

FASCICLES OF FLORA OF INDIA

FASCICLE 2



**BOTANICAL SURVEY OF INDIA
P. O. BOTANIC GARDEN
HOWRAH-711103**

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PREFACE

The first Fascicle of the Flora of India dealing with the families Coriariaceae and Paeoniaceae was published in October 1978. The Fascicle received a warm welcome and requests for its copies are being received from various parts of the country and abroad.

Few constructive suggestions have been received; these have necessitated the following modifications:

- (i) Original year of publication and page number of the Regional Floras are cited, followed by a reference to the reprinted editions in brackets.
- (ii) The names of languages for local names are abbreviated.

The present Fascicle deals with the family Dilleniaceae.

It is hoped that more Fascicles will soon follow.

P. O. Botanic Garden
Howrah-711103
30th May, 1979

S. K. JAIN
Director
Botanical Survey of India

DILLENIACEAE

Salisbury in W. Hook. Parad. Lond. 2 (1). t. 73. 1807 (Dilleneae).

N. C. MAJUMDAR*

Trees, shrubs, climbers, or herbs with radical leaves. Leaves simple, alternate or spirally arranged, entire or dentate, with prominent, parallel, lateral nerves; stipules absent or if present wing-like, mostly caducous. Flowers bisexual, hypogynous, generally yellow or white. Sepals usually 4-5, imbricate, persistent. Petals usually 3-5, often crumpled in bud, caducous. Stamens numerous, free or united into bundles at the base, usually persistent, anthers basifixed, opening by apical pores or longitudinal slits. Carpels 1-20, free or coherent along the central axis, styles free, ovules 1-many, anatropous or apotropous, on an axile placenta. Fruits follicular or baccate. Seeds arillate or exarillate, testa crustaceous, endosperm copious, fleshy, embryo minute.

Pollen : Elliptic in meridional and subangular in polar view; average size less than 25μ triporate, tricolporate, tricolpate and tetracolpate; furrow granular provided with opercular membrane; exine pattern reticulate (Dickison in J. Arnold Arb. 48: 231-240.1967; Rao & Ong. in J. Paly. 10: 1-37.1974).

10 genera and *ca.* 400 species in the tropical and subtropical regions of the world. 3 genera and *ca.* 12 species in India.

- 1a. Herbs with radical leaves ...1. *Acrotrema*
- 1b. Trees, shrubs or woody climbers :
 - 2a. Trees. Flowers white or yellow; anther-loculi parallel; receptacle conical. Fruits indehiscent, enclosed by enlarged sepals ...2. *Dillenia*
 - 2b. Shrubs or woody climbers. Flowers white to reddish white; anther-loculi divergent towards base; receptacle flat. Fruits dehiscent ...3. *Tetracera*

*Botanical Survey of India, P.O. Botanic Garden, Howrah-711103.

1. ACROTREMA

Jack, Mal. Misc. 1. 5: 36. 1820; Benth. & Hook. f. Gen. Pl. 1 : 13. 1862; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1: 31. 1872; Hoogland in Fl. Males. I. 4: 151. 1951; Hutchinson, Gen. Fl. Pl. 1: 159. 1964.

Perennial herbs; rhizomes woody, horizontal. Leaves all radical or on short stem, simple dentate or pinnatisect; petioles with broad, membranous, caducous wing. Flowers in short, terminal racemes with membranous bracts, yellow. Sepals 5. Petals 5. Stamens 15-numerous, in 3 bundles, alternating with carpels. Carpels usually 3, slightly coherent along the axis, styles linear, recurved, ovules 2-6, or 10-20. Follicles dehiscing irregularly. Aril membranous, white.

Distrib. : 10 species in the tropics. INDIA, SRI LANKA, LOWER BURMA, MALAYSIA and THAILAND. 1 species in India.

Acrotrema arnottianum Wight, Ill. Ind. Bot. 1: 9. t. 3. 1840; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1:32. 1872; Gamble, Fl. Pres. Madr. 1: 6. 1915 (Repr. ed. 1: 5.1957).

Herbs without or with very short stems. Leaves 15-30 × 7-12 cm, obovate-oblong, apex obtuse, base rounded or cordate, margin more or less dentate, young leaves floccose, mature leaves with long, soft hairs and at times glabrescent; petioles 2-8 cm long, broadly winged from above to the base. Flowers many, on 9-14 cm long peduncles; pedicels 5-15 cm long, clothed with long hairs. Sepals 8-9 mm long. Petals 8 mm long, obovate. Stamens numerous, anthers spathulate. Carpels 8 mm long, many-ovuled. Follicles many or by abortion few-seeded.

Type : Courtallam, Wight 12 (K, CAL, Photo !).

