm, elliptic, oblong, linear-elliptic, ovate, cuneate at base, almost sessile. Flowers white, 0.2 cm long, in axillary, globose or slightly elongated heads about 1×0.5 cm; rachises ciliate; bracteoles 0.5 cm long; perianth 0.2 cm long, ovate-lanceolate; stamens 5, filaments connate at base, anthers 1-celled; ovary glabrous, style short, stigma capitate. Utricles 0.2×0.3 cm, depressed at apices.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17967; Diguva-metta, 17-11-1969, *Ellis* 32473.

NOTHOSAERVA Wt.

Nothosaerva brachiata (Linn.) Wt. Ic. 6 : t. 1776 bis. 1853 ; Hook. f. FBI 4 : 726. 1885 ; Gamble, FPM 7 : 1175. 1925. *Achyranthes brachiata* Linn. Mant. Pl. 50. 1767. *Illecebrum brachiatum* Linn. Mant. Pl. 2 : 23. 1767. *Aerva brachiata* (Linn.) Mart. Beitr. Amar. 83. 1825 ; Moq. in DC. Prodr. 13 (2) : 304. 1849. *Pseudanthus brachiatus* Wt. Ic. 5 : t. 1776. 1852 et 6 : t. 1776. 1853.

Erect herbs, about 40 cm high, growing in marshy places ; stems terete, glabrous. Leaves 3×1.7 cm, ovate-spathulate, acute, cuneate or acute at base, glabrous ; petioles up to 1 cm long. Flowers white, 0.1 cm long, in axillary, clustered spikes about 1.5 cm long ; bracts and bracteoles scarious, glabrous ; perianth 4, 0.1×0.5 cm, ovate, tomentose-villous without ; stamens 2, small ; ovary glabrous, style slender. Utricles 0.5 cm across ; seeds black, shining.

Fl. & Fr. : August-January.

World distribution : Tropics in Africa, India, Sri Lanka, Burma and Malaysia.

Specimen examined : Chelama, 12-12-1963, *Ellis* 18073.

AERVA Forsk. *nom. cons.*

- | | | |
|---|----|-------------------------|
| 1. Leaves fasciculate, linear | .. | <i>A. monsoniae</i> |
| 1. Leaves not fasciculate : | | |
| 2. Flowers 0.1 cm long ; leaves obovate-oblong or orbicular | .. | <i>A. lanata</i> |
| 2. Flowers 0.4 cm long ; leaves ovate-acuminate | .. | <i>A. sanguinolenta</i> |

Aerva monsoniae (Linn. f.) Mart. in Nov. Acad. Caes. Leop.-Carol. 13 : 291. 1826 ; Moq. in DC. Prodr. 13 (2) : 305. 1849 ; Wt. Ic. 2 : t. 724. 1843 ; Hook. f. FBI 4 : 728. 1885 ; Gamble, FPM 7 : 1178. 1925. *Illecebrum monsonium* Linn. f. Suppl. 161. 1781. *Trichuris monsoniae* (Linn. f.) Townsend in Kew Bull. 29 : 466. 1974.

Decumbent or prostrate herbs, about 50 cm long ; stems angled, grooved, woolly ; rootstocks woody with deep tap roots. Leaves 1.5 cm long, fascicled at nodes, linear or filiform, shortly spinous at top, margins excurved ; midrib prominent beneath. Flowers pale pink, 0.2 cm long, in terminal and axillary, cylindric spikes 1.8 cm long ; bracteoles 0.2 cm long, scarious, aristate, pilose ; perianth 0.3 cm long, ovate-acuminate, aristate, scarious, densely pilose along margins ; stamens 5, filaments connate at base ; ovary glabrous, style slender, stigma 2-fid. Utricles 0.1 cm long ; seeds brown, shining.

Fl. & Fr. : July-February.

World distribution : India and Burma, in dry localities.

Specimens examined : Srisailam, 16-7-1963, *Ellis* 16903 ; Diguvaletta, 17-11-1969, *Ellis* 32451.

Aerva lanata (Linn.) Juss. [in *Ann. Mus. Paris* 11 : 131. 1808] ex Schult. *Syst. Veg.* ed. 15, 5 : 564. 1819 ; Townsend in *Handb. Fl. Ceyl.* p. 32. 1980 ; Moq. in *DC. Prodr.* 13 : 303. 1849 ; Hook. f. *FBI* 4 : 728. 1884 ; Gamble, *FPM* 7 : 1178. 1925. *Achyranthes lanata* Linn. *Sp. Pl.* 204. 1753. *Aerva floribunda* Wt. *Ic.* 5 : t. 1776 (analysis only), t. 1776 bis A. 1852.

Erect herbs, about 60 cm high ; stems terete, striate, pubescent. Leaves about 5×3 cm, generally smaller, obovate-oblong or orbicular, cuneate at base, sparsely pilose above, densely so beneath ; petioles 0.5 cm long. Flowers whitish, 0.1 cm long, in axillary, cylindric spikes about 1 cm long ; bracts ovate-caudate, sparsely pilose without ; perianth 0.1 cm long, ovate, scarious, densely pilose without ; stamens 5, included, filaments slender, connate at base ; ovary glabrous, style slender, stigma bifid. Utricles very small ; seeds black, shining.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka, Malaysia and Philippines.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17985 ; Chelama, 16-10-1964, *Ellis* 22045 ; Bogada, 19-11-1969, *Ellis* 32523.

A. sanguinolenta (Linn.) Bl. *Bijdr.* 547. 1825 ; Backer in Steenis, *Fl. Males.* ser. I. 4(2) : 85. 1949. *Achyranthes sanguinolenta* Linn. *Sp. Pl.* 294. 1762. *Aerva scandens* Wall. [Cat. 6911. 1829] ex Moq. in *DC. Prodr.* 13(2) : 300. 1849 ; Wt. *Ic.* 3 : t. 724. 1844, excl. fruits ; Hook. f. *FBI* 4 : 727. 1884 ; Gamble, *FPM* 7 : 1178. 1925.

Straggling undershrubs, about 2 m high ; stems terete, striate, puberulous to tomentose. Leaves about 8×3 cm, ovate-acuminate, apiculate, acute at base, puberulous above, densely so beneath, subsessile. Flowers white, 0.4 cm long, in terminal and axillary cylindric spikes about 2 cm long, often clustered at ends of panicles about 25 cm long ; bracts and bracteoles 0.3 cm long, ovate, mucronulate, scarious, sparsely pilose ; perianth 0.4 cm long, ovate-acuminate, aristate, scarious-margined, pilose without ; stamens 5, filaments connate at base ; ovary glabrous, style slender, stigma 2-fid. Utricles 0.1 cm across ; seeds black, shining.

Fl. & Fr. : November-February.

World distribution : Tropics in Africa, India, China, Malaysia and Philippines.

Specimens examined : Chelama, 10-12-1965, *Ellis* 18076 ; Upper Ahobilam, 22-11-1969, *Ellis* 32582.

ACHYRANTHES Linn.

Achyranthes aspera Linn. Sp. Pl. 204. 1753 ; Moq. in DC. Prodr. 13(2) : 314. 1849 ; Wt. Ic. 5 : t. 1777. 1852 ; Hook. f. FBI 4 : 730. 1885 ; Gamble, FPM 7 : 1176. 1925.

Erect herbs, about 80 cm high ; stems terete, striate, puberulous to tomentose. Leaves about 9×6 cm, ovate, oblong, obovate, orbicular, obtuse or rounded at base, puberulous above, pubescent beneath ; petioles about 1.5 cm long. Flowers white, 0.5 cm long, in terminal spikes about 35 cm long, deflexed towards base ; bracts 0.6 cm long, scarious ; bracteoles 2, 0.3 cm long, spinous, winged at base ; perianth 0.6 cm long, scarious, hyaline-margined ; fertile stamens 4, included, staminodes laciniate, filaments connate at base forming a tube ; ovary glabrous, style slender, stigma capitate. Utricles 0.5 cm long, ovoid ; seeds shining.

Fl. & Fr. : July-December.

World distribution : Pantropic.

Specimen examined : Chelama, 12-12-1963, *Ellis* 18078.

Remarks : How far the varieties of J. D. Hooker (*op. cit.* p. 730) are really distinct needs more study ; Gamble (*op. cit.* p. 1176) recognises two, viz., var. *rubro-fusca* and var. *porphyristachya*. Haines [*Bot. Bihar and Orissa* 2 : 806. rep. ed. 1961 (1924)] speaks of var. *porphyristachya* Hook. f. thus, '...whether it is really a variety or the differences only the result of its forest habitat is uncertain.' C. A. Backer [in Steenis, *Flora Malesiana* ser. I. 4(2) : 88. 1949] apparently does not speak of the varieties ; his description of leaves runs thus : '...Leaves oval-obovate or elliptic-oblong, from an acute or obtuse base, acuminate or not, acute, obtuse or rounded ..' (p. 88), thereby indicating the range of variability:

PUPALIA Juss. *nom. cons.*

Pupalia lappacea (Linn.) Juss. in Ann. Mus. 2 : 132. 1803 ; Moq. in DC. Prodr. 13(2) : 331. 1849 ; Hook. f. FBI 4 : 724. 1885 ; Gamble, FPM 7 : 1173. 1925 ; Backer in Steenis, Fl. Males. ser. I. 4(2) : 83. 1949. *Achyranthes lappacea* Linn. Sp. Pl. 204. 1753. *Pupalia atropurpurea* (Lamk.)

Moq. *loc. cit.* 331 ; Hook. f. *op. cit.* 723. Gamble, *loc. cit.* *Achyranthes atropurpurea* Lamk. *Encycl.* 1 : 346. 1785. *Desmochaeta atropurpurea* (Lamk.) DC. *Cat. Hort. Monsp.* 102. 1813.

Erect or straggling undershrubs, about 1.5 m long ; stems terete, striate, pubescent to glabrescent. Leaves up to 11 × 5.5 cm, elliptic-ovate, ovate, shortly acuminate, rounded or acute or cuneate at base ; petioles 0.8 cm long. Flowers pale green or whitish, 0.5 cm long, in terminal spikes about 20 cm long ; bracts 0.3 cm long, broadly ovate, spinous at apices, sparsely pilose without ; perianth 0.5 cm long, elliptic-lanceolate, horny, densely pilose without, of sterile with spreading hooked awns ; stamens 5, included, filaments dilated and connate at base ; ovary glabrous, style slender, stigma capitate. Utricles 0.2 cm long ; seeds brown, shining.

Fl. & Fr. : Throughout the year.

World distribution : Tropics in Africa, India, Sri Lanka and Malaysia.

Specimens examined : Srisailam, 15-7-1963, *Ellis* 16889 ; Chelama, 7-12-1963, *Ellis* 17991 ; Chelama, 16-10-1964, *Ellis* 22057 ; Upper Ahobilam, 29-8-1965, *Ellis* 25588 ; Diguvametta, 16-11-1969, *Ellis* 32390.

ALLMANIA R. Br. ex Wt.

Allmania nodiflora (Linn.) R. Br. [Wall. *Cat.* 6890. 1832] ex Wt. in *Journ. Bot.* 1 : 226. 1834 ; Hook. f. *FBI* 4 : 716. 1885 ; Gamble, *FPM* 7 : 1167. 1925. *Celosta nodiflora* Linn. *Sp. Pl.* 205. 1753. *Allmania albida* R. Br. [Wall. *Cat.* 6981. 1832] ex Hook. f. *op. cit.* 717. *Chamissoa albida* Moq. in DC. *Prodr.* 13(2) : 248. 1849. *C. nodiflora* Mart. ex Moq. *loc. cit.* 249 ; Wt. *lc.* 5 : 1770. 1852.

Erect or decumbent or trailing herbs, up to 60 cm long ; stems sub-quadrangular, grooved, striate, sparsely hirtellous. Leaves 7 × 0.8 cm, linear, spatulate, apiculate, sparsely asperulous or not ; petioles short. Flowers pale green, 0.5 cm long, in terminal or leaf-opposed, cylindric heads about 2 cm long ; bracts and bracteoles 0.4 cm long, ovate-lanceolate, caudate, asperulous on midrib without ; perianth 0.4 cm long, ovate-lanceolate, scarious ; stamens 5, filaments connate at base, glabrous ; ovary glabrous, style filiform, stigma capitate. Utricles glabrous ; seeds 0.2 cm across, black, shining.

Fl. & Fr. : March-July.

World distribution : Tropics in India, Sri Lanka, Malaysia and Philippines.

Specimen examined : Mahanandi, 23-8-1972, *Ellis* 42333.

Remarks : Hooker f. (*op. cit.*) has treated 6 varieties under *Allmania nodiflora* R. Br. viz., *angustifolia*, *dichotoma*, *roxburghii*, *aspera*, *procumbens* and *esculenta*. Gamble (*op. cit.*) has given 4 varieties, reducing var. *roxburghii* Hook. f. under the *typica*. It is obvious that *Allmania nodiflora* R. Br. ex Wt. is a variable taxon. In fact, it is felt that *Allmania longepedunculata* (Trimen) Gamble is one of the forms ; except for the length of peduncles which perhaps is dependent on the type of soil and climate it cannot be differentiated qualitatively. Pending an examination of the Type Material of Trimen, it has not been taken up.

AMARANTHUS Linn.

Amaranthus spinosus Linn. Sp. Pl. 991. 1753 ; Wt. Ic. 2 : t. 513. 1841 ; Moq. in DC. Prodr. 13(2) : 260. 1849 ; Hook. f. FBI 4 : 718. 1885 ; Gamble, FPM 7 : 1170. 1925.

Erect herbs, about 60 cm high ; stems glabrous, terete. Leaves 4 × 2 cm, ovate-elliptic, spathulate, apiculate, cuneate or acute at base ; petioles about 4.5 cm long. Flowers pale green, 0.2 cm long, in axillary clusters or in terminal, branched spikes about 10 cm long ; bracts 1.2 cm long, spinous, grooved above ; bracteoles 0.2 cm long, ovate, acuminate, scarious ; perianth 0.2 cm long, elliptic-lanceolate, spathulate ; stamens 5, included, filaments free ; ovary glabrous, styles 2. Utricles 0.1 cm across, flattened, with circumscissile dehiscence ; seeds black, shining.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Malaysia, in waste lands ; sometimes cultivated.

Specimen examined : Bogada, 19-11-1969, *Ellis* 32529.

CELOSIA Linn.

- | | | |
|--|----|------------------------|
| 1. Flowers in uninterrupted spikes ; bracts and perianth shining | .. | <i>C. argentea</i> |
| 1. Flowers in interrupted spikes ; bracts and perianth not shining | .. | <i>C. polygonoides</i> |

Celosia argentea Linn. Sp. Pl. 205. 1753 ; Wt. Ic. 5 : t. 1767. 1852 ; Moq. in DC. Prodr. 13(2) : 242. 1849 ; Hook. f. FBI 4 : 714. 1885 ; Gamble, FPM 7 : 1166. 1925.

Erect herbs, about 80 cm high ; stems grooved, glabrous. Leaves about 7 × 1.5 cm, very variable, obovate, elliptic-ovate or linear, acute or cuneate at base, glabrous. Flowers white, 0.7 cm long, in uninterrupted

spikes about 10 cm long ; bracts and bracteoles 0.3 cm long, ovate-acuminate ; perianth 0.4 cm long, elliptic-lanceolate, scarious, shining ; stamens 5, included, filaments united ; ovary glabrous, styles faintly bifid at apices. Utricles 0.2 cm across, circumscissilely dehiscing ; seeds 0.1×0.1 cm, black, shining.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic—cultivated and run wild.

Specimens examined : Gundlabrahmeswaram, 26-10-1964, *Ellis* 22214 ; Bogada, 19-11-1969, *Ellis* 32522.

Celosia polygonoides Retz. Obs. 2 : 12. 1781 ; Hook. f. FBI 4 : 715. 1885 ; Gamble, FPM 7 : 1166. 1925.

Erect herbs, about 40 cm high ; stems grooved, puberulous. Leaves about 3×3 cm, broadly ovate, abruptly cuneate at base, sparsely hirtellulose along veins below ; petioles about 1.5 cm long. Flowers pale green, 0.2 cm long, in interrupted spikes 2.6 cm long ; bracts scarious ; perianth 0.2 cm long, ovate-lanceolate, scarious along margins ; stamens 5, included, filaments connate at base forming a tube ; ovary glabrous, stigmas bifid. Utricles 0.4 cm long, flask-shaped, thickened at top, dehiscing circumscissilely below the middle ; seeds small, numerous, alveolate.

Fl. & Fr. : April-December.

World distribution : India and Sri Lanka.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16864.

POLYGONACEAE

POLYGONUM Linn.

- | | | |
|--------------------|----|--------------------|
| 1. Erect herbs | .. | <i>P. barbatum</i> |
| 1. Prostrate herbs | .. | <i>P. plebeium</i> |

Polygonum barbatum Linn. Sp. Pl. 362. 1753 ; Wt. Ic. 5 : t. 1798. 1852 ; Meissn. in DC. Prodr. 14(1) : 104. 1856 ; Hook. f. FBI 5 : 37. 1886 ; A. T. Gage in Rec. bot. Surv. Ind. 2(6) : 397. 1903 ; Gamble, FPM 7 : 1189. 1925.

Erect herbs, about 1 m high ; stems terete, striate, glabrous. Leaves about 16×2.5 cm, elliptic-lanceolate, acuminate, acute at base, sparsely hirsute, more on nerves beneath, sessile or shortly petiolate ; stipules 2 cm long, thin, strigose without, fimbriate at apices. Flowers white, 0.3 cm long, in spikes 10 cm long ; pedicels articulate ; bracts small, obovate,

shortly strigose at apex ; perianth lobes 0.2 cm long, lanceolate, tube 0.1 cm long, stamens 5, included, filaments dilated and connate at base ; ovary trigonous, glabrous, styles 3, stigmas capitate. Utricles 0.3 cm long ; seeds trigonous, shining.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka, China, Japan, Burma, Malaysia and Australia.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22159 ; Bairani, Diguvametta, 17-11-1969, *Ellis* 32464.

Polygonum plebeium R. Br. Prodr. 420. 1810 ('*plebejum*'); Meissn. in DC. Prodr. 14 (1) : 94. 1856 ; Hook. f. FBI 5 : 27. 1886 ; A. T. Gage in Rec. bot. Surv. Ind. 2 (6) : 386. 1903 ; Gamble, FPM 7 : 1188. 1925. *P. indicum* Heyne in Roth, Nov. Sp. Pl. 208. 1821 ; Wt. Ic. 5 : t. 1808. 1852.

Prostrate, diffusely branched herbs ; stems running to about 30 cm, angled, grooved, striate, faintly hirtellulous ; rootstocks woody. Leaves about 1 cm long, linear-ovate, oblong, obovate-lanceolate, acute at base ; stipules scarious, fimbriate at apex. Flowers pale white, 0.4 cm long, in axillary, 3-4-flowered clusters ; perianth lobes 0.1 cm long, lanceolate-acuminate, tube 0.2 cm long, midrib prominent at back ; stamens 5, included, filaments dilated at base ; ovary glabrous, trigonous, stigma 3-lobed. Capsules 0.2 cm across, acutely 3-angled.

Fl. & Fr. : January-July.

World distribution : Pantropic.

Specimens examined : Chelama, 9-7-1963, *Ellis* 16807 ; Chelama, 20-3-1965, *Ellis* 23735.

Remarks : Hooker f. (*op. cit.* pp. 27-29) has given at length a critical review of the species, *plebeium*, and recognises 10 varieties, of which Gage (*op. cit.* p. 386) treats what he proposes to give under *plebeium* 4 species and 7 varieties from Peninsular India. Cooke (*Fl. Pres. Bombay* 3 : 4-5. rep. ed. 1958) records 8 varieties from his area. Prain (*Beng. Pl.* 2 : 661-663. rep. ed. 1963) includes 5 varieties even in the key. Gamble (*op. cit.* p. 1189) recognises just 2 varieties under the species, *plebeium* from the former Presidency of Madras. For the time being the treatment of Gamble as given in his Flora is followed. Cooke (*op. cit.* p. 4) calls *P. plebeium* a polymorphic plant.

ARISTOLOCHIACEAE

ARISTOLOCHIA Linn.

Aristolochia indica Sp. Pl. 960. 1753 ; Duchart. in DC. Prodr. 16 : 479. 1849 ; Hook. f. FBI 5 : 75. 1886 ; Gamble, FPM 7 : 1202. 1925. *A. lanceolata* Wt. Ic. 5 : t. 1858. 1852.

Shrubby twiners ; stems grooved, glabrous. Leaves about 15×6 cm, ovate-acuminate, obovate, abruptly acuminate, obtusely truncate or sometimes linear-ovate, rounded and cordate at base, glabrous ; reticulations prominent below. Flowers green with reddish tinge near mouth, about 3 cm long, in axillary racemes about 15 cm long ; bracts 0.2 cm long, ovate-acuminate, serrulate ; perianth about 3 cm long, bulbous at base, tube bent, mouth funnel-shaped ; obliquely passing on to spatulate lip, hairy within ; stamens 4, adnate to ovary ; ovary inferior, clavate, ribbed. Capsules 3×2 cm, dehiscing from base upwards along pedicels forming ribs ; seeds many, flattened, winged.

Fl. & Fr. : September-March.

World distribution : India and Sri Lanka.

Specimen examined : Ahobilam, 22-11-1969, Ellis 32574.

PIPERACEAE

PIPER Linn.

- | | |
|---|----------------------------|
| 1. Leaves crispately hairy beneath ; lateral nerves on leaves arising almost from base : | |
| 2. Leaves elliptic-acuminate, acute or obtuse at base ; nerves arising from base and also from above the base | .. <i>P. hymenophyllum</i> |
| 2. Leaves broadly ovate-acuminate, obtuse or cordate at base ; nerves arising almost from base | .. <i>P. attenuatum</i> |
| 1. Leaves glabrous on both surfaces ; lateral nerves arising at least 1 cm above base | .. <i>P. nigrum</i> |

Piper hymenophyllum Miq. in Hook. Journ. Bot. 5 : 554. 1853 ; Wt. Ic. 6 : t. 1942. 1853 ; Cas. DC. Prodr. 16 (1) : 364. 1868 ; Hook. f. FBI 5 : 93. 1886 ; Gamble, FPM 7 : 1207. 1925.

Climbing herbs ; stems terete, grooved, glabrous, nodes swollen. Leaves about 13×6 cm, elliptic-lanceolate, shortly acuminate, acute or obtuse at base, coriaceous, sparingly crispate-hairy beneath ; nerves 5-7 from base, the last 2 from above the base ; petioles about 1.8 cm long.

Flowers green, 0.1 cm long, in slender spikes 10 cm long; bracts small, oblong, orbicular or truncate; stamens 2, 0.05 cm long; ovary glabrous, stigma 2-lobed. Berries 0.4 cm across, orbicular; seed one, globose.

Fl. & Fr. : February-December.

World distribution : Peninsular India.

Specimen examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16957.

Piper attenuatum Buch.-Ham. [in Wall. Cat. 6642, 1832] ex Miq. Syst. Pip. 306. 1851; Wt. Ic. 6 : t. 1933. 1853; Cas. DC. in Prodr. 16(1) : 363. 1868; Hook. f. FBI 5 : 92. 1886; Gamble, FPM 7 : 1207. 1925. *P. sylvestre* Wt. Ic. 6 : t. 1937. 1853; Hook. f. *op. cit.* 93.

Climbing herbs; stems terete, striate. Leaves about 12×9 cm, ovate, acuminate, rounded and cordate at base, crispately hairy beneath; nerves 5-7 almost from base; petioles 1.5 cm long. Flowers green, 0.05 cm long, in leaf-opposed spikes about 11 cm long; bracts small, ovate-orbicular; stamens 2, filaments short; ovary glabrous, style simple. Berries 0.3 cm across, globose.

Fl. & Fr. : July-September.

World distribution : India.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16912.

P. nigrum Linn. Sp. Pl. 28. 1753; Cas. DC. in Prodr. 16(1) : 363. 1869; Hook. f. FBI 5 : 90. 1886; Gamble, FPM 7 : 1206. 1925.

Climbing herbs, often reaching great lengths; stems terete, grooved, swollen at nodes, sometimes rooting at nodes. Leaves about 18×9 cm, elliptic-abruptly acuminate, obtuse at base, coriaceous, glabrous; nerves about 6, basal 3 paired, rest alternate, obliquely reaching apices; reticulations parallel; petioles about 2.5 cm long. Flowers unisexual, green, 0.1 cm long, in leaf-opposed spikes about 10 cm long; bracts small, semilunar; stamens 2, 0.05 cm long; ovary glabrous, styles 4. Berries 0.7 cm across, globose, glabrous; seed one.

Fl. & Fr. : May-December.

World distribution : India, often cultivated. A plant of humid tropics.

Specimen examined : Gundlabrahmeswaram, 26-10-1964, *Ellis* 22210.

LAURACEAE

CASSYTHA Linn.

Cassytha filiformis Linn. Sp. Pl. 35. 1753 ; Wt. Ic. 5 : t. 1847. 1852 ; Meissn. in DC. Prodr. 15 : 1. 1864 ; Hook. f. FBI 5 : 188. 1886 ; Gamble, FPM 7 : 1241. 1925.

Extensive, wiry, twining, parasitic herbs, attached to hosts by suckers ; stems puberulous. Leaves of minute scales or leafless. Flowers white, 0.2 cm long, in lateral spikes about 1.5 cm long ; bracts small, ovate, ciliolate along margins ; perianth 3+3, in 2 rows, outer smaller, inner 0.1 cm long, ovate-lanceolate, glabrous, tube short, turbinate ; stamens 9, in 3 rows, innermost eglandular ; ovary glabrous, style short, stigma capitate. Drupes 0.7×0.7 cm, ovoid or globose with persistent calyx ; seeds ovoid or globose.

Fl. & Fr. : July-December.

World distribution : Pantropic.

Specimens examined : Atmakaur, 19-2-1943, T. V. Reddy & S. R. Raju s. n. ; Vishnunandi, 21-8-1965, Ellis 25446 ; Diguvametta, 18-11-1969, Ellis 32516 ; Bairanidokku, Diguvametta, 12-8-1972, Ellis 42235.

GYROCARPACEAE

GYROCARPUS Jacq.

Gyrocarpus americanus Jacq. Selct. Stip. Amer. 282, t. 178. 1763 ; Brandis, Indian Trees, 542. 1906 ; Gamble, FPM 7 : 1242. 1925. *G. jacquini* Gaertn. Fruct. 2 : 92, t. 97. 1791 ; C. B. Cl. in Hook. f. FBI 2 : 461. 1878. *G. asiaticus* Willd. Sp. Pl. 4 : 982. 1806 ; DC. Prodr. 15(1) : 248. 1864.

Trees, about 6 m tall ; branches glabrous, tomentose in very young branches. Leaves about 15×15 cm, broadly ovate, often 3-lobed, rounded and cordate at base, glabrous above, tomentose to puberulous beneath ; nerves and reticulations prominent ; petioles about 20 cm long. Flowers pale yellow, minute, unisexual, in clustered cymes 0.5 cm across, in dichotomously branched inflorescences ; peduncles about 4 cm long, puberulous ; perianth in male 5-partite, in female 2-lobed, densely hairy ; stamens about 5, alternating with staminodes, filaments hairy, anthers with valvular dehiscence ; ovary glabrous, stigma sessile. Samaras about 8×2 cm, drupaceous, persistent perianth lobes wing-like ; seeds solitary.

Fl. & Fr. : March-September.

World distribution : Throughout the tropics.

Specimens examined : Diguvametta, June 1905, C. A. Barber s. n. ; Chelama, 20-3-1965, Ellis 23732.

LORANTHACEAE (*sensu stricto*)

- | | | |
|---------------------|----|--------------|
| 1. Leaves alternate | .. | TAXILLUS |
| 1. Leaves opposite | .. | DENDROPHTHÖE |

TAXILLUS van Tiegh.

Taxillus heyneanus (Schult.) Danser in Bull. Jard. Bot. Buit. ser. 3. 10 : 355. 1929 et in Verh. Kon. Akad. Wet. Amstr. Nat. sec. 2. 29(6) : 124. 1933. *Loranthus heyneanus* Schult. Syst. 7(1) : 106. 1829. *L. bracteatus* Heyne ex Wall. in Roxb. Fl. Ind. 1 : 220. 1824 (non Rich. 1792) ; Hook. f. FBI 5 : 213. 1886 ; Gamble, FPM 7 : 1252. 1925. *L. tomentosus* Wt. & Arn. Prodr. 385. 1834 ; Wt. Ic. 2 : t. 378. 1843.

Semi-parasitic shrubs, on branches of other plants ; stems terete, lenticellate, rusty-tomentose when young. Leaves alternate, about 2×2 cm, orbicular, coriaceous, tomentose ; nerves rather prominent on both surfaces ; petioles about 0.8 cm long, densely pubescent. Flowers green, 2 cm long, in 2-3-flowered, axillary, short, umbellate cymes, falcate, shortly pedicellate ; calyx 0.2 cm long, pubescent within ; corolla 2 cm long, tomentose without, lobes linear, recurved, tube about 1.5 cm long, falcate ; stamens about 6, included, anther cells parallel ; ovary glabrous, style angled, grooved, stigmas capitellate. Drupes 0.5 cm across, oblong, puberulous ; seed 1.

Fl. & Fr. : June-September.

World distribution : Peninsular India.

Specimen examined : Chelama, 9-7-1963, Ellis 16791.

Remarks : In spite of Danser's (*op. cit.*) recognition of *Taxillus heyneanus* and *T. tomentosus* van Tiegh. as 2 distinct species, the studies both in the field and at MH and CAL show a range of variation in the amount of tomentum and other characters which imperceptibly pass from one to another species. Thus these two forms are of one variable taxon. Therefore, Gamble's (*op. cit.*) treatment of these two forms is followed.

DENDROPHTHÖE Mart.

Dendrophthöe falcata (Linn. f.) Ettingh. in Denk. Akad. Wissen. Math.-Naturw. Cl. 32 : 52. 1872 ; Danser in Verh. Kon. Akad. Wet.

Amstr. Nat. sec. 2. 29(6) : 44. 1933. *Loranthus falcatus* Linn. f. Suppl. 211. 1781. *L. longiflorus* Desv. in Lamk. Encycl. Method. 3 : 598 & 601. 1789 ; Wt. & Arn. Prodr. 384. 1834 ; Wt. Ic. 1 : t. 302. 1840 ; Hook. f. FBI 5 : 214. 1886. *L. longiflorus* Desv. var. *falcatus* (Linn. f.) Kurz, For. Fl. 2 : 321. 1877 ; Gamble, FPM 7 : 1250. 1925.

Semi-parasitic shrubs, on branches of other plants ; branches glabrous. Leaves opposite, about 12×8 cm, ovate, elliptic, often linear, generally falcate, acute at base, glabrous ; lateral nerves obscure ; petioles about 1 cm long. Flowers pale yellow, about 3 cm long, lobes green, tube falcate, in axillary racemes about 8 cm long, bracteate ; calyx 0.3 cm long, cupular, lobes minute ; corolla about 3 cm long, lobes linear, reflexed, tube narrow ; stamens about 6, included, filaments slender, anthers red, linear ; ovary glabrous, style filiform, stigma ovoid. Drupes 1 cm across, ovoid ; seeds many.

Fl. & Fr. : February-July.

World distribution : India and Sri Lanka.

Specimens examined : Chelama, 5-7-1963, Ellis 16768 ; Diguvaletta, 17-11-1969, Ellis 32434.

VISCACEAE

[S. N. Dixit's (in *Bull. bot. Surv. Ind.* 4 : 49-55. 1962) opinion in treating *Viscum* Linn. under the family, Viscaceae, is followed in raising the subfamilial status to a family as propounded earlier by Miers in 1851 ; Dixit (*op. cit.*) takes into cognisance floral structure, development of embryo sac, endosperm, embryo, etc.]

VISCUM Linn.

- | | | |
|--|----|---------------------|
| 1. Leaves absent or very much reduced ;
stems flattened | .. | <i>V. nepalense</i> |
| 1. Leaves present, not reduced ;
stems terete or angled : | | |
| 2. Leaves usually 5-nerved from base ;
berries smooth, truncate at apex | .. | <i>V. monoicum</i> |
| 2. Leaves 3-nerved from base ; berries
very minutely granulate, ellipsoid | .. | <i>V. orientale</i> |

Viscum nepalense Spreng. Syst. Veg. Cur. post. 47. 1827 ; Danser in *Blumea* 4(2) : 283. 1941. *V. articulatum sensu* Hook. f. FBI 5 : 226. 1886, *p.p.* (non Burm. f. 1768, incl. var. *dichotoma*) ; Gamble, FPM 7 : 1259. 1921, incl. var. *dichotomum* ; C. E. C. Fischer in *Rec. bot. Surv. Ind.*

11(1) : 181. 1926. *V. elongatum* A. DC. Prodr. 4 : 284. 1830. *V. attenuatum* A. DC. *loc. cit.*

Suffrutescent, semi-parasitic herbs ; stems articulated, terete in main, flattened in lateral ones, grooved. Leaves much reduced, scale-like, obtuse. Flowers green, 0.2 cm long, in 3-4-flowered fascicles about 1.2 cm long, central female, laterals male, subsessile ; bracts in pairs, connate to form a cup ; male smaller, perianth small ; stamens 3-4, attached to perianth lobes, anthers introrsely dehiscent ; female larger, ovary glabrous, styles small. Drupes 0.5 cm across, globose, smooth.

Fl. & Fr. : August-February.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Chelama, 15-7-1963, *Ellis* 16882.

Viscum monoicum A. DC. Prodr. 4 : 278. 1830 ; Hook. f. *FBI* 5 : 13. 1886 ; Gamble, *FPM* 7 : 1257. 1925 ; C. E. C. Fischer in *Rec. bot. Surv. Ind.* 11(2) : 180. 1926 ; Danser in *Blumea* 4 : 305. 1941.

Semi-parasitic shrubs, on other plants, about 50 cm long ; stems dichotomously branched, main terete, others angled, grooved, nodes swollen. Leaves about 5 × 2.5 cm, oblong-obovate, ovate, attenuate at base, sometimes falcate, sessile, chartaceous ; nerves 5 from base. Flowers green, in axillary or lateral clusters or cymes ; bracts 2, connate ; terminal flower female, laterals male ; perianth small, 4-lobed, ovate ; stamens 4, attached to perianth lobes at base ; ovary glabrous, stigmas subsessile. Berries about 0.4 × 0.2 cm, truncate at apex, smooth ; seed 1.

Fl. & Fr. : February-August.

World distribution : India, Sri Lanka and Indonesia.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16914.

V. orientale Willd. *Sp. Pl.* 4(2) : 737. 1805 ; DC. Prodr. 4 : 278. 1830, *p.p.* ; Hook. f. *FBI* 5 : 224. 1886 ; Gamble, *FPM* 7 : 1257. 1925 ; Fischer in *Rec. bot. Surv. Ind.* 11 : 180. 1926 ; Danser in *Blumea* 4(2) : 299. 1941.

Semi-parasitic shrubs, on branches of other plants ; main stems terete, younger angled, internodes swollen. Leaves about 4.5 × 3 cm, obovate-oblong, cuneate at base, coriaceous ; nerves 3 from base. Flowers green, 0.2 cm long, about 5, in axillary cymes 0.7 cm long ; peduncles 0.2 cm long ; bracts 0.1 cm long, in opposite pairs, broadly ovate ; middle 3 flowers female, laterals male, female larger than male ; perianth small, 4-lobed, ovate ; stamens 4, attached to perianth at base. Berries 0.3 cm long, ellipsoid, minutely granular.

Fl. & Fr. : April-August.

World distribution : India, Sri Lanka, China, Burma, Malaysia and Australia.

Specimen examined : Rollapenta, 16-8-1972, *Ellis* 42273.

SANTALACEAE

SANTALUM Linn.

Santalum album Linn. Sp. Pl. 497. 1753 ; A. DC. Prodr. 14 : 683. 1857 ; Hook. f. FBI 5 : 231. 1886 ; Brandis, Indian Trees, 553. 1906 ; Gamble, FPM 7 : 1261. 1925.

Trees, about 6 m tall ; bark cracked ; young branches purplish, striate. Leaves about 9 × 3 cm, elliptic-lanceolate, acute at base, chartaceous, glabrous ; petioles about 1 cm long. Flowers maroon within, green without, 0.3 cm long, in axillary, paniced cymes about 4 cm long ; bracts small, deciduous ; perianth lobes 4, 0.1 cm long, tube 0.2 cm long ; stamens 4, exserted, alternating with rounded scale of disks ; filaments dilated ; ovary half-inferior, stigmas shortly 3-lobed. Drupes 0.6 cm long, ovoid, turning purplish on ripening, edible ; seed 1.

Fl. & Fr. : January-October.

World distribution : Peninsular India, both on Eastern and Western Ghats, at low altitudes.

Specimens examined : Diguvametta, 18-11-1969, *Ellis* 32494 ; Chinna-mantrala, 17-8-1972, *Ellis* 42294.

Remarks : A semi-parasitic tree on roots of neighbouring plants. This is, however, one of the most important oil-yielding plants of India. Also the heartwood is in great demand for carvings.

The plant is an evergreen tree in open dry deciduous and scrub forests.

EUPHORBIACEAE

- | | | |
|---|----|-----------|
| 1. Flowers in cyathia | .. | EUPHORBIA |
| 1. Flowers not in cyathia : | | |
| 2. Leaves 3-5-lobed, or sometimes unlobed : | | |
| 3. Herbs with stinging hairs | .. | TRAGIA |
| 3. Shrubs or small trees without stinging hairs : | | |
| 4. Capsules red-glandular ; nervules on leaves parallel | .. | MALLOTUS |
| 4. Capsules glabrous ; nervules on leaves not parallel | .. | JATROPHA |

2. Leaves not lobed :
5. Leaves (simple) appearing on branchlets as pinnate .. PHYLLANTHUS
5. Leaves simple :
6. Leaves linear or linear-oblong :
7. Herbs ; male spikes 1 cm long .. SEBASTIANIA
7. Shrubs ; male spikes about 10 cm long .. HOMONOLA
6. Leaves ovate, oblong-obovate or orbicular :
8. Trees or shrubs :
9. Leaves as long as broad, up to 25 × 25 cm, prominently dentate .. GIVOTIA
9. Leaves longer than broad, less than 20 × 10 cm, entire or faintly crenulate :
10. Petals present :
11. Fruits drupaceous .. BRIDELIA
11. Fruits capsular .. CLEISTANTHUS
10. Petals absent :
12. Male flowers in axillary fascicles :
13. Styles prominent, united or free :
14. Styles united .. GLOCHIDION
14. Styles free :
15. Disk present .. SECURINEGA
15. Disk absent .. BREYNIA
13. Styles inconspicuous :
16. Fruits capsular .. SUREGADA
16. Fruits drupaceous .. DRYPETES
12. Male flowers in axillary spikes .. ANTIDESMA
8. Herbs or undershrubs :
17. Male flowers globose ; disk present .. BALIOSPERMUM
17. Male flowers not globose ; disk absent .. ACALYPHA

EUPHORBIA Linn.

