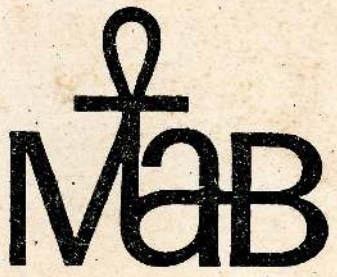

UNESCO: Man and the Biosphere National Committee for Sri Lanka

Publication No: 12

THE FAMILIES OF THE FLOWERING PLANTS OF SRI LANKA

PART I

Monocotyledons

by B. A. Abeywickrama

(University of Colombo, Colombo 3, Sri Lanka)

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The Families of the Flowering Plants of Sri Lanka

Part 1 - Monocotyledons

INTRODUCTION

The flora of Sri Lanka has about 2900 species of indigenous flowering plants and nearly 300 species of naturalised exotics. These species were placed by Trimen in his Hand-book to the Flora of Ceylon (1893 - 1900) in 149 families, which were then referred to as Natural Orders. A Key to the families by Sir Joseph Hooker was given in an appendix to the last volume of the Handbook.

Considerable progress has been made in botanical studies in the island since Trimen's Handbook was published but this work still remains the only available full comprehensive work on the local flora. A revision of the flora sponsored jointly by the University of Ceylon, the Department of Agriculture, Peradeniya, and the Smithsonian Institution, Washington, was initiated in 1967, and work on several families has already been completed.

In accordance with the more recent systems of classification, based on new interpretations of the phylogenetic relationships of the various genera, the number of families has been raised from 149 in Trimen's Handbook to a little over 200 in the present work. These families are arranged in the same sequence, with a few modifications, as in the author's "Checklist of the Flowering Plants of Ceylon (1959)". In the preparation of the Keys only the characters of the local species have been considered. Keys to the genera are provided for the smaller families, and short notes on some of the more common species are also included. For

more detailed information on the genera and the species reference should be made to the revised flora or to other monographic revisions of the families. The Monocotyledonous families are dealt with in this part (Part I).

The illustrations were drawn by Miss D.E.N.M. de Silva and Mrs. P.Arulgnanam under the author's directions. Some are from his original drawings; others are redrawn from various publications and in such cases the sources are indicated. The author wishes to record his sincere thanks to Dr. (Mrs.) Kanthi Abeynayake and Mrs. Lilani K. Senaratna for assistance in checking the Keys and to Miss D.E.N.M. de Silva and Mrs.P. Arulgnanam for the preparation of the illustrations.

List of Families

MONOCOTYLEDONS

1. Typhaceae
2. Pandanaceae
3. Aponogetonaceae
4. Potamogetonaceae
5. Ruppiaceae
6. Zannichelliaceae
7. Najadaceae
8. Alismataceae
9. Butomaceae
10. Hydrocharitaceae
11. Triuridaceae
12. Gramineae
13. Cyperaceae
14. Palmae
15. Araceae
16. Lemnaceae
17. Flagellariaceae
18. Xyridaceae
19. Eriocaulaceae
20. Bromeliaceae
21. Commelinaceae
22. Pontederiaceae
23. Juncaceae
24. Roxburghiaceae
25. Liliaceae
26. Smilacaceae
27. Amaryllidaceae
28. Hypoxidaceae
29. Agavaceae
30. Taccaceae
31. Trichopodaceae
32. Dioscoreaceae
33. Iridaceae
34. Musaceae
35. Zingiberaceae
36. Cannaceae
37. Marantaceae
38. Burmanniaceae
39. Thismiaceae
40. Apostasiaceae
41. Orchidaceae

THE FAMILIES OF THE FLOWERING PLANTS OF SRI LANKA

I. MONOCOTYLEDONS

Plants mostly herbaceous; a few are woody and are shrubs or trees. Leaves simple except in some aroids and palms. Veins usually parallel. Vascular bundles of stem, as seen in a transverse section, are usually scattered and not arranged in a ring. Flowers usually trimerous. Embryo-monocotyledonous.

Key to the Families

1.	Plants woody; leaves large, palmately or pinnately lobed or divided	Palmae (14)*
	Plants herbaceous, or if woody, with simple leaves.	2
2.	Perianth absent, or minute, or reduced to scales, setae or lodicules	3
	Perianth present and distinct	12
3.	Flowers in spikes; in axils of dry, chaffy, imbricating bracts	4
	Flowers not in spikes, or if in spikes not in axils of dry imbricating bracts	5
4.	Leaves sheathing at base, sheaths closed; anthers basifixed	Cyperaceae (13)
	Leaves with sheaths open on one side; anthers versatile	Gramineae (12)
5.	Plants aquatic, floating or submerged	6
	Plants epiphytic, terrestrial, or growing in marshes	10
6.	Plants free-floating on surface of water	7
	Plants submerged	8

*The numbers in brackets refer to the serial numbers given to the families in the text.

7.	Plants very small, stemless, frond-like	Lemnaceae (16)
	Plants with distinct stems; leaves in rosettes	Araceae (15)
8.	Leaves with dentate or serrate margins	Najadaceae (7)
	Leaves filiform or with entire margins	9
9.	Flowers bisexual	Ruppiaceae (5)
	Flowers unisexual	Zannichelliaceae (6)
10.	Inflorescence a naked, cylindrical spike; spathes absent	Typhaceae (1)
	Inflorescence a spadix; one or more spathes present	11
11.	Spathe single	Araceae (15)
	Spathes several	Pandanaceae (2)
12.	Ovary superior	13
	Ovary inferior or half-inferior	30
13.	Flowers in cone-like or capitulum-like heads; in axils of imbricating bracts	14
	Flowers not in heads as above	15
14.	Flowers unisexual	Eriocaulaceae (19)
	Flowers bisexual	Xyridaceae (18)
15.	Carpels free	16
	Carpels fused	20
16.	Each carpel with a single ovule	17
	Each carpel with 2 or several ovules	19
17.	Plants saprophytic; leaves much reduced or absent	Triuridaceae (11)
	Plants not saprophytic; normal leaves present	18
18.	Perianth uniseriate	Potamogetonaceae (4)
	Perianth biseriate; outer segments sepaloid	Alismataceae (8)

19.	Leaves aerial	Butomaceae (9)
	Leaves floating or submerged	Aponogetonaceae (3)
20.	Perianth segments 2+2; stamens 4	Roxburghiaceae (24)
	Perianth segments 3, or 3+3; stamens 2,3 or 6	21
21.	Outer perianth segments sepaloid, inner petaloid	Commelinaceae (21)
	All perianth segments more or less similar	22
22.	Flowers unisexual	23
	Flowers bisexual	24
23.	Plants climbing; leaves with tendrils at base	Smilacaceae (26)
	Plants not climbing; tendrils absent	Flagellariaceae (17)
24.	Leaf apex ending in a tendril	25
	Leaf apex not ending in a tendril	26
25.	Leaf sheathing at base; flowers small, white	Flagellariaceae (17)
	Leaf amplexicaul; flowers large; yellow, orange or red	Liliaceae (25)
26.	Flowers in scapose umbels	Amaryllidaceae (27)
	Flowers not in scapose umbels	27
27.	Flowers actinomorphic	28
	Flowers zygomorphic	Pontederiaceae (22)
28.	Perianth segments leathery	Juncaceae (23)
	Perianth segments fleshy or membranous	29
29.	Plants terrestrial	Liliaceae (25)
	Plants aquatic	Pontederiaceae (22)
30.	Plants aquatic; leaves floating or submerged	Hydrocharitaceae (10)
	Plants epiphytic or terrestrial	31

31.	Flowers with only 1 or 2 fertile stamens	32
	Flowers with 3 or more fertile stamens	36
32.	Fertile stamen single; flowers mostly zygomorphic or irregular	33
	Fertile stamens 2; flower actinomorphic	Apostasiaceae (40)
33.	Stamen fused to style forming a gynandrium; petaloid staminodes absent	Orchidaceae (41)
	Stamens not fused as above; petaloid staminodes often present	34
34.	Anther 2-locular; sepals often fused to form a tube	Zingiberaceae (35)
	Anther 1-locular; sepals free or connivent at base	35
35.	Each loculus of ovary with a single ovule	Marantaceae (37)
	Each loculus with several ovules	Cannaceae (36)
36.	Ovary half-inferior	Liliaceae (25)
	Ovary fully inferior	37
37.	Ovary 1-locular	38
	Ovary 3-locular	39
38.	Plants 5 to 10 cm. high, saprophytic	Thismiaceae (39)
	Plants much larger, autotrophic	Taccaceae (3)
39.	Anthers with connectives appendaged	40
	Anthers with no appendages on connectives	41
40.	Each loculus with 2 ovules	Trichopodaceae (31)
	Each loculus with several ovules	Burmanniaceae (38)
41.	Perianth with outer segments sepaloid	42
	Perianth with all segments petaloid	43
42.	Plants large, tree-like; petal single	Musaceae (34)
	Plants smaller, Petals 3	Bromeliaceae (20)
43.	Plants climbing; flowers unisexual	Dioscoreaceae (32)
	Plants not climbing; flowers bisexual	44

44.	Stamens 3	Iridaceae (33)
	Stamens 6	45
45.	Flowers terminal on a scape; solitary or in umbels	Amaryllidaceae (27)
	Flowers not as above	46
46.	Leaves thick, often fleshy; surface not plicate	Agavaceae (29)
	Leaves not thick, surface plicate	Hypoxidaceae (28)

DESCRIPTIONS OF FAMILIES

1. TYPHACEAE (T.F.C. 4:342)*

Aquatic or marsh herbs with short erect stems arising from creeping rhizomes. Leaves mostly radical, 2-ranked, sheathing at base; Lamina simple, elongate-linear, somewhat thick and fleshy.

Inflorescence a pedunculate, open, cylindrical spike with densely crowded flowers; bracts absent. Flowers unisexual; perianth absent but an investment of hairs and spathulate scales often present. Male flowers in upper part of spike; stamens 2 to 5. Female flowers lower down, ovary 1-locular; ovule single and pendulous. Fruit dry. Seed endospermous.

Typha, with one species, T. angustifolia L. in ponds and marshes, mainly in the dry zone.

2. PANDANACEAE (T.F.C. 4:338)

Terrestrial or marsh plants with erect or climbing stems; mostly woody. Leaves spirally arranged, sheathing at base, lamina simple, elongate-linear, often spinulose along margins and underside of midrib.

Inflorescence a spadix with several spathes. Flowers unisexual; male and female in separate spadices. Perianth absent. Male flower with numerous, free or connate stamens. Female flower sometimes with staminodes; ovary 1-locular; free, or fused to adjacent ovaries to form clusters; ovules 1 to several in each loculus. Fruit a drupe or berry. Seeds small, endospermous.

* Figures refer to volume and page of Trimen's Flora of Ceylon.

EXPLANATIONS OF PLATES

PLATE I.

Fig. 1. Typha angustifolia L. (Typhaceae)

a. Plant, x 1/5.
b. Spike, x 1/5.
c. Staminate flower, x5.
d. Pistillate flower, x5.
e. L.S. of ovary. x10.

Fig. 2. Pandanus tectorius Soland. (Pandanaceae)

a. Plant, x 1/20.
b. Part of male inflorescence (reduced).
c. Male flower, x3.
d. Fruit cluster, x 1/10.
e.f. Separate fruits, each formed from several fused carpels, as seen from apical end.
g. A single fruit, (side view).

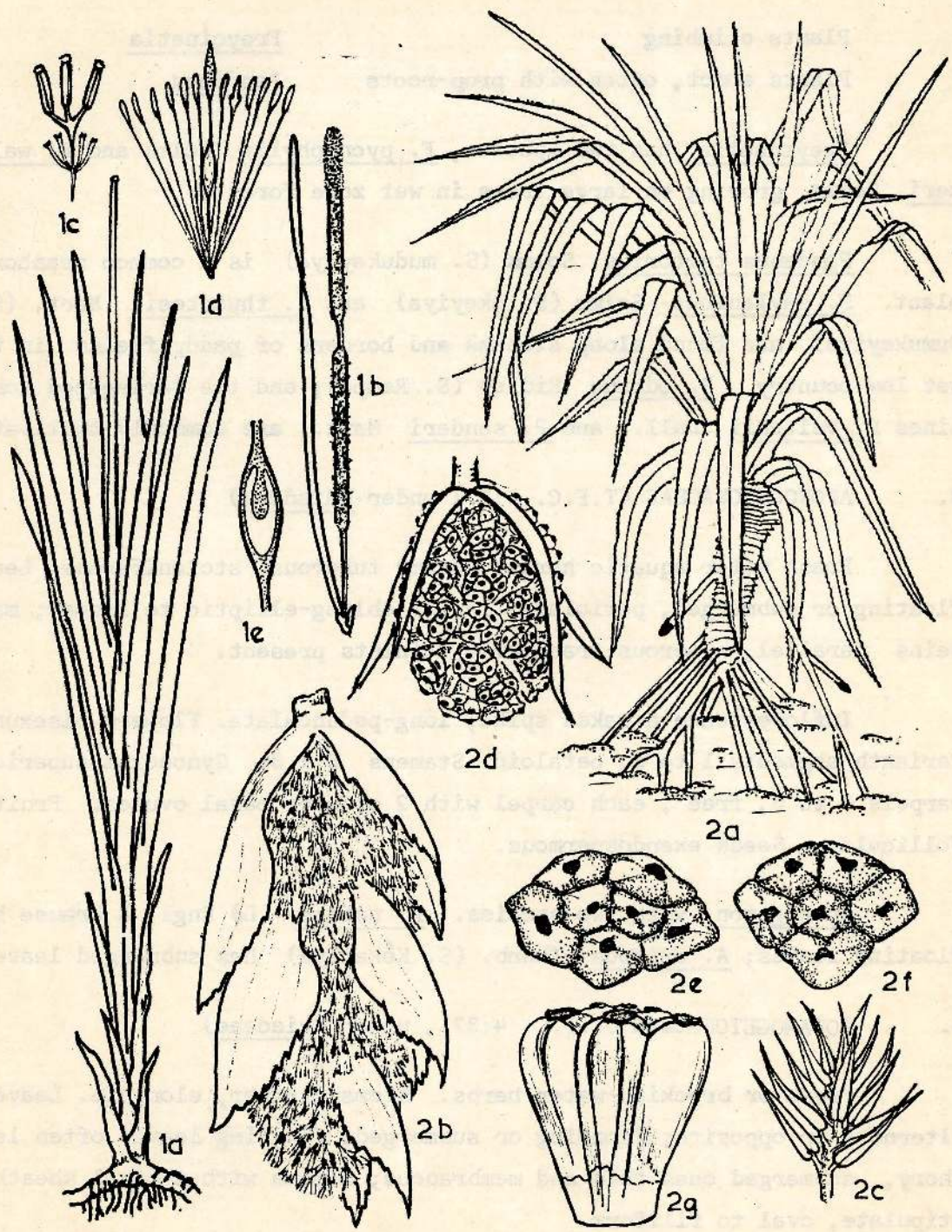

PLATE I

Plants climbing	Freycinetia
Plants erect, often with prop-roots	Pandanus

Freycinetia has two species, F. pycnophylla Solms and F. walkeri Solms, growing on large trees in wet zone forests.

Pandanus tectorius Solms (S. mudukeyiya) is a common seashore plant. P. ceylanicus Solms (S. okeyiya) and P. thwaitesii Mart. (S. Dumukeyiya) are found along streams and borders of paddy fields in the wet low country. P. odorus Ridley (S. Rampe); and the variegated screw-pines P. veitchii Dall. and P. sanderi Mart. are commonly cultivated.

3. APONOGETONACEAE (T.F.C. 4:371 under Naiadeae)

Fresh water aquatic herbs. Stems tuberous, stoloniferous. Leaves floating or submerged, petiolate; lamina oblong-elliptic to linear; main veins parallel, numerous transverse veinlets present.

Inflorescence a naked spike; long-pedunculate. Flowers bisexual. Perianth segments 1 to 3, petaloid. Stamens 3 + 3. Gynoecium superior; carpels 3 to 6, free ; each carpel with 2 or more basal ovules. Fruit follicular. Seeds exendospermous.

Aponogeton with two species. A. natans (L.) Engl. & Krause has floating leaves; A. crispus Thunb. (S. Kékatiya) has submerged leaves.

4. POTAMOGETONACEAE (T.F.C. 4:371, under Naiadeae)

Fresh or brackish-water herbs. Stems slender, elongate. Leaves alternate or opposite; floating or submerged; floating leaves often leathery, submerged ones thin and membranous; lamina with a basal sheath, stipulate, oval to filiform.

Inflorescence spicate, pedunculate, axillary or terminal. Flowers actinomorphic, bisexual. Perianth segments 4, uniseriate; segments free, valvate, rounded, clawed at base. Stamens 4, inserted on claws of perianth segments. Gynoecium superior, carpels 4, free; each carpel with a single ovule. Fruit indehiscent. Seed exendospermous.

Potamogeton with 3 local species, of which P. pectinatus L. is common in some coastal lagoons.

5. RUPPIACEAE (T.F.C. 4:371, under Naiadeae)

Brackish water herbs. Stems slender, much branched. Leaves alternate or opposite, submerged, sheathing at base, filiform.

Inflorescence a small, pedunculate, 2-flowered spadix; bracts absent. Flowers small, bisexual. Perianth absent. Stamens 2, opposite each other; filaments very short. Gynoecium of 4 free carpels, each with a single pendulous ovule. Fruit indehiscent, becoming long-stalked as it matures. Seed exendospermous.

