

FLORA OF
MADHYA PRADESH

V. MUDGAL, K. K. KHANNA & P. K. HAJRA

स्वतंत्रता के 50 वर्ष



Years
of
Independence

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FLORA OF MADHYA PRADESH

VOLUME II

ANGIOSPERMS
(Primulaceae to Ceratophyllaceae)

Editors

V. Mudgal
K.K. Khanna
P.K. Hajra



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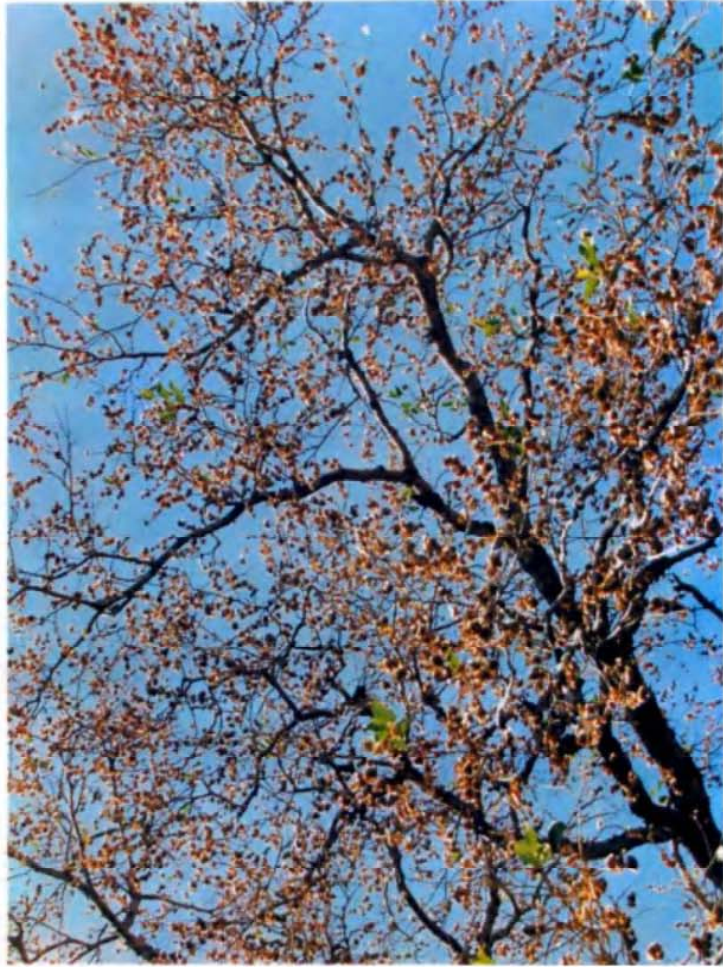


Plate 1. *Holoptelea integrifolia* (Roxb.) Planch.
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84. PRIMULACEAE

(Ramesh Kumar)

About 22 genera and 800 species; subcosmopolitan especially Northern hemisphere; 3 genera and 6 species in M.P.

- 1a. Leaves cauline; flowers solitary or in racemes; corolla-lobes contorted:
 - 2a. Filaments hairy; capsules circumscissile ...1. *Anagallis*
 - 2b. Filaments glabrous; capsules dehiscing by valves or bursting irregularly ...2. *Lysimachia*
- 1b. Leaves radical; flowers in one or more superposed whorls or umbels; corolla-lobes imbricate ...3. *Primula*

1. ANAGALLIS (Tourn.) L.

Herbs, annual or perennial, erect or prostrate; stems slender, terete or angular, glabrous. Leaves opposite or alternate, entire, sessile, exstipulate. Flowers axillary, solitary, sessile or pedicellate, ebracteate. Calyx campanulate, 5-partite. Corolla rotate to urceolate, 5-partite; lobes small or large. Stamens 5, epipetalous; filaments hairy. Ovary 1-locular; ovules many; style simple; stigma capitate. Fruit a capsule, globose or subglobose, circumscissile, many-seeded. Seeds smooth.

About 20 species; Europe, Africa and S. America; 2 in M.P.

- 1a. Leaves opposite; corolla red or blue, lobes fringed with glands ...1. *A. arvensis*
- 1b. Leaves alternate, rarely lower ones opposite; corolla white, lobes not fringed with glands ...2. *A. pumila*

1. *Anagallis arvensis* L., Sp. Pl. 148. 1753; Hook. f., Fl. Brit. India 3: 506. 1882; P. Taylor in Kew Bull. 1955: 329. 1955. **Fig. 1.**

Herbs, annual, erect or decumbent-ascending, up to 60 cm high; stems branched from base; branches 4-angled, narrowly winged, glabrous. Leaves opposite, ovate-lanceolate, 1.5-2 x 0.5-1.5 cm, subacute at apex, glabrous. Flowers axillary, solitary; pedicels 1-3 cm long, usually longer than leaves, recurved in fruits. Calyx-segments lanceolate, acuminate,

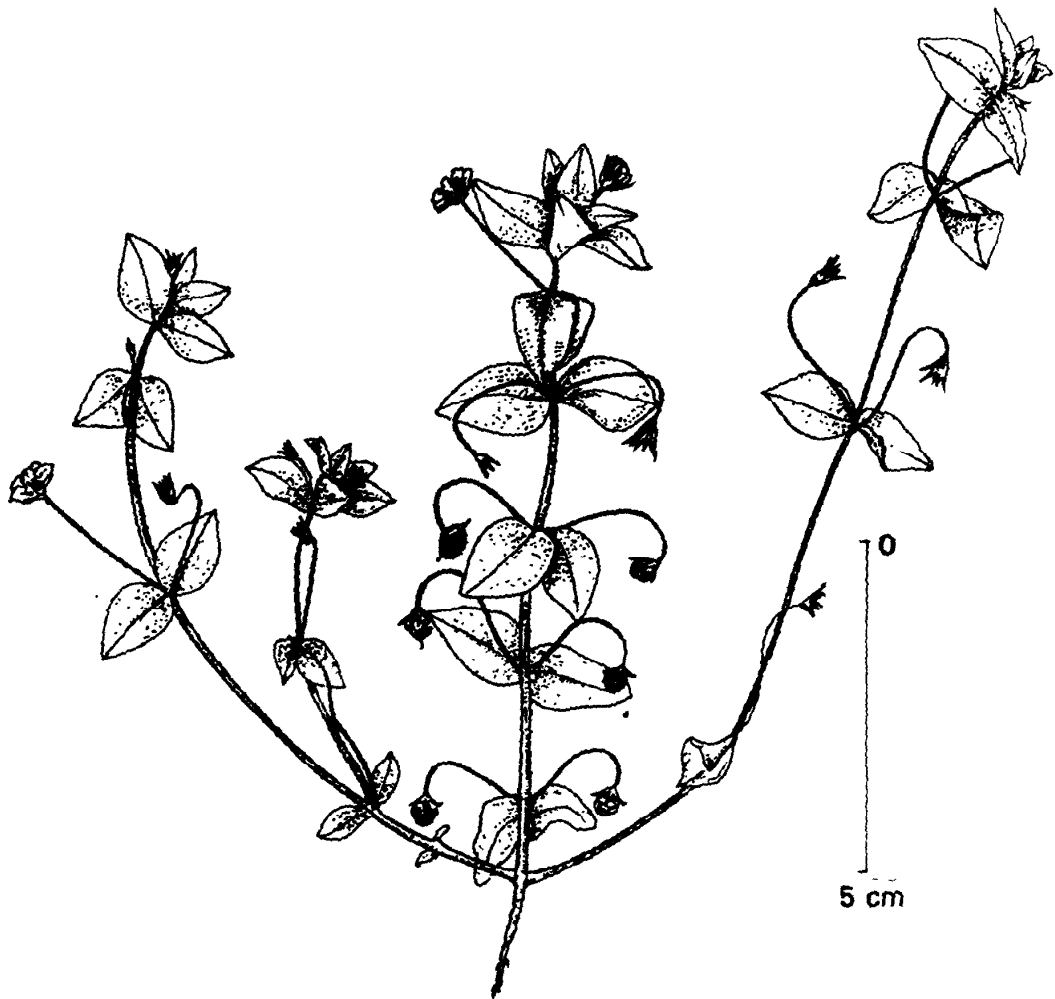


Fig. 1. *Anagallis arvensis* L.

crenulate. Corolla red or blue; lobes fringed with minute glands. Capsules globose, 4-6 mm across. Seeds flattened, somewhat 3-angled.

Common in cultivated fields and near water channels. Bilaspur, Chhatarpur, Damoh, Hoshangabad, Indore, Panna, Raipur, Rewa, Sagar, Satna, Sidhi, Surguja. *Fl. & Fr.*: Dec. March.

