



# **MEDICINAL PLANTS**

## **(Indigenous and Exotic) Used in Ceylon**

### **PART II**

#### **CACTACEAE – FAGACEAE**

**With 119 illustrations including one colour plate**

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**WITH TAXONOMIC UPDATING**

**BY**

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## INTRODUCTION

Part II of the "Medicinal Plants Used in Ceylon" includes 23 families from Cactaceae to Fagaceae. 122 species are described and of these 29 species are exotics, some of which are cultivated for food and others introduced for their medicinal value. Three species are not cultivated in Ceylon, as they are mostly temperate plants and the Island's requirements are imported from abroad. Four endemic species have been included as they are used medicinally in Ceylon. The balance species are indigenous and are of universal use in India, Ceylon and elsewhere.

Most species described are illustrated, the numbering of the figures being continued from Part I. The illustrations have been made from fresh material wherever possible. Where fresh material was not available, authentic herbarium specimens deposited in the Herbarium of the Department of Agriculture were examined and cited in the text.

I am grateful to Mr. K. L. D. Ameratunge, Systematic Botanist, for allowing me the use of the herbarium, reference literature and drawings in his charge and to Mrs. Nimala Amarasuriya of the National Science Council for editorial assistance.

D. M. A. JAYAWERA

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**REPRINT OF MEDICINAL PLANTS (INDIGENOUS AND EXOTIC) USED IN  
CEYLON – PARTS I-V BY D.M.A.JAYAWEERA (1981-1982)**

**NOTES ON PLANT NAMES TO USERS OF THIS REPRINT**

Many of the names of plant taxa given in D.M.A.Jayaweera's "Medicinal Plants (Indigenous and Exotic) Used in Ceylon" Parts I-V (1981-1982), have been changed for taxonomic and/or nomenclatural reasons and for the correction of misidentifications of certain plants by the authors of early floras. Further the author citations and the abbreviations used to indicate the names of authors also have to be given in a specific form. Some of the names of plant families have been changed and a few genera have been transferred from one family to another.

In these corrections lists the plant name as it is indicated in Jayaweera's publication is given against the name now considered to be the correct one. This does not necessarily mean that the name in Jayaweera's work is a synonym of the second name.

These corrections have been based primarily on "A Revised Handbook to the Flora of Ceylon" Volumes I-XIV (1980-2000) Edited by Dassanayaka, M.D., Fosberg, F.R. and Clayton, W.D. and on "A Check List of the Flowering Plants of Sri Lanka" by Senaratna, L.K. (2001). Reference has been made to several other publications to establish the correct names, especially for the exotic plants. A list of the more important of these works is given at the end of each corrections list.

In the reference given against each name considered to be the correction, "R" refers to the "A Revised Handbook to the Flora of Ceylon". For other references, the number indicates the numeral against the name of the publication in the References, and this is followed by the number of the volume, if any, and the page on which the name of the plant is given.

Lilani Kumudini Senaratna  
The Open University of Sri Lanka  
15<sup>th</sup> August 2005

**CORRECTIONS LIST - PART II**

<b>PAGE</b>	<b>CORRECTIONS</b>	<b>Ref.</b>
05	The genus <i>Lobelia</i> is now separated from CAMPANULACEAE and is placed in the family LOBELIACEAE. For <i>Lobelia nicotianifolia</i> Heyne ex Roem. read: <i>Lobelia nicotianifolia</i> Roth ex Roem. & Schult.	R4:166 R4:172
07	For CANNABINACEAE read: CANNABACEAE. For <i>Cannabis sativa</i> Linn. read: <i>Cannabis sativa</i> L.	10:226
09	For CAPPARIDACEAE read: CAPPARACEAE. For <i>Capparis horrida</i> Linn.f. read: <i>Capparis zeylanica</i> L. <i>C. horrida</i> L.f. is now considered to be the same as <i>C. zeylanica</i> L. of page 13. In this page the author citation should be changed from "Linn." to "L."	R10:23 R10:37

15	For <i>Crataeva religiosa</i> Forst.f. read: <i>Crateva adansonii</i> DC. subsp. <i>odora</i> (Buch.-Ham.) Jacobs	R10:49
17	For <i>Gynandropsis gynandra</i> (Linn.) Merr. read: <i>Cleome gynandra</i> L.	R10:28
19	For <i>Polanisia icosandra</i> (Linn.) Wight and Arn. read: <i>Cleome viscosa</i> L.	R10:25
20	For <i>Carica papaya</i> Linn. read: <i>Carica papaya</i> L.	R10:52
25	For <i>Elaeodendron glaucum</i> (Rottb.) Pers. read: <i>Cassine glauca</i> (Rottb.) Kuntze	R10:86
27	For <i>Kokoona zeylanica</i> Thwaites read: <i>Kokoona zeylanica</i> Thw.	R10:105
29	For <i>Anogeissus latifolia</i> Wall. read: <i>Anogeissus latifolia</i> (DC.) Wall.	9:42
31	For <i>Terminalia arjuna</i> Wight and Arn. read: <i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	R 9:44
35	For <i>Terminalia catappa</i> Linn. read: <i>Terminalia catappa</i> L.	R9:39
39	For <i>Terminalia tomentosa</i> Wight and Arn. read: <i>Terminalia tomentosa</i> (Roxb.) Wight & Arn.	
43	For <i>Cyanotis axillaris</i> (Linn.) J.A. & J.H.Schult. read: <i>Cyanotis axillaris</i> (L.) Sweet	R14:119
45	The recommended name for the family COMPOSITAE is ASTERACEAE. For <i>Ageratum conyzoides</i> Linn. read: <i>Ageratum conyzoides</i> L.	10:47 R1:141
47	For <i>Anacyclus pyrethrum</i> DC. read: <i>Anacyclus pyrethrum</i> (L.) Lagasea	9:35
51	For <i>Artemisia vulgaris</i> Linn. read: <i>Artemesia dubia</i> Wall. ex Bess. var. <i>grata</i> (Wall.) ex DC.) Pampan.	R1:240
53	For <i>Blumea mollis</i> (D.Don) Merr. read: <i>Blumea axillaris</i> (Lam.) DC.	10:49
55	For <i>Centipeda minima</i> (L.) A.Br. & Aschers. read: <i>Centipeda minima</i> (L.) A.Br. & Asch.	R1:235
57	For <i>Eclipta prostrata</i> (Linn.) Linn. read: <i>Eclipta prostrata</i> (L.) L.	R1:212
59	For <i>Elephantopus scaber</i> Linn. read: <i>Elephantopus scaber</i> L.	R1:135
61	For <i>Emilia sonchifolia</i> (Linn.) DC. read: <i>Emilia sonchifolia</i> (L.) DC.	R1:251
65	For <i>Gynura pseudo-china</i> DC. read: <i>Gynura pseudochina</i> (L.) DC.	9:322
67	For <i>Saussurea lappa</i> Clarke read: <i>Saussurea costus</i> (Falc.) Lipschitz	9:642
69	For <i>Sphaeranthus indicus</i> Linn. read: <i>Sphaeranthus indicus</i> L.	R1:181
71	For <i>Spilanthes paniculata</i> Wall. read: <i>Spilanthes calva</i> DC.	R1:221
77	For <i>Vernonia zeylanica</i> Less. read: <i>Vernonia zeylanica</i> (L.) Less.	R1:131

79	For <i>Wedelia chinensis</i> (Osbeck) Merrill read: <b><i>Wedelia chinensis</i> (Osbeck) Merr.</b>	R1:215
81	For <i>Xanthium strumarium</i> Linn. read: <b><i>Xanthium indicum</i> Koenig</b>	R1:209
83	For <i>Abies spectabilis</i> (D.Don) Spach read: <b><i>Abies webbiana</i> Lindley</b>	3:1
85	For <i>Cedrus deodara</i> (Roxb.) Loudon read: <b><i>Cedrus deodara</i> (D.Don) G.Don f.</b>	9:137
87	For <i>Argyreia nervosa</i> (Burm.f.) Boj. read: <b><i>Argyreia nervosa</i> (Burm.f.) Bojer</b>	R1:297
95	For <i>Evolvulus alsinoides</i> Linn. read: <b><i>Evolvulus alsinoides</i> (L.) L.</b>	R1:309
97	For <i>Ipomoea angustifolia</i> Jacq. read: <b><i>Merremia tridentata</i> (L.) Hall.f.</b>	R1:351
99	For <i>Ipomoea aquatica</i> Forsk. read: <b><i>Ipomoea aquatica</i> Forssk.</b>	10:92
101	For <i>Ipomoea asarifolia</i> (Desr.) Roem. and Schult. read: <b><i>Ipomoea asarifolia</i> (Desr.) Roem. &amp; Schult.</b>	R1:319
103	For <i>Ipomoea mauritiana</i> (Jacq.) Abeywick. read: <b><i>Ipomoea mauritiana</i> Jacq.</b>	R1:331
105	For <i>Ipomoea maxima</i> (Linn.f.) G.Don read: <b><i>Ipomoea sepiaria</i> Roxb.</b>	R1:338
107	For <i>Ipomoea nil</i> (Linn.) Roth read: <b><i>Ipomoea nil</i> (L.) Roth</b>	R1:332
109	For <i>Ipomoea obscura</i> (Linn.) Ker-Gawl. read: <b><i>Ipomoea obscura</i> (L.) Ker-Gawl.</b>	R1:333
111	For <i>Ipomoea pes-caprae</i> (Linn.) Roth read: <b><i>Ipomoea pes-caprae</i> (L.) R.Br.</b>	R1:334
113	For <i>Ipomoea pes-tigridis</i> Linn. read: <b><i>Ipomoea pes-tigridis</i> L.</b>	R1:336
115	For <i>Operculina turpethum</i> (Linn.) S. Manso read: <b><i>Operculina turpethum</i> (L.) S. Manso</b>	R1:356
117	For <i>Kalanchoe laciniata</i> DC. read: <b><i>Kalanchoe laciniata</i> (L.) Pers.</b>	R13:63
119	The recommended name for the CRUCIFERAE is <b>BRASSICACEAE.</b> For <i>Brassica alba</i> Hook.f. and Th. read: <b><i>Brassica alba</i> (L.) Rabenh.</b>	10:70 5:159 (sub syn.)
121	For <i>Brassica integrifolia</i> (West) O.E.Schulz read: <b><i>Brassica juncea</i> (L.) Czern.</b>	R9:03
123	For <i>Brassica nigra</i> (Linn.) Koch read: <b><i>Brassica nigra</i> (L.) Koch</b>	5:155
127	For <i>Bryonopsis laciniosa</i> (Linn.) Naud. read: <b><i>Diplocyclos palmatus</i> (L.) C.Jeffrey</b>	R11:31
129	For <i>Coccinea grandis</i> Kurz read: <b><i>Coccinia grandis</i> (L.) J.Voigt</b>	R11:28
131	For <i>Colocynthis citrullus</i> (Linn.) Kuntze read: <b><i>Citrullus lanatus</i> (Thunb.) Matsum &amp; Nakai</b>	R11:21
133	For <i>Colocynthis vulgaris</i> Schrad. read: <b><i>Citrullus colocynthis</i> (L.) Schrad.</b>	R11:20
135	For <i>Corallocarpus epigaeus</i> C.B.Clarke read: <b><i>Corallocarpus epigaeus</i> (Arn.) Hook.f.</b>	R11:39

137	<i>Cucumis callosus</i> (Rottl.) Cogn. has been reduced to the next species <i>C. melo</i> L.	R11:27
139	For <i>Cucumis melo</i> var. <i>egrestis</i> Naud. read: <i>Cucumis melo</i> L.	R11:26
141	For <i>Cucumis sativus</i> Linn. read: <i>Cucumis sativus</i> L.	R11:27
143	For <i>Cucurbita maxima</i> Duchesne read: <i>Cucurbita maxima</i> Lam.	R11:08
145	For <i>Lagenaria siceraria</i> (Mol.) Standley read: <i>Lagenaria siceraria</i> (Molina) Standley	R11:08
147	For <i>Luffa acutangula</i> Roxb. read: <i>Luffa acutangula</i> (L.) Roxb.	R11:18
149	For <i>Luffa cylindrica</i> (Linn.) M.Roem. read: <i>Luffa cylindrica</i> (L.) M.Roemer	R11:17
151	For <i>Melothria heterophylla</i> Cogn. read: <i>Solena amplexicaulis</i> (Lam.) Gandhi	R11:40
153	For <i>Melothria maderaspatana</i> (Linn.) Cogn. read: <i>Mukia maderaspatana</i> (L.) M.Roemer	R11:35
155	For <i>Momordica charantia</i> Linn. read: <i>Momordica charantia</i> L.	R11:23
157	For <i>Momordica dioica</i> Roxb. read: <i>Momordica dioica</i> Roxb. ex Willd.	R11:22
159	For <i>Trichosanthes anguina</i> Linn. read: <i>Trichosanthes anguina</i> L.	R11:13
161	For <i>Trichosanthes bracteata</i> (Lam.) Voigt read: <i>Trichosanthes tricuspida</i> Lour.	R11:10
163	For <i>Trichosanthes cucumerina</i> Linn. read: <i>Trichosanthes cucumerina</i> L.	R11:12
165	For <i>Zanonia indica</i> Linn. read: <i>Zanonia indica</i> L.	R11:45
167	For <i>Cycas circinalis</i> Linn. read: <i>Cycas circinalis</i> L.	R14:301
169	For <i>Cyperus rotundus</i> Linn. read: <i>Cyperus rotundus</i> L.	R5:181
171	For <i>Dillenia indica</i> Linn. read: <i>Dillenia indica</i> L.	R10:115
175	For <i>Dipterocarpus glandulosus</i> Thwaites read: <i>Dipterocarpus glandulosus</i> Thw.	R1:370
181	For <i>Diospyros malabarica</i> (Lam.) Kostel. read: <i>Diospyros malabarica</i> (Desr.) Kostel.	R3:27
183	For <i>Gaultheria rudis</i> Stapf. read: <i>Gaultheria leschenaultii</i> DC.	R13:75
185	For <i>Rhododendron zeylanicum</i> Booth read: <i>Rhododendron arboreum</i> Smith subsp. <i>zeylanicum</i> (Booth) Tagg	R13:73
191	For <i>Acalypha indica</i> Linn. read: <i>Acalypha indica</i> L.	R11:132
193	For <i>Bridelia retusa</i> (Linn.) Spreng. read: <i>Bridelia retusa</i> (L.) Spreng.	R13:81
197	For <i>Croton lacciferus</i> Linn. read: <i>Croton laccifer</i> L.	10:133

199	For <i>Croton tiglium</i> Linn. read: <i>Croton tiglium</i> L.	R11:94
201	For <i>Dimorphocalyx glabellus</i> Thwaites read: <i>Dimorphocalyx glabellus</i> Thw.	R11:107
203	For <i>Euphorbia antiquorum</i> Linn. read: <i>Euphorbia antiquorum</i> L.	R11:193
205	For <i>Euphorbia hirta</i> Linn. read: <i>Euphorbia hirta</i> L.	R11:198
207	For <i>Euphorbia indica</i> Lamk. read: <i>Euphorbia indica</i> Lam.	R11:196
209	For <i>Euphorbia nerifolia</i> Linn. read: <i>Euphorbia nerifolia</i> L.	R11:192
211	For <i>Euphorbia thymifolia</i> Linn. read: <i>Euphorbia thymifolia</i> L.	R11:201
213	For <i>Euphorbia tirucalli</i> Linn. read: <i>Euphorbia tirucalli</i> L.	R11:195
215	For <i>Excoecaria agallocha</i> Linn. read: <i>Excoecaria agallocha</i> L.	R11:188
217	For <i>Jatropha curcas</i> Linn. read: <i>Jatropha curcas</i> L.	R11:85
223	For <i>Macaranga peltata</i> (Roxb.) Muell.-Arg. read: <i>Macaranga peltata</i> (Roxb.) Muell. Arg.	R11:170
225	For <i>Mallotus philippinensis</i> (Lam.) Muell.-Arg. read: <i>Mallotus philippinensis</i> (Lam.) Muell. Arg.	R11:158
227	For <i>Phyllanthus debilis</i> Klein ex Willd. read: <i>Phyllanthus amarus</i> Schum.	R11:226
229	For <i>Phyllanthus emblica</i> Linn. read: <i>Phyllanthus emblica</i> L.	R11:219
233	For <i>Phyllanthus urinaria</i> Linn. read: <i>Phyllanthus urinaria</i> L.	R11:227
237	For <i>Ricinus communis</i> Linn. read: <i>Ricinus communis</i> L.	R11:175
243	For <i>Securinega leucopyrus</i> (Willd.) Muell.-Arg. read: <i>Flueggea leucopyrus</i> Willd.	R11:235
245	For <i>Tragia involucrata</i> Linn. read: <i>Tragia involucrata</i> L.	R11:140

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# PART II

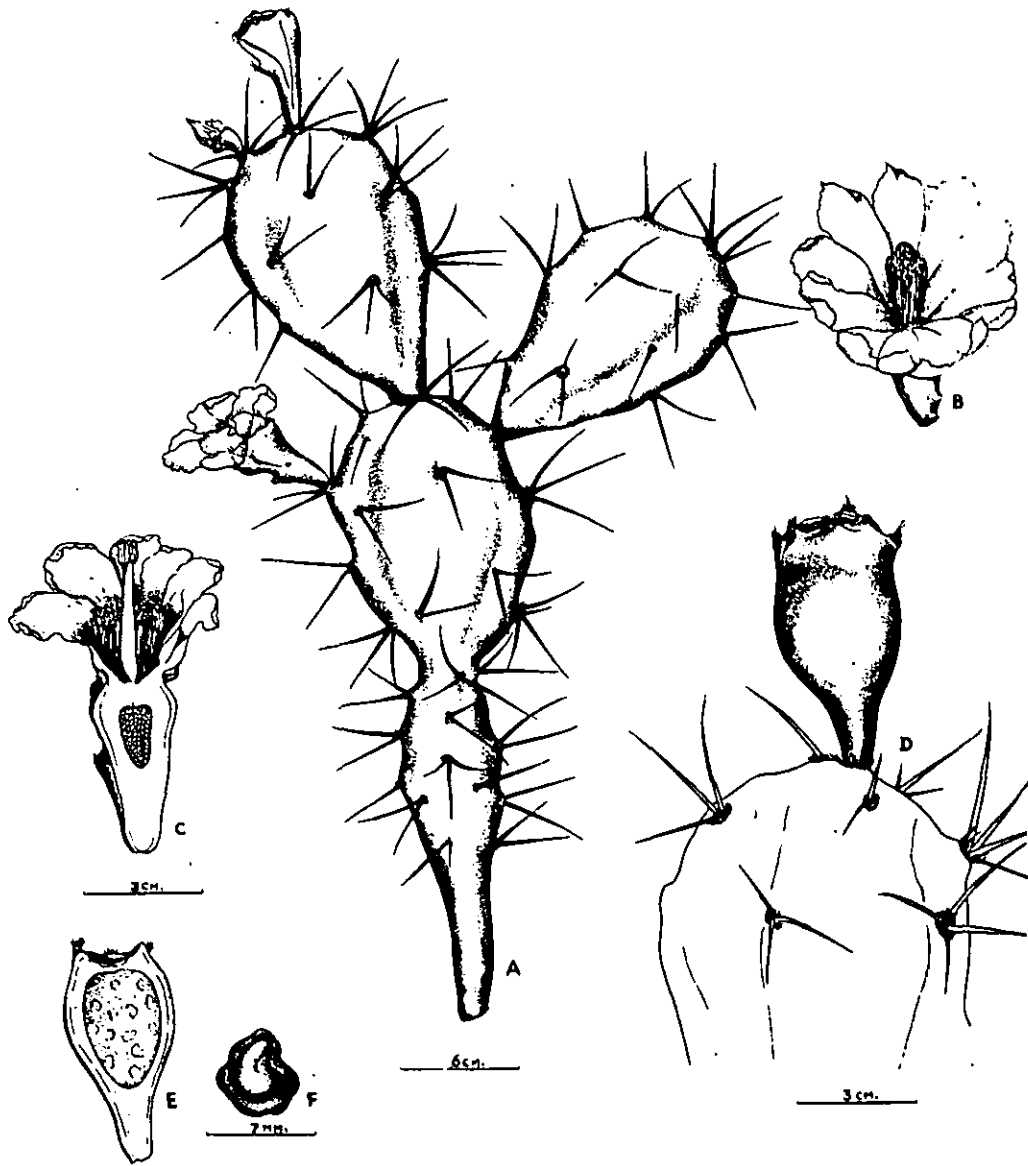


FIG. 101. *Opuntia dillenii*. A, portion of the stem with spines and flowers. B, front view of flower. C, longitudinal section of flower. D, fruit. E, longitudinal section of fruit. F, seed.

## 23. CACTACEAE

### 1. *Opuntia dillenii* (Ker-Gawl.) Haw., Suppl. Succ. 79. 1819. (Fig. 101).

*Cactus dillienii* Ker-Gawl.—*Opuntia horrida* Salm-Dyck.—*Cactus indicus* Roxb.

*Engl.* Prickly Pear, *Sinh.* Katu-pathok, Kodugaha; *Tam.* Kalli, Manjarnagadali, Mullukkalli, Nagadali, Nagakkalli, Palagaikkalli, Pattanadugalli, Sappattu, Sappattukkalli, Sapattumul; *Hindi* Haththathoira, Nagphana, Nagphani; *Sans.* Bahudugdhika, Bahushala, Dondavrikshaka, Guda, Gula, Kandarahaka, Kandashaka, Krishnakhara, Kubshadruma, Mahavriksha, Nagadru, Nagaphana, Netrari, Nistrinshapatrika, Samantadugha, Shakhakanta, Shihunda, Sihunda, Sinhatunda, Snuha, Snuka, Snusha, Sudha, Vajra, Vajradruma, Vajrakantaka, Vajri, Vidara, Visvasaraka.

A large, densely branched bush, about 1.5 m high, stems flattened into cladodes, each section of the stem 17—22 cm long, 7.5—13 cm broad, obovate, flat, thick, green or greyish-green with large, yellowish areoles, each provided with 1—5 long spines and glochids; spines 0.5—2.5 cm long, yellow or lighter, bright, sharp, usually somewhat curved; glochidia numerous and yellowish; flowers regular, bisexual, large, about 7 cm across, solitary from the areoles on the edges of the flat shoots; perianth rotate, the outer segments ovate, acute, rounded with membranous margins, the inner segments obovate, rounded, mucronate and the innermost ones 5 cm long, 2 cm broad, obovate—spathulate; stamens numerous of unequal lengths, scarcely reaching half the length of the inner perianth segments; ovary inferior, shoot-like, 5 cm long, obconical with areoles and glochidia, unilocular with the ovules on parietal placentas, style stout, about 2.2 cm long, exceeding the stamens, stigmas 5—8, erect; fruit a pyriform, reddish-purple berry, 6 cm long, 3 cm broad, depressed at apex bearing tufts of glochidia, seeds 5.5 cm across, ridged.

Flowers almost throughout the year, especially during months of drought.

*Illustrations.* Edward's *Bot. Reg.* 3: pl. 258. 1817; Kirtikar and Basu, *Indian Med. Pl.*, pl. 469B. 1933; Herb. Peradeniya, drawing.

*Distribution.* Probably indigenous to Mexico and found growing abundantly in Florida, tropical South America and West Indies. It is naturalized in India, Ceylon, China and Australia. In Ceylon, it is found in abundance near the coast in the dry regions and rocky waste ground in the low country.

*Ceylon.* Eastern Prov., Trincomalee, *Alston* 531, May 1922.

*Uses.* The young cladodes of this plant, ground and applied as a poultice, allays heat and inflammation. The ground cladode applied to boils hastens suppuration. Its juice cures ear-ache. The fruit is considered a refrigerant and is said to be useful for gonorrhoea and whooping cough. A syrup prepared from the juice of the ripe fruit is used to control spasmodic cough and promote expectoration. It is beneficial for all heart ailments.

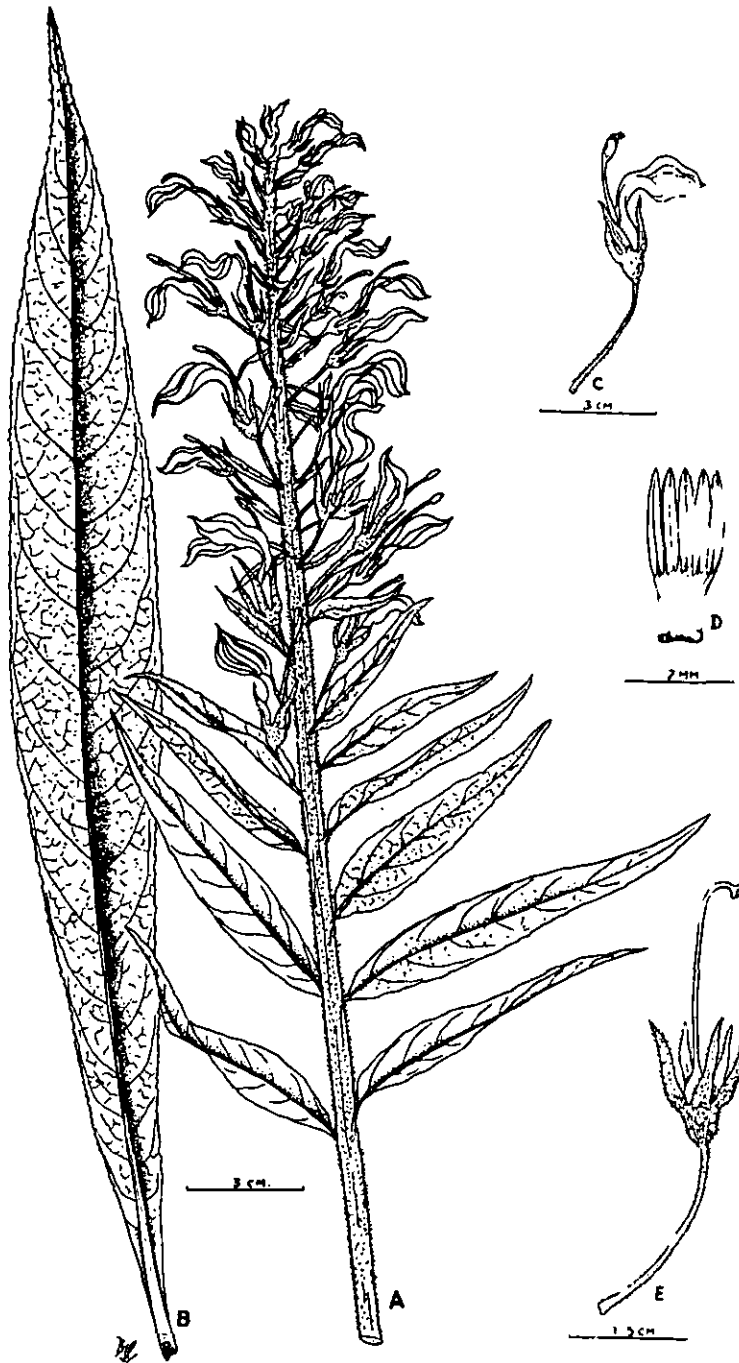


FIG. 102. *Lobelia nicotianifolia*. A, apical portion of stem bearing top leaves and raceme. B, leaf. C, lateral view of flower. D, top of stamen tube spread out. E, flower with corolla and stamen-tube removed showing the calyx and pistil.

## 24. CAMPANULACEAE

### 1. *Lobelia nicotianifolia* Heyne ex Roem. in Roth. Nov. Plant. 1821. (Fig. 102).

*Lobelia nicotianaefolia* Heyne.—*Lobelia aromatica* Moon—*Lobelia excelsa* Lesch.—*Rapuntium nicotianaefolium* Presl.

*Engl.* Wild Tobacco; *Sinh.* Rasni, Wal-dunkola; *Tam.* Kattuppugaiyilai; *Hindi* Nala, Narasala; *Sans.* Bibhishana, Chhidrana, Devanala, Dhamana, Dirghavansha, Kichaka, Kukshirandhra, Lalavansha, Mahanala, Mala, Mriduchhada, Mridupatra, Mrityupushpa, Nada, Nalottama, Narttaka, Nata, Nati, Potagala, Shunyamadhya, Sthuladanda, Sthulanala, Suradruma, Suranala, Vanshapatra, Vanya.

A large, biennial or perennial herb, stem 1—3 m high, erect, stout, simple or slightly branched, cylindrical, glabrous or pubescent; leaves simple, alternate, exstipulate, nearly sessile, numerous, the longest 30—45 cm but becoming gradually smaller towards the apex, the uppermost ones about 7.5 cm long, passing into floral bracts, all linear-lanceolate, tapering at both ends, serrate, denticulate or nearly entire, glabrous above, glabrous or densely pubescent beneath; flowers deep purplish-pink or white, irregular, bisexual, numerous, large, on long spreading pedicels, each with a leafy bract in dense simple or branched, erect, terminal racemes 30—60 cm long; sepals 5, fused into a tube adnate to the ovary, glabrous or pubescent, segments long, linear, acuminate, serrate; petals 5, fused, split down the back to the base, 2-lipped, upper lip 2-lobed, lower lip 3-lobed, glabrous or pubescent outside, 2.5—3.7 cm long, much curved with a sharp hard point at apex, lobes very long, linear, three, connate throughout, all generally remaining connected at the apex; stamens 5, epigynous, filaments connate into a tube, curved, dilated at the base, anthers linear, obtusely pointed, glabrous or with a few hairs on the back; ovary inferior, 2-locular with two large placentas and numerous ovules, style simple, stigma 2-lobed; fruit a dry capsule, dehiscent loculicidally by 2 valves on the top, protruded above the rim of adnate calyx-tube, seeds very small, smooth and shining.

Flowers from December to April.

*Illustrations.* Curtis Bot. Mag. *pl.* 5587; Wight, Ic. Pl. Ind. Orient. *pls.* 1172—1174. 1848; Kirtikar and Basu, Indian Med. Pl., *pl.* 567A. 1933; Herb. Peradeniya., drawing.

*Distribution.* Grows along the Western Ghats of India from Bombay to Travancore and rather common in Ceylon in the montane zone from 4000 feet to 7000 feet altitude.

*India.* Nilghiri and Kurg, *G. Thomson.* Malabar, Concan, etc., *Stocks, Law, etc.* Pen. Ind. Or. *Herb.* Wight 1274, Kew Distribution 1866—7. *Ceylon.* Central Prov., Madulkelle, *Senaratne* 10, 019, Feb. 1953; Maskeliya, *Herb. Peradeniya*, March 1883; between Ramboda and Nuwara Eliya, *Thwaites C.P.* 2592; Maturata, High Forest Estate, *A.M. Silva*, May 1906; Horton Plains, Haldummulla Road, *Willis*, Jan. 1906.

*Composition.* The leaves contain lelobanidines I, II and III, lobeline, and norlobelanidine. The flowers contain only lobeline. The seeds contain an acro-narcotic poison.

*Uses.* An infusion of the leaves is used as an antispasmodic and is a useful remedy for asthma.

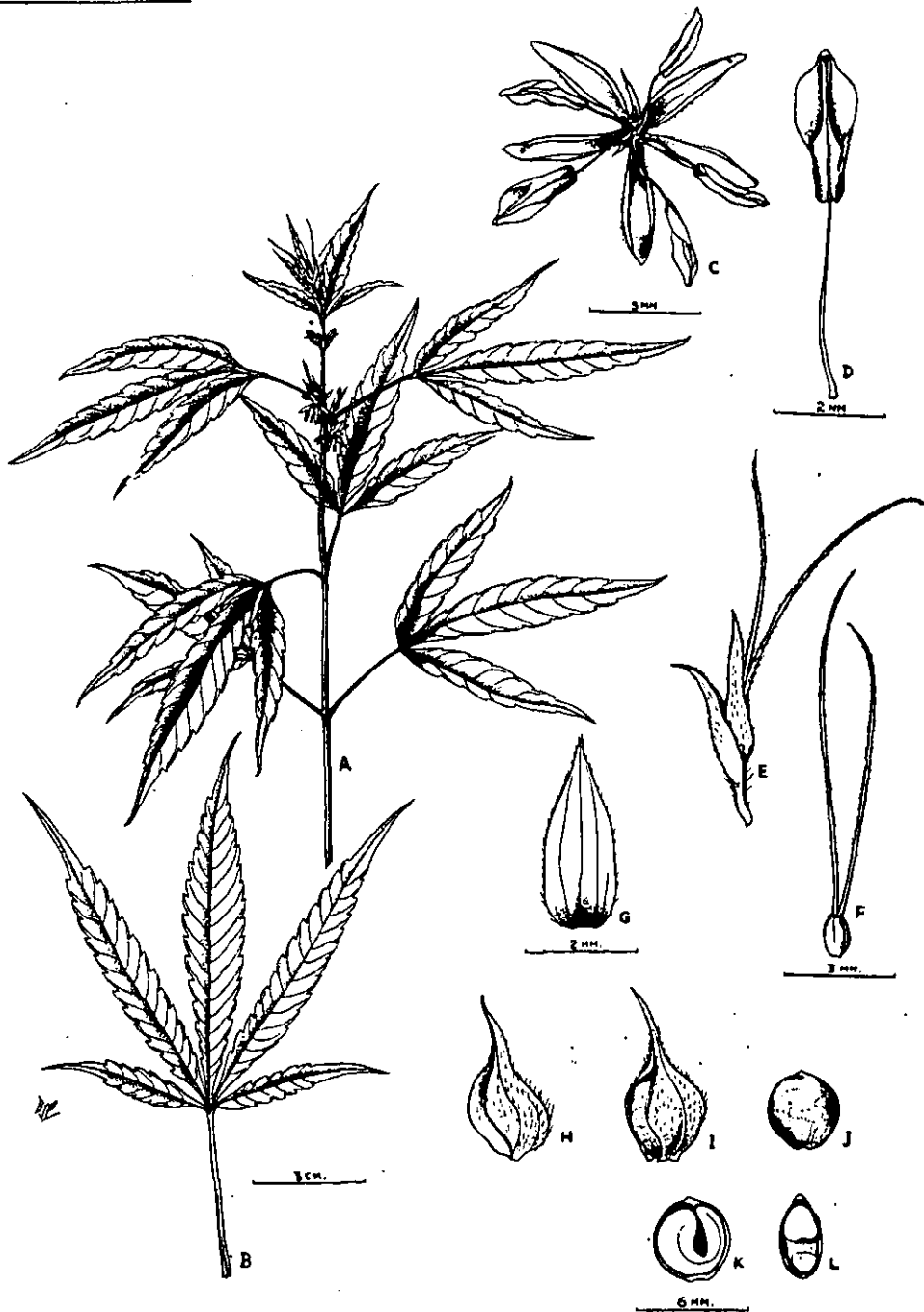


FIG 103. *Cannabis sativa*. A, branch of the male plant. B, leaf. C, male flower from top. D; stamen. E, female flower with bract and perianth-leaf. F, female flower with perianth removed. G, perianth-leaf. H, I, fruits surrounded with persistent perianth. J, fruit. K, vertical, and L, transverse section of fruit.

## 25. CANNABINACEAE

1. *Cannabis sativa* Linn. Sp. Pl. 1027. 1753. (Fig. 103).

*Cannabis indica* Lamk.—*Cannabis chitensis* Del.

*Engl.* Hemp; *Sinh.* Ganja, Kansa, Math-kansa; *Tam.* Bangi, Ganja, Kōlpam, Korkkarmuli; *Hindi* Bhang, Charas, Garja, Ganjekaper, Gur, Kinnab, Phulganja, Sabzi, Siddhi; *Sans.* Ajaya, Ananda, Bhanga, Bhringi, Chapala, Dhurtapatni, Dhurtavadhu, Ganja, Ganjika, Hanga, Hara, Harshini, Indrashana, Jaya, Jnanavallika, Kamagni, Manchara, Matkunari, Matta, Matulani, Matuli, Maya, Mohini, Nili, Shakrashana, Shiva, Shivapriya, Tandraruchivardhini, Trailokhyavijaya, Ujaya, Unmattini, Ununda, Vajra-druvikshaha, Vijaya, Virapatra, Vrijpatta, Yogini.

An annual herb about 1—3 m tall, erect, slender, stem slightly woody at the base, striate, slightly rough with very close, short and fine tomentum, greyish green; leaves numerous, alternate or opposite, palmate compound, spreading on long slender, scabrous petioles with linear acute stipules at the base; leaflets 5—7, or only 3 in the upper leaves, the middle one longest, sessile, linear-lanceolate, acute or attenuate at both ends, strongly and sharply serrate, finely scabrous and dark green above, pale and finely downy beneath; flowers small, unisexual, dioecious; male plant smaller, flowers numerous, shortly stalked, irregularly arranged on the branches of lax drooping panicles arising from axils of leaves and on the summit of the stem; perianth very deeply divided into 5, almost separate, oblong, nearly equal, downy, pale yellow segments imbricate in bud; stamens 5, opposite perianth segments, filaments slender, very short, anthers large, pendulous; female flower with a single, cordate-ovate, hirsute, glandular, 5-veined perianth leaf sheathing round the ovary; ovary superior, ovoid, smooth, unilocular with a single, pendulous ovule, style arms 2, filiform, caducous, hairy; fruit small, about 2 mm long, enclosed in the persistent, spathe-like perianth, ovoid-compressed, pointed; seed completely filling the fruit, albuminous.

**Illustrations.** Bentley and Trimen *Med. Pl.*, pl. 231. 1880; Kirtikar and Basu, *Indian Med. Pl.*, pl. 888. 1933; Watt and Breyer-Brandwijk, *Medicinal and Poisonous Med. Pl. of South and East Africa*, pl. 208. 1962; Herb. Peradeniya, drawing.

**Distribution.** Native of the temperate parts of Asia, Southern Siberia and Persia and probably of Northern India, and China. It is cultivated in Ceylon, illicitly in chenas in the dryzone

**India.** Sikkim, *T. Thomson*, 1859. Nepal, *Wallich* 4665G, 1821. Misor and Carnatic, *G. Thomson*. Ceylon. Peradeniya, Bot. Gard., cultivated, 1900. China. Peking, *Williams* 352, Aug. 1863; Wein, *Kovats* 1041.

**Composition.** The active principle in this plant is an amorphous resin called cannabin which yields a toxic oily substance known as cannabinol. The plant also contains nicotine and the seed, trigonelline.

**Uses.** The flowering tops of the female plant or the resin exuded spontaneously from the leaves and stems, under certain climatic conditions, are used medicinally or as a narcotic. The powdered leaf is mixed with tobacco and smoked as a cigarette or in a pipe. "Sabjee" and "Legiam" are two sweetened preparations, frequently used by Mohammedans.

Hemp is unreliable therapeutically as its effects vary with the physical condition and idiosyncracies of the user. It excites high psychic centres as well as the central nervous system. It distorts time and space sense. It can cause merriment and dancing or uncontrollable violence.

Medicinally, the leaves are used with other ingredients for preparations in the treatment of coughs, asthma, dropsy, diarrhoea, dysentery, piles, neuralgia, migraine, etc. In Africa, the plant is used in the treatment of malaria, blackwater fever, blood poisoning, anthrax, dysentery and snake bites.

The stem yields a valuable fibre used for cordage, sacking and sail cloth. The seeds are used as bird food as they do not contain any narcotic properties. They contain a fixed oil used as varnish.

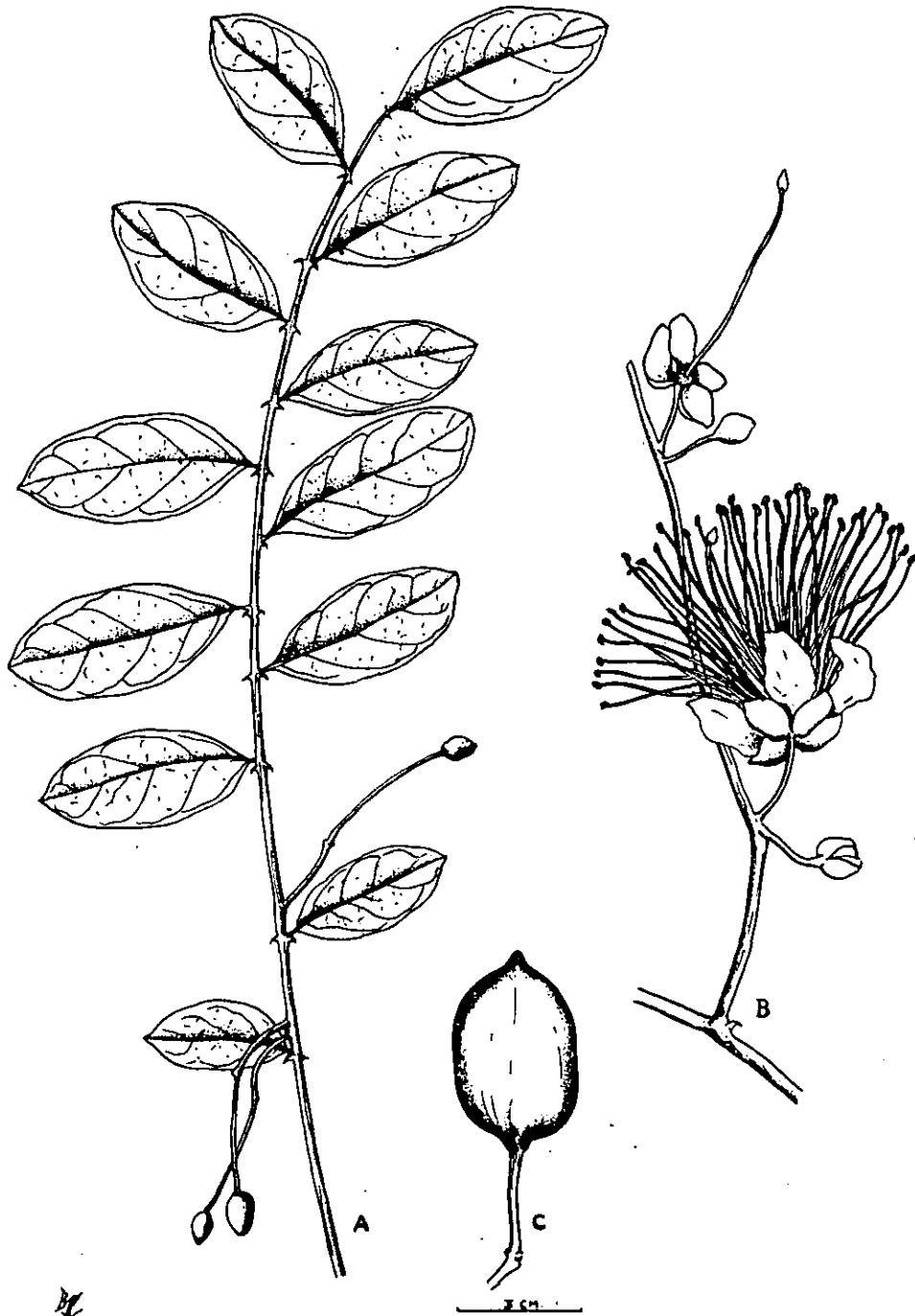


FIG. 104. *Capparis horrida*. A, branch with leaves showing stipule spines. B, flower, lateral view. C, fruit.

## 26. CAPPARIDACEAE

### 1. *Capparis horrida* Linn.f., Suppl. Plant. 264. 1781. (Fig. 104).

*Capparis zeylanica* Roxb.—*Capparis formosa* Wall.—*Capparis acuminata* Willd.—*Capparis tenuiflora* DC.—*Capparis quadriflora* DC.—*Capparis erythrodasy* Miq.—*Capparis aurantioides* Presl.—*Capparis nemerosa* Blanco—*Capparis micrantha* Blanco—*Capparis linearis* Blanco—*Capparis viminea* F.—Vill.

*Sinh.* Welangiriya; *Sans.* Hinsra.

A climbing shrub with long, divaricate branches, young shoots covered with rufous, scurfy tomentum; leaves simple, alternate, oval-lanceolate or oblong, 4.2—4.5 cm long, 2—2.4 cm broad, acuminate or strongly apiculate, obtuse, rounded at base, tomentose when young, afterwards glabrous and shining, petioles 0.4—0.5 cm long with a pair of recurved, stipular spines at the base; flowers large, bisexual, 3.7 cm diameter, supra-axillary, solitary or 2 or 3 together above one another in a vertical line, pedicels 1.2—1.8 cm long and tomentose; sepals 4, free, biseriate, nearly equal, concave, rufous, tomentose outside; petals 4, twice as long as sepals, imbricate, white and hairy; stamens numerous, crimson, much longer than petals, inserted at the base of a long gynophore; gynophore about 2.5 cm long; ovary superior, ovoid, apiculate, unilocular with 4 parietal placentas, ovules numerous; fruit subglobose, 3.2 cm diameter on a thickened stalk, indehiscent, many seeded, seeds embedded in a pulp.

Flowers during March and April.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. 1: pl.173. 1839; Herb. Peradeniya., drawing.

**Distribution.** Distributed through the Indian Peninsula, Ceylon, Malaya, Indo-China and in the Philippine Islands. In Ceylon, it is rather rare and found in the dry, low country: Jaffna, Anuradhapura, Uma Oya, Hanguranketa, etc.

**India.** Nepal, *Wallich* 6990B; Siwalik and Jaunsar, *Khosla* 7, April 1921. Malabar, Concan, etc. *Storks, Law, etc.* Maisor and Carnatic. *G. Thomson.* Ind. Orient. *Herb. Wight; Wallich* 92. Ceylon. *Thwaites* C.P. 1058; Northern Prov., Elephant Pass, *Herb. Peradeniya.*, March 1912. North Central Prov., Anuradhapura, *Herb. Peradeniya.*, March 1883. Eastern Prov., Uma Oya, *Herb. Peradeniya.*, April 1883. Ruhuna National Park, Walaskema, *Mueller—Dumbois, Comanor & Cooray* 67100110, Oct. 1967; Walaskema Rocks, *Mueller—Dumbois & Comanor* 67100110A, Oct. 1967; Warahana, *Mueller—Dumbois & Comanor* 67062214. June 1967. BURMA Upper Burma, *Huk*, June 1890.

**Uses.** The leaves of this plant are used as a counter-irritant and as a cataplasm for boils, swellings and piles. In Madras, a decoction of the leaves is used for syphilis. The root-bark is a sedative, stomachic and anti-hidriotic and useful in relieving gastric irritation, vomiting and pain. It also, improves the appetite. In Chota Nagpore, the bark mixed with arrack is given for cholera.

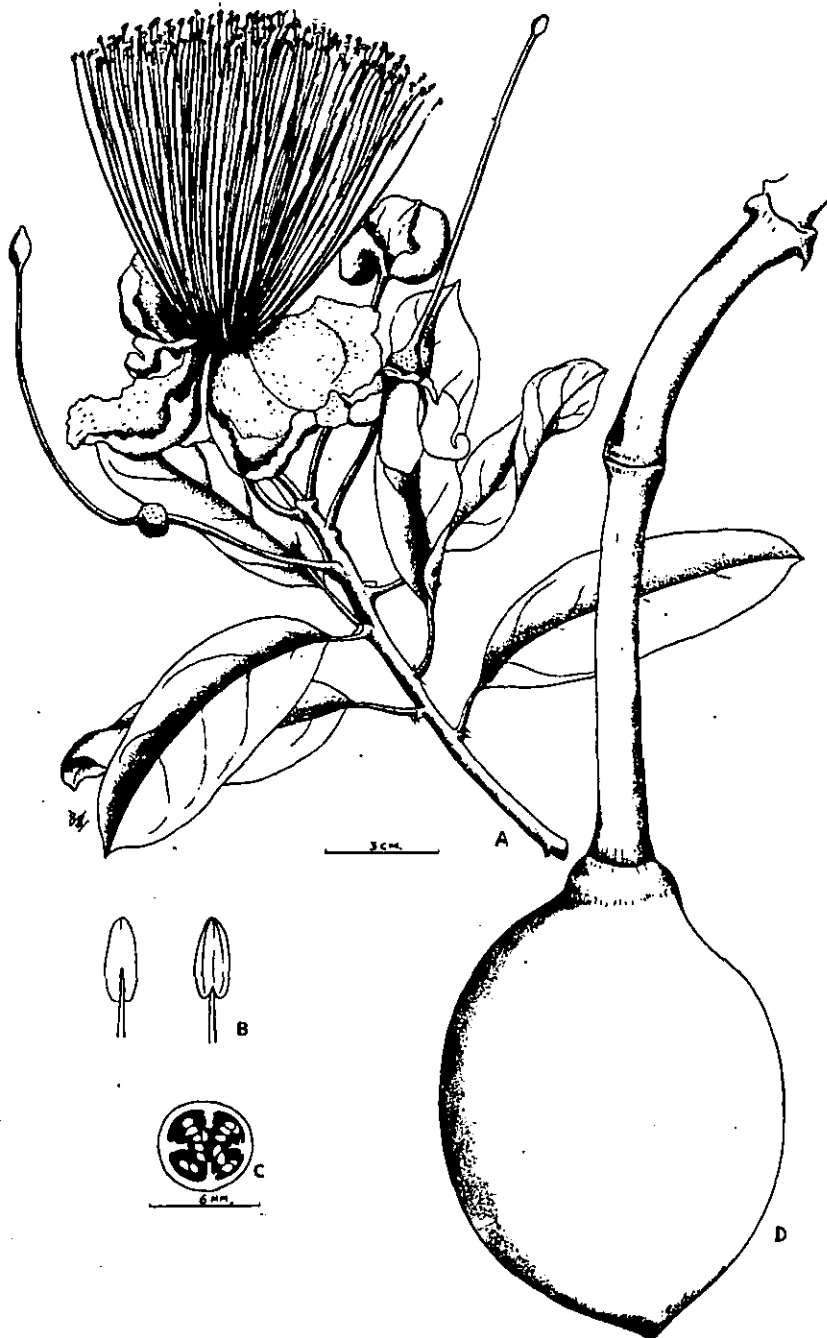


FIG. 105. *Capparis moonii*. A, branch with a flower. B, anther. C, transverse section of ovary; D, fruit.

2. *Capparis moonii* Wight, Ill. 1: 35. 1840. (Fig. 105).

*Sinh.* Sudu—welangiriya.

A very large, much-branched, woody climber, stems attaining as much as 20 cm in diameter, bark smooth, young branches shining; leaves simple, alternate, 8.5—12.5 cm long, 2.5—4.5 cm broad, oval-oblong or oblong-lanceolate, acuminate, apiculate, entire, rather thick, glabrous and shining; petioles 1—1.2 cm long with a pair of sharp, hooked, stipule spines at the base of each; flowers regular, bisexual, very large, 10—12.5 cm diameter, pure white, 3—6 together in corymbose clusters at the ends of branches, pedicel 3.5—5.5 cm long; sepals 4, biseriate, imbricate, about 2.5 cm long, orbicular, concave; petals 4, imbricate, spreading, 5 cm long, pubescent on the upper surface; stamens numerous, erect, 8—10 cm long, gynophore slightly longer; ovary superior, unilocular, urceolate, glabrous with 4 parietal placentas, ovules numerous, style short; fruit very large, 10—12 cm long, subglobose pointed on much thickened woody stalk, seeds numerous, large, about 2 cm long, rotundate and pinkish.

Flowers during March and April.

**Illustration.** Herb. Peradeniya, drawing.

**Distribution.** This extremely ornamental creeper grows in Western India and Ceylon. It is rather rare, confined to the moist low-country, up to an altitude of 3000 feet in Ceylon. Uva Province, Hunnasgiriya, Panwila, Alagalla, Hantane, etc.

**Ceylon.** *Thwaites C.P.* 2415. North Central Prov., Ritigala, *Willis*, March 1905. Central Prov. Hantane, *Appuhamy*, Jan. 1957. Uva Prov., above Welimada, *Simpson* 9631, May 1932.

**Uses.** The roots of this plant, along with other ingredients are made into pills and given for all ailments and glandular swellings of the throat, bronchitis, tonsillitis, etc. They are often used for removing growths in the throat.

MEDICINAL PLANTS

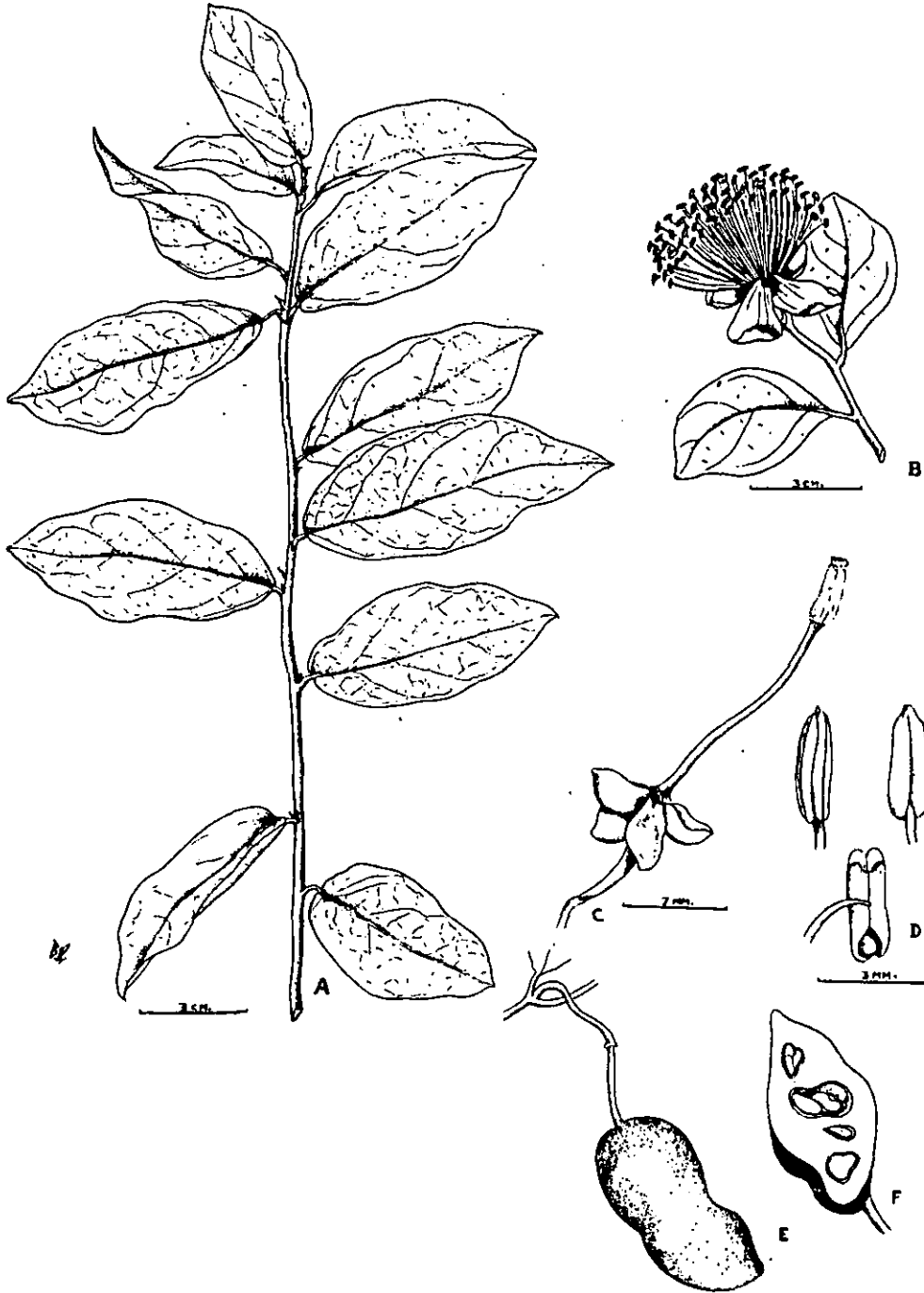


FIG. 106. *Capparis zeylanica*. A, branch with leaves. B, flower, lateral view C, flower with stamens and petals removed. D, anther. E, fruit. F, longitudinal section of fruit.

3. *Capparis zeylanica* Linn. Sp. Pl. 720. 1753. (Fig. 106).

*Capparis acuminata* Roxb.—*Capparis brevispina* DC.—*Capparis wallichiana* Wight & Arn.

*Sinh.* Welangiriya; *Tam.* Adondai, Igudi, Indu, Kagaturatti, Kattoddi, Migupalattam, Tondai, Tulambikkiri, Vennachchi, Viyanicham; *Hindi* Ardanda; *Sans.* Govindi, Granthila, Kantakalata, Karambha, Katukandari, Kinkani, Krishangi, Tapasapriya, Vartala, Vyaghraghanti, Vyaghrapada, Vyagranakhi.

A much branched shrub with glabrous young shoots; leaves simple, alternate, 3.8—10 cm long, lanceolate, ovate—lanceolate or oblong-lanceolate, acute, entire, glabrous, thick, reticulate, venation prominent; petioles short, each with two small, straight, sharp and persistent stipular spines; flowers large, white, the two upper petals usually with a basal blotch of yellow, afterwards purple, bisexual, 4.5—5 cm diameter, axillary, solitary or two together at the ends of branchlets, pedicel 2.5 cm long; sepals 4, nearly equal, free, very concave, biseriate; petals 4, imbricate, three or four times as long as sepals, oblong-lanceolate, obtuse, undulate, the lower pair spreading, the upper pair approximated; stamens indefinite, inserted at the base of the gynophore, anthers pale blue; gynophore as long as stamens; ovary superior, oblong, unilocular with 4 parietal placentas, ovules numerous, stigma capitate; fruit irregularly ovoid, bright orange-pink, very conspicuous, 6.4 cm long, 3.2 cm broad, pointed or blunt on a stalk 1.2 cm long, smooth, shining and soft with subreniform seeds immersed in a white, creamy pulp.

Flowers from March to July.

*Illustrations.* Hooker, *lc.* Pl. 2: pl. 126. 1837; Herb. Peradeniya, drawing.

*Distribution.* A common shrub in the southern and warmer parts of India and in the dry regions of Ceylon, Jaffna, Trincomalee, Kantalai, Weragantota and Tissamaharama.

*Ceylon.* *Thwaites* C.P. 1060; North Western Prov., Chilaw, *Nevill*, March 1882. North Central Prov., Habarana, *Alston* 505, May 1927. Eastern Prov., Kantalai, *Herb. Peradeniya*, Aug. 1885. Central Prov., Peradeniya, Bot. Gard., cultivated, *Jayaweera* 1755, Oct. 1957; Nitre Cave Dist., *Herb. Peradeniya*, Sept. 1888; Ambanganga, *Simpson* 9821, June 1932. Uva Prov., Uma oya, *Herb. Peradeniya*, April 1885; Weragantota, *Alston* 802, July 1927. Southern Prov., Ranna, *Brown*, April 1900; Tissamaharama, *Simpson* 9959, Aug. 1932; Ruhuna National Park, near Yala Bungalow, *Mueller-Dumbois* 67082607, Aug. 1967.

*Uses.* For the same diseases as *Capparis horrida* is used.

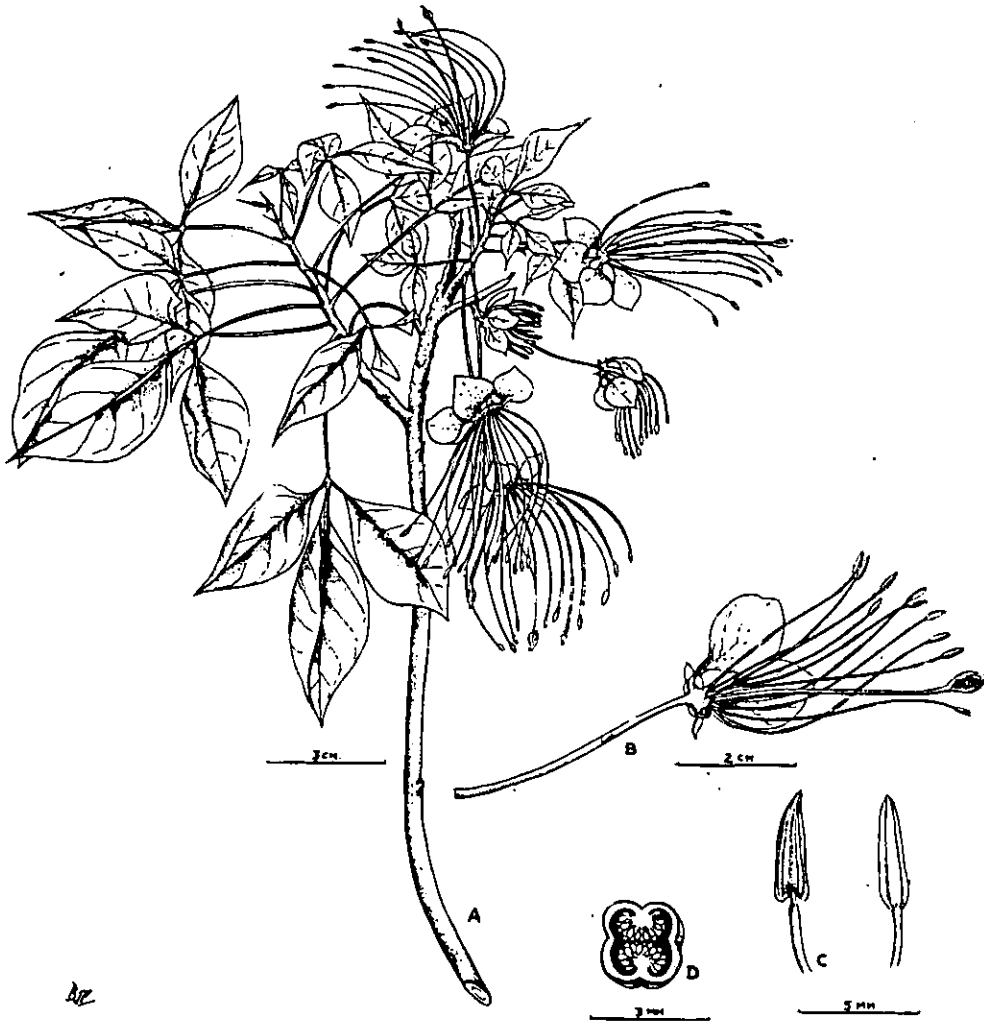


FIG. 107. *Crataeva religiosa*. A, branch with leaves and flowers. B, longitudinal section of flower. C, anther with a part of the filament. D, transverse section of ovary.

4. *Crataeva religiosa* Forst. f., Prodr. 35. (Fig. 107).

*Crataeva roxburghii* R. Br.—*Crataeva odorata* Ham.—*Crataeva unilocularis* Ham.—*Crataeva axillaris* Presl.

*Sinh.* Lunu-warana; *Tam.* Adicharanam, Adimalam, Anjali, Inaivilai, Kattumavilangai, Kuvilam, Maluram, Maralingam, Mavilangai, Miguttiyal, Narvala, Nilluvam, Nirumalyam, Periamavilangai, Shuppigam, Shurvedam, Sinnamavilingam, Tiriburamerittan, Varanam, Villuvam; *Hindi* Tapia; *Sans.* Ajapa, Ashmarygna, Barhupushpa, Kumara, Kumaraka, Mahakapittha, Maturapaha, Pasunadha, Sadhuvriksha, Setuka, Setuvriksha, Shikhimandal, Shvetadru, Shvetadruma, Shvetavriksha, Tamala, Tiktashaka. Urumana, Varana, Varuna, Vasaha.

A small tree with a grey bark, much branched, the young twigs marked prominently with leaf scars; leaves alternate, 3-foliate, deciduous, leaflets shortly stalked, 6.5—15.5 cm long, 6.5—9.5 cm broad, broadly oval, acuminate, tapering to base, entire, glabrous, the lateral ones oblique, petioles 7.5—14 cm long; flowers bisexual, large, greenish-white appearing with the new leaves, 5 cm diameter, arising from axils of bud scales below the new leaves forming corymbose clusters, pedicels stout, glabrous, 3.7 cm long; sepals 4, free, distant, small, ovate-acute, inserted on the edge of a large, lobed disc; petals 4, 1.9—2.5 cm long, rounded-oval with a long narrow claw; stamens indefinite, inserted on the base of a long gynophore; gynophore 2.5—3.7 cm long exceeding the stamens; ovary superior, small, ovoid, unilocular with 2 parietal placentas, ovules numerous; fruit a globose berry on the thickened woody gynophore now nearly 5 cm long, pericarp hard and smooth; seeds several embedded in the pulp.

Flowers during December.

**Illustrations.** Hooker, Ic, Pl. pl. 178. 1837; Beddome, Fl. Sylv. pl. 116. 1868—72; Herb. Peradeniya, drawing.

**Distribution.** Occurs in India, Ceylon, Malaya, East Africa and Philippine Islands. In Ceylon, it is rather common in the dry districts of Jaffna, Trincomalee, Dambulla, Kekirawa and Hambantota.

**India.** Sikkim: *J. D. Hooker*, at 10,000 feet altitude. Siwalik and Jaunsar Div., *Choudry*: 11, April 1920. Madras: *Leghorn* 44. Pen. Ind. Or., *Herb Wight* 83. Ceylon. *Thwaites C.P.* 1067. Central Prov., Peradeniya, Bot. Gard.; cultivated, *J. M. Silva*, March 1910; *Jayaweera* 868, Feb. 1952. Southern Prov., Hambantota, *Herb. Peradeniya*, Dec. 1882; Ruhuna National Park, Komawa Wewa, *Comanor* 1155, March 1968; *Comanor* 408, Aug. 1967; Mahagajabawa, *Cooray* 67100205, Oct. 1967.

**Composition.** The plant yields a gum, a saponin and tannin from the bark. It also yields 3 crystalline products including lupeol and B—sitosterol.

**Uses.** The bark is useful for urinary complaints, fever and mild forms of skin diseases. It relieves vomiting and gastric irritation. The fresh leaves are a good substitute for mustard poultice. They are efficacious on gouty swellings, swelling and burning sensation in the soles of feet, etc. In India, the plant is used as a stomachic, purgative, diuretic and as a snake-bite remedy. In Ceylon, a decoction of the powdered bark is given for stones in the kidney or bladder; dropsy and enlargement of abdominal viscera, scrofula and painful micturition. In the Philippines, it is used as a stomachic, tonic and febrifuge, while in West Africa, preparations of the leaf are administered for colic, indigestion and rheumatism.



FIG. 108. *Gynandropsis gynandra*. A, whole plant. B, branch with leaves and flowers. C, D, flowers, lateral view. E, fruit. F, longitudinal section of fruit.

5. *Gynandropsis gynandra* (Linn.) Merr., Enum. Philip. Pl. 2: 209. 1923. (Fig. 108).

*Cleome gynandra* Linn.—*Gynandropsis pentaphylla* DC.—*Pedicellaria pentaphylla* Schrank.—*Sinapistrum pentaphyllum* Medic.—*Cleome alliacea* Blanco—*Cleome alliodora* Blanco

*Sinh.* Vela; *Tam.* Kadugu, Nayvelai, Velai; *Hindi* Churota, Hulhul, Hurhur, Karalia, Lalhulhul, Safedhulhul; *Sans.* Ajagandha, Arkapushpika, Avigandha, Barbaragandha, Bastagandha, Bodhayika, Bramhagrabha, Brahmi, Choraka, Hulhul, Kabari, Karnaspota, Khara-pushpa, Putimayurika, Sugandhika, Surjavarta, Titaparni, Tungi, Uragandha.

An erect, branched, annual herb, 60—120 cm high; stem shaggy with long, white, spreading hair; leaves palmately compound, 5-foliolate, leaflets sessile, broadly ovate, acute, entire, pubescent on both sides and ciliate, pale beneath, the terminal one the largest, 3.7—5 cm long, petioles 5 cm long, stout, hairy and prickly; flowers white or pale pink, bisexual, at first corymbose, later in erect racemes, pedicels 1.2 cm long or more, viscid, pubescent, bracts trifoliolate, subsessile; sepals 4, distinct, narrowly lanceolate, acute, glandular pubescent; petals 4, rotundate with a long, narrow claw, three times the length of sepals and all curved upwards; gynophore purplish, 2.5—3 cm long, slightly curved upwards; stamens 6, purplish, inserted half-way up the gynophore; ovary superior, off top of the gynophore, linear-oblong, very glandular, 2-carpellary, unilocular with numerous ovules on two parietal placentas, style absent and stigma capitate; fruit capsule 5—7.5 cm long, linear, slightly curved, viscid pubescent and somewhat compressed; seeds reniform and dark brown.

Flowers during May and June.

**Illustrations.** Rheede, Hort. Mal. 9: pl. 34; Curtis, Bot. Mag. pl. 1681; Kirtikar and Basu, Indian Med. Pl. pl. 70B; Herb. Peradeniya, drawing.

**Distribution.** A common weed in all tropical countries. In Ceylon, it is very common in waste and cultivated ground in the low-country.

**India.** Assam: Gauhati, *Chatterjee*, April 1902. East Bengal: *Griffith* 165, Kew Distribution 1861—2. Misor and Carnatic: *G. Thomson*. Ceylon. *Thwaites* C.P. 2460. Central Prov., Peradeniya, *Alston* 392, Oct. 1926; Bot. Gard., cultivated, *Jayaweera* 1008, Jan. 1954. **Burma.** Upper Burma: Kachin Hills, *Mokin*, 1897. **Maldivé Islands.** Heddufuri, Veimandu, Horsburgh Atoll, *Gardiner*, 1899—00.

**Composition.** The leaves contain an alkaloid. The plant yields an acrid, volatile oil having the properties of garlic or mustard oil. The seeds, too, contain a greenish, drying oil.

**Uses.** The whole plant made into an ointment with oil, is effective for pustular eruptions and other cutaneous diseases especially leprosy. The bruised leaves are rubefacient and vesicant and often used as a counter-irritant for rheumatism, neuralgia, headache and stiff neck provided the application is withdrawn before it produces blisters. A decoction of the root is a mild febrifuge. The seeds are antispasmodic, sudorific, anthelmintic and carminative. In Ceylon, it is a reputed snake-bite cure. Taken internally, it is useful in acute dyspepsia, flatulence and colic. It is also used as an aphrodisiac.

MEDICINAL PLANTS

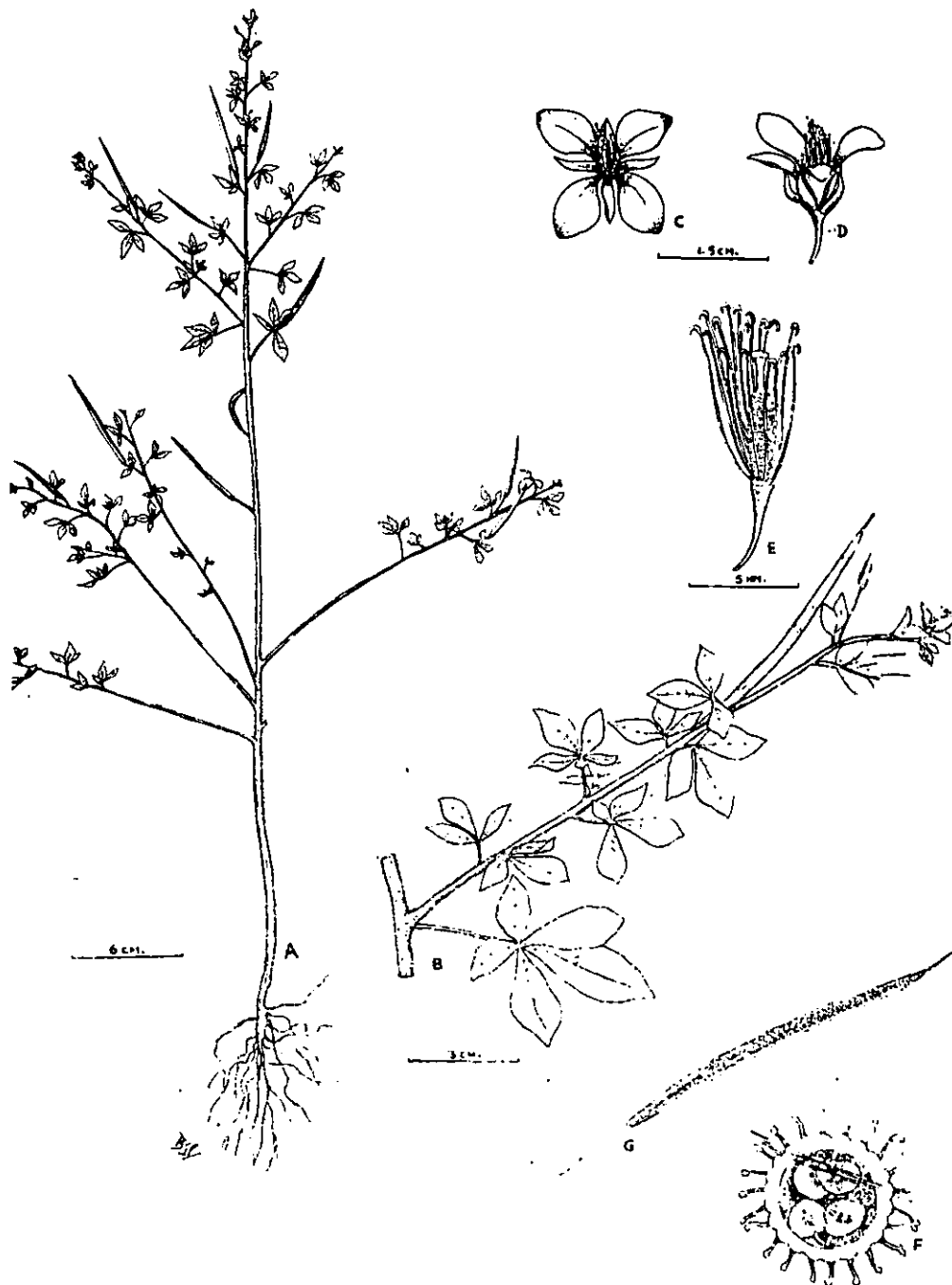


FIG 19. *Polanisia icosandra*. A, plant with fruits. B, branch with leaves and flowers. C, flower from front. D, flower, lateral view. E, flower with the sepals and petals removed. F, transverse section of the ovary. G, longitudinal section of a fruit showing the seeds. F, enlarged.

6. *Polanisia icosandra* (Linn.) Wight and Arn., Prodr. Fl. Penin. Ind. Orient. 22. 1834. (Fig. 109).

*Cleome viscosa* Linn.—*Cleome icosandra* Linn.—*Cleome acutifolia* Elm.—*Polanisia viscosa* Thw.

**Sinh.** Ran-manissa, Wal-aba; **Tam.** Nayikadugu, Nayivelai; **Hindi** Hulhul, Hurhur, Hurhurch, Jungliharrar, Kanphytia; **Sans.** Adityabhakta, Arkabhakta, Arkakanta, Barbara, Mandukaparni, Manduki, Raviprita, Ravishta, Sauri, Satyanamni, Suryalata, Suvarchala, Suteja, Tilparni, Vikranta.

An annual erect herb, 30—90 cm tall, softly glandular, hairy and viscid throughout; leaves alternate, palmately compound, 3—5 foliate, leaflets sessile, ovate or obovate, entire, the terminal one the largest and the lateral ones often unequal at base; petioles 1.2—2.5 cm long becoming shorter above and the uppermost bracts often sessile; flowers nearly regular, lemon yellow, bisexual, axillary, hairy, growing into lax racemes, 1.8 cm diameter; sepals 4, distinct, ovate, acute; petals 4, twice as long as sepals, obtuse, long-clawed, two approximate and two divaricate; stamens 12—24, anthers linear, curled and blue-black in colour; ovary superior, 2-carpellary, uni-locular with numerous ovules on two parietal placentas and without a gynophore; fruit capsules 5—10 cm long, erect, linear, cylindrical, very viscous, terminating in a glabrous, blunt style; seeds black, finely ridged on the back.

Flowers between January and March.

**Illustrations.** Burmann, Thes. Zeyl. pl. 99. 1737; Wight, Ic. Pl. Ind. Orient. 1: pl. 2. 1838.

**Distribution.** Occurs as a weed throughout the tropical and warmer regions of the world. In Ceylon, it is very common in cultivated ground in the low-country.

**India.** East Bengal, *C.B. Clarke* 17159, June 1872. Assam: *Jenkins*. Pen. Ind. Or., *Herb. Wight* 77. Ceylon. *Thwaites* C.P. 1073. North Central Prov., Anuradhapura, *Alston* 1118, March 1927. Eastern Prov., Trincomalee, *E. Brund*, Sep. 1913. Central Prov., Dambulla, Mirisgoniyowa Rock, *J. M. Silva*, Nov. 1926; Peradeniya Bot. Gard., cultivated, *Jayaweera* 1176, May 1954. Western Prov., Colombo, Govt. Dairy Farm, *Alston* 1119, December 1926; Kalutara, *A. de Alwis*, Nov. 1920. Southern Prov., Ruhuna National Park, Patanagala Ocean Beach, *Mueller-Dombois* 67082508, Aug. 1967. **Burma.** Upper Burma, *W. A. Cole*. 1890. **Maldivé Islands.** *Didi* 149, 1896; Heddufuri, *Gardiner*, 1899—00; Horsburgh Atoll, *Gardiner*, 1899—00. **Laccadive Islands.** *Kiltan*, Nov. 1891.

**Composition.** The seeds contain a fixed oil which consists of a mixture of myristic acid, palmitic acid and viscoside acid. They also contain viscosin.

**Uses.** The seeds are anthelmintic, carminative, rubefacient and vesicant and useful for fevers, diarrhoea and infantile convulsions. In Cochin-China, the whole plant is used as a counter-irritant and for blisters, while in the United States, the root is used as a vermifuge. A decoction of the plant is used for colic. The juice of the leaves, poured into the ear, relieves earache and deafness. Mixed with oil, it is a popular remedy for purulent discharges from the ear. The bruised leaves are applied to the skin as a counter-irritant and applied to boils to prevent the formation of pus. In Ceylon, the roots and seeds are considered to be cardiac stimulants. In the Philippines, the root, leaves and seeds are powdered and given with sugar for worm complaints.

## 27. CARICACEAE

*Carica papaya* Linn. Sp. Pl. 1036. 1753.

*Papaya sativa* Tussac

*Engl.* Papaw, Papeta, Papaya, Tree-melon; *Sinh.* Gas-labu, Pepol; *Tam.* Pappali.

An erect tree, 2—6.6 m tall, with an unbranched, hollow, soft trunk, 10—60 cm diam., marked with the scars of fallen leaves; leaves alternate, spreading, together forming a terminal crown, petiolate, subpeltately palmate, lamina 30—44 cm long, deeply cut into 5—7 segments, segments more or less lobed, petioles 58—83 cm long, hollow, shorter in the younger leaves, stipules absent; the trunk and leaves contain a milky juice; flowers regular, dioecious or polygamous, white, yellow or greenish, unisexual or a few in the inflorescence bisexual; male and polygamous inflorescences pendulous with long peduncles, cymose-paniculate, panicle more or less ample; female very short, generally cymosely 3-flowered; male flowers 2—3.5 cm long, elongate, tubulose, yellowish, odorous; calyx very small, sepals 5, free, 4—5 mm long; corolla with a long slender tube 1.3 cm long, lobes valvate, oblong, 2.7 cm long, 7 mm broad, thick and twisted in the bud; stamens 10, inserted in the throat of the corolla, 5 alternating with the lobes of the corolla with short filaments, 5 opposite the lobes, sessile, anthers adnate to filaments, rudiments of ovary awl-shaped, 5 mm long, style wanting or very short; female flowers: 4—6.5 cm long with corolla cut almost to the base; calyx as in the male; petals 5, 4.7—6.5 cm long, 1—1.5 cm broad, oblong or oblong—ovate, falling early, staminodes wanting; ovary superior, large 2.5—3.5 cm long, 1.2—1.6 cm broad ovate or oblong-ovate, 5-carpellary, unilocular with numerous parietal ovules, stigma 5-rayed, each ray with several flattened lobes; fruit large, shortly stalked, ovoid, roundish, pear-shaped or ellipsoidal, 20—35 cm long, 10—15 cm diam., pendulous, varying in colour when ripe from green or yellow, with or without red markings to purple, flesh yellow or red, cavity ample or small with many seeds or none; seeds ellipsoidal, rough, angular, 6—7 mm long, enclosed in a membranous aril and in pulp.

**Illustrations.** Fawcett and Rendle, *Flora of Jamaica*, 5: pl. 94. 1926; Macmillan, *Trop. Planting and Gardening*, p. 231. 1956.

**Distribution.** Indigenous to tropical America and West Indies but cultivated throughout the tropics. It is a common fruit tree planted in almost all village gardens in the mid and low-country in Ceylon.

**Composition.** The entire plant contains a proteolytic enzyme papain (papayotin), mallic acid and calcium malate. The leaves contain a glucoside, carposide and the alkaloid carpaine. The fruits contain saccharose, dextrose, levulose, mallic acid, pectin, papain and citrates. The ripe fruit is a good source of vitamins A, B, B<sub>2</sub> and C in addition to iron and calcium. The fruit also yields caricaxanthin and violaxanthin.

**Uses.** The ripe fruit is eaten for its vitamin value. The papain extracted from the mature fruits has the proteolytic action of a digestive enzyme, a property of softening and disintegrating proteins. It is administered for dyspepsia and intestinal irritation. It is also used in solution to dissolve the fibrous membrane in croup or diphtheria. It has been applied on ulcers and fissures of the tongue with good results. In the form of an ointment prepared with borax, it removes warts and corns. It is a styptic, vermifuge, anthelmintic and sometimes used to cause abortion.

## CARICACEAE

The Caribbeans used the ripe fruit as a cosmetic. The remarkable complexion of those people is attributed to the use of the pulp of the ripe fruit as a skin soap. It also removes freckles.

In the Philippines, the bruised papaya leaves are used for rheumatism and the roots for yaws and piles. A decoction of the leaves is given for asthma. In East Africa, the root is used as an anthelmintic and as a remedy for syphilis and gonorrhoea. In West Africa, the young shoot of the plant is used as a substitute for asparagus and in Ghana, the root is used on yaws and piles. In Java, the leaf is used for beriberi, the root for kidney and bladder ailments, bark for venereal diseases and the flower for jaundice. In Mauritius, the leaf is smoked for relief from asthma and for tenderising meat. In Malaya and Java, the flower is made into a sweetmeat. In tropical America, the leaf is used for fever, beri-beri and as an anthelmintic. In U.S.A., papain is used as a medicine, preparation of pre-cooked foods, shrinking textiles, leather industry, manufacture of chewing gum, tenderising meat and for "Chill-proofing" beer.

The seed is used as a condiment, carminative, emmenagogue, counter-irritant and as an abortifacient.

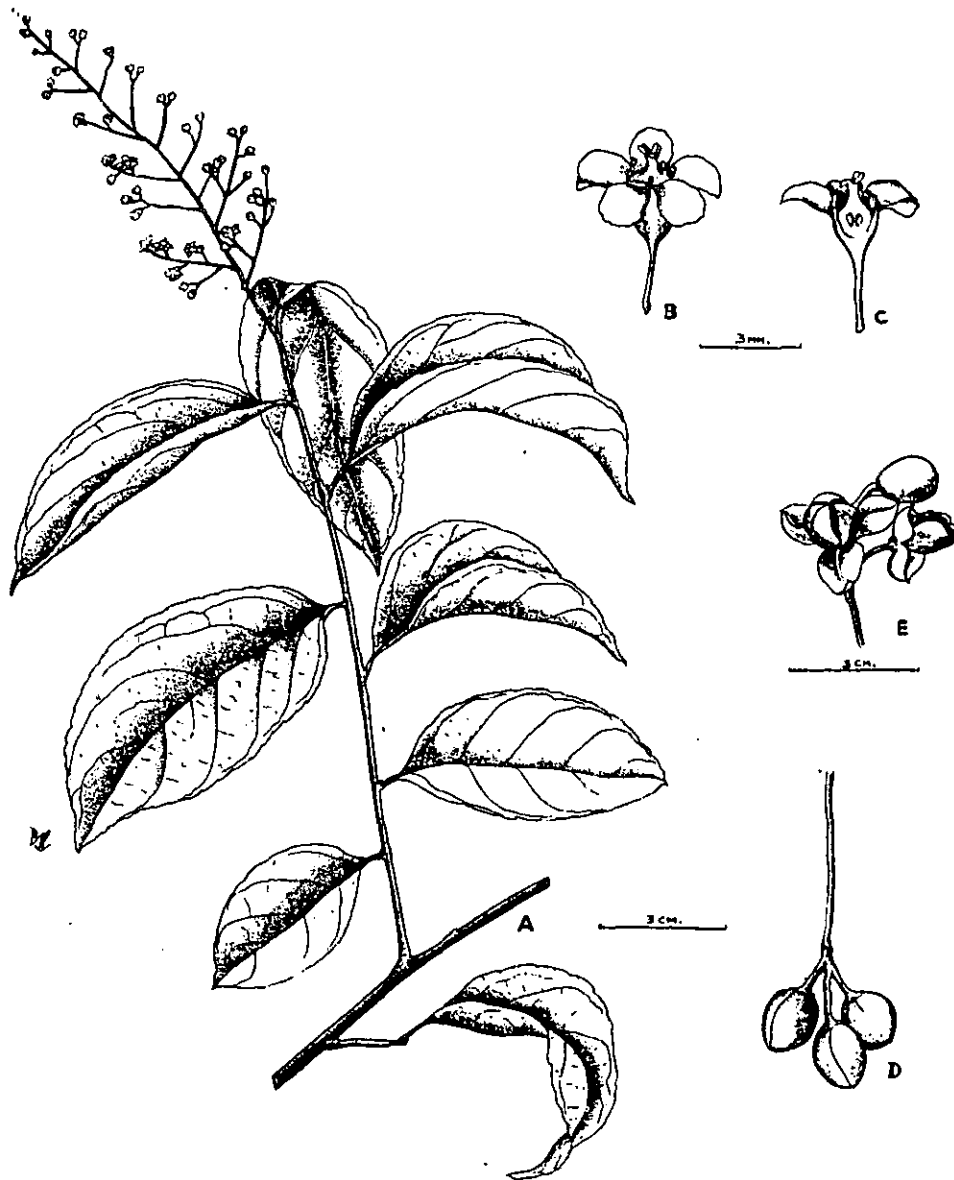


FIG. 110. *Celastrus paniculatus*. A, branch with flowers. B, flower, lateral view. C, longitudinal section of flower. D, fruits. E, dehiscent fruits showing the seeds.

## 28. CELASTRACEAE

### 1. *Celastrus paniculatus* Willd. Sp. Pl. 1: 1125. 1797. (Fig. 110).

*Celastrus alnifolia* Don—*Celastrus dependens* Wall.—*Celastrus multiflora* Roxb.—*Celastrus nutans* Roxb.—*Celastrus rothiana* Roem. and Schult.—*Celastrus metziana* Turcz.—*Celastrus polybotrys* Turcz.—*Ceanothus paniculatus* Roth.—*Scutia paniculata* Don—*Diosma serrata* Blanco

*Sinh.* Duhudu, Valuvai-eta; *Tam.* Adibaricham, Kalambam, Kagodagi, Kaligam, Kirumikkundram, Kungiligam, Kuvangundal, Malganguni, Mallagam, Siruvaluluvai, Sodiyam, Tanisi, Tipadisam, Valuluvai; *Hindi* Malkakni, Malkamni, Malkangni, Malkungi; *Sans.* Agnimasha, Amruta, Avega, Dipta, Durjara, Durmada, Gatida, Ingudi, Jyotishka, Jyotishmati, Jyotislata, Kakandi, Kanguni, Katabhi, Kinshuka, Lagana Lavana, Medhya, Nishphala, Paravatanghri, Paravatapadi, Pidya, Pinya, Pitataila, Putitala, Saraswati, Sphutabandhani, Supingala, Swarnalata, Tahnirusi, Triparni.

A large, climbing shrub, about 4—18 m. high with pendulous branches, rough furrowed bark and glabrous young parts; leaves alternate without stipules, 5—9 cm long, 3.8—5 cm broad, broadly oval, acute at base, shortly acuminate, obtuse, shallowly crenate—serrate except at the base, glabrous, petioles 0.6—1 cm long; flowers regular, pale yellow, polygamous, 3—4 mm diameter, in terminal, pyramidal, pendulous panicles 5—10 cm long, pedicels slender, puberulous; sepals 5, fused into a 5-lobed calyx, lobes shallow, unequal; petals 5, spreading, oblong, broad-based, acute; disc inconspicuous; stamens 5, inserted on the edge of the disc; ovary superior, 3-locular with two erect ovules in each loculus, style short, stigma deeply 3-lobed; fruit a loculicidal, 3-valved capsule, 1.2 cm long, broadly ovoid or roundish, blunt, transversely wrinkled, bright yellow, valves septifragal above, remaining united at base and spreading or reflexed, leaving the seeds exposed; seeds 0.8 cm long, cinnamon brown, striate, completely enveloped in scarlet, fleshy aril.

Flowers during May and August.

**Illustrations.** Wight, Ill. pl. 72. 1841; Wight, Ic. Pl. Ind. Orient. pl. 158. 1839; Kirtikar and Basu. Indian Med. Pl. pl. 235. 1933; Herb. Peradeniya., drawing.

**Distribution.** Occurs in the sub-Himalayan tract throughout India, Ceylon, Burma. Malay Peninsula to New Caledonia and in the Philippine Islands. In Ceylon, it is common in the moist low-country up to 2000 feet altitude.

**India.** Him. Bor. Occ. *T. Thomson*. Sikkim: *Clarke* 24867A, Oct. 1875. Khasia: *J. D. Hooker & T. Thomson*. Concan: *Stocks*. Bengal: *Clarke* 11727A, May 1870. Mt. Nilghiris & Curg: *Hooker f. and T. Thomson*. Pen. Ind. Or., *Herb. Wight* 453, Kew Distribution 1866-7. Assam: *Prairie's Collector* 357. Ceylon. Deltota, *Thwaites C.P.* 1232; Peradeniya, Bot. Gard., cultivated, *Alston*. Burma: Upper Burma: South Shan State, *Khalil*, 1893.

**Composition.** The leaves contain traces of an alkaloid and a glucoside. The seeds yield a fatty oil which contains cholesterol, a colouring matter, chromogen, celestrine and paniculatine.

**Uses.** The juice of the leaves is an antidote for opium poisoning. A decoction of the seeds is given for rheumatism, gout, paralysis and leprosy. The oil extracted from the seeds is a remedy for beri-beri, a nerve stimulant and brain tonic. The pulverised seeds are used as an antirheumatic and in cases of paralysis.

In Java, the leaves are used for dysentery while in Ceylon the plant is used externally as a parasiticide for scabies, ringworm and other skin diseases. A decoction of the bark is given internally to stimulate the appetite improving digestion and employed with much benefit for anorexia and chronic dyspepsia. The oil from the seeds is used as a nerve tonic, diaphoretic and diuretic. With cow's milk, it gives good results in the treatment of anasarca and ascites.

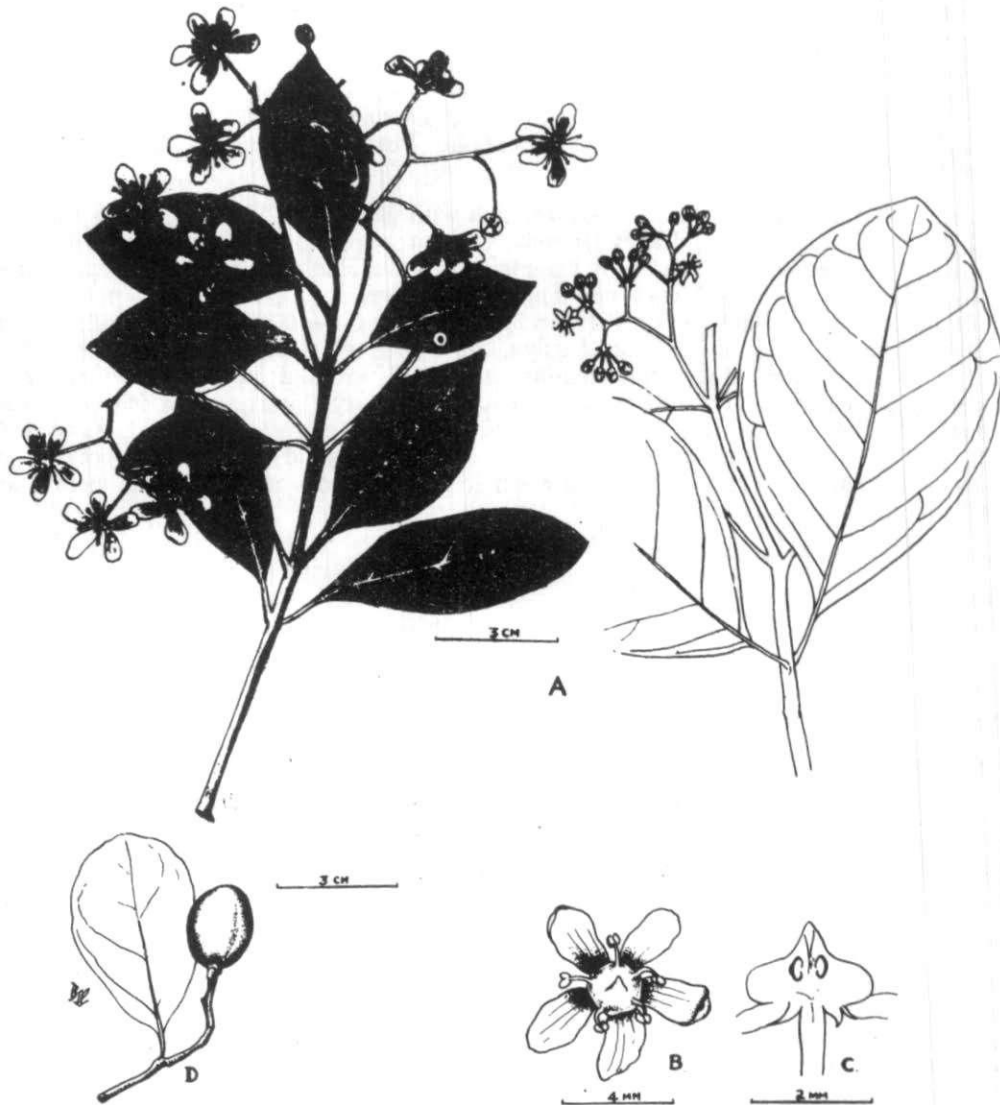


PLATE. IV. *Elaeodendron glaucum*. A, branch with flowers. B, flower from top. C, longitudinal section of ovary. D, fruit.

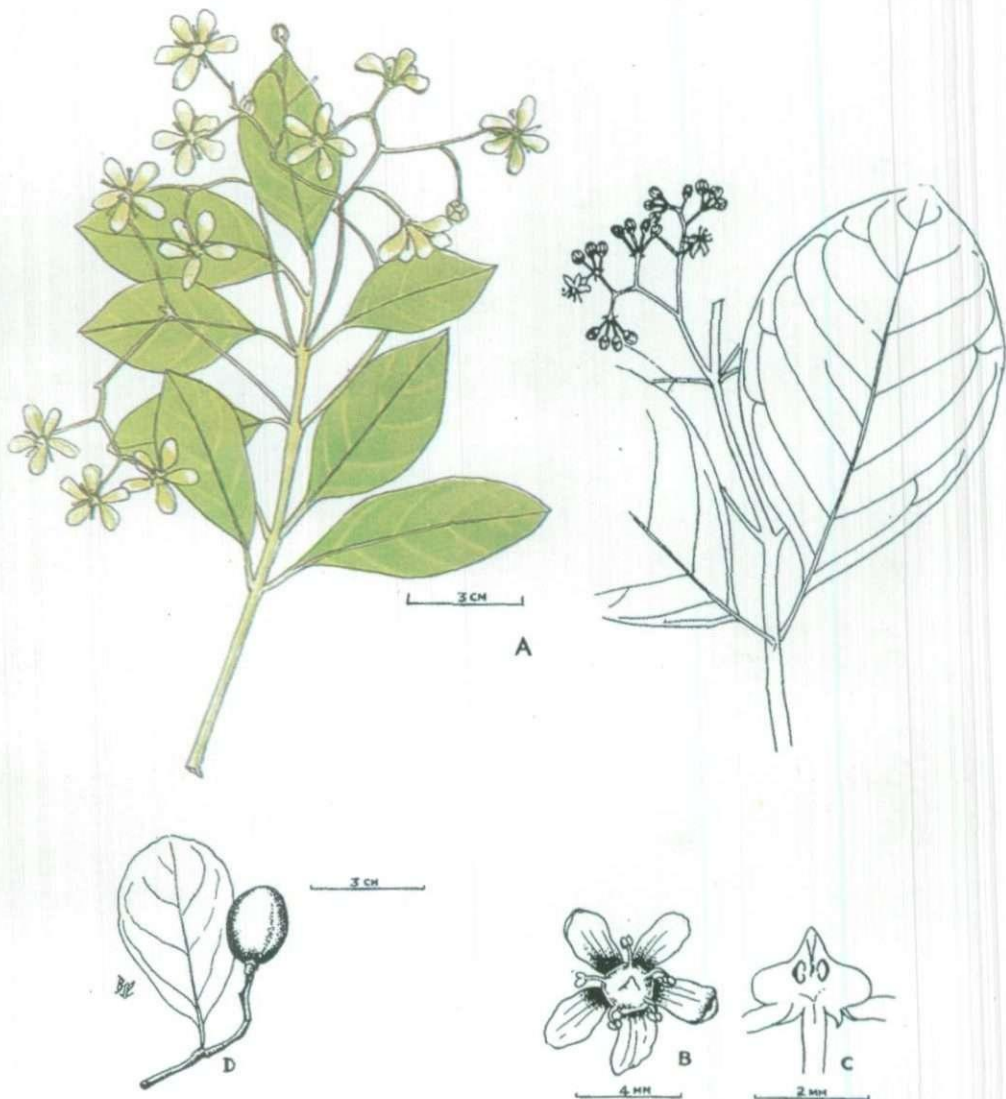


PLATE. IV. *Elaeodendron glaucum*. A, branch with flowers. B, flower from top. C, longitudinal section of ovary. D, fruit.

2. *Elaeodendron glaucum* (Rottb.) Pers., Synops. 1: 241. 1805. (Plate IV).

*Elaeodendron roxburghii* W. & A.—*Elaeodendron paniculatum* W. & A.—*Elaeodendron oxydon* Turcz.—*Celastrus glaucus* Vahl—*Mangifera glauca* Rottb.—*Euonymus glossa* Wall.—*Euonymus tina* Hom.—*Neerija dichotoma* Roxb.—*Rhamnus neerija* Spreng.—*Schrebera albens* Willd.

*Sinh.* Chutaya, Neralu, Pieri, Tamaruja; *Tam.* Irgoli, Kannirai, Karrukuva, Karuvali, Kiri, Pirai; *Hindi* Seluppai, Siri; *Sans.* Bhutaphala.

A dichotomously branched, small tree with a thick, brownish-grey, warted bark and glabrous young parts; leaves simple, opposite, stipulate, 5—9.5 cm long, 3.5—6.5 cm broad, variable, oval or roundish-oval, acute at base, obtuse, often twisted at apex, shallowly serrate-crenate or entire, glabrous, rather coriaceous, glaucous, reticulate, petioles 0.6—1.7 cm or more, stipules minute, triangular; flowers regular, bisexual, pale yellowish-green, 7 mm in diameter, numerous in very divaricate, axillary or extra-axillary, paniculate, dichotomous cymes, pedicels long and glabrous; sepals 5, almost distinct, imbricate, lobes unequal and rounded; petals 5, imbricate, oblong, obtuse, distant; stamens 5, inserted on the disc, much shorter than petals, anthers roundish; disc large, tumid, obscurely lobed; ovary superior, immersed in the disc, 2-locular with 2 collateral, erect ovules in each loculus, style conical, very short; fruit an ovoid, 1-seeded drupe, 0.8—2 cm long, apiculate, glabrous, stone bony.