Ruppia, with one species R. maritima L. in coastal lagoons.

6. ZANNICHELLIACEAE (T.F.C. 4:371 under Naiadeae)

Fresh-, brackish-, or salt-water herbs. Rhizomes slender, creeping. Leaves submerged; alternate, or opposite, or crowded at the nodes; sheathing at the base, sheath often ligulate at apex; lamina simple, linear to oval.

Inflorescence axillary and cymose, or flowers solitary. Flowers very small, unisexual, Perianth absent. Male flower with 2 stamens. Female flower with 2 free carpels, each with a single pendulous ovule. Fruits indehiscent. Seeds exendospermous.

PLATE II

Fig. 3. Aponogeton crispus Thunb. (Aponogetonaceae)

a. a small plant, x 1/2.
b. Inflorescence, x 1/2.
c. Flower, x 5.
d. Floral diagram and Formula.
e. Fruits, x 5.

Fig. 4. Potamogeton spp. (Potamogetonaceae)

a. P. pectinatus L., Plant x 1/2 (after Muenscher).
b. P. perfoliatus L. Plant x 1/2 (after Muenscher).
c. Potamogeton sp. Flower.
d. Perianth segment and stamens.
e. Carpels.
f. L.S. carpel.
g. L.S. of seed.
h. Floral diagram.

(c. - g. after Hutchinson, all enlarged).

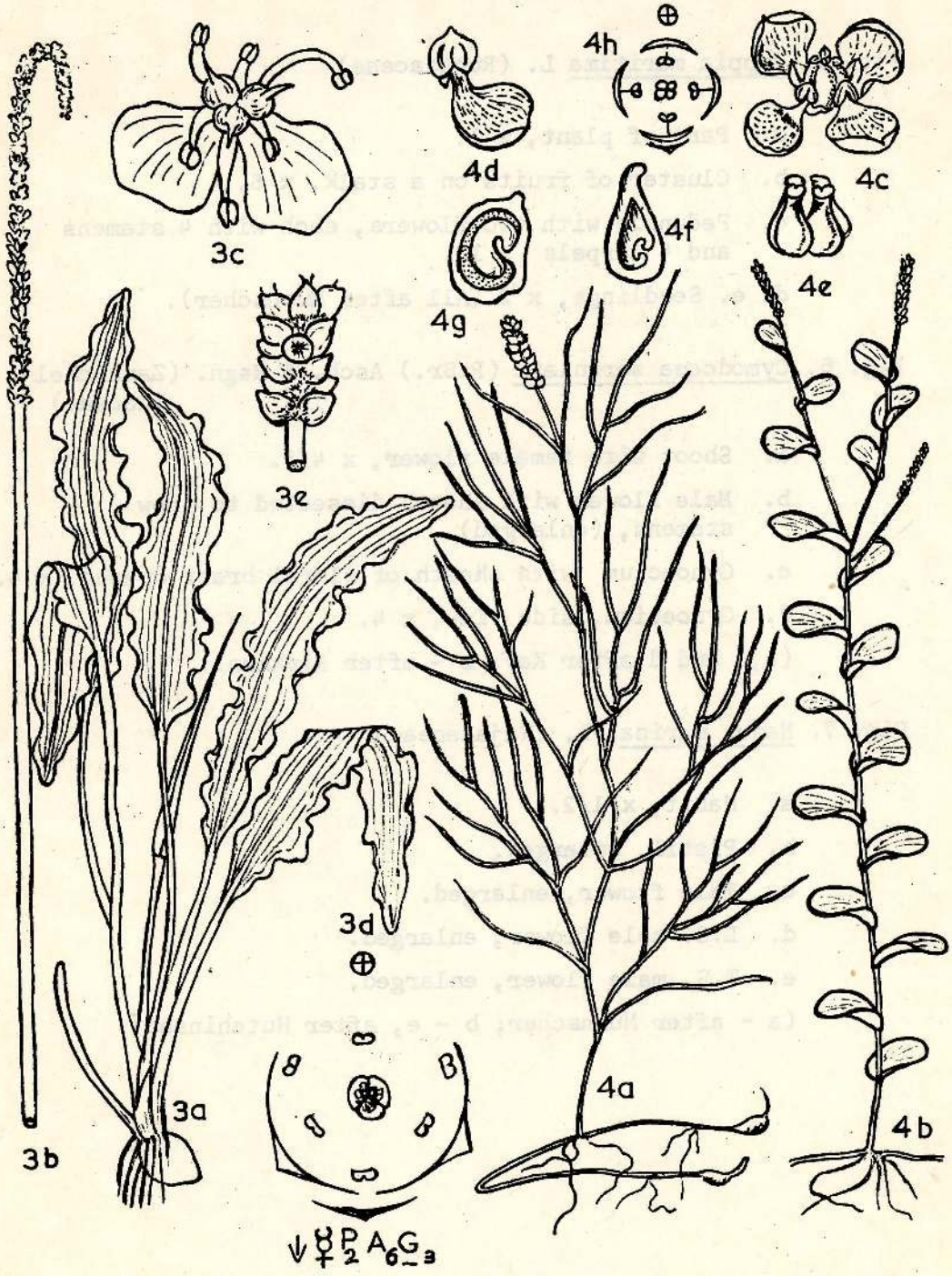

PLATE II

PLATE III

Fig. 5. Ruppia maritima L. (Ruppiaceae)

a. Part of plant, x 1.

b. Cluster of fruits on a stalk, x 5.

c. Peduncle with two flowers, each with 4 stamens and 4 carpels x 10.

d. e. Seedlings, x 2 (All after Muenscher).

Fig. 6. Cymodocea serrulata (R.Br.) Asch. & Magn. (Zannichelliaceae)

a. Shoot with female flower, x 4/5.

b. Male flower with sheath dissected to show stamens, (enlarged).

c. Gynoecium with sheath of floral bract opened, x 4.

d. Gynoecium, side view, x 4.

(a,c and d after Kay; b - after Kirkman).

Fig. 7. Najas marina L. (Najadaceae).

a. Habit, x 1/2.

b. Pistil, enlarged.

c. Male flower, enlarged.

d. L.S. male flower, enlarged.

e. T.S. male flower, enlarged.

(a - after Muenscher; b - e, after Hutchinson).

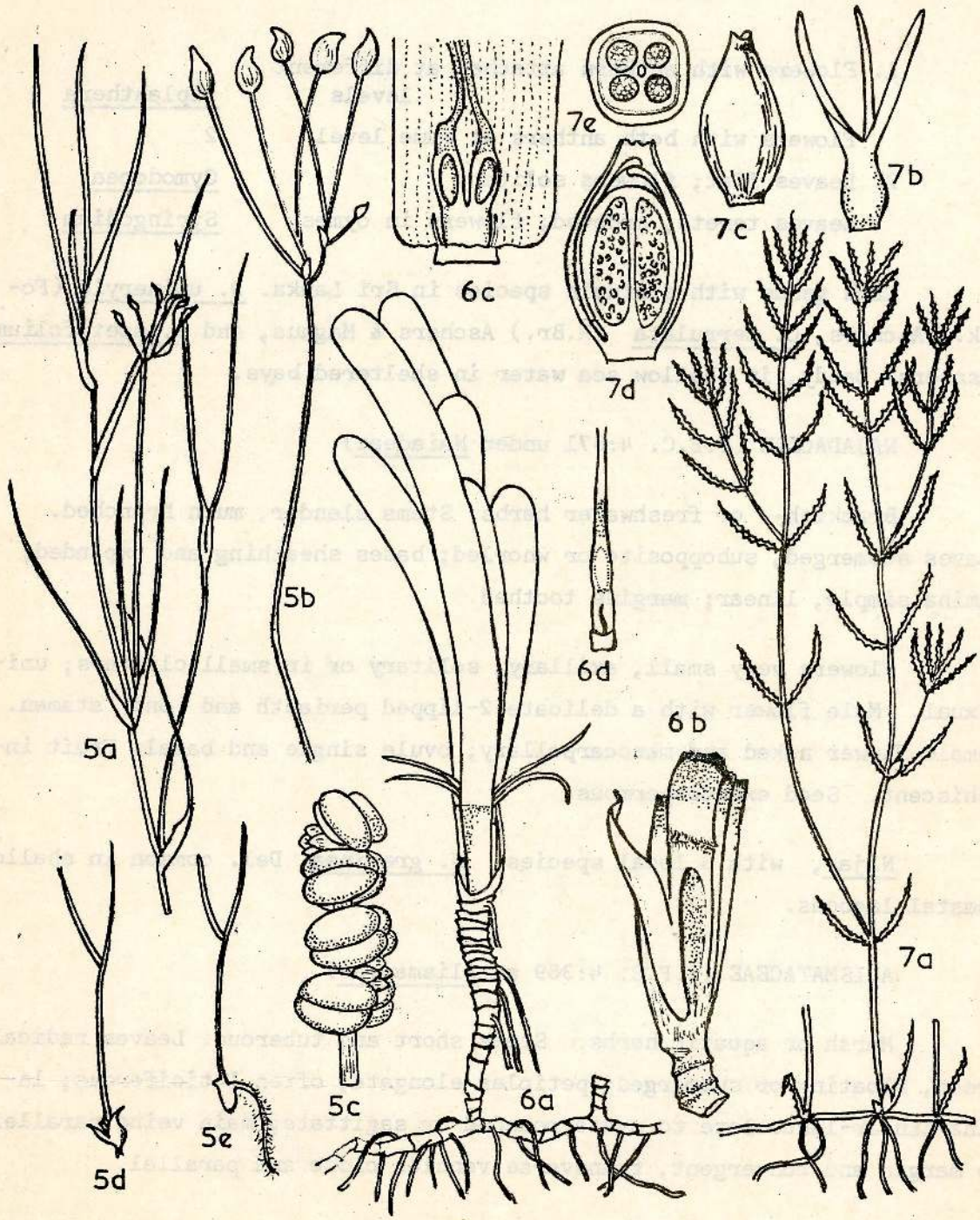

PLATE III

1.	Flowers with anthers attached at different levels	Diplanthera
	Flowers with both anthers at same level	2
2.	Leaves flat; flowers solitary	Cymodocea
	Leaves terete, grooved; flowers in cymes	Syringodium

Each genus with a single species in Sri Lanka. D. uninervis (Forsk.) Aschers, C. serrulata (R.Br.) Aschers & Magnus, and S.isoetifolium (Aschers) Dandy, in shallow sea water in sheltered bays.

7. NAJADACEAE (T.F.C. 4:371 under Naiadeae)

Brackish- or freshwater herbs. Stems slender, much branched. Leaves submerged, subopposite or whorled; bases sheathing and expanded; Lamina simple, linear; margins toothed.

Flowers very small, axillary, solitary or in small clusters; unisexual. Male flower with a delicate 2-lipped perianth and one stamen. Female flower naked and monocarpellary; ovule single and basal. Fruit indehiscent. Seed exendospermous.

Najas, with 3 local species. N. graminea Del. common in shallow coastal lagoons.

8. ALISMATACEAE (T.F.C. 4:369 as Alismaceae)

Marsh or aquatic herbs. Stems short and tuberous. Leaves radical; erect, floating or submerged; petioles elongate, often laticiferous; lamina linear-lanceolate to ovate-rounded or sagittate; main veins parallel to margin and convergent, transverse venules close and parallel.

Inflorescence pedunculate, with flowers in whorls, racemes or panicles. Flowers actinomorphic, bisexual or unisexual. Perianth biseriate; outer 3 segments sepaloid, inner 3 segments petaloid. Stamens 6 to indefinite. Ovary superior, carpels 6 to several, free; each carpel with a single ovule. Fruit indehiscent. Seed exendospermous, embryo curved.

Leaves ovate-cordate; flowers bisexual	Caldesia
Leaves sagittate to triangular; flowers unisexual	Limnophyton

Each genus with a single species in Sri Lanka in tanks and other still waters mainly in the dry zone. Caldesia oligococca (F.Muell.) Buchen. is rather rare but Limnophyton obtusifolium (L.) Miq. is more common.

9. BUTOMACEAE

Marsh or aquatic herbs. Stems tuberous. Leaves radical, erect, petiolate, laticiferous; lamina ovate-rounded.

Flowers solitary or in umbels, pedunculate; actinomorphic, bisexual. Perianth differentiated into calyx and corolla; sepals 3, petals 3. Stamens numerous. Gynoecium superior with numerous free carpels, each with several ovules. Fruit dehiscent. Seeds numerous, exendospermous.

Limnocharis, with one species naturalised in the island. L.flava (L.) Buchen., now common in paddy fields and other wet places in many parts of the low country wet zone.

PLATE IV

Fig. 8. Limnophyton obtusifolium (L.) Miq. (Alismataceae).

a. a small plant, x 1/2.
b. Flower, x 2.
c. Stamen, enlarged.
d. A single carpel, enlarged.
e. Fruit, enlarged.
f. L.S. Fruit, enlarged.

(a and e - after den Hartog; b - d, and F after Andrews).

Fig. 9. Limnocharis flava (L.) Buchen. (Butomaceae)

a. a small plant, x 1/2.
b. an average sized leaf, x 1.
c. L.S. of a flower.
d. Part of T.S. of ovary, enlarged.
e. L.S. of ovary, enlarged.
f. Floral diagram.

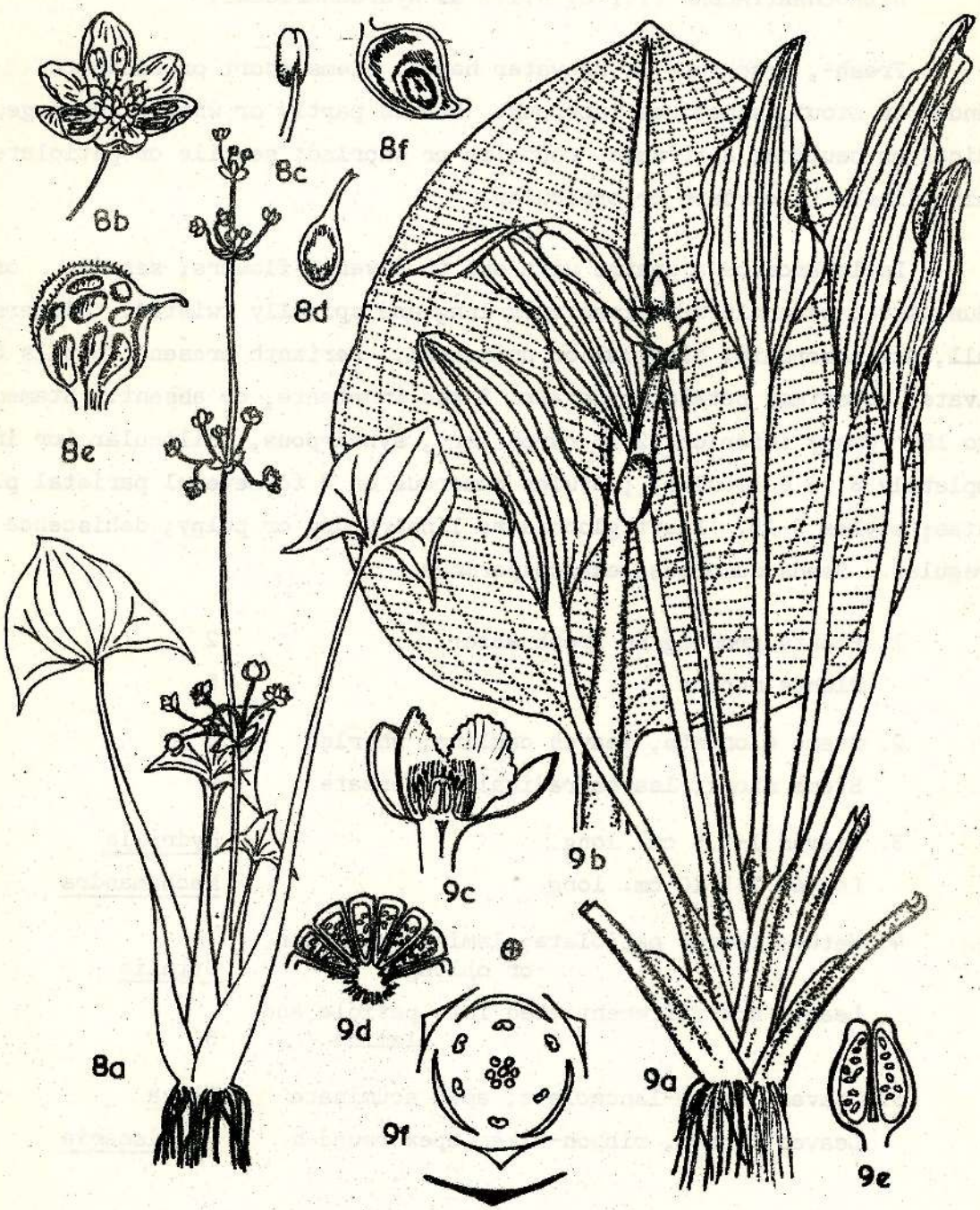

PLATE IV

10. HYDROCHARITACEAE (T.F.C. 4:122 as Hydrocharideae)

Fresh-, brackish- or seawater herbs. Stems short or elongate, slender or stout; sometimes tuberous. Leaves partly or wholly submerged; radical or cauline; alternate, opposite or whorled; sessile or petiolate; lamina linear to cordate or orbicular.