The plant has expectorant and stimulant properties and is used to treat dropsy, leprosy and hydrophobia.

2. *Anagallis pumila* Sw., Prodr. 40. 1788; P. Taylor in Kew Bull. 1955: 342. 1955. *Centunculus tenellus* Duby in DC., Prodr. 8: 72. 1844; Hook. *f.*, Fl. Brit. India 3: 506. 1882.

Herbs, annual, erect, 5-20 cm high; stems slightly margined. Leaves alternate, rarely opposite, ovate or obovate to suborbicular, 0.5-1 x 0.4-0.5 cm, acute or obtuse at apex, cuneate at base, glabrous. Flowers axillary, solitary. Calyx-segments lanceolate-oblong, 2-3 mm long, acute or mucronate. Corolla white; lobes ovate-lanceolate, apiculate. Capsules subglobose, as long as calyx. Seeds 3-angled.

Common in moist, shady places alongwith *Stylidium tenellum* and grasses. Balaghat, Hoshangabad, Raigarh, Rajnandgaon, Sagar, Shivpuri. *Fl. & Fr.*: Sept. Feb.

2. LYSIMACHIA L.

Herbs. Leaves opposite, alternate or whorled, entire, usually minutely gland-dotted. Flowers solitary or in racemes. Calyx 5-6-lobed. Corolla white or pink, rotate or infundibuliform, 5-6-lobed. Stamens inserted at the base of corolla-lobes. Ovary subglobose; style filiform, persistent. Fruit a capsule, dehiscent by 5 valves or bursting irregularly, many-seeded. Seeds 3-angled or plano-convex.

About 150 species; temperate regions especially Europe, E. Asia and N. America; 3 in M.P.

1a. Corolla white:

2a. Corolla hardly exceeding the calyx;

stamens longer than corolla ...1. *L. candida* subsp. *obovata*

- 2b. Corolla twice as long as the calyx; stamens shorter than corolla ...2. *L. decurrens*
- 1b. Corolla pink ...3. *L. leschenaultii*

1. *Lysimachia candida* Lindl. subsp. *obovata* (Buch.-Ham. ex Hook. f.) Kunth in Engl., Pflanzenr. 22: 301. 1905. *L. obovata* Buch.-Ham. ex Hook. f., Fl. Brit. India 3: 502. 1882.

Herbs, erect, branched, more or less glaucous, up to 30 cm high. Leaves elliptic-lanceolate, 2-6 x 1-2 cm, acute or obtuse at apex, minutely gland-dotted, usually petiolate. Flowers in terminal racemes; bracts as long as the pedicels. Calyx-lobes lanceolate. Corolla white; lobes obovate. Capsules 5-valved or bursting irregularly. Seeds 3-angled.

Common in grassy fields and moist places, usually in association with *Polygonum* sp. and *Ludwigia* sp. Balaghat, Bilaspur, Mandla, Raipur, Rajnandgaon, Shahdol, Surguja. *Fl. & Fr.*: March - Dec.

2. *Lysimachia decurrens* G. Forster, Fl. Ins. Austr. 12. 1786. *L. javanica* Blume, Bijdr. 14: 736. 1826; Hook. f., Fl. Brit. India 3: 502. 1882. **Fig. 2.**

Herbs, erect, robust, up to 50 cm high; stems angular, provided with lenticels. Leaves usually opposite, narrowly ovate-lanceolate, 3-6 x 1-2.5 cm, subacuminate at apex, decurrent along the stem, membranous, glabrous, with glands often confined to the margin, long petiolate. Flowers in terminal, 1-5-flowered, 10-25 cm long, sometimes leafy racemes; pedicels obliquely erect or recurved, provided with stalked glands; bracts linear. Calyx-lobes lanceolate, acuminate, with longitudinal, black glands inside. Corolla white, deeply lobed; lobes oblong, rounded. Filaments with small, sessile glands. Capsules longer than calyx, bursting irregularly.

Rare. Bilaspur. *Fl. & Fr.*: March - April.

3. *Lysimachia leschenaultii* Duby in DC., Prodr. 8: 61. 1844; Hook. f., Fl. Brit. India 3: 501. 1882.

Herbs. Leaves alternate, lanceolate, acute at apex, smooth or crisped on the margins, glabrous, gland-dotted. Flowers in terminal, densely flowered racemes. Calyx-lobes lanceolate, acuminate. Corolla pink; lobes obovate-spathulate. Stamens exserted; filaments slender. Capsules many-seeded.



Fig. 2. *Lysimachia decurrens* G. Forster

Scarce in sandy alluvial core on gneissic rocks near water fall. Surguja (Lal and Panigrahi, 1967). *Fl. & Fr.*: April.

3. PRIMULA L.

Herbs. Leaves radical, in rosette. Flowers in superposed whorls or umbels. Calyx dentate or deeply divided. Corolla white or red, hypocrateriform or infundibuliform; mouth annulate or with folds opposite the lobes; tube short or long. Stamens inserted on the corolla-tube; filaments short; anthers included. Ovary globose or ellipsoid; style filiform; stigma capitate. Fruit a capsule, 5-valved, 2 or rarely more-seeded. Seeds angular or subglobose.

About 400 species; Northern hemisphere including Ethiopia, tropical Asia to Java and New Guinea; one in M.P.

Primula umbellata (Lour.) Bentvelzen, *Fl. Males. Ser. 1. 6:* 191. 1962. *Drosera umbellata* Lour., *Fl. Cochinch. 186.* 1790. *Androsace saxifragaefolia* Bunge, *Enum. Pl. China Bor. 53.* 1831 & in *Mém. Sav. Etr. Acad. Petersb. 2:* 127. 1835; Hook. *f.*, *Fl. Brit. India 3:* 496. 1882. *A. umbellata* (Lour.) Merr. in *Philipp. J. Sci. 15:* 237. 1919.

Herbs, annual, glandular pubescent. Leaves suborbicular, 0.75-2 cm across, cordate at base, subentire or serrate, pubescent above; petioles ca 2 cm long. Flowers in 1-several-flowered umbels; peduncles 4-6 cm long, slender; pedicels 1-3 cm long, slender, pubescent. Calyx deeply 5-lobed, enlarged in fruit; lobes spreading. Corolla white, hypocrateriform or infundibuliform; mouth yellow, annulate; tube short. Capsules globose or ovoid. Seeds deeply pitted.

In shady places. Bilaspur, Panna, Rewa, Satna, Sidhi. *Fl. & Fr.*: March April.

85. MYRSINACEAE

(U.S. Vaish)

About 39 genera and 1250 species; tropical and subtropical to temperate regions of Old World; 2 genera and 6 species in M.P.

- 1a. Flowers 10-20 mm across; corolla pink, blue or purple; anthers much longer than filaments ...1. *Ardisia*
- 1b. Flowers 4-5 mm across; corolla greenish white or greenish yellow; anthers not longer than filaments ...2. *Embelia*

1. *ARDISIA* Sw., *nom. cons.*

Shrubs or small trees. Leaves simple, alternate, spiral or subverticillate, entire, dentate, serrate or crenate, gland-dotted, herbaceous or coriaceous, sessile or shortly petiolate. Flowers in axillary panicles, corymbs or umbels, bisexual, actinomorphic, 5-merous, pedicellate. Calyx 5-lobed or 5-partite; lobes imbricate or not. Corolla pink, blue or purple, deeply 5-lobed; lobes somewhat fleshy, imbricate to right. Stamens subsessile; filaments free; anthers erect, sagittate at base. Ovary globose; style cylindrical, filiform; stigma indistinct. Fruit a drupe, subglobose or globose, fleshy, with persistent style, 1-seeded.

About 250 species; tropical and subtropical regions excluding Africa, rare in Australia; 4 in M.P.

- 1a. Leaves serrate; pedicels 0.3-0.5 cm long ...4. *A. thyrsiflora*
- 1b. Leaves entire or subcrenate; pedicels 1 cm or more long:
- 2a. Leaves lanceolate, up to 2.5 cm broad; corolla dark blue ...2. *A. quinquegona*
- 2b. Leaves obovate-oblong, elliptic-lanceolate or oblanceolate, more than 3 cm broad; corolla pink:
- 3a. Twigs and petioles rusty tomentose; leaves up to 4 cm broad; corolla spotted ...1. *A. depressa*
- 3b. Twigs and petioles glabrous; leaves 5-7 cm broad; corolla unspotted ...3. *A. solanacea*

1. *Ardisia depressa* C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 522. 1882.