1. Succulent shrubs or small trees, spinous .. *E. antiquorum*
1. Non-succulent herbs, not spinous :
2. Leaves about 8 × 4 cm :
3. Leaves radical .. *E. acaulis*
3. Leaves not radical .. *E. geniculata*
2. Leaves up to 5 × 1.8 cm :
4. Decumbent or prostrate herbs :
5. Prostrate herbs ; leaves generally retuse at apices .. *E. heyneana*
5. Decumbent herbs ; leaves not retuse :
6. Stems pubescent or shaggy ; stipules linear .. *E. hirta*

- | | | |
|---|----|--|
| 6. Stems glabrous ; stipules ovate | .. | <i>E. deccanensis</i>
var. <i>nallamalayana</i> |
| 4. Erect herbs : | | |
| 7. Foliar bracts very prominent,
enclosing involucre | .. | <i>E. elegans</i> |
| 7. Foliar bracts inconspicuous : | | |
| 8. Limbs of glands multifid | .. | <i>E. longistyla</i> |
| 8. Limbs of glands entire : | | |
| 9. Flowers greenish or white ;
capsules sparsely pubescent | .. | <i>E. parviflora</i> |
| 9. Flowers pinkish ; capsules glabrous | .. | <i>E. senguptae</i> |

Euphorbia antiquorum Linn. Sp. Pl. 450. 1753 ; Wt. Ic. 3 : t. 897. 1844 ; Boiss. in DC. Prodr. 15 : 81. 1866 ; Hook. f. FBI 5 : 256. 1887 ; Gamble, FPM 7 : 1277. 1925 ; Santapau in Bull. bot. Soc. Bengal 8 : 7. 1954.

Large, succulent shrubs or small trees about 3 m high ; branches 3-4-sinuately-winged, jointed, succulent. Leaves 0.8 cm long, oblong, obovate, orbicular, cuneate at base, glabrous ; petioles short ; stipules spinous. Flowers yellowish-green, 0.2 cm long, in cyathia along pedunculate cymes about 0.8 cm long, bracteate ; involucre glands 5, orbicular ; stamens solitary, filaments jointed, anthers 2-celled ; ovary glabrous, styles 3, stigma 2-fid. Capsules 0.5 cm across, of 3, 2-valved cocci, glabrous ; seeds one in each coccus, ovoid.

Fl. & Fr. : September-January.

World distribution : India and Sri Lanka, in very dry localities.

Specimen examined : Srisailam, 5-12-1969, Ellis 32692.

E. acaulis Roxb. Fl. Ind. 2 : 472. 1824 ; Gamble, FPM 7 : 1276. 1925. *E. fusiformis* Buch.-Ham. in D. Don, Prodr. 62. 1825 ; Boiss. in DC. Prodr. 15 : 93. 1866 ; Hook. f. FBI 5 : 257. 1887 ; Santapau in Bull. bot. Soc. Bengal 8 : 3. 1954.

Acaulescent herbs, about 8 cm high ; rootstocks cylindrical, fusiform, about 18×5 cm, laticiferous. Leaves about 10×4, radical, dark pink below, linear-elliptic, obovate, cuneate at base, curled along margins, fleshy ; petioles 0.5 cm long. Flowers green, 0.5 cm long, in cyathia 0.5 cm across, on peduncles about 10 cm long ; involucre bracts hemispheric ; male flowers glabrous ; ovary glabrous, stigma recurved. Capsules 0.4 cm across, glabrous ; seeds ovoid.

Fl. & Fr. : March-August.

World distribution : India, in arid localities.

Specimen examined : Lukki, Diguvaletta, 9-8-1972, *Ellis* 42218.

Euphorbia geniculata Orteg. Nov. Rar. Pl. Hort. Motrit. Decad. 18. 1797 ; Hook. f. FBI 4 : 239. 1887 ; Santapau in Bull. bot. Soc. Bengal 8 : 5. 1954.

Erect herbs, about 40 cm high ; stems terete, striate, glabrous. Leaves about 8 × 4 cm, elliptic-ovate or obovate, obtuse or acute at base, glabrescent ; petioles up to 1.5 cm long. Flowers greenish-white, 0.4 cm long, in axillary clusters confined to ends of branches ; floral leaves white at base, narrowly ovate ; involucral bracts 0.5 cm long, lobes many, ovate ; glands external, oblong, stalked ; bracteoles fimbriate, hairy ; male slightly exerted ; ovary prominently exerted, glabrous, stigmas peltate. Capsules 0.4 cm across, glabrous ; seeds angled, faintly furrowed.

Fl. & Fr. : August-December.

World distribution : A native of Tropical America, growing as weed elsewhere. Although seen in other parts of India earlier, it is a very recent introduction in Nallamalais.

Specimen examined : Ahobilam, 29-8-1965, *Ellis* 25571.

E. heyneana Spreng. Syst. Veg. 3 : 791. 1826 ; G. Panigrahi in Kew Bull. 29 : 695. 1974. *E. microphylla* Heyne ex Roth, Nov. Sp. Pl. 229. 1821, (non Lamk. 1788) ; Hook. f. FBI 4 : 252. 1887 ; Gamble, FPM 7 : 1272. 1925. *E. orbiculata* Miq. Fl. Ind. Bat. 1 : 421. 1859, (non H. B. K. 1817). *E. serpens* Kunth var. *indica* Engelm. ex Boiss. in DC. Prodr. 15 ; 30. 1866. *E. bombaiensis* Santapau in Bull. bot. Soc. Bengal 8 : 17. 1955, excl. syn. *Chamaesyce heyneana* (Spreng.) Sojak in Cas. Nar. Muz. (Prague) 140 : 169. 1972.

Prostrate herbs, running to about 40 cm long ; stems terete, grooved, glabrous. Leaves about 0.5 × 0.4 cm, oblong, orbicular, retuse, unequally oblong or cordate at base ; reticulations prominent ; petioles 0.1 cm long ; stipules interpetiolar, ovate, slightly lacinate. Flowers pale pink, 0.1 cm long, in axillary cyathia 0.1 cm long ; involucral bracts acute, glands oval ; stamens included ; ovary exerted, glabrous, styles 3. Capsules 0.15 cm long, glabrous ; seeds 4-angled, smooth.

Fl. & Fr. : Throughout the year.

World distribution : A native of West Africa—now a weed in India.

Specimen examined : Pathalaganga, Srisailam, 4-12-1969, *Ellis* 32690.

Euphorbia hirta Linn. Sp. Pl. 454. 1753 ; Gamble, FPM 7 : 1275. 1925. *E. pilulifera* auct. (non Linn.) ; Hook. f. FBI 5 : 250. 1887. *Chamaesyce hirta* (Linn.) Millsp. Pub. Field Mus. Nat. Hist., bot. ser. 2 : 303. 1909 ; Webster & Derek Burch in Ann. Mus. Bot. Gardn. 54 : 340. 1967.

Erect or decumbent, robust herbs, up to 50 cm in length ; stems terete, striate, glandular-pubescent, sometimes shaggy. Leaves about 4 × 1.8 cm, elliptic, ovate-oblong, almost rhomboidal, unequally obtuse or acute at base, serrulate, sparsely hirtellous, chartaceous ; petioles 0.2 cm long, pubescent ; stipules interpetiolar, of 2 linear structures. Flowers greenish, 0.1 cm long, in axillary, cymose cyathia about 0.8 cm across ; peduncles 0.5 cm long ; male slightly exerted ; ovary pilose, exerted ; limb of stalked gland minute or sometimes absent, entire. Capsules 0.1 cm across, pilose ; seeds angled, shallowly furrowed.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimen examined : Chelama, 6-7-1963, Ellis 16799.

E. deccanensis V.S. Raju var. *nallamalayana* (Ellis) V.S. Raju in Taxon 34 : 520. 1985. *E. linearifolia* Roth var. *nallamalayana* Ellis in Bull. bot. Surv. Ind. 8 : 345. 1966. *Chamaesyce linearifolia* (Roth) J. Sojak var. *nallamalayana* (Ellis) [Raju et P.N. Rao in Phytologia 37 : 454. 1977, illeg.] K.S. Rao et M.N.V. Prasad in Taxon 36 : 762. 1987.

Decumbent herbs, about 20 cm long or less, depending on seasons ; stems terete, glabrous, internodes swollen ; rootstocks woody. Leaves up to 5 × 1.2 cm, linear-lanceolate, ovate, obtuse, apiculate, rounded at base, faintly serrulate ; reticulations prominent beneath ; petioles short ; stipules ovate, ciliate along margins. Flowers pink, 0.3 cm long, in terminal or axillary cyathia 0.5 cm long ; peduncles 0.5 cm long ; involucrel bracts 5, margins fringed ; glands 4, oval, limbs 0.3 × 0.2 cm, orbicular, sinuate ; male flowers exerted, glabrous ; ovary 0.3 cm long, glabrous, styles 3, bifid. Capsules 0.3 cm across, glabrous ; seeds quadrangular, smooth.

Fl. & Fr. : March-November.

World distribution : Peninsular India.

Specimens examined : Chelama, 6-7-1963, Ellis 16774 ; Chelama, 18-3-1965, Ellis 23711 ; Ahobilam, 23-11-1969, Ellis 32591 ; Bairanidokku, Eastern Nallamalais, 12-8-1972, Ellis 42238.

Remarks : V.S. Raju (*op. cit.*) has worked out the nomenclature of this taxon indicating that Roth's name in 1821 is a later homonym of

Willdenow's in 1799, proposing a new name, *Euphorbia deccanensis*, and treating the variety under it. K. Seshagiri Rao and M. N. V. Prasad (*loc. cit.*) have questioned Raju's treatment of the variety under the genus *Euphorbia* Linn. when earlier he had accepted the segregation of *Chamaesyce* from *Euphorbia*, following Webster (in *Taxon* 24 : 593-601, 1975), treating the variety under *Chamaesyce*. As Roth's specific epithet (*Nov. Sp. Pl.* 224, 1821) is illegitimate under *Euphorbia*, K.S. Rao and Prasad have made a new combination under *Chamaesyce*.

From the summation of over-all characters marking *Euphorbia* Linn., it is apparent that the segregation of *Euphorbia* and *Chamaesyce* into separate genera is still not settled beyond questionable doubt. The variety is therefore retained under *Euphorbia*, and Raju's (*loc. cit.*) treatment is followed.

Euphorbia elegans Spreng. Syst. 3 : 794. 1826 ; Boiss. in DC. Prodr. 15 : 19. 1866 ; Hook. f. FBI 5 : 246. 1887 ; Gamble, FPM 7 : 1274. 1925. *Chamaesyce elegans* (Spreng.) Sojak in Cas. Nar. Muz. (Prague) 140 : 169. 1972.

Erect herbs, about 12 cm high ; stems terete, striate, pilose. Leaves up to 2.2 × 1.2 cm, oblong-ovate or ovate, unequally rounded at base, serrulate, excurved along margins, sparingly pilose ; nerves about 6 from base, reticulations prominent beneath ; petioles 0.1 cm long, pilose. Flowers pink, 0.5 cm across, in terminal, condensed spikes about 1 cm long ; floral leaves distichous, imbricate, enclosing cyathia ; involucreal limbs obovate, sinuate, cuneate at base ; ovary glabrous, styles elongate, bifid. Capsules 0.2 cm across, pilose ; seeds angled, grooved.

Fl. & Fr. : August-January.

World distribution : India, in dry localities.

Specimens examined : Diguvametta, 7-12-1963, *Ellis* 17943 ; Chelama, 15-10-1964, *Ellis* 22009 ; Diguvametta, 17-11-1969, *Ellis* 32431 & *Ellis* 32439.

E. longistyla Boiss. Centuria Euphoriarum 9. 1860 et in DC. Prodr. 15 : 26. 1866 ; Hook. f. FBI 5 : 247. 1887 ; Gamble, FPM 7 : 1275. 1925 ; Subramanyam & Balakrishnan in Journ. Madras Univ. B. 29 : 45-47. 1959.

Erect herbs, about 35 cm high ; stems terete, striate, glabrous. Leaves up to 2 × 1.2 cm, oblong, elliptic-oblong, apiculate, obliquely rounded at base, serrulate ; reticulations prominent beneath ; petioles 0.1 cm long ; stipules laciniate. Flowers pinkish, 0.2 cm long, in terminal

cyathia about 0.2 cm long; involueral bracts 5, lobes small; glands 4, capitate, limbs of glands multifid; male flowers exserted; ovary glabrous, styles 3, filiform. Capsules about 0.2 cm across, glabrous; seeds angled, furrowed.

Fl. & Fr. : August-February.

World distribution : Peninsular India.

Specimen examined : Way to Pathalaganga, Srisailam, 20-10-1964, Ellis 22095.

Euphorbia parviflora Linn. Syst. 2 : 1047. ed. 10. 1759; Santapau in Bull. bot. Soc. Bengal 8 : 13. 1954 et in Rec. bot. Surv. Ind. 16 (1) : 243. rep. ed. 1967. *E. hypericifolia* Linn. Sp. Pl. 454. 1753, p.p.; Boiss. in DC. Prodr. 15 : 23. 1886; Hook. f. FBI 5 : 249. 1887; Gamble, FPM 7 : 1275. 1925. *E. hypericifolia* Linn. var. *parviflora* (Linn.) Prain, Beng. Pl. 2 : 924. 1903. *Chamaesyce hypericifolia* (Linn.) Millsp. Publ. Field Mus. Nat. Hist. bot. ser. 2 : 302. 1909; Webster & Derek Burch in Ann. Miss. bot. Gardn. 54 : 345. 1967. *C. parviflora* (Linn.) Sojak in Cas. Nar. Muz. (Prague) 140 : 169. 1972.

Erect herbs, about 40 cm high; stems terete, striate, glabrescent. Leaves up to 3.2 × 1.5 cm, oblong-obovate, unequally rounded at base, faintly serrulate, glabrescent; nerves prominent beneath; petioles 0.2 cm long; stipules interpetiolar, ovate. Flowers greenish or white, 0.2 cm long, in axillary and terminal cyathia 1 cm long; peduncles 1 cm long, bracteolate; involueral bracts puberulous without, lobes small, lanceolate, limbs of glands sinuate; male flowers slightly exserted; ovary pubescent, styles glabrous, stigmas bifid. Capsules 0.2 cm long, sparsely pubescent; seeds angled, rugose or furrowed.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimen examined : Srisailam, 12-7-1963, Ellis 16840.

Remarks : *Euphorbia hypericifolia* Linn. is a new world species which is separable from *E. parviflora* Linn. in being entirely glabrous.

E. senguptae Balakrishnan & Subramanyam in Bull. bot. Surv. Ind. 2 : 175. 1960.

Erect herbs, about 20 cm high; stems terete, striate, glabrous. Leaves about 2 × 1.4 cm, oblong, orbicular, obliquely rounded at base, faintly crenulate, glabrous; reticulations prominent beneath; petioles 0.1 cm long; stipules slightly fimbriate. Flowers pinkish, 0.1 cm long, in

axillary and terminal cyathia 0.25 cm long; peduncles 0.15 cm long; involucre bracts 0.1 cm long, ovate, slightly fimbriate; limbs of glands oblong; male flowers slightly exserted; ovary glabrous, styles 3. Capsules 0.3 cm across, glabrous; seed obtusely angled, furrowed.

Fl. & Fr. : September-December.

World distribution : Peninsular India, in dry localities.

Specimens examined : Ramanapenta, 27-8-1917, *K. C. Jacob* 14953; Mahanandi, 22-8-1965, *Ellis* 25462; Srisailam, 6-12-1969, *Ellis* 32713; Mahanandi, 23-8-1972, *Ellis* 42331.

TRAGIA Linn.

- | | | |
|-----------------------------|----|-----------------------|
| 1. Leaves simple | .. | <i>T. involucrata</i> |
| 1. Leaves palmately 3-lobed | .. | <i>T. cannabina</i> |

Tragia involucrata Linn. Sp. Pl. 980. 1753; Muell.-Arg. in DC. Prodr. 15 : 943. 1866; Hook. f. FBI 5 : 465. 1888, *p.p.*; Gamble, FPM 7 : 1332. 1925.

Climbing herbs, about 1.5 m long, often robust; stems terete, striate, hispid with stinging hairs. Leaves up to 8×5 cm, ovate or elliptic, acuminate or caudate-acuminate, rounded or obtuse at base, serrate, hispidly hairy; petioles up to 2.5 cm long; stipules ovate-acuminate. Flowers pale green, in axillary racemes about 2.5 cm long, bracteate; male included; female with accrescent calyx; ovary 3-celled, styles united into a column. Capsules 0.5×0.8 cm, 3-lobed, sparingly hairy; seeds globose, smooth.

Fl. & Fr. : March-November.

World distribution : India, Sri Lanka, Burma and China.

Specimen examined : Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23755.

T. cannabina Linn. f. Suppl. 415. 1781; Gamble, FPM 7 : 1333. 1925. *T. involucrata* Linn. var. *cannabina* (Linn. f.) Muell.-Arg. in DC. Prodr. 15 : 943. 1866; Hook. f. FBI 5 : 465. 1888.

Erect or climbing herbs or undershrubs; stems terete, striate, hispid with stinging hairs, often woody. Leaves 6×3.5 cm, palmately, deeply 3-lobed, middle lobe larger than laterals; lobes crenate-dentate, acute, truncate or rounded or cordate at base, sparingly hispid generally along nerves. Flowers greenish-yellow, in axillary spikes 8 cm long, bracteate; rachises hispid; male flowers minute, calyx small, lobes ovate, entire; female flowers at base, 0.9 cm long, calyx accrescent in fruits, laciniated,

hispidly hairy along margins ; ovary glochidiate, sparsely hispid, styles 3, glabrous, styles united into a column. Capsules 0.4×0.7 cm, lobed, hispid ; seeds globose.

Fl. & Fr. : May-December.

World distribution : India and Sri Lanka, in very dry localities.

Specimen examined : Maddipenta, Eastern Nallamalais, 11-8-1972, *Ellis* 42227.

MALLOTUS LOUR.

Mallotus philippensis (Lamk.) Muell.-Arg. in *Linnaea* 34 : 196. 1865 et in DC. *Prodr.* 15 : 981. 1866 ; Hook. f. *FBI* 5 : 442. 1887 ; Brandis, *Indian Trees*, 590. 1906 ; Pax in Engler ; *Pflanzenr.* 81 : 184. 1922 ; Gamble, *FPM* 7 : 1322. 1925 ('*philippinensis*'); Airy Shaw in *Kew Bull.* 21 : 392. 1968 et *ibid.* 26 : 300. 1971. *Croton philippense* Lamk. *Encycl.* 2 : 206. 1786.

Trees, about 10 m tall ; branchlets tawny-tomentose. Leaves about 20×10 cm, glaucous beneath, elliptic-acuminate, glabrous above, stellate-puberulous and glandular beneath ; nerves 3 from base, nervules parallel ; petioles about 9 cm long. Flowers pale yellow, 0.2 cm long, in terminal racemes 8 cm long in male, shorter in female ; calyx 0.2 cm long, lobes ovate, tomentose without, thicker in female ; stamens numerous, filaments glabrous, anthers parallel ; ovary reddish, stellate-puberulous, styles free, plumose above. Capsules 0.8×0.8 cm, of 3 cocci, tubercled, red-glandular ; seeds greyish, globose.

Fl. & Fr. : August-February.

World distribution : India, Sri Lanka, China, Malaysia and Australia.

Specimens examined : Srisailam, 15-7-1963, *Ellis* 16885 ; Ramana-penta, Gundlabrahmeswaram, 25-10-1964, *Ellis* 22208 ; way to Krishnanandi, Mahanandi, 21-8-1965, *Ellis* 25448 ; Upper Ahobilam, 22-11-1969, *Ellis* 32580 ; Krishnanandi, 9-12-1969, *Ellis* 32725.

JATROPHA Linn.

- | | | |
|---|----|------------------------|
| 1. Leaf margins stipitately glandular ;
stipules prominently laciniate | . | <i>J. gossypifolia</i> |
| 1. Leaf margins eglandular ; stipules capillary | .. | <i>J. heynei</i> |

Jatropha gossypifolia Linn. Sp. Pl. 1006. 1753 ; Muell.-Arg. in DC. Prodr. 15 : 1086. 1866 ; Hook. f. FBI 5 : 383. 1887 ; Gamble, FPM 7 : 1340. 1925 ; Airy Shaw in Kew Bull. 26 : 283. 1971.

Shrubs, about 1 m high ; branchlets glabrous. Leaves about 10×14 cm, 3-5-lobed below the middle ; lobes obovate, margins entire with stipitate glands, cordate at base, glabrous, hirsute above near the joint of nerves ; petioles about 10 cm long, stipitately glandular along the groove above ; stipules laciniate, glandular. Flowers crimson red, 0.5 cm long, in axillary, paniculate cymes about 9 cm long ; peduncles about 8 cm long ; bracts 1 cm long, obovate, stipitately glandular along margins ; calyx lobes 0.4 cm long, ovate, stipitately glandular and hairy along margins ; corolla 0.5 cm long, lobes oblong ; ovary glabrous, style bifid, stigmas obtusely laciniate, glandular-tipped. Capsules 1 cm across, faintly rugose ; seeds oblong, aril furrowed.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India and Sri Lanka, generally in eroded places.

Specimen examined : Srisaillam, 13-7-1963, *Ellis* 16843.

J. heynei Balakrishnan in Bull. bot. Surv. Ind. 3 : 40. 1962. *J. heterophylla* Heyne ex Hook. f. FBI 5 : 382. 1887 (*non* Steud.) ; Gamble, FPM 7 : 1339. 1925.

Undershubs, about 80 cm high ; stems glabrous ; rootstocks tuberous. Leaves about 12×7 cm, deeply 3-lobed ; lobes oblong, obovate, cuneate at base, uneven along margins ; nerves 3 almost from base ; petioles about 2.8 cm long ; stipules 0.8 cm long, capillary. Flowers green, 0.4 cm long, in terminal, cymose panicles 3 cm long, bracteate ; calyx lobes 0.1 cm long, tube 0.1 cm long ; petals 0.2 cm long, glabrous ; stamens numerous, included ; ovary glabrous, styles 2-fid. Capsules about 1.5 cm across, globose, slightly 3-lobed ; seeds oblong.

Fl. & Fr. : June-August.

World distribution : Peninsular India, in dry localities, generally on black-cotton soil.

Specimens examined : Nallaymalays, no date, ? 48448 ; Diguvametta, 11-8-1921, *C.E.C. Fischer* 4655 ; Srisaillam, 15-7-1963, *Ellis* 16891.

PHYLLANTHUS* Linn. *emend.* Gaertn.

1. Fruits of berries ; trees or shrubs :
2. Berries with stony endocarp ; leaves up to 0.6 cm broad ; trees :
3. Berries about 5×5 cm ; leaves about 1.5×0.3 cm .. *P. emblica*
3. Berries about 2.5×2.5 cm ; leaves about 1.9×0.6 cm .. *P. indofischeri*
2. Berries without stony endocarp ; shrubs .. *P. reticulatus*
1. Fruits capsular ; herbs or undershrubs :
4. Capsules verrucose or rugose :
5. Seeds distinctly muriculate ; leaves not prominently distichous .. *P. virgatus*
5. Seeds grooved, not muriculate ; leaves distichous .. *P. urinaria*
4. Capsules smooth :
6. Seeds sparingly pitted .. *P. polyphyllus*
6. Seeds furrowed or grooved :
7. Leaves ovate ; flowers white .. *P. rheedit*
7. Leaves obovate ; flowers greenish :
8. Leaves about 2.5×0.8 cm, cuneate at base, not distichous .. *P. maderaspatensis*
8. Leaves up to 1×0.8 cm, obtuse at base, distichous :
9. Calyx lobes accrescent in fruits .. *P. debilis*
9. Calyx lobes not accrescent in fruits .. *P. amarus*

Phyllanthus emblica Linn. Sp. Pl. 982. 1753 ; Hook. f. FBI 5 : 287. 1887 ; Webster in Journ. Arn. Arb. 38 : 76. 1957 ; Backer & Bakh. Fl. Java 1 : 468. 1963 ; Airy Shaw in Kew Bull. 26 : 319. 1972. *Embllica officinalis* Gaertn. Fruct. 2 : 122, t. 108. 1790 ; Wt. Ic. 5 : t. 1896. 1852 ; Gamble, FPM 7 : 1295. 1925.

Trees, about 10 m tall ; young branchlets puberulous. Leaves up to 1.5×0.3 cm, linear, rounded at base, excurved along margins, subsessile, distichous, stipulate. Flowers pale green, 0.1 cm long, in axillary clusters, bracteate, male shortly pedicellate ; calyx lobes 0.1 cm long, ovate-oblong ; stamens 3, filaments united in a column, anther-cells parallel, connectives excurrent ; disk cupular ; ovary glabrous, styles free at top. Berries about 5×5 cm, globose, fleshy, endocarp stony, vertically 6-furrowed ; seeds 6, trigonous.

* Webster (in Journ. Arn. Arb. 38 : 1957) is followed in the delimitation of the genus, *Phyllanthus* comprising *Cicca* Linn., *Embllica* Gaertn., *Kirganelia* Juss. etc.

Fl. & Fr. : March-November.

World distribution : India, Sri Lanka, China and Malaysia.

Specimens examined : Chelama, 21-3-1965, *Ellis* 23747 ; Ahobilam, 22-11-1969, *Ellis* 32576.

Phyllanthus indofischeri (Gamble) Bennet in Indian For. 109 : 221, 1983. *P. cecilfischeri* (Gamble) Ellis in Bull. bot. Surv. Ind. 22 : 193, 1980 (1984). *Embllica fischeri* Gamble in Kew Bull. 1925 : 330. 1925 et in FPM 7 : 1295. 1925.

Trees, about 8 m tall; young branchlets generally glabrous; bark reddish within. Leaves about 1.9×0.6 cm, linear-oblong, rounded at base, margins excurved, chartaceous, subsessile. Flowers 0.2 cm long, in axillary clusters, bracteate; pedicels 0.3 cm long, filiform; calyx lobes 0.1 cm long, obovate-oblong; anthers parallel, filaments united in a column; female flowers fewer, larger, ovary glabrous, styles connate at base, bifid at apices. Fruits 2.5×2.5 cm, globose; endocarp stony, vertically furrowed; seeds 6, trigonous.

Fl. & Fr. : March-October.

World distribution : Peninsular India, in dry localities.

Specimen examined : Mahanandi, 22-8-1965, *Ellis* 25475.

P. reticulatus Poir. in Lamk. Encycl. Method. 5 : 298. 1804 ('*reticulata*'); Muell.-Arg. in DC. Prodr. 15 : 344. 1866; Hook. f. FBI 5 : 288. 1887; Webster in Journ. Arn. Arb. 38 : 57. 1957; Webster & Airy Shaw in Kew Bull. 26 : 88. 1971. *Kirganelia reticulata* (Poir.) Baill. Etud. Gen. Euphor. 613. 1858; Gamble, FPM 7 : 1294. 1925. *Anisonema multiflorum* Wt. Ic. 5 : t. 1899. 1852.

Shrubs, about 2 m high; branchlets striate, puberulous to pubescent. Leaves about 2.5×1.8 cm, oblong, orbicular, obtuse or rounded at base, sparsely puberulous on prominent reticulations above; petioles 0.1 cm long, pubescent; stipules small, ovate. Flowers greenish, 0.1 cm long, 2 or 3, axillary; pedicels 0.3 cm long, puberulous; calyx lobes 0.1 cm long in male, larger in female, ovate-orbicular, stamens 5, outer two filaments not connate at base, anther cells parallel; ovary glabrous, stigmas bifid. Berries 0.4×0.3 cm, globose; seeds wedge-shaped.

Fl. & Fr. : July-October.

World distribution : Tropics from Africa, India, Sri Lanka, China and Malaysia.

Specimen examined : Chelama, 6-7-1963, *Ellis* 16800.

Phyllanthus virgatus Forst. f. Fl. Ins. Austr. Prodr. 65. 1786 ; Backer & Bakh. f. Fl. Java 1 : 469. 1763. *Phyllanthus simplex* Retz. Obs. 5 : 29. 1789 ; Muell.-Arg. in DC. Prodr. 15 : 391. 1866 ; Hook. f. FBI 5 : 295. 1887 ; Gamble, FPM 7 : 1289. 1925. *Macraea oblongifolia* Wt. Ic. 5 : t. 1902. 1852.

Erect herbs, about 50 cm high ; branches rather compressed, faintly winged, striate ; rootstocks woody. Leaves up to 1.9 × 0.5 cm, ovate-elliptic, oblong, apiculate, linear, rounded at base, margins excurved, subsessile ; stipules peltate. Flowers greenish, about 0.2 cm long, axillary, solitary ; pedicels up to 0.7 cm long ; calyx lobes 0.1 cm long, ovate-orbicular, tube small ; stamens 3, filaments sometimes connate at base, anther cells parallel ; ovary glabrous, styles 3, 2-fid at apices. Capsules 0.3 × 0.3 cm, globose, faintly rugose ; seeds wedge-shaped, finely muriculate.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, China, Malaysia and Pacific Islands.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16750 ; Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22132 ; Mahanandi, 21-8-1965, *Ellis* 25410 ; Mahanandi, 22-8-1965, *Ellis* 25458 ; Diguvametta, 18-11-1969, *Ellis* 32511.

P. urinaria Linn. Sp. Pl. 982. 1753 ; Muell.-Arg. in DC. Prodr. 15 : 362. 1866 ; Hook. f. FBI 5 : 293. 1887 ; Gamble, FPM 7 : 1289. 1925 ; Webster in Journ. Arn. Arb. 38 : 194. 1957 et Webster & Burch in Ann. Miss. bot. Gardn. 54 : 224. 1967. *P. leprocarpus* Wt. Ic. 5 : t. 1895. 1852.

Erect herbs, about 20 cm high, sometimes decumbent ; branches obscurely-angled, grooved, branchlets angled, faintly winged, hispid. Leaves 1 × 0.3 cm, linear-ovate, obovate, apiculate, obtuse or rounded at base, subsessile, in lateral branchlets, glabrous, stipulate. Flowers greenish, 0.2 cm long, axillary, solitary ; male small, filaments connate ; female larger ; calyx lobes 0.05 cm long, linear-oblong, connate at base ; ovary glabrous, styles 3, 2-fid. Capsules 0.2 × 0.2 cm, globose, verrucose ; seeds wedge-shaped, transversely grooved.

Fl. & Fr. : July-October.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22163 ; Ahobilam, 29-8-1965, *Ellis* 25575 ; Lukki, Diguvametta, 9-8-1972, *Ellis* 42224.

Phyllanthus polyphyllus Willd. Sp. Pl. 4 : 586. 1805 ; Wt. Ic. 5 : t. 1895, fig. 2. 1852 ; Muell.-Arg. in DC. Prodr. 15 : 352. 1866 ; Hook. f. FBI 5 : 290. 1887 ; Gamble, FPM 7 : 1288. 1925.

Shrubs, about 1 m tall ; juvenile branchlets angled. Leaves up to 1.8×0.5 cm, linear-oblong, rounded at base, margins excurved ; nerves rather prominent. Flowers green, 0.2 cm long, in axillary clusters generally towards ends of branchlets, bracteate, pedicellate ; calyx 0.1 cm long, lobes ovate ; stamens 3, filaments forming a column, anthers parallel ; ovary glabrous, styles 3, 2-fid. Capsules 0.4 cm across, smooth ; seeds trigonous, sparingly pitted.

Fl. & Fr. : July-December.

World distribution : Peninsular India and Sri Lanka, in dry localities.

Specimen examined : Srisaifam, 15-7-1963, *Ellis* 16887.

P. rheedii Wt. Ic. 5 : t. 1895. 1852 ; Muell.-Arg. in DC. Prodr. 15 : 363. 1866 ; Hook. f. FBI 5 : 293. 1887 ; Gamble, FPM 7 : 1289. 1925.

Erect herbs ; branches woody, terete. Leaves about 2.3×1.2 cm, ovate, obtuse or rounded at base, glaucous beneath, shortly petioled, stipulate. Flowers white, male small, fascicled, female larger ; pedicels of female rather thick ; calyx 5-lobed, lobes ovate, green with white margins ; stamens 3, filaments connate to form a column ; ovary glabrous, styles 2-fid. Capsules 0.4×0.4 cm, globose, smooth ; seeds wedge-shaped, concentrically minutely striated and with minute cross-bars.

Fl. & Fr. : July-August.

World distribution : Tropics from Africa and India.

Specimens examined : Chelama, 13-7-1963, *Ellis* 16860 ; Mahanandi, 22-8-1965, *Ellis* 25460.

P. debilis Klein ex Willd. Sp. Pl. 4 : 582-583. 1804 ; Hook. f. FBI 5 : 299. 1887 ; Gamble, FPM 7 : 1290. 1925 ; Webster in Journ. Arn. Arb. 38 : 307. 1957.

Erect herbs, up to 10 cm high ; stems terete, glabrous. Leaves 1×0.8 cm, glaucous beneath, elliptic, obovate, acute or rounded at base ; petioles short ; stipules ovate. Flowers greenish, 0.3 cm long, axillary ;

pedicels longer in female ; calyx 0.1 cm long, lobes obovate-orbicular, scarious along margins, accrescent ; stamens 3, filaments free ; ovary glabrous, styles 3, recurved, bifid at ends. Capsules 0.2×0.2 cm, globose ; seeds wedge-shaped, concentrically furrowed with very minute tubercles joined by minute cross-bars.

Fl. & Fr. : July-August.

World distribution : Tropics from Africa and India.

Specimens examined : Chelama, 13-7-1963, *Ellis* 16860 ; Mahanandi, 22-8-1965, *Ellis* 25460.

Phyllanthus maderaspatensis Linn. Sp. Pl. 982. 1753 ; Wt. Ic. 5 : t. 1895. fig. 3. 1852 ; Muell.-Arg. in DC. Prodr. 15 (2) : 362. 1866 ; Hook. f. FBI 5 : 292. 1887 ; Gamble, FPM 7 : 1289. 1925.

Erect herbs or undershrubs, about 50 cm high ; branches terete or obtusely angled, striate, sometimes grooved ; rootstocks woody. Leaves about 2.5×0.8 cm, oblong-obovate, cuneate at base, shortly petioled, stipulate. Flowers pale green, 0.3 cm long, axillary, solitary ; pedicels of female flowers filiform ; calyx 6-lobed, lobes 0.2×0.2 cm, orbicular-ovate, scarious-margined ; stamens 3, filaments connate, anthers parallel ; ovary glabrous, styles 3, bifid. Capsules 0.3×0.3 cm, ovoid ; seeds 6, wedge-shaped, striately muriculate-grooved.

Fl. & Fr. : August-February.

World distribution : Tropics from Africa, India, Sri Lanka, Malaysia and Australia.

Specimen examined : Chelama, 9-7-1963. *Ellis* 16786.

P. amarus Schum. & Thonn. in Kongl. Danske Vidensk. Selsk. Skr. 4 : 195-196. 1829 ; Brenan in Kew Bull. 1950 : 217. 1951 ; Webster in Journ. Arn. Arb. 38 : 313. 1957. *P. niruri sensu* Hook. f. FBI 5 : 298. 1887, *p.p.* ; Gamble, FPM 7 : 1289. 1925, *p.p.* ; *P. niruri* Linn. var. *amarus* (Schum. & Thonn.) Leandri in Humbert, Fl. Madag. 111 : 73. 1958. *P. nanus* Hook. f. *loc. cit.*

Erect herbs, about 15-20 cm high ; branches terete, glabrous. Leaves about 0.9×0.3 cm, disposed alternately on branchlets about 3 cm long, oblong-ovate, obovate, rounded at base, sessile, stipulate. Flowers greenish, 0.05 cm long, in axillary or lateral pairs, shortly pedicellate, cymes mostly bisexual, terminal 1 or 2 male, the other axils with 1 male and 1 female flowers ; calyx lobes 5, greenish with white margins ; disk small ; stamens 3, filaments columnar ; ovary glabrous, styles 3, bifid at tips. Capsules 0.1×0.1 cm, globose ; seeds 6, wedge-shaped, ribbed.

Fl. & Fr. : Throughout the year.

World distribution : Native of tropical America, a weed in India and several other tropical countries.

Specimen examined : Chelama, 9-7-1963, Ellis 16802.

Remarks : Brennan (*op. cit.* 217) has given some important characters in the key to *P. amarus*, distinguishing it from *P. niruri*. Webster (*op. cit.* pp. 309-315) has discussed at length the confusion regarding 4 plants, viz. *P. asperulatus* Hutchinson, *P. fraternus* Webster, *P. niruri* Linn. and *P. amarus* Schum. & Thonn. He states (p. 311), '...I acted too hastily in reducing *P. fraternus* to the status of a synonym of *P. asperulatus* Hutchinson.' and '...*P. fraternus* and *P. asperulatus* are by no means identical and had best be kept separate for the time being.' He concludes that what occur in India are 2 species, viz. *P. fraternus* Webster and *P. amarus* Schum. & Thonn. The distribution of *P. fraternus* is in '...west Pakistan and western India,...' The ubiquitous plant occurring in India is *P. amarus* Schum. & Thonn. commonly reported as *P. niruri* Linn. Webster and Burch (in *Ann. Miss. bot. Gardn.* 54 : 226. 1967) conclude, '...This weedy plant, the most widespread and abundant species of *Phyllanthus*, has until recently been confused with *P. niruri*; .. It is easily distinguished from *P. niruri*, however, by its equilateral leaf bases, bisexual cymules, and ribbed instead of verrucose seeds....'.

SEBASTIANIA Spreng.

Sebastiania chamaelea (Linn.) Muell.-Arg. in DC. Prodr. 15 : 1175. 1866 ; Hook. f. FBI 5 : 475. 1887 ; Gamble, FPM 7 : 1344. 1925 ; Airy Shaw in Kew Bull. 26 : 339. 1971. *Tragia chamaelea* Linn. Sp. Pl. 981. 1753.

Erect herbs, about 30 cm high ; lateral branches decumbent, terete in older, angled in younger, grooved, glabrous or ciliate. Leaves up to 6 × 1 cm, linear-oblong, obtuse, acute or obtuse at base, glabrescent, hirtellous along excurved margins ; petioles 0.1 cm long. Flowers greenish yellow ; male flowers minute, in axillary or leaf-opposed spikes 1 cm long ; calyx minute, ovate, ciliate along margins ; stamens 3, filaments free, anther cells parallel ; female flowers larger, solitary, axillary or at base of male spikes ; calyx ovate, ciliate along margins ; ovary glabrous, glochidiate. Capsules 0.5 × 0.4 cm, globosely angular, with two rows of spikes on the cocci ; seeds ellipsoid, carunculate.

Fl. & Fr. : June-December.

World distribution : Tropics from Africa, India, Sri Lanka, China, Malaysia and Australia.

Specimens examined: Chelama, 5-7-1963, *Ellis* 16757; way to Upper Ahobilam, 29-8-1965, *Ellis* 25561; Diguvaletta, 19-11-1969, *Ellis* 32548.

HOMONIA Lour.

Homonia riparia Lour. Fl. Cochinch. 637. 1790; Muell.-Arg. in DC. Prodr. 15: 1023. 1866; Hook. f. FBI 5: 455. 1887; Gamble, FPM 7: 1333. 1925; Airy Shaw in Kew Bull. 26: 282. 1971. *Adelia nerifolia* Roth, Nov. Sp. Pl. 375. 1821; Wt. Ic. 5: t. 1868. 1852.

Shrubs, about 1.5 m high, along river beds on rocky boulders; branchlets pubescent. Leaves up to 17×2 cm, linear-acuminate, apiculate, acute at base, entire, sometimes serrulate, glabrous above, peltate-glandular beneath, sparsely puberulous beneath; petioles up to 1 cm long, pubescent. Flowers pale pink, about 0.2 cm long, in axillary and terminal spikes about 10 cm long, bracteate, bracteolate; calyx lobes 0.4 cm long, in male flowers 3, valvate, in female flowers about 6, smaller, puberulous; stamens numerous, in globose clusters of branched filaments about 0.5 cm across; ovary pubescent, styles 3, papillate. Capsules 0.2×0.2 cm, globose, pubescent; seeds slightly angled on inner face and rounded on outer face.

Fl. & Fr.: March-August.

World distribution: India, Sri Lanka and Malaysia.

Specimens examined: Nandikanama Pass, March 1883, *J. S. Gamble* 10833; Upper Ahobilam, 29-8-1965, *Ellis* 25557 (female) and *Ellis* 25559 (male); Mahanandi, 22-8-1972, *Ellis* 42326 (female).

GIVOTIA Griff.