Inflorescence a spathe with one to several flowers; sessile or pedunculate; peduncle sometimes very long and spirally twisted. Flowers small, actinomorphic, bisexual or unisexual. Perianth present; sepals 3, valvate, sometimes petaloid; petals, 3 and imbricate, or absent. Stamens 3 to 15. Ovary inferior, 2-15 carpellary, syncarpous, unilocular (or incompletely 3 to 6 locular) ; ovules numerous on 2 to several parietal placentas; styles 2-15. Fruit globose to linear, dry or pulpy; dehiscence irregular. Seeds numerous, exendospermous.

1.	Plants growing in fresh water	2
	Plants marine	6
2.	Stems elongate, leaves cauline, whorled	3
	Stems short, leaves radical, alternate	4
3.	Leaves 1-2.5 cm. long	Hydrilla
	Leaves 7.5-10 cm. long	Nechamandra
4.	Mature leaves petiolate; lamina orbicular or oblong	Ottelia
	Leaves not differentiated into petiole and lamina	5
5.	Leaves linear-lanceolate; apex acuminate	Blyxa
	Leaves linear, ribbon-like; apex rounded	Vallisneria

6. Leaves 60-90 cm. long — Enhalus
   Leaves less than 30 cm. long — 7

7. Leaves petiolate; 1.2-7 cm. long — Halophila
   Leaves sessile, linear; 7.5-30 cm. long — Thalassia.

Hydrilla verticillata (L.f.) Royle, Blyxa aubertii Rich. (S. Diya-hawariya), and Ottelia alismoides (L) Pers. are common in ponds and tanks, and in slow running fresh waters in the low country. Nechamandra alternifolia (Roxb.) Thw. has been recorded from tanks near Batticaloa and is very rare. Enhalus acoroides (L.f.) Steud. (Eel-grass) and Thalassia hemprichii (Ehrenb.) Aschers are found in sea water. Halophila ovalis (R.Br.) Hook.f. and H. beccarii Aschers occur in brackish water in coastal lagoons. Vallisneria spiralis L. is commonly grown in aquarium tanks.

11. TRIURIDACEAE (T.F.C. 4:367 as Triurideae)

Mycotrophic, saprophytic herbs. Stem filiform, slender or wiry, coloured. Leaves much reduced, scale-like, not green.

Inflorescence a raceme or corymb, long-pedunculate. Flowers very small, actinomorphic, unisexual. Perianth uniseriate, segments 3-8, valvate . Male flower with 3-8 stamens. Female flower: gynoecium superior, with numerous free carpels, each with a single basal ovule. Fruits dehiscent. Seeds endospermous.

Perianth segments 8; stamens 4 — Hyalisma
Perianth segments 6; stamens 3 — Sciaphila

Hyalisma has one species, H. janthina Champ., and Sciaphila four species; in shady places in wet zone forests, very rare.

PLATE V

Fig. 10 Hydrocharitaceae.

a-f: Hydrilla verticillata (L.f) Royle

a. Plant, x 1/2.

b. Apex of female flower in water surface (diagrammatic).

c. Base of female flower showing sheath, enlarged.

d. Unopened male flower, enlarged.

e. Male flower before shedding pollen, from above, enlarged.

f. Male flower after shedding pollen, with raised anthers, enlarged.

(a-f - after den Hartog).

g. Nechamandra alternifolia (Roxb). Thw. Female plant, x 1.

h. Halophila ovalis (R.Br.) Hook f. Plant, x 1.

i-k. Vallisneria spiralis L.

i. Plant, x 1.

j. L.S. male flower bud, enlarged.

k. open male flower, enlarged.

l-n; Blyxa aubertii Rich.

l. Plant, x 1/3.

m. Female flower, enlarged.

n. Apex of female flower, enlarged.

l-n, partly after den Hartog)

Fig. 11 Sciaphila sp. (Triuridaceae)

a. Plant, x 1.

b. Male flower, enlarged.
c. Same with perianth removed.
d. Female flower, enlarged.
e. L.S. Carpel, enlarged.
(a-e; after Hutchinson).

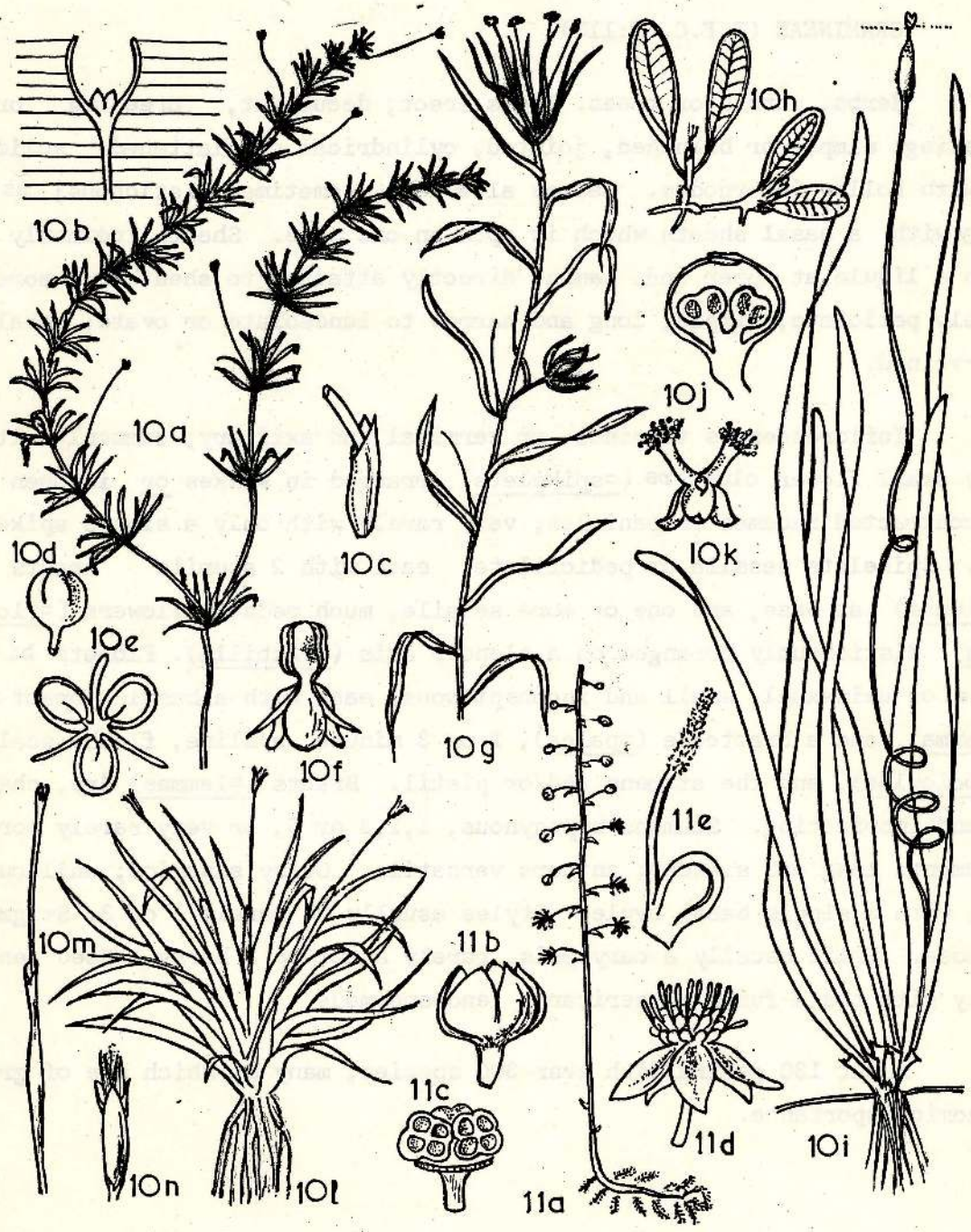

PLATE V

12. GRAMINEAE (T.F.C. 5:113)

Herbs, shrubs or trees. Stems erect, decumbent, creeping or floating; simple or branched, jointed, cylindrical or flattened, solid or with hollow internodes. Leaves alternate, sometimes distichous; usually with a basal sheath which is open on one side. Sheath commonly with a ligule at upper end. Lamina directly attached to sheath or more rarely petiolate; simple, long and narrow to lanceolate or ovate; parallel-veined.

Inflorescences terminal, or terminal and axillary; commonly with many small flower clusters (=spikelets) arranged in spikes or in open or contracted racemes or panicles; very rarely with only a single spikelet. Spikelets sessile or pedicillate; each with 2 sterile bracts (=glumes) at base, and one or more sessile, much reduced flowers (=florets) distichously arranged on a slender axis (=rachilla). Florets bisexual or unisexual, small and inconspicuous; each with a basal bract (=lemma) and a bracteole (=palea), 2 or 3 minute, hyaline, fleshy scales (=lodicules), and the stamens and/or pistil. Bracts (=lemmas) dry, chaffy and imbricating. Stamens hypogynous; 1,2,3 or 6, or very rarely more; filaments long and slender; anthers versatile. Ovary superior; unilocular, with a single basal ovule. Styles usually 2, rarely 1 or 3. Stigmas plumose. Fruit usually a caryopsis, rarely a nut or a berry. Seed generally with testa fused to pericarp, endospermous.

About 130 genera with over 300 species, many of which are of great economic importance.

13. CYPERACEAE (T.F.C. 5:12)

Grass-like herbs, usually growing in damp or marshy habitats. Rhizomes short or elongate, often covered by scales. Stems commonly solid and 3-angled. Leaves in three rows, sheathing at base. Sheaths tubular, closed, ligule absent or poorly developed. Lamina narrow-linear and parallel-veined, sometimes much reduced.

Inflorescences usually pedunculate and terminal, more rarely lateral; often subtended by one or more involucral bracts and composed of several flower clusters (=spikelets), variously arranged umbellately, paniculately or spicately; more rarely consisting of only a single spikelet. Spikelets with distichous or spirally arranged dry, chaffy, imbricating, glume-like bracts, each bearing a single flower in its axil. Flowers very small, bisexual or unisexual. Perianth reduced to hairs, bristles or scales, or absent. Stamens usually 3, anthers basifixed. Ovary superior, unilocular, with a single basal ovule. Style 2-3 fid or 2-3 toothed. Fruit nut-like, indehiscent. Seed free from pericarp, endospermous.

About 20 genera with nearly 170 species.

14. PALMAE (T.F.C. 4:319)

Shrubs or trees, or woody climbers; solitary or gregarious. Stems erect, scandent, or decumbent; solid; simple or branched at base; unarmed or with straight or recurved spines; sometimes covered by persistent leaf-bases. Leaves scattered or forming a crown at apex of stem; large, pinnately or palmately lobed or divided; leaf-base semi-amplexicaul or forming a sheath round stem. Leaf segments parallel-veined.

PLATE VI

Fig. 12. Eleusine indica (L) Gaertn. (Gramineae)

a. Plant x 1.

b. Ligule.

c. Junction of leaf sheath and lamina.

d. Part of spike.

e. Spikelet.

f. Stamens and pistil.

g. Floral diagram.

h. Grain.

(b - h: enlarged, after Andrews).

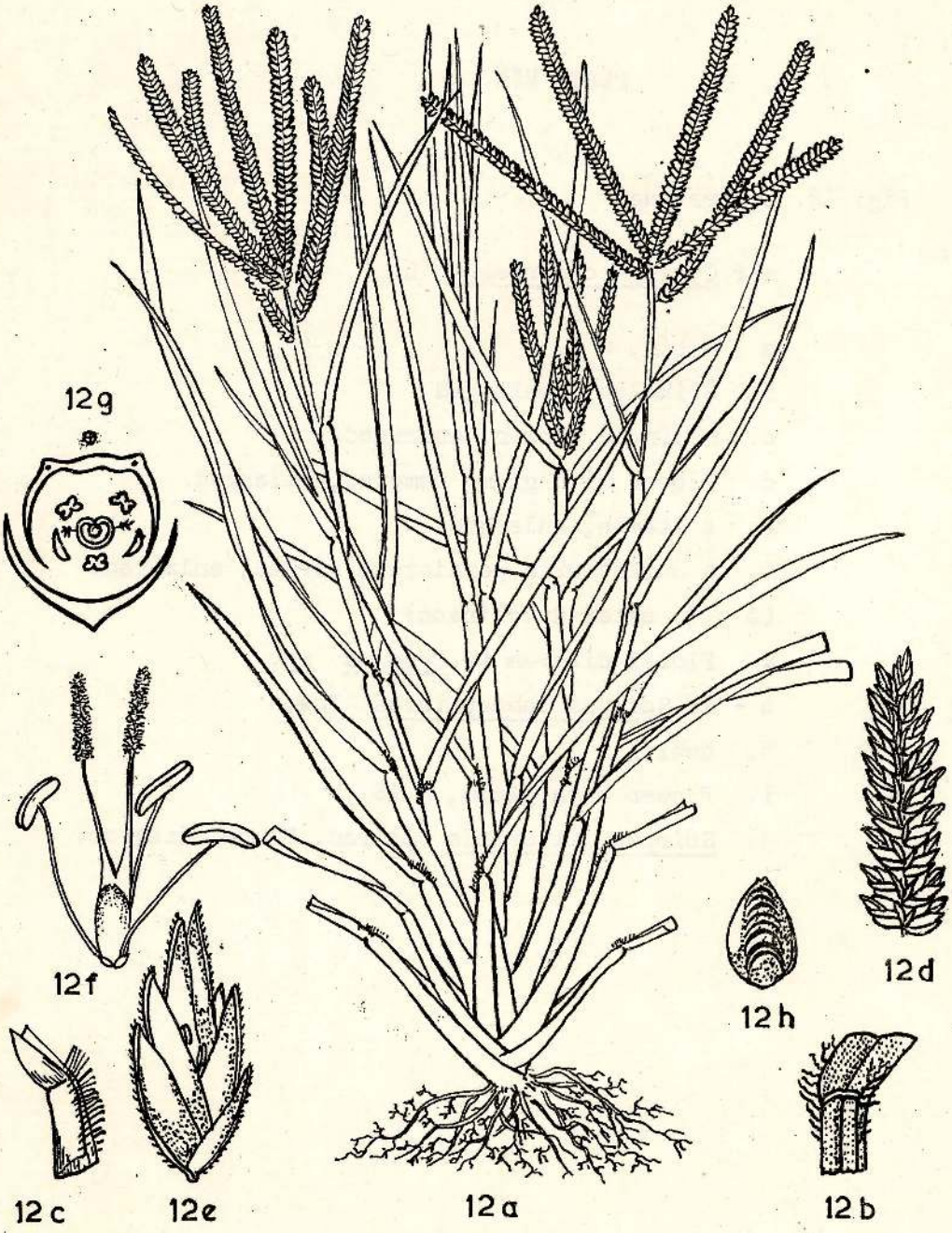

PLATE VI

PLATE VII

Fig. 13. Cyperaceae.

a-f Cyperus compressus L.

a. Habit, x 1.
b. Spikelet, enlarged.
c. A single flower, enlarged.
d. Flower with glume removed, enlarged.
e. a stamen, enlarged.
f. a nutlet with persistent styles, enlarged.
(a - f after Hutchinson)
g. Floral diagram of Cyperus sp.
h - i: Scirpus subcapitatus Thw.
h. habit, x 1.
i. flower with glume, x 15.
j. Scirpus littoralis Schrad. Floral diagram.

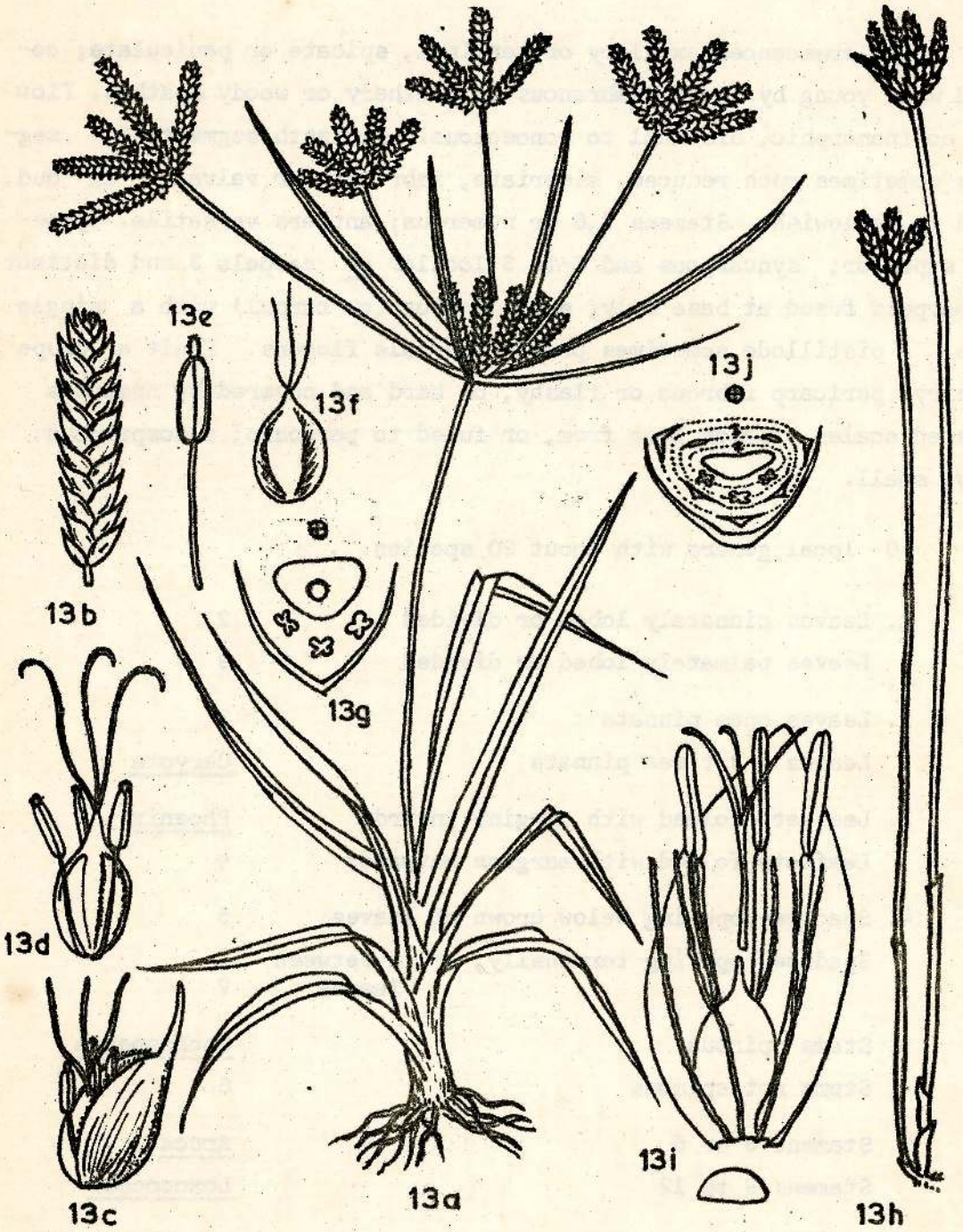

PLATE VII

Inflorescences axillary or terminal, spicate or paniculate; covered when young by large membranous or leathery or woody spathes. Flowers actinomorphic, bisexual to monoecious. Perianth segments 6, segments sometimes much reduced, biseriate, imbricate or valvate in bud, green to yellowish. Stamens 3,6 or numerous; anthers versatile. Gynoecium superior; syncarpous and 1-to 3-locular or carpels 3. and distinct or carpels fused at base only; each loculus (or carpel) with a single ovule. A pistillode sometimes present in male flowers. Fruit a drupe or berry; pericarp fibrous or fleshy, or hard and covered by numerous reflexed scales. Seeds free from, or fused to perioarp; endospermous. Embryo small.