Shrubs; twigs rusty tomentose. Leaves oblong-lanceolate or elliptic-lanceolate, 5-14 x 3-4 cm, acuminate at apex, cuneate at base, entire, subcoriaceous, glabrous; petioles rusty tomentose. Flowers in umbels; umbels axillary or clustered on small shoots, much branched. Calyx-lobes

ovate-lanceolate, spreading. Corolla pinkish; lobes glandular, spreading. Drupes depressed globose, black.

Rare. Bastar (Mooney, 1942). *Fl. & Fr.*: March - June.

2. *Ardisia quinquegona* Blume, *Bijdr.* 13: 689. 1826. *A. pauciflora* Heyne *ex* Roxb., *Fl. Ind.* (Carey & Wallich ed.) 2: 279. 1824; C.B. Clarke in *Hook. f.*, *Fl. Brit. India* 3: 529. 1882.

Shrubs, *ca* 2.5 m high. Leaves lanceolate, up to 9.5 x 2.5 cm, acuminate at apex, acute at base, subcrenate, coriaceous; petioles up to 1 cm long. Flowers in axillary, 1-7-flowered, slender racemes, pulpy. Calyx-lobes deltoid, subacute. Corolla dark blue; lobes punctate. Drupes globose, *ca* 6 mm across, red.

Rare. In evergreen forests. Bastar. *Fl. & Fr.*: Dec. - Feb.

3. *Ardisia solanacea* Roxb., *Pl. Coromandel* 1: 27. t. 27. 1795. *A. humilis auct. non* Vahl, 1794: C.B. Clarke in *Hook. f.*, *Fl. Brit. India* 3: 529. 1882, *p.p. excl. syn.*

Shrubs, 2-3 m high. Leaves alternate, sometimes crowded towards the tip of branchlets, obovate-oblong or oblanceolate, 12-18 x 5-7 cm, acute-acuminate at apex, cuneate at base, coriaceous. Flowers in axillary, corymbose racemes, 1.5-2 cm across. Calyx-segments almost free up to base, coriaceous, persistent. Corolla pink, gland-dotted; lobes ovate, coriaceous. Stamens exerted, connivent around style. Drupes depressed globose, 1-1.5 cm across, green, purple-black on maturity, long stalked.

Common in evergreen forests or on hill slopes, sometimes near rocky stream. Bastar, Bilaspur, Raigarh, Raipur, Surguja. *Fl. & Fr.*: June - Oct.

4. *Ardisia thyrsoiflora* D. Don, *Prodr. Fl. Nepal.* 148. 1825. *A. floribunda* Wallich in Roxb., *Fl. Ind.* (Carey & Wallich ed.) 2: 272. 1824. *A. neriifolia* A. DC. in *Trans. Linn. Soc. Bot.* 17: 118. t. 8. 1834; C.B. Clarke in *Hook. f.*, *Fl. Brit. India* 3: 522. 1882.

Shrubs. Leaves elliptic-lanceolate or oblanceolate, 10-20 x 4-7 cm, acute to acuminate at apex, cuneate at base, serrate. Flowers in axillary or terminal, minutely rusty panicles; pedicels 0.3-0.5 cm long. Calyx-lobes ovate. Corolla pale purple; lobes ovate. Drupes depressed globose, *ca* 5 mm across, 5-angled.

Rare. Bastar (Saxena and Khotele, 1976). *Fl. & Fr.*: May - Nov.

2. *EMBELIA* Burm. *f.*, *nom. cons.*

Shrubs, erect, scandent or liana. Leaves simple, alternate below, opposite above, distichous or spiral, entire or dentate, often glandular, petiolate. Flowers in axillary or terminal racemes or panicles, sometimes fascicled, bisexual or unisexual, 4-6-merous; bracts minute; bracteoles absent. Calyx deeply divided; segments valvate, ciliate. Corolla - lobes free or connate at base, imbricate, ciliate, papillose inside. Stamens somewhat exserted; filaments short or long, inserted above the base of corolla-lobes; anthers obovoid. Ovary superior, abortive or reduced in male, globose-ovoid in female and bisexual flowers; style short; stigma capitate. Fruit a drupe, subglobose or globose, 1-seeded.

About 130 species; tropical and subtropical regions of Old World; 2 in M.P.

- 1a. Plants erect; leaves eglandular; racemes axillary ...1. *E. basaal*
 1b. Plants liana; leaves glandular; racemes terminal
 and axillary ...2. *E. ribes*

1. *Embelia basaal* (Roem. & Schult.) A. DC. in Trans. Linn. Soc. Bot. 17: 131. 1837; Panigrahi & S.M. Almeida in J. Bombay Nat. Hist. Soc. 84: 472. 1987. *Ardisia basaal* Roem. & Schult., Syst. Veg. 4: 517. 1819. *Embelia robusta auct. non* Roxb., 1820: C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 515. 1882, *p.p. quoad E. basaal* in *syn. E. tsjeriam-cottam auct. non* (Roem. & Schult.) A. DC., 1834: Santapau, Fl. Khandala ed. 3: 141. 1967, *p.p. quoad syn. E. basaal. E. acutipetalum* S.M. Almeida & M.R. Almeida in J. Bombay Nat. Hist. Soc. 81: 741. 1984, *nom. superfl. illeg. - Baberung.* **Fig. 3.**

Shrubs or small trees, deciduous, *ca* 2 m high. Leaves obovate-oblong or obovate, 5-11 x 3-6 cm, acute-acuminate at apex, cuneate at base, entire or obscurely serrulate, rusty pubescent beneath. Flowers in axillary racemes, bracteate. Calyx-segments 4-5, glandular, persistent. Corolla greenish white; lobes 5, free or slightly connate at base. Drupes globose, red, with persistent style forming filiform beak.

Common in sal and mixed forests. Balaghat, Bastar, Bilaspur, Chhindwara, Hoshangabad, Panna, Raigarh, Raipur, Rajnandgaon, Sagar, Satna, Seoni, Sidhi, Surguja. *Fl. & Fr.*: July - Jan.

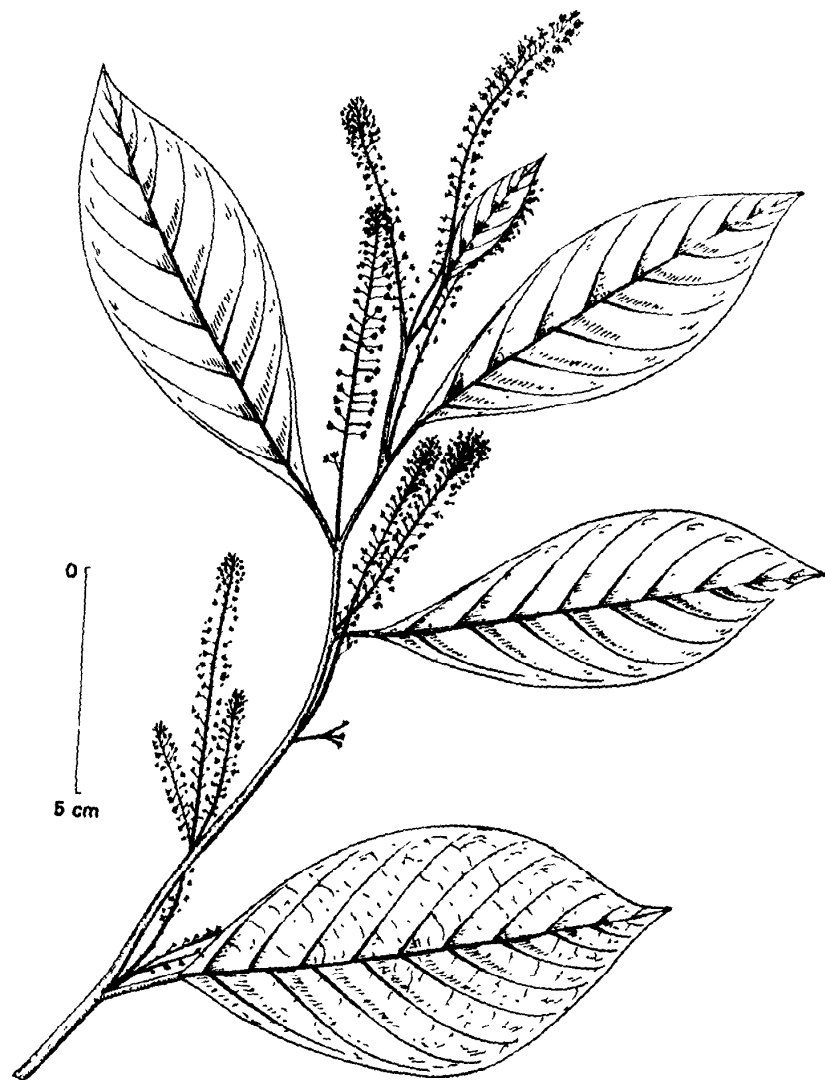


Fig. 3. *Embelia basaal* (Roem. & Schult.) A. DC.