Fls. : May-Aug.; *Frts.* : Sept.-Oct.

Distrib. : INDIA : Kerala, Tamil Nadu.

Ecol. : An endemic herb, growing in shady, moist places, under bushes and on the edges of wet ditches.

Notes : Hook. f. & Thoms. (l. c.) point out that *A. costatum* Jack (Mal. Misc. 1. 5: 36. 1820) does not occur in India. The record by Wight (l. c.) of this species from Peninsular India is presumably due to wrong fixation of label "Travancore" on a specimen of *A. costatum* (*A. wightianum* Wt. & Arn.) collected by Koenig from Malayan region. *A. costatum* Wall. N. L. 1117B. 1828 (non Jack. 1820) and *A. wightianum* Wall. N. L. 3669. 1828 (non Wt. & Arn. 1834) represent *A. arnottianum* Wt.

2. DILLENIA

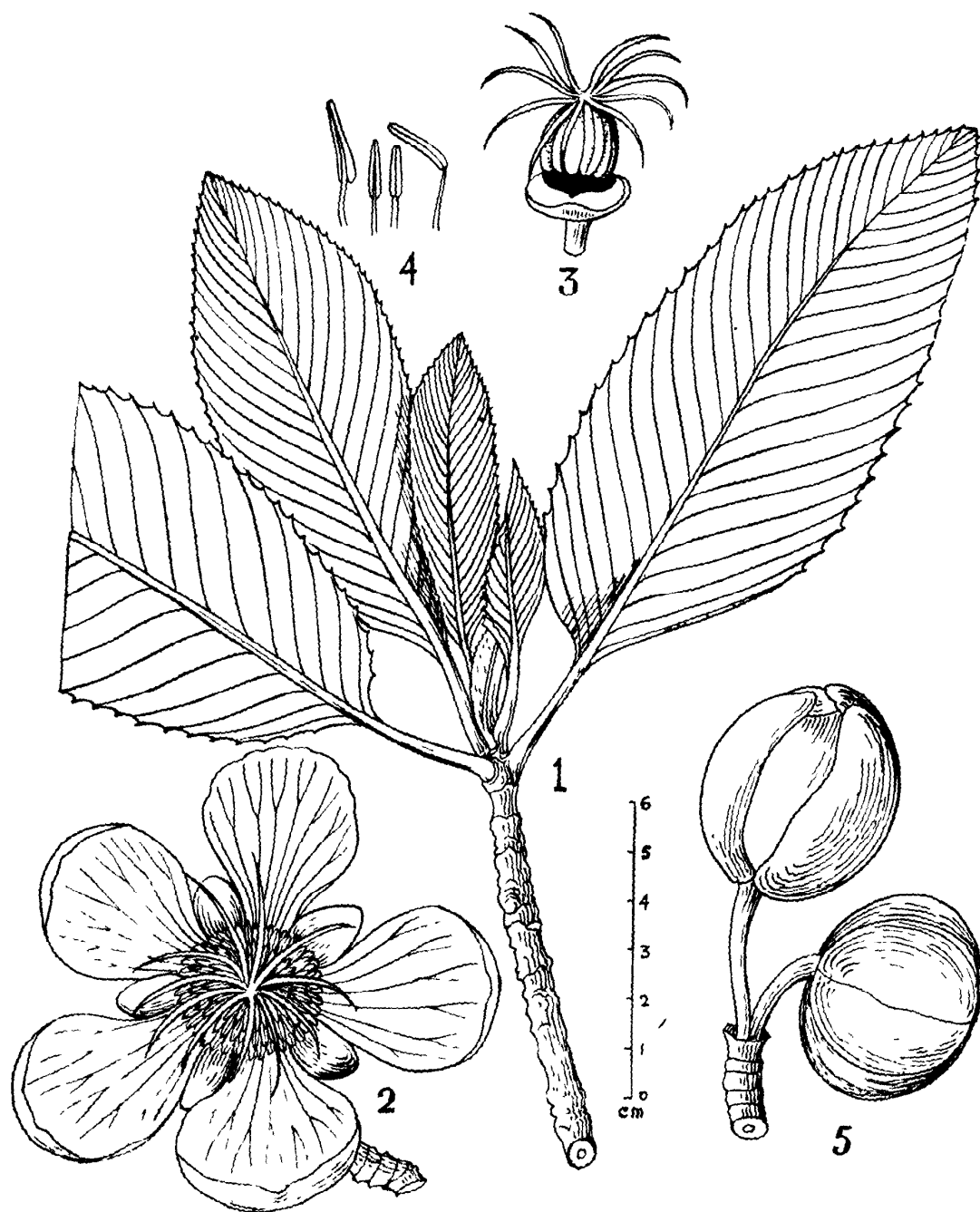
L. Sp. Pl. 1: 535. 1753; Benth. & Hook. f. Gen. Pl. 1:13. 1862; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1: 36. 1872; Hoogland in Blumea 7: 3. 1952; Hutchinson, Gen. Fl. Pl. 1: 159. 1964. **Wormia* Rottb. Nye Samml. Vidensk. Selsk. Skrift. 2: 531. 1783.

