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VOLUME 2

Edited by
B.V. SHETTY & V. SINGH

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Cover Photo: A fruiting twig of *Miliusa tomentosa*

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71. CAMPA NULACEAE

(V. Singh)

Corolla white or purple. Capsules laterally dehiscent at the base or sides below the calyx - teeth. ... 1. Campanula

Corolla blue. Capsules loculicidally dehiscent by 2 - 5 valves in upper region. ... 2. Wahlenbergia

1. CAMPA NULA L.

1a. Capsules dehiscing by valves at the base:

2a. Annual herbs. Calyx - lobes 2.0 - 3.5 mm long. Corolla 5 - 6 mm long. Seeds much compressed, margined. ... 1. C. benthami

2b. Perennial herbs. Calyx - lobes 5 - 6 mm long. Corolla 1.0 - 1.5 cm long. Seeds subcompressed. ... 2. C. colorata

1b. Capsules dehiscing by valves on the sides or towards the apex. ... 3. C. fulgens


Erect, multicauline, annual herbs, 10 - 20 cm high. Basal leaves in rosette, 1.5 - 2.0 × 0.8 - 1.5 cm, obovate spatulate, narrowed into a petiole; upper ones sessile, 1.0 - 1.5 × 0.2 - 0.5 cm, linear lanceolate to oblong, subacute. Flowers 5 - 8 mm long, solitary, sessile, forming a spiciform panicle. Calyx lobes linear - lanceolate, hairy. Corolla divided less than half way down. Capsules hemispheric, 3 - celled, hairy.

Fl. & Fr.: January - April.

Rare, in wet and shady habitats, particularly in the gardens and forests in the east of Aravalli.

Selected specimens: Bundi: Kota Dam, Singh 74403 (LWG); Jhalawar: Verma 3427 (BSA); Kota: Darah, Singh 74437 (LWG); Sirohi: Mt. Abu, Mehia 410 (JAC).
Leaves not perforated. Calyx glandular, 5-nerved but not winged between the nerves.

\[ \ldots \]

2. *Plumbago*

1. **Dyerophytum O. Ktze.**


Undershrubs, 1 - 2 m high, with terete branches. Leaves 3.5 - 8.0 × 2.0 - 5.5 cm, ovate or ovate-elliptic to suborbicular, obtuse or apiculate, undulate, coriaceous, more or less covered with scurfy scales. Flowers golden yellow, in 2 - 10 cm long, bracteate, branched spikes. Calyx-teeth about half the length of tube, acute. Corolla lobes obovate-oblong, emarginate. Capsules 5 - 8 mm long, glabrous, 5 - valved. Seeds pyriform, smooth, brown.

*Fl. & Fr.*: October - January.

Common in wastelands and open forests, particularly on dry rocky hill slopes.

*Selected specimens*: Ajmer: Mowa Bir, *Duthie* 6661 (DD); Barmer: Haldeshwar, Tiwari 1178 (BSJ); Jaipur: Ramgarh, *Sharma* 1810 (RUBL); Sirohi: Mt. Abu, *Raizada* 20771 (DD); Udaipur: *Parkar* 3383 (DD).

2. **Plumbago L.**


Erect or straggling undershrubs. Leaves 2.5 - 10.0 × 1.5 - 6.0 cm, ovate-lanceolate or oblong, acute, contracted at the base into a petiole, undulate-crispy, glabrous, white punctate beneath. Flowers white, in axillary and terminal, 5 - 30 cm long racemes combined into leafy panicles. Corolla - lobes oblong, apiculate. Styles glabrous. Capsules 5 - 6 mm long, oblong, longitudinally furrowed, enclosed within the persistent calyx. Seeds oblong, smooth.

*Fl. & Fr.*: Most part of the year.

Common in wastelands and open forests among bushes.
Selected specimens: Ajmer: Nagpahar, Sharma 1136 (LWG); Banswara: Garhi, Kanodia 7554 (BSA); Jaipur: Amer, Sharma 247 (RUBL); Kota: Singh 90102 (LWG); Sirohi: Mt. Abu, Jain 62177 (BSI).

CULTIVATED SPECIES

Plumbago auriculata Lam. Shrubs, with alternate or subverticillate, obovate leaves and blue flowers in panicles. Native of S. Africa; cultivated for ornamental purposes.

Plumbago indica L. - Shrubs, with rosy-scarlet flowers. Native of Sikkim and Khasia hills; cultivated for ornamental purposes.

74. PRIMULACEAE

(V. Singh)

1a. Leaves alternate or opposite. Flowers solitary, axillary.

1b. Leaves in a basal rosette, often also alternate in upper region. Flowers in racemes or umbels:

2a. Leaves in a basal rosette only. Flowers in umbels which are borne on several, leafless scapes. Ovary superior.

2b. Leaves in rosette at base and alternate above. Flowers in axillary and terminal racemes. Ovary half-inferior.

1. Anagallis L.

Leaves 3 nerved. Corolla blue. Filaments hairy. ... 1. A. arvensis

Leaves 1-nerved. Corolla white. Filaments glabrous. ... 2. A. pumila


Annual herbs, up to 60 cm high. Stem and branches 4-angular. Leaves opposite, sessile, 1.5 - 2.0 × 0.5 - 1.5 cm, ovate-lanceolate, subacute, glabrous. Flowers axillary, solitary; pedicels longer than leaves, recurved in fruits. Calyx deeply 5-lobed; lobes lanceolate,

*Fl. & Fr.*: December - March.

Native of Europe and Mediterranean region; naturalized as a weed in cultivated fields and gardens during winters.


Erect, annual herbs, 5 - 15 cm high. Stems slightly margined. Leaves alternate, rarely opposite, 0.5 - 1.0 x 0.4 - 0.5 cm, ovate or obovate to suborbicular, acute or obtuse, cuneate at base, glabrous. Flowers axillary, solitary. Calyx divided up to base; lobes 2 - 3 mm long, lanceolate-oblong, acute or mucronate. Corolla - lobes ovate-lanceolate, apiculate, eglandular. Filaments glabrous. Capsules as long as calyx. subglobose. Seeds trigonal, solid.

*Fl. & Fr.*: September - February.

Rare, weed in cultivated fields and nearby localities.

*Selected specimen*: Banswara: Kushalgarh, *Kanodia* 5708 (BSA).

2. **Primula** L.


Scapigerous, annual herbs, 3 - 20 cm high. Petioles narrowly winged; leaves 1 - 3 cm in diam., orbicular - subreniform or broadly elliptic, subcordate or truncate at base, crenate - dentate - margined. Scapes 3 - 20 cm long, many, glandular hairy; umbels 2 to 6 - flowered; pedicels unequal, glandular hairy. Bracts ovate-lanceolate, acute. Calyx - lobes elliptic, enlarged after anthesis. Corolla white. Capsules globose, 5 - valved. Seeds angular, pitted.
Fl. & Fr. : December - March.