The plant is given to expecting mothers. Leaves are applied on itches while fruits are used for blood purification and as condiments.

2. *Embelia ribes* Burm. *f.*, Fl. Ind. 62. t. 23. 1768; C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 513. 1882.

Shrubs, scandent; branches slender. Leaves oblong-elliptic, *ca* 8.5 x 3 cm, subacuminate at apex, obtuse or cuneate at base, thinly coriaceous, dark green, gland-dotted; petioles *ca* 1 cm long. Flowers in terminal and axillary, paniculate racemes, 5-merous; pedicels glandular pubescent. Calyx-segments 5, ovate, ciliate. Corolla greenish yellow; lobes 5, elliptic, pubescent. Drupes globose, black when ripe.

Rare. In dense forests. Bastar. *Fl. & Fr.*: Feb. April.

85a. THEOPHRASTACEAE*

(A. and Kumar)

About 5 genera and 90 species; tropical America; one species naturalized in M.P.

JACQUINIA L., *nom. cons.*

Shrubs or trees. Leaves opposite, alternate or somewhat whorled, entire, coriaceous. Flowers solitary or in racemes or umbels. Calyx 5-lobed; lobes ovate-orbicular. Corolla white, purple or orange, hypocrateriform, 5-lobed. Stamens 5, inserted near the base of corolla-tube; filaments subulate, usually longer than anthers. Staminodes 5, rounded, crowded at the throat and between the corolla-lobes. Ovary glabrous; stigma capitate-peltate. Fruit a berry, ellipsoid, coriaceous, few to many-seeded. Seeds ovoid, compressed.

*Possibly due to ornamental nature of the plant and restricted distribution in M.P., the family has escaped the attention and has not been included under Key to families given in Flora of M.P. Vol. I. However, for the purpose, it should be placed after lead 121b on page 110 and can be distinguished from Myrsinaceae and Primulaceae by the presence of staminodes and yellow or orange seeds.

About 30 species; Central America and Carribean; one in M.P.

Jacquinia ruscifolia Jacq., Enum. Syst. Pl. 15. 1760.

Shrubs or small trees. Leaves alternate or crowded at the tip of branches, elliptic-oblong, up to 6.5 x 1.8 cm, with 2-6 mm long apical spine, exstipulate; petioles up to 5 mm long. Flowers in terminal, up to 6 cm long racemes. Calyx-lobes orbicular, membranous. Corolla bright orange; lobes ovate, rounded. Filaments broader at base, glandular hairy. Staminodes petaloid. Ovary 1-locular; ovules many. Berries many-seeded. Seeds immersed in mucilage.

Cultivated in gardens and along the river banks. Mandla. *Fl. & Fr.*: April June.

86. SAPOTACEAE

(Ram Lal)

About 116 genera and 1100 species; tropical to temperate regions; 4 genera and 5 species in M.P.

- 1a. Calyx-lobes 2-seriate; stamens 6 or more:
 - 2a. Calyx-lobes 4; staminodes absent ...1. *Madhuca*
 - 2b. Calyx-lobes 6 or 8; staminodes present:
 - 3a. Stamens 6; staminodes 6, glabrous ...2. *Manilkara*
 - 3b. Stamens 8; staminodes 8, hairy ...3. *Mimusops*
- 1b. Calyx-lobes 1-seriate; stamens 5 ...4. *Xantolis*

1. MADHUCA Buch.-Ham. ex J.F. Gmelin

Trees, branched; sap milky. Young leaves petaloid, clustered towards the end of branches, coriaceous, silky or tomentose beneath; stipules caducous. Flowers fascicled, crowded near the apex of branches among the leaves or from the axil of fallen leaves, pedicellate, often nodding. Calyx-lobes 4, 2-seriate; 2 outer valvate, thicker; inner imbricate, thinner. Corolla campanulate, usually 8-lobed; lobes erect, subcontorted in bud. Stamens 16 or more, in 2-3 whorls. Staminodes absent. Ovary usually pubescent, 8-more-locular; style subulate, persistent. Berries globose or ovoid, fleshy, more or less compressed.

About 85 species; Indo-Malesia especially from W. Malesia to Australia; one in M.P.

Madhuca longifolia (J. Koenig) Macbr. var. **latifolia** (Roxb.) Chevalier in Rev. Int. Bot. Appl. 23: 149. 1943; P. Royen in Blumea 10: 55. 1960. *Bassia latifolia* Roxb., Pl. Coromandel 1: 20. t. 19. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 544. 1882. *Madhuca latifolia* (Roxb.) Macbr. in Contr. Gray Herb. Harv. Univ. N.S. 53: 17. 1918. *M. indica* J.F. Gmelin, Syst. Nat. 799. 1791. *Bassia longifolia* J. Koenig in L., Mant. Pl. App. 563. 1771; C.B. Clarke in Hook. f., Fl. Brit. India 3: 544. 1882. *Mahua*.

Trees, deciduous, up to 18 m high; branches many, spreading. Leaves elliptic, obovate or broadly lanceolate, 7-22 x 4-11 cm, shortly acuminate at apex, rounded or acute at base; young leaves densely woolly; petioles 2.5-3 cm long; stipules subulate, densely pubescent. Flowers in dense fascicles at the end of branches; pedicels ca 3 cm long, rusty tomentose. Calyx ca 9 mm long; lobes rusty tomentose. Corolla cream-coloured, more than 1 cm long; lobes usually 8-9, ovate or lanceolate; tube ca 8 mm long, fleshy. Berries ovoid, 2.5-5 cm long, greenish, 1-4-seeded.

Common throughout the state on roadsides, near villages and in dry mixed deciduous forests. Bastar, Bilaspur, Chhatarpur, Damoh, Durg, Raigarh, Raipur, Rajnandgaon, Seoni, Shivpuri, Sidhi, Surguja. *Fl. & Fr.*: Jan. June.

Wood is used for making comb as well as for various other purposes. Bark yields tannin and employed for the treatment of scabies and rheumatism. Flowers are eaten and used for cough and distillation of liquor. At Bastar, the tribal folk use them for magical performance. Ripe fruits are eaten and used to treat asthma, burning and pthisis while seed oil for cooking, lighting and making soap. Decoction of seed cake is given as antidote to snake bite.

2. MANILKARA Adans., *nom. cons.*

Trees, evergreen. Leaves coriaceous, petiolate, exstipulate; lateral nerves parallel, raised below. Flowers solitary or few in leaf axils. Calyx-lobes 6 or 8, in 2 series of 3 or 4 each; outer valvate; inner imbricate, alternate with outer. Corolla-lobes 16 or 18, in 2 or 3 series, imbricate.

Stamens 6. Staminodes 6. Ovary globose, 6-8-locular; style columnar. Berries ellipsoid or globose, 1 or 3-seeded; epicarp thin. Seeds oblong, albuminous, shining.

About 70 species; tropical regions; 2 in M.P.

- 1a. Leaves obtuse to emarginate; berries ellipsoid, yellow when ripe; seeds reddish brown ...1. *M. hexandra*
- 1b. Leaves acute; berries globose, brown when ripe; seeds black ...2. *M. zapota*

1. *Manilkara hexandra* (Roxb.) Dubard in Ann. Mus. Col. Marseille (ser. 3) 23: 9. t. 2. 1915; P. Royen in Blumea 7: 408. 1953. *Mimusops hexandra* Roxb., Pl. Coromandel 1: 16. t. 15. 1795 & Fl. Ind. 2: 238. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 549. 1882. *M. indica* A. DC. in DC., Prodr. 8: 205. 1844 - *Khirni*.

Trees, 15-18 m high; bark deeply furrowed, grey. Leaves obovate or oblong, 5-10 cm long, obtuse to emarginate at apex, cuneate at base, dark green and shining above, glabrous; petioles *ca* 1.2 cm long, glabrous. Flowers axillary, solitary or in fascicles; pedicels up to 1.2 cm long, pale yellow. Calyx-lobes 6, *ca* 0.5 cm long, reflexed, usually rusty pubescent outside, ciliate on margins. Corolla white; lobes 18, *ca* 0.4 cm long, 2-seriate; 12 outer lobes linear; 6 inner lobes oblanceolate; tube *ca* 0.6 cm long. Berries ellipsoid, 1.2-1.8 cm long, yellow when ripe, 1(-2)-seeded.

Along roadsides and near streams. Bilaspur, Chhatarpur, Damoh, Dhar, Hoshangabad, Indore, Panna, Raisen, Rewa, Sagar, Satna. *Fl. & Fr.*: Sept. Dec.