Trees Leaves large, sometimes stipulate; petioles channelled above. Flowers showy, solitary or in terminal racemes, sometimes fasciculate on short shoots; bracts and bracteoles caducous if present. Sepals 5, persistent. Petals 5, yellow or white, caducous. Stamens numerous, filaments equal or unequal in length, anthers linear, loculi parallel, inner erect and introrse, outer recurved and extrorse. Carpels 5–20, coherent to the axis, ovules 4–80. Pseudocarps indehiscent, enclosed by enlarged, thick sepals.

Distrib. : 60 species in the world. INDIA, BURMA, SRI LANKA, MALAYSIA, THAILAND, BORNEO, JAVA, SUMATRA, CELEBES, MOLUCCAS, PHILIPPINES, NEW GUINEA, AUSTRALIA, SEYCHELLE ISLANDS, FIJI ISLANDS, MADAGASCAR. 7 species in India.

- 1a. Flowers 15–20 cm across. Carpels 14–20. Fruits 8–10 cm across
...4. **D. indica**
- 1b. Flowers 3–12 cm across. Carpels 5–12. Fruits up to 3.5 cm across:
 - 2a. Stamens equal in length
...3. **D. bracteata**
 - 2b. Stamens unequal, inner ones longer :
 - 3a. Flowers white
.. 6. **D. retusa**
 - 3b. Flowers yellow :
 - 4a. Flowers up to 5 cm across. Anthers opening by longitudinal slits:
 - 5a. Flowers 2.5–3.0 cm across; pedicels without bracteoles
...5. **D. pentagyna**
 - 5b. Flowers 4–5 cm across; pedicels with caducous bracteoles
...7. **D. scabrella**
 - 4b. Flowers 10–12 cm across. Anthers opening by apical pores:
 - 6a. Outer sepals 15 × 12 mm, inner ones 18 × 14 mm. Outer stamens 7 mm long
...1. **D. andamanica**
 - 6b. Outer sepals at least 25 × 18 mm, inner ones 30 × 20 mm. Outer stamens at least 10 mm long
...2. **D. aurea**

*Hutchinson (l.c.) treats it as a distinct genus.



Dillenia aurea J. E. Smith

Figs. 1—5 : 1. Branch with young leaves 2. Flower
3. Gyncecium 4. Stamens 5. Fruits

1. *Dillenia andamanica* Parkinson in Indian For. 61: 452. t. 29. 1935. *D. pilosa* auct. non Ham. (1827) nec Roxb. (1832): Kurz in J. Asiat. Soc. Beng. 41 (2): 291. 1872; Parkinson, For. Fl. Andaman Isls. 71. 1923.

Deciduous trees up to 30 m tall. Leaves 25–45 × 10–15 cm, narrowly obovate to oblanceolate, with 40–45 pairs of nerves, obtuse at apex, entire to dentate along margin, acute at base, strigose mainly on nerves beneath; petioles 0.5–2.0 cm. Flowers solitary or in pairs, ca. 12 cm across, on shoots up to 3 mm long, bracteate; pedicels 1.0–3.5 cm long, more or less strigose hirsute. Sepals sericeous outside, margin ciliate. Petals 5 × 3 cm, yellow, obovate. Inner stamens with reflexed apex, 13 mm long. Carpels 8 (rarely 6), arranged around the conical receptacle, each with 15–20 ovules, styles recurved, 10 mm long. Fruits 2.5 cm across, subglobose, orange in colour.

Type : Bomlungta, Middle Andaman, 12th Apr. 1916, *Parkinson* 1185 (K CAL !).

Fls. : Mar -May ; *Frts.* : May-July.

Distrib. : INDIA : Endemic to the Andaman & Nicobar Islands.

Notes : A common tree, leafless when flowering ; wood used as fuel.

2. *D. aurea* J. E. Smith in Exot. Bot. 2: 65. t. 92, 93. 1806; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind 1:37. 1872; Prain, Beng. Pl. 1: 196. 1903 (Repr. ed. 1: 126.1963); Duthie, Fl. Upper Gang. Pl. 1: 21.1903 (Repr. ed. 1: 23. 1960); Haines, Bot. Bih. & Or. 2: 7. 1921 (Repr. ed. 1: 7. 1961); Parkinson in Indian For. 61: 450. 1935. *D. pulcherrima* Kurz in J. Asiat. Soc. Beng. 40 (2): 46. 1871.