Rare, in wet and shady habitats in the forests. After the disappearance of radical leaves, the plant looks rather bare.

Selected specimen : Kota : Atru, Singh 90958 (LWG).

3. SAMOLUS L.


Glabrous, decumbent or ascending, annual or perennial herbs, upto 50 cm high. Leaves spatulate or obovate elliptic, apiculate, entire. Flowers white ; pedicels geniculate at the insertion of bracts or above the middle. Calyx hemispheric ; lobes triangular. Corolla - lobes imbricate. Stamens alternating with 5 scaly staminodes. Ovary inferior. Capsules shorter than calyx. Seeds rugose.

Fl. & Fr. : January - March.

Rare, in moist and shady habitats on rocky grounds. So far known from Bhilwara alone.

Selected specimen : Bhilwara : Mandalgarh forest, Singh 7164 (BSJO).

75. SAPOTACEAE

(V. Singh)

1a. Corolla 6 - lobed. Fertile stamens 6. ... 2. Manilkara

1b. Corolla more than 6 - lobed. Stamens more than 6:

2a. Petals with 2 - fid appendages on the back. Calyx 8 - lobed. Stamens 8, alternating with 8 staminodes. ... 3. Minusops

2b. Petals not appendaged. Calyx 4 - lobed. Stamens 16 or more ; staminodes absent. ... 1. Madhuca
1. Madhuca Ham. ex J. F. Gmelin


Large, deciduous trees. Leaves crowded at the end of branches, 7 20 x 5 10 cm, elliptic obovate, obtuse or subacuminate. Stipules caducous. Flowers white or cream coloured, tomentose, in 3 to 5 flowered axillary clusters at the end of branches. Calyx tomentose, 4 lobed. Corolla tube succulent. Stamens 20 30, roughly in 2 3 series. Style exserted. Berries ovoid, fleshy. 1 to 4 seeded, tomentose.

Fl. : March April ; Fr. : May June.

Fairly common in the forests and wastelands, particularly in the southern and south eastern parts of the state.

Selected specimens : Banswara : Ghatol, Singh 4202 (BSJO) ; Jhalawar : Aklera, Verma 3450 (BSA) ; Kota : Wadhwa 9223 (BSA) ; Pali : Lapi, Pandey 4668 (BSJO) ; Sirohi : Mt. Abu, Mehta 994 (JAC) ; Udaipur : Jaismand, Verma 37 (BSA).


Evergreen trees, 10 20 m high, with blackish grey, deeply furrowed bark. Leaves 7 - 10 x 3.5 6.0 cm, elliptic obovate or oblong, obtuse or emarginate, entire. Flowers white, in axillary fascicles of 2 - 6. Calyx - lobes 6, ciliate. Corolla - lobes 16 or 24, in 2 or 3 series; outer ones linear; inner ones ob lanceolate. Staminodes 6 or 8. Berries ovoid, reddish - yellow, 1 - seeded, edible.

Fl. & Fr. : October - April.

Wild or self sown near villages; also planted along the roads.
Selected specimens: Banswara: Ghatol, Majumdar 10220 (BSA); Jaipur: Chaum, Wadhwa 8343 (BSA); Jhalawar: Jhalarapatan, Majumdar & Mishra 10043 (BSA); Kota: Rampura, Verma 1795 (BSA).

3. MIMUSOPS L.


Evergreen trees, with ringed, grey bark and milky sap. Leaves 5-15 x 3-7 cm, elliptic-oblong, acute or acuminate. Flowers white with pinkish tinge, axillary, solitary or fascicled, sweet-scented. Calyx deeply 8-lobed; lobes in two series. Corolla 8-lobed. Stamens 8. Staminodes ovate-lanceolate, acute or acuminate, hairy on the back. Berries 3-2 cm, elliptic-oblong, fleshy, yellow, edible. Seed usually 1, oblong, black.

Fl.: February March; Fr.: April June.

Rare, in the forests; usually planted along the roads in cities.

Selected specimens: Banswara: Anand Sagar Forest, Singh 4611 (BSJO); Jaisalmer: Mool Sagar, Wadhwa 5242 A (BSA); Kota: Chhabra, Singh 90942 (LWG); Sawaimadhopur: Bayana, Saran 41869 (LWG); Tonk: Tordi, Pandey 4804 (BSJO).

CULTIVATED SPECIES

Manilkara sapota (L.) P. Royen (Sapota achrás Mill., Achrás sapota L.) ‘Cheeku’ (Hindi). - Evergreen trees, with oblong-lanceolate to elliptic, acute leaves, white flowers and globose fruits. Staminodes absent. Native of S. America; cultivated in orchards for edible fruits.

76. EBENACEAE

(V. Singh)

Diospyros L.

1a. Stamens at the most up to 18:

2a. Anthers awnless. Staminodes 8-16:
3a. Leaves subopposite and alternate. Corolla of male flowers tubular. Albumen of seeds ruminate. ... 3. *D. melanoxyylon*

3b. Leaves alternate only. Corolla of male flowers urceolate or campanulate. Albumen of seeds not ruminate. ... 1. *D. cordifolia*

2b. Anthers awned, Staminodes 4. ... 4. *D. montana*

1b. Stamens always more than 20. ... 2. *D. malabarica*


Large shrubs or small trees, 3 - 4 m high, with smooth bark. Leaves alternate, 2.5 - 9.0 x 1.5 - 3.0 cm, oblong, ovate-oblong or ovate-lanceolate, glabrous. Flowers creamy-white, axillary; males in 3-flowered cymes; female ones solitary. Stamens in opposite pairs, united at the base; anthers awnless, pubescent. Calyx of female flowers reflexed in fruits. Fruits 2.0 - 2.5 cm in diam., globose or ovoid, yellow when ripe.

*Fl. & Fr.*: Summer and rainy season.

Rare, in wastelands and forests, particularly in the east of Aravalli.

*Selected specimens*: Chittorgarh: Fort, Majumdar 10399 (BSA); Jaipur: Bairat forest, Wadhwa 8377 (BSA); Kota: Singh 74741 (LWG); Udaipur: Banki forest, Nautilal & Raizada 25444 (DI).


Medium-sized trees, with spreading branches and smooth bark flaking off in large pieces. Leaves distichously spreading, 10 - 15 x 2.5 - 10.0 cm, oblong or oblong-lanceolate, obtuse at base. Male-flowers in axillary, 2 to 7-flowered cymes; female flowers axillary, solitary. Calyx of female flowers dilated and subcordate at the base. Stamens 24 - 64, in pairs; anthers with a line of hairs up to the middle. Fruits globose, 8-celled, clothed with rusty scurfiness. Seeds 4 - 8, flattened, reddish-brown.