10 local genera with about 20 species.

1.	Leaves pinnately lobed or divided	2
	Leaves palmately lobed or divided	9
2.	Leaves once pinnate	3
	Leaves 2-3 times pinnate	Caryota
3.	Leaflets folded with margins inwards	Phoenix
	Leaflets folded with margins outwards	4
4.	Spadices opening below crown of leaves	5
	Spadices opening terminally, or in between leaves	7
5.	Stems spinous	Onchosperma
	Stems not spinous	6
6.	Stamens 3 or 6	Areca
	Stamens 9 to 12	Loxococous

7. Petioles and leaf rachises with hooked spines	Calamus
Petioles and leaf rachises unarmed	8
8. Stems erect, unbranched	Cocos
Stems decumbent, branched	Nypa
9. Spadix solitary, terminal	Corypha
Spadices several, axillary	Borassus

Among the species of economic importance are Cocos nucifera L. (Coconut), Borassus flabellifer L. (Palmyrah), Areca catechu L. (Arecanut), A. concinna Thw. (S. Len-teri), Loxococcus rupicola (Thw.) Hook.f. (S. Dotalu), Caryota urens L. (kitul), Nypa fruticans Wurmb. (S. Gin-Pol), Corypha umbraculifera L. (Talipot) and Phoenix zeylanica Trim. (Ceylon Date). Various species of Calamus provide the canes of commerce.

15. ARACEAE (T.F.C. 4:343)

Epiphytic, terrestrial or aquatic herbs. Stems short and tuberous; or elongate, slender or stout, and creeping or climbing. Leaves radical, or cauline and alternate; sheathing or amplexicaul at base; lamina entire or variously lobed or divided; very often sagittate to hastate. Raphides often present.

Inflorescence a pedunculate or subsessile spadix; spathe green or coloured. Flowers small or minute, bisexual and all similar, or unisexual with male flowers on upper part of axis and female flowers lower down, with or without interposed neuter flowers. Axis sometimes extending above male flowers as a sterile column or bearing neuter flowers.

PLATE VIII

Fig. 14. Palmae.

a-h: Cocos nucifera L.

a. Inflorescence, much reduced.
b. a single spike, x 1/2.
c. a female flower, x 1.
d. same in L.S. x 1.
e. same in T.S., x 3 and floral formula.
f. male flower x 1.
g. same with perianth spread out, x 3.
h. Floral diagram and formula of male flower.

i.- n. Caryota urens L.

i. Part of spike, x 1.
j. Male flower; x 3.
k. Female flower, x 3.
l. Fruits, x 1.
m. Floral diagram and formula of male flower.
n. Floral diagram and formula of female flower.

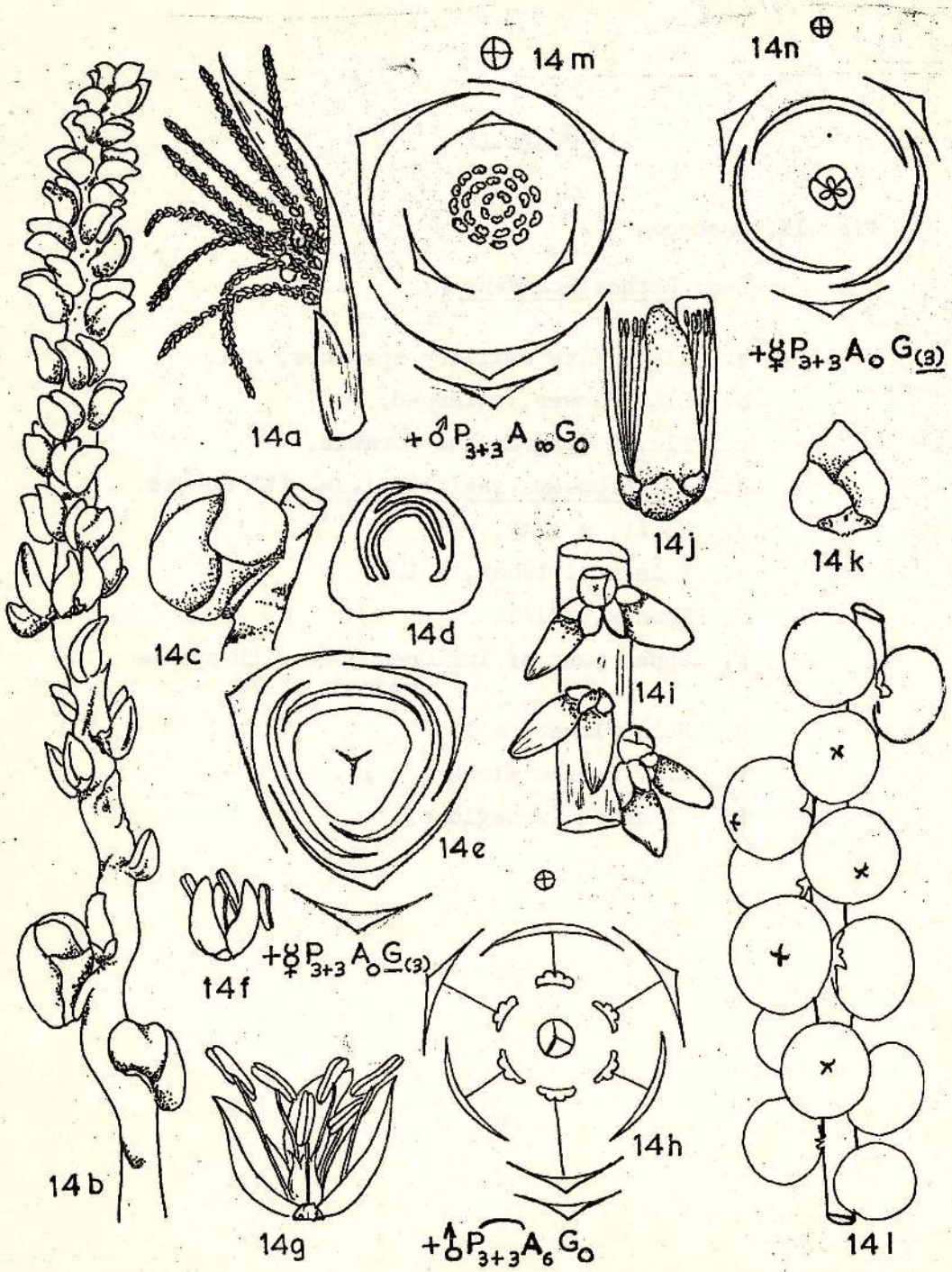

PLATE VIII

PLATE IX

Fig. 15. Araceae.

a-c: Pothos scandens L.

a. Plant with axillary spadices, x 1.

b. L.S. Flower, enlarged.

c. Floral diagram and formula.

d - i: Xanthosoma sagittifolium (L.) Schott.

d. Habit, x 1/12.

e. a lateral tuber, x 1/6.

f. Spadix, x 1/3.

g. Upper part of inflorescence with spathe removed, x 1/3.

h. Male flower, x 10.

i. L.S. female flower, x 10.

(d - i after Purseglove).

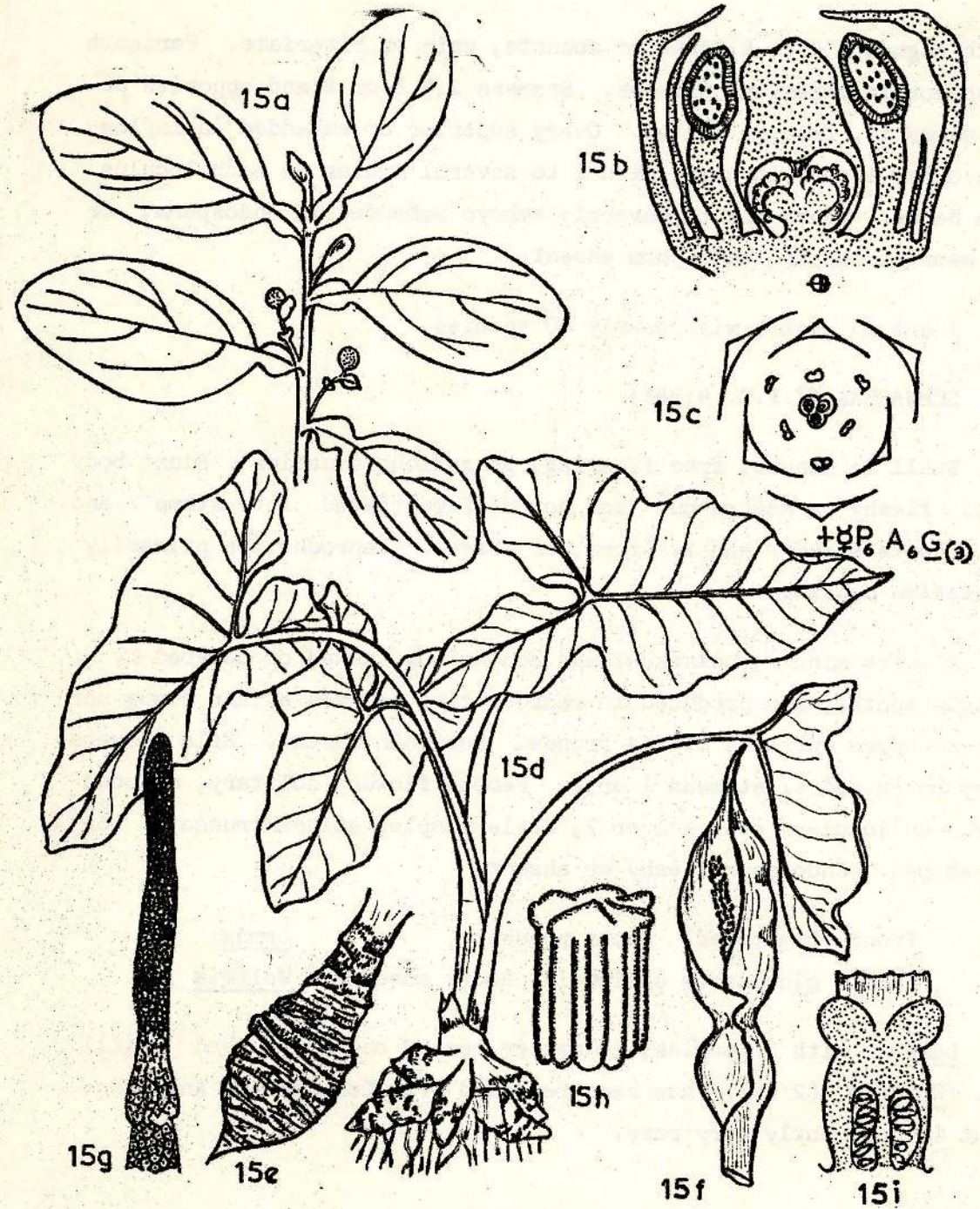

PLATE IX

Perianth segments 4 to 6, free or connate, uni- or biseriate. Perianth often absent in unisexual flowers. Stamens 2,4,6 or 8 and opposite perianth segments, free or united. Ovary superior or embedded in inflorescence axis; 1 to 3 locular, with 1 to several ovules in each loculus. Fruit a berry. Seeds one to several; embryo embedded in endosperm, or embryo macropodous and endosperm absent.

About 15 genera with nearly 40 species.

16. LEMNACEAE (T.F.C. 4:366)

Small to minute, free floating, gregarious aquatics. Plant body (=frond) fleshy or membranous and not differentiated into stems and leaves. Roots slender and filiform, or absent. Reproduction primarily by vegetative budding.

Flowers minute, unisexual and monoecious, naked or covered by a membranous spathe, and produced in reproductive pouches either along margins or on upper surfaces of the fronds. Perianth absent. Male flowers solitary or in pairs; stamens 1 or 2. Female flower solitary, monocarpellary, unilocular; ovules 1 or 2, style simple; stigma truncate or funnel-shaped. Endosperm fleshy or absent.

Fronds flattened. Roots present	Lemna
Fronds globose or ellipsoid. Roots absent.	Wolffia

Lemna, with 3 species, is rather common on undisturbed still waters. Wolffia (2 spp.) has been recorded from Colombo and Anuradhapura but is apparently very rare.

17. FLAGELLARIACEAE (T.F.C. 4:316)

Climbing or decumbent herbs or shrubs. Stems elongate, or short and stout with erect shoots arising from branched creeping rhizomes. Leaves radical, or cauline and alternate; simple and elongate; sheathing at base with sheaths closed; lamina 10 to 30 cm. long and ending in tendrils, or much longer (60-90 cm. long).

Inflorescence terminal, paniculate, much-branched. Flowers small, actinomorphic; bisexual, or unisexual and dioecious. Perianth segments 6, subsimilar, free or slightly fused at base, more or less biseriately imbricate, green or petaloid, persistent. Stamens 6, free or inserted at base of perianth segments. Ovary superior, 3-locular with a single ovule in each loculus; styles 3 or 3-lobed. Fruit indehiscent, fleshy or drupaceous. Seeds endospermous.

Plants climbing; leaves ending in tendrils	Flagellaria
Plants decumbent; tendrils absent	Hanguana

F. indica L. (S. Goyi-wel) is common in the low country. H. malayana (Jack), Merr. (S. Induru) is locally common in marshes and ponds in the low-country wet zone.

18. XYRIDACEAE (T.F.C. 4:296)

Erect, sedge-like marsh herbs. Stems short. Leaves radical and tufted, sheathing at base with sheath open on one side; lamina narrowly linear, flat or terete.

Inflorescence a terminal, pedunculate, bracteate, cylindrical or globose, cone-like or capitulum-like head. Peduncle stout or slender,

PLATE X

Fig. 16. Lemnaceae. (after Muenscher)

a-c: Lemna minor L.

a,b. Habit, x 5.

c. Sectional view of flowering plant showing male and female flowers, x 15.

d,e; Wolffia sp.

d. Vegetative plants, x 12.

e. Section through flowering plant, x 12.

Fig. 17. Flagellariaceae (after Hutchinson)

a-e; Flagellaria indica L.

a. Habit, x 1.

b. Flower, enlarged.

c. L.S. flower, enlarged.

d. Fruit, enlarged.

e. L.S. Fruit, enlarged.