Chamaggai (Beng.); *Dhengr* (Nep.); *Rai* (Or.).

Figs. 1–5

Deciduous trees up to 14 m tall. Leaves 20–40 × 10–25 cm, elliptic-oblong, rounded to truncate above, entire to slightly undulate dentate along margin, nerve endings often with small tufts of hairs; petioles 3.0–6.5 cm long. Flowers solitary or rarely in pairs, 10–12 cm across. Sepals coriaceous, ciliate along margin. Petals yellow, obovate. Inner stamens with reflexed apex, 16–21 mm long. Carpels 10–12, each with 19–22 ovules, styles spreading, 19 mm long. Fruits orange-yellow, 30–32 mm across, subglobose. Seeds obovoid, 4 × 3 mm, glossy, dark-brown.

Type : The plates 92 & 93 of Smith in Exot. Bot. 2: 65. 1806 are treated as types (Hoogland in Blumea 7: 128. 1952).

Fls. : Mar.-May; *Frts.* : May-July.

Distrib. : In the Sal forests of Chotanagpur Plateau, Upper Gangetic Plain and N. W. India. INDIA : Andaman & Nicobar Islands, Bihar, Madhya Pradesh, Orissa, Uttar Pradesh, West Bengal; BURMA, N. E. THAILAND.

Uses : Wood mostly used as fuel; fruits eaten by elephants.

3. ***D. bracteata*** Wight, Ic. Pl. Ind. Or. 2:4. t. 358 1840 (as *bractiata* in tab.); Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 37. 1872 *pro parte*, excl. syn. *D. repanda* Roxb. (1832); Gamble, Fl. Pres. Madr. 1: 7. 1915 (Repr. ed. 1: 5. 1957). *Wormia bracteata* (Wight) Hook. f. & Thoms. Fl. Ind. 1: 68. 1855.

Bettakanigala (Kan.); *Kate gunna* (Mal.); *Kolikkay* (Tam.); *Ciruteku* (Tel.).

Evergreen trees with tomentose, younger shoots. Leaves 10–16 × 5–10 cm, elliptic to obovate, 14–20-nerved, hirsute, specially on the nerves above, glabrescent at maturity, margin undulate or dentate, apex obtuse to retuse. Flowers yellow, 9 cm across, in racemes. Bracts caducous, lanceolate or spatulate, hirsute; bracteoles lanceolate. Sepals coriaceous, silky pubescent. Petals obovate. Stamens 9 mm long, anthers linear, 2-porose. Carpels 5, each with 30 ovules in two rows, styles 9 mm long. Fruits subglobose, 2.5–3.0 cm across with enclosed sepals, each with 1 seed. Seeds ovoid, 5 × 4.5 mm, dark-brown to black, arillate.

Type : Balaghaut mountains near Madras, Wight 13 (K, GH, CAL!).

Fls. : Dec.-Apr.; *Frts.* : May-June.

Distrib. : Endemic to Deccan Peninsula. INDIA : Kerala, Tamil Nadu.

Uses : Wood is used as timber.

4. ***D. indica*** L. Sp. Pl. 1 : 535. 1753, Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 36. 1872 *pro parte* excl. syn. *D. elliptica* Thunb. (1791); Cooke, Fl. Pres. Bomb. 1 : 6. 1901 (Repr. ed. 1 : 6. 1958); Prain, Beng. Pl. 1 : 195. 1903 (Repr. ed. 1 : 126. 1963); Duthie, Fl. Upper Gang. Pl. 1 : 21. 1903 (Repr. ed. 1 : 22. 1960); Gamble, Fl. Pres. Madr. 1 : 7. 1915 (Repr. ed. 1 : 5. 1957); Haines, Bot. Bih. & Or. 2: 6. 1921 (Repr. ed. 1 : 7. 1961); Kanjilal *et al.* Fl. Assam 1 : 10. 1934. *D. speciosa* Thunb. in Trans. Linn. Soc. 1 : 200. 1791. *nom. superfl. illeg.*

Otingah (Asm.); *Chalta* (Beng.); *Chalta* (Hind.); *Betta Kanagala* (Kan.); *Syalita* (Mal.); *Mota Karmal* (Mar.); *Ramphal*, *Mechiaphal* (Nep.); *Oae* (Or.); *Uva* (Tam.); *Uva*, *Pedda Kalinga* (Tel.).



Flowering twig of *Dillenia indica* L.