Givotia moluccana (Linn.) Sreemadhavan in Taxon 24: 696. 1975. *Croton moluccanum* Linn. Sp. Pl. 1005. 1753. *Givotia rottleriformis* Griff. in Calc. Journ. nat. Hist. 4: 388. 1844; Wt. Ic. 5: t. 1889. 1852; Muell.-Arg. in DC. Prodr. 15: 1112. 1866; Hook. f. FBI 5: 395. 1887; Brandis, Indian Trees, 578. 1906; Gamble, FPM 7: 1342. 1925; Smith in Kew Bull. 22: 504. 1968.

Trees, about 10 m tall; branchlets white with stellate-tomentum, sap reddish. Leaves about 25×25 cm, ovate, cordate at base, dentate, glabrescent above, densely whitish-brown stellate-tomentose beneath; nerves 5 from base, reticulations parallel; petioles about 20 cm long, dense-tomentose. Flowers pale yellow, 0.5 cm long, in cymes about 2 cm across, bracteate, along panicles 20 cm long; calyx lobes 5, 0.4 cm long,

densely tomentose without; petals slightly longer than calyx, connate at base; disk glands globular in male, disk in female cupular; stamens many, included, filaments connate at base, hairy; ovary hairy, styles 3, short, bifid. Drupes about 2×1.5 cm, ovoid; endocarps stony; seeds ellipsoid.

Fl. & Fr. : March-December.

World distribution : India and Sri Lanka, in dry localities of deciduous forests.

Specimens examined : Kurnool, 1886, *J. S. Gamble* s.n.; Chelama, 13-7-1963, *Ellis* 16867; Chelama, 12-12-1963, *Ellis* 18070; Mahanandi, 23-8-1965, *Ellis* 25502.

Remarks : Sreemadhavan (*op. cit.*) has argued for reinstating the Linnean epithet, *moluccanum* for this species which Smith (*op. cit.*) earlier had considered as a *nomen confusum*.

BRIDELIA Willd. corr. Spreng.

Bridelia retusa (Linn.) Spreng. Syst. Veg. 3 : 48. 1826; Muell.-Arg. in DC. Prodr. 15 : 493. 1866; Hook. f. FBI 5 : 268. 1887, *p.p.*; Gamble, FPM 7 : 1280. 1925; Santapau in Journ. Bombay nat. Hist. Soc. 50 : 308. 1953; Airy Shaw in Kew Bull. 26 : 230. 1971. *Cluytia retusa* Linn. Sp. Pl. 1042. 1753.

Trees, about 15 m tall; young branches puberulous. Leaves about 17×7 cm, glaucous beneath, elliptic-ovate obtuse, sometimes retuse, rounded at base, coriaceous, faintly puberulous beneath; lateral nerves about 20 pairs, parallel, nervules parallel, reticulations prominent; petioles 1 cm long, thick. Flowers reddish yellow, 0.2 cm across, in clusters along terminal and axillary paniculate spikes about 15 cm long, bracteate; rachis tomentose; calyx reddish, lobes 0.1 cm long, ovate, tube pubescent; petals 5, 0.05 cm long, ovate, cucullate in male, spatulate in female; disk flat; stamens 5, on gynophore; ovary glabrous, styles 2. Drupes 0.4×0.4 cm, globose; pyrenes 2, grooved without.

Fl. & Fr. : August-October.

World distribution : Tropics from Africa, India, Sri Lanka, Malaysia and Philippines.

Specimens examined : Mahanandi, 21-8-1965, *Ellis* 25438; Mahanandi, 8-12-1969, *Ellis* 32723; Diguvametta, 7-8-1972, *Ellis* 42173.

CLEISTANTHUS Hook. f. ex Planch.

- | | | |
|---|----|--------------------|
| 1. Leaves oblong-obovate or orbicular ; shortly acute,
sometimes emarginate ; capsules 2.5×2.5 cm | .. | <i>C. collinus</i> |
| 1. Leaves elliptic-acuminate ; capsules 0.7×0.7 cm | .. | <i>C. patulus</i> |

Cleistanthus collinus (Roxb.) Hook. f. Fl. Brit. Ind. 5 : 274. 1888 ; Gamble, FPM 7 : 1282. 1925. *Cluytia collina* Roxb. Pl. Corom. 2 : 37, t. 169. 1802. *Lebidieropsis orbicularis* Muell.-Arg. in DC. Prodr. 15 : 509. 1866. *Amanoa collina* Baill. Etud. Gen. Euphorb. 582. 1858.

Trees, about 8 m tall ; branchlets terete, glabrous. Leaves 8×6.5 cm, oblong-obovate, orbicular, shortly acute, sometimes emarginate, obtuse or acute at base, chartaceous to coriaceous ; lateral nerves and reticulations prominent ; petioles 0.5 cm long, thick, pubescent. Flowers 0.5 cm long, in axillary clusters or spikes 2 cm long ; rachises pubescent ; calyx 0.4 cm long, ovate, pubescent without ; petals 0.3 cm long, cucullate at tips ; stamens 5, included ; disk glabrous, styles 3, stigmas bifid. Capsules 2.5×2.5 cm, orbicular-depressed, 3-locular ; seeds 0.5 cm across, shining black, globose.

Fl. & Fr. : March-October.

World distribution : India and Sri Lanka.

Specimens examined : Diguvaletta, 11-11-1906, *C. A. Barber* 8089 ; Chelama, 4-7-1963, *Ellis* 16702 ; Chelama, 19-3-1965, *Ellis* 23720 ; Mahanandi, 21-8-1965, *Ellis* 25420 ; Mahanandi, 23-8-1965, *Ellis* 25500 ; Diguvaletta, 7-8-1972, *Ellis* 42172.

C. patulus (Roxb.) Muell.-Arg. in DC. Prodr. 15 : 505. 1866 ; Hook. f. FBI 5 : 279. 1887 ; Gamble, FPM 7 : 1282. 1925. *Cluytia patula* Roxb. Pl. Corom. 2 : 37, t. 170. 1802. *Lebidiera patula* (Roxb.) Muell.-Arg. in Linnæa 32 : 21. 1864-65. *Amanoa indica* Wt. Ic. 5 : 1911. 1852.

Trees, about 8 m tall ; branchlets terete, glabrous. Leaves 10×3.5 cm, elliptic-acuminate, obtuse or rounded at base, coriaceous, red when young ; petioles 0.4 cm long, rather thick, glabrous. Flowers 0.4 cm long, in axillary spikes about 2 cm long, bracteate ; calyx 0.4 cm long, lobes ovate ; petals 0.2 cm long, obovate ; disk flat ; stamens 5, on gynophore ; ovary villous, styles 3, bifid. Capsules 0.7×0.7 cm, pilose to glabrous ; seeds reniform.

Fl. & Fr. : March-July.

World distribution : India and Sri Lanka.

Specimen examined : Gundlabrahmeswaram, 30-3-1965, *Ellis* 23803.

GLOCHIDION J. R. & G. FORST, *nom. cons.*

1. Leaves and capsules glabrous	..	<i>G. zeylanicum</i>
1. Leaves and capsules pubescent	..	<i>G. velutinum</i>

Glochidion zeylanicum (Gaertn.) A. Juss. Tent. Euphor. 107, t. 3. 1824; Hook. f. FBI 5: 310. 1887; Brandis, Indian Trees, 573. 1906; Gamble, FPM 7: 1306. 1925. *Bradleya zeylanica* Gaertn. Fruct. 2: 128, t. 109. 1790.

Trees, about 8 m tall; branchlets zig-zag, puberulous. Leaves glaucous above, copper-coloured beneath, about 15 × 6 cm, slightly falcate, elliptic-acuminate, ovate, unequally rounded at base, glabrous, rather coriaceous; petioles 0.5 cm long, thick; stipules acuminate, recurved. Flowers greenish, 0.3 cm long, in axillary clusters; pedicels 0.3 cm long; bracts small, recurved; calyx 0.2 cm long, lobes oblong-orbicular, coriaceous; stamens about 6, included, filaments connate, anther cells parallel, connectives extended; ovary glabrous, styles connate. Capsules 0.6 × 1 cm, globose, longitudinally grooved; seeds shining, wedge-shaped.

Fl. & Fr.: Throughout the year.

World distribution: India, Sri Lanka and Malaysia.

Specimens examined: Sunnipenta, Srisailam, 21-10-1964, *Ellis* 22134; Mahanandi, 10-12-1969, *Ellis* 32733; Rollapenta, 14-8-1972, *Ellis* 42254.

G. velutinum Wt. Ic. 5: 29, t. 1907. 1852; Hook. f. FBI 5: 322. 1887; Brandis, Indian Trees, 574. 1906; Gamble, FPM 7: 1307. 1925. *Phyllanthus velutinus* (Wt.) Muell.-Arg. in DC. Prodr. 16 (2): 309. 1866.

Trees, about 7 m tall; branchlets slightly zig-zag, velutinous. Leaves up to 10 × 4 cm, ovate, obovate, obtuse or acute at base, sparsely puberulous above, densely tomentose beneath. Flowers greenish, 0.3 cm long, in axillary clusters; pedicels about 0.4 cm long, slender in male; sepals 0.15 cm long, ovate, pubescent without on the back; anthers syngenesious; ovary pubescent, styles connate, slightly toothed at apices. Capsules 0.4 × 0.7 cm, oblong, furrowed, pubescent; seeds orange, flattened.

Fl. & Fr.: September-March.

World distribution: India and Burma.

Specimen examined: Gundlabrahmeswaram, 21-7-1963, *Ellis* 16941.

SECURINEGA Comm. ex Juss., *nom. cons.*

Securinega virosa (Roxb. ex Willd.) Baillon in Adansonia 6: 334. 1866; Pax & Hoffm. in Engler, Pflanzenf. ed. 2. 19c: 60. 1931; Airy Shaw in Kew Bull. 35: 688. 1980. *Phyllanthus virosus* Roxb. ex Willd.

Sp. Pl. 4 : 580. 1805. *Flueggea microcarpa* Bl. Bijdr. 580. 1825 ; Hook. f. FBI 5 : 328. 1887. *F. virosa* Baillon, Etud. Gen. Euphor. 593. 1858 (*nomen*) ; Gamble, FPM 7 : 1296. 1925.

Shrubs to small trees, about 4 m tall ; stems obscurely angled, grooved, sparsely puberulous or glabrous. Leaves glaucescent beneath, very variable in size, generally 3 × 2 cm, but up to 8 × 4 cm, obovate, orbicular, elliptic-ovate, retuse, acute or obtuse at base ; petioles up to 0.5 cm long ; stipules ovate, faintly ciliolulate along margins. Flowers pale yellow, 0.1 cm long, male smaller than female, in axillary clusters, pedicelled, many-bracteate ; calyx lobes ovate, crispate along margins ; stamens exerted ; ovary glabrous, styles bifid. Berries 0.3 × 0.3 cm, globose, smooth ; seeds reddish, wedge-shaped.

Fl. & Fr. : March-September.

World distribution : Tropics from Africa, India, Sri Lanka, China, Malaysia and Australia.

Specimens examined : Cheiama, 4-7-1963, *Ellis* 16705 (male), 16707 (female) ; Mahanandi, 23-8-1965, *Ellis* 25511 (female).

BREYNIA J. R. & G. Forst, *nom. cons.*

Breynia retusa (Dennst.) Alston in Ann. Roy. bot. Gard. Peradeniya 11 : 204. 1925 ; Airy Shaw in Kew Bull. 26 : 227. 1971 ; *Phyllanthus retusus* Dennst. in Dillw. Rev. Hort. Malab. 24. 1818. *Melanthesa retusa* (Dennst.) Kostel. Allg. Med.-Pharm. Flora. 5 : 1771. 1835 ; Santapau in Bull. bot. Surv. Ind. 3 : 19. 1961. *Breynia patens* (Roxb.) Rolfe in Journ. Bot. n. s. 11 : 359. 1887 ; Hook. f. FBI 5 : 329. 1887 ; Gamble, FPM 7 : 1304. 1925.

Shrubs, about 2 m high ; juvenile branches reddish, rather angular. Leaves about 2 × 1.5 cm, ovate-elliptic, orbicular, obtuse or rounded at base ; petioles 0.2 cm long ; stipules 0.15 cm long, acuminate. Flowers greenish, axillary, pedicellate ; male 0.4 cm long, calyx 0.1 cm long, lobes minute ; stamens 3, filaments connate ; female larger, calyx 0.4 cm long, lobes rather orbicular ; ovary glabrous, styles 3, bifid. Capsules 0.8 × 1 cm, globose, seated on accrescent calyx cup, yellow when ripe ; seeds about 6, 0.4 cm long, wedge-shaped.

Fl. & Fr. : February-July.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Rollapenta to Pecharavu, 16-8-1972, *Ellis* 42277..

SUREGADA Roxb. ex Rottl.

Suregada angustifolia (Muell.-Arg.) Airy Shaw in Kew Bull. 23 : 128. 1969. *S. angustifolia* Baillon, Etud. Gen. Euphorb. 396. 1858, *nomen.* *Gelonium angustifolium* Muell.-Arg. in DC. Prodr. 15 (2) : 1128. 1866. *Suregada lanceolata* (Willd.) O. Ktze. Rev. Gen. Pl. 619. 1891. *Gelonium lanceolatum sensu* Thw. Enum. Pl. Zeyl. 274. 1861 (*non* Willd.); Hook. f. FBI 5 : 459. 1887 ; Brandis, Indian Trees, 582. 1906 ; Gamble, FPM 7 : 1343. 1925, *p. p.*

Trees, about 8 m tall ; branchlets terete, glabrous. Leaves up to 16 × 6 cm, rather shining, elliptic-ovate, obovate or oblong, acute at base, entire, repand, excurved along margins, coriaceous ; reticulations prominent ; petioles 0.2 cm long. Flowers green, 0.3 cm long, in axillary, shortly racemose clusters, bracteate ; pedicels 0.2 cm long ; perianth 0.2 cm long, oblong-orbicular, puberulous without ; stamens numerous, exserted ; ovary glabrous. Capsules 0.6 × 0.9 cm, glabrous ; seeds ovoid, hollow-pitted.

Fl. & Fr. : March-December.

World distribution : Peninsular India and Sri Lanka—along perennial water courses.

Specimens examined : Gundlabrahmeswaram, 27-10-1964, *Ellis* 22217 ; Gundlabrahmeswaram, 30-3-1965, *Ellis* 23796 ; way to Upper Ahobilam, 29-8-1965, *Ellis* 25589 ; way to Upper Ahobilam, 22-11-1969, *Ellis* 32586 ; Bairani, Diguvaletta, 7-8-1972, *Ellis* 42187.

DRYPETES Vahl

Drypetes sepiaria (Wt. & Arn) Pax & Hoffm. in Engler, Pflanzenr. 81 : 271. 1922. *Hemicyclia sepiaria* Wt. & Arn. in Edinb. New Phil. Journ. 14 : 297. 1833 ; Wt. Ic. 5 : t. 1872. 1852 ; Muell.-Arg. in DC. Prodr. 15 : 487. 1866 ; Hook. f. FBI 5 : 337. 1887 ; Gamble, FPM 7 : 1299. 1925.

Trees, about 6 m tall ; branchlets pale, glabrescent. Leaves up to 9 × 4 cm, elliptic-ovate, ovate, oblong or orbicular, rounded at base, faintly distantly serrate, glaucous beneath, coriaceous ; nerves rather inconspicuous ; petioles 0.5 cm long, thick, puberulous. Flowers 0.5 cm long, in axillary clusters ; pedicels 0.4 cm long, pubescent ; calyx 0.2 cm long, ovate, pubescent without ; stamens about 8, filaments glabrous ; ovary glabrous, stigmas peltate. Drupes 0.5 × 0.5 cm, globose, endocarp bony ; seeds solitary.

Fl. & Fr. : February-July.

World distribution : India and Sri Lanka, in dry ever-green localities.

Specimens examined : Dornal, February 1887, *J. S. Gamble* 18685 ; Srisailam, 16-7-1963, *Ellis* 16902 ; Srisailam, 26-3-1965, *Ellis* 23772.

ANTIDESMA Linn.

- | | |
|--|------------------------|
| 1. Leaves ovate-obtuse, rounded and cordate at base ;
petioles 0.3 cm long ; inflorescence rachises pubescent | <i>A. ghaesembilla</i> |
| 1. Leaves obovate, acute at base ; petioles 1 cm long ;
inflorescence rachises glabrous | <i>A. acidum</i> |

Antidesma ghaesembilla Gaertn. Fruct. 1 : 189, t. 39. 1788 ; Muell.-Arg. in DC. Prodr. 15 (2) : 251. 1866 ; Hook. f. FBI 5 : 357. 1887 ; Gamble, FPM 7 : 1298. 1925 ; Airy Shaw in Kew Bull. 26 : 353. 1971. *A. paniculatum* Roxb. Wt. Ic. 3 : t. 820. 1844.

Trees, about 10 m tall ; young branches brown-tomentose. Leaves up to 10 × 6 cm, ovate-obtuse, orbicular, abruptly acute, rounded at base, rather coriaceous, more puberulous below ; petioles 1 cm long. Flowers pale green, both male and female 0.15 cm long, in axillary, clustered, paniculate spikes about 4 cm long ; rachises hairy ; calyx densely brown-pubescent ; stamens about 5, filaments glabrous, anthers curved ; ovary pubescent, stigma 3-lobed. Drupes 0.3 × 0.3 cm, globose or slightly flattened, orange-coloured when ripe, prominently rugose when dry ; seeds covered with dried albumen.

Fl. & Fr. : May-August.

World distribution : India, Sri Lanka, Malaysia and China.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16760 ; Mahanandi, 21-8-1965, *Ellis* 25443 ; Mahanandi, 23-8-1965, *Ellis* 25499 ; Bairani, Diguvametta, 7-8-1972, *Ellis* 42174.

A. acidum Retz. Obs. Bot. 5 : 30. 1789 ; Muell.-Arg. in DC. Prodr. 15 : 249. 1866 ; Airy Shaw in Kew Bull. 26 : 352. 1971. *A. diandrum* (Roxb.) Roth, Nov. Pl. Sp. 369. 1821 ; Muell.-Arg. *op. cit.* 361 ; Hook. f. FBI 5 : 361. 1887 ; Gamble, FPM 7 : 1298. 1925. *Stilago diandra* Roxb. Pl. Corom. 2 : 35, t. 166. 1798. *Antidesma lanceolarium* Wall. Cat. 7284. 1832 ; Wt. Ic. 3 : t. 766. 1844.

Trees, about 6 m tall ; young branches glabrescent. Leaves up to 9 × 4 cm, obovate, acute or acuminate, acute or obtuse at base, glabrous or sparsely puberulous ; petioles 0.3 cm long. Flowers greenish, 0.3 cm long, in terminal spikes about 4 cm long, bracteate ; rachises glabrous ; calyx 0.1 cm long, sparsely puberulous, rather cupular in male, lobes

minute in female ; stamens about 2, much exerted, filaments glabrous, anthers curved ; ovary glabrous, stigma 3, recurved. Drupes 0.3×0.3 cm, globose, slightly flattened, prominently ribbed.

Fl. & Fr. : April-December.

World distribution : India, Sri Lanka and Burma.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22189 ; Gundlabrahmeswaram, 29-11-1969, *Ellis* 32662.

BALIOSPERMUM Bl.

Baliospermum montanum (Willd.) Muell.-Arg. in DC. Prodr. 15 (2) : 1125. 1866 ; Hoffm. in Engler, Pflanzenr. 63 : 202. 1914 ; Gamble, FPM 5 : 1342. 1925. *Jatropha montana* Willd. Sp. Pl. 4 : 563. 1805. *Baliospermum axillare* Bl. Bijdr. 604. 1825 ; Hook. f. FBI 4 : 461. 1887.

Herbs or undershrubs, about 1 m high ; branches terete, glabrous. Leaves about 20×10 cm, ovate-elliptic, abruptly acuminate, rounded at base, distantly dentate, glabrous above, sparsely hairy beneath ; midrib, lateral nerves and reticulations prominent ; petioles about 19 cm long, hirtellous. Flowers greenish, 0.5 cm across, in axillary racemes about 8 cm long, bracteate ; pedicels about 1 cm long, slender in male ; calyx of male flowers glabrous, of female hirtellous without ; stamens many, connectives broad ; ovary pubescent styles 2, glabrous. Capsules 0.8×0.6 cm, ovoid, smooth ; seeds ovoid.

Fl. & Fr. : October-February.

World distribution : India, Burma and Malaysia.

Specimens examined : Gazulapalle, 8-11-1906, *C. A. Barber* 8066 ; Ramanapenta, Gundlabrahmeswaram, 25-10-1964, *Ellis* 22198 ; Ramanapenta, Gundlabrahmeswaram, 31-3-1964, *Ellis* 23823 ; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32654.

ACALYPHA Linn.

- | | |
|---------------------------------------|----------------------|
| 1. Petioles up to 5 cm long | <i>A. alnifolia</i> |
| 1. Petioles more than 5 cm long : | |
| 2. Bracts of female flowers fimbriate | <i>A. ciliata</i> |
| 2. Bracts of female flowers dentate | <i>A. lanceolata</i> |

Acalypha alnifolia Klein ex Willd. Sp. Pl. 4 : 525. 1805 ; Muell.-Arg. in DC. Prodr. 15(2) : 843. 1866 ; Pax & Hoffm. in Engler, Pflanzenr. 85 : 82. 1924 ; Hook. f. FBI 5 : 415. 1887 ; Gamble, FPM 7 : 1330. 1925.

Suffrutescent herbs, about 60 cm high ; stems tomentose, glabrescent, ciliate. Leaves about 3×1.8 cm, ovate, oblong, rounded, cordate at base, crenate-serrate, sparsely ciliate ; nerves 5 from base, nerves and reticulations prominent ; petioles up to 2 cm long. Flowers greenish, minute, in axillary spikes (male) about 4 cm long, and in terminal, shorter spikes (female), shortly pedicellate ; bracts small, linear, ciliate ; perianth minute ; stamens many ; ovary hirsute, style lacinate. Capsules 0.5 cm across, globose ; seeds globose, smooth.

Fl. & Fr. : July-December.

World distribution : Peninsular India, in dry localities.

Specimen examined : Way to Pathalaganga, Srisailam, 12-7-1963, Ellis 16827.

Acalypha ciliata Forsk Fl. Aegypt.-Arab. 162. 1775 ; Muell.-Arg. in DC. Prodr. 15(2) : 873. 1862 ; Hook. f. FBI 5 : 417. 1886 ; Pax & Hoffm. in Engler, Pflanzenr. 85 : 98. 1924 ; Gamble, FPM 7 : 1330. 1925.

Erect herbs, about 30 cm high ; branches terete, striate, puberulous. Leaves about 5×3.5 cm, elliptic-acuminate, rounded at base, crenate-serrate, sparsely setose on both surfaces ; nerves 3 from base ; petioles pale pink, about 6 cm long. Flowers greenish, in axillary spikes about 1.5 cm long, male very minute at top, sessile, female many, clustered at base ; bracts of female 0.5 cm long, fimbriate, ovate-caudate, hispid, tube glabrous or long-ciliate. Capsules 0.2×0.2 cm, glabrous ; seeds single in each locule, globose, smooth.

Fl. & Fr. : November-February.

World distribution : Tropics from Africa, India and Sri Lanka.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 31-8-1917, Rangachari 14980 ; Diguva metta, 6-8-1972, Ellis 42154.

A. lanceolata Willd. Sp. Pl. 4 : 524. 1805 ; Gamble, FPM 7 : 1331. 1925. *A. fallax* Muell.-Arg. in Linnaea 34 : 43. 1865 et in DC. Prodr. 15(2) : 873. 1866 ; Hook. f. FBI 5 : 416. 1887.

Erect herbs, about 50 cm high ; stems glabrous, pubescent when young. Leaves up to 6×3 cm, ovate-elliptic, acute or obtuse at base, crenate-serrate, sparsely pilose ; nerves 3-5 from base ; petioles about 5 cm long, ciliate. Flowers greenish, in axillary spikes about 4 cm long, both male and female on the same spike, male very small, filaments hairy ; female enclosed in a prominent bract ; bracts dentate ; ovary glabrous. Capsules 0.2×0.2 cm, globose, locules 1 seeded ; seeds globose, smooth.

Fl. & Fr. : April-August.

World distribution : India, Sri Lanka and Malaysia.

Specimen examined : Mahanandi, 22-8-1965, *Ellis* 25479.

ULMACEAE

- | | |
|--|------------|
| 1. Leaves 3-nerved from base ; fruits drupaceous : | |
| 2. Leaves serrulate, chartaceous | TREMA |
| 2. Leaves entire, coriaceous | CELTIS |
| 1. Leaves 1-nerved from base ; fruits samaroid | HOLOPIELEA |

TREMA Lour.

Trema orientalis (Linn.) Bl. Mus. Bot. Lugd.-Bat. 2 : 62. 1856 ; Hook. f. *FBI* 5 : 484. 1888 ; Fischer, *FPM* 8 : 1350. 1928 ; Soepadmo in Steenis, *Fl. Males*, ser. I. 8(2) : 50. 1977. *Celtis orientalis* Linn. *Sp. Pl.* 1044. 1753. *Saponia orientalis* (Linn.) Planch. in *Ann. Sci. Nat.* ser. 3. 10 : 322. 1848.

Trees, about 10 m tall ; branchlets terete, sparsely pubescent. Leaves pale or whitish beneath, about 13 × 7.5 cm, ovate-acuminate or caudate, unequally cordate at base, scabrous above, serrulate, tomentose beneath, chartaceous ; nerves of first lateral ones reaching to the top, nervules parallel ; petioles about 0.8 cm long, pubescent. Flowers greenish, 0.15 cm long, in axillary, pedunculate cymes 1.5 cm long, bracteate, bracteolate ; sepals 0.1 cm long, ovate, densely white-pubescent along margins ; stamens 4, slightly exserted ; disk hairy ; ovary faintly puberulous. Drupes 0.3 cm long, ovoid.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Malaysia, along perennial streams in moist deciduous forests.

Specimens examined : Gundlabrahmeswaram, 27-10-1964, *Ellis* 22215 ; way to Upper Ahobilam, 22-11-1969, *Ellis* 32581.

Remarks : Soepadmo (*op. cit.* p. 52) recognises 3 entities of this taxon, depending on geographic distributions. However, he concludes (*loc. cit.*), 'Several intermediates are present however, making formal infraspecific distinction not advisable.'

CELTIS Linn.

Celtis cinnamomea Lindley [in Wall. *Cat.* 3696. 1831] ex Planch. in *Ann. Sci. Nat.* ser. 4. 10 : 303. 1848 et in *DC. Prodr.* 17 : 181. 1873 ;

Hook. f. FBI 5 : 482. 1888 ; Fischer, FPM 8 : 1349. 1928 ; Santapau in Rec. bot. Surv. Ind. 16(1) : 253. 3rd rev. ed. 1967. *C. wightii* Planch. *op. cit.* 307. et DC. *op. cit.* 184 ; Hook. f. FBI 5 : 483. 1888 ; Fischer, *loc. cit.* ; Wt. Ic. 4 : t. 1349. 1848.

Trees, about 20 m tall ; young branchlets puberulous or glabrous, lenticellate. Leaves up to 15 × 6 cm, ovate, elliptic, acuminate, generally unequally rounded or acute at base, coriaceous ; nerves 3 from base, nerves and reticulations prominent below ; petioles 1 cm long, grooved above, thick ; stipules 0.8 cm long, softly pilose. Flowers greenish, 0.15 cm long, in axillary, paniculate cymes about 1 cm long, bracteate ; calyx 0.15 cm long, lobes oblong, scarious, softly pilose without ; male flowers at base, stamens 4, included ; disk villous ; female flowers higher up, ovary sparingly villous, styles divided, recurved, stigmas bifid. Drupes 0.8 × 0.5 cm, pisciform ; seeds single, slightly flattened.

Fl. & Fr. : December-March.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimens examined : Dornal, February 1887, *J. S. Gamble* 18695 ; Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23753.

HOLOPTELEA Planch.

Holoptelea integrifolia (Roxb.) Planch. in Ann. Sci. Nat. ser. 3. 10 : 266. 1848 ; Wt. Ic. 6 : t. 1968. 1853 ; Planch. in DC. Prodr. 17 : 154. 1873 ; Hook. f. FBI 5 : 481. 1888 ; Fischer, FPM 8 : 1348. 1928. *Ulmus integrifolia* Roxb. Pl. Corom. 1 : 56. 1795.

Trees, about 30 m tall ; branchlets terete, glabrous, lenticellate. Leaves about 14 × 8 cm, ovate-abruptly acuminate, rounded and cordate at base, chartaceous, puberulous along main nerves ; petioles about 1.2 cm long ; stipules scarious, puberulous. Flowers greenish, 0.3 cm long, in axillary racemes about 2 cm long ; calyx 0.2 cm long, pubescent without, lobes ovate ; stamens about 4, exserted, anthers pubescent ; ovary stipitate, compressed, glabrous, styles bifid, stigmatose within. Samaras about 2 × 2 cm, orbicular, flattened, winged, puberulous.

Fl. & Fr. : February-April.

World distribution : India, Sri Lanka, Burma and South Vietnam.

Specimen examined : Chelama, 19-3-1965, *Ellis* 23730.

MORACEAE

FICUS Linn.

- | | |
|---|------------------------|
| 1. Leaves opposite | <i>F. hispida</i> |
| 1. Leaves alternate : | |
| 2. Syconia glabrous : | |
| 3. Petioles about 5.5 cm long | <i>F. virens</i> |
| 3. Petioles about 0.7 cm long | <i>F. microcarpa</i> |
| 2. Syconia puberulous to pubescent : | |
| 4. Leaves glabrous | <i>F. racemosa</i> |
| 4. Leaves puberulous to tomentose beneath : | |
| 5. Syconia 2×2 cm | <i>F. benghalensis</i> |
| 5. Syconia 0.8×0.8 cm | <i>F. tomentosa</i> |

Ficus hispida Linn. f. Suppl. 442. 1781 ; King in Ann. Roy. bot. Gardn. 1 : 166. 1887 ; Hook. f. FBI 5 : 522. 1888 ; Brandis, Indian Trees, 606. 1906 ; Fischer, FPM 8 : 1367. 1928. *F. oppositifolia* Willd. Sp. Pl. 4 : 1151. 1805 ; Wt. Ic. 2 : t. 638. 1843.

Trees, about 8 m tall ; branchlets terete, hispid ; aerial roots absent. Leaves up to 25×14 cm, opposite, elliptic-ovate, obovate, abruptly acuminate, obtuse or rounded at base, sometimes cordate, serrate, crenate-serrulate, coriaceous, bullate above, hispidulous below ; nerves and nervules prominent below ; petioles up to 5.5 cm long, hispid ; stipules 1.5×0.6 cm, ovate-caudate, glabrous or hispid along the back. Syconia green, 1.8×1.5 cm, ovoid, sparingly hispid, in axillary peduncles 2 cm long ; bracts small, glabrous.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Burma, North Australia, in moist deciduous tracts, along perennial streams.

Specimen examined : Srisailam, 15-7-1963, *Ellis* 16886.

F. virens Aiton, Hort. Kew. 3 : 451. 1789 ; Corner in Gard. Bull. 17 : 376. 1960. *F. infectoria* Roxb. Fl. Ind. 3 : 551. 1832 ; Wt. Ic. 2 : t. 665. 1843 ; King in Ann. Roy. bot. Gardn. Cal. 1 : 60. 1887 ; Hook. f. FBI 5 : 515. 1888 ; Brandis, Indian Trees, 602. 1906 ; Fischer, FPM 8 : 1362. 1928. *F. infectoria* Roxb. var. *lambertiana* (Miq) King. *loc. cit.* ; Brandis, *loc. cit.* *F. lucescens* Bl. Bijdr. 444. 1825 ; Santapau in Rec. bot. Surv. Ind. 16 (1) : 291. 1960. *F. lucescens* Bl. var. *lambertiana* (Miq.) Santapau in Rec. bot. Surv. Ind. 16 (1) : 291. 1960. *F. lambertiana* Miq. in Ann. Mus. 3 : 286. 1867 ; Hook. f. *op. cit.* 516.

Trees, about 20 m tall; young branchlets glabrous. Leaves 13×8.5 cm, ovate, abruptly acuminate, rounded and cordate at base, coriaceous; nerves and nervules prominent; petioles about 5.5 cm long; stipules 0.5 cm long, tomentose without. Syconia green, 1×1 cm, globose, glabrous; bracts 0.3 long, ovate; peduncles 0.3 cm long, angled.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16852.

Ficus microcarpa Linn. f. *Suppl.* 442. 1781; Corner in *Gard. Bull. Singapore* 17: 397. 1960. *F. retusa auct. (non Linn.)*; King in *Ann. Roy. bot. Gardn. Cal.* 1: 50. 1887; Hook. f. *FBI* 5: 511. 1888; Brandis, *Indian Trees*, 603. 1906; Fischer, *FPM* 8: 1362. 1928. *F. retusa* (var. *nitida* Thunb.) Hook. f. *loc. cit.*; Gamble, *loc. cit.*

Trees, about 15 m tall; young branchlets glabrous; aerial roots few. Leaves about 9×4 cm, elliptic-ovate, obovate, acute or obtuse at base, coriaceous, glabrous; lateral nerves and reticulations prominent beneath, the basal pair of lateral nerves prominent, arched, joining all the rest near margin; petioles 0.7 cm long; stipules 1 cm long, ovate-acuminate. Syconia white, 0.6×0.8 cm, globoid, glabrous; bracts ovate.

Fl. & Fr. : January-June.

World distribution : India, China and Malaysia.

Specimens examined : Way to Ramanapenta, 31-3-1965, *Ellis* 23825; Upper Ahobilam, 29-8-1965, *Ellis* 25584; Mahanandi, 23-8-1972, *Ellis* 42342.

Remarks : The recognition of *nitida* even at varietal status seems to be untenable, for there is a range in variability and characters merge one with another imperceptibly. Examination of the type is a *desideratum*.

F. racemosa Linn. *Sp. Pl.* 1060. 1753; Corner in *Dansk. Bot. Arkiv.* 23: 28. 1963; Santapau in *Rec. bot. Surv. Ind.* 16 (1): 259. 3rd rev. ed. 1967. *F. glomerata* Roxb. *Pl. Corom.* 2: 13, t. 123. 1798; King in *Roy. bot. Gardn. Cal.* 173. 1887; Hook. f. *FBI* 5: 535. 1888; Wt. *lc.* 2: t. 667. 1843; Brandis, *Indian Trees*, 601. 1906; Fischer, *FPM* 8: 1364. 1928.

Trees, about 20 m tall; young branchlets tomentose to glabrescent. Leaves about 13.5×8 cm, ovate, elliptic, obtuse, acute or rounded at base, last basal pair of lateral nerves arched reaching half of lamina; nerves

and reticulations prominent below ; petioles about 4 cm long, puberulous ; stipules ovate-acuminate, pilose. Syconia green, up to 2×2 cm, globose, tomentose ; bracts small, ovate, pubescent without.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka.

Specimens examined : 'Kurnool', 1886, *J. S. Gamble* 49197 ; Chelama, 10-12-1963, *Ellis* 18050 ; Chelama, 21-3-1965, *Ellis* 23748.

Ficus benghalensis Linn. Sp. Pl. 1059. 1753 ; King in Ann. Roy. bot. Gardn. Cal. 1 : 18. 1887 ; Hook. f. FBI 5 : 499. 1888 ; Brandis, Indian Trees, 600. 1906 ; Fischer, FPM 8 : 1361. 1928 ; Corner in Gard. Bull. Singapore 17 : 381. 1960. *Urostigma bengalense* Gasp. Nov. Gen. Fic. 7. 1844 ; Wt. Ic. 6 : t. 1989. 1853.

Trees, about 30 m tall ; branches spreading, pubescent when young ; aerial roots several. Leaves about 18×10 cm, elliptic-ovate or obtuse orbicular, rounded at base, coriaceous, glabrescent above, puberulous beneath, glandular near petiole ; nerves generally 3-7 from base, reticulations prominent ; stipules puberulous, caducous ; petioles about 4 cm long. Syconia bright red, up to 2×2 cm, globose, in axillary pairs, pubescent ; bracts orbicular ; receptacles almost nil.

Fl. & Fr. : Almost throughout the year.

World distribution : India ; perhaps never truly wild, almost always planted and venerated.

Specimen examined : Mahanandi, 23-8-1972, *Ellis* 42344.

F. tomentosa Roxb. ex Willd. Sp. Pl. 4 : 1136. 1806 ; Wt. Ic. 2 : t. 647. 1843 ; King in Ann. Roy. bot. Gardn. Cal. 1 : 22. 1887 ; Hook. f. FBI 5 : 501. 1888 ; Brandis, Indian Trees, 601. 1906 ; Gamble, FPM 8 : 1361. 1928.

Trees about 15 m tall ; young branches densely tomentose, pubescent ; aerial roots several. Leaves generally about 11×8 cm, broadly ovate, rounded and cordate at base, glabrous above, densely tomentose beneath ; lateral nerves and nervules prominent beneath, main nerves 3-7 from base, glandular near petiole beneath ; petioles about 1.8 cm long, tomentose. Syconia green, about 0.8×0.8 cm, in pairs, globose, tomentose ; bracts small, ovate or orbicular.

Fl. & Fr. : Almost throughout the year.

World distribution : India and Sri Lanka, in dry localities.

Specimens examined : Srisailam, 13-7-1963, *Ellis* 16844 ; Pathalaganga, Srisailam, 20-10-1964, *Ellis* 22297 ; way to Sunnipenta, Srisailam, 5-12-1969, *Ellis* 32706.

URTICACEAE

POUZOLZIA Gaud.

- | | |
|---------------------------------------|----------------------|
| 1. Stipules broadly ovate, few-haired | <i>P. zeylanica</i> |
| 1. Stipules linear, pubescent | <i>P. auriculata</i> |

Pouzolzia zeylanica (Linn.) Benn. Pl. Jav. Rar. 67. 1838 ; Merrill, Interp. Herb. Amb. 202. 1917 ; Santapau in Rec. bot. Surv. Ind. 16(1) : 255. 3rd ed. 1967. *Parietaria zeylanica* Linn. Sp. Pl. 1052. 1753. *Pouzolzia indica* Gaud. Bot. Freyc. Voy. 503. 1826 ; Wt. Ic. 6 : tt. 1980, f. 1, 2100, f. 40. 1853 ; Hook. f. FBI 5 : 581. 1888 ; Fischer, FPM 8 : 1382. 1928.

Weak-stemmed herbs, about 30 cm high ; stems obscurely 4-angled, grooved, hirsute. Leaves up to 3.5 × 1.8 cm, gradually reducing in size, very variable, ovate, acute or acuminate, rounded at base, pilose below, less so above, lineolate, 3-nerved from base ; petioles about 0.4 cm long ; stipules scarious. Flowers white, 0.15 cm long, in axillary clusters ; bracts ovate-caudate, scarious, ciliate along margins ; perianth lobes linear-ovate, sparingly hirsute without ; stamens 4 in male flowers, exserted ovary with filiform style and stigmas. Utricles 0.15 cm long, ovoid, shining.

Fl. & Fr. : July-December.

World distribution : India, Sri Lanka, China and Malaysia.

Specimens examined : Chelama, 12-12-1963, *Ellis* 18075 ; Chelama, 15-10-1964, *Ellis* 22019 ; Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32623.

P. auriculata Wt. Ic. 6 : t. 1980. 1853 ; Wedd. in DC. Prodr. 16 (1) : 225. 1887 ; Hook. f, FBI. 5 : 582. 1888 ; Fischer, FPM 8 : 1383. 1928.

Herbs to undershrubs, about 80 cm high ; stems woody, young branches angled, pubescent. Leaves up to 13 × 4 cm, elliptic-acuminate, acute to rounded at base, pilose below, sparsely so and lineolate above ; petioles 4 cm long, puberulous ; stipules linear. Flowers greenish. 0.2 cm long, in axillary clusters ; bracts ovate-acuminate, pubescent on midrib without ; calyx lobes ovate, pubescent without, tube short ; stamens 4 in male, exserted, filaments glabrous ; ovary pubescent, styles feathery. Achenes white, 0.1 cm long, shining.