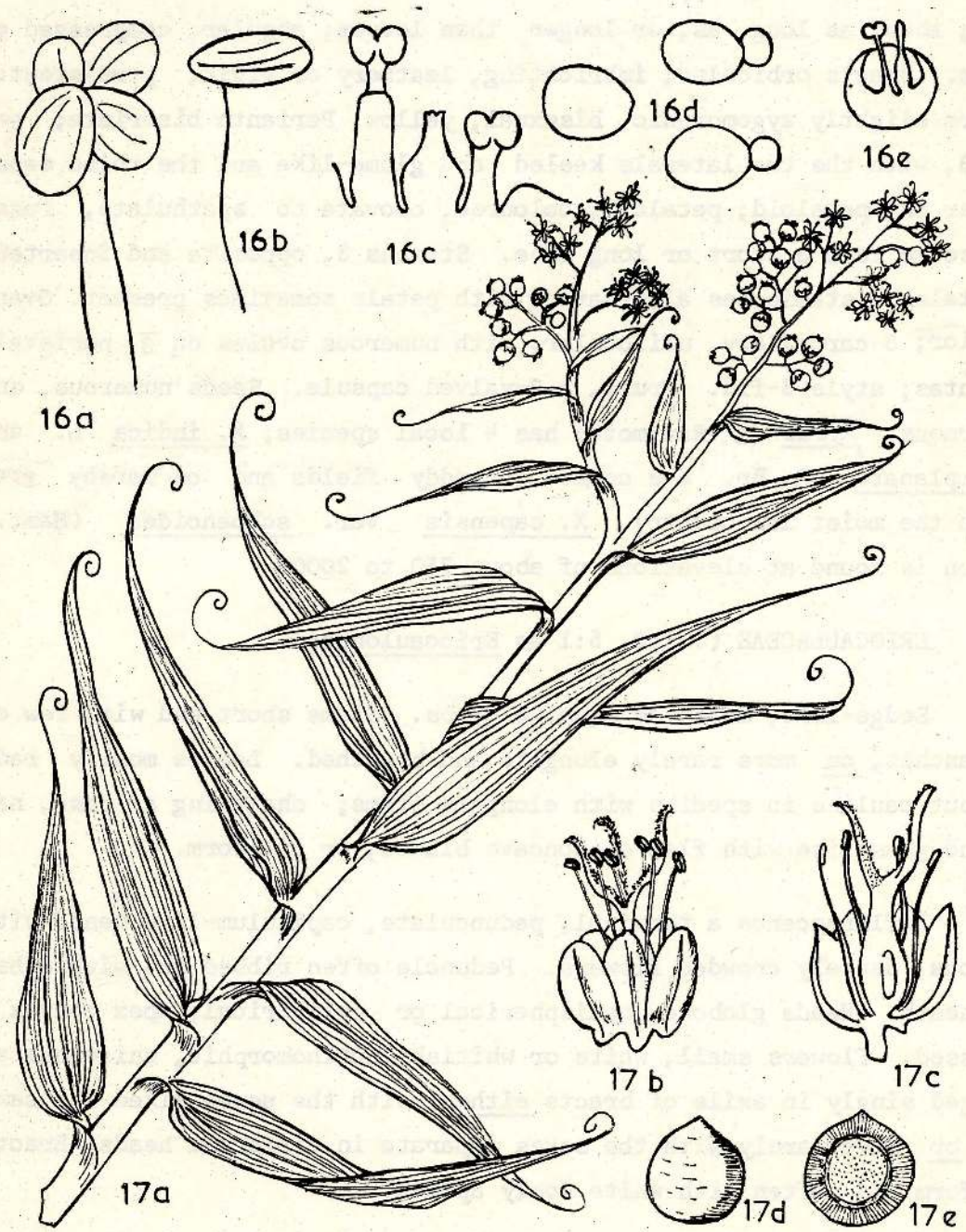

PLATE X

rigid; about as long as, or longer than leaves; angular, compressed or terete. Bracts orbicular, imbricating, leathery or rigid, persistent. Flowers slightly zygomorphic, bisexual, yellow. Perianth biseriate; sepals 3, with the two laterals keeled and glume-like and the third sepal broader and petaloid; petals 3, coloured, obovate to spathulate, fused at base to form a short or long tube. Stamens 3, opposite and inserted on petals; 3 staminodes alternating with petals sometimes present. Ovary superior; 3-carpellary, unilocular, with numerous ovules on 3 parietal placentas; style 3-fid. Fruit, a 3-valved capsule. Seeds numerous, endospermous. Xyris (S. Ran-mota) has 4 local species; X. indica L. and X. complanata R. Br. are common in paddy fields and on marshy ground in the moist low-country. X. capensis var. schoenoides (Mart.) Nilsson is found at elevations of about 750 to 2000m.

19. ERIOCAULACEAE (T.F.C. 5:1 as Eriocauloneae)

Sedge-like, marsh or aquatic herbs. Stems short and with few or no branches, or more rarely elongate and branched. Leaves mostly radical, but cauline in species with elongate stems; sheathing at base, narrow and grasslike with flat or concave blades, or filiform.

Inflorescence a terminal, pedunculate, capitulum-like head with numerous, densely crowded flowers. Peduncle often ribbed and with a basal sheath. Heads globose, hemispherical or cylindrical; apex convex or depressed. Flowers small, white or whitish, actinomorphic, unisexual and arranged singly in axils of bracts either with the sexes mixed in same head, or more rarely with the sexes separate in different heads. Bracts cuneiform and often with white wooly apices.

Male flowers: stipitate. Sepals 3,2 or absent; all similar or one different from the others; free or connate; hyaline and deciduous. Petals 3; usually fused to form a cylindrical or funnel-shaped, 3-lobed or truncate tube; one lobe usually longer than the others; rarely with petals free; lobes of petals often with black subapical glands. Stamens 4, or 6, usually in two series; white, yellow or black.

Female flowers; sessile or stipitate. Sepals 1-3 or absent, when 3 or 2 often unequal; usually free and deciduous. Petals 3, free, narrow or broad, unequal, usually pilose, a black subapical gland usually present; persistent. Ovary superior, 2-3 locular with a single ovule in each loculus; stigmas 2-3. Fruit capsular, 3-lobed. Seeds minute, endospermous.

Eriocaulon with about 25 species. E. quinquangulare L. (S.Heen kokmota) and E. sexangulare L. (S. kokmota) are two of the commonest species.

20 BROMELIACEAE

Plants epiphytic or growing on moist rocks or soil. Stems short. Leaves densely clustered, sheathing and often coloured at base; lamina long and strap-shaped, rigid, often with toothed or spinulose margins.

Inflorescence a terminal, pedunculate, spicate head or panicle; bracts usually coloured. Flowers actinomorphic, bisexual. Perianth epigynous, segments 6 and biseriate; outer segments sepaloid and imbricate; inner segments subsimilar, petaloid, free or fused, imbricate. Stamens 6, inserted near base of perianth segments and free or partially adnate to them. Ovary inferior, 3-locular, ovules numerous in each loculus and

PLATE XI

Fig. 18 Xyris indica L. (Xyridaceae) (All figures after Hutchinson; b - g much enlarged).

a. Habit, x 1.
b. L.S. of Flower.
c. Corolla spread out.
d. Gynoecium.
e. T.S. ovary.
f. fruit.
g. Seed.

Fig. 19 Eriocaulon brownianum Mart. (Eriocaulaceae).

(All drawings after Fyson; b-h; much enlarged.)

a. Habit, x 1/2.
b. Male flower.
c. Female flower.
d. Perianth segment.
e. Gynoecium.
f. Floral diagram of male flower.
g. Floral diagram of female flower.
h. Nutlet attached to base of a sepal.

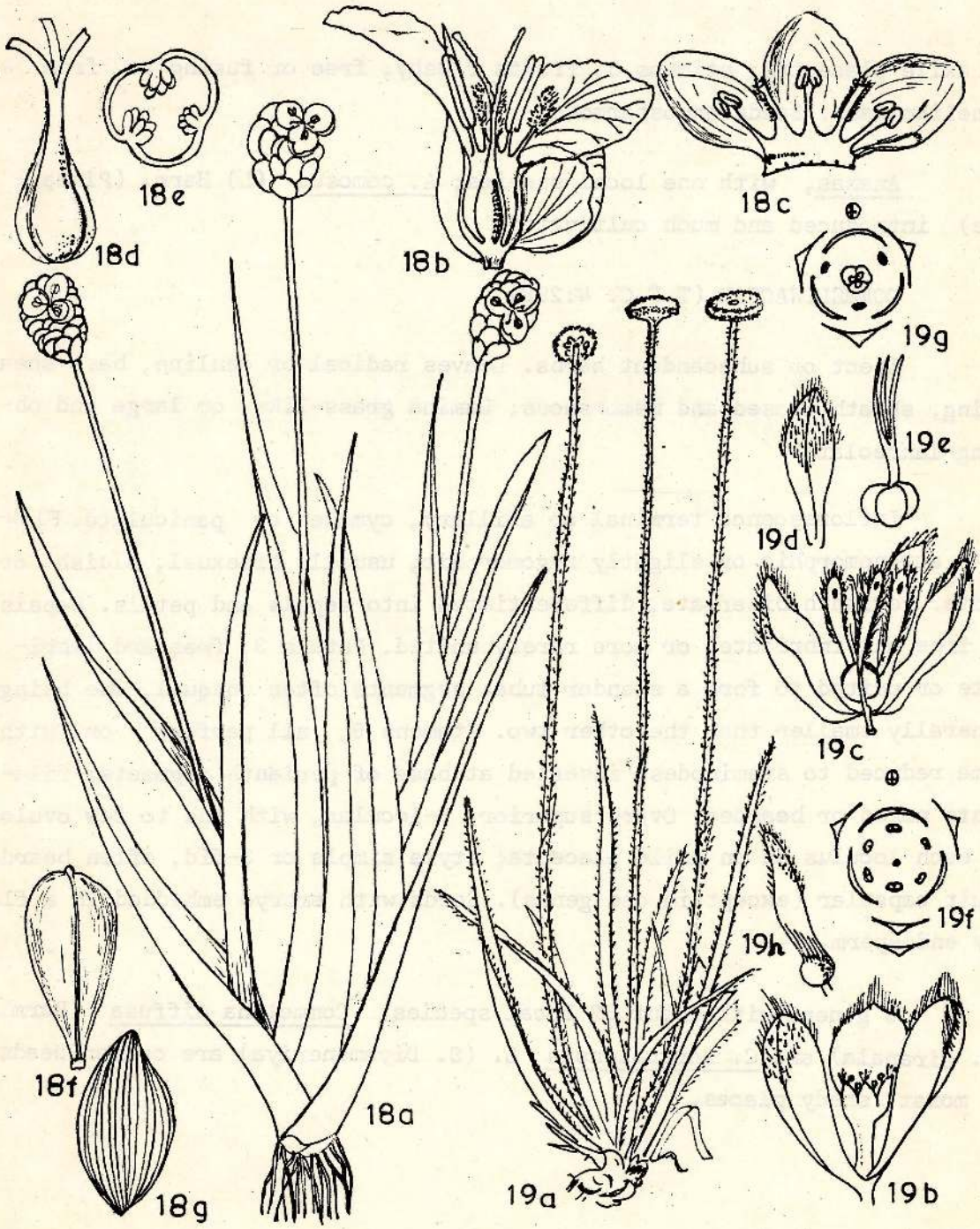

PLATE XI

on axile placentas; stigmas 3. Fruits fleshy, free or fusing to from a conelike mass. Seeds endospermous.

Ananas, with one local species; A. comosus (L) Herr. (Pineapple) introduced and much cultivated.

21 COMMELINACEAE (T.F.C. 4:298)

Erect or subscandent herbs. Leaves radical or cauline, base sheathing; sheath closed and membranous; Lamina grass-like, or large and oblong-lanceolate.

Inflorescence terminal or axillary, cymose or paniculate. Flowers; actinomorphic or slightly zygomorphic, usually bisexual, bluish or white. Perianth biseriate, differentiated into sepals and petals. Sepals 3, free and imbricate, or more rarely united. Petals 3, free and imbricate or united to form a slender tube; segments often unequal, one being generally smaller than the other two. Stamens 6, all perfect or with some reduced to staminodes; inserted at base of perianth segments; filaments naked or bearded. Ovary superior, 3-locular, with one to few ovules in each loculus on an axile placenta; style simple or 3-fid, often bearded. Fruit capsular (except in one genus). Seeds with embryo embedded in a floury endosperm.

8 genera with about 32 local species. Commelina diffusa Burm.f. (S. Girapala) and C. benghalensis L. (S. Diyameneriya) are common weeds in moist, shady places.

22. PONTEDERIACEAE (T.F.C. 4:295)

Aquatic or freshwater-marsh herbs. Rhizomes short or long, creeping or floating, simple or branched, often stoloniferous. Leaves erect, floating or submerged; bases sheathing; petiolate, with lower part of petiole sometimes swollen and spongy; lamina narrow and linear to broad and orbicular.

Inflorescence terminal, pedunculate, racemose or spicate, subtended by a spathe-like sheathing leaf. Flowers actinomorphic or zygomorphic, bisexual. Perianth segments 6, biseriate, all petaloid. Stamens 6, inserted at base of perianth segments; 1 or 3 stamens often longer than the others. Ovary superior, 3-locular, each loculus with numerous ovules on an axile placenta; style simple or lobed. Fruit capsular, 3-valved. Seeds longitudinally ribbed, endospermous.

Flowers pedicelled; perianth actinomorphic	Monochoria
Flowers sessile; perianth zygomorphic	Eichhornia

M. hastata (L.) Solms (S. Diyahabarala) and M. vaginalis (Burm. f.) Kunth are very common in wet places, especially in paddy fields in the low country. E. crassipes (Mart.) Solms (S. Japanjabara) is an introduced aquatic which has now become naturalized and a troublesome weed.

23. JUNCACEAE (T.F.C. 4:318)

Erect herbs. Stems tufted and arising from short creeping rhizomes. Leaves mostly radical; flat and grasslike, or cylindrical, or reduced to basal sheaths.

PLATE XII

Fig. 20. Ananas comosus (L.) Merr. (Bromeliaceae)

a. Plant with young fruit, x 1/8.
b. Inflorescence x 1/8.
c. Flower, side view, x 2.
d. L.S. flower, x 3.

Fig. 21. Commelina benghalensis L. (Commelinaceae)

a. Plant, x 1.
b. Inflorescence with bract, enlarged.
c. Flower, enlarged.
d. Floral diagram.

Fig. 22. Eichhornia crassipes (Mart.) Solms (Pontederiaceae).

a. Habit x 1/2.
b. L.S. of Flower, x 1.

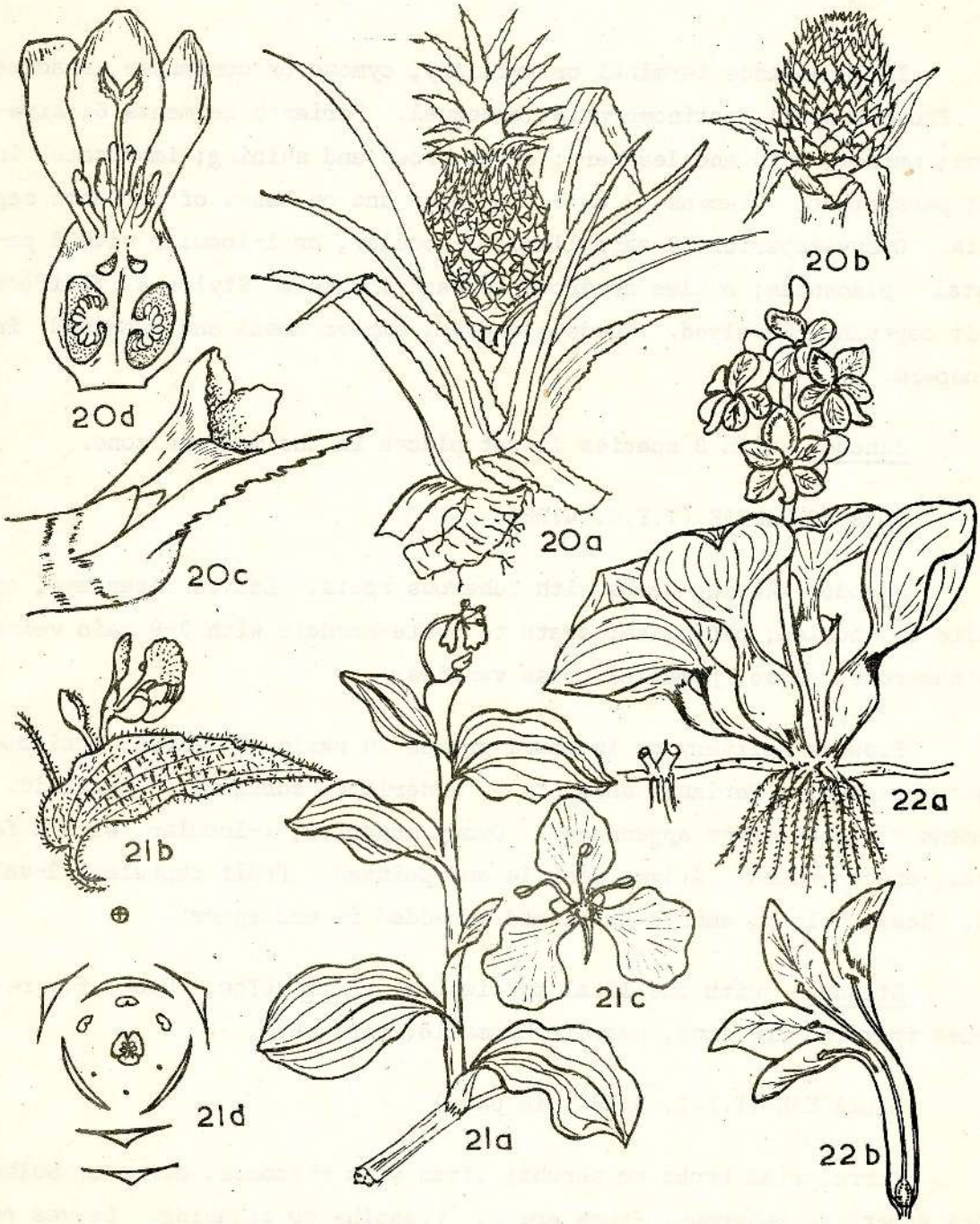

PLATE XII

Inflorescence terminal or axillary, cymose or corymbose, bracteate. Flowers small, actinomorphic, bisexual. Perianth segments 6, biseriate; narrow, thin and leathery; often brown and shining; imbricate in bud; persistent. Stamens 3 or 6, opposite and on bases of perianth segments. Ovary superior, 3-carpellary; 3-locular, or 1-locular with 3 parietal placentas; ovules numerous in each loculus. Styles 3, filiform. Fruit capsular, 3-valved. Seeds elongate, embryo small and embedded in endosperm.