Evergreen trees up to 30 m tall. Leaves 15–30 × 5–12 cm, oblong, apex acute to acuminate, margin more or less dentate, 25–50-nerved, glabrous above, strigose specially on nerves beneath; petioles 2.5–7.5 cm long. Flowers solitary, pendant. Sepals elliptic, fleshy. Petals 7–9 cm long, white. Outer stamens 13–15 mm long, inner ones 20–22 mm long with reflexed apex. Carpels with 40–80 ovules, style 25 mm long, linear-lanceolate, white. Fruits yellowish-green, with enclosed sepals. Seeds immersed in glutinous pulp, reniform, 4–6 mm across, black, margin spiny.

Type : The plates 38 & 39 in Rheede, Hort. Malab. 3. 1683 are treated as types.

Fls. : May-July; *Frts.* : Sept.-Feb.

Distrib. : INDIA : Andhra Pradesh, Assam, Bihar, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Uttar Pradesh, West Bengal; BURMA, S. CHINA, THAILAND, CAMBODIA, VIETNAM, MALAYSIA, JAVA, SUMATRA, BORNEO.

Uses : The timber is used for making tool handles, gunstocks and bottom of boats. Ripe sepals are used to prepare jam and jellies and cold drinks. They possess tonic and laxative properties and are used for abdominal pains. Dry leaves are used for polishing ivory and horn.

Notes : This beautiful evergreen tree is often cultivated as an ornamental. Fruits are edible and are dispersed by animals.

5. *D. pentagyna* Roxb. Pl. Corom. 1: 21. t. 20. 1795; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 38. 1872. *D. pilosa* Roxb. Fl. Ind. 2 : 652. 1832 (non Ham. 1827); Cooke, Fl. Pres. Bomb. 1: 6. 1901 (Repr. ed. 1: 7. 1958); Duthie, Fl. Upper Gang. Pl. 1: 21. 1903 (Repr. ed. 1 : 23. 1960); Prain, Beng. Pl. 1: 195. 1903 (Repr. ed. 1 : 126. 1963); Gamble, Fl. Pres. Madr. 1: 8. 1915 (Repr. ed. 1 : 6. 1957); Haines, Bot. Bih. & Or. 2 : 7. 1921 (Repr. ed. 1: 7. 1961); Kanjilal *et al.* Fl. Assam 1: 11. 1934.

Akshi (Asm.); *Karkotta* (Beng.); *Aggai*, *Kallai* (Hind.); *Kanigala*, *Kadukanigala* (Kan.); *Punna* (Mal.); *Karmal* (Mar.); *Tatri* (Nep.); *Rai* (Or.); *Naitekku* (Tam.); *Chinnakalinga*, *Raduvana* (Tel.).

Deciduous trees up to 25 m tall. Leaves 20–50 × 10–20 cm, obovate-oblong, obtuse at apex, nearly entire to dentate along margin, leaves on young plants much bigger; petioles 1.5–5.0 cm long, with persistent wing-like stipules. Flowers 2–7, on short shoots up to 3 mm long; pedicels 2.5–6.0 cm long; bracts hairy. Sepals 8–12 mm long, elliptic. Petals 15–20 mm long. Stamens in 2 distinct groups, outer 60–90, each 2.5–4.0 mm

long, inner 10, each 6–9 mm long with apex reflexed in bud. Carpels 5 (– 6), each $3.5\text{--}4.0 \times 1.4$ mm with 5–20 ovules, styles 4 mm long. Fruits 15×13 mm, subglobose, yellow, orange or red, 1 (–2)-seeded. Seeds ovoid, 5.0×3.5 mm, exarillate.

Type : Coromandel, *Roxburgh s. n.* (BM).

Fls. & Frts. : June–Nov.

Distrib. : INDIA : Andaman & Nicobar Islands, Andhra Pradesh, Assam, Bihar, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Sikkim, Uttar Pradesh, West Bengal; BURMA, JAVA, LESSER SUNDA ISLANDS, CELEBES, THAILAND, VIETNAM, CHINA.

Uses : Wood is used for planking, panelling, furniture, and also as match wood. Buds and fruits are eaten. Leaves are used as green manure; dry leaves used for polishing ivory and horn. Bark yields a fibre suitable for cordage.

6. ***D. retusa*** Thunb. in Trans. Linn. Soc. 1: 200. t. 19. 1791; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1: 37. 1872; Gamble, Fl. Pres. Madr. 1: 7. 1915 (Repr. ed. 1: 5. 1957). *Wormia retusa* (Thunb.) Hook. f. & Thoms. Fl. Ind. 1: 68. 1855.