Wood is used for house building while bark as medicines. Fruits are eaten. An oil is extracted from the seeds.

2. *Manilkara zapota* (L.) P. Royen in Blumea 7: 410. 1953. *Achras zapota* L., Sp. Pl. App. 1190. 1753, *quoad typum excl. syn. Sloanei et Plukenetii*. *Manilkara achras* (Mill.) Fosberg in Taxon 13: 255. 1964. *Sapota achras* Mill., Gard. Dict. ed. 8. n. 1. 1768. *Achras sapota* L., Syst. Nat. ed. 10. 2: 988. 1759; C.B. Clarke in Hook. f., Fl. Brit. India 3: 534. 1882. *Cheekku*.

Trees, 8-15 m high. Leaves crowded at the end of branches, oblong-lanceolate or elliptic-oblong, 5-12 x 2-3 cm, acute at apex, entire, sometimes undulate, shining, glabrous. Flowers axillary, solitary; pedicels up to 2 cm long, rusty tomentose. Outer calyx-lobes ovate, *ca* 8 mm long, concave, thin, fleshy, pendulous. Corolla white, *ca* 0.7 cm across; lobes usually 16 in 2 series of 8 each, *ca* 4.5 mm long. Berries globose, 4-5 cm across, brown when ripe, 3-5-seeded. Seeds compressed, black.

Cultivated for edible fruits. Bhopal, Indore. *Fl. & Fr.*: Nov. March.

3. MIMUSOPS L.

Trees; sap milky. Leaves coriaceous; primary nerves numerous, spreading. Flowers axillary, solitary or in fascicles. Calyx-lobes 6-8, in 2 series; outer series valvate in bud, enclosing the inner; inner series imbricate. Corolla-lobes 18-24, in 2 or 3 series; tube short. Stamens 8, inserted at the base of corolla; filaments short; anthers with excurrent connective. Staminodes 8, alternate with stamens or connate with them at the base, entire or variously notched. Ovary pubescent, 8-locular; style elongate. Berries globose, ovoid or ellipsoid, fleshy, 1 or few-seeded. Seeds ellipsoid, compressed.

About 57 species; tropical Africa including one from Malesia to Pacific regions; one in M.P.

Mimusops elengi L., Sp. Pl. 349. 1753; C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 548. 1882. - *Maulshri*, *Molsri*.

Trees, evergreen, 12-15 m high; bark rough, dark grey. Leaves elliptic-ovate or lanceolate, 4-12 x 3.5-5.5 cm, acute to shortly acuminate at apex, acute at base, subcoriaceous, exstipulate; petioles up to 4 cm long. Flowers axillary, solitary or in fascicles of 2-6, fragrant; pedicels 1.2-1.9 cm long, rusty tomentose. Calyx-lobes 8. Corolla white, up to 1 cm across; lobes *ca* 24, in 3 series of 8 each, imbricate. Berries ovoid or ellipsoid, 3 x 2 cm, yellow when ripe, 1-seeded. Seeds brown, shining.

Usually planted in gardens and parks. Bhopal, Bilaspur, Chhatarpur, Damoh. *Fl. & Fr.*: Jan. Sept.

Flowers are used in perfumery while bark in native medicines. Wood is valuable and exploited for various purposes. Fruits are edible while seeds yield oil.

4. XANTOLIS Raf.

Trees, rarely shrubs. Leaves alternate, lanceolate, elliptic or obovate, coriaceous. Flowers in axillary fascicles, subsessile or shortly pedicellate; pedicels villous or tomentose. Calyx-lobes 5, rarely 6, subequal, imbricate. Corolla campanulate; lobes 5, rarely 6, shorter or longer than tube, imbricate. Stamens 5, inserted at the base of corolla-lobes; filaments short, linear; anthers ovate or lanceolate. Staminodes 5, alternate with stamens, petaloid. Ovary villous, 5-locular, rarely 2-4-locular; style short or long, cylindrical. Berries ovoid or globose, usually 1, sometimes 3-5-seeded. Seeds much compressed.

About 14 species; S.E. Asia and Philippines; one in M.P.

Xantolis tomentosa (Roxb.) Raf., Sylva Tellur. 35. 1838. *Sideroxylon tomentosum* Roxb., Pl. Coromandel 1: 28. t. 28. 1795 & Fl. Ind. 1: 602. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 538. 1882.

Small or medium-sized trees; bark cracked; twigs often spinous; young parts pubescent or woolly. Leaves elliptic or obovate, 5-10 x 2.5-5 cm, subacute or nearly retuse at apex, acute at base, dark green above, pale beneath; petioles ca 1.2 cm long, glabrous or pubescent. Flowers in axillary, rounded clusters; pedicels ca 0.6 cm long, drooping. Calyx-lobes 5; tube woolly. Corolla white, 0.6-0.8 cm long; lobes 5, narrowly lanceolate, nearly glabrous. Staminodes linear-lanceolate, hairy. Berries ovoid, 1.8-2.5 x 1.2-1.6 cm, yellowish green, pubescent when young, glabrous on ripening. Seeds ca 1.2 cm long, smooth.

- 1a. Spines 5-7 mm long; leaves up to 3.5 cm broad;
petioles pubescent ...1.1. var. *elengioides*
- 1b. Spines absent or very small; leaves more than
4 cm broad; petioles usually glabrous ...1.2. var. *tomentosa*

1.1. var. elengioides (Bedd.) Ram Lal in Bull. Bot. Surv. India 9: 267. 1967. *Achras elengioides* Bedd., Fl. Sylv. S. India t. 235. 1872. *Sideroxylon tomentosum* Roxb. var. *elengioides* Gamble, Fl. Madras 1: 534. 1919.

Rare. Bastar. Fl. & Fr.: Oct. - Feb.

Fruit is used as pickles and in curries.

1.2. var. tomentosa

Rare. Bastar. *Fl. & Fr.*: Oct. Feb.

87. EBENACEAE

(M.I. Hanfi)

Two genera and about 485 species; tropical and subtropical to temperate regions; one genus with 7 species in M.P.

DIOSPYROS L.

Shrubs or trees, dioecious, rarely polygamous. Leaves simple, subopposite or alternate, entire, usually coriaceous, pinnately veined, stipulate. Flowers (often female) solitary, fascicled or in cymes, usually unisexual, actinomorphic, 3-5-merous. Calyx more or less deeply lobed, persistent and accrescent in bisexual and female flowers, deciduous in male ones. Corolla tubular, campanulate, hypocrateriform or urceolate; lobes contorted. Stamens usually multiples of corolla-lobes, sometimes in clusters. Ovary superior, 2-10-locular; ovule 1, rarely 2 in each locule, axile, pendulous; styles very short, 1-5. Fruit a berry, usually globose or ovoid, 1-many-seeded.

About 475 species; tropical regions; 7 in M.P.

1a. Stamens up to 16:

2a. Anthers awnless; staminodes 7-16:

3a. Leaves always alternate; corolla of female flowers urceolate, campanulate or hypocrateriform; albumen of seeds not ruminant:

4a. Corolla urceolate or campanulate; ovary glabrous:

5a. Male calyx glabrous inside; staminodes 7-9

...1. *D. chloroxylon*

5b. Male calyx pubescent inside; staminodes 12

...2. *D. cordifolia*

4b. Corolla hypocrateriform; ovary pubescent

...3. *D. lancifolia*

- 3b. Leaves subopposite and alternate;
corolla of female flowers tubular;
albumen of seeds ruminant ...5. *D. melanoxyton*
- 2b. Anthers awned; staminodes 4 ...6. *D. montana*
- 1b. Stamens more than 16:
- 6a. Corolla glabrous outside ...4. *D. malabarica*
- 6b. Corolla densely pilose outside ...7. *D. sylvatica*

1. *Diospyros chloroxyton* Roxb., Pl. Coromandel 1: 38. t. 49. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 560. 1882. *D. capitulata* Wight, Icon. Pl. Ind. Orient. 4: t. 1224. 1848 & t. 1588. 1850.

Trees; branchlets pubescent, often modified into thorns. Leaves alternate, elliptic or oblong, 2-3 x 1-2 cm, obtusely apiculate at apex, rounded at base, pubescent. Male flowers in axillary, short, 6-7-flowered clusters; female flowers solitary. Calyx cupular, 4-lobed. Corolla white, urceolate-campanulate, 4-lobed, larger in female flowers. Stamens 16, 2-seriate. Berries globose, glabrous.

Rare. Indore (Rao and Sastry, 1964). *Fl. & Fr.*: July - Dec.