Juncus, with 3 species in wet places in the montane zone.

24. ROXBURGHIACEAE (T.F.C. 4:280)

Slender twining herbs with tuberous roots. Leaves alternate, opposite or whorled; petiolate; ovate to ovate-cordate with 3-9 main veins and numerous, close, parallel cross venules.

Flowers solitary or in small groups in axils of leaves; actinomorphic, bisexual. Perianth segments 4, biseriate, subequal, petaloid. Stamens 4, connectives appendaged. Ovary superior, 1-locular, with a few basal, erect ovules. Stigma sessile and pointed. Fruit capsular, 2-valved. Seeds oblong, embryo small and embedded in endosperm.

Stemona, with one local species, S. minor (Thw.) Hook. f., recorded from the dry zone, near Trincomalie; very rare.

25. LILIACEAE (T.F.C. 4:281, in part)

Terrestrial herbs or shrubs; often with rhizomes, corms or bulbs. Roots sometimes tuberous. Stems erect, creeping or climbing. Leaves radical or cauline, base amplexicaul but not sheathing; lamina simple,

linear to broad; sometimes ending in tendrils, or reduced to thorns and then with axillary branches modified into leaf-like cladodes.

Inflorescence a raceme or panicle, or flowers solitary, but never in umbels. Flowers usually large and showy; mostly actinomorphic, bisexual. Perianth segments 6, biseriate, petaloid, usually imbricate in bud; segments free or fused at base to form a tube. Stamens 6 or less; opposite to and inserted on perianth segments, filaments free or variously connate, anthers bilocular. Ovary superior or half-inferior, 3-locular, with one or more ovules in each loculus on an axile placenta; style simple or 3-fid. Fruit a berry or capsule. Seeds globose or flattened. Endosperm horny or fleshy.

About 15 local genera with nearly 20 species.

26. SMILACACEAE (T.F.C. 281, under Liliaceae)

Climbing or scandent herbs or shrubs with rhizomatous bases. Shoots usually prickly. Leaves alternate or opposite, petiolate; petiole sheathing at base, often with a pair of tendrils arising from upper end of sheath; Lamina simple, deltoid to ovate or orbicular, 3-9 veined with reticulated venules.

Inflorescence axillary, umbellate. Flowers small, unisexual and dioecious. Perianth segments 6, free, recurved or incurved. Male flower: stamens 6, inserted at base of perianth segments, filaments free or united, anthers apparently unilocular due to confluence of pollen-sacs; pistillode small or absent. Female flower with 3 or 6 staminodes; ovary superior, 3-locular with 1 or 2 ovules in each loculus; stigmas 3, recurved. Fruit a globose berry. Seed solitary and globose, or 2-3 and hemispherical or angular. Endosperm horny.

PLATE XIII

Fig. 23. Juncus sp. (Juncaceae)

a. J.effusus L., base of plant, x 2/3.
b. J.prismatocarpus R. Br., Inflorescence, x 2/3.
c. J.effusus L. Inflorescence, x 2/3.
d. J.prismatocarpus R.Br., Flower x 2/3.
e. Floral diagram.
(a,c - after Backer; b,d - after Fyson).

Fig. 24. Stemona minor (Thw.) Hook.f., (Roxburghiaceae)

a. habit, x 1.
b. L.S. of ovary.
c. Stamen.
d. T.S. of Stamen.
e. Floral diagram.
(all after Wight; b,c,d - enlarged).

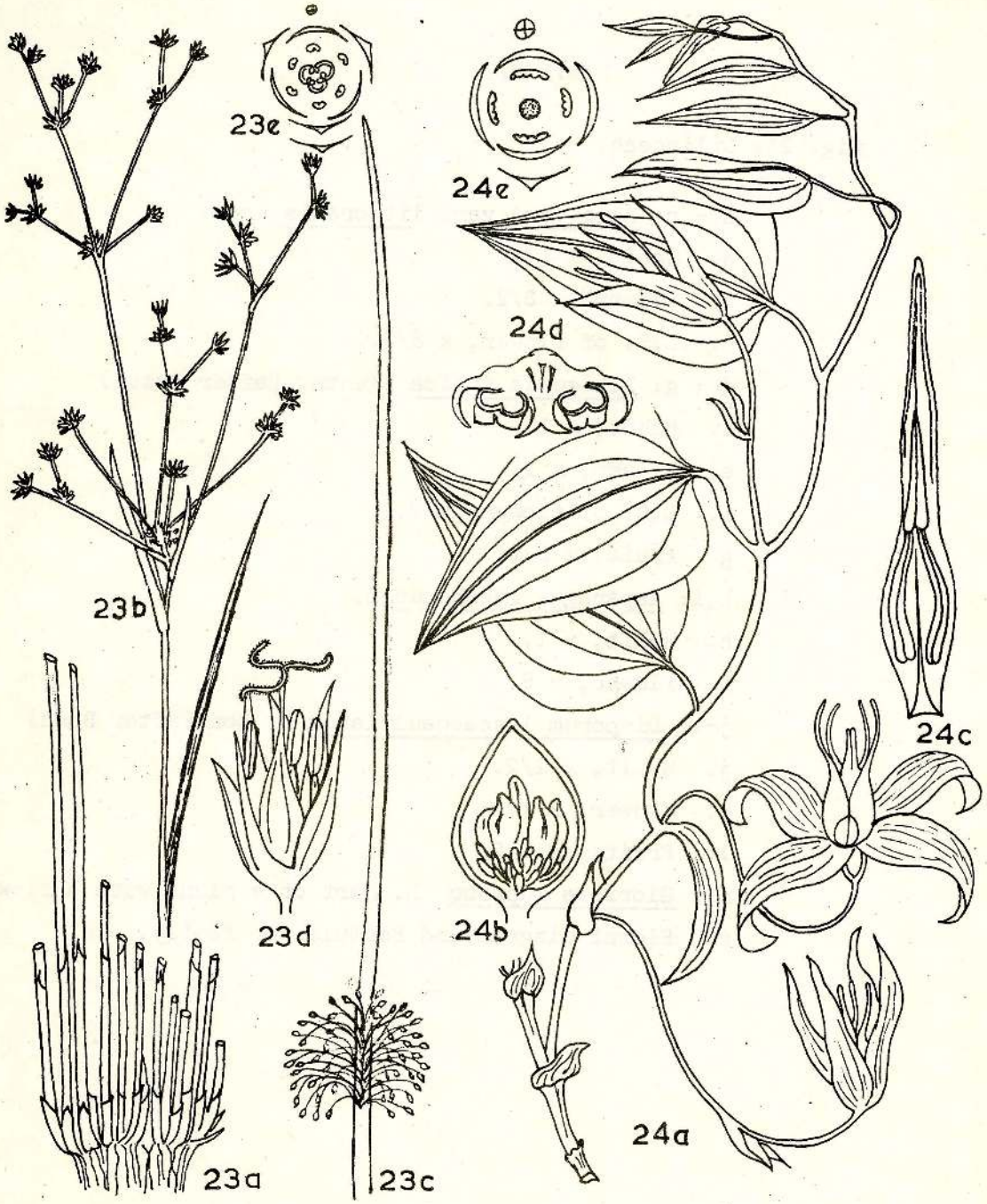

PLATE XIII

PLATE XIV

Fig. 25. Liliaceae.

a - c: Aloe vera var. littoralis Koen.

a. Habit, x 1/8.

b. Flower, x 3/2.

c. L.S. of flower, x 3/2.

d - g: Iphigenia indica Kunth. (after Fyson)

d. Habit, x 1.

e. Flower, x 2.

f. L.S. of flower, x 2.

g. Fruit, x 3/2.

h,i; Asparagus racemosus L.

h. Habit, x 1.

i. Flower, x 5.

j-l: Disporum leschenaultianum D. Don (after Bond)

j. Habit, x 1/2.

k. Flower, x 1/2

l. Fruits, x 1/2.

m; Gloriosa superba L. Part of a plant with a flower.

n; Floral diagram and Formula for family.

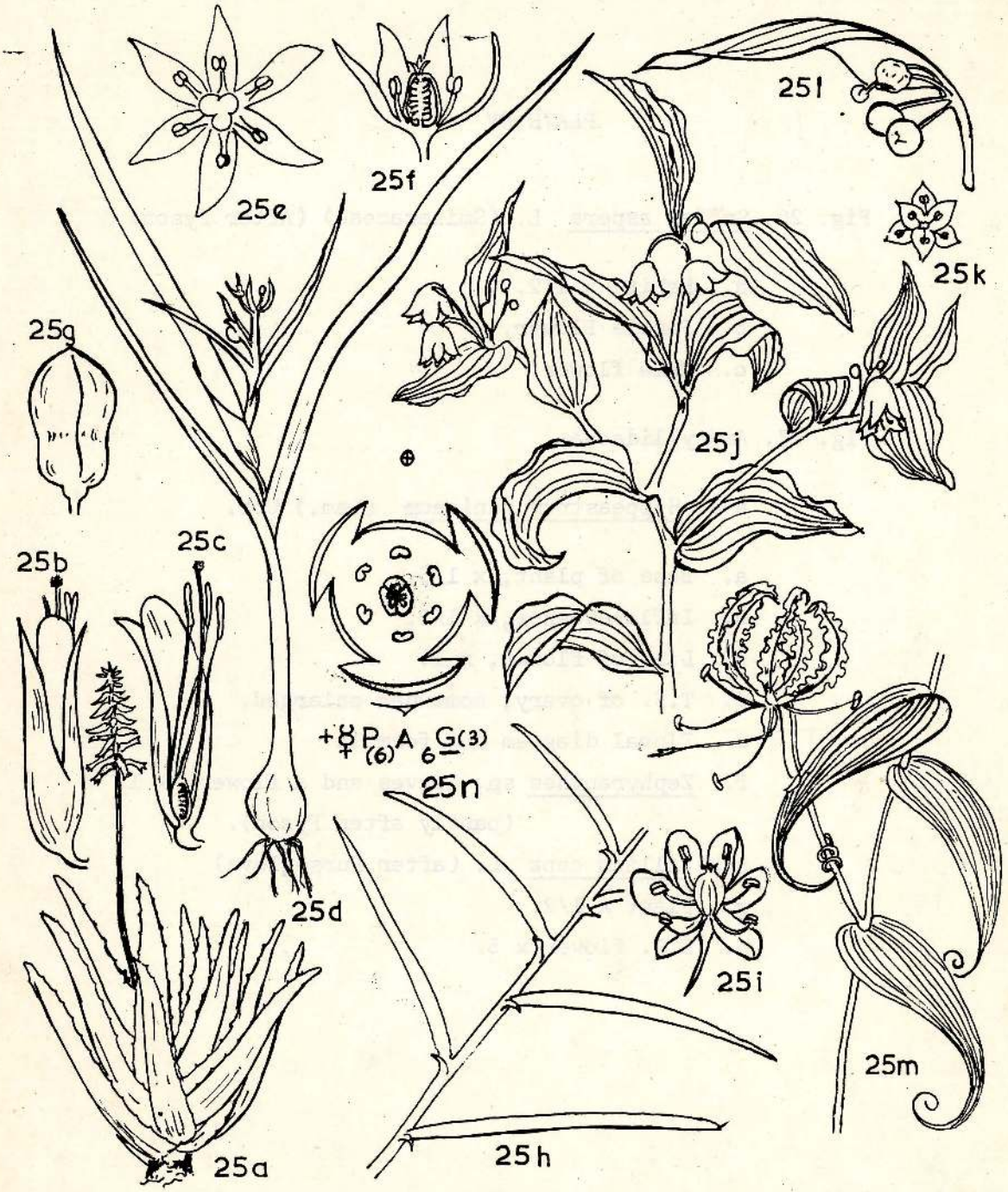

PLATE XIV

PLATE XV

Fig. 26. Smilax aspera L. (Smilacaceae) (After Fyson).

a. Habit, x 1/2.
b. Female Flower.
c. Male flower.

Fig. 27. Amaryllidaceae

a-e: Hippeastrum puniceum (Lam.) Urb.

a. Base of plant, x 1/5.
b. Inflorescence, x 1/3.
c. L.S. of flower, x 1.
d. T.S. of ovary, somewhat enlarged.
e. Floral diagram and formula.
f. Zephyranthes sp., Leaves and a flower, x 1. (partly after Fyson).

g-h: Allium cepa L. (after Purseglove)

g. Plant x 1/2.
h. L.S. flower x 5.

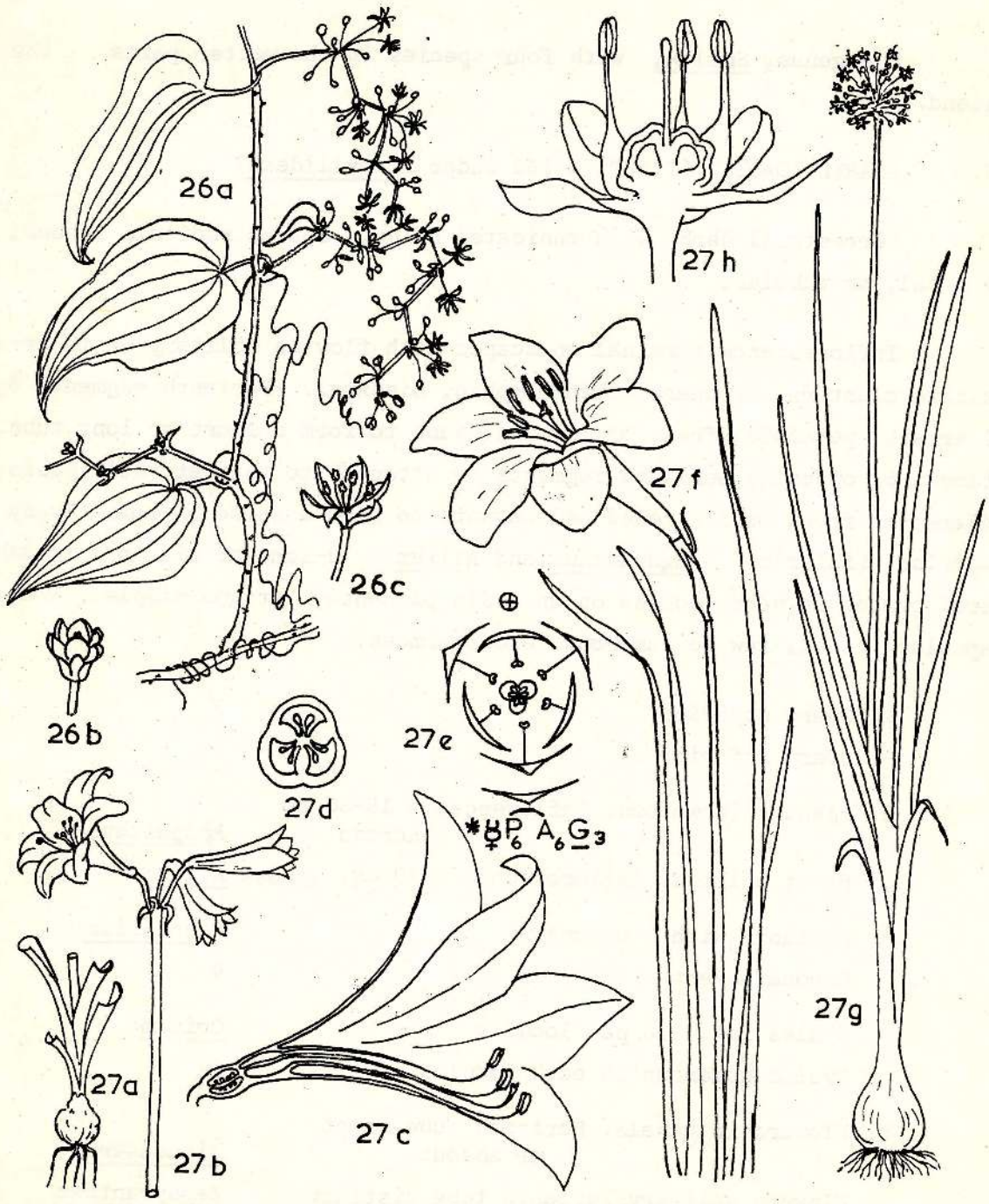

PLATE XV

One genus, Smilax, with four species in the wetter parts the island.

27. AMARYLLIDACEAE (T.F.C. 4:268 under Amaryllideae)

Terrestrial herbs with tunicated bulbs. Leaves radical; linear, or broad, or tubular,

Inflorescence terminal on scapes with flowers solitary or in umbellate clusters. Flowers actinomorphic, bisexual. Perianth segments 6, biseriate, petaloid; free, or fused at base to form a short or long tube. Stamens 6, opposite perianth segments or attached to them at their bases; filaments free, or flattened and connate to form a false corona. Ovary superior, (inferior in Agapanthus and Allium) 3-locular with one to several ovules in each loculus on an axile placenta, stigma simple. Fruit capsular. Seeds few to numerous, endospermous.