Evergreen trees up to 20 m tall. Leaves $10\text{--}20 \times 7\text{--}11$ cm, obovate, 10–14-nerved, apex obtuse to retuse, glabrous above, strigose on nerves beneath; petioles 1.3–2.2 cm. Flowers 6–8 cm across, few, in racemes; pedicels 1–3 cm long, without bracteoles. Inner 3 sepals bigger, 20×20 mm, orbicular to ovate, silky hairy outside. Petals obovate. Outer stamens 6–7 mm long, inner ones 11 mm long with reflexed apex. Carpels 5–6, each with 22–34 ovules in two rows, styles 7–8 mm long. Fruits orange in colour, subglobose, 2–3 cm across, with enclosed sepals. Seeds many, ovoid, 3×2 mm, exarillate.

Type : Ceylon, Herb. *Thunberg* (UPS; Microfiche No. 12869, CAL 1).

Fls. : Apr.–Sept.

Distrib. : INDIA : Karnataka, Tamil Nadu; SRI LANKA.

7. ***D. scabrella*** (D. Don) Roxb. ex Wall. Pl. As. Rar. 1: 20. t. 22. 1830; Hook. f. & Thoms in Hook. f. Fl. Brit. Ind. 1: 38. 1872; Prain, Beng. Pl. 1: 195. 1903 (Repr. ed. 1: 126. 1963); Kanjilal *et al.* Fl. Assam 1: 11. 1934. *Colbertia scabrella* D. Don, Prod. Fl. Nep. 226. 1825. *D. pilosa* Ham. in Trans. Linn. Soc. 15: 102. 1827 *pro parte* excl. cit. Roxb. Hort. Beng. 43. 1814.

Daine Oksi, *Banji-ou* (Asm.); *Hargeza* (Beng.).

Deciduous trees up to 30 m tall. Leaves 15–30 × 6–14 cm, ovate to narrowly obovate, with 35–45 nerves, more or less scabrid above, strigose hirsute on nerves beneath, obtuse to acute at apex, more or less dentate along margin; petioles 2.5–6.0 cm. Sepals ovate. Petals 25 × 10 mm, bright yellow. Outer stamens 4–5 mm long, inner 9–10 mm long with reflexed apex. Carpels 5–7, glabrous, each with 8–10 ovules, styles recurved to spreading, 8 mm long. Fruits orange in colour, 24 mm across with enclosed sepals. Seeds obovoid, 5.0 × 3.5 mm, glossy black, glabrous.

Type : Chittagong (HBC), Wallich 944 (K, CAL!).

Fls. : Jan.-June; *Frts.* : May-July.

Distrib. : INDIA: Assam, Meghalaya; NEPAL, BURMA, LAOS, CAMBODIA, VIETNAM.

Uses : The wood is of good quality ; fruit is edible.

DOUBTFUL SPECIES

1. *Dillenia mansonii* (Gage) Hoogl. in *Blumea* 7: 83. 1952. *Wormia mansonii* Gage in *J. Asiat. Soc. Beng.* 2 (N.S.) : 73. 1906.

Hoogland (l. c.) remarked on a specimen of Assam (*Masters* 1737, July, 1845, CAL) as follows : 'The Assam specimen is sterile and referred here with doubt'.

2. *D. repanda* Roxb. *Fl. Ind.* 2: 652. 1832.

According to Hoogland (l. c.) this species, described from the Deccan Peninsula, has insufficient description and no type specimen seems to exist. The species comes near to *D. bracteata* Wight, to which it was reduced by Hooker & Thomson (1855).

3. TETRACERA

L. Sp. Pl. 1: 533. 1753; Benth. & Hook. f. *Gen. Pl.* 1: 12. 1862; Hook. f. & Thoms. in Hook. f. *Fl. Brit. Ind.* 1: 31. 1872; Hoogland in *Reinwardtia* 2: 186. 1953; Hutchinson, *Gen. Fl. Pl.* 1: 157. 1964. *Delima* L. *Gen. Pl.* ed. 5: 231. 1754; Hook. f. & Thoms. l. c. 31. 1872.

Shrubs or lianas, sometimes straggling. Leaves simple, often scabrid; petioles short, furrowed. Panicles axillary or terminal, few to many-flowered. Flowers scented. Sepals 4–5, persistent, often reflexed in fruit.

Petals 3–5, white to reddish white, emarginate at apex, caducous. Stamens numerous with broad connectives. Carpels 1–4, free, each with 4–20 ovules, style short. Follicles ovoid to globose with a short beak, coriaceous, dehiscent by 1–2 longitudinal slits, one to few-seeded. Seeds glossy black or dark-brown.

Distrib. : 40 species in the Tropics. INDIA, SRI LANKA, BURMA, MALAYSIA, JAVA, SUMATRA, BORNEO, CELEBES, PHILIPPINES, NEW GUINEA, AUSTRALIA, CHINA, THAILAND, CAMBODIA, VIETNAM, AFRICA, AMERICA. 4 species in India.