Fl. & Fr. : March-December.

World distribution : India and Sri Lanka.

Specimens examined : Srisailam, 12-7-1963, *Ellis* 16832 ; Upper Ahobilam, 29-8-1965, *Ellis* 25581 ; Bairani, Diguva-metta, 7-8-1972, *Ellis* 42182.

Remarks : Fischer (*op.cit.*) has treated both the species, *zeylanica* and *auriculata* assigning them a broad circumscription for each ; several of Wight's species have been treated as just two taxa envisaging a broad spectrum of variability for each taxon. Merrill (*op. cit.*) apparently is instrumental in understanding these two taxa better. Merrill is followed in treatment of the taxa.

HYDROCHARITACEAE

1. Leaves broadly ovate
1. Leaves linear

OTTELIA
BLYXA

OTTELIA Pers.

Ottelia alismoides (Linn.) Pers. Syn. Pl. 1 : 400. 1805 ; Hook. f. FBI 5 : 662. 1888 ; Fischer, FPM 8 : 1398. 1928 ; Hartog in Steenis, Fl. Males. ser. I. 5(4) : 398. 1957 ; Subramanyam, Aquat. Angiosp. 61. 1962 *Stratiotes alismoides* Linn. Sp. Pl. 535. 1753.

Aquatic herbs, length depending on depth of water, generally about 20 cm long ; roots fibrous. Leaves about 10 × 12 cm, broadly ovate, oblong, orbicular, cordate at base, sinus large ; petioles up to 25 cm long. Flowers white, yellowish towards centre, up to 5 cm long, axillary, solitary ; spathes about 3.5 cm long, about 5, crispately winged on the back ; sepals about 1.5 cm long, oblong ; petals 1.5 cm long, almost orbicular ; stamens about 10, slightly exerted, anthers erect ; ovary glabrous, styles about 6, bifid. Fruits oblong, enclosed in spathes ; seeds several, small, oblong.

Fl. & Fr. : August-December.

World distribution : India, Sri Lanka and Australia.

Specimens examined : Mahanandi, 21-8-1965, *Ellis* 25436 ; Mahanandi, 8-12-1969, *Ellis* 32724 ; Mogulutla, Chinnamantrala, Eastern Ghats, 17-8-1972, *Ellis* 42287.

BLYXA Noronha ex Thouars.

Blyxa octandra (Roxb.) Planch. ex Thwaites, Enum. Pl. Zeyl. 332. 1864 ; Fischer, FPM 8 : 1397. 1928 ; Hartog in Steenis, Fl. Males. ser. I.

5 (4) : 392. 1957 ; Subramanyam, Aquat. Angiosp. 60. 1962. *Vallisneria octandra* Roxb. Pl. Corom. 2 : 34. 1802. *Blyxa roxburghii* Rich. in Mem. Inst. Paris 12, 2 : 77. 1812 ; Hook. f. FBI 5 : 660. 1888. *B. griffithii* Planch. ex Hook f. *op. cit.* 661. p. p.

Aquatic herbs, glabrous ; stemless. Leaves about 45 cm long, 0.5 cm broad, linear, glabrous. Flowers greenish, 0.4 cm long, on scapes up to 30 cm long ; male many, enclosed in spathes, stamens about 9, anthers erect ; female and bisexual solitary, sessile, enclosed in spathes ; sepals 3, 0.5 cm long, linear ; petals about 1 cm long, linear ; ovary slender, beaked, stigmas 3, filiform. Fruits about 5 × 0.2 cm, linear ; seeds many, tubercled, elongated on either ends.

Fl. & Fr. : August-February.

World distribution : India and Australia.

Specimen examined : Chinnamantrala, Eastern Nallamalais, 17-8-1972, Ellis 42288.

Remarks : C. D. K. Cook and Ruth Luond (in *Aquatic Bot.* 15 : 20. 1983) have worked on the herbarium specimen cited, identifying it as *Blyxa aubertii* L.C. Richard var. *echinosperma* (C. B. Cl.) Cook & Luond, treating under it 8 synonyms, four of which are from India, the plant's distribution being Sri Lanka, West Coast of India, "...but is absent from S.E India ;..." (p. 15), E. Asia, up to Japan and Northern and Eastern Australia. Obviously there appears to be some confusion about the plant's circumscription. It is felt that some more studies are required before a definite opinion is cast.

ORCHIDACEAE

- | | |
|-----------------------------|------------|
| 1. Epiphytic herbs | VANDA |
| 1. Terrestrial herbs : | |
| 2. Inflorescence lateral | GEODORUM |
| 2. Inflorescence terminal : | |
| 3. Leaves radical : | |
| 4. Flowers long-spurred | HABBNARIA |
| 4. Flowers not spurred | LIPARIA |
| 3. Leaves cauline | PERISTYLUS |

VANDA R. Br.

Vanda tessellata (Roxb.) Hook. ex G. Don in Loud. Hort. Brit. 372. 1830 ; Fischer, FPM 8 : 221. 1928 ; Santapau & Kapadia, Orchids of Bombay, 220. 1966. *Epidendrum tessellatum* Roxb. Pl. Corom. 1 : 34.

1795. *Vanda roxburghii* R. Br. in Bot. Reg. 6 : t. 506. 1820 ; Hook. f. FBI 5 : 52. 1890 ; Wt. Ic. 3 : t. 916. 1844.

Epiphytic, robust herbs ; stems woody, terete, covered by fallen leaf bases. Leaves about 23 × 3 cm, linear, falcate, unequally 2-lobed at apices, sheathing at base, coriaceous, parallel-veined. Flowers about 5 cm across, yellowish-brown, in axillary racemes about 17 cm long ; bracts small ; pedicels 3 cm long ; sepals about 2 cm long, unequal, oblong, tessellated within, crisped along margins ; petals oblong, clawed at base ; lip 3-lobed, spur conical, column clavate, foot short ; anthers obovate ; ovary twisted. Capsules about 8 × 1.5 cm, clavate, ribbed.

Fl. & Fr. : April-August.

World distribution : India and Sri Lanka.

Specimen examined : Chelama, 8-7-1963, *Ellis* 16781.

GEODORUM Jackson

Geodorum densiflorum (Lamk.) Schlecht. in Fedde, Repert. 4 : 259. 1928 ; Fischer, FPM 8 : 1437. 1928 ; Santapau & Kapadia, Orchids of Bombay, 203. 1966. *Limodorum densiflorum* Lamk. Encycl. 3 : 516. 1791-1792. *Geodorum purpureum* R. Br. in Aiton, Hort. Kew. ed. 2, 5 : 207. 1813 ; Hook f. FBI 6 : 16. 1890. *G. dialatum* R. Br. in Aiton. *loc. cit.* ; Wt. Ic. 3 : t. 912. 1844 ; Hook. f. *op. cit.* 17.

Erect herbs, about 40 cm high ; pseudobulbs about 4 × 2 cm, rather conical. Leaves about 35 × 9 cm, acute at base, elliptic, glabrous, prominently 8-nerved from base ; petioles sheathing forming pseudostems about 20 cm long. Flowers whitish, about 1.5 cm long, in lateral spikes about 60 cm long, pedicellate ; bracts about 1.4 cm long, sheathing at base ; sepals 1 × 0.4 cm, oblong, abruptly, shortly acuminate ; petals about 1.2 × 1 cm, slightly 3-lobed, middle crenulate, emarginate ; column about 0.5 cm long ; anthers 2 ; stigmas broad. Capsules 4 × 2.5 cm, oblong-ovoid, smooth.

Fl. & Fr. : May-December.

World distribution : India, Sri Lanka and Malaysia.

Specimen examined : Chelama, 9-12-1963, *Ellis* 18064 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22181 ; Krishnanandi, 24-8-1965, *Ellis* 25530.

HABENARIA Willd.

Habenaria roxburghii Nicolson in Saldanha & Nicolson, Fl. Hassan Dt. 834. 1976. *Orchis plantaginea* Roxb. Pi. Corom. tt. 32 & 37. 1795

(non *Habenaria plantaginea* Lindl. 1835). *O. platyphyllos* Willd. Sp. Pl. 4 : 11. 1805, *nom. superfl.* *O. roxburghii* Pers. Syn. Pl. 2 : 503. 1807, *nom. superfl.* *Habenaria platyphylla* Spreng. Syst. Veg. 3 : 690. 1826, *nom. superfl.* ; Wt. Ic. 5 : t. 1709. 1852 ; Fischer, FPM 8 : 1470. 1928 ; Santapau & Kapadia, Orchids of Bombay, 19. 1966.

Erect herbs, about 30 cm high ; roots tuberous. Leaves radical, about 8 × 7 cm, lying flat on ground, ovate-orbicular, sessile ; petioles sheathing. Flowers white, about 4 cm long, in terminal spikes up to 40 cm long, confined to ends of spikes ; bracts 0.8 cm long, linear-acuminate ; sepals unequal, about 1 × 0.6 cm ; petals about 0.6 × 2 cm, linear-spathulate, lip 3-lobed, midlobe triangular, laterals orbicular, spur 1.5 cm long, linear-clavate ; anther cells spreading ; ovary 1.8 cm long, linear-ovoid, beaked, stigmas clavate. Capsules 1.8 × 0.3 cm, ovoid.

Fl. & Fr. : July-September.

World distribution : India, in lateritic-clayey soil.

Specimens examined : Mahanandi, 21-8-1965, *Ellis* 25401 ; Diguva-metta, 7-8-1972, *Ellis* 42165 ; Mahanandi, 22-8-1972, *Ellis* 42322.

Fischer (*op. cit.* 1471) has recorded *Habenaria marginata* Coleb. from '...Nallamalai Hills at 1,500 ft (Fischer).' It is rather surprising that this has not been collected from Nallamalais ; as such it has not been taken up for a detailed study.

LIPARIS L.C. Rich. *nom. cons.*

Liparis prazeri King & Pantl. in Journ. Asiat. Soc. Beng. 66 : 582. 1897 ; Santapau & Kapadia, Orchids of Bombay, 179. 1966 ; Ellis & Swaminathan in Journ. Bombay nat. Hist. Soc. 66 : 233. 1969.

Erect herbs, about 18 cm high ; tubers about 1 cm across ; stems about 2 cm long, underground, sheathed. Leaves 2-5, about 17 × 10 cm, radical, ovate, caudate-acuminate, plicate, glabrous, about 7-9-nerved from base, sheathing into short petioles. Flowers greenish-orange, about 0.8 cm across, in terminal spikes about 16 cm long, pedicellate ; bracts about 0.8 cm long, deflexed, linear-ovate ; sepals 0.8 × 0.3 cm, lanceolate, dorsal deflexed, laterals straight petals about 0.9 × 0.2 cm, spathulate, lip-clawed, limb about 0.7 cm long, bent back, oblong-orbicular, faintly emarginate ; column bent ; anthers oblong. Capsules about 1.5 × 0.6 cm, obovoid, ribbed.

Fl. & Fr. : August-December.

World distribution : Peninsular India and Burma.

Specimen examined : Gundlabrahmeswaram, 29-11-1969, *Ellis* 32666.

Remarks : This is a new record for the Eastern Ghats.

PERISTYLUS Bl. *nom. cons.*

Peristylus goodyeroides (D. Don) Lindl. Gen. Sp. Orch. 299. 1835 ; Fischer, FPM 8 : 1475. 1928 ; Santapau & Kapadia, Orchids of Bombay, 53. 1966. *Habenaria goodyeroides* D. Don, Prodr. Fl. Nep. 25. 1825 ; Hook. f. FBI 5 : 161. 1890.

Erect herbs, about 90 cm high ; root tubers about 5 cm long, roots fibrous. Leaves about 20 × 6 cm, elliptic-ovate, obtuse at base, margins minutely papillate ; petioles short, sheathed at base. Flowers pale green, about 1 cm long, sessile, in terminal spikes about 40 cm long ; bracts 2 cm long, ovate-acuminate, minutely papillate along margins ; sepals about 4 × 1.5 cm, unequal, obovate, entire ; petals 0.3 cm long, lip 3-fid, spur 0.2 cm long, saccate ; anthers oblong ; ovary twisted. Capsules 1 cm long, oblong, ribbed.

Fl. & Fr. : August-November.

World distribution : India, Sri Lanka, China and Malaysia.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22180.

ZINGIBERACEAE

- | | | |
|--|----|--------|
| 1. Capsules about 1.8 × 1.2 cm ; herbs suffrutescent, about 1.5 m high | .. | COSTUS |
| 1. Capsules about 0.5 × 0.3 cm ; herbs not suffrutescent, about 60 cm high | .. | GLOBBA |

COSTUS Linn.

Costus speciosus (Koenig) Smith in Trans. Linn. Soc. 1 : 249. 1791 ; Wt. Ic. 6 : t. 2014. 1853 ; Hook. f. FBI 5 : 250. 1892 ; Schumann in Engler, Pflanzenr. 4 (46) : 398. 1904 ; Fischer, FPM 8 : 1490. 1928. *Banksea speciosa* Koenig in Retz. Obs. 3 : 75. 1783.

Suffrutescent herbs, about 1.5 m high ; stems covered with leaf-sheaths, spirally twisted ; rootstocks horizontal, tuberous. Leaves about 22 × 7 cm, obovate-acuminate, cuspidate, obtuse or attenuate at base, pubescent beneath ; lateral nerves parallel ; petioles 0.2 cm long, sheaths broad, about 5 cm long. Flowers white, yellowish-tinged at centre, about 5 cm long, in terminal, condensed almost globose racemes about 8 cm across ; bracts bright red, about 2.5 × 1.2 cm, ovate-oblong, cuspidate ; calyx 2 × 1 cm, lobes cuspidate ; corolla tube slightly bent, lip broad ; filaments broad, petaloid ; anthers linear ; ovary glabrous, style filiform. Capsules about 1.8 × 1.2 cm, ovoid ; seeds angular, pitted at apices.

Fl. & Fr. : July-December.

World distribution : India, Sri Lanka, Malaysia, in most deciduous forests.

Specimens examined : Gundlabrahmeswaram, 29-7-1963, *Ellis* 16906 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22155 ; Rollapenta, 14-8-1972, *Ellis* 42245.

Remarks : This genus is sometimes treated under the Costaceae, thus taking a restricted view of the Zingiberaceae.

The plant, *Costus speciosus* has a reputation in having alkaloids of medicinal value.

GLOBBA Linn.

Globba marantina Linn. Mant. Pl. 170. 1771 ; *sensu* Wt. Ic. 6 : t. 2001. 1853 (non Linn.) ; Baker in Hook. f. FBI 6 : 206. 1891 ; Burt & Smith in Dassanayake, Rev. Handb. Fl. Ceyl. IV : 499. 1983. *G. bulbifera* Roxb. in Asiat. Res. 11 : 358. 1810 ; Baker, *loc. cit.* ; Fischer, FPM 8 : 1481. 1928.

Erect herbs, about 60 cm high ; stems covered by sheaths, glabrous ; rootstocks fibrous. Leaves 16 × 5 cm, pale beneath, sheaths about 25 cm long, ligules ciliate along margins. Flowers orange, 1 cm long, in terminal spikes about 8 cm long ; rachises pubescent ; bracts about 1.8 × 0.6 cm, obovate, glabrous ; calyx 0.5 cm long, obconical, lobes acute ; corolla about 0.8 cm long, lobes unequal, oblong, lip 2-lobed, deflexed ; anthers linear, winged, filaments slender ; ovary glabrous. Capsules about 0.5 × 0.3 cm, ovoid, smooth ; seeds ovoid.

Fl. & Fr. : August-October.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 26-8-1917, K. C. Jacob 14958 ; Gundlabrahmeswaram, 21-7-1963, *Ellis* 16958 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22170 ; way to Upper Ahobilam, 29-8-1965, *Ellis* 25574.

HYPOXIDACEAE

CURCULIGO Gaertn.

Curculigo orchioides Gaertn. Fruct. 1 : 63, t. 16. 1788 ; Hook. f. FBI 5 : 279. 1892 ; Gamble, FPM 8 : 1502. 1928. *C. malabarica* Wt. Ic. 6 : t. 2043. A. 1853.

Erect herbs, about 8 cm high; rootstocks tuberous, covered with leaf-bases, roots fibrous. Leaves about 10×3 cm, linear-elliptic, acute at apices, plicate, glabrescent; nerves prominent. Flowers yellow, up to 4 cm long, axillary, solitary, or in simple racemes about 8 cm long; male generally terminal; perianth lobes 0.3 cm long, elliptic-acuminate, sparsely long-haired without, tube about 1.5 cm long, linear, hairy; stamens 6, anthers linear; ovary glabrous, style filiform, stigmas clavate. Capsules 0.8 cm long, ovoid; seeds about 4, globose, black, grooved.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Diguvametta, 5-11-1906, C. A. Barber 8050; Chelama, 4-7-1963, Ellis 16708; Mahanandi, 23-8-1965, Ellis 25505.

TACCACEAE

TACCA J. R. & G. Forst. *non. cons.*

Tacca leontopetaloides (Linn.) O. Ktze. *Rev. Gen. Pl.* 2 : 704. 1891; Drenth in *Blumea* 20 : 367-406. 1972 et in Steenis, *Fl. Males. ser. I.* 7(4) : 809. 1974. *Leontice leontopetaloides* Linn. *Sp. Pl.* 313. 1753. *Tacca pinnatifida* J. R. & G. Forst. *Char. Gen. Pl.* 35, t. 35. 1775; Hook. f. *FBI* 6 : 287. 1892.

Erect herbs, about 1 m high; rootstocks tuberous. Leaves about 80 cm across, 3-partite, each irregularly pinnatifid, glabrous; petioles about 40 cm long, grooved, glabrous. Flowers green, 1 cm across, drooping, in umbels 8 cm across; bracts about 8, about 3×1 cm; bracteoles several, 10 cm long, filiform; perianth green, 1 cm long, segments oblong; stamens 6, included, filaments expanded at base, dilated and hooded above anthers at top; ovary glabrous, styles short, stigmas 3, 2-lobed. Berries about 2×1.2 cm, ovoid, with persistent perianth; seeds numerous, striate.

Fl. & Fr. : July-September.

World distribution : Africa, India, Sri Lanka, Malaysia, Australia and Pacific Islands.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 26-8-1917, K. C. Jacob 14955; Gundlabrahmeswaram, 21-7-1963, Ellis 16939; Krishnanandi, 21-8-1965, Ellis 25440; Lukki, Diguvametta, 9-8-1972, Ellis 42220.

DIOSCOREACEAE

DIOSCOREA Linn.

1. Leaves simple :
 2. Bulbils present ; stems twining to left *D. bulbifera*
 2. Bulbils present ; stems twining to right *D. wallichii*
1. Leaves compound :
 3. Lateral leaflets prominently gibbous on one side ;
petioles up to 21 cm long ; capsules 5 × 2 cm *D. hispida*
 3. Lateral leaflets not prominently gibbous ; petioles
about 10 cm long ; capsules 2.5 × 1.5 cm :
 4. Leaflets glabrous *D. pentaphylla*
 4. Leaflets densely tomentose beneath *D. tomentosa*

Dioscorea bulbifera Linn. Sp. Pl. 1033. 1753 ; Wt. Ic. 3 : t. 878. 1844 ; Kunth in Engler, Pflanzenr. 87 : 88. 1924 ; Fischer, FPM 8 : 1511. 1928 ; Prain & Burkill in Ann. Roy. bot. Gardn. Calcutta 14 : 111, tt. 50 & 51. 1936 ; Burkill in Steenis, Fl. Males. ser. I. 4(3) : 311. 1951. *D. sativa* Thunb. Fl. Jap. 1784 (non Linn.) ; Hook. f. FBI 5 : 295. 1892.

Climbing herbs ; stems twining to left, terete, grooved, glabrous ; rootstocks tuberous ; bulbils round, several, in leaf axils. Leaves up to 15 × 14 cm, broadly ovate, abruptly acuminate, cordate at base, sinus large, glabrous ; nerves 7 from base, nervules parallel ; petioles about 6 cm long, purplish. Flowers whitish, male 0.3 cm long, in axillary, 3-4 spikes about 12 cm long ; rachises angled ; perianth lobes 0.2 cm long, linear-ovate ; stamens 6, alternating with 6 staminodes ; female flowers 0.6 cm long, in axillary spikes about 25 cm long ; ovary glabrous, 3-gonous, styles 3 ; bracts 0.15 cm long, broadly ovate. Capsules about 2.2 × 1 cm, oblong-ovoid, wings rounded, glabrous ; seeds 2 in each cell, flattened, winged.

Fl. & Fr. : September-December.

World distribution : Africa, India, Sri Lanka and Pacific Islands.

Specimen examined : Diguvaletta, 8-8-1972. *Ellis* 42195.

Remarks : Prain and Burkill (*op. cit.* 111) have distinguished some varieties which are separable depending on cultivated and wild varieties. Fischer (*op. cit.* p. 111) recognises 2 varieties. Burkill (*op. cit.* p. 312) working on Malaysian plants further speaks of this taxon thus : '...It is convenient to distinguish some varieties...'. Studies of the taxon both in the field as also in MH and CAL indicate that it is impossible to distinguish this highly variable taxon into distinct varieties. However, a monographic work is necessary to differentiate various taxa.

Dioscorea wallichii Hook. f. Fl. Brit. Ind. 6 : 295. 1892 ; Prain & Burkill in Journ. Asiat. Soc. 10 : 31. 1914 ; Kunth in Engler, Pflanzenr. 87 : 274. 1924 ; Fischer, FPM 8 : 1512. 1928 ; Prain & Burkill in Ann. Roy. bot. Gardn. Calcutta 14 : 281, t. 115. 1938 ; Burkill in Steenis, Fl. Males. ser. I. 4 (3) : 328. 1951. *D. aculeata* Linn. Sp. Pl. 1033. 1753 ; Hook. f. *op. cit.* 296.

Climbing herbs ; stems terete, sometimes grooved, twining to right ; bulbils absent. Leaves up to 12×10 cm, broadly ovate and abruptly acuminate, cordate at base, sinus large, glabrous ; nerves 9 from base, nerves and nervules prominent below ; petioles about 11 cm long, grooved. Flowers yellowish, 0.1 cm long, globose, in axillary spikes about 10 cm long, bracteate ; rachises angled ; perianths 0.1 cm long, ovate ; stamens 6 fertile alternating with 6 sterile, included ; ovary in female flowers glabrous. Capsules about 2×2 cm, apices depressed ; seeds 4, winged.

Fl. & Fr. : October-January.

World distribution : India, Burma and Malaysia.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22156 (male) and *Ellis* 22175 (female) ; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32656 (female).

D. hispida Dennst. Schluss. Hort. Malab. 15. 1818 ; Fischer, FPM 8 : 1511. 1928 ; Prain & Burkill in Ann. Roy. bot. Gardn. Calcutta 14 : 188, tt. 77 & 78. 1936 ; Burkill in Steenis, Fl. Males. ser. I. 4 (3) : 318. 1951. *D. daemonia* Roxb. Fl. Ind. 3 : 805. 1832 ; Wt. Ic. 3 : t. 811. 1844 ; Hook. f. FBI 6 : 289. 1892.

Extensive climbers ; stems twining to left, glabrous, grooved ; rootstocks tuberous. Leaves 3-foliolate ; leaflets about 14×10 cm, ovate-abruptly acuminate, laterals gibbous on one side, obtuse at base ; nerves 5 from base, prominent as are reticulations ; petiolules 0.7 cm long, hairy ; petioles about 23 cm long, puberulous, grooved. Flowers greenish, 0.1 cm across, in spikes 0.8 cm long, several, along racemes about 50 cm long, bracteate ; rachises pubescent ; female flowers in solitary spikes directed downwards. Capsules 5×2 cm, obtuse at apices ; seeds 4, winged.

Fl. & Fr. : April-November.

World distribution : India and Malaysia.

Specimens examined : Gazulapalli, 3-9-1917, *K. C. Jacob* 14984 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22179 ; Krishnanandi, 21-8-1965, *Ellis* 25411 (male) and *Ellis* 25451 (female) ; Diguvametta, 8-8-1972, *Ellis* 42202 (female).

Dioscorea pentaphylla Linn. Sp. Pl. 1032. 1753 ; Wt. Ic. 3 : t. 805. 1844 ; Hook. f. FBI 6 : 289. 1892 ; Prain & Burkill in Journ. Asiat. Soc. Beng. 10 : 23. 1914 ; Kunth in Engler, Pflanzenr. 87 : 145. 1924 ; Fischer, FPM 8 : 1511. 1928 ; Prain & Burkill in Ann. Roy. bot Gardn. Calcutta 14 : 160, tt. 66 & 67. 1936 ; Burkill in Steenis, Fl. Males. ser. I. 4 (3) : 315. 1951.

Climbing herbs ; stems terete, grooved, twining to left, often prickly, glabrous ; roots tuberous. Leaves 3-5-foliolate ; petioles up to 10 cm long ; middle leaflet about 10×3 cm, elliptic, suddenly acuminate, acute at base, laterals broader, gibbous on one side, obtuse at base ; petiolules short, villous. Flowers greenish, in panicles about 40 cm long, unbranched in male ; male 0.15 cm long, perianths 0.2 cm long, ovate, sparsely hairy ; ovary pubescent, styles 3. Capsules about 2.5×1.5 cm, winged, oblong, glabrous.

Fl. & Fr. : September-November.

World distribution : India, Sri Lanka, Malaysia and Australia.

Remarks : The following varieties which had been described by Prain and Burkill (1914) have also been recognised by Fischer (*op. cit.* pp. 1511-1514), depending mainly on the nature of tubers and leaves, viz. shining in var. *linnaei* Prain & Burkill, dark in var. *rheedei* Prain & Burkill and rusty-pubescent in var. *communis* Prain & Burkill. How far these varieties are distinct is rather not clear—at least from the present studies of the plants both in the field and in MH and CAL. Apparently they seem to merge imperceptibly into one another. Burkill (*op. cit.*), incidentally, treats 5 varieties under *D. pentaphylla* from Malaysia ! It is obvious that this taxon is highly variable. This being an economically important plant it is likely that these varieties are perpetuated by human interference ; some might have escaped from cultivation. As this requires some detailed critical studies, this problem has not been taken up.

D. tomentosa Heyne in Roth, Nov. Pl. Sp. 371. 1821 ; Hook. f. FBI 5 : 289. 1892 ; Prain & Burkill in Journ. Asiat. Soc. Bengal 20 : 21. 1914 ; Fischer, FPM 8 : 1511. 1928.

Climbing herbs ; stems twining to left, grooved, tomentose and brown-villous ; rootstocks tuberous. Leaves triphyllous, rarely 5-phyllous ; petioles up to 8 cm long, tomentose ; lateral leaflets up to 11×7 cm, elliptic-ovate, abruptly acuminate, gibbous on one side, middle obovate, acute at base, densely tomentose below ; petioles. Flowers white, in axillary, simple (in female) or branched (in male) panicles about 30 cm long, pendulous ; rachises densely pubescent ; male 0.1 cm long, perianth villous ; stamens 6 fertile alternating with 6 sterile, included ; female

0.3 cm long, perianth villous ; ovary tomentose. Capsules 2.5×1.5 cm, oblong ; brown-tomentose.

Fl. & Fr. : September-November.

World distribution : India and Sri Lanka.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16905.

LILIACEAE

1. Climbing herbs or undershrubs :

- | | | |
|---|----|-----------|
| 2. Flowers about 10 cm across ; fruits oblong | .. | GLORIOSA |
| 2. Flowers about 0.2 cm across ; fruits globose | .. | ASPARAGUS |

i. Erect herbs :

- | | | |
|--|----|--------------|
| 3. Racemes about 25 cm long, spicate ; flowers white | .. | CHLOROPHYTUM |
| 3. Racemes about 4 cm long, corymbose ; flowers
purplish-pink | .. | IPHIGENIA |

GLORIOSA Linn.

Gloriosa superba Linn. Sp. Pl. 305. 1753 ; Wt. Ic. 6 : t. 2047. 1853 ; Hook. f. FBI 6 : 358. 1892 ; Fischer, FPM 8 : 1519. 1928.

Climbing herbs, often extensive ; stems grooved, glabrous ; rootstocks tuberous. Leaves about 15×5 cm, ovate-acuminate, caudate, cirrhous, rounded at base, glabrous, sessile. Flowers red towards top, yellowish towards base, about 10 cm across, solitary, by the side of leaves ; pedicels about 12 cm long ; perianth petaloid, about 7×1 cm, undulately crisped along margins, united at base ; stamens 6, shorter than perianth, anthers linear ; ovary glabrous, style reflexed, 3-branched at apex. Capsules about 3×0.8 cm, oblong ; seeds globose.

Fl. & Fr. : July-October.

World distribution : India, Sri Lanka, Malaysia and Australia.

Specimens examined : Chelama, 17-10-1964, *Ellis* 22084 ; way to Vishnunandi, Mahanandi, 21-8-1965, *Ellis* 25407.

ASPARAGUS Linn.

Asparagus racemosus Willd. Sp. Pl. 2 : 152. 1799 ; Wt. Ic. 6 : t. 2056. 1853 ; Hook. f. FBI 6 : 316. 1892 ; Fischer, FPM 8 : 1517. 1928.

Climbing undershrubs ; stems terete or faintly angled, spinous, glabrous ; rootstocks tuberous, often creeping. Cladodes about 3 cm long,

in clusters, acicular, triquetrous or flattened, falcate; stipules scarious; leaves modified into scales. Flowers white, 0.2 cm long, in axillary racemes up to 12 cm long, bracteate; pedicels 0.2 cm long, jointed; perianth 0.2 cm long, oblong; stamens 6, included, filaments dilated; ovary trigonous, style columnar, stigmas 3. Berries 0.5 × 0.5 cm, globose, ripen red; seed 1.

Fl. & Fr. : July-October.

World distribution : Africa, India, Sri Lanka, Malaysia and Australia.

Specimens examined : Chelama, 5-7-1963, *Ellis* 14743; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22186.

CHLOROPHYTUM Ker-Gawl.

- | | | |
|---|----|------------------------|
| 1. Leaves 40 × 5 cm; anthers longer than filaments | .. | <i>C. arundinaceum</i> |
| 1. Leaves 25 × 1.5 cm; anthers as long as filaments | .. | <i>C. tuberosum</i> |

Chlorophytum arundinaceum Baker in Journ. Linn. Soc. 15 : 323. 1875 et in Hook. f. FBI 6 : 333. 1892; Fischer, FPM 8 : 1526. 1928.

Erect herbs, about 50 cm high; rootstocks fibrous. Leaves about 40 × 5 cm, radical, linear-ovate or obovate, sheathed at base into petioles, glabrous. Flowers white, about 1 cm long, in spikes about 35 cm long, bracteate; pedicels jointed below the middle; perianth 1.2 cm long, elliptic-ovate; stamens 6, filaments shorter than anthers; ovary glabrous. Capsules 0.8 × 0.8 cm, depressed-globose, 3-winged; seeds black, flattened.

Fl. & Fr. : May-October.

World distribution : India and Burma.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16920.

C. tuberosum (Roxb.) Baker in Journ. Linn. Soc. 15 : 322. 1875; Hook. f. FBI 6 : 334. 1892; Fischer, FPM 8 : 1526. 1928. *Antherium tuberosum* Roxb. Fl. Ind. 1 : 149. 1832; Wt. Ic. 6 : t. 2036. 1853.

Erect herbs, about 35 cm high; roots cylindric, tuberous. Leaves 25 × 1.5 cm, radical, linear-lanceolate, acuminate, sheathing at base, glabrous. Flowers white, 0.5 cm across, in terminal scapes about 30 cm long; pedicels jointed at the middle; bracts lanceolate; perianth 6, about 0.5 cm long, oblong, parallel-nerved; stamens 6, filaments as long as anthers; ovary glabrous, style slender, stigmas simple. Capsules 0.6 cm across, obovoid, glabrous; seeds black, flattened.

Fl. & Fr. : June-October.

World distribution : Middle East, India and Burma.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16742 ; Lukki, Digu-vametta, 9-8-1972, *Ellis* 42223.

IPHIGENIA Kunth, *nom. cons.*

Iphegenia indica (Linn.) A. Gray in Kunth, Enum. 4 : 213. 1843 ; Hook. f. FBI 6 : 347. 1892 ; Fischer, FPM 8 : 1528. 1928. *Melanthium indicum* Linn, Mant. Pl. Alt. 2 : 226. 1771.

Erect herbs, about 20 cm high ; rootstocks tuberous. Leaves about 20 × 1 cm, linear-acuminate, sheathing at base, glabrous. Flowers purplish-pink at base and green at top, 0.5 cm long, terminal, solitary or in corymbs 4 cm long ; pedicels up to 6.5 cm long ; bracts linear ; perianth 0.8 cm long, linear-acuminate, obovate, narrowed at base ; stamens 6, filaments flattened, anthers 2-celled ; ovary glabrous, styles 3, stigmas globose. Capsules 1.5 × 0.5 cm, oblong ; seeds orbicular.

Fl. & Fr. : July-September.

World distribution : India, Sri Lanka, Philippines and Australia.

Specimens examined : Digu-vametta, 11-8-1921, *C.E.C. Fischer* 4654 ; Mahanandi, 23-8-1965, *Ellis* 25501 ; Chinnamantrala, Eastern Nallamalais, 17-8-1972, *Ellis* 42293.

AGAVACEAE

SANSEVIERIA Thunb. *nom. cons.*

Sansevieria roxburghiana J. & J. Schult. Syst. 7 : 347. 1829 ; Hook. f. FBI 6 : 271. 1892 ; Fischer, FPM 8 : 1520. 1928. *S. zeylanica* Roxb. Pl. Corom. 2 : 45. 1805 [*non* (Linn.) Willd.].

Fleshy, erect herbs about 70 cm high ; stemless ; rootstocks rhizomatous. Leaves about 70 × 3.5 cm, more or less cylindric, channelled above, sheathed at base. Flowers pale green, 1.5 cm long, in clusters of about 4, along a terminal scape about 70 cm long, shortly pedicellate ; bracts about 0.5 cm long, scarious ; perianth tube 1 cm long, lobes linear ; stamens 6, epiphyllous on perianth lobes ; ovary glabrous, style filiform. Capsules about 0.6 × 1 cm, prominently bilobed ; seeds angled, hairy.

Fl. & Fr. : June-August.

World distribution : India, in dry localities.

Specimen examined : Srisailam, 16-7-1963, *Ellis* 16901.

SMILACACEAE

SMILAX Linn.

Smilax zeylanica Linn. Sp. Pl. 1029. 1753; Hook. f. FBI 6 : 309. 1892; Fischer, FPM 8 : 1518. 1928; Koyama in Adv. Front. Pl. Sci. 4 : 50. 1966. *S. macrophylla* Roxb. Fl. Ind. 3 : 793. 1832; Hook. f. *op. cit.* 310. *S. ovalifolia* Roxb. *loc. cit.*; Wt. Ic. 3 : t. 809. 1844.

Shrubby, tendrillar climbers; stems zig-zag, angled, grooved, sparingly prickly. Leaves about 13×8 cm, ovate, orbicular or elliptic-acuminate or emarginate, rounded or cordate or acute at base, coriaceous, glabrous; nerves 3-5 from base, reticulations prominent; petioles 1 cm long, curved; stipules winged; leaf base modified into tendrils. Flowers pale green, 0.3 cm long, pedicellate in pedunculate umbels about 3 cm across, bracteate; perianth 0.5×0.15 cm, linear-ovate, generally recurved; stamens in male flowers 6, included, anthers recurved; ovary in female flowers glabrous, stigmas recurved. Fruits 0.8×0.8 cm, globose; seeds 1-2.

Fl. & Fr. : September-March.

World distribution : India, Sri Lanka, Burma and Malaysia.

Specimen examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16936.

COMMELINACEAE

- | | | |
|--|----|-----------------|
| 1. Inflorescences terminal | .. | MURDANNIA |
| 1. Inflorescences axillary : | | |
| 2. Bracteoles biseriate : | | |
| 3. Inflorescences enclosed in leaf-sheaths | .. | AMISCHOPHACELUS |
| 3. Inflorescences not enclosed in leaf-sheaths | .. | CYANOTIS |
| 2. Bracteoles not biseriate | .. | COMMELINA |

MURDANNIA Royle, *nom. cons.*

- | | | |
|------------------------------------|----|----------------------|
| 1. Sheaths very prominently winged | .. | <i>M. juncooides</i> |
| 1. Sheaths not prominently winged | .. | <i>M. nudiflora</i> |

Murdannia juncooides (Wt.) Rolla Rao & Kammathy in Bull. bot. Surv. Ind. 6 : 3. 1964 (1965). *Dichaespermum juncooides* Wt. Ic. 6 : t. 2078. 1853. *Aneilema paniculatum* Wall. [Cat. 5216. 1831-1832] ex C. B. Cl. in DC. Monogr. Phan. 3 : 2.5. 1881, *p.p.*; Hook. f. FBI 6 : 381. 1892; Fischer, FPM 9 : 1545. 1931.

Erect herbs, about 18 cm high ; stems tufted, sheathed at base ; roots tuberous. Leaves about 16 × 3 cm, linear, acute, apiculate, often filiform, slightly falcate ; sheaths up to 3 cm long, prominently winged. Flowers violet, 0.3 cm long, in terminal panicles about 6 cm long, scariously ochreate-bracteate, bracteolate ; pedicels about 0.8 cm long ; sepals 0.2 cm long, elliptic ; petals 0.3 cm long, obovate ; stamens 3, included, filaments connate at base ; ovary glabrous, style slender. Capsules 0.3 cm long, ovoid, shining ; seeds many, angled, smooth.

Fl. & Fr. : August-January.

World distribution : India and Sri Lanka.

Specimen examined : Way to Sunnipenta, Srisailam, 5-12-1969, *Ellis* 32704.

Murdannia nudiflora (Linn.) Brenan in Kew Bull. 1952 : 189. 1952 ; Hong De-yuang in Acta Phytotax. Sinica 12 : 473. 1974. *Commelina nudiflora* Linn. Sp. Pl. 41. 1753, *p.p.* ; Merrill in Journ. Arn. Arb. 18 : 64-66. 1937. *Aneilema nudiflorum* (Linn.) Wall. Cat. 182, No. 5224. 1830 ; C. B. Cl. in DC. Monogr. Phan. 3 : 210. 1881 ; Hook. f. FBI 6 : 378. 1892 ; Fischer, FPM 9 : 1545. 1931. *Murdannia malabarica* (Linn.) Bruckner in Engler, Pflanzenf. ed. 2. 15 A : 173. 1930 ; Santapau in Journ. Bombay nat. Hist. Soc. 52 : 658. 1955. *Aneilema malabaricum* (Linn.) Merrill in Philip. Journ. Sci. Bot. 232. 1912. *Tradescantia malabarica* Linn. Sp. Pl. ed. 2. 412. 1762.

Erect or procumbent herbs, about 20 cm high ; stems glabrous, often rooting at nodes ; roots fibrous. Leaves up to 8 × 0.5 cm, linear, acute, rounded at base, glabrous ; sheaths sparsely hairy. Flowers pale purple, 0.5 cm across, in terminal, paniculate cymes about 8 cm long, bracteate ; sepals 0.2 cm long, ovate ; petals 0.4 cm long, orbicular stamens included, 2 fertile, filaments hairy ; ovary glabrous. Capsules 0.3 cm across, globose ; seeds 2 in each cell, truncate at one end and orbicular at the other, tuberculate.

Fl. & Fr. : June-October.

World distribution : India, Sri Lanka, China and Malaysia.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 31-8-1917, K. C. Jacob 14977 ; Chelama, 17-10-1964, *Ellis* 22077 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22167 ; Mahanandi, 22-8-1965, *Ellis* 25488.