1.	Ovary superior	2
	Ovary inferior	3
2.	Plant rhizomatous. Inflorescence 15-30 cm across	Agapanthus
	Plant bulbous. Inflorescence 5-10 cm. across	Allium
3.	Perianth with a corona	Pancratium
	Corona absent	4
4.	Ovules few, 2-6 per loculus	Crinum
	Ovules numerous in each loculus	5
5.	Flowers in umbels. Perianth tube short or absent	Hippeastrum
	Flowers solitary. Perianth tube distinct	Zephyranthes

Of these only Pancratium and Crinum are native to Sri Lanka; the other four are introduced genera. P. zeylanicum L. is common in grassy places in some parts of the low country. C. asiaticum L. is found on the southwestern sandy coasts. The other species of Crinum are common in some wet places in the low country. Allium spp., Agapanthus africanus Hoffmg., Zephyranthes grandiflora Lindl. and Hippeastrum puniceum (Lam.) Urb. are commonly cultivated. Of these, the last is often found as an escape from cultivation.

28. HYPOXIDACEAE (T.F.C. 4:268, under Amaryllideae)

Terrestrial herbs with short or long tuberous rhizomes. Leaves mostly radical, linear-lanceolate to lanceolate, prominently veined, plicate.

Inflorescence short-stalked and spicate or racemose, or flowers solitary. Flowers actinomorphic, bisexual, usually yellow coloured. Perianth epigynous, segments 6; attached directly to top of ovary, or on a slender column above ovary. Stamens 6, opposite and attached to base of perianth segments. Ovary inferior, 3-locular, with 2 to several ovules in each loculus; style columnar, stigmas 3. Fruit indehiscent, few- to many-seeded. Seeds subglobose, black, endospermous.

Perianth segments directly attached to top of ovary	Moliniera
Perianth segments raised above ovary on an elongate, slender column	Curculigo

M. leptostachya (Wight) Abeywick., and C. orchioides Gaertn. are indigenous species and are rather common in some moist open places in the low country and up to about 1000m. M. capitulata (Lour.) Herbert is a common garden plant.

29. AGAVACEAE

Terrestrial herbs or shrubs. Stems short or elongate, sometimes rhizomatous. Leaves radical or cauline and crowded on stem; lamina simple, linear to lanceolate or ovate-lanceolate; thick, fibrous or fleshy; apex and margin sometimes spinous. Reproduction often by means of bulbils formed on flowering axes.

Inflorescence racemose or paniculate, sometimes very large and up to 3m or more in height. Flowers actinomorphic or slightly zygomorphic; bisexual. Perianth segments 6, fused at base to form a short or long tube, segments subequal; a corona always absent. Stamens 6, inserted at base of perianth segments or on tube. Ovary inferior, 3-locular; ovules one to several in each loculus on an axile placenta; style slender, stigma 3-lobed or 3-fid. Fruit a loculicidal capsule or berry.

Seeds few to numerous, compressed, endospermous.

1. Leaves narrow, linear; flowers in simple racemes — Polianthes
   Leaves broader; flowers in large panicles — 2
2. Stamens longer than perianth segments — Agave
   Stamens shorter than perianth segments — Furcraea

Polianthes tuberosa L. is commonly cultivated. Agave vera-cruz Hill. and Furcraea foetida (L.) Haw. are sometimes grown in gardens and are often found as escapes from cultivation.

30. TACCACEAE (T.F.C. 4:273)

Perennial herbs with large tuberous rhizomes. Leaves radical, large, entire or much-lobed.

Inflorescence pedunculate and umbellate with an involucre of bracts; inner bracts filiform. Flowers actinomorphic, bisexual. Perianth segments 6, more or less petaloid, biseriate, imbricate in bud. Stamens 6, inserted at base of perianth lobes, filaments very short. Ovary inferior, 1-locular, with numerous ovules on 3 parietal placentas; style short; stigmas 3, broad and reflexed over style. Fruit a 6-ribbed berry. Seeds numerous and endospermous.

Tacca leontopetaloides (L.) Kuntze, in grassy open places in the dry zone; rather rare. T. chantrieri Andre is sometimes found in cultivation.

31. TRICHOPODACEAE (T.F.C. 4:274 under Dioscoreaceae)

Terrestrial herbs. Stems rhizomatous short, tufted. Leaves petiolate, stipulate; Lamina triangular or ovate-elliptic to linear-lanceolate, 3-9 nerved.

Flowers solitary or fascicled, long-pedicillate, in axils of bracts at base of petioles; small, actinomorphic, bisexual. Perianth shortly campanulate, deeply 6-lobed; lobes biseriate, subequal, ovate-lanceolate. Stamens 6, inserted at base of perianth lobes; filaments very short; connective appendaged. Ovary inferior, 3-locular, with 2 ovules in each loculus on an axile placenta; style short and stout; stigmas 3, short, each bifid and reflexed. Fruit obovoid or pyriform, 3-winged, indehiscent, few-seeded. Seeds with a much folded testa, endospermous.

PLATE XVI

Fig. 28. Moliniera leptostachya (Wight) Abeywick. (Hypoxidaceae)

a. Plant, x 1/2 - (after Wight).
b. L.S. of Flower, x 3 - (after Wight).
c. Floral diagram and formula.

Fig. 29. Agave sp. (Agavaceae).

a. Habit, x 1/30.
b. Flowers, x 1/2.
c. L.S. of flower, x 1/2.
d. T.S. of ovary, x 2.

Fig. 30. Tacca leontopetaloides (L) Kuntze (Taccaeae). (After Hutchinson and Dalziel).

a. Plant, x 1/9.
b. Part of Inflorescence, x 1.
c. T.S. of ovary, x 6.

PLATE XVI

PLATE XVII

Fig. 31. Trichopus zeylanicus Gaertn. (Trichopodaceae) (Partly after Hutchinson).

a. Plant, x 1.
b. Perianth, x 2.
c. An outer tepal, x 4.
d. Part of T.S. of a flower showing stamens with enlarged/connectives, x 5.
e. A stamen, enlarged.
f. T.S. of ovary, x 4.
g. L.S. of fruit, x 3.

Fig. 32. Dioscorea spp. (Dioscoreaceae)

a. D. bulbifera L. showing axillary tubers, x 1/2.
b-f: D. alata L.
b. Part of a plant with male inflorescences, x 1/3.
c. Part of female inflorescence, x 2.
d. A single male flower, x 10.
e. A single female flower, x 5.
f. A female flower as seen from above, x 10.

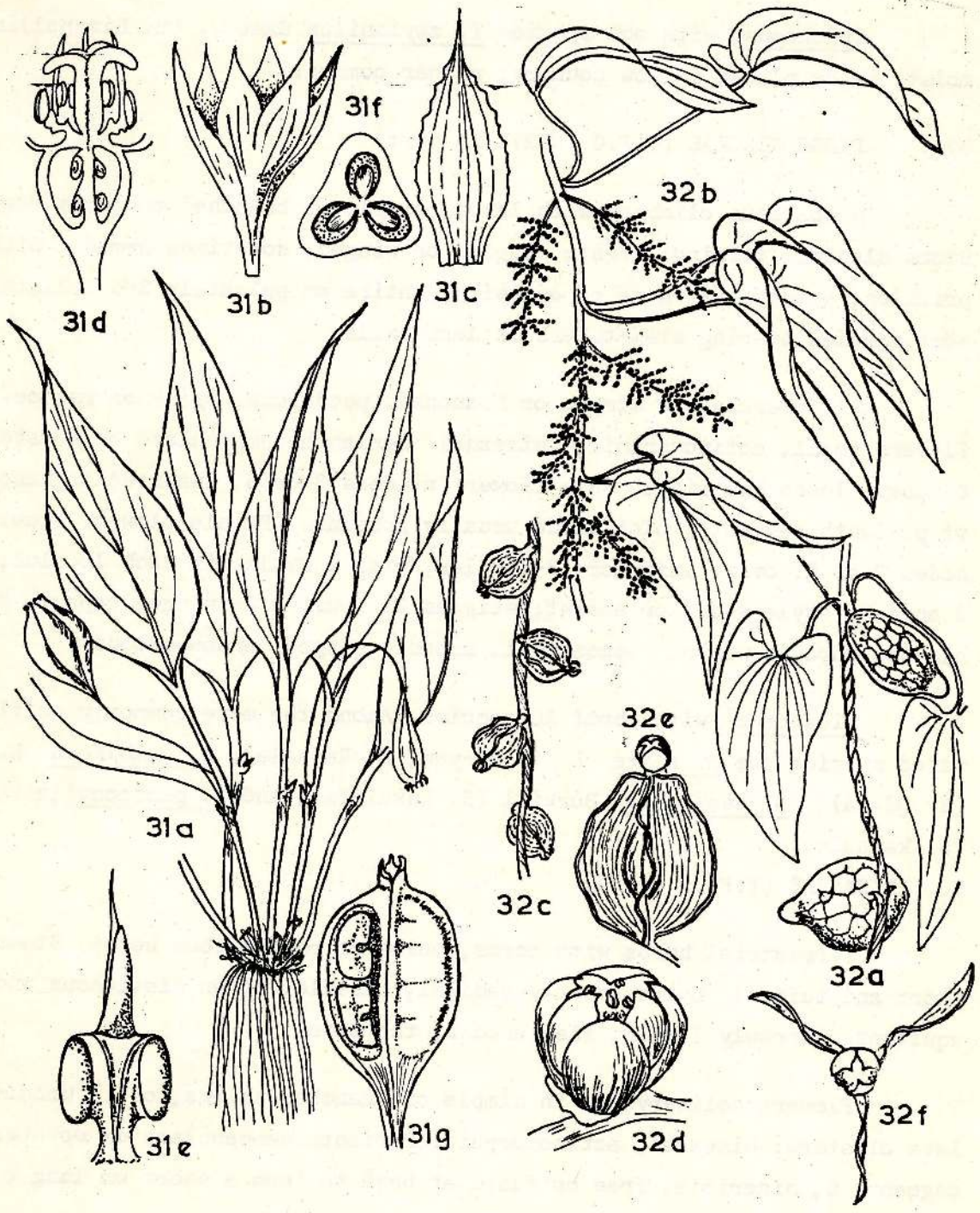

PLATE XVII

Trichopus, with one species T. zeylanicus Gaertn. (S. Bin-pol)in moist, sandy places in low country; rather common.

32. DIOSCOREACEAE (T.F.C. 4:274 in part)

Herbaceous climbers with large, simple or branched tuberous roots. Stems slender, twining; terete, angled or winged; sometimes armed with prickles. Leaves alternate or opposite; entire or palmately 3-5 foliate; some species bearing stem-tubers in leaf axils.

Inflorescence a simple or branched, pendulous, spike or raceme. Flowers small, actinomorphic, unisexual. Perianth campanulate or rotate, 6-lobed, lobes biseriate. Male flower: stamens 3 or 6, inserted at base of perianth segments; pistillode usually present. Female flower: staminodes 3 or 6; ovary inferior, 3-locular, with 2 ovules in each loculus; 3 angled; style short or absent; stigmas 3. Fruit a 3- winged capsule dehiscing through wings. Seeds flat, broadly winged, endospermous.

Dioscorea with about 10 species. Among the more commonly cultivated species are D. alata L. (King-yam, S. Rajaala), D. bulbifera L. (S. Udala), D. esculenta Burkill (S. kukulala), and D. pentaphylla L. (S. katuala).

33. IRIDACEAE (T.F.C. 6:284)

Terrestrial herbs with corms, bulbs or rhizomatous bases. Stems short and tufted. Leaves mostly radical, sessile, often distichous and equitant, narrowly linear, flattened at the sides.

Flowers solitary, or in simple or branched spikes, or in umbellate clusters; bisexual; actinomorphic. Perianth campanulate or rotate; segments 6, biseriate, free or fused at base to form a short or long tube;

segments petaloid, subequal or inner segments larger and different in shape. Stamens 3, opposite outer perianth segments; filaments free or partly connate. Ovary inferior, 3-locular, each loculus with numerous ovules on an axile placenta; style slender, 3-lobed with lobes sometimes further divided or flattened. Fruit capsular, 3-valved. Seeds numerous, endospermous.

1.	Perianth tube absent	2
	Perianth tube present	3
2.	Inflorescence umbellate	Sisyrinchium
	Inflorescence dichotomous or loosely corymbose	Belamcanda
3.	Tube short; flower actinomorphic	Aristea
	Tube well developed; flower zygomorphic	Gladiolus

In this family there are no genera indigenous to the island, but several are commonly grown as ornamentals. Belamcanda chinensis DC. and Gladiolus spp. are found only under cultivation. Aristea ecklonii Baker and Sisyrinchium laxum Sims have now become naturalized and are found in a semiwild condition in the montane zone.

34. MUSACEAE (T.F.C. 4:238 under Scitamineae)

Large tree-like herbs. Stems rhizomatous. Leaves very large, sheathing at base and petiolate; sheaths imbricating and forming a stem-like axis; lamina oblong, midrib stout, lateral veins numerous and parallel.

Inflorescence terminal, pendulous and spicate with flowers in comb-like clusters in axils of coloured spathes; spathes spirally arranged on inflorescence axis. Flowers subsessile, zygomorphic, functionally unisexual; with female flowers bearing fertile ovaries in the basal clusters,

and with male flowers bearing fertile stamens in the more apical clusters. Perianth biseriate; outer whorl calyx-like and tubular but split open on one side, 5-lobed with 3 lobes longer than the other 2, segments recurved; inner whorl with a single, membranous petaloid segment, placed opposite slit in outer whorl and sheathing base of stamens and style. Stamens 5,a staminode sometimes present. Ovary inferior, 3-locular, each loculus with numerous ovules on an axile placenta; style filiform, stigma subglobose. Fruit fleshy and indehiscent. Seeds with hard testas, endospermous. Cultivated varieties parthenocarpic.

M. acuminata Colla and M. balbisiana Colla, on steep rocks near streams in wet zone up to about 1000m. These are considered to be the parents of M. x paradisiaca L., many varieties of which are cultivated in the island.

35. ZINGIBERACEAE (T.F.C. 4:238 under Scitamineae)

Terrestrial herbs with short, erect leafy axes arising from creeping , tuberous rhizomes; tissues usually with aromatic compounds. Leaves distichous or spirally arranged, sheathing at base; sheaths open or closed; blade linear to ovate-lanceolate.

Inflorescence terminal on erect axes or on leafless peduncles arising from rhizome, with flowers solitary or in spikes, racemes, panicles or cone-like heads. Flowers actinomorphic or zygomorphic, bisexual. Perianth biseriate; outer 3 segments sepaloid free or fused to form a short or long tube; inner 3 segments petaloid and often united at base, posterior segment sometimes much longer than others and showy. Fertile stamen solitary, anther 2-locular; one or more petaloid staminodes often present. Ovary inferior, 3-locular or 1-locular with 3 parietal placentas; ovules numerous. Fruit a berry or capsule. Seeds numerous, endospermous.

About 12 genera with nearly 30 species. Among the species of economic importance are the cardamoms, Elettaria repens (Sonner.) Baill. and E. ensal (Gaertn.) Abeywick.; Zingiber officinale Roscoe (Ginger,) Kaempferia galanga L. (S. Inguru-piyali) and Curcuma domestica Valet. (Turmeric).

36. CANNACEAE (T.F.C. 4:238 under Scitamineae)

Terrestrial herbs with erect leafy shoots arising from creeping rhizomes. Leaves sheathing at base, sheath with upper region open on one side; lamina large, lanceolate to ovate or orbicular.

Inflorescence terminal on erect axes, simple or branched, racemose. Flower irregular, bisexual. Perianth biseriate; all segments more or less sepal-like; outer 3 segments free, imbricate, persistent; inner 3 segments longer, fused at base and with staminal column. Stamens flattened and petaloid, adnate at base; outer whorl with 3 imbricate petal-like staminodes; inner whorl with one large petal-like segment (which probably represents 2 fused staminodes) and a smaller petal-like segment with one fertile anther attached laterally; anther 1-locular. Ovary inferior, 3-locular, each loculus with numerous ovules on an axile placenta; style flattened. Fruit capsular. Seeds globose, testa and endosperm very hard.

Canna, with one species C. indica L. common in waste places throughout the island.

37. MARANTACEAE (T.F.C. 4:238 under Scitamineae)

Terrestrial herbs with erect leafy axes arising from fleshy rhizomes. Leaves distichous, or solitary, or in pairs; sheathing at base, sheaths open; lamina large, lanceolate to ovate or orbicular.

PLATE XVIII

Fig. 33. Gladiolus sp. (Iridaceae).

a. Inflorescence, x 1/4.
b. L.S. of flower, x 1/2.
c. Floral diagram.

Fig. 34. Musa sp. (Musaceae).

a. Plant with inflorescence, x 1/25.
b. A single "comb" of flowers with spathe, x 1/8.
c. A single flower, x 1.
d. L.S. of a flower, x 1, and floral formula.
e. Floral diagram of a male flower.
f. Floral diagram of a female flower.

Fig. 35. Hedychium coronarium Koen. (Zingiberaceae).

a. Part of a plant with flowers, x 1/3.
b. A single flower, x 2/3.
c. A stamen with adnate style.
d. Floral diagram and formula.

Fig. 36. Canna indica L. (Cannaceae)

a. Plant with flowers, x 1/5.
b. L.S. of a flower, x 1/2.
c. Floral diagram and formula.