- 1a. Inflorescence up to 12-flowered, without leaves at base. Carpels 2–4 :
 - 2a. Sepals glabrous outside, sericeous inside except margin
 - ...1. *T. akara*
 - 2b. Sepals glabrous
 - ...2. *T. indica*
- 1b. Inflorescence 30- or more-flowered, with 1–5 small leaves at base. Carpel 1 (rarely 2) :
 - 3a. Follicles glabrous
 - ...3. *T. sarmentosa*
ssp. *andamanica*
 - 3b. Follicles hirsute
 - ...4. *T. scandens*

- 1. *Tetracera akara* (Burm. f.) Merr. in Philipp. J. Sci. 19: 366. 1921. *Calophyllum akara* Burm. f. Fl. Ind. 121. 1768. *T. rheedii* DC. Syst. 1: 402. 1818; Wight & Arn. Prod. Fl. Pen. Ind. Or. 1: 5. 1834; Wight, Ic. Pl. Ind. Or. 1. t. 70. 1838. *T. laevis* auct. non Vahl: DC. Syst. 1: 401. 1818; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1: 31. 1872; Gamble, Fl. Pres. Madr. 1: 7. 1915 (Repr. ed. 1: 5. 1957).

Akara patsjoti (Mal.).

Large liana up to 25 m. Leaves 8–13 × 3.5–6.0 cm, elliptic-oblong to lanceolate, glabrous, coriaceous, glossy green, acute to acuminate at apex. Flowers usually 5–8, in axillary or terminal panicles. Sepals 4, each 8–10 × 6–8 mm. Petals 3–4, greenish white. Stamens 7–8 mm long. Follicles almost globose, ca. 10 mm across. Seeds 2 × 3 mm; aril fimbriate.

Type : The plate 8 in Rheede, Hort. Malab. 5: 15. 1685 is treated as the type.

Fls. & Frts. : Sept.–Mar.

Distrib. : INDIA : Kerala; SRI LANKA, MALAYSIA, BORNEO, CELEBES, PHILIPPINES, CAMBODIA.

Ecol. : In evergreen forests up to 750 m.

2. *T. indica* (Houtt. ex Christm. & Panz.) Merr. Int. Rumph. Herb. Amb. 367. 1917. *Assa indica* Houtt. ex Christm. & Panz. Pfl. Syst. 4: 40. t. 26. f. 1. 1779. *Tetracera assa* DC. Syst. 1: 402. 1818; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1: 31. 1872.

Shrubs or lianas up to 5 m tall. Leaves 5–12 × 3–6 cm, elliptic to oblong or obovate, slightly glossy above. Flowers usually 4–7, in terminal panicles on short branches. Sepals 4, each 8–10 × 7–9 mm. Petals 3–5, usually 4, reddish white. Stamens 6–8 mm long. Carpels with a few, stiff hairs on the back. Follicles globose, 10 mm across with 2–6 mm long beaks. Seeds 3.5 × 2.5 mm; aril finely fimbriate.

Type : Original of Houttuyn's figure (*Assa indica*) in Herbarium Houttuyn Pl. Ind. Or. Java, is treated as the type (Hoogland in Reinwardtia 2: 208. 1953).

Fls. & Frts. : Feb.-Oct.

Distrib. : INDIA : Assam; BURMA, MALAYSIA, JAVA, SUMATRA, THAILAND, CAMBODIA, VIETNAM, CHINA.

Ecol. : In open forests from sea-level up to 600 m.

Uses : Leaves used as sand paper and leaf paste applied to skin-itches (Burkill, Dict. Econ. Prod. Mal. Pen. 2 : 2143. 1935).

Notes : Though no specimen is available at CAL, Hoogland (l. c. 1953) reports the presence of a single specimen from Assam in Pierre herbarium (P). In the CAL herbarium there is one sterile specimen named *T. rheedii* (Travancore, February 7, 1827, Wallich N. L. 6627B) and subsequently identified by Hoogland as *T. indica*. In the absence of any floral material, identity of this specimen cannot be ascertained.

Though Hoogland (l. c. 1953) cited *T. malabarica* Lam. (Illustr. 3: 32. pl. 485. 1823) as a synonym of *T. indica*, he indicated the occurrence of the latter in Assam only within the limits of India. The author has not seen any specimen from Malabar nor he had any opportunity to examine the type of *T. malabarica* Lam. He is therefore not in a position to comment on the conspecificity of the two taxa.