*Fl. & Fr.*: March - June.

Very rare; included on the authority of Ramdeo (1969) from Udaipur and Sharma (1958) from Ajmer.

Deciduous trees, 4 8 m high. Bark exfoliating in 4 - angular scales. Leaves 5 17 × 4 - 12 cm, ovate elliptic or oblong, coriaceous, pubescent, acute at base. Male flowers in subsessile, drooping cymes. Anthers 4 - 16, linear - lanceolate, not awned. Female flowers solitary. Sepals of fruiting calyx fulvous tomentose with recurved and wrinkled margins. Ovaries 4 to 8 - celled, hairy. Fruits 2 - 4 cm in diam., globose or ovoid, glabrous, yellow when ripe. Seeds obovate oblong, blackish.

*Fl.*: April - May; *Fr.*: June - November.

Fairly common in the forests and wastelands, particularly on and in the east Aravalii.


Shrubs or trees, with hairy twigs. Leaves 3 10 × 2 - 5 cm, ovate elliptic, acute, cuneate or cordate at base, pubescent beneath, chartaceous. Male flowers in cymes; female ones solitary. Calyx - lobes 4, flat in fruiting stage. Corolla lobes 5, ovate, acute, pubescent. Stamens 15; staminodes present in female flowers. Pistillode conical. Fruits 2.0 - 2.5 cm in diam., globose, glabrous.

*Fl. & Fr.*: Summer and rainy seasons.

Occasional, in wastelands. Plants resemble closely *D. cordifolia* Roxb.


**DOUBTFUL TAXON**

*Diospyros tomentosa* Roxb. Fl. Ind. 2: 532. 1832.
Moderate sized tree, closely resembling *D. melanoxylon* Roxb. except that leaves are rounded or obtuse at the base and staminodes are 0 - 6.

Duthie (*l.c.*) considered *D. tomentosa* Roxb. & *D. melanoxylon* Roxb. as conspecific. Hiern (*Trans. Camb. Philos. Soc.* 12 : 147, 158, 159. 1873) considers them as distinct species. Enough material is not available in the hands of authors, therefore, it is not possible at this moment to comment with certainty on the taxonomy of these two taxa. However, there are possibilities of the occurrence of *D. tomentosa* Roxb. too in Rajasthan, if it is a distinct species.

77. OLEACEAE

(V. Singh)

1a. Fruit a capsule :

2a. Shrubs, with simple leaves. Capsules flattened. ... 2. *Nyctanthes*

2b. Trees, with imparipinnate leaves. Capsules obovoid, turgid. ... 3. *Schrebera*

1b. Fruit a berry. ... 1. *Jasminum*

1. *Jasminum L."


Semi evergreen, erect shrubs. Leaves alternate, 2 - 10 cm long, sometimes revolute; leaflets 3 - 7, elliptic, ovate or lanceolate, acute or obtuse, paler beneath. Flowers in terminal corymbose cymes. Bracts small, linear. Calyx - tube c. 3 mm long; teeth short. Corolla yellow; tube 1.0 - 2.5 cm long; lobes broadly ovate - obtuse, reflexed in open flower. Berries simple or didymous, globose - ellipsoid, 4 - 6 mm long, black when ripe; juice crimson.

*Fl. & Fr.*: August - October.

Rare, found on Mt. Abu in wild state. Usually cultivated ornamentally in the gardens.

*Selected specimen*: Bundi: PWD Dak Banglow, *Singh* 74724 (LWG).
2. **Nyctanthes L.**


Large shrubs, with 4 angled branches. Leaves opposite, 4 - 11 × 2 - 7 cm, ovate or ovate - lanceolate, acute or acuminate, distantly serrate, scabrous with unicellular, warty trichomes and glandular hairs. Flowers white to orange, fragrant, sessile, 3 to 5 together on axillary, solitary or fascicled peduncles or in terminal 3 cotomous cymes. Bracts ovate. Ovule basal. Capsules 1.3 × 2.0 × 1.2 2.0 cm, orbicular, compressed, 2 celled, separating into 2, 1 seeded pyrenes.

*Fl. & Fr.*: August - November.

Abundant in the forests, often so densely that even movement becomes difficult; also cultivated in the gardens for ornamental purposes.

*Selected specimens*: Banswara: Loharia forest, *Singh* 3013 (BSJ); Chittorgarh: Pratapgarh, Majumdar 12313 (BSA); Kota: Shahabad, Majumdar & Murti 10864 (BSA); Pali: Kan Pahar, Pandey 10380 (BSJ); Sirohi: Mt. Abu, Mehta 997 (JAC).

3. **Schrebera Roxb. nom. cons.**


Deciduous trees, 10 - 20 m high, with scabrous, ash - coloured bark. Leaflets 7 - 9 pairs, opposite, 5 - 9 × 3 - 5 cm, ovate, abruptly acuminate, entire. Flowers white, in cymes. Calyx irregularly 4 to 6 - toothed. Corolla with brown glandular dots on the inner surface. Capsules 4 - 5 × 2.5 - 3.0 cm, pendulous, pear - shaped, woody, 2 valved, with white lines on the surface. Seeds winged.

*Fl. & Fr.*: February - May.

Occasional, in mixed forests on the hills. Trees appear beautiful when in full bloom.

*Selected specimens*: Bundi: Kota - Dam. *Singh* 74720 (LWG); Jhalawar: *Verma* 3397 (BSA); Sirohi: Mt. Abu, Blatter 18105 (BLAT). Also reported from Kota (Jain and Kotwal, 1960) and Udaipur (Vyas, 1965).
Jasminum arborescens Roxb. *Chameli, Bana'kunda* (Hindi) Scandent shrubs, with simple leaves and white flowers in lax cymes. Cultivated for ornamental purposes.

Jasminum auriculatum Vahl Scandent shrubs, with 1 to 3 foliolate leaves and white flowers in cymes. Cultivated for ornamental purposes.

Jasminum azoricum L. - Scandent or climbing shrubs, with 3-foliolate leaves and white flowers in axillary and terminal cymes or panicles. Cultivated ornamentally.

Jasminum grandiflorum L. *Chameli* (Hindi) - Scandent or climbing shrubs, with imparipinnate leaves having 4-7 pairs of leaflets and white flowers in dense capitate cymes. Cultivated ornamentally.

Jasminum multiflorum (Burm. f.) Andrews (Nyctanthes multiflora Burm. f.) *Gulcharia* (Hindi) - Scandent shrubs, with simple leaves and white flowers in dense capitate cymes. Cultivated ornamentally.

Jasminum odoratissimum L. - Climbing shrubs, with pinnate leaves and yellow flowers. Cultivated for ornamental purposes.

Jasminum officinale L. *Chameli* (Hindi) - Climbing shrubs, with pinnate leaves and white flowers. Cultivated ornamentally.