Flowers all the year round.

*Illustrations.* Wight, Ill. pl. 71. 1841; Beddome, Fl. Sylvat. pl. 148. 1868—73; Kirtikar and Basu, Indian Med. Pl., pl. 237. 1933; Herb. Peradeniya., drawing.

*Distribution.* Occurs in the hotter parts of India, Ceylon and Malay Archipelago. In Ceylon, it is common in the dry country especially near the coast. Jaffna, Trincomalee, Kalpitiya, Mannar, Hunnagiriya, Deltota, Dambulla, Sigiriya, Minipe.

*India.* Dehra Dun: Lachiwala, *Sen* 32, April 1920; *Madan* 28; *Murdia* 36. Ceylon, *Thwaites C.P.* 1227. Northern Prov., Mullativu, *Nevill*, July 1889. North Western Prov., Mannar. *Herb. Peradeniya.*, Feb. 1890; Kalpitiya, *Herb. Peradeniya*, Aug. 1883. Eastern Prov., Batticaloa near Unichchai Tank, *Mueller-Dombois* 67081406, Aug. 1967. Central Prov., Deltota, *Thwaites C.P.* 2520. Southern Prov., Ruhuna National Park, behind Yala bungalow, *Mueller-Dombois* 68083002, Aug. 1968; *Cooray* 68052909, May 1968; *Wirawan* 681, Oct. 1968; Buttawa Beach area, *Comanor* 899, Jan. 1968; *Mueller-Dombois and Cooray* 67121021, Dec. 1967.

*Uses.* The powdered leaf is used as snuff to relieve headaches. The rootbark is made into a paste with water and applied onto swellings. The root is a specific against snake-bite poisoning. The crushed root soaked in water and the solution strained off is taken as an emetic. This solution is also rubbed on the chest for pneumonia.

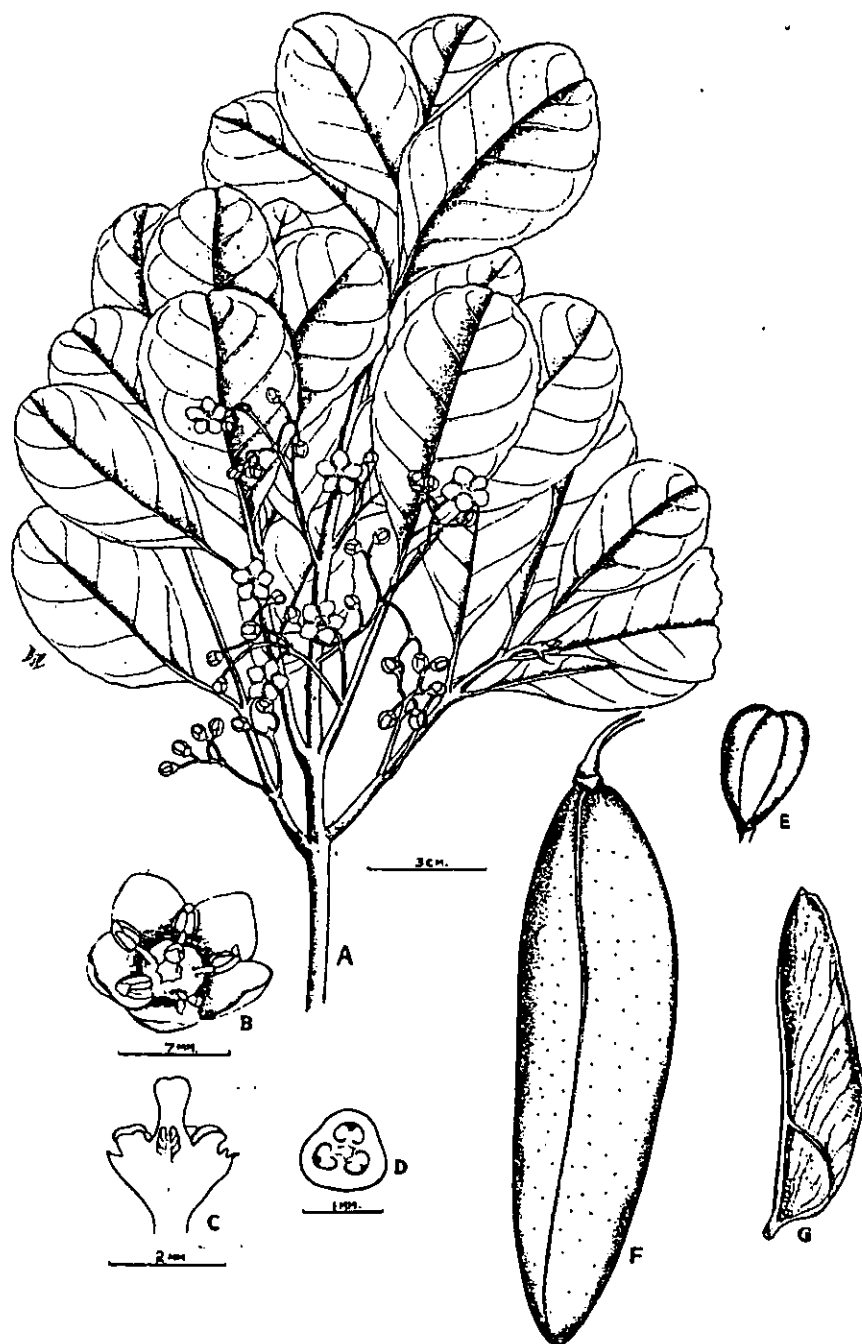


FIG. 111. *Kokoona zeylanica*. A, branch with leaves and flowers. B, flower from above. C, longitudinal section of the ovary and disc. D, transverse section of ovary. E, young fruit. F, mature fruit. G, winged seed.

3. *Kokoona ceylanica* Thwaites in Hook. Kew Journ. Bot. 5: 380. 1853. (Fig. 111).

*Sinh.* Kokun, Pottueta, Wanapotu.

A very large tree with a rough, corky, grey bark, inner bark yellow and young parts glabrous; leaves simple, opposite, stipulate, 6.4—10 cm long, obovate, cuneate at base, rounded or retuse at apex, entire or faintly serrate, coriaceous, glabrous above, paler beneath and punctate with numerous, minute, glandular dots each covered by a red scale; petioles 1.2 cm long; stipules very minute, triangular, persistent; flowers regular, bisexual, dull yellowish-brown, 1—1.2 cm diameter, in axillary or extra-axillary panicles much shorter than leaves, pedicels glabrous, bracts minute; sepals 5, fused into a 5-lobed, cup-shaped calyx, lobes very shallow and glabrous; petals 5, contorted in bud, rounded, concave, thick, dotted within; disc fleshy, perigynous, green and lobed; stamens 5, inserted on top of the disc; ovary superior, 3-locular with two pairs of ascending ovules in each loculus, style short, stigma capitate; fruit a bluntly trigonous, oblong-ovoid, loculicidal capsule, 10 cm long, with four seeds in each compartment, valves thick, coriaceous, glabrous; seeds compressed, over 7.5 cm long, winged, orange-yellow.

Flowers from March to May.

**Illustrations.** Thwaites in Hook. Kew Journ. 5: *pl.* 6. 1853; Beddome, *Flor. Sylvat. pl.* 146. 1868—73; Kirtikar and Basu, *Indian Med. Pl. pl.* 234A. 1933; Herb. Peradeniya., drawing.

**Distribution.** Occurs in the Annamallay hills in India and in Ceylon. It is rather rare in Ceylon and found in forests in moist regions between 1000—4000 feet altitude. Pelawatte, Pasdun Korale; Ratnapura; Ambagamuwa; Udugama and Hiniduma Forests.

Ceylon. Without locality, *Thwaites C.P.* 2084.

**Uses.** The inner bark, which is yellow, is used in the treatment of diabetes, snake-bites, swollen joints, eye diseases and headaches. With other drugs, it is used in treating framboesia pimples and diseases of the skin. The bark may also be used to lighten the colour of the skin and for removing marks from the face. It is often used as snuff for severe headaches.

The oil from the seeds is used as a leech repellent.

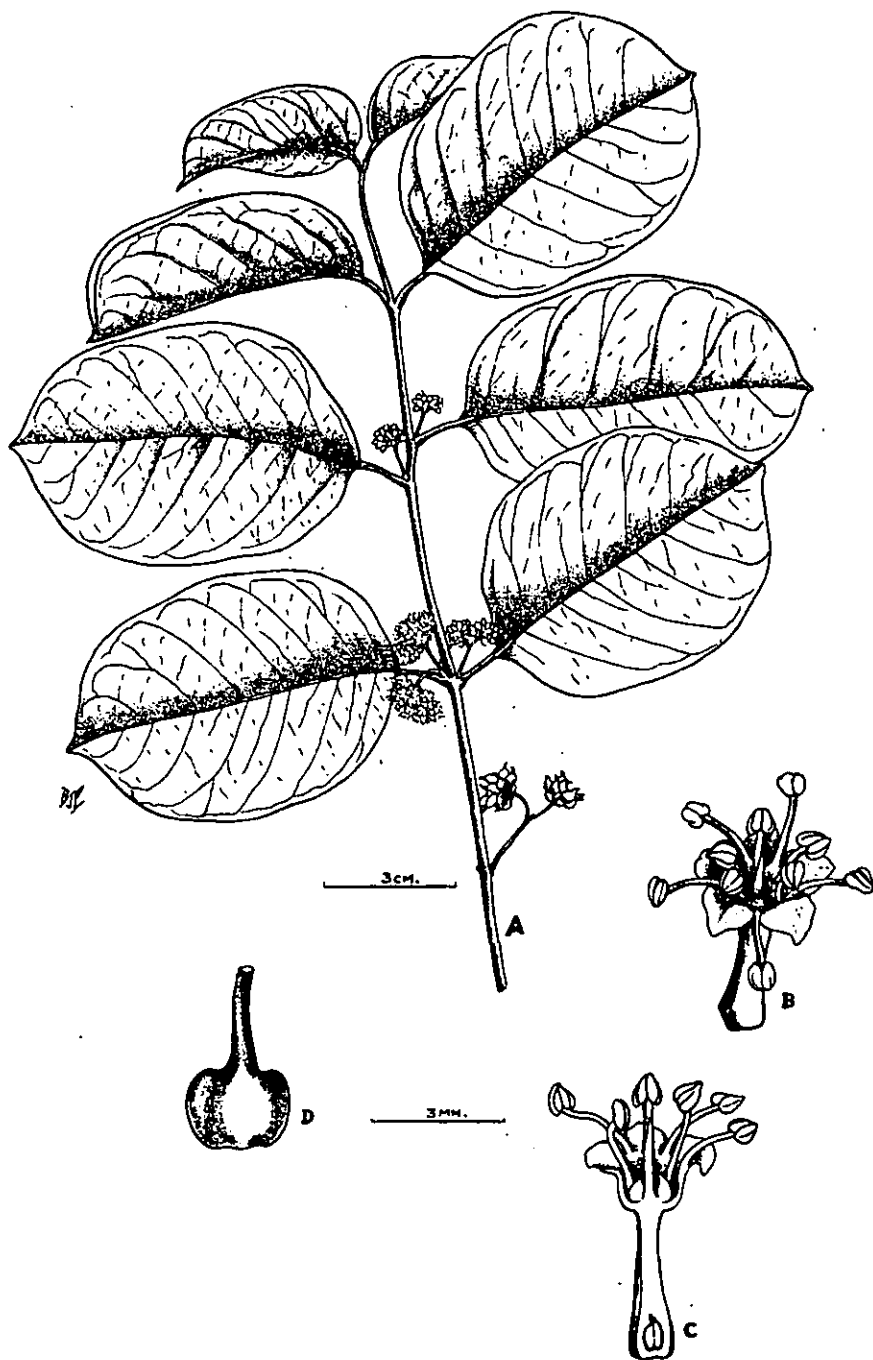


FIG. 112. *Anogeissus latifolia*. A, branch with leaves, flowers and fruits. B, flower from top. C, longitudinal section of flower. D, fruit.

## 29. COMBRETACEAE

### 1. *Anogeissus latifolia* Wall. Cat. 4015. 1828. (Fig. 112).

*Conocarpus latifolia* DC.

*Engl.* Button Tree; *Sinh.* Dawu; *Tam.* Namai, Vekkali, Vellanagai, Vellainamai; *Hindi* Bakla, Bakli, Bankli, Dhaoya, Dhau, Dhaura, Dhauri, Dhauta, Dhava, Dohu; *Sans.* Baka, Dhava, Dhavala, Dhurandhara, Dridhataru, Gaura, Ghata, Kashaya, Madhuratvacha, Madhuratvaka, Nanditaru, Pandura, Pandutaru, Pishachavriksha, Pitaphala, Shakatakhyā, Shushkanga, Shushkavriksha, Sthira.

A small or medium-sized tree with an erect trunk, very smooth whitish-grey bark and glabrous young parts; leaves simple, alternate or subopposite without stipules, 5–10 cm long, 3–5 cm broad, broadly oblong-oval or sub-rotundate, rounded or sub-cordate at base, obtuse often apiculate at apex, entire, more or less undulate, quite glabrous, pale, dull glaucous green, pink when young, often conduplicate, midrib prominent beneath and pink in colour, petioles very short, channelled above; flowers pale greenish-yellow, bisexual, regular, sessile in small dense heads, peduncles slightly pubescent, scarcely longer than petioles; sepals 5, fused to the ovary and extending above it as a long solid tube and persistent, limb campanulate with five short and broad segments; petals absent; stamens 10, inserted on the calyx limb in two rows, ovary inferior, compressed, unilocular with two pendulous ovules; fruits very small, indehiscent, crowded in small globular heads, plano-convex with a rather broad wing along the edges and beaked with the long, persistent, upper part of the calyx-tube.

Flowers during January and February.

*Illustrations.* Wight,  *Ic. Pl. Ind. Orient.* 3: *pl.* 994. 1843–45; Beddome, *Flor. Sylvat. pl.* 15. 1868–73; Kirtikar and Basu, *Indian Med. Pl.* *pl.* 418. 1933; *Herb. Peradeniya*, drawing.

*Distribution.* Occurs throughout India and Ceylon. It is rare in Ceylon growing in open grasslands in the dry country, often gregarious. Haragama, Bintenne, Nilgala, etc.

*India.* W. Himalaya: *Griffith.* Calcutta, *Wallich* 4015B. Behar: Parasnath, *Clarke* 20176J; *Clarke* 20176F, Sept. 1873; *J. D. Hooker.* Siwalik and Jaunsar Div. Lachiwala, *Choudhury* 55, May 1921. Misor and Carnatic, *G. Thomson.* Malabar, Concan, etc., *Stocks, Law*, etc. Pen. Ind. Or., *Herb. Wight* 1003, *Kew Distribution* 1866–7. Ceylon. *Thwaites C.P.* 1220. Uva Prov., Nilgala, *Herb. Peradeniya*, Jan. 1888.

*Uses.* Used in the treatment of snake-bites. The bark is used for the preparation of a remedy against painful expectoration and obstruction of the windpipe by phlegm.

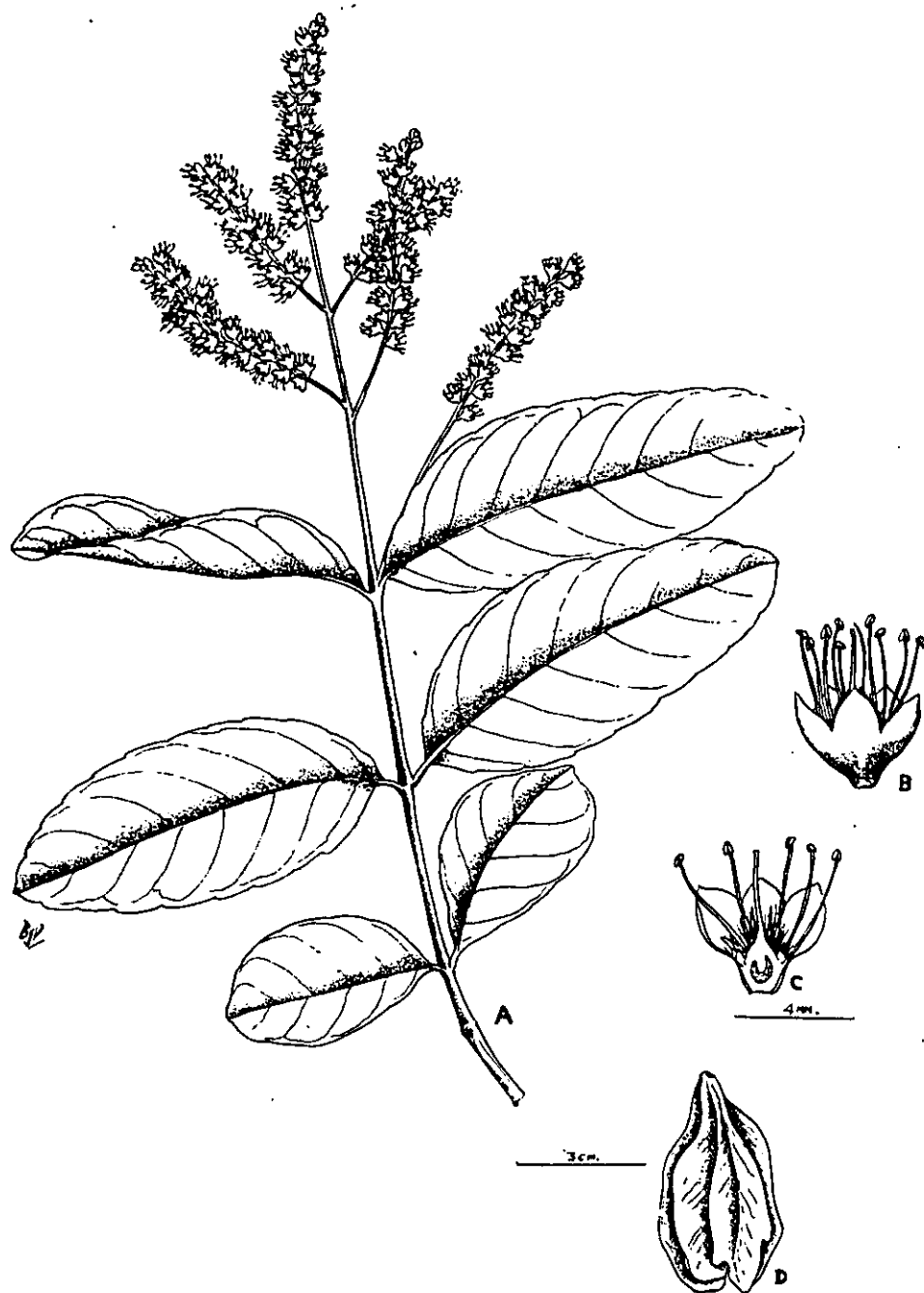


FIG. 113, *Terminalia arjuna*. A, branch with flowers. B, flower, lateral view C, longitudinal section of flower showing the disc with hairs. D, fruit.

2. *Terminalia arjuna* Wight and Arn., Prodr. 314. 1834. (Fig. 113).

*Terminalia berryi* Wight and Arn.—*Terminalia glabra* Wight and Arn.—*Terminalia ovalifolia* Rottl.—*Pentaptera arjuna* Roxb.—*Pentaptera glabra* Roxb.—*Pentaptera angustifolia* Roxb.

*Engl.* White Murdah; *Sinh.* Kumbuk; *Tam.* Attumarudu, Kulamarudu, Marudu, Nirmarudu, Vellaimarudu; *Hindi* Anjan, Anjani, Arjan, Arjun, Arjuna, Jamla, Kahu, Kahua, Kaugach, Khawa, Koha, Kowa; *Sans.* Arjuna, Chitrayodhi, Dhananjaya, Dhanvi, Dhavala, Gandiri, Gandivi, Indradru, Indradruma, Indrasunu, Kakubha, Karaviraka, Karnari, Kaunteya, Kiriti, Krishnasarathi, Nadisarja, Pandava, Partha, Phalguna, Prithaja, Savyasachi, Shambara, Shivamallaka, Vairantak, Vira, Virataru, Viravriksha.

A very large tree with a buttressed, spreading base and horizontally spreading branches, bark pinkish or greenish-white, smooth, flaking off in large flat pieces, young twigs finely pubescent; leaves simple, opposite or sub-opposite without stipules, 7.5—15 cm long, 4—7 cm broad, oblong or oval-oblong, rounded at both ends, obscurely apiculate, very shallowly serrate—crenate in the upper part, glabrous but not shining on both sides, pale dull green, veins arcuate, pellucid, petioles very short, 6—10 mm long with 1 or 2 prominent glands at the top immediately beneath the leaf; flowers regular, polygamous, sessile, greenish-white strongly honey scented, in rather lax spikes which are short, axillary or in small terminal panicles; bracteoles linear—lanceolate, shorter than the flowers, caducous; sepals 5, fused into a tube adnate to the ovary, limbs nearly glabrous on both sides; petals absent; disc with a few long white hairs; stamens 10, distinct, five often longer, inserted on the calyx-tube outside the annular epigynous hairy disc; ovary inferior, unilocular with 2 or 3 pendulous ovules; fruit an indehiscent drupe, 3.5—5 cm long, obovate-ovoid, somewhat narrowed at base, bluntly pointed, glabrous, fibrous-woody, with 5, stiff, hard, projecting wings becoming wider upwards and striated with numerous, much-curved veins, dark brown; seed solitary.

Flowers during April and May.

*Illustrations.* Beddome, *Flor. Sylvat. pl.* 28. 1868—73; Kirtikar and Basu, *Indian Med Pl.* 414. 1933; Herb. Peradeniya., drawing.

*Distribution.* Grows throughout the greater part of India and Ceylon. It is very common along banks of streams in the low-country and in the dry regions in Ceylon; Jaffna, Dambulla, Deltota, Minipe, Hambantota, etc.

*India.* Silhet: *Wallich* 3979F. Behar: *J. D. Hooker*. S. Canara; *Beddome* 306. Pen. Ind Or., *Herb.* Wight 1009, Kew Distribution 1866—7. Ceylon. Without locality, *Thwaites* C.P. 1603.

*Composition.* The bark contains large amounts of the carbonates of calcium and sodium, tannins, organic acids, an organic ester and sugars but no active principles of the nature of alkaloids, glucosides, essential oils, etc.

*Uses.* A decoction of the bark is used to wash ulcers and is taken internally for bilious affections and as an antidote to poisons. The juice of the leaves is a remedy for earache. For fractures and contusions, with excessive ecchymosis, powdered bark is given internally with milk.

In Ceylon. preparations with the bark are administered for diseases of the heart and lungs and for fractures and contusions.

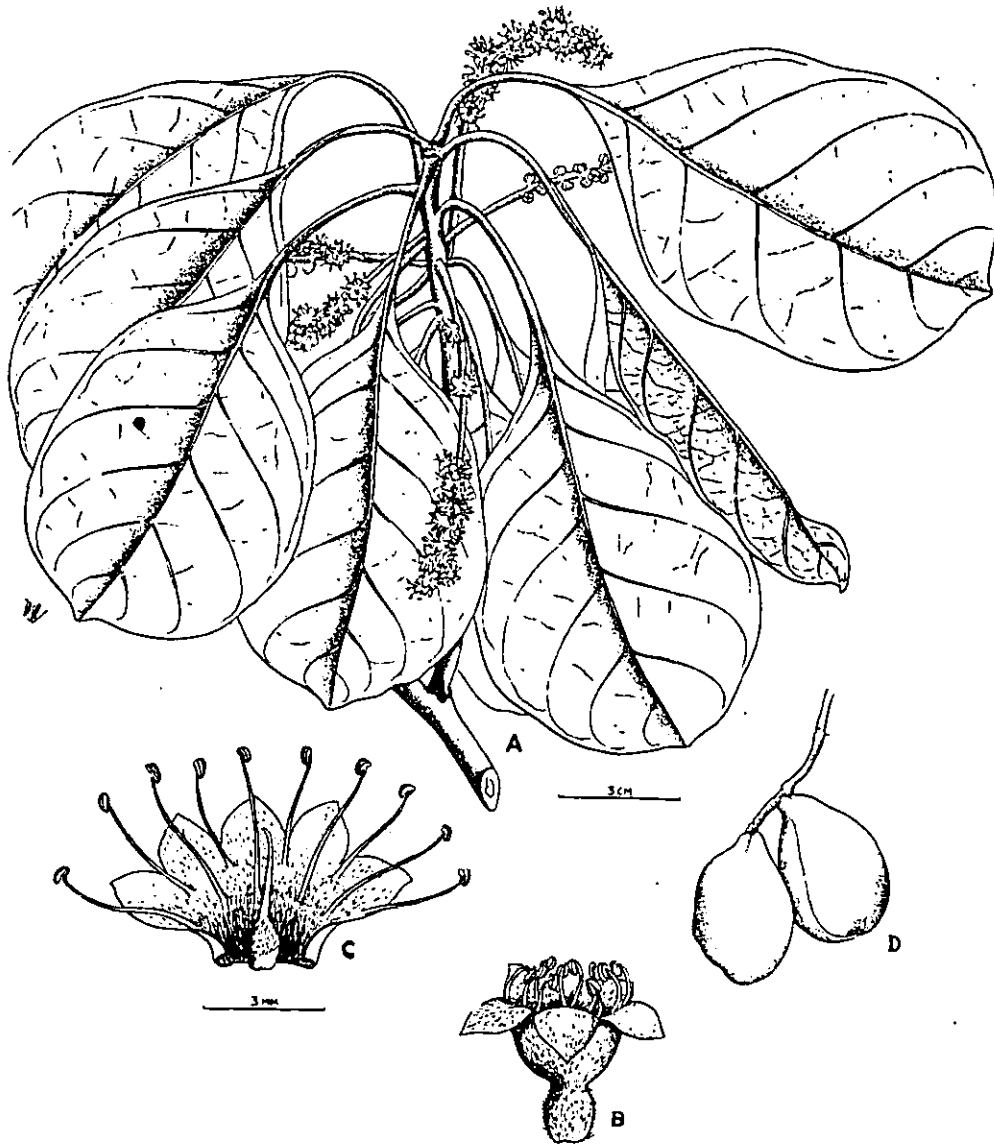


FIG. 114. *Terminalia bellirica*. A, branch with leaves and flowers. B, flower, lateral view. C, flower, opened out. D, fruits.

3. *Terminalia bellirica* (Gaertn.) Roxb., Pl. Corom. 2: 54. 1798. (Fig. 114).

*Terminalia belerica* Roxb.—*Myrobalanus bellerica* Gaertn.

*Engl.* Belleric Myrobalan; *Sinh.* Bulu; *Tam.* Akkam, Akkana, Akkandam, Ambalatti, Kalanduri, Kalitturumam, Kandugam, Sadagam, Sirottam, Tanri, Vibidagam; *Hindi* Bahera, Behara, Behra, Bhaira, Bhairach, Bharla, Buhura, Bulla, Sagona; *Sans.* Anilagnaka, Baheduka, Bahuvirya, Bhutavasa, Bibhitaki, Harya, Kali, Kalidruma, Kalinda, Kalivriksha, Kaliyugalaya, Kalpavriksha, Karshaphala, Kasaghna, Kushika, Sanvarta, Tailaphala, Talaphala, Tilapushpaka, Tusha, Vasanta, Vibhitaka, Vishaghna.

A large, deciduous tree with a straight, buttressed trunk and long, horizontal branches, bark brown and young parts glabrous; leaves simple, alternate, without stipules, placed at the ends of branchlets, 10—20 cm long, 7—15 cm broad, obovate—oval, tapering to the base, rounded or very shortly acuminate at apex, entire with a pellucid margin, glabrous and shining on both sides, paler beneath, stiff, venation finely reticulate, main veins prominent beneath, petioles 3.7—5 cm long, cylindrical without glands at apex; flowers regular, polygamous, small, pale greenish-yellow, strongly scented, male flowers shortly pedicellate, bisexual flowers nearly sessile, numerous in axillary spikes or racemes shorter than leaves, often crowded at ends of branchlets without leaves so as to form terminal panicles, peduncles pubescent, bracts minute, caducous; sepals 5, fused into a calyx-tube adnate to the ovary and constricted above, limbs free, campanulate divided into lobes, tomentose outside, the limbs with long hairs within; petals absent; stamens 10, biseriate, 5 longer ones inserted on the calyx-tube outside an annular, epigynous, hairy disc alternating with the calyx teeth and the five shorter ones opposite calyx teeth, anthers opening by slits; ovary inferior, unilocular with 2 or 3 pendulous ovules; fruit an indehiscent drupe, often somewhat pyriform, narrowed at base, irregular on the surface, not angled, covered with a fine, close, brownish-yellow tomentum, stone large, woody with a large seed cavity

Flowers during February.

*Illustrations.* Roxburgh, Pl. Corom. 2: pl. 198. 1798; Wight, Ill. Ind. Bot. pl. 91. 1841—50; Beddome, Flor. Sylvat. 1: pl. 19. 1868—73; Kirtikar and Basu, Indian Med. Pl. pl. 412B. 1933; Herb. Peradeniya, drawing.

*Distribution.* Grows in the forests of India, Burma, Ceylon and Malaya. It is not very common in Ceylon, confined to the moist and intermediate regions of the low-country; Kurunegala, Bibile, Gal-oya, etc.

*India.* Assam. *Herb. Kurz* 14. Sivalik and Jaunsar Div., Lachiwala, *Gandhe* 49, April 1921; Chota Nagpore, *Clarke* 25077C, Nov. 1874. Concan, *Storks*. Maisor and Carnatic: *G. Thomson*. Pen. Ind. Or., *Herb. Wight* 1011/1, Kew Distribution 1866—7. Ceylon. Kurunegala, *Thwaites C.P.* 1605; *Walker*.

*Uses.* The pericarp of the dry fruit is an ingredient in many decoctions for a variety of diseases. It is one of the myrobalans which go to form the "Thippal" which is largely used by every Ayurvedic physician for all the diseases of the human body and enters into the combination of many of their stock preparations. In India, it is chiefly employed in dropsy, piles, diarrhoea, leprosy and fever. It is an ingredient in a very useful preparation for sore eyes even after white spots appear in the cornea. The bark is a mild diuretic and the gummy exudation is believed to be a demulcent and purgative. The fixed oil extracted from the seeds is considered a beneficial application for the hair and for rheumatism.

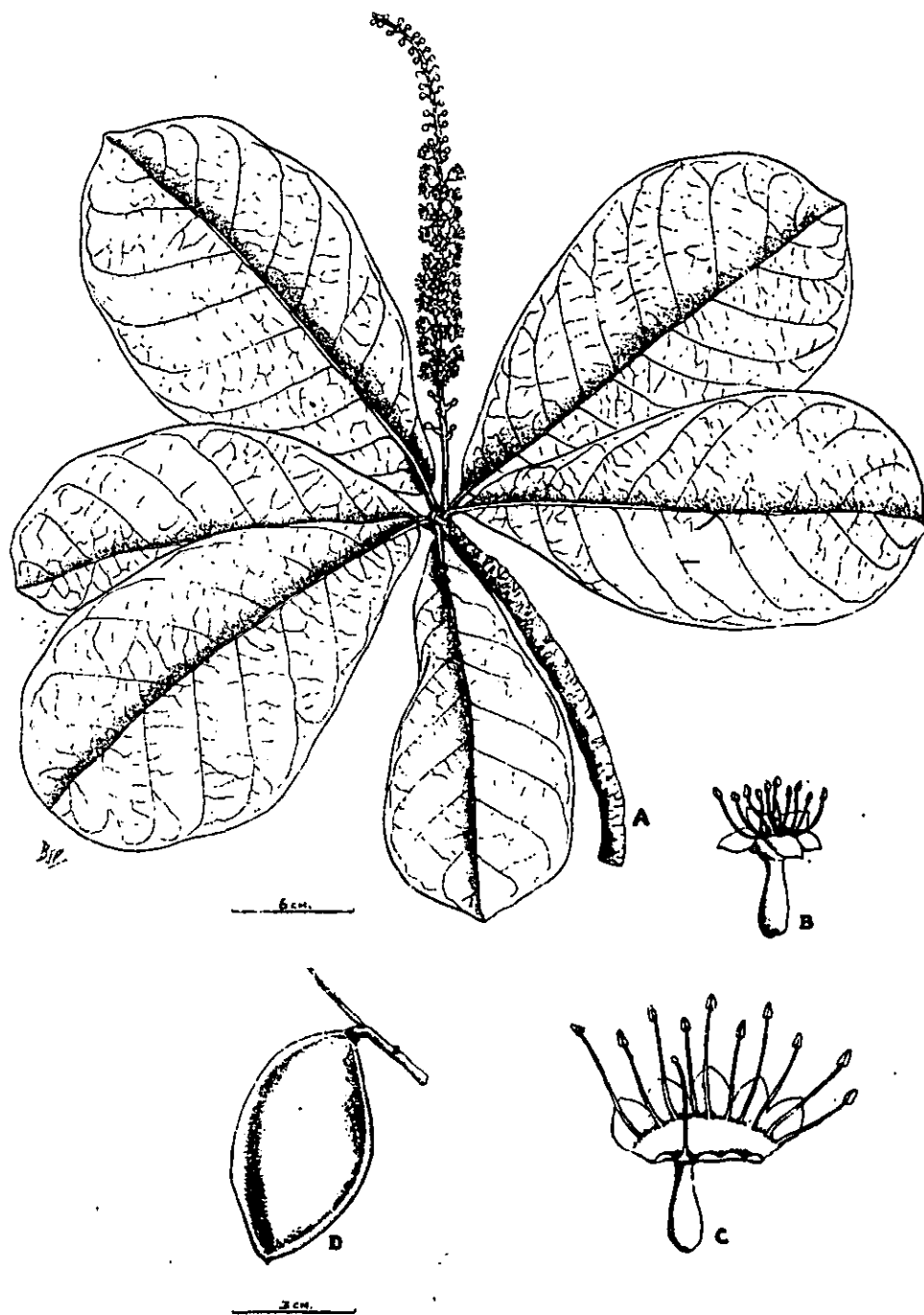


FIG. 115. *Terminalia catappa*. A, branchlet with leaves and flower spike. B, flower, lateral view. C, flower with the calyx-tube spread out. D, fruit.

4. *Terminalia catappa* Linn. Mant. 519. 1771. (Fig. 115).

*Terminalia badamia* Tulasne—*Terminalia moluccana* Lamk.—*Terminalia myrobalana* Roth—*Terminalia subcordata* Willd.—*Terminalia intermedia* Spreng.—*Terminalia latifolia* Blanco—*Terminalia mauritiana* Blanco—*Juglans catappa* Lour.—*Badamia commersoni* Gaertn.—*Catappa domestica* Rumph.—*Catappa litorea* Rumph.—*Catappa sylvestris* Rumph.

*Engl.* Indian Almond; *Sinh.* Kottang, Kottamba; *Tam.* Amandi, Nattuvadumai Pinga, Siruppinga, Vadumai; *Hindi* Badami, Hindibadam, Janglibadam; *Sans.* Desabadama, Grahadruma, Ingudi, Kshudrabadama, Kshudrabija, Tapasataruvu, Tailaphala, Vatama.

A tree about 25 m high with horizontal whorls of branches; leaves simple, alternate, clustered towards the ends of branches, very shortly petioled, 15–28 cm long, 10.5–16.5 cm broad, glabrous and shining above, tomentose below with two glandular depressions near the base of the midrib on the underside; flowers regular, polygamous, in simple, solitary, axillary, rusty-tomentose or pilose spikes 6–18 cm long, the upper flowers male and the lower flowers bisexual, bracts minute; calyx-tube cylindric, adnate to and constricted above the ovary, calyx lobes of 5 triangular valves, soon deciduous; petals absent; stamens 10 inserted on the calyx lobes, biseriate, 5 lower stamens opposite the calyx teeth and the 5 higher ones alternating with them; ovary inferior, unilocular with 2 or 3 pendulous ovules, glabrous or hairy, ellipsoid, slightly compressed showing two ridges; fruit an indehiscent ellipsoid drupe 3–6 cm long, with a hard endocarp.

**Illustrations.** Beddome, *Flor. Sylvat.* 1: *pl.* 18. 1868–73; Wight, *lc. Pl. Ind. Orient.* 1: *pl.* 172. 1839; Kirtikar and Basu, *Indian Med. Pl.* *pl.* 411. 1933; *Herb. Peradeniya*, drawing.

**Distribution.** Probably indigenous to Andamans and the neighbouring islands. It is now grown widely in India, Burma, Ceylon, Malaya and Philippine Islands. It is common along the coast in Ceylon.

**India.** Calcutta, *Wallich* 3975C. *Pen. Ind. Or., Herb. Wight* 1006, *Kew Distribution* 1866–7. **Ceylon.** Peradeniya, *Bot. Gard.*, cultivated, *J. M. Silva*, Nov. 1921. **Maldive Islands.** *Veimandu, Gardiner*, 1899–00; *Didi* 22, 1896; *Hulule, Gardiner* 5, 1899–00; *Christopher*, 1888.

**Composition.** The seeds contain a fixed oil with olein, palmitin and stearin. The bark contains tannin. The leaves and the flowers yield tannin and a sterol. The trunk of the tree exudes a gum while the bark yields a black dye.

**Uses.** The astringent bark is used against bilious diarrhoea, gastric fevers and dysentery. A decoction of the bark is recommended to be taken internally as a remedy for gonorrhoea and leucorrhoea. In India, the juice of the young leaves is used to prepare an ointment for scabies, leprosy, and other cutaneous diseases. The bark is a mild diuretic and a fairly potent cardiotonic. In the East Indies, the plant is used as a remedy for catarrh, diarrhoea and dysenteries and externally on skin diseases. In Indo-China, the leaves are used as a sudorific and also applied to rheumatic joints.

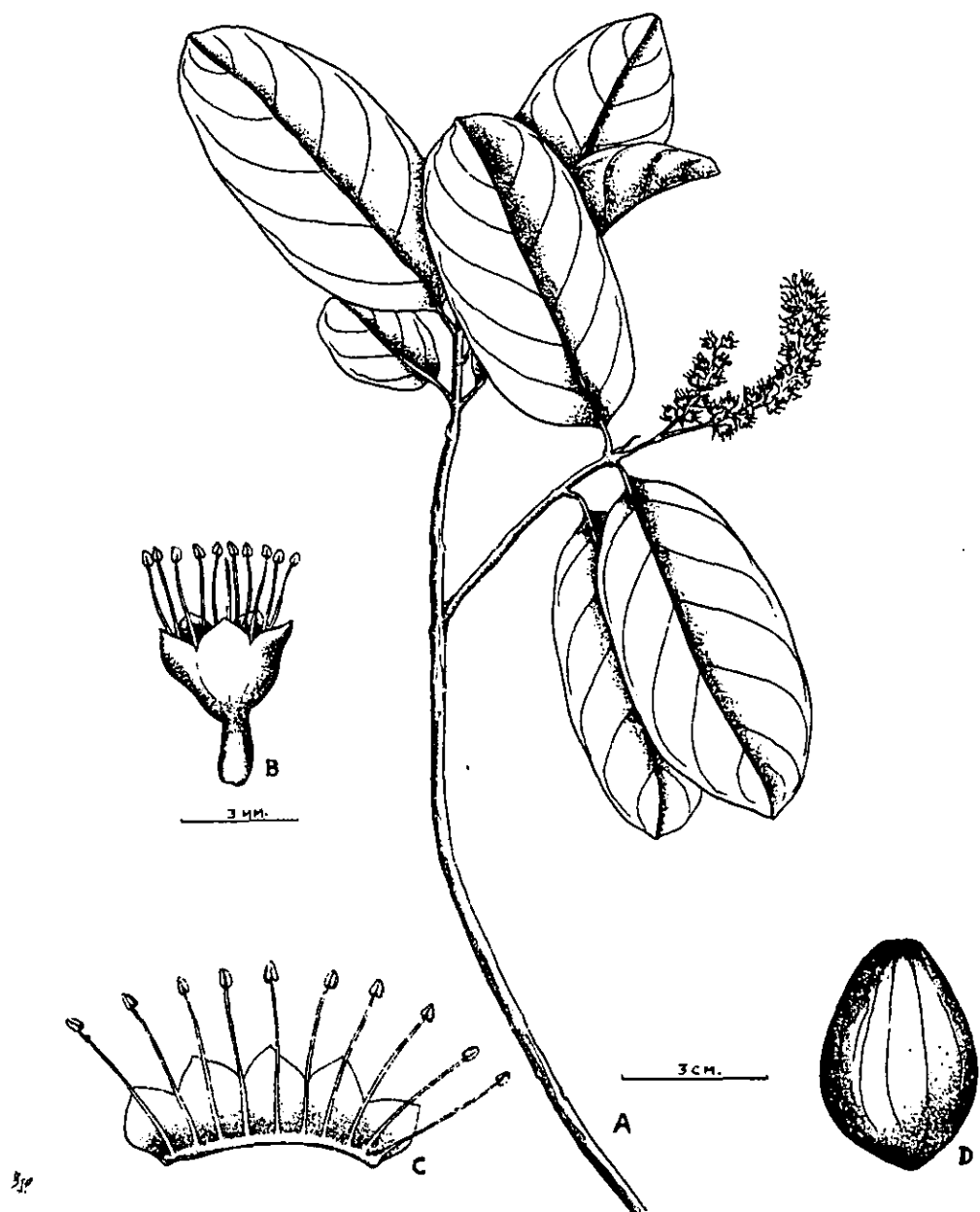


FIG. 116. *Terminalia chebula*. A, branch with flowers. B, flower, lateral view. C, calyx-tube opened out showing the stamens. D, fruit.

5. *Terminalia chebula* Retz.; Obs. 5: 31. 1789. (Fig. 116).

*Terminalia reticulata* Roth.—*Terminalia aruta* Ham.—*Myrobalanus chebula* Gaertn.—*Embryogonia arborea* Teys. and Binn.

*Engl.* Chebulic Myrobalan; *Sinh.* Aralu; *Tam.* Amagola, Arabi, Aridadi, Attan, Kadil, Kadukkay, Kagodagasingi, Nechi, Pattiyam, Piradamai, Seya, Sidegi, Singi, Sirottam, Sittilai, Siva, Sivandi, Taduvairi, Tuvarchigai, Urugini, Vayadaram; *Hindi* Har, Harara, Harra; *Sans.* Abhaya, Amogha, Amruta, Avyatha, Balya, Bhishagvara, Bhishakpriya, Chetaki, Chetamaki, Dev; Divya, Girija, Haimavati, Haritaki, Himaja, Jaya, Jivanika, Jivanti, Jivapriya, Jivya, Karkatakasringi, Kayastha, Nandini, Pachani, Panjarasa, Pathya, Pramatha, Pranada, Prapathya, Putana, Rasayanaphala, Reshaki, Rohini, Rudrapriya, Shaka, Shakrasrishta, Shiva, Shreyasi, Sudha, Sudhodbhava, Triphala, Vanatikta, Vayastha, Vijaya.

A moderate-sized tree with a very thick, grey-brown bark, crooked trunk and many spreading branches drooping at the extremities and pubescent young parts; leaves simple, alternate without stipules, 7.5—12.5 cm long, broadly oblong-oval, rounded or cordate at base, very obtuse at apex, pubescent on both sides especially when young, thick and rigid; petioles 1—2 cm long, pubescent with 2 prominent glands at the top just beneath the leaf; flowers small, regular, bisexual, greenish-white, nearly sessile, numerous in terminal spikes or from the axils of the uppermost leaves; bracts linear, hairy, conspicuous in bud; calyx-tube adnate to ovary, limbs 5, free, campanulate, glabrous outside with long hairs within; petals absent; stamens 10, the longer ones inserted on the calyx-tube outside an annular, epigynous, hairy disc; ovary inferior, unilocular with 2 pendulous ovules; fruit a pendulous drupe, 2—4 cm long, broadly ovoid, glabrous, not angled, yellowish green; stone oblong, bony, very thick, obscurely angled; seed solitary, in a very small cavity without endosperm.

Flowers during April.

*Illustrations.* Roxburgh, *Pl. Corom.* 2: *pl.* 197. 1798; Beddome, *Flor. Sylvat.* 1: *pl.* 27. 1868—73; Kirtikar and Basu, *Indian Med. Pl.* *pl.* 413. 1933; Herb. Peradeniya, drawing.

*Distribution.* Grows in India, Burma, Ceylon and Malay Peninsula. In Ceylon, it is rather rare in the dry districts of the low-country up to 2500 feet altitude. It is gregarious and abundant in certain areas such as Bibile, Galoya, Batticaloa, Nilgala, etc.

*India.* Chota Nagpore: *Clarke* 20437A, Oct. 1873. Calcutta: *Wallich* 3967E. Siwalik and Jaunsar Div., Kaluwala, *De*, April 1929; Canara: Yellapore, *Talbot*, 1882. Pen. Ind. Or., *Herb. Wight* 1011, Kew Distribution 1866—7. Ceylon. *Thwaites* C.P. 1604; Central Prov., Huluganga near Panwila, *Herb. Peradeniya*, April 1886; Uva Prov., between Passara and Lunugala, *Herb. Peradeniya* Jan. 1888.

*Composition.* The fruits contain a mixture of gallic acid and tannic acid, apparently derived from an organic acid, chebulinic acid; they contain, also, a greenish oleo-resin which is termed myrobalanin.

*Uses.* The bark possesses diuretic and cardio-tonic properties. The pericarp of the dry fruit in decoction is a good purgative. It is finely powdered and used as a dentifrice useful for carious teeth, bleeding and ulceration of the gums. Along with other drugs, it is used in fever, all diseases of the eye, piles and 80 types of dropsy. The ashes of the fruit mixed with butter form a good ointment for sores. The roasted powder of the fruit given with milk is an excellent remedy for chronic dysentery. Regular use of the powder with king-coconut water is supposed to improve the complexion.

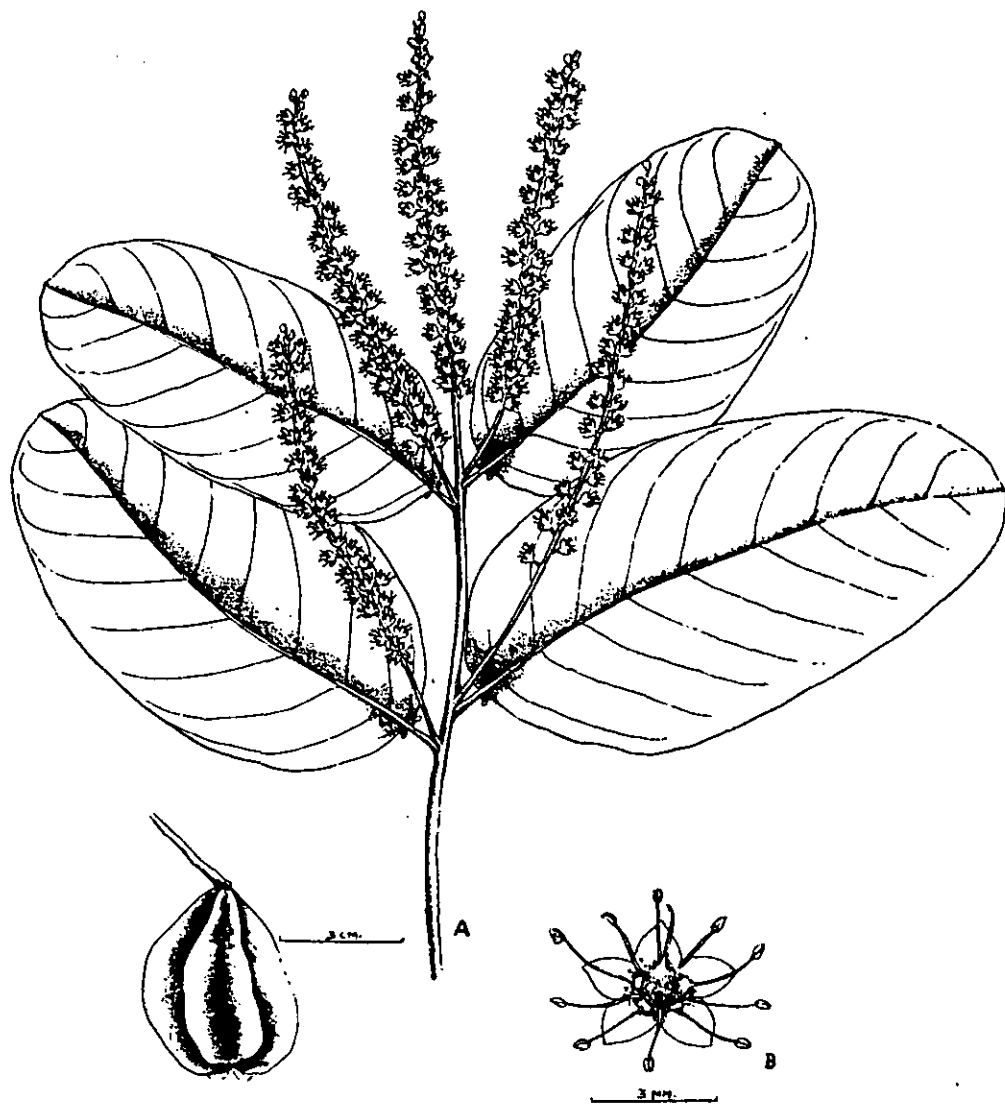


FIG. 117. *Terminalia tomentosa*. A, branch with leaves showing stalked glands and flowering spikes. B, flower from above. C, fruit.

6. *Terminalia tomentosa* Wight and Arn., Prodr. 314. 1834. (Fig. 117).

*Terminalia tomentosa* var. *typica* C. B. Clarke—*Terminalia glabra* var. *tomentosa* Dalz. and Gibs.—*Terminalia alata* Roth—*Terminalia ovata* Herb. Rottler.—*Terminalia chebula* var. *minor* Hierck & Muell Arg.—*Pentaptera tomentosa* Roxb.

*Engl.* Black Murdah; *Sinh.* Asana; *Tam.* Aruchanam, Kagubam, Kalimarudu, Karumarudu, Karuppumarudu, Marudam, Marudu, Maruta-maram, Mikkuvam, Pudavam; *Hindi* Ain, Asaina, Asan, Asna, Assain, Kauha, Sadri, Sain, Saj, Sein; *Sans.* Dharaphala, Krishnatvaka, Nissaraphalaka, Sajada, Saradru, Shyamasaraka, Vanajavriksha, Viravrikshaka.

A tall, erect tree with a straight trunk, rough, deeply cracked bark and young parts more or less clothed with yellowish-brown pubescence; leaves simple, sub-opposite or the uppermost alternate, hard, coriaceous, 7.5—20 cm long, 5—8 cm broad, ovate-oblong or elliptic-oblong, rarely obovate, softly tomentose when young becoming more or less glabrous when mature, with 1 or 2 stalked glands usually on the midrib at the base, but sometimes absent, base often cordate, main nerves arcuate, parallel, 10—20 pairs, prominent; petioles 1 cm long, pubescent when young, glabrous when old; flowers regular, bisexual, dull yellow, in axillary fulvous—pubescent spikes or terminal panicles; calyx hairy or glabrous outside, 4 mm long, mouth broadly campanulate, constricted above the ovary, limb of 5, short, valvate triangular lobes, lobes 1.5 mm long, slightly hairy within; bracteoles 4 mm long, linear-lanceolate, hairy, caducous; petals absent; stamens 10, inserted on the calyx lobes, biseriate, the 5 lower opposite calyx teeth, the 5 upper longer and alternate with the calyx teeth, filaments exerted; ovary inferior, unilocular with 2 or 3 pendulous ovules, style subulate, thickened and villous at the base, stigma simple; drupe 3.5—5 cm long with 5 broad, coriaceous, brown, glabrous wings striated with numerous straight lines running horizontally from the axis to the edges.

Flowers between April and June.

*Illustrations.* Wight, Ic. Pl. Ind. Orient. 1: pl. 195. 1839; Beddome, Flor. Sylvat. 1: pl. 17. 1968—73; Kirtikar and Basu, Indian Med. Pl. pl. 415. 1933.

*Distribution.* Grows in India, Nepal and Sikkim. It is easily cultivated in Ceylon.

*India.* Manipur: Kobo Valley, Khongal Thannah, Watt. 6620, Dec. 1882. Annamallay, Beddome. Pen. Ind. Or., Herb. Wight 1008, Kew Distribution 1866—7.

*Uses.* The bark has diuretic and cardio-tonic properties. It is taken in decoction for atonic diarrhoea. The powdered bark mixed with oil is used to remove apthae. It is also applied externally on ulcers and on fractures.

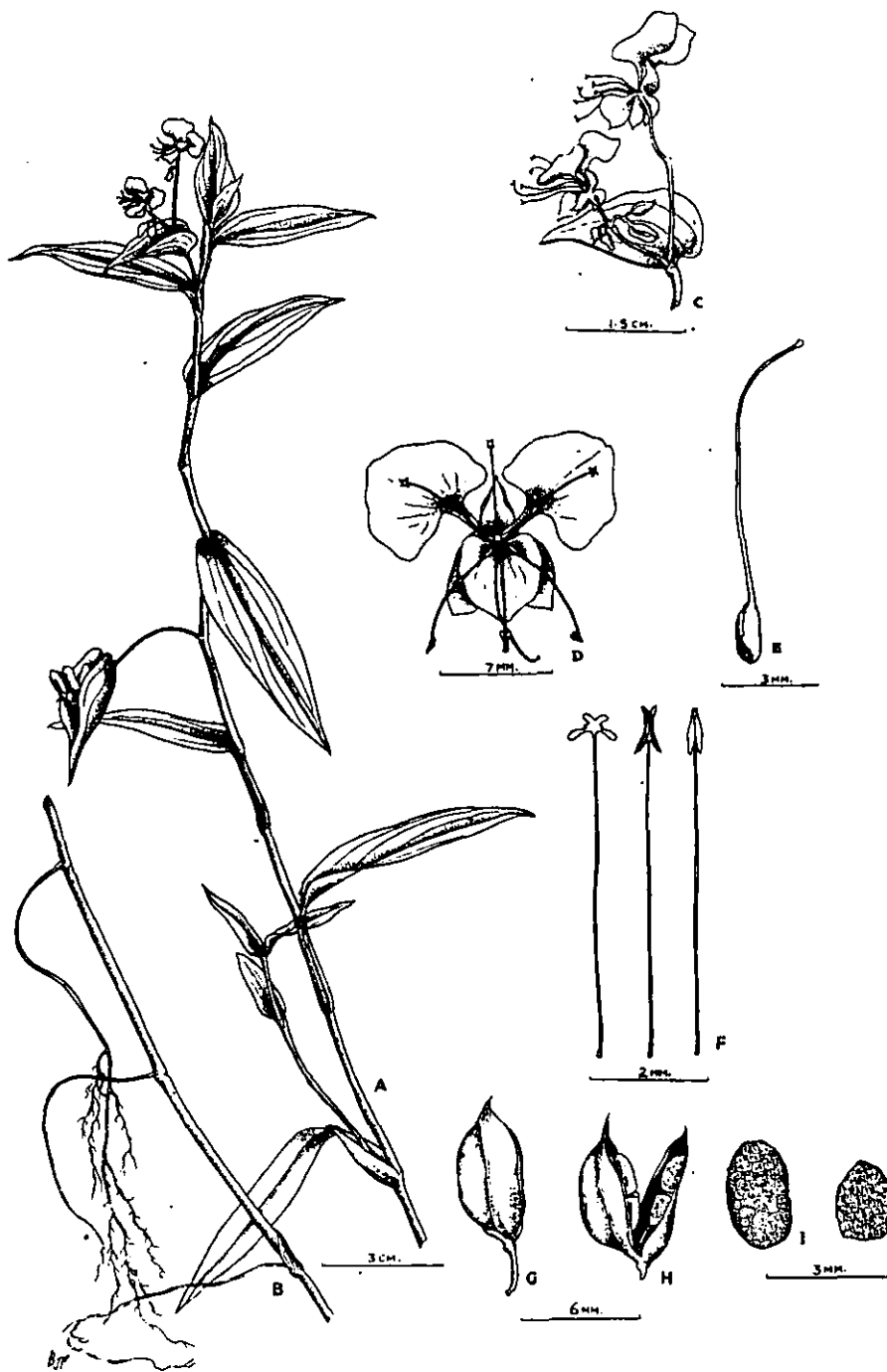


FIG. 118 *Commelina diffusa*. A, branch with leaves and flowers. B, portion of the stem with fibrous roots. C, inflorescence with half the spathe removed. D, flower from front. E, ovary, style and stigma. F, stamens. G, fruit. H, dehiscent fruit. I, seeds.

### 30. COMMELINACEAE

#### 1. *Commelina diffusa* Burm. f., Fl. Ind. 18. 1768. (Fig. 118).

*Commelina nudiflora* Linn.—*Commelina communis* Walt.—*Commelina cacsposita* Roxb.—*Commelina agrarea* Kunth—*Commelina salicifolia* Bojer—*Commelina longicaulis* Jacq.—*Tradescantia cristata* Naves

*Sinh.* Girapala; *Hindi* Kanshura; *Sans.* Katsapriya, Koshapushpi.

Annual, nearly glabrous, prostrate or subscandent, branching herb, rooting at the rather distant nodes, tips ascending; leaves simple, 3.7—7.5 cm long, 1.2—1.6 cm broad, sessile, lanceolate or ovate-lanceolate, acute or acuminate, glabrous or puberulous, ciliate, sheath 1.2—2.5 cm long, loose, glabrous; flowers irregular, bisexual, 1.2—1.6 cm broad, shortly pedicelled, in simple or bifid scorpioid cymes, 1 to few-flowered, enclosed in a spathe from which the flowers emerge singly; spathes 1.6—2.5 cm long, ovate or ovate-lanceolate, acute, glabrous or pubescent, base cordate with rounded lobes; sepals 3, small, free or 2 connate; petals 3, the two interior, large-clawed, orbicular or cordate and dark blue in colour, the third smaller, subsessile and of a paler blue colouration; stamens 3, perfect, hypogynous, filaments slender, naked, anthers oblong, one larger than the others; staminodes 3, like stamens but deformed with cruciform anthers; ovary superior, 3-locular, 2 loculi each 2-ovuled and the third loculus 1-ovuled, style slender, glabrous, stigma punctiform; capsule 5 mm long, broadly oblong, acuminate, coriaceous, 5-seeded, hidden in the spathe by the decurving of the pedicel after flowering, loculicidally 3-valved with the dorsal valve indehiscent; seeds oblong, tubercled, reticulate and brown in colour.

Flowers mostly during January.

**Illustrations.** Burmann fil., Fl. Ind. pl. 7, fig. 2. 1768; Herb. Peradeniya drawing.

**Distribution.** Grows throughout the tropical and subtropical regions of India, Ceylon, Malay Peninsula, China and in the Philippine Islands. It is a very common herb in shady places amongst grass in the low-country in Ceylon.

**Ceylon.** Central Prov., Pelwehera Tank, Simpson 9814, June 1932; Peradeniya, Bot. Gard., Herb. Peradeniya., Jan. 1889; Talawakelle, Watagoda Road, Simpson 8913, Nov. 1931; Ambawela, A. M. Silva, March 1906; Haputale, A. M. Silva, May 1906. **Malaya.** Perak: Wray Jr. 799. **Indo-China.** Hue and vicinity, Squires 12, Jan.—May 1927.

**Uses.** The bruised plant is applied to burns, itches and boils with beneficial results. In Ghana, it is pounded with seeds of *Leea guineensis* G. Don and *Piper nigrum*, made into a poultice in a heated plantain leaf and applied for relief of swellings of the groin. An eye lotion is prepared from it in Nigeria.



FIG. 119. *Cyanotis axillaris*. A, portion of the plant with roots B flower, lateral view C, longitudinal section of flower. D, ovary, style and stigma E, stamen with hairy filament. F, fruit. G, dehiscent fruit. H, I, seeds showing the pits.

2. *Cyanotis axillaris* (Linn.) J. A. & J. H. Schult., Syst. 7: 1154. 1830. (Fig. 119).

*Cyanotis disrumpens* Hassk.—*Commelina axillaris* Linn.—*Tradescantia axillaris* Linn.—*Zygomenes axillaris* Salisb.

Tam Nirpulli, Hindi Baghanulla, Soltraj.

An annual, diffusely branched, fibrous-rooted herb, stem 15—45 cm long, stout or slender, leafy, branches suberect and creeping below or prostrate, glabrous or sparsely hairy, internodes 2.5—7.5 cm long; leaves simple, alternate, sessile, bases sheathing, 5—15 cm long, 4—8 mm broad, narrowly linear or linear-lanceolate, acute or acuminate, flat, glabrous or hairy, sheaths 6—8 mm long, mouths ciliate; flowers regular, bisexual, bright violet-blue, cymes reduced to axillary fascicles with small linear or linear-lanceolate bracteoles, almost concealed in the leaf-sheaths; sepals 3, 8 mm long, spatulate-lanceolate, acuminate, sparingly hairy; petals 3, fused into a funnel-shaped tube, 8 mm long, lobes small, rounded; stamens 6, inserted at the base of the corolla-tube, filaments subequal, fusiform below the tip, anthers oblong; ovary superior, 3-locular with 2 ovules in each loculus, style slender, fusiform below the acuminate tip, stigma punctiform, ovules superposed; fruit capsule 5—6 mm long, shortly stipitate, long beaked, quite glabrous, 3-valved, 6-seeded, loculicidally dehiscent; seeds large, 2.5 mm long, oblong, compressed or ventrally concave, brown and shining with shallow pits.

Flowers during March and October.

**Illustrations.** Roxburgh, Pl. Corom. 2: pl. 107. 1798; Kirtikar and Basu, Indian Med. Pl. pl. 985. 1933; Herb. Peradeniya., drawing.

**Distribution.** Grows in marshy paddy fields in India, Ceylon, Malaya, China, Australia and Philippine Islands. It is common in the low-country in Ceylon.

**India.** E. Bengal: *Herb. Griffith* 5502, Kew Distribution 1863—4; *T. Thomson and J. D. Hooker*; Serampore, *Griffith*. Maisor and Carnatic, *G. Thomson*. Ceylon. *Thwaites C.P.* 2330. Central Prov., Pelwehera Tank, *Simpson* 9813, June 1932; Peradeniya, *Livera*, March 1922. Southern Prov., Kirinde, *Livera*, Dec. 1922.

**Uses.** A useful remedy in tympanitis. It is applied externally with oil for cases of ascites.

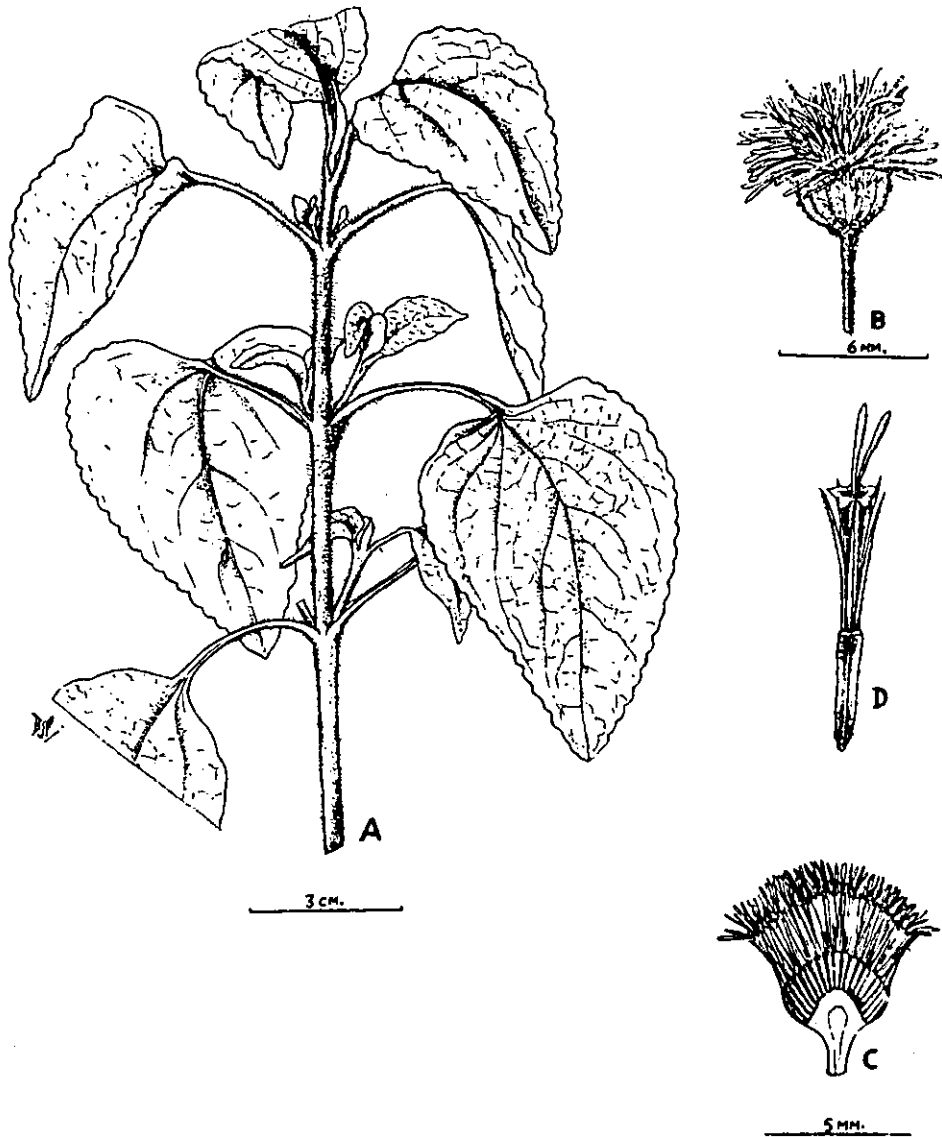


FIG. 120. *Ageratum conyzoides*. A, top of a plant B, flower head lateral view. C, longitudinal section of a flower head. D, flower, lateral view

## 31. COMPOSITAE

### 1. *Ageratum conyzoides* Linn., Sp. Pl. 839. 1753. (Fig. 120).

*Ageratum cordifolium* Roxb.

*Sinh* Hulantala; *Tam.* Pumpillu.

An annual, 30—90 cm high, with an erect, terete, branched stem which is more or less hairy; leaves simple, opposite or the upper alternate, 5—7.5 cm long, 2.5—5 cm broad, broadly ovate, subacute, crenate with ciliate margins, more or less hairy on both sides, base cuneate, petioles 2.5—3 cm long and hairy; flower heads small, in dense terminal corymbs; flowers pale blue or white, malodorous; involucre campanulate, bracts 2—3-seriate, linear, very acute, ribbed on the back, ciliate and with scarios margins, receptacle flat, naked or with caducous scales between flowers; pappus of 5 scales, aristate, dilated at the base, serrulate, about equalling the corolla; corolla all tubular, regular, the tube scarcely distinct from the shortly 5-fid limb; stamens 5, epipetalous, syngenesious, anthers appendiculate at the apex, obtuse at the base; ovary inferior, 2-carpellary, unilocular with a basal ovule, style arms elongate, obtuse; achenes 2—2.5 cm long, sharply angled, sometimes glandular, attenuated at the base.

Flowers from November to March.

**Illustrations.** Kirtikar and Basu, *Indian Med. Pl. pl.* 518C. 1933; *Herb. Peradeniya*, drawing.

**Distribution.** A native of tropical America and now naturalized in all tropical countries including India and Ceylon. It is a vexatious weed in Ceylon.

**Egypt.** Canal Banks, *Shabetai*, Nov. 1931. **India.** Khasia: *J. D. Hooker and T. Thomson*. Nilghiri and Courtalam: *Hooker fil. and T. Thomson*. Bengal: *Kurz*. Ceylon. Cultivated and now naturalized. Central Prov., Peradeniya, *Bot. Gard., Herb. Peradeniya*, 1887; Hakgala, roadside by patana, *Willis*, Feb. 1906; *Bot. Gard., Simpson 8647* Sept. 1931; *Simpson 9090*, Jan. 1932; Haputale Estate, *Hyde*, Nov. 1926. **Maldive Islands.** Kochchefai, *Didi 73*, 1896; Male, *Gardiner*, 1899—00. **Malaya.** Singapore: *Bot. Gard., Deschamps*, Sept. 1900. **Indo-China.** Hue and vicinity, *Squires 164*, Jan.—May 1927. **China.** Hongkong, *Chun 5152*; Kwangtung Prov., Taipo, *Ying 119*, April 1928. **Java.** *Kooders 26495B*, 1897. **Sumatra.** East Coast, Asahan, *Krukoff 4062*. Oct.—Nov. 1932. **British Guiana.** *Appun 321*. **Philippine Islands.** Luzon: Benquet Prov., Baguio, *Ramos and Edano 45042*, March 1928.

**Composition.** The leaves contain an alkaloid, a volatile oil containing sesquiterpenene and a vegetable principle known as "coumarin". The vegetative and reproductive organs of the plant yield hydrocyanic acid.

**Uses.** The leaves are commonly used for wounds and sores. In Indo-China, the roots and leaves are a common remedy for diarrhoea and dysentery. The leaves are supposed to prevent tetanus if applied to wounds. In Brazil, a decoction of the plant is given for diarrhoea, intestinal colic with flatulence, rheumatism and vesical catarrh. In Central Africa, the leaves are used for healing wounds especially those caused by burns. It is also a purgative and the roots employed for colic. The plant is a household medicine in Madagascar and La Reunion. The leaves and stems are used as a fomentation in skin diseases particularly leprosy. A poultice of the leaves is applied on boils. A cold decoction of the root is used as a lotion for purulent ophthalmia.

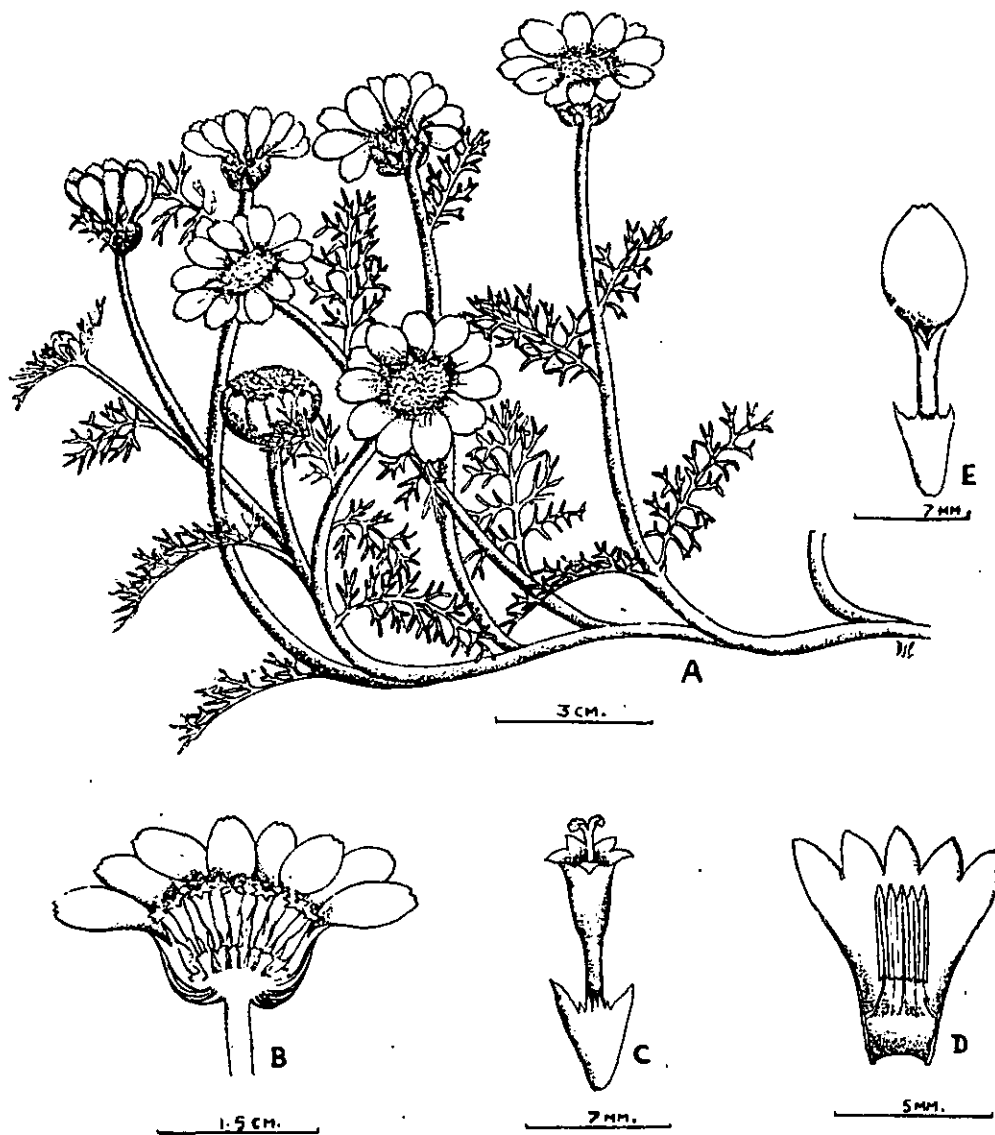


FIG. 121. *Anacyclus pyrethrum*. A, part of the plant with leaves and flower heads. B, longitudinal section of a flower head. C, lateral view of a bisexual tubular flower. D, corolla of bisexual flower opened out. E, front view of a ray-flower.

2. *Anacyclus pyrethrum* DC.. Fl. Franc. 5: 480. 1815. (Fig. 121).

*Anthemis pyrethrum* Linn.—*Anacyclus pseudo-pyrethrum* Ascherson.

*Engl.* Pellitory; *Sinh* Akkrakkara; Akrapatta, Jalapattan, *Tam.* Akkirakaram;  
*Sans.* Akarakarabha, Akallaka.

A perennial herb with numerous spreading, prostrate or ascending branched stems, hairy in the upper portions, glabrous below; leaves alternate, deeply pinnatisect, segments linear acute, often again 2-or-3-fid, glabrous or pubescent; flower heads terminal, large, 2.5—3.5 cm wide with a wide disc; involucre scales in several rows, imbricated, ovate-lanceolate, smooth, pale green, bordered with an edge of brown; receptacle slightly convex with large obovate rounded transparent scales beneath the flowers; disc-flowers bisexual, corolla tubular, contracted below with 5, equal, triangular, spreading teeth, yellow; anthers apiculate not tailed at the base, included in the corolla, style exerted, stigma bifid; ray-flowers female in a single row, corolla ligulate, trifid at the apex, white above, tinged with bright pink below; fruit dorsally compressed, obovoid, more or less denticulate above forming a short scarious pappus prolonged at the sides.

**Illustration.** Bentley and Trimen, *Medicinal Plants*, pl. 151. 1880.

**Distribution.** Indigenous to North Africa and Algeria in particular. It is cultivated in India but not in Ceylon.

**Composition.** The roots contain the alkaloids, anacyclin and pellitorine.

**Uses.** A paste of the root is applied to boils, sores and framboesia, with beneficial results. The seeds are considered stimulant sialagogue and used in rheumatism. As a masticatory, the root has been found useful for toothache, aphonia, paralysis of the tongue and muscles of the throat. It is often employed as a gargle for treatment of tonsils. In Ceylon, it is used as an important ingredient in decoctions given in typhoid fever, convulsions in children, rheumatism, skin eruptions due to impurities in the blood, bronchial diseases and sexual debility.

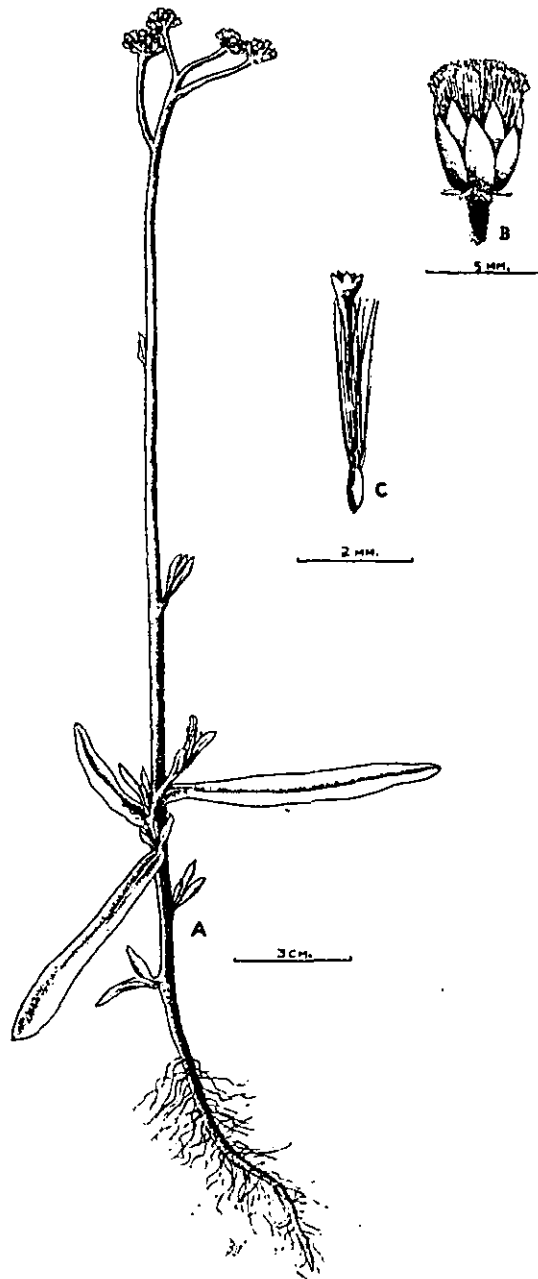


FIG. 122. *Anaphalis subdecurrens*. A, plant with flower heads. B, flower head, lateral view  
C bisexual flower, lateral, view.

3. *Anaphalis subdecurrens* (DC.) Gamble, Fl. Madras, 695. 1921. (Fig. 122).

*Gnaphalium subdecurrens* DC.—*Gnaphalium indicum* Thw.—*Gnaphalium semisubdecurrens* Wall.—*Gnaphalium oblongum* Thw.—*Anaphalis oblonga* DC.

Sinh. Mahasudana.

A perennial herb with an erect, slightly branched stem 30—90 cm tall, covered with a very thick, cottony felt; leaves simple, alternate, sessile, numerous, crowded below, distant and much smaller above, 2.5—5 cm long, oblong, broad and stem-clasping at base, acute, margin flat or very loosely recurved, densely covered on both sides with persistent cottony wool, 1—(rarely 3) nerved; flower heads small, 0.4 cm long, sessile, crowded in globular clusters arranged in a usually close, cottony, corymbose inflorescence, involucre oblong—campanulate; bracts small, not or slightly spreading, narrowly oblong, petaloid appendage acute, laxly cottony, bright pink, receptacle naked; flowers bright yellow, numerous, all tubular; outer ones narrow females; disc florets bisexual (often sterile); sepals reduced to bristles; corolla tubular with 5 valvate lobes; stamens 5, inserted in the corolla tube, anther bases sagittate, tailed; ovary inferior unilocular with a single basal ovule, style branches of bisexual flowers obtuse or clavate; fruit a small achene with a pappus of one row of rough hairs.

Flowers during April and from September to November.

**Distribution.** Grows along the Western Ghats and Pulney Hills in India and in Ceylon in the montane zone between 4000—7000 feet altitude. It is abundant in the Uva<sup>a</sup>patanas.

**Ceylon.** Central Prov., *Thwaites C.P.* 1762; Knuckles Hills, *J. M. Silva* 99, May 1926; Hantane, *J. M. Silva*, May 1924; Rangala, *Ferndale Estate, Alston* 1510, Sept. 1927; Condegala, *Alston* 1915, Sept. 1927; Hakgala, *J. M. Silva* 164, Aug. 1926; Maturata Patanas, *A. M. Silva*, April 1906. Uva Prov., Haputale, *Herb. Peradeniya*. Sept. 1890; Namunukula, *J. M. Silva*, March 1907.

**Uses.** In preparation of medicinal oils for removal of poisonous effects from the body.

MEDICINAL PLANTS

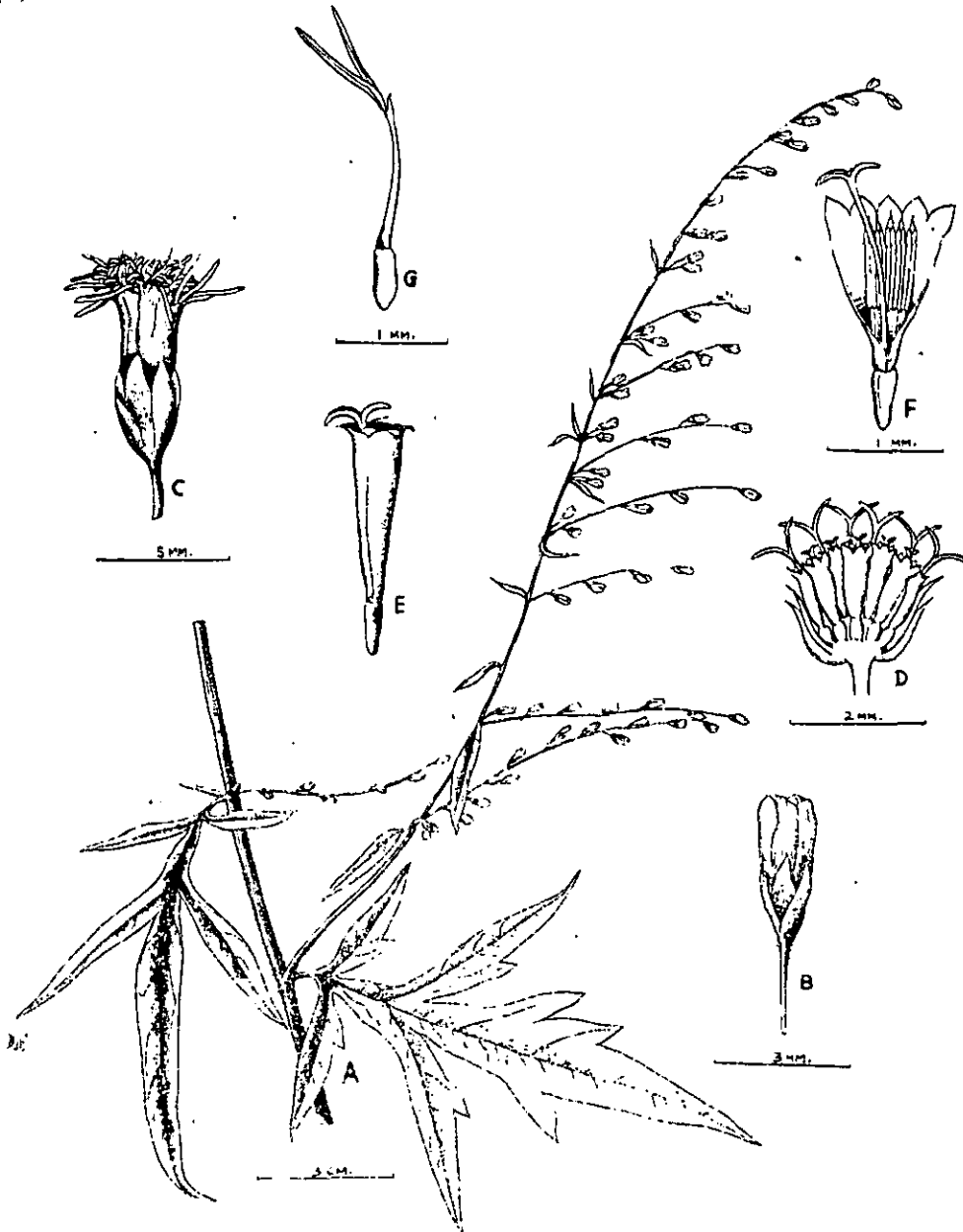


FIG. 123 *Artemisia vulgaris*. A. portion of the stem with leaves and inflorescence. B. unopened flower head, lateral view. C. opened flower head, lateral view. D. longitudinal section of flower head. E. tubular flower, lateral view. F. tubular flower with corolla opened out showing the stamens. G. female flower.

4. *Artemisia vulgaris* Linn. Sp. Pl. 848. 1753. (Fig. 123).

*Artemisia indica* Willd.—*Artemisia dubia* Wall.—*Artemisia myriantha* Wall.—*Artemisia paniculata* Roxb.—*Artemisia leptostachya* DC.—*Artemisia grata* Wall.—*Artemisia lavandulaefolia* DC.—*Artemisia affinis* Hassk.—*Artemisia parviflora* Wight

*Engl.* Fleabane, Indian Wormwood, Mugwort; *Sinh.* Walkolundu; *Tam.* Mashibattiri, Tirunama; *Hindi* Dona, Gathivana, Majtari, Mastaru, Nugduna; *Sans.* Barha, Barhikusum, Barhipushpa, Granthika, Granthiparna, Granthiparnaka, Guchhaka, Gutthaka, Ka kapushpa, Kukura, Nagodamani, Nilapushpa, Saraparni, Shuka, Shukabarha, Shukachhada, Shukapuccha, Sthauneya, Sugandha, Svaramaguchhaka, Tailaparnaka, Vanyadamanaka, Vshirnakhay.

A semi-shrubby perennial with erect stems 60—90 cm tall, virgate and slightly cottony; leaves simple, alternate, numerous, 5—10 cm long, broadly oval in outline, very deeply pinnatisect, the upper segment large, lower segments very small, all cut again into narrow, acute, mucronate segments, pilose or glabrous above, densely cottony-pubescent and white beneath, uppermost segment lanceolate and entire; flowers brownish-yellow, regular, all tubular in heads which are solitary or 2 or 3 together, sessile or stalked in axils of leaves forming a long spicate leafy inflorescence; involucre ovoid, bracts few, imbricate, the inner ones very obtuse, membranous, receptacle naked, outer row of flowers female, fertile; disc flowers few and bisexual; sepals absent, petals 5 fused, tubular or ligulate; stamens 5, inserted in the corolla-tube, absent in female flowers, anther bases obtuse; ovary inferior, unilocular with a basal ovule, style-branches of bisexual flowers short, truncate with a tuft of hair at the end; fruit a very small achene without a pappus.

**Illustrations.** Wight, *lc. Pl. Ind. Orient. pl.* 1112. 1846; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 540. 1933; Herb. Peradeniya, drawing.

**Distribution.** Grows in the hilly districts of India, Ceylon, temperate Europe and Asia, Thailand and Java. In Ceylon, it is rather common as a weed along roadsides and waste ground.

**India.** Nepal: *Wallich* 3293A. Khasia: *J. D. Hooker & T. Thomson*. Assam: *Simons*. Malabar, Concan, etc. *Storks, Law*, etc. **Ceylon.** Central Prov., Galagedara, *Thwaites C.P.* 1755; Peradeniya, Bot. Gard., cultivated, *F. W. de Silva* 646, Aug. 1936; Hatton, *Alston* 927, Oct. 1927. **Maldive Islands.** *Didi* 34, 1896. **China.** Hainan: *Tak* 17467, June 1928. **Japan.** Yokohama, *Maximowicz*, 1862. **Philippine Islands.** Luzon: Rizal Prov., *Ahern's Collector* 3159, May—June 1905.

**Composition.** This plant yields a volatile oil which consists of cineol, thujone, paraffin and an aldehyde. The roots, too, contain a volatile oil in addition to inulin, tannin and resin.

**Uses.** Considered as a valuable stomachic, deobstruent, antispasmodic and anthelmintic. Externally, it is used for fomenting ulcers and certain skin diseases. The expressed juice is applied on the head of small children to prevent convulsions. In China, it is prescribed in decoction for haemoptysis, dysentery, menorrhagia, postpartum haemorrhage, as a wash for all types of wounds and ulcers and to allay griping pains of indigestion, diarrhoea, or dysentery. Also, the expressed juice of the plant is employed as a haemostatic, for tape worm, and as a carminative. In Persia, India and Afghanistan, a strong decoction is given as a vermifuge. In Annam, the leaves are used for metrorrhagia, dysentery, and intestinal and urinary troubles while in Malaya they are employed as a carminative and haemostatic.

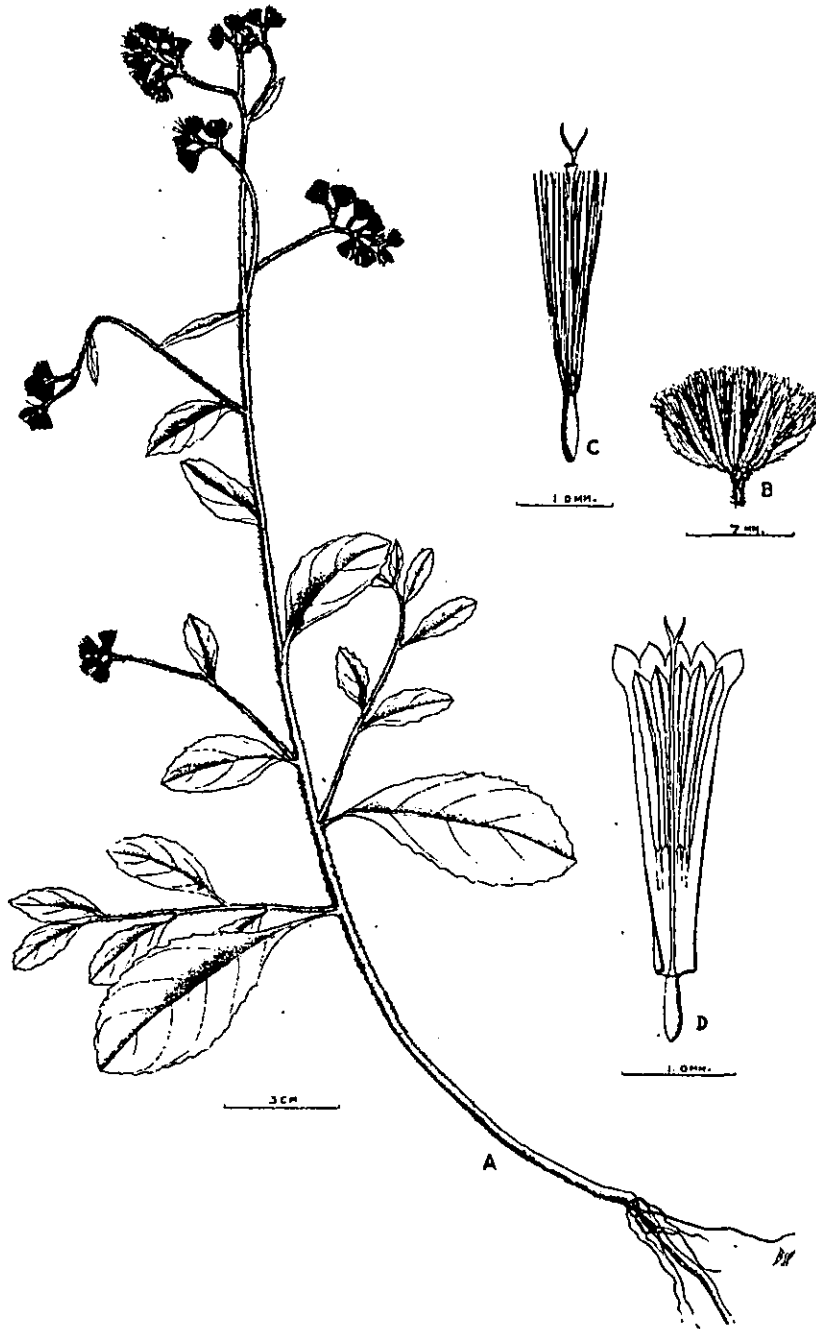


FIG. 124. *Blumea mollis*. A, plant with leaves and inflorescences. B, flower head showing the involucre and flowers. C, flower, lateral view. D, flower with calyx removed and corolla opened out.

5. *Blumea mollis* (D. Don) Merr. in Philip. Journ. Sc. Bot. 5: 395. 1910. (Fig. 124).

*Blumea lacera* Trim. non DC.—*Blumea wightiana* HK. f. non DC.—*Erigeron molle* Don—*Conyza bifoliata* Chamisso and Less.

*Sinh.* Kukula, Kukuruduru; *Tam.* Kattumulangi, Narakkarandai; *Hindi* Janglimuli. Kakronda, Kukkurbanda; *Sans.* Kukkuradru, Kukundara, Mriduchhada, Sukshmapatra, Tamrachuda.

An annual herb with an erect stem 30—60 cm high, branched above, densely glandular-pubescent; leaves simple, alternate, exstipulate, sessile, 2—7 cm long, 0.6—2.8 cm broad, oval or oblong-oval tapering to base, obtuse or subacute, sharply dentate-serrate, finely silky-pubescent on both sides; flowers all tubular in numerous purple heads, crowded in short cymes forming a large elongated inflorescence, stalks glandular-pubescent, involucre bracts in several rows, narrowly linear, acuminate, glandular hairy; outer rows of flowers all female and the disc flowers bisexual; sepals reduced to numerous bristles; petals 5, fused into a valvate corolla-tube 3.2 mm long, lobes 5, spatulate rounded at apex; stamens 5, epipetalous, filaments free, anthers 1.5 mm long, fused, anther bases sagittate with slender tails; ovary inferior, 0.6 mm long, 2—carpellary, unilocular with a single basal ovule, style 3 mm long and styler arms 0.5 mm long; fruit a small achene, not ribbed but with a white pappus in a single row.

Flowers about September, October, December, January and May.

**Distribution.** This annual grows as a common weed in India, Ceylon, Malaya, southern China, Australia, Philippine Islands and in tropical Africa. In Ceylon, it is a common weed by roadsides, edges of paddy fields upto an altitude of 4000 feet; Batticaloa, Kurunegala, Nalanda, Katugastota, Hantane, Haragama, Bandarawela, Ella, etc.

**Ceylon.** *Thwaites C.P.* 1735. North Central Prov., Kurunegala, Wetakeyapotha, *Alston* 1275, Jan. 1927. Central Prov., Nalanda, *Alston* 2407, May 1928; Haragama, *Alston* 461, Oct. 1926. Uva Prov., Bandarawela, *Herb. Peradeniya*, Sept. 1890; Ella Pass, *Herb. Peradeniya*, Sept. 1890.

**Composition.** Yields a volatile oil which contains blume camphor. The leaf is rich in carotene and vitamin C.

**Uses.** The expressed juice of the leaves is a useful anthelmintic especially for cases of thread-worm. It is given for dysentery and chronic discharges from the uterus. Mixed with black pepper, it is useful for bleeding piles. For renal dropsy, a preparation made by oxidising iron filings in the juice of the plant is given with beneficial results. The plant, is also a diuretic and useful for catarrhal affections. In India, it is also used as an insect repellent. In the Philippines, a decoction of the fresh flowers is given before meals for bronchitis. It is prescribed as an antiscorbutic in West Africa.

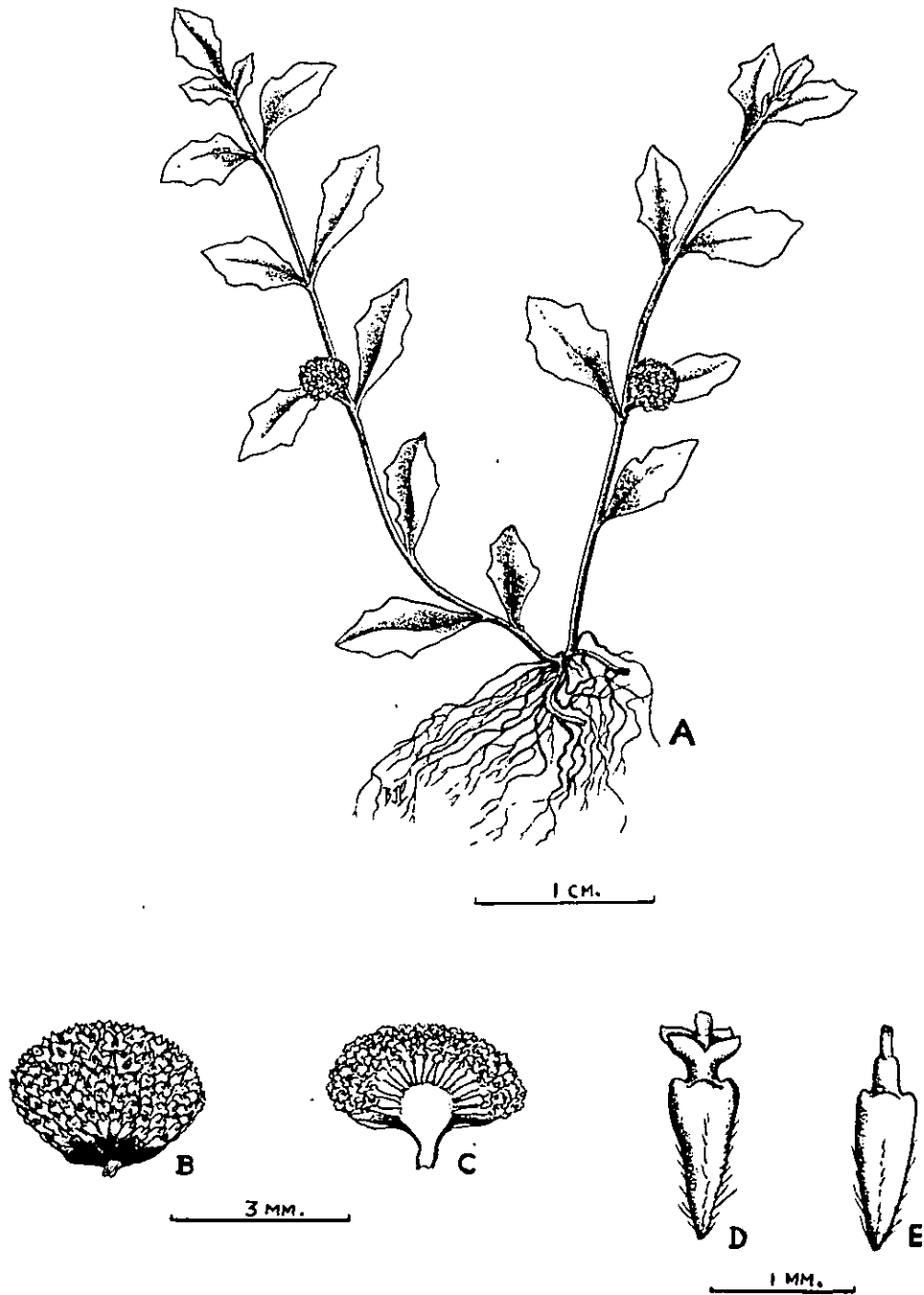


FIG. 125. *Centipeda minima*. A, plant with spreading stems and flower heads. B, flower head showing the involucre, female flowers and bisexual flowers. C, longitudinal section of a flower head. D, bisexual flower, lateral view. E, female flower.

6. *Centipeda minima* (L.) A. Br. & Aschers. Ind Sem. Hor. Berol. App. 6. 1867. (Fig. 125).

*Artemisia minima* Linn.—*Centipeda orbicularis* Lour.—*Centipeda minuta* Benth.—*Cotula minima* Willd.—*Myriogyne minuta* Less.—*Cotula sternutatoria* Wall.—*Dichrocephala schmidii* Wight.—*Artemisia sternutatoria* Roxb.—*Sphaeromorphaea centipeda* DC.