AMISCHOPHACELUS Rolla Rao & Kammathy

Amischophacelus axillaris (Linn.) Rolla Rao & Kammathy in Journ. Linn. Soc. Beng. 59 : 306. 1966 ; Hong De-yuang in Acta Phytotax. Sinica

12 : 478. 1974. *Commelinæ axillaris* Linn. Sp. Pl. 42. 1753. *Tradescantia axillaris* (Linn.) Linn. Syst. ed. 13. 260. 1774. *Cyanotis axillaris* (Linn.) J.A. & J.H. Schultes, Syst. Veg. 7 : 1154. 1830 ; C. B. Cl. in DC. Monogr. Phan. 3 : 244. 1881 ; Hook. f. FBI 6 : 388. 1892 ; Fischer, FPM 9 : 1550. 1931. *Zygomenes axillaris* (Linn.) Salisb. in Trans. Hort. Soc. 1 : 271. 1812 ; Rolla Rao in Notes Roy. bot. Gardn. Edinb. 25 : 187. 1964.

Prostrate to procumbent herbs, running to about 40 cm long ; branches glabrous, often rooting at nodes. Leaves up to 12×1 cm, linear-acuminate, rounded at base, often falcate, glabrous ; sheaths 0.6 cm long, scarious, ciliate along margins. Flowers purple, 1 cm long, in axillary fascicles about 1.5 cm long, bracteolate ; sepals 0.8 cm long, spathulate-acuminate, ciliate along margins at apices ; corolla lobes ovate, tube 0.4 cm long ; stamens 6, filaments blue, bearded ; ovary glabrous. Capsules 0.6 cm long, oblong, beaked ; seeds about 4, 4-angled, conical, truncate at base, prominently pitted.

Fl. & Fr. : August-December.

World distribution : Tropics from India, Sri Lanka and Australia.

Specimens examined : Srisailam, 13-7-1963, *Ellis* 16851 ; Chelama, 7-12-1963, *Ellis* 17966 ; Chelama, 16-10-1964, *Ellis* 22049 ; Ahobilam, 29-8-1965, *Ellis* 25568.

Remarks : Rolla Rao and Kammathy (*loc. cit.*) have erected the genus *Amischophacelus*, separable from *Cyanotis* D. Don depending on, (i) sessile inflorescences enclosed in leaf-sheaths, (ii) a transparent, linear, inconspicuous bracteole, and (iii) capsules pointed or depressed. They adduce also the chromosomal evidence, viz. $2n=20$ in *Amischophacelus*, and $2n=24$ in *Cyanotis* D. Don. Bakhuizen (*Fl. Java* 3 : 14 et 659. 1968), however, treats it still under *Cyanotis* D. Don.

CYANOTIS D. DON, *nom. cons.*

- | | | |
|--|----|-----------------------|
| 1. Plants cobwebby-woolly throughout | .. | <i>C. fasciculata</i> |
| 1. Plants not cobwebby-woolly ; | | |
| 2. Roots tuberous ; plants pubescent ;
leaves up to 15 cm long | .. | <i>C. tuberosa</i> |
| 2. Roots not tuberous ; plants almost glabrous ;
leaves about 5 cm long | .. | <i>C. cristata</i> |

Cyanotis fasciculata (Heyne ex Roth) Schult. f. Syst. 7 : 1152. 1830 ; Wt. Ic. 6 : t. 2086. 1853 ; C. B. Cl. in DC. Monogr. Phan. 3 : 253. 1881 ; Hook. f. FBI 6 : 387. 1892 ; Fischer, FPM 9 : 1550. 1931. *Tradescantia fasciculata* Heyne ex Roth, Nov. Pl. Sp. 189. 1821.

Erect or decumbent herbs, about 10 cm long (rarely up to 30 cm long) ; stems terete, striate, sparsely cobwebby-woolly. Leaves up to 4×0.7 cm, linear-oblong, acute, rounded at base, cobwebby-glabrescent ; sheaths 0.6 cm long. Flowers pinkish, 0.3 cm long, enclosed in falcate, linear-ovate, cottony-woolly bracteoles about 0.5 cm long, in terminal and axillary, scorpioid cymes about 1 cm long ; bracts 1.5 cm long ; bracteoles ovate, falcate, cobwebby ; filaments hairy. Capsules 0.6 cm across, almost glabrous ; seeds 2, oblong, rugose.

Fl. & Fr. : July-December.

World distribution : India.

Specimens examined : Way to Pathalaganga, 20-10-1964, *Ellis* 22112 ; Upper Ahobilam, 29-8-1965, *Ellis* 25586.

Cyanotis tuberosa (Roxb.) Schult. f. Syst. 7 : 1153. 1830 ; C. B. Cl. in DC. Monogr. Phan. 3 : 253. 1881 ; Hook. f. FBI 6 : 387. 1892 ; Fischer, FPM 9 : 1549. 1931. *Tradescantia tuberosa* Roxb. Pl. Corom. 2 : 5, t. 108. 1798.

Erect or procumbent herbs, up to 90 cm long ; stems densely pubescent ; roots fibrous, pubescent, often tuberous. Leaves up to 15×2 cm, dark pink on lower surface, radical and cauline, linear-acuminate, apiculate, obtuse at base, softly pilose ; sheaths up to 2.5 cm long, prominent. Flowers purple, 0.3 cm long, enclosed in 2-seriate, foliaceous, falcate, softly pilose, bracteoles 0.5×0.2 cm, in axillary and terminal, scorpioid cymes 2.5 cm long ; peduncles 1 cm long ; sepals small, linear, villous ; corolla lobes 0.5 cm long, ovate, tube short ; filaments villous ; ovary glabrous, styles rather thickened. Capsules 0.3×0.2 cm, hairy ; seeds 2 in each cell, brown.

Fl. & Fr. : July-December.

World distribution : India and Sri Lanka.

Specimens examined : Chelama, 4-7-1963, *Ellis* 16711 ; Lukki, Diguvametta, 9-8-1972, *Ellis* 42219.

C. cristata (Linn.) D. Don, Prodr. Fl. Nep. 46. 1825 ; C. B. Cl. in DC. Monogr. Phan. 3 : 247. 1881 ; Wt. Ic. 6 : t. 2082. 1853 ; Hook. f. FBI 6 : 385. 1892 ; Fischer, FPM 9 : 1549. 1931 ; Hong De-yuang in Acta Phytotax. Sinica 12 : 479. 1974. *Commelina cristata* Linn. Sp. Pl. 42. 1753.

Prostrate or procumbent herbs, about 20 cm long ; stems glabrous or sparsely ciliate, often rooting at nodes. Leaves up to 5×0.8 cm, ovate,

rounded at base, hairy along margins; sheaths about 0.6 cm long. Flowers blue, 0.3 cm long, in scorpioid cymes about 2.5 cm long; bracteoles 1 cm long, falcate, linear-ovate, ciliate along margins; sepals 0.3 cm long, linear-ovate, sparsely hairy; petals ovate, connate at base; stamens 6, included, filaments bearded; ovary glabrous. Capsules 0.3 cm long, triangular; seeds conical, 4-sided, pitted, ridged.

Fl. & Fr. : August-December.

World distribution : Tropical Africa, India, Sri Lanka, Burma and Malaysia.

Specimen examined : Mahanandi, 22-8-1965, Ellis 25461.

COMMELINA Linn.

- | | | |
|---|----|------------------------|
| 1. Leaves almost as broad as long, broadly ovate | .. | <i>C. benghalensis</i> |
| 1. Leaves longer than broad : | | |
| 2. Spathes funnel-shaped : | | |
| 3. Inflorescences subtended by 2 smaller leaves; leaf-sheaths rufous-haired along margins | .. | <i>C. erecta</i> |
| 3. Inflorescences not subtended by 2 smaller leaves; sheaths rufous-haired along margins | . | <i>C. paludosa</i> |
| 2. Spathes broadly cordate at base, boat-shaped : | | |
| 4. Seeds ovoid : | | |
| 5. Seeds smooth | .. | <i>C. hasskarlil</i> |
| 5. Seeds tuberculate | .. | <i>C. diffusa</i> |
| 4. Seeds broader than long, truncate at both ends with appendages | | <i>C. attenuata</i> |

Commelina benghalensis Linn. Sp. Pl. 41. 1753; Wt. Ic. 6 : t. 2065. 1853; C. B. Cl. in DC. Monogr. Phan. 3 : 159. 1881; Hook. f. FBI 6 : 370. 1892; Fischer, FPM 9 : 1539. 1931; Hong De-Yuang in Acta Phytotax. Sinica 12 : 481. 1974.

Diffuse, procumbent or prostrate herbs, often rooting at nodes; stems grooved, sparsely pilose. Leaves up to 8×6 cm, ovate, rounded to cordate at base, pilose, shortly petiolate; sheaths 1.5 cm long, hairy, hirsute along margins. Flowers blue, 0.6 cm across, in axillary cymes 1 cm long, enclosed in spathaceous, puberulous, sparsely hirsute bracts about 1.5 cm broad; sepals small; petals blue, ovate-orbicular, clawed at base; ovary glabrous. Capsules 0.6 cm across, ovoid, membranous; seeds 5, pitted.

Fl. & Fr. : July-December.

World distribution : Africa, India, Sri Lanka and China.

Specimens examined : Srisailam, 20-10-1964, *Ellis* 22110 ; Upper Ahobilam, 29-8-1965, *Ellis* 25567.

Remarks : Cleistogamous flowers which are subterranean have been reported in this species by several workers.

Commelina erecta Linn. Sp. Pl. 41. 1753 ; Rolla Rao *et al.* in Bull. bot. Surv. Ind. 12 : 250. 1970 (1972). *C. kurzii* C. B. Cl. in Journ. Linn. Soc. bot. 11 : 144. 1871 et in DC. Monogr. Phan. 3 : 185. 1881 ; Hook. f. FBI 6 : 373. 1892 ; Fischer, FPM 9 : 1540. 1931 ; Rolla Rao & Kammathy in Journ. Bombay nat. Hist. Soc. 59 : 61. 1962.

Erect or procumbent herbs, about 40 cm high, rather robust, sometimes slender ; stems glabrous. Leaves up to 17 × 4 cm, elliptic-acuminate, rounded at base, glabrous or softly pilose ; sheaths about 2.5 cm long, sometimes hirsute along margins. Flowers pale violet, in 3-6-flowered racemes 1 cm long ; spathes about 1 cm across, cucullate, about 5, towards ends of branches, along with 2-4 smaller leaves ; sepals small, ovate ; petals 0.3 cm long, ovate-orbicular, clawed at base ; stamens included ; ovary glabrous. Capsules about 0.6 cm across, 2-celled, with one seed in each ; seeds hemispherical, pitted.

Fl. & Fr. : July-December.

World distribution : India.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 29-8-1917, *K. C. Jacob* 14967 ; Chelama, 4-7-1963, *Ellis* 16734 ; Vishnunandi, Mahanandi, 21-8-1965, *Ellis* 25437 ; Mahanandi, 22-8-1965, *Ellis* 25459 ; Upper Ahobilam, 29-8-1965, *Ellis* 25590 ; Diguvametta, 19-11-1969, *Ellis* 32549 ; Bairani, Diguvametta, 7-8-1972, *Ellis* 42175.

C. paludosa Bl. Enum. Pl. Java 1 : 2. 1827 ; Rolla Rao & Kammathy in Journ. Bombay nat. Hist. Soc. 59 : 60. 1962 ; Hong Deyuang in Acta Phytotax. Sinica 12 : 481. 1974. *C. obliqua* Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 45 : 1825, (non Vahl) ; C. B. Cl. in DC. Monogr. Phan. 3 : 178. 1881 ; Hook. f. FBI 372. 1892 ; Fischer, FPM 8 : 1539. 1931. *C. polyspatha* Wt. Ic. 6 : t. 2066. 1853.

Erect or procumbent, robust herbs, rooting at nodes ; stems branched, glabrous ; roots fibrous, rufous-haired. Leaves up to 15 × 4 cm, ovate-acuminate, acute or obtuse at base, glabrous ; sheaths 2.5 cm long, rufous-haired along margins towards apices. Flowers blue, 0.6 cm long, in about 6-flowered racemes 1 cm long, enclosed in spathes ; spathes about

2 × 2.5 cm, crowded, triangular, sessile; peduncles small; sepals small, ovate; petals 0.6 cm long, ovate orbicular, clawed at base; stamens included; ovary glabrous. Capsules about 0.5 cm across, ovoid, 3-loculed with one seed in each; seeds smooth.

Fl. & Fr. : August-December.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, Jacob 14967; Chelama, 16-10-1964, Ellis 22039.

Commelina hasskarlii C. B. Cl. Comm. & Cyrt. Bengal, 13, t. 3. 1874 et in DC. Monogr. Phan. 3 : 157. 1881; Hook. f. FBI 6 : 370. 1892; Fischer, FPM 9 : 1538. 1931.

Prostrate or decumbent herbs, often rooting at nodes; stems glabrous or glabrescent. Leaves up to 7 × 2 cm, elliptic-ovate, rounded at base, glabrous; sheaths about 1 cm long, rather inflated. Flowers blue, in axillary cymes about 1 cm long, 3-flowered; spathes 1.5 cm long, rounded at base; peduncles short; sepals small, ovate-spathulate, glabrous; petals 0.6 cm long, ovate-orbicular, clawed at base; stamens included, filaments glabrous; ovary glabrous. Capsules 0.6 cm across, membranous; seeds ovoid, conical, smooth.

Fl. & Fr. : September-December.

World distribution : India.

Specimen examined : Chelama, 8-12-1963, Ellis 17949.

C. diffusa Burm. f. Fl. Ind. 18. 1768; Rolla Rao *et al.* in Bull. bot. Surv. Ind. 12 : 249. 1970. *C. nudiflora auct. (non Linn.)*; Hook. f. FBI 6 : 369. 1892; Fischer, FPM 9 : 1538. 1931.

Decumbent to prostrate herbs, running to about 60 cm long; stems glabrous, rooting at nodes. Leaves about 6.5 × 2.5 cm, elliptic-acuminate, rounded at base; sheaths about 1.5 cm long, glabrous, ciliate along margins. Flowers blue, 0.5 cm across, generally solitary, sometimes 2-3, in lateral cymes 0.7 cm long, enclosed in spathes; peduncles about 2 cm long, puberulous; spathes about 2 cm long, ovate-lanceolate or acuminate, rounded at base; calyx small, ovate; petals orbicular, clawed at base; ovary glabrous. Capsules 0.4 cm across, glabrous; seeds about 5, tubercled.

Fl. & Fr. : October-December.

World distribution : South Africa, India, Sri Lanka, China and Malaya Peninsula.

Specimen examined : Chelama, 16-10-1964, Ellis 22039.

Commelina attenuata Koenig ex Vahl, Enum. 2 : 168. 1806 ; C. B. Cl. in DC. Monogr. Phan 3 : 179. 1881 ; Hook. f. FBI 6 : 372. 1892 ; Fischer, FPM 9 : 1538. 1931.

Prostrate or procumbent herbs, up to 50 cm long ; stems profusely branched, glabrous, often rooting at nodes. Leaves about 10×0.6 cm, linear-acuminate, rounded or obtuse at base, glabrous ; sheaths 1 cm long, ciliate along margins. Flowers blue, 0.3 cm across, solitary or 2, in cymes enclosed in spathes ; spathes up to 4.5×1.6 cm, ovate-acuminate, glabrous without, sparsely hairy within ; peduncles up to 2 cm long ; calyx 0.15 cm long, ovate ; petals small ; stamens included ; ovary glabrous. Capsules 0.5 cm across ; seeds 2, doliform with appendages on either side and with one large pit in the centre.

Fl. & Fr. : June-December.

World distribution : India and Sri Lanka.

Specimens examined : 'Nallamalai Hills', 13-8-1921, C. E. C. Fischer 4660 ; Chelama, 16-10-1964, Ellis 22056 ; Mahanandi, 22-8-1965, Ellis 25463 ; Upper Ahobilam, 29-8-1965, Ellis 25565.

PALMAE (ARECACEAE)

- | | | |
|---|----|---------|
| 1. Climbing shrubs | .. | CALAMUS |
| 1. Erect shrubs or trees : | | |
| 2. Leaflets broadly obovate ; stems smooth | .. | CARYOTA |
| 2. Leaflets linear ; stems covered with persistent petioles | .. | PHOENIX |

CALAMUS Linn.

Calamus rotang Linn. Sp. Pl. 325. 1753 ; Beccari & Hook. f. FBI 6 : 447. 1892 ; Fischer, FPM 9 : 1568. 1931.

Shrubby, extensive climbers, reaching lengths of several metres ; stems spinous or prickly. Leaves pinnatisect, about 1 m long ; leaf-sheaths spinous, rachises flattened, strongly armed below ; leaflets about 40×2 cm, linear-acuminate, ciliate and bristly along margins. Flowers small, unisexual, in spikelets 2.5 cm long, biseriate in male, bracteolate ; calyx 0.5 cm long, cupular, 3-toothed ; petals 3, free or connate ; stamens 6, filaments connate ; ovary in female flowers retrosely scaly, stigmas 3. Fruits 0.9×0.9 cm, globose, covered by rhomboidal, shortly toothed scales ; seed 1, subglobose.

Fl. & Fr. : March-August.

World distribution : India and Sri Lanka.

Specimens examined : Mahanandi, 24-8-1965, *Ellis* 25527 ; Mahanandi, Nallamalais, March 1883, *J. S. Gamble* 10930.

Remarks : It is remarkable that *Calamus rotang* Linn. is confined to Krishnanandi near Mahanandi ; it is not seen anywhere else in Nallamalais. Krishnanandi is fed by the stream formed from the hot spring at Mahanandi.

CARYOTA Linn.

Caryota urens Linn. Sp. Pl. 1189. 1753 ; Beccari & Hook. f. FBI 6 : 422. 1892 ; Brandis, Indian Trees. 652. 1906 ; Fischer, FPM 9 : 1560. 1931 ; Mahabale & Nandini Shirke in Journ. Bombay nat. Hist. Soc. 64 : 468. 1967.

Palms about 10-15 m tall ; stems about 40 cm in diameter, smooth, marked with scars of fallen leaves. Leaves about 5×3 cm, bipinnate ; pinnae about 1.5 m long ; leaflets about 18×13 cm, alternate, truncate at top with margins irregularly serrate, cuneate at base, terminal trapeziform. Flowers yellow, about 1×0.8 cm, unisexual, in pendulous spadix about 3 m long ; spathes long ; male flowers—stamens numerous ; female flowers—ovary glabrous. Fruits 1.5×1.5 cm long, globose ; seed 1.

Fl. & Fr. : October-December.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : 'Kurnool', 1886, *J. S. Gamble* s.n. ; Bakari-manuchela, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32645.

PHOENIX Linn.

Phoenix humilis Royle, Illus. Himal. 394, 397, 399. 1840 var. *pedunculata* Beccari, Males. 3 : 379, 387. t. 44. f. 13-15. 1890 et in Hook. f. FBI 6 : 427. 1892 ; Fischer, FPM 9 : 1560. 1931.

Gregarious shrubs to stunted trees, about 2 m tall ; stems short, covered with persistent leaf-sheaths. Leaves about 1.5 m long ; rachis angular ; leaflets about 25×0.8 cm, linear-acuminate, obtuse at base, pulvinate, basal ones turning spinous. Flowers pale yellow, 0.8 cm long, in spadix about 30 cm long, encased in leathery spathes about 35 cm long ; male flowers—calyx cupular, 3-toothed ; petals 3, 0.5 cm long, ovate ; stamens about 6 ; female flowers—rather orbicular, petals orbicular ; staminodes present ; ovary with 3 distinct carpels. Drupes about 1.5 cm long, oblong, ripen black ; seeds grooved ventrally.

Fl. & Fr. : March-May.

World distribution : India.

Specimens examined : Gundlabrahmeswaram, 31-3-1965, *Ellis* 23817 (male) and *Ellis* 23818 (female).

Remarks : At CAL Beddome's collection from 'Nallymallys', dt. '7/81', is present, annotated in pencil as "*Ph. humilis* R."

ARACEAE

- | | | |
|---|----|---------------|
| 1. Aquatic, floating herbs | .. | PISTIA |
| 1. Terrestrial herbs : | | |
| 2. Leaves 3-partite with segments pinnatisect | .. | PLESMONIUM |
| 2. Leaves entire | .. | THERIOPHONIUM |

PISTIA Linn.

Pistia stratiotes Linn. Sp. Pl. 963. 1753 ; Hook. f. FBI 6 : 497. 1893 ; Fischer, FPM 9 : 1573. 1931 ; Subramanyam, Aquat. Angiosp. 75. 1962.

Floating, stoloniferous herbs ; stems absent ; roots tufted, profuse. Leaves about 5 × 4 cm, several, spirally arranged, obovate-cuneate, rounded or retuse at apices, puberulous on both surfaces. Flowers pale green, unisexual ; spathes 0.3 cm long, tubular below, cucullate above ; spadix 0.8 cm long, adnate to tube within ; male flowers at top of spadix, stamens connate ; neuters in a whorl below the male ; female flowers solitary, naked ; ovary glabrous, stigmas discoid. Berries 0.5 cm long, ovoid ; seeds 4-5, doliform, rugose.

Fl. & Fr. : September-December.

World distribution : Pantropic.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16855.

PLESMONIUM Schott

Plesmonium margaritifera (Roxb.) Schott, Syn. Aroid. 34. 1856 ; Hook. f. FBI 6 : 519. 1893 ; Fischer, FPM 9 : 1588. 1931. *Arum margaritifera* Roxb. Fl. Ind. 3 : 512. 1832 ; Wt. Ic. 3 : t. 795. 1844.

Erect herbs, about 80 cm high ; roots tuberous. Leaves about 60 × 40 cm, 3-partite, each segment pinnatisect, glabrous ; petioles about 45 cm long ; spathes purple within, about 11 cm long, ovate, convolute-cucullate, glabrous. Flowers pale green, unisexual, 0.5 cm long, on

stipitate spadix about 4 cm long; peduncles about 15 cm long; male flowers 0.1 cm long, towards apex of spadix, stamens 5, anthers connate, adnate to connectives; female flowers 0.4 cm long, towards base of spadix, ovary glabrous, stigmas capitate; neuters white, ovoid, in the centre of spadix. Berries 0.6×0.6 cm, ovoid, glabrous; seeds 2, angled.

Fl. & Fr. : March-August.

World distribution : India, in rather dry localities, in dry deciduous forests.

Specimen examined : Dhongabhavikonda, Chelama, 6-7-1963, *Ellis* 16772.

THERIOPHONUM Bl.

Therriophonum minutum (Willd.) Baillon, *Hist. Pl.* 13 : 457. 1895; Engler, *Pflanzenr.* IV. 23F. 73 : 105. 1920; Fischer, *FPM* 9 : 1579.1931; M. Sivadasan & Dan H. Nicolson in *Kew Bull.* 37 : 285. 1982. *Arum minutum* Willd. *Sp. Pl.* 4 : 484. 1805. *Therriophonum crenatum* Bl. *Rumph.* 1 : 128. 1835; Hook. f. *FBI* 6 : 512. 1893.

Erect herbs, about 30 cm high; roots tuberous. Leaves about 7×4 cm, triangular, trilobed, hastate or sagittate, glabrous; petioles pinkish, up to 15 cm long, channelled above. Flowers purple, on shortly stipitate spadix about 5 cm long; spathes greenish, about 11 cm long, cucullate, cuspidate, truncate at base, margins undulate, crenate; male flowers with 2 stamens, anthers beaked; female flowers with ovaries glabrous, stigmas sessile; neuters about 0.15 cm long, elongated. Berries 0.5 cm long; seeds globular.

Fl. & Fr. : July-August.

World distribution : India.

Specimen examined : Chelama, 5-7-1963, *Ellis* 16766.

APONOGETONACEAE

APONOGETON Linn. f. *nom. cons.*

Aponogeton natans (Linn.) Engler & Krause, *Pflanzenr.* 24 : 11. 1906; Fischer, *FPM* 9 : 1598. 1931; Bruggen in *Blumea* 16 : 265. 1968. *Saururus natans* Linn. *Mant. Pl. Alt.* 2 : 227. 1771. *Aponogeton monostachyon* Linn. f. *Suppl.* 214. 1781; Hook. f. *FBI* 6 : 564. 1893.

Submerged, aquatic herbs; rhizomes up to 3 cm across; roots fibrous. Leaves radical, about 14×3 cm, floating, linear-oblong, oblong,

obtuse or cordate at base, glabrous, punctate ; midrib broad, about 6 from base, nervules parallel ; petioles up to 30 cm long. Flowers pale purple, 0.3 cm long, in terminal spikes about 8 cm long ; peduncles about 25 cm long ; perianth segments 1-3, 0.2 cm long, spatulate, tube 0.1 cm long ; stamens 6, in two whorls, included ; ovary apocarpous, 3-6-carpelled, styles coiled. Follicles 0.3 cm long, 3-6, beaked ; seeds oblong, striate.

Fl. & Fr. : July-December.

World distribution : Tropics from India, Sri Lanka and Australia.

Specimens examined : Rudravaram, 31-8-1917, *K. C. Jacob* 14995 ; Isagundum river, Diguvaletta, 16-11-1969, *Ellis* 32387 ; Diguvaletta, 6-8-1972, *Ellis* 42150.

NAJADACEAE

NAJAS Linn.

Najas graminea Del. Descr. Fl. Egypt. Hist. 282, t. 50. f. 3. 1813 ; Hook. f. FBI 6 : 569. 1893 ; Rendle in Engler, Pflanzenr. 7 : 18. 1901 ; Fischer, FPM 9 : 1604. 1931 ; de Wilde in Steenis, Fl. Males. ser. I. 6(2) : 169. 1962 ; Subramanyam, Aquat. Angiosp. 100. 1962.

Submerged, extensive herbs ; stems profusely branched, filiform, faintly angled, grooved, glabrous. Leaves about 1.5×0.1 cm, alternate, opposite or ternate, linear, spinulose along margins, auricled at base. Flowers greenish, 0.3 cm long, unisexual, solitary or in clusters of 2-4 ; male flowers with two whorls of perianth lobes, stamen 1, attached to inner perianth ; female flowers—perianth tubular when present, ovary 1-carpellate, glabrous, stigmas 2. Achenes 0.3 cm long, oblong with persistent style, areolate.

Fl. & Fr. : June-October.

World distribution : India and Sri Lanka.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16856.

ERIOCAULACEAE

ERIOCAULON Linn.

Eriocaulon quinquangulare Linn. Sp. Pl. 87. 1753 ; Hook. f. FBI 6 : 582. 1893 ; Fyson in Journ Indian Bot. 2 : 259. 1921 ; Fischer, FPM 8 : 1620. 1931.

Marshy plants, erect, about 10 cm high ; stems very short or absent. Leaves pinkish, about 10×1.5 cm, linear-acuminate, acute at base,

membranous, about 7-nerved from base. Flowers white, often with a black tinge, unisexual, in globose heads about 0.6 cm across; peduncles up to 10 cm long, about 5 ribbed; involucre bracts 0.3 cm long, obovate, scarious; male with sepals 0.2 cm long, ovate, hairy at top, petals minute, stamens 6; female with sepals 3, 0.2 cm long, linear, hairy at apices; ovary stipitate, 3-lobed, styles 3. Capsules 0.3 cm long; seed 1, smooth.

Fl. & Fr. : Almost throughout the year.

World distribution : Pakistan, India, Sri Lanka and Burma.

Specimens examined : Srisailam, 15-7-1963, *Ellis* 16895; Sunnipentavagu, Srisailam, 21-10-1964, *Ellis* 22129; Srisailam, 1-12-1969, *Ellis* 32703.

CYPERACEAE*

- | | | |
|---|----|--------------|
| 1. Nuts pearly-white, shining, 0.5 cm across, globose | | SCLERIA |
| 1. Nuts dull-brown or brown, 0.3 cm across, flattened : | | |
| 2. Leaf-blades absent | .. | ELEOCHARIS |
| 2. Leaf-blades present : | | |
| 3. Stems filiform, tufted | .. | BULBOSTYLIS |
| 3. Stems not filiform : | | |
| 4. Glumes spirally arranged | .. | FIMBRISTYLIS |
| 4. Glumes not spirally arranged | .. | CYPERUS |

SCLERIA Berg.

- | | | |
|---|----|-----------------------|
| 1. Nuts smooth; leaves 0.4 cm broad; leaf-sheaths clasping the stems | | <i>S. lithosperma</i> |
| 1. Nuts faintly rugose; leaves 0.8 cm broad; leaf-sheaths loose, not clasping the stems | .. | <i>S. levis</i> |

Scleria lithosperma (Linn.) Swartz, Prodr. Veg. Ind. Occ. 18. 1788; C. B. Cl. in Hook. f. FBI 6 : 685. 1894; Fischer, FPM 9 : 1677. 1931; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 740. 1974. *Scirpus lithospermus* Linn. Sp. Pl. 1 : 51. 1753.

Erect, marshy herbs about 60 cm high; stems trigonous; roots rhizomatous. Leaves 12×0.4 cm, linear, sparsely scabrous below; sheaths about 10 cm long, clasping the stem, faintly puberulous. Flowers greenish, unisexual, in terminal, loose panicles about 30 cm long; bracts 0.5 cm long, filiform; glumes in female 0.5×0.3 cm, ovate, apiculate, keeled on back; male flowers with narrower glumes. Nuts 0.5 cm long, pearly-white, shining, globose or faintly trigonous.

Fl. & Fr. : June-October.

* Kern is followed in this treatment of the Cyperaceae.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22185 ; Chinnamantrala, Eastern Nallamalais, *Ellis* 42289.

Scleria levis Retz. Obs. 4 : 13. 1786 ; S. T. Blake in Journ. Arn. Arb. 35 : 226. 1954 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 732. 1974. *S. habecarpa* Nees in Wt. Contr. 117. 1834 ; C. B. Cl. in Hook. f. FBI 6 : 689. 1894. *S. habecarpa* Nees var. *pubescens* C. B. Cl. loc. cit. 689.

Erect, marshy herbs, about 60 cm high ; stems slender, triangular, scabrous on angles ; roots fibrous. Leaves 40 × 0.8 cm, linear, scabrous beneath ; sheaths loose, hyaline, hirsute or glabrous. Flowers greenish, unisexual, in terminal panicles 12 cm long ; bracts 2 cm long, filiform ; male spikelets oblong-lanceolate ; female ovate ; glumes 0.6 cm long, ovate-acuminate, keeled on back. Nuts white, shining, globose or obscurely trigonous, faintly rugose.

Fl. & Fr. : June-October.

World distribution : India, Sri Lanka, Malaysia and Queensland.

Specimen examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16948.

ELEOCHARIS R. Br.

Eleocharis geniculata (Linn.) Roem. & Schult. Syst. Veg. 2 : 150. 1817 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 536. 1974. *Scirpus geniculatus* Linn. Sp. Pl. 1 : 48. 1753. *Eleocharis capitata* R. Br. Prodr. 225. 1810 ; C. B. Cl. in Hook. f. FBI 6 : 627. 1893.

Rigid, erect, marshy herbs, about 20 cm high ; stems about 20 cm high, tufted, striate ; sheaths pinkish at base, appressed. Flowers greenish, several, in terminal, globose spikelets about 0.5 × 0.3 cm ; bracts bristly at base ; glumes 0.2 × 0.1 cm, broadly ovate, membranous ; stamens 2-3 ; styles 2-fid. Nuts 0.1 cm across, biconvex, obovate, smooth.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimen examined : Bairani, Diguvaletta, 7-8-1972, *Ellis* 42185.

BULBOSTYLIS Kunth, *nom. cons.*

Bulbostylis barbata (Rottb.) Kunth ex C. B. Cl. in Hook. f. FBI 6 : 651. 1893 ; Fischer, FPM 7 : 1662. 1931 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 539. 1974. *Scirpus barbatus* Rottb. Descr. Pl. Rar. Progr. 27.

1772. *Fimbristylis barbata* Benth. Fl. Austral. 7 : 321. 1878. *Stenophyllus barbatus* Cooke, Fl. Pres. Bombay 2 : 887. 1908.

Erect herbs, about 30 cm high ; stems tufted, terete, grooved, filiform. Leaves about 10 cm long, capillary ; sheaths long-ciliate along oblique mouth. Spikelets 0.3 cm long, in terminal clusters about 0.8 cm across ; bracts up to 2 cm long, capillary ; glumes brown, 0.2 cm long, keeled, ovate, mucronate, obtuse at base, scarious, faintly puberulous ; stamens 3, small ; ovary trigonous, glabrous, stigmas 3. Nuts white, 0.1 cm long, trigonous.

Fl. & Fr. : Throughout the year.

World distribution : Throughout the world.

Specimens examined : Papili, July 1885, *J. S. Gamble* 16339 ; Srisailam, 13-7-1963, *Ellis* 16863 ; Srisailam, 20-10-1964, *Ellis* 22086 ; Mahanandi, 22-8-1965, *Ellis* 25482 ; Diguvametta, 19-11-1969, *Ellis* 32844 ; Mahanandi, 23-8-1972, *Ellis* 42335.

FIMBRISTYLIS Vahl, *nom. cons.*

- | | | |
|---|----|---------------------|
| 1. Leaves filiform ; spikelets solitary, compressed | .. | <i>F. ovata</i> |
| 1. Leaves linear ; spikelets several, ovoid | .. | <i>F. dichotoma</i> |

Fimbristylis ovata (Burm. f.) Kern in Blumea 15 : 126. 1967 et in Steenis, Fl. Males. ser. 1. 7(3) : 565. 1974. *Carex ovata* Burm. f. Fl. Ind. 194. 1768 ; Kuken. in Engler, Pflanzenr. 38 : 103. 1909. *Abildgaardia ovata* (Burm. f.) Kral in Sida 4 : 72. 1971. *Cyperus monostachyos* Linn. Mant. Pl. Alt. 2 : 180. 1771. *Fimbristylis monostachyos* (Linn.) Hassk. Pl. Jav. Rar. 61. 1848 ('*monostachya*') ; C. B. Cl. in Hook. f. FBI 6 : 649. 1893 ; Fischer, FPM 9 : 1660. 1931 ('*monostachya*').

Erect herbs, about 40 cm high ; stems tufted, about 40 cm high, base thickened with leaf-sheaths. Leaves about 30 × 0.1 cm, filiform, scabrous or not. Flowers greenish, in a single, terminal, compressed spikelets 1.5 × 0.6 cm ; glumes distichous, ovate, mucronate, keeled without, lowest awned ; styles trigonous, stigmas 3. Nuts 0.3 × 0.2 cm, trigonous, trabeculate.

Fl. & Fr. : July-January.

World distribution : Pantropic.

Specimens examined : Ramanapenta, 31-8-1917, *K. C. Jacob* 14976 ; Pyapali, Kurnool, July 1885, *J. S. Gamble* s.n. ; Srisailam, 15-7-1963, *Ellis* 16877 ; Mahanandi, 22-8-1965, *Ellis* 25471.

Fimbristylis dichotoma (Linn.) Vahl, Enum. 2 : 287. 1806 ; Fischer, FPM 9 : 1658. 1931 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 575. 1974. *Scirpus dichotomus* Linn. Sp. Pl. 50. 1753. *Fimbristylis diphylla* (Retz.) Vahl, Enum. 2 : 289. 1806 ; C.B. Cl. in Hook. f. FBI 6 : 636. 1893.

Erect herbs, about 30 cm high ; stems trigonous, striate ; rootstocks fibrous. Leaves about 15 cm long, linear, glabrous. Flowers greenish, in terminal, dichotomously branched panicles about 15 cm across ; peduncles about 5 cm long ; bracts about 4 cm long ; spikelets 1 × 0.5 cm, oblong-ovoid ; glumes 0.3 × 0.2 cm, pale brown, mucronulate ; stamens 3 ; styles ciliolate, stigmas 2. Nuts pale white, 0.1 × 0.1 cm, obovate, biconvex, striate.

Fl. & Fr. : April-October.

World distribution : Pantropic.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18006 ; Chelama, 17-10-1964, *Ellis* 22079.

CYPERUS Linn.

- 1. Inflorescences of condensed heads :
 - 2. Inflorescences pedunculate :
 - 3. Glumes prominently winged on back .. *C. pseudokyllingoides*
 - 3. Glumes not prominently winged on back .. *C. compactus*
 - 2. Inflorescences not pedunculate :
 - 4. Glumes prominently many parallel-nerved, 0.5 × 0.4 cm .. *C. dubius*
 - 4. Glumes faintly few-nerved, 0.5 × 0.2 cm :
 - 5. Glumes faintly serrulate and pilose along margins ; heads not lobed .. *C. kyllingia*
 - 5. Glumes entire, glabrous ; heads 3-lobed .. *C. triceps*
- 1. Inflorescences of elongated spikes :
 - 6. Inflorescences simple .. *C. cyperinus*
 - 6. Inflorescences compound :
 - 7. Stems spongy .. *C. pangorei*
 - 7. Stems not spongy :
 - 8. Inflorescences prominently compressed :
 - 9. Inflorescences greenish or greyish-brown ; glumes faintly apiculate :
 - 10. Inflorescences with flowers close ; glumes brown .. *C. polystachyos*
 - 10. Inflorescences with flowers distant ; glumes white .. *C. compressus*

- | | | |
|---|----|----------------------|
| 9. Inflorescences reddish-brown ; glumes prominently apiculate | .. | <i>C. castaneus</i> |
| 8. Inflorescences not prominently compressed : | | |
| 11. Inflorescences with distant flowers | .. | <i>C. distans</i> |
| 11. Inflorescences with closely arranged flowers : | | |
| 12. Glumes prominently apiculate, slightly falcate | .. | <i>C. nutans</i> |
| 12. Glumes not apiculate, not falcate : | | |
| 13. Glumes very prominently scarious, as long as broad | .. | <i>C. iria</i> |
| 13. Glumes slightly scarious along margins, longer than broad : | | |
| 14. Nuts papillose | .. | <i>C. tenuispica</i> |
| 14. Nuts smooth : | | |
| 15. Spikelets 3 cm long | | <i>C. rotundus</i> |
| 15. Spikelets 1 cm long | .. | <i>C. halpan</i> |

Cyperus pseudokyllingioides Kueken. in Engler, Pflanzenr. 101 : 501. 1936. *Courtoisia cyperoides* (Roxb.) Nees in Wt. Contr. Bot. Ind. 92. 1834 et in Linnaea 9 : 286. 1834 ; C. B. Cl. in Hook. f. FBI 6 : 625. 1893 ; Fischer, FPM 9 : 1645. 1931. *Kyllinga cyperoides* Roxb. Fl. Ind. 1 : 182. 1820.

Erect, marshy herbs, about 40 cm high ; stems simple, tufted. Leaves about 40 × 0.7 cm, linear, sheathing at base. Flowers 0.3 cm long, in globose, umbellate spikelets 0.8 cm across ; common peduncle up to 10 cm long ; individual peduncles up to 2 cm long ; bracts up to 2 cm long, foliar ; bracteoles ovate-caudate, hyaline towards margins ; glumes brownish, keeled, strongly winged on the back, scarious along margins ; stamens as long as glumes, filaments dilated ; ovary triangular. Nuts 0.3 cm long, linear, prominently triangular.

Fl. & Fr. : Throughout the year.

World distribution : Madagascar, India and Burma.

Specimen examined : Chenchukunta, Diguvametta, 18-11-1969, *Ellis* 32512.

C. compactus Retz. Obs. 5 : 10. 1789 ; Kueken. in Engler, Pflanzenr. 101 : 423. 1936 ; Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 638. 1974. *Mariscus microcephalus* Presl, Rel. Haenk. 1 : 182. 1828 ; C. B. Cl. in Hook. f. FBI 6 : 624. 1893. *M. compactus* Boldingh, Zakfl. Landbouwstr. Java. 77. 1916 ; Druce, Rep. Bot. Exch. Cl. 634. 1916 (1917) ; Fischer, FPM 9 : 1645. 1931.

Erect herbs, about 1 m tall ; stems terete, striate, spongy ; rootstocks fibrous. Leaves about 50 × 0.8 cm ; sheaths pinkish, up to 25 cm long.