Jasminum rottharianum Wall. ex A. DC. - Scandent shrubs, with simple leaves and white flowers in terminal capitate cymes. Cultivated ornamentally.

Jasminum roxburghianum Wall. ex DC. *Chameli* (Hindi) - Climbing shrubs, with simple leaves and white flowers in trichotomous cymes.

Jasminum sambac (L.) Ait. (Nyctanthes sambac L.) *Mogra* (Hindi) Scandent or climbing shrubs, with simple leaves and white flowers which are solitary or in 3-flowered cymes.

78. SALVADORACEAE

(V. Singh)

**Salvadora L.**

Leaves ovate - lanceolate, more than 1.5 cm in diameter. Flowers pedicellate. Fruits red when ripe. ... 2. *S. persica*
Leaves linear - lanceolate, up to 1.3 cm in diameter.  
Flowers sessile. Fruits yellow when ripe.  ...  \textit{1. Salvadora oleoides}


Evergreen trees, 3-5 m high, with short, twisted trunks and drooping branches. Leaves 6.5-10.0 × 0.7-1.3 cm, entire, coriaceous. Flowers greenish-white, in axillary, panicled spikes. Bracts ovate, acute, deciduous. Calyx-lobes 4, rounded. Stamens exserted, epipetalous. Drupes globose, 1-seeded.

\textit{Fl. & Fr.}: February - June.

Common in dry sandy and saline soils, often on hard rocky grounds.

\textit{Selected specimens}: Barmer: Rao: 66868 (BSA); Bundi: Mangli river, Verma 1861 (BSA); Jaipur: Amer, Sharma 3001 (KÜBL); Jodhpur: Mandore, Verma 594 (BSJO); Sirohi: Vadakheda, Jain 60448 (BSI).


Evergreen trees, 4-7 m high, with drooping branches. Bark grey-white. Leaves 3-8 × 1.5-3.5 cm, fleshy, acute. Flowers dull yellow, in compound panicles longer than leaves. Bracts ovate, shorter than pedicels, deciduous. Calyx-lobes rounded. Stamens exserted, epipetalous. Drupes globose, 1-seeded.

\textit{Fl. & Fr.}: December - June.

Common in dry wastelands, often forming compact clumps.

\textit{Selected specimens}: Banswara: Loharia, Singh 4240 (BSJO); Bikaner: Shivbari, Roy 2394 (BSJO); Jaipur: Amer, Parker 5953 (DD); Kota: Baran, Singh 90494 (LWG); Sirohi: Abu Road, Kaul 9386 (LWG).

\section*{79. APOCYNACEAE}

(V. Singh)

\textbf{1a. Plants armed with spines. Fruit an indehiscent berry.}  ...  \textit{1. Caprista}
1b. Plants unarmed. Fruit of dehiscent follicles:

2a. Erect herbs. Seeds not comose. ... 2. Catharanthus

2b. Trees, shrubs or shrubby climbers. Seeds comose:

3a. Anthers conniving in a cone and adhering to the stigma:

4a. Corolla - throat villous or with fimbriate scales inside:

5a. Trees. Corolla - lobes overlapping to the left. ... 6. Wrightia

5b. Shrubby climbers. Corolla - lobes overlapping to the right. ... 4. Ichnocarpus

4b. Corolla - throat naked. ... 5. Vallaris

3b. Anthers free, not adhering to the stigma. ... 3. Holarrhena


Spines paired. Berries about 1.5 cm in diameter. ... 1. C. congesta

Spines solitary. Berries about 7 mm in diameter. ... 2. C. spinarum


Erect or scandent shrubs, armed with straight, paired, horizontal spines. Leaves 2 - 6 × 1.5 - 4.0 cm, elliptic-oblong to ovate, acute, mucronate. Flowers white, in corymbose cymes. Calyx-lobes acute. Corolla-tube 10 - 15 mm long; lobes 5 - 7 mm long. Berries 1.3 - 2.5 × 1.0 - 1.5 cm, elliptic-oblong, fleshy, 2-celled, 4-seeded.

Fl.: January - April; Fr.: May - June.

Usually met with in the forests and wastelands; abundant at Sitabari (Kota); also cultivated in the gardens for its edible fruits.

Selected specimens: Banswara: Anand Sagar, Singh 4614 (BSJO); Churu: Roy 4022 (BSJO); Jaipur: Raj. College, R. Singh Acc. No. 10479 (RUBL); Kota: Shahabad, Singh 91042 (LWG); Sirohi: Mt. Abu, Blatter 21982 (BLAT).

Large, thorny, evergreen shrubs. Leaves 1.3 3.0 × 1.0 2.5 cm, elliptic or broadly ovate suborbicular, acute or mucronate, entire, often revolute - margined. Flowers white or tinged with pink, scented, in terminal and axillary, corymbose cymes. Calyx divided nearly to the base; lobes acuminate. Berries subglobose, dark - purple at maturity, 4 seeded. Seeds ovate.

Fl.: January April; Fr.: May - August.

Rare; in dry stony grounds in wastelands and open forests.

Selected specimens: Jhalawar: Aklera, Majumdar & Mishra 10035 (BSA); Kota: Chhabra - Gugor, Singh 90948 (LWG); Sirohi: Mt. Abu, Mehta 896 (JAC).

2. Catharanthus G. Don


Erect, glabrous, annual herbs, 15 - 50 cm high. Leaves 3 7 × 0.7 - 2.0 cm, lanceolate, acute, entire. Flowers 1.0 - 1.5 cm long, white, sessile, axillary, solitary or paired. Corolla - tube upto 1 cm long, dilated at the top. Filaments short; anthers exappendiculate. Carpels 2, free, glabrous or pubescent. Follicles 3.5 - 5.0 cm long, lincar, pointed, many - ribbed. Seeds oblong, black, longitudinally muricately ribbed.

Fl. & Fr.: July September.

Common and abundant in the fields, gardens, wastelands and forests.

Selected specimens: Banswara: Paleoda, Singh 2829 (BSJO); Jaipur: Amer, Sharma 860 (RUBL); Kota: Kathoon, Singh 90586 (LWG); Sirohi: Mt. Abu, Blatter 2290 (BLAT); Tonk: Niwai, Shetty 1247 (BSJO).


Shrubs or small trees, 3-6 m high, with blackish brown bark. Leaves 5 30 × 5 - 15 cm, ovate elliptic, abruptly acuminate. Flowers white, in corymbose cymes. Corolla tube pubescent. Stamens inserted near the base of corolla tube. Follicles 20 40 × 0.5 - 1.0 cm, cylindric, lenticelled. Seeds linear oblong, compressed, comose.

*Fl.* : May June; *Fr.* : June September.

Common in the forests in hilly tracts. Often confused for *Wrightia tinctoria* R. Br.