2. *Diospyros cordifolia* Roxb., Pl. Coromandel 1: 38. t. 50. 1795. *D. montana auct. non Roxb.*, 1795: C.B. Clarke in Hook. f., Fl. Brit. India 3: 555. 1882, p.p. *D. montana* Roxb. var. *cordifolia* (Roxb.) Hiern, Monogr. Eben. in Trans. Camb. Phil. Soc. 12(1): 222. 1873. *Bis-tendu*.

Large shrubs or small trees, 3-4 m high; bark smooth. Leaves alternate, oblong, ovate-oblong or ovate-lanceolate, 2.5-9 x 1.5-3 cm, thinly coriaceous, glabrous. Male flowers in axillary, 3-flowered cymes; female flowers solitary. Calyx-lobes 4, ciliate on margins, of female flowers reflexed in fruits. Corolla creamy white, urceolate. Stamens 16, in opposite pairs, united at the base. Berries globose or ovoid, 2-2.5 cm across, yellow when ripe.

Rare. In wastelands and forests. Chhatarpur, Jabalpur, Satna, Seoni
Fl. & Fr.: June - Sept.

3. Diospyros lancifolia Roxb., Fl. Ind. 2: 537. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 562. 1882, "*lanceaefolia*" *D. multiflora* Wallich ex A. DC. in DC., Prodr. 8: 231. 1844.

Trees. Leaves lanceolate or oblong, acuminate at apex, subobtusate at base, glabrous. Male flowers in axillary clusters, sessile; female flowers solitary, subsessile. Calyx-lobes 4, obovate and deciduous in males, ovate with reflexed margins, persistent and densely tomentose in females. Corolla hypocrateriform, densely fulvous outside. Stamens *ca* 16; filaments minutely pilose. Berries subglobose or ovoid, villous.

Rare. In mixed forests. Bilaspur. *Fl. & Fr.*: March - following March.

4. Diospyros malabarica (Desr.) Kostel., Allg. Med.- Pharm. Fl. 3: 1099. 1834; Panigrahi & Murti in Bangladesh J. Bot. 10(1): 36. 1981. *Garcinia malabarica* Desr. in Lam., Encycl. 3: 701. 1792. *Diospyros embryopteris* Pers., Syn. Pl. 2: 624. 1807, *p.p.*; C.B. Clarke in Hook. f., Fl. Brit. India 3: 556. 1882, *p.p. excl. syn. Embryopteris peregrina* Gaertn., 1788. *D. peregrina* Guerke in Engl. & Prantl, Nat. Pflanzenfam. 4(1): 164. 1891, *p.p. majore excl. ref. Gaertn., 1788.* - *Kala-tendu, Makar-tendu.*

Fig. 4.

Trees; branches spreading; bark smooth, flaking off in large pieces. Leaves distichous, oblong or oblong-lanceolate, 10-15 x 2.5-5.5 cm, obtuse at apex. Male flowers in axillary, 2-7-flowered cymes; female flowers axillary, solitary. Calyx of female flowers dilated and subcordate at base. Stamens 24-64, in pairs; anthers with a line of hairs up to the middle. Berries globose, 8-celled, covered with rusty scurfiness, 4-8-seeded. Seeds flattened, reddish brown.

In mixed forests. Bastar, Bilaspur, Chhatarpur, Raigarh, Raipur. *Fl. & Fr.*: April following April.

Fruits are eaten raw. Rind and bark have astringent properties and are used to treat diarrhoea. Seed oil is used for the treatment of dysentery. Wood is used for construction and boat building.

5. Diospyros melanoxylon Roxb., Pl. Coromandel 1: 36. t. 46. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 564. 1882. *Biripatta, Tendu.*

Shrubs or trees, up to 8 m high; twigs softly pubescent. Leaves ovate-elliptic, 5-18 x 4-12 cm, acute at apex, rounded or sometimes cuneate at



Fig. 4. *Diospyros malabarica* (Desr.) Kostel.

base, pubescent beneath; venation distinct. Male flowers in axillary, simple or branched, 3-15-flowered, drooping cymes; female flowers solitary. Calyx-lobes 5, acute in males, cordate in females, broadly 2-winged. Corolla-lobes 5, densely hairy. Stamens 10. Berries globose, 2.5-3.5 cm across, glabrous with age.

Common in dry deciduous forests and on roadsides. Balaghat, Bastar, Bilaspur, Chhatarpur, Damoh, Hoshangabad, Indore, Jabalpur, Mandla, Morena, Panna, Raigarh, Raipur, Rajnandgaon, Satna, Seoni, Shivpuri, Sidhi, Surguja, Tikamgarh. *Fl. & Fr.*: March Aug.

Leaves are used for rolling 'Bidis' the Indian cigarette while mature fruits are eaten raw. Roasted seeds, calyx and peduncles are referred for the treatment of cough, spermatorrhoea, urinary and skin diseases. 'Gonds' tribe worship the tree.

Notes : Hole (Indian For. 30: 579. 1904) and Saxena and Khotele (J. Bombay Nat. Hist. Soc. 73: 26. 1976) have reported the occurrence of *D. exsculpta* Buch.-Ham. (*D. tomentosa* Roxb.) in Jabalpur and Bastar respectively while there is some confusion regarding the nomenclature of *D. tomentosa* Roxb. and *D. melanoxyton* Roxb. Haines (Bot. Bihar Orissa 4: 519.1922) has treated *D. tomentosa* Roxb. as synonymous to *D. melanoxyton* Roxb. On the other hand, Gamble (*Fl. Madras* 2(5): 772. 1922) has treated these species separately. Ellis (*Fl. Nallamalais* 2: 240. 1990) has clearly stated that although *D. tomentosa* Roxb. appears to have larger leaves, the taxa requires detailed monographic study.

6. *Diospyros montana* Roxb., Pl. Coromandel 1: 37. t. 48. 1795; C.B. Clarke in Hook. *f.*, *Fl. Brit. India* 3: 555. 1882, *p.p.* *Bis-tendu*.

Shrubs or trees; twigs pubescent. Leaves ovate-elliptic, 3-10 x 2-5 cm, acute at apex, cuneate-cordate at base, pubescent beneath; veins distinct. Male flowers in axillary, short, usually 3-flowered cymes; female flowers solitary. Calyx-lobes 4, rounded. Corolla-lobes 5, ovate, acute, sparsely pubescent. Stamens 15. Berries globose, 2-2.5 cm across, glabrous.

Common in plains and sal forests. Chhatarpur, Mandla, Raigarh, Raipur, Rajnandgaon. *Fl. & Fr.*: March Aug.

Wood is exploited for various purposes.

7. **Diospyros sylvatica** Roxb., Pl. Coromandel 1: 37. t. 47. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 559. 1882.

Small trees. Leaves narrowly elliptic or elliptic-oblong, 10-18 x 5-9 cm, acuminate at apex, sparsely pubescent beneath when young. Male flowers very small, in numerous, small, dense, pedunculate cymes, axillary and from the scars of caducous scales on new shoots, sometimes paniculate on special leafless branchlets, 3-4-merous; female flowers in distichous rows mostly below the leaves, often on special branchlets, more or less silky pubescent. Fruiting calyx-lobes 3-5, broadly oblong, *ca* 0.4 cm long, obtuse, coriaceous, usually reflexed; tube short, campanulate. Berries *ca* 1.3 cm across, 1-4-seeded; testa with crimson sap.

In semi-evergreen forests, frequently in damp places. Balaghat, Bilaspur, Raigarh, Satna, Seoni. *Fl. & Fr.*: April - March.

88. SYMPLOCACEAE

(M.I. Hanfi)

One genus with about 250 species; tropical and subtropical regions of America and E. Old World; 2 species in M.P.

SYMPLOCOS Jacq.

Shrubs or trees. Leaves alternate, entire, serrulate or dentate, often coriaceous. Flowers in axillary, simple or branched, sometimes much reduced spikes or racemes, bracteate, bracteolate. Calyx-lobes 5, small, imbricate. Corolla-lobes 5. Stamens many, adnate to corolla-tube, usually in 2 or more whorls; anthers shortly oblong. Ovary 3-4-locular, rarely 2-locular; ovules 2, pendulous; style filiform; stigma small, capitate, somewhat 3-lobed. Fruit a drupe, ellipsoid or subglobose, 1-3-seeded. Seeds oblong.

- 1a. Twigs glabrous; stamens 45-50; drupes ovoid ...1. *S. laurina*
 1b. Twigs pubescent; stamens more than 50; drupes narrowly ellipsoid ...2. *S. racemosa*

1. **Symplocos laurina** (Retz.) Wallich, Numer. List No. 4416. 1831; Panigrahi & Murti in Bangladesh J. Bot. 10(1): 32. 1981. *Myrtus laurinus*

Retz., *Observ. Bot.* 4: 26. 1786. *Symplocos spicata* Roxb., *Fl. Ind.* 2: 541. 1832; C.B. Clarke in *Hook. f., Fl. Brit. India* 3: 573. 1882. *S. cochinchinensis* (Lour.) S. Moore subsp. *laurina* (Retz.) Noot., *Rev. Sympl.* 156. 1975.