Spikelets 0.8 cm long, several, in almost globose heads about 2 cm across, in compound umbels 15 cm across; peduncles up to 5 cm long, common one up to 20 cm long; foliar bracts about 15×1 cm, spongy, linear, scabrous along margins; glumes brown, 0.4 cm long, oblong, hyaline towards margin. Nuts muriculate.

Fl. & Fr. : Throughout the year.

World distribution : Mauritius Islands, India, Sri Lanka, China and Malaysia.

Specimens examined : Krishinanandi, 24-8-1965, *Ellis* 25529; Mahanandi, 21-8-1972, *Ellis* 42317.

Cyperus dubius Rottb. *Descr. & Ic.* 20, t. 4, f. 5, 1773; Kueken. in Engler, *Pflanzenr.* 101 : 563, 1936; Kern in Steenis, *Fl. Males.* ser. 1, 7(3) : 643, 1974. *Mariscus dregeanus* Kunth, *Enum.* 2 : 120, 1837; C. B. Cl. in Hook. f. *FBI* 6 : 620, 1893. *M. dubius* Kueken. ex Fischer, *FPM* 9 : 1644, 1931.

Erect, marshy herbs, about 30 cm high; stems about 30 cm high; stems about 30 cm high, triquetrous, base bulbous with sheaths. Leaves 15×0.4 cm, linear; sheaths pinkish. Flowers green, 0.5 cm long, in dense, lobed heads about 2×1.5 cm; floral bracts up to 30 cm long; spikelets many; glumes 0.4×0.3 cm, broadly ovate, parallel-nerved; stamens 3; stigmas 3. Nuts 0.2×0.1 cm, trigonous, ellipsoid, apiculate.

Fl. & Fr. : Throughout the year.

World distribution : Africa, India, Sri Lanka, Malaysia and Philippines.

Specimen examined : Gundlabrahmeswaram, 29-11-1969, *Ellis* 32670.

C. kyllingia Endl. *Cat. Hort. Acad. Vindob.* 1 : 94, 1842; Kueken. in Engler, *Pflanzenr.* 101 : 606, 1936. *Kyllingia monocephala* Rottb. *Descr. & Ic.* 13, t. 4, 1773 (excl. syn. *nonnullis*); C. B. Cl. in Hook. f. *FBI* 6 : 588, 1873; Fischer, *FPM* 9 : 1624, 1931.

Erect, marshy herbs, about 30 cm high; stems about 20 cm high; trigonous, glabrous; rootstocks rhizomatous, reddish. Leaves about 15×0.5 cm, linear; sheaths 5 cm long, glabrous. Flowers green, 0.2 cm long, several, in terminal, ovoid heads 1 cm long; foliar bracts about 15×0.4 cm, linear; glumes 0.2 cm long, ovate-acuminate, 2-toothed at apices, slightly serrulate and hairy along margins. Nuts brown, biangular.

Fl. & Fr. : Throughout the year.

World distribution : Africa, India, Sri Lanka and Malaysia.

Specimen examined : Sunnipentavagu, Srisailam, 27-10-1964, *Ellis* 22131.

Cyperus triceps (Rottb.) Endl. Cat. Hort. Acad. Vindob. 1 : 94. 1842 ; Kueken. in Engler, Pflanzenr. 101 : 578. 1936 ; Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 659. 1974. *Kyllinga triceps* Rottb. Descr. & Ic. 14, t. 4. f. 6. 1773 ; C. B. Cl. in Hook. f. FBI 6 : 587. 1893 ; Fischer, FPM 9 : 1623. 1931.

Erect, marshy herbs, about 20 cm high ; stems tufted, slightly trigonous, base with sheaths. Leaves 10×0.3 cm, linear. Flowers greenish, 0.2 cm long, in capitate, sessile, often 3-lobed heads about 1 cm long ; foliar bracts 5 cm long, linear ; glumes about 0.15 cm long, ovate-oblong, acuminate, about 7-nerved ; stamens 2 ; stigmas 2, glabrous. Nuts 0.1×0.05 cm, biconvex, laterally compressed, apiculate.

Fl. & Fr. : Throughout the year.

World distribution : Africa, India, South China and Australia.

Specimen examined : Chelama, 9-7-1963, *Ellis* 16816.

C. cyperinus (Retz.) Valck. Sur. Gesl. Cyp. Mal. Arch. 154, t. 6. f. 10. 1898 ; Kueken. in Engler, Pflanzenr. 101 : 518. 1936 ; Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 641. 1974. *Kyllinga cyperina* Retz. Obs. 6 : 21. 1791. *Mariscus cyperinus* (Retz.) Vahl, Enum. 2 : 377. 1806 ; C. B. Cl. in Hook. f. FBI 6 : 621. 1893 ; Fischer, FPM 9 : 1644. 1931.

Marshy herbs, up to 45 cm long ; stems glabrous ; rhizomes woody. Leaves about 30×0.5 cm, sheathing at base, pinkish. Spikelets 2 cm long, in umbels about 4 cm long ; foliar bracts about 15×0.5 cm ; glumes brown, 0.3 cm long, rather falcate, prominently nerved. Nuts 0.2 cm long, faintly angled, oblong.

Fl. & Fr. : June-September.

World distribution : India, Sri Lanka and Pacific Islands.

Specimens examined : Chelama, 4-7-1963, *Ellis* 16733 ; Chelama, 6-7-1963, *Ellis* 16771.

C. pangorei Rottb. Descr. & Ic. 31, t. 7. f. 3. 1773 ; Fischer, FPM 9 : 1641. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 76. 1936. *C. tagetum* Roxb. Fl. Ind. ed. 1. 1 : 211. 1820. *C. corymbosus* Rottb.

op. cit. 42, t. 7. f. 4. 1773 var. *pangorei* (Rottb.) C. B. Cl. in Hook. f. FBI 6 : 612. 1893.

Erect, marshy herbs, about 1 m high ; stems trigonous ; roots rhizomatous, woody. Leaves about 8 cm long, linear-ovate, prominent sheaths at base pinkish, about 25 cm long. Spikelets brown, up to 2 cm long, in terminal, umbellate panicles 15 cm long ; peduncles up to 10 cm long ; bracteate leaves 15 × 0.4 cm, linear-ovate, rounded at base ; glumes pinkish-brown, 0.3 cm long, obovate-oblong, obtuse at base, scarious along margins ; filaments dilated ; ovary glabrous. Nuts 0.2 cm long, triangular.

Fl. & Fr. : September-December.

World distribution : India, Sri Lanka and Malaysia.

Specimen examined : Bairani river, Diguvametta, 17-11-1969, *Ellis* 32466.

Cyperus polystachyos Rottb. *Descr. Pl. Rar. Progr.* 21. 1772 et in *Descr. & Icon.* 39, t. 11. f. 1. 1773 ; Kueken. in Engler, *Pflanzenr.* 101 : 367. 1936 ; Kern in Steenis, *Fl. Males. Ser. 1. 7 (3)* : 649. 1974. *Pycreus polystachyos* Beauv. *Pl. Oware & Benin* 2 : 48. 1807 ; C. B. Cl. in Hook. f. FBI 6 : 592. 1893. *P. odoratus* Urban, *Symb. Ant.* 2 : 164. 1900 (non *Cyperus odoratus* Linn) ; Fischer, *FPM* 9 : 1627. 1931.

Erect, marshy herbs, about 60 cm high ; stems about 60 cm high ; tufted, triquetrous. Leaves 10 × 0.4 cm, linear-acuminate. Flowers green, 0.5 cm long, in simple or compound, contracted inflorescences about 10 cm across ; floral bracts up to 29 cm long ; spikelets about 50 flowered ; glumes 0.2 × 0.1 cm, elliptic-ovate, keeled, hyaline ; stamens 2 ; stigmas 2. Nuts 0.15 × 0.5 cm, laterally compressed, ovoid.

Fl. & Fr. : Throughout the year.

World distribution : Mediterranean, India, South China, Japan, Malaysia and Australia.

Specimen examined : Srisailam, 12-7-1963, *Ellis* 16835.

C. compressus Linn. *Sp. Pl.* 46. 1753 ; C. B. Cl. in Hook. f. FBI 6 : 605. 1893 ; Fischer, *FPM* 9 : 1640. 1931 ; Kueken. in Engler, *pflanzenr.* 101 : 156. 1936 ; Kern in Steenis, *Fl. Males. ser. 1. 7 (3)* : 617. 1974.

Erect herbs, up to 40 cm high ; stems about 30 cm high, trigonous, glabrous. Leaves about 2.5 cm long, linear ; sheaths pinkish. Spikelets

about 1.5 cm long, several, in terminal umbels ; peduncles about 10 cm long ; glumes green with a brown tinge, 0.4 cm long, broadly ovate, apiculate, rounded at base, scarious along margins, keeled ; stamens 3, filaments dilated ; ovary glabrous. Nuts strongly trigonous, smooth.

Fl. & Fr. : July-December.

World distribution : Pantropic.

Specimen examined : Mahanandi, 22-8-1965, *Ellis* 25433.

Cyperus castaneus Willd. Sp. Pl. 1 : 278. 1797 ; C. B. Cl. in Hook. f. FBI 6 : 598, 1893 ; Fischer, FPM 9 : 1639. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 264. 1936 ; Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 630. 1974.

Erect herbs, about 10 cm high ; stems angled, grooved. Leaves about 5 cm long, linear, sheathed at base. Spikelets deep brown, 0.15 cm long, in umbels 1 cm long ; rachises rather thick ; bracts up to 5 cm long, linear ; glumes deep brown, oblong, apiculate, rounded at base, compressed, keeled ; stamens 2 ; ovary glabrous. Nuts brown, 0.1 cm long, trigonous, faintly granulate.

Fl. & Fr. : Throughout the year.

World distribution : India and Sri Lanka.

Specimens examined : Way to Pathalaganga, Srisailam, 20-10-1964, *Ellis* 22115 ; way to Pathalaganga, Srisailam, 4-12-1969, *Ellis* 32686.

Remarks : A plant occurring on boulders with little soil, in dry localities.

C. distans Linn. f. Suppl. 103. 1781 ; C. B. Cl. in Hook. f. FBI 6 : 607. 1893 ; Fischer, FPM 9 : 1640. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 137. 1936 ; Kern in Steenis, Fl. Males. ser. 1. 7 (3) : 610. 1974.

Erect, marshy herbs, about 80 cm high ; stems prominently trigonous, glabrous. Leaves up to 60×0.8 cm, linear, sheaths at base pinkish. Spikelets 1.5 cm long, spicate, in terminal umbels 4 cm long ; floral bracts several, as long and broad as leaves ; bracteoles small ; glumes brown, 0.2 cm long, oblong, rounded at base, hyaline along margins ; stamens 3, filaments dilated ; ovary glabrous, styles 3. Nuts 0.15 cm long trigonous.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimens examined: Chinnamantrala, Eastern Nallamalais, 17-8-1972, *Ellis* 42290.

Cyperus nutans Vahl, Enum. 2 : 363. 1806 ; C. B. Cl. in Hook. f. FBI 6 : 607. 1893 ; Fischer, FPM 9 : 1640. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 144. 1935 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 609. 1974.

var. nutans

Erect, marshy herbs up to 1 m high ; stems trigonous, glabrous ; rootstocks rhizomatous. Leaves about 40×0.8 cm, linear ; sheaths pinkish, up to 20 cm long. Spikelets 0.6 cm long, about 10-flowered, in spikes about 3 cm long, in umbellate panicles about 40 cm long ; bracteate leaves about 40×1 cm, robust ; floral bracts small, linear ; peduncles 20 cm long ; glumes 0.2 cm long, ovate-acuminate, obtuse at base, scarious along margins, slightly falcate ; styles slightly exerted. Nuts obovate, triangular.

Fl. & Fr. : August-December.

World distribution : India and Sri Lanka.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16913.

var. eleusinoides (Kunth) Haines, Bot. Bihar & Orissa 5 : 898. 1924. Kern in Steenis, Fl. Males. ser. 1. 7(3) : 610. 1974. *C. eleusinoides* Kunth, Enum. Pl. 2 : 39. 1837 ; C. B. Cl. in Hook. f. FBI 6 : 608. 1893 ; Fischer FPM 9 : 1640. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 144. 1935.

Erect, marshy herbs, up to 1 m high ; stems prominently trigonous ; rootstocks woody. Leaves about 50×0.8 cm, linear, prominently sheathing at base, glabrous. Spikelets up to 4 cm long, several, in terminal umbels ; bracts about 6×0.8 cm, scarious along margins ; peduncles about 25 cm long ; glumes brownish 0.2 cm long, oblong, thinly hyaline along margins ; stamens 3, filaments thin ; ovary glabrous. Nuts pale, trigonous.

Fl. & Fr. : April-October.

World distribution : Africa, India and Australia.

Specimens examined : 'Kurnool', July 1884, *J. S. Gamble* 17739 ; Vishnunandi, Mahanandi, 21-8-1965, *Ellis* 25449 ; Rollapenta, 14-8-1972, *Ellis* 42253.

Remarks : Haines (*op. cit.*) has reduced Kunth's *C. eleusinoides* remarking, "This seems to be a form of *nutans* with more fascicled denser, shorter spikes and with denser umbels." T. Koyama (*Gard. Bull. Singapore* 30 : 136. 1977 et in Dassanay & Fosberg, Rev. Handb. Fl. Ceylon 5 : 191. 1985) treats the Taxon at a subspecific level.

Cyperus iria Linn. Sp. Pl. 45. 1753 ; C. B. Cl. in Hook. f. FBI 6 : 606. 1893 ; Fischer, FPM 9 : 1640. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 150. 1935 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 616. 1974.

Erect, marshy herbs, up to 50 cm high ; stems trigonous, glabrous. Leaves about 25 × 0.5 cm, glabrous ; sheaths at base pink. Spikelets 0.7 cm long, alternate, in terminal, umbellate panicles ; bracts capillary ; peduncles up to 13 cm long ; bracteate leaves about 25 × 0.8 cm ; glumes 1.5 × 1.5 cm, ovate-orbicular, apiculate, obtuse at base, hyaline along margins towards top, keeled at back. Nuts brown, obovate, trigonous.

Fl. & Fr. : June-December.

World distribution : Middle East, India, Sri Lanka and Australia.

Specimen examined : Chenchukunta tank, Diguvametta, 18-11-1969, *Ellis* 32515.

C. tennispica Steudel, Syn. Cyp. 11. 1855 ; Fischer, FPM 9 : 1640. 1931 ; Kueken. in Engler, Pflanzenr. 101 : 245. 1935 ; Kern in Steenis, Fl. Males. ser. 1. 7(3) : 625. 1974. **C. flavidus** C. B. Cl. in Journ. Linn. Soc. Bot. 21 : 122. 1884 et in Hook. f. FBI 6 : 600. 1893 (non Retz.).

Erect, marshy herbs, up to 20 cm high ; stems tufted, trigonous. leaves about 20 × 0.5 cm, linear ; sheaths at base pinkish. Spikelets about 0.7 cm long, in umbellate racemes ; peduncles about 7 cm long ; foliar bracts up to 10 × 0.5 cm, vaginate at base ; glumes 0.1 cm long, oblong, slightly keeled, scarious along margins. Nuts 0.05 cm long, globose, papillose.

Fr. & Fr. : May-January.

World distribution : India, in dry localities.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18012 ; Chelama, 16-10-1964, *Ellis* 22053 ; Ahobilam, 24-11-1969, *Ellis* 32608.

C. rotundus Linn. Sp. Pl. 45. 1753 ; C. B. Cl. in Hook. f. FBI 6 : 614. 1893 ; Fischer, FPM 9 : 1641. 1931 ; Kueken, in Engler, Pflanzenr. 101 : 197. 1936 ; Kern in Steenis, Fl. Males ser. 1. 7 (3) : 604: 1974.

Erect herbs about 40 cm high ; stems triangular, glabrous ; main rootstocks tuberous, aromatic, laterals fibrous. Leaves about 30 × 0.4 cm, linear ; sheaths about 30 cm long. Spikelets brown, up to 3 cm long, in umbels about 10 cm long ; peduncles 5 cm long ; foliar bracts about 15 × 0.4 cm ; glumes 0.3 × 0.15 cm, ovate, rounded at base, scarious along margins, keeled on back. Nuts 0.2 cm long, obovoid, trigonous.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimens examined : 'Nandial' (Nandyal), March 1883, *J. S. Gamble* 10886 ; Bairani, Diguvametta, 7-8-1972, *Ellis* 42191.

Cyperus halpan Linn. Sp. Pl. 45. 1753 ('haspan'); C.B. Cl. in Hook. f. *FBI* 6 : 600. 1893 ; Fischer, *FPM* 9 : 1640. 1931 ; Kueken, in Engler, *Pflanzenr.* 101 : 247. 1936 ; Kern in Steenis, *Fl. Males.* ser. 1, 7(3) : 624, 1974.

Erect, marshy herbs, about 35 cm high ; stems tufted, trigonous, glabrous ; roots rhizomatous. Leaves 15 x .03 cm, linear ; sheaths at base pinkish ; spikelets up to 1 cm long, brownish, in terminal umbels ; peduncles 10 cm long, glumes 0.1 cm long, oblong, scarious along margins ; stamens 3, filaments thin ; ovary trigonous, styles 3. Nuts white, 0.05 cm, trigonous.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimen examined : Sunnipentavagu, Srisailam, 15-7-1963, *Ellis* 16894.

Remarks : Kern (*op. cit.* p. 625) observes that he invokes Art. 73 of the Code to restore the vernacular name, *halpan* instead of *haspan*, correcting an orthographic error of Linnaeus. Interestingly, Koyama (in Dassanay & Fosberg, *Rev. Handb. Fl. Ceylon* 5 : 203. 1985) does not follow the changed spelling.

POACEAE (GRAMINEAE)

- | | | |
|---------------------------------------|----|---------------|
| 1. Arborescent | | DENDROCALAMUS |
| 1. Herbs or shrubs : | | |
| 2. Spikelets awned : | | |
| 3. Spikes digitate : | | |
| 4. Awns prominently geniculate : | | |
| 5. Glumes prominently 1-2-dotted | .. | BOTHRIOCHLOA |
| 5. Glumes not dotted | | EULALIA |
| 4. Awns not prominently geniculate : | | |
| 6. Bracts sheathing the racemes | .. | ARTHRAKON |
| 6. Bracts not sheathing the racemes | .. | CHLORIS |
| 3. Spikes not digitate : | | |
| 7. Awns prominent, often geniculate : | | |

- | | |
|---|----------------|
| 8. Leaves prominently convolute | ARISTIDA |
| 8. Leaves not convolute : | |
| 9. Awns twisted, glabrous : | |
| 10. Outer glumes horny, ridged | ISCHAEMUM |
| 10. Outer glumes chartaceous, not ridged | SEHIMA |
| 9. Awns not twisted, puberulous : | |
| 11. Spikelets clustered, sheathed by bracts | THEMEDA |
| 11. Spikelets clustered, not sheathed by bracts : | |
| 12. Spikelets in loose panicles | CHRYSOPOGON |
| 12. Spikelets in spikes : | |
| 13. Lemmas chartaceous | ORYZA |
| 13. Lemmas hyaline | HETEROPOGON |
| 7. Awns not prominent : | |
| 14. Spikes secund | MELANOCENCHRIS |
| 14. Spikes not secund : | |
| 15. Spikes uninterrupted : | |
| 16. Spikes more than 15 cm long | PEROTIS |
| 16. Spikes up to 15 cm long : | |
| 17. Leaves more than 15 cm long, flat | SETARIA |
| 17. Leaves up to 8 cm long, convolute | POGONATHERUM |
| 15. Spikes interrupted : | |
| 18. Leaves about 25 × 6 cm ; panicles dichotomous, more than 25 cm long | SORGHUM |
| 18. Leaves about 15 × 4 cm ; panicles not dichotomous, less than 15 cm long : | |
| 19. Panicles solitary | OPLISMENUS |
| 19. Panicles not solitary : | |
| 20. Spikes clustered : | |
| 21. Leaves with oil glands, scented when crushed | CYMBOPOGON |
| 21. Leaves without oil glands, not scented when crushed | APLUDA |
| 20. Spikes in loose panicles : | |
| 22. Awns about 2 cm long | CAPILLIPIDIUM |
| 22. Awns less than 0.5 cm long | ARUNDINELLA |
| 2. Spikelets not awned : | |
| 23. Inflorescences lustrous-pubescent : | |
| 24. Inflorescences of simple spikes | IMPERATA |
| 24. Inflorescences of dichotomous panicles : | |
| 25. Densely ciliate or barbate near ligules ; leaves generally convolute | SACCHARUM |
| 25. Glabrous near ligules ; leaves flat | PHRAGMITES |
| 23. Inflorescences not lustrous-pubescent : | |

- | | |
|---|----------------|
| 26. Common bracts broadly winged enveloping spikes | CHIONACHNE |
| 26. Common bracts not broad, nor enveloping spikes : | |
| 27. Grains alveolate | HACKELOCHLOA |
| 27 Grains smooth : | |
| 28. Inflorescences of cylindric, spiciform racemes | ROTTBOELLIA |
| 28. Inflorescences of compressed, racemes : | |
| 29. Spikelets pedicellate : | |
| 30. Leaves flat : | |
| 31. Callus thick, wollen | ERIOCHLOA |
| 31. Callus absent | CENTOTHECA |
| 30. Leaves convolute | SPOROBOLUS |
| 29. Spikelets sessile : | |
| 32. Rachises prominently flattened : | |
| 33. Spikes about 5 cm long : | |
| 34. Outer glumes acuminate or aristate | ACRACHNE |
| 34. Outer glumes orbicular | PASPALUM |
| 33. Spikes less than 3 cm long : | |
| 35 Inflorescences digitate | DACTYLOCTENIUM |
| 35. Inflorescences not digitate | DINEBRA |
| 32. Rachises not or faintly flattened : | |
| 36. Outer glumes marginally prominently pubescent | ALLOTEROPSIS |
| 36. Outer glumes not marginally pubescent : | |
| 37. Inflorescences of alternate, spiciform racemes : | |
| 38. Inflorescences glabrous | PASPALIDIUM |
| 38. Inflorescences puberulous : | |
| 39. Paleas smooth, shining, horny | ECHINOCHLOA |
| 39. Paleas rugulose, dull, slightly horny : | |
| 40. Leaf-sheaths pilose | UROCHLOA |
| 40. Leaf-sheaths glabrous | BRACHIARIA |
| 37. Inflorescences of solitary, secund spikes or dichotomous panicles or digitate : | |
| 41. Spikelets prominently compressed : | |
| 42. Inflorescences of panicles . . | ERAGROSTIS |
| 42. Inflorescences of solitary, secund spikes . . | ERAGROSTIELLA |
| 41. Spikelets not compressed . . | DIGITARIA |

DENDROCALAMUS Nees

Dendrocalamus strictus (Roxb) Nees in *Linnaea* 9 : 476, 1834 ; Gamble, in *Hook. f. FBI* 7 : 404, 1897 ; Brandis, *Indian Trees*, 675, 1906 ; Fischer, *FPM* 10 : 1858, 1934. *Bambos stricta* Roxb. *Pl. Corom.* 1 : 58, t. 80, 1796.

Trees, about 20 m tall, in dense clumps ; culms about 20 cm across, hollowed in centre, sheath auricled ; root-stocks branched. Leaves about 15 × 1.5 cm, ovate-acuminate, glabrescent, shortly petioled ; ligules short ; sheaths about 7 cm long, faintly puberulous. Spikelets about 1 cm long, several, in clustered heads 2 cm across, along branched panicles about 50 cm long ; flowers yellow ; glumes 0.5 cm long, ovate, puberulous without : paleas spinously apiculate. Grains 0.4 cm long, beaked at top, shining, puberulous at top and on beak.

Fl. & Fr. : Throughout the year during the flowering period.

World distribution : India and Malaysia.

Specimens examined : 'Kurnool', without date, *Beddome* s.n. ; 'Nallamalais', March 1883, *J. S. Gamble* 10949 ; Mantralakanama, Feb. 1887, *J. S. Gamble* 18698 ; Chelama, 9-12-1963, *Ellis* 18038 ; way to Upper Ahobilam, 27-11-1969, *Ellis* 32572.

BOTHRIOCHLOA Ktze.

1. Herbs ; leaves 0.4 cm broad ; lower glumes prominently dotted

B. pertusa

1. Shrubby ; leaves 0.8 cm broad ; lower glumes faintly dotted or not

B. glabra

Bothriochloa pertusa (Linn.) A. Camus in *Ann. Soc. Linn. Lyon* n. s. 76 : 164, 1930 (1931) ; Bor, *Grasses*, 109, 1960. *Holcus pertusus* Linn. *Mant. Pl. Alt.* 301, 1771. *Andropogon pertusus* Willd. *Sp. Pl.* 4 : 922, 1806 ; *Hook. f. FBI* 7 : 173, 1896 ; Rangachari, *South Indian Grasses*, 191, 1921. *Amphilophis pertusa* (Linn.) Nash ex Stapf in *Agric. News. W. Ind.* 15 : 179, 1916 ; Fischer, *FPM* 10 : 1731, 1934.

Decumbent herbs, about 30 cm high ; stems terete, glabrous, often rooting at nodes ; rootstocks woody. Leaves 5 cm long, linear-ovate ; ligules scarious, pubescent ; sheaths 5 cm long. Spikelets 0.5 cm long, in terminal, umbellate spikes 3 cm long ; peduncles 5 cm long, glumes 0.4 cm long, ovate, lower prominently dotted on the back, awned ; pedicels pubescent. Grains oblong, faintly flattened,

Fl. & Fr. : October-December.

World distribution : Tropics from Africa, India, Sri Lanka and Australia.

Specimen examined : Rollapenta, 16-8-1972, *Ellis* 42266.

Bothriochloa glabra (Roxb.) A. Camus in Ann. Soc. Linn. Lyon s.c. 76 : 164. 1930 (1931); Bor, Grasses, 107. 1960. *Andropogon glaber* Roxb. Fl. Ind. 1 : 271. 1820. *A. intermedius* R. Br. Prodr. 202. 1810; Hook. f. FBI 7 : 175. 1896. *Amphilophis glabra* (Roxb.) Stapf in Prain, Fl. Trop. Afr. 9 : 172. 1917.

Decumbent herbs, about 90 cm high; stems terete, glabrous, often rooting at nodes; rootstocks woody. Leaves 13 × 0.8 cm, linear-ovate, obtuse at base, sparsely hairy, pubescent near ligules; sheaths 10 cm long. Spikelets 0.3 cm long, in spikes 3 cm long, along panicles 14 cm long; rachises pubescent; glumes 0.3 cm long, oblong, with twisted awns, faintly dotted on back. Grains oblong.

Fl. & Fr. : October-January.

World distribution : Africa, India, Sri Lanka, China and Malaysia.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16931.

EULALIA Kunth

- | | |
|--|----------------------------|
| 1. Leaves densely crispately pubescent below ;
rootstocks covered by brown-pubescence | <i>E. phaeothrix</i> |
| 1. Leaves sparsely ciliate below ; rootstocks not
covered with brown-pubescence | . . . <i>E. trispicata</i> |

Eulalia phaeothrix (Hack.) O. Ktze. Rev. Gen. Pl. 2 : 775. 1891; Fischer, FPM 10 : 1715. 1934; Bor, Grasses, 156. 1960. *Pollinia phaeothrix* Hack. in DC. Monogr. Phan. 6 : 168. 1889; Hook. f. FBI 7 : 112. 1897.

Erect herbs, about 80 cm high; stems tufted, glabrous; roots fibrous, stocks covered by rusty-brown pubescence. Leaves about 30 × 0.6 cm, linear-acuminate, obtuse at base, crispately brown-pubescent below; ligules densely ciliate; sheaths about 10 cm long, curved-pubescent without. Spikelets 0.4 cm long, in digitately 3-5-spiked racemes about 12 cm long; rachises densely brown-pubescent; upper glumes 0.4 cm long, linear-ovate, densely brown-hirsute without; lemmas hyaline, slightly pubescent at top, upper with an awn 1 cm long. Grains oblong.

Fl. & Fr. : July-December.

World distribution : India and Sri Lanka, generally at high altitudes.

Specimen examined : Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32627.

Eulalia trispicata (Schult.) Henrard in *Blumea* 3 : 453. 1940 ; Bor, *Grasses*, 157. 1960. *Andropogon trispicatus* Schult. *Syst. Veg.* 2, Mant. 452. 1824. *Eulalia argentea* Brogn. in Duperr. *Voy. Coquille Bot.* 2(2) : 92. 1830. *E. tristachya* (Roxb.) O. Ktze. *Rev. Gen. Pl.* 2 : 775. 1891 ; Fischer, *FPM* 10 : 1715. 1891. *Andropogon tristachyus* Roxb. *Fl. Ind.* 1 : 256. 1820, (non H. B. K. 1816). *Pollinia argentea* (Brogn.) Trin. in *Bull. Sci. Acad. Petersb.* 1 : 71. 1836 ; Hook. f. *FBI* 7 : 111. 1897.

Erect herbs, about 1 m high ; stems glabrous ; roots fibrous. Leaves about 25 × 0.6 cm, linear-acuminate, sparsely hairy below ; ligules scarious ; sheaths up to 12 cm long, glabrous. Spikelets 0.5 cm long, in digitate racemes about 15 cm long ; rachises pubescent ; peduncles about 40 cm long ; glumes 0.5 cm long, linear-ovate, convolute, sparsely ciliate at base ; lemmas hyaline ; awns 2 cm long. Grains oblong.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Australia.

Specimen examined : Chelama, 5-7-1963, *Ellis* 16751.

ARTHRAOXON Beauv.

Arthraxon lancifolius (Trin.) Hochst. in *Flora* 39 : 188. 1856 ; Fischer, *FPM* 10 : 1729. 1934 ; Bor, *Grasses*, 100. 1960. *Andropogon lancifolius* Trin. in *Mem. Acad. Petersb.* ser. 6. 2 : 271. 1833. *Arthraxon microphyllum* (Trin.) Hochst. *loc. cit.* ; Hook. f. *FBI* 7 : 147. 1897. *Andropogon microphyllum* Trin. *loc. cit.* 275.

Diffuse, erect or decumbent herbs, about 20 cm high ; roots fibrous. Leaves up to 3 × 0.8 cm, ovate-acuminate, rounded at base, pilose ; ligules of tufted hairs ; sheaths 1 cm long, puberulous. Spikelets of 2 florets, one pedicelled, other sessile, in terminal, umbellate racemes 2 cm long ; peduncles about 5 cm long, puberulous ; lower glumes of sessile spikelets 0.2 cm long, puberulous ; upper glumes of sessile spikelets 0.1 cm long, micronulate ; pedicelled spikelets awnless. Grains linear.

Fl. & Fr. : July-November.

World distribution : Africa, India, Sri Lanka and Burma.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22165.

Remarks : A plant confined to moist deciduous forests, especially under the shade.

CHLORIS Sw.

1. Spikelets unilateral ; rachilla awned at base ;
glumes not awned
1. Spikelets bilateral ; rachilla not awned ; glumes awned

C. dolichostachya
C. barbata

Chloris dolichostachya Lagasca, Gen et Sp. Pl. 5. 1816 ; Bor, Grasses, 466. 1960. *C. incompleta* Roth, Nov. Pl. Sp. 60. 1821 ; Hook. f. FBI 7 : 290. 1897 ; Rangachari, South Indian Grasses, 258. 1921 ; Fischer, FPM 10 : 1838. 1934.

Erect herbs, about 1 m high ; stems glabrous ; roots fibrous. Leaves up to 40 × 0.8 cm, linear-acuminate, obtuse at base, scaberulous ; ligules ciliate ; sheaths 6 cm long, glabrous. Spikelets 0.5 cm long, unilateral, in digitate spikes up to 17 cm long ; peduncles up to 40 cm long ; rachilla hairy at base, awned slightly at top ; glumes 0.5 cm long, linear-ovate, hyaline, apiculate. Grains brown, 0.3 cm long, linear-oblong.

Fl. & Fr. : October-February.

World distribution : Afghanistan, India, Sri Lanka, China and Burma.

Specimen examined : Gundlabrahmeswaram, 24-10-1964; Ellis 22164.

C. barbata (Linn.) Sw. Fl. Ind. Occ. 1 : 200. 1797 ; Hook. f. FBI 7 : 292. 1896 ; Rangachari, South Indian Grasses, 264. 1921 ; Fischer, FPM 10 : 1838. 1934 ; Bor, Grasses, 465. 1960. *Andropogon barbatus* Linn. Mant. Pl. Alt. 302. 1771, (non Linn. 1759). *Chloris inflata* Link, Enum. Pl. Hort. Berol. 1 : 105. 1821.

Erect herbs, about 30 cm high ; stems glabrous, sometimes rooting at nodes. Leaves up to 20 cm long, linear, glabrous ; ligules small, ciliate ; sheaths about 10 cm long. Spikelets about 0.3 cm long, in terminal, digitately arranged spikes about 6 cm long, enclosed in buds by leaf-sheaths ; glumes 0.2 cm long, linear-elliptic, hyaline ; floral glumes densely hairy along margins above the middle, awned ; barren glumes 0.2 cm long, obcordate, awned. Grains oblong.

Fl. & Fr. : October-February.

World distribution : Pantropic.

Specimen examined : Chelama, 17-10-1964, Ellis 22066.

ARISTIDA Linn.

1. Glumes oblong, not bristly at top ; panicles loose
1. Glumes ovate, bristly at top ; panicles contracted

A. depressa
A. setacea

Aristida depressa Retz. Obs. Bot. 4 : 22. 1786 ; Fischer, FPM 10 : 1809. 1934 ; Bor, Grasses, 409. 1960. *A. adscencionis sensu* Hook. f. FBI 7 : 224. 1897, *p.p.* (non Linn.) ; Rangachari, South Indian Grasses, 223. 1921.

Erect herbs, about 30 cm high, tufted ; stems often decumbent, glabrous ; roots fibrous. Leaves 12 cm long, filiform, convolute at base ; ligules scarious ; sheaths 2 cm long, scarious. Spikelets several, in loosely branched panicles up to 15 cm long ; glumes blunt ; lower glumes awned ; lemmas keeled. Grains elongated.

Fl. & Fr. : Throughout the year.

World distribution : Tropical Africa, India, Sri Lanka and Burma.

Specimen examined : Chelama, 17-10-1964, *Ellis* 22072.

A. setacea Retz. Obs. Bot. 4 : 22. 1786 ; Hook. f. FBI 7 : 225. 1897 ; Rangachari, South Indian Grasses, 225. 1921 ; Fischer, FPM 10 : 1809. 1934 ; Bor, Grasses, 412. 1960.

Erect herbs, about 60 cm high ; stems glabrous ; roots fibrous. Leaves about 15 cm long, linear, convolute, glabrous ; ligules of tufted hairs ; sheaths about 5 cm long. Spikelets 2 cm long, in contracted panicles about 20 cm long ; lower glumes 1 cm long, awned, upper minutely 2-toothed ; lemmas not keeled. Grains elongate.

Fl. & Fr. : Almost throughout the year.

World distribution : Middle East, India and Sri Lanka.

Specimens examined : Ramanapenta, Gundlabrahmeswaram, 30-8-1917, *K. C. Jacob* 14973 ; Gundlabrahmeswaram, 20-7-1963, *Ellis* 16933 ; Jabakulavagu, Mahanandi, 22-8-1965, *Ellis* 25495 ; Gundlabrahmeswaram, 30-11-1969, *Ellis* 32679 ; Mahanandi, 23-8-1972, *Ellis* 42340.

ISCHAEMUM Linn.

Ischaemum rugosum Salisb. Icon. Stirp. Rar. 1 : t. 1. 1791 ; Hook. f. FBI 7 : 127. 1897 ; Rangachari, South Indian Grasses, 153. 1921 ; Fischer, FPM 10 : 1722. 1934 ; Bor, Grasses, 184. 1960.

Erect herbs, about 80 cm high ; stems erect, glabrous, pubescent at nodes ; roots fibrous. Leaves about 30 × 1 cm, linear-elliptic, acuminate at base, pilose to glabrescent ; ligules scarious, sparsely ciliate near them ; sheaths up to 13 cm long, membranous, extended at top into 2 linear appendages. Spikelets 0.7 cm long, in terminal spikes about 6 cm long, base ciliate ; outer glumes 0.6 cm long, horny, ovate, transversely ridged,

top scarious ; lemmas 2-lobed, hyaline, awned in between lobes ; awns about 3 cm long. Grains oblong.

Fl. & Fr. : August-February.

World distribution : India, Sri Lanka, Burma, China and Malaysia.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22160.

SEHIMA Forssk.

Sehima nervosum (Rottl.) Stapf in Prain, Fl. Trop. Africa, 9 : 36. 1917 ; Fischer, FPM 10 : 1724. 1934 ; Bor, Grasses, 218. 1960. *Andropogon nervosus* Rottl. apud Willd. in Verh. Ges. Naturf. Freund. Berlin, Neue Schr. 4 : 218. 1806. *Ischaemum laxum* R. Br. Prodr. 205. 1810 ; Hook. f. FBI 7 : 136. 1897 ; Rangachari, South Indian Grasses, 160. 1921.

Erect herbs, about 75 cm high, tufted ; stems glabrous ; rootstocks rather woody. Leaves about 25×0.5 cm, linear-acuminate, rounded at base, puberulous-scaberulous ; ligules densely pubescent ; sheaths about 10 cm long. Spikelets 0.8 cm long, in terminal spicate racemes about 12 cm long, pedicellate, sessile ; pedicels flat, laterally densely pubescent ; callus ciliate ; glumes 0.8 cm long, linear-elliptic, 2-lipped, obtuse at base, prominently nerved, inner rather scarious, pilose at top ; lemmas hyaline, awns up to 3 cm long, twisted. Grains oblong.

Fl. & Fr. : August-December.

World distribution : East Africa, India, Sri Lanka and Australia.

Specimens examined : 'Kurnool Hills', 1870, *R. H. Beddome* s.n. ; Diguvametta, 11-11-1906, *C. A. Barber* 8109 ; Chelama, 16-10-1964, *Ellis* 22055 ; Gundlabrahmeswaram, 29-11-1969, *Ellis* 32674.

THEMEDA Forssk.

Themeda triandra Forssk. Aegypt.-Arab. 123 & 178. 1775 ; Fischer, FPM 10 : 1746. 1934 ; Bor, Grasses, 254. 1960. *T. forsskalii* Hack. in DC. Monogr. Phan. 6 : 659. 1889, *p. p.* *T. imberbis* (Retz.) Cooke, Fl. Bombay Pres. 2 : 993. 1908. *Anthistiria imberbis* Retz. Obs. Bot. 3 : 11. 1783 ; Hook. f. FBI 7 : 211. 1897.

Erect, robust herbs, about 1 m high, tufted ; stems glabrous ; roots fibrous. Leaves about 20×0.3 cm, linear, scaberulous ; ligules scarious ; sheaths about 6 cm long, broadened. Spikelets 1 cm long, in fascicled racemes 4 cm long, along panicles about 15 cm long ; peduncles 4 cm long ; bracts about 5 cm long, enclosing spikelets, linear, generally

sparingly hirsute; callus pubescent; outer glumes 1.2 cm long, elliptic, hyaline along margins, pubescent or not at top; lemmas unequal, lower hyaline, upper stipitate, horny towards apices, geniculately awned above. Grains 0.5 cm long, linear-ovoid, shining.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22046; Ramana-penta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32624.

CYMOPOGON Spreng.

- | | |
|---|---------------------|
| 1. Spikelets fascicled and clustered | <i>C. coloratus</i> |
| 1. Spikelets loosely branched, not clustered : | |
| 2. Leaves obtuse at base, hairy-without and within near ligules | <i>C. flexuosus</i> |
| 2. Leaves subcordate at base, not hairy near ligules | <i>C. martinii</i> |

Cymbopogon coloratus (Nees) Stapf in Kew Bull. 1906 : 321. 1906; Fischer, FPM 10 : 1756. 1934; Bor, Grasses, 126. 1960. *Andropogon coloratus* Nees in Wt. Cat. 1706. 1833, *nomen nudum*. *A. nardus* Linn. var. *coloratus* (Nees) Hook. f. FBI 7 : 206. 1896. *A. nardus* var. *glomeratus* Hack. in DC. Monogr. Phan. 6 : 604. 1889.