*Selected specimens* : Banswara : Chhatripoda forest, *Singh* 2977 (BSJO); Jaipur : Daosa, *Wadhwa* 8124 (BSA); Kota : *Verma* 3301 (BSA); Pali : Paras Ram Mahadeo, *Shetty* 1904 (BSJO); Udaipur : Jaisamand *Kanodia* 82247 (BSI).

4. **ICHNOCARPUS** R. Br. nom. cons.


Large twining shrubs. Leaves 4 10 × 3.5 cm, elliptic - oblong or ovate lanceolate, acute to acuminate, entire. Flowers greenish white, rarely rose coloured, in trichotomous cymes. Corolla - tube narrow below, globular in the middle and constricted in upper part with white hairs inside. Follicles 7 - 15 cm long, straight, cylindric, rusty pubescent when young, glabrous at maturity. Seeds linear, black.


Common among bushes in the forests, on the boundaries of fields and gardens. Plants prefer moist and shady localities in the east of Aravalli.

5. Vallaris N.C. Burman


Twining or straggling shrubs. Bark light grey. Leaves 5 11 × 2.0
2.5 cm, elliptic or ovate oblong, glabrous, gland-dotted. Flowers white, in lax, axillary cymes. Calyx glandular. Anthers exerted, glandular, inserted near the base of tube. Follicles 10 - 15 cm long, cylindric. Seeds ovoid, beaked; coma silvery white.

Fl. & Fr.: December - April.

Rare, in valleys among bushes, often on the boundaries of fields and gardens; also cultivated for ornamental purposes.

Selected specimens: Jaipur: Maheshwari 67 (DD); Kota: Shahabad, Wadhwa 9254 (BSA); Sirohi: Mt. Abu, Jain 62086 (BSI). Also reported from Alwar and Udaipur (Vyas, 1967; Ramdeo, 1969).


Follicles smooth, paired, cohering at the apex only i.e. two fruits produced by each flower. ... 2. W. tinctoria

Follicles rough with white tubercles, solitary due to complete fusion of two follicles i.e. one fruit produced by each flower. ... 1. W. arborea


Trees, 6 - 15 m high, with ash-coloured bark. Leaves 3 - 11 × 1.5 - 5.0 cm, elliptic or ovate oblong, acute or obtuse, tomentose. Flowers creamy-white, in terminal, tomentose cymes. Corona scales oblong. Anther apex not eiliate. Follicles 15 - 20 × 1 - 2 cm, stout, cylindric, not ribbed. Seeds linear-oblong; coma longer than seeds.

Fl.: December - July; Fr.: January - September.
Frequent in the forests in hilly tracts; often planted in the gardens.

*Selected specimens*: Bhilwara: Banera, Singh 6018 (BSJO); Jaipur: Jalana hills, Sharma 981 (RUBL); Kota: Bara-bagh, Singh 74711 (LWG); Pali: Ghanerao forest, Pandey 4648 (BSJO); Sirohi: Mt. Abu, Mehta 645 (JAC); Tonk: Toda Rai Singh Forest, Shetty 552 (BSJO).


Deciduous trees or large shrubs, 5-10 m high. Bark fissured, greyish black. Leaves 4.5-15.0 × 2.5-7.0 cm, elliptic lanceolate or oblong, glabrous or pubescent. Flowers white, in dichotomous cymes. Corolline corona of many laciniate scales. Anther apex ciliate. Follicles 15-50 × 0.6 cm, cylindric, globose, longitudinally striated, black. Seeds brown; coma longer than seeds.

*Fl.*: March May; *Fr.*: June October.

Common in the forests, particularly in hilly tracts.

*Selected specimens*: Banswara: Dagia Bowji, Singh 2859 (BSJO); Barmer: Balotra, Shetty 2258 (BSJO); Jaipur: Moti Dungri, Sharma 1599 (RUBL); Kota: Shahabad, Majumdar 10491 (BSA); Sirohi: Mt. Abu, Jain 62075 (BSJ).

**CULTIVATED SPECIES**

*Allamanda cathartica* L. - Trailing shrubs, with bright yellow flowers in terminal cymes. Native of Brazil; cultivated for ornamental purposes.

*Alstonia scholaris* (L.) R. Br. (*Echites scholaris* L.) - Trees, with oblong-lanceolate leaves in whorls and greenish yellow flowers in cymes. Planted for ornamental purposes.

*Beaumontia grandiflora* Wall. - Evergreen climbers, with elliptic-ovate leaves and white flowers in cymes. Native of E. Himalaya; cultivated for ornamental purposes.

*Catharanthus roseus* (L.) G. Don (*Vinca rosea* L.) 'Sadaphuli' (Hindi) - Perennial herbs, with white or rosy, solitary, axillary flowers. Native of Tropical America; cultivated for ornamental purposes.

*Ervatamia divaricata* (L.) Burkhill (*Nerium divaricatum* L.) 'Chandni' (Hindi) - Evergreen shrubs, with white flowers in dichotomous cymes. Native of Tropical Asia; cultivated for ornamental purposes.
Nerium oleander L. *'Kaner'* (Hindi) - Evergreen shrubs, with white or red flowers in cymes. Native of Mediterranean region; cultivated for ornamental purposes.

*Plumeria rubra* L. - Small trees, with ovate - lanceolate leaves and white flowers with yellow eye. Native of America; cultivated for ornamental purposes.

*Rauvolfia serpentina* (L.) Benth. ex Kurz (*Ophioxylon serpentinum* L.) - Woody shrubs, with elliptic leaves in whorls of 3 and white or pink flowers in corymbose cymes.

*Thevetia peruviana* (Pers.) Merr. (*Cerbera peruviana* Pers.) *'Pili-Kaner'* (Hindi) Shrubs or small trees, with linear leaves, yellow flowers and subglobose fruits. Native of Tropical America; cultivated for ornamental purposes.