3. *T. sarmentosa* (L.) Vahl subsp. *andamanica* (Hoogl.) Hoogl. in Blumea 9: 588. 1959. *T. asiatica* (Lour.) Hoogl. subsp. *andamanica* Hoogl. in Fl. Mal. I. 4: 144. 1951 cum descr. angl. et in Reinwardtia 2: 195. 1953. *Delima sarmentosa* L. var. *glabra* Hook. f. & Thoms. Fl. Ind. 1: 61. 1855 et in Hook. f. Fl. Brit. Ind. 1: 31. 1872; Prain, Beng. Pl. 1: 195. 1903 (Repr. ed. 1: 126. 1963); Kanjilal et al. Fl. Assam 1: 10. 1934.

Ou lota, Panilewa (Asm.).

Figs. 1—5



Tetracera sarmentosa (L.) Vahl subsp. *andamanica* (Hoogl.) Hoogl.

Figs. 1—5 : 1. Branch with flowers 2. Seed with aril
3. Stamen 4. Carpel 5. Follicle

Shrubs up to 3 m tall or lianas up to 6 m. Young branches and shoots of inflorescences strigose with sparse or dense, divergent, tufts of 3–12 hairs. Leaves 5–12 × 2–6 cm, oblong, acute to obtuse at apex, sparsely strigose on nerves and midrib beneath. Sepals 5, outer two 2.0 × 1.5 mm, inner three 4 × 3 mm, hirsute outside. Petals 3, white or yellowish white, each 3–4 × 2–3 mm. Stamens 100–125, each 3–4 mm long. Follicles with 2–5 mm long beaks, purplish, shining, 1 (–2)-seeded. Seeds 4 × 3 mm; aril up to 5 mm long, fimbriate.

Type : Port Blair, Andamans, July 6, 1884, *King's Collector* 337 (L, CAL!, G, K).

Fls. : May-Oct.; *Frts.* : June-Feb.

Distrib. : INDIA : Andaman & Nicobar Islands, Assam, Meghalaya, Nagaland, Tripura, West Bengal; BURMA, MALAYSIA.

Ecol. : In evergreen forests and on hills up to 600 m.

4. *T. scandens* (L.) Merr. Int. Rumph. Herb. Amb. 365. 1917. *Tragia scandens* L. in Stickm. Herb. Amb. 18. 1754. *Delima sarmentosa* L. var. *hebecarpa* (DC.) Hook. f. & Thoms. Fl. Ind. 1: 61. 1855 et in Hook. f. Fl. Brit. Ind. 1: 31. 1872. *D. hebecarpa* DC. Prodr. 1: 70. 1824.

Shrubs up to 2 m tall or lianas up to 30 m. Leaves 6–15 × 3–7 cm, oblong to obovate. Flowers up to 200 in terminal panicles. Sepals 4, sometimes 5, scabrid-strigose outside, 3 × 2 mm, ciliate along margin. Petals 3, each 3–5 × 2.0–3.5 mm, white, yellowish or reddish-white. Stamens 65–80, each 3 mm long. Carpels densely hairy. Follicles 10 × 6 mm, with 1–3 mm long beaks, 1 (–2)-seeded. Seeds 4 × 3 mm, glossy black; aril 2–3 mm long, fimbriate.

Type : The plate 9 in Rumphius, Herb. Amb. 5: 13. 1747 is treated as the type.

Distrib. : INDIA : Andaman & Nicobar Islands; MALAYSIA, CHINA.

Notes : Though no specimen is available at CAL, Hoogland (Reinwardtia 2: 192. 1953), has reported its occurrence in the above islands. The two specimens (*Lobb* 133) at CAL represent the collection made by Lobb in March 1868 (flowering and early fruiting) from the plants cultivated in the Botanic Garden, Howrah. The source of this introduction seems to be from Singapore, Malaysia (*Lobb s. n.*, K), where Lobb travelled for plant collection during 1843 on behalf of the firm James Veitch & Sons.

ABBREVIATIONS OF LANGUAGES

Assamese	...	Asm.
Bengali	...	Beng.
Hindi	...	Hind.
Kannada	...	Kan.
Malayalam	...	Mal.
Marathi	...	Mar.
Nepali	...	Nep.
Oriya	...	Or.
Tamil	...	Tam.
Telugu	...	Tel.

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D. aurea	3, 4, 5	subsp. <i>andamanica</i>	10, 11, 12
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<i>D. elliptica</i>	6	<i>Tragia scandens</i>	13
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ERRATA

<i>Page</i>	<i>Line</i>				<i>Subject</i>
2	34	...	...	...	For 1828 read 1829
2	35	...	...	...	For 1828 read 1831
7	23	...	...	...	Read <i>D. pilosa</i> Roxb. Fl. Ind. 2:652. 1832 (non Ham. 1827) after Kanjilal et al. Fl. Assam 1:11. 1934 in line 29.

FASCICLES OF FLORA OF INDIA

Family	Fascicle	Date of Publication
CORIARIACEAE	1	Oct. 1978
PAEONIACEAE	1	Oct. 1978