*Engl.* Sneezewort; *Sinh.* Wisaduli; *Hindi* Nagdowana, Nakchhikni, Nakkchikni, Pachittie; *Sans.* Chhikkani, Chhikkika, Ghranadukhada, Kruranasa, Kshavaka, Kshavakrita, Sanyedanapatu, Tikshna, Ugra, Uragandha.

A small, annual herb with numerous, prostrate, slender, branching stems 5—10 cm long, spreading from the centre; leaves simple, alternate, subsessile, 0.6—1.2 cm long, 0.5—0.6 cm broad, oblong—spathulate, tapering to the base, obtuse at apex, with 2 sharp teeth on each side, glabrous on both surfaces; flowers numerous, very small, regular, female and bisexual, all tubular, the outer rows female without corolla segments, inner rows bisexual. 1.5 mm long on nearly sessile globose axillary heads 3—3.5 mm in diameter; involucre bracts very small in two rows, about 1 mm long, oblong, obtuse with membranous margins; sepals absent or reduced to protruberances; petals 4, fused into a corolla-tube, segments diverging in bisexual flowers, absent in female flowers; stamens 4, epipetalous, filaments free, anthers fused into a tube round the style, anther-bases obtuse; ovary inferior, unilocular with a single basal ovule, style arms short and truncate; fruit a minute achene, tipped with persistent style, bristly on angles without a pappus.

Flowers from January to March.

*Illustrations.* Wight,  *Ic. Pl. Ind. Orient. pl.* 1610. 1850; Kirtikar and Basu, *Indian Med. Plants, pl.* 538. 1933; Herb. Peradeniya, drawing.

*Distribution.* Grows in moist places in India, Ceylon, Malaya, China, Australia and Pacific Islands. In Ceylon, it is rather rare confined to damp places in the lower montane zone, Maturata, Dolosbage, Maskeliya, Peradeniya, etc.

*India.* Chota Nagpore, *Clarke* 25238, Dec. 1874; *Clarke* 26241, April 1875. Ganget. Plain. *T. Thomson.* Assam. *Jenkins.* Ceylon. Central Prov., Maturata and Dunutibu Oya, *Thwaites C.P.* 2715; Maskeliya, *Herb. Peradeniya.* March 1882; Dolosbage, *Herb. Peradeniya,* Sept. 1885; Rosella Estate, *Herb. Peradeniya,* May 1886. Tenasserim and Andamans. *Herb. Helfer* 3216/2, *Kew Distribution* 1862—3.

*Composition.* Wehmer records that the herb contains an amorphous volatile oil and a bitter principle, myriogynin while Caius reports that it contains an alkaloid, a glucoside and traces of saponin.

*Uses.* The powdered herb and seeds are used as a sternutatory and administered for ozaena, headaches and colds. It is useful in paralysis and pains in the joints. In the Punjab, the herb is boiled and ground into a paste and applied on the cheeks for toothache.

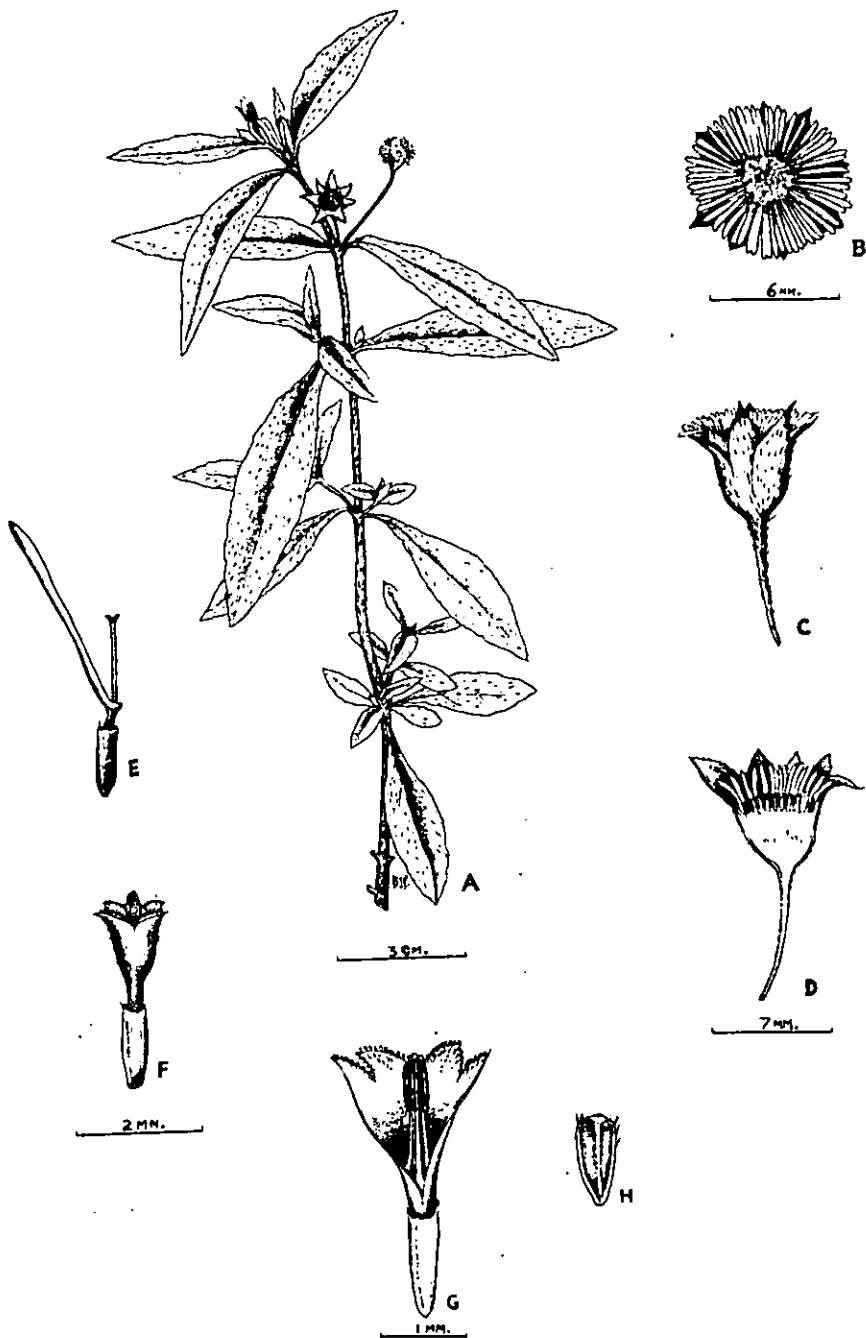


FIG. 126. *Eclipta prostrata*. A, part of the plant with leaves and flower heads. B, flower head from above. C, flower head, lateral view. D, longitudinal section of flower head. E, ray floret. F, disc floret. G, disc floret with corolla open. H, seed.

7 *Eclipta prostrata* (Linn.) Linn. Mant. 2: 266. 1771. (Fig. 126).

*Eclipta alba* (Linn.) Hassk.—*Verbesina alba* Linn.—*Verbesina prostrata* Linn.—*Eclipta erecta* Linn.—*Eclipta marginata* Boiss.—*Eclipta undulata* Wall.—*Eclipta parviflora* Wall.—*Anthemis cotula* Blanco—*Artemisia viridis* Blanco—*Eclipta philippinensis* Gandog.

*Sinh.* Kikirindi; *Tam.* Kaikeshi, Kaivishiilai, Karippan, Karishlanganni, *Hindi* Babri, Bhangra, Mochkand; *Sans.* Ajagara, Angaraka, Bhekaraja, Bhringa, Bhringarja, Bhringaso-dara, Bhringavha, Ekaraja, Karanjaka, Kesharaja, Kesharanjana, Keshya, Kuntalavardhana, Mahabhringa, Mahanila, Markara, Markava, Nagamara, Nilabhringaraja, Nilapushpa, Pankajata, Pararu, Putanga, Pitripriya, Rangaka, Shyamala, Sunilaka.

An erect or prostrate annual herb, often rooting at nodes, with many diffuse reddish branches, strigose with adpressed hair; leaves simple, opposite, exstipulate, sessile, 2.5—6.2 cm long, 0.5—1.7 cm broad, lanceolate—oblong, tapering to the base, acute or subacute, faintly serrate, strigose with scanty adpressed hair on both sides; flowers numerous, white, ray-florets ligulate in two rows, female (often barren), disc-florets bisexual, regular, both kinds together in heads, about 7 mm in diameter, which are solitary or two together on stiff unequal peduncles, involucre bracts about 8, ovate-lanceolate or oblong, 5 mm long, 2 mm broad, acute or subacute; ray-florets spreading, scarcely as long as bracts, linear, not toothed; disc-florets about 3 mm long, calyx reduced to scantily hairy teeth; petals 4, fused into a tube and expanded distally, segments spreading, minutely hairy on the inner surface; stamens 4, epipetalous, syngenesious; ovary inferior, 2-carpellary, unilocular with a solitary ovule at the base, stigma bifid; fruit an oblong, compressed, 4-angled, truncate achene, about 2.5 mm long with 2 winged and 2 blunt angles, sides covered with warty excrescences, top not carrying a pappus but sometimes with minute spines.

Flowers from January to May and in November.

**Illustration.** Kirtikar and Basu, *Indian Med. Plants*, pl. 530. 1933

**Distribution.** Occurs throughout India, Ceylon, Malaya, Philippine Islands and other tropical countries. In Ceylon, it is very common in wet places almost everywhere.

**Egypt.** *Boissier ex Herb. Hance* 475, 1846. **India.** Bengal: *Clarke* 26376, May 1875; *J. D. Hooker and T. Thomson*; Calcutta, *Clarke* 3569, Jan. 1866. Madras: *G. Thomson*. **Ceylon.** *Thwaites C.P.* 1754; North Western Prov., Kalpitiya, *Simpson* 9158, Feb. 1932. **Maldive Islands.** *Veimandu, Gardiner*, 1899—00; Kalukadili, *Didi* 62, 1896. **Indo-China.** Hue and vicinity, *Squires* 347, Jan.—May 1927. **Philippine Islands.** Alabat Island: *Ramos and Edano* 48262, Sept.—Oct. 1926.

**Composition.** Contains an alkaloid and nicotine. Nadkarni reports that it contains a large amount of resin and an alkaloid ecliptine.

**Uses.** This plant has different uses in different countries. In India, it is used externally on chronic skin diseases, ulcers, elephantiasis, conjunctivitis and to stimulate the growth of hair, and internally for arthritis, dropsy and as a deobstruent for hepatic and splenic enlargements. The root has emetic properties and is used as a purgative. In Malaya, China and Indo-China, it is used for checking haemorrhages in women after childbirth, asthma, bronchitis and externally as a counter-irritant in toothache and for strengthening of gums. In Assam, the leaves are applied to sores and the juice given for jaundice, fevers and uterine haemorrhages. In the Philippine Islands, a decoction of the leaves and flower tops is given for hepatitis, while in Java the leaves are eaten and also used externally for ringworm and for tattooing to impart a blue colour.

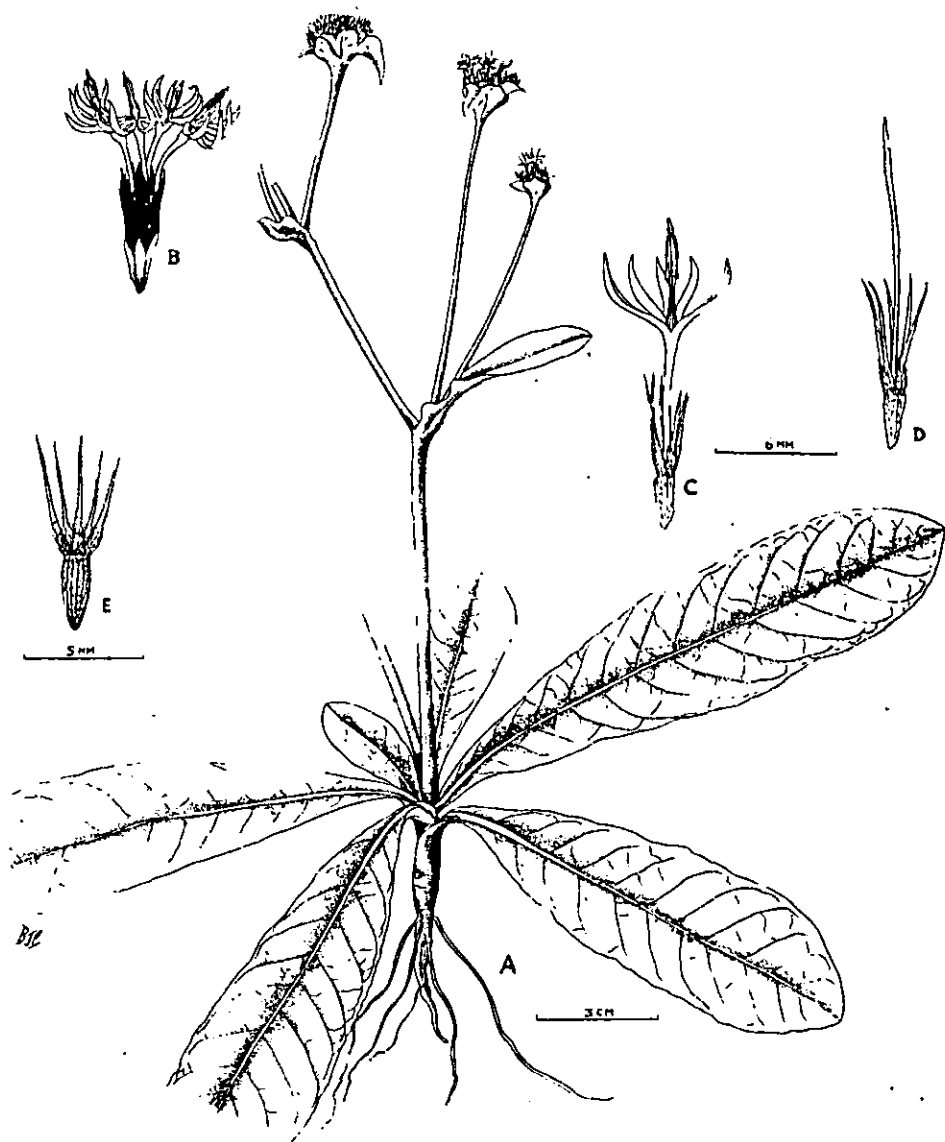


FIG. 127. *Elephantopus scaber*. A, whole plant with inflorescences. B, flower head with 8 bracts and 4 flowers. C, flower, side view. D, flower with corolla removed. E, fruit.

8. *Elephantopus scaber* Linn., Sp. Pl. 814. 1753. (Fig. 127).

*Engl.* Elephant's Foot; *Sinh.* Et-adi; *Tam.* Anashovadi; *Hindi* Gobhi; *Sans.* Adhomukha, Anadujivha, Darvi, Darvika, Darvipatrika, Gobhi, Gojivha, Gojivhika, Hdapushpi, Kharapatri, Kurasa, Satamulika Vatona.

A biennial or perennial herb with a short, vertical rootstock; leaves simple, mostly radical, forming a spreading rosette on the ground; leaves 10—29 cm long, 2—5 cm broad, oblong—lanceolate, attenuate to the base, acute at apex, undulate, shallowly crenate-serrate and notched, rough with coarse hairs on both sides, ciliate along the margin, veins very prominent beneath, petioles short, very broad and sheathing, flowering stem 15—60 cm long, stout, rigid, tough, scabrous with minute prickles and with adpressed white hair, dichotomously branched above with a small amplexicaul, acute leaf at each bifurcation; flower heads very numerous, sessile, closely packed forming a large, flat-topped, terminal inflorescence, 1—2.5 cm wide and surrounded at base by three, large, stiff, broadly ovate, conduplicate, leafy bracts; involucre bracts 8 in two rows, lanceolate, acuminate, outer ones 4.5 mm long and the inner ones 8 mm long, scarious; flowers few, pale violet, usually 4 in a head, several such heads crowded together in each inflorescence, regular, bisexual, all flowers tubular; sepals 5, reduced to hairy bristles; petals 5, fused into a corolla-tube 6 mm long, segments free and oblong, about 4 mm long, wide spreading; stamens 5 on the corolla-tube, filaments free, anthers fused round the style; ovary inferior, 2-carpellary, unilocular with a solitary basal ovule, style much exserted, tapering, pubescent, arms recurved; fruit a small, 10-ribbed, pubescent achene, 3.5 mm long with a pappus reduced to 5 bristles.

Flowers most of the year.

**Illustrations.** Wight,  *Ic. Pl. Ind. Orient.* pl. 1086. 1846; Kirtikar and Basu, *Indian Med. Plants*, pl. 517. 1933.

**Distribution.** A weed found throughout India, Ceylon, Malaya, China, Australia, America and Africa. In Ceylon, it is very common in open ground up to 7000 feet altitude.

**India.** E. Bengal: *Herb. Griffith* 3110, Kew Distribution 1862—3. Courtallam, *Hooker f. and T. Thomson*. Chittagong, *King's Collector* 588, 1886. Ceylon, *Thwaites C.P.* 1772. Central Prov., Peradeniya, Bot. Gard., *Alston* 1272, March 1927; *Ramanayake*, April 1953; Horton Plains, *W. Nock*, 1886.

**Composition.** The roots contain a glucoside.

**Uses.** In India, a decoction of the root is given for urethral discharges, diarrhoea, dysentery, dysuria and as a cardiac-tonic, while in Malaya the plant is used as an anthelmintic for roundworms and a decoction of the root for coughs. In Ceylon, the leaves are ground into a paste with water and applied with bees' honey on septic nails and on wounds caused by bites of wild animals. In Indo-China, the plant is used as a decoction for increasing the discharge of urine. In Madagascar, it is considered a diuretic and febrifuge and in the West Indies as a tonic, diaphoretic and emmenagogue and given for dyspepsia, intermittent fevers and menstrual derangements. Guerrero records that the plant is used in decoction as a diuretic, febrifuge and emollient in the Philippine Islands.



FIG. 128. *Emilia sonchifolia* A, flowering branch. B, typical leaves on a stem. C, flower head from side. D, flower, side view. E, fused anthers. F, seed.

9. *Emilia sonchifolia* (Linn.) DC. in Wight Contrib. 24. 1834 (Fig. 128).

*Cacalia sonchifolia* Linn.—*Cacalia glabra* Heyne—*Gynura ecalyculata* DC.—*Prenanthes sarmentosa* Wall.—*Crassocephalum sonchifolium* Less.—*Emilia humifusa* Elm.—*Emilia marivelensis* Elm.

*Sinh.* Kadupara.

A perennial herb with prostrate or decumbent stems, becoming erect at the ends, much branched, glabrous and often rooting; leaves simple, alternate, sessile, 3.7—10 cm long, 2.5—4.5 cm broad, somewhat lyrate on the barren shoots, with the upper half ovate and the lower narrower and oblong, on the flowering branches, oblong or lanceolate-oblong, sagittate with acute auricles at the base, hairy on both sides, rather thick, glaucous beneath; flowers regular, bisexual, bright pinkish-violet, slightly bent, all tubular, sessile on heads which are few and nodding when young, about 1.2 cm wide, involucre about 0.6 cm long, nearly glabrous, bracts 8 in one row, connate near the top, flowers much exceeding involucre, outer ones spreading; sepals reduced to bristles; petals 5, fused, corolla-tube 8 mm long, segments 5, oblong, 2.5 mm long; stamens 5, on the corolla-tube, filaments free, anthers fused into a tube round the style, anther bases obtuse; ovary inferior, 1 mm long, 2—carpellary, unilocular with a single basal ovule, style-arms tipped with tufts of hair; fruit an oblong brown achene, about 2.5 mm long with 5 rows of white bristles on the ribs and copious white pappus.

Flowers all the year round.

**Illustrations.** Kirtikar and Basu, *Indian Med. Plants*. pl. 544A. 1933; Herb. Peradeniya drawing.

**Distribution.** A weed found commonly growing along with grass in most parts of India, Ceylon, Malaysia, China and other tropical countries. In Ceylon, it is abundant all over the island.

**India.** Chota Nagpore, *Clarke* 24921, Nov. 1874; *Clarke* 25060B, Nov. 1874. Calcutta: *Clarke* 3607, Feb. 1866. **Ceylon.** *Thwaites* C.P. 3343, Southern Prov., Kirinde, *Alston* 1643, Jan. 1928. **Maldive Islands.** Hirikulla, *Didi* 124, 1896; Horsburgh Atoll, *Gardiner*, 1899—1900. **China.** Hongkong: *Herb. Hance* 481. **Japan.** Nagasaki, *Maximowicz*, 1863. **Philippine Islands.** Luzon: Sulu Prov., Tawitawi, *Ramos and Edano* 44037, July—Aug. 1924.

**Composition.** The plant contains an alkaloid.

**Uses.** Used as a salad before flowering, in Malaysia and Indo-China. In India, the juice of the plant, mixed with sugar, is given for bowel complaints. The pure juice is poured into the eyes, drop by drop, for night blindness and eye inflammations. In Indo-China, a decoction of the leaves is prescribed as an antipyretic. In Ceylon and in the Philippine Islands, the leaves are used as a styptic for cuts and wounds and long-standing superficial ulcers. A decoction of the plant is given as an expectorant, anti-haemostatic and in cases of fever. In Malaya, the leaves are used for dressing ulcers and in decoction as a cure for coughs and phthisis and to arrest diarrhoea. The plant is used as an astringent, an anti-asthmatic and vulnerary in Africa and also to treat sore throat.

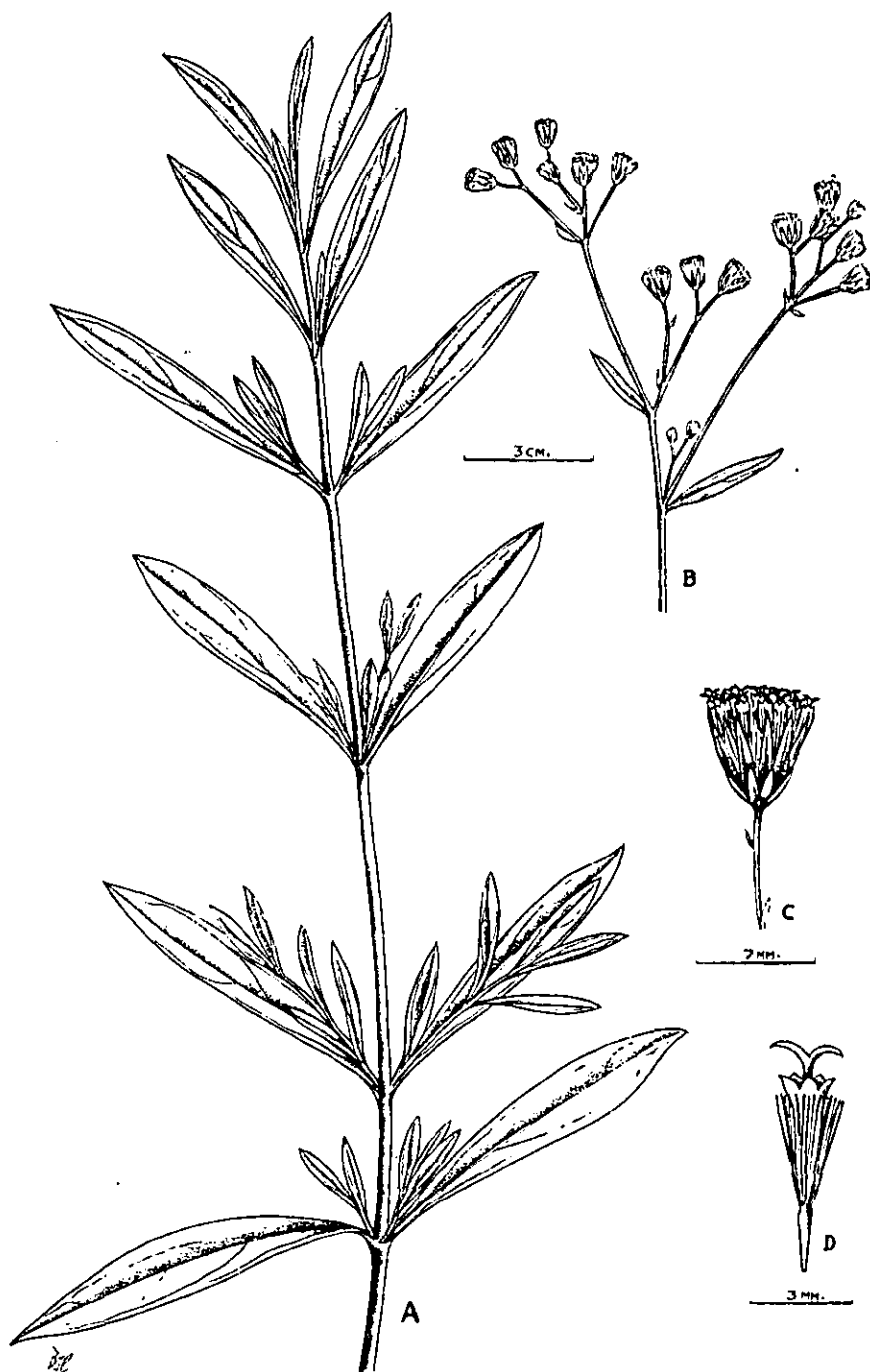


FIG. 129. *Eupatorium triplinerve*. A, branch. B, inflorescence containing flower heads C, a flower head from side. D, side view of a bisexual flower.

10. *Eupatorium triplinerve* Vahl, Symb. 3: 97. (Fig. 129).*Eupatorium ayapana* DC.*Engl.* Ayapana Tea; *Sinh.* Aiyapana; *Tam.* Ayapeni; *Sans.* Ayiapana.

A low, semi-woody undershrub, about 1 m tall, with thin, glabrous, reddish branches rooting at nodes; leaves subsessile, opposite in pairs, 8—13 cm long, 1.5—2.7 cm broad, lanceolate, tapering to both ends, veins reddish, main vein joined by 2 lateral veins about half way giving a 3-veined appearance, glabrous on both sides; flowers slate blue, regular, bisexual, all tubular, in corymbose heads, each head bearing about 20 flowers; involucre bracts sub-uniseriate, linear, acuminate, unequal, puberulous at the back; sepals reduced to numerous bristles; petals 5, fused into a slender corolla-tube; stamens 5, epipetalous, syngenesious, anthers appendaged; ovary inferior, 2-carpellary, unilocular with a single basal ovule, style arms long and obtuse; fruit a truncate, 5-angled achene carrying a pappus of uniseriate scabrid hairs.

**Illustrations.** Kirtikar and Basu, *Indian Med. Plants*, pl. 518A. 1933; Macmillan, *Trop. Agri.* 26: plate on page 28. 1906.

**Distribution.** A native of the Amazon Valley, Brazil and other northern parts of South America. It is cultivated in India and Ceylon.

**India.** Bengal, without the collector's name. Ceylon. Central Prov., Peradeniya, Bot. Gard. cultivated. Western Prov., Colombo, *Ferguson*.

**Composition.** The leaves of this plant contain a volatile oil (ayapana oil), the principle constituent of which is dimethyl ether of thymohydroquinone.

**Uses.** In Mauritius, an infusion of the plant is given for dyspepsia and other affections of the bowels and lungs. The leaves are used for treatment of fevers, colds, diarrhoea and as a sudorific and tonic in the Philippine Islands. An infusion of the plant is a stimulant and tonic in small doses, and laxative when taken in quantity; the hot infusion is emetic and diaphoretic and may be given with advantage in the cold stages of ague. It is an excellent cure for indigestion and also used as a foment on skin affections.

**11. *Gynura pseudo-china* DC. Prodr. 6: 299.**

*Gynura sinuata* DC.—*Gynura nudicaulis* Arn.—*Cacalia bicolor* Wall.—*Cacalia sagittaria* Heyne.—*Cacalia bulbosa* Lour.

*Sinh.* Ala-beth.

Succulent, tuberous herb, glabrous or pubescent, stem very short; leaves simple, alternate, all subradical, obovate, 5—17.5 cm long, very variable, narrowed into the petiole, sinuate or sub-pinnatifidly lobed, scapes long, nearly leafless, involucre cylindric, bracts 10—12, uniseriate, narrow, equal, margin scarious, receptacle flat; flowers bisexual, all tubular in heads 8—13 cm long; calyx superior, limb absent; corolla limb 5-toothed; stamens 5, epipetalous, syngenesious, anther bases entire; achene glabrous with a pappus of white hairs

**Illustration.** Dillenius, Hort. Elth. 2: *pl.* 258.

**Distribution.** Occurs in India, Ceylon, Java and China. It is commonly grown in gardens in Ceylon.

**India.** Sikkim: *J. D. Hooker.*

**Uses.** The tuberous roots of this herb are used as a cooling medicine and also for leprosy.

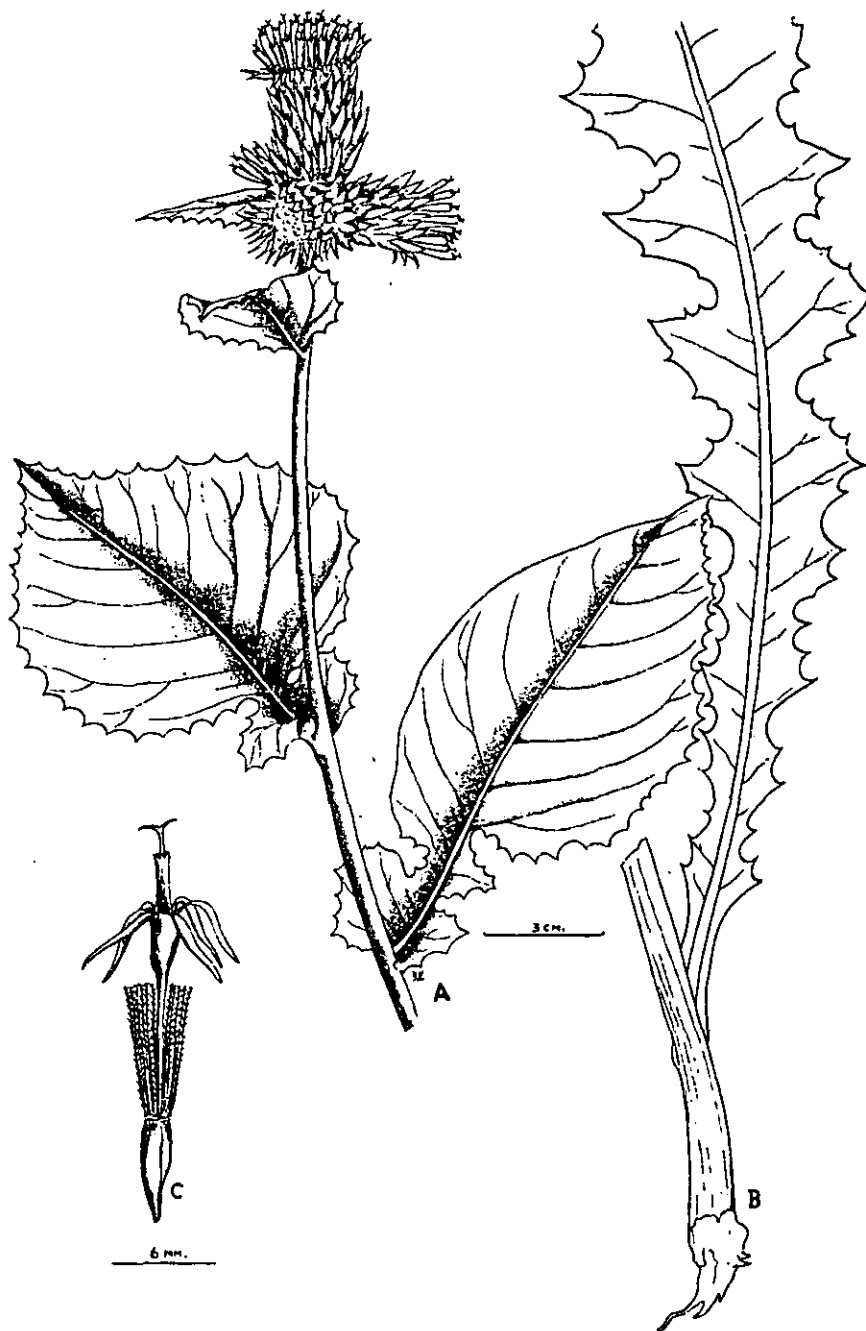


FIG. 130. *Saussurea lappa*. Redrawn from Kirtikar and Basu. A, terminal portion of the stem with cauline leaves and cluster of flower heads. B, a portion of the base of the stem with the lower part of a radical leaf. C, lateral view of a flower.

12. *Saussurea lappa* Clarke, Comp. Ind. 233. (Fig. 130).

*Aplotaxis lappa* Dcne.—*Aucklandia costus* Falconer.

*Sinh.* Godamahanel, Pushkaramula, Suwanda-Kottang; *Tam.* Goshtam, Kostum, Putchuk; *Hindi* Kot, Kur, Kust, Kut, Pachak; *Sans.* Agada, Amaya, Apya, Bhasura, Dushta, Gada, Gadakhya, Gadavha, Gadavhaya, Haribhadra, Jarana, Kadakhya, Kakala, Kashmirja, Kaubera, Kinjalka, Kushtha, Kuthika, Kutsita, Niruja, Padmaka, Pakala, Pakalam, Paribhadra, Paribhavya, Pavana, Rama, Roga, Rogavhaya, Ruja, Ruk, Utpala, Vaniraja, Vyadhi, Vyapya.

A tall, robust, perennial herb; stem 1.2—2 m high, pubescent above with radical and cauline leaves; radical leaves very large, 0.6—1.2 m long, triangular, with a long, lobately winged stalk, terminal lobe about 30 cm diameter; cauline leaves 15–30 cm long, stalked or stalkless with 2 half-stem—clasping lobes at the base, membranous, scaberulous above, glabrate beneath, irregularly toothed; flower heads subglobose, 2.5—3.7 cm diameter, sessile, hard, in axillary or terminal clusters of 2—5; involucre bracts many, purple, ovate-lanceolate, acuminate, rigid, squarrosely recurved, glabrous; corolla 2 cm long, tubular, dark blue-purple; stamens free, anther tails fimbriate; achenes curved, compressed, 0.8 cm long, margins thickened, one rib on each face, top contracted and cupped, pappus of double hairs 1.6 cm long, brown, feathery.

**Illustrations.** Blatter, Beautiful Fl. Kashmir 1: *pl.* 33, fig. 1. 1927; Kirtikar and Basu, Indian Med. Plants, *pl.* 551 B. 1933.

**Distribution.** Grows in Kashmir between 8,000 and 12,000 feet altitude. It does not grow in Ceylon.

**Composition.** The chief constituents of the root are an essential oil, an alkaloid called saussurine, resin, traces of a bitter substance and small quantities of tannin, inulin, potassium nitrate, sugars, etc.

**Uses.** This drug is extensively used in Ceylon and is imported from India. The roots of this plant enter into the composition of preparations used for treatment of leucoderma, abdominal colic, dropsy, piles, asthma, coughs, anaemia, enlarged liver, diarrhoea, urticaria, insanity, epilepsy, impotence, carbuncles, fistula, syphilis and nervous, urinary and blood diseases. It is also prescribed in the advanced stage of typhous fever.

The drug is a cardiac stimulant, expectorant and diuretic. It relieves asthmatic attacks and is useful against persistent hiccough.

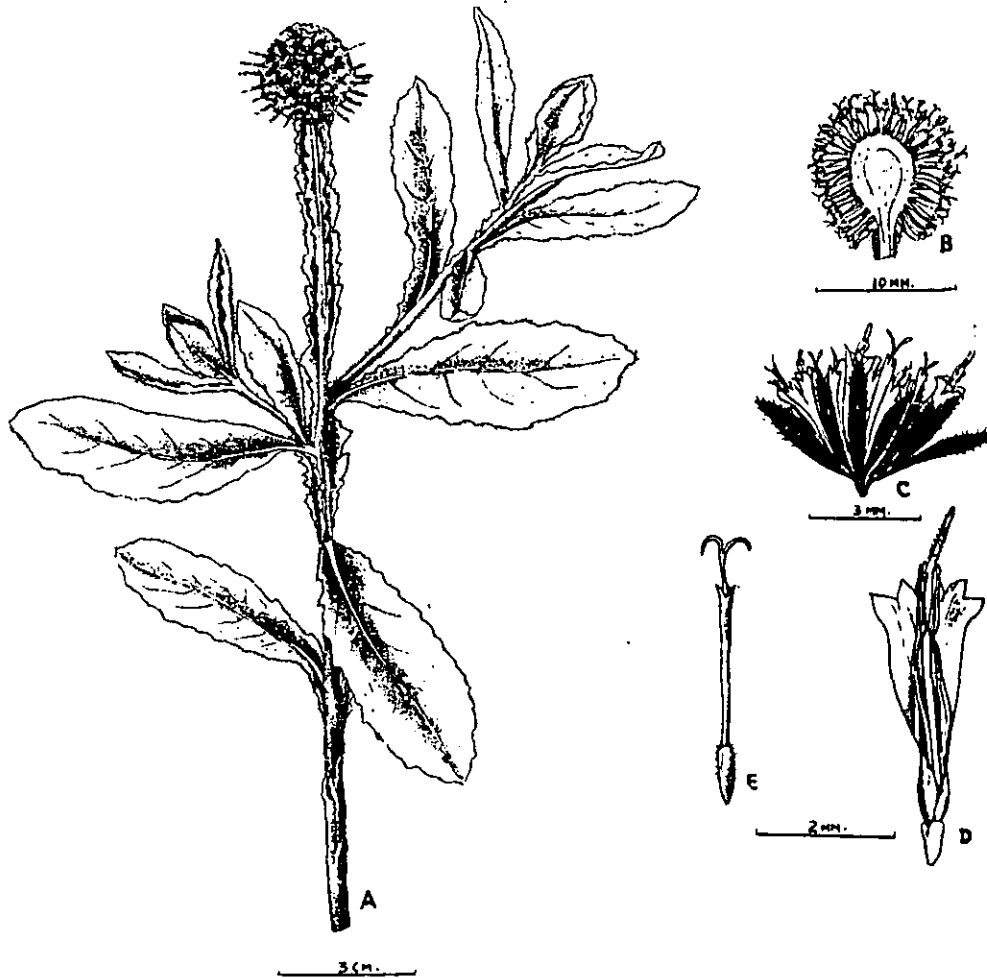


FIG. 131. *Sphaeranthus indicus*. A, part of a stem with leaves and a flower head. B, longitudinal section of flower head. C, a group of bisexual flowers, female flowers and bracts. D, bisexual flower opened out showing the stamens. E, female flower.

13. *Sphaeranthus indicus* Linn. Sp. Pl. 927. 1753. (Fig. 131).

*Sphaeranthus indicus* Willd.—*Sphaeranthus hirtus* Willd.—*Sphaeranthus africanus* Wall.—*Sphaeranthus mollis* Roxb.

*Sinh.* Mudamahana; *Tam.* Kottakkarandai; *Hindi* Gorakmundi, Mundi; *Sans.* Alambusha, Aruna, Avyatha, Bhikshu, Bhukadambika, Bhukanda, Bhutaghni, Boda, Chhitragranthika, Kadambapushpa, Kadambapushpika, Krodachuda, Kumbhala, Lochani, Lotani, Mahamundi, Mahashvrnaka, Mata, Mundakhya, Mundi, Munderika, Nadikadamba, Nilakadambika, Palankasha, Parivraji, Pravrajita, Shravana, Shraavanashirshika, Shravani, Sthavira, Tapasvini, Tapodhana, Vikacha, Vridha.

An annual about 30 cm high with many long, tough, divaricate branches; stem cylindrical, strongly winged with sharp-toothed decurrent bases of leaves, glandular hairy; leaves simple, alternate without stipules, decurrent, sessile, 2.5—5 cm long, 1.2—2 cm broad, slightly tapering to base, obtuse or subacute, sharply spinous-serrate, very glandular and also with long white hairs on both sides, glaucous-green; flowers purple, all tubular, in groups of 1 or more, larger, 5-toothed, bisexual flowers, slender 3-toothed female flowers and linear bracts in compound heads which are ovoid, globose and 1—1.5 cm across; bracts linear, as long as the flowers, ciliate at the end; sepals absent; petals 3 in the female, 5 in bisexual flowers, fused into a tube; stamens 5 on the corolla-tube, filaments free, anthers fused into a tube round the stout style, sagittate at base; ovary inferior, about 1 mm long, hairy or glabrous, 2-carpellary, unilocular with a single basal ovule, style arms filiform, connate in bisexual flowers, diverging in female flowers; fruit an oblong—ovoid, smooth, stalked achene without a pappus.

Flowers almost throughout the year.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. pl. 1094. 1846; Kirtikar and Basu, Indian Med. Plants, pl. 524. 1933.

**Distribution.** Occurs throughout India, Ceylon, Malaysia, Africa and China. In Ceylon, it is common in moist places especially in paddy fields in the low country. Kurunegala, Jaffna, Haragama, etc.

**India.** Chota Nagpore, Clarke 20817, Nov. 1873. Hughly Dist., Gohat, Musker 22, March 1902. Assam. Jenkins. Bengal: J. D. Hooker and T. Thomson. Madras: Hook. f. and T. Thomson; Coimbatore, Clarke 11532, April 1870. Ceylon. Thwaites C.P. 1769; Megaswewa, Simpson 8709, Oct. 1931; Pamunugama, Simpson, April 1931. Tenasserim and Andamans. Herb. Helfer 3128, Kew Distribution 1861—2.

**Composition.** Contains the alkaloid sphaeranthine.

**Uses.** This plant is a pungent, bitter, stomachic and stimulant and is a remedy for glandular swellings in the neck, urethral discharges and jaundice. It is useful for acute dyspepsia, flatulence and colic. It also acts as a diaphoretic and stimulating expectorant and useful in treating catarrhal fever, acute laryngitis and bronchitis. In India, the juice of the fresh leaves is boiled with milk and given for coughs. The roots and seeds are considered anthelmintic. The bark is a valuable remedy for piles. The plant is also used as a fish poison. In Java, it is considered as a useful diuretic.

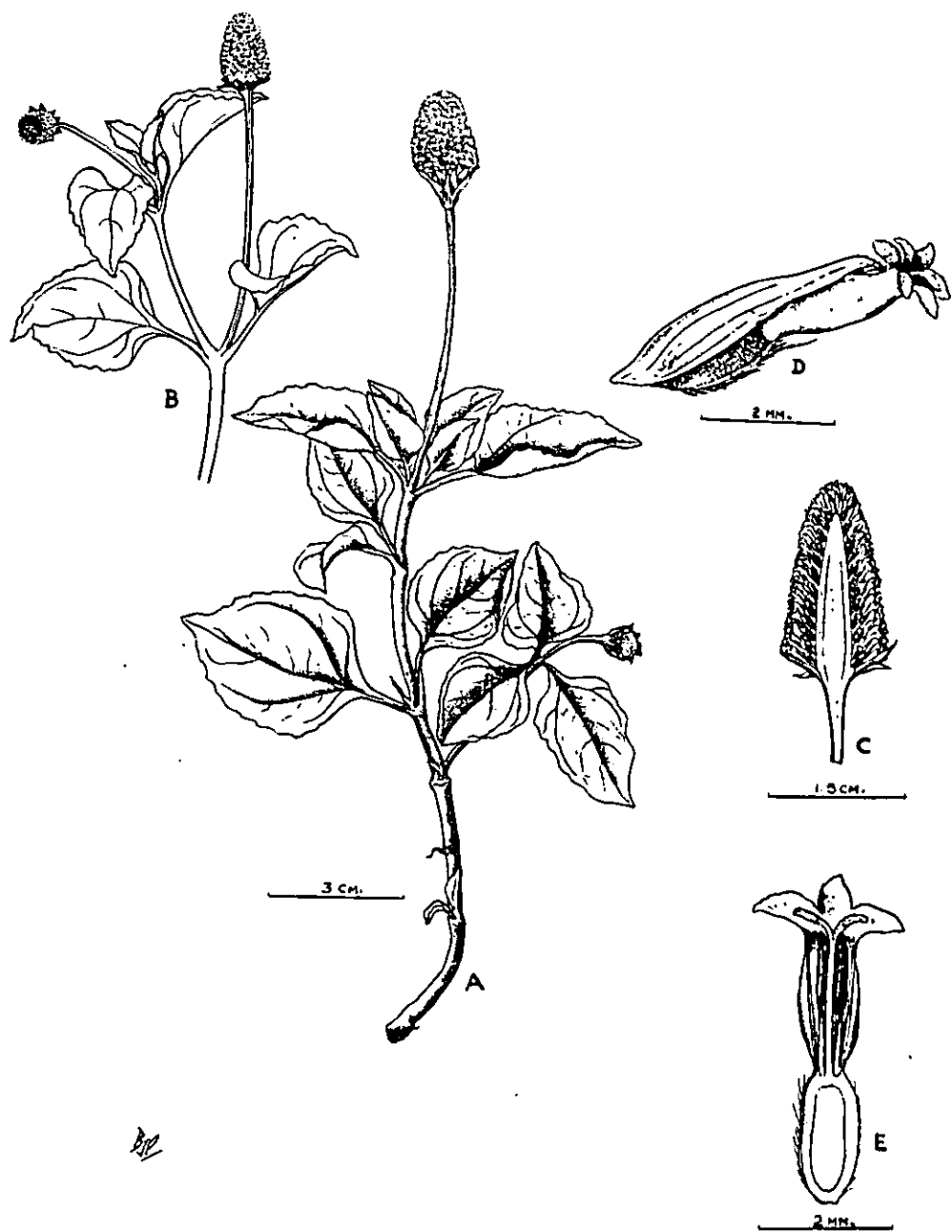


FIG. 132. *Spilanthes paniculata*. A, and B, stems with leaves and flower heads. C, longitudinal section of a flower head. D, bisexual flower with bract, side view. E, longitudinal section of a flower.

14. *Spilanthes paniculata* Wall. ex DC. Prodr. Syst. Nat. Reg. Veg. 5: 625. 1836. (Fig. 132).

*Spilanthes acmella* (Linn.) Murr.—*Spilanthes calva* Wight—*Spilanthes lobata* Blanco—*Verbesina acmella* Linn.—*Verbesina pseudo-acmella* Linn.—*Acmella linnaea* Cass.

*Sinh.* Akmella; *Tam.* Akkirakaram; *Sans.* Aggimala, Atragandha, Nadekanta, Nandikantha.

An annual with a prostrate or ascending, much branched, cylindrical, more or less hairy stem; leaves simple, opposite, without stipules, 2.5—4.5 cm long, 2—4 cm broad, ovate, suddenly tapering at the base, acute, faintly and irregularly serrate, glabrous above, scantily pubescent along veins beneath, thin, somewhat 3-veined; petioles 0.8—2 cm long, slender, pilose; flowers very small, yellow, ray florets absent, bisexual flowers regular on heads apparently terminal but really axillary, surrounded by an involucre of reddish brown bracts, on long glabrous peduncles 3.5—6 cm long; bracts membranous, 4 mm long, lanceolate, keeled, subacute, pilose outside; calyx absent; petals 5, fused, tubular, valvate, somewhat inflated in the middle, 2 mm long; lobes triangular; stamens 5, inserted on the corolla-tube, filaments free, anthers connate into a tube round the style, bases shortly pointed; ovary inferior, 2—2.5 mm long, 2-carpellary, unilocular with a solitary erect ovule at the base, style branches short, truncate, bifid; fruit a compressed, 2-edged, glabrous, oblong, dark brown, dull achene without a pappus.

Flowers throughout the year.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. pl. 1109. 1846; Kirtikar and Basu, Indian Med. Plants, pl. 532. 1933; Herb. Peradeniya drawing.

**Distribution.** Occurs throughout India, Ceylon and other tropical countries. In Ceylon, it is common in moist places up to 6000 feet altitude. Ramboda, Hantane, etc.

**India.** Bengal: *J. D. Hooker and T. Thomson.* Assam: *Simons;* Naga Hills, *Prain;* July 1886. Pen. Ind. Or. *Herb. Wight* 1607, Kew Distribution 1866—7. Ceylon. without locality, *Thwaites C.P.* 684. **Indo-China.** Hue and Vicinity, *Squires* 32; *Squires* 187, Jan.—May 1927. Sumatra. *Burmeyer* 3672, July 1918.

**Composition.** The plant contains an alkaloid and probably spilanthol, an active principle found in the Japanese form.

**Uses.** The flower heads are chewed for toothache and the powdered leaves are rubbed on the lips and gums for sore-mouth in children. It is an insecticide as well. The oil prepared from mature leaves with gingelly oil is used on burns and scalds. Internally, the plant acts as an aromatic stomachic and expectorant and is useful in chronic dyspepsia and bronchitis. In Indo-China, a decoction of the plant is given for dysentery while in the Philippines, a decoction of the root is used as a purgative. An infusion of the root given internally has a diuretic effect and is reputed to be a solvent of vesical calculi. It is also used locally against itching and psoriasis.

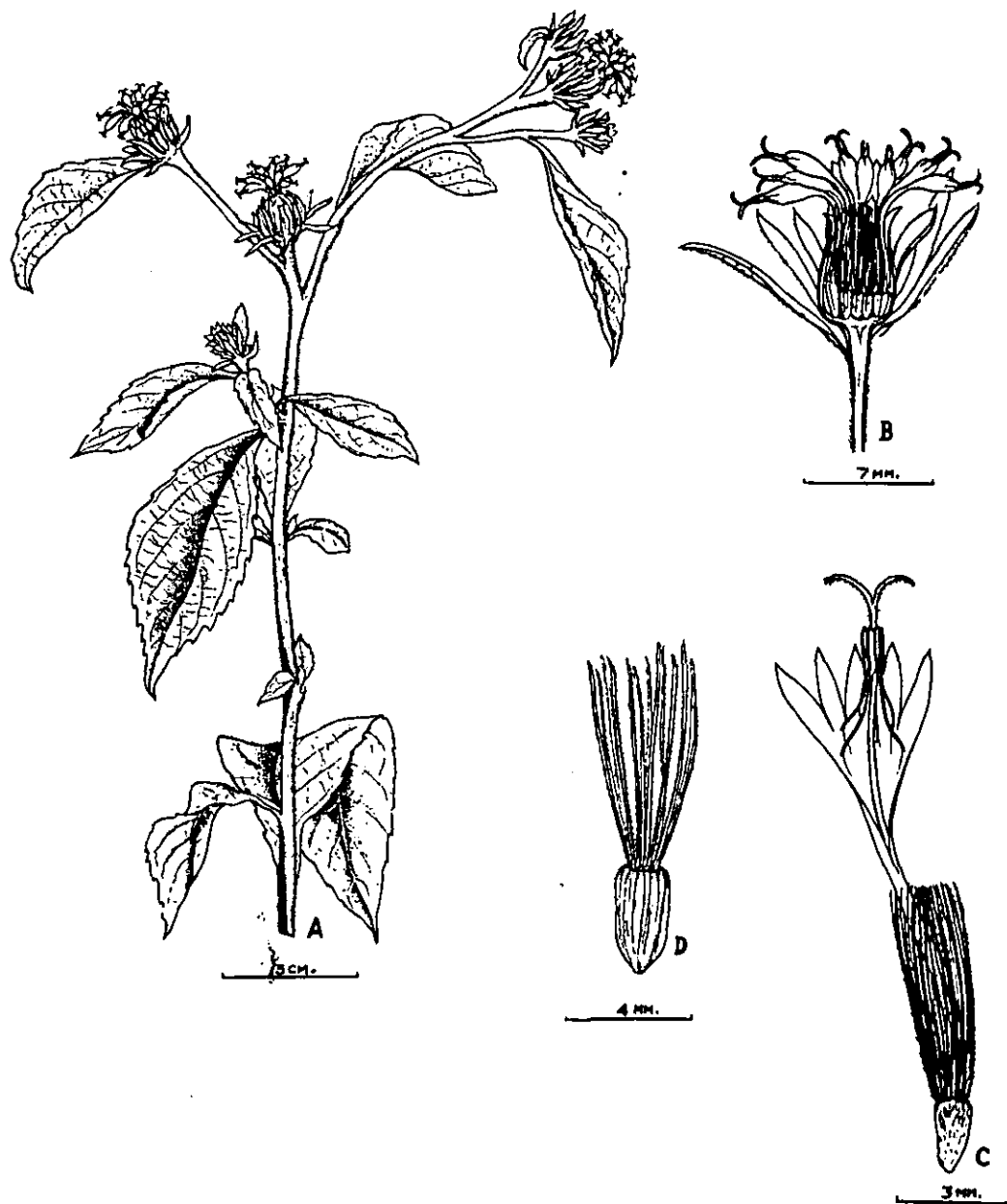


FIG. 133. *Vernonia anthelmintica*. A, portion of the stem with leaves and flower heads. B, longitudinal section of a flower head C, flower opened out showing the stamens. D, fruit.

15. *Vernonia anthelmintica* (L.) Willd., Sp. Pl. 3: 1634. 1800 (Fig. 133).

*Centratherum anthelminticum* O. Ktze.—*Conyza anthelmintica* Linn.—*Serratula anthelmintica* Roxb.—*Ascaricida indica* Cass.

*Engl.* Purple Fleabane; *Sinh.* Sanninayan; *Tam.* Kattuchiragam, Neychitti, Nirnochi Sittilai; *Hindi* Bakshi, Buckshi, Kalijhiri, Kaliziri, Somaraj, Vapchi; *Sans.* Agnibija, Aranyajiraka, Avalguja, Atavijiraka, Brihanyali, Kana, Kananajiraka, Krishnaphala, Kshudrapatra, Putiphali, Somraji, Tiktajiraka, Vakushi, Vanajiraka.

A stout, much branched annual with cylindrical, striate, finely pubescent stems, 60—90 cm tall; leaves simple, alternate without stipules, 6.5—10 cm long, 2.5—4.5 cm broad, lanceolate or elliptic—lanceolate, much tapering to base, acute, coarsely and sharply serrate, pubescent on both sides with glands embedded in the epidermis; flowers regular, bisexual, pale violet, sessile, all tubular, numerous in large solitary heads, peduncles thickened upwards; involucre bracts linear or oblong-linear, acute, the outer ones pilose, inner ones shorter, often tipped with purple, spreading, all ultimately reflexed after fruiting; sepals reduced to hairy bristles; petals 5, fused into a tube about 8 mm long and slender, corolla lobes 1.5 mm long, narrowly triangular and deep; stamens 5 on the corolla-tube, filaments free, anthers fused to form a tube round the style, anther cells not tailed at base; ovary inferior, 2 mm long, hairy, 2-carpellary, unilocular with a single basal ovule, style bifid, arms subulate, hairy; fruit a slightly hairy, 10-ribbed, black achene with a short, pale red, sub-deciduous pappus where the outer row is very short, scale-like and persistent.

Flowers from December to March.

*Illustrations.* Burmann, *Thes. Zeyl.* pl. 95. 1737; Kirtikar and Basu, *Indian Med Plants*, pl. 515A, 1933; *Herb. Peradeniya*, drawing.

*Distribution.* Occurs as a weed throughout India, Ceylon and Malay Peninsula. In Ceylon, it is common in waste ground in the dry regions especially near houses and along roadsides but is nowhere indigenous. Puttalam, Anuradhapura, Galagama, Lunugala, etc.

*India.* Bengal: *J. D. Hooker and T. Thomson*; Chota Nagpore, *Clarke* 20278A, Oct. 1873; Basia, *Clarke* 34102B, Nov. 1883. Pen. Ind. Or., *Herb. Wight* 1521, Kew Distribution 1866—7. Ceylon. North Western Prov., Puttalam-Anuradhapura Road, *Simpson* 9164, Feb. 1932. North Central Prov., Anuradhapura, *Alston* 1057, March 1927; Galagama, *Thwaites* C.P. 487. Uva Prov., near Lunugala, *Herb. Peradeniya*, Jan. 1888.

*Uses.* Used for fever and convulsions. It stimulates the appetite and improves digestion. It is useful in anorexia, atonic dyspepsia and flatulence. The seeds are considered to possess anthelmintic, diuretic and stomachic properties. They are administered for intestinal colic and dysuria. The powdered seed is applied externally for paralysis. In the Malabar coast, an infusion of the seeds is given for coughs and flatulence.



FIG. 134. *Vernonia cinerea*. A, apical portion of a plant with the inflorescence. B, flower head. C, side view of a flower. D, fruit.

16. *Vernonia cinerea* (L.) Less. in *Linnaea* 4: 291. 1829. (Fig. 134).

*Vernonia conyzoides* DC.—*Conyza cinerea* Linn.—*Eupatorium luzoniensis* Llanos.

*Engl.* Ash-coloured Fleabane; *Sinh.* Monerakudimbiya; *Tam.* Puvamkurundal, Sahadevi, Sirashengalanir; *Hindi* Dantotpala, Sahadevi, Sadodi, Sadori; *Sans.* Dantotpala, Devasasha, Devika, Gandhavalii, Govandani, Saha, Sahadeva, Sahadevi, Vishamajvaranashini, Vishvadeva.

An annual herb with a slightly branched, stiff, erect, cylindrical, more or less pubescent stem 15—60 cm tall; leaves simple, alternate, distant, the lower ones 4—5 cm long, 3—3.5 cm broad, gradually becoming smaller upwards, broadly oval to linear—lanceolate, tapering to the base, sub-obtuse, apiculate, coarsely and shallowly crenate-serrate, more or less hairy on both sides, petioles 0.6—1.8 cm long; flowers regular, bisexual, pinkish violet, all tubular, sessile on long, stalked, small heads in divaricate, terminal corymbs, involucre—bracts linear to oblong, 1.5—2.5 mm long, mucronate, silky outside, flowers 20—25 in a head; sepals reduced into long bristles with a shorter outer row; petals 5, fused into a long, tubular corolla about 4 mm long, segments deep and narrow; stamens 5, on the corolla tube, anthers not tailed at the base; ovary 1 mm long, hairy, inferior, 2-carpellary, unilocular with a single basal ovule, style stout, 3.5 mm long, stigma bilobed; fruit a hairy achene, 1.5—2 mm long but not ribbed, with a white pappus the outer row of which is very short.

Flowers all the year round.

**Illustrations.** Wight.  *Ic. Pl. Ind. Orient. pl.* 1076. 1846; Kirtikar and Basu. *Indian Med. Plants, pl.* 516. 1933.

**Distribution.** Occurs throughout India, Ceylon, tropical Asia, Africa and Australia. In Ceylon, it is a very common weed everywhere.

**India.** Sikkim: *J. D. Hooker; T. Thomson*, 1857. Khasia: *Clarke* 18067, Nov. 1872; *Clarke* 18688, Nov. 1872; Jaintea, *Clarke* 17894, Nov. 1872; *J. D. Hooker and T. Thomson*. Assam: *Simons; Parasnath, T. Thomson*. Ceylon. *Thwaites C.P.* 1736; North Western Prov.. Chilaw, *Simpson* 8164, May 1931. Central Prov., Haputale, *Hyde*, Nov. 1926. Sabaragamuwa Prov., Veddagala, *Herb. Peradeniya*. Upper Burma. Keng Taung, *Khalil*, 1896. Thailand. *Schomburgh* 308, 1859. Laccadive Islands. Minikoy, *H.I.M.S. Investigator*, Dec. 1891; *Gardiner* 13, 1899. Maldivé Islands. Heddufuri and Horsburgh Atoll. *Gardiner*, 1899—1900; Hulule, *Gardiner* 51, 1899—1900.

**Composition.** The leaves contain an alkaloid.

**Uses.** A stomachic and carminative and used for dyspepsia, flatulence and colic. It is said to be a diaphoretic. The fresh juice of the leaves is used in dysentery, piles and colic. The root is given as a vermifuge and also employed in dropsy. The flowers are administered for conjunctivitis and seed as an anthelmintic. The entire plant is used in the treatment of coughs, asthma, bronchitis and consumption. The crushed leaves are applied externally on wounds and sores.



FIG. 135. *Vernonia zeylanica*. A, branch with leaves and flower heads. B, a single flower head. C, longitudinal section of a flower head. D, a single flower. E, flower with corolla opened out showing the stamens.

17. *Vernonia zeylanica* Less. in *Linnaea* 344. 1829. (Fig. 135)*Eupatorium zeylanicum* Linn.

Sinh. Pupula; Tam. Kappilay.

An under-shrub with many, straggling, divaricate, cylindrical branches, finely tomentose when young; leaves simple, alternate, 3—8.5 cm long, 1.7—3.5 cm broad, fiddle-shaped, auriculate at base, obtuse or subacute at apex, strongly crenate and undulate, finely tomentose above, white with fine wool beneath, rather thick and stiff, venation reticulate, pellucid, prominent beneath, petioles short, tomentose; flower heads small, numerous, very shortly stalked, often in 2—4, cymes large, lax, irregularly corymbose; involucre bracts 1.5—2.5 mm long, oblong—oval, apiculate, closely imbricate, slightly floccose pubescent; flowers all tubular, bisexual, very pale violet, 6—8 to a head, wide spreading, the corolla being curved outwards, pappus of hairs erect, more or less in the centre of the head; sepals reduced to hairy bristles almost as long as the corolla-tube; petals fused into a tube, 3.5—4 mm long, lobes linear or triangular about 1.5 mm long, acute, spreading at the tips; stamens 5, fused to corolla-tube, filaments free, anthers fused into a tube round the style, anther cells acute, not tailed; ovary inferior, 1.5 mm long, hairy, unilocular with a basal ovule, style 6 mm long, arms subulate, hairy outside; fruit a faintly 5-ribbed pubescent achene with a yellowish-white pappus, the outer row being scanty and extremely short.

Flowers during March, September and October.

Illustration. Burmann, *Thes. Zeyl. pl.* 21. 1737.

**Distribution.** An endemic shrub which is very common in both the moist and dry regions of the low-country.

**Ceylon.** Central Prov., Peradeniya, Bot. Gard., cultivated, *Jayaweera* 921, May 1952.

**Uses.** Used in fractures as it promotes the fusion of bones. The leaves ground into a paste and applied on boils promote suppuration. Toasted with turmeric, they are applied for eczema of the legs with beneficial results. Internally, the juice of the leaves is used for treatment of asthma. It is also a useful emetic, particularly in cases of food poisoning.



FIG 136. *Wedelia chinensis*. A, top portion of a plant with the flower head. B, front view of flower head. C, longitudinal section of a flower head. D, side view of a disc floret with a bractlet. E, side view of a ray floret and bractlet. F, same showing the staminodes at the base of the corolla.

18. *Wedelia chinensis* (Osbeck) Merrill in Philip. Journ. Sc. Bot. 12: 111. 1917. (Fig. 136).

*Solidago chinensis* Osbeck—*Wedelia calendulacea* Less.—*Wedelia prostata* Hemal.—*Wedelia hengalensis* Rich.—*Verbesina calendulacea* Linn.—*Joeeria calendulacea* Spreng.

*Sinh.* Ranwankikirindiya; *Tam.* Patalaikaiantagerai; *Hindi* Bhangra, Bhanra; *Sans.* Bhringaraja, Devapriya, Haripriya, Harivesa, Kesaraja, Pavana, Pitabhringaraja, Pitabhringi, Svarnabhringara, Vandaniya.

A perennial herb with a short, procumbent stem, rooting at nodes and then ascending, cylindrical, slightly rough with adpressed hair; leaves few, simple, opposite, nearly sessile, 4–6 cm long, 1–1.7 cm broad, oblong, strap-shaped or oblong-oval, tapering to base, acute, sparingly and shallowly serrate or entire, slightly rough with adpressed hair on both sides, somewhat 3-veined; flowers yellow, ligulate female ray florets, and regular bisexual disc florets, on large heads about 1.8 cm diameter, borne in axillary peduncles 2–6 cm long; bracts 5–10, each 1 cm long, 3 mm broad, leafy, oblong, obtuse, hairy, inner ones much smaller, hairy along the margin; receptacle flat with a linear acute, hyaline, ciliate bractlet to each flower, ray florets 8–12, spreading, about equalling the bracts, broad, corolla deeply 2- or 3-toothed bearing 3 or 4 staminodes at the base; disc flowers about 20, short, narrowed at the base so that they are almost pedicellate; sepals reduced to scales; petals 5, fused into a corolla-tube, lobes valvate; stamens 5, adnate to corolla-tube, filaments free, anthers fused into a tube round the style, anther bases triangular; ovary inferior, 1.5 mm long, 2-carpellary, unilocular with a single ovule at the base, style stout with pubescent stigma lobes and a fleshy cup round the base; fruit a nearly cylindrical pubescent achene crowned by a ring of short, scarious, ciliate, scaly calyx.

*Flowers between October and March.*

*Illustrations.* Wight, Ic. Pl. Ind. Orient. pl. 1107. 1846; Kirtikar and Basu, Indian Med. Plants, pl. 528. 1933; Herb. Peradeniya., drawing.

*Distribution.* Occurs in moist places in India, Ceylon, Burma, China, Philippine Islands and Japan. In Ceylon, it is common in damp grassy places up to an altitude of 4000 feet. Batticaloa, Kurunegala, Negombo, etc.

*India.* East Bengal: *Herb. Griffith* 3184, Kew Distribution 1862—3; Calcutta: Salt Lakes, *Clarke* 21611B, March 1874; *Clarke* 21611L, March 1874. *Ceylon.* *Walker; Thwaites C.P.* 1756 in part. Western Prov., Negombo, *Simpson* 7912, April 1931; *Heyarc, Alston* 1280, Aug. 1926. *China.* Canton River: Dane's Island, *Herb. Hance* 38, Sept. 1857.

*Uses.* A decoction of this plant is given for uterine haemorrhage and menorrhagia. It is a useful deobstruent. The leaves are used to treat coughs, cephalalgia, skin diseases and alopecia. They are also used for dyeing grey hair and to promote hair growth.

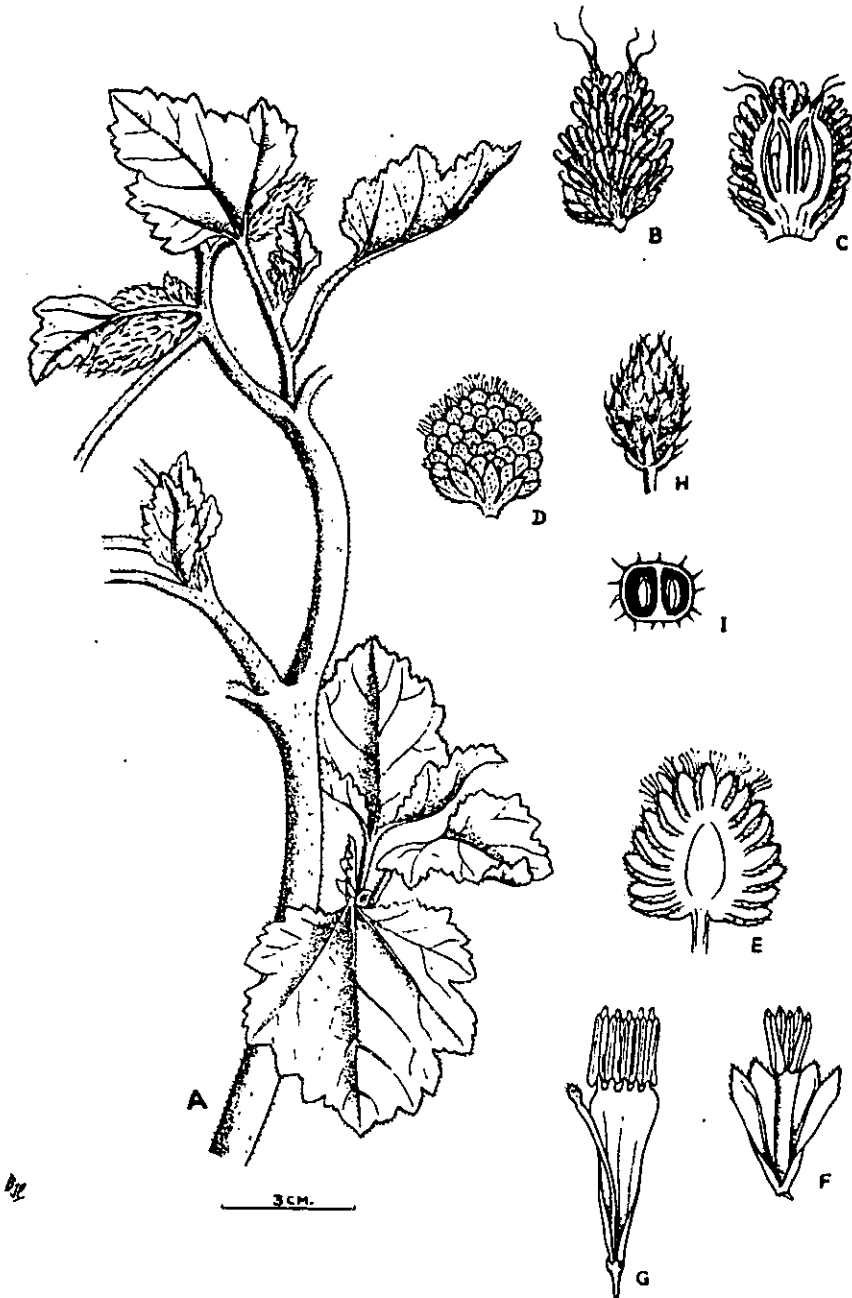


FIG. 137. *Xanthium strumarium*. A, branch. B, a group of 2 female flowers. C, longitudinal section showing the ovaries and fused bracts of the utricle. D, group of bisexual flowers. E, longitudinal section showing the receptacle and bracteoles. F, bisexual flower with corolla opened out showing the stamen tube. G, bisexual flower with corolla removed and stamen tube showing the style. H, fruit. I, transverse section of fruit.

19. *Xanthium strumarium* Linn. Sp. Pl. 987, 1753. (Fig. 137).

*Xanthium indicum* DC.—*Xanthium roxburghii* Wallroth.—*Xanthium discolor* Wallroth.—*Xanthium brevirostre* Wallroth.—*Xanthium orientale* Blume

*Engl.* Bur-weed, Cocklebur; *Sinh.* Urukossa; *Tam.* Marlumutta; *Hindi* Banokra, Chhotagokhru, Shankhahuli; *Sans.* Arishta, Bhulagna, Chanda, Itara, Kambumalini, Kambupushpa, Kiriti, Malavinashini, Mangalyakusuma, Medhya, Pitapushpi, Raktapushpi, Sarpakshi, Shankhagalini, Shankhakusuma, Shankhapupuspi, Shankhavha, Shwetakusuma, Sukshmapatra, Supushpi, Vanamalini.

An annual herb with a short, stout, slightly branched, flexuose stem, harsh with bristly hairs; leaves simple, alternate, numerous, 5—7.5 cm long and almost as broad, on petioles about as long or longer, broadly triangular-ovate, often 3-lobed, somewhat cordate at base, acute, irregularly incised-serrate, harsh with short adpressed hair on both sides; flowers in two types of heads, the upper ones globose with numerous, bisexual but sterile, tubular flowers each enclosed by a bracteole, on an ovoid receptacle and with a few, small, hairy involucre bracts; the lower ones broadly ovoid, with only two female, apetalous but fertile flowers in an involucre of fused bracts forming an ovoid, closed, spiny, 2-horned, 2-locular utricle with one flower in each loculus; sepals absent; petals 5, fused with a tubular corolla in bisexual flowers but absent in the lower female flowers; stamens 5, distinct, filaments fused into a tube in bisexual flowers only; ovary inferior, unilocular with a basal ovule, style of bisexual flower not divided, in female flowers deeply divided, long, exerted from the involucre; achenes completely enclosed in chambers of the enlarged involucre (like seeds in a capsule), 1.2 cm long, oblong—ovoid, compressed, glabrous, pappus absent; involucre of fertile fruits capped with 2, erect, mucronate beaks, thickly set with sharp rather long prickles usually hooked at the ends, 2-chambered, hard and tough.

*Illustrations.* Wight, *lc. Pl. Ind. Orient. pl.* 1104. 1846; Kirtikar and Basu, *Indian Med. Plants, pl.* 528A. 1933; Herb. Peradeniya, drawing.

*Distribution.* Occurs throughout the warmer parts of Europe, Australia, America, Burma, China, India and Ceylon. It is rather rare in Ceylon, mostly confined to waste ground at the edge of tanks, etc. specially in the dry regions; Kandy, Passara, Kantalai, Mihintale, Batticaloa, etc.

*India.* Ganget. Plain: *T. Thomson.* Maisor and Carnatic, *G. Thomson.* Ceylon. *Thwaites C.P.* 1771. Eastern Prov., Kantalai, *Herb. Peradeniya* Aug. 1885. *Upper Burma.* *Khalil,* 1896. *China.* Hainan, *Wu* 1103, May 1928.

*Composition.* The seeds contain a glucoside xanthostrumarium and a fixed oil which consists of oleic, linoleic and isolinoleic acids. They also contain a fat splitting enzyme.

*Uses.* The root is useful for cancer and against strumous diseases. The whole plant is supposed to possess diaphoretic and sedative properties. It is administered for longstanding cases of malarial fever. in the form of a decoction. In Indo-china, an extract of the root is applied on ulcers, boils and abscesses. In southern Europe, the leaf, fruit and root are used as remedies for catarrh, scrofula, leprosy, tubercular and other skin diseases, cancer, dysenteries and bladder ailments.

In certain parts of Assam, the young flower tops are eaten as a potherb.

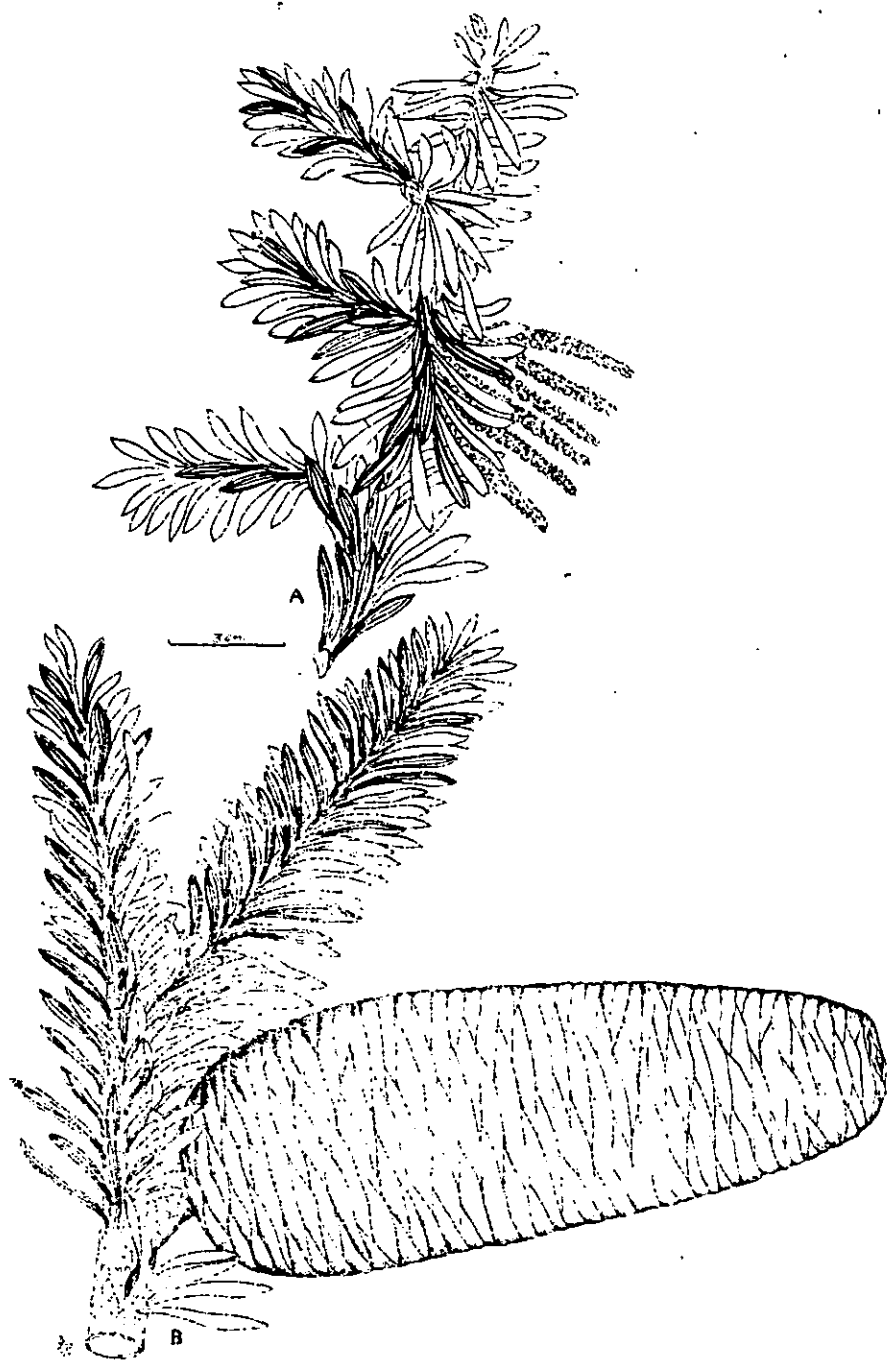


FIG. 138. *Abies spectabilis*. A, branch with male catkins. B, branch with a female cone.

## 32. CONIFERAE

### 1. *Abies spectabilis* (D. Don) Spach, Hist. Veg. Phan. 11: 422. (Fig. 138).

*Abies chilensis* Hort.—*Abies chilrowensis* Hort.—*Abies densa* Griff.—*Abies webbiana* Lindl.—*Picea webbiana* Lour.—*Pinus webbiana* Wall.

*Engl.* Himalayan Silver Fir; *Sinh.* Talispaturu; *Tam.* Talis patra; *Hindi* Talispatra; *Sans.* Talispatra.

A large tree, about 50—70 m tall with heavy, spreading branches forming a more or less flattened head; bark greyish brown, rough, fissured and scaling off on old trees; young shoots stout, reddish-brown, deeply-grooved, hairy in the furrow; winter buds large, rounded covered with resin which conceals the scales; leaves variable in size, 2.5—6.5 cm long, about 2.5 mm broad, arranged in two lateral sets spreading right and left, each set of several ranks, the lower ranks with leaves spreading horizontally, upper ranks with leaves becoming gradually shorter, directed outwards and upwards forming a V-shaped depression between them, linear, flat, obtusely emarginate, dark green and grooved on the upper surface, silvery beneath with two conspicuous white bands of stomata; flowers unisexual, both male and female borne on the same tree; male flowers in short, ovoid catkins from the leaf axils on the underside of the branchlets which on falling leave gall-like scars; female flowers in cones composed of numerous bracts each bearing a large scale and two ovules at the base; mature cones cylindrical, blunt, 15—20 cm long, standing erect on the upper branchlets, with close overlapping fan-shaped scales and hidden bracts, violet purple changing into dark brown when mature, scales and bracts falling soon after the seeds are ripe, seeds winged.

**Illustrations.** Dallimore and Jackson, Handbook of Coniferae, fig. 27. 1954; Kirtikar and Basu, Indian Med. Plants, pl. 928B. 1933; Veitch and Sons, Manual of the Coniferae p. 109. 1881.

**Distribution.** Occurs in the forests of inner Himalaya extending from Afghanistan to Bhutan at 8000—13,000 feet altitude. It does not grow in Ceylon but the drug is imported from India.

**Composition.** The leaves yield a volatile oil and resin.

**Uses.** The leaves are regarded as carminative, expectorant and stomachic and useful for phthisis, asthma, bronchitis, dyspepsia and flatulence. The drug is rapidly excreted through the skin, bronchial mucous membrane and kidneys stimulating them and acting as a diaphoretic and diuretic. Hence, it is used in pneumonia, septic conditions of the urinary tract and for haemorrhoids.

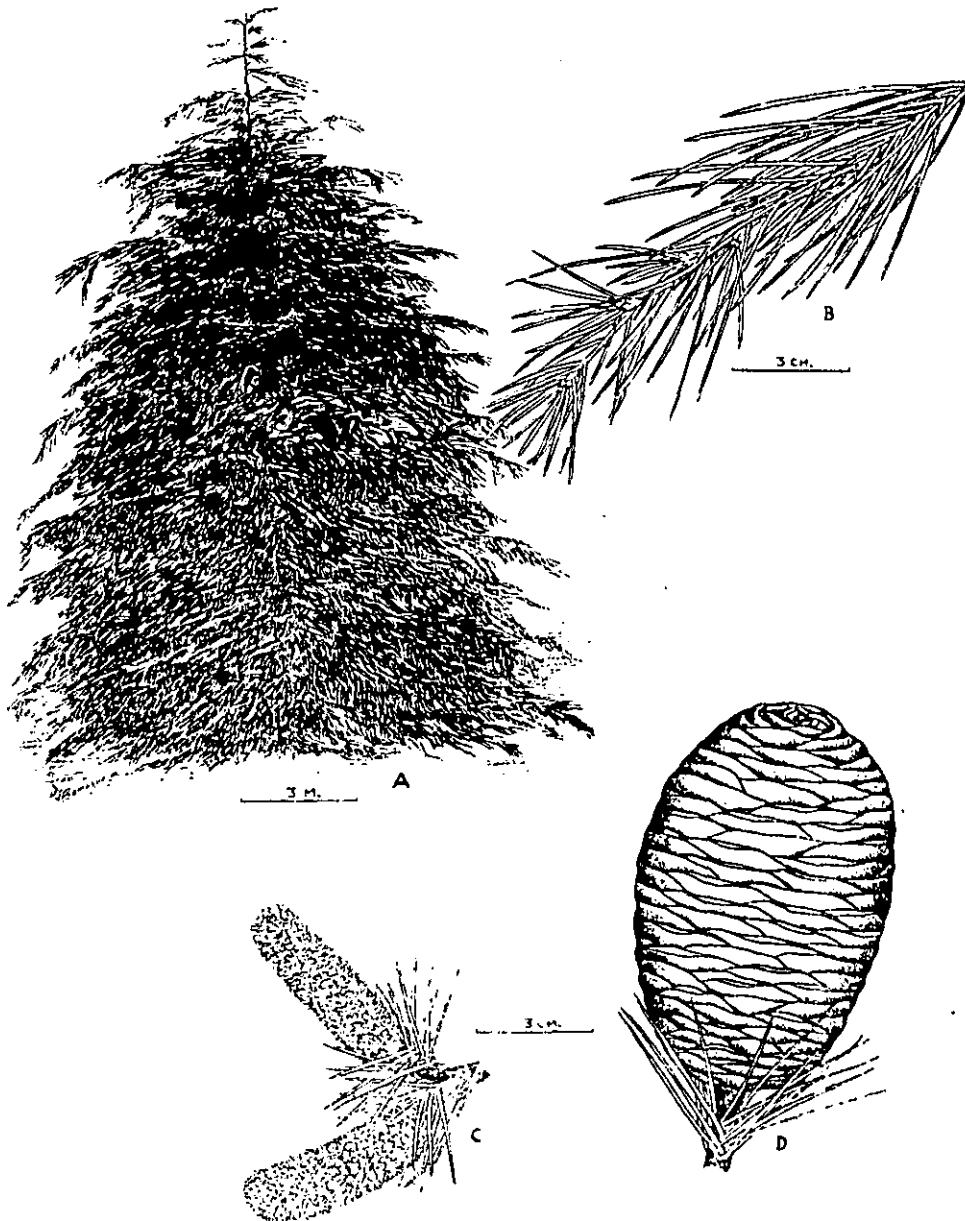


FIG. 139. *Cedrus deodara*. A, a tree. B, a twig showing the leaves. C, male cones. D, female cone.

2. *Cedrus deodara* (Roxb.) Loudon, Arb. Brit. 4: 2428. 1838. (Fig. 139).

*Cedrus indica* Chambray.—*Cedrus libani* var. *deodara* Hook. *Abies deodara* Lindl.—*Larix deodara* K.Koch.—*Pinus deodara* Roxb

*Engl.* Deodar, Himalayan Cedar; *Sinh.* Devadara; *Tam.* Tevadari, Tevadaram, Tevadaru, Vandugolli; *Hindi* Dedwar, Deodar, Deyar, Kilan, Kilankaper; *Sans.* Amaradaru, Bhadradaru, Bhadrawata, Bhavadaru, Bhutahari, Daru, Darubhadra, Daruka, Deodaru, Devakashtha, Drukilima, Indravriksha, Kalpapadapa, Kilima, Mastadaru, Paribhadra, Pitadaru, Pittadru, Putikashtha, Shakradruma, Shambhava, Shatapadapa, Shivadaru, Snighdhadaru, Suradaru, Suradruma, Surakashtha, Suravhaya, Surbhuruha, Svehavriksha.

A large tree, about 50—60 m in height and 8—10 m in girth; bark greyish brown, smooth, divided into oblong, irregular scales; branches horizontal and young branches pendulous; foliage light green when young becoming dark with age; leaves needle-like, 2.5—3.7 cm long, 3-sided, clustered at the end of short branchlets, dark green, glaucous or silvery and sharply pointed, male and female cones on the same tree or on separate trees; male cones numerous, erect, solitary at the end of leaf-bearing branchlets, cylindrical, 4.3 cm long when mature; anther-cells 2; female cones few, erect, solitary at the end of leaf-bearing branchlets, mature cones ovoid or ovoid—cylindrical, 10—12.5 cm long, 7.5—10 cm broad, dark brown when ripe, top rounded; scales numerous, fan-shaped, 3—3.5 cm across, thin at the tip and thickened towards the base; seeds triangular with a broad wing, seed and wing 2.5—3 cm across.

**Illustrations.** James Veitch and Sons, *Manual of Coniferae pl. on page 134*. 1881; Dallimore and Jackson, *Handbook of Coniferae pl. 35*. 1954; Chaudun and Higgins, *Ornamental Conifers pl. on page 18*. 1956; Kirtikar and Basu, *Indian Med. Plants, pl. 928B*. 1933.

**Distribution.** A forest tree growing in the North West Himalayan regions extending from Afghanistan to Garhwal at an altitude between 4000 to 10,000 feet. Does not grow in Ceylon but the drug is imported from India.

**Composition.** The wood yields an oleo-resin and a dark coloured oil.

**Uses.** Taken internally, the wood of this tree acts as an aromatic stomachic and carminative, stimulating the appetite and improving the digestion and is useful in anorexia, acute and chronic dyspepsia and flatulence. As the drug is rapidly excreted by the skin, bronchial mucous membrane and kidneys, it acts as a diaphoretic, stimulating expectorant and diuretic. It is also useful in acute laryngitis, bronchitis, pneumonia and for cardiac, renal and hepatic dropsy. It is largely employed as an antilithic in urinary gravel and calculi.

It has anti-periodic properties and may be used along with other anti-periodics for acute and chronic malarial fevers.

The bark is an astringent and used in fevers, diarrhoea and dysentery. The oil is used for skin diseases such as eczema, psoriasis and in the treatment of leprosy.

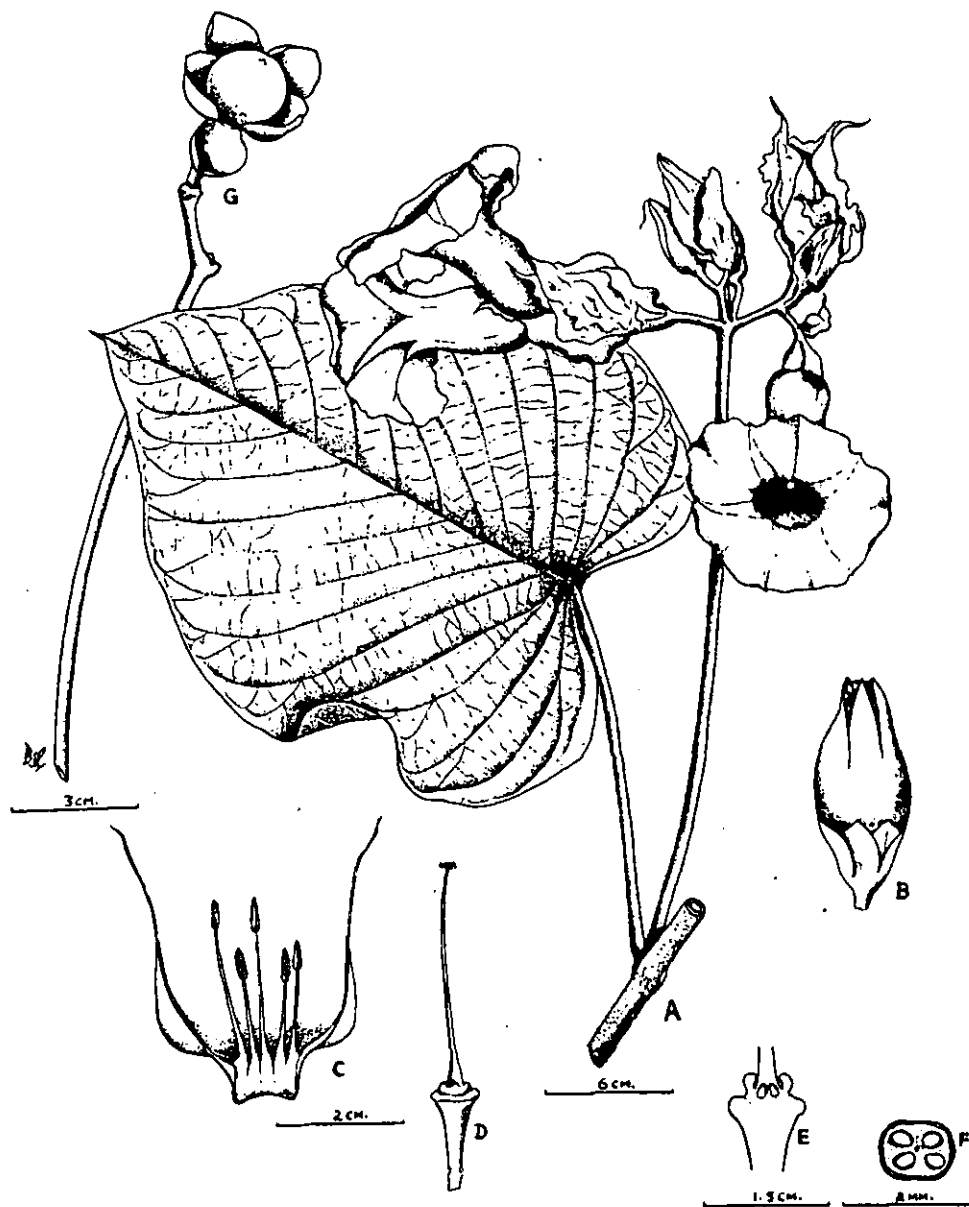


FIG. 140. *Argyreia nervosa*. A, a portion of a stem with a leaf and inflorescence. B, a bud showing the calyx. C, corolla opened out showing the stamens. D, pistil with annular disk at base of long style and bilobed stigma. E, longitudinal section of ovary through the disk. F, transverse section of ovary. G, fruit with persistent calyx.

### 33. CONVULVACEAE

#### I. *Argyrea nervosa* (Burm. f.) Bej., Hort. Maurit. 224. 183. (Fig. 140).

*Convolvulus nervosus* Burm. f.—*Convolvulus speciosus* Linn. f.—*Argyrea speciosa* Sweet—*Lettsomia speciosa* Roxb.—*Lettsomia nervosa* Roxb.—*Ipomoea speciosa* Blume.

*Engl.* Elephant Creeper; *Sinh.* Mahadumudu; *Tam.* Ambagar, Peymunnai, Sadarbalai, Samutrachogi, Samutrappachai, Samutrappalai; *Hindi* Samandarpāt, Samandarphaind, Samandarsaf, Samandarsakh, Samudrasakh; *Sans.* Ajantri, Antakotarapushpi, Chhagaladi, Chhagalanghri, Chhagantri, Chhagala, Dirgha, Driddhadaraka, Driddhadaru, Hastivalli, Rykshagandha, Samudrapalaka, Samudrapatra, Samudrasosha, Vryddhadaraka.

A very large climber with stout, white-tomentose stems; leaves simple, alternate, 7.5–30 cm long, 6.2–25 cm broad, ovate, acute, glabrous above, persistently white-tomentose beneath, base cordate; petioles 5–15 cm long, white-tomentose; flowers regular, bisexual in subcapitate cymes, peduncles 7.5–15 cm long, stout, white-tomentose, bracts large, ovate with a long acumen, 6.5–7.8 cm long, 3.5–5 cm broad, thin, veined, pubescent outside, glabrous inside, deciduous, pedicels very short, white-tomentose; sepals 5, free, imbricate, 1.5–1.7 cm long, 1.2–1.3 cm broad, oblong-elliptic, apiculate, white-tomentose outside; corolla gamopetalous, 5–6.2 cm long, tubular-infundibuliform, the bands silky pubescent outside, tube inflated, rose-purple and glabrous inside; stamens 5, epipetalous, included, opposite sepals, filaments hairy at the base, anthers 2-celled, dorsifixed, dehiscent longitudinally; ovary superior, glabrous, 4-locular with a single ovule in each loculus, style filiform with an annular disc at the base, stigma 2-globose; fruit a dry, hard berry, 1.8–2 cm diameter, globose, apiculate with persistent calyx.

Flowers from May to September.

**Illustrations.** Wight, *lc. Pl. Ind. Orient. pl.* 851. 1843–1845; Kirtikar and Basu, *Indian Med. Plants, pl.* 658. 1933.

**Distribution.** Occurs throughout India from Assam to Mysore and in Ceylon, in the low-country, probably cultivated. It also occurs in Java and in the Philippine Islands.

**India.** Sikkim: *Anderson* 957, Sept. 1862. Hindustan: *Wallich* 1363/1, 1820. Ceylon. *Thwaites C.P.* 2849. Central Prov., Peradeniya, Bot. Gardens, *Herb. Peradeniya*, July 1898. Cuba. Santiago de las Vegas, *Baker* 105, Sept. 1907.

**Composition.** The roots yield acid resins and a tannin-like principle.

**Uses.** The root is regarded as an alternative and tonic. It is useful for rheumatism and diseases of the nervous system. Externally, a paste made out of the tuber is applied on abscesses of the stomach. The leaves are antiphlogistic, rubefacient and maturative and used as poultices for wounds and skin diseases.

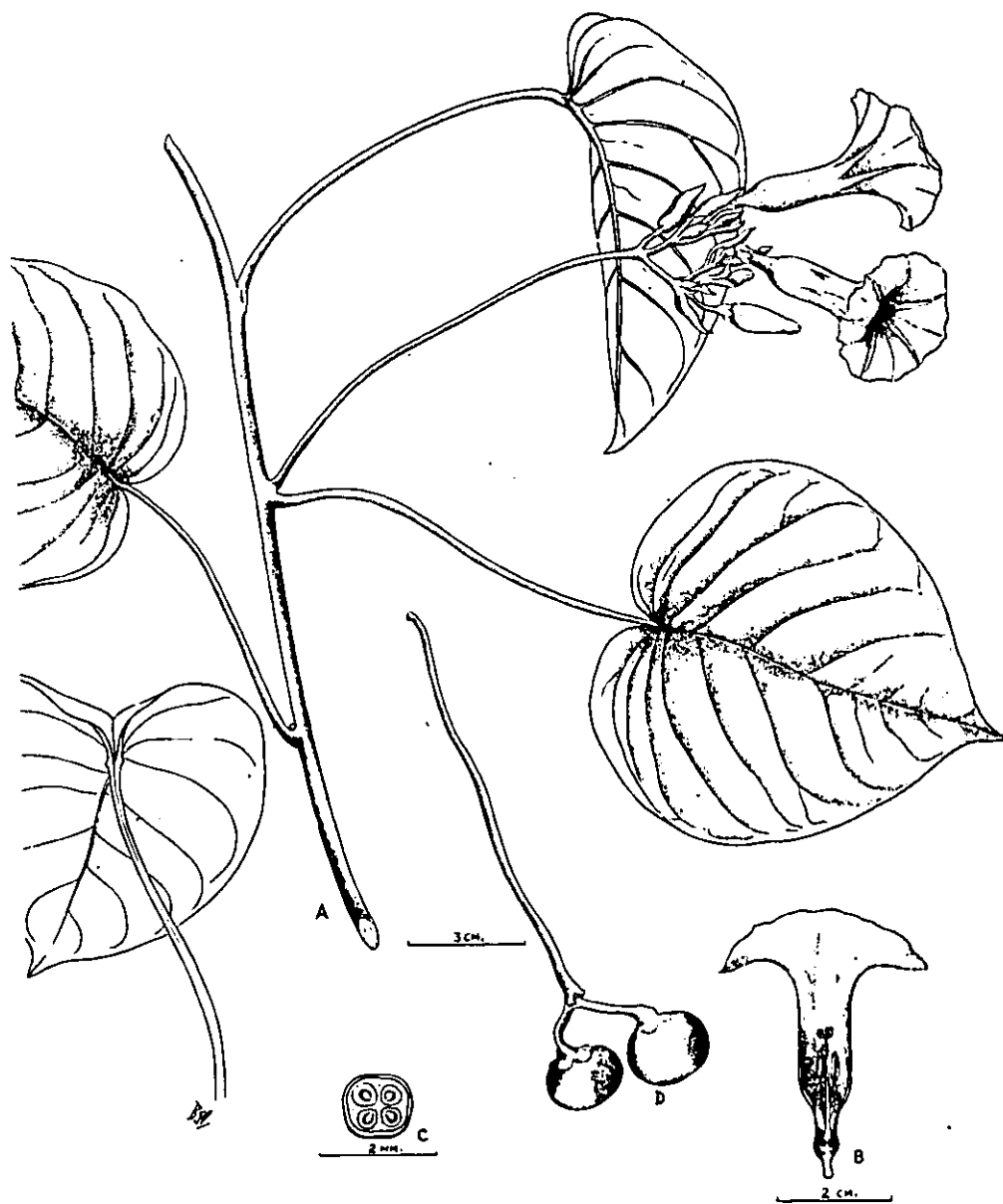


FIG. 141. *Argyreia populifolia*. A, a stem with leaves and flowers; below a lower surface view of a leaf showing a pair of wart-like glands at the end of the petiole. B, longitudinal section of a flower. C, transverse section of an ovary. D, fruits.

2. *Argyreia popullifolia* Choisy, Convolv. Orient. 32. 1834. (Fig. 141).

*Ipomaea zeylanica* Gaertn.—*Convolvulus festivus* Wall.—*Rivea zeylanica* var. Thw.

*Sinh.* Giritilla; *Tam.* Sindu-kodi; *Sans.* Avegi, Saikari.

A stout, perennial, twining or trailing climber with nearly glabrous or slightly hairy stems which yield a milky latex; leaves simple, alternate, 8—18 cm long, 7.5—12 cm broad, ovate, cordate at base, acuminate, acute, glabrous on both sides except on the prominent veins beneath; petioles 4.5—10 cm long, stout, thickened at base, adpressed—pubescent with two wart-like glands at the summit of the petiole; flowers regular, bisexual, pale violet pink, sessile in capitulate cymes with very short dichotomous branches; bracts large, leafy, unequal, lanceolate—oblong, obtuse, slightly hairy, peduncles 12—20 cm long; sepals 5, free, imbricate, oval, obtuse, silky pubescent, scarcely enlarged in the fruit; petals 5, fused into a funnel-shaped corolla, corolla-tube 2.5—3 cm long, limb 3.5 cm diameter, hairy outside; stamens 5, unequal, on corolla-tube, not exerted, filaments hairy at base; ovary superior, 4-locular with a single ovule in each loculus, style long, stigmas 2, globose; fruit 1.5 cm across, globose, somewhat depressed, smooth, fleshy and yellow in colour with persistent calyx segments.