60. ASCLEPIADACEAE

(P.J. Parmar)

1a. Plants succulent:

2a. Twining shrubs, Stem jointed, cylindrical. Corolla pale yellowish. ... 13. Sarcostemma

2b. Erect or ascending herbs. Stem not jointed, quadrangular. Corolla purplish. ... 2. Caralluma

1b. Plants not succulent:

3a. Erect herbs or shrubs (except *Leptadenia reticulata*):

4a. Follicles echinate. ... 8. Odontanthera

4b. Follicles smooth:

5a. Anthers with a membranous appendage. Pollen - masses pendulous. Follicles in pairs. ... 1. Calotropis

5b. Anthers incumbent on the stigma, without a membranous appendage. Pollen - masses erect. Follicles solitary:


3b. Plants climbing or scrambling:
7a. All leaves deeply cordate:

8a. Cymes dichasia1y branched, sessile or
shortly peduncled. ... 7. Marsdenia

8b. Cymes umbellate or racemose, not
dichasia1y branched, long peduncled:

9a. Corolla salver-shaped; lobes
densely pilose within. Follicles
echinate. ... 12. Pergularia

9b. Corolla rotate or shallowly campanu-
late; lobes glabrous. Follicles
smooth:

10a. Peduncles shorter than the
petioles. Corolla purplish-
crimson. ... 5. Holostemma

10b. Peduncles equalling or
exceeding the petioles. Corolla
greenish. ... 16. Wattakaka

7b. Leaves not or very shallowly cordate or
only the lower ones cordate:

11a. Flowers in lax, dichasia1y branched
or in dense umbellate cymes, but in
latter case cymes paired at the nodes:

12a. Calyx - lobes acute. Corolla rotate. ... 15. Tylophora

12b. Calyx - lobes obtuse. Corolla
campanulate. ... 4. Gymnema

11b. Flowers in umbellate or racemose
cymes. Cymes solitary at the nodes:

13a. Flowers greenish - yellow:

14a. Cymes sub - sessile. Corolla
divided to the base. ... 11. Pentatropis

14b. Cymes peduncled. Corolla
tubular; lobes twice as
long as the tube. ... 14. Telosma

13b. Flowers white, often purplish -
red within:

15a. Corolla tubular; lobes
connate with their tips. ... 3. Ceropogia

15b. Corolla rotate; lobes not
coherent with their tips. ... 10. Oxystelma
1. CALOTROPIS R. Br.

Corolla - buds ovoid; corona - lobes hairy, shorter than the staminal column, with two obtuse auricles just below the apex. ... 1. C. gigantea

Corolla - buds hemispherical; corona - lobes glabrous, equalling or longer than staminal column, without auricles. ... 2. C. procera subsp. hamiltonii


Erect shrubs or small trees, with ash coloured bark, clothed with white pubescence all over. Leaves sessile, 6 - 18 × 3 - 10 cm, elliptic - oblong or obovate - oblong, acute to acuminate at apex, semi - ampeloxicaul at base. Flowers in terminal and lateral umbellate cymes. Corolla 2 - 4 cm in diam., purplish or white. Follicles 7 10 × 3 - 4 cm, glaucous green, recurved. Seeds 5 - 6 mm long, broadly ovate, flat, comose.

Fl. & Fr.: Almost throughout the year.

Not common, found in wastelands.

Selected specimens: Bundi: Baijnath Mahadev temple, Singh 74732 (LWG); Jodhpur: Near Umaid Garden, Ray 2459 (BSJO); Sirohi: Mt. Abu, Mehta 647 (JAC); Udaipur: Sharma Acc. No. 12052 (RUBL). Also reported from Ajmer (Sharma, 1958), Jaipur (Bajpai & Verma, 1964), Jhunjhunu (Nair, 1956, 1961) and Bikaner (Sarup, 1958).


Erect shrubs or small trees, covered with white pubescence; branches many from the base. Leaves 5 - 12 × 1.5 - 8.9 cm, broadly ovate, ovate - oblong. elliptic or obovate, acute at apex, cordate at the base. Flowers in umbellate, lateral cymes. Corolla c. 2.5 cm in diam., pure white to whitish - purple. Follicles 6.5 - 9.5 × 3 - 5 cm, ellipsoid or ovoid, recurved, tip not invaginated in the fruit. Seeds 6 - 8 mm long, flat, broadly ovate; coma silky, upto 5 cm long.

Fl. & Fr.: Throughout the year.

Fairly common throughout the state in wastelands.
2. CARALLUMA R. BR.


Erect, succulent herbs, 15 - 60 cm high; branches subterete, 4 - angled. Leaves 0.6 - 1.3 cm long, linear or ovate-lanceolate, acute, caducous. Flowers 1 - 3, in the axils of leaves, all along distal nodes. Corolla campanulate, 0.7 mm long, purplish inside; lobes ovate-lanceolate, acute, glabrous within. Corona in two rows; outer cupular, 5 - lobed, each lobe produced into 2 distinct, subulate teeth; inner one linear, subacute. Follicles 8 - 17 cm long, lanceolate, terete, smooth. Seeds brown, winged on the margins; coma c. 2.5 cm long.

Fl. & Fr.: February - September.

Rare, in desertic habitats.

Selected specimens: Jaisalmer: Bhandari 2141 (JAC); Mohangarh, Wadhwa 5071 (BSA).

3. CERPESIA L.

1a. Erect herbs.

1b. Twining herbs:

2a. Leaves fleshy:

3a. Leaves orbicular or ovate, emarginate or apiculate, long - petioled.

3b. Leaves linear to lanceolate, subsessile.

2b. Leaves membranous:

4a. Corolla - lobes equal or longer than tube.

1. C. affinis
2. C. bulbosa
3. C. bulbosa var. bulbosa
4. C. bulbosa var. humilis
5. C. zingibersifolia
4b. Corolla - lobes shorter than the tube :

5a. Plants glabrous. ... 4. C. candelabrum

5b. Plants hirsute. ... 5. C. hirsuta


Tall, tuberous herbs. Stem usually one, rarely two or three from same tuber, hairy above. Leaves subsessile, 4 8 × 0.7 - 1.0 cm, linear, acute, tapering at base. Cymes axillary or extra - axillary, shortly peduncled, 1 to 2 flowered. Corolla tube inflated in lower part, narrowed above, enlarge near the mouth, yellowish - green outside, striated with purple inside. Outer corona of 5, bisid, ciliate lobes. Follicles c. 7.5 cm long, straight, tapering to a fine point. Seeds 4.0 × 1.5 mm, ovate - oblong, comose.

Fl. & Fr.: July - October.

Rare, in exposed rocky grounds.

Selected specimen: Jaipur: Galta, Sharma 2270 (RUBL). Ansari (l.c.), however, mentioned it endemic to Goa, Karnataka and Maharashtra.


var. bulbosa

Twining, perennial herbs, with an underground, tuberous stem. Leaves 2.5 - 4.5 × 2.0 - 3.5 cm, glabrous. Cymes pedunculate, 6 to 10 - flowered. Corolla 1.5 - 2.0 cm long; tube inflated at base, funnel - shaped at the mouth, glabrous within; lobes linear, hairy within. Follicles 8.5 - 9.0 cm long, glabrous, terete. Seeds linear - oblong, with membranous wings.

Fl. & Fr.: July - December.

Rare, in exposed rocky habitats, particularly on hillocks.

Selected specimen: Jodhpur: Mandore, Tiwari 625 A (BSJO).

Soc. 5: 204. 1862. *C. bulbosa* Roxb. var. *esculenta* (Edgew.) Hook. f. l.c. 4: 68. 1883.

Very similar to the type, but can be easily distinguished by its linear to lanceolate, sub sessile leaves.