Shrubs or trees, *ca* 8 m high. Leaves lanceolate, 6-15 x 2.5-6 cm, acuminate at apex, attenuate to cuneate at base, serrulate-crenate, glabrous; nerves prominent, 6-9 pairs; petioles 0.8-1.4 cm long. Flowers in 5-15 cm long, 3-partite (below) spikes, sessile; bracteoles softly hairy along the margin. Calyx-lobes *ca* 1 mm long. Corolla white to yellow-white; lobes 2.4-4 mm long. Stamens 45-50; filaments exceeding the length of corolla-lobes, flat. Drupes ovoid, 3.5 x 4 mm, green when young, bluish when ripe, ribbed.

Rare. Along streams. Bastar, Bilaspur. *Fl. & Fr.*: Sept. April.

2. *Symplocos racemosa* Roxb., *Fl. Ind.* 2: 539. 1832; C.B. Clarke in *Hook. f., Fl. Brit. India* 3: 576. 1882. *S. beddomei* C.B. Clarke in *Hook. f., Fl. Brit. India* 3: 582. 1882.

Shrubs or trees, 4.5-15 m high. Leaves narrowly to broadly elliptic, 9-16 x 2.5-5.5 cm, acuminate to blunt at apex, cuneate to rounded at base, entire, undulate or serrulate, sparsely pilose beneath on midrib; nerves 7-10 pairs; petioles 0.5-2 cm long. Flowers in 4-9 cm long, woolly or tomentose racemes; pedicels 1-3 mm long, hairy; bracts ovate; bracteoles nearly elliptic, appressedly hairy, caducous. Calyx-lobes 1.8-2.3 mm long, softly hairy on margin. Corolla white; lobes 2.5-5 mm long, mildly fragrant. Stamens more than 50. Style glabrescent or hairy at base. Drupes narrowly ellipsoid, 8-12 x 3-5 mm.

Common in deciduous forests. Bastar, Bilaspur, Raigarh, Satna, Sidhi, Surguja. *Fl. & Fr.*: Sept. May.

89. OLEACEAE

(K.K. Khanna and S.K. Srivastava)

About 29 genera and 900 species; subcosmopolitan especially Asia; 5 genera and 20 species in M.P.

- 1a. Corolla infundibuliform or hypocrateriform, lobes imbricate in bud, usually more than 4 in number:
- 2a. Plants usually scandent shrubs, rarely erect; fruit a berry ...2. *Jasminum*
- 2b. Plants always erect shrubs or trees; fruit a capsule:
- 3a. Leaves simple, siliceous; corolla eglandular inside, tube orange ...3. *Nyctanthes*
- 3b. Leaves imparipinnate, non-siliceous; corolla with brown glandular dots inside, tube white or green ...5. *Schrebera*
- 1b. Corolla tubular-campanulate, lobes valvate in bud, never more than 4 in number:
- 4a. Corolla-lobes free or connate in pairs; stigma clavate or 2-lobed ...1. *Chionanthus*
- 4b. Corolla-lobes all connate; stigma capitate ...4. *Olea*

1. CHIONANTHUS L.

Shrubs or trees. Leaves simple, opposite, entire, coriaceous, glabrous. Flowers in axillary or extra-axillary panicles, cymes or clusters, small, bisexual, bracteate; bracts small. Calyx small, 4-fid or 4-toothed. Corolla 4-partite; lobes free or connate in pairs, short or long, subfleshy, induplicate-valvate in bud. Stamens 2; filaments short or absent. Ovary 2-locular; ovules 2 in each locule; style short; stigma entire or 2-fid. Fruit a drupe, ellipsoid or oblong, usually 1-seeded.

About 120 species; tropical and subtropical regions; 2 in M.P.

- 1a. Petioles up to 1 cm long; panicles *ca* 4 cm long; calyx pubescent outside ...1. *C. mala-elengi*
- 1b. Petioles more than 1 cm long; panicles *ca* 10 cm long; calyx glabrous outside ...2. *C. ramiflorus*

1. *Chionanthus mala-elengi* (Dennst.) Green in Bull. Bot. Surv. India 26: 124. (1984) 1985; Srivastava and Kapoor in J. Econ. Tax. Bot. 15(1): 133. 1991. *Forsythia mala-elengi* Dennst., Schluessel Hortus Malab. 12. 21 & 31. 1818. *Chionanthus malabaricus* (Wallich ex G. Don) Bedd., Fl. Sylv.

S. India t. 239. 1872. *Linociera malabarica* Wallich ex G. Don, Gen. Hist. 4: 53. 1837-1838; C.B. Clarke in Hook. f., Fl. Brit. India 3: 607. 1882.

Trees. Leaves elliptic-oblong, 5-12 x 2-4 cm, obtuse or narrowed into a blunt acumen at apex, cuneate at base, revolute, coriaceous, glabrous; petioles up to 1 cm long. Flowers in ca 4 cm long panicles, fragrant, sessile. Calyx-lobes ovate, acute, pubescent. Corolla white, shortly tubular; lobes lanceolate, ca 6 mm long; tube ca 2 mm long. Drupes ellipsoid, ca 1 cm long, black.

Rare. Bastar. *Fl. & Fr.*: Feb. - April.

2. *Chionanthus ramiflorus* Roxb., Fl. Ind. (Carey & Wallich ed.) 1: 106. 1820, "*ramiflora*"; Srivastava and Kapoor in J. Econ. Tax. Bot. 15(1): 136. 1991. *Linociera ramiflora* (Roxb.) Wallich ex G. Don, Gen. Hist. 4: 54. 1837-1838. *L. macrophylla* Wallich ex G. Don, Gen. Hist. 4: 53. 1837-1838; C.B. Clarke in Hook. f., Fl. Brit. India 3: 610. 1882. *L. macrophylla* var. *attenuata* (Wallich ex G. Don) C.B. Clarke in Hook. f., Fl. Brit. India 3: 611. 1882. *Chionanthus macrophylla* Kurz var. *attenuata* (C.B. Clarke) Nair and Janardhanan in J. Bombay Nat. Hist. Soc. 78: 331. 1981.

Trees, up to 9 m high. Leaves oblong or elliptic-oblong, 7-20 x 3-5 cm, acuminate at apex, attenuate at base, entire, undulate or serrate; petioles up to 2.5 cm long. Flowers in axillary, pyramidal, ca 10 cm long panicles. Calyx 4-toothed. Corolla white to cream-coloured; lobes oblong, incurved. Drupes oblong or ellipsoid, ca 1.5 cm long, blue-purple.

Along rocky drains and on lateritic soil. Bastar, Raigarh, Raipur, Surguja. *Fl. & Fr.*: Feb. - April.

2. JASMINUM L.

Shrubs, erect or climbing. Leaves simple, 3-foliolate or imparipinnate, opposite, rarely alternate or 3-nately whorled; petioles articulate. Flowers solitary or in terminal or axillary cymes or panicles, small to large. Calyx small, 5-9-lobed; lobes inconspicuous to long, filiform; tube campanulate. Corolla white or yellow, often with violet tinge, infundibuliform or hypocrateriform, 5 or more-lobed. Stamens 2, inserted on corolla-tube, usually included; connectives apiculate. Ovary 2-locular; ovules 2 in each locule; style terminal; stigma oblong, 2-lobed, sometimes undivided. Fruit a berry, simple or didymous, red, black or purple-black, 2-seeded, often single by abortion.

About 450 species; tropical and temperate regions of Old World; 14 in M.P.