Robust, erect herbs, about 1.5 m high; stems glabrous; rootstocks rhizomatous. Leaves 40 × 1.2 cm, linear-acuminate, rounded at base, scabrously puberulous below; ligules glabrous; sheaths about 8 cm long. Spikelets pale brown, about 1.5 cm long, in interrupted, clustered panicles about 12 cm long, geniculately awned; rachilla white-pubescent; bracts pubescent towards margins; lower glumes 0.5 cm long, 2-keeled, keels winged; lemmas hyaline, ciliate along margins. Grains oblong.

Fl. & Fr. : October-February.

World distribution : India.

Specimens examined : Diguva-metta, 9-11-1955, *S. C. Agrawal* 117; Chelama 7-12-1963, *Ellis* 17962.

C. flexuosus (Nees ex Steudel) Watson in Atkins. Gaz. N. W. Pr. India 392. 1882; Fischer, FPM 10 : 1756. 1934; Bor, Grasses, 126. 1960. *Andropogon flexuosus* Nees ex Steudel, Syn. Pl. Glum. 1 : 388. 1854. *A. nardus* Linn. subsp. *flexuosus* (Nees) Hack. in DC. Monogr. Phan. 6 : 603. 1889; Hook. f. FBI 7 : 207. 1897.

Erect herbs, about 1.5 m high; stems glabrous; rootstocks robust. Leaves about 50 × 1.5 cm, linear, obtuse at base, scaberulous, densely

hairy without and within near ligules ; ligules scarious, glabrous ; sheaths about 20 cm long. Spikelets 2 cm long, in spikes about 4 cm long, along panicles about 35 cm long ; rachilla pubescent ; glumes 0.3 cm long, linear-ovate, faintly 2-keeled without, faintly bifid at tips ; geniculate awns about 1.5 cm long ; glumes linear-ovate, glabrous ; lemmas scarious. Grains oblong.

Fl. & Fr. : Almost throughout the year.

World distribution : India, Burma and Thailand.

Specimens examined : 'Nallamalais', 21-9-1951, *V. S. Raman* 94233 ; Chelama, 7-7-1963, *Ellis* 16788.

Cymbopogon martinii (Roxb.) Wats. in Atkins. Gaz. N. W. Prov. India 392. 1882 ; Fischer, FPM 10 : 1840. 1934 ; Bor, Grasses, 129. 1960. *Andropogon martinii* Roxb. Fl. Ind. 1 : 280 1820. *A. shoenantus* Linn. var. *genuinus* Hack. in DC. Monogr. Phan. 6 : 609. 1889. *A. shoenantus* var. *martinii* (Roxb.) Hook. f. FBI 7 : 204. 1896.

Robust, erect herbs, about 1 m high ; stems glabrous ; roots rhizomatous. Leaves about 30×0.8 cm, linear-acuminate, subcordate or rounded at base, glabrous or puberulous ; ligules stiff, glabrous. Spikelets 1.5 cm long, in loose panicles about 12 cm long ; bracts faintly puberulous ; rachises densely pubescent ; outer glumes 0.3 cm long, linear, winged at apices, finely puberulous, 2-keeled within ; lemmas scabrous. Grains oblong.

Fl. & Fr. : October-February.

World distribution : India, Sri Lanka and Malaysia.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16925.

DACTYLOCTENIUM Willd.

Dactyloctenium aegyptium (Linn.) P. Beauv. Ess. Agrost. Expl. Pl. 15. 1812 ; Fischer, FPM 10 : 1840. 1934 ; Bor, Grasses, 489. 1960. *Cynosurus aegyptius* Linn. Sp. Pl. 72. 1753. *Dactyloctenium aegyptiacum* Willd. Enum. Pl. Hort. Berol. 1029. 1809. *Eleusine aegyptiaca* Desf. Pl. Atlant. 1 : 85. 1798 ; Hook. f. FBI 7 : 295. 1897 ; Rangachari, South Indian Grasses, 276. 1921.

Erect or prostrate herbs, about 40 cm long, rooting at nodes. Leaves about 12×0.5 cm, linear-acuminate, obtuse at base, sparsely pilose, scabrous along margins ; ligules small, scarious, faintly hairy along margins ; sheaths about 5 cm long. Spikelets 0.3 cm long, compressed,

in 2 rows, in 3-4-digitately arranged spikes about 2.5 cm long ; peduncles about 8 cm long ; rachilla produced beyond spikes ; glumes 0.2 cm long, keel slightly bent, excurrent ; lemmas scarious. Grains globose.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Bairani, Diguvametta, 7-8-1972, *Ellis* 42181.

CHRYSOPOGON Trin. *nom. cons.*

Chrysopogon fulvus (Spreng.) Chiov. Fl. Somalia 1 : 327. 1929 ; Bor, Grasses, 116. 1960. *Pollinia fulva* Spreng. Pugill. 2 : 10. 1815. *Andropogon montanus* Koenig ex Trin. in Spreng. Neue Entdeck. 2 : 93. 1821. *Chrysopogon montanus* Trin. ex Spreng. *Lc.* ; Fischer, FPM 10 : 1739. 1934. *C. monticola* (Roem. & Schult.) Haines in Indian For. 40. 495. 1914. *Andropogon monticola* Roem. & Schult. Syst. Veg. 2, Mant. 665. 1827 ; Hook. f. FBI 7 : 192. 1897 ; Rangachari, South Indian Grasses, 199. 1921. *A. assimilis* Steudel in Zoll. Syst. Verz. 58. 1854 ; Hook. f. FBI 7 : 179. 1897.

Erect herbs, about 60 cm high ; culms glabrous ; roots fibrous. Leaves about 18 × 0.5 cm, linear-acuminate, rounded at base, serrulately scabrous along margins ; ligules ciliolate along margins ; sheaths about 6 cm long. Spikelets 0.5 cm long, 2-flowered, in terminal panicles about 8 cm long ; peduncles about 30 cm long ; pedicels rufous-hairy ; upper glumes 0.5 cm long, shortly aristate ; lemmas geniculately awned. Grains linear.

Fl. & Fr. : October-February.

World distribution : South Africa, Middle East, India, Sri Lanka and Burma.

Specimens examined : Chelama, 17-10-1964, *Ellis* 22083 ; Bairani-dokku, Diguvametta, 12-8-1972, *Ellis* 42242.

ORYZA Linn.

1. Erect herbs, on dry land, about 80 cm high :
 2. Outer lemmas awned ; panicles compound *O. sativa*
 2. Outer lemmas not awned ; panicles simple *O. meyeriana* var. *granulata*
1. Decumbent herbs, on marshy land, about 1.5 m tall *O. minuta*

Oryza sativa Linn. Sp. Pl. 1 : 333. 1753 ; Hook. f. FBI 7 : 92. 1897 ; Fischer, FPM 10 : 1814. 1934 ; Bor, Grasses, 605. 1960.

Erect herbs, about 1 m high, tufted ; stems glabrous ; roots fibrous. Leaves about 60 × 1.5 cm, linear-acuminate, glabrous, scaberulous along margins ; ligules prominent, fimbriate. Spikelets 0.8 cm long, in terminal panicles about 15 cm long ; pedicels 0.2 cm long ; glumes 0.15 cm long, scarious, hairy along margins ; lemmas 0.8 cm long, oblong, horny, outer with awns about 3 cm long, inner rigidly apiculate, both hispidulous. Grains 0.5 cm long, oblong.

Fl. & Fr. : September-December.

World distribution : Africa, India, Sri Lanka and Malaysia.

Specimen examined : Elephant Walk, Gundlabrahmeswaram, 26-10-1964, *Ellis* 22209.

Remarks : Clearly an accidental occurrence due to man's activities in this part of the forest.

Oryza meyeriana (Zoll. & Mor.) Baill. Hist. Pl. 12 : 166. 1894 var. *granulata* (Watt) Duistermaat in Blumea 32 : 185. 1987. *O. granulata* Nees & Arn. ex [Steudel, Syn. 1 : 3. 1853] Watt, Dict. Econ. Prod. Ind. 5 : 500. 1891 ; Hook. f. FBI 7 : 93. 1896 ; Bor, Grasses, 604. 1960. *O. meyeriana* subsp. *granulata* Tateoka in Bot. Mag. Tokyo 75 : 460, f. 3a. 1962.

Erect herbs, about 80 cm high, tufted, densely gregarious ; stems glabrous ; rootstocks rather robust. Leaves up to 24 × 2 cm, linear, elliptic-acuminate, acute at base, finely scaberulous, especially along margins ; ligules scarious, glabrous, hairy without ; sheaths about 7 cm long. Spikelets 0.5 cm long, in terminal panicles 9 cm long, pedicellate ; glumes 2, less than 0.1 cm long ; lemmas 0.6 cm long, densely irregularly granulate, ovate, coriaceous. Grains oblong.

Fl. & Fr. : July-October.

World distribution : Africa, India and Australia.

Specimen examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16953.

Remarks : According to some *O. granulata* Nees et Arn. ex Steudel ex Hook. f is quite distinct from the Indonesian *O. meyeriana* Baillon. Recent taxonomical studies indicate that the Indian plant may be considered as a separate sub-species. (*Anon. Wealth of India* 7 : 113. 1966).

O. minuta Presl, Rel. Haenk. 1 : 208. 1830 ; Bor, Grasses, 605. 1960 ; Duistermaat in Blumea 32 : 179. 1987. *O. officinalis* Wall. ex Watt, Dict. Econ. Prod. 5 : 501. 1891. *O. malampuzhaensis* Krishnaswamy &

Chandrasekharan in Madras Agric. Journ. 45 : 471-472. 1958 ; Bor, *op. cit.* 606. *O. officinalis* subsp. *malampuzhaensis* Tateoka in Bot. Mag. Tokyo 75 : 422. 1962.

Perennial, decumbent herbs, about 1.5 m tall. Leaves 53×1.4 cm, linear, glabrous ; ligules with a fringe of fine hairs at apices. Spikelets about 0.6×0.3 cm, black when mature, in panicles about 43 cm long ; peduncles slightly woolly-pubescent at base, rest scabrous ; glumes minute ; lemmas slightly chartaceous ; lemmas awned, awns up to 3.6 cm long, sterile lemmas shorter than fertile, bristly over surface ; stamens 6 ; styles 2. Grain 0.4 cm long, brown, oblong.

Fl. & Fr. : September-November.

World distribution : Peninsular India.

Specimens examined : Way to Diguvametta, Gundlabrahmeswaram, 24-10-1964, *Ellis* 22158 ; Gundlakamma river, Gundlabrahmeswaram, 29-11-1969, *Ellis* 32665.

Remarks : The present collection of this species extends its distribution to the Eastern Ghats of peninsular India ; it is a new record. A new tetraploid species separable from *O. officinalis* by hairy ligules, longer spikelets and tetraploidy, treated as a subspecies by Tateoka (1962).

HETEROPOGON Pers.

Heteropogon contortus (Linn.) Beauv. ex Roem. & Schult. Syst. Veg. 2 : 836. 1817 ; Fischer, FPM 19 : 1743. 1934 ; Bor, Grasses, 163. 1960. *Andropogon contortus* Linn. Sp. Pl. 1045. 1753 ; Hook. f. FBI 7 : 199. 1897 ; Rangachari, South Indian Grasses, 207. 1921.

Erect herbs, about 80 cm high ; stems glabrous, pubescent at nodes ; rootstocks woody. Leaves up to 30×0.8 cm, linear-acuminate, obtuse at base, softly, sparsely ciliate, more ciliate near ligules ; ligules fimbriate, pubescent ; sheaths about 9 cm long, sparsely hirtellous. Spikelets 0.7 cm long, in terminal spikes up to 15 cm long ; rachises jointed ; peduncles about 15 cm long ; glumes 0.5 cm long, lower white-margined, hirsutely hairy from bulbous bases without, keeled within ; lemmas hyaline, softly pilose ; awns 9 cm long, pubescent. Grains oblong.

Fl. & Fr. : Throughout the year.

World distribution : Middle East, India, Sri Lanka and Malaysia.

Specimens examined : Diguvametta, 11-11-1906, *C. A. Barber* 8113 ; Chelama, 16-10-1964, *Ellis* 22026 ; Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32625.

MELANOCENCHRIS Nees

1. Herbs up to 10 cm high ; spikelets up to 6 *M. jacquemontii*
 1. Herbs more than 25 cm high ; spikelets more than 10 *M. monoica*

Melanocenchris jacquemontii Jaub. & Spach, Ill. Pl. Or. 4 : 36. 1851 ; Bor, Grasses, 473. 1960. *M. royleana* Nees ex Steudel, Syn. Pl. Glum. 1 : 218. 1854 ; Fischer, FPM 10 : 1832. 1934. *Gracilea royleana* (Nees) Hook. f. FBI 7 : 284. 1897 ; Rangachari, South Indian Grasses, 245. 1921.

Erect herbs, about 10 cm high, profusely tufted ; stems angular, grooved, faintly puberulous ; roots fibrous. Leaves about 3.5 cm long, linear, convolute, distantly, sparingly bristly along margins ; ligules pubescent ; sheaths about 2 cm long, hirtellous with bulbous bases ; spikelets 0.7 cm long, up to 6, in secund, terminal racemes 2.5 cm long ; peduncles 7 cm long ; glumes 0.7 cm long, linear-elliptic, aristate, outermost densely ciliate, inner hyaline ; lemmas hyaline, flat, 3-aristate. Grains oblong.

Fl. & Fr. : August-December.

World distribution : India.

Specimen examined : Chelama, 16-10-1964, *Ellis* 22061.

M. monoica (Rottl.) Fischer, FPM 10 : 1831. 1934 ; Bor, Grasses, 473. 1960. *Pommereulla monoica* Rottl. in Ges. Naturf. Fr. Berlin. Neue Schr. 4 : 218. 1807. *Gracilea nutans* Koenig ex Rottl. *loc. cit.* ; Hook. f. FBI 7 : 284. 1897 ; Rangachari, South Indian Grasses, 244. 1921.

Erect herbs, about 35 cm high, sparsely tufted ; stems angular, finely puberulous ; roots fibrous. Leaves about 8 × 0.3 cm, linear-acuminate, generally convolute, sparsely hirtellous along margins ; ligules pubescent ; sheaths 3 cm long, glabrous. Spikelets 1 cm long, more than 10, in terminal, secund spikes about 10 cm long ; peduncles up to 20 cm long ; outer glumes about 1 cm long, linear-acuminate, aristate, densely ciliate along margins, sparsely so without ; lemmas 0.5 cm long, broadly ovate, scarious, puberulous ; paleas horny, rather channelled. Grains oblong.

Fl. & Fr. : June-December.

World distribution : India and Sri Lanka, in dry localities.

Specimens examined : Diguvametta, 18-11-1969, *Ellis* 32487 ; Bairanidokku, Eastern Nallamalais, 12-8-1969, *Ellis* 42237.

PEROTIS Aiton

Perotis indica (Linn.) O. Ktze. Rev. Gen. Pl. 2 : 787. 1891 ; Fischer, FPM 10 : 1814. 1934 ; Bor, Grasses, 611. 1960. *Anthoxanthum indicum* Linn. Sp. Pl. 28. 1753. *Perotis latifolia* Aiton, Hort. Kew. 1 : 85. 1789 ; Hook. f. FBI 7 : 98. 1897 ; Rangachari, South Indian Grasses, 137. 1921.

Erect herbs, about 30 cm high ; stems tufted, glabrous ; rootstocks often stout. Leaves 4 × 0.8 cm, ovate, amplexicaule at base, distantly barbate along margins ; ligules scarious ; sheaths about 3 cm long, glabrous. Spikelets purplish, 0.3 cm long, in terminal spikes about 7 cm long ; rachises puberulous ; glumes 0.2 cm long, linear, convolute, keeled, puberulous, 2-awned at top ; lemmas linear, hyaline. Grains linear.

Fl. & Fr. : Throughout the year.

World distribution : South Africa, India and Sri Lanka.

Specimen examined : Diguvaletta, 17-11-1969, *Ellis* 32477.

SETARIA Beauv. *nom. cons.*

- | | | |
|--|----|------------------------|
| 1. Inflorescences cylindrical ; bristles faintly retrose ; leaves 0.5 cm broad | .. | <i>S. pallidifusca</i> |
| 1. Inflorescences not cylindrical ; bristles prominently retrose ; leaves more than 0.5 cm broad | .. | <i>S. verticillata</i> |

Setaria pallidifusca (Schum.) Stapf & Hubbard in Kew Bull. 1930 : 259. 1930 ; Fischer, FPM 10 : 1789. 1934 ; Bor, Grasses, 363. 1960. *Panicum pallidifuscum* Schum. Beskr. Guin. Pl. 58. 1827. *Setaria glauca* Beauv. Agrost. 51 : 178. 1812 ; Hook. f. FBI 7 : 78. 1897, *p.p.* ; Rangachari, South Indian Grasses, 110. 1921.

Erect herbs, up to 80 cm high, tufted ; stems glabrous, often rooting at nodes towards base ; roots fibrous. Leaves about 18 × 0.5 cm, linear-acuminate, obtuse at base, puberulous ; ligules pubescent ; sheaths glabrous. Spikelets 0.2 cm long, in terminal, solitary, cylindrical spikes about 5 cm long ; callus bristly ; rachises puberulous ; peduncles about 40 cm long ; outer glumes 0.1 cm long, scarious ; lower lemmas longer, scarious, upper horny, transversely rugose, enclosing grain. Grains oblong.

Fl. & Fr. : July-December.

World distribution : Pantropic, extending to warm temperates.

Specimens examined : 'Nallamalai', 26-9-1951, *V. S. Raman* 94230 ; Chelama, 9-7-1963, *Ellis* 16792 ; Chelama, 15-10-1964, *Ellis* 22024 ; way to Upper Ahobilam, 29-8-1965, *Ellis* 25569 ; Ahobilam, 23-11-1969, *Ellis* 32600 ; Mahanandi, 23-8-1972, *Ellis* 42334.

Setaria verticillata (Linn.) Beauv. Ess. Agrost. 51 ; 178. 1812 ; Hook. f. FBI 7 : 80. 1897 ; Rangachari, South Indian Grasses, 113. 1921 ; Fischer, FPM 10 : 1789. 1934 ; Bor, Grasses, 365. 1960. *Panicum verticillatum* Linn. Sp. Pl. ed. 2. 2 : 82. 1762.

Erect or decumbent herbs, about 1.5 m high, tufted ; stems glabrous ; roots rather thick. Leaves about 30 × 2 cm, linear-acuminate, acute or obtuse at base, softly sparsely pilose, scabrous along margins ; ligules scarious, fimbriate ; sheaths up to 10 cm long, glabrous. Spikelets 0.2 cm long, in spikes about 1.2 cm long, in terminal, closely knit racemes about 14 cm long ; rachises retrose puberulous, ending in long bristles ; peduncles 12 cm long ; outer glumes 0.1 cm long, ovate, inner longer ; outer lemma scarious, inner horny, transversely rugose, enclosing grains.

Fl. & Fr. : July-December.

World distribution : Pantropic and temperate.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22042 ; Pathalaganga, Srisailam, 25-3-1965, *Ellis* 23757 ; Upper Ahobilam, 29-8-1965, *Ellis* 25585 ; Diguvametta, 8-8-1972, *Ellis* 42201.

POGONATHERUM Beauv.

Pogonatherum paniceum (Lamk.) Hack. in Allg. Bot. Z. 12 : 178. 1906 ; Fischer, FPM 10 : 1714. 1934 ; Bor, Grasses, 202. 1960. *Saccharum paniceum* Lamk. Encycl. Meth. Bot. 1 : 595. 1785. *Pogonatherum saccharoideum* Beauv. Agrost. Expl. Pl. 9, t. 11, f. 7. 1812 ; Hook. f. FBI 7 : 141. 1897.

Erect herbs, about 20 cm high, tufted ; stems glabrous ; rootstocks thick. Leaves about 4.5 × 0.3 cm, linear-acute, rounded at base, scaberulous, convolute ; ligules ciliate ; sheaths 3 cm long, glabrous. Spikelets 0.1 cm long, in terminal spikes up to 3 cm long ; callus and pedicels ciliate ; glumes scarious ; lemmas hyaline, awned. Grains oblong.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Burma, China and Malaysia.

Specimen examined : Gundlakamma, Gundlabrahmeswaram, 1-4-1965, *Ellis* 23832.

SORGHUM Moench. *nom. cons.*

Sorghum halepense (Linn.) Pers. Syn. Pl. 1 : 101. 1805 ; Fischer, FPM 10 : 1735. 1934 ; Bor, Grasses, 222. 1960. *Holcus halepensis* Linn. Sp. Pl. 1047. 1753. *Andropogon halepensis* Brot. var. *halepensis* Stapf

in Hook. f. FBI 7 : 183. 1897, [var. *genuinus* (Hack.) Stapf]. *A. sorghum* (Linn.) Brot. var. *halepense* Hack. in DC. Monogr. Phan. 6 : 501. 1889.

Erect, marshy herbs, along streams, about 2 m high ; stems glabrous ; roots stoloniferous. Leaves about 75 × 6 cm, elliptic-acuminate, obtuse at base, glabrous, scaberulous along margins ; ligules densely pubescent ; sheaths 40 cm long, glabrous. Spikelets 0.5 cm long, cymose with 2 laterals pedicelled and central sessile, in terminal, whorled panicles about 40 cm long, joints densely pubescent ; glumes 0.5 cm long, of pedicelled linear-ovate, of sessile ovate and horned, softly pilose ; lemmas scarious, softly pilose, inner shortly, geniculately awned. Grains oblong.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimen examined : Bairani, Diguvaletta, 17-11-1969, *Ellis* 32479.

OPLISMENUS Beauv.

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|--|----|----------------------|
| 1. Leaves about 14 × 2.5 cm, scaberulous ; spikes up to 12 cm long | .. | <i>O. compositus</i> |
| 1. Leaves 5 × 1.2 cm, pilose on both surfaces ; spikes up to 1.3 cm long | .. | <i>O. burmannii</i> |

Oplismenus compositus (Linn.) Beauv. Ess. Agrost. 54 : 168 & 169. 1812 ; Hook. f. FBI 7 : 66. 1897 ; Fischer, FPM 10 : 1778. 1934 ; Bor. Grasses, 317. 1960. *Panicum compositum* Linn. Sp. Pl. 57. 1753.

Erect or decumbent herbs about 1 m high ; stems glabrous, sparsely ciliolate in grooves ; roots rather long, less fibrous. Leaves up to 14 × 2.5 cm, elliptic-acuminate, rounded at base, scaberulous. Spikelets 0.4 cm long, several, alternate in spikes up to 12 cm long ; rachises triquetrous, puberulous ; outer glumes 0.5 cm long, linear-ovate ; scarious towards margins, ciliate ; lemmas broadly ovate ; lemmas and paleas horny enclosing grains. Grains oblong.

Fl. & Fr. : August-January.

World distribution : Pantropic.

Specimens examined : Paradhara-Panchadhara, Srisailam, 21-10-1964, *Ellis* 22150.

O. burmannii (Retz.) Beauv. Ess. Agrost. 54. 168 & 169. 1812 ; Hook. f. FBI 7 : 68. 1897 ; Fischer, FPM 10 : 1778. 1934. *Panicum burmannii* Retz. Obs. 3 : 10. 1783.

Erect or decumbent herbs, about 50 cm high ; stems glabrous to sparingly pilose in grooves especially towards base, often rooting at nodes ; roots fibrous. Leaves up to 5 × 1.2 cm, elliptic-acuminate, obtuse at base, softly pilose on both surfaces ; ligules scarious, fimbriate-ciliate along margins ; sheaths up to 3 cm long, densely ciliate along margins, glabrous at top to sparsely ciliate with bulbous-based hairs at base ; roots fibrous. Spikelets 0.3 cm long, in distant spikes 1.3 cm long, in racemes 10 cm long ; peduncles 12 cm long ; rachises ciliate ; glumes 0.3 cm long, ovate, long-aristate, pilose, keeled ; lemmas unequal, aristate. Grains oblong, surrounded by horny paleas.

Fl. & Fr. : August-January.

World distribution : Tropics from Africa, India, China, Japan and Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17971 ; Chelama, 15-10-1964, *Ellis* 22025 ; Diguvametta, 16-11-1969, *Ellis* 32414.

APLUDA Linn.

Apluda mutica Linn. Sp. Pl. 82. 1753 ; Fischer, FPM 10 : 1750. 1934 ; Bor, Grasses, 93. 1960. *A. varia* Hack. Monogr. Andropog. in DC. Monogr. Phan. 6 : 196. 1889 ; Rangachari, South Indian Grasses, 171. 1921. *A. varia* subsp. *mutica* Hack. *loc. cit.* ; Hook. f. FBI 7 : 150. 1897.

Erect herbs, about 1.5 m high ; stems terete, glabrous. Leaves 30 × 1.5 cm, elliptic-acuminate, obtuse at base, sparingly pilose below, margins scabrous ; ligules pubescent ; sheaths 7 cm long. Spikelets 0.8 cm long, in compound panicles about 20 cm long, one sessile, two pedicellate, slightly falcate ; bracts ovate, apiculate, convolute ; lower glumes ovate, bicuspidate, upper 3-5-nerved ; lemmas hyaline, awned. Grains oblong, slightly flattened.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka, Malaysia, Australia and Pacific Islands.

Specimens examined : Diguvametta, 11-11-1906, *C. A. Barber* 1882 ; Chelama, 15-10-1964, *Ellis* 22002 ; Diguvametta, 19-11-1969, *Ellis* 32551.

CAPILLIPEDIUM Stapf

Capillipedium huegelii (Hack.) Stapf in Hook. Ic. t. 3085. 1922 ; Fischer, FPM 10 : 1730. 1934 ; Bor, Grasses, 111. 1960. *Andropogon huegelii* Hack. in DC. Monogr. Phan. 4 : 492. 1889 ; Hook. f. FBI 7 : 180. 1897. *A. schmidii* Hook. f. *loc. cit.*

Erect herbs, often suffrutescent, 1 m high; stems glabrous, nodes prominently bearded. Leaves 15×1.2 cm, linear-acuminate, acute at base, sparingly setose and puberulous beneath, serrulately scabrous along margins; ligules pubescent; sheaths 15 cm long. Spikelets of 2 florets, one pedicellate, the other sessile, in loose panicles 15 cm long; pedicels hairy; glumes 0.6 cm long, ovate-convolute, softly setose; upper lemmas spirally awned; stigmas plumose. Grains oblong, flattened.

Fl. & Fr. : September-January.

World distribution : India.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17949; Diguvametta 19-11-1969, *Ellis* 32545.

Remark : Panicles are scented when bruised.

ARUNDINELLA Raddi

- | | |
|---|---------------------|
| 1. Herbs up to 30 cm high; stems sparsely hairy; upper lemmas without setae | <i>A. pumila</i> |
| 1. Herbs about 1 m high; stems glabrous; upper lemmas with 2 setae | .. <i>A. setosa</i> |

Arundinella pumila (Hochst. ex A. Rich.) Steudel, *Syn. Pl. Glum.* 1: 114. 1854; Fischer, *FPM* 10: 1801. 1934; Bor, *Grasses*, 423. 1960. *Acratherum pumilum* Hochst. ex A. Rich. *Tent. Fl. Abyss.* 2: 414, t. 100. 1851. *Arundinella tenella* Nees ex Steudel, *op. cit.* 115.; Hook. f. *FBI* 7: 71. 1897.

Erect herbs, up to 30 cm high; stems sparsely hairy; roots fibrous. Leaves about 13×1.5 cm, elliptic-acuminate, acute at base, setose; ligules scarious, fimbriate; sheaths 16 cm long. Spikelets 0.4 cm long, 2-flowered, in panicles about 15 cm long; rachises slender; pedicels slender; outer glumes 0.2 cm long, glabrous; upper lemmas without setae. Grains oblong.

Fl. & Fr. : September-February.

World distribution : Western Africa, India, Sri Lanka and Burma.

Specimen examined : Gundlabrahmeswaram, 25-10-1964, *Ellis* 22202.

A. setosa Trin. *Gram. Panic.* 63. 1826; Hook. f. *FBI* 7: 70. 1897; Fischer, *FPM* 10: 1801. 1934; Bor, *Grasses*, 424. 1960 *A. capillaris* Hook. f. *FBI* 7: 74. 1896. *A. mutica* Nees ex Steudel, *Syn. Pl. Glum.* 1: 116. 1854; Fischer, *FPM* 10: 1801. 1934.

Erect herbs, about 1 m high; stems glabrous; roots rhizomatous. Leaves about 20×0.8 cm, ovate-acuminate, rounded at base, hirtellous with bulbous-based hairs; sheaths about 4.5 cm long, hirtellous. Spikelets 0.5 cm long, 2-flowered, in terminal panicles about 30 cm long; rachises angled, puberulous; upper flowers longer, pedicellate; outer glumes 3-nerved, bulbous-based hairs along nerves; ovary with 2 styles, comose at base. Grains cylindric, scaberulous at top.

Fl. & Fr. : October-January.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Chelama, 7-12-1963, *Ellis* 17961; Chetama, 10-12-1963, *Ellis* 18057; Chelama, 16-10-1964, *Ellis* 22031.

IMPERATA Cyril

Imperata cylindrica (Linn.) Beauv. Ess. Agrost. 165. 1812, var. *major* (Nees) C. E. Hubbard ex Hubbard & Vaughan, Grass. Maur. 96. 1940; Bor, Grasses, 170. 1960. *I. koenigii* (Retz.) Beauv. var. *major* Nees, Fl. Afr. Austr. 90. 1841. *I. cylindrica* var. *koenigii* (Retz.) Dur. & Schinz, Consp. Flor. Afr. 5 : 694. 1894; Fischer, FPM 10 : 1707. 1934. *I. arundinacea* Cyril, Pl. Rar. Neap. fasc. 2 : 26, t. 11. 1792; Hook. f. FBI 7 : 106. 1897.

Erect herbs, about 50 cm high; stems glabrous, densely ciliate near nodes; rootstocks robust, fibrous. Leaves about 30×1.8 cm, linear-acuminate, acuminate at base, glabrous; ligules scarious, densely ciliate near them; sheaths up to 18 cm long, glabrous. Spikelets about 0.8 cm long, in terminal, dense spikes about 18 cm long, densely silvery white ciliate on callus, pedicellate; glumes linear-elliptic, ciliate at tips; stigmas long, feathery. Grains oblong.

Fl. & Fr. : February-August.

World distribution : Pantropic.

Specimens examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16916 and *Ellis* 16952.

SACCHARUM Linn.

Saccharum spontaneum Linn. Mant. Pl. Ait. 183. 1771; Hook. f. FBI 7 : 118. 1897; Rangachari, South Indian Grasses, 149. 1921; Fischer, FPM 10 : 1709. 1934; Bor, Grasses, 214. 1960.

Robust, erect herbs, about 2 m high; stems glabrous, densely pubescent near nodes; rootstocks woody. Leaves about 50×0.5 cm,

linear-acuminate, obtuse at base, hirtellous along margins; ligules rather thick, pubescent at top; sheaths about 16 cm long, glabrous. Spikelets 0.3 cm long, in terminal panicles about 26 cm long; callus, rachises and pedicels densely ciliate; glumes 0.4 cm long, linear-ovate, scarious; lemmas scarious. Grains oblong.

Fl. & Fr. : August-February.

World distribution : Southern Europe, India, Sri Lanka and East Australia.

Specimens examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22182; Bairani Falls, Diguvametta, 17-11-1969, *Ellis* 32465.

PHRAGMITES Trin.

Phragmites karka (Retz.) Trin. ex Steudel, *Nom. Bot.* ed. 2, 2 : 324. 1841; Hook. f. *FBI* 7 : 304. 1897; Fischer, *FPM* 10 : 1807. 1934; Bor, *Grasses*, 416. 1960. *Arundo karka* Retz. *Obs. Bot.* 4 : 21. 1786.

Erect, marshy, suffrutescent herbs, up to 2 m high; stems stout, glabrous; roots rhizomatous. Leaves about 60 × 3 cm, linear-acuminate, obtuse to rounded at base, scaberulous; ligules pubescent; sheaths 20 cm long. Spikelets 0.8 cm long, in terminal, branched panicles 30 cm long; rachilla silky; outer glumes 0.2 cm long, inner 0.8 cm long; linear, scarious, keeled; lemmas linear, hyaline; callus silky hairy. Grains oblong.

Fl. & Fr. : March-December.

World distribution : Tropics from Africa, India, Sri Lanka, Burma, Japan and Australia.

Specimen examined : Bairani falls, Diguvametta, 17-11-1969, *Ellis* 32468.

CHIONACHNE R. Br.

Chionachne koenigii (Spreng.) Thw. *Enum. Pl. Zeyl.* 357. 1864; Fischer, *FPM* 10 : 1706. 1934; Bor, *Grasses*, 262. 1960. *Coix koenigii* Spreng. *Syst.* 1 : 239. 1825. *Polytoca barbata* (Roxb.) Stapf ex Hook. f. *FBI* 7 : 102. 1896; Rangachari, *South Indian Grasses*, 144. 1921.

Erect herbs, suffrutescent, about 2 m high; stems glabrous. Leaves about 40 × 1 cm, linear-acuminate, obtuse at base, scabrous-serrate along margins; ligules glabrous; sheaths about 10 cm long, glabrous. Spikelets 1 cm long, 2-flowered, in terminal spikes 3.5 cm long, enclosed in spathaceous bracts; glumes 0.5 cm long, convolute, scabrous along

margins at top ; lemmas similar. Grains compressed, enclosed in hardened lower glume.

Fl. & Fr. : Almost throughout the year.

World distribution : India, Sri Lanka and Malaysia.

Specimens examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16918 ; Gundlabrahmeswaram, 24-10-1964, *Ellis* 22168 ; Bairani Falls, Diguva-metta, 17-11-1969, *Ellis* 32472.

HACKELOCHLOA O. Ktze. *nom. cons.*

Hackelochloa granularis (Linn.) O. Ktze. *Rev. Gen. Pl.* 776. 1891 ; Fischer, *FPM* 10 : 1758. 1934 ; Bor, *Grasses*, 159. 1960. *Cenchrus granularis* Linn. *Mant. Alt.* 2 : 575. 1771. *Manisuris granularis* Linn. f. *Nov. Gram. Gen.* 40. 1779 ; Hook. f. *FBI* 159. 1897 ; Rangachari, *South Indian Grasses*, 180. 1921.

Erect herbs, about 50 cm high, tufted ; stems terete, sparsely barbate with bulbous-based hairs ; roots fibrous. Leaves 16 × 0.8 cm, linear-ovate, rounded at base, hirsute with bulbous-based hairs ; ligules densely hairy on fimbriate margin ; sheaths up to 4 cm long, sparsely barbate, pubescent along margin. Spikelets 0.3 cm long, of 2 types, in axillary and terminal spikes about 1 cm long ; peduncles about 3 cm long ; glumes 0.1 cm long, brown, margins white, chartaceous, keeled within, scaberulous along margin ; lemmas hyaline ; glumes of sessile, bisexual ones globose, scrobiculate. Grains globose.

Fl. & Fr. : July-December.

World distribution : India, Sri Lanka and Burma.

Specimens examined : 'Nallamalais Hills', 22-9-1951, *V. S. Raman s.n.* ; Ahobilam, 23-11-1969, *Ellis* 32598.

ROTTBOELLIA Linn. f. *nom. cons.*

Rottboellia exaltata Linn. f. *Nov. Gram. Gen.* 40, t. 1. 1779 ; Hook. f. *FBI* 7 : 156. 1897 ; Rangachari, *South Indian Grasses*, 175. 1921 ; Fischer, *FPM* 10 : 1759. 1934 ; Bor, *Grasses*, 206. 1960. *Manisuris exaltata* (Linn. f.) O. Ktze. *Rev. Gen. Pl.* 2 : 779. 1891.

Erect herbs, about 1.5 m high ; stems glabrous ; rootstocks robust. Leaves about 30 × 1.5 cm, linear-acuminate, rounded at base, scaberulous ; ligules pubescent ; sheaths sparingly hispid with bulbous-based hairs. Spikelets 0.5 cm long, in spiciform racemes about 12 cm long, in loose panicles about 50 cm long ; rachises fragile, break at joints having

concavities to hold spikelets; glumes 0.5 cm long, oblong, retuse at apices, incurved within; lemmas scarious. Grains oblong.

Fl. & Fr. : August-December.

World distribution : Tropics from Africa, India, Sri Lanka, Malaysia and Australia.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22041; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32621.

ERIOCHLOA Kunth

Eriochloa procera (Retz.) C. E. Hubbard in Kew Bull. 1930 : 256. 1930; Fischer, FPM 10 : 1767. 1934; Bor, Grasses, 312. 1960. *Agrostis procera* Retz. Obs. Bot. 4 : 19. 1786. *Eriochloa polystachya sensu* Hook. f. FBI 7 : 20. 1897, (*non* HBK, 1816); Rangachari, South Indian Grasses, 62. 1921. *E. ramosa* (Retz.) O. Ktze. Rev. Gen. Pl. 2 : 775. 1891. *Milium ramosum* Retz. Obs. Bot. 6 : 22. 1791.

Erect herbs, about 50 cm high; tufted; stems glabrous; roots fibrous. Leaves about 20 × 0.8 cm, ovate-acuminate, obtuse at base, glabrous; ligules pubescent; sheaths 7 cm long, glabrous. Spikelets 0.3 cm long, alternate, in spikes 6 cm long, along panicles about 17 cm long, pedicellate; callus thickened; peduncles about 20 cm long; rachises puberulous; upper glumes 0.3 cm long, ovate, softly pilose without, lower reduced, lemmas chartaceous; ovary reddish. Grains flattened.

Fl. & Fr. : August-February.

World distribution : Pantropic.

Specimen examined : Chelama, 8-12-1963, *Ellis* 18013.

CENTOTHECA Desv.

Centotheca latifolia (Osborn) Trin. Fund. Agrost. 141. 1820; O. Ktze. Rev. Gen. Pl. 2 : 765. 1891; Monod. Froideville in Blumea 19 : 59. 1971. *Holcus latifolius* Osborn. Dagb. Ostind. Resa, 247. 1757. *Centotheca lappacea* (Linn.) Desv. in Nonv. Bull. Soc. Philom. 2 : 189. 1810; Hook. f. FBI 7 : 332. 1897; Fischer, FPM 10 : 1848. 1934; Bor, Grasses, 457. 1960.

Erect herbs, about 1 m high; stems glabrous; roots fibrous. Leaves up to 15 × 3.5 cm, elliptic-acuminate, obtuse at base, transverse nervules between veins prominent beneath; ligules hirsute; sheaths about 7 cm long. Spikelets 0.5 cm long, 1-3-flowered, compressed, in terminal panicles about 22 cm long, shortly pedunculate; rachises puberulous;

glumes 0.2 cm long ; upper lemmas with deflexed, tubercled bristles ; styles 2. Grains ovoid.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka, China and Malaysia.

Specimens examined : Gundlabrahmeswaram, 30-3-1965, *Ellis* 23799 ; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32659.

Remarks : Monod, de Froideville (*op. cit.* p. 58) argues that Desvaux (1810) based his specific epithet on Linnaeus' name, not realising that *Holcus latifolius* Osb. was older. Trinius (1820) realised this and made new combination which he repeated in 1831. Froideville concludes, '...I therefore agree with Merrill (1933) that the type species should be called *C. latifolia* (Osb.) Trin.'

SPOROBOLUS R. Br.