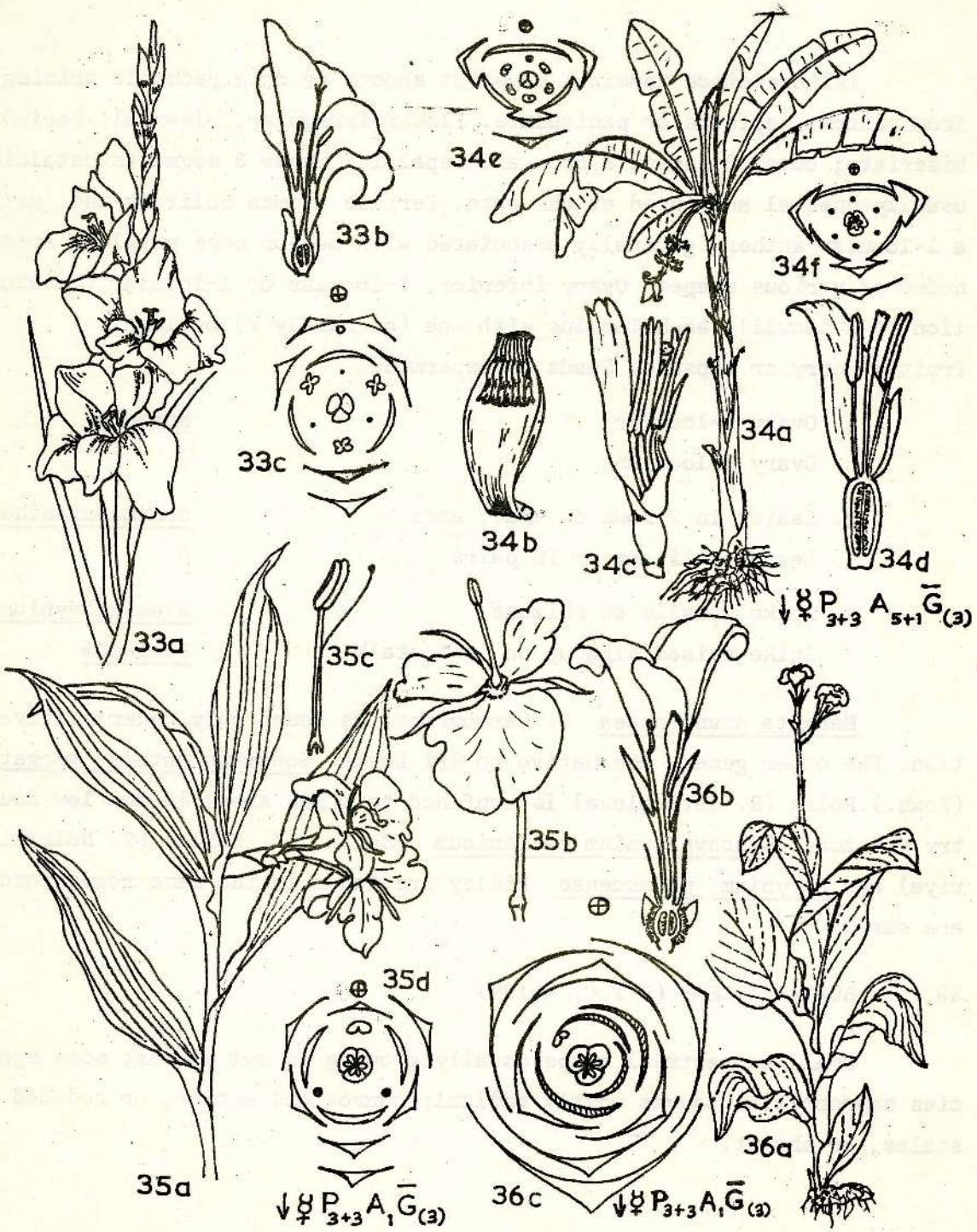

PLATE XVIII

Inflorescence terminal on erect shoots or on a peduncle arising from rhizome, spicate or paniculate. Flower irregular, bisexual. Perianth biseriate; outer 3 segments free and sepaloid; inner 3 segments petaloid, usually unequal and fused at the base. Fertile stamen solitary and with a 1-locular anther, generally associated with one or more petaloid staminodes of various shapes. Ovary inferior, 3-locular or 1-locular (by abortion of 2 loculi); each loculus with one (or rarely 2) ovules. Fruit a berry or capsule. Seeds endospermous.

1.	Ovary 1-locular	Maranta
	Ovary 3-locular	2
2.	Leaves in 2 rows on erect axes	Schumannianthus
	Leaves solitary or in pairs	3
3.	Spike sessile on rhizome	Stachyphrynium
	Spike raised high up on leaf-stalk	Phrynium

Maranta arundinacea L. (arrowroot) is found only under cultivation. The other genera are native to Sri Lanka. Schumannianthus virgatus (Roxb.) Rolfe (S. Geta-oluwa) is confined to a few areas in the low country wet zone. Stachyphrynium zeylanicum (Benth.) K. Schum. (S. Hulankiriya) and Phrynium malaccense Ridley are found in the same region and are rare.

38. BURMANNIACEAE (T.F.C. 4:129)

Small terrestrial herbs usually growing in wet places; some species saprophytic. Leaves mostly radical; narrow and entire, or reduced to scales, or absent.

Flowers solitary, or in simple spikes or racemes, or attached to one side of a bifurcating cyme; actinomorphic, bisexual. Perianth corolla-like, tubular, tube sometimes 3-winged; mouth 6-lobed, outer 3 lobes valvate, inner 3 lobes smaller and narrower or much reduced. Stamens 3, subsessile, opposite and attached to inner perianth lobes; connective appendaged; crest-like. Ovary inferior, 3-locular, each loculus with numerous ovules on an axile placenta; style short and 3-lobed. Fruit capsular, 3-winged. Seeds very small, endosperm scanty.

Burmannia has 4 local species, found mainly in the low country wet-zone. Of them B. championii Thw. is a delicate, milk-white, total saprophyte.

39. THISMICEAE (T.F.C. 4:129 under Burmanniaceae)

Small saprophytic herbs. Leaves reduced to scales and pale in colour, or leaves absent.

Flowers terminal; solitary, or in spikes or heads; actinomorphic, bisexual. Perianth corolla-like, inflated-tubular or campanulate, mouth contracted, 6-lobed; outer 3 lobes broadly ovate; inner 3 lobes longer, linear, columnar, and with filiform appendages. Stamens 6, almost sessile and attached to perianth-tube; connective much flattened and dilated. Ovary inferior, very small, 1-locular with 3 parietal placentas, ovules numerous, stigmas 3 and each bifid; placentas separating from wall at an early stage. Fruit a circumscissile capsule. Seeds small and numerous; endosperm absent.

PLATE XIX

Fig. 37. Maranta arundinacea L. (Marantaceae, after Brown).

a. Plant with basal tubers, x 1/6.
b. Inflorescence, x 1/2.
c. Floral diagram.

Fig. 38. Burmannia caelestis D. Don (Burmanniaceae).

a. Plant, x 1.
b. Perianth spread out to show stamens.
c. A single stamen, enlarged.
d. Flower, x 5.
e. T.S. ovary, enlarged.

Fig. 39. Thismia gardnerana Hook. f. (Thismiaceae).
(after Hutchinson - all drawings enlarged)

a. Plant in flower.
b. Perianth spread out.
c. A single stamen.
d. L.S. of ovary.
e. Stigma.

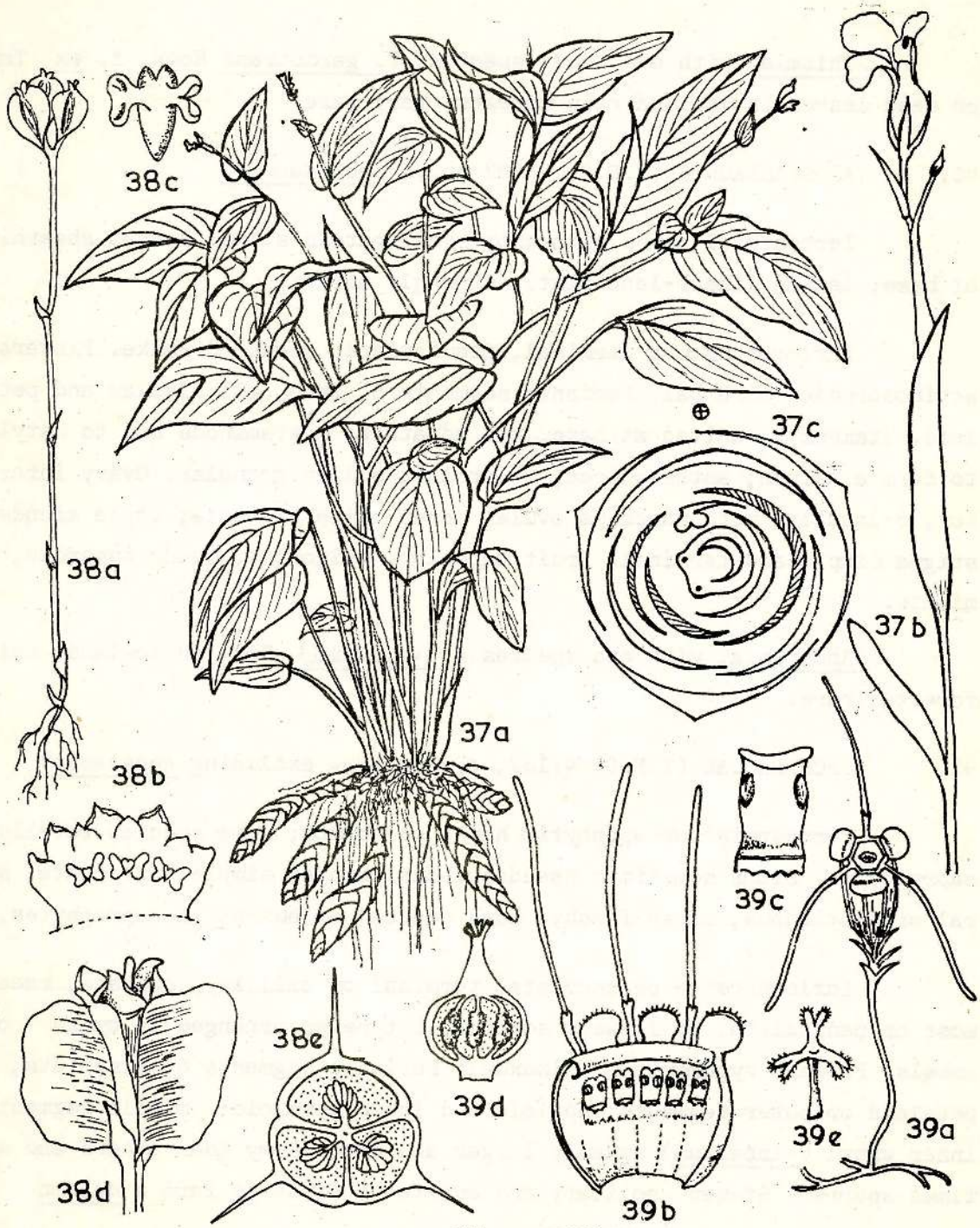

PLATE XIX

Thismia with one local species, T. gardnerana Hook. f. ex Thw. on dead leaves in lowland rain forests; very rare.

40. APOSTASIACEAE (T.F.C. 4:132 under Orchidaceae)

Terrestrial herbs with short rhizomatous stems. Leaves sheathing at base; lamina linear-lanceolate, strongly nerved.

Inflorescence a terminal, pedunculate, branched spike. Flowers actinomorphic, bisexual. Perianth segments 6, free, all similar and petaloid. Stamens 2, united at base, and adnate to a staminode and to style to form a column; anthers free, 2-locular, pollen granular. Ovary inferior, 3-locular, with numerous ovules on an axile placenta; style slender, stigma simple and terminal. Fruit capsular, trigonous. Seeds numerous, minute.

Apostasia, with one species A. wallichii Br., in lowland rain forests; rare.

41. ORCHIDACEAE (T.F.C. 4:132, Orchidaceae excluding Apostasia)

Terrestrial or epiphytic herbs or shrubs; some species totally saprophytic. Stems sometimes pseudobulbous. Leaves simple; alternate, spiral or distichous, often fleshy; much reduced or absent in saprophytes.

Inflorescence pedunculate, terminal or axillary; spicate, racemose or paniculate, or flowers solitary but never arranged in cymes or umbels. Flowers zygomorphic, bisexual. Perianth segments 6, biseriate, all petaloid or outer segments sepaloid and inner petaloid; middle segment of inner whorl (=labellum) usually larger and more showy than others and sometimes spurred. Stamen solitary and adnate to style to form a column or

gynandrium. Pollen granular or aggregated into masses of pollinia. Ovary inferior, 1-locular with numerous ovules on 3 parietal placentas; style a part of column; 2 stigmas fertile and laterally placed, the 3rd sterile and transformed into a small outgrowth (=rostellum). Fruit capsular. Seeds minute and numerous; embryo not differentiated.

About 65 genera with over 150 species, of which about 70 are endemic to Sri Lanka.

Some of the more important are Dendrobium maccarthiae Thw. (Wesak-orchid), D. crumenatum Sw. (Pigeon-orchid), Ipsea speciosa Lindl. (Daffodil orchid), Rhynchostylis retusa (L.) Bl. (Fox-tail orchid), Zeuxine regia (Lindl.) Trim. (S. Iru-raja) and Anoectochilus setacea Bl. (S. Wana-raja).

PLATE XX

Fig. 40. Apostasia sp. (Apostasiaceae) Floral diagram and formula.

Fig. 41. Orchidaceae.

a-b: Spathoglottis plicata Bl.

a. Plant, x 1/5.

b. L.S. of Flower, x 1.

c,d and e: Phaius tancarvilleae (Banks) Bl.

c. Plant, x 3/20 (after Holttum).

d. Flower, x 1.

e. L.S. of Flower, x 1.

f. A group of orchid pollinia.

g. Floral diagram and formula.

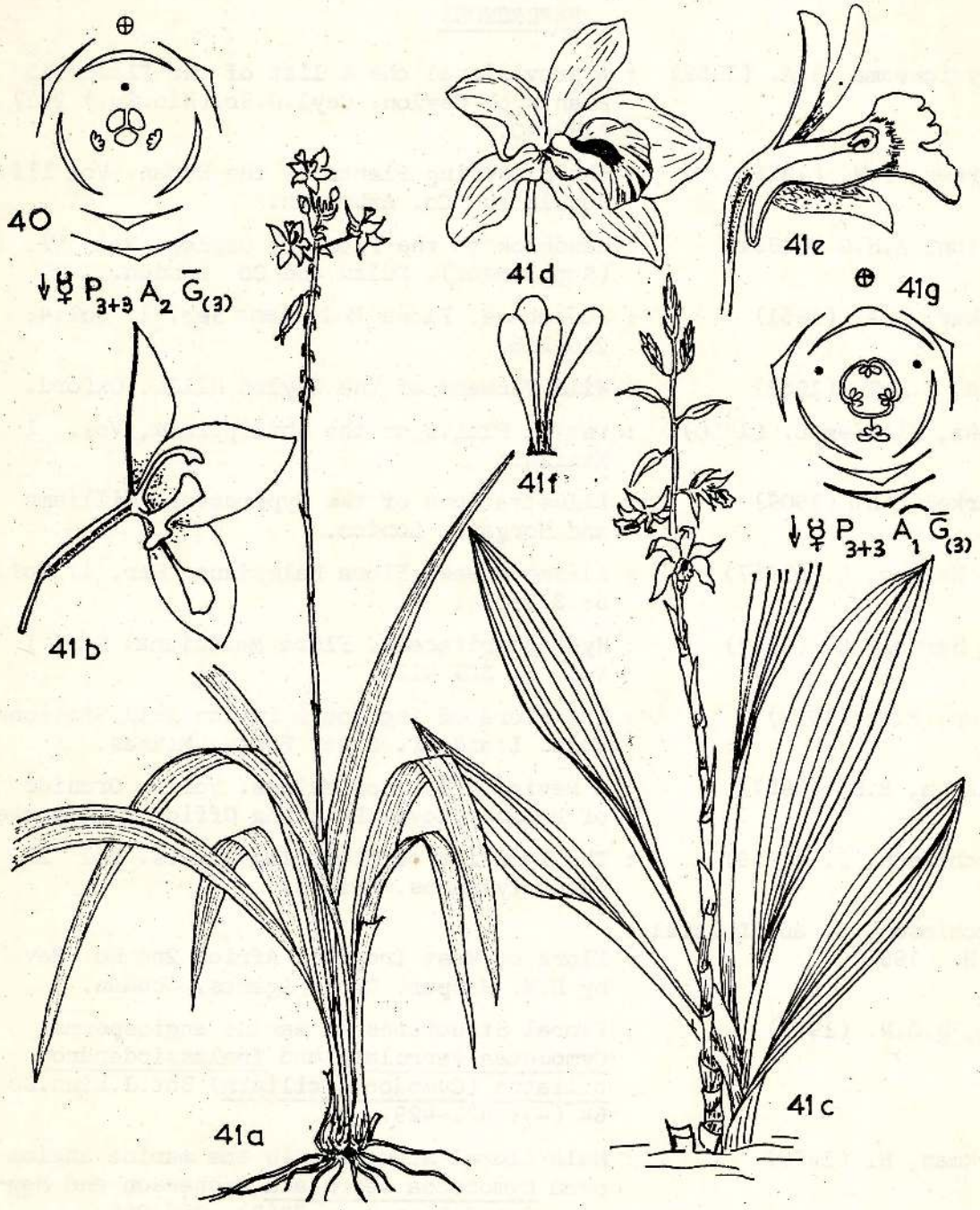

PLATE XX

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INDEX TO THE FAMILIES

The numbers refer to the serial numbers given to the families in the text.)

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