Flowers from April to June.

**Illustrations.** Gaertner, *Fruct.* 2: *Pl.* 178, f. 1; Herb. Peradeniya, drawing.

**Distribution.** A very common, endemic species growing on fences or trailing on the ground in the low-country to about 5000 feet altitude.

**Ceylon.** *Thwaites* C.P. 1943; Urugala, Siyambalagastenne, *Alston* 483; Sept. 1926; Negombo, *F. W. de Silva*, July 1930.

**Uses.** An astringent and antiseptic. The milky juice is applied to gums and a decoction of the leaves is used as a gargle for treating weak and spongy gums. The root is pounded, boiled with coconut milk and applied to swellings caused by dog bite. It is also used in cases of rabid dog bites.

The young and tender shoots are eaten as a pot-herb.

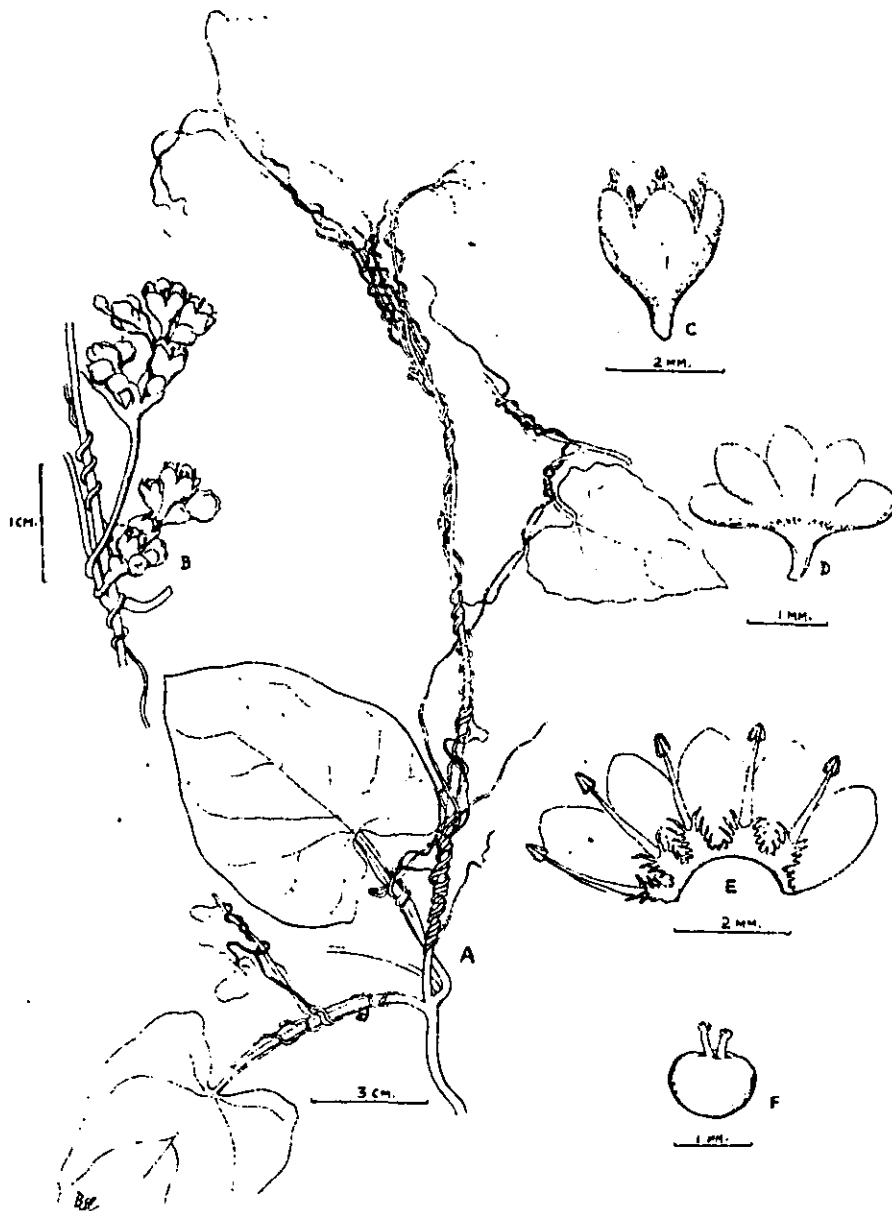


FIG. 142. *Cuscuta chinensis*. A, plant parasitic on *Mikania scandens*. B, plant showing 2 clusters of flowers. C, side view of a flower. D, calyx spread out. E, corolla spread out showing scales. F, ovary with 2 styles.

3. *Cuscuta chinensis* Lam., Encycl. Method. 2: 229. 1786. (Fig. 142).

Engl. Dodder; Sinh. Agamulanetivel.

A leafless, twining annual with very slender, much branched, yellowish stems forming a tangled mass, parasitic on stems and leaves of low herbs and shrubs by means of discs; flowers white, bisexual, about 3 mm across, sessile or shortly pedicelled in clusters of one to many; bracts 2 mm long, 1.5 mm broad, ovate, rounded at apex; sepals 5, orbicular, 1.5 mm long, 1—1.5 mm broad, connate, rounded at apex; petals 5, 2.5 mm long, 1.5 mm broad, oblong, connate, campanulate, with fimbriate scales at the throat of the corolla just below the stamens, stamens 5, fused with the corolla-tube between segments, filaments 0.7 mm long; ovary superior globular, smooth, 1 mm long, 1.5—1.7 mm broad, 2-locular with two ovules in each loculus, styles 2, 0.5—0.7 mm long, stigmas capitate; fruit capsules about 2.5 mm in diameter, globose, divided into two lobes by a deep groove at the top, seeds rough and black.

Flowers during April, November and December.

Illustration. Wight, Ic. Pl. Ind. Orient. 4: pl. 1373. 1850.

Distribution. Occurs in India, Ceylon, Persia and Australia. In Ceylon, it is rather rare in the moist low-country, parasitic on grass and low herbs and shrubs. Peradeniya, Ratnapura, Colombo, etc.

India. Silhet, Wallich 1320. Ceylon. Central Prov., Gannoruwa, Herb. Peradeniya, July, 1915; Jayaweera 1876, Oct. 1961. Western Prov., Colombo, Drieberg, June 1915; Ferguson, Nov. 1892; Thwaites C.P. 611; Rao 4, Oct. 1927.

Uses. The properties of this parasite are the same as those of *Cuscuta reflexa*. The young shoots are made into a lotion and applied on sore heads and inflamed eyes in China. The seeds are said to be tonic, diaphoretic and demulcent.

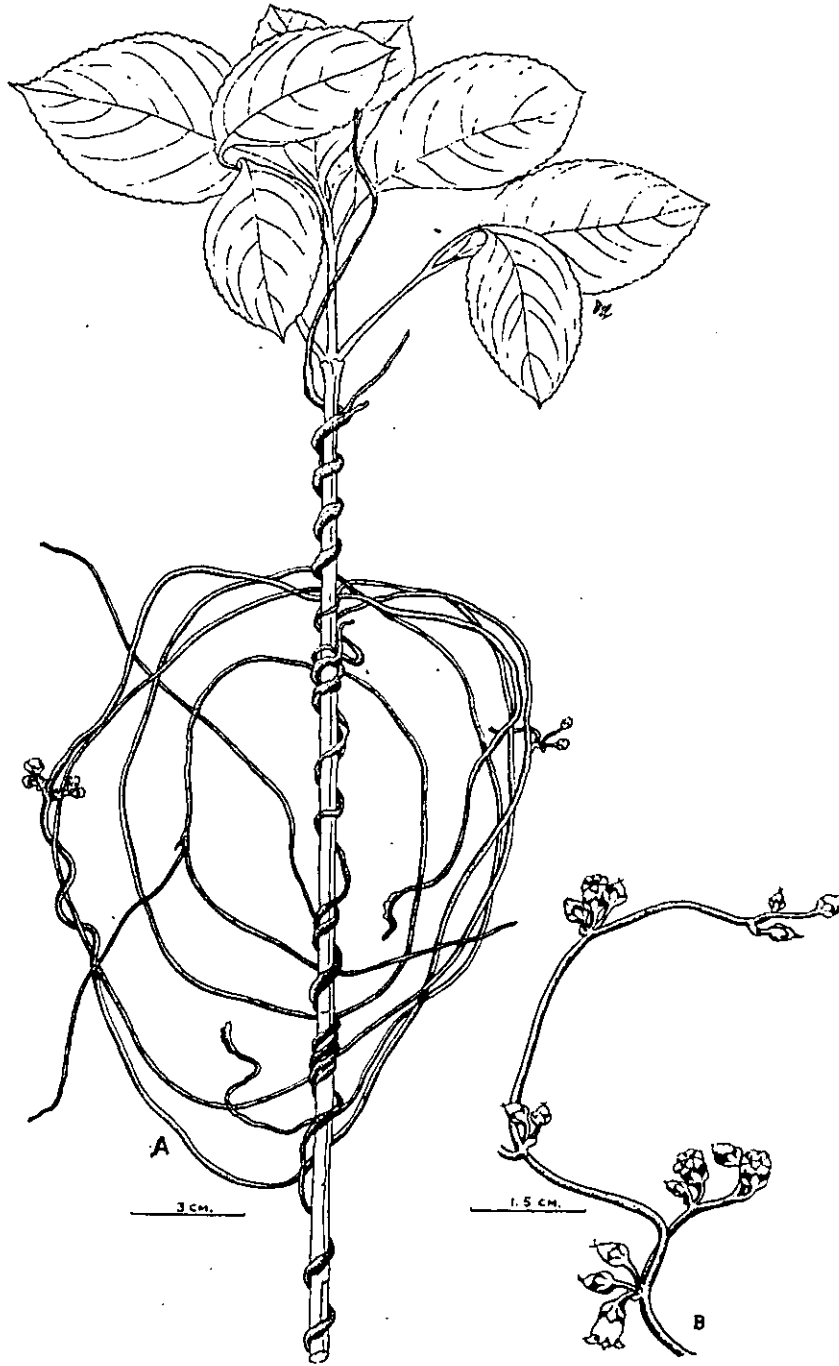


FIG. 143. *Cuscuta reflexa*. A, a plant parasitic on *Strobilanthes* sp. B, a portion of the stem with flowers and fruits.

4. *Cuscuta reflexa* Roxb. Pl. Corom 2: 3. 1798. (Fig. 143).

*Cuscuta grandiflora* Wall.—*Cuscuta verrucosa* Sweet—*Cuscuta hookeri* Sweet—*Cuscuta macrantha* G. Don—*Cuscuta elatior* Choisy.

*Engl.* Dodder; *Sinh.* Agamulaneti-vel; *Tam.* Kodiyagundal, Sadadori; *Hindi.* Akashabela, Amarabela; *Sans.* Akashabhavana, Akashapavana, Akashavalli, Amaravallari, Amaravela, Dusparsha, Khavalli, Nilatar, Vyomavallika.

A leafless, twining, parasitic annual with long branched, closely twining, succulent and brittle, glabrous, pale greenish yellow stems, sometimes dotted with red; leaves absent; flowers regular, bisexual, small, white, scented, on short, glabrous, curved pedicels, solitary or in umbellate clusters of 2—4, or in short racemes; bracts 1.5 mm long, ovate-oblong, obtuse, fleshy; sepals 5, free, 3 mm long, broadly oval, obtuse, glabrous and fleshy; petals 5, fused into a more or less campanulate or urceolate corolla, tube over 6 mm long, lobes very short, triangular, acute; scales 5, almost at the base of the corolla-tube, obovate—oblong, incurved, fimbriate; stamens 5, inserted in the throat of the corolla-tube, filaments very short; ovary superior, 2-locular with two ovules in each chamber, style solitary, short, stigmas 2, oblong; fruit capsule over 6 mm long depressed—globose, apiculate, glabrous, dehiscent by a ring near the base; seeds usually 2, rather large, glabrous and dull black.

Flowers during December.

*Illustrations.* Roxb., Pl. Corom. 2: pl. 104. 1795; Kirtikar and Basu, Indian Med. Plants, pl. 668A. 1933; Herb. Peradeniya, drawing.

*Distribution.* Occurs in India, Ceylon and Malaya. In Ceylon, it is rather common in the upper montane zone, parasitic on *Strobilanthes* Sp. Nuwara Eliya, Pidurutalagala, etc

*India.* Sikkim: *J. D. Hooker* Behar: *J. D. Hooker*. *Ceylon.* Central Prov., Nuwara Eliya, *Thwaites* C.P. 1922; Pidurutalagala, *Herb. Peradeniya*, April 1881; *A. M. Silva*. April 1906. *China* Hongkong, *Herb Hance* 111.

*Uses.* This plant is a purgative. Externally, it is used against itch and internally for protracted fevers, retention of wind, and induration of the liver. The stems are used for bilious disorders. The seeds are carminative and applied as an anodyne.

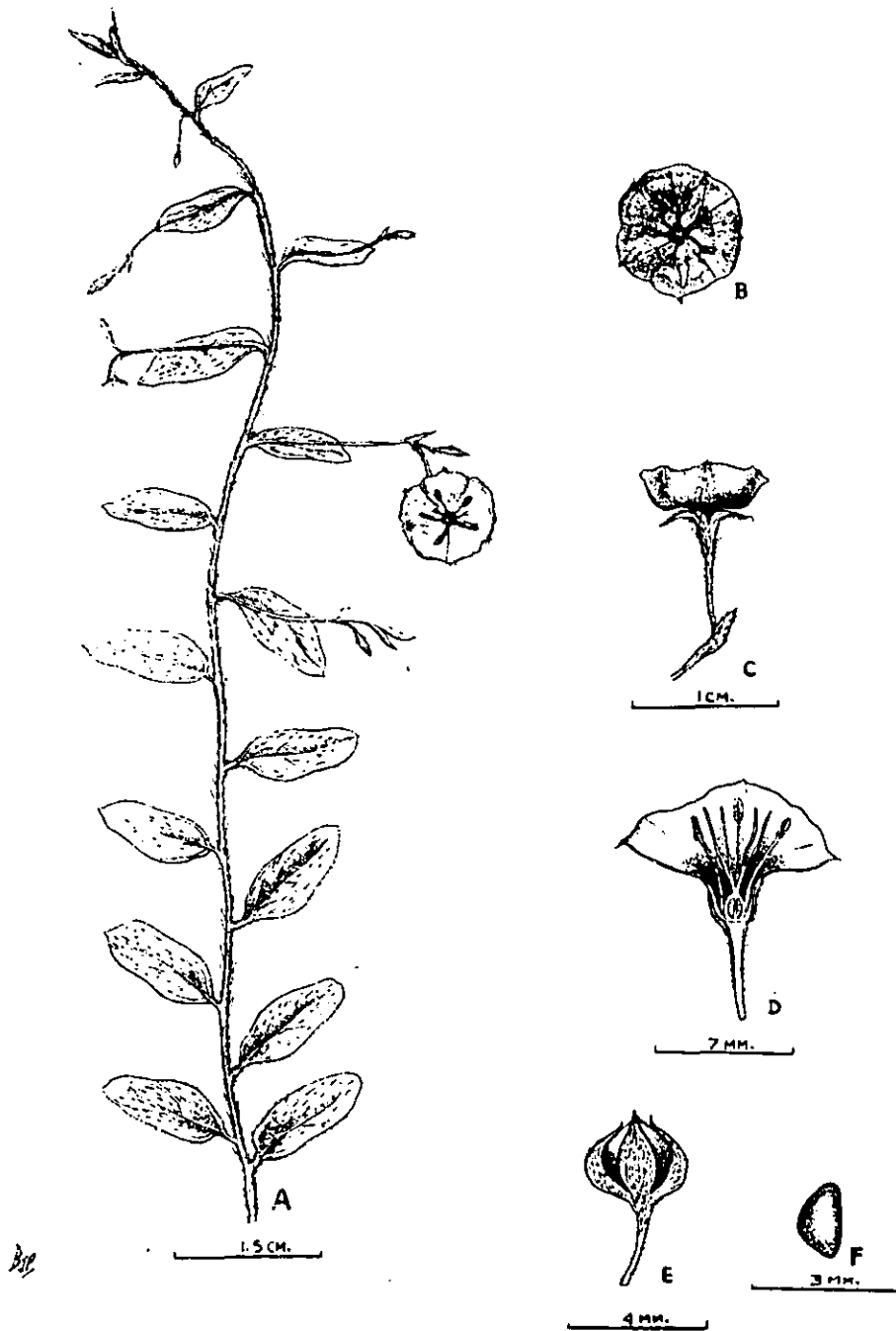


FIG. 144. *Evolvulus alsinoides*. A, a branch with leaves and flowers. B, flower from top C, flower from side. D, longitudinal section of flower. E, fruit with persistent calyx. F, seed.

5. *Evolvulus alsinoides* Linn. Sp. Pl. ed. 2, 392. 1762. (Fig. 144).

*Evolvulus linifolius* Linn.—*Evolvulus angustifolius* Roxb.—*Evolvulus hirsutus* Lamk.—*Evolvulus sericeus* Wall.—*Convolvulus valerianoides* Blanco.

*Sinh.* Vishnukranthi; *Tam.* Vishnukarandi, Vishnukranthi; *Hindi* Shyamakranta; *Sans.* Laghuvishnukranta, Nilapushpi, Vishnigandhi, Vishnukranta.

A perennial herb with a small, woody, branched rootstock and numerous, prostrate, spreading slender, wiry stems usually with long spreading hair; leaves simple, alternate, exstipulate, 0.6—1.5 cm long, 5—8 mm broad, nearly sessile, oblong—oval, usually acute at base, very obtuse but apiculate at apex, densely covered with hair on both sides; flowers regular, bisexual 7.5 mm across, bright blue on short filiform pedicels, solitary or 2, bracts small linear-lanceolate, persistent, peduncle 9 mm long, filiform, hairy, usually longer than leaves; sepals 5, equal, 3.5 mm long, lanceolate, acute, very hairy; petals 5, fused into a nearly rotate corolla about 9 mm in diameter, lobes obscure; stamens 5, exerted; ovary superior, 2-locular with two ovules in each loculus, styles 2, each deeply bifid, stigmas linear; fruit capsule about 2.5 mm across, globose, 4-valved, 4-seeded with persistent calyx; seeds brown, glabrous.

Flowers all the year round.

**Illustrations.** Burmann, *Thes. Zeyl. pl.* 9. 1737; Wight, *Ill. pl.* 168b, f. 10. 1841—50; Kirtikar and Basu, *Indian Med. Plants, pl.* 668B. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs in tropical and subtropical countries, including India, Ceylon and Philippine Islands. In Ceylon, it is very common in dry and sandy ground in the low-country, up to an altitude of 2000 feet.

**India.** E. Bengal: East India Co., *Herb. Griffith* 5871/2, Kew Distribution 1863—4. Misor and Carnatic: G. Thomson, Malabar, Concan. etc. *Stocks, Law, etc. Pen. Ind. Or., Herb. Wight* 2004, Kew Distribution 1866—7. Ceylon. Northern Prov., *Thwaites C.P.* 1926; Talaimannar, J. M. Silva, July 1916. Western Prov., Negombo, *Senaratne, Dec.* 1940; Jaala, *Mudlr. Rajapakse, Dec.* 1913. Sabaragamuwa Prov., between Delgoda and Karawita, *Lewis and J. M. Silva, March* 1919. **Maldive Islands.** Hulule, *Gardiner* 64, 1899—1900; Heddufuri, *Gardiner* 1899—1900. **Indo-China,** Hue and vicinity, *Squires* 384, Jan-May 1927. **China.** Hongkong: *Herb. Hance* 502, Oct. 1809. **Philippine Islands:** Luzon: Zambales Prov., Mt. Tapolao, *Ramos and Edano* 44736, Nov.—Dec. 1924.

**Composition.** The stems and leaves of this plant contain an alkaloid, a yellow, neutral fat, an organic acid and a saline substance.

**Uses.** Reputed to be an excellent remedy for bowel complaints and dysentery. It is also used in the form of a decoction as a febrifuge, alterative, vermifuge, and for nervous debility, loss of memory, syphilis, scrofula, etc. With oil it is used to promote the growth of hair. The roots are used for intermittent fevers in children. The leaves are made into cigarettes and smoked in cases of chronic bronchitis and asthma.



FIG. 145. *Ipomoea angustifolia*. A, part of the stem with leaves. B, side view of flower C, longitudinal section of flower. D, fruit. E, seed, enlarged.

6. *Ipomoea angustifolia* Jacq., Ic. Rar. 2: pl. 317. 1786. (Fig. 145).

*Convolvulus medium* Moon—*Ipomoea tridentata* var. 8 Thw.

*Sinh.* Hin-madu.

An annual or biennial herb with very long stems, not twining, prostrate, not rooting at nodes, 5-angled, glabrous, wiry, slightly branched; leaves simple, alternate, without stipules, very numerous, 5—6.2 cm long, 1—1.3 cm broad on very short petioles, linear or narrowly lanceolate-oblong, dilated with coarsely dentate auricles at base, otherwise entire, cuspidate at apex; flowers regular, bisexual, solitary or 2 or 3 together, pale cream, red inside base of the tube, on thick, glabrous pedicels, peduncle 3.2—4.5 cm long, slender, stiff, divaricate; sepals 5, free, imbricate, 7—9 mm long, 2—3 mm broad, lanceolate, acuminate acute, glabrous, apices recurved; petals 5, fused into a funnel-shaped corolla, 2.5 cm in diameter, shallowly lobed; stamens 5, almost equal or unequal on corolla-tube; ovary superior, 2-locular with two ovules in each chamber with an annular disc below, style simple, elongated, stigmas 2, globose; fruit capsule about 6 mm across, depressed—globose with a persistent style, surrounded by slightly enlarged, persistent sepals, seeds glabrous.

Flowers during May and June.

**Illustrations.** Rheede, Hort. Malab. 11: pl. 55. 1678—1703; Curtis, Bot. Mag. pl. 5426. 1864.

**Distribution.** A weed found in the tropics of the Old World. In Ceylon, it is common in open places in mid and low-country.

**Ceylon.** Central Prov., Peradeniya *Jayaweera*, 772, Oct. 1951; *Jayaweera* 2215, Nov. 1955; *Jayaweera* 2585, April 1957.

**Uses.** Used as an ingredient, along with other drugs, as an application on the scalp for head ailments of people bitten by poisonous snakes. Milch cows fed on this plant are supposed to yield more milk.

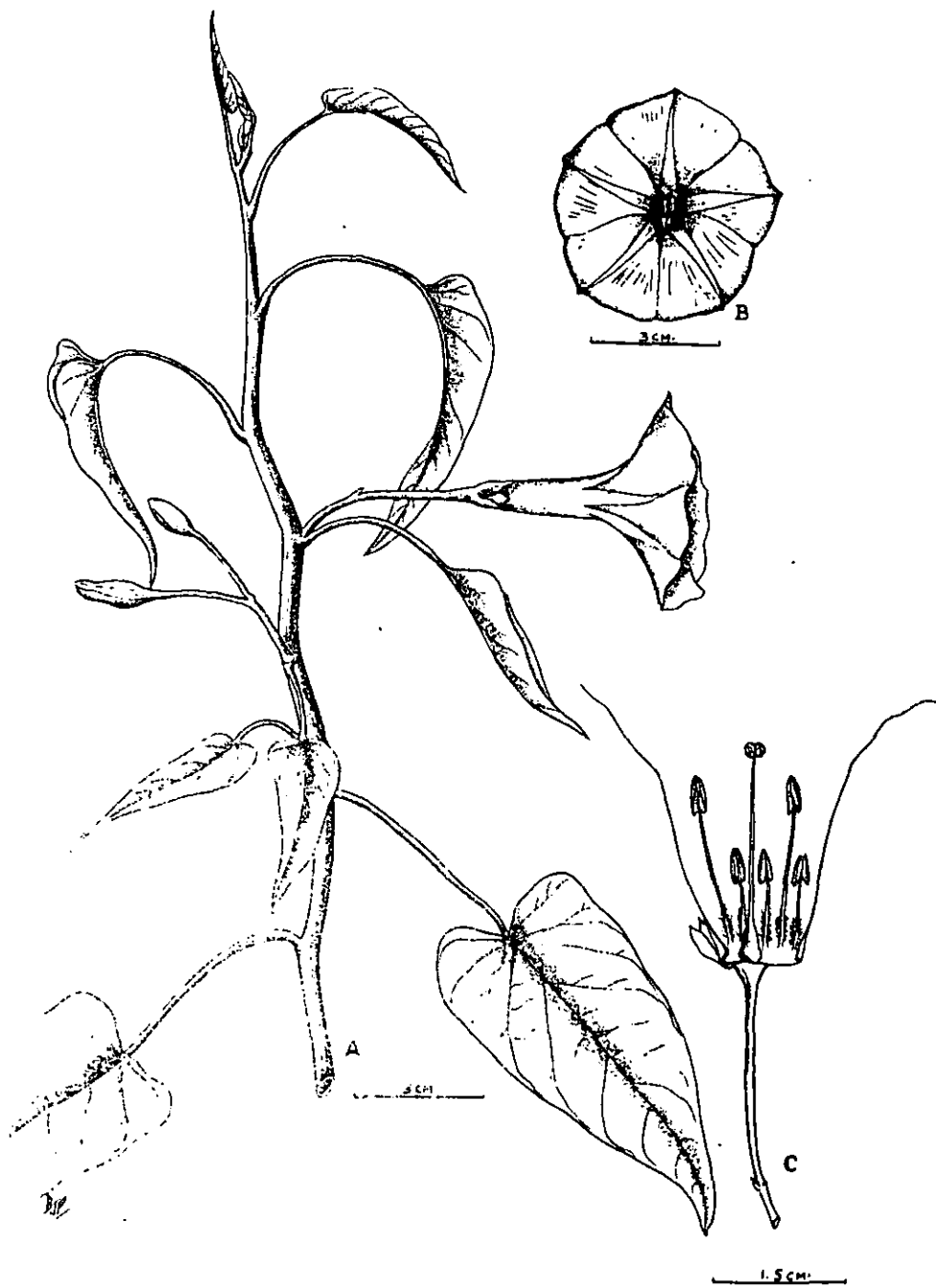


FIG. 146. *Ipomoea aquatica*. A, a branch with a flower and leaves. B, front view of a flower, C, flower with corolla opened out showing the pistil and stamens.

7. *Ipomoea aquatica* Forsk. Fl. Aegypt—Arab. 44. 1775. (Fig. 146).

*Ipomoea reptans* (Linn.) Poir.—*Ipomoea subdentata* Miq.—*Convolvulus reptans* Linn.—*Convolvulus adansoni* Lam.—*Convolvulus reptans* Vahl.

*Sinh.* Kankun; *Tam.* Koilangu, Sarkareivalli; *Hindi* Kalmisag, Karmi, Patuasaga; *Sans.* Kadambi, Kalaka, Kalambi, Kalambika, Kalashaka, Kechuka, Nadika, Pattashaka, Peehu, Pechuli, Shataparna, Shradhashaka, Vishvarochana.

Annual or biennial herb with long, prostrate stems rooting at nodes, thick, hollow, glabrous, internodes 7—14 cm long; leaves simple, alternate without stipules, 5—12 cm long, 4.5—7 cm broad, ovate-oblong, the base usually dilated and hastate with rounded or acute lobes, glabrous, paler beneath, petioles as long as or longer than the leaves; flowers regular, bisexual, rather large, dull purple on long glabrous pedicels, usually solitary, often 2, peduncle much shorter than the petiole, bracts small; sepals 5, free, imbricate, equal, 8 mm long, 4 mm broad, lanceolate, subacute, glabrous; petals 5, fused into a tubular, funnel-shaped corolla, limb about 4—5 cm diameter, lobes obscure; stamens 5, unequal, on corolla-tube, filaments 0.8—1.2 cm long, hairy at the base; ovary superior, 1.5 mm long, conical with a circular disc at the base, 2-locular with two ovules in each chamber, style simple, 1.5 cm long, stigmas 2, globose; fruit capsule dehiscent, globose, seeds minutely pubescent.

Flowers from August to November.

**Illustrations.** Rumph, *Herb. Amb.* 5: *pl.* 155, *fig.* 1, 1741—1745; Rheede, *Hort. Ind. Mal.* II: *pl.* 52. 1678—1703; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 665A. 1933; *Herb. Peradeniya*, drawing.

**Distribution.** Occurs in damp places throughout India, Ceylon, Burma and the Philippines. Often cultivated as a pot herb. It also occurs in Africa and Australia. In Ceylon, it is very common in shallow water and moist places in the dry regions.

**India.** Bengal: *J. D. Hooker and T. Thomson*. Punjab: *T. Thomson*. Malabar, Concan, etc., *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 1973, *Kew Distribution* 1866—7. Ceylon. *Thwaites C.P.* 3535. Southern Prov., Kirinde, Dorawe Aru, *Simpson* 9951, Aug. 1932.

**Composition.** An excellent source of iron, calcium and vitamins B, C, and G. It also contains protein, fat, vitamins C<sub>3</sub>, and B<sub>2</sub>, and an insulin-like principle.

**Uses.** The leaves are used as a vegetable. The plant is mildly laxative, and owing to the presence of insulin-like principle it is used against diabetes melitus. In Burma, the juice of the plant is employed as an emetic against arsenic and opium poisoning, while in Cambodia it is used as a poultice for cases of fever accompanied by delirium. The bud is applied on ringworm

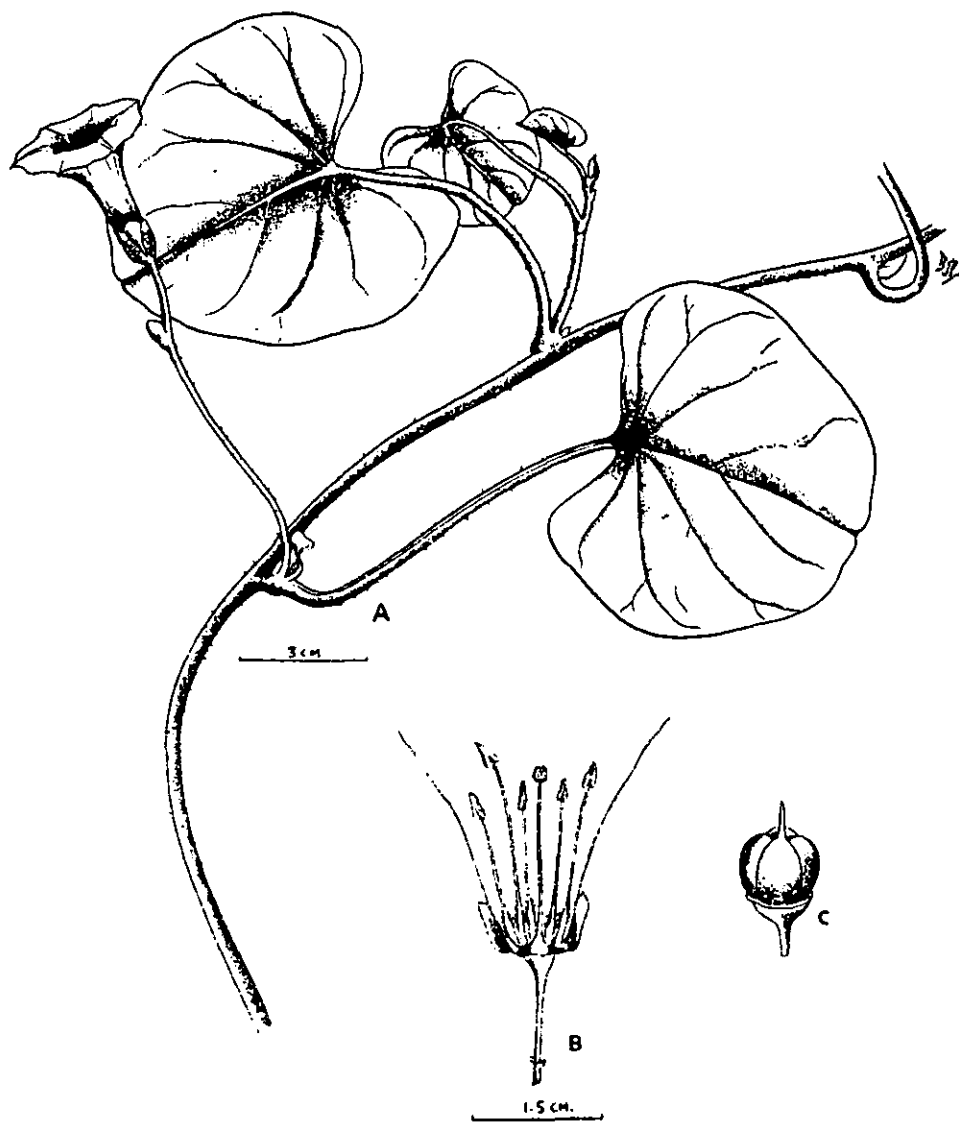


FIG. 147. *Ipomoea asarifolia*. A, portion of a branch with leaves and a flower. B, flower with corolla opened out. C, fruit.

8. *Ipomoea asarifolia* (Desr.) Roem. and Schult. Syst. 4: 251. (Fig. 147).

*Ipomoea repens* Lamk.—*Ipomoea rugosa* Choisy.—*Ipomoea beladombae* R. and S.—*Convolvulus rugosus* Rottl.—*Convolvulus repens* Moon—*Convolvulus beladambu* Spreng.

*Sinh.* Binthambuu, Ela-binthamburu, Ratu-binthamburu; *Tam.* Vari, Nali; *Hindi* Ganthian; *Sans.* Bhumilatha.

A prostrate herb, rooting at nodes, glabrous but with rough, small, warty projections; leaves simple, alternate, 3.5—6 cm long, 5—7.5 cm broad, reniform, slightly cordate at base, apiculate or rounded at apex, glabrous, rather thick with prominent veins beneath; petioles 3—8.5 cm long, erect, often rough with small points; flowers regular, bisexual, on glabrous pedicels 0.7—1.7 cm long, thickened upwards, 1—3 together, peduncle 1.8—3 cm long, bracts very small; sepals 5, free, imbricate, unequal, two outer 4.5 mm long, 3 mm broad, broadly oval, obtuse, apiculate, thick, transversely wrinkled and puckered, three inner 9 mm long, 4.5 mm broad, oval-oblong, membranous; petals 5, fused into a campanulate, pink-purple or white corolla, about 4 cm long, 3.7 cm in diameter; stamens 5, epipetalous, filaments unequal, hairy at the base; ovary superior, 2-carpellary with two ovules in each loculus, style simple, stigmas 2, globose; fruit capsule smooth, globose, 8 mm long, seeds yellowish, glabrous.

Flowers during May, June and November.

*Illustrations.* Rheede, Hort. Ind. Mal. 11: pl. 58. 1678—1703; Wight, Ic. Pl. Ind. Orient. 3: pl. 887. 1843—1845.

*Distribution.* Occurs in South India and Ceylon. It is very common in moist places in the low-country in Ceylon.

*Ceylon.* Thwaites C. P. 2850. Sabaragamuwa Prov., Ratnapura, *Herb. Peradeniya*, Feb. 1898

*Uses.* A tonic and alternative and is useful for anaemia, neurasthenia, general debility, chronic rheumatism and tertiary syphilis. It is used for poulticing sores, boils, skin eruptions, leprosy and elephantiasis. Along with other ingredients, it is used on fractures. The pounded leaf roasted in cow ghee is applied as a poultice on injuries of the eye with beneficial results. Medicinal oils, prepared with it are used for removing poisonous substances from the body.

The green variety is frequently used medicinally and so is the red-leaved variety.



FIG. 148. *Ipomoea mauritiana*. A, a branch with leaves and inflorescence. B, longitudinal section of a flower.

9. *Ipomoea mauritiana* (Jacq.) Abeywick., Ceyl. Journ. Sc. 2 (2): 215. 1959. (Fig. 148).

*Ipomoea digitata* Linn.—*Ipomoea paniculata* R. Br.—*Ipomoea gossypifolia* Willd.—*Ipomoea eriosperma* Beauv.—*Ipomoea insignis* Andr.—*Ipomoea tuberosa* G.F.W. Mey.—*Convolvulus paniculatus* Linn.—*Convolvulus digitatus* Spreng.—*Convolvulus pratensis* Spreng.—*Convolvulus roseus* Kunth—*Batatas paniculata* Choisy—*Batatas edulis* Choisy.

*Engl.* Giant Potato; *Sinh.* Kiribadu; *Tam.* Nilappuchani, Palmodikka, Palmudangi Pucharkkaraikkilangu, Valli; *Hindi* Bilaikand; *Sans.* Bhukshmandi, Bhumikushmanda, Gandhaphala, Gajavajipriya, Gajeshta, Ikshugandha, Kshirakhanda, Kshirashukla, Kshiravalli Kshiravidali, Kroshtri, Mahaveshta, Payasvini, Shreshtakanda, Shrigalika Shukla, Sita, Svadukanda, Svadulata, Triparna, Vajjvallabha, Vidali, Vidari, Vidarika, Vrikshavalli, Vrishyakanda, Vrishyavatlika, Vrishyavardhini.

A perennial twiner with very large, ovoid or elongated, tuberous roots and long, twining, tough, glabrous and shining stems; leaves simple, alternate, 8—15 cm long, broader than long, deeply palmately cut into 5 or 7 lanceolate-acuminate, obtuse lobes, glabrous, paler and with prominent veins beneath; petioles nearly as long as the leaves, glabrous, channelled above; flowers regular, bisexual, bright mauve-purple, large on glabrous pedicels, 1.5 cm long, in dichotomous cymes, peduncle 6 cm long and stout, exceeding the petiole; sepals 5, imbricate, 9 mm long, 8—10 mm broad, rotundate, obtuse, very concave and glabrous; petals 5, fused into a funnel-shaped corolla, 6—7.5 cm diameter, lobes emarginate, convolute and contorted in bud; stamens 5, filaments almost equal inserted on the corolla-tube, hairy at the base; ovary superior, 2—4 locular, glabrous, style simple, stigmas 2, globose; capsule 1.2 cm long, ovoid, closely surrounded by enlarged, rather fleshy sepals; seeds covered with very long, brownish, cottony hair which is readily detached.

Flowers during April, May and September.

*Illustrations.* Edward, Bot. Reg. pls. 75 and 333; Curtis, Bot. Mag. pls. 1790 and 3685; Kirtikar and Basu, Indian Med. Plants, pl. 662. 1933; Herb. Peradeniya., drawing.

*Distribution.* Occurs in tropical Asia, India, Ceylon, Africa, America, Australia and the Philippine Islands. In Ceylon, it is rather common in the low-country, generally near habitations, probably cultivated.

Ceylon. North Central Prov., *Herb. Peradeniya*. Aug. 1885. Central Prov., Peradeniya, Bot. Gard., *Jayaweera* 1307, Jan. 1955. Western Prov., Colombo, *Thwaites C.P.* 499.

*Uses.* The tuberous root is frequently used as a restorative, alterative, aphrodisiac, demulcent and galactagogue. It is an aromatic stomachic and cholagogue and is useful for chronic dyspepsia, acute and chronic congestion of the liver and jaundice. It is also a diuretic in addition to its demulcent qualities. It is useful against Bright's disease, acute and chronic pyelitis, cystitis gonorrhoea and strangury. Owing to its nutritive qualities, it may be employed as a substitute, for cod-liver oil to tone up and restore the system and for cerebral and spinal paralysis. It is essentially a uterine tonic and a regulator of menstrual functions. Maserated in its own juice and taken with milk and cow ghee, it increases sexual vigour and counteracts sterility. It has anti-rheumatic properties of much value and gives relief from both acute and chronic rheumatism.



FIG. 149. *Ipomoea maxima*. A, portion of the stem with leaves and flowering inflorescences. B, seed.

10. *Ipomoea maxima* (Linn. f.) G. Don in Sweet Hort. Brit. ed. 2, 373. 1830. (Fig. 149).

*Ipomoea sepiaria* Koenig.—*Ipomoea striata* Roth.—*Ipomoea heynei* Wall.—*Convolvulus maxima* Linn. f.—*Convolvulus maximus* Vahl—*Convolvulus striatus* Vahl—*Convolvulus marginatus* Lamk.—*Convolvulus sepiarius* Wall.—*Convolvulus incrassatus* Wall.

*Sinh.* Rasatelkola; *Tam.* Manjigai, Manjigam, Talikkirai, Talikkodi; *Hindi* Bankalmi; *Sans.* Asrabinduchhada, Lakshamana, Manjika, Nagaputri, Nagavha, Nagini, Puchhada, Putrada, Putrajani, Putrakanda, Tulini.

A perennial herb with slender, twining, glabrous or rarely hairy stems; leaves simple, alternate without stipules, 5—8.7 cm long, 2.2—5.7 cm broad, ovate or broadly ovate, widely cordate at base, shortly acuminate, obtuse or subacute, glabrous; petioles 2.5—5.3 cm long; flowers regular, bisexual, moderate-sized, white or pale pinkish-purple on glabrous pedicels 4—8 together, rather crowded in umbellate or corymbose cymes, peduncle 2.5—15 cm long, stout; sepals 5, broadly oval, imbricate, very obtuse with membranous margins, the two outer sepals shorter than the inner ones; petals 5, fused into a salver-shaped corolla, corolla-tube 2.5 cm long, purple within, limb 3.1 cm diameter, lobes shortly apiculate, convolute and contorted in bud; stamens 5, unequal on corolla-tube, filaments short, hairy at the base; ovary superior, 2-locular with 2 ovules in each chamber, style simple, stigmas 2, globose; fruit capsule 0.8—1 cm long, ovoid, glabrous, dehiscent, seeds grey with adpressed silky pubescence.

Flowers in July and August.

*Illustrations.* Rheede, Hort. Ind. Mal. 11: pl. 53. 1678—1703; Wight, Ic. Pl. Ind. Orient. pl. 838. 1843—45; Herb Peradeniya., drawing.

*Distribution.* Occurs throughout India, Ceylon, Malaya and Formosa. In Ceylon, it is common in the dry low-country.

*Ceylon.* Northern Prov., Jaffna, *Thwaites C.P.* 1937. North Western Prov., Kurunegala, *Herb. Peradeniya.*, Sept. 1888. Southern Prov., Hambantota, *Alston*, Dec. 1926; Ruhuna National park, *Fosberg* 50371, April 1968.

*Uses.* Used as a deobstruent, diuretic and as an antidote for arsenic poisoning.

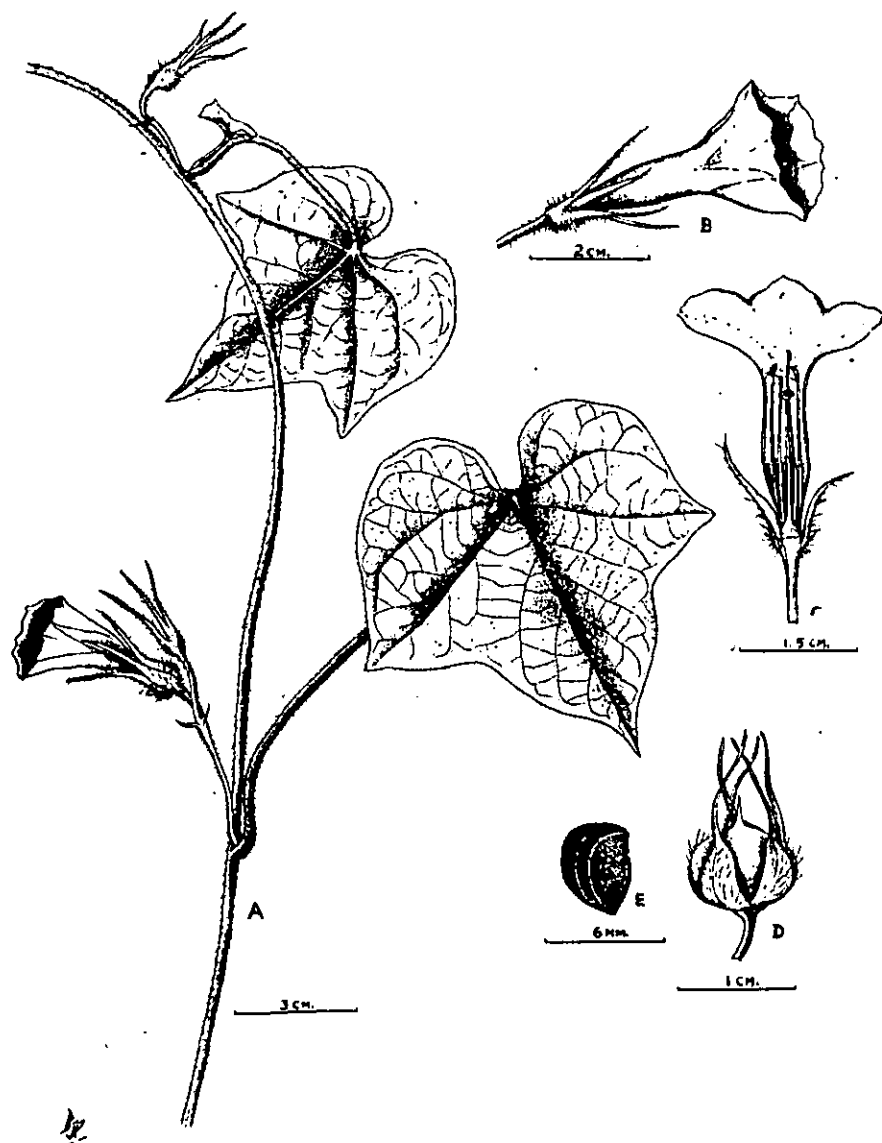


FIG. 150. *Ipomoea nil*. A, a branch with leaves and a flower. B, lateral view of a flower. C, longitudinal section of a flower showing the stamens and the pistil. D, fruit with persistent calyx. E, seed.

11. *Ipomoea nil* (Linn.) Roth. *Cataleca Botan.*, 1: 36. 1797. (Fig. 150).

*Convolvulus nil* Linn.—*Convolvulus hederaceus* Linn.—*Convolvulus dillenii* Lamk.—*Convolvulus coeruleus* Spreng.—*Convolvulus triloba* Moench.—*Ipomoea coerulea* Koen.—*Ipomoea punctata* Pers.—*Ipomoea barbata* Roth.—*Ipomoea dillenii* Roem. and Schult.—*Ipomoea hederacea* (Linn.) Jacq.—*Pharbitis hederacea* Choisy—*Pharbitis nil* Choisy—*Pharbitis diversifolia* Lindl.—*Pharbitis variifolia* Dcne.—*Pharbitis purshii* G. Don—*Pharbitis punctata* G. Don—*Pharbitis barbata* G. Don.

*Engl.* Indian Jalap; *Sinh.* Kaladana; *Tam.* Kakkattan, Kodikkakkattan, Sirikki, Tali; *Hindi* Kaladanah, Mirchai; *Sans.* Krishnabija, Shyamabija, Shyamalabijaka.

An annual herb with slender, twining, hirsute stems; leaves simple, alternate on very long, hairy stalks without stipules, 5—8 cm long, 4.5—8 cm broad, cordate at base, more or less deeply cut into 3 acute lobes, middle lobe the largest, margin entire, slightly hairy on both sides especially on veins beneath, petioles 1.5—9 cm long; flowers regular, bisexual, large on short, stout pedicels, usually solitary but often in threes, bracts linear, persistent, peduncle 3.5—6 cm long, hairy; sepals 5, free, imbricate, 2.5—2.8 cm long, linear, dilated below, acute, hairy outside but glabrous inside; petals 5, fused into a tubular funnel-shaped corolla limb about 5 cm diameter, pale blue or pink; stamens 5, unequal on corolla-tube, filaments included, hairy at base; ovary superior, surrounded by a small entire annular disc, 3-locular with two ovules in each loculus, style simple, thickened at the base, stigmas 2-lobed, globose; fruit capsule 1.2 cm diameter, dehiscent, surrounded by much longer enlarged sepals, globose, 3-valved; seeds 6, each about 0.6 cm long, ovoid—triangular, glabrous and dull black.

Flowers from January to May.

*Illustrations.* Bentley and Trimen, *Med Plants*, pl. 185. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 661. 1933.

*Distribution.* Occurs in all the tropical and subtropical countries including India, Ceylon and Philippine Islands. In Ceylon, it is found commonly in the low country, mostly cultivated. Jaffna, Polonnaruwa, Mannar, Peradeniya, etc.

*India.* Sup. Ganget. Plan., *T. Thomson*. Pen. Ind. Or., *Herb. Wight* 1969, Kew Distribution 1866—8. *Ceylon.* *Thwaites C.P.* 1938. Northern Prov., Mannar, *Simpson* 9326. Central Prov., Nalanda, *Alston* 2455, May 1928; Peradeniya, Bot. Gardens, *Alston* 1303, Sept. 1926. *Burma.* *Mokin* 582, Nov. 1902. Pegu, *Wallich* 1373/2.

*Composition.* Contains a resin which has a nauseous, acrid taste and unpleasant odour.

*Uses.* In many parts of India, the roasted seeds are used as a purgative. In China, the seeds are regarded as diuretic, anthelmintic and deobstruent. They are prescribed for dropsy and constipation and also to cause abortion.

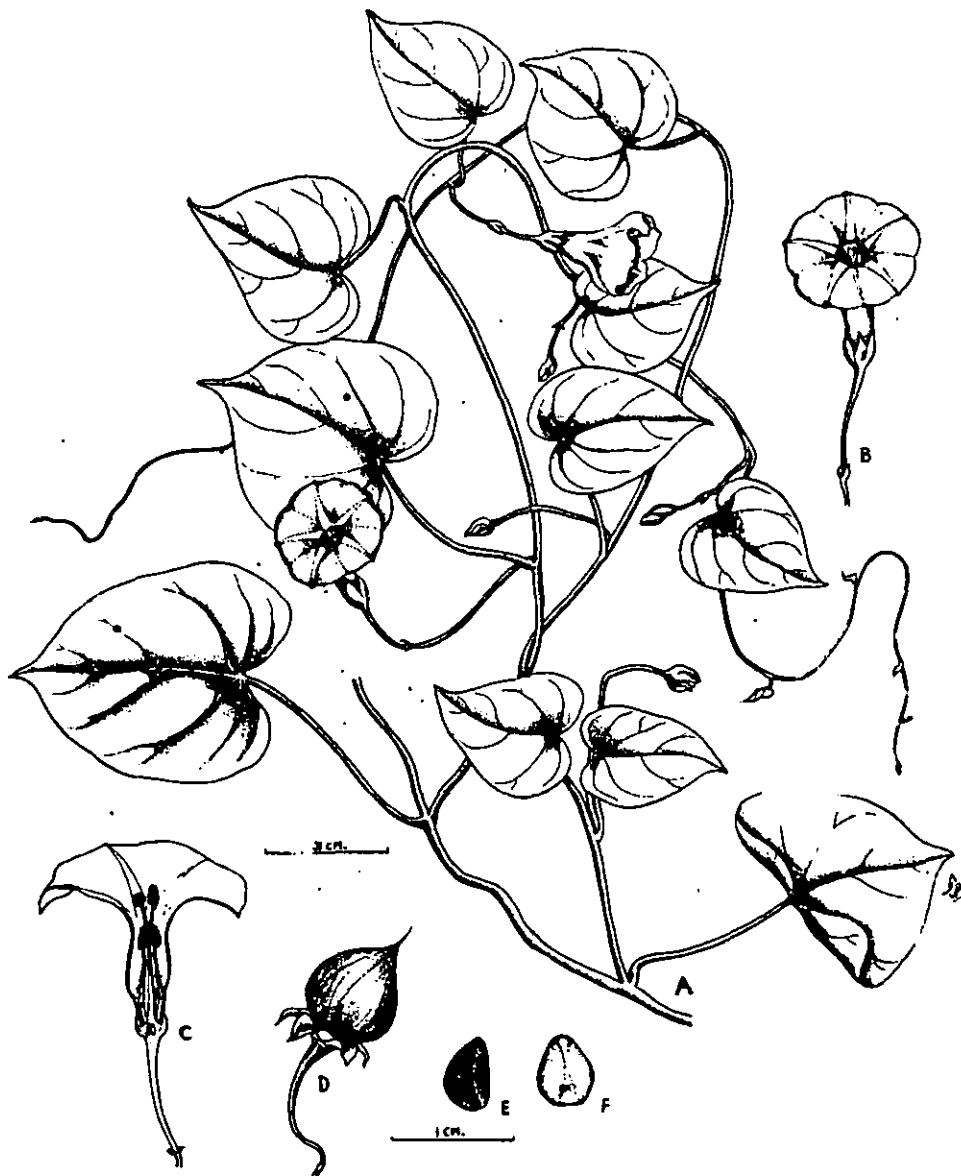


FIG. 151. *Ipomoea obscura*. A, branch with leaves and flowers. B, side view of flower. C, longitudinal section of flower. D, fruit capsule. E, seed from side. F, seed from front.

12. *Ipomoea obscura* (Linn.) Ker-Gawl. in Bot. Reg. Pl. 239. 1817. (Fig. 151).

*Ipomoea insuavis* Blume—*Ipomoea ocularis* Bartl.—*Ipomoea ochroleuca* Spanogoe—*Convolvulus obscurus* L.

*Sinh.* Mahamadu, Telkola; *Tam.* Chirudali, Chirutali, Kuruguttali, Sirudali, Siruttali; *Sans.* Vachagandha.

A twining plant with very long, slender, glabrous or slightly hairy, purplish green stems; leaves simple, alternate, without stipules, 5—7.5 cm long, 4—6.5 cm broad, deeply cordate-ovate, acuminate, subacute, glabrous or finely ciliate, thin, petioles 3.7—5 cm long, glabrous or pubescent; flowers regular, yellowish white with a small purple eye, bisexual, rather small, on stout glabrous or pubescent pedicels 0.6—2 cm long, solitary or 2 together, peduncles 3—4.3 cm long, bracts very small; sepals 5, imbricate, nearly equal, 5—5.5 mm long, 3.5—4 mm broad, ovate, shortly cuspidate; petals 5, fused into a wide tubular corolla, corolla-tube 1 cm long, cylindrical, limb 2.5 cm diameter; stamens 5, unequal on corolla-tube; ovary superior, 2-locular with two ovules in each chamber, style simple, about 1 cm long, stigmas 2 globose; fruit capsule dehiscent, 1 cm long, ovate-ovoid, tipped with the style on thickened, deflexed pedicel, seeds ovoid, 4 mm long, dark brown and densely velvety.

Flowers from July to August.

*Illustrations.* Ker-Gawl., Bot. Reg. pl. 239. 1817; Kirtikar and Basu, Indian Med. Plants, pl. 659.4 1933; Herb. Peradeniya., drawing.

*Distribution.* Occurs throughout India, Ceylon, Malaya, Mascarene Islands and East Africa. It is common in the low-country in Ceylon, both in the dry and moist regions. Anuradhapura, Dambulla, Hantane, Peradeniya, Colombo, etc.

*India.* Plan Ganget. Sup., T. Thomson. Maisor and Carnatic: G. Thomson. Ceylon. Dambulla, Thwaites C.P. 1935, March 1868; Peradeniya, Alston 1305, Dec. 1925.

*Uses.* The leaves are used as an application on aphthous affections. The latex is used for treatment of gangrenous sores and for the preparation of medicinal oils used for the same purpose. The bruised fresh leaves are often applied to remove pieces of broken needles and to remove foreign bodies from the eye. Internally, they act as a cardiac, stomachic, expectorant, and diuretic and are useful for chronic dyspepsia, bronchitis and renal and hepatic dropsy.



FIG 152. *Ipomoea pes-caprae*. A, branch with leaves and a flower. B, longitudinal section of flower.

13. *Ipomoea pes-caprae* (Linn.) Roth. Nov. Sp. 109. 1821. (Fig. 152).

*Ipomoea biloba* Forsk.—*Ipomoea carnosa* F.—Vill.—*Ipomoea maritima* R. Br.—*Convolvulus pes-caprae* Linn.—*Convolvulus maritimus* Lamk.—*Convolvulus bilobatus* Roxb.—*Batatas maritima* Bojer.

*Engl.* Goat's Foot Creeper; *Sinh.* Mudu-bintamburu; *Tam.* Adambu, Adappangodi, Attukkal, Musattalai; *Hindi* Dopatilata; *Sans.* Manmatha, Maravalli, Maryada, Rakta-pushpa, Sagara, Sagaramekhala, Yugmapatra.

A prostrate, weak, perennial, not twining nor rooting at nodes with cylindrical, very long, glabrous and reddish stems, internodes 5.5—14 cm long, roots with a thick brown bark, leaves simple, alternate, 2.5—6.5 cm long, 3.5—8.5 cm broad, deeply bilobed, lobes obliquely oval spreading, sub-coriaceous, glabrous, venation conspicuous on the lower surface and reddish, pellucid, midrib terminating in a mucro between the lobes; petioles 5—10 cm long, erect, glabrous, reddish with 2 glandular spots at the summit; flowers regular, bisexual, very large, 5.5 cm long, solitary or 2 or 3 together, purplish-rose, on pedicels 2—3.7 cm long, bracts lanceolate, falling early, peduncle erect, 2—5.5 cm long; sepals 5 imbricate, 0.8—1.2 cm long, 0.7—1 cm broad, broadly oval, subacute or obtuse, mucronate; petals 5, fused into a widely funnel-shaped corolla, 5.5—7.5 cm diameter; stamens 5, unequal, on corolla-tube, filaments dilated and hairy at base; ovary superior, 2 mm long, 2-locular with two ovules in each chamber, style 1.9 cm long, stigma globular, 2-lobed; fruit capsule 1.2 cm long, ovoid, glabrous; seeds pubescent, dark brown.

Flowers from October to December.

*Illustrations.* Edward, Bot. Reg. pl. 319. Rumph., Herb. Ambo. 5: pl. 159, fig. 1. 1747; Rheede, Herb. Mal. 11: pl. 57. 1678—1703; Kirtikar and Basu, Indian Med. Plants, pl. 667A. 1933; Herb. Peradeniya, drawing.

*Distribution.* Grows along the sea shores of both hemispheres. In Ceylon, it is very common on the sandy seashore all round the island.

*India.* Maisor and Carnatic, G. Thomson. Chittagong: J. D. Hooker and T. Thomson. Ceylon. *Thwaites C.P.* 1934. Northern Prov., Talaimannar, J. M. Silva, July 1916. Eastern Prov., Pottuvil, F. W. de Silva, March 1929. Maldive Islands. *Didi* 41, 1896; Minikoi, *Gardiner* 19, 1899—1900. Philippine Islands. Luzon: Prov. of Union, Bauang, *Elmer* 5649, Feb. 1904.

*Composition.* Contains a volatile oil, a complex resin, fat, phytosterol, bitter substances and red colouring matter.

*Uses.* The leaves are applied externally for rheumatism, colic and as a paste on boils and carbuncles. The juice is given as a diuretic in dropsy. In Madagascar the leaves are frequently used for inflammation of the legs, prolapsus ani, whitlow, colic and rheumatism. In the Philippines, the leaves are employed as an escharotic to extirpate the fungoid growth in ulcers. It is used as a purgative in Brazil. In Australia, the boiled leaf is applied as an anodyne in colic and rheumatism. The boiled tuber is diuretic and brings relief to diseases of the bladder. The seed is used for treating stomachache and cramps.

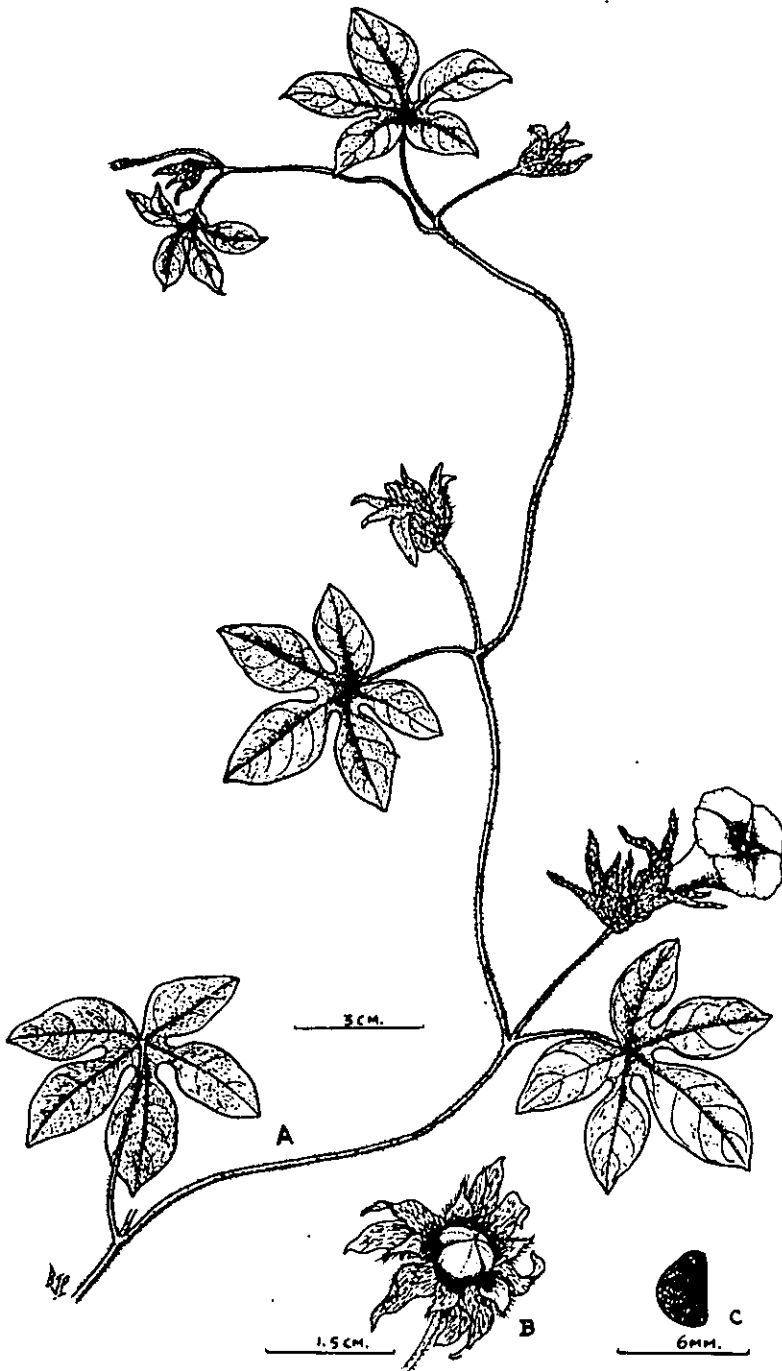


FIG. 153. *Ipomoea pes-tigridis*. A, a portion of the plant with leaves and flowers. B, fruit with the bracts and calyx spread out. C, seed.

14. *Ipomoea pes-tigridis* Linn. Sp. Pl. 162. 1753. (Fig 153).

*Convolvulus pes-tigridis* Spreng.—*Convolvulus bryoniaefolius* Salisb.—*Convolvulus palmata* Moench.—*Ipomoea hepaticaefolia* Linn.

*Engl.* Tiger's Foot, Bindweed; *Sinh.* Diviadiya, Divipahuru; *Tam.* Pulichovadi, Punaikkirai; *Sans.* Chakra.

An annual, prostrate, twining or straggling herb with long, spreading hairs, leaves simple, alternate without stipules, 3.5—7.5 cm long, and as broad, rotundate in outline, more or less deeply and palmately cut into 5, 7 or 9 ovate—acute lobes narrowed at base, hairy on both sides; petioles 2.3—6.5 cm long with long hair; flowers regular, bisexual, sessile, 2 or more in a head, bracts oblong-oval, or ovate-oblong, obtuse, hairy, outer ones nearly 2.5 cm long, inner ones 1 cm long, peduncle 2.5—7.5 cm long, stout, very hairy; sepals 5, imbricate, nearly equal, 8—12 mm long, lanceolate, very acuminate with copious, long hair, two outer sepals broader than the inner ones; petals 5, fused into a tubular—campanulate corolla 4 cm long, limb 2.5 cm diameter, white or pale pink; stamens 5, filaments usually unequal on the corolla-tube; ovary superior, 2-locular with two ovules in each chamber, style simple, stigmas 2, globose; fruit capsule glabrous concealed in a persistent, hairy calyx, 6—7 mm long, globose; seeds 4.5 mm long, triquetrous with one phase rounded, pubescent.

Flowers in October.

**Illustrations.** Rheede, Hort. Ind. Mal. 11: pl. 59. 1678—1703; Wight, Ic. Pl. Ind. Orient. 3: pl. 836. 1843—1845; Kirtikar and Basu, Indian Med. Plants, pl. 664. 1933; Herb. Peradeniya., drawing.

**Distribution.** Occurs in India, Ceylon, Malaya, China, Polynesia, Philippine Islands and in tropical Africa. In Ceylon, it is common in the low-country, confined to dry, sandy places.

**India.** Ganget. Plain., *T. Thomson*. Maisor and Carnatic, *G. Thomson*. Ceylon. *Thwaites* C.P. 1942. North Western Prov., Mannar, *Herb. Peradeniya.*, Feb. 1890. North Central Prov., Polonnaruwa, *Senaratne* 3497, June 1943. Southern Prov., Hambantota, Ruhuna National Park, *Fosberg* 50225, April 1968.

**Uses.** The root of this plant is a purgative. The leaves are used for poulticing sores, boils and carbuncles. The plant is also used for treatment of rabid dog bites. It is a nervine and muscular tonic and is used in neurasthenia, debility of old age and paralytic conditions. It has some aphrodisiacal properties.

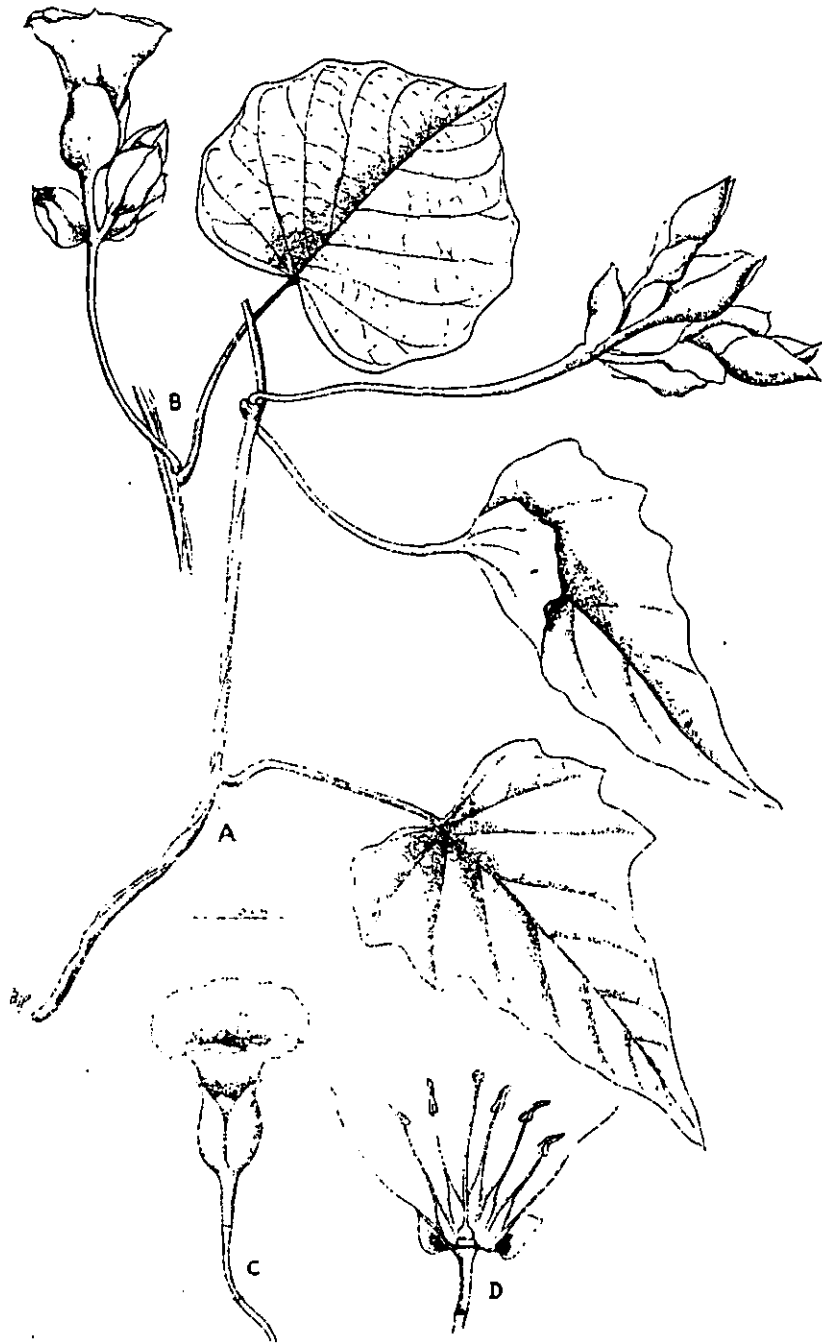


FIG. 154. *Operculina turpethum*. A, portion of a stem with one form of leaves and inflorescence. B, cyme with an open flower and another form of leaves. C, flower from side. D, flower with corolla opened showing the stamens and the pistil.

15. *Operculina turpethum* (Linn.) S. Manso, Enum. Subst. Bras. 16 and 40. 1836 (Fig. 154).

*Ipomoea turpethum* R. Br.—*Ipomoea replans* Llanos—*Ipomoea ventricosa* Llanos—*Ipomoea anceps* Roem. and Schult.—*Ipomoea triquetra* Roem. and Schult.—*Convolvulus maximus* Blanco—*Convolvulus turpethum* Linn.—*Convolvulus anceps* Linn.—*Convolvulus triquetra* Vahl—*Spiranthera turpethum* Bojer—*Argyreia alulata* Miq.—*Turpethum repens* Bauh.

*Engl.* False Jalap, Indian Jalp, Turpeth root; *Sinh.* Thrasthavalu, Tirassa valu; *Tam.* Adimbu, Kumbam, Kumbanjan, Kunagandi, Paganrai, Samaran, Saralam, Sivada; *Hindi* Nisotar, Nisoth, Nukpatar, Pitohri, Tarbal, Tarbud, Trabal; *Sans.* Ardachandra, Aruna, Kalameshi, Kalaparni, Kali, Kalingika, Kumbhadhatri, Laghurochani, Malavika, Masuravidala, Masuri, Nandi, Paripakini, Rechani, Rochani, Saha, Sara, Sarana, Sarasa, Sarata, Sarvanubhuti, Shyama, Susheni, Suvaha, Tribhandi, Tripura, Trivela, Trivrit, Trivrittika, Vidala.

A perennial, twining climber with long, slender, fleshy, much-branched roots and very long, non-woody, much twining, slightly pubescent, angled stems, the angles widely winged, tough, brown and fibrous when old, young stems nearly cylindrical and densely pubescent; leaves simple, alternate without stipules, 7—11 cm long, 6.5—10 cm broad, broadly ovate or oblong—cordate, subacute, slightly repand, shallowly cordate at base, margin entire or slightly undulately lobed, more or less pubescent on both sides, especially when young, minutely reticulate; petioles 2—8 cm long, slightly pubescent. flowers regular, bisexual rather large, 4 cm long and as much in diameter, white in simple cymes, 2—5 flowers together, pedicels stout, thickened upwards, pubescent, peduncle 6—8.5 cm long; bracts large, 2.7 cm long, 1.8 cm broad, oblong—lanceolate, pubescent, apiculate, soon falling off; sepals 5, unequal, imbricate, the two outer 2.5 cm long and as broad, ovate, membranous, mucronate, hairy on both sides, sprinkled over with black dots, becoming much enlarged in the fruit, inner sepals 1.7—2 cm long, 1.4—1.7 cm broad, hairy; petals 5, fused into a more or less rotate corolla, 4 cm in diameter, segments obscure, convolute and contorted in bud; stamens 5, epipetalous, filaments dilated at base and hairy; ovary superior, 2 mm long, 2-locular with 2 ovules in each chamber, style simple, 1.6 cm long, stigma globose; fruit capsule over 1.2 cm long, completely enclosed in enlarged, brittle, membranous, fleshy sepals, shortly stalked, depressed, strongly 4-lobed, slightly hairy; seeds large, glabrous.

Flowers during May and November.

*Illustrations.* Edward, Bot. Reg. 4: pl. 279. 1818; Curtis, Bot. Mag. 46: pl. 2093. 1819; Kirtikar and Basu, Indian Med. Plants. pl. 666. 1933.

*Distribution.* Occurs throughout the tropics of the Old World, including India and Ceylon. It is found in damp shady places in the low-country in Ceylon, often cultivated.

*India.* Bengal: Wallich 1371/1. Mount Nilghiri and Kurg. G. Thomson. Malabar, Concan, etc., Stocks, Law, etc. Ceylon. Central Prov., Kandy, Suduhumpola, Herb. Peradeniya., June 1894. *Maldive Islands.* Didi 23, 1896. *Philippine Islands.* Luzon: Clemens, Feb. 1924.

*Composition.* The roots of this plant contain the glucosides, turpethin and turpethin. Turpethin is made up of l-turpethin containing jalapic, ipomoic and tampicollic acids and f-turpethin.

*Uses.* The fleshy roots are used along with other ingredients for fever, cough, asthma, skin diseases, sores, boils, itches, etc., anaemia, diarrhoea, piles, dyspepsia, rheumatism, gout, vomiting, biliousness, urinary diseases such as strangury, dysuria, stones in the bladder, diseases of the spleen and all ailments due to excessive indulgence in alcohol. The powdered root is given as a purgative. With ginger, it is particularly beneficial in rheumatic and paralytic affections. The plant has a considerable degree of antibiotic action.

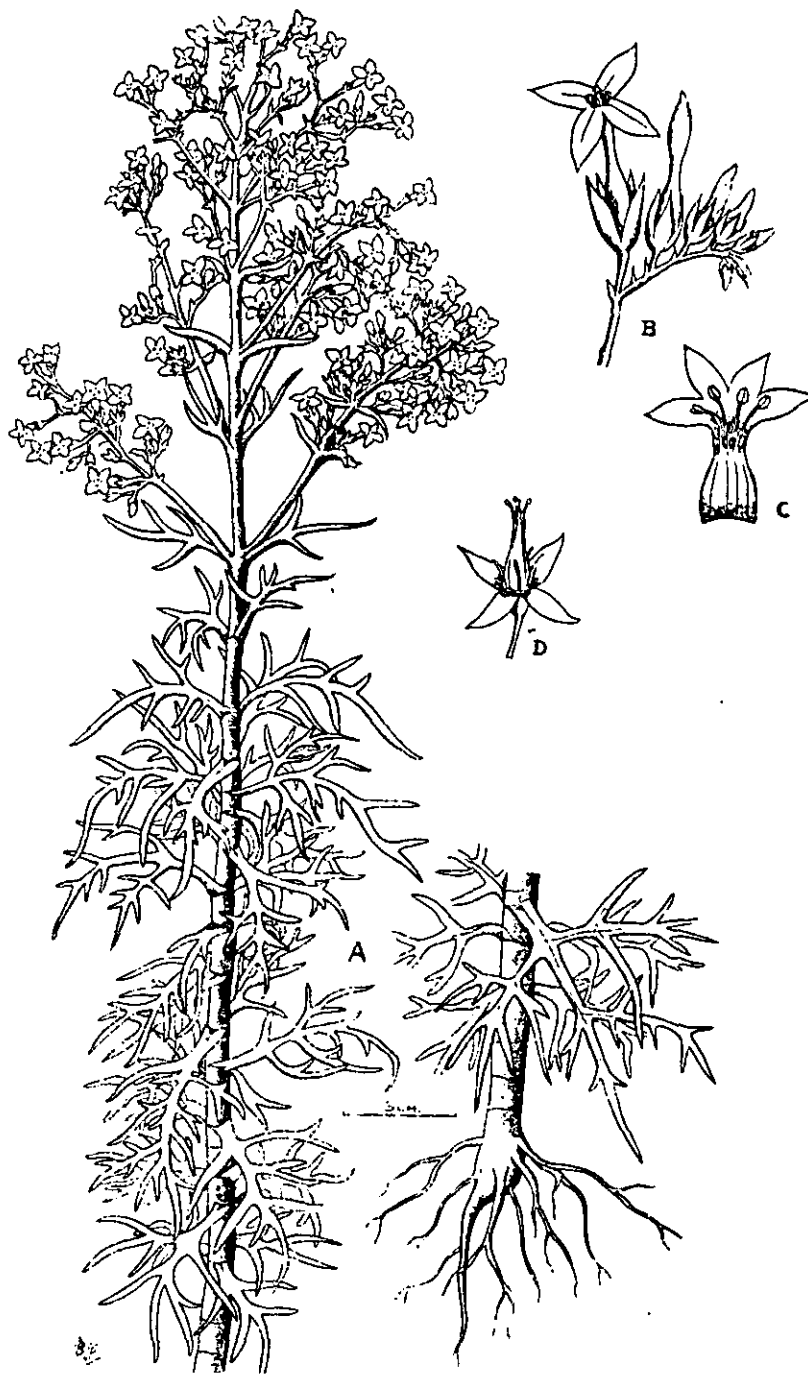


FIG. 155. *Kalanchoe laciniata*. A, adult plant in flower. B, part of the inflorescence with an open flower. C, corolla opened out showing the stamens. D, flower with corolla removed showing the scales at base of ovary.

### 34. CRASSULACEAE

1. *Kalanchoe laciniata* DC. Succ. Pl. and Grass. 2: *pl.* 100. 1799. (Fig. 155).

*Kalanchoe teretifolia* Haw.—*Cotyledon laciniata* Linn.—*Cotyledon serrata* Blanco—*Cotyledon lanceolata* Blanco—*Bryophyllum serratum* Blanco—*Bryophyllum triangulare* Blanco.

*Sinh.* Akkapana; *Tam.* Malakalli; *Hindi* Hamsagar; *Sans.* Asthibhaksha, Hema-sagara, Parnaviji.

A large, glabrous, succulent herb, 0.9—1.2 m tall, stems stout, slightly branched, pale glaucous green; leaves opposite, numerous without stipules, large, very succulent, 7.5—10 cm long, very variable, the lowest deeply divided, segments narrow—oblong, acute, dentate, serrate or crenate, middle leaves more or less deeply pinnatifid and the uppermost ones with narrow almost cylindrical segments, all shining, pale, glaucous green; petioles flattened, fleshy, amplexicaul, 2.5—3.8 cm long; flowers regular, bisexual, rather large, bright chrome yellow in large, lax, paniculate cymes, pedicels glabrous, bracts linear; sepals 4, very slightly connate at base, glabrous or pubescent, 3—5 mm long, narrowly lanceolate, acute, somewhat spreading; petals 4, fused to form an inflated corolla-tube 1.3 cm long, segments 3 mm long, oval or lanceolate, acute; stamens 8, inserted in two rows on the tube of the corolla; ovary superior, 4-carpellary, slightly adnate to the base of the corolla, carpels distinct, each with a linear hypogynous scale at the base, style long; fruit of 4 follicles, 8 mm long, glabrous, seeds numerous.

Flowers from March to May.

**Illustrations.** Wight, *lc. Pl. Ind. Orient.* 4: *pl.* 1158. 1846; Haworth in Wall. *Pl. As. Rar.* 2: *pl.* 166. 1831; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 406. 1933.

**Distribution.** Grows in India, Burma, Ceylon, Java and tropical Africa. It is rare in Ceylon, mostly confined to the lower montane zone; Matale East, Kandy, etc.

**India.** Madras: *Cleghorn* 212. *Pen. Ind. Or., Herb. Wight* 957, Kew Distribution 1866—7. **Ceylon.** Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*. Feb. 1901. **Burma.** Jungai, *Mockin* 844, Dec. 1902.

**Composition.** The leaves contain a yellow organic acid, cream of tartar, sulphate and oxalate of calcium, tartaric acid, fat and malic acid.

**Uses.** The leaves and roots are used for the treatment of urinary diseases. The juice of the leaves is given for diarrhoea, dysentery, lithiasis, cholera and phthisis. The ground leaves are applied to chronic sores and ulcers. In Malaya, a poultice of the leaves is applied to the chest for coughs and colds. The juice of the roasted leaves is applied to bruises and contusions. In Central Africa, the leaf is applied to give relief from itch. A curry made from the leaves, helps to dissolve stones in the bladder.



FIG. 156. *Brassica alba*. A, plant with leaves, flowers and fruits. B, flower with perianth removed. C, ripe fruit. D, longitudinal section of fruit. E, seed (enlarged).

### 35. CRUCIFERAE

1. *Brassica alba* Hook f. and Th. in Hook. Fl. Brit. Ind. 1: 157. 1872. (Fig. 156).

*Brassica foliosa* Willd.—*Sinapsis alba* Linn.—*Leucosinapsis alba* Spach.

*Engl.* White Mustard; *Sinh.* Ela-aba; *Tam.* Kagudu, Venkaduku; *Hindi* Sufed-rai; *Sans.* Siddhartha.

An erect, annual herb, about 60 cm high with a few, ascending branches, stiff, bright green, bristly with reflexed hairs throughout; leaves simple, alternate, petioled, pinnatifid, the lowest ones with a terminal lobe large, the divisions reaching to the midrib, uppermost ones less cut, rough with hairs; flowers regular, bisexual, yellow in corymbose racemes, pedicels longer than the calyx, ebracteate; sepals 4, nearly oblong, pale green, spreading; petals 4, alternating with the sepals, pale yellow, spreading; stamens 6, hypogynous, tetra-dynamous, the two with the shortest filaments lateral, inserted lower than the others with a small gland placed above the base of each, the four with longer filaments placed in pairs antero-posteriorly, with a large gland at the base of each pair, anthers versatile; pistil superior, oblong-ovoid, a little longer than stamens, hairy below, acuminate at apex; siliquas 2.5—3.7 cm long, on divaricate stalks, spreading, the lower half bearded with 4—6 contained seeds, the upper half a flat, vertical, nearly smooth beak curved upwards with a seed contained at its base, valves short with 3 prominent veins, strongly bristly; seeds subglobular, 2.5 mm diameter, pale yellow, testa smooth.

**Illustration.** Bentley and Trimen, *Med. Plants*, pl. 23. 1880.

**Distribution.** Occurs in east Syria and throughout southern Europe. It is a frequent weed in cultivated ground in England, Asia Minor, Algeria and China. It is cultivated in the Punjab in India.

**Composition.** The seeds on grinding yield a fixed oil and myrosin. They also contain a crystalline principle called sinalbin which is a compound of sulphocyanate of acrinyl, sulphate of sinapin and sugar.

**Uses.** Mustard is a powerful stimulant and a valuable rubefacient. It is used as an emetic in narcotic poisoning and diuretic for dropsy. As a poultice, it is applied on the chest for bronchitis, pleurisy and for alleviation of neuralgic pains. The powdered seeds are added to warm water and used to bathe the feet in cases of high fever.

Mustard is frequently used as a condiment, as it promotes the appetite and assists digestion.



FIG. 157. *Brassica integrifolia*. A, plant with leaves, flowers and fruits. B, branch of same. C, flower from front. D, flower from side. E, flower with perianth removed showing the stamens and pistil. F, fruit whole and in longitudinal section.

2. *Brassica integrifolia* (West) O.E. Schulz ap. Symb. Antill. 3 (3): 509. 1903. (Fig. 157).

*Brassica juncea* Hook. f. and Th.—*Brassica willdenovii* Boiss.—*Brassica orientalis* Blanco—*Sinapsis juncea* Linn.—*Sinapsis integrifolia* Willd.—*Sinapsis amosa* Roxb.—*Sinapsis rugosa* Roxb.—*Sinapsis cuneifolia* Roxb.—*Sinapsis brassicata* Blanco—*Sinapsis sinensis* Blanco.

*Engl.* Indian Mustard; *Sinh.* Aba; *Tam.* Kadugu; *Hindi* Badshahirai, Barirai, Barlai, Gohnsarson, Khasrai, Rai, Sarson, Sarsonlahi, Shahzadarai; *Sans.* Rajika. Sarshapa.

Erect, annual herb with a stem, 0.4—1 m high, glabrous or with a few bristles at the base, much branched, often purplish up to the pedicels, leaves large, pinnatifid without basal lobes, terminal lobe much the largest; basal leaves long, persistent, 5—10 cm long, broadly obovate, cuneately narrowed into the petiole, unequally and more or less coarsely dentate, middle leaves oblong, upper ones linear, slightly obtuse, narrowed at base, entire, all glabrous, membranous, glaucescent; flowers regular, bisexual, yellow, 6—8 mm long, in long racemes; sepals 4, spreading, somewhat saccate at base; petals 4, obovate—spathulate; stamens 6, hypogynous, tetradynamous, the two with the shortest filaments lateral, inserted lower than others, anthers versatile; ovary superior, 2-carpellary, 12—18 ovuled; siliques 1.5—3 cm long, somewhat contracted between seeds; beak narrowly conical, seedless, nearly 1.2 cm long; seeds 1—1.3 mm diameter.

**Illustration.** Kirtikar and Basu, Indian Med. Plants, *pl.* 65. 1933.

**Distribution.** This herb has a wide distribution. It occurs from Egypt to China and is often cultivated in India. In Ceylon, it occurs as a weed in vegetable plantations.

**India.** Tibet: *T. Thomson*. Sikkim: *J. D. Hooker*. Punjab: *T. Thomson*. Calcutta, *Bot. Gard.*, cultivated. Ceylon. Eastern Prov., Trincomalee, *Thwaites C.P. 3772*. Central Prov., Haragama, *Alston*, Oct. 1936; Maturata, *A.W.S.*, May 1906; Hakgala, *Willis*, Feb. 1906; Pattipola, *Silva*, May 1911.

**Composition.** The pale yellow oil extracted from the seed contains sinigrin. The leaves contain calcium, phosphorus, iron and vitamin B. The fixed oil is mustard oil and the volatile oil is an allyl mustard oil.

**Uses.** A plaster of ground mustard seed applied externally relieves pain due to pleurodynia, pleuritis, hepatitis, gastralgia, colic, neuralgia, lumbago and is used as a counter-irritant in inflammatory conditions of the viscera. Applied to the nape of the neck, it prevents cerebral congestion. To check convulsions in children, the patient is immersed in a mustard bath. Mustard oil and camphor is an efficacious embrocation for muscular rheumatism, stiff neck, etc. Ground mustard seed is eaten with roast meats as it stimulates secretion of gastric juices, sharpens the appetite and promotes digestion. Mustard oil is largely used in Bengal for culinary purposes. In the Philippines, the leaves are eaten as a salad. In Africa, the root is used as a galactagogue and the sun-dried leaf is smoked like hemp.

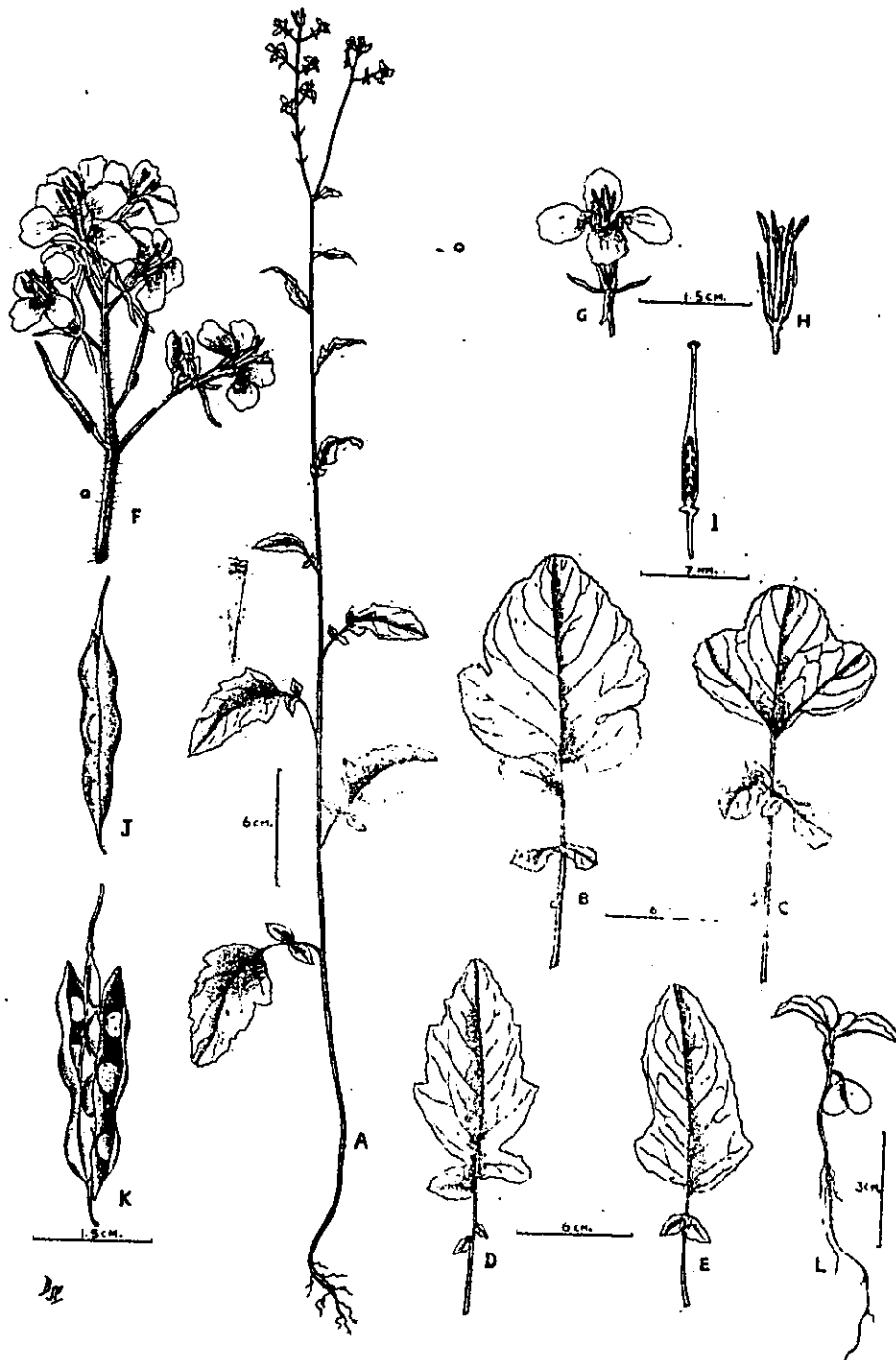


FIG. 158. *Brassica nigra*. A, plant in flower. B—E, forms of leaves. F, portion of the inflorescence. G, flower. H, stamens and pistil. I, longitudinal section of pistil. J, fruit. K, dehiscent fruit. L, seedling.

3. *Brassica nigra* (Linn.) Koch in Rohling's *Deutschl. Fl.* ed. 3, 4: 713. 1833. (Fig. 158).

*Sinapsis nigra* Linn.—*Sinapsis erysimoides* Roxb.—*Brassica sinapioides* Roth.—*Melanosinapsis communis* Spenn.

*Engl.* Black mustard; *Sinh.* Gan-aba, Kalu-aba; *Tam.* Kadugu; *Hindi* Asrai, Banarasirai, Ghorrai, Jagrai, Kalirai, Lahi, Makrarai, Rai, Taramira, Tira; *Sans.* Asuri, Atitikshva, Jwalanti, Jwalatprabha, Katuasuri, Krimika, Krishnasarshapa, Krishnika, Kshava, Kshavaka, Kshudhabhijanana, Kshujjanika, Kshutabhijanaka, Kshutaka, Madhurika, Rajl, Rajika, Raktasarshapa, Raktika, Sarshapa, Tikshnagandha.

A large, branching, annual herb, 0.5—1.5 m tall, hispid, internodes 4—5 cm long; leaves irregularly lobed or pinnate with a large terminal lobe and 1—3 pairs of progressively smaller ones below, 11.6—17.3 cm long, terminal lobe 8.7—12.5 cm long, 5—10 cm broad, margin serrate, glabrous above and hispid along veins beneath; petioles 1.5—4.5 cm long, hispid and purplish in colour; flowers regular, bisexual in a terminal panicle of branched racemes, ebracteate, bracteoles foliar, lanceolate, 1.4—5.5 cm long, 0.3—1.9 cm broad, glabrous on both surfaces and petiolate; pedicel 4 mm long, glabrous; sepals 4, 5 mm long, 1.2 mm broad, linear—oblong, imbricate, glabrous and spreading almost horizontally; petals 4, 1 cm long, 4.5 mm broad, yellow, spathulate tapering to a petiolate base; stamens 6, hypogynous tetradynamous, the two short-filamented laterals inserted lower than the others, filaments of outer stamens 2.5 mm long and those of the inner ones 3.6 mm long, anthers 1.5 mm long; ovary superior, 2-carpellary, 2-locular, 3 mm long, style and stigma 2.7 mm long; fruit a fusiform, glabrous silique, 1—2.5 cm long; seeds round and brown, 1.5—2 mm in diameter and minutely pitted.

**Illustrations.** Bentley and Trimen, *Med. Plants*, pl. 22. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 64B. 1933.

**Distribution.** A weed in waste and cultivated ground in England, Asia Minor, N.W. India, S. Siberia, N. Africa, N. and S. America and the Mediterranean regions. It is frequently cultivated in India, Tibet, and other tropical countries.

**Composition.** Besides the alkaloid sinapine, the seeds contain myrosin, sinigrin, inosite, albumins, gums, colouring matter and fixed and volatile oils of mustard.

**Uses.** A poultice of the ground seeds is very useful for cases of febrile and inflammatory diseases, internal congestions, spasmodic, neuralgic and rheumatic affections. A paste of the seed along with other ingredients is applied on pimples and urticaria.

The oil extracted from the seeds is a stimulant and mild counter-irritant when applied externally. Hence, it is useful against sore throat, internal congestion and chronic muscular rheumatism.

Ground mustard is eaten with roast meats as it promotes digestion.

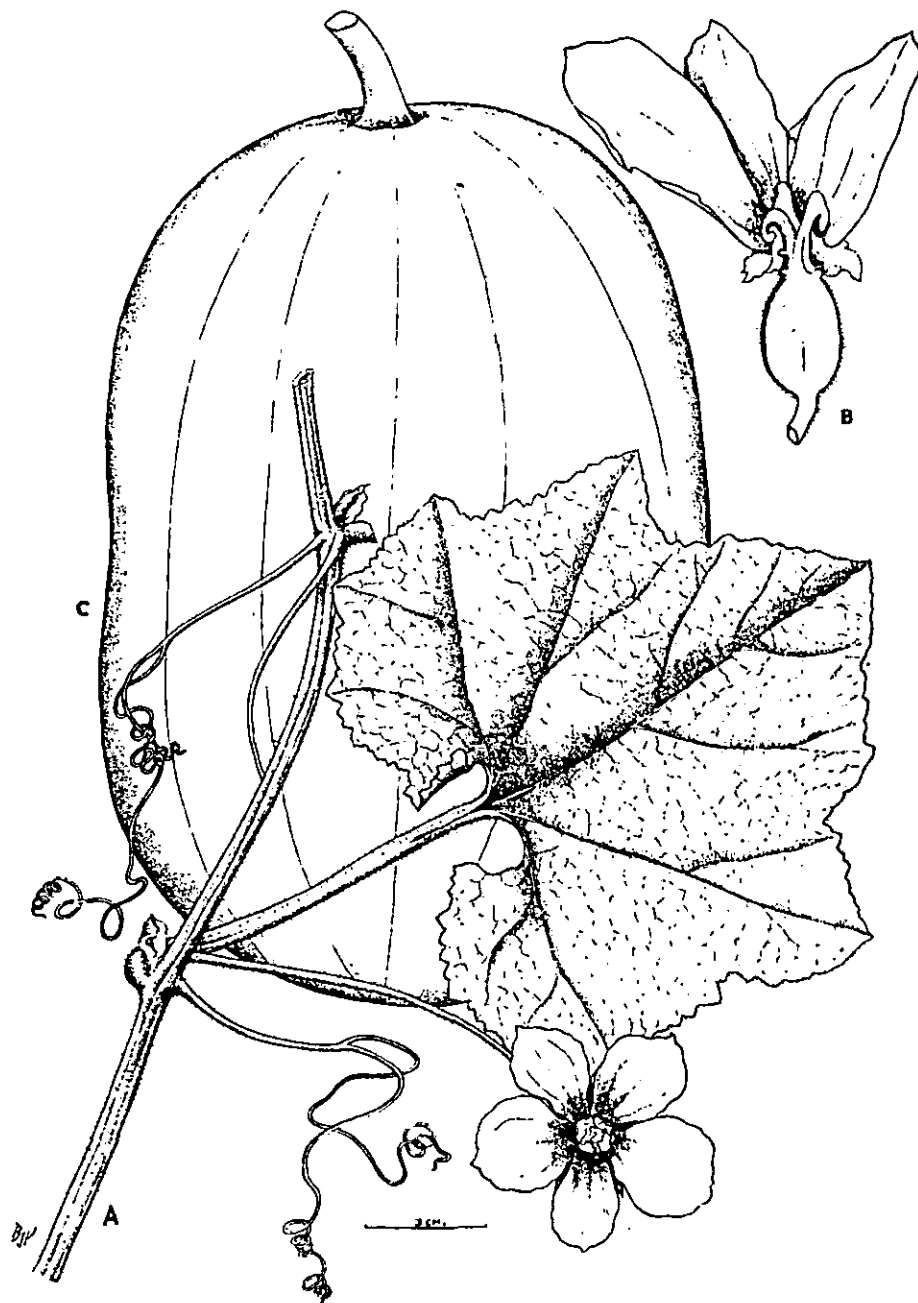


FIG. 159. *Benincasa hispida*. A, stem with a leaf and a male flower. B, longitudinal section of a female flower. C, fruit.

## 36. CUCURBITACEAE

### 1. *Benincasa hispida* (Thunb.) Cogn. in DC. Mon. Phan. 3: 513. 1881. (Fig. 159).

*Cucurbita hispida* Thunb.—*Cucurbita pepo* Lour.—*Cucurbita farinosa* Bl.—*Cucurbita pepo-aspera* Blanco—*Benincasa cerifera* Savi.—*Gymnopetalum calyculatum* Miq.

*Engl.* Ash Pumpkin; *Sinh.* Alupuhul; *Tam.* Kalyanappushinikkay, Pusanikkai, Pushini; *Hindi* Golkaddu, Kondha, Kudimah, Kumra, Petha, Phuthia; *Sans.* Brihatphala, Ghrinavasa, Gramyakarkati, Karkaru, Karkotika, Kumbhanda, Kunjaphala, Kushmanda, Kushmandaka, Kushmandi, Kushpandaha, Nagapushpaphala, Pitapushpa, Pushpaphala, Shikhivardhaka, Suphala, Timisha.

A large trailing or climbing plant with stout, angular, hispid stems, tendrils 2-fid; leaves 10—25 cm diameter, reniform—orbicular, cordate, more or less deeply 5-lobed, hispid beneath; petioles 7.5—10 cm long without glands; flowers large, yellow, monoecious, all solitary without bracts; sepals 5, fused into a campanulate calyx-tube, lobes leaf-like, serrate; petals 5, free, obovate; male flower: stamens 3, inserted near the mouth of the tube, filaments angular hispid at the base, cells sigmoid; female flower: ovary inferior, oblong, densely hairy, style thick with 3 flexuous stigmas, ovules numerous, horizontal; fruit 30—45 cm long, broadly, cylindric, not ribbed, hairy, ultimately covered with a waxy bloom; seeds many, oblong, compressed and margined.