- 1a. Corolla bright yellow ...7. *J. humile*
- 1b. Corolla greenish white, white or white with red tinge:
 - 2a. Leaves simple:
 - 3a. Calyx-lobes shorter than calyx-tube:
 - 4a. Leaves elliptic, velvety tomentose on both the surfaces; lateral nerves distinct ...12. *J. roxburghianum*
 - 4b. Leaves broadly ovate, nearly glabrous on both the surfaces with age; lateral nerves obscure ...1. *J. arborescens*
 - 3b. Calyx-lobes longer than calyx-tube:
 - 5a. Lateral nerves 3-4 pairs:
 - 6a. Cymes terminal ...11. *J. rottlerianum*
 - 6b. Cymes axillary:
 - 7a. Branchlets nearly glabrous; berries ellipsoid ...14. *J. scandens*
 - 7b. Branchlets hairy; berries globose ...4. *J. elongatum*
 - 5b. Lateral nerves 5-6 pairs or more:
 - 8a. Calyx-lobes equal to one third of the corolla-tube:
 - 9a. Calyx glabrous, lobes not curved ...3. *J. brevipetiolatum*
 - 9b. Calyx pubescent, lobes curved:
 - 10a. Calyx 5-8 mm long; berries ellipsoid ...8. *J. malabaricum*
 - 10b. Calyx ca 10 mm long; berries globose ...13. *J. sambac*
 - 8b. Calyx-lobes equal to half of the length of corolla-tube ...9. *J. multiflorum*

2b. Leaves compound:

11a. Leaflets 3; calyx-lobes shorter than calyx-tube:

12a. Branches glabrous; corolla 3-3.5 cm long ...5. *J. flexile*

12b. Branches densely pubescent; corolla 1.5-2 cm long ...2. *J. auriculatum*

11b. Leaflets more than 3; calyx-lobes longer than calyx-tube:

13a. Midrib glabrous on both the surfaces; bracts ovate-linear; corolla with pink tinge outside ...6. *J. grandiflorum*

13b. Midrib hairy on both the surfaces; bracts linear; corolla white outside ...10. *J. officinale*

1. *Jasminum arborescens* Roxb., Fl. Ind. (Carey & Wallich ed.) 1: 94. 1820; C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 594. 1882. *J. arborescens* Schult., Mant. 1: 90. 1822, *nom. illegit. J. arborescens* var. *montana* (Roth) C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 594. 1882. - *Bara kunda, Chameli, Jangli chameli, Mutabela*. **Fig. 5.**

Large shrubs, suberect, up to 3 m high; branchlets scandent, densely hairy. Leaves simple, opposite, broadly ovate or orbicular, 4-9 x 2.5-6 cm, acuminate at apex, rounded at base, softly tomentose when young, glabrous with age. Flowers in trichotomous, lax, pubescent cymes, fragrant; bracts linear. Calyx-lobes 5-6, linear, short, pubescent. Corolla white; lobes usually 9, lanceolate, as long as or longer than the tube; tube *ca* 1.5 cm long. Berries simple, often bent, oblong or ellipsoid, 1-1.5 cm long, black on ripening.

Common in mixed forests. Balaghat, Bhopal, Bilaspur, Damoh, Durg, Hoshangabad, Mandla, Raigarh, Raipur, Rajnandgaon, Shivpuri. *Fl. & Fr.*: March - Oct.

2. *Jasminum auriculatum* Vahl, Symb. Bot. 3: 1. 1794; C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 600. 1882. *J. affine* Wight, Icon. Pl. Ind. Orient. 4(1): t. 1255. 1848. *J. ovalifolium* Wight, Icon. Pl. Ind. Orient. 4(1): t. 1256. 1848. - *Juhi*.



Fig. 5. *Jasminum arborescens* Roxb.

Shrubs, bushy, scandent or climbing; branches densely pubescent. Leaves opposite, 3-foliolate; leaflets ovate or deltoid, 4.5-9 x 2-3.5 cm, acute or acuminate at apex, obtuse or rounded at base, chartaceous, glabrous to pubescent; lateral leaflets reduced. Flowers in terminal or upper axillary, paniculate cymes, fragrant. Calyx 2-3 mm long, pubescent; lobes narrowly oblong, *ca* 1 mm long; tube *ca* 2 mm long. Corolla greenish white, 1.5-2 cm long, 5-7-lobed; lobes obovate, *ca* 6 mm long; tube 1-1.5 cm long. Berries globose, *ca* 1 mm across, black.

Near streams and also cultivated. Bilaspur, Rewa. *Fl. & Fr.*: July - Aug.

Flowers are exploited in perfume industry. They are also used for consumption.

3. *Jasminum brevipetiolatum* Duthie *ex* Brandis, Ind. Trees 450. 1906.

Large shrubs or small trees; branches glabrous. Leaves simple, elliptic-lanceolate or narrowly lanceolate, 7-12 x 1-2.5 cm, acute or acuminate at apex, cuneate at base, entire, chartaceous, glabrous; lateral nerves 5-6 pairs; petioles 4-6 mm long, glabrous. Flowers in terminal, lax, 3-6-flowered cymes; pedicels *ca* 1 cm long; bracts glabrous. Calyx 0.7-1 cm long, glabrous; lobes 6, linear, 5-6 mm long. Corolla 2.5-3 cm long; lobes 8-10, narrowly elliptic; tube *ca* 1.5 cm long. Berries ovoid-rounded, *ca* 1 cm across.

Endemic. Rare. Shahdol (Saxena, 1970). *Fl. & Fr.*: May - Sept.

4. *Jasminum elongatum* (Bergius) Willd., Sp. Pl. 1: 37. 1797; Green in Kew Bull. 42(2): 437-438. 1987. *Nyctanthes elongata* Bergius in Phil. Trans. 61: 289. t. 11. 1772 & in Phil. Trans. Abrev. (Hutton) 13: 147. t. 4. 1809. *Jasminum amplexicaule* Buch.-Ham. *ex* G. Don, Gen. Hist. 4: 60. 1837-1838. *J. undulatum* Ker-Gawl., Bot. Reg. 6: t. 436. 1820, *non* Willd., 1797; C.B. Clarke in Hook. *f.*, Fl. Brit. India 3: 592. 1882.

Shrubs, erect or scandent, 1-2 m high; branchlets hairy, slender. Leaves simple, opposite, ovate-lanceolate, 3-6 x 1.5-2.5 cm, acute or acuminate at apex, rounded or subcordate at base, pubescent on the nerves beneath. Flowers in axillary few-flowered cymes, not fragrant. Calyx-lobes filiform, 7-10 mm long, pubescent. Corolla white; lobes 6, ovate, *ca* 1.2 cm long, acute. Berries simple or didymous, globose, *ca* 1 cm across, red.

Rare. Bastar. *Fl. & Fr.*: Aug. - April.

5. *Jasminum flexile* Vahl, *Symb. Bot.* 3: 1. 1794; C.B. Clarke in Hook. *f.*, *Fl. Brit. India* 3: 601. 1882. - *Malti*.

Shrubs, scandent, glabrous. Leaves opposite, 3-foliolate; leaflets ovate or deltoid-obovate, 3-6 x 2-3 cm, acuminate at apex, obtuse or truncate at base, more or less coriaceous, shining, glabrous. Flowers in axillary or terminal, dichasial cymes, fragrant; bracts linear, *ca* 2.5 mm long. Calyx 3-4 mm long; lobes 6, *ca* 1 mm long, glabrous; tube 2-3 mm long. Corolla white, 3-3.5 cm long; lobes 5, oblong, 10-15 mm long. Berries oblong, 0.8-1 cm long.

In mixed deciduous forests. Chhatarpur, Damoh, Indore, Raigarh. *Fl. & Fr.*: Oct. - Nov.

Notes: In most of the Indian Floras, Flora of West Pakistan (59: 16. 1974) and Flora of Java (2: 217. 1965) *Jasminum azoricum* L. has been given as correct name for *J. flexile* Vahl while Green (personal communication with S.K. Srivastava) has stated that *J. azoricum* is a plant of Azore and so *J. flexile* has been treated here as correct name.

6. *Jasminum grandiflorum* L., *Sp. Pl.* ed. 2. 9. 1762; C.B. Clarke in Hook. *f.*, *Fl. Brit. India* 3: 603. 1882; Sacht in *Smithsonian Contrib. Bot.* 23: 15. 1975. *J. aureum* D. Don, *Prodr. Fl. Nepal.* 106. 1825. - *Chameli*. **Fig. 6.**

Shrubs, scandent; branches glabrous, striate. Leaves opposite, imparipinnate; leaflets 7-11, ovate to elliptic, 1.8-3 x 0.6-1.6 cm, glabrous, dark green, upper pair with a broad flat base and often confluent with the terminal leaflet, terminal one slightly larger, ovate, acuminate at apex, acute at base; midrib glabrous on both the surfaces. Flowers in terminal or axillary cymes, fragrant; pedicels of lateral flowers slightly longer than the central one; bracts foliaceous, ovate-linear. Calyx 8-12 mm long; lobes 5, linear, 5-7 mm long; tube 3-4 mm long. Corolla white with pink tinge outside, 5-lobed; tube *ca* 2 cm long. Berries 6-8 mm long.

As forest undergrowth and commonly planted in gardens. Bhopal, Chhatarpur, Hoshangabad. *Fl. & Fr.*: July - Aug.

Leaves and flowers are used in native medicines while flowers are exploited in perfume industry.