- | | |
|---|-----------------------|
| 1. Spikelets 0.1 cm long ; leaf sheaths up to 8 cm long | <i>S. tenuissimus</i> |
| 1. Spikelets 0.3 cm long ; leaf sheaths more than 8 cm long | <i>S. wallichii</i> |

Sporobolus tenuissimus (Schrank) O. Ktze. *Rev. Gen. Pl.* 3 : 369. 1893 ; Bor, *Grasses*, 633. 1960. *Panicum tenuissimum* Schrank in *Denkscher. Bot. Ges. Regensb.* 2 : 26. 1822. *Sporobolus minutiflorus* (Trin.) Link, *Hort. Berol.* 1 : 88. 1827 ; Hook. f. *FBI* 7 : 248. 1897 ; Fischer, *FPM* 10 : 1817. 1934. *Vilfa minutiflora* Trin. *Diss. Bot.* 158. 1824.

Erect herbs, about 40 cm high, tufted ; stems glabrous ; roots fibrous. Leaves 20×0.3 cm, glabrous, often convolute ; ligules minute ; sheaths about 8 cm long, glabrous. Spikelets minute, in loose panicles 25 cm long ; pedicels capillary ; peduncles about 13 cm long ; callus glabrous ; glumes 0.1 cm long, oblong-orbicular, scarious ; lemmas longer, acute. Grains rather greyish, obovoid, flattened.

Fl. & Fr. : August-December.

World distribution : India and Sri Lanka.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16919.

S. wallichii Munro ex Trin. in *Journ. Bot.* 27 : 171. 1889 ; Hook. f. *FBI* 7 : 248. 1897 ; Fischer, *FPM* 10 : 1817. 1934 ; Bor, *Grasses*, 634. 1960.

Erect herbs, about 80 cm high ; stems glabrous ; roots fibrous. Leaves about 19×0.5 cm, linear, obtuse at base, flat or convolute,

glabrescent; ligules slightly fimbriate along margin; sheaths about 11 cm long, glabrous. Spikelets 0.2 cm long, in terminal panicles about 30 cm long; pedicels capillary, sinuate; peduncles about 25 cm long; outer glumes about half as long as the inner, oblong, inner 0.2 cm long, elliptic, both scarious; lemmas 0.2 cm long, elliptic, scarious. Grains ovoid, flattened, faintly rugose.

Fl. & Fr. : August-December.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, *Ellis* 22169.

ACRACHNE Wt. & Arn. ex Chiov.

Acrachne racemosa (Heyne ex Roem. & Schult.) Ohwi in Bull. Tokyo Sci. Mus. n. 18 : 1. 1947; Bor, Grasses, 487. 1960. *Eleusine racemosa* Heyne ex Roem. & Schult. Syst. Veg. 2 : 583. 1817. *E. verticillata* Roxb. Fl. Ind. 1 : 346. 1820; Hook. f. FBI 7 : 295. 1897; Fischer, FPM 10 : 1840. 1934. *Acrachne verticillata* (Roxb.) Lindley ex Chiov. in Ann. Inst. Bot. Rom. 8 : 361. 1908; Jain & Kotwal in Sci. & Cult. 26 : 191. 1960.

Erect herbs, up to 60 cm high; stems glabrous; roots fibrous. Leaves 23 × 0.8 cm, ovate-acuminate, rounded at base, scaberulous along margins; ligules hairy; sheaths about 6 cm long, glabrous to glabrescent. Spikelets about 0.5 cm long, 4-5-flowered, in spikes in whorled racemes 20 cm long, laterally compressed; glumes 0.2 cm long, broadly ovate, keeled on back, 3-nerved, each ending in an arista. Grains oblong, brown, transversely rugose.

Fl. & Fr. : June-August.

World distribution : Africa, India, Sri Lanka and Australia.

Specimens examined : Pecharla range, Nallamalais, 26-9-1951, *V. S. Raman* s.n.; Srisailam, 12-7-1963, Pathalaganga, *Ellis* 16833.

PASPALUM Linn.

Paspalum scrobiculatum Linn. Mant. Pl. 29. 1767; Hook. f. FBI 7 : 10. 1897; Rangachari, South Indian Grasses, 49. 1921; Fischer, FPM 10 : 1772. 1934; Bor, Grasses, 340. 1960.

Erect, marshy plants, about 40 cm high; stems glabrous; roots fibrous. Leaves 20 × 0.5 cm, linear-acuminate, glabrous; ligules ciliate; sheaths up to 15 cm long, often enclosing panicles. Spikelets 0.3 cm long, several, biseriate in digitate or racemose spikes about 8 cm long; glumes

0.3 cm long, orbicular-ovate, glabrous ; lemmas horny, enclosing grains. Grains oblong.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimens examined : 'Mityalapad near Nandial', 1855, *Beddome* s.n. ; Rudravaram, Sirvel, 7-8-1917, *Rangachari* s.n. ; Chelama, 8-11-1955, *S. C. Agrawal* 104 ; Chelama, 7-12-1963, *Ellis* 17969.

DINEBRA Jacq.

Dinebra retroflexa (Vahl) Panz. in Denkschr. Acad. Wiss. Munchen, 270, t. 12. 1814 ; Fischer, FPM 10 : 1841. 1934 ; Bor, Grasses, 491. 1960. *Cynosurus retroflexus* Vahl, Symb. 2 : 20. 1791. *Dinebra arabica* Jacq. Fragm. 77, t. 12, f. 1. 1807 ; Hook. f. FBI 10 : 297. 1897 ; Rangachari, South Indian Grasses, 279. 1921.

Erect herbs, about 40 cm high ; stems tufted ; roots fibrous. Leaves about 6×0.3 cm, linear ; ligules finely fimbriate ; sheaths 5 cm long. Spikelets 0.3 cm long, in deflexed spikes 1.5 cm long along racemes about 15 cm long ; rachises 4-angled ; glumes 0.4 cm long, ovate-acuminate, long-cuspidate, very finely puberulous ; lemmas 0.2 cm long, broadly ovate. Grains ovoid, trigonous.

Fl. & Fr. : Almost throughout the year.

World distribution : Africa, India and Sri Lanka.

Specimen examined : Srisailam, 4-12-1969, *Ellis* 32691.

ALLOTEROPSIS J. S. Presl ex C. B. Presl

Alloteropsis cimicina (Linn.) Stapf in Prain, Fl. Trop. Africa 9 : 487. 1919 ; Fischer, FPM 10 : 1766. 1934 ; Bor, Grasses, 276. 1960. *Milium cimicinum* Linn. Mant. Pl. Alt. 184. 1771. *Axonopus cimicinus* (Linn.) Beauv. Ess. Agrost. 12. 1812 ; Hook. f. FBI 7 : 64. 1897 ; Rangachari, South Indian Grasses, 108. 1921.

Erect or decumbent herbs, about 1 m high ; stems striate ; roots fibrous. Leaves 10×1.5 cm, ovate-lanceolate, distantly hirsute along margins ; sheaths up to 13 cm long, sparsely hirsute. Spikelets brown, 0.3 cm long, in terminal, umbellate spikes 13 cm long, articulate ; glumes upper 0.3 cm long, densely ciliate along margins, slightly aristate. Grains ovoid, flattened.

Fl. & Fr. : June-December.

World distribution : India, Sri Lanka, China, Burma and Malaysia.

Specimens examined : Chelama, 17-10-1964, *Ellis* 22071 ; Vishnunandi, Mahanandi, 21-8-1965, *Ellis* 25417 ; Mahanandi, 23-8-1972, *Ellis* 42337.

PASPALIDIUM Stapf

Paspalidium flavidum (Retz.) A. Camus in Lecomte, *Fl. Gen. de l. Indo-Chine* 7 : 419. 1922 ; Fischer, *FPM* 9 : 1774. 1934 ; Bor, *Grasses*, 333. 1960. *Panicum flavidum* Retz. *Obs. fasc.* 4 : 15. 1786 ; Hook. f. *FBI* 7 : 28. 1897 ; Rangachari, *South Indian Grasses*, 69. 1921.

Erect or decumbent marshy herbs, about 50 cm high ; stems glabrous ; roots fibrous. Leaves up to 22 × 0.8 cm, linear-acuminate, spathulate, rounded at base, scaberulous along margins ; ligules ciliate ; sheaths about 10 cm long, glabrous. Spikelets 0.3 cm long, in spikes about 2.5 cm long, in racemes up to 40 cm long ; glumes 0.2 cm long, broadly ovate, glabrous, scarious ; lemmas rather horny. Grains enclosed in horny lemmas and paleas.

Fl. & Fr. : Throughout the year.

World distribution : Tropics from Africa, India, Sri Lanka and Burma.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16754 ; Chelama, 17-10-1964, *Ellis* 22067.

ECHINOCHLOA Beauv.

Echinochloa colonum (Linn.) Link, *Hort. Berol.* 2 : 209. 1833 ; Fischer, *FPM* 10 : 1776. 1934 ; Bor, *Grasses*, 308. 1960. *Panicum colonum* Linn. *Syst. Nat. ed.* 10. 2 : 870. 1759 ; Hook. f. *FBI* 7 : 32. 1897 ; Rangachari, *South Indian Grasses*, 80. 1921.

Erect or decumbent, marshy herbs, about 40 cm high ; stems tufted, glabrous, often rooting at nodes. Leaves up to 20 × 0.8 cm, linear-acuminate, rounded at base ; ligules absent ; sheaths glabrous. Spikelets 0.3 cm long, ovate, biseriate, in spikes up to 2.5 cm long, along racemes 20 cm long ; rachises puberulous ; upper glumes 0.3 cm long, ovate, puberulous, lower shorter ; lemmas unequal, upper crustaceous, ovate, convex without, shining, lower scarious. Grains elliptic, flat on one side, convex on the other.

Fl. & Fr. : Throughout the year.

World distribution : Pantropic.

Specimens examined : Chelama, 9-7-1963, *Ellis* 16787 ; Maddipenta, Eastern Nallamalais, 11-8-1972, *Ellis* 42225.

UROCHLOA Beauv.

Urochloa panicoides Beauv. var. *pubescens* (Kunth) Bor, Grasses, 372. 1960. *U. pubescens* Kunth, Rev. Gram. 1 : 31. 1829. *U. panicoides* Beauv. Ess. Agrost. 53, t. 11. 1812 ; Fischer, FPM 10 : 1775. 1934, p.p. *P. javanicum sensu* Hook. f. FBI 7 : 35. 1897, (*non* Poir.) ; Rangachari, South Indian Grasses, 86. 1921.

Erect or decumbent herbs, about 50 cm high ; stems glabrous, nodes pubescent ; roots fibrous. Leaves about 9 × 1.5 cm, ovate-elliptic, rounded at base, crispate along margins, sparsely hirsute ; ligules pubescent ; sheaths 7 cm long, densely hirsute. Spikelets 0.5 cm long, in spikes about 4 cm long, in terminal racemes about 6 cm long ; rachillae flattened, puberulous ; outer glumes 0.15 cm across, orbicular, puberulous without, inner 0.5 cm long, ovate, prominently nerved, pubescent ; upper lemmas 0.5 cm long, enclosing inner, horny-rugose, cuspidate at apices. Grains oblong.

Fl. & Fr. : July-December.

World distribution : Pantropic.

Specimen examined : Diguvaletta, 6-8-1972, *Ellis* 42152.

BRACHIARIA Griseb.

Brachiaria ramosa (Linn.) Stapf in Prain, Fl. Trop. Africa 9 : 542. 1919 ; Fischer, FPM 10 : 1770. 1934 ; Bor, Grasses, 284. 1960. *Panicum ramosum* Linn. Mant. Pl. 1 : 29. 1767 ; Hook. f. FBI 7 : 36. 1897 ; Rangachari, South Indian Grasses, 89. 1921.

Erect or decumbent herbs, about 20 cm high ; culms puberulous ; roots fibrous. Leaves up to 15 × 1.5 cm, elliptic-acuminate, rounded at base, glabrous or glabrescent ; sheaths 8 cm long. Spikelets 0.3 cm long, in terminal, branched racemes 12 cm long ; rachises trigonous, grooved, puberulous, sparsely ciliate ; glumes of 2 type, outer smaller, orbicular, inner larger, ovate, puberulous. Grains ovate, transversely rugose.

Fl. & Fr. : May-August.

World distribution : Middle East and India.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16909.

ERAGROSTIS Beauv. *emend.* Reinchb.

1. Racemes whorled along panicles :
 2. Racemes spicate, close *E. diarrhena*
 2. Racemes dichotomously branched and loose :
 3. Spikelets about 7 ; ligules faintly fimbriate *E. japonica*
 3. Spikelets 10-12 ; ligules pubescent and ciliate near margin *E. pilosa*
1. Racemes not whorled, but dichotomously branched :
 4. Lemmas ciliolate along margins *E. tenella*
 4. Lemmas not ciliolate along margins :
 5. Spikes broadly ovoid, prominently compressed *E. unioloides*
 5. Spikes linear, not prominently compressed :
 6. Grains oblong ; glumes slightly greyish ; rachises puberulous *E. gangetica*
 6. Grains globose ; glumes pale green ; rachises glabrous *E. nutans*

Eragrostis diarrhena (Schult.) Steudel, Syn. Pl. Glum. 1 : 266. 1854 ; Fischer, FPM 10 : 1826. 1934 ; Bor, Grasses, 507. 1960. *Poa diarrhena* Schult. Syst. Veg. 2, Mant. 616. 1827. *P. diandra* Roxb. Fl. Ind. 1 : 337. 1820 (non R. Br. 1810). *Eragrostis interrupta sensu* Hook. f. (non Beauv.) var. *koenigii* Stapf ex Hook. f. FBI 7 : 316. 1897 ; Rangachari, South Indian Grasses, 294. 1921 ; Fischer, *loc. cit.* *E. interrupta sensu* Hook. f. var. *diarrhena* Stapf ex Hook. f. *loc. cit.*

Erect herbs, up to 1 m high, tufted ; stems glabrous ; roots fibrous. Leaves up to 18 × 0.5 cm, linear-acuminate, obtuse at base, finely puberulous ; ligules scarious, fimbriate at top ; sheaths about 9 cm long, glabrous. Spikelets 0.1 cm long, about 12, laterally compressed spikes about 0.4 cm long, in interrupted, whorled racemes 6 cm long, along panicles about 30 cm long ; rachises puberulous ; peduncles about 25 cm long ; glumes 0.1 cm long, oblong-obtuse, keeled on back ; lemmas similar to glumes, acuminate. Grains brown, small, obovoid.

Fl. & Fr. : August-December.

World distribution : Africa, India, Sri Lanka and Burma.

Specimens examined : Chelama, 8-11-1955, S. C. Agrawal 112 (ICAR Grassland Survey Scheme) ; Iskagundum riverside, Diguvametta, 19-11-1969, Ellis 32547.

E japonica (Thunb.) Trin. in Mem. Acad. Sci. Petersb. ser. 6. 1 : 405. 1831 ; Fischer, FPM 10 : 1826. 1837 ; Bor, Grasses, 509. 1960. *Poa japonica* Thunb. Fl. Jap. 51. 1784. *Eragrostis interrupta* (R. Br.) Beauv. var. *tenulissima* Stapf ex Hook. f. FBI 7 : 316. 1897.

Erect herbs, about 40 cm high ; diffusely tufted ; stems glabrous ; roots fibrous. Leaves up to 25×0.4 cm, linear-acuminate, puberulous ; ligules faintly fimbriate ; sheaths about 8 cm long, glabrous. Spikelets minute, about 7, 0.1 cm long, in whorled racemes 3 cm long, along panicles 25 cm long ; rachises angular, grooved, puberulous ; glumes small, ovate-oblong, unevenly apiculate at apices, scarious. Grains brown, minute, ovoid.

Fl. & Fr. : August-January.

World distribution : India and Sri Lanka, in rather dry localities.

Specimen examined : Chelama, 12-12-1963, *Ellis* 18074.

Eragrostis pilosa (Linn.) Beauv. Ess. Agrost. 71, 162, 175. 1812 ; Hook. f. FBI 7 : 323. 1897 ; Rangachari, South Indian Grasses, 305. 1921 ; Fischer, FPM 10 : 1827. 1934 ; Bor, Grasses, 512. 1960. *Poa pilosa* Linn. Sp. Pl. 68. 1753.

Erect herbs, about 40 cm high, tufted ; stems glabrous ; roots fibrous. Leaves about 18×0.5 cm, linear-acuminate, obtuse at base ; ligules pubescent, ciliate near margins ; sheaths about 6 cm long, glabrous. Spikelets 0.1 cm long, 10-12, in spikes 0.5 cm long, in whorled racemes about 12 cm long, along panicles about 25 cm long ; peduncles 15 cm long ; rachises sparsely puberulous ; glumes 0.1 cm long, ovate, faintly falcate, puberulous along margins and keel ; lemmas scarious. Grains reddish, oblong.

Fl. & Fr. : October-January.

World distribution : Subtropical and tropical Europe, India, Sri Lanka and Malaysia.

Specimen examined : Chelama, 9-7-1963, *Ellis* 16805.

E. tenella (Linn.) Beauv. ex Roem. & Schult. Syst. Veg. 2 : 576. 1817 ; Bor, Grasses, 513. 1960. *Poa tenella* Linn. Sp. Pl. 69. 1753. *Eragrostis plumosa* (Retz.) Link. Hort. Berol. 1 : 192. 1827 ; Fischer, FPM 10 : 1826. 1934. *Poa plumosa* Retz. Obs. Bot. 4 : 20. 1786. *Eragrostis amabilis* (Linn.) Wt. & Arn. ex Hook. & Arn. Bot. Beechey Voy. 251. 1838 ; Rangachari, South Indian Grasses, 295. 1921. *Poa amabilis* Linn. *op. cit.* 68. *E. tenella* var. *plumosa* (Retz.) Stapf ex Hook. f. FBI 7 : 315. 1897.

Erect or decumbent herbs, about 35 cm long ; tufted ; stems faintly angled, sparsely puberulous ; roots fibrous. Leaves about 5.5×0.4 cm, linear-acuminate, obtuse at base, slightly convolute, finely puberulous within ; ligules ciliate ; sheaths 3.5 cm long, finely puberulous. Spikelets

0.1 cm long, 6-9, in compressed spikes 0.3 cm long, along dichotomous racemes 12 cm long; peduncles 6 cm long; rachises angled, glabrous but for a few hairs near dichotomy; glumes 0.1 cm long, ovate; lemmas ciliolulate along margins. Grains brown, globose.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma.

Specimen examined : Bairani, Diguvametta, 17-11-1969, *Ellis* 32478.

Eragrostis unioides (Retz.) Nees ex Steudel, *Syn. Pl. Glum.* 1 : 264. 1854; Fischer, *FPM* 10 : 1826. 1934; Bor, *Grasses*, 515. 1960. *Poa unioides* Retz. *Obs. Bot.* 5 : 19. 1789. *Eragrostis amabilis sensu* Hook. f. *FBI* 7 : 317. 1897 (non Wt. & Arn. ex Hook. & Arn. 1838).

Erect, marshy herbs, about 45 cm high; stems glabrous; roots fibrous. Leaves about 10×0.5 cm, linear-ovate, obtuse at base, glabrous; ligules small, glabrous; sheaths glabrous. Spikelets 0.2 cm long, many, in flattened spikes 0.5 cm long, along panicles about 12 cm long; peduncles about 20 cm long; rachises angled, glabrous. Glumes 0.2 cm long, broadly ovate, compressed, scarious, 3-nerved; lemmas hyaline, puberulous along margins. Grains brownish-red, oblong.

Fl. & Fr. : August-November.

World distribution : India, Sri Lanka and Burma.

Specimens examined : Chelama, 8-12-1963, *Ellis* 18014; Chelama, 17-10-1964, *Ellis* 22065.

E. gangetica (Roxb.) Steudel, *Syn. Pl. Glum.* 1 : 266. 1854; Fischer, *FPM* 10 : 1826. 1934; Bor, *Grasses*, 508. 1960. *Poa gangetica* Roxb. *Fl. Ind.* 1 : 341. 1820. *Eragrostis stenophylla* Hochst. ex Miq. in *Verh. Konink. Nederl. Inst.* 3, 4 : 39. 1851, *p.p.* *E. elegantula* Nees ex Miq. *Anal. Bot. Ind.* 2 : 27. 1865; Hook. f. *FBI* 7 : 318. 1897.

Erect herbs, about 60 cm high, tufted; stems glabrous; roots rather thickly fibrous, often stilted. Leaves about 25 cm long, linear, convolute; ligules small, fimbriate, ciliate; sheaths 8 cm long, glabrous. Spikelets 0.2 cm long, about 12, in flattened spikes 0.5 cm long, in panicles up to 25 cm long; rachises angled, puberulous; glumes slightly greyish, compressed, ovate, puberulous, ciliolulate along margins; lemmas scarious, puberulous. Grains reddish-brown, oblong.

Fl. & Fr. : Throughout the year.

World distribution : India, Sri Lanka and Burma.

Specimens examined : Sunnipenta, Srisailam, 27-10-1964, *Ellis* 22130 ; Gundlakamma, Gundlabrahmeswaram, 1-4-1965, *Ellis* 23838 ; Bairani, Diguvametta, 7-8-1972, *Ellis* 42180.

Eragrostis nutans (Retz.) Nees ex Steudel, *Nom. Bot.* ed. 2. 563. 1840 ; Fischer, *FPM* 10 : 1826. 1934 ; Bor, *Grasses*, 511. 1960. *Poa nutans* Retz. *Obs. Bot.* 4 : 19. 1786. *Eragrostis stenophylla sensu* Hook. f. *FBI* 7 : 318. 1897, *p.p.* (non Hochst. 1851).

Erect, marshy herbs, about 45 cm high ; stems glabrous ; roots fibrous. Leaves about 20 × 0.3 cm, linear, glabrous ; ligules puberulous ; sheaths about 5 cm long. Spikelets 0.2 cm long, in branched spikes 0.5 cm long, along panicles about 12 cm long ; rachises glabrous. Glumes 0.2 cm long, greyish, ovate, glabrous ; lemmas slightly bent. Grains reddish, globose.

Fl. & Fr. : August-December.

World distribution : Tropical Africa, India, Sri Lanka and Burma.

Specimen examined : Chenchukunta ponds, Diguvametta, 18-11-1969, *Ellis* 32513.

ERAGROSTIELLA BOR

1. Leaves puberulous above, convolute
1. Leaves glabrous, not convolute

E. bifaria
E. brachyphylla

Eragrostiella bifaria (Vahl) Bor in *Indian For.* 66 : 270. 1940 et *Grasses*, 494. 1960. *Poa bifaria* Vahl, *Symb. Bot.* 2 : 19. 1791. *Eragrostis bifaria* (Vahl) Wt. & Steudel [*Nom. Bot.* ed. 2. 1 : 562. 1840 ex] *Syn. Pl. Glum.* 1 : 264. 1854 ; Rangachari, *South Indian Grasses*, 307. 1921 ; Fischer, *FPM* 10 : 1828. 1934. *E. coromandeliana* (Koenig ex Rottl.) Trin. in *Mem. Acad. Petersb.* vi. 1 : 415. 1831 ; Hook. f. *FBI* 7 : 326. 1897. *Poa coromandeliana* Koenig ex Rottl. in *Ges. Naturf. Fr. Berl. Neue Schrift.* 4 : 191. 1803.

Erect herbs, about 35 cm high ; culms tufted, glabrous, covered at base with persistent fibrous leaf-sheaths ; roots fibrous. Leaves 12 cm long, linear, convolute, puberulous above ; ligules long-ciliate ; sheaths 5 cm long, finely puberulous. Spikelets 0.2 cm long, compressed, in alternate spikes about 1 cm long, along racemes about 18 cm long ; peduncles up to 30 cm long ; rachises angled, puberulous ; glumes 0.2 cm long, ovoid, scarious and puberulous along margins ; lemmas 0.2 cm long, ovate-acuminate, falcate, finely puberulous along margins. Grains small, longitudinally faintly striate.

Fl. & Fr. : August-December.

World distribution : India and Burma, in dry localities.

Specimens examined : Gazulapalli, 30-8-1936, *K. C. Jacob* 32132 ; Diguvametta, 9-11-1955, *M. P. Guha* 115 (ICAR Grassland Survey Scheme) ; Sunnipenta, Srisailam, 27-10-1964, *Ellis* 22141 ; Mahanandi, 21-8-1965, *Ellis* 25424 ; Srisailam, 6-12-1969, *Ellis* 32712 ; Bairani, Diguvametta, 7-8-1972, *Ellis* 42178.

Eragrostiella brachyphylla (Stapf) Bor in Indian For. 66 : 270. 1940 et Grasses, 494. 1960. *Eragrostis brachyphylla* (Stapf ex Hook. f.) FBI 7 : 327. 1896 ; Fischer, FPM 10 : 1828. 1934.

Erect herbs, about 50 cm high ; culms tufted, glabrous, surrounded at base with persistent fibrous leaf-sheaths ; roots fibrous. Leaves 10 × 0.3 cm, linear-obtuse, obtuse at base, flat, glabrous ; ligules fimbriate, long-ciliate ; sheaths up to 8.5 cm long. Spikelets 0.2 cm long, in flattened spikes up to 1.5 cm long, along racemes 18 cm long ; peduncles 25 cm long ; glumes 0.2 cm long, ovate, scarious and puberulous along margins ; lemmas ovate, puberulous along margins. Grains ovoid, angled, obscurely reticulate.

Fl. & Fr. : August-December.

World distribution : India.

Specimens examined : Chelama, 4-7-1963, *Ellis* 16737 ; Chelama, 5-7-1963, *Ellis* 16746.

DIGITARIA Haller, *nom. cons.*

- | | | |
|---|----|----------------------|
| 1. Inflorescences of loose panicles | .. | <i>D. tomentosa</i> |
| 1. Inflorescences of digitate racemes : | | |
| 2. Pedicels hairy at top | .. | <i>D. stricta</i> |
| 2. Pedicels not hairy at top : | | |
| 3. Lower glumes present, of pedicellate spikelets densely hairy along margins | | <i>D. ciliaris</i> |
| 3. Lower glumes absent, upper glumes of both spikelets glabrate | .. | <i>D. longiflora</i> |

Digitaria tomentosa (Koenig ex Willd.) Henrad in Blumea 1 : 100. 1934 ; Hook. f. FBI 7 : 51. 1896 ; Bor, Grasses, 306. 1960. *Milium tomentosum* Koenig ex Willd. in Ges. Naturf. Fr. Berl. Neue Schr. 4 : 220. 1803. *Panicum subeglume* Trin. in Mem. Acad. Sci. Petersb. ser. 6. 3 : 292. 1834 ; Fischer, FPM 10 : 1765. 1934.

Erect herbs, about 50 cm high ; stems tufted, glabrous ; roots fibrous.

Leaves up to 15×1 cm, ovate, linear-acuminate, rounded at base, puberulous or glabrate, softly pilose; ligules scarious; sheaths 6 cm long, puberulous, setose along margins. Spikelets 0.2 cm long, in loose panicles about 15 cm long; pedicels about 1.5 cm long, filiform; peduncles up to 20 cm long; rachises slightly wavy; glumes absent; lemmas 0.2 cm long. Grains greyish-purple, ovoid.

Fl. & Fr. : August-January.

World distribution : "Endemic in Madras State" (Bor, *op. cit.* p. 307), meaning the present Tamil Nadu and Andhra Pradesh.

Specimen examined : Way to Pathalaganga, Srisailam, 20-10-1964 Ellis 22090.

Digitaria stricta Roth ex Roem. & Schult. Syst. Veg. 2 : 474. 1817; Bor, Grasses, 305. 1960. *D. royleana* (Nees ex Thwaites) Prain, Bengal Pl. 1182. 1903; Fischer, FPM 10 : 1765. 1934. *Paspalum royleanum* Nees ex Thwaites, Enum. Pl. Zeyl. 358. 1864; Hook. f. FBI 7 : 18. 1896.

Erect to decumbent herbs, about 50 cm high; stems tufted, striated. Leaves 14×0.3 cm, linear, glabrous; ligules scarious, hairy near attachment; sheaths glabrous. Spikelets 0.1 cm long, in sub-digitate to alternate racemes about 6 cm long; peduncles up to 30 cm long; rachises triquetrous; pedicels short, hairy at top; lower glumes absent, upper small, slightly hairy. Grains ovoid.

Fl. & Fr. : August-January.

World distribution : Tropics in India, Sri Lanka and Burma.

Specimen examined : Gundlabrahmeswaram, 24-10-1964, Ellis 22183.

D. ciliaris (Retz.) Koeler, Descr. Gram. Gallia & Germ. 27. 1802; Veldkamp in Blumea 21 : 32. 1973. *Panicum ciliare* Retz. Obs. 4 : 16. 1786. *Paspalum sanguinale* Lamk. var. *ciliare* Hook. f. FBI 7 : 15. 1896, *p. p.* *Digitaria adscendens* (HBK) Henrad in Blumea 1 : 92. 1934 et Monogr. *Digitaria* 9. 1950; Bor, Grasses 298. 1960. *D. sanguinalis* Scop. f. var. *ciliaris* Hook. f. ex Haines, Bot. Bihar & Orissa 5 : 1008. 1924. *D. fimbriata* Link, Hort. Berol. 1 : 226. 1827. *D. marginata* Link, Enum. Hort. Berol. 1 : 102. 1821; Fischer, FPM 10 : 1764. 1934. *D. fimbriata* var. *marginata* (Link.) Stapf in Fl. Trop. Africa 9 : 440. 1919, *p. p.*; Fischer, *loc. cit.*

Erect herbs, about 80 cm high; stems glabrous, often rooting at lower nodes. Leaves up to 25×0.8 cm, linear-ovate, rounded at base, sparsely strigose; ligules scarious; sheaths up to 10 cm long, sparingly strigose.

Spikelets 0.3 cm long, in digitate racemes about 12 cm long ; rachises triquetrous, slightly winged ; lower glumes 0.3 cm long, larger than inner, sparingly hairy along margins, of pedicellate flowers densely hairy along margins. Grains oblong.

Fl. & Fr. : July-January.

World distribution : Africa, India, Sri Lanka and Malaysia.

Specimen examined : Gundlabrahmeswaram, 20-7-1963, *Ellis* 16929.

Digitaria longiflora (Retz.) Pers. Syn. Pl. 1 : 85. 1805 ; Rangachari, South Indian Grasses, 59. 1921 ; Fischer, FPM 10 : 1765. 1934 ; Henrad, Monogr. *Digitaria*, 408. 1950 ; Bor, Grasses, 302. 1960 ; Veldkamp in *Blumea* 21 : 66. 1973. *Paspalum longiflorum* Retz. Obs. Bot. 4 : 15. 1786 ; Hook. f. FBI 7 : 17. 1896.

Erect herbs, about 40 cm high ; stems tufted, often creeping, striated, often rooting at nodes. Leaves up to 10×0.5 cm, linear-acuminate to ovate, sparingly pilose above ; ligules scarious ; sheaths up to 7 cm long, glabrous. Spikelets 0.1 cm long, in digitate racemes up to 9 cm long, shortly pedicellate ; rachises winged ; upper glumes 0.1 cm long, ovate, glabrate, lower absent. Grains ovoid.

Fl. & Fr. : August-November.

World distribution : Plains of India, Sri Lanka and Malaysia.

Specimen examined : Diguvaletta, 6-8-1972, *Ellis* 42156.

FERNS AND FERN-ALLIES

ACTINIOPTERIDACEAE

ACTINIOPTERIS Link

Actiniopteris radiata (Swartz) Link, Fil. Sp. Hort. Reg. Bot. Berol. Cult. 80. 1841 ; Bedd. Ferns of South India, t. 124. 1871. *Acrostichum dichotomum* Forssk. Fl. Aegypt.-Arab. 184. 1775. *A. dichotoma* (Forssk.) Kuhn, Bot. Zeit. 504. 1871 ; Bedd. Handb. 197. 1883.

Erect herbs, about 10 cm high.

Specimens examined : Chelama, 16-10-1964, *Ellis* 22058 ; Srisailam, 5-12-1969, *Ellis* 32699.

Remark : Plants of dry localities.

ADIANTACEAE

ADIANTUM Linn.

Adiantum caudatum Linn. Mant. Pl. Alt. 308. 1771 ; Bedd. Handb. 83. 1883.

Erect herbs, about 8 cm high.

Specimens examined : Chelama, 5-7-1963, *Ellis* 16759 ; Ahobilam, 28-8-1965, *Ellis* 25535 ; Diguva metta, 17-11-1969, *Ellis* 32456.

Remark : A common plant throughout the hills.

A. philippense Linn. Sp. Pl. 1094. 1753. *A. lunulatum* Burm. f. Fl. Ind. 235. 1768 ; Bedd. Handb. 83. 1883.

Erect or slightly decumbent herbs, about 12 cm high.

Specimens examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16935 ; Ramanapenta, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32653.

Remark : The plants are generally confined to moist deciduous forests.

ASPIDIACEAE

TECTARIA Cav.

Tectaria macrodonta (Fee) C. Christensen, Index Fil. Suppl. 3 : 181. 1934. *Sagenia macrodonta* Fee, Gen. Fil. 313, t. 24. 1852. *Aspidium cicutarium* Swartz, Schrad. Journ. 1800 : 36. 1801 ; Bedd. Handb. 220. 1883.

Erect herbs, about 15 cm high.

Specimen examined : Way to Ramanapenta, Gundlabrahmeswaram, 25-10-1964, *Ellis* 22204.

ATHYRIACEAE

ATHYRIUM Roth

Athyrium hohenackerianum (O. Ktze.) T. Moore *apud*. Bedd. *Handb. Suppl.* 37. 1892. *Asplenium hohenackerianum* O. Ktze. *Bot. Zeit.* 771. 1849.

Erect herbs, about 4 cm high.

Specimens examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16947 ; Ramanapenta, Gundlabrahmeswaram, 25-10-1964, *Ellis* 22206 ; Bakari-manachela, Gundlabrahmeswaram, 28-11-1969, *Ellis* 32647.

Remark : Plants of very moist localities.

CHEILANTHACEAE

CHEILANTHES Swartz, *nom. cons.*

Cheilanthes farinosa (Forssk.) Kaulf. *Enum. Fil.* 202. 1824 ; Bedd. *Handb.* 92. 1883. *Pteris farinosa* Forssk. *Fl. Aegypt.-Arab.* 187. 1775. *Aleuritopteris farinosa* (Forssk.) Fee, *Gen. Fil.* 153, t. 12 B f. 1. 1852.

Erect herbs, about 8 cm high. Fronds white beneath.

Specimens examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16942 ; Gundlabrahmeswaram, 27-10-1964, *Ellis* 22219 ; Gundlabrahmeswaram, 30-11-1969, *Ellis* 32683.

Remarks : Generally plants of moist localities, though often seen in drier localities.

C. tenuifolia (Burm. f.) Swartz, *Syn. Fil.* 129. 332. 1806 ; Bedd. *Handb.* 92. 1883. *Trichomanes tenuifolium* Burm. f. *Fl. Ind.* 237. 1768.

Erect herbs, about 4 cm high.

Specimen examined : Gundlabrahmeswaram, 25-10-1964, *Ellis* 22199.

Remark : Plants of wet localities.

NEPHROLEPIDACEAE

NEPHROLEPIS Schott

Nephrolepis cordifolia (Linn.) Presl, *Tent. Pterid.* 79. 1836 ; Bedd. *Handb.* 282. 1883. *Polypodium cordifolium* Linn. *Sp. Pl.* 1089. 1753.

Erect herbs, about 24 cm high.

Specimen examined: Ramanapenta, Gundlabrahmeswaram 25-10-1964, *Ellis* 22207.

Remarks: Generally plants are confined to banks of small, perennial streams under shade.

POLYPODIACEAE

LEPTOCHILUS Kaulf.

Leptochilus decurrens Bl. Enum. Pl. Jav. 206. 1828. *Paraleptochilus decurrens* (Bl.) Copel. Gen. Fil. 198, t. 7. 1947. *Gymnopteris variabilis* Bedd. Ferns Brit. Ind. t. 272. 1868 et Handb. 429. 1883.

Erect herbs, about 25 cm high; generally epiphytic.

Specimen examined: Gundlabrahmeswaram, 1-4-1965, *Ellis* 23833.

Remark: Plants of moist localities.

THELYPTERIDACEAE

CHRISTELLA Leveille emend. Holttum

Christella dentata (Forssk.) Brownsey & Jermy in Brit. Fern. Gaz. 10: 338. 1973; Holttum in Saldanha & Nicolson, Fl. Hassan Dt. 860. 1976. *Polypodium dentatum* Forssk. Fl. Aegypt.-Arab. 185. 1775. *Nephrodium molle sensu* Hook. Spec. Fil. 4: 67. 1862, *p.p.* *Cyclosorus parasiticus* (Linn.) Tardieu ex Tardieu & C. Christensen in Notul. Syst. (Paris) 7: 76. 1938. *Polypodium parasiticum* Linn. Sp. Pl. 1090. 1753. *Thelypteris dentata* (Forssk.) St. John in Amer. Fern Journ. 26: 44. 1936. *Cyclosorus dentatus* (Forssk.) Ching in Bull. Fan. Mem. Inst. Biol. 8: 206. 1938.

Erect herbs, about 40 cm high.

Specimens examined: Near waterfalls, Sunnipentavagu, Srisailam, 27-10-1964, *Ellis* 22142; Gundlabrahmeswaram, 28-11-1969, *Ellis* 32643.

Remark: Plants of very moist localities under shade.

LYGODIACEAE

LYGODIUM Swartz, *nom. cons.*

Lygodium flexuosum (Linn.) Swartz in Schrad. Journ. 1800(2): t 106. 1801; Bedd. Handb. 457. 1883. *Ophioglossum flexuosum* Linn. Sp. Pl. 1063. 1753.

Climbing herbs.

Specimens examined: Gundlabrahmeswaram, 20-7-1963, *Ellis* 16932 Gundlabrahmeswaram, 28-11-1969, *Ellis* 32639; Chinnamantrala, 17-8-1972, *Ellis* 42292.

Remarks : Restricted to moist deciduous forests, generally in the cleared forests.

PARKERIACEAE

CERATOPTERIS Brongn.

Ceratopteris thalictroides (Linn.) Brongn. in Bull. Soc. Philom. Paris 186 C. 1821 ; Bedd. Handb. 123. 1883. *Acrostichum thalictroides* Linn. Sp. Pl. 1070. 1753.

Aquatic herbs, in fairly fast moving streamlets.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16850.

Remark : Generally growing in moist deciduous forests.

MARSILEACEAE

MARSILEA Linn.

Marsilea quadrifolia Linn. Sp. Pl. 1099. 1753.

Aquatic or marshy plants, about 8 cm high.

Specimen examined : Srisailam, 13-7-1963, *Ellis* 16858.

OPHIOGLOSSACEAE

OPHIOGLOSSUM Linn.

Ophioglossum pedunculatum Desv. Berl. Mag. 5. 306. 1811 ; Holttum, Ferns of Malaya, 39. 1966 ; Carl Christensen, Index Fil. 471. 1973. *O. reticulatum* *quoad* Bedd. Handb. 465. 1883 ; Panigrahi & Dixit in Proc. nat. Inst. Sci. Ind. 35 : 257. 1969.

Erect herbs, about 6 cm high.

Specimen examined : Gundlabrahmeswaram, 21-7-1963, *Ellis* 16950.

SELAGINELLACEAE

SELAGINELLA Beauv. *nom. cons.*

Selaginella inaequalifolia (Hook. & Grev.) Spring, Bull. Acad. Brux. 10 : 145, no. 71. 1843 ; C. F. Reed, Mem. Soc. Broteriana 18 : 130. 1965-66. *Lycopodium inaequalifolium* Hook. & Grev. Enum. Fil. in Hook. Bot. Misc. 2 : 391. no. 139, 1831. *Lycopodioides inaequalifolia* (Hook. & Grev.) O. Ktze. Rev. Gen. Pl. 1 : 826. 1891.

Erect or decumbent, weak-stemmed herbs, about 7 cm high.

Specimen examined : Gundlabrahmeswaram, 27-10-1964, *Ellis* 22229.

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