**Illustrations.** Rheede, Hort. Ind. Mal. 8: pl. 3. 1678—1703; Kirtikar and Basu, Indian Med. Plants, pl. 451. 1933.

**Distribution.** Cultivated throughout India, Ceylon and other tropical countries. It is probably a native of Java but cultivated. In Ceylon it is mostly cultivated in the dry zone during the rainy season and elsewhere throughout the year.

**Ceylon.** Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, April 1897. Western Prov., Colombo. *Ferguson*.

**Composition.** The fruit contains a fixed oil, starch, cucurbitine, resin, the proteins, myosin and vitellin, sugar and vitamins B and C.

**Uses.** The fruit forms a major constituent in the preparations for treatment of epilepsy, haemoptysis, phthisis, cough, asthma, ulceration of lungs, retention of urine, hiccough and internal haemorrhages.

The fresh juice is a specific antidote for mercuric, alcoholic and snake-bite poisoning. It is used for insanity, epilepsy and other nervous diseases. The cortical portion of the fruit is given for diabetes. A decoction of the leaves with rock salt is given for cholera. Decoctions of the stem and fresh juice of the fruit are also antidotes for many vegetable poisons. In Indo-China, the leaves and seeds are given as a purgative. The seeds are anthelmintic and are beneficial for cases of taenia and as a diuretic.

The unripe fruit is cooked and eaten as a vegetable, while the pulp of the ripe fruit is candied into a delicacy. The roasted seeds are also eaten.

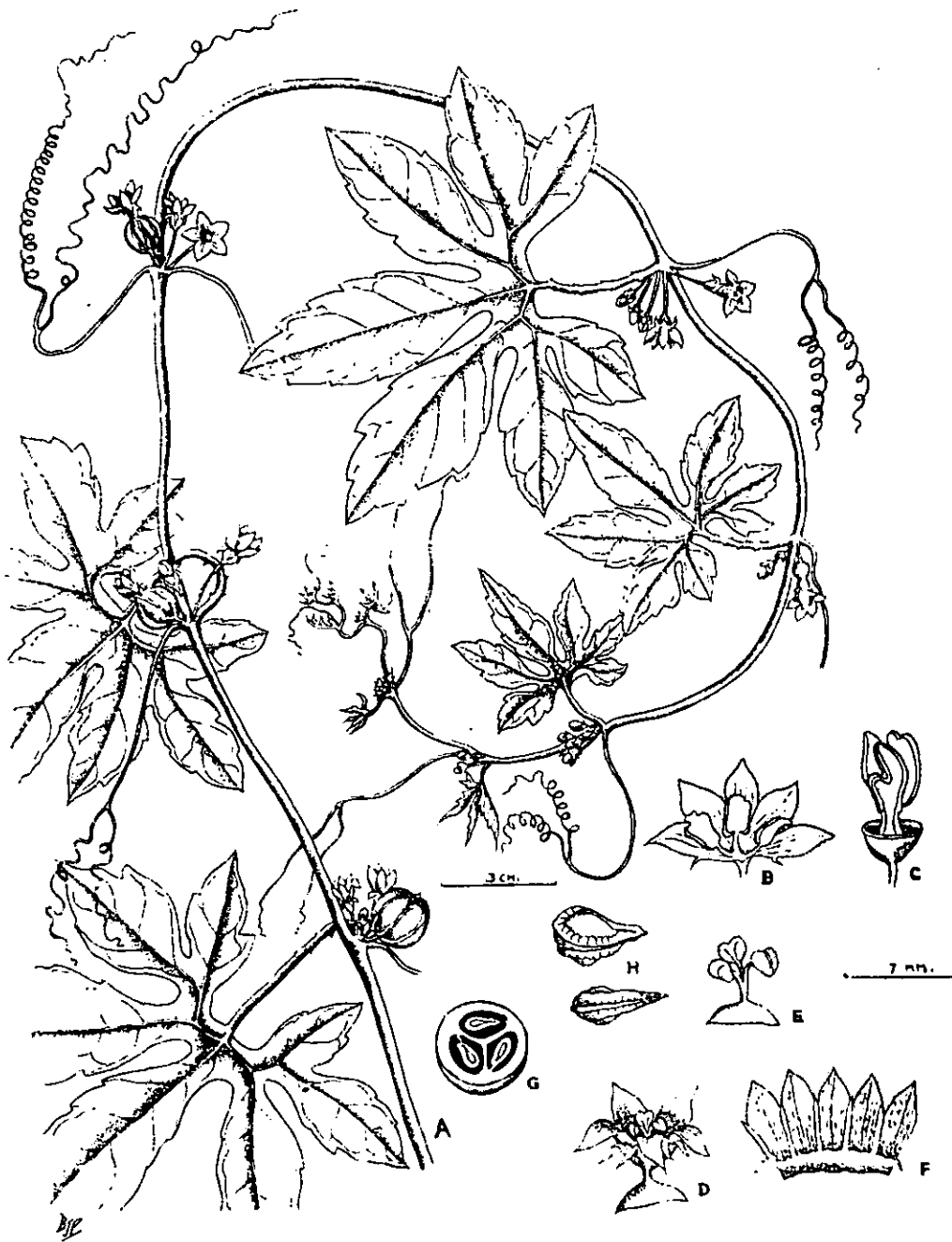


FIG. 160. *Bryonopsis luciniosa*. A, flowering branch. B, male flower opened and spread out. C, male flower with corolla removed to show anthers in situ. D, female flower, front view. E, style and stigma. F, corolla of female flower spread out. G, transverse section of young fruit. H, different views of the seed.

2. *Bryonopsis laciniosa* (Linn.) Naud. in Ann. Sc. Nat. ser. 5: 30. 1866. (Fig. 160).

*Bryonia laciniosa* Linn.—*Bryonopsis courtallensis* Arn.—*Bryonopsis erythrocarpa* Naud.—*Bryonopsis laciniosa* Hook. f.—*Cucumis verrucosus* Herb. Rottler.

*Sinh.* Basuagilli; *Hindi* Gargumaru, Ishwaralingi, Shivalingi; *Sans.* Apastambhini, Bahupatra, Bakapushpa, Chandra, Chitrphala, Devi, Ishwari, Lingaja, Lingasambhuta, Lingi, Lingini, Pandoli, Shaivamallika, Shivaja, Shivavalli, Svayambhu, Tutthini.

Perennial tendril climber with a large, tuberous root and very slender, glabrous, often spotted, dark green stems and long internodes, tendrils bifid; leaves simple, alternate, membranous, 7.5—12.5 cm long and about as broad, ovate—rotundate in outline, very deeply cordate at base, cut nearly to base into 5 lanceolate or linear, acute, coarsely serrate segments, the two basal ones deeply pedate, glabrous thin, the upper surface slightly rough with minute scattered scales; petioles 2.5—3.7 cm long, striate, slender; flowers regular, very pale yellow, unisexual, male flowers in small fascicles of 3—6, females solitary or few also in clusters in the same axils; sepals 5, fused into a cup-shaped calyx, segments linear, filiform, glabrous; petals 5, fused to about  $\frac{1}{4}$  way up, segments oval-oblong, acute, pubescent; male flowers: stamens 3, quite distinct, cells sigmoid; female flowers: ovary inferior, globose, glabrous, style slender, 3-fid; fruit globose, sessile, 1.8—2.5 cm diameter, smooth, bluish green with broad white vertical stripes; seeds 5—6 mm long, gibbous at the sides with a prominent raised band running round the edge.

Flowers from August to October.

**Illustrations.** Wight, Ic. Pl. Ind. Orient 2: pl. 500. 1840—43; Kirtikar and Basu, Indian Med. Plants, pl. 464. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs throughout India, Ceylon, Malaya, tropical Africa, Australia and Philippine Islands. In Ceylon it is common in moist and dry country up to 6000 feet altitude.

**India.** Bengal: *J. D. Hooker and T. Thomson*; Calcutta, *Wallich 6699C*; *Wallich 6699 F*. **Ceylon.** North Central Prov., Mahailupalama, *Herb. Peradeniya*, March 1905; Polonnaruwa *Alston 575*, May 1927. Central Prov., Peradeniya Bot. Gard., *Alston 2205*, June 1928. Uva Prov., Ella, *Herb. Peradeniya*, Sept. 1896. **Philippine Islands.** Mindanao, Davao Prov., Mt Apo, *Clemens 15663*, June 1924.

**Composition.** The fruits and leaves contain an alkaloid.

**Uses.** This plant is bitter and aperient. It possesses tonic properties and used as a cathartic. The leaves are applied topically on inflammations.

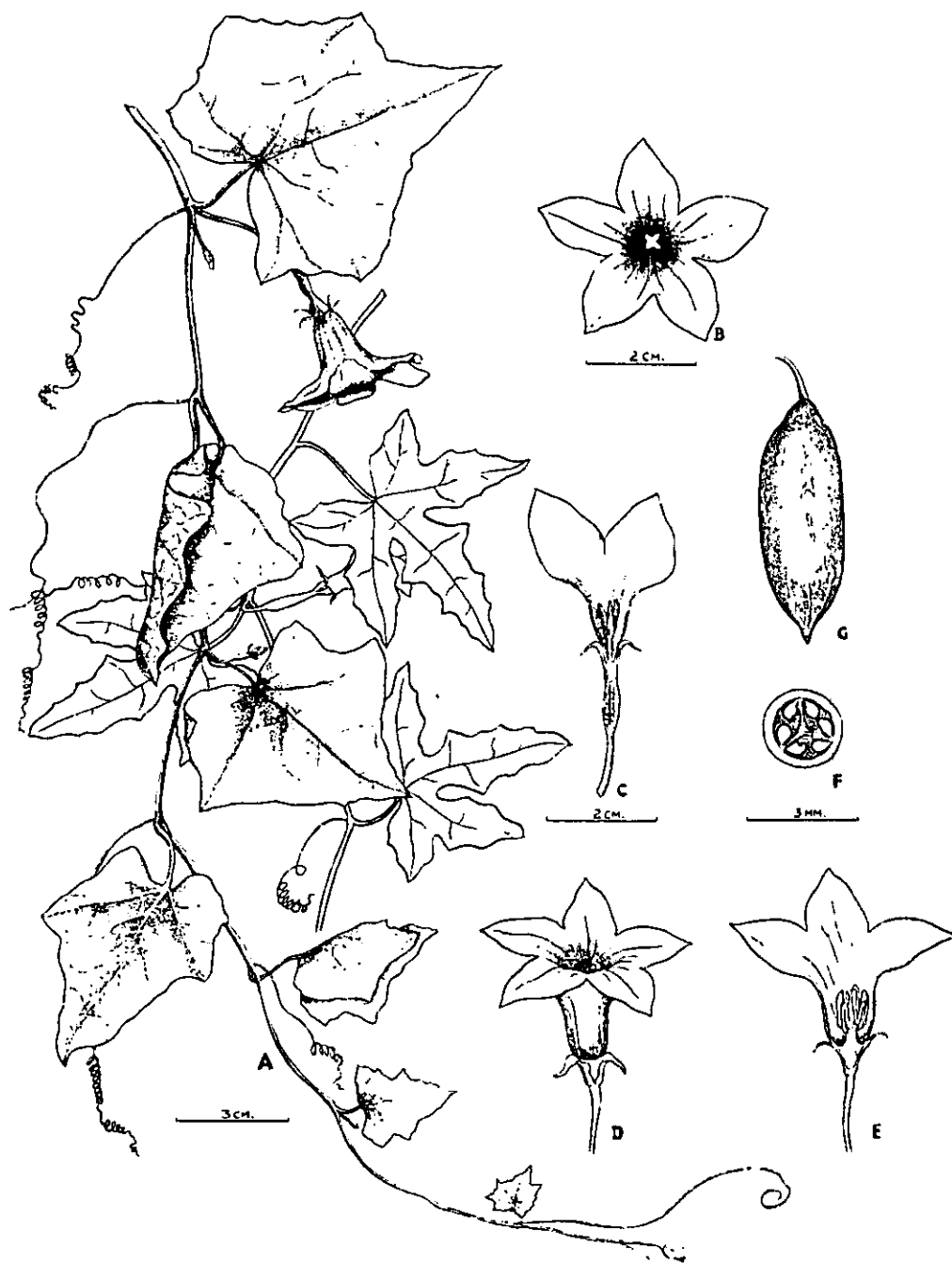


FIG. 161. *Coccinea grandis*. A, branches with leaves and tendrils. B, female flower from top. C, longitudinal section of female flower. D, male flower from side. E, longitudinal section of male flower. F, transverse section of ovary. G, fruit.

3. *Coccinea grandis* Kurz in Journ. Asiat. Soc. Bengal, 102. 1877. (Fig. 161).

*Coccinea cordifolia* Cogn.—*Coccinea indica* W.&A.—*Coccinea schimperi* Naud.—*Coccinea wightiana* Roem.—*Cephalandra indica* Naud.—*Bryonia grandis* Linn.—*Bryonia palmata* Wall.—*Momordica monadelpha* Roxb.

*Sinh.* Kowakka, Kobowakka, Kem-wel; *Tam.* Kovai, Kwai; *Hindi* Bhimb, Kanduri, Kunderi; *Sans.* Bimba, Bimbaka, Bimbi, Bimbika, Chhardini, Dantachhadopama, Govhi, Jhundikeshi, Kamboja, Karmakari, Katubimbi, Katuka, Katutundika, Oshthi, Oshtopamaphala, Piluparni, Raktaphala, Ruchiraphala, Tiktabimbi, Tiktatundi, Tundi, Tundika, Tundikeri, Tundiparyayaga, Vimba.

A perennial climber with slender, cylindrical, glabrous stems and simple tendrils; leaves simple, alternate, 5—10 cm long, 4.5—9 cm broad, variable in form, usually broadly cordate—ovate in outline with the basal sinus triangular, obtuse, apiculate, more or less 5-lobed, distantly dentate, quite glabrous on both sides, rather succulent, dull green above, glaucous beneath, ciliate along the margin, finely punctate, provided with several large flat circular glands near the axils of veins beneath, specially at the base, petioles 2—3.2 cm long; flowers regular, unisexual white with green veins, dioecious, solitary, axillary, peduncles 1-flowered; male flowers: peduncles 4—6.5 cm long, subfiliform; sepals 5, fused into a broadly campanulate glabrous calyx-tube, 4.5 mm long, calyx teeth 2.5 mm long and linear; corolla campanulate of 5, fused petals, 2.5 cm long, veined, pubescent inside, glabrous outside, segments triangular 1.6 cm long; stamens 3, anthers connate, cells conduplicate, filaments free; female flowers: peduncles 3—3.5 cm long; perianth similar to male flower; staminodes 3, subulate, 2.5 mm long, hairy at base; ovary inferior, glabrous, fusiform, 1.3—1.5 cm long with parietal placentas, style short, stigmas 3, long and hairy; fruit 2.5—5 cm long, fusiform—ovoid, cylindrical, slightly beaked, marked when immature with white streaks, bright scarlet when fully ripe; seeds oblong—ovoid, much compressed, smooth, yellowish—grey.

Flowers from June to August.

*Illustrations.* Wight, Ill. Indian Bot. pl. 105. 1841—1850; Kirtikar and Basu, Indian Med. Plants, pl. 462A. 1933.

*Distribution.* Occurs throughout India, Ceylon, Malaya and tropical Africa. In Ceylon, it is common in the low-country especially in dry regions in bushy places. Jaffna, Anuradhapura, Polonnaruwa, Ritigala, Hunnasingiriya, Colombo, Galle, Matara, etc.

*Ceylon.* *Thwaites* C.P. 1609; North Central Prov. Anuradhapura, Nuwara-Wewa bund, *Simpson* 9360, March 1932; Polonnaruwa, *Alston* 571, May 1927; Ritigala, *Willis*, March 1905.

*Composition.* This plant contains an enzyme, a hormone and traces of an alkaloid.

*Uses.* The leaves are applied on eruptions of the skin such as ringworm, itch, psoriasis, etc., and the plant taken internally in decoction for gonorrhoea and diabetes. It is useful for dropsical conditions and in acute and chronic pyelitis, cystitis and strangury. It has antilithic properties of some value and is largely employed for urinary gravel and calculi. The leaves are also cooked and eaten. The bark of the root is a good cathartic. The fruits and leaves are used in the treatment of snake-bite.



FIG. 162. *Colocynthis citrullus*. A, leaf. B, apical portion of a branch showing the tendrils and male and female flowers. C, female flower. D, male flower, both with the corolla removed. E, fruit.

4. *Colocynthis citrullus* (Linn.) Kuntze, Abeywick., Ceyl. Journ. Sci. 2 (2): 233. 1959. (Fig. 162).

*Citrullus fistulosus* Stocks—*Citrullus vulgaris* Schrad.—*Cucumis citrullus* DC.—*Cucurbita citrullus* Linn.

*Engl.* Water Melon; *Sinh.* Komadu, Peni-Komadu; *Tam.* Pitcha, Pullum; *Hindi* Halinda, Hindwana, Karbuj, Samanka, Tarbuz, Tarbuza, Turmuz; *Sans.* Alpapramanaka, Brihadgold, Chayaphula, Chelana, Chitra, Chitraphala, Chitravallika, Ghrinaphala, Godumba, Kalinda, Kalinga, Krishnabija, Latapanasa, Madhuraphala, Mansala, Mansaphala, Meta, Mutrala, Natamra, Rajatinisha, Raktabija, Seta, Shirnavrinta, Sukhasha, Sukhavaśa, Suvartula, Tarambuja, Vrittaphala.

An extensively, climbing annual with thick, angular, branching stems; young shoots villous, woolly at their tips, tendrils bifid and pubescent; leaves simple alternate, 7.5–20 cm long, ovate to ovate-oblong in outline, cordate at base, deeply or moderately 3–7 lobed with the lobes pinnatifid, glabrous or somewhat hairy, petioles a little shorter than the limb, villous; flowers about 2–3.5 cm diameter, monoecious, yellow, solitary and axillary; sepals 5, fused into a campanulate calyx-tube, lobes narrowly lanceolate; petals 5, fused, subcampanulate, 5-partite beyond the middle, yellow within, greenish outside, villous, lobes prominently 5-nerved; male flowers: stamens 3, epipetalous, filaments short, free; female flowers: stamens 3, rudimentary, setose or ligulate; ovary inferior, ovules many, horizontal, style short, stigmas 3; fruit about 25 cm diameter, subglobose or ellipsoid, smooth, greenish with a glaucous waxy coating, flesh juicy, red or yellowish white, seeds black margined.

**Illustrations.** Stocks in Hook. Kew. Journ. Bot. 3: *pl.* 3.; Kirtikar and Basu, Indian Med. Plants, *pl.* 461. 1933.

**Distribution.** Indigenous to tropical and South Africa but cultivated in most of the eastern countries. In Ceylon, it is cultivated in the dry zone during the rainy season.

**Composition.** Contains ascorbic acid oxidase, while the flesh of the fruit contains saccharose, dextrose, levulose, invert sugar, citrullin, lycopin, carotin, etc. The peel contains a fixed oil, arachidic acid and traces of copper. The seed yields an oil, proteins, a small amount of phytosterol, cucurbitol and an active principal, cucurbocitrin.

**Uses.** The juice of the root is used to arrest haemorrhage after abortion. The seeds are nutritive. The fruit is frequently eaten to quench thirst. The fruit pulp, juice and seeds are each credited with diuretic properties probably due to the presence of the aminoacids, arginine and citrulline. In Africa, the seed is an article of commerce used as a medicine, food, masticatory and a source of oil. The seed is also roasted and eaten in India and China.

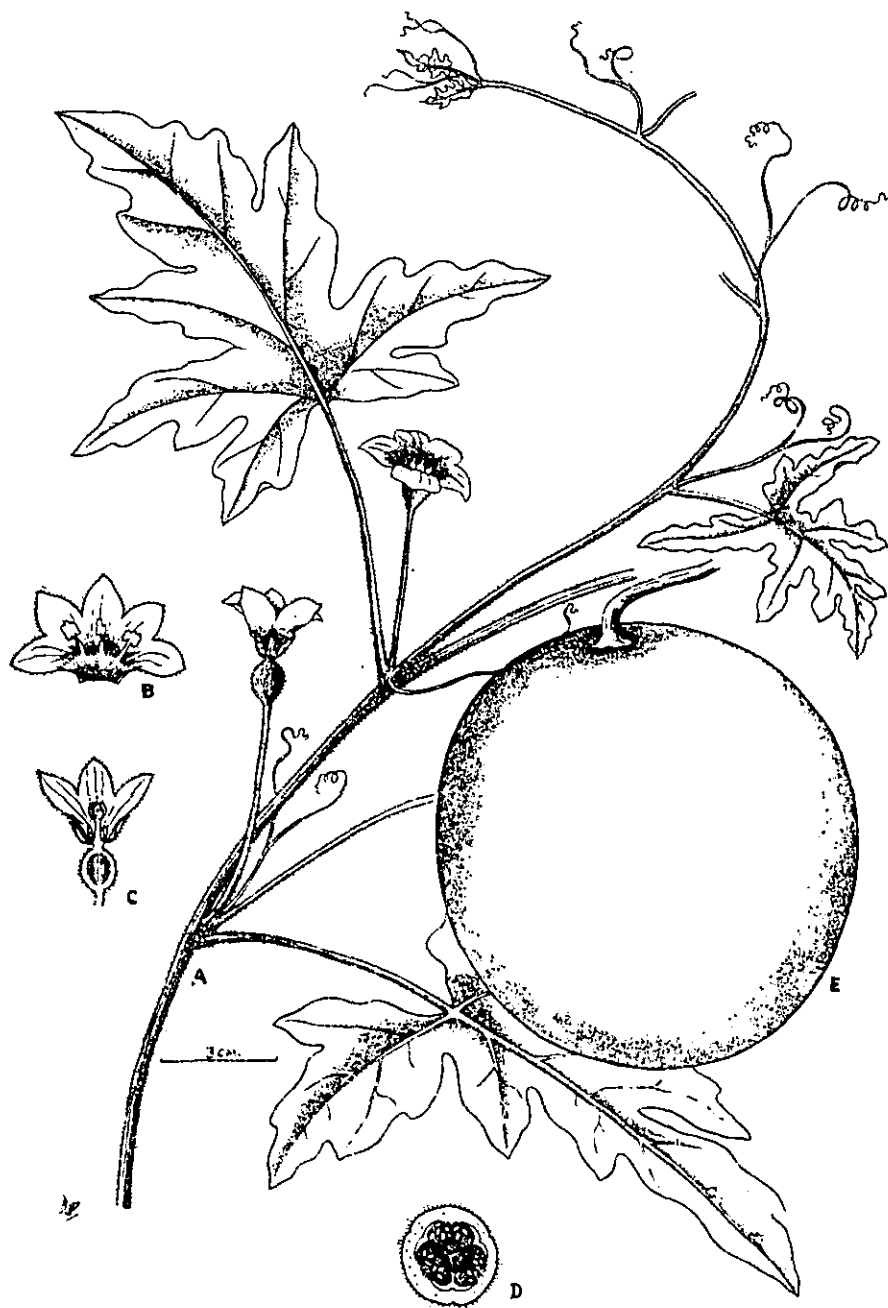


FIG. 163. *Colocynthis vulgaris*. A, branch with leaves and male and female flowers. B, male flower spread out. C, longitudinal section of a female flower. D, transverse section of the ovary. E, fruit.

5. *Colocynthis vulgaris* Schrad., Ind. Sem. Hort. Gotting. 1833. (Fig. 163).

*Cucumis colocynthis* Linn.—*Citrullus colocynthis* Schrad.

*Engl.* Colocynth, Bitter Cucumber; *Sinh.* Yak-Komadu, Tittakomadu; *Tam.* Peykkumutti, Peytumatti, Verikkummatti, Verittumatti, Visala; *Hindi* Ghcrumba, Indrayan, Makal; *Sans.* Atmaraksha, Brihadvaruni, Brihatphala, Chitrالا, Chitraphala, Chitravalli Devi, Dirghavalli, Gajachirbhira, Hastidanti, Kapilakshi, Katurasa, Kaya, Kumbhasi, Mahaphala, Mahendraravuni, Mahendri, Mrigadini, Mrigakshi, Mrigevaru, Ramya, Sheveta pushpa, Soumya, Trapusi, Tunvasi, Urupriya, Vishala.

Annual or perennial, slender, prostrate climber with angular, scabrous or somewhat hairy stems, tendrils 2-or 3-fid, slender, hairy; leaves simple, alternate, 3.8—8.8 cm long, variable, usually deltoid in outline, very deeply trifid, the middle lobe the longest, each lobe deeply pinnatifid with the segments lobed or dentate, margin often involute, nearly glabrous above, very scabrous with short, swollen, prickly bristles beneath; petioles about half the length of the leaf, bristly or hairy; flowers regular, unisexual, pale yellow, monoecious, solitary in the axils of leaves, rather large, peduncle about 1.2 cm long, rough or hairy; sepals 5, fused into a campanulate calyx-limb, hairy, segments linear-lanceolate; petals 5, united nearly half-way up to form a cup-shaped corolla, segments oval, subacute; male flower: stamens 3, small, inserted in the tube of the corolla, filaments short, glabrous, anther distinct, one 1-celled and two 2-celled, cells conduplicate; female flower: ovary inferior, globular-ovoid, fleshy, calyx-tube fused with ovary, hairy, unilocular with three large, fleshy, parietal placentas, style short stout with 3 small staminodes round it, stigmas 3, sessile; fruit globular, slightly depressed, 5—8 cm diameter, dark green, mottled with 10 lines of paler irregular spots, completely filled with white spongy very bitter pulp; seeds numerous, horizontal, pale brown, immersed in the pulp.

**Illustrations.** Wight,  *Ic. Pl. Ind. Orient.* pl. 498, 1840—43; Bentley and Trimen,  *Medicinal Plants*, pl. 114. 1880; Kirtikar and Basu,  *Indian Med. Plants*, pl. 460. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs in Arabia, Syria, Egypt, Western Asia, tropical Africa, Mediterranean regions, India and Ceylon. In Ceylon, it is rather rare confined to the dry and desert regions such as Batticaloa, Puttalam, Jaffna and Talaimannar.

**India.** Punjab,  *T. Thomson*; Pen. Ind. Orient.  *Herb. Wight* 1114, Kew Distribution 1866—8. Ceylon.  *Thwaites C.P.* 1607. Northern Prov., Jaffna,  *Herb. Peradeniya*, Feb. 1890; Talaimannar,  *J. M. Silva*, July 1916.

**Composition.** The fruit contains an alkaloid. The purgative properties of colocynth is due to a bitter principle colocynthin, a glucoside. The fruit pulp contains a very small amount of volatile oil; citrullol,  $\alpha$ -elaterin, hentriacontane and a phytosterol. The fruit juice contains citrullin, citrulluen, citrullinic acid in addition to  $\alpha$ -elaterin. The seeds yield a fixed oil and a yellow bitter principle. The root also contains  $\alpha$ -elaterin.

**Uses.** The fruit and the root are made into a paste and applied on boils and pimples. A paste of the root is applied on abdominal swellings in children and a decoction of it is given for cough and asthma. A poultice of the root is applied on inflammation of breasts in women. The root along with other ingredients is used in chronic skin diseases, syphilis, elephantiasis, leprosy, hemiplegia, piles, anaemia, colic, ascites, jaundice, rheumatism and various urinary diseases. The juice of the fruit mixed with sugar is a specific for dropsy. The fruit and the root are prescribed in the treatment of snake bites.

The oil extracted from the seed is used in India as a remedy for snake-bites, scorpion sting, epilepsy and to stimulate the growth and to darken grey hair. In some parts of Baluchistan the fruit and seeds are used as a purgative.

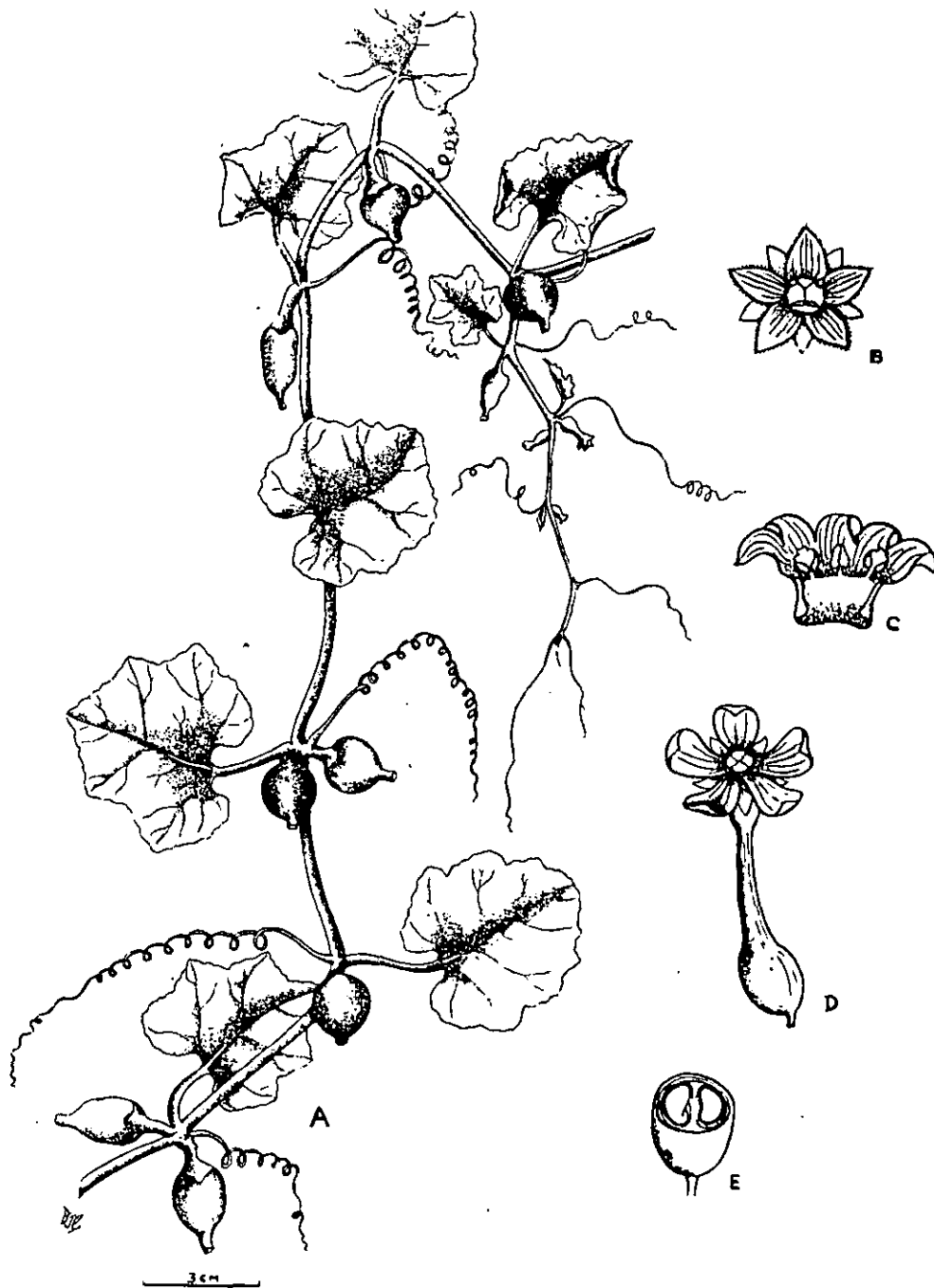


FIG. 164. *Corallocarpus epigaeus*. A, branch with leaves and fruits. B, male flower from front. C, corolla detached and opened to show the stamens. D, female flower. E, transverse section of a fruit.

6. *Corallocarpus epigaeus* C.B. Clarke in Hook. f., Fl. Brit. Ind. 2:628. 1879. (Fig. 164).

*Aechmandra epigaeu* Arn.—*Bryonia epigaeu* Rottl.—*Bryonia glabra* Roxb.—*Bryonia sinuata* Wall.

*Sinh.* Gopalanga; *Tam.* Akashagarudan, Gollankovai; *Hindi* Akasgaddah, Rakasgaddah; *Sans.* Katunahi, Patala-garadan.

A perennial, tendril climber with a large, turnip-shaped root and succulent, prostrate, zig-zag, glabrous and glaucous stems; tendrils simple, slender, glabrous; leaves simple, alternate, rather small, 2.5—3.7 cm long, rotundate, very cordate at base, more or less 3- or 5-lobed with obtuse or acute, irregularly dentate lobes, shortly and roughly pubescent on both surfaces, rather thick; petioles more than half the length of the leaf, stout, glabrous; flowers regular, yellowish-green, unisexual, monoecious, male flowers on shortly pedicelled, straight pedunculate, stiff corymbs, female flowers solitary; sepals 5, fused into a campanulate calyx, segments very small; petals 5, very slightly connected at the base; male flowers: stamens 3, inserted at the mouth of the calyx-tube, filaments very short, anthers distinct, cells straight without connective; female flowers: ovary inferior, ovoid, 2-locular, style long, stigma large and 2-lobed; fruit 1.8—2.5 cm long, ovoid with a blunt beak, smooth, scarlet in the middle with base and beak dark green, dehiscent by a circular line at junction of red and green portions near the base; seeds about 9 in orange coloured pulp, very slightly compressed, pale brown, adpressed pilose.

Flowers from January to March.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. *pl.* 503. 1840—43; Kirtikar and Basu, Indian Med. Plants, *pl.* 461 *f.* 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs in India and Ceylon. In Ceylon, it is rather common in the dry districts such as Mannar, Anuradhapura, Dambulla, etc.

**Ceylon.** Northern Prov., Mannar Dist., Mantai, *Herb. Peradeniya* Feb. 1890. North Central Prov., Anuradhapura, Puliyankulama, *Alston* 1254, March 1927. Central Prov., Dambulla, *Thwaites C.P.* 1622; Uma Oya, *Herb. Peradeniya* April 1883.

**Uses.** This herb is prescribed in the later stages of dysentery and for chronic venereal complaints. It is considered anthelmintic and sometimes used externally in chronic rheumatism. The root is usually given for syphilitic rheumatism and possesses laxative properties. It has a reputation as a snake-bite cure in Decca and Mysore.

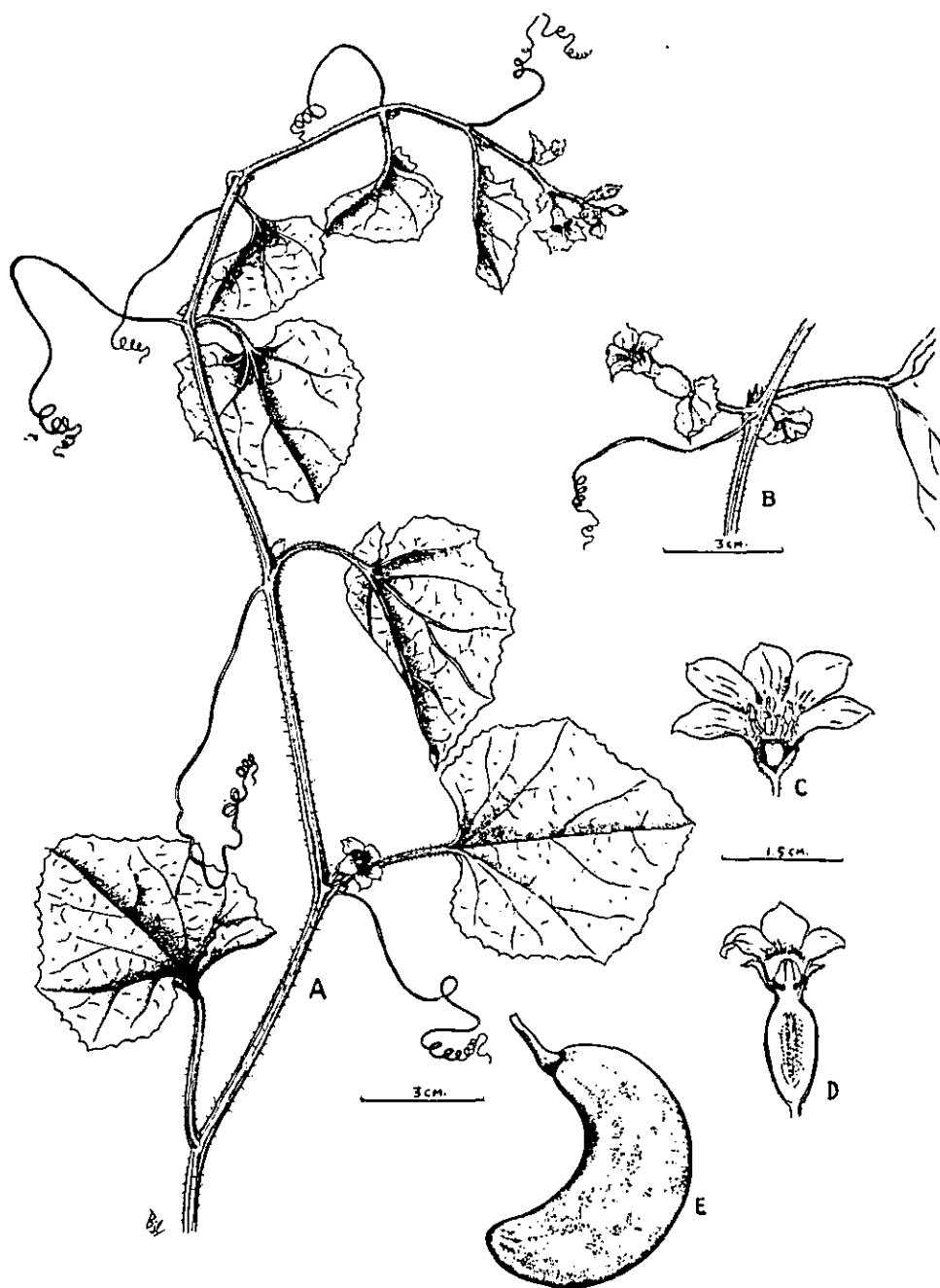


FIG. 165. *Cucumis callosus*. A, a branch with male flowers. B, portion of a branch with a female flower as well as a male. C, male flower opened out showing the stamens and rudimentary pistil. D, longitudinal section of female flower. E, fruit.

7. *Cucumis callosus* (Rottl.) Cogn. in Engl. Pflanzenr. Cucurb., Cucum. 129. 1924. (Fig. 165).

*Cucumis callosa* (Ser.) Als.—*Bryonia callosa* Rottl.—*Momordica lambertiana* Ser.—*Cucumis trigonus* Roxb.—*Cucumis pseudo-colocynthis* Royle

*Sinh.* Gon-Kekiri; *Tam.* Kattuttumatti, Metukku; *Hindi* Bhakura, Bislambhi, Bislombi, Gorakhakakadi, Janglindrayan, Sengha; *Sans.* Bahuphalla, Chira, Chitraphala, Chitravalli, Devi, Garakshvriksha, Godumba, Kapilakshi, Katphala, Kumbhasi, Laghuchirbhitta, Maruja, Mrigadani, Mrigachirbhitta, Mrigakshi, Mrigervaru, Mrigeshana, Pathya, Schvetapushpa, Vichitra, Vishala.

A perennial herb with numerous, prostrate, more or less quadrangular, hispid stems and simple tendrils; leaves simple, alternate, 5—12 cm long and as broad, broadly cordate-ovate, more or less deeply 5-lobed, lobes rounded, dentate, scabrous on both sides, petioles 3—8 cm long, hispid; flowers regular, unisexual, monoecious; male flowers in small clusters, shortly stalked about 1.5 cm in diameter; sepals 5, fused into a campanulate calyx-tube, very hairy, segments setaceous; petals 5, connate  $\frac{1}{2}$  way up, segments elliptic, hairy, acute; stamens 3, filaments very short, anthers small, connate, hairy, female flowers solitary, sepals and petals same as in the male, calyx-tube constricted above the ovary; ovary inferior, ovoid, 1 cm long, hairy, style short, slender, stigmas very large; fruit ellipsoid or oblong, 4—6 cm long, 2.5—2.8 cm in diameter, longitudinally variegated with 10 green stripes, pale yellow when ripe and softly tomentose, pulp bitter; seeds white, ellipsoid, not margined.

Flowers from February to April and in August and September.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. pls. 497 and 496. 1840—43; Kirtikar and Basu, Indian Med. Plants, pl. 456. 1933.

**Distribution.** Occurs throughout India and Ceylon. It is rather rare in Ceylon, confined to the dry regions. Mannar, Anuradhapura, Minneriya, Batticaloa and Tissamaharama.

**India.** Maisor and Carnatic: *G. Thomson*; Coimbatore, *Clarke* 11510E, April 1870. Ceylon. North Western Prov., Mannar, *Crawford* 110, 1890; North Central Prov., *Thwaites* C.P. 1618; Eastern Prov., Minneriya, *Herb. Peradeniya*, Sept. 1885; Southern Prov., Tissamaharama *Simpson* 9922, Aug. 1932.

**Uses.** The pulp of the fruit is very bitter and is a drastic purgative. In Malabar, the fruit is given for insanity and to strengthen the memory. The seeds are useful for bilious disorders and for diabetes. According to Roberts the juice of the fresh leaves as well as a decoction of the roots are given internally for snake-bites. The root has diuretic properties and is useful in cardiac, renal and hepatic dropsy and in nephritis, pyelitis, cystitis and gonorrhoea. It also has antilithic properties and is frequently used for treating urinary gravel and calculi.

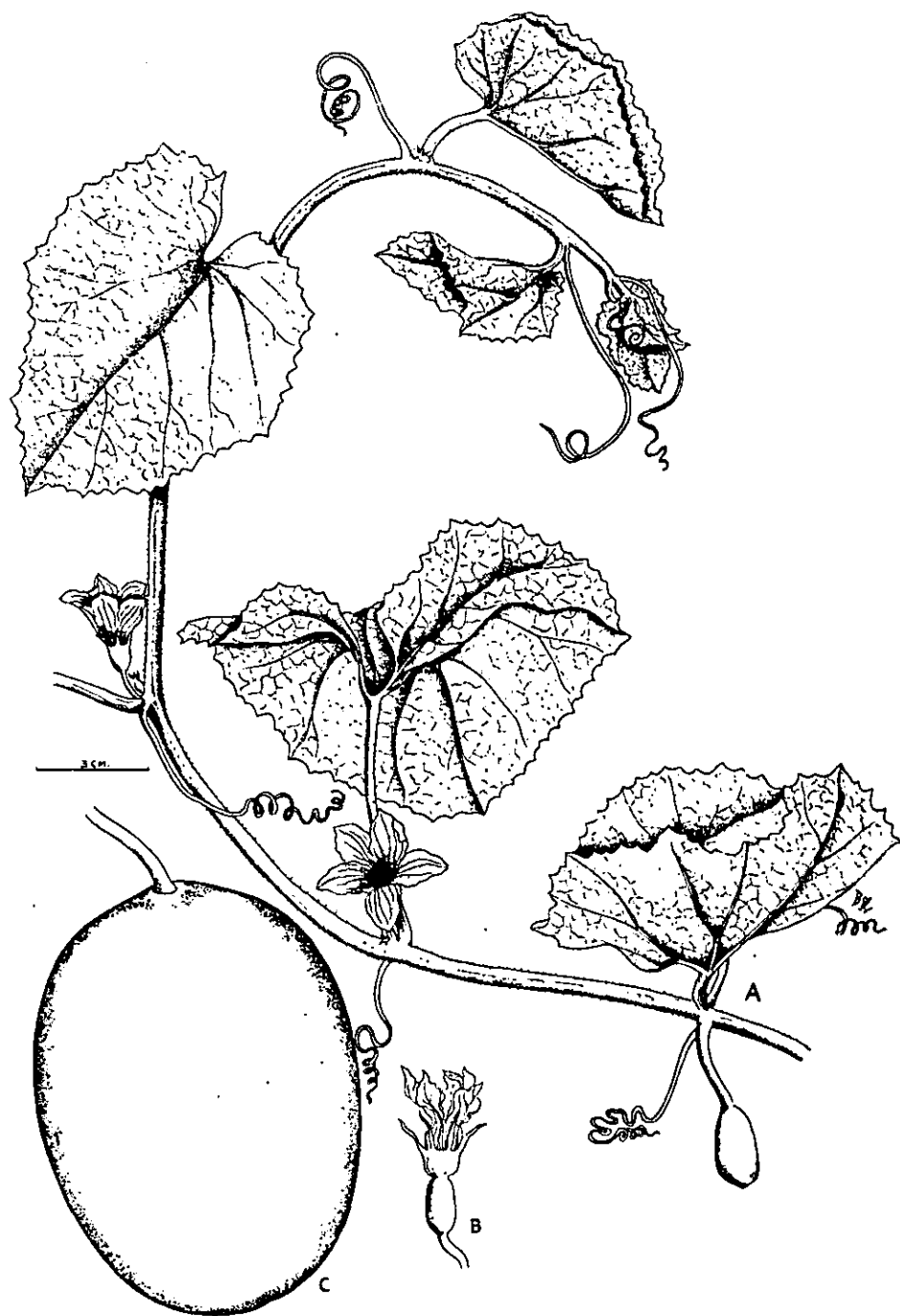


FIG. 166. *Cucumis melo* var. *egrestis*. Cultivated form. A, branch with male flowers and a young fruit. B, female flower. C, fruit.

8. *Cucumis melo* var. *egrestis* Naud. in Ann. Sc. Nat. ser 4, 11: 73. 1859. (Fig. 166).

*Cucumis chate* Linn.—*Cucumis pubescens* Willd.—*Cucumis maderaspatanus* Moon—*Cucumis melo* var. *pubescens* Kurz —*Cucumis cicatrisatus* Stocks.

*Sinh.* Hen-Kekiri.

An annual, tendril climber with long, bluntly angular stems, rough with hooked prickly hairs on ridges, tendrils simple; leaves simple, alternate, 7.5—11.2 cm long, broadly cordate—ovate with the basal lobes rounded, usually shallowly cut into 3 or 5 acute lobes, slightly dentate, very roughly hairy on both sides; petioles stout, often as long as the leaves, deeply sulcate above, often much twisted, very harsh with prickly hairs; flowers regular, yellow, unisexual, monoecious, small, male flowers in small clusters, female flowers solitary, 1.8 cm wide; sepals 5, fused into a campanulate calyx, very hairy, segments setaceous; petals 5, connate at base about  $\frac{1}{2}$  way up, rounded; male flowers: stamens 3, filaments very short, anthers small, connate, connective produced into a long appendage; female flowers: calyx-tube constricted above the ovary, ovary ovoid with scattered, bulbous-based, bristly, deciduous hairs, style short, slender, stigmas very large; fruit ovoid-globose, slightly trigonous in section, small, glabrous, obscurely striped with dark and light green, solid, fleshy; seeds numerous, horizontal, narrowly ovoid, compressed and smooth.

Flowers during August and September.

*Illustrations.* Wight, Ic. Pl. Ind. Orient. pl. 496. 1840—43; Herb. Peradeniya, drawing.

*Distribution.* Occurs in India, Malaya and Ceylon. It is common in waste ground in the low-country in Ceylon.

*Ceylon.* Central Prov., Ambagamuwa, *Thwaites C.P.* 3534; Giriagama, Siyambalagoda Estate, *Alston* 2116, Aug. 1927.

*Uses.* The juice of the fruit after being impregnated with impure carbonate of potash and steamed in hot ash, is used as a diuretic for cases of difficulty in passing urine and other urinary complaints. The fruit of the cultivated form is cooked and eaten as a vegetable.

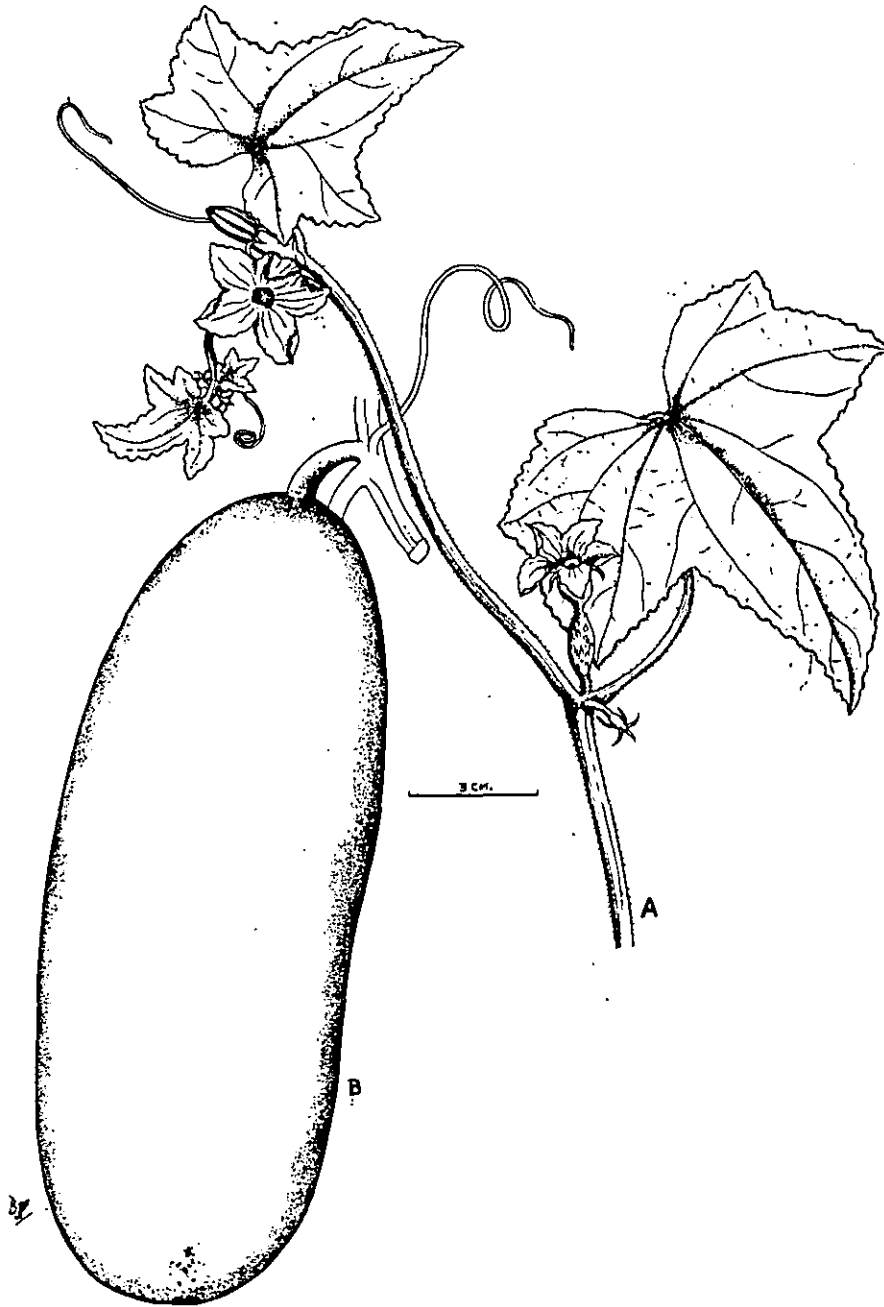


FIG. 167. *Cucumis sativus*. A, branch with leaves and male and female flowers. B, fruit.

9. *Cucumis sativus* Linn. Sp. Pl. 1012. 1953. (Fig. 167).

*Cucumis muricatus* Wall.—*Cucumis hardwickii* Royle.

*Engl.* Cucumber; *Sinh.* Pipingna; *Tam.* Pipingkay; *Hindi* Khira; *Sans.* Bahuphala, Kandalu, Kantakilata, Kantakiphala, Kantalu, Koshaphala, Pitapushpa, Sudhavasa, Sushitala, Trapukarkati, Trapushpa, Tundilaphala.

A medium sized, hairy, tendril climber; leaves simple, alternate, 11–16 cm long, 10–14 cm broad, broadly ovate-cordate, acuminate, 5-veined, shallowly 3–5 lobed, hairy on both sides, veins prominent below; petioles 5–8 cm long, cylindrical, hairy; flowers unisexual on the same plant, bright yellow, male flowers in axillary clusters, female flowers solitary, about 3 cm in diameter; calyx fused at the base and with the corolla; calyx segments 5–7, linear, hairy; corolla open, bell-shaped to rotate, hairy, 5–7 partite; stamens 3–5, free, epipetalous, filaments short, anthers contorted, stigmas rudimentary; female flowers solitary, calyx and corolla same as in the male; ovary inferior, 1.5–2.5 cm long, spindle shaped, ash green, studded with bulbous hairs, stigmas 5 with a circular disc around at the base; fruit large, globular to oblong elongated, yellowish or brown, smooth or with sharp elevations; seeds flat, white, about 6 mm long.

**Illustrations.** Ames, Economic Annuals and Human Cultures. 79. 1939; Kirtikar and Basu, Indian Med. Plants, pl. 459. 1933.

**Distribution.** Cultivated throughout India, Ceylon, Indo-China and Philippine Islands.

**Composition.** The fruit contains dextrose, saccharose, ascorbic acid, ascorbic acid oxidase and a fixed oil. The seeds also contain a fixed oil, phytine and lecithine. The fruit is a good source of iron and calcium containing very little vitamin A and fair amounts of vitamins B, C and G. The fruit of the wild bitter variety contains a proteolytic enzyme and an unknown bitter substance. The leaves contain urea.

**Uses.** The fruit is used as a vegetable or a salad. The raw cucumber is eaten for sprue. In Indo-China, the immature fruit is cooked and given to children for dysentery. The seeds are considered cooling and used as a diuretic and taenicide. In Madagascar, the fruit is considered anthelmintic. The fruit juice is used in the preparation of many cosmetic preparations as it imparts its characteristic odour. The juice of the bitter variety banishes cockroaches, moths and woodlice.

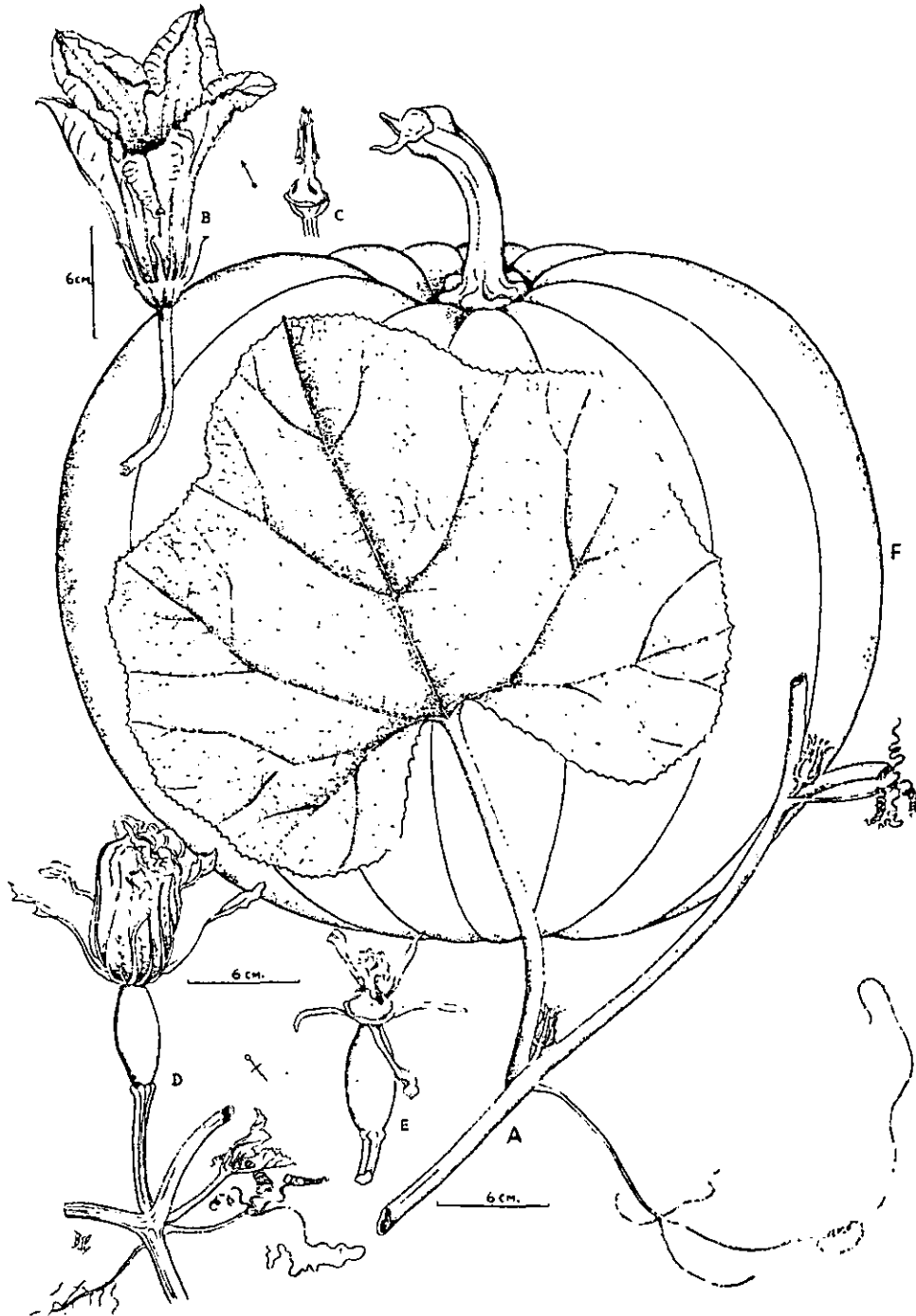


FIG. 168. *Cucurbita maxima*. A, branch with a leaf and young flowers. B, male flower. C, male flower with perianth removed showing the stamens. D, female flower. E, female flower with the corolla removed showing the calyx, style and stigmas. F, fruit.

10. *Cucurbita maxima* Duchesne in Lamk. *Encycl. Meth.* 2: 151 1786 (Fig. 168).*Cucurbita sulcata* Blanco.

*Engl.* Melon Pumpkin, Red Gourd, Squash Gourd; *Sinh.* Kumbala, Ratalabu, Wattakka; *Tam.* Pushini; *Hindi* Kadu, Mithakaddu; *Sans.* Dangari, Gramya, Gudayogaphala, Kushmanda, Pitakushmanda, Pitaphala, Pitapushpa.

A large, climbing or prostrate, annual, hispid herb, tendrils 4-fid; leaves simple, alternate, large 15—30 cm long, a little broader, orbicular in outline, cordate with very deep sinus, faintly 5-lobed, hairy, shallowly serrate; petioles about 20 cm long, hispid; flowers regular, large, yellow, about 12 cm long, monoecious, peduncles longer in male flowers; male flowers: calyx campanulate at base, segments 5, linear; corolla campanulate, 5-lobed with crinkly revolute lobes; stamens 3, inserted low in the calyx-tube, anthers connate, one 1-celled, 2 two-celled, cells conduplicate; female flowers: calyx and corolla almost the same as in the male flower with the sepals larger and more foliar; ovary inferior, oblong, about 5 cm long, glabrous, unilocular with 3 parietal placentas, style short, stigmas 3, bifid, ovules many, horizontal; fruit large, fleshy, indehiscent; seeds ovoid, compressed, margined.

Flowers almost throughout the year.

**Illustrations.** Kirtikar and Basu, *Indian Med. Plants*, pl. 462B. 1933; Herb. Peradeniya., drawing.

**Distribution.** Cultivated throughout India, Ceylon and in most regions of the world. In Ceylon, it grows best in the dry zone especially after the rains.

**Composition.** The fruit contains fat, protein, pentosan, vitamin A, sugar, two pigments cucurbitene and cucurbitaxanthin, niacin, riboflavine and aneurin. The young shoots are good sources of calcium, iron, phosphorus, vitamin B and also contain hydrocyanic acid and ascorbic acid oxalate. The seeds contain a fixed oil, saponin, a protein called cdestin and an active principle.

**Uses.** In India, the pulp of the fruit is used as a poultice for boils, carbuncles and ulcers. The dried pulp is a remedy for haemoptysis and haemorrhages from the pulmonary organs. The fruit stalk in immediate contact with the ripe gourd made into a paste with water is a specific for insect and centipede bites. The seeds are employed as a vermifuge. They may be given with sugar for tapeworm. As a diuretic, they are given for gonorrhoea and urinary diseases. The oil from the seeds is used as a nervine tonic. In tropical Africa, the seeds are given as a roundworm remedy, while in Guinea the pulp of the fruit is applied to burns, scalds, inflammations, abscesses and boils. The young shoots, flowers and the mature fruits are often used as vegetables.

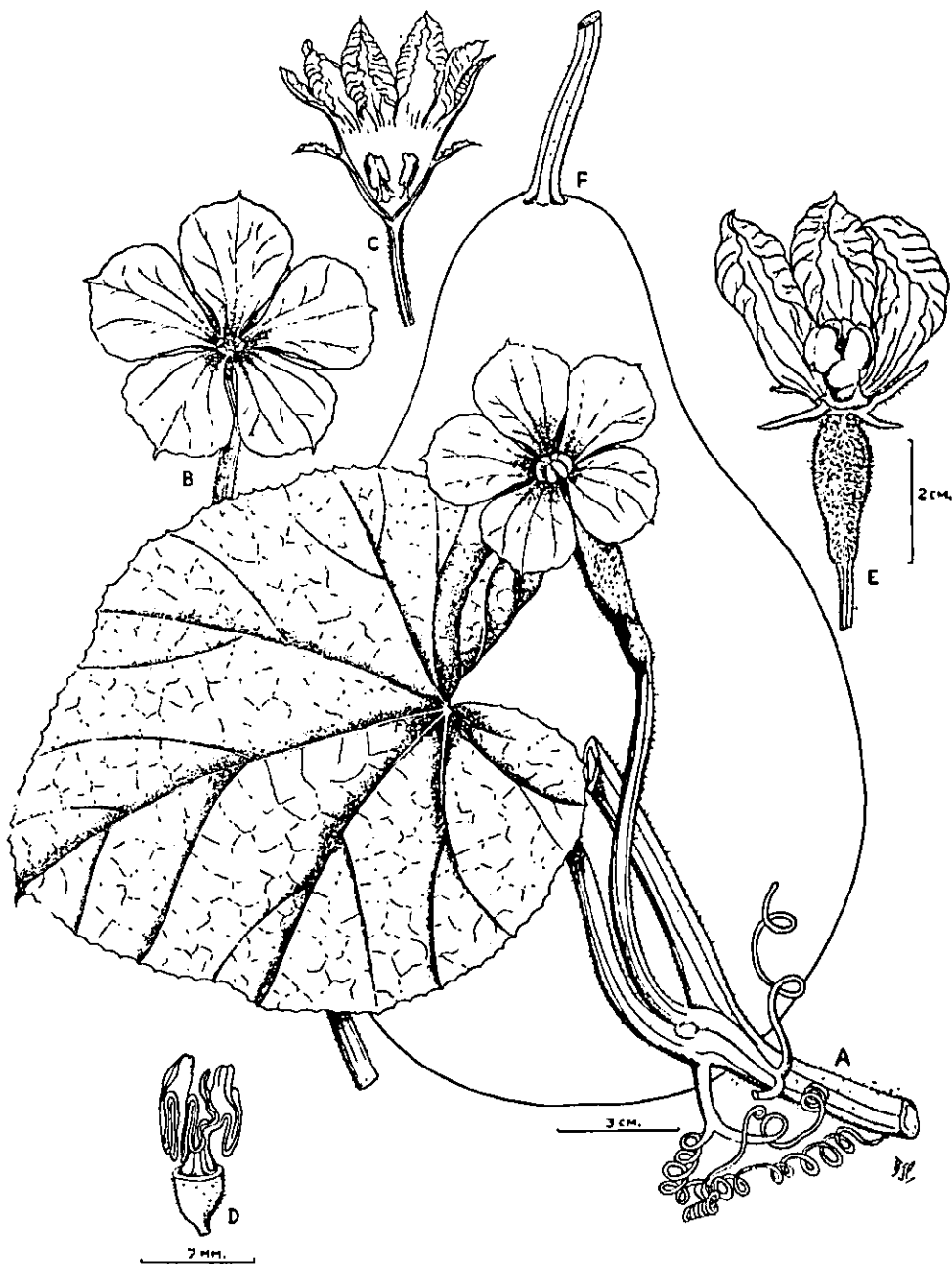


FIG. 169. *Lagenaria siceraria*. A, a portion of a stem with a leaf, tendrils and a female flower. B, male flower from front. C, male flower, spread out showing the insertion of stamens. D, male flower with the calyx and corolla removed, showing the conduplicate anthers. E, female flower with 2 petals removed, to show the bifid stigmas. F, fruit.

11. *Lagenaria siceraria* (Mol.) Standley in Field Mus. Nat. Hist. Bot. ser 3, 433. 1930. (Fig. 169).

*Lagenaria leucantha* (Duch.) Rusby—*Lagenaria vulgaris* Ser.—*Lagenaria lagenaria* Cockrell —*Lagenaria vittata* Ser.—*Lagenaria hispida* Ser.—*Lagenaria idolatrica* Ser.—*Cucurbita leucantha* Duch.—*Cucurbita lagenaria* Linn.—*Cucurbita siceraria* Molina.—*Cucurbita lagenaria-oblonga* Blanco—*Cucurbita lagenaria-villosa* Blanco.

*Engl.* Bottle Gourd; *Sinh.* Diya-labu; *Tam.* Shorakkai; *Hindi* Alkaddu, Golkaddu Kaddu, Kadutumbari, Kadutumbi, Kashiphal, Lau, Lauka, Lauki, Mithitumbi, Titalau, Tumri; *Sans.* Alabu, Brihatphala, Dantabija, Ikshavaku, Katukalabu, Katutiktaka, Katutumbi, Katutumbini, Kshayatriyavira, Labuka, Lamba, Mahaphala, Nripatmaja, Phalini, Pindaḥhala, Rajputri, Tiktaka, Tiktatumbi, Tumbā, Tumbaka, Tumbi.

A moderate-sized, softly tomentose, tendril climber with 5-angled stems: leaves simple, alternate, petiolate with tendrils and flowers at their axils; lamina 13—20 cm long and as broad, broadly ovate or orbicular, faintly 5-lobed, acute, deeply cordate at base, dentate, softly hairy on both sides, veins prominent below; petioles 8—13 cm long, cylindrical, pubescent with two glands at the apex; tendrils bifid, main branch longer than the other, pubescent; flowers large, brownish white, unisexual, regular, solitary, both male and female flowers on the same plant; male flowers: peduncle 10—13 cm long, pubescent; sepals 4 or 5, bases fused into a funnel-shaped, subcampanulate tube, 1.7 cm long, segments lanceolate, dentate and pubescent; petals 4 or 5, broadly obcordate and infolded, 5 cm long, 3.5 cm broad, fused  $\frac{1}{2}$  way up with the calyx-tube, pubescent; stamens 3, epipetalous, filaments short and glabrous, anthers connate, conduplicate; female flowers: peduncle 5—8 cm long, cylindrical, hairy; sepals 5, small, lanceolate, pubescent; petals 5, free, obovate, 4.5 cm long, 2.5 cm broad, pubescent and prominently 3-veined; ovary inferior, 2—3 cm long, obpyriform, pubescent, 3-carpellary with 3, bifid stigmas; fruit large, dumbbell-shaped, indehiscent; seeds many, white, horizontally compressed with a marginal groove.

Flowers throughout the year depending on the time of planting.

*Illustrations.* Kirtikar and Basu, Indian Med. Plants, pl. 446. 1933; Ames, Economic Annuals and Human Culture, 88. 1939.

*Distribution.* Indigenous to tropical Africa and Asia. It is frequently cultivated in India, Ceylon and Philippine Islands.

*India.* N.W. Prov., Banda, *Bell* 228, March 1901. *Ceylon.* Central Prov., *Bot. Gard.* Jan. 1890.

*Composition.* The fruit contains niacin, riboflavine and aneurin. It is a good source of iron, calcium, phosphorus and vitamin B. The seeds contain a fixed oil and saponin.

*Uses.* The fruit is eaten as a vegetable. The shell of the fruit is used as a gourd or for making musical instruments. The pulp is useful for coughs and as an antidote to certain poisons. It is also considered as antibilious, diuretic and refrigerant. In Guiana, the juice of the plant is used as a cathartic, seeds used for dropsy and as a taenicide. The oil from the seeds is an emollient and applied on the head for relief from headaches.

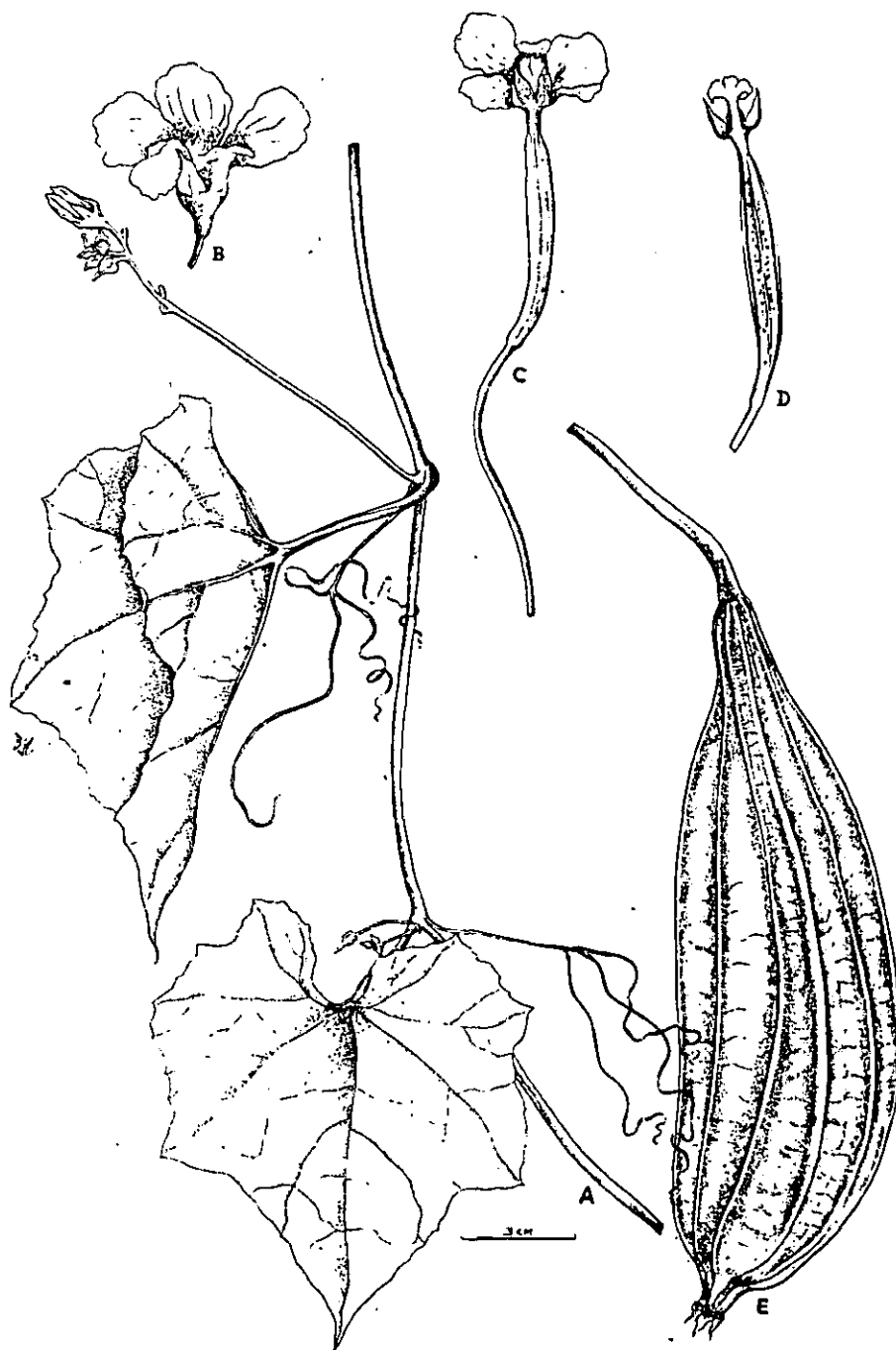


FIG. 170. *Luffa acutangula*. A, branch with leaves, tendrils and a male inflorescence. B, side view of male flower. C, female flower. D, longitudinal section of female flower. E, fruit.

12. *Luffa acutangula* Roxb. Hort. Beng. 70. 1814. (Fig. 170).

*Cucumis acutangulosus* Linn.—*Luffa foetida* Cav.—*Momordica luffa* Linn.

*Sinh.* Daravetakolu, Vetakolu; *Tam.* Peeram, Pekankai, Peyppichukku, Pekunkai; *Hindi* Jinga, Sataputitorai, Torai, Turi; *Sans.* Dhamargowa, Dharaphala, Dirghaphala, Gramya, Jalini, Jhingaka, Karkotaki, Koshataki, Kritawedhana, Laghukoshataki, Pitapushpa, Rajakoshataki, Rajimatphala, Saptaputri, Sukosha, Supushpa, Svaduphala.

A stout annual, climbing by means of tendrils, stems 5-angled, glabrous, often scabrid, tendrils 3-fid and the young parts slightly pubescent; leaves simple, alternate, large, pale green, 6—23 cm long and as broad, orbicular in outline, very cordate at base, usually more or less palmatifid, lobes acute, distantly denticulate, finely scabrous on both sides; nerves and veins prominent beneath; petioles 1.5—6 cm long, angular, slightly scabrous; male flowers many in axillary, 12—20-flowered racemes, each flower carrying a small, fleshy bract near the base bearing 3 or 4 large immersed glands; calyx fused at the base with the base of the corolla to form a campanulate tube, segments 5 or 6, 9—9.5 mm long, 3.5—4 mm broad, lanceolate, hairy with or without immersed glands; petals 5 or 6, free on the calyx-tube, infolded, hairy on both sides; stamens 3 or 4, epipetalous, filaments hairy; female flowers solitary in the same axils as the males or separate, ovary inferior, 2.5—3 cm long, strongly 10-ridged, style short, thick, stigmas 3, large, bilobed; fruit 15—30 cm long, clavate-oblong tapering to the base, very obtuse, smooth, longitudinally ribbed or almost winged with 10 sharp angles or ridges; seeds numerous, 1.2 cm long, oblong—ovoid, much compressed, slightly corrugated on the sides and black in colour.

Flowers almost all the year round.

**Illustration.** Kirtikar and Basu, *Indian Med. Plants*, pl. 449. 1933.

**Distribution.** Indigenous in India and in Malay Archipelago. It is frequently cultivated in Ceylon in the mid and low-country and also in other tropical countries.

**India.** *Buysman*, Sept. 1899. **Ceylon.** *Thwaites C.P.* 1624; Eastern Prov., *Thwaites C.P.* 1623; Central Prov., Peradeniya, cultivated, *Herb. Peradeniya*, Feb. 1898. **Indo-China.** Hue and vicinity, *Squires* 308, Jan.—May 1927.

**Composition.** The fruit contains an amorphous bitter principle, luffeine and it is a good source of iron, calcium, phosphorus and vitamin B. The seeds contain a fixed oil which consists of the glycerides of palmitic, stearic and myristic acids. Both vegetative and reproductive organs contain hydrocyanic acid.

**Uses.** The fruit is cooked and consumed as a vegetable. The bruised leaves are applied locally to splenitis, haemorrhoids and leprosy and the expressed juice dropped into the eyes of children for granular conjunctivitis. The fruit is used in combination with other drugs in the treatment of snake-bites. The dried fruits are powdered and made into a snuff for treating jaundice. In Mauritius, the seed is used as a strong purgative, the active principle being elaterin. The oil extracted from the dry seeds is used in skin diseases. The root is used as a purgative in Russia and in India, while in the latter country it is used for dropsy as well. Both fruit and seeds are toxic to fish.

The fibre is used for making hats in Nigeria, Senegal and Ghana.

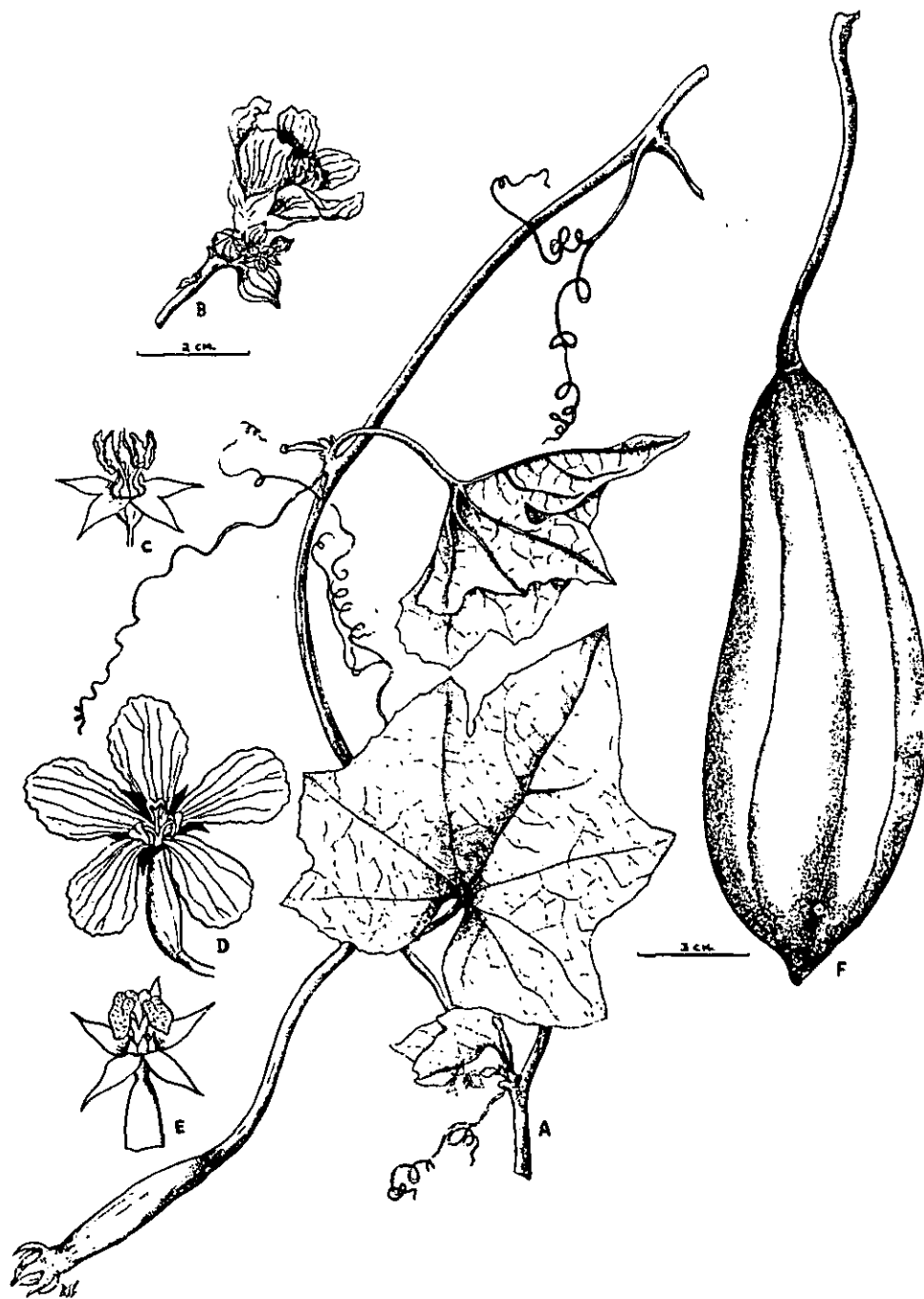


FIG. 171. *Luffa cylindrica*. A, branch with leaves, tendrils and a female flower. B, male inflorescence. C, male flower with corolla removed, showing the stamens. D, female flower. E, female flower with corolla removed. F, fruit.

13. *Luffa cylindrica* (Linn.) M. Roem., Synops. 2: 63. 1840. (Fig. 171).

*Luffa aegyptiaca* Mill.—*Luffa petola* Seringe—*Luffa pentandra* Roxb.—*Momordica cylindrica* Linn.—*Momordica luffa* Linn.

*Engl.* Sponge Gourd, Vegetable Sponge; *Sinh.* Niyān-wetakolu; *Tam.* Pichuknu, Pikku; *Hindi* Ghiatarui, Nenua, Purula; *Sans.* Aibhi, Brihatkoshataki, Dhamargava, Dirghapatolika, Ghoshaka, Hastighosha, Hastikoshataki, Hastiparna, Mahakoshataki, Mahaphala, Mahapushpa, Rajakoshataki, Sapitaka.

Annual, tendril climber with 5-angled, stout, twisted stems, young parts slightly pubescent; leaves simple, alternate, large, 10—20 cm long, orbicular in outline, often broader than long, very cordate at base, usually more or less 7-lobed, lobes acute, distantly denticulate, finely scabrous on both sides; petioles 2.5—7.5 cm long, angular, slightly scabrous; flowers regular, yellow, unisexual, monoecious; male flowers: numerous in racemes 10—20 cm long, pedicels 0.6—1.2 cm long, pubescent with a small fleshy bract near the base bearing 3 or 4 large immersed glands, buds pointed; sepals 5, fused into a cup-shaped calyx-tube, segments lanceolate, acuminate; petals 5, connate more than half-way up, obovate-oblong; stamens 5, distinct; female flowers solitary, over 5 cm long on peduncles 7.5—10 cm in length; calyx segments lanceolate, acute, tube produced a little beyond the ovary; petals obovate-oblong; ovary inferior, oblong cylindrical, glabrous or pubescent, style short, thick, stigmas large; fruit very large, 15—30 cm or more long, cylindrical or somewhat trigonous, not ribbed, blunt at the end; seeds oval, about 1.2 cm long, much compressed, narrowly winged, grey, rough on the sides.

Flowers in July.

*Illustrations.* Rheede, Hort. Mal. 8: pl. 8. 1678—1703; Wight, Ic. Pl. Ind. Orient. pl. 499. 1840—43; Kirtikar and Basu, Indian Med. Plants, pl. 447. 1933.

*Distribution.* Cultivated throughout India, Ceylon and Philippine Islands. It is common in native gardens in the low-country, up to an altitude of 3000 ft.

*India.* Khasia: J. D. Hooker and T. Thomson; Tharia Ghat, Clarke 5404, Sept. 1867. Ceylon. Thwaites C.P. 2805. Central Prov., Peradeniya, cultivated, J. M. Silva, Feb. 1921; F. W. de Silva, Feb. 1930. Philippine Islands. Luzon: Isabella Prov., San Marino, Ramos and Edano 46999, Feb.—March 1926; Rizal Prov., San Andales, Edano 48749, Dec. 1926.

*Composition.* Wehmer records that the fruit fibre contains cellulose, xylan, mannan, galactan and lignin. The seeds contain a fixed oil and the fruit, saponin and abundant mucilage.

*Uses.* The root is a hydragogue cathartic. The leaves are prescribed in skin diseases and orchitis. In Java the juice of the leaves is given for amenorrhoea. The fresh fruit is considered cooling, beneficial to the intestines and tonic to the genital organs. The seeds are said to be emetic and cathartic. An infusion of the seeds is a drastic purgative and a useful anthelmintic. In Cambodia, the fruit is used as a diuretic.



FIG. 172. *Melothria heterophylla*. A, female plant with leaves, tendrils and flowers. B, portion of a male plant with leaves and a male corymb. C, another form of a male plant with leaves and tendrils. D, female flower with perianth opened out showing the style and stigma. E, male flower opened out showing stamens. F, fruit.

14. *Melothria heterophylla* Cogn. in DC. Mon. Phan. 3: 618. 1881. (Fig. 172).

*Solena heterophylla* Lour.—*Zehneria hastata* Miq.—*Zehneria umbellata* Thw.—*Zehneria connivens* Miq.—*Karivia umbellata* Arn.—*Karivia rheedii* Roem.—*Momordica umbellata* Roxb.—*Bryonia umbellata* Klein.—*Bryonia amplexicaulis* Lamk.—*Bryonia sagittata* Blume.—*Bryonia rheedii* Bl.—*Harlandia bryonioides* Hance.

*Sinh.* Kawudu-kekiri; *Tam.* Peyppudal; *Hindi* Amantmul; *Sans.* Karivivalli.

Perennial, tendril climber with very long, slender, glabrous stems, root with pendulous tubers, tendrils very long and young parts puberulous; leaves simple, alternate, very variable, 7.5—10 cm long, usually triangular ovate with a cordato—hastate base, lobes often overlapping but sometimes prolonged into oblong or even linear divaricate lobes, acute, distantly denticulate, slightly rough with scales, bright green above, smooth and glaucous beneath, scabrous on margin; petioles 1.2 cm long, cylindrical, twisted; flowers regular, yellowish white, unisexual, dioecious, males on slender pedicels, numerous, crowded in a close, umbellate, pedunculate corymb much shorter than the leaves, females solitary; sepals 5, fused into a campanulate calyx limb, segments minute; petals 5, very slightly connate at base, very short, triangular; male flowers: stamens 3, inserted low down in the calyx, anthers small, distinct, cells slightly curved; female flowers: ovary inferior, calyx-tube constricted above the ovary into a narrow neck, glabrous, 10-ribbed with 3 placentas, style stout, surrounded at base by a lobed disc and three erect staminodes, stigmas very large; fruit about 3.7 cm long, oblong-ovoid, cylindrical, tapering to a point but not beaked, smooth and red in colour; seeds ovoid, scarcely compressed, smooth and white.

Flowers from June to July.

*Illustrations.* Rheedee, Hort. Ind. Mal, 8: pl. 26. 1678—1703; Kirtikar and Basu, Indian Med. Plants, pl. 466 B. 1933.

*Distribution.* Occurs in tropical Asia, India, Ceylon, China, Java, etc. In Ceylon, it is very common in the moist low-country.

*India.* Nepal: *Wallich* 6705T, 1821; *Wallich* 6705L. Sikkim: *J. D. Hooker*. Khasia: *J. D. Hooker and T. Thomson*. Simla: *T. Thomson*; Bengal: *Kurz*. Pen. Ind. Or., *Herb. Wight* 1129, Kew Distribution 1866—7. Ceylon. *Thwaites* C.P. 1619. Western Prov., Katunayake, *Alston* 2395, Aug. 1928. Uva Prov., *Herb. Peradeniya*, Jan. 1888; Ella Pass, *Herb. Peradeniya*, Sept. 1890; Moneragala, *Alston*, March 1928.

*Uses.* The juice of the root along with other ingredients is given as a remedy for spermatorrhoea. In Indo-china, the seeds are used as a purgative.

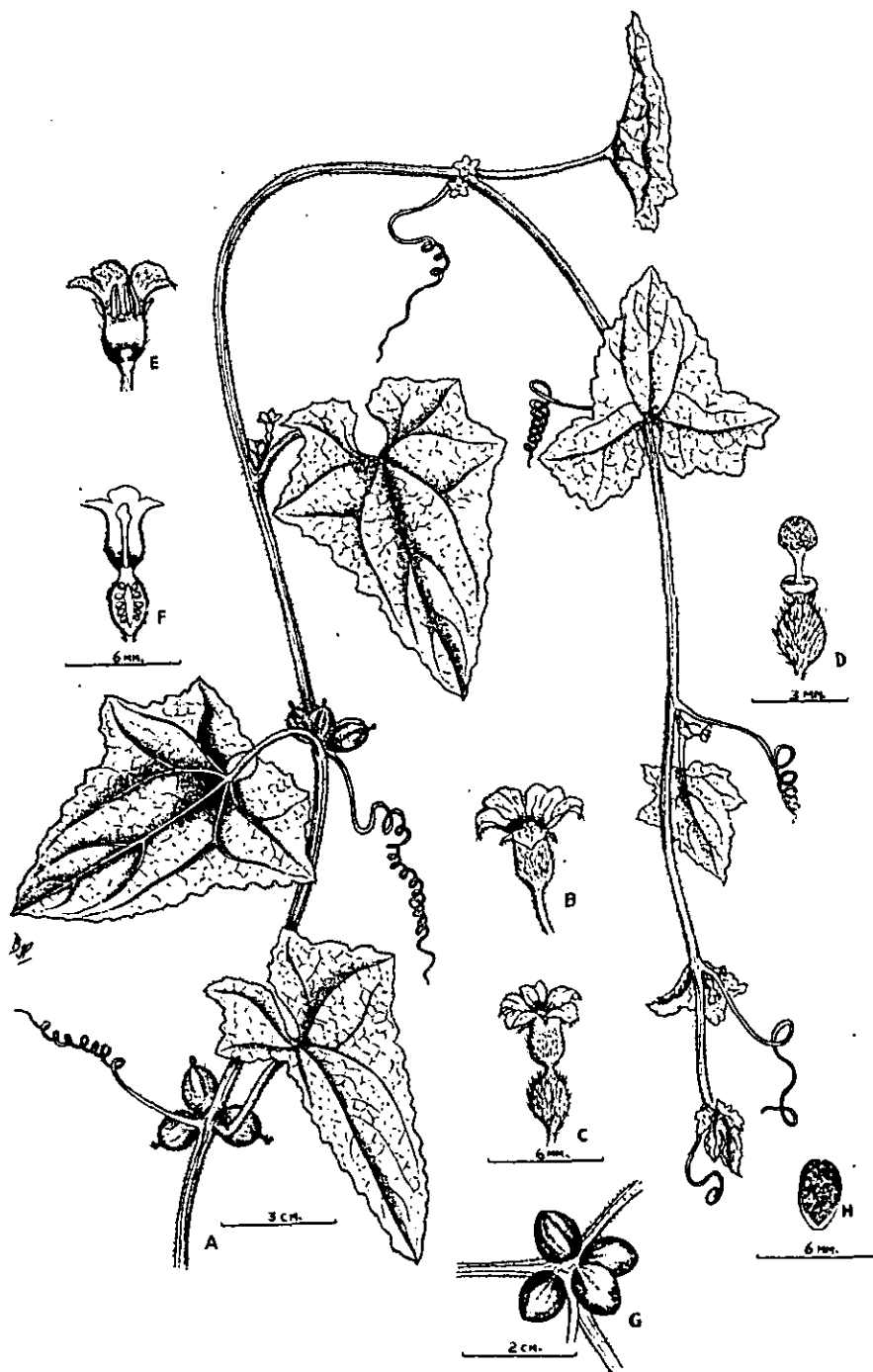


FIG. 173. *Melothria maderaspatana*. A, stem with leaves, fruits and flowers. B, male flower. C, female flower from side. D, female flower with calyx and corolla removed, showing style and annular disk. E, longitudinal section of male flower. F, longitudinal section of female flower. G, fruits. H, seed.

15. *Melothria maderaspatana* (Linn.)-Cogn. in DC. Mon. Phan. 3: 623. 1881. (Fig. 173).

*Cucumis maderaspatana* Linn.—*Kukia scabrella* Arn.—*Mukia maderaspatana* Kurz.—*Bryonia scabrella* Linn. f.—*Bryonia cordifolia* Linn.—*Bryonia wightiana* Wall.—*Bryonia maderaspatana* DC.—*Bryonia althacoides* DC.—*Karivia javana* Miq.

*Sinh.* Hin-kekiri; *Tam.* Mochumochukkai, Musimusikkayi, Musumusukkai; *Hindi* Agumaki, Bilari; *Sans.* Ahilekhana.

Annual or perennial, tendril climber with long, slender, much branched, angular, very hispid stems, young parts densely, covered with white hairs, tendrils simple; leaves simple, alternate, variable in size, 7.5—10 cm long, but often 4.5—6 cm or even less long and as broad, deltoid-ovate, very deeply cordate at base with a wide sinus and the rounded lobes often overlapping, acute or obtuse at apex, rather shallowly 5-lobed, coarsely dentate-serrate, usually scabrous with stiff hairs on both sides; petioles half as long as leaves, cylindrical, very hispid; flowers yellow, regular, unisexual, monoecious, very small, about 5 mm diameter, male and female together in axillary clusters, males on pilose pedicels as long as the calyx, females nearly sessile; sepals 5, fused into a campanulate hairy calyx, segments linear, hispid; petals 5, very slightly connate at base, ovate or oblong, ciliate, a little longer than calyx segments; male flowers: stamens 3, distinct, slightly connate by the anthers, anther cells straight, ovary vestigial, globular at the base of calyx-tube; female flowers: ovary inferior, 3.5 mm long, ovoid, very hispid, style thick, surrounded at the base by an annular disc, placentas usually 2; fruit a scarlet berry, 1.2 cm long, broadly ovoid, apiculate with a few scattered hairs; seeds horizontal, closely packed, oval, compressed, bluntly muriculate on the sides surrounded by a pulpy envelope.

Flowers all the year round.

*Illustrations.* Wight, Ic. Pl. Ind. Orient. pl. 501. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 465. 1933; Herb. Peradeniya, drawing.

*Distribution.* Occurs throughout India, Ceylon, Malaya, Australia, Philippine Islands and Africa. In Ceylon, it is common in the low-country up to 3000 feet altitude. Jaffna, Anuradhapura, Kantalai, Kurunegala, Peradeniya, Galle, etc.

*India.* Sikkim: *T. Thomson*, 1857. Khasia: *J. D. Hooker and T. Thomson*. Cachar: *Clarke* 18525, Dec. 1872. Calcutta: *Wallich* 6708C. Malabar, Concan, etc., *Stocks, Law, etc.* Ceylon. *Thwaites C.P.* 1616; *Walker*. North Central Prov., Puliyankulama, *Alston* 1252, March 1927. Eastern Prov., Kantalai, *Herb. Peradeniya*, Aug. 1885. North Western Prov., Kurunegala, Wetakeyapotha, *Alston* 1455, Jan. 1927. Uva Prov., Uma Oya. *F. W. de Silva*, March 1930.

*Uses.* The leaves are used as an expectorant. The roots when masticated fresh relieves toothache. Taken in the form of a decoction it relieves flatulence. The seeds are sudorific. The crushed seeds are applied on strained backs.

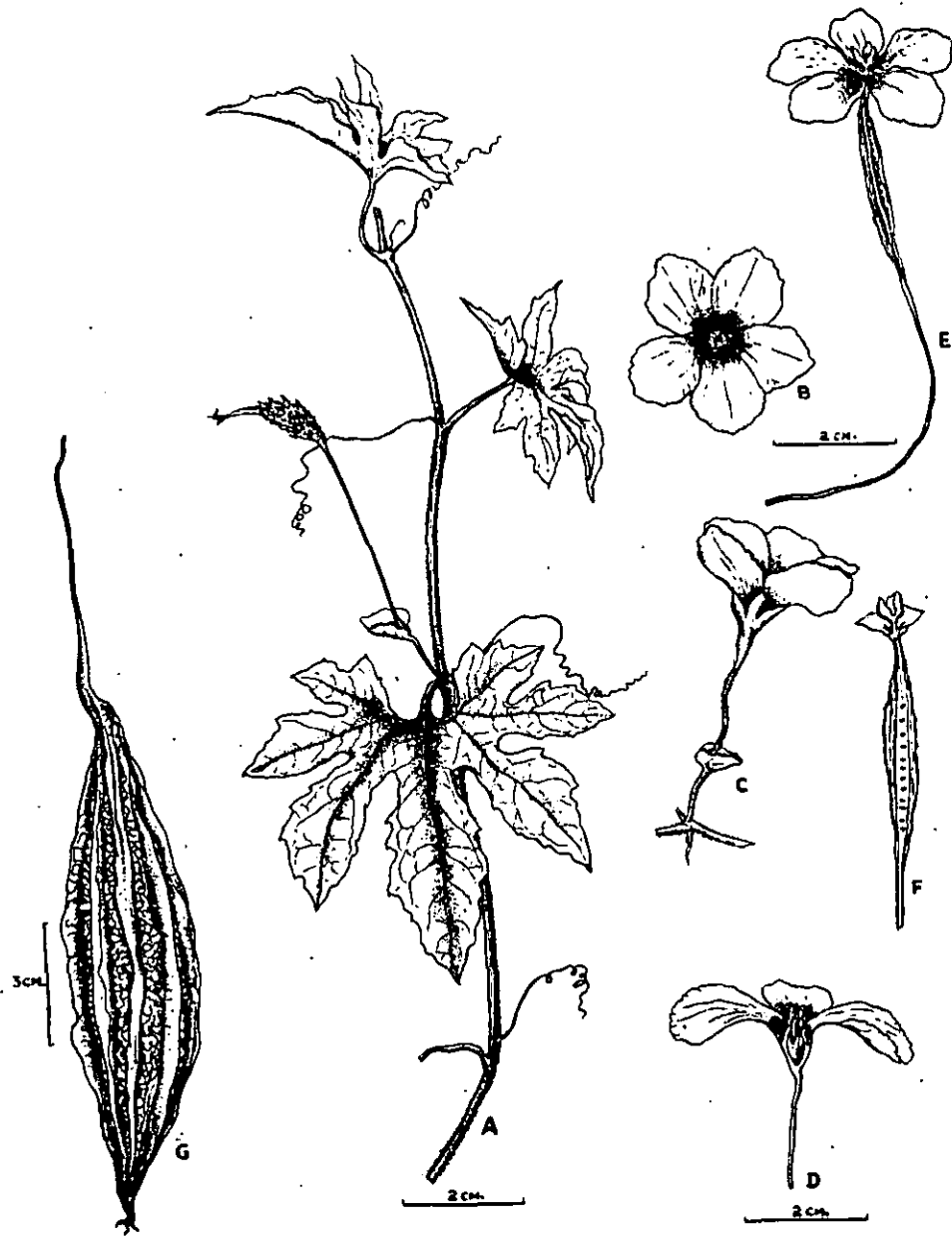


FIG. 174. *Momordica charantia*. A, portion of a plant with leaves, tendrils and a young fruit. B, front view of male flower. C, lateral view of male flower. D, longitudinal section of male flower. E, female flower. F, longitudinal section of female flower. G, fruit.

16. *Momordica charantia* Linn. Sp. Pl. 1009. 1753. (Fig. 174).

*Momordica humilis* Wall.—*Momordica muricata* DC.—*Momordica senegalensis* Lamk.—*Momordica balsamina* Blanco—*Momordica cylindrica* Blanco—*Cucumis africanus* Thunb.

*Engl.* Bitter Gourd; *Sinh.* Kariwila; *Tam.* Pakal, Pavakkachedi, Pavakkayi; *Hindi* Karela, Kareli, Karola; *Sans.* Ambuvallika, Brihadvalli, Chiripatra, Kandakataka, Kandura, Kantaphalla, Karaka, Karavalli, Karawallilata, Karavella, Karavellaka, Karavelli, Kathilla, Kathillaka, Katilla, Katillaka, Krimighna, Patu, Pitapushpa, Rahavalli, Sukanda, Sukandaka, Sukshnavalli, Sushavi, Susuvi, Toyavalli, Ugrakanta, Urdhvasita, Varivalli, Visakantaki.

An annual, tendril climber with somewhat twining, much branched, 5-angled, roughly pubescent stems, young parts hairy; leaves simple, alternate, 6—12.5 cm long, almost circular in outline, very deeply cordate at base, palmately cut to beyond the middle into 7 or 9 lobes, lobes acute, apiculate coarsely spinous-dentate, pubescent on veins on both sides, petioles 2.5—5 cm long, channelled above and narrowly bordered with decurrent leaf-bases; flowers regular, lemon yellow, unisexual, monoecious, solitary, axillary on slender peduncles 5—7.5 cm long, usually with a large, sessile, rotundate, entire bract on the lower half and often close to the base; calyx segments 5, fused at base, oval, subacute, pubescent; petals 5, slightly connate at base, twice as long as calyx segments, rounded, veiny; male flowers: stamens 3, anthers slightly connate, cells conduplicate; female flowers: ovary inferior, papillose, style short, stigmas 3, bilobed; fruit large, 7.5—15 cm long, pendulous, fusiform, usually pointed or beaked, closely tubercled and also bluntly muricated, orange coloured when ripe; seeds large, about 1.2 cm long, ovoid, compressed each enclosed in a red pulpy envelope.