*Fl. & Fr.*: July - December.

Frequent among bushes on the outskirts of forests.

*Selected specimens*: Barmer: *Bhandari* 1543 (JAC); Jaipur: Ramgarh, *Sharma* 1343 (RUBL); Jhalawar: Lotiajhil, *Wadhwa* 5499 (BSA); Jodhpur: Mandore (on hills), *Tiwari* 625 B (BSJO); Udaipur: *Kanodia* 82209 (BSI).


Glabrous twiners. Leaves variable, petioled, linear to orbicular. Flowers many, in lateral umbellate cymes; pedicels shorter than peduncles. Corolla 3.0 - 4.0 cm long; tube inflated in lower half; lobes truncate or narrowed into a beak, 5 - 8 mm long, hairy within. Outer corona of 5 truncate hairy lobes; the inner corona linear - spathulate.

*Fl. & Fr.*: August - March.

This species is a denizen of South India and included here on the authority of Nair (1956, 1961) and Nair & Nathawat (1957) who reported it from Jhunjhunu and Sikar districts respectively.


Coarse, tuberous twiners, hirsute all over except the corolla. Leaves variable, 5 - 6 × 3.5 - 3.8 cm, linear - lanceolate or ovate - cordate, acuminate. Flowers few, in lateral umbellate cymes. Corolla 2.5 - 6.0 cm long; tube depressedly inflated at the base, funnel - shaped above, yellow, striated with green at the base; lobes purple, hairy inside. Outer corona of 5, bifid lobes; inner corona erect, linear. Follicles 10.0 × 0.5 cm, finely pointed. Seeds narrowly oblong.

*Fl. & Fr.*: July - October.

Fairly common at Mt. Abu than elsewhere.


Coarse, tuberous climbers; branches glabrous. Leaves 5 - 10 cm long, variable, narrowly lanceolate or ovate cordate, obtusely acuminate to acute. Flowers in few flowered umbellate cymes; peduncles hirsute; pedicels glabrous. Corolla 3 - 8 cm long, greenish, blotched with purple; tube inflated at base, funnel shaped at mouth; lobes pubescent inside. Outer corona of 5, erecto-patent, emarginate, fleshy lobes tipped with long hairs; the inner one ligulate-oblanceolate, glabrous. Follicles linear-lanceolate, finely pointed, glabrous.

Fl. & Fr.: July - October.

Rare, in the forests among clumps of shrubs at Mt. Abu.

Selected specimens: Sirrohi: Mt. Abu, Carl 6625, 6626, 6628, 6627 (BLAT), McCann 60i0 (BLAT).


Much branched, twining shrubs. Leaves 3.5 - 5.5 cm long, ovate, elliptic or oblong, acute or apiculate, rounded at base, subcoriaceous. Flowers minute, spirally arranged in lateral pedunculate or nearly sessile cymes, greenish-yellow. Corolla - lobes imbricate. Ridges of corona protruding beyond the mouth of corolla. Follicles usually solitary, 6 - 8 x 0.8 cm, straight or slightly curved, terete, lanceolate, tapering, glabrous. Seeds c. 1.2 x 0.5 cm, narrowly ovoid-oblong, glabrous, brown.

Fl. & Fr.: April - January.

Frequent in the deciduous forests in the east of Aravalli.

Selected specimens: Banswara: Shergarh forest, Singh 3084 (BSJO); Jaipur: Jain 49627 (BSI); Jalalwara: Asnowar, Verma 6876 (BSA); Kota: Verma 422 (BSA); Sawaimadhopur: Ranthambhore, Sharma 3240 (RUBL).
5. Holostemma R. Br.


Extensive, perennial twiners; stem terete, sparingly branched. Leaves 7 - 17 × 5 - 15 cm, broadly ovate, acuminate, cordate at base, with gland - pit on the midrib beneath, glaucous. Flowers in axillary, few - flowered lax cymes. Corolla fleshy, white, purple inside. Anthers completely connate, with membranous appendages and one pendulous pollen - mass in each cell i.e. 10 in all. Follicles 10 - 12 × 5 - 6 cm, turgid, boat - shaped, green, linear - oblong, glabrous. Seeds 0.7 × 0.5 cm, ovate, compressed, glabrous; coma c. 3 cm long.

*Fl. & Fr.* : June - October.

Rare, in deciduous forests on the outskirt.

*Selected specimens* : Banswara : Shergarh forest, Singh 3082 (BSJO); Misc.

*Locality* : Mehibir forest, Puri 37353 (BSI). Also reported from Jodhpur by Sarup (1954).


Erect, bushy shrubs, leafless or nearly so.


Erect, much - branched bushy shrubs, upto 1.5 m high, with watery sap. Leaves when present, 2.5 - 6.5 × 0.2 - 0.3 cm, sessile, narrowly linear to linear - lanceolate, caducous. Flowers in lateral umbellate cymes, greenish - yellow. Corolla - lobes valvate. Outer corona of 5 small scales; staminal corona of raised, undulate, fleshy ring. Follicles 7.0 - 14.0 × 0.5 - 0.8 cm, terete, lanceolate, tapering to a slender beak, glabrous. Seeds 5 - 7 mm long, ovate - lanceolate, glabrous; coma 2.5 - 3.5 cm long.
**Fl. & Fr.** : August - January.

Common throughout the state in dry habitats, particularly in the desertic zone.


Twining shrubs, with watery sap and corky deeply cracked bark. Leaves 3.0 17.5 × 1.5 7.0 cm, broadly ovate to ovate - lanceolate, acute at apex, rounded at base, sub coriaceous. Flowers in lateral, many flowered umbellate cymes, greenish. Corolla - lobes valvate. Outer corona of 5, fleshy quadrate - truncate lobes; staminal corona annular. Anthers without terminal appendages. Follicles 5 - 9 × 2 - 3 cm, oblong or broadly lanceolate, with a thick curved beak. Seeds c. 1 cm long, narrowly ovoid; coma 3 - 4 cm long.

*Fl. & Fr.* : Almost throughout the year.

Common in wastelands, open forests and on the edges of fields and gardens, particularly in the east of Aravalli.

*Selected specimens*: Banswara : Paloda, *Singh* 2845 (BSJO); Dungarpur : *Majumdar & Mishra* 10337 (BSA); Kota : Rampura, *Verma* 1788 (BSA). Also reported from Jodhpur by Sarup (1954).

7. **Marsdenia R. Br.**


Extensive, woody twiners, with thick root - stock and sticky latex. Leaves 7 - 20 × 5.5 - 12.0 cm, broadly ovate - cordate, acuminate, densely hairy. Flowers in large drooping panicles composed of alternate drooping branches of umbellate cymes, yellowish green. Staminal corona basal, of linear flattened lobes. Follicles 6 - 15 × 2.0 - 4.5 cm, ovoid - lanceolate, acute, longitudinally rugose, velvety pubescent. Seeds 1.2 × 0.8 cm,
broadly ovate - oblong, margined; coma of white silky hairs, 3-4 cm long.