Flowers from June to August.

*Illustrations.* Curtis, Bot. Mag. 51: pl. 2455. 1824; Edward, Bot. Reg. 12: pl. 980. 1826; Wight, Ic. Pl. Ind. Orient. pl. 504. 1840—43; Kirtikar and Basu, Indian Med. Plants. pl. 452. 1933; Herb. Peradeniya, drawing.

*Distribution.* Cultivated throughout India, Ceylon, Malaya, China and tropical Africa. In Ceylon, it is cultivated in the low-country up to 3000 feet altitude.

*India.* Gangetic Plain, cultivated, *T. Thomson*. Maisor and Carnatic, *G. Thomson*. Ceylon. Peradeniya, Bot. Gard., cultivated, *J. M. Silva*, Feb. 1928. *Maldive Islands*. Faga, *Didi* 61, 1896.

*Composition.* The whole plant, including the unripe fruit, contains probably two alkaloids one of which is momordicine, a glucoside—like substance, an aromatic ethereal oil, a fixed oil, traces of a fatty acid and carotene. The fruit is a good source of iron, calcium, phosphorus and vitamin B. The seeds yield a purgative oil high in saponin content.

*Uses.* The fruits and leaves are anthelmintic and used as a vermifuge. They are also useful for piles, leprosy and jaundice. The leaves are used in the treatment of colic. The root is an ingredient in aphrodisiacal preparations and used externally for haemorrhoids. The fruit is a tonic and stomachic and useful for rheumatism, gout and diseases of the spleen and liver. In large doses it is a drastic purgative and is considered abortifacient.

In Indo-China, the seeds are used as a cure for dysentery. In Cuba the whole plant is used in the treatment of diabetes and chronic ulcers in the stomach. The seed is administered as an anthelmintic in Brazil and Congo. The plant is used for preparing remedies for skin diseases, headaches and constipation in Japan. In the Philippines, the juice of the green fruit is given for chronic colitis and bacillary dysentery, while the juice of the leaves is administered for children's coughs.

The green fruit is used as a vegetable in spite of its bitterness.



FIG. 175. *Momordica dioica*. A, male plant with leaves and flowers. B, part of a stem of a female plant with a flower. C, another form of a male plant showing the tuber, a portion of the stem with leaves and tendrils and a flower. D, front view of a male flower. E, side view of male flower with corolla removed. F, female flower with corolla removed. G, fruit.

17. *Momordica dioica* Roxb. in Willd. Sp. Pl. 4: 605. 1805. (Fig. 175).

*Momordica balsamina* Wall.—*Momordica wallichii* Roem.—*Momordica renigera* Wall.—  
*Momordica hamiltoniana* Wall.—*Momordica heyneana* Wall.—*Momordica missionis* Wall.—  
*Momordica subangulata* Bl.—*Trichosanthes russeliana* Wall.—*Bryonia grandis* Wall.

*Sinh.* Thumbakariwila; *Tam.* Palupalagakalungai, Paluppakkay, Tumbai; *Hindi* Beksa, Ghosalphal, Golkandra; *Sans.* Avandhya, Bhaktadamani, Bodhanajali, Bhutapaha, Devi, Diva, Ishwari, Kandashalini, Kandavalli, Kanta, Karkotaki, Mahajati Mahajalinika, Mahayogeshwari, Manasvini, Manodna, Nagahantri, Nagarati, Nagari, Nakradamani, Pathya, Pitapushpi, Putrada, Sakanda, Sarpadamani, Sarvanshadi, Srikanda, Sugandha, Vahisi, Vandhya, Vandhyakarkotaki, Vara, Vishakandakini, Vishakantakini, Vishamo-haprashamani, Yogeswari.

A dioecious, perennial, tendril climber with tuberous roots; stems slender, somewhat compressed and 2-edged or cylindric and furrowed, striate, glabrous or somewhat scantily pubescent and shining; tendrils simple, elongate, striate, glabrous, opposite a leaf; leaves simple, alternate, variable, 5—10 cm long, 4—7 cm broad, broadly ovate in outline, very cordate at base, acute, entire or more or less deeply cut into 3 or 5 lobes, distantly dentate or denticulate, thin, quite glabrous and shining on both sides, minutely punctate beneath; petioles 2.5—3.7 cm long, pubescent or glabrous, channelled above, eglandular; flowers regular, unisexual, pale lemon yellow, dioecious, solitary, peduncle 3—5 cm long, slender, glabrous or finely pubescent at the top, in the male with a large hooded bract a little below the flower and enclosing it, in the female with a minute bract below the middle; sepals 5, fused at the base, distant, 3.5 mm long, linear-lanceolate, hairy; petals 5, connate slightly at the base, 1.2—2.5 cm long, 0.5 cm broad, oblong-lanceolate, acuminate, pubescent; male flowers: stamens 3, anthers slightly connate, cells conduplicate; female flowers: ovary inferior, densely covered with long, soft papillae, style short, stigmas bifid with erect horns; fruit oblong-ovoid, 5—6.3 cm long, beaked, glabrous, evenly covered with equal-pointed papillae, many seeded; seeds broadly oblong, compressed, slightly and irregularly corrugated, enclosed in a red pulp.

Flowers from June to August.

*Illustrations.* Wight, Ic. Pl. Ind. Orient. pls. 505 and 506. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pls. 453 and 454. 1933, same as Wight Ic; Herb. Peradeniya, drawing (male flowers incorrect).

*Distribution.* Occurs throughout India, Ceylon and Singapore. In Ceylon, it is common in the low-country especially in the dry regions.

*India.* Sylhet: Chattuk, Clarke 17388, male plant. Bengal: Clarke 14147, Aug. 1871. Ceylon. Central Prov., Dambulla, J. M. Silva, Feb. 1928. Southern Prov., Galle, Thwaites C.P.197.

*Uses.* The leaves of the female plant are used as an aphrodisiac, anthelmintic and in asthma, bronchitis, hiccough and piles. The tuberous root is an expectorant and used in urinary complaints. The roasted root is applied to stop bleeding from piles. The fruit is a stomachic, laxative and cures asthma, leprosy, bronchitis, excessive salivation and heart ailments. The root of the male plant is useful in all kinds of poisoning, including snake-bites, and for elephantiasis. It cures ulcers caused by snake-bite poisoning.

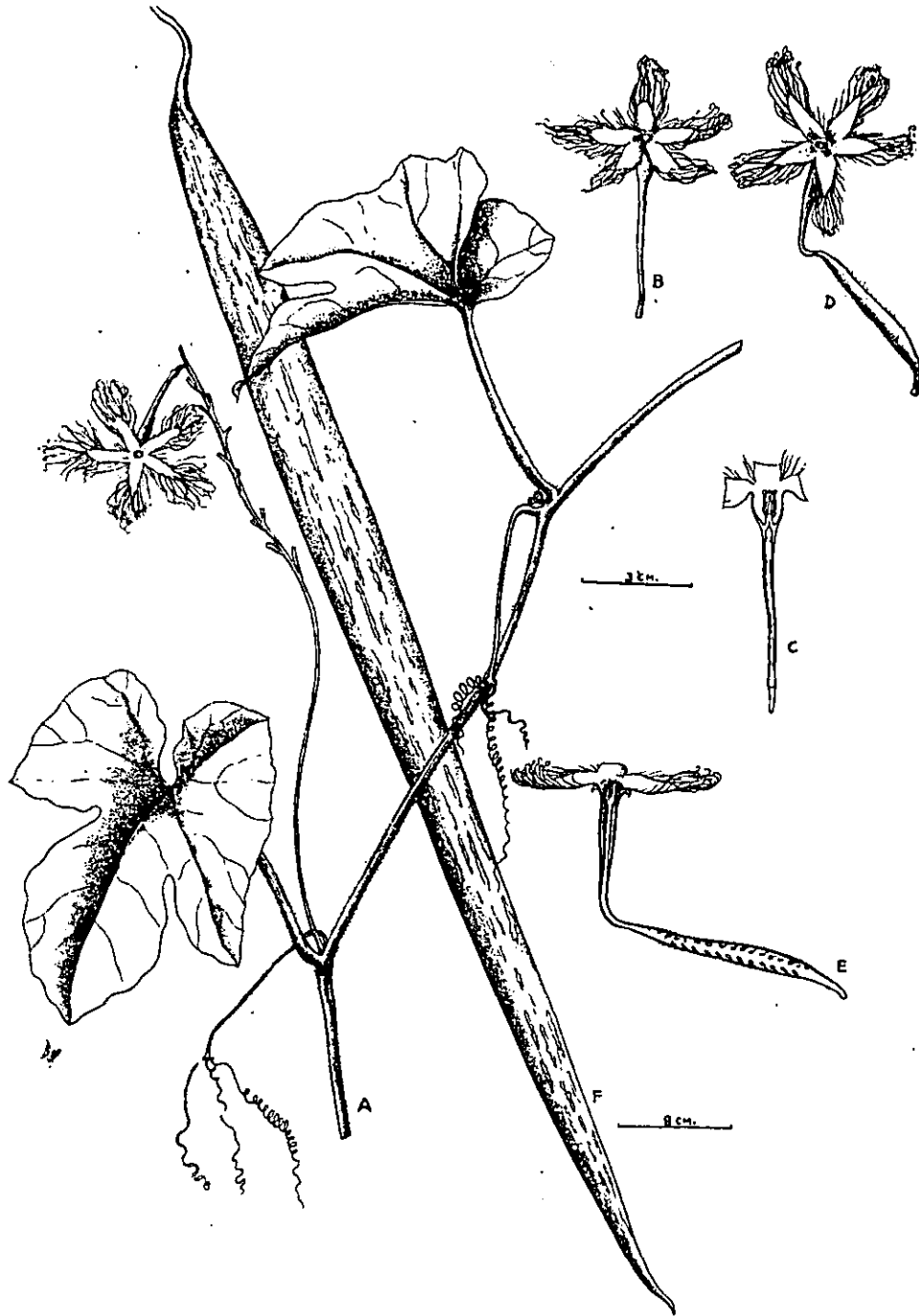


FIG. 176. *Trichosanthes anguina*. A, portion of a plant with leaves and a male inflorescence. B, lateral view of male flower. C, longitudinal section of male flower. D, female flower. E, longitudinal section of a female flower. F, fruit.

18. *Trichosanthes anguina* Linn., Sp. Pl. 1008. 1753. (Fig. 176).*Cucumis anguinus* Linn.

*Engl.* Snake Gourd; *Sinh.* Pathola; *Tam.* Padivilangu, Podalangai; *Hindi* Chachanda, Chachinga, Purwul; *Sans.* Ahiphala, Brihatphala, Chichinda, Chichunda, Chinakarkatika, Dirghaphala, Grihakulaka, Shvetaraji, Sudirgha, Veshmakula.

An annual, tendril climber with long, slender, furrowed, slightly hairy, leafy stems; tendrils 3-fid; leaves simple, alternate, 10—12.5 cm long, broadly ovate, more or less 3—5 lobed, lobes broad, acute, glabrous or nearly so above, more or less pubescent beneath, deeply cordate with a deep sinus; petioles 5—6 cm long, striate and pubescent; flowers regular, white, unisexual monoecious, male flowers in axillary 8—15 flowered racemes, female flowers solitary and axillary; male flowers: peduncles of racemes 10—15 cm long, slender, striate, flowers borne towards the apex, pedicels 8—20 mm long, puberulous, bracts absent, calyx-tube dilated at apex, teeth short, acutely triangular; petals lanceolate-oblong, laciniate at apex; female flowers: peduncles 3—16 mm long, calyx-tube about 3 cm long, petals same as in male flower, ovary inferior, 4 cm long, hairy, unilocular with 3 parietal placentas, style slender, stigmas 3; fruit about 0.3—0.9 m long, green striped with white, changing to bright orange colour when ripe.

Flowers throughout the year.

*Illustrations.* Curtis, Bot. Mag. *pl.* 722; Kirtikar and Basu, Indian Med. Plants, *pl.* 445. 1933; Ames, Eco. Annuals and Human Cultures, 81. 1939.

*Distribution.* Widely cultivated in the hotter parts of India, Ceylon, Malaya and China but never found in a wild state. In Ceylon, it is extensively grown in the mid and low-country.

*Ceylon.* Peradeniya, Bot. Gard., *Herb. Peradeniya*, June 1899.

*Uses.* In Indo-China, the plant is used as a purgative and vermifuge. The fruit is considered an emetic and anthelmintic in the Philippine Islands.

The fruit is commonly used as a vegetable.

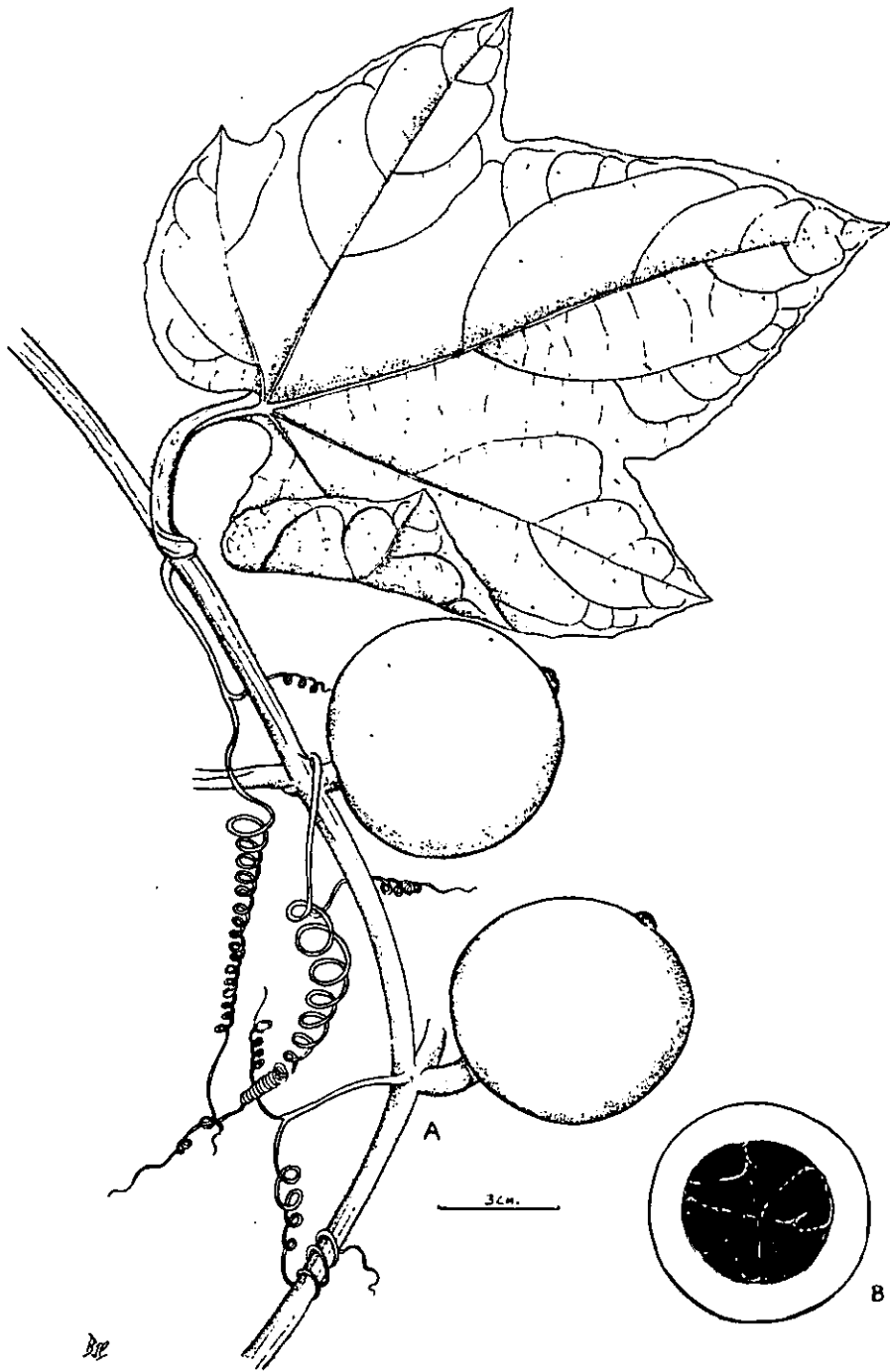


FIG. 177. *Trichosanthes bracteata*. A, portion of a female plant with a leaf and fruits. B, transverse section of a fruit.

19. *Trichosanthes bracteata* (Lam.) Voigt, Cat. Hort. Calc. 52. 1845. (Fig. 177).

*Trichosanthes palmata* Roxb.—*Trichosanthes tricuspis* Miq.—*Modecca bracteata* Lamk.—*involveraria wallichii* Ser.—*Bryonia palmata* Wall.

*Sinh.* Tittahondala; *Tam.* Ankorattai, Korattai, Shavaripalam; *Hindi* Indrayan, Lalindrayan, Mahakal, Makal; *Sans.* Mahakala.

Long, woody, tendril climber with angular stems and tendrils 2- or 3-fid; leaves simple, alternate, 10—12.5 cm long and about as broad, variable, more or less deeply palmately 3- or 5-lobed, dark green above, paler beneath, lobes more or less dentate-serrate, glabrous, often scabrous with small scales above and on the veins beneath, base cordate; petioles 2.5—7.5 cm long, scaly-scabrous; flowers unisexual, bright pink, regular, dioecious; racemes of male flowers 1.5—2.3 cm long, drooping, flowers large over 5 cm long, nearly sessile, distant, each in the axil of a very large broadly wedge-shaped, glabrous or pubescent, lacerate, persistent bract 2.5 cm long, often set with broad, flat glands; sepals 5, fused into a long campanulate calyx-tube, segments leafy lacinate; petals 5, distinct, rather longer than calyx segments, 2.5 cm long, wedge-shaped with many long filiform lacinae; stamens 3, inserted on calyx-tube, filaments short, anthers connate, linear-oblong, cells conduplicate; female flowers axillary, solitary, shortly stalked, calyx-tube nearly 5 cm long, segments acuminate, petals shorter and narrower than in the male; ovary inferior with numerous horizontal or pendulous ovules on 3 parietal, placentas, style long, stigmas 3; fruit large, 5-6 2 cm long, globose with a blunt nipple, smooth brilliant scarlet-crimson, pericarp thick; seeds densely packed, 1 2 cm long, oblong, compressed, smooth, brownish-grey, each enveloped in dark green pulp.

Flowers between February and June.

**Illustrations.** Wight, *Ill. pls.* 104 and 105. 1841—50; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 442B. 1933.

**Distribution.** Occurs in India, Ceylon, Malaya and China. In Ceylon, it is rather common in the low-country dry regions.

**India.** Pen. Ind. Orient., *Herb. Wight* 1134, Kew Distribution 1866—7. **Ceylon.** *Thwaites C.P.* 1626. Eastern Prov., Koddar, *Herb. Peradeniya*, Aug. 1885. Uva Prov., Uma Oya, Bolandawela, *J. M. Silva* 276, Dec. 1927; Nildandahena, *J. M. Silva* 245, Dec. 1927; Ekeriyankumbura, *Herb. Peradeniya*, Jan. 1888.

**Uses.** The fruit is a hydragogue cathartic. The pounded fruit is applied on boils and ulcers. Boiled with coconut or gingelly oil it is applied on the scalp as a cure for hemicrania and ozaena and dropped into the ear for otorrhoea. In Bombay, the fruit is smoked as a remedy for asthma.

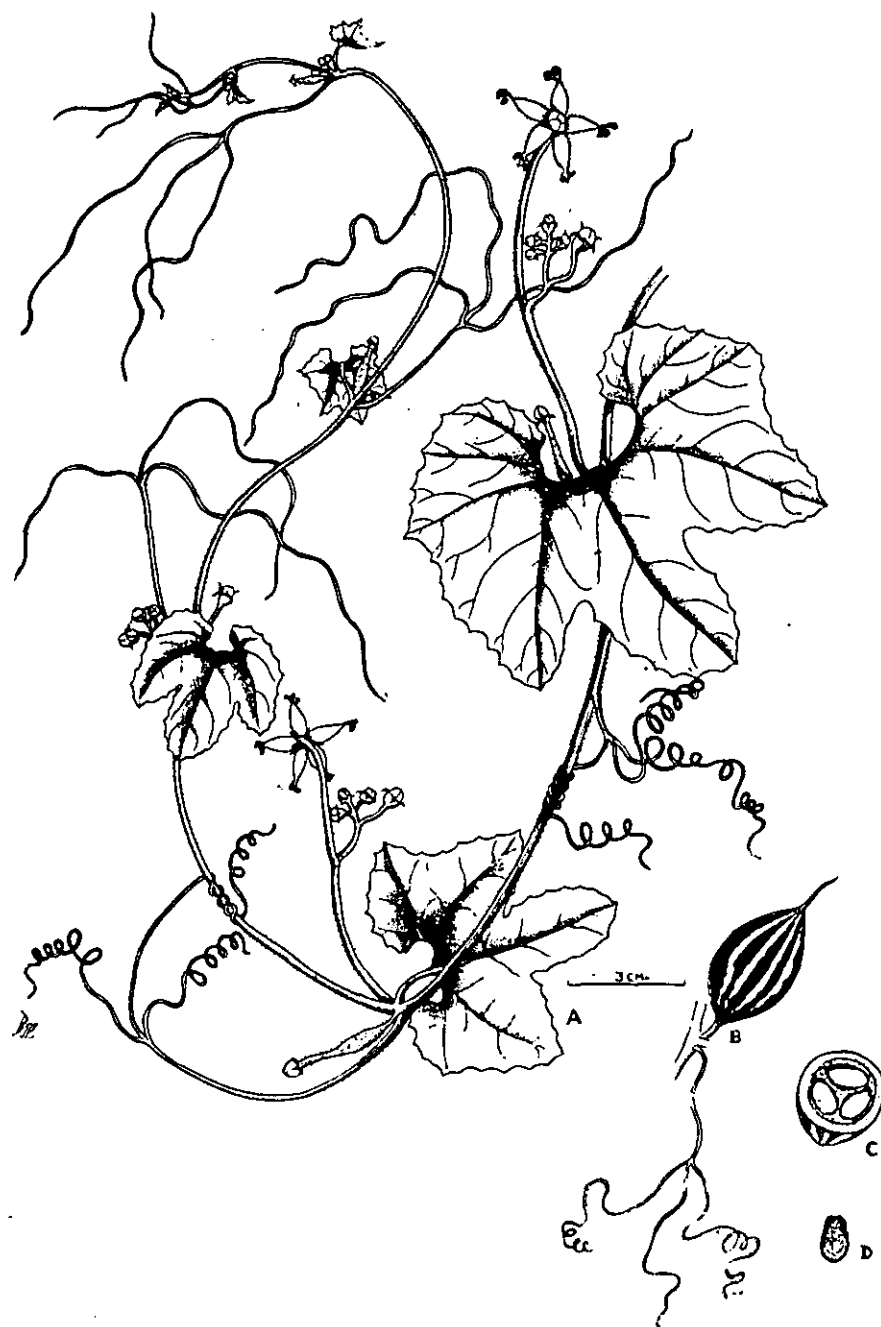


FIG. 178. *Trichosanthes cucumerina*. A, branch with leaves, tendrils and male and female flowers. B, fruit. C, transverse section of a fruit. D, seed.

20. *Trichosanthes cucumerina* Linn. Sp. Pl. 1008. 1753. (Fig. 178).

*Trichosanthes laciniosa* Klein.—*Trichosanthes pilosa* Wall.—*Trichosanthes amara* Blanco—*Trichosanthes locuniana* Naves—*Bryonia umbellata* Wall.—*Cucumis missionis* Wall.

*Sinh.* Dummella; *Tam.* Kattuppeyppudal, Pudal, Peyppudal; *Hindi* Janglichichonda; *Sans.* Amritaphala, Bijagarbha, Jvaranashana, Jyotsna, Kachhughni, Kachhura, Kadupatola, Karkashachhada, Karkashadala, Kasabhangana, Kasamaradana, Katuka, Katuphala, Kulaja, Kulaka, Kushthaha, Kushtari, Lataphala, Nagaphala, Pancharajiphala, Panduka, Panduphala, Panjura, Patola, Patri, Patrika, Rajapatola, Rajimana, Rajiphala, Tiktabhadra, Tiktaka, Tiktapatola, Tiktottama, Vajimana, Varatikta.

An annual, tendril climber, 3.6—4.5 m long with slender, glabrous or slightly hairy, furrowed stems and 3-fid tendrils; leaves simple, alternate, 5—12 cm long, 6.5—11 cm broad or broader, very cordate with an excavated sinus at the base, more or less deeply palmately 3- or 5- or 7-lobed, usually about half way down, lobes rounded or subacute, distantly denticulate, glabrous or nearly so above, more or less pubescent beneath; petioles 2—4.5 cm long, pubescent; flowers white, regular, unisexual, monoecious, males in long stalked racemes, females often in the same axil, solitary and short stalked; male flowers: peduncles 5—15 cm long bearing 8—15 flowers near the apex, pedicels 0.8—2 cm long, pubescent; sepals 5, fused into a campanulate calyx-tube, about 2.5 cm long, dilated at the top, segments narrowly lanceolate, acute, spreading; petals 5, distinct, 1 cm long, lanceolate-oblong with a tuft of curled laciniae at apex; stamens 3, inserted in the calyx-tube, filaments short, anthers connate, linear-oblong, cells conduplicate; female flowers: peduncles 0.3—1.6 cm long, hairy, calyx-tube gradually dilated upwards, lower part often hairy; ovary inferior, unifolocular with 3 large, fleshy, parietal placentas, style simple, stigmas 3; fruit 3.7—5 cm long, 2—2.3 cm diameter, ovoid-fusiform tapering at both ends with a long sharp beak, striped with white, afterwards turning scarlet, pericarp thin; seeds oblong, glabrous, 1 cm long surrounded by a red pulp.

Flowers from September to December.

**Illustrations.** Kirtikar and Basu, *Indian Med. Plants*, pl. 444B. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs in India, Ceylon, Malay Peninsula and in Luzon in the Philippine Islands. In Ceylon, it is common in the low-country.

**India.** Plan Ganget. Sup. *T. Thomson*. Ceylon. Northern Prov., Mullaittivu, *Alston* 1451, March 1927. Western Prov., Kalutara, *Thwaites C.P.* 2806; *Walker*. Eastern Prov., Batticaloa, *Thwaites C.P.* 1620. Uva Prov., Weragantota, *Alston* 1963, Feb. 1926. **Maldives Islands.** Fainu, *Gardiner*, 1899—1900.

**Uses.** Used along with other drugs for indigestion, dyspepsia, jaundice, fever, dropsy, acute bronchitis, pneumonia, anaemia, catarrh, bilious fevers, boils, sores, skin eruptions such as urticaria, eczema, dermatitis, psoriasis and diabetes. The juice of the plant produces vomiting and the root is a violent purgative and anthelmintic. In Konkan, the juice of the leaves is rubbed over the liver to relieve liver congestion. The seeds are used for stomach disorders on the Malabar Coast. The fruit is used as an anthelmintic in French Guiana.

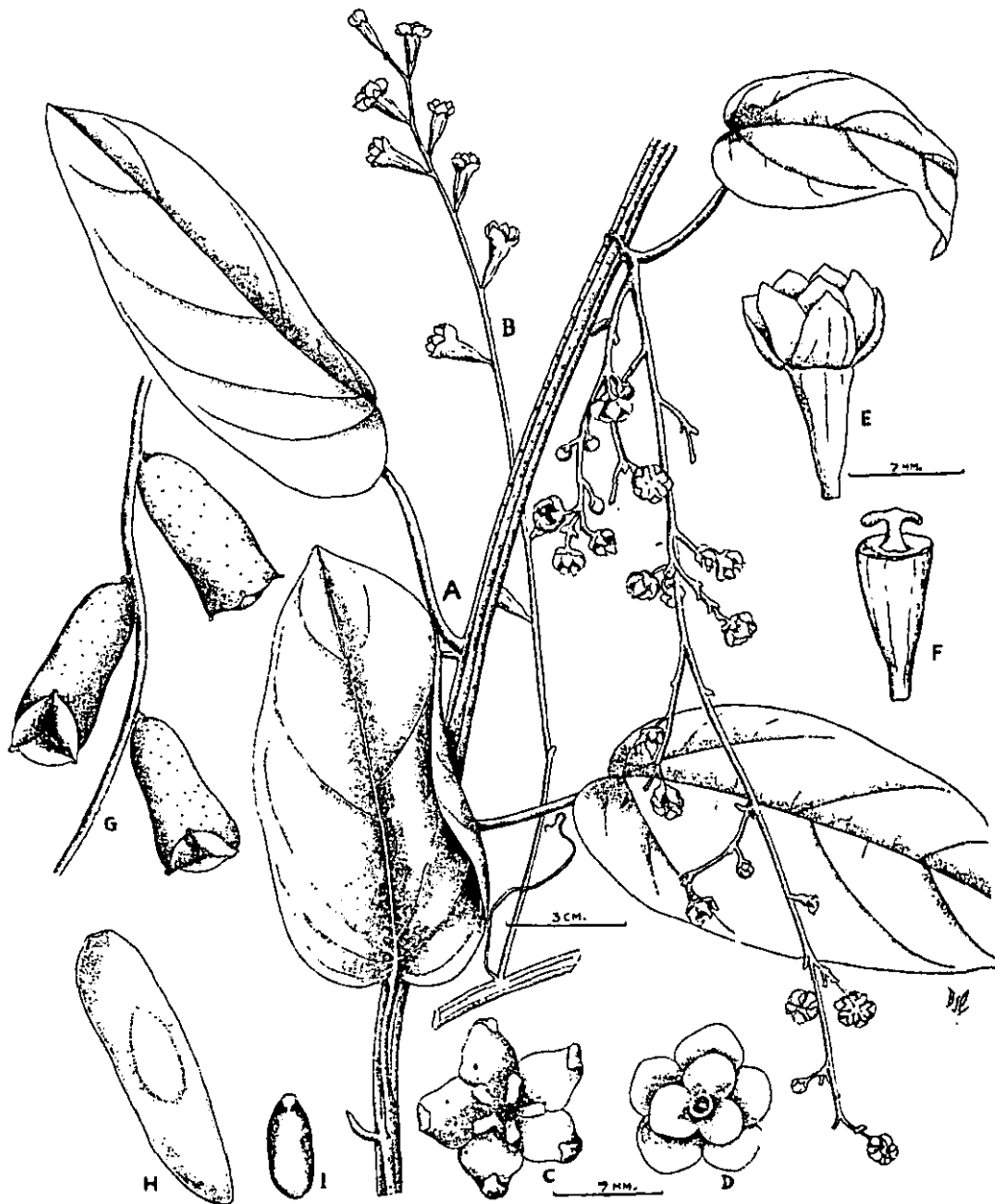


FIG. 179. *Zanonía indica*. A, a portion of a male plant with leaves and panicle of flowers. B, a portion of a female plant with a raceme of flowers and a simple tendril. C, male flower from front. D, male flower from behind. E, lateral view of female flower. F, female flower with the perianth removed. G, fruits. H, seed with wings. I, seed with wings removed.

21. *Zanonia indica* Linn., Sp. Pl. ed. 2, 1457. 1763. (Fig. 179).

*Sinh.* Wal-rasakinda; *Tam.* Penarvalli; *Hindi* Chirpotana, Chirpoti, Patakona, Shanasokha; *Sans.* Chirpota, Dirghapatra, Jvarakarini, Kuntali, Parpoti, Phalamba, Raktahantri, Tiktaka.

Perennial, semi-woody, scandent, tendril climber with grey, glabrous stems; tendrils simple, elongate, terete, glabrous; leaves simple, alternate, coriaceous, 7.5—15 cm long, 5—9.5 cm broad, deciduous leaving prominent circular scars, broadly oval to lanceolate, rounded or cordate at base, somewhat acuminate, apiculate, quite entire, glabrous, rather thick, venation reticulate rather conspicuous beneath; petioles 2.7—3 cm long; flowers regular, unisexual, dioecious, greenish yellow, rather small on short pedicels, male flowers in racemes or panicles 15—30 cm long, branched chiefly at base with flowers in small clusters, pedicels articulated about the middle, 2—4 mm long, bracteolate at base; sepals 3, valvate, fused into a calyx, segments rotundate, concave, glabrous; petals 5, connate below to form a rotate corolla, imbricate, segments ovate, acuminate, obtuse with incurved apices; stamens 5, inserted on central disc distinct, filaments short, broad, spreading, anther 1-celled, opening transversely; female flowers in 5—12-flowered racemes 10—30 cm long; sepals broadly triangular, 4 mm long; petals ovate-oblong, 6—8 mm long; ovary inferior, narrowly turbinate, cylindrical, 1.2 cm long, glabrous, styles rather long spreading, bifid; fruit capsule 2.5—3.7 cm long, cylindrical, rounded at base, truncate at apex opening on summit by 3 valves, glabrous, pale yellowish brown; seeds few, compressed with wing as long as the fruit, very flat, glabrous, yellow, wing rounded at the ends.

Flowers during June.

**Illustrations.** Wight, Ill. pl. 103, 1841—50; Rheede, Hort. Mal. 8: pls. 47—49. 1678—1703; Kirtikar and Basu, Indian Med Plants, pl. 468. 1933; Herb. Peradeniya, drawing.

**Distribution** Occurs from Nepal to Burma and from Malabar to Ceylon. It is also found in Java, Borneo and New Guinea. In Ceylon, it is rather rare, growing in the moist low-country upto an elevation of 2000 feet.

**Ceylon.** Central Prov., Gannoruwa, *J. M. Silva*, Nov. 1910; Kadugannawa, *Thwaites C.P.* 1628.

**Uses.** The stems and leaves are used as a febrifuge and are beneficial in asthma and cough. The fruit possesses cathartic properties. In Malabar, a bath made by boiling the leaves in water is used to remove nervous irritation caused by boils.

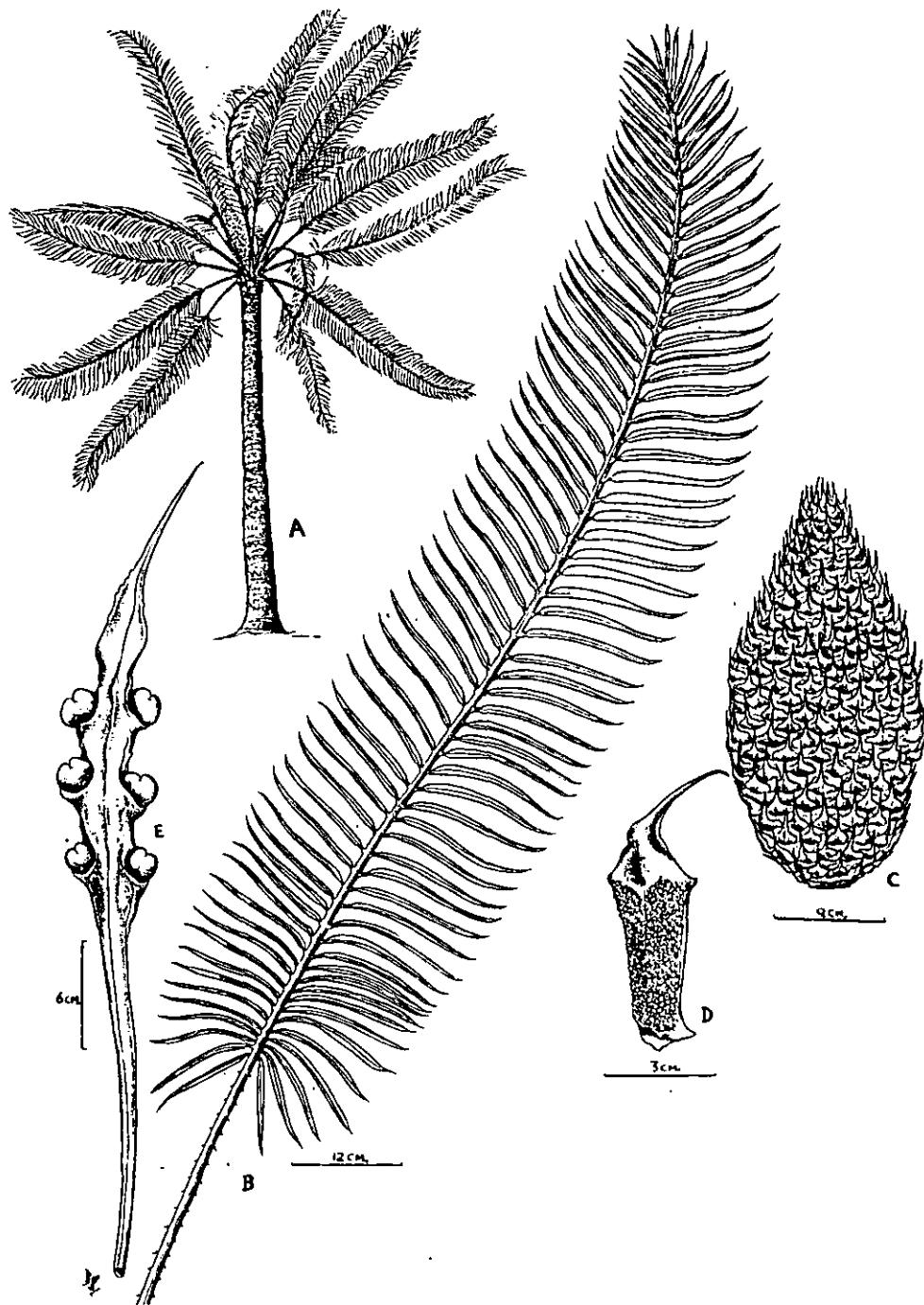


FIG. 180. *Cycas circinalis*. A, male tree. B, leaf. C, male cone. D, scale showing the anthers and the under surface. E, female carphophyll with naked ovules.

### 37. CYCADACEAE

1. *Cycas circinalis* Linn. Sp. Pl. 118. 1753. (Fig. 180).

*Sinh.* Madu.

A palm-like tree with a cylindric trunk about 5 m tall, simple or forked, clothed with the compacted woody bases of petioles; leaves in a terminal crown of two kinds, simple short sessile, subulate, woolly prophylla 5—7.5 cm long and long—petioled pinnate leaves 1.5—2.7 m long; petioles 45—60 cm long with short deflexed spines near the base; leaflets 25—30 cm long, 1.2 cm wide, linear-lanceolate, acuminate, subfalcate, bright green, glabrous and shining, midrib prominent beneath; inflorescence dioecious, male cone 30—60 cm long, shortly peduncled, erect, woolly, cylindric-ovoid consisting of a short axis, clothed with closely imbricate cuneiform scales; scales 4—5 cm long, deltoidly obovate, tip contracted into an upcurved spine about 2.5 cm long, reddish brown, each scale bearing on its under surface groups of 3—5 globose anthers; female inflorescence consists of a whorl of long, spreading, woolly carpophylls each about 30 cm long, 2.5—3.7 cm wide, narrowed into a long stalk, clothed with buff tomentum, crenate or spinous-serrate, bearing 3—5 pairs of naked orthotropous ovules above the middle; fruits orange-red, each containing a large seed with copious endosperm.

*Illustrations.* Rheede, Hort. Mal. 3: pls. 13—21; Curtis, Bot. Mag. pls. 2826 and 2827.

*Distribution.* Grows in S. India, Ceylon, Java, Sumatra, Madagascar and East Tropical Africa. In Ceylon, it is found in the moist regions upto 1500 feet altitude. Hanguranketa, Peradeniya, Teldeniya, Galle, Matara, Ratnapura, etc.

*Ceylon.* Without locality, *Thwaites C.P.* 3689.

*Uses.* The young leaves are cooked and eaten for piles and haemorrhoids. The leaves and seeds are useful for chronic constipation. The seeds yield a flour which is edible.

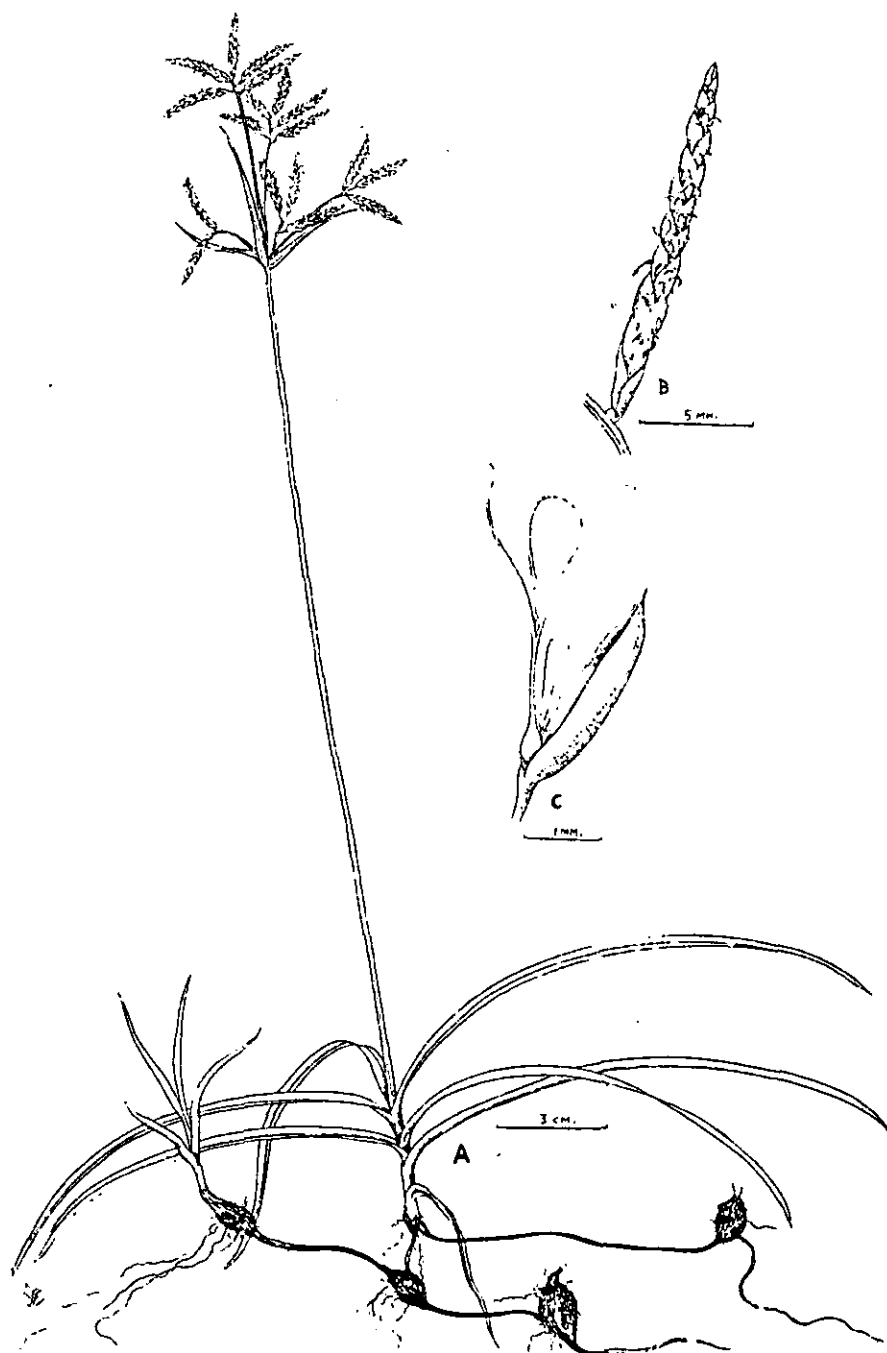


FIG. 181. *Cyperus rotundus*. A, plant with leaves, tubers and inflorescence. B, a spikelet  
C, a flower in the axil of a glume.

## 38. CYPERACEAE

### 1. *Cyperus rotundus* Linn Sp. Pl. 45. 1753. (Fig. 181).

*Cyperus hexastachyous* Rottb.—*Cyperus leptostachyus* Griff —*Cyperus tenuiflorus* Royle—*Cyperus curvatus* Llanos.

*Sinh.* Kalanduru; *Tam.* Kora, Korai Kilangu; *Hindi.* Mootchoo. Motha, Mutha; *Sans.* Abda, Arnoda, Bhadrakshi, Bhadramusta, Gangeya, Granthi, Gundra, Hima, Kachhola, Kakshottha, Kasheru, Krodeshttha, Kuru, Kurubilva, Kutannata, Musta, Mustaka, Suganthi-granthila, Valya, Varahi, Varida, Vindakhya.

An annual herb with a small, stoloniferous rootstock; stolons elongate, slender, bearing ovoid, hard, tunicate, black, fragrant tubers 0.8—2.5 cm diameter, root fibres wiry, covered with flexuous root hairs; stems subsolitary, 15—60 cm long, slender, trigonous below, triquetrous above, base sometimes tuberous; leaves subradical, shorter or longer than the stem, narrowly linear, 0.4—0.8 cm broad, finely acuminate or narrowed from the middle to both ends, flat, flaccid, 1-veined; inflorescence a simple or compound umbel, primary rays 2—8, unequal, very slender bearing short spikes of 4—10, slender, spreading, red-brown spikelets; involucre bracts 3, longest about 17.5 cm spikelets 1.2—3.1 cm 1.5 mm broad, linear, acute, slightly compressed, 10—20-flowered, pale or dark brown; rhachilla very slender, wings elliptic; flowers bisexual at the axils of glumes which are 1.6—2.4 mm long, closely or loosely imbricate, suberect, ovate, obtuse, dorsally green, hardly keeled streaked with red-brown, 5—7 veined, sides broadly membranous, margins and tip narrowly scarious; perianth 0; stamens 3, anthers long, narrow, mucicous, basifixed; ovary superior, unilocular with an erect basal ovule, style long, stigmas 3, capillary; fruit  $\frac{1}{2}$  length of the glume, obovoid or oblong, obtuse, trigonous, black, opaque and granulate.

Flowers all the year round.

**Illustrations.** Rumph., *Herb. Ambo.* 6. pl. 1. 1741—45; Kirtikar and Basu, *Indian Med. Plants*, pl. 1011. 1933.

**Distribution.** Occurs in all warm countries including India, Ceylon and Philippine Islands In Ceylon, it is a very common and vexatious weed in cultivated ground in the low-country.

**Afghanistan.** *Herb. Griffith* 6179, Kew Distribution 1863—4. **India.** Punjab: *T. Thomson* Assam: *Jenkins*. Bengal: *J. D. Hooker* and *T. Thomson*. Himal. Bor. Occ., *T. Thomson*. Pen. Ind Or., *Herb. Wight* 2868, Kew Distribution 1866—8. **Ceylon.** Northern Prov., Jaffna, *J. M. Silva*, Nov. 1920; *Thwaites C.P.* 804; North Central Prov., Anuradhapura, *Sinniah*, Nov. 1926; Eastern Prov., Trincomalee. *Ramanathan* 421, Dec. 1926; Central Prov., Dambulla, *Thwaites C.P.* 3966. Gannoruwa, *Alston* 300, Oct. 1926; Haragama, *Alston*, Oct. 1926; Kadugannawa, *Alston* 1089, June 1927; Southern Prov., Tissamaharama, *Herb. Peradeniya*, Dec. 1882. **Philippine Islands.** La Midu, *Lete* 102, June 1927.

**Composition.** The tubers contain an essential oil, fat, sugar, gum, carbohydrates, starch, albuminous matter and an alkaloid. The crude volatile oil contains sesquiterpene ketone  $\alpha$ -cyperone and has antibiotic properties.

**Uses.** The tubers are astringent and antiseptic. A paste made with lime juice is applied in acne, scorpion stings and ulcers with beneficial effect. Internally, the tubers act as a stomachic, carminative and cholagogue with astringent properties and used in anorexia, acute dyspepsia, diarrhoea, dysentery and congestion of the liver. They are also used in acute laryngitis, bronchitis and pneumonia. In India, they are held in great esteem as a diaphoretic, astringent, stimulant, tonic, diuretic and demulcent. A paste of the tubers is applied on the breasts as a galactagogue. In Indo-China they are given to women in childbirth and to infants for indigestion. In Cambodia they are used in liver complaints with jaundice, for malarial fever, etc. In the Philippine Islands, they are employed in dysentery and in Java for urinary disorders. In Vietnam, the plant is used as a diuretic and emmenagogue and for uterine haemorrhage.

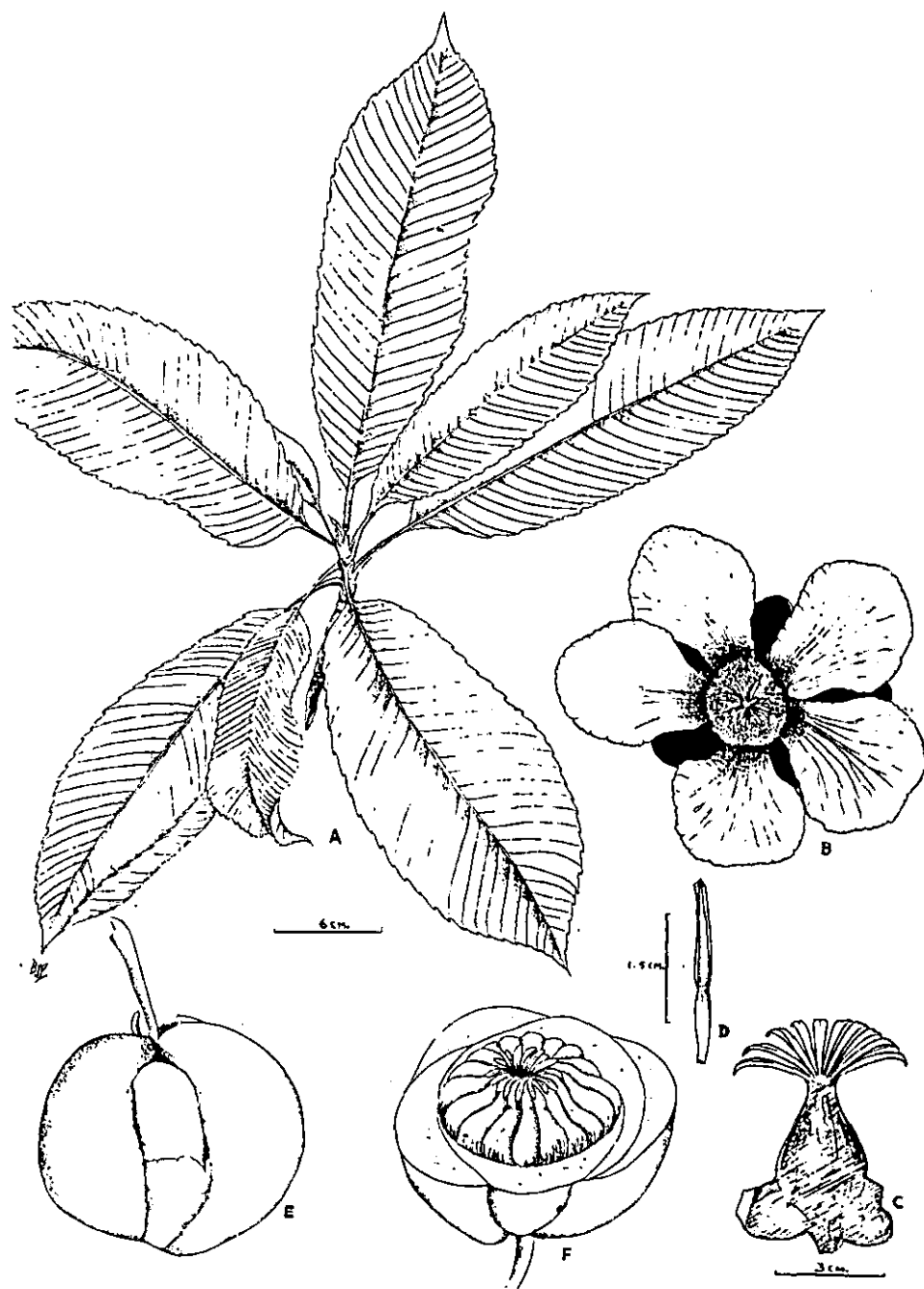


FIG. 182. *Dillenia indica*. A, branch showing leaves. B, flower from front. C, longitudinal section of pistil. D, stamen. E, fruit, external view. F, fruit with half the sepals removed showing the true fruit inside.

### 39. DILLENACEAE

#### 1. *Dillenia indica* Linn. Sp. Pl. 535, 1753. (Fig. 182).

*Dillenia speciosa* Thunb.—*Dillenia elliptica* Thunb.

*Sinh.* Hondapara, Wampara; *Tam* Akku, Ugakkay, Uva. Uvav. Uvatteku; *Hindi* Chalta, Girnar; *Sans.* Bharva, Bharvya, Ruvya.

A moderate-sized, round-headed tree with a cinnamon-brown bark; leaves very large, closely placed, 25—30 cm long, 10—13 cm broad, oblong-lanceolate, acute, sharply serrate, glabrous above, finely pubescent on veins beneath, lateral veins numerous, parallel, strong; petioles 3.5—5 cm long, deeply channelled above, pubescent outside, pulvinate at base, adnate to stipules forming a sheath; flowers regular, bisexual, very large, 15—17.5 cm diameter, solitary, white with yellow stamens on stout subterminal pedicels, bracteoles 6 cm long, 1.8 cm broad, lanceolate; sepals 5, free, imbricate, very fleshy, persistent, subsequently enlarging to enclose the fruit; petals 5, free, orbicular with a broad base; stamens very numerous in many series, persistent, innate, anthers opening by small pores at the apex; ovary superior consisting of 15—20 free carpels, coherent at the axis, styles white, free and spreading, fruit enclosed by greatly enlarged, thickened and imbricate sepals, the whole fruit forming a large, green globose berry, 12—15 cm in diameter; the real fruit inside 6.3 cm diameter, indehiscent; seeds numerous compressed with a hairy margin.

Flowers from June to August.

**Illustrations.** Wight, *lc. Pl. Ind. Orient.*, *pl.* 832. 1843—1845; Kirtikar and Basu, *Indian Med. Plants. pl.* 24. 1933; Herb. Peradeniya, drawing.

**Distribution.** Grows in the Indian and Malayan Peninsulas in the tropical forests extending from Nepal to Singapore. It is commonly planted in the low-country in Ceylon.

**India.** Bengal: *Wallich* 943. Ceylon. Central Prov., Haragama, *Thwaites C.P.* 2961, Aug. 1853

**Uses.** The leaves and bark are astringent. The juice of the fruit which is slightly laxative is used as a cooling beverage in fevers and as a cough mixture. Externally, it is used for fomentation of swellings in joints recovering from dislocations. Malays eat the fruit and the pulp is used as a hair wash.

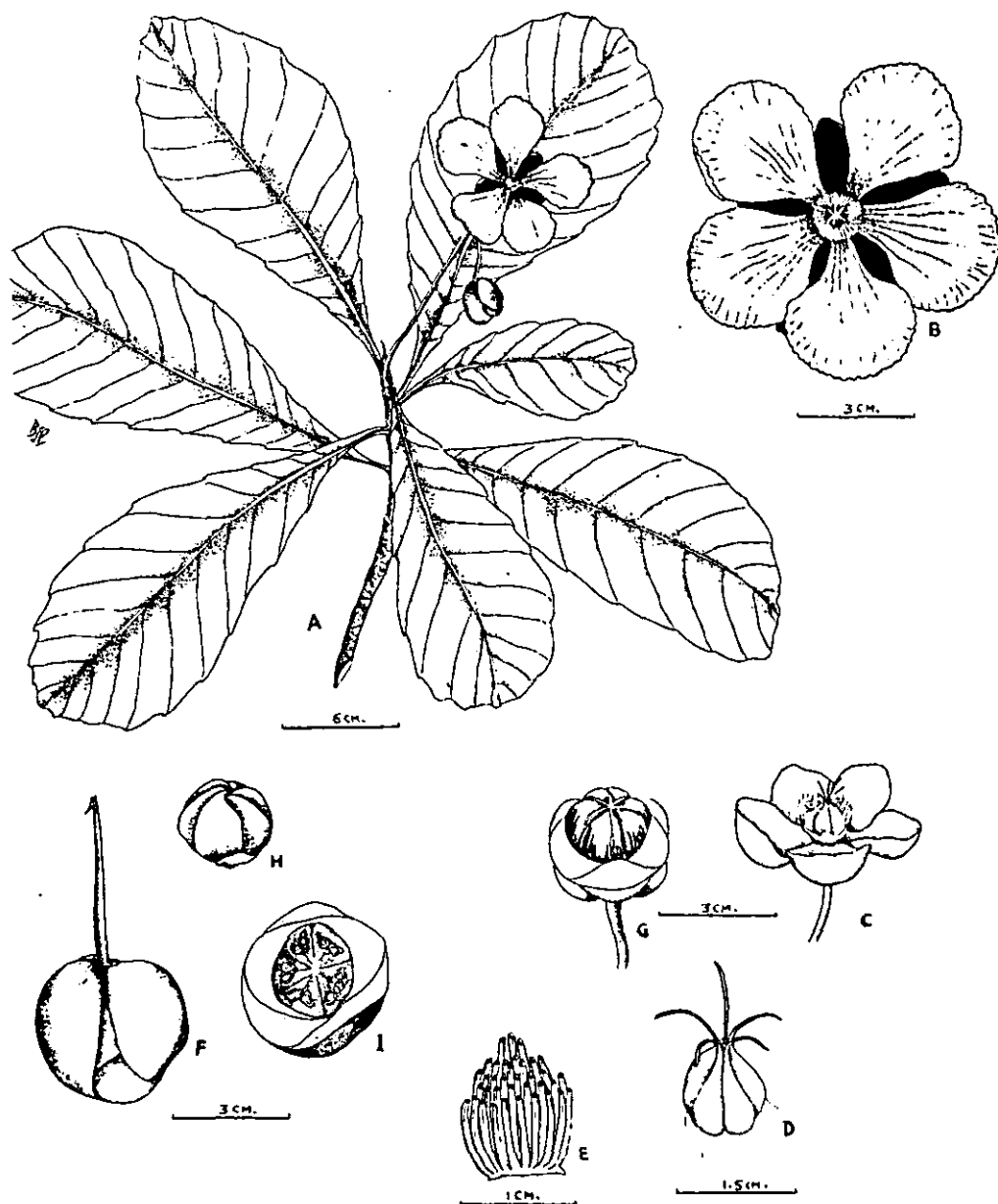


FIG. 183. *Dillenia retusa*. A, branch with leaves and flower. B, flower from front. C, flower with petals and some of the stamens removed showing the pistil. D, pistil. E, stamens. F, Fruit. G, fruit with a part of calyx removed showing the true fruit. H, true fruit. I, section of a fruit.

2. *Dillenia retusa* Thunb. in Trans. Linn. Soc. 1 : 200. pl. 19. 1791. (Fig. 183).

*Dillenia integra* Thunb.—*Wormia integra* Hook. f.—*Wormia retusa* Hook. f.

Sinh. Godapara.

A moderate-sized tree with a brownish-grey bark; leaves large, simple, alternate, 15—24 cm long, 6.5—10 cm broad, obovate-oblong, very obtuse, gradually tapering to the base, shallowly repand-serrate, stiff, coriaceous, glabrous and shining on both surfaces, veins strong, parallel, scantily pubescent beneath; petioles 2.5—3.5 cm long, channelled, pubescent and pulvinate with adnate stipules; flowers large, regular, bisexual, 7.5—9 cm diameter, white with pink or purple stamens on long, pubescent, subterminal or leaf-opposed, often 2-flowered clusters, peduncle 3.5—5.5 cm long, pedicels 2.5—4.5 cm long and cylindrical; sepals 5, fleshy, orbicular or obovate, 1.8—2.3 cm long, 1.5—2 cm broad, cup-shaped, free, persistent, imbricate, hairy outside; petals 5, free, 4—4.5 cm long, 2.8—3.5 cm broad; rotund with a narrow base; stamens numerous, all erect, innate in many series, anthers opening by pores at the apex; ovary superior, carpels 5, free, coherent at the axis, styles subulate, ovules numerous; ripe fruit enclosed by much enlarged, imbricate sepals forming a depressed-globose, very finely pubescent orange fruit, 2.5—3.8 cm diameter; the real fruit 1.2—2 cm with a thin, fleshy pericarp; seeds many, smooth.

Flowers in May, June and August.

Illustrations. Thunberg in Trans. Linn. Soc. 1: pls. 18 and 19. 1791.

Distribution. A rather common, endemic species found in the moist low-country.

Ceylon. Thwaites C.P. 2960, Sept. 1864; Central Prov., Peradeniya, Bot. Gard., *Herb*, Peradeniya, 1859; *Jayaweera* 1597, April 1956; *Jayaweera* 1951, Jan. 1957.

Uses. The fruit is used as an ingredient for poultices applied on fractures and dislocations.

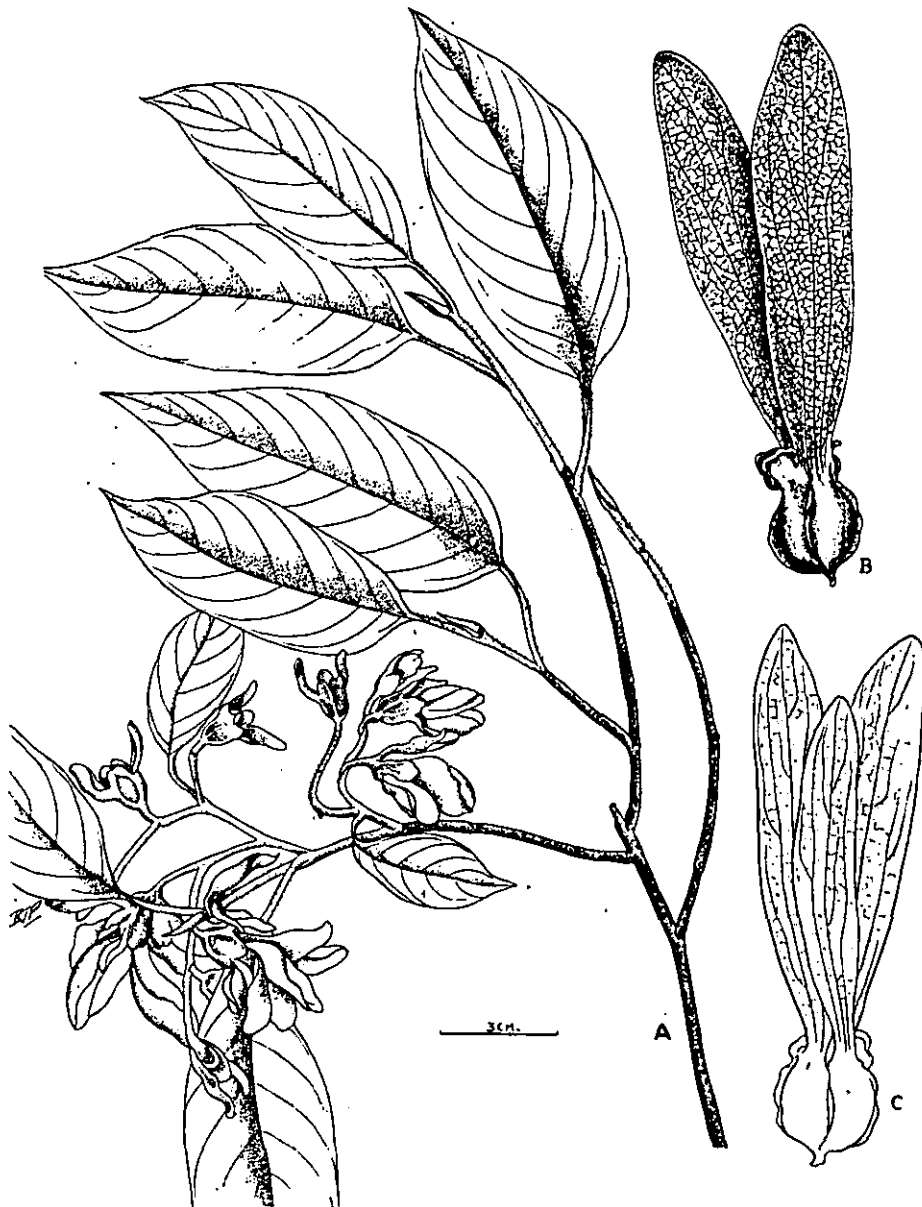


FIG. 184. *Dipterocarpus glandulosus* A, twig with short axillary racemes of flowers. B, C, fruits with 2 and 3 enlarged sepals respectively.

## 40. DIPTEROCARPEAE

### 1. *Dipterocarpus glandulosus* Thwaites, Enum. 34. 1858. (Fig. 184).

*Sinh.* Dorana; *Tam.* Yennai; *Sans.* Guga.

A large tree, about 55 m tall with a straight trunk, pale grey bark flaking off irregularly, few branches and a sparse crown, young parts hairy; leaves simple, alternate, stipulate, 7.5—12.5 cm long, oblong-oval, rounded at base, shortly acuminate, entire, glabrous above except on midrib, finely stellate pubescent and glandular beneath with 11—13 pairs of lateral veins, new leaves light bronze; petioles 1.8—2.5 cm long, stellate-hairy; stipules 3.7 cm long with tufts of long stellate hairs outside; flowers regular, bisexual, pale yellow with a pink tinge, 3.7 cm diameter, few in short axillary racemes, pedicels stellate-hairy; sepals 5, connate into a campanulate tube, two lobes much longer than the others, stellate-pubescent, lobes greatly enlarged in the fruit; petals 5, connate at the base, contorted, stellate-pubescent outside; stamens numerous, filaments short, anthers linear, long-acuminate; ovary superior, 3-carpellary, 3-locular with two pendulous ovules in each chamber; fruit a 1-seeded indehiscent nut with an enlarged calyx-tube surrounding it and lobes expanded into two or three wings 9—10 cm long.

Flowers during March and April.

**Illustrations.** Worthington, Ceylon trees, *pl.* 47. 1959; Herb. Peradeniya, drawing.

**Distribution.** A rare, endemic tree growing in the moist, low-country mostly in the Sabaragamuwa Province.

**Ceylon.** Without locality, *Thwaites C.P.* 2590.

**Uses.** The resin which exudes from the stem and collects at the base of the tree, yields an oil which is used externally in the treatment of rheumatic swellings and leprosy. It is a suitable substitute for Gurjun balsam.

The oil is also used for varnishing furniture and for dissolving paints.

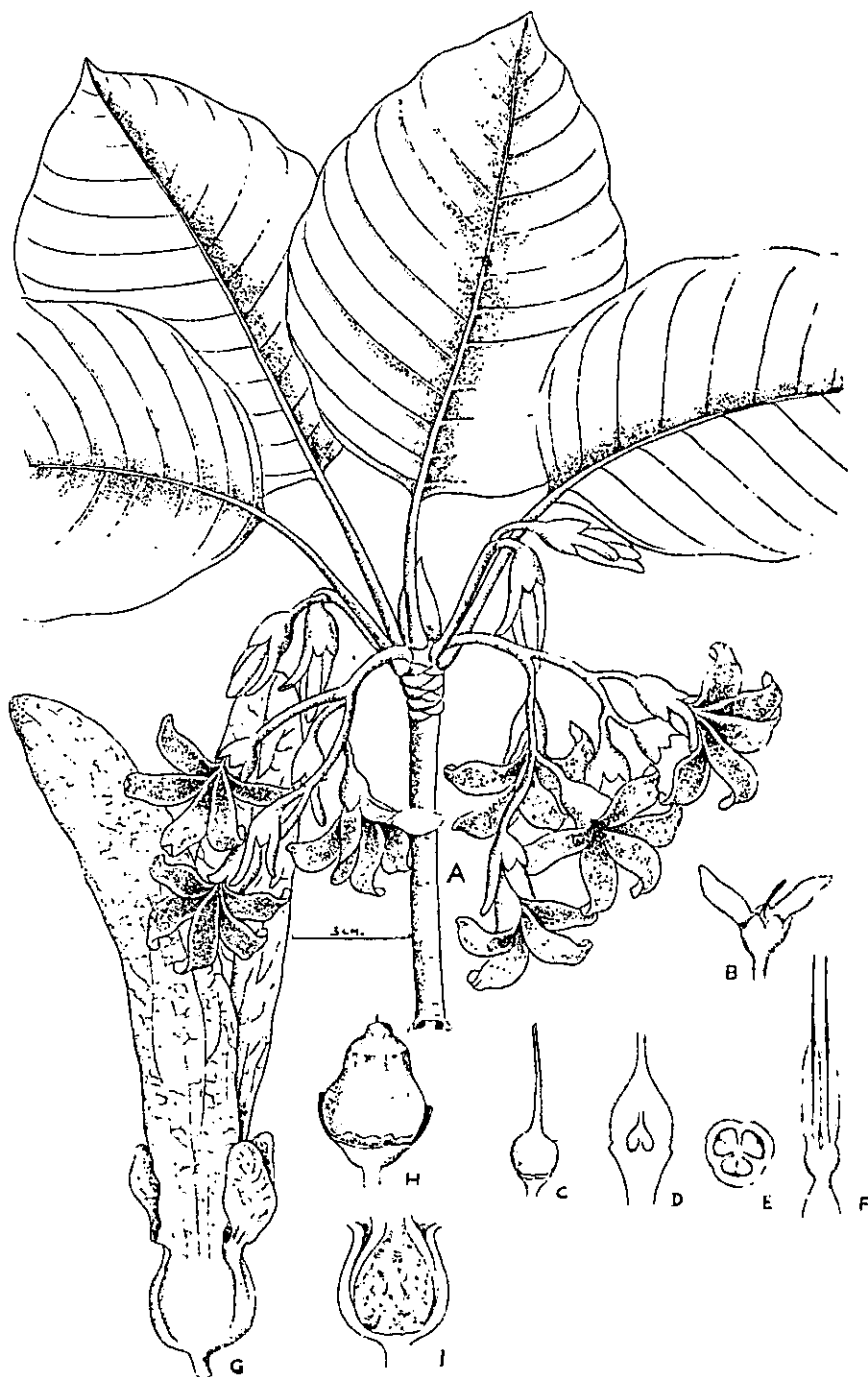


FIG. 185. *Dipteroecarpus zeylanicus*. A, a twig with leaves and flowers. B, calyx. pistil. D, vertical, and E, transverse sections of ovary. F, stamens. G, ripe fruit in persistent calyx. H, ripe fruit with the calyx removed. I, vertical section of fruit.

2. *Dipterocarpus zeylanicus* Thw., Enum. 33. 1859. (Fig. 185).*Dipterocarpus turbinatus* Moon

Sinh. Hora, Sarala, Sora; Sans. Sanigha.

A very tall, straight tree, about 56 m in height with an erect trunk, branching mostly at the top, bark grey, flaking off in large shields from the bottom edge in older trees, twigs bearing scars of fallen leaves and stipules, young parts densely pubescent or silky; leaves simple, alternate, stipulate, large, 12.5—17.5 cm long, broadly oval, rounded at base, suddenly acute, obscurely crenate-serrate, glabrous when old, lateral veins 14—18 pairs; petioles 3.8—5 cm long; stipules 12.5 cm long, oblong, acute, thick, pink, caducous, pubescent inside; flowers regular, bisexual, 3.8 cm diameter in drooping double racemes, pedicels 0.6—1.2 cm long, at first stellate puberulous; sepals 5, connate at base into a campanulate calyx-tube, glabrous, stellate-pubescent; petals 5, oblong, purplish red with a yellow border, 2.5 cm long, obtuse, recurved at ends, connate at base and contorted; stamens indefinite, filaments short, anthers linear, long-acuminate with an apiculus nearly as long; ovary superior, pubescent, 3-carpellary, 3-locular with two pendulous ovules in each chamber; fruit a 1-seeded, indehiscent nut enclosed in the persistent, enlarged calyx-tube, fruit calyx purple when young 17.5 cm long, tube 3.2 cm long, bluntly 5-ribbed down, urceolate, wings strongly 3-veined, reticulated, smaller lobes about 2.5 cm long, nut ovoid conical, finely silky and about 2.5 cm long.

Flowers in February.

**Illustrations.** Trimen, Hand-book Fl. Ceyl. pl. 10. 1893; Worthington, Ceylon Trees, pl. 49. 1959. Herb. Peradeniya, drawing.

**Distribution.** A common, endemic tree, growing in the moist low-country extending into the lower montane zone.

**Ceylon.** Central Prov., Peradeniya, Bot. Gard., cultivated, *Alston*, Jan. 1926; *Ferguson*. Sabaragamuwa Prov., Pasdunkorale, Deltota. *Thwaites C.P.* 1921.

**Uses.** The heart-wood of the tree is used along with other ingredients in the treatment of fever. The greenish-grey gum resin is used on chronic ulcers, sinuses and fistulae. Internally, it acts as a diaphoretic and expectorant and useful in the treatment of pharyngitis, tonsillitis, bronchitis and pneumonia.

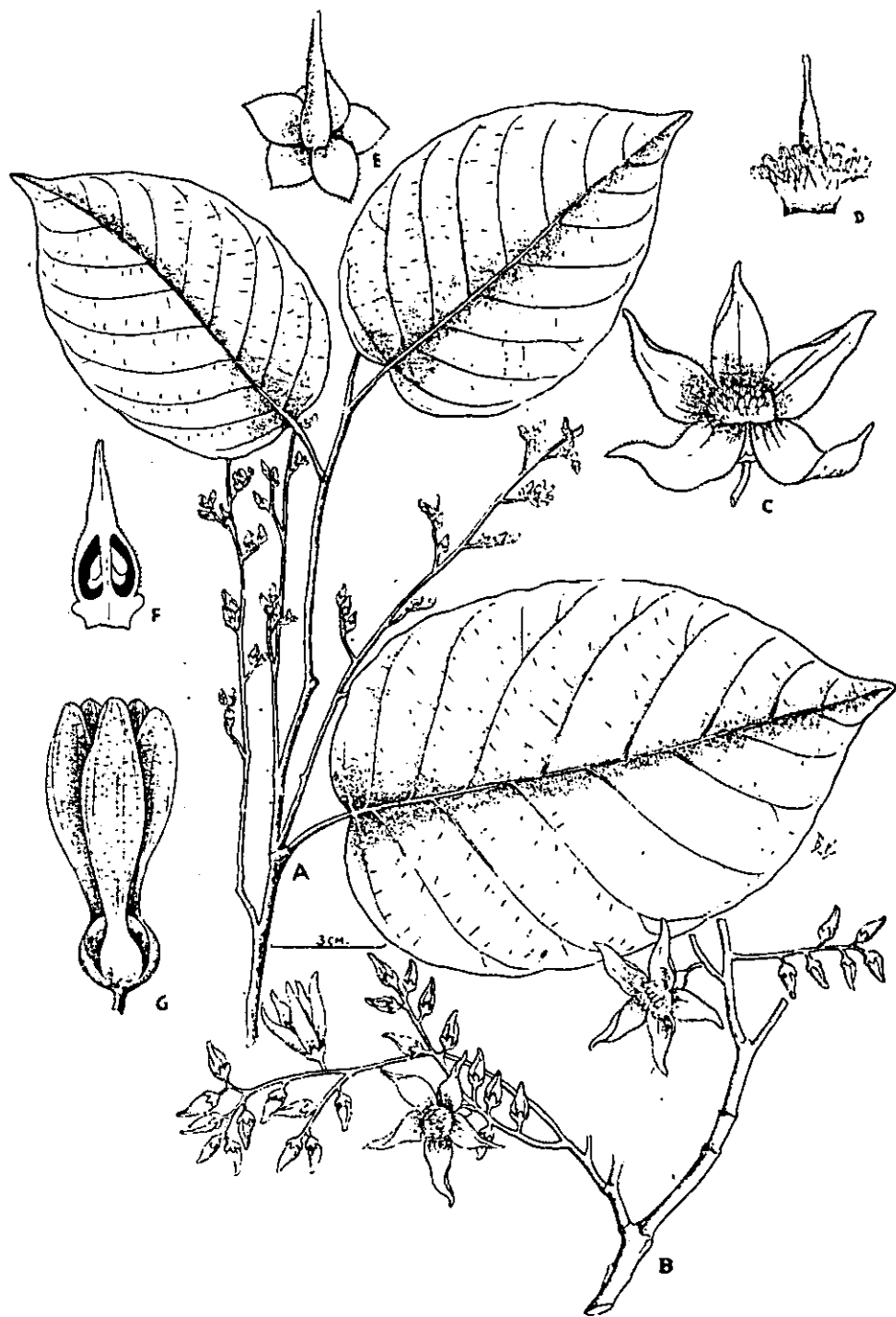


FIG. 186. *Shorea robusta*. A. twig with leaves and young panicles. B. panicle. C. flower from front. D. stamens and pistil. E. flower with corolla and stamens removed. F. longitudinal section of ovary. G. fruit.

3. *Shorea robusta* Gaertn. f. Fruct. 3: 48. t. 186. 1848. (Fig. 186).*Vatica robusta* Steud.

*Engl.* Indian Dammer, Sal tree; *Sinh.* Dammala, Sal-gaha; *Tam.* Attam, Kungiliyam, Shalam; *Hindi* Sakher, Sakhu, Sakhua, Sakob. Sal, Sala, Salwa, Shal; *Sans.* Agnivallabha, Ashvakarna, Ashvakarnika, Chiraparna, Dhanya, Dirghaparna, Dirghashaka, Divyasara, Jaladashara, Jaranadruma, Kala, Kalalajodhbhava, Kashya, Kashayi. Kaushika, Kaushikahva, Kushika, Lalana, Latashankha, Latataru, Rala, Ralakarya, Sala, Salaniryas, Salaveshta, Sarja, Sarjakarya, Sarjarasa, Sarjjaka, Sasyasambara, Sasyasamvera, Shankataru, Shankurriksha, Shasyasambara, Shura, Sidhaka, Sureshtaka, Tarkshyaprasava, Vallivriksha, Vansha, Vastakarna. Yakshadhupa.

A deciduous tree with a dark brown bark, cracking longitudinally; leaves simple, alternate, 10—30 cm long, 5—18 cm broad, ovate-oblong, acuminate, tough, thinly coriaceous, glabrous and shining when mature, cordate or rounded, lateral nerves 12—15 pairs; petioles 1.2—2 cm long; stipules 7.5 mm long, pubescent and deciduous; flowers regular, bisexual, yellowish in terminal and axillary racemose panicles 7.5—23 cm long; calyx-tube very short, not enlarged in the fruit, adnate to the torus, lobes 2.5 mm long, ovate, grey tomentose outside, imbricate, unequally enlarged in the fruit and closely embracing it; petals 5, narrow-oblong or lanceolate, silky tomentose outside; stamens numerous, shorter than petals, connectives with subulate bearded appendages, minutely 3-fid at apex; ovary superior, 3-locular with two ovules in each loculus, style subulate; fruit ovoid, 1.2 cm long, indehiscent, pubescent, wings of the fruiting calyx unequal, oblong or spatulate with 10—15 longitudinal nerves joined by numerous transverse veins.

**Illustrations.** Gaertn. f., Fruct. 3: pl. 186. 1805; Beddome, Fl. Sylvat. pl. 4. 1868—73; Kirtikar and Basu, Indian Med. Plants, pl. 113. 1933.

**Distribution.** Grows in the jungles of tropical Himalaya, Assam and Khasia Hills. One specimen of it is in cultivation in the Botanical Gardens, Peradeniya.

**India.** Sikkim: *J. D. Hooker*; *Wallich* 965; *Beddome*; Calcutta Bot. Gard., *Wallich* 965/3; Dehra Dun, *Roy* 1, April 1921.

**Uses.** The resin exuded from the tree is used for dysentery, weak digestion, gonorrhoea and as an aphrodisiac.

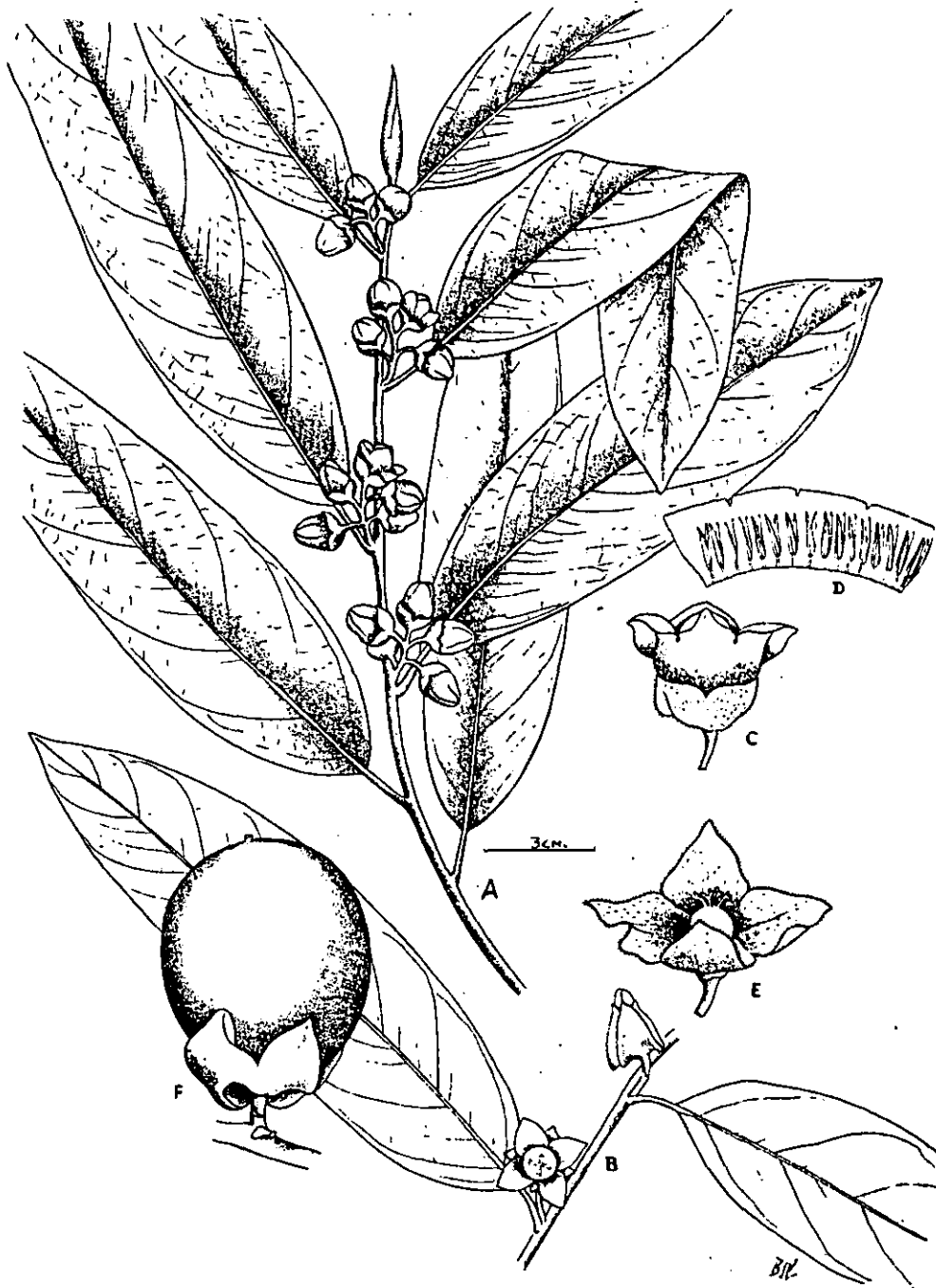


FIG. 187. *Diospyros malabarica*. A, branch with leaves and male racemose cymes. B, portion of a branch containing solitary and axillary female flowers. C, male flower from side. D, corolla spread out showing stamens. E, female flower with corolla removed. F, fruit.

## 41. EBENACEAE

*Diospyros malabarica* (Lam.) Kostel. Allg. Med.—Pharm. Fl. 3: 1099. 1831—6. (Fig. 187).

*Diospyros glutenifera* Wall.—*Diospyros embryopteris* Pers.—*Diospyros peragrina* Gamble—*Diospyros glutinosa* Koen.—*Embryopteris glutenifera* Roxb.—*Embryopteris getinifera* G. Don.—*Garcinia malabarica* Desr.

*Engl.* Riber Ebony; *Sinh.* Timbiri; *Tam.* Kattatti, Kavikattai, Panichai, Pattuppallam, Tumbi, Tuvarai; *Hindi* Gab, Kalatendu, Makurkendi, Tendu; *Sans.* Anilsara, Atimuktaka, Dantasatha, Kalaskandha, Kendu, Krishnasara, Krishnatvaka, Nilasara, Rava, Ravana, Shitisaraka, Sphurjaka, Sphurjana, Shrishta, Susara, Svaryaka, Syandana, Syandanavhaya, Tinduka, Tinduki, Tindula, Tuvara, Virupaka.

A moderate-sized or large tree with a blackish bark, flaking off in pieces and many spreading branches, forming a dense, wide head, young parts silky; leaves simple, alternate, without stipules, numerous, spreading distichously, persistent, 12.5—17.5 cm long, 2.5—9 cm broad, oblong or oblong-lanceolate, usually tapering, rarely rounded at base, obtuse or subacute, glabrous and shining, veins prominent when dried; petioles 1—2 cm long, thick rigid; flowers small, regular, unisexual, yellow, sweet-scented, dioecious, male flowers rather small, 2—5 together, on short pedicels in shortly pedunculate, pubescent, racemose cymes; sepals 4, fused into a shallowly cup-shaped calyx, silky, segments very broad; petals 4, fused into a broadly campanulate corolla, very thick, lobes very short, spreading; stamens 24—64, usually 40, equal, anthers linear, filaments extremely short; ovary reduced to a lobed fleshy disc; female flowers solitary, much larger than the male, 2.5 cm diameter on short pedicels; sepals 4, fused, segments deep, erect, broadly ovate, cordate and dilated at the base, acute; petals 4, fused into a campanulate corolla, lobes deep, cordate, obtuse, recurved; staminodes 4—16, adnate to corolla-tube; ovary superior, hairy, 8-locular with a solitary ovule in each chamber, styles 4, stigmas lobed and undulated; fruit large, 3.7—8.7 cm diameter, subglobose, very thick, covered with a hard, rusty mealiness readily detached, yellow, calyx enlarged, spreading or reflexed, pericarp thin, pulp viscid and glutinous; seeds 4—8 oblong, flattened, smooth, reddish brown, embedded in the pulp.

Flowers during May.

*Illustrations.* Edward, *Bot. Reg.*, pl. 499. 1820; Beddome, *Flor. Sylvat.*, pl. 69. 1868—73; Roxburgh, *Corom. Pl.* 1: pl. 70. 1795; Wight, *lc. Pl. Ind. Orient. pls.* 843 and 844. 1843—45; Kirtikar and Basu, *Indian Med. Pl.*, pl. 586. 1933; Bentley and Trimen, *Med. Pl.*, pl. 168. 1880; Herb. Peradeniya., drawing.

*Distribution.* Occurs throughout India, Ceylon, Burma, Siam, Malay Archipelago and Java. It is very common in Ceylon in the dry low-country, specially by streams.

*India.* Dhaka, *Clarke* 16991D, April 1872. Chota Nagpore, Ranchi, *Clarke* 20333B, Oct. 1873; *Clarke* 20333A, Oct. 1873. Sivalik and Jaunsar Div., Kalsi, *Shankar* 92, June 1920. Malabar, Concan, etc., *Stocks, Law, etc. S. India, Barber* 2846. Pen. Ind. Orient., *Herb. Wight* 1711; *Kew Distribution* 1866—7. Ceylon. Northern Prov., Mullaitivu, *Hensman*, Feb. 1927. Central Prov., Peradeniya, *F. W. de Silva* 34, April 1928; *Wright*, 1907. Uva Prov., Uma Oya, *Thwaites C.P.* 1915.

*Uses.* The juice of the unripe fruit makes an excellent application on fresh wounds owing to its high tannin content. An infusion of the fruit is used as a gargle for aphthae and sore throat. The oil extracted from the seeds is used with success in diarrhoea and dysentery.

The viscid juice of the fruit is used for daubing the bottoms of boats and an infusion of it for staining fishnets.

## 42. ERICACEAE

1. *Gaultheria rudis* Stapf. Bot. Mag. sub. t. 9147. 1929.

*Gaultheria fragrantissima* Sensus Trimen.—*Gaultheria punctata* Bl.—*Gaultheria leschenaultii* DC.

Sinh. Wal-kapuru.

A much branched shrub with stiff erect twigs and leaves, bark yellowish, young twigs smooth, pink and somewhat compressed; leaves simple, alternate, numerous, persistent, 3.7—6.3 cm long on short, stout petioles, oblong-oval or oblong-lanceolate, rounded at base, obtuse or apiculate at apex, serrate, venation reticulate, bright green above, paler and dotted with dark brown glands beneath; flowers regular, bisexual, numerous, white on short, drooping pedicels with a pair of bractlets below the flower and a bract at the base, closely placed in dense, pubescent, axillary racemes much shorter than leaves; calyx white, free, not adnate to ovary but becoming succulent in fruit, segments 5, acute; corolla urceolate, globose, lobes 5, small; stamens 10, hypogynous, distinct, anther cells opening by short slits at apex and produced above into 2 spurs which are very sharp and reflexed; ovary superior, 5 lobed, 5-locular, pubescent; fruit capsule small, pubescent, completely enclosed in fleshy, ovoid, enlarged calyx which is 0.8—1.8 cm long, smooth, shining, deep purple-blue with a red stalk.

Flowers from February to July.

Illustrations. Bond, *Wild Flowers of Ceylon Hills*, pl. 65. 1953.

**Distribution.** Occurs in patanas at high elevations, overhanging the edge of deeply sunken tracks. It also occurs in North and South India, Burma, Malaya, Java and Sumatra.

**India.** East Himalaya, *Herb. Griffith* 3481/1, Kew Distribution 1862—3. Nepal: *Wallich* 765, 1824. Khasia: *J. D. Hooker*; *J. D. Hooker and T. Thomson*. Malabar: *Anderson*, Oct. 1861. Pen. Ind. Or., *Herb. Wight* 1292, Kew Distribution 1866—7. Ceylon. *Thwaites* C.P. 42. Central Prov., Horton Plains, World's End, *Mueller-Dombois and Comanor* 67070841, July 1967; *Herb. Peradeniya*, Jan. 1906; Fort Macdonald, *J. M. Silva*, May 1911; Ambawela, *Mueller-Dombois* 67071003, July 1967; Knuckles, *W. Ferguson*, April 1887; Hakgala, *A. M. Silva*, Oct. 1906; Sita Eliya, *A. M. Silva*, Oct. 1906. Java. *Yates* 2802, March 1928. Sumatra. *Forbes* 2439, 1881.

**Composition.** The leaves on distillation yield oil of Wintergreen, which by enzyme action on the glucoside, monotropitoxide produces methyl salicylate in addition to arbutin and annin. The oil also contains minute quantities of an alcohol, a ketone and an ester.

**Uses.** The leaves are astringent and aromatic and are used for preparation of ointments used as an application on muscular pains and rheumatism. The oil is a stimulant, carminative and antiseptic. It is applied externally as a liniment in rheumatism, sciatica and neuralgia. It is given internally in the form of an emulsion. It has a vermicide action against hookworm. It is a constituent of several insecticidal and insect-repellent preparations and is used as a flavouring agent in confectionery, soft drinks and dentifrices. In Java, it is used as a hair tonic.

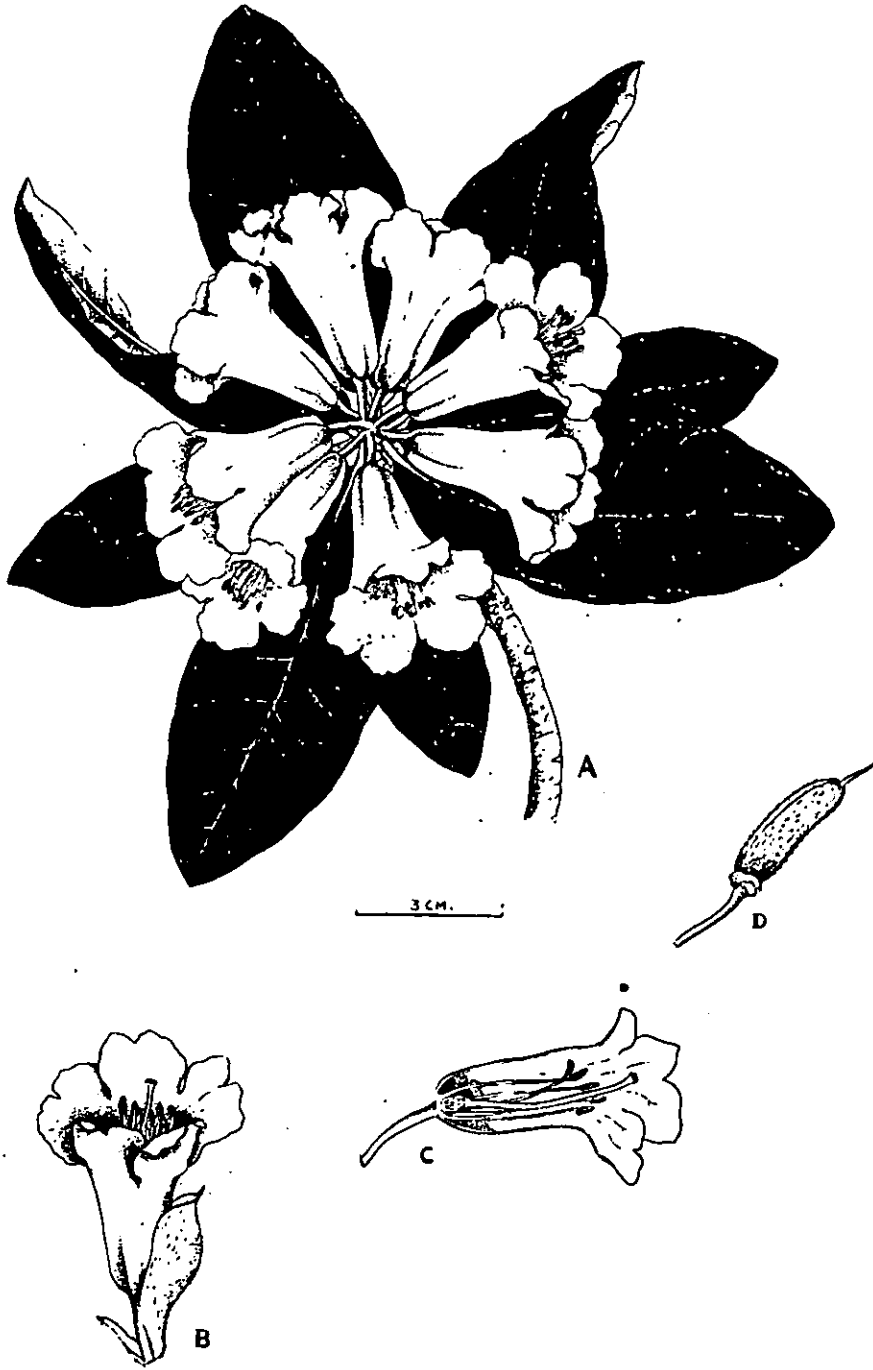


FIG. 188. *Rhododendron zeylanicum*. A, branch with leaves and a flowering raceme. B, flower from side with bract and bracteole. C, longitudinal section of flower. D, fruit.

2. *Rhododendron zeylanicum* Booth in Gard. Chron. 150. 1850. (Fig. 188).

*Rhododendron arboreum* Sm.—*Rhododendron puniceum* Roxb.—*Rhododendron cinnamomeum* Wall.—*Rhododendron album* Sweet—*Rhododendron campbelliae* Hook. f.—*Rhododendron windsorii* Nutt.

Sinh. Asoka, Ma-ratmal; Tam. Alingi, Billi.

A small tree with a stout, twisted trunk, deeply furrowed, grey bark and stout twigs, marked with leaf scars of fallen leaves; leaves simple, alternate without stipules, 7.5—12.5 cm long, crowded at ends of branches but below flowers, oblong-oval or oblong—lanceolate, tapering to or slightly rounded at base, acute at apex, margin often recurved, glabrous above, more or less densely covered beneath, with a thin hard felt of white ferruginous hairs, thick and very stiff, veins impressed above, prominent beneath; petioles 1.2—1.8 cm long, thick, glabrous; flowers regular, bisexual, very large, dark crimson on short, pubescent pedicels closely placed in a short, terminal, capitulate raceme, each with a very large, rotundate, apiculate, deciduous bract more or less silky hairy on the back; sepals 5, free, nearly glabrous, persistent, segments obscure, rounded; petals 5, fused into an infundibular—campanulate corolla, 3.1—5 cm diameter, lobes broad, rounded, undulate; stamens 10, hypogynous, distinct, filaments glabrous, anther cells opening by terminal pores; ovary superior, 10-locular with many ovules in each chamber, style simple, stigma capitate, lobed; fruit a woody capsule, dehiscent septifragally from above into 5 valves, leaving the placental column often tipped with persistent style, valves ultimately reflexed; seeds numerous, minute, winged at both ends.

Flowers from April to July.

Illustrations. Beddome, Fl. Sylvat. pl. 228. 1868—73; Herb. Peradeniya, drawing; Curtis, Bot. Mag. pl. 5311. 1862; Edward, Bot. Reg. pl. 890. 1825.

Distribution. Occurs in temperate Himalayas, Nilgiris, Pulneys, Travancore in India, Ceylon and Burma. In Ceylon, it is common in the patanas at Nuwara-Eliya, Rangala, etc., generally growing gregariously.

India. Tibet: *Younghusband* 10. Sikkim: *J. D. Hooker*; *T. Thomson*, 1857. Bhutan: *Simons*. Khasia: *Simons* Ceylon. *Thwaites* C.P. 149; Rangala, *Herb. Peradeniya*; Maskeliya, *Herb. Peradeniya*, May 1891; *Namunukula*, *J. M. Silva*, March 1907.

Uses. The young leaves are poisonous but generally applied on the forehead to cure headaches.

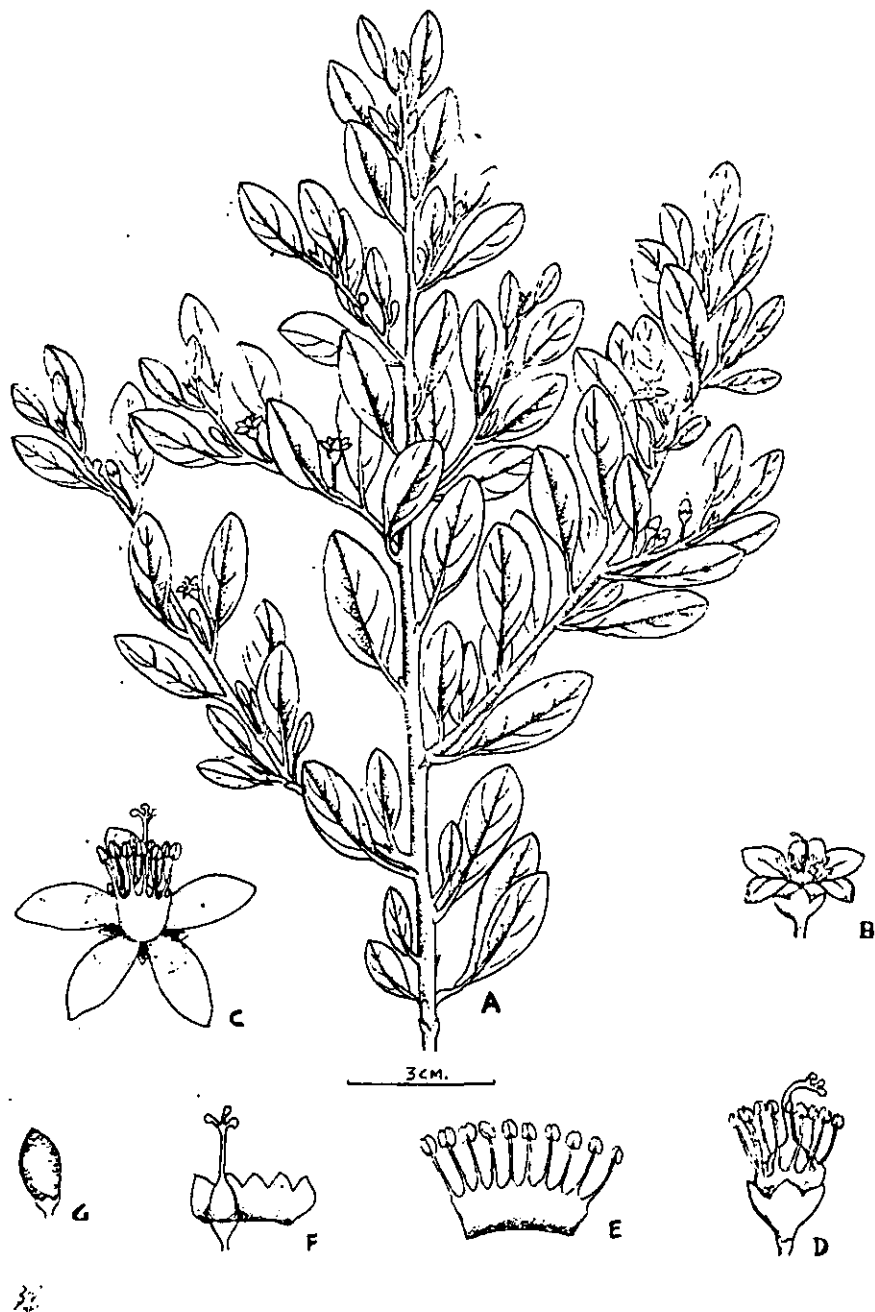


FIG. 189. *Erythroxylum monogynum*. A, branch with leaves and flowers. B, flower from side. C, flower from front showing scales on the inner surface of petals. D, flower with petals removed. E, stamen-tube spread out. F, flower with the petals and stamens removed, showing the pistil and spread out calyx. G, fruit. B—F enlarged.

### 43. ERYTHROXYLACEAE

#### 1. *Erythroxylum monogynum* Roxb., Pl. Corom. 1: 61. pl. 88. 1795. (Fig. 189).

*Erythroxylon indicum* Beddome—*Sethia indica* DC.

*Engl.* Bastard Sandal; *Tam.* Dásadaram, Devadaram, Devadari, Kadavulardaram, Kattusandanam, Kurardurumam, Sammanati, Sem, Sembilichan, Semmanalli, Semmanam, Simpulicham, Tevadaram, Tevadari, Tevadaru.

A small, much branched tree with a thick, very rough, dark brown bark; leaves simple, alternate, stipulate, 3.7—6.2 cm long, 1.5—2.5 cm broad, oval-obovate, tapering to base, very obtuse at apex, dull, not shining, paler beneath, veins reticulate, combined stipules triangular, persistent; flowers regular, bisexual, greenish white, 6 mm long, on slender pedicels, axillary, generally in fascicles of 1—4; sepals 5, triangular, acute, glabrous, slightly connate below; petals 5, distinct, imbricate, spreading, longer than sepals with a large, double, erect scale on the inner surface; stamens 10, filaments connate into a tube; ovary superior, 3-locular with one ovule in each loculus, styles 3, connate for nearly its whole length, stigmas capitate; fruit a drupe 1 cm long, oblong, apiculate, somewhat trigonous, smooth, bright scarlet, surrounded at base by persistent sepals and stamens.

Flowers in March and August.

*Illustrations.* Roxburgh, Pl. Corom. 1: pl. 88. 1795; Beddome, Flor. Sylvat. pl. 81. 1868—73; Kirtikar and Basu, Indian Med. Plants, pl. 166. 1933.

*Distribution.* Occurs in the warm, hilly parts of western India and very common in the dry country in Ceylon. Jaffna, Mihintale, Kirinde, etc.

*India.* Calcutta: *Wallich* 6848C. Pen. Ind. Orient: Coimbatore, *Herb. Wight* 288, Kew Distribution 1866—67. Ceylon. *Thwaites* C.P. 1168. Northern Prov., Elephant Pass, *Simpson* 9260, March 1932.

*Composition.* The leaves contain small quantities of alkaloids. The wood yields a creosote-like volatile oil containing  $\alpha$  pinene, diterpene, diterpene alcohol and a trace of sesquiterpene.

*Uses.* An infusion of the wood and bark is considered a stomachic, diaphoretic and a stimulant diuretic. It is also useful in some slight cases of dyspepsia, fever and dropsy. The leaves are used as an anthelmintic.

The resinous tar obtained from distillation of wood is used as a wood preservative for fishing boats.

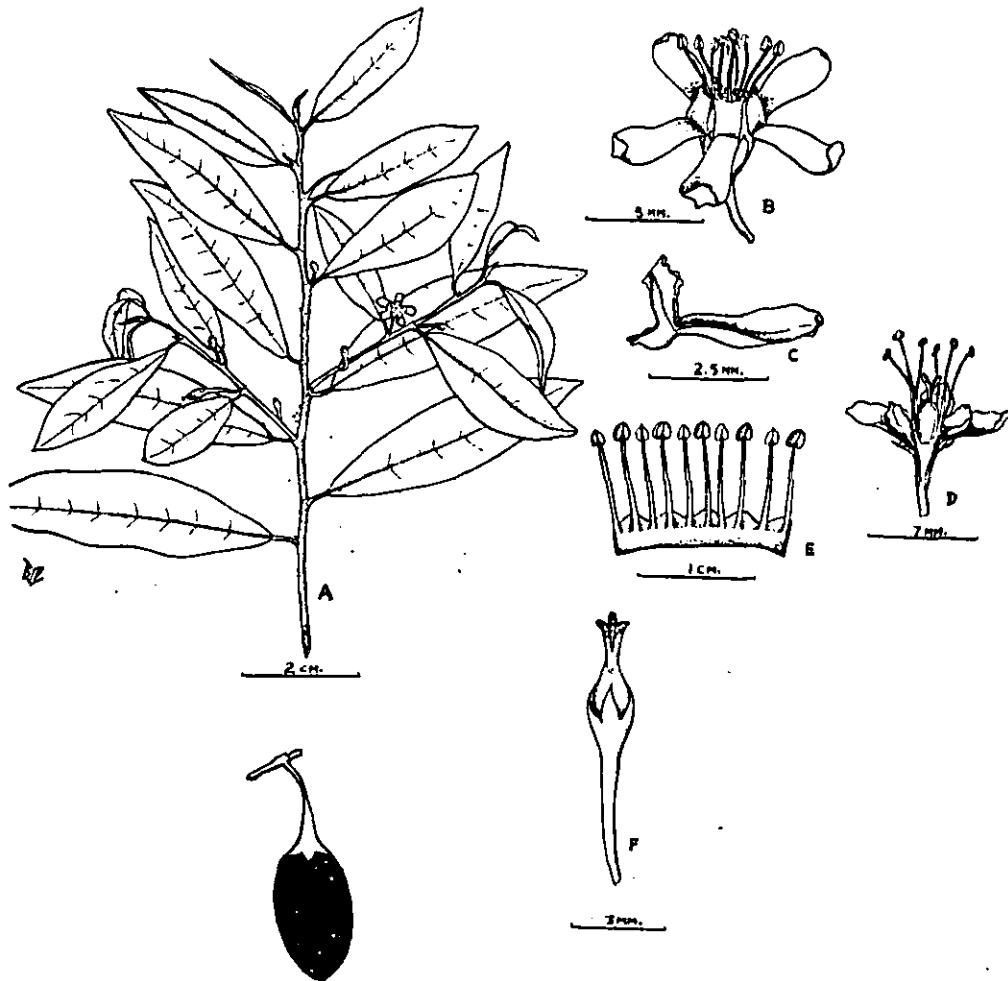


FIG. 190. *Erythroxylum moonii*. A, a branch with leaves and flowers. B, front view of flower showing double scales on petals and stamens. C, a petal with the double scale. D, longitudinal section of flower. E, stamens with stamen tube spread out. F, pistil with the calyx. G, fruit.

2. *Erythroxylum moonii* Hochr. in Bull. Inst. Bot. Buit. 22: 54. 1905. (Fig. 190).*Erythroxylum acuminatum* Walp.—*Erythroxylum lucidum* Moon—*Sethia acuminata* Arn.

Sinh. Bata-kirilla; Tam. Chiruchemannati, Chiruchenatti.

A much branched, twiggy, glabrous shrub, with a pale bark; leaves simple, alternate with stipules, 3.7—7.5 cm long, 1.5—2.5 cm broad, linear—lanceolate to oval—lanceolate, acute or rounded at base, tapering, acuminate with obtuse apex, glabrous and shining on both surfaces, lateral veins horizontal and faint; petioles 5 mm long, stipules caducous; flowers regular, bisexual, solitary, axillary, greenish yellow or white, about 9 mm across, pedicels longer than petioles; sepals 5, 1—1.5 mm long, lanceolate, acute, slightly connate at base; petals 5, distinct, imbricate, 3.5 mm long, spreading, oblong, obtuse with a large double, erect scale on the inner surface; stamens 10, filaments 2.5 mm long, connate into a tube; ovary superior, oblong, 1.4 mm long, 3-locular with one ovule in each loculus, styles 3, connate at base; fruit a scarlet drupe, 1.2—1.3 cm long, pointed, faintly grooved and shining with persistent calyx and stamens.

Flowers from March to May.

Illustration. Herb. Peradeniya., drawing.

Distribution. Occurs in south India and Ceylon and perhaps in Borneo. It is rather common in the low-country in Ceylon. Ratnapura, Kuruwita Korale, Singha Raja Forest, Uma Oya, Nilgala, Dambulla, Matara (Dickwella), etc.

Ceylon. Thwaites C.P. 222; Thwaites C.P. 3488. Central Prov., Peradeniya, Bot. Gard. Jayaweera 1173, Sept. 1955; Jayaweera 2597, June 1957. Western Prov., Gampaha, Bot. Gard., Jayaweera 2223, Nov. 1955.

Uses. The leaves given in various forms (the commonest being a bolus made by mixing the powdered dry leaves with rice flour and honey) are very effective anthelmintic for round worms. Externally the bruised leaves in the form of a poultice hastens suppuration of boils and abscesses.

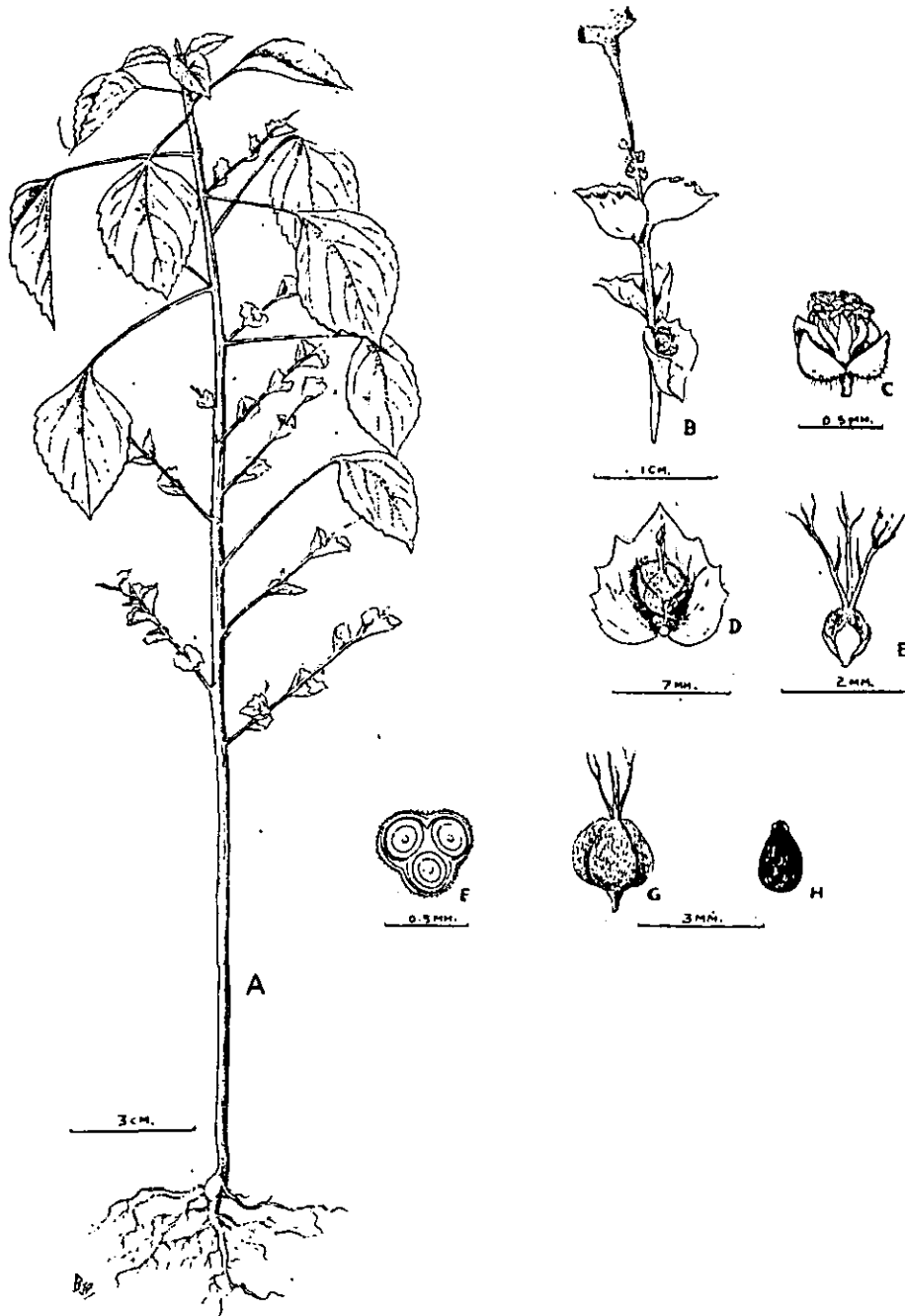


FIG. 191. *Acalypha indica*. A, plant with leaves and flower spikes. B, flower spike showing the female and male flowers in clusters. C, male flower. D, group of female flowers protected by the bract. E, female flower. F, transverse section of the ovary. G, fruit. H, seed.

## 44. EUPHORBIACEAE

### 1. *Acalypha indica* Linn Sp. Pl. 1003. 1753. (Fig. 191).

*Acalypha spicata* Forsk.—*Acalypha ciliata* Wall.—*Acalypha canescens* Wall.—*Acalypha caroliniana* Blanco

*Sinh.* Kuppameniya; *Tam.* Kuppaimeni, Kuppamani; *Hindi* Khokali, Khokla, Khokli, Kuppi; *Sans.* Arittamunjariye.

An annual herb, 30—75 cm tall, erect, branches numerous, long, ascending, angular, finely pubescent; leaves simple, alternate, 3.7—9 cm long, 2.8—7 cm broad, rhomboid—ovate, tapering at base, acute, serrate, glabrous, thin, somewhat 3-nerved at base, pale green, finely pubescent on veins beneath; petioles usually longer than the leaf, 2—9.5 cm long, slender, spreading, pubescent, stipules minute; flowers minute, green, unisexual, apetalous, monoecious, sessile or shortly pedicelled, in numerous, lax, erect, axillary spikes, each terminating in a swollen 2-fid apex bearing a seed; male flowers: very small, white, short-pedicelled in clusters towards the upper end of the spike; sepals 4, valvate, ovate, hairy, petals and disc absent; stamens 8 on a convex receptacle, filaments swollen and anthers branched; female flowers: solitary or in clusters of 2 or 3, scattered, each group with a large, leafy, truncate, dentate bract; sepals 3, ovate, hairy; petals absent; ovary superior, hispid, 3-locular with a single ovule in each loculus, styles 3, much divided into several long slender branches; fruit capsule small, concealed by the large bract, consisting of three, 2-valved, crustaceous cocci; seeds brown, glabrous, conical, about 1.4 mm long.

Flowers all the year round.

*Illustrations.* Wight, *lc. Pl. Ind. Orient. pl.* 877. 1843—45; Kirtikar and Basu, *Indian Med. Plants, pl.* 874. 1933; Herb. Peradeniya., drawing.

*Distribution.* Occurs in the hotter parts of India, Ceylon, Malaya, Burma, Philippine Islands, Polynesia and tropical Africa. In Ceylon, it is a common weed in cultivated and waste ground in the low-country especially, in the dry regions.

*India.* Maisor and Carnatic, *G. Thomson.* Madras, *Wallich 7779B.* Ceylon. North Central Prov., Anuradhapura, *Thwaites C.P.* 2098, Central Prov., Peradeniya, *Jayaweera* 1044, Jan. 1954; *Jayaweera* 2227, May 1957. Maldives Islands. *Didi* 161, 1896; Horsburg and Addu Atolls *Gardiner*, 1899—1900. Timor. *Meyer*, 1884.

*Composition.* Contains the alkaloids, acalyphine and triacetoneamine, resin, tannin, a volatile oil and a cyanogenetic glucoside.

*Uses.* The leaves possess laxative powers. A decoction of the leaves and roots is given to children as an expectorant and emetic for bronchitis. The fresh juice of the leaves is given for asthma and bronchitis. A teaspoonful of the juice with a tablespoonful of arrack taken early in the morning on an empty stomach for a fortnight, is said to cure asthma. The root bruised in water is used as a cathartic. Externally, a poultice made with the fresh bruised leaves applied to the lower part of the abdomen is a popular remedy for spasmodic retention of urine. The leaves are an anti-parasiticide. The powdered dry leaves are used for bed sores and a paste of it for ringworm. In chronic constipation in children, a paste of the leaves made into a ball and introduced to the rectum relieves contraction of the sphincter ani. The juice of the leaves mixed with lime is applied for painful rheumatic affections.

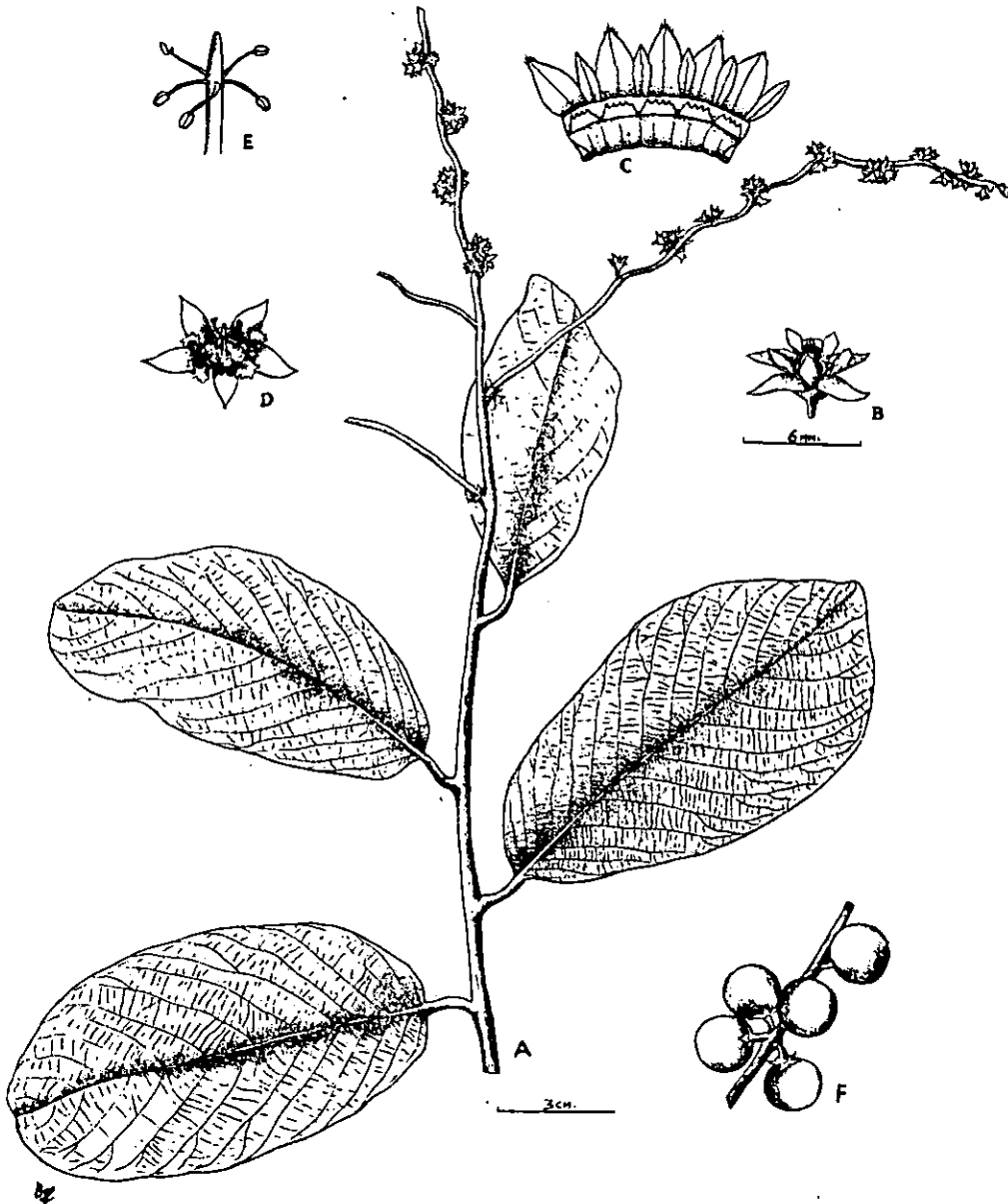


FIG. 192. *Bridelia retusa*. A, branch with leaves and inflorescence. B, female flower lateral view. C, female flower opened showing the petals and the double disc, outer adnate to calyx and the inner thin membranous and much jagged. D, male flower dorsal view. E, staminal column showing the insertion of 5 stamens below its apex. F, fruits. B-E, enlarged.

2. *Bridelia retusa* (Linn.) Spreng. Syst. Veg. 3 48 1926. (Fig. 192).

*Bridelia amoena* Wall. ex Baill.—*Bridelia montana* Wall.—*Bridelia spinosa* Roxb.—*Cluytia retusa* Linn.—*Cluytia spinosa* Willd.

*Sinh.* Ketakala; *Tam.* Adamarudu, Asuvai, Kadugai, Komanjr, Malai-vengai, Mullumarudu, Mulluvengai, Mulvengai, Mulvenkai, Sem, Singattan, Siruvengai; *Hindi* Gauli, Kaj, Kajja, Kassi, Khaja; *Sans.* Asana, Ekadivi, Ekavira, Mahavira, Sakridvira, Suvarika.

A small tree with a smooth, pale yellowish-grey bark and rusty—pubescent young twigs; leaves simple, alternate, numerous, 8.7—11.2 cm long, oblong—oval, usually rounded at base, very obtuse or rounded at apex often emarginate, entire; lateral veins 16—20 pairs, strong, parallel, uniting with a transparent marginal vein and connected by numerous fine transverse veinlets, glabrous and bright green above, whitish with minute pubescence beneath, rather thick; petioles short, stout, finely pubescent; stipules lanceolate with a broad base, very acuminate, pubescent, deciduous; flowers regular, unisexual, green tinged with red with a purple disc, monoecious (or dioecious) on very short pedicels in small dense clusters on spicate or rarely branched, axillary inflorescences exceeding the leaves; male flowers: 4 mm. diameter; sepals 5, valvate, narrowly triangular, acute, spreading; petals 5, inserted on the calyx, much smaller, deeply pectinate, disc conspicuous, annular, thick and pulpy; stamens 5, filaments united below into a column, distinct and spreading above, pistillode terminating the column; female flowers: smaller, calyx as in male; petals 5, persistent, spatulate, acute, not pectinate; disc truncate tubular enclosing the ovary; ovary superior, 2-locular with two ovules in each chamber, styles 2, short and forked; fruit a drupe with 2 one-seeded pyrenes on persistent calyx and petals, about 8 mm diameter, globose, slightly pulpy and purplish-black.

Flowers during June and July.

**Illustrations.** Beddome, *Flor. Sylvat. pl.* 260. 1869—73; Roxburgh, *Pl. Corom.* 2: *pl.* 172. 1798; Kirtikar and Basu, *Indian Med. Plants, pl.* 854. 1933; *Herb. Peradeniya*, drawing.

**Distribution.** Grows in the warmer parts of India, Ceylon, Burma and Malacca. It is common in the moist, low-country up to 2000 feet altitude.

**India.** Sikkim: *J. D. Hooker*. Khasia: *J. D. Hooker and T. Thomson*. East Bengal: *Herb. Griffith* 4887, *Kew Distribution* 1864; Assam: *Simons*. Bombay: *Gibson*. Siwalik and Jaunsar: *Hassan* 165, 1921. Malabar, Concan, etc. *Stock, Law, etc.* Pen. Ind. Orient. *Herb. Wight* 2602 *Kew Distribution* 1866—8. Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Jayan eera* 1150, May 1954. *Thwaites C.P.* 2161, Western Prov., Mirigama. *Alston* 676, June 1927; Middeniya, *Alston* 1348, March 1927. Uva Prov., Lunugala, *Herb. Peradeniya.*, *Ja* 888. **Burma.** *Prazer*.

**Uses.** The root and bark are valuable astringents, the latter being used as a liniment with gingly oil for rheumatism.

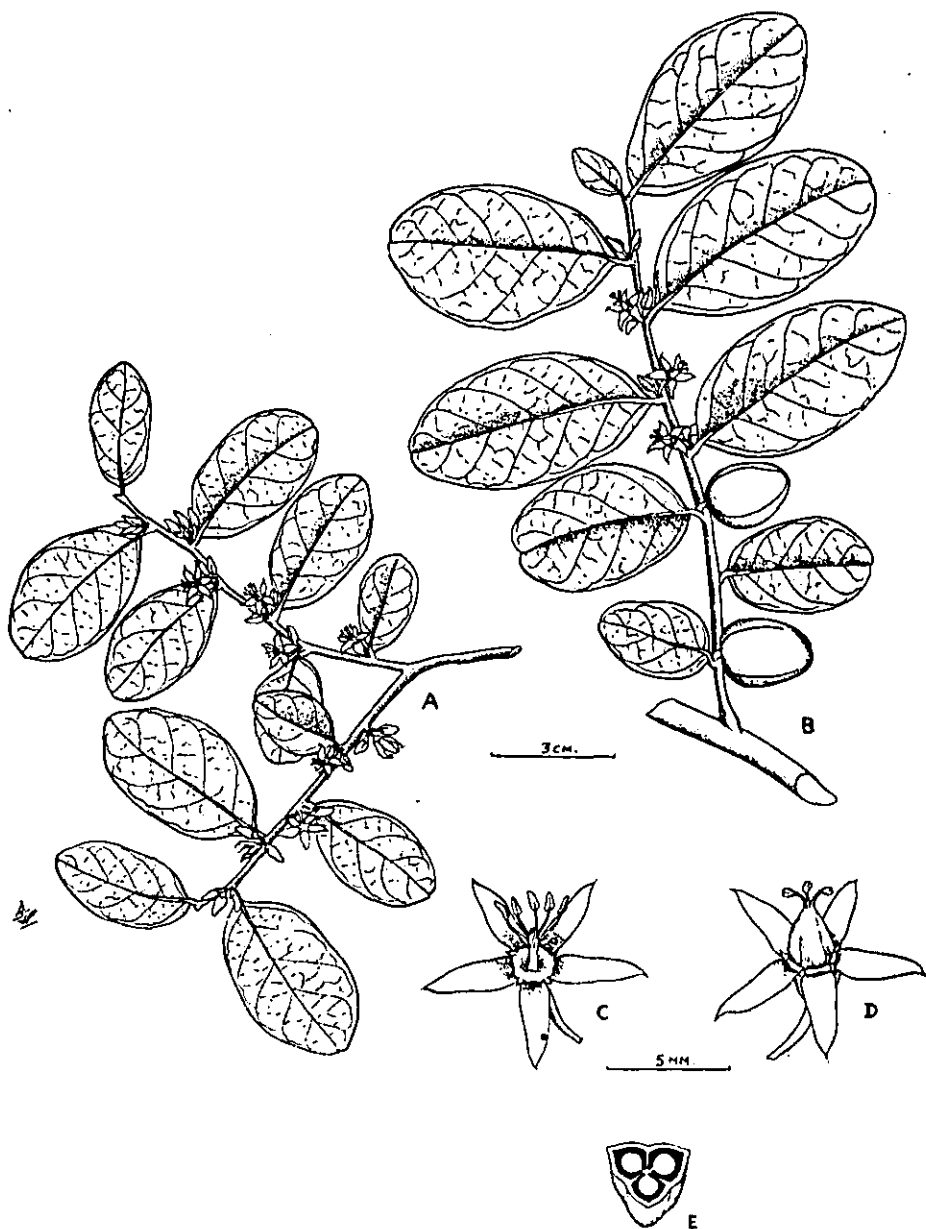


FIG. 193. *Cleistanthus collinus*. A, branch with leaves and clusters of male flowers. B, branch with female flowers and fruits. C, male flower. D, female flower. E, transverse section of fruit.

3. *Cleistanthus collinus* (Roxb.) Benth., Gen. Pl. 3: 268. 1880. (Fig. 193).

*Bridelia collina* Hook. and Arn.—*Amanca collina* Baill.—*Lebidieropsis collina* Muell. Arg.—*Lebidieropsis lobicularis* Muell. Arg.—*Chuytia collina* Roxb.—*Andrachne orbiculata* Roth.

*Sinh.* Madara; *Tam.* Nilaippalai, Odaichi, Odan, Odishi, Odu, Odugu, Oduppai, Oduvan; *Hindi* Garari, Garrar; *Sans.* Indrayava, Kaudigam, Kutaja, Nandi.

A small tree with a corky, pustulate, reddish-grey bark and stout spreading branches; leaves simple, alternate, few, rather large, 5—10.5 cm long, 3.2—6.5 cm broad, broadly oblong—oval, shortly petioled, very obtuse or rounded at apex, glabrous, rather pale beneath; venation reticulate; flowers yellowish, unisexual, monoecious or dioecious, very shortly stalked in axillary clusters, male flowers about 10 mm across; sepals 5, 3.5 mm long, 1.5 mm broad, lanceolate, valvate, thick, hairy outside; petals 5, minute, 0.5 mm long, subulate, disc broad, circular; stamens 5, filaments connate, half way up in a column and then diverging, pistillode small, conical, trifid terminating the column; female flowers 1.2—1.4 cm across; sepals 5, valvate, 6.5—7 mm long, 2.5—3 mm broad, lanceolate, hairy outside; petals minute, 1 mm long, subulate; ovary superior, 3.5 mm tall, glabrous and shining, 3-locular with two ovules in each chamber, styles 3, bifid; fruit large, 1.8—2.2 cm long, depressed globose, very distinctly 3-lobed, smooth, shining woody and brown; seeds nearly globose, dark brown.

Flowers in June and October.

*Illustrations.* Roxburgh, Pl. Corom. *pl.* 169. 1798; Beddome, Forrester's Man. *pl.* 23, *fig.* 5.

*Distribution.* Occurs in India and Ceylon. It is very rare in Ceylon, found in the low-country in Sabaragamuwa Province.

*India.* Pen. Ind. Or., *Herb. Wight* 2605, Kew Distribution 1866—8. *Ceylon.* Sabaragamuwa Prov., Bintenne, *Thwaites C.P.* 2163.

*Uses.* This is a poisonous plant. An extract of the leaves is a violent gastro-intestinal irritant. The bark and fruits are employed as a fish poison. The bark is useful as an application on cutaneous diseases. The flowers are used for various medicinal purposes.

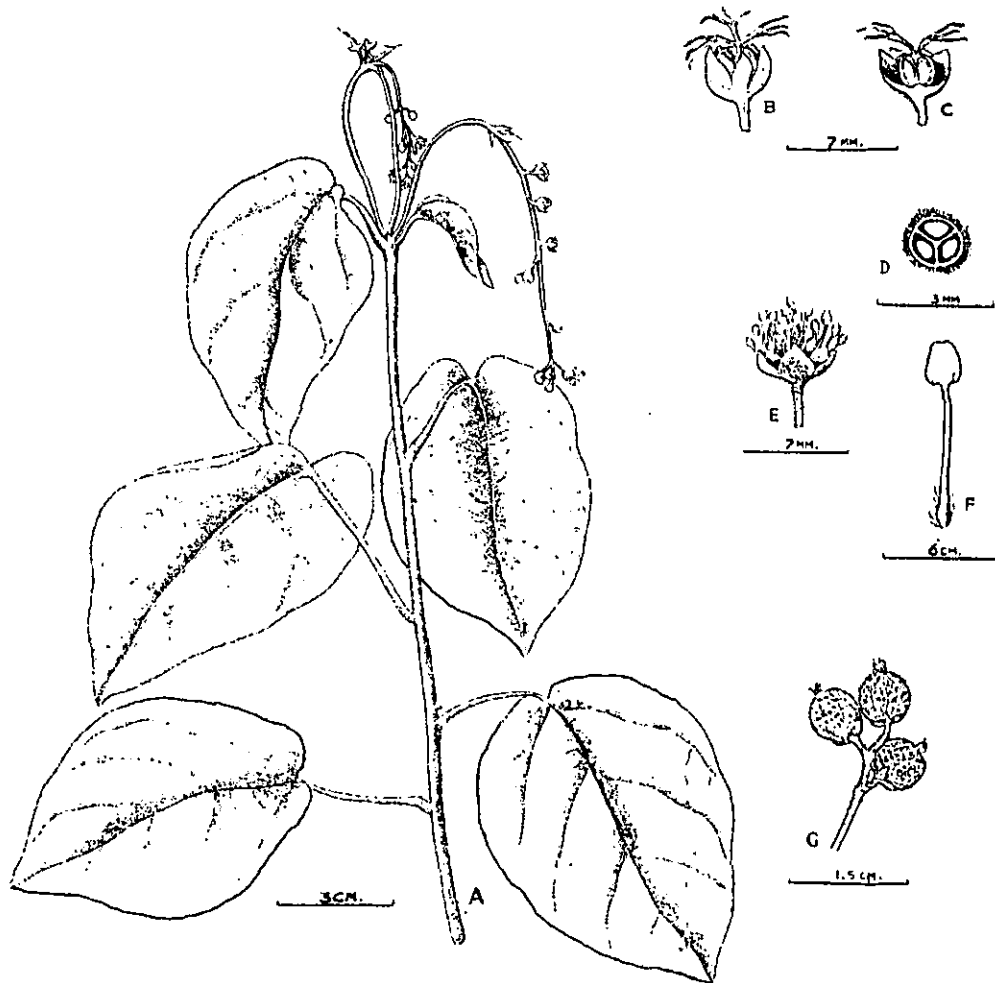


FIG. 194. *Croton lacciferus*. A, branch with leaves and a terminal inflorescence. B, female flower lateral view. C, longitudinal section of female flower. D, transverse section of ovary. E, male flower lateral view. F, stamen. G, fruits.

4. *Croton lacciferus* Linn., Sp. Pl. 1005. 1753. (Fig. 194).*Croton aromaticus* var. *lacciferus* Trim.

Sinh. Gas-keppitiya, Keppitiya; Tam. Teppaddi.

A large shrub with a smooth, pale grey bark; young parts almost villous with yellowish hair; leaves simple, alternate, 8—9 cm long, 5.5—6.5 cm broad, ovate, rounded or subcordate at base, shortly attenuate, acute, irregularly and shallowly crenate—serrate or almost entire, hairy on both sides, woolly beneath with simple, long hairs mixed with stellate ones, base with a pair of small, circular, peltate glands; petioles 2.5—4.5 cm long, hairy; stipules filiform; flowers regular, unisexual, greenish—white, monoecious in usually terminal slender racemes, female flowers few confined to the base; male flowers: about 5 mm across; sepals 5, imbricate, acute, stellate, hairy; petals 5, ovate bordered with white hair, disc glands opposite sepals; stamens 20 or less, disc slightly hairy, pistillode absent; female flowers: 4 mm across; sepals 5, imbricate, stellate hairy, enlarged in the fruit; petals absent; ovary superior, densely stellate hairy, 3-locular with one ovule in each chamber, styles split almost to the base into filiform branches; fruit nearly globose, densely hairy; seeds ovoid, smooth and dark brown.

Flowers from August to November.

Illustrations. Burmann, *Thes. Zeyl. pl.* 91. 1737; Herb. Peradeniya, drawing.

**Distribution.** Grows in South India and Ceylon. It is very common, both in the moist and dry regions up to 3000 feet altitude in Ceylon.

**Ceylon.** Central Prov., Ritigala, *Willis*, March 1905; Dambulla, *Alston* 599, March 1927; Rattota, *Alston* 662, June 1927; Kandy, *Alston* 2221, Oct. 1927; Peradeniya, Bot. Gard., *Jayaweera* 1362, March 1955.

**Uses.** A continuous waxy incrustation formed by the secretions of certain species of scale-insects (*Tachardia lacca*) living on the tender branches of the shrub, sucking juice from them, forms the lac of commerce much used for lacquer work in Ceylon. It is used medicinally in the preparation of medicinal oils and pills used in the treatment of fever, colds, dysentery and lung diseases including tuberculosis. The root is used for preparation of pills given for chronic fevers. The juice of the bark and leaves is used as a styptic and on skin diseases.

The leaves are used for manuring paddyfields and betel vines as they are supposed to control certain soil-borne pests and diseases

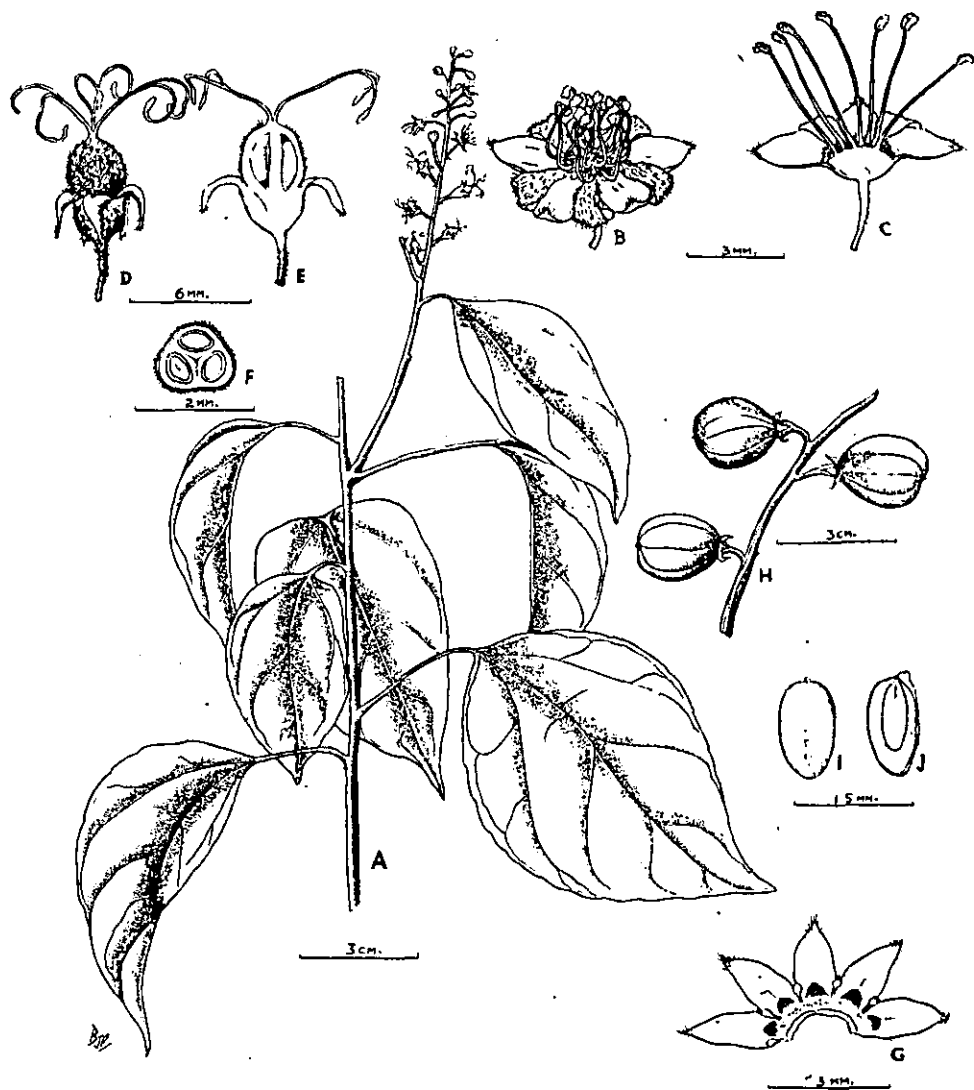


FIG. 195. *Croton tiglium*. A, portion of the plant with leaves and a flowering raceme. B, male flower dorsal view. C, longitudinal section of male flower. D, lateral view of female flower. E, longitudinal section of female flower. F, transverse section of ovary. G, sepals of female flower spread out showing the glands and globular protuberances. H, fruits. I, seed. J, longitudinal section of seed showing a foliar cotyledon and albumen.

5. *Croton tiglium* Linn. Sp. Pl. 1004. 1753. (Fig. 195).

*Croton jamalgota* Ham.—*Croton parana* Ham.—*Croton camaza* Perr.—*Croton glandulosum* Blanco—*Croton muricatum* Blanco—*Tiglium officinale* Klotzsch.

*Engl.* Purging Croton; *Sinh.* Jayapala; *Tam.* Kattukkattai, Naganam, Nagandi, Nervalam, Nigumbam, Nirvalam, Sambari, Sayabalam, Sevalangottai, Siduram, Sittudu, Tendi; *Hindi* Jamalgota; *Sans.* Danti, Jayapala, Nepala.

A small tree, 3—7 m tall with a rather crooked trunk but smooth bark; branches slender, smooth, terete, bark paler, whitish-brown, marked with scars of fallen leaves; leaves simple, alternate, on stalks nearly half as long as the blade which is about 8—14.5 cm long, 4.5—7 cm broad, thin, glabrous, ovate, faintly and rather distantly serrate, bright green, veins prominent beneath, petioles breaking up immediately on entering the leaf into 5 veins, the two lateral ones faint, the two intermediate well marked, giving with the midrib a triple-nerved aspect of the leaf; on either side of the base of the blade and connected with the petiole is a prominent sessile gland; stipules minute, filiform, deciduous; young leaves and buds with scattered stellate hairs; flowers unisexual in lax, terminal, erect racemes, the male flowers on the upper part of the raceme, the female less numerous on the lower part, pedicels longer than the flowers, bracts minute; male flowers yellowish, about 7 mm in diameter, calyx of 5 spreading, broadly triangular, blunt sepals 2.5 mm long, 1.5 mm broad, valvate, apices pubescent; petals 5, inserted on the flat receptacle, alternate with and reflexed between sepals, 2.5 mm long, 0.7 mm broad, oblong—linear, blunt, set with rather long white hairs above, glabrous beneath, whitish; a prominent roundish yellow gland stands within each sepal, alternating with the petals; stamens 14—20, as long as petals, one opposite each petal and sepal, the remainder irregularly dispersed over the receptacle which is covered with short, white hairs, anthers small, broad, innate, cells semilunar; female flowers about 3 mm across, dark green; calyx deeply 5-partite, divisions 2 mm long, 0.7 mm broad, ovate, acute, tipped with hairs, spreading or reflexed, set with few or more numerous stellate hairs and with a small, rounded prominence at the angle between each, glands 5, blunt, prominent, opposite the sepals as in male flowers, petals absent; ovary sessile, 1 mm long, thickly covered with stellate hairs, 3-locular with a single pendulous ovule in each loculus, styles 3, bifid; fruit slightly inflated, pale, smooth, brownish-yellow, capsular with a single, large seed inside each chamber; seeds albuminous, 1.2 cm long, 1 cm wide, ovoid, rounded at the back, marked on the ventral surface by a fine raised raphe, testa thin, brittle, light-brown.

**Illustrations.** Bentley and Trimen, *Med. Plants*, pl. 239. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 872B. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs in India, Ceylon, Burma, Malaya extending on to New Guinea and Borneo. In Ceylon, it is found in the dry zone jungles.

**India.** Sikkim: *T. Thomson*, 1857; Assam: *Simons*. Calcutta, *Wallich 7722D*; *J. D. Hooker and T. Thomson*, cultivated. Ceylon. Peradeniya, Bot. Gard., *Herb. Peradeniya*, May 1887; *Herb. Peradeniya*, 1878, cultivated. **Philippine Islands.** Luzon, Mount Prov., Benguet, *Valentin 29782*, Sept. 1924. Cuba. Santiago de las Vegas, *Baker 97*, Aug. 1907.

**Composition.** The seeds possess a fixed oil which contains croton globulin and croton albumen, arginine and lysine; alkaloid vicinine; lipase; invertase, amylase, raffinase; proteolytic enzyme, croton resin, tiglic acid, croton oleic acid, stearic, palmitic, myristic, lauric, oenanthallic, capronic, valerianic, butyric, isobutyric, acetic and formic acids; tannin, etc.

**Uses.** The roots, leaves, bark and seeds possess drastic purgative properties. The bruised root is applied to carbuncles and cancerous sores. The seeds are poisonous and are a powerful and drastic purgative. The oil extracted from the seeds applied externally is a counter-irritant and a liniment prepared from it, is useful in rheumatism, glandular and other swellings, chronic bronchitis and other pulmonary affections. The oil is also useful in dropsy, intestinal obstructions and lead poisoning. The seeds and leaves are used for poisoning fish by the Dayaks of Borneo and in the Philippine Islands. The leaves are one of the constituents of the Batak arrow poison.

The oil is a very valuable cathartic and it acts speedily and powerfully on the bowels. In Ceylon, the seed is used along with other drugs in fever, constipation in dropsy and as a drastic purgative for colic, ascites, etc.,

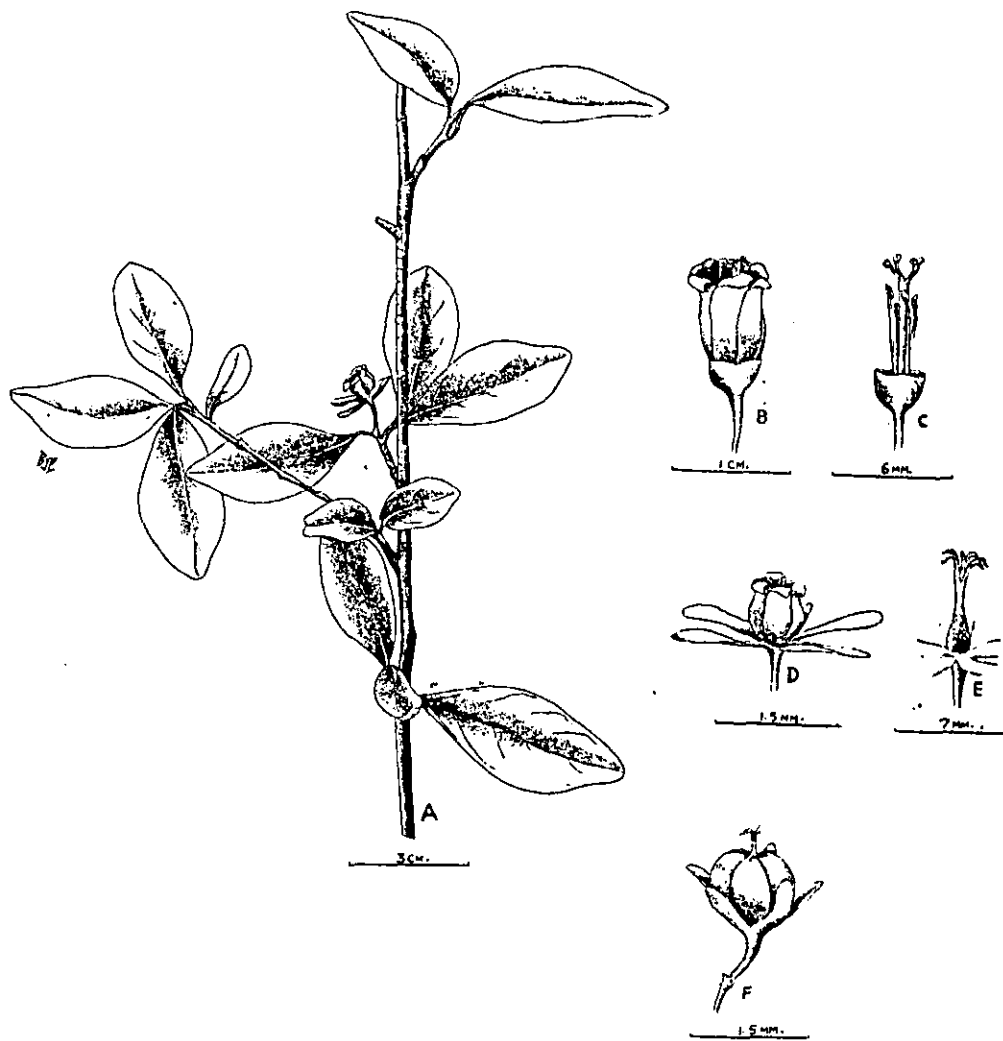


FIG. 196. *Dimorphocalyx glabellus*. A, branch of a female tree with leaves and a flower. B, male flower lateral view. C, male flower with corolla removed. D, female flower lateral view. E, female flower with corolla removed. F, fruit

6. *Dimorphocalyx glabellus* Thwaites, Enum. 278. 1861. (Fig. 196).

*Trigonostemon lawianus* Muell. Arg.—*Croton glabellus* Heyne.

*Sinh.* Welī-wenna; *Tam.* Tentukki; *Sans.* Hansapada.

A small, much branched tree with a cinnamon grey bark, slender twigs and glabrous young parts; leaves simple, alternate, stipulate, 7.5—11.2 cm long, lanceolate or oblong—lanceolate, tapering to base, acuminate, subacute, entire or slightly repand-dentate, glabrous, dull dark green, paler beneath; petioles 1.2 cm long; stipules small, triangular; flowers regular, unisexual, white, dioecious, males in clusters on the old wood and females solitary or 2—3 together, terminal or leaf opposed; male flowers: sepals 5, fused into a shallow, membranous, cup-shaped calyx, segments much shorter than petals; petals 5, erect, recurved in the upper part, imbricate; stamens 10 in two rows, outer ones shorter, filaments connate below into a column; disc of 5 scale—like glands, pistillode absent; female flowers: sepals 5, fused into a large calyx, segments divided nearly to base, longer than petals, rather unequal, oblong—lanceolate, obtuse, parallel veined, each with a rounded gland on the back of apex; petals 5, erect, imbricate, larger than in the male; ovary superior, 3-locular with a single ovule in each chamber, disc annular, styles 3, bifid; fruit less than 1.5 cm pubescent, capsule of three, 2-valved, crustaceous cocci surrounded at base by persistent calyx, capped with styles.

Flowers from June to December.

*Illustrations.* Trimen, *Fl. Ceyl. pl.* 84. 1895; Herb. Peradeniya, drawing.

*Distribution.* Grows in India and the drier parts of Ceylon where it is very common. Anuradhapura, Trincomalee, Jaffna, Bintenne, Galle, Kalutara, etc.

*India.* Malabar, Concan, etc., *Stocks, Law, etc.*; Tinnevely Hills, *Beddome* 94, 1867; Madras, *Beddome*. *Ceylon.* *Thwaites C.P.* 1046. North Central Prov., Habarana, *F. W. de Silva*, June 1928; Nakkala, *Senaratne*, Oct. 1955. Uva Prov., Bibile, *J. M. Silva*, July 1924; Bintenne, *J. M. Silva*, Oct. 1908. Southern Prov., Tissamaharama, *Herb. Peradeniya*, Dec. 1882.

*Uses.* Used as a diuretic and purgative.

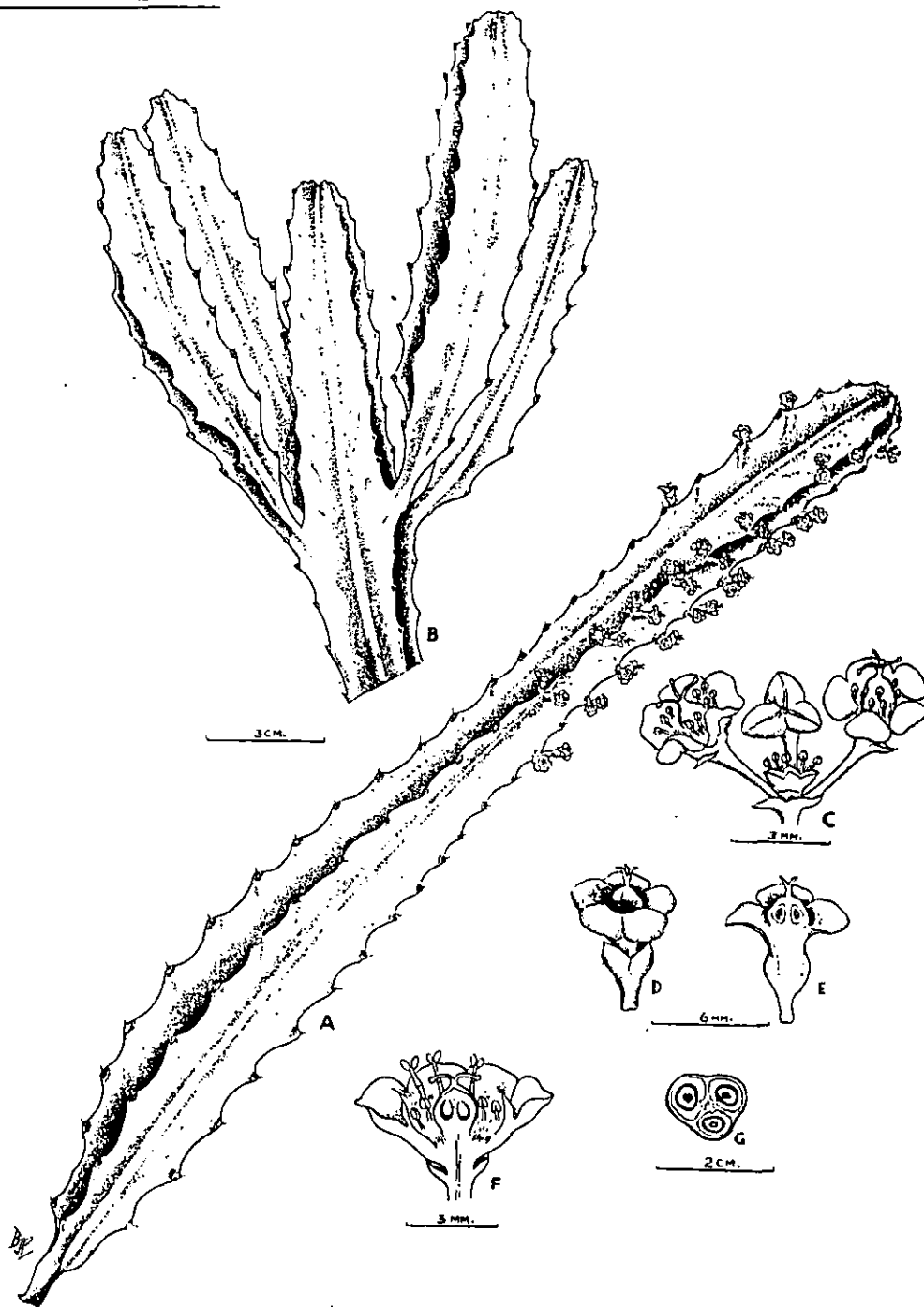


FIG. 197. *Euphorbia antiquorum*. A, branch with inflorescences. B, terminal position of a branch showing the branching. C, cyme of flower heads. D, female flower. E, longitudinal section of female flower. F, longitudinal section of a flower head showing a female flower surrounded by many males. G, transverse section of ovary.

7. *Euphorbia antiquorum* Linn. Sp. Pl. 450. 1753. (Fig. 197).*Euphorbia arborescens* Roxb.

*Sinh.* Daluk; *Tam.* Amudangam, Chatura-Kalli, Kalli, Kandiravam, Kaniravam, Kodiravam, Mavirukkam, Murittargalli, Sadurakkalli, Saduchi, Sunakkudam, Tiruvargalli, Vachiram, Vachirangam, Velangalli; *Sans.* Simhunda, Snuhi, Tridharaka, Vajrakantaka, Vajri.

A large shrub or small tree, 5—10 m tall; trunk stout often about 30 cm in circumference, cylindrical or fluted; bark thick, very rough and corrugated brown; branches numerous, curving upwards, young branches whorled, stout, fleshy, green, jointed with three very wide thick wings which are narrowed to either end in each joint and very coarsely repand-crenate; leaves very small on very young parts, falling off early, 6—12 mm long, sessile on summit of each crenation, cuneate, truncate, glabrous, fleshy; stipule-spines short, sharp, divaricate, persistent; flowers regular, unisexual, greenish-yellow, monoecious without a perianth, one female with many males arranged in a perianth-like involucre, flower heads in small, shortly stalked cymes of 3, the central one sessile, the two laterals on long stout peduncles; involucre glands 5, very large, much broader than long, fleshy; male flowers (stamens) numerous, mixed with many laciniate bractlets, stamen 1, pedicelled; female flowers consisting each of a single, superior, sessile, pink ovary surrounded by 1-stamened male flowers, 3-locular with one ovule in each chamber, styles 3 combined for half their length; fruit capsule 3-lobed, of 3 cocci separating from a central axis and each splitting ventrally and dorsally.

Flowers between September and February.

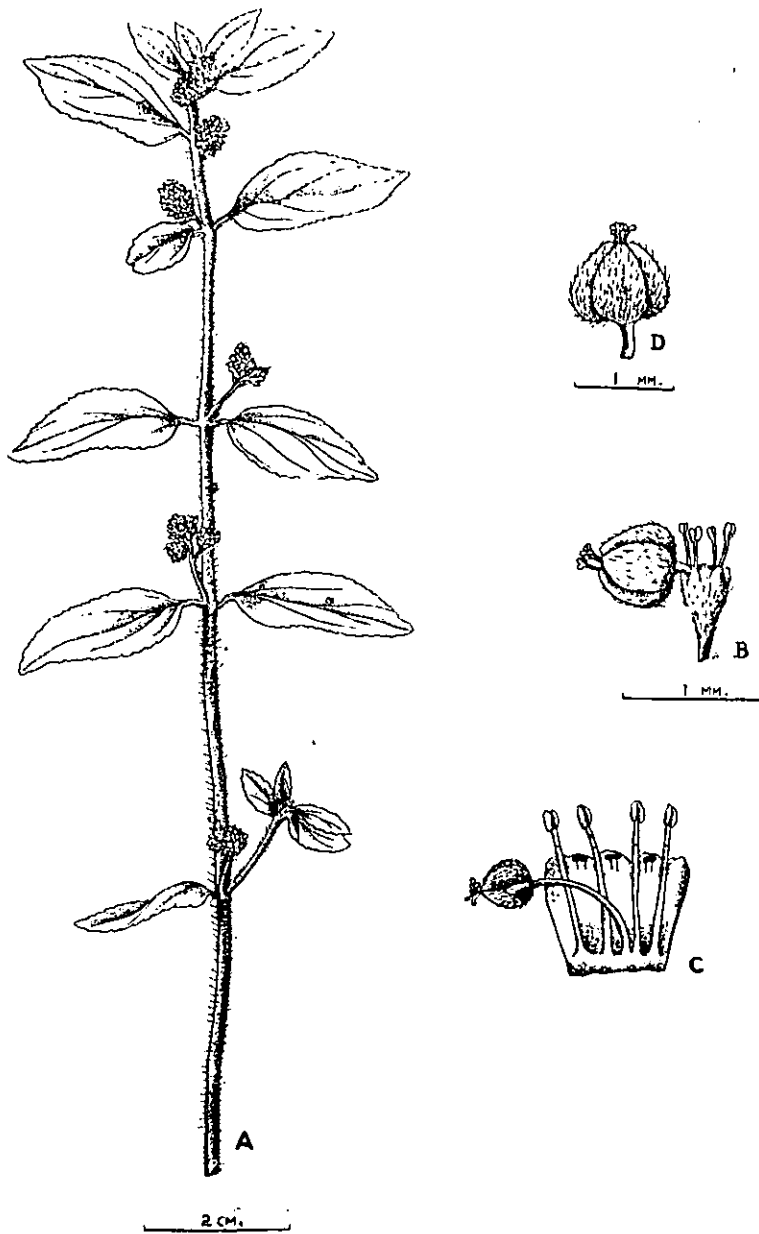
*Illustrations.* Wight,  *Ic. Pl. Ind. Orient. pl.* 897. 1843-45; Kirtikar and Basu,  *Indian Med. Plants, pl.* 851 1933; Herb. Peradeniya, drawing.

*Distribution.* Grows in the hotter parts of India and Ceylon. It is common in rocky and dry places, especially in dry regions.

*Ceylon.* Without locality, *Thwaites C.P.* 2944.

*Uses.* The bark of the root is a purgative and a decoction of the stem is given for gout. The juice from the branches is used as a purgative to relieve pain in the loins. It is an acrid irritant for rheumatism and relieves tooth-ache. It is employed in nervine diseases, dropsy, palsy, deafness and amaurosis. It is a popular application to warts and other cutaneous affections. Externally, mixed with margosa oil, it is applied to limbs which are affected by rheumatism.

In Bombay, the juice is used to kill maggots in wounds and as drops to cure earache. A preparation from this plant is given as a cure for cough. In Cambodia, the core of the plant is administered for dysentery.



B.H.

FIG. 198. *Euphorbia hirta*. A, plant with leaves and axillary cymes of involucre. B, involucre of male and female flowers. C, involucre opened out showing pedicelled male and female flowers. D, fruit.

8. *Euphorbia hirta* Linn. Sp. Pl. 454. 1753. (Fig. 198).*Euphorbia pilulifera* Linn.—*Euphorbia capitata* Wall.*Sinh.* Budadakiriya, Dadakiriya, Kepunkiriya, Kiritala; *Tam.* Amumpatchaiyarissi, Palavi, Patchaiyarissi; *Hindi* Dudhi; *Sans.* Pusitao.

An annual with a decumbent, ascending or erect, cylindrical, rather stout stems, 15—30 cm long, covered with more or less copious spreading bristly hair; leaves simple, opposite, 1.8—3.7 cm long, 0.6—1.6 cm broad, lanceolate—oblong, very unequal sided, acute or subacute, serrate, sparingly hairy on both surfaces, dark green above, pale glaucous or pinkish with prominent veins beneath; petioles short, stipules pectinate, falling early; flowers unisexual, greenish, monoecious, small, numerous without a perianth, many males and one female arranged in a common perianth-like, small involucre; involucre numerous, crowded in small, axillary, shortly pedunculate, globose cymes, glands minute or absent; male flower of only 1, pedicelled stamen; female flower of a single, pedicelled, superior ovary, surrounded by about four male flowers, 3-locular with a single ovule in each chamber, styles 3, free or slightly connate; capsule about 1.2 mm diameter, adpressed hairy, of 3 cocci separating from a single axis and each splitting ventrally and dorsally; seeds 0.8 mm long, ovoid—trigonus, transversely wrinkled and reddish brown in colour.

Flowers all the year round.

**Illustrations.** Burmann, *Thes. Zeyl. pls.* 104 and 105, f. 1., 1737; Kirtikar and Basu, *Indian Med. Plants*, pl. 846A. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs throughout the warmer parts of India, Ceylon and in most tropical countries including Philippine Islands. It is a common weed in Ceylon.

**India.** Plan. Ganget. Sup., *T. Thomson*; Canara, *Talbot*, July 1882; Maisor and Carnatic, *G. Thomson*. Ceylon. *Thwaites C.P.* 3337; *Senaratne* 3109. Central Prov., Peradeniya, *Herb. Peradeniya*, Nov. 1890; *Jayaweera* 2249, May 1957; Pallekellay Estate, *Livera*, July 1922. **Maldive Islands.** *Didi* 104, 1896; *Gardiner*, 1899—1900. **Laccadive Islands.** Minikoy, *H. M. I. M.* "Investigator", Dec. 1891.

**Composition.** The plant contains the alkaloid xanthorhamnine, gallic acid, quercetin, a phenolic substance, triacontane, euphosterol, phytosterol, a phytosterolin, jambulol, and melissic acid. Both vegetative and reproductive organs yield hydrocyanic acid.

**Uses.** The fluid extract of this plant is used to relieve the difficulty of breathing in asthma, bronchitis and in pulmonary, cardiac disease, angina pectoris. It is also a useful remedy for acute and chronic dysentery. The latex is applied externally on ringworm. In India, the plant is largely used in bowel complaints and chest affections in children. In the Philippines, the leaves are mixed with leaves and flowers of *Datura metel* for preparation of asthma-cigarettes. In Ghana, the plant is ground with water and used as an enema for constipation. In Brazil, it is used in decoction for gonorrhoea and for asthma. The roots are employed for intermittent fevers. The milky juice of the plant is dropped into the eye for conjunctivitis and ulcerated cornea. In Africa, it is employed as a remedy for gonorrhoea and the latex as an ophthalmic remedy.

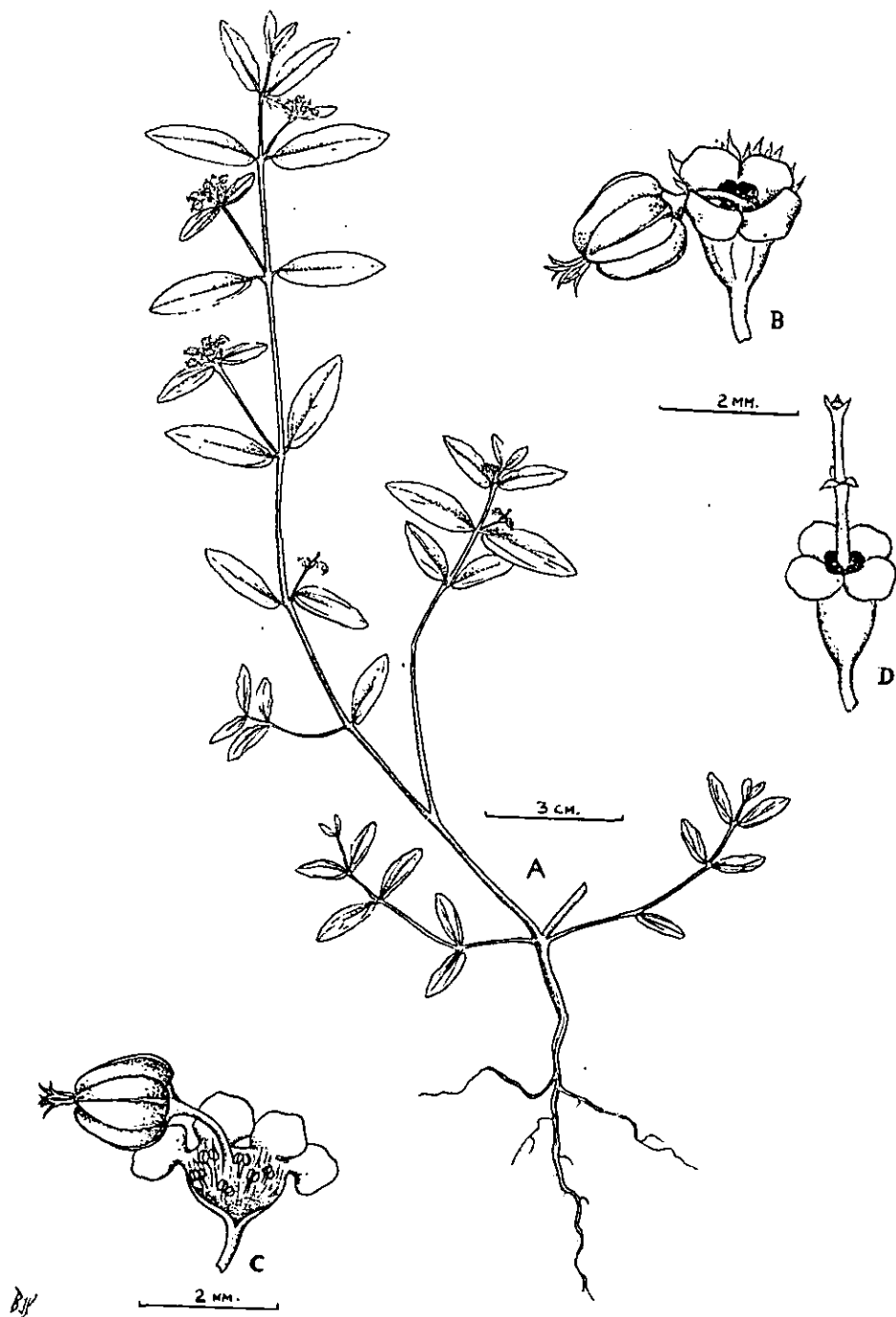


FIG. 199. *Euphorbia indica*. A, plant. B, involucre showing the glands and the female flower. C, involucre opened out showing the male flowers with female flower in the centre. D, young inflorescence.

9. *Euphorbia indica* Lamk. Dict. 2: 423. 1786. (Fig. 199).*Euphorbia hypericifolia* Linn.*Sinh.* Eladadakiriya; *Hindi* Dudhi, Dudhikalave, Hakshardana; *Sans.* Dughika.

An annual herb, 15—45 cm long, spreading or erect, usually with long ascending branches from the base; stem cylindrical, slightly pubescent; leaves simple, opposite, very shortly petiolate, 1.2—2.5 cm long, 0.5—1 cm broad, oval—oblong, rounded and usually unequal at the base, obtuse, faintly denticulate, serrate, slightly pubescent and whitish beneath with prominent veins; flower heads minute, stalked in small, very shortly peduncled, axillary cymes; flowers unisexual, monoecious without a perianth, white or pinkish, one female and many males arranged in a common perianth-like oblong, glabrous involucre, lobes small, lanceolate; glands with a large, rotundate, white petaloid limb; male flower consisting of a single pedicelled stamen and the female flower of a superior, pedicelled, perianth-less, 3-locular ovary, styles 3; capsule very small, lobes rounded, slightly hispid, seeds smooth.

Flowers from September to December.

*Illustrations.* Burmann, Thes. Zeyl. pl. 105. f. 2. 1739; Herb. Peradeniya, drawing.

**Distribution.** Occurs in the warmer parts of India and Ceylon and in the tropics generally except in the Pacific Islands and Australia. It is a common weed in waste and cultivated ground in Ceylon.

**India.** Plan. Ganget. Sup. T. Thomson. Pen. Ind. Orient. Herb. Wight 2569, Kew Distribution 1866—8. **Ceylon.** Thwaites C.P. 2125. Northern Prov., Talaimannar, J. M. Silva, July 1916. Central Prov., Peradeniya, Appuhamy, June 1954; Herb. Peradeniya, Sept. 1882; Jayaweera 1107, March 1954; Hakgala, A.D.A., June 1920. **Maldive Islands.** Veimandu, Addu Atoll and Heddufuri, Gardiner, 1899—1900; Minikoi, Gardiner 15, 1899—1900.

**Composition.** Contains a phenolic-like substance, a volatile oil and a small amount of alkaloid and glucoside. The latex contains a resin and euphorbon.

**Uses.** An infusion of the dried leaves is used as a remedy for diarrhoea, dysentery, menorrhagia, and leucorrhoea. It is given with milk to children for colic. In East Africa, the latex is used as a purgative and on skin diseases. It is also used medicinally in Angola, while in Mozambique, it is considered poisonous.

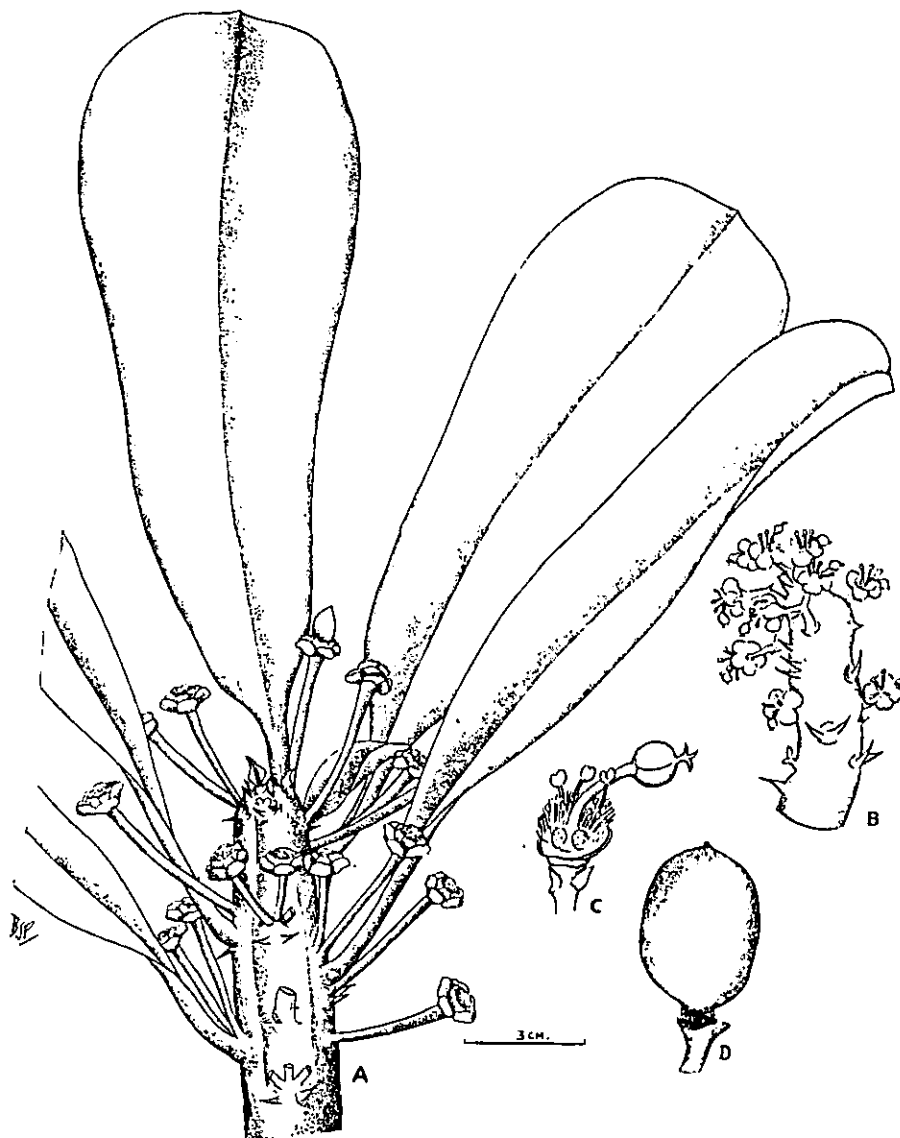


FIG. 200. *Euphorbia neriifolia*. A, terminal portion of a young branch with leaves and flowers. B, portion of a mature branch with inflorescences. C, involucre with the bracts and glands removed to show the female flower and male flowers. D, fruit.

10. *Euphorbia neriifolia* Linn. Sp. Pl. 451. 1753. (Fig. 200).

*Eulophia ligularia* Roxb.—*Euphorbia pentagona* Blanco—*Euphorbia trigona* Merr.

*Sinh.* Pathuk; *Tam.* Ilaikkalli, Kalli, Manjevi, Nedanji, Naynakki; *Hindi* Pat-tonkisend, Schund, Sij, Thohar; *Sans.* Patrasnuhi, Snuhi, Svarasna.

A large, glabrous, fleshy, erect shrub or small tree, 1.8—4.5 m tall, branches round, somewhat verticillate with pairs of sharp stipular spines arising from low, conical, truncate, distant, spirally arranged tubercles; leaves towards the ends of branches, fleshy, alternate, 10—20 cm long, 3—6.2 cm broad, obovate or obovate—oblong, rounded or emarginate at apex, smooth, glabrous, tapering towards the base, sessile or nearly so, deciduous, midrib conspicuous beneath, other nerves obscure; flowers unisexual, monoecious; combined in involucre forming cymes, usually 3 with very short, fleshy peduncles, solitary or twin cymes arising from above the leaf scars on the tubercles, central involucre of each cyme male, sessile, appearing first, the two lateral ones bisexual and pedicellate; lobes of involucre large, erect, fimbriate; glands transversely oblong without a petaloid limb, bracteoles numerous, fimbriate; stamens 40 in 5 bundles, anthers sagittate, apiculate; ovary superior, 3-locular, styles 3, connate to the middle, stigmas slightly dilated and minutely toothed, capsule 3-lobed, seeds smooth.

Flowers from March to May.

*Illustrations.* Rumph., Herb. Ambo. 4: *pl.* 40. 1741—45; Kirtikar and Basu, Indian Med. Plants, *pl.* 840A. 1933.

*Distribution.* Occurs in India and probably cultivated in Burma, Malaya and Ceylon. It is often planted for hedges.

*Composition.* Contains euphorbin, resin, gum caoutchouc, malate of calcium, etc.

*Uses.* The fluid extracted from the roasted leaves is used for earache. The milky juice is a purgative and is used in the preparation of strong purgatives. An extract prepared from the latex of this plant and syrup is found to cure asthma. The leaves are considered diuretic and the expressed juice of the leaves relieves paroxysms of spasmodic asthma. The plant has the same properties as *Euphorbia antiquorum* on rheumatism, removal of warts, etc. In Netherlands Indies, Indonesia, Malaya and Philippines, the plant is used as a fish-poison.

MEDICINAL PLANTS



FIG. 201. *Euphorbia thymifolia*. A, plant. B, involucre containing a female flower and male flowers. C, involucre opened out showing the female flower and male flowers.

11 *Euphorbia thymifolia* Linn. Sp. Pl. 454. 1753. (Fig. 201).

*Euphorbia burmanniana* J.Gray—*Euphorbia prostata* Grah.—*Euphorbia rubicunda* Bl.—*Euphorbia foliata* Hamilt.—*Euphorbia maculata* Auld.—*Anisophyllum thymifolium* Klotzsch and Gareke—*Anisophyllum burmannianum* Klozsch and Gareke

*Sinh.* Bindadakiriya; *Tam.* Chinamampatchaiyausi, Sittrapaladi, Chittirapalavi; *Hindi* Chhotidudhi, Chothadudhi; *Sans.* Laghudugdhika, Raktavindachada.

A small, annual herb with depressed-prostrate, cylindrical, divaricately branched, hairy stems; leaves simple, opposite, very small, 0.4—0.8 cm long, 2.5—4 mm broad, oblong—oval, rounded and very oblique at the base, rounded at apex, dentate—serrate, glabrous above, glaucous and slightly hairy beneath; petioles very short; stipules minute, fimbriate; flower heads very small, sessile, 1—3 in an axil; flowers unisexual, pinkish, monoecious, small without a perianth, one female and many males arranged in a common perianth-like, hairy, companulate involucre without or with very minute glands at the mouth, lobes very short; male flower consisting of a single pedicelled stamen and the female a single superior ovary, all together in the involucre, ovary 3-locular with a single ovule in each chamber, styles 3, short, 2-fid.; fruit capsule 1.5 mm long, pubescent, of 3 cocci separating from a central axis, each obtusely keeled; seeds 1.2 mm long, quadrangular with 5 or 6 transverse furrows.

Flowers all the year round.

**Illustrations.** Burmann, *Thes. Zeyl. pl.* 105, f. 2. 1737; Kirtikar and Basu, *Indian Med. Plants*, pl. 847. 1933.

**Distribution.** Occurs throughout India, Ceylon and in all other tropical countries, except N. Australia. It is a common weed in waste and cultivated ground in Ceylon. Kalutara, Haragama, etc.

**India.** Misor and Carnatic, *G. Thomson. Ceylon. Thwaites C.P.* 2128 Central Prov., Peradeniya *Herb. Peradeniya*, April 1895; *Bot. Gard., Jayaweera* 2251, May 1957; *Jayaweera* 2255, Nov. 1955; *Jayaweera* 606, April 1953. **Maldive Islands.** Veimandu, *Gardiner*, 1899—1900.

**Composition.** Contains a crystalline alkaloid principle, allied to quercetin.

**Uses.** The leaves are employed as a poultice to counteract the effects of bites of poisonous snakes. The expressed juice of the plant is given with wine for the same purpose. In La Reunion and Java, it is used as an astringent for diarrhoea and dysentery. A decoction of the root is given for amenorrhoea. The leaves and seeds are given in powderform for worms and bowel complaints in children. The latex is a cure for ringworm. Burkill says that poultices of leaves are applied over dislocated joints and skin complaints. In North India it is considered a stimulant and laxative.

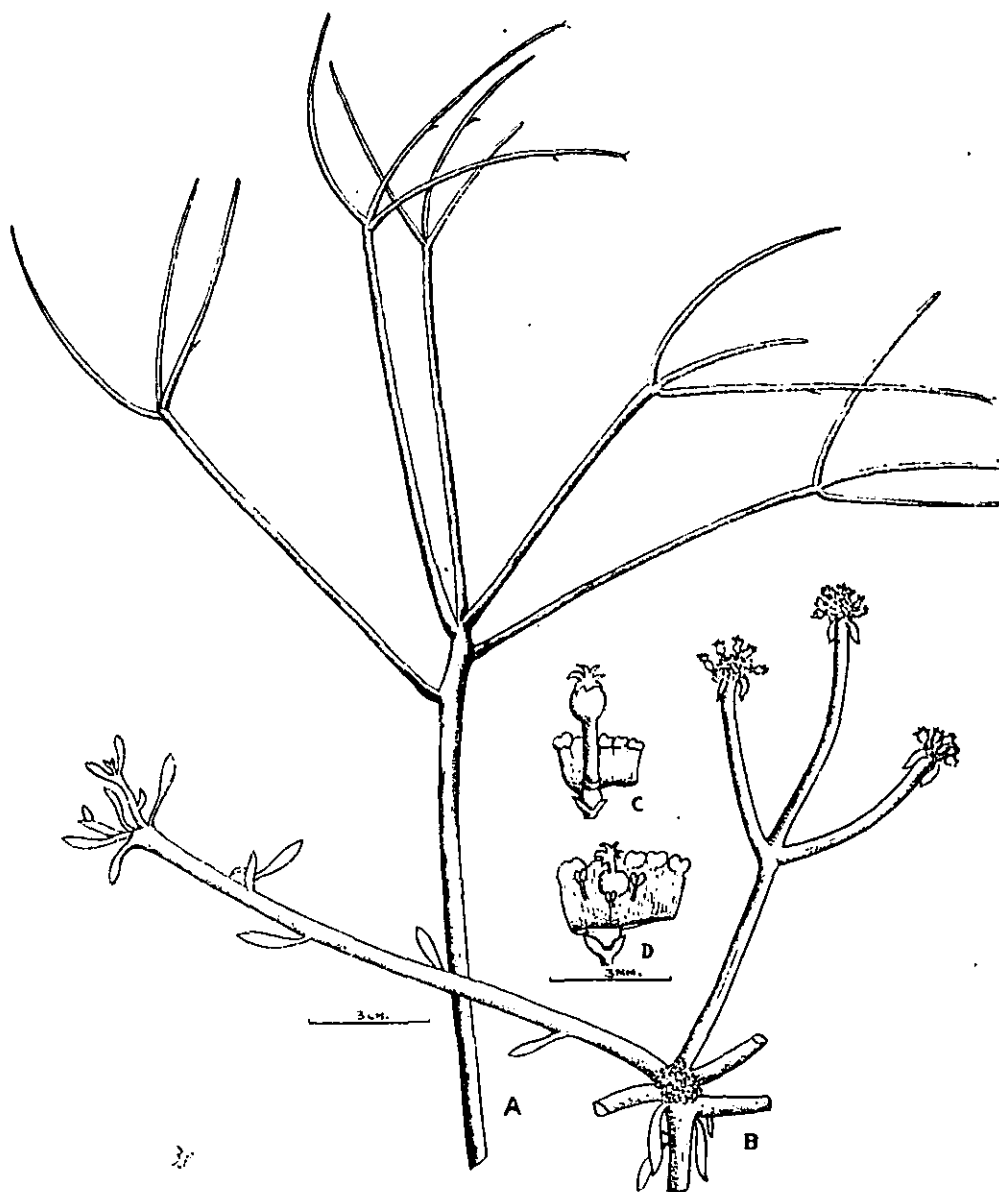


FIG. 202. *Euphorbia tirucalli*. A, branch showing whorled branchlets. B, branchlets bearing inflorescences. C, involucre opened out showing a female flower. D, involucre opened out showing both male and female flowers.

12. *Euphorbia tirucalli* Linn. Sp. Pl. 452. 1753. (Fig. 202).

*Euphorbia viminalis* Mill.—*Euphorbia rhipsaloides* Lmr.

*Engl.* Milk Bush, Milk Hedge, Indian Tree Spurge; *Sinh.* Navahandi, Tovar; *Tam.* Kallí, Kiri, Kombukkallí, Pachankallí, Parchanu, Tirukkallí, Tiruvatti; *Hindi* Konpahlsehand, Sehud, Sehund, Sendh, Shirthohar, Sindh, Thohra; *Sans.* Bahukshira, Dandaruha, Ganderi, Snuka, Trikuntaka, Vajradruma.

An erect, smooth, somewhat fleshy shrub or small tree, 2—5 m high, branches green, somewhat fleshy, cylindric, smooth, clustered or scattered carrying a milky latex inside; leaves usually absent in mature branches but the young ones bear leaves, 6—13 mm long, linear—oblong; flowering involucre clustered in the forks of branchlets, shortly pedicelled, mostly female, bracteoles numerous, lacerate, campanulate; flowers unisexual monoecious, combined in an inflorescence of many male florets surrounding a female arranged in a common, 4—5-lobed, perianth-like involucre with 3—5, thick glands, transversely oval peltate, lobes short and hairy; male flowers are each a stalked stamen without a floral envelope; female flowers also naked each with a 3-locular, superior ovary on an ultimately exerted stalk in the centre of the involucre; styles 3, short, recurved, 2-fid; capsule 5 mm long, cocci compressed, velvety. seeds ovoid and smooth.

*Illustrations.* Kirtikar and Basu, *Indian Med. Plants*, pl. 849B. 1933; Watt and Bryer-Brandwijk, *Medicinal and Poisonous Plants of E. & S. Africa*, pls. 125 and 126. 1962.

*Distribution.* A native of Southern Rhodesia and now naturalized in India, Ceylon and planted in most tropical countries.

*Ceylon.* Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Oct. 1901.

*Composition.* The crude latex contains resin, caoutchouc, euphorbone and other compounds analogous to euphorbone.

*Uses.* The stems are used along with other ingredients to serve as poultices for healing fractures of bones. The milky juice is a warm rubefacient remedy for rheumatism, tooth-ache, etc. It is applied to itches and scorpion stings. A decoction of the root and tender branches is given for colic and gastralgia. The fresh juice is applied to remove warts.

In the Philippines, the plant is used as a fish poison. In Tanganyika, the juice is used as a remedy for sexual impotence, mosquito repellent and fish poison and the root as an emetic in the treatment of snake-bite. In Malabar and Moluccas the latex is used as an emetic and antisyphilitic. Rice boiled with the latex is used to narcotize and poison crows.

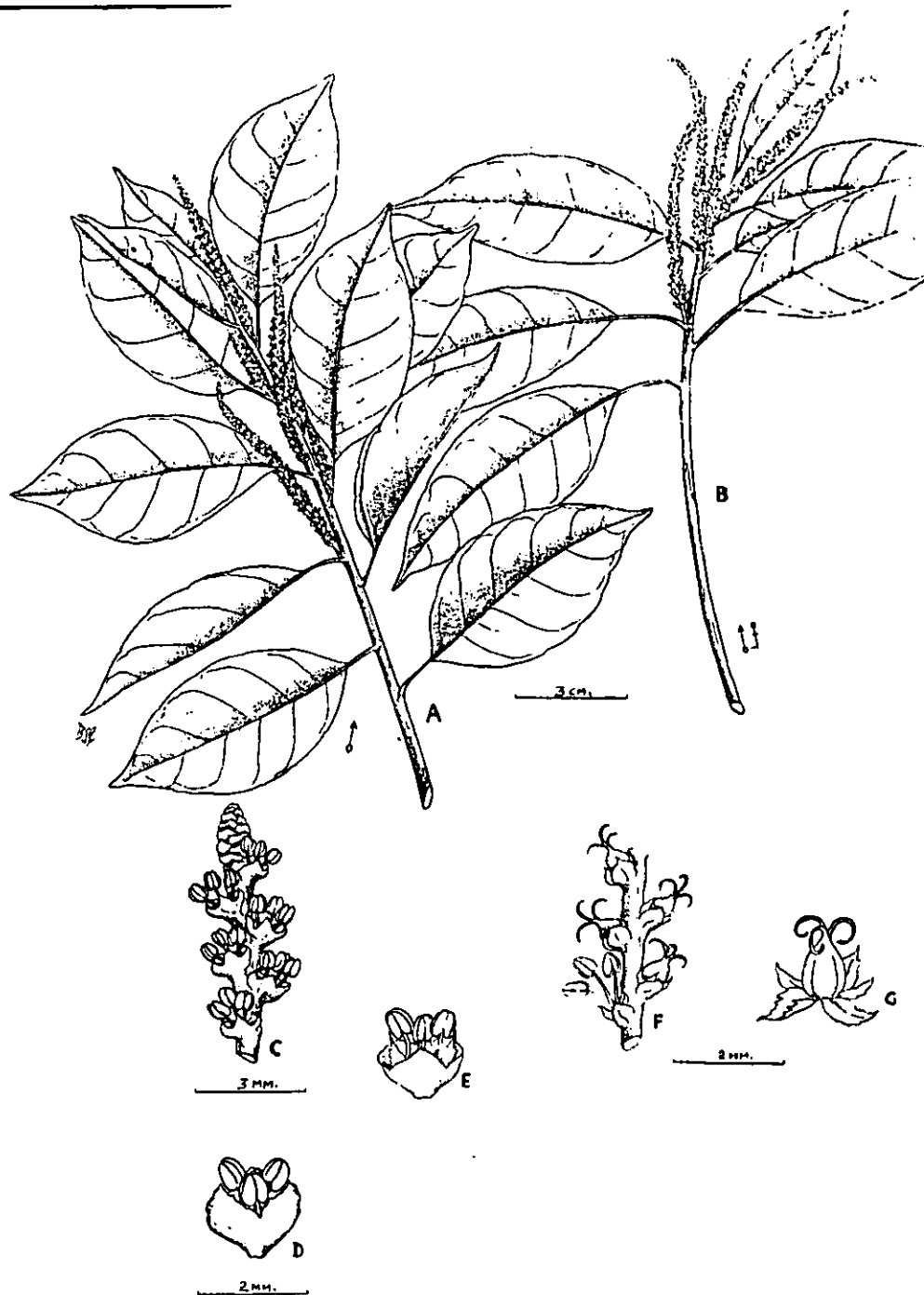


FIG. 203. *Excoecaria agallocha*. A, part of a plant with leaves and male spikes. B, branch with male and female flowers on the same spike or raceme. C, part of the spike with male flowers. D, & E male flowers. F, part of the inflorescence with female flowers and a male flower. G, female flower.

13. *Excoecaria agallocha* Linn Syst Nat ed. 10, 1288. 1759. (Fig. 203).

*Excoecaria camettia* Willd. *Excoecaria affinis* Endl.—*Stillingia agallocha* Baill.

*Engl.* Blinding Tree; *Sinh.* Telakiriya; *Tam.* Agadil, Agi, Ambalatti, Ambalavirukkam, Tillai, Perundillai; *Sans.* Agaru.

A small, glabrous tree with acrid milky juice and smooth, rather thick branchlets marked with leaf scars; leaves simple, alternate, 5.4—7.8 cm long, 3—4.7 cm broad, oval, acute or rounded at base, shortly obtusely acuminate, obtuse, entire or obscurely crenate, rather thick, veins except the midrib very inconspicuous; petioles 1.8—2.5 cm long, slender; flowers regular, unisexual, apetalous, in yellow, fragrant, catkin-like spikes, males or males and females together; male flowers sessile, spikes numerous, supraxillary, crowded, bracts rounded; sepals 3, minute, unequal, subserrulate; stamens 3, filaments distinct, elongate; female flowers somewhat pedicellate in racemes mixed with male flowers; sepals 3, minute, ovary superior, 3-locular with a single ovule in each chamber, styles 3, free nearly to the base, undivided and recurved; fruit capsule very variable in size, 0.6—1.2 cm long, consisting of 3, crustaceous cocci falling away from a central column; seeds smooth, subglobose.

Flowers from February to September

*Illustrations.* Wight, Ic. Pl. Ind. Orient *pl* 1865B. 1852; Kirtikar and Basu, Indian Med. Plants, *pl.* 883. 1933.

*Distribution.* Occurs in India, Ceylon, Burma, Malaya to Polynesia and Philippine Islands, New Caledonia and North Australia. In Ceylon, it is common along the coast by tidal estuaries and backwaters.

*Ceylon.* Northern Prov., *Thwaites C.P.* 2169; Jaffna, *Herb. Peradeniya.*, Feb. 1890., North Western Prov., Puttalam, *J. M. Silva* 41 and 42, March 1926; *J. M. Silva* 43. Western Prov., Negombo, *Simpson* 7935, April 1931.

*Uses.* The milky latex which exudes from the bark of this tree is very caustic and poisonous, causing blindness if it touches the eyes and blisters the skin. In Fiji, the smoke of the burning wood is used in the treatment of leprosy. According to Burkill the roots are less poisonous than the parts above the ground and pounded with ginger serves to make an embrocation for swellings on hands and feet. The latex is used as fish poison. Dried and powdered leaves are used for poisoning drinking water. Ridley says that this plant is used in the composition of arrow poison. A decoction of the leaves is used occasionally in epilepsy and as an application on ulcers.

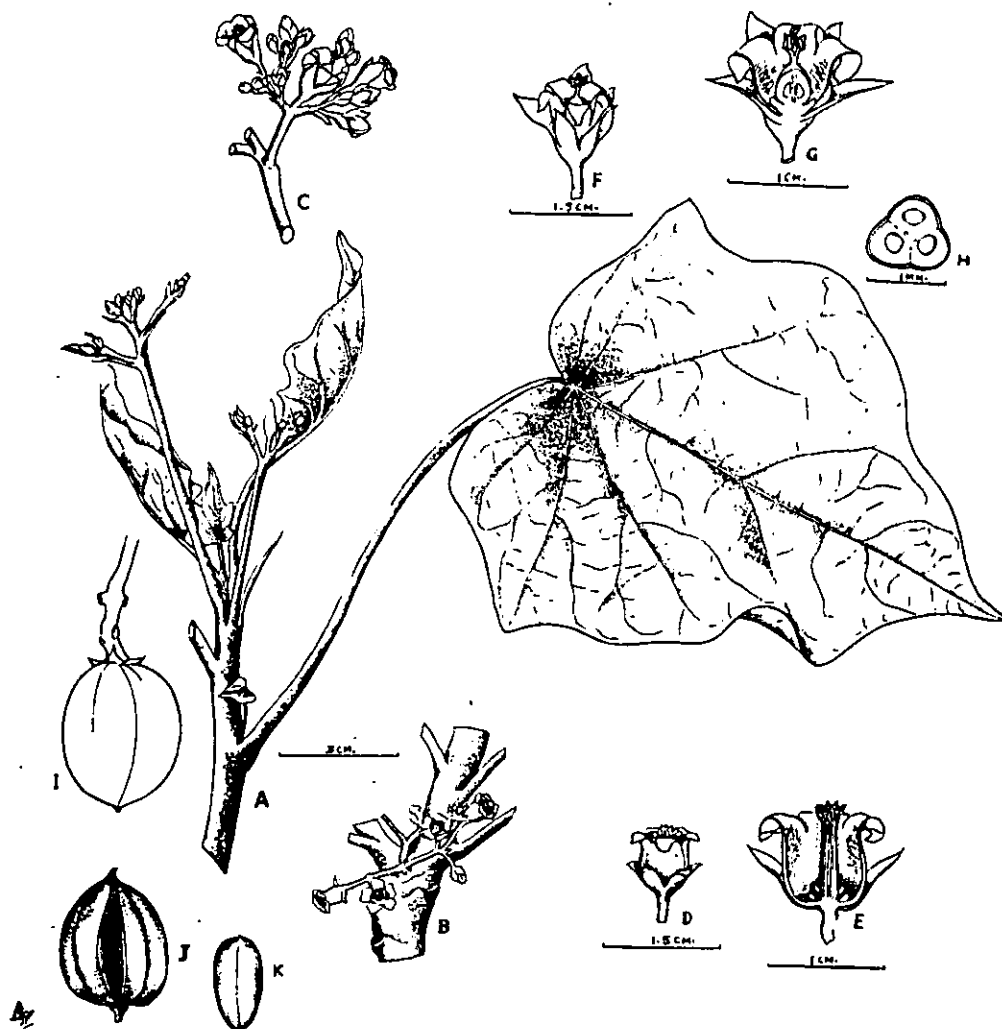


FIG. 204. *Jatropha curcas*. A, terminal portion of a branch with leaf. B, part of a branch showing an inflorescence. C, part of an inflorescence showing male and female flowers. D, male flower lateral view. E, longitudinal section of male flower. F, female flower lateral view. G, longitudinal section of female flower. H, transverse section of ovary. I, fruit. J, dehiscent fruit. K, seed.

14. *Jatropha curcas* Linn. Sp. Pl. 1006. 1753. (Fig. 204).

*Engl.* Physic Nut, Purging Nut, Poison Nut. *Sinh.* Rataerandu, Pela-ini, Weta-erandu; *Tam.* Adalai, Kadalamanakku, Kaitta, Kattamanakku, Kattukottai, Kuribaravuni, Naligadi, Nikkurottam, Tiravadi, Vellaiyamanakku; *Hindi* Bagberenda, Bagbherenda, Bherenda, Jangliarandi, Paharierand, Safedarand, Safedind; *Sans.* Akhuparnika, Chitra, Dravanti, Kananeranda, Mushikaparni, Nyagrodhi, Parvateranda, Pratyakshreni, Randa, Shanbari, Sutashreni, Vrisha.

A large shrub or small tree containing a sticky opalescent juice; leaves simple, alternate, 10—15 cm long, 7.5—12.5 cm broad, broadly ovate, cordate, acute, usually palmately 3- or 5-fid, glabrous; petioles 7.5—23 cm long, stipules absent; flowers unisexual, monoecious, yellowish—green in loose axillary cymose panicles, peduncles and pedicels more or less tomentose, bracts linear; male flowers: about 7.5 mm across; calyx 3.8 mm long, deeply 5-cleft, lobes elliptic, obtuse, imbricate; corolla longer than calyx, campanulate, villous within, lobes 5, disc of 5 large glands; stamens 10, biseriate, filaments of the inner series connate half way up in a central column, anthers oblong, apiculate, erect, pistillode absent; female flowers: calyx 5 mm long, lobes ovate, acute, corolla scarcely exceeding the calyx, disc as in the male; ovary superior, 3-locular with a single pendulous ovule in each chamber, styles connate at the base, stigmas large, lanceolate; fruit 2.5 cm long, ovoid, black breaking up into three, 2-valved cocci; seeds ovoid-oblong, dull brownish black, about 1.8 cm long.

Flowers during May and August.

*Illustrations.* Kirtikar and Basu, *Indian Med. Plants*, pl. 867B, 1933; *Herb. Peradeniya*, drawing.

*Distribution.* A native of Mexico and now grown in India, Ceylon, Philippine Islands and other tropical countries. In Ceylon, it is a very common plant grown along boundaries.

*Ceylon.* Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Aug. 1908.

*Composition.* The bark contains a trace of a volatile oil, saponin, tannin and a wax. The leaves and stems contain an alkaloid. The seeds contain a yellow fixed oil which consist of the glycerides of a characteristic acid, curcaneoleic acid, and other acids. The toxalbumen, curcurin remains with the seed cake. The root yields a yellow oil, which is strongly anthelmintic.

*Uses.* The oil extracted from the seeds is a drastic purgative and used externally for cutaneous diseases and rheumatism. It is also used as a remedy for dropsy, sciatica, paralysis and worms. In the Philippines, a decoction of the leaves and roots is used as a cure for diarrhoea. The bark is employed as a poultice for sprains and dislocations and to cure toothache. In Cambodia, the leaves are applied to wounds, the latex to sores and ulcers and the fresh juice for arresting bleeding or haemorrhage from wounds, cuts and abrasions. It is a local remedy for scabies, eczema and ringworm. In Goa the root bark is applied externally for rheumatism. The fresh stems are used as toothbrushes to strengthen the gums and cure gum boils.

In Ghana, the leaves are commonly used in enema preparations. They are also widely used to treat guinea-worm sores. In India and Malaya, the leaves are used as a cataplasm to the mammae which acts as a lactagogue, the latex as a styptic.

Commercially, the oil from the seed is employed in the manufacture of soaps and candles and as an illuminant.

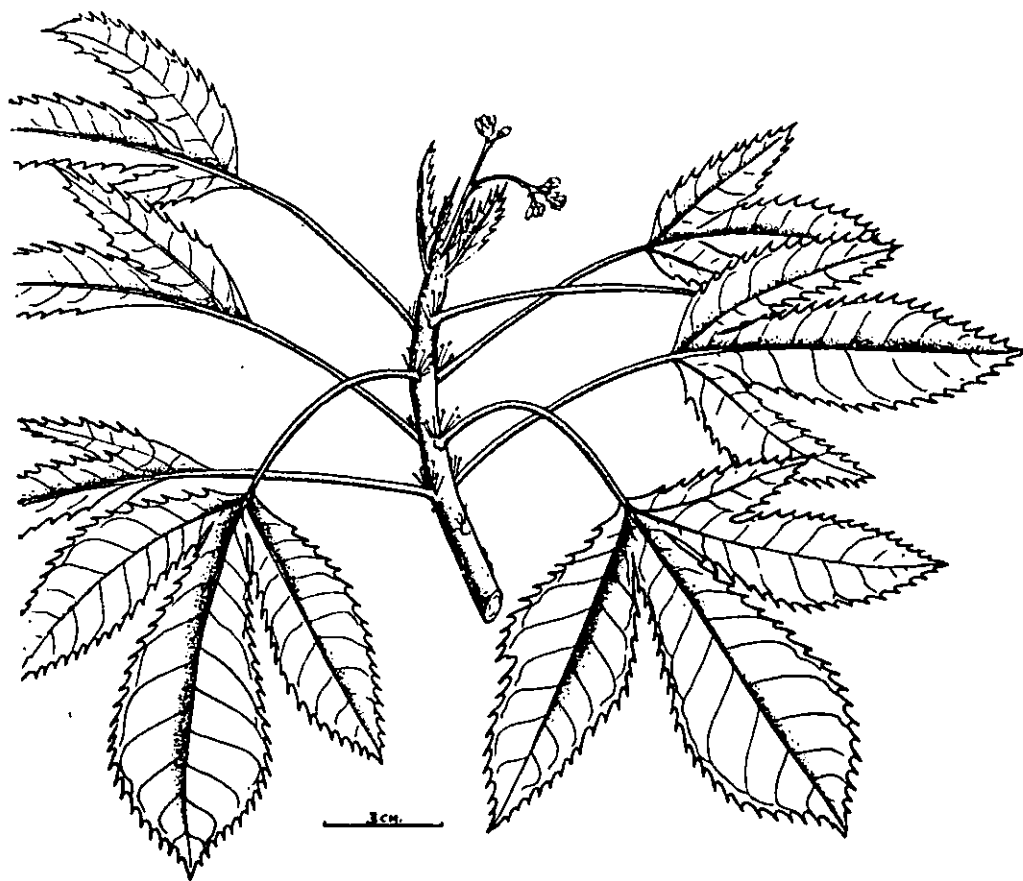


FIG 205. *Jatropha glandulifera*. Branch drawn from herbarium specimen. Thwaites C.P. 2168.

15. *Jatropha glandulifera* Roxb., Fl. Ind. 3: 688. 1832 (Fig. 205).*Jatropha glauca* Vahl.

*Sinh.* Detta-ala; *Tam.* Adalai, Atalai, Eliyamenakku, Erikkarakattamanaku, Kattamanaku, Puliyamanaku; *Hindi* Janglerandi, Undarbibbi; *Sans.* Nikumbha.

A semi-shrubby, rather succulent undershrub containing a clear pale-yellow juice and with a stout, glabrous and shining, dichotomously branched stem, marked with large, prominent leaf scars; leaves simple, alternate with stipules, 7.5—10 cm long, deeply palmately cut into 3 or 5 lobes which are obovate-oval, acuminate, acute, sharply serrate with gland-tipped serrations; base cordate with a broad but shallow sinus, petioles 5—7.5 cm long without glands, stipules lacinate divided into long segments each tipped with a gland; flowers unisexual, monoecious, yellowish in stalked cymes, bracts long, lanceolate, acute with gland-tipped hairs on the margins; male flowers: calyx divided almost to the base, segments ovate, obtuse, not glandular—ciliate; corolla longer than sepals, 5-lobed, obtuse, contorted in the bud; stamens 8, filaments connate, disc of 5 glands at the base of the staminal column, pistillode absent; female flowers: calyx divided to the base or nearly so, segments 5, ovate acute, disc annular, lobed; ovary superior, glabrous, 3-locular with one ovule in each loculus, styles 3, bifid and recurved; fruit ovoid—globose, faintly lobed, glabrous, about 1.3 cm long; seeds about 8 mm long, smooth, black and shining.

Flowers about January.

**Illustrations.** Kirtikar and Basu, Indian Med. Plants, pl. 866A. 1933.

**Distribution.** Grows in South India, Ceylon and South Africa. In Ceylon it is common in the low-country chiefly along the coast, especially in the dry regions. It is abundant in Jaffna, Mannar and Hambantota, where it is a gregarious weed covering large areas of ground.

**India.** Tinnavelly, Koilpati, *U.T.*, May 1883. **Ceylon.** *Thwaites C.P.* 2168. Northern Prov., Mannar Dist., Mantai, *Herb. Peradeniya*, Feb. 1890.

**Uses.** The root is useful in the treatment of piles and for abdominal enlargements in children. It causes purging and is said to reduce glandular swellings. The juice of the plant is used to remove films from retina of the eye. The fixed oil from the seeds has purgative properties. It is applied to sinuses, ulcers, wounds, ringworm and also for rheumatism and paralysis. In Ceylon, the roots are used along with other ingredients for preparing pills given for cough, asthma, anaemia, typhoid fever, bronchitis, indigestion and worms. An oil prepared with it is an effective application on piles. The underground stem is used for fever and bronchitis. Seeds are also used with other ingredients to prepare pills for treating fever.

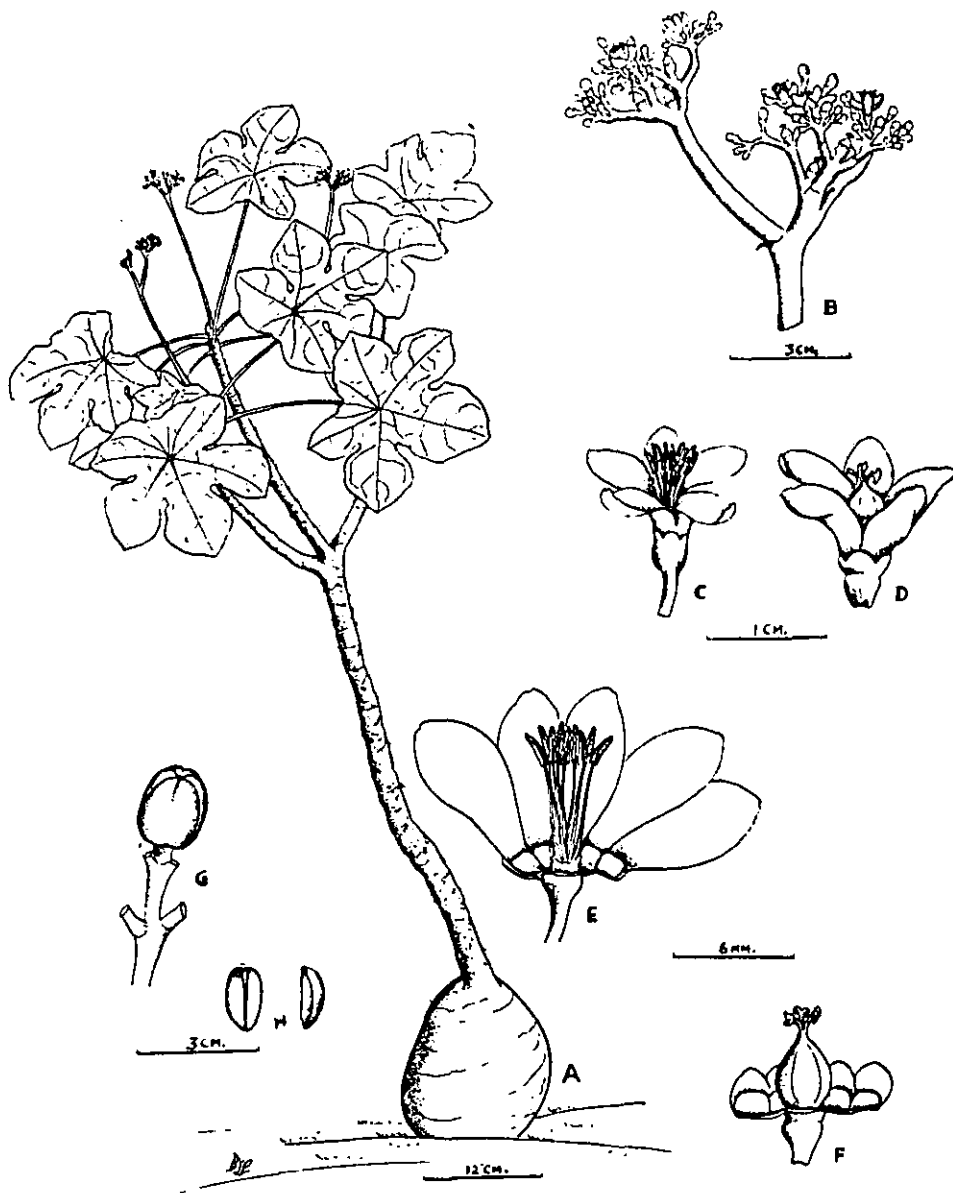


FIG. 206. *Jatropha podagrica*. A, plant showing the swollen base of the stem, crowns of leaves and inflorescences. B, part of the inflorescence. C, male flower lateral view. D, female flower lateral view. E, male flower opened out showing the glands. F, female flower opened out with petals removed. G, fruit. H, seeds dorsal and lateral views.

16. *Jatropha podagrica* Hook., Bot. Mag. pl. 4376. 1848. (Fig. 206).

*Sinh.* Wishu-kumbha.

Crooked-stemmed, single or scantily branched perennial shrub, 0.7—1.5 m tall with a crown of leaves and inflorescences at the top; stem swollen at the base, rough with prominent leaf scars and persistent stipular strands; leaves simple, alternate, peltate, 11—23 cm long, 12—26 cm broad, palmate and deeply pinnatifid into 3 or 5 lobes, glabrous on both sides, dark green above and ash green below, lobes broadly ovate, obtuse, entire, undulate; petioles stout, reddish green, 14—27 cm long; stipules lacerate, persistent; flowers numerous, regular, 1.2—1.5 cm diameter, unisexual, monoecious, orange red in stout peduncled, large, axillary cymes; female flowers few in axils of main bracts of the peduncle; calyx cup-shaped, 5-lobed, lobes erect, rounded; petals 5, free, overlapping regularly, segment obovate or oblong; male flowers: stamens 8, filaments continued at base having 5 yellow glands united into a ring; female flowers: ovary superior, 3.5 mm long, ovate with similar glands, 3-locular with a single ovule in each loculus, style short, trifid with three, bilobed, green stigmas; fruit capsule 1.7 cm long, oblong.

Flowers throughout the year.

**Illustrations.** Curtis, Bot. Mag. pl. 4376. 1848.

**Distribution.** A native of Panama and now cultivated in many village gardens owing to its medicinal value.

**Uses.** A valuable snake-bite cure.

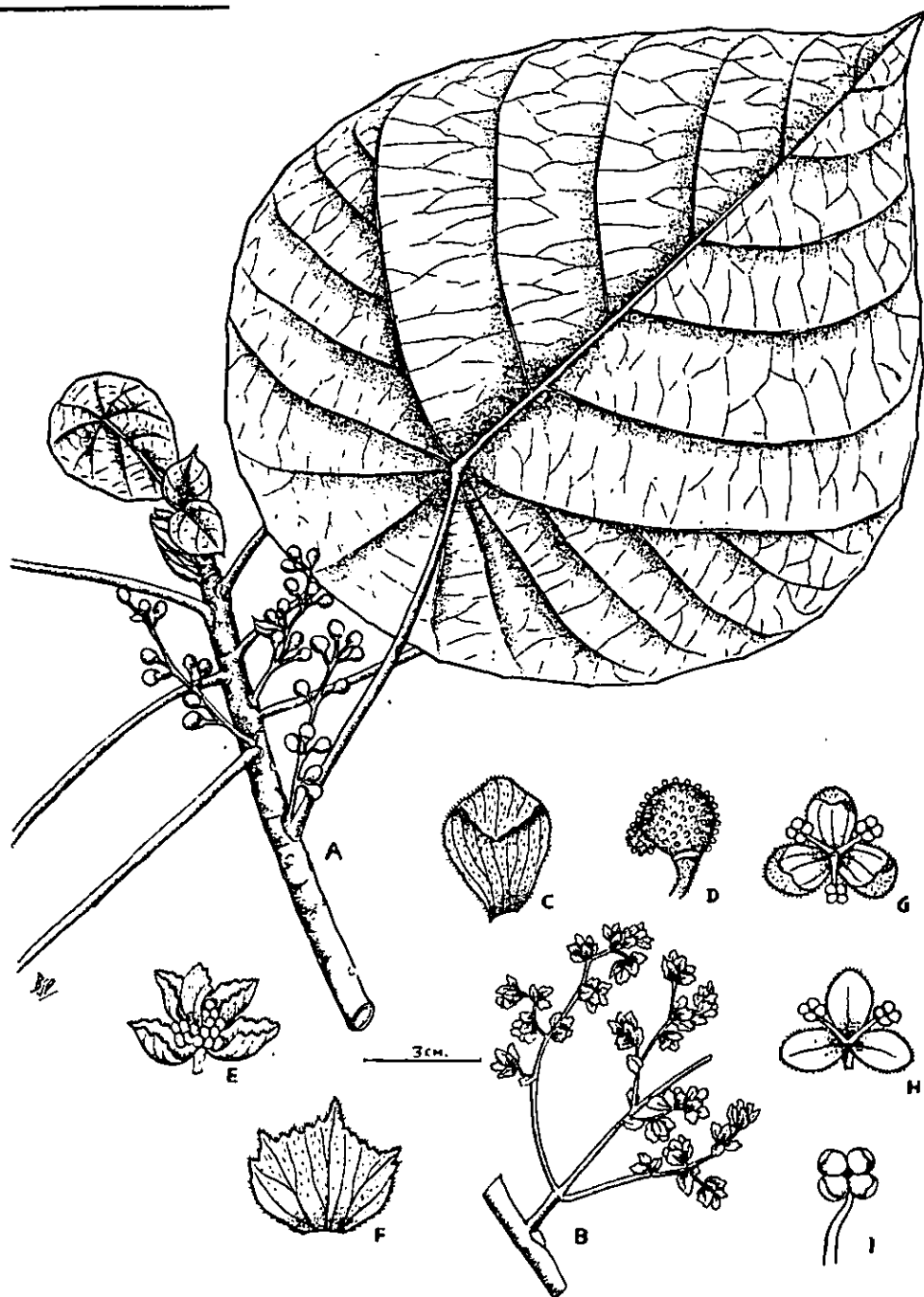


FIG. 207. *Macaranga peltata*. A, branch with a leaf and female flowers in panicles. B, portion of a branch with male flowers in panicles. C, bract from the female panicle. D, female flower with lateral stigma and covered with glands. E, male flowers and bracts. F, 3-lobed bract. G, flower with 3 stamens, calyx 3-lobed. H, flower with two stamens. I, stamen showing 4-celled anther. C, I, enlarged.

17. *Macaranga peltata* (Roxb.) Muell.—Arg. in DC. Prodr. 15: 1010. 1862. (Fig. 207).

*Macaranga tomentosa* Wight—*Macaranga roxburghii* Wight—*Macaranga wightiana* Baill.—*Mappa peltata* Wight—*Ricinus mappa* Moon

Sinh. Bukenda, Kenda; Tam. Vatta, Vattikanni, Vattittutti.

A small tree with stout, green branchlets covered with a glaucous bloom and marked with large leaf and stipule scars when young; leaves simple, alternate, very large, 22.5—30 cm long, broadly ovate, peltate with a round base, acuminate acute or caudate, entire, glabrous, dark-green above, paler beneath, venation prominent beneath, translucent; petioles very long, usually longer than the leaf, cylindrical, glabrous; stipules large, ovate, acuminate, reflexed, falling early; flowers regular, unisexual, greenish, dioecious, apetalous in axillary panicles, bracts broader than long and toothed; male flowers: very small in numerous, finely pubescent panicles; sepals 3 or 4, valvate in bud; stamens 2—5, filaments distinct, anthers 4-locellate, pistillode absent; female flowers: calyx 2—4 lobed; ovary superior, unilocular with a single ovule, exerted; densely glandular, style large, short, lateral and peltate; fruit capsule small, 6—8 mm diameter, globose, glabrous but warted with glands.

Flowers in October.

Illustrations. Wight, Ic. Pl. Ind. Orient. pl. 817. 1843—45; pl. 1949, figs. 1 & 4. 1853; Beddome, Flor. Sylvat. pl. 287. 1868—73; Kirtikar and Basu, Indian Med. Plants, pl. 877. 1933; Herb. Peradeniya., drawing.

Distribution. Grows from Concan to Travancore in India and abundant in moist regions of Ceylon upto 3000 feet altitude.

India. Malabar, Concan, etc. *Stocks, Law, etc.*, Pen. Ind. Orient., *Herb. Wight* 2632, Kew Distribution 1866—68. Ceylon. *Thwaites C.P.* 2171 Central Prov., Peradeniya, Bot. Gard., *Javaweera* 1476, Jan. 1956.

Uses. The hardened, gummy exudation from this tree is powdered, made into a paste and applied externally on venereal sores.

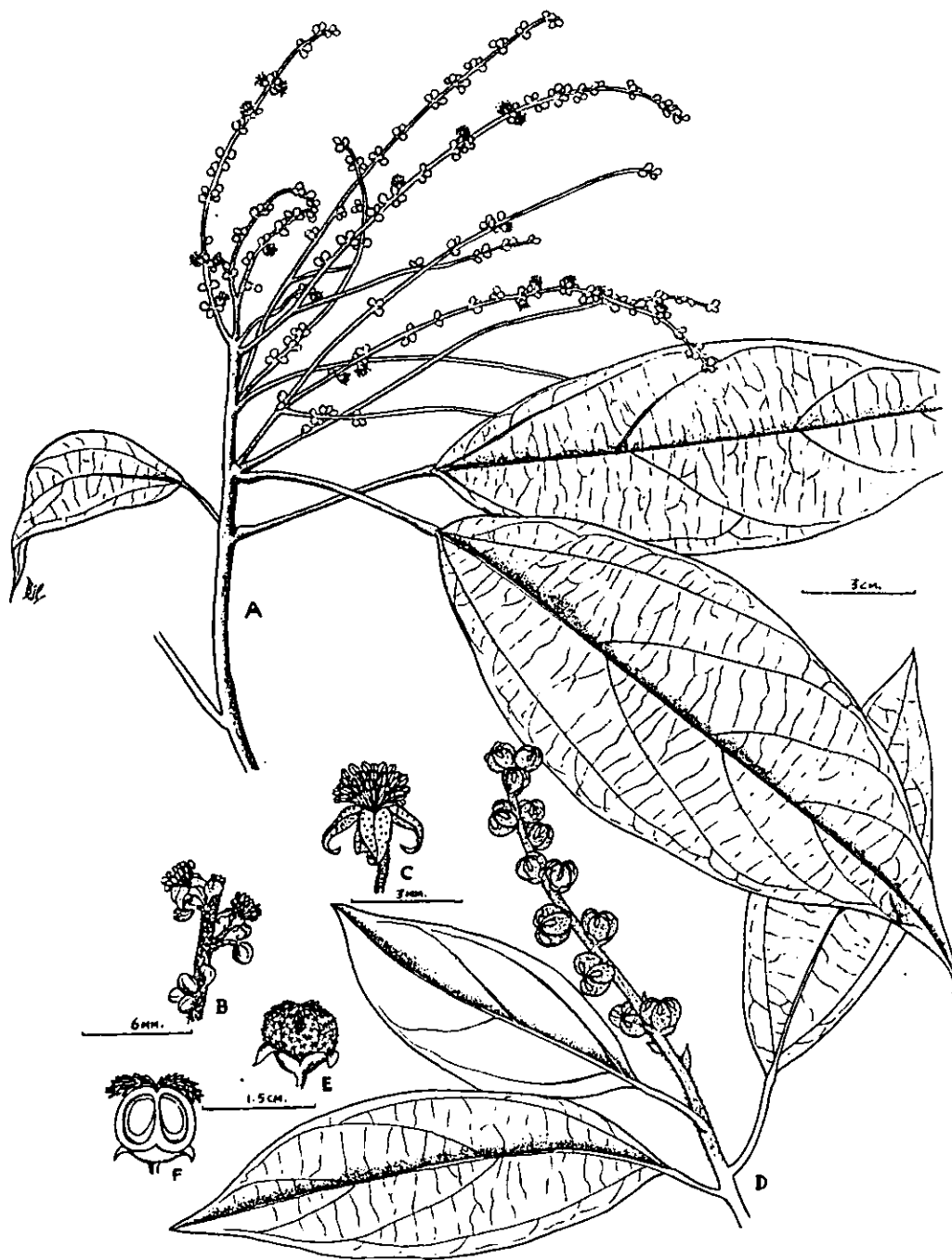


FIG. 208. *Mallotus philippensis*. A, branch with leaves and male spikes. B, portion of a male spike showing groups of flowers. C, male flower. D, branch with female flowers. E, female flower. F, longitudinal section of a female flower.

18. *Mallotus philippinensis* (Lam.) Muell.—Arg. in *Linnaea* 34: 196. 1865. (Fig. 208).

*Rottlera tinctoria* Roxb.—*Rottlera aurantiaca* Hook. & Arn.—*Rottlera affinis* Hassk.—*Rottlera montana* Wall.—*Rottlera mollis* Wall.—*Rottlera philippinensis* Scheff.—*Rottlera manilensis* Klotz.—*Croton philippense* Lamk.—*Croton punctatus* Retz.—*Croton coccineus* Vahl—*Croton montanus* Willd.—*Croton distans* Wall.—*Croton cascavilloides* Rauesch.—*Echinus philippinensis* Baill.

*Engl.* Monkey Face Tree; *Sinh.* Hamparandella, Hamparila, Hampirila; *Tam.* Avam, Kabilam, Kabilappodi, Kamala, Kamboam, Kapila, Kopilapodi, Kungumam, Kurangumanjanatti, Manjanai, Suvanagesari, Tavattai, Tiruchalai; *Hindi* Kamala, Kambhal, Kambila, Kamela, Kamila, Kamud, Raini, Rauni, Rohni, Roini, Roli, Rora, Ruin, Rulu; *Sans.* Bahupushpa, Chandra, Kampilla, Kampillaka, Kapila, Karkasha, Kesara, Laghupatraka, Lohitanga, Madhuka, Nadvasa, Pikaksha, Punnaga, Punnagakesara, Punnama, Raktachurnaka, Raktanga, Raktaphala, Ranjaka, Rechanaka, Rechani, Rechi, Rochana.

A moderate-sized tree, 6—10 m tall, much branched with a smooth bark and scurfy and fulvous pubescent young parts; leaves simple, alternate, 8—17 cm long, 4—8 cm broad, variable, ovate—lanceolate, rhomboid-ovate or linear—lanceolate, acuminate, rounded or acute at base, entire, glabrous on the upper surface when mature, finely tomentose, pale or white beneath, thickly sprinkled with minute crimson glands, strongly 3-nerved with veins prominent on the lower surface; petioles 2.5—4 cm long, cylindrical, fulvous—pubescent with 2, small, sessile glands at the summit or at base of leaf; flowers regular, small, unisexual, apetalous, dioecious, males in clusters, sessile in erect, terminal spikes which are usually several together and often longer than leaves and female flowers stalked in short racemes, both covered with ferruginous tomentum; male flowers: globose; sepals 3—5, usually 4, somewhat thick, lanceolate, valvate, densely rusty—pubescent; stamens 18—25, distinct, much exerted, anthers dorsifixed, cells small, often widely separated without a pistillode; female flowers: sepals 3—5, ovate, valvate; ovary superior, glandular, covered with red, stellate, glandular hairs, 2—3-locular with a single ovule in each loculus, styles 3, simple, papillose; fruit a trigonous—globular capsule, 0.8 cm long, lobes rounded, smooth but covered with a scurf of minute easily detached deep red particles, dehiscing septically into 3 valves; seeds nearly globose, black without a caruncle.

Flowers during August and September.

*Illustrations.* Beddome, *Flor. Sylvat. pl.* 289. 1868—73; Bentley and Trimen, *Med. Plants, pl.* 236. 1880; Roxburgh, *Pl. Corom. pl.* 168. 1798; Rheede, *Hort. Mal.* 5: *pls.* 21—24. 1678—1703; Herb. Peradeniya, drawing.

*Distribution.* Grows from Abyssinia to S. China and Formosa through India, Ceylon, Burma and Malay Islands extending southwards to New South Wales and Philippine Islands, In Ceylon, it is rather common in both the moist and dry low-country up to 2,500 feet altitude.

*India.* Sikkim: *J. D. Hooker. Himal. Bor. Occ. T. Thomson. Behar, J. D. Hooker. East Bengal, Herb. Griffith* 4766, Kew Distribution 1863—4. Assam *Jenkins. Manipur, 'Metaiphum, Watt* 6076, Feb. 1882. Malabar, Concan, etc. *Stocks, Law, etc. North Canara: Talbot, 1880; Wallich* 7839, Dec. 1826. Misor and Carnatic, *G. Thomson. Mt. Nilghiri and Kurg: G. Thomson. Chittagong. King's Collector* 81, Oct. 1866; *King's Collector* 315. Pen. Ind. Or. *Herb. Wight* 2628, Kew Distribution 1866—8. Ceylon. North Central Prov., Ritigala, *Herb. Peradeniya, July* 1887; *Willis, March* 1905. Eastern Prov., Trincomalee, *Thwaites C.P.* 2103. Central Prov., Peradeniya, *Herb. Peradeniya, 1900; Maturata, A. M. Silva May, 1906; Haputale, Herb. Peradeniya, Sept. 1890. Uva Prov., Bibile, J. M. Silva, Aug. 1924.*

*Composition.* The leaves contain an alkaloid. The red powder obtained from the glands and hairs which cover the fruit contains rottlerin, mallotoxin and kamalin. The seeds contain a fixed oil, camul oil and a bitter glucoside. The bark has tannin.

*Uses.* This red powder is used as an anthelmintic for expulsion of tape-worm and other intestinal worms and to remove leprous eruptions. The leaves and bark are used as poultices on cutaneous diseases. The powdered seeds are also taken internally as an anthelmintic and a cure for itch. The root is ground into a paste and applied on regions affected by painful articular rheumatism.

The capsule yields a dye which gives a permanent, rich, flame colour.

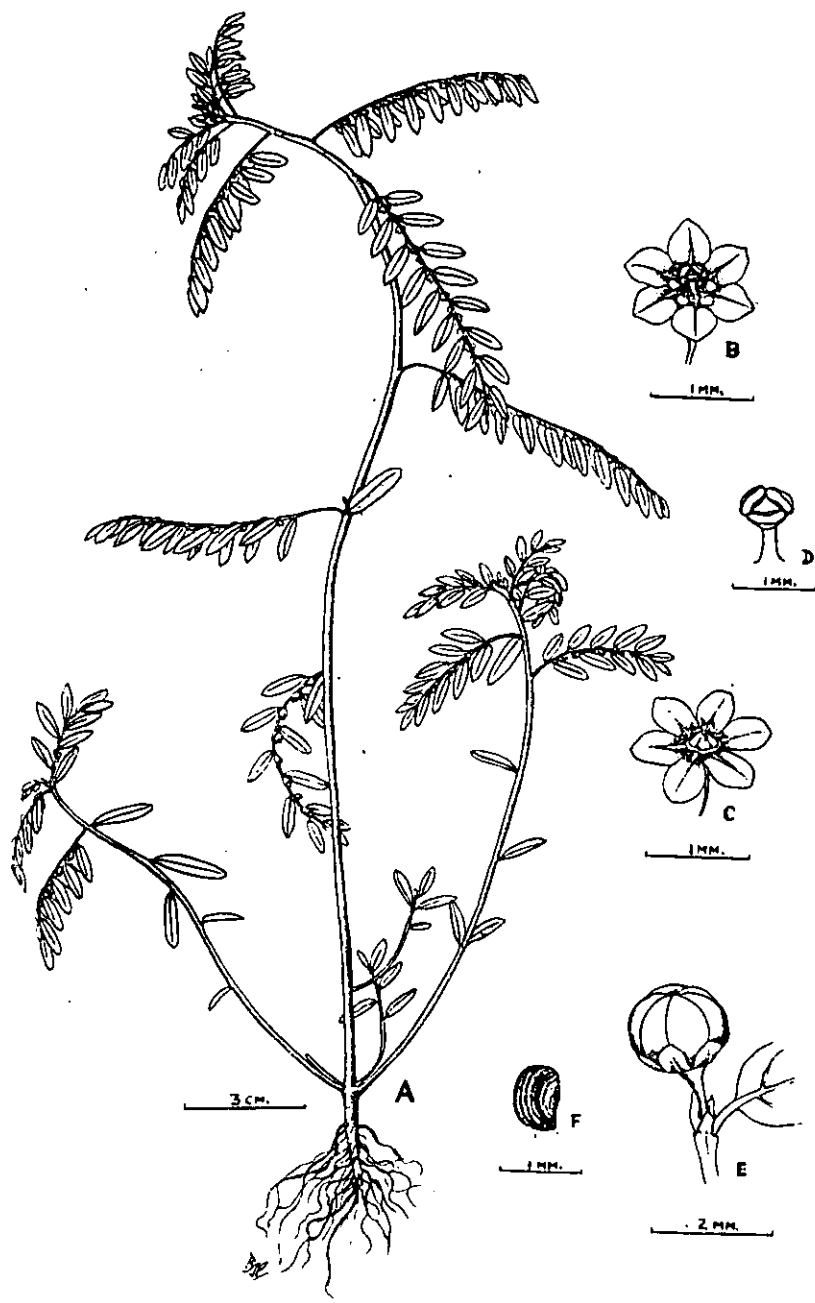


FIG. 209. *Phyllanthus debilis*. A, plant with branches, leaves and flowers. B, dorsal view of male flower. C, dorsal view of female flower. D, dehiscent anthers. E, fruit. F, seed.

19. *Phyllanthus debilis* Klein ex Willd., Sp. Pl. 4: 582. 1805. (Fig. 209).

*Phyllanthus nuriri* Linn.—*Phyllanthus carolianus* Blanco—*Phyllanthus kirganellii* Blanco—*Phyllanthus pumilus* Muehl. Arg.—*Nymphanthus niruri* Lour.—*Kirganellia pumila* Blanco

*Sinh.* Pitawakka, Binnelli; *Tam.* Kilanelli, Kilkkaynelli; *Hindi* Bhonyaabali, Bhuinanvalah, Jaramla, Sadahazurmani; *Sans.* Adhyanda, Ajata, Ajuta, Amala, Amlika, Amrita, Aphala, Bahupatra, Bahupatri, Bahuphala, Bahupushpi, Bhudatra, Bhudhatri, Bhumyamalaki, Bhuparva, Charati, Chorata, Dalaparshini, Dridhapadi, Hilolika, Jada, Jharika, Jhatamala, Kshetramali, Mala, Nilolika, Putrashronika, Shiva, Sukshmadala, Sukshmaphala, Uchchata, Vishagni, Vishvaparni, Vitunnaka, Vitunika, Vrishya.

An annual herb, 30—60 cm tall, stem often branched at base, angular, glabrous; leaf-bearing branchlets slender, spreading; leaves simple, alternate, distichous, numerous, crowded, somewhat imbricated, spreading, very shortly stalked, 1.5—3 cm long, 4.5—5.5 mm broad, oblong—oval, obtuse, thin, paler beneath, stipules very acute; flowers unisexual, monoecious, apetalous, axillary, pedicelled and regular; male flowers: very minute, 1.5 mm diameter, often 2 or 3 together in the axils of lower leaves, sepals 6, distinct, imbricate, 0.5 mm long, orbicular, rounded, reddish green with 6 shining glands between them; stamens 3, anther-cells opening transversely; female flowers: larger than males, 2.5 mm across, solitary, axillary; sepals 6, 1 mm long, oval, subacute with broad, white margins; ovary superior, broader than long, 3-locular with 2 ovules in each loculus, styles 3, bifid; fruit 1.5—2 mm long, depressed, globose, faintly 3-lobed, quite smooth, splitting into 3, crustaceous, 2-seeded cocci; seeds with slender ribs.

Flowers all the year round.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. pl. 1894. 1852; Kirtikar and Basu, Indian Med. Plants, pl. 861. 1933: Herb. Peradeniya, drawing.

**Distribution.** Occurs throughout the tropics including the Philippine Islands, except in Australia. In Ceylon, it is a common weed in waste and cultivated ground.

**India.** Punjab, *T. Thomson*; Canara, *Talbot*, July 1882. Malabar, Concan, etc., *Stocks, Law*, etc. Misor and Carnatic, *G. Thomson*; Nilghiri, *Schmid*, 1818—1835. Pen. Ind. Or., *Herb. Wight* 2589, Kew Distribution 1866—8. Ceylon, *Thwaites C.P.* 2138. Maldiv Islands, Veimandu and Horsburgh Atoll, *Gardiner*, 1899—1900.

**Composition.** Contains phyllanthin and a considerable amount of potash.

**Uses.** Much used as a diuretic in dropsical affections, gonorrhoea and to allay griping in dysentery and in intermitent fevers. The fresh root is said to be an excellent remedy for jaundice. The milky juice is effective on offensive sores. The fruits are useful in tubercular ulcers, wounds, sores, bruises, scabies and ringworm.

In Ceylon, the expressed juice of the plant is given as a diuretic in gonorrhoea and the root along with other drugs for diarrhoea, while the whole plant ground to a paste is given with cow's milk for jaundice.

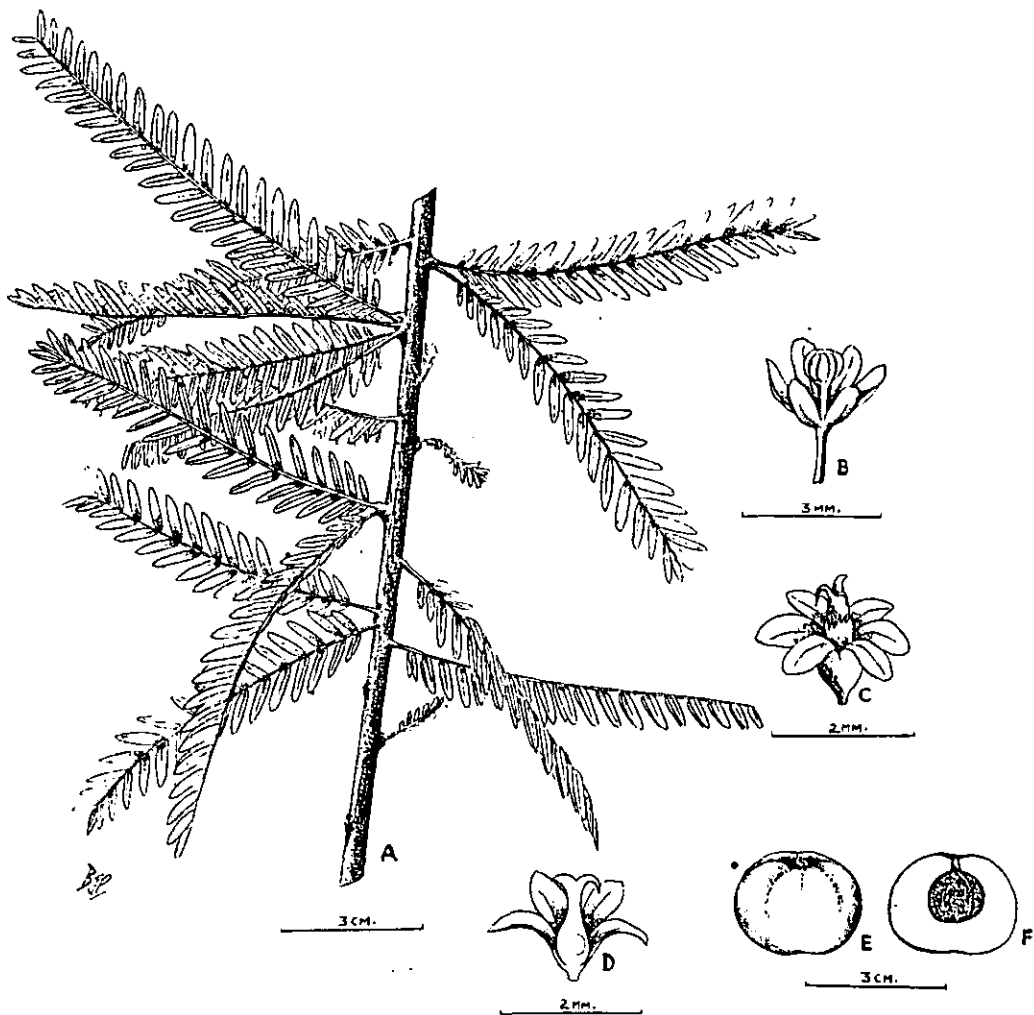


FIG. 210. *Phyllanthus emblica*. A, branch with branchlets and leaves. B, male flower. C, female flower. D, longitudinal section of female flower. E, fruit. F, longitudinal section of fruit showing pericarp and seed.

20. *Phyllanthus emblica* Linn. Sp. Pl. 982. 1753. (Fig. 210).

*Emblica officinalis* Gaertn.—*Phyllanthus taxifolius* Don—*Cicca emblica* Kurz—*Dichelastina nodicaulis* Hance.

*Engl.* Emblic Myrobalan Tree; *Sinh.* Ambula, Awusada-nelli, Nelli, Nellika; *Tam.* Amalagam, Andakoram, Indul, Kattunelli, Nelli, Perunelli, Sirottam, Tattiri, Toppunelli; *Hindi* Amalaci, Amla, Amlika, Anola, Anuli, Anvula, Anvurah, Anwera, Aonla, Aungra, Aunra, Daula; *Sans.* Adiphala, Akara, Amalaki, Amamalakam, Amlika, Amraphala, Amrita, Amritaphala, Bahuphali, Dhatri, Dhatrika, Dhatriphala, Jatiphala, Karshaphala, Kayastha, Panchiarasa, Rochani, Shanta, Shiva, Shriphala, Shriphali, Tishya, Tishyaphala, Triphala, Vayastha, Vrishya, Vrittaphala.

A small or middle-sized tree, about 10 m high, with a crooked trunk and spreading branches; bark thin, grey with numerous bosses whence arise the leaf-bearing branchlets, young parts pubescent; leaves simple, alternate, very numerous, closely placed, distichous, overlapping, spreading, nearly sessile, about 1.2 cm long, linear strap-shaped, rounded at base, subacute, glabrous, paler beneath; stipules minute, acute; flowers unisexual, small, greenish yellow, monoecious, apetalous and axillary; male flowers: very small, numerous on slender pedicels in axillary fascicles; sepals 6, oblong, obtuse, distinct, imbricate, disc absent; stamens 3, connate throughout; female flowers: few, nearly sessile, sepals as in male; ovary superior, 3-locular with 2 ovules in each loculus, surrounded by a cuplike lacerate disc, styles 3, large, recurved or spreading, lobed; fruit globose, 1.2—1.6 cm diameter, fleshy, pale green or yellow. of 3 sub-dehiscent, 2-seeded, crustaceous cocci enclosed in a thick fleshy coat; seeds 6, trigonous.

Flowers during October.

*Illustrations.* Beddome, *Flor. Sylvat. pl.* 258. 1868—1873; Wight, *lc. Pl. Ind. Orient. pl.* 1896. 1852; Kirtikar and Basu, *Indian Med. Plants. pl.* 858. 1933; *Herb. Peradeniya*, drawing.

*Distribution.* Grows in tropical and subtropical parts of India, Ceylon, Malay Peninsula and China. In Ceylon, it is very common in exposed places on patana land in the moist regions up to 4000 feet altitude.

*India.* Bengal: *J. D. Hooker.* Assam: Naga Hills, Kohina, *Prain*, June 1886; Tingale Bam, *Prain's Collector*, April 1899; Siwalik and Jaunsar Div., *Dewan* 107, 1921. Malabar, Concan, etc., *Stocks, Law, etc.* Misor and Carnatic, *G. Thomson*; Nilghiri Hills, *Schmid*, 1815—1835. Pen. Ind. Orient., *Herb. Wight* 2582, Kew Distribution 1866—8. Ceylon. *Thwaites C.P.* 2144; Lenadora, *Alexander*, Oct. 1890. Central Prov., Peradeniya, Bot. Gard., cultivated, *J. M. Silva*, April 1911; *Jayaweera* 1871, Nov. 1961. Uva Prov., Namunukula, *J. M. de Silva*, April 1924. *Burma.* Shan States, Fort Stedman Valley, *Aplin*, Nov. 1887. *Cuba.* Harvard Trop. Gard., *Jack* 4246, Feb. 1928.

*Uses.* The pericarp of the fruit is often used in decoctions along with other ingredients and externally on boils with cow ghee to promote suppuration. The root, bark and fruit are astringent. The unripe fruit is cooling, laxative and diuretic. Exudation from incisions on the fruit is applied externally on inflammation of the eye. The juice of the bark with honey and turmeric is given for gonorrhoea. An infusion of the leaves with fenugreek seed is given for chronic diarrhoea. The fruit is rich in vitamin C. A decoction of the fruit with stems of *Tinospora cordifolia* is a well-known remedy for various urinary diseases.

The expressed juice of the fruit along with other ingredients is used to cure haemorrhage, anaemia, colic, acute leprosy, fits, insanity, jaundice, cough, hiccough, indigestion, dyspepsia, asthma and other diseases.

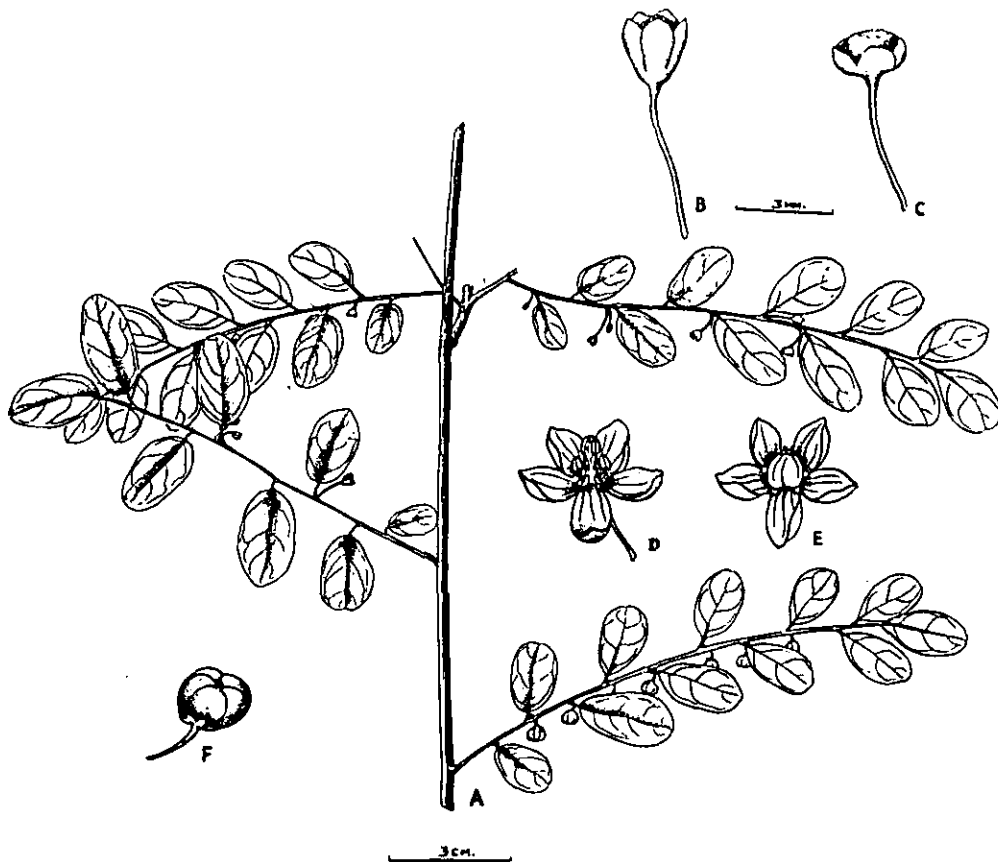


FIG. 211. *Phyllanthus reticulatus* A, portion of a plant with leaves and male and female flowers. B, male flower lateral view. C, female flower lateral view. D, male flower dorsal view. E, female flower dorsal view. F, fruit.

21. *Phyllanthus reticulatus* Poir., Encyc. Method. 5: 298. 1804. (Fig. 211).

*Kirganelia lineata* (Willd.) Als.—*Kirganelia reticulata* Baill.—*Kirganelia multiflora* Thw.—*Phyllanthus multiflorus* Willd.—*Phyllanthus chamissonis* Klotzsch—*Andisonema multiflorum* Wight—*Cicca decandra* Blanco—*Rhamnus zeylanicus* Burm.—*Rhamnus vitisidaea* Burm. f.—*Zizyphus lineatus* Willd.

*Sinh.* Welkayila; *Tam.* Abirangi, Karuppupilanji, Karunelli, Kattukkilanelli, Melanelli, Mippullanti, Nirppul, Nirppula, Nirppulanji, Pul, Pula, Pulanji, Pula-vayr, Pullanti; *Hindi* Buinowla, Kalemadhkaper, Makhi, Panjoli, Panjuli; *Sans.* Bahupraja, Bahupushpa, Kamboji, Kambojini, Krishnakambhoji.

A climbing or straggling shrub, 2.5—3 m tall, with lenticellate branches and finely pubescent or glabrous shoots; leaves simple, alternate, distichous, 1.8—3.7 cm long, 0.8—2 cm broad, variable, lanceolate or oblong oval or nearly rotundate on short petioles, obtuse or acute, rather thin, glabrous or slightly pubescent, somewhat paler beneath; stipules small, subulate, persistent; flowers regular, unisexual, monoecious, pink, apetalous; male flowers: in clusters of 2—6; sepals 5, distinct, imbricate, very obtuse, segments alternating with glands of the disc; stamens 5, the three inner filaments connate into a short column, the two outer free and shorter, pistillode absent; female flowers: solitary, sepals 5 or 6, very obtuse, persistent; ovary superior, 4- or 5-locular with two ovules in each loculus, styles 3, stigmas very small; fruit berry about 0.6 cm long, fleshy, depressed—globose, smooth and shining, purplish-black; seeds usually 10, two superposed in each chamber.

Flowers all the year round.

*Illustrations.* Wight, Ic. Pl. Ind. Orient. *pl.* 1899. 1852; Burmann, Thes. Zeyl. *pl.* 88. 1737; Kirtikar and Basu, Indian Med. Plants. *pl.* 857. 1933; Herb. Peradeniya, drawing.

*Distribution.* Occurs in India; Ceylon, Burma extending eastwards to S. China and southwards through Malaya to Timor, Celebes and Philippine Islands. It is also found in tropical Africa. It is very common in Ceylon in the low-country, especially in the dry regions.

*India.* Bengal. *Masters.* Assam: *Masters.* Behar: *J. D. Hooker.* Nilghiris: *Schmid,* 1818—1835. Pen. Ind. Orient., *Herb. Wight* 2581, Kew Distribution 1866—68. Ceylon. *Thwaites* C.P. 2142, North-Western Prov., Batalagoda, *Alston,* Sep. 1927. Western Prov., Narahenpita, *A.O.W.D.,* May 1954. Southern Prov., Tissamaharama, *Alston* 1091, Jan. 1927.

*Composition.* The leaves contain tannic acid and a crystalline principle.

*Uses.* A decoction of the bark is used as an astringent and diuretic and that of the roots is prescribed for asthma. In Ghana, the juice of the stem is blown into sore eyes. The powdered leaves are applied on sores, burns and suppurations with beneficial results. The juice of the leaves is used for diarrhoea in children. The fruit is astringent and useful for inflammation of bowels and diseases of the blood.

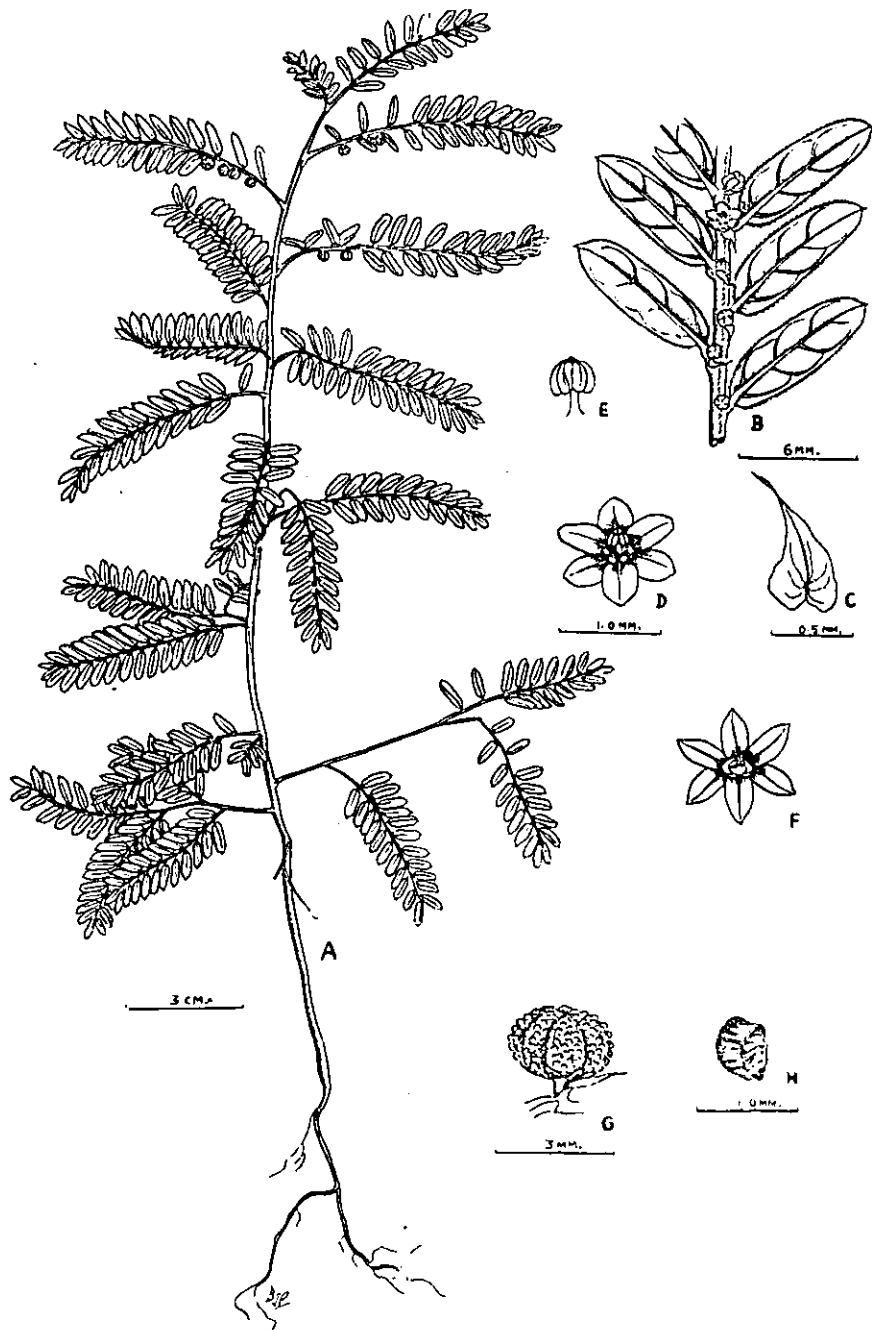


FIG. 212. *Phyllanthus urinaria*. A, plant. B, portion of branchlet. C, stipule. D, male flower, dorsal view. E, anthers dehiscent longitudinally. F, female flower. G, fruit. H, seed.

22. *Phyllanthus urinaria* Linn. Sp. Pl. 892. 1753. (Fig. 212).

*Phyllanthus leprocarpus* Wight—*Phyllanthus alatus* Bl.—*Phyllanthus cantoniensis* Hornem.

*Sinh.* Ratpitawakka; *Tam.* Shivappunelli; *Hindi.* Hazarmani, Lalbhuanvalah; *Sans.* Adhyanda, Ajata, Ajuta, Amala, Aphala, Aruha, Bahupatra, Bahuphala, Bahupushpa, Charati, Chorata, Dalasparshini, Dridhapadi, Hilolika, Jada, Jharika, Jhatamala, Mala, Nilolika, Putrashronika, Shiva, Sukshmadala, Sukshmaphala, Tali, Tamalika, Tamalini, Tamravalli, Uchchata, Vishaghni, Vishvaparni, Vitunnaka, Vituntika, Vrishya.

An annual herb with an erect, very slightly branched, slender, somewhat hairy stem, 30—60 cm high, leaf-bearing branchlets short, flattened or slightly winged; leaves simple, alternate, numerous, closely placed, distichously imbricate, nearly sessile, 7—15 mm long, 2.5—5 mm broad, oblong, rounded at base, apiculate, pubescent along the margin, paler or silvery beneath; stipules 1—2 mm long, peltate, very acute; flowers regular, unisexual, monoecious, apetalous, axillary, very minute, nearly sessile, solitary; male flowers: 1.5 mm across, yellowish white; sepals 6, distinct, imbricate with 6 glandular discs in between; stamens 3, filaments connate, anther cells parallel dehiscing longitudinally; female flowers: sepals 6, free, imbricate, about 0.6 mm long, oblong, reddish along the middle; ovary superior, 3-locular with two ovules in each loculus, styles 3, bifid; fruit about 3 mm diameter, depressed globose, scarcely lobed, muricate with 3 crustaceous 2-seeded cocci, seeds transversely furrowed.

Flowers all the year round.

**Illustrations.** Wight. Ic. Pl. Ind. Orient. *pl.* 1895, *fig.* 4. 1852; Kirtikar and Basu, Indian Med. Plants, *pl.* 859B. 1933; Herb. Peradeniya, drawing.

**Distribution.** Occurs throughout India, Ceylon, Burma, Malaya, etc. It is a common weed in Ceylon on waste ground in the low-country.

**India.** Bengal: *J. D. Hooker*; Calcutta, *Herb. Bot. Ceylon. Thwaites C.P.* 2137; Eastern Prov., Batticaloa, *Arianayagam*, Oct. 1947; Central Prov., Peradeniya, Getambe, *John Singho*, July 1925. Maldives Islands. Heddufuri and Horsburgh Atolls, *Gardiner*, 1899—1900. Japan. Nagasaki, *Oldham* 737. 1862.

**Composition.** This plant contains an alkaloid.

**Uses.** Used as a diuretic in dropsical affections, in gonorrhoea and in urinogenital troubles. In La Reunion it is given as a drink for dysentery and cystitis. The root is given to children suffering from insomnia.

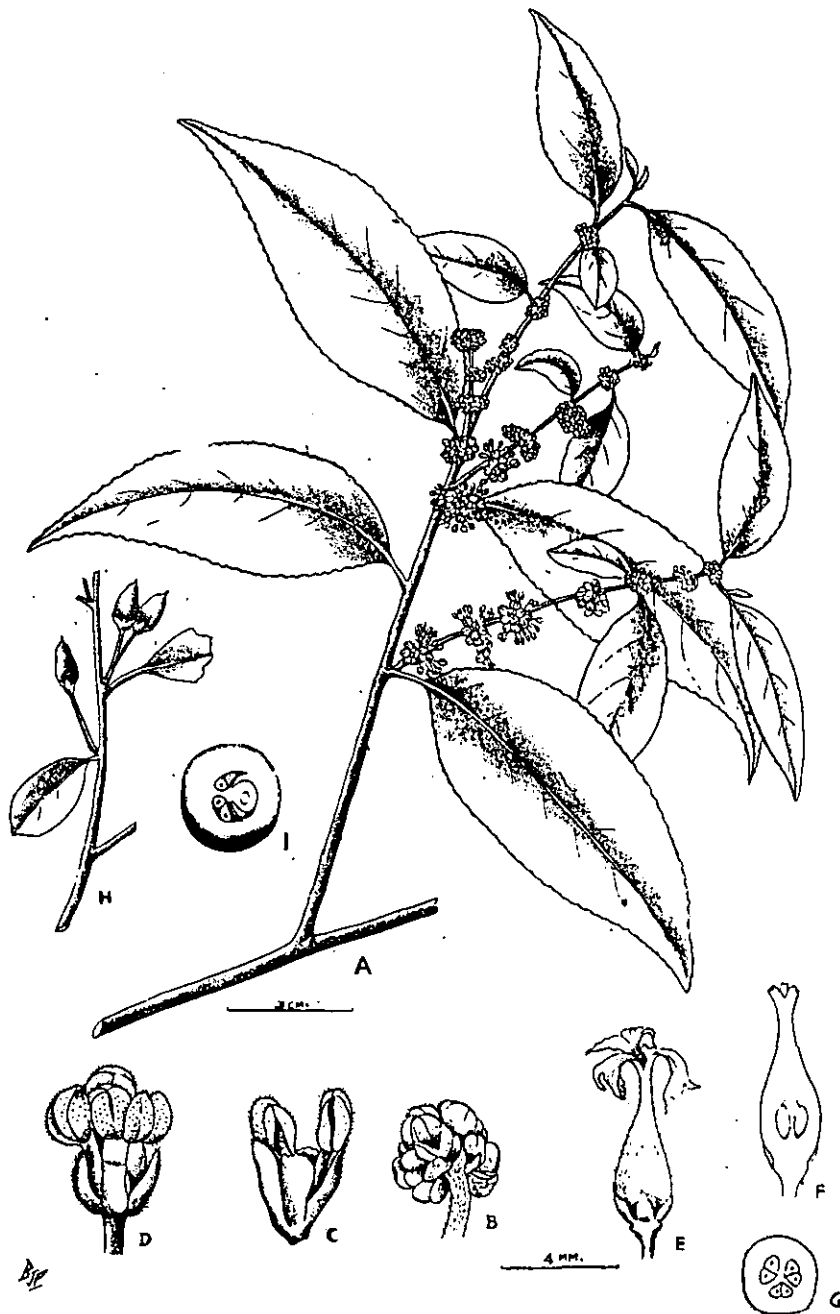


FIG 213. *Putranjiva roxburghii*. A, branch with leaves and clusters of male flowers. B, clusters of male flowers. C & D, male flowers with 2 and 3 stamens respectively. E, female flower lateral view. F, longitudinal section of female flower. G, transverse section of ovary. H, branch with young fruits. I, transverse section of a young fruit.

23. *Putranjiva roxburghii* Wall., Tent. Fl. Nep. 61. 1826. (Fig. 213).

*Putranjiva sphaerocarpa* Muell.-Arg.-*Putranjiva amblyocarpa* Muell.-Arg.—*Negeia putranjiva* Roxb.

*Tam.* Irukolli, Karupali, Karuppilai, Karippalai, Vitchurunai; *Hindi* Jiaputa, Jivputrak, Joti, Juti, Patigia, Patji, Putajan, Putijia, Putrajiva, Putranjiva; *Sans.* Ardhasādhaka, Apatyajiva, Garbhada, Garbhakara, Jivanaputra, Kumarajiva, Mavu, Pavitra, Putrajiva, Putranjiva, Shlipadapaha, Sidhida, Sutajivaka, Sutrajiva, Yashtipushpa.

A moderate-sized tree with pendant branches and whitish bark; buds pubescent; leaves simple, alternate, coriaceous, dark green and shining, 6.2—10 cm long, 2.2—3.8 cm broad, oval or lanceolate or oblong-lanceolate, shortly acuminate, acute, unequal at base, faintly serrate, glabrous; flowers regular, unisexual, green, apetalous, dioecious; male flowers: sessile, crowded in rounded clusters on very short axillary peduncles; sepals 4 or 5, oblong, imbricate, 2.5 mm long, ciliolate, disc absent; stamens 2 or 3, distinct, filaments short, anthers globose; female flowers: solitary or in pairs; sepals 5 or 6, generally 5, elliptic, obtuse, concave, ciliolate; disc absent; ovary superior, flask-shaped, finely silky, 3-locular with two ovules in each loculus; styles 3, recurved, dilated into broad fleshy crescent-shaped stigmas; fruit a drupe about 1.2 cm long, globose, not pointed, pale green, densely, finely tomentose, stone very hard.

Flowers during February.

*Illustrations.* Wight Ic. Pl. Ind. Orient. *pl.* 1876. 1852; Beddome, Flor. Sylvat. *pl.* 275-1868—73; Kirtikar and Basu, Indian Med. Plants, *pl.* 864. 1933; Herb. Peradeniya, drawing; Worthington, Ceylon Trees, *pl.* 373. 1959.

*Distribution.* Occurs throughout tropical India, Ceylon and Burma. It is rare in Ceylon confined to the dry regions. Minneriya, Minipe, Kalkudah, Haragama, Kundasale, etc.

*India.* Silhet: *Wallich* 6814B; *Wallich* 6814D, 1820; Siwalik and Jaunsar Div., *Samanasena* 112, Oct. 1921. Malabar, Concan, etc., *Stocks, Law*, etc. Ceylon. *Thwaites C.P.* 2122. Eastern Prov., Kalkudah, Rest House compound, *Worthington* 1051, Aug. 1940.

*Uses.* The leaves and fruits are given in the form of a decoction for colds and fevers.

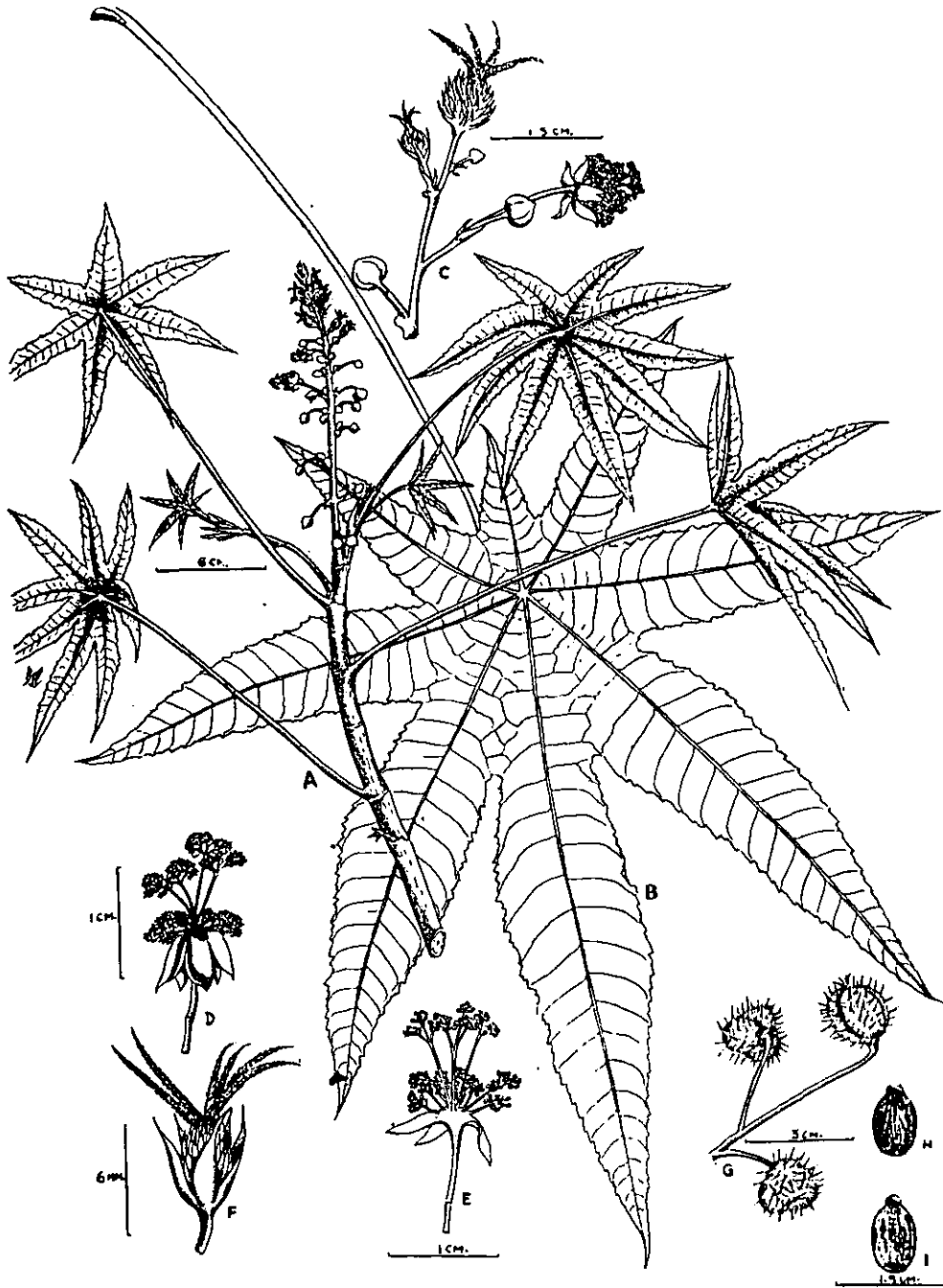


FIG. 214. *Ricinus communis* A, branch with leaves and inflorescence. B, leaf. C, portion of the inflorescence towards the middle of the panicle containing both male and female flowers. D, male flower. E, longitudinal section of male flower. F, lateral view of female flower. G, fruits. H, seed showing the marking on upper surface. I, seed showing markings on the under surface.

24. *Ricinus communis* Linn. Sp. Pl. 1007. 1753. (Fig. 214).

*Ricinus inermis* Jacq.—*Ricinus lividus* Jacq.—*Ricinus speciosus* Burm.—*Ricinus spectabilis* Bl.—*Ricinus viridis* Willd.—*Ricinus laevis* DC.—*Ricinus africanus* Mill.—*Croton spinosus* Linn.

*Engl.* Castor-oil Plant; *Sinh.* Erandu, Tel-erandu; *Tam.* Aimugi, Amanakku, Andagam, Asaram, Attagam, Attamanam, Attugam, Erandam, Kottai, Koitaimuttu, Muttukottai, Peramanakku, Sanju, Sasambari, Sigandi, Sittaman, Sittamanakku, Sittiram, Tabinjam, Urrpulam, Vattaman; *Hindi* Arand, Arandi, Arend, Erand, Erandi, Erend, Ind, Rand; *Sans.* Amanda, Amangala, Bhandra, Chankuka, Chitrabija, Chitraka, Dirghadantaka, Eranda, Gandharvahasta, Gandharvahastaka, Ishta, Kanta, Panchangula, Panjangula, Ruvuka, Shukla, Shulashatru, Svehaprada, Taruna, Triputi, Triputipphala, Tuchhadru, Vardhamana, Vatari, Vranaha, Vuka, Vyadatvaka, Vyaghradala, Vyaghrapuchha.

A very variable plant both in habit and appearance; annual or perennial, 3.5—13.5 m tall, stems hollow, smooth, cylindrical, glaucous; leaves simple, alternate, on long curved, cylindrical, purplish or green petioles, sub-peltate, drooping; stipules large, ovate, green or yellowish, united into a cap enclosing the buds, deciduous; lamina 15—48 cm across, palmately cut for  $\frac{2}{3}$  of its depth into 7—11 lanceolate, acute, coarsely serrate segments, smooth, blue-green, paler beneath; flowers monoecious, large, arranged on the thick rachis of an oblong, spicate panicle, which is at first terminal but becomes lateral by the growth of an axillary bud beneath it; male flowers stalked on branched peduncles at the base of the panicle or in groups with female flowers about the middle of the inflorescence, pedicels articulate about the middle or lower; female flowers in groups in the upper part or at apices of male inflorescences towards the middle of the panicle, bracts broadly triangular; male flowers: calyx deeply cut into 3—5 smooth, broadly ovate, pointed segments, valvate in aestivation, petals none, stamens many, irregularly combined into much branched, compound stamens inserted on the raised centre of the receptacle, anthers small, 2-celled, dehiscing longitudinally; female flowers: calyx as in the male, glaucous green but more deeply cut with segments narrower, more acute and erect, petals none, ovary shorter than the calyx, superior, globose-trigonal with the blunt angles bearing several lines of large, soft, erect, finger-shaped prominences each tipped with a transparent spiny bristle, 3-locular with a single ovule attached to the top of the axis in each chamber, style very deeply divided into 3 long, flattened branches each split into two, the inner surface covered with papillae, bright carmine-red; fruit a blunt, greenish, deeply grooved, tricoccal capsule about 2 cm long, with the prominences of the ovary becoming sharp, weak, spreading spines, dehiscing longitudinally and septically into 6 valves; seeds ovoid, flattened, 0.8—1.2 cm long, 0.6 cm broad, smooth, shining, pinkish-grey, prettily mottled with dark brown, caruncle large, subglobose, raphe faintly raised running down the centre of the ventral surface, albuminous.

**Illustrations.** Bentley and Trimen, *Med. Plants*, pl. 237. 1880; Burmann, *Fl. Indica*, pl. 62, fig. 2. 1768; Kirtikar and Basu, *Indian Med. Plants*, pl. 878. 1933; Herb. Peradeniya, drawing.

**Distribution.** Castor-oil plant is probably of African origin, now naturalized and cultivated near habitations in all tropical countries. It is cultivated commercially in India, Italy, etc. In Ceylon, it grows in village gardens.

**Ceylon.** *Driberg*, July 1913; *Baker* 127, June 1907. **Maldive Islands.** Minikoi, *Gardiner* 6, 1899; Horsburgh Atoll, *Gardiner*, 1899—1900; *Didi* 143, 1896. **Laccadive Islands.** Specimen without collector's name, 1891.

**Composition.** The seeds contain a high proportion of fixed oil, an active principle ricin and an alkaloid ricinine. Ricinine is also found in the leaves and appears to be non-toxic. The seed also yields riboflavin, nicotinic acid, lipase and uric acid.

**Uses.** Castor oil is used commercially on a large scale as a lubricant for internal combustion engines particularly aero-engines, manufacture of turkey-red oil for the dyeing industry, in the leather industry and for making varnishes, etc.

## EUPHORBIACEAE

The cake left after the extraction of oil containing poisonous resin is used as a fertilizer.

Medicinally, the fresh leaves are used externally for headaches and as a poultice for boils and rheumatism. The Zulus apply a paste of the root for toothache. The root bark is a purgative and it is also effective in skin diseases, burns and sores. A poultice of the leaves is applied to breasts of women to increase the secretion of milk. Internally, a decoction of the leaves acts as a lactagogue and emmenagogue. The crushed seeds are used by the Chinese to relieve scrofulous sores.

Although the seed is poisonous, the oil extracted is a mild purgative, adaptable to infants and young children. It is a valuable drug in diarrhoea caused by indigestible food and for acute dysentery if prescribed at the very outset. It is the most reliable purgative for obstinate constipation.

In Southern Rhodesia the Africans use the bark for stitching up wounds and as a dressing for sores. In Libya, the pounded leaf cooked in oil is used in the treatment of framboesia and in Somaliland, the oil is rubbed on rheumatic joints. The local application of the leaf to the mammae is said to produce a powerful galactogogic action. The root is a remedy for abdominal pains and diarrhoea, while the root bark is a purgative. In Vietnam, the plant is used as a diaphoretic and diuretic. In India the root and leaves are used in rheumatism, lumbago, sciatica, pleurodynia and certain skin diseases. The dried root is used as a febrifuge and in the treatment of jaundice and nervous disorders. The seed is poisonous causing vomiting and purging. It is used to poison rats and moles. In Ceylon, the root of the plant is used in pleurodynia, and rheumatic pains while the seeds are used for lumbago and sciatica.

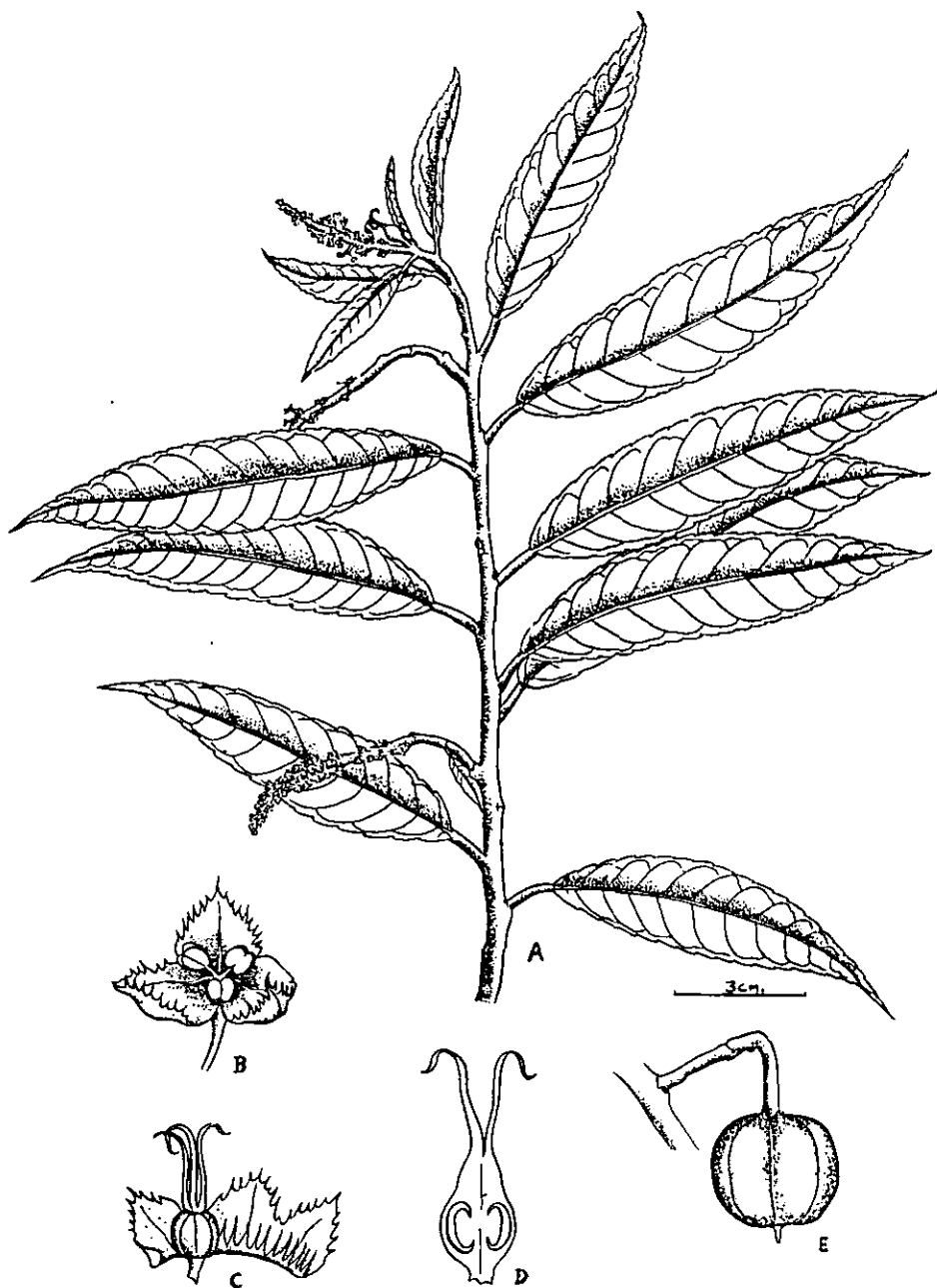


FIG. 215. *Sapium indicum*. A, branch with leaves and flower spikes. B, male flower. C, female flower with calyx spread out. D, longitudinal section of the ovary. E, fruit. B, C, D, enlarged.

23 *Sapium indicum* Willd., Sp. Pl. 4: 572. 1805. (Fig. 215).

*Sapium nirmala* Ham. *Sapium bingirum* Roxb. — *Stillingia indica* Baill. *Stillingia himalayensis* Klotzsch — *Excoccaria indica* Muell.-Arg.

Sinh. Kumakulu.

An evergreen, glabrous tree, 6—8 m tall, with a white, smooth bark and acrid, milky juice. Leaves simple, alternate, 8.7—12.5 cm long, 2.3—2.7 cm broad, lanceolate, subacute at base, attenuate acute at apex, finely crenate-serrate, glabrous, shining above, venation translucent, conspicuously pinnate; petioles 1.2 cm long, bi-glandular at the top; flowers regular, unisexual, apetalous, greenish yellow, monoecious in leaf-opposed or subterminal spikes 5—7.5 cm long, sessile, males numerous in clusters, females larger, usually 1 or 2 at the base of the spike. Male flowers: sepals fused into a minute, membranous, 2- or 3-toothed cup, not enclosing the stamens in bud, ciliate; stamens 2 or 3, filaments distinct, pistillode absent; female flowers: calyx 3-fid or 3-partite; ovary superior, 3-locular with a single ovule in each loculus, styles 3, very long, undivided; capsule with woody cocci and central persistent column, about 2.5 cm diameter, depressed, globose, glabrous, blackish green, cocci thick and hard; seeds grey, about 1.2 cm long.

Flowers during April.

Illustrations. Wright, Ic. Pl. Ind. Orient. pl. 1950. 1853; Kirtikar and Basu, Indian Medicinal Plants, pl. 881. 1935. Herb. Peradeniya, drawing.

Distribution. Grows from Bengal to Tenasserim in India and in the mountains especially in Ceylon especially near the sea coast in Kalutara and Galle. It is somewhat rare.

Ceylon. Western Prov., Kalutara, Thwaites, C.P. 2946. Burma. Tenasserim, Amherst, Falconer.

Composition. The seeds contain a thick greenish, drying oil.

Uses. The juice of this tree is very poisonous and seeds are used in medicine. The juice is chiefly used as a dye for dyeing yarn a yellow-green colour. The Malays apply the leaves to the abdomen to cure fevers. An infusion of the leaf is used for gonorrhoea.

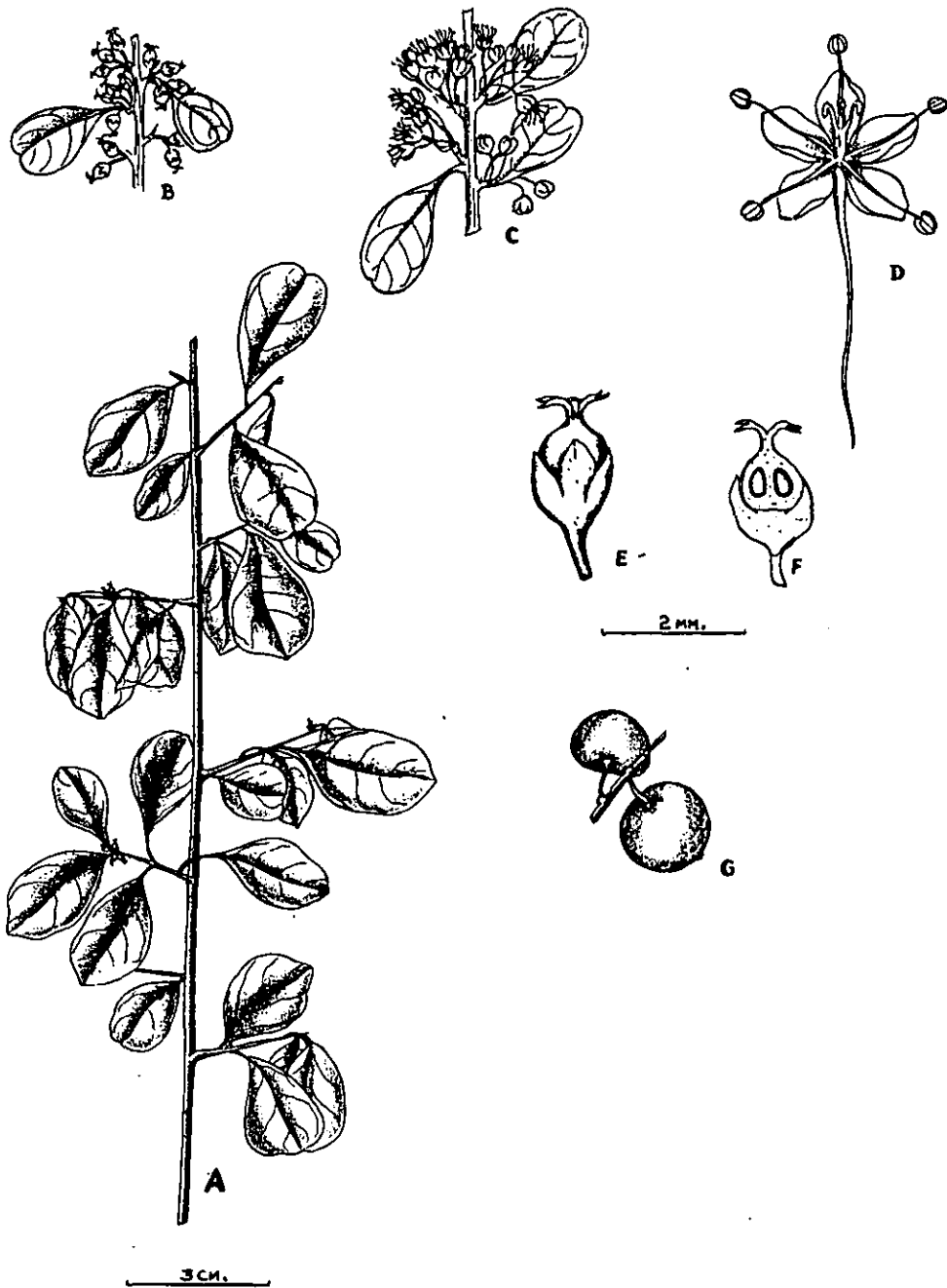


FIG. 216. *Securinega leucopyrus*. A, part of a plant showing leaves and female flowers. B, portion of a branch with female flowers. C, portion of a plant bearing axillary clusters of male flowers. D, male flower lateral view. E, female flower lateral view. F, longitudinal section of female flower. G, fruits.

26. *Securinega leucopyrus* (Willd.) Muell.-Arg. in DC. Prodr. 15 (2): 451. (Fig. 216).

*Flueggea leucopyrus* Willd.—*Flueggea wallichiana* Baill.—*Cicca leucopyrus* Kurz—*Xylophylla lucerna* Roth

*Sinh.* Hin-katupila; *Tam.* Irubulai, Mudbulanji, Mudpulanti, Mulluppulatti, Pula, Pulanji, Varadbul, Varadbula, Vedbula, Vellaippula, Vellaippulanji; *Sans.* Apiyadruma, Bhuriphali, Panduphali, Svetakamboja.

A large bush with long straggling branches, twigs leafy, horizontal, divaricate, rigid, usually ending in sharp spines, bark white or grey; leaves simple, small, alternate, distichous, 1.2—2.5 cm long, obovate, obcordate or rotundate on short petioles, entire, glabrous, glaucous beneath; flowers minute, unisexual, apetalous, dioecious, green, pedicellate in axillary clusters, females fewer than males; male flowers: sepals 5, distinct, obtuse, imbricate in bud, disc glands 5; stamens 5, much exserted, distinct, anthers erect, pistillode large; female flowers: sepals same as in the male, disc annular; ovary superior, 3-locular with two ovules in each loculus, styles rather long, recurved, bifid; fruit a small globose berry, about 1.2 cm diameter, smooth, quite white when ripe with 6 seeds.

Flowers in June and August.

**Illustrations.** Wight, Ic. Pl. Ind. Orient. *pl.* 1875. 1852; Herb. Peradeniya, drawing.

**Distribution.** Occurs in India, Ceylon and Burma. It is common in Ceylon in the dry low-country.

**India.** Pen. Ind. Orient., *Herb. Wight* 2597, Kew Distribution 1866—68; *Talbot* 53, April 1885. **Ceylon.** *Thwaites C.P.* 2154. Northern Prov., Talaimannar, *J. M. Silva*, July 1916; Vaddukodai, *Koshy*, Nov. 1951. North Central Prov., Kekirawa, *Herb. Peradeniya*, Aug. 1885; Central Prov., Hanguranketa, *J. M. Silva*, Oct. 1920.

**Composition.** The leaves contain an alkaloid.

**Uses.** The juice of the leaves is used to destroy maggots in sores.

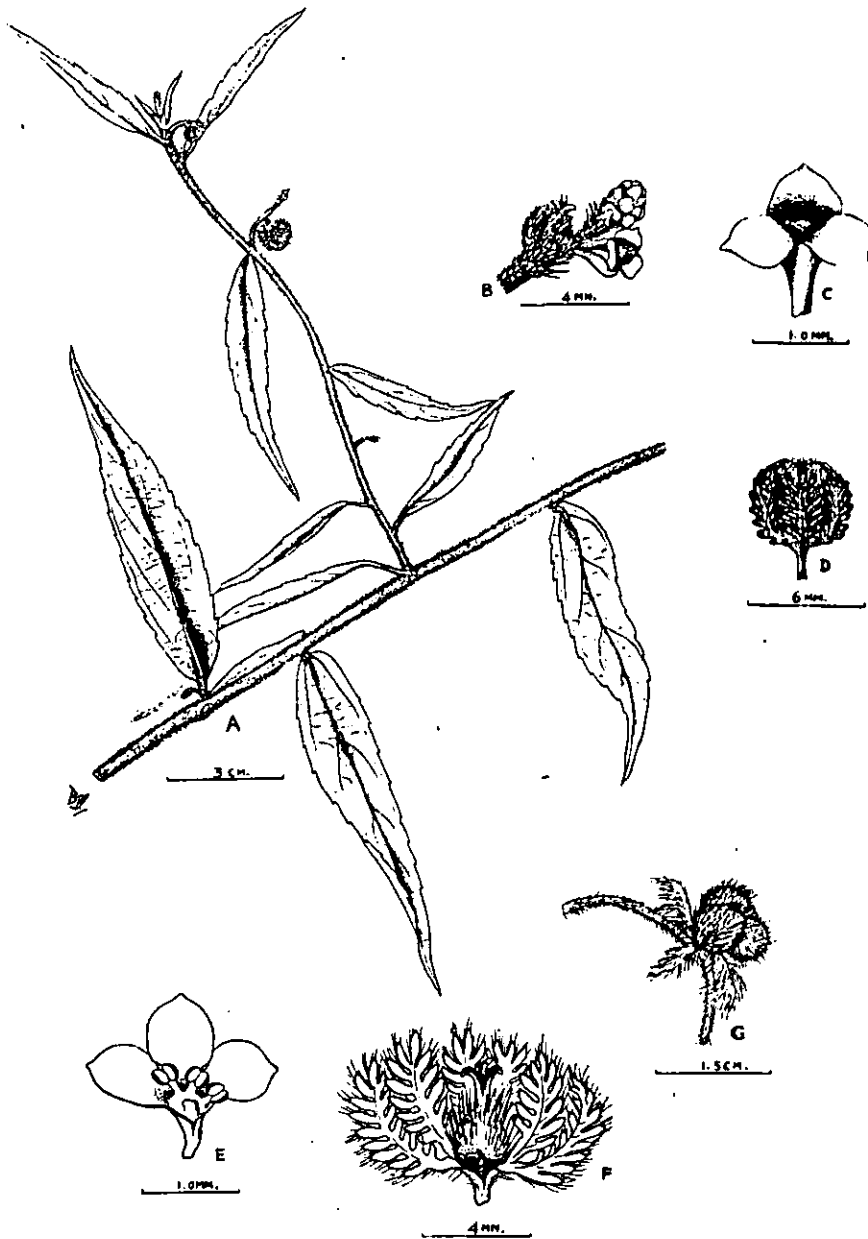


FIG. 217. *Tragia involucrata*. A, portion of a plant with leaves and flowering racemes. B, flowering raceme with male and female flowers. C, male flower lateral view. D, female flower lateral view. E, male flower opened showing the stamens. F, female flower with calyx spread out showing the pistil. G, fruit.

27. *Tragia involucrata* Linn. Sp. Pl. 980 1753. (Fig. 217).*Tragia hispida* Willd.

*Sinh.* Welkahambiliya, Helkahambiliya; *Tam.* Ambu, Cherukanjuru, Erumaikkanjori, Kanjori, Kandudi, Kanuichi, Karuppukkanjori, Kunasagam, Kurundotti, Punaikkanjori, Samuttirandam, Sendotti, Siruganjori, Tanavaiyadam, Turalobam, Turpparigam, Vellaikkanjori, *Hindi* Barhanta. *Sans.* Duralabha, Dusparcha, Grahini, Kachchura, Kasaghni, Samudranta, Virupa, Vrishchikali, Vrishchikapatri.

A perennial, hispid herb, with scattered, stinging hairs; stem elongate, slender and twining; leaves simple, alternate, stipulate, 2.5—12.5 cm long, 2—4.5 cm broad, very variable from linear-oblong to broadly ovate-cordate, acuminate, serrate, hairy, sometimes deeply 3-fid or 3-partite with irregularly serrate or sub-pinnatifid lobes, base rounded or cordate; petioles 1—1.5 cm long and hairy; flowers regular, unisexual, monoecious, shortly pedicellate, apetalous in terminal axillary and leaf-opposed racemes 2.5—5 cm long with many male and few female flowers, the male flowers in the upper part, yellowish, and females in the lower part of the raceme; bracts 1.5 mm long and as broad; male flowers: 2 mm diameter, sepals 3, orbicular, concave, fused, valvate; stamens 3 on the sepals, filaments distinct, pistillode absent; female flowers: strigosely hispid, green; sepals 6, pinnatifid, very hispid, much elongating and becoming rigid in fruit; ovary superior, 3-locular with a single ovule in each loculus, hispid, styles 3, circinate-revolute, united below in a stout, cylindrical style; fruit capsule 8 mm diameter, 3-lobed, more or less hispid; seeds globose, smooth.

Flowers during February, March and June.

**Illustrations.** Kirtikar and Basu, *Indian Med. Plants*, pl. 880. 1933; Herb. Peradeniya drawing.

**Distribution.** Occurs in India, Ceylon, Burma and China. In Ceylon, it is common in waste ground in the low country Jaffna, Anuradhapura, Minneriya, Galle, Matara, etc.

**India.** Malabar, Cancan, etc. *Stocks, Law*, etc. *Pen. Ind. Orient. Herb. Wight* 2621, *Kew Distribution* 1866-68. *Ceylon. Jaffna, Thwaites C. P.* 2099; *Middeniya, Alston* 1359, March 1927.

**Uses.** The root is considered a cholagogue, diaphoretic and an alterative. It is useful in acute congestion of the liver, laryngitis, bronchitis, pneumonia and typhoid and other fevers. An infusion of it is given for itching of the skin. It is also used as an application for leprosy. The roots boiled in milk is given at bedtime for dry cough.

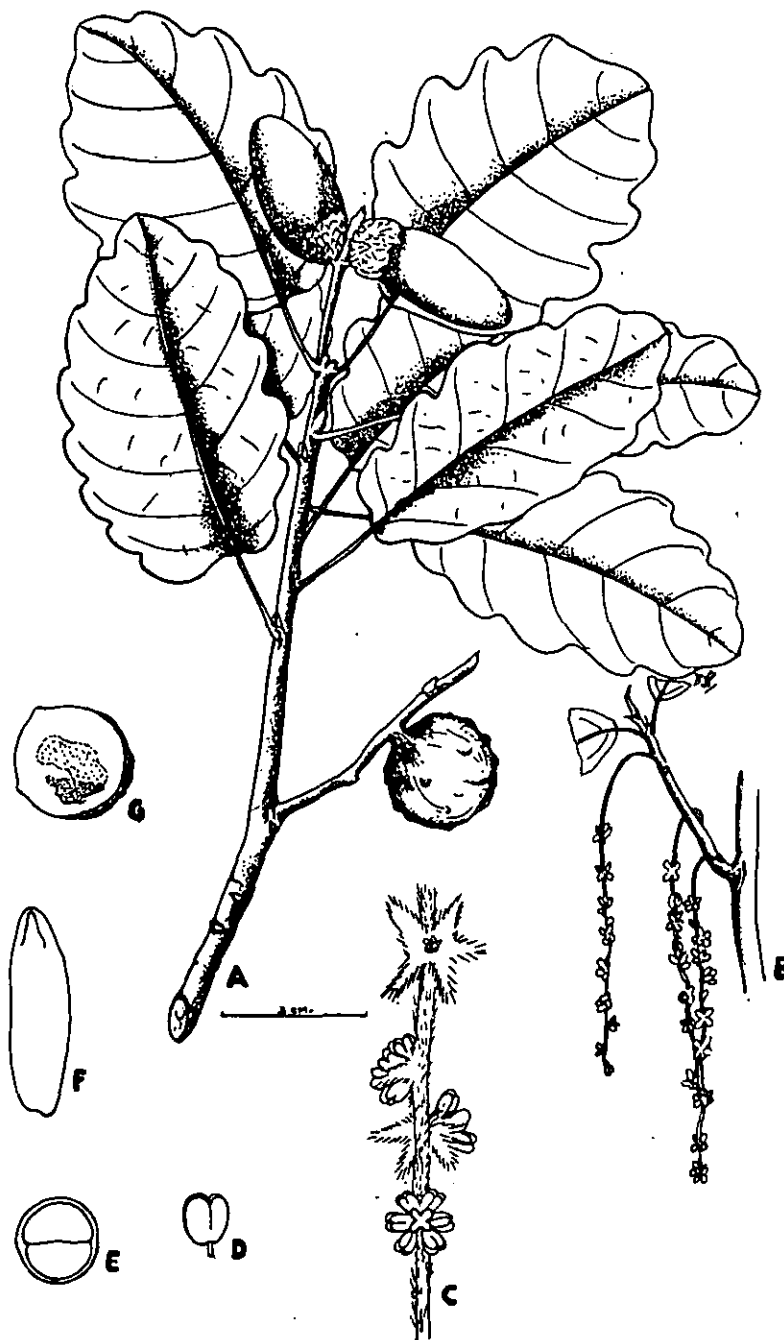


FIG. 218. *Quercus lusitanica*. A, branch with leaves, fruits and a gall. B, young branch with male catkins. C, male flowers. D, anther. E, transverse section of a fruit. F, seed with one cotyledon removed. G, section of a gall. C—F, enlarged.

## 45. FAGACEAE

*Quercus lucitanica* Lam., Encycl. 1: 719. (Fig. 218).

*Quercus infectoria* Oliv.—*Quercus lucitanica* var. *infectoria* A. DC.—*Quercus rigida* C. Koch—*Quercus petiolaris* Boiss.

*Sinh.* Masakka; *Tam.* Machakai, Mashik-kay; *Hindi* Majuphal, Mazu; *Sans.* Majuphal, Mayika, Mayin.

An erect shrub with irregular spreading branches, brownish-grey bark and woolly or downy twigs; leaves alternate, petiolate, lamina broadly oval or obovate-oblong, 5—7.5 cm long, rounded at both ends, rather shallowly cut into large, acute or obtuse, rounded teeth or lobes, stiff and thick, smooth above, stellate hairy chiefly on the veins beneath, stipules large, strap-shaped, blunt, chaffy, pale brown and quickly deciduous; flowers unisexual, inconspicuous, monoecious; male flowers numerous, sessile, loosely and irregularly arranged on the hairy axis of very slender, pendulous catkins, generally 2 or 3 catkins together from the axils of the lowest leaves; female flowers sessile, surrounded by an involucre of several rows of triangular, strongly-imbriated, ciliate, reddish bracts forming a bud-like cup, solitary or two or three at the extremity of erect tapering peduncles arising from the axils of the uppermost leaves, each flower subtended by a deciduous, ciliate bract; male flowers: perianth cup-shaped, deeply cut into 4—7 strap-shaped segments; stamens 4—7, inserted on the central receptacle, filaments short, anthers 2-celled dehiscing longitudinally; female flowers: perianth completely fused with the ovary, usually with 6 teeth; ovary inferior, thick, fleshy, 3-loculed with two erect ovules in each loculus, style thick and short, stigma fleshy with 3 spreading lobes; fruit surrounded at the base by the enlarged involucre which has become a solid, hemispherical cup with an entire margin, covered with dense, grey tomentum, solitary or two or three in a cluster, readily separating from the cupule when ripe, 1-loculed, indehiscent; seed solitary, completely filling the pericarp.

Flowers in May and the fruit ripens in September.

**Illustrations.** Bentley and Trimen, *Med. Plants*, pl. 249. 1880; Olivier, *Voy. dans l' Empire Othoman*, Atlas, pls. 14 and 15.

**Distribution.** Grows abundantly in many parts of Asia Minor, especially Syria, Greece, Southern Turkey and Cyprus. It does not grow in Ceylon and India.

**Composition.** The galls used in medicine are formed by the hypertrophied vegetable tissues as a result of punctures made by insects in leaf buds to lay their eggs. They are picked before or after the insect has escaped.

The galls contain ellagic acid in addition to sugar, resin, etc.

**Uses.** The bark and acorns of this shrub are used in the form of an ointment with vaseline in the treatment of eczema and other skin diseases. These galls are the most powerful of vegetable astringents. In decoction, they are used in diarrhoea, dysentery and as an antidote to poisoning by vegetable alkaloids. As a gargle they are useful in stomatitis. An ointment prepared from the galls with opium is a beneficial application on anal fissures and ulcerating haemorrhoids.

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