*Fl. & Fr.*: May August.

Common on the edges of fields and gardens, in the wastelands and open forests, particularly in the east of Aravalli.

*Selected specimens*: Banswara: Shergarh forest, *Singh* 3085 (BSJO); Bharatpur: Ghana Bird Sanctuary, *Parmar* 8616 (BSJO); Jhalawar: Ghotdi, *Wadhwa* 7555 (BSA); Pali: Kotra village, *Shetty* 1452 (BSJO); Sirohi: Mt. Abu, *Mehta* 889 (JAC); Tonk: *Maheshwari* 52986 (LWG).

8. **ODONTANTHERA** Wight


Small, erect, annual or perennial herbs, 10-15 cm high. Leaves opposite, 2.5-7.0 × 1.8-5.0 cm, lower round ovate, sub - cordate, obtuse or retuse; upper ones elliptic, acuminate, hairy on both sides. Flowers in subsessile, umbellate, 2 to 8 - flowered cymes, white or yellow. Corona - lobes c. 0.25 cm long, entire or bifid. Follicles 2.5 - 5.0 cm long, ellipsoid, covered with soft scattered spines. Seeds 4 - 6 mm long, broadly ovate, acute, flat with papery margins, sinuate dentate at the broader end.

*Fl. & Fr.*: August - December.

Rare, in the rocky habitats in western desertic zones of the state.

*Selected specimens*: Barmer: *Bhandari* 1608 (JAC); Jaisalmer: Bojka, *Shetty* 3350 (BSJO); Range Management area, *Tiwari* 823 (BSJO); Pokaran Lavan, *Jain* 4946 (BSI); Kuri, *Stower* B - 40 (BSI); Vinjurai, *Wadhwa* 5308 A (BSA); Budhi Nala, *Wadhwa* 4987 (BSA); Mohangarh, *Wadhwa* 5075 (BSA).

9. **ORTHANTHERA** Wight

Small, erect, leafless shrubs; young branches pubescent. Flowers in compact woolly cymes, dull brown; peduncles 0.8 – 2.5 cm long. Sepals as long as corolla - tube. Corolla villous outside, glabrous within, salwar - shaped. Follicles erect, 7.0 – 12.5 cm long, linear, compressed, smooth, with thin pericarp. Seeds 0.25 – 0.35 cm long, dark brown, flat, comose.

Fl. & Fr.: March July.

Included on the authority of Sarup (1954) from Jodhpur. Duthie (l.c.) also mentioned its distribution in Rajasthan, but authors could not trace any specimen of it from Rajasthan in Indian herbaria.

10. Oxytelma R. Br.


Twining, glabrous herbs or undershrubs. Leaves 4 – 9 × 0.4 – 0.8 cm, linear lanceolate, acute or acuminate at apex and acute or rounded at base. Flowers in drooping, few flowered, lateral, subumbellate cymes. Corolla rotate, white outside, pink inside, with purplish reticulations. Outer staminal corona cupular, adnate to the base of column; inner of 5, free lobes, 2 keeled within. Follicles 4 – 7 × 1 cm, ovoid - lanceolate, acute. Seeds ovate or sub orbicular; coma up to 2 cm long.

Fl. & Fr.: May - February.

Common in marshy habitats, particularly in the east of Aravalli in association with Typha angustata Bory & Chaub.

Selected specimens: Banswara: On the way to Kushalgarh, Singh 3026 (BSJO); Bharatpur: Ghana Bird Sanctuary, Parmar 8634 (BSJO); Jaipur: Ramgarh, Singh Acc. No. 8172 (RUBL); Jaisalmer: Masya dam, Jain 40565 (BSA, BSI).

11. Pentatropis Wight & Arnott

Slender, twining undershrubs, with watery sap. Leaves 1.5 × 0.6 - 1.8 cm, thick, ovate, ovate-lanceolate or elliptic-oblong, acute to obtuse at apex, mucronate, rounded or subcordate at base, glabrous. Flowers in 3 to 7 flowered, lateral umbellate cymes, yellowish-green with a reddish eye. Corolla lobes with long, linear tails. Follicles 7.9 × 1.5 cm, lanceolate, tapering to a beak, glabrous. Seeds ovate, flattened; coma 2.0 - 2.5 cm long.

_Fl. & Fr._: January October.

Fairly common throughout the state, preferably in loamy soils.

_Selected specimens_: Bharatpur: Achanera, Parmar 8665 (BSJO); Bikaner: Kolayat, Roy 2053 (BSJO); Jaipur: Amber, H. Lal 34626 (LWG); Jaisalmer: Devikot, Wadhwa 5302 (BSA); Tonk: Tordi Sagar, Shetty 1104 (BSJO).

12. _Pergularia L._


Hispid, twining undershrubs. Leaves 3.9 × 2.5 - 6.0 cm, ovate, acuminate, cordate at base. Flowers in drooping, lateral corymbose cymes, pale yellowish green. Basal staminal corona of 5-lobed membrane; upper of 5, laterally compressed lobes adnate to the anthers. Follicles in pairs, 5 - 8 × 1.0 - 1.5 cm, reflexed, slightly curved, lanceolate, tapering to a point, pubescent, softly echinate all over. Seeds 7 × 5 mm, ovate, truncate at apex, dentate-marginated, densely velvety pubescent; coma 3 - 4 cm long, white, hairy.

_Fl. & Fr._: March December.

Common among bushes on the edges of fields, gardens, fringes of forests and wastelands.

_Selected specimens_: Alwar: Sariska Tiger Reserve, Parmar 9593 (BSJO); Banswara: Paloda, Singh 2848 (BSJO); Barmer: Kundal, Pandey 8024 (BSJO); Jaipur: Road to Amber, Sharma 313 (RUBL); Kota: Wadhwa 1990 (BSA); Pali: Rajpurdam, Shetty 1502 (BSJO).

1a. Flowers in terminal and lateral umbels. Style-apex oblong-fusiform, much exserted. ... 1. *S. intermedium*

1b. Flowers in terminal umbels only. Style-apex conical, not exserted:

2a. Follicles 10 - 12 cm long, lanceolate, tapering at both ends, slightly divergent. ... 2. *S. viminalis* subsp. *viminalis*

2b. Follicles 5.5 - 8.5 cm long, cylindric not tapering towards base but little towards the apex. ... 3. *S. viminalis* subsp. *stocksi*


Leafless, pendulous or scandent shrubs. Flowers in lateral and terminal, sessile umbels, whitish. Inner processes of corona oblong. Stigma fusiform, simple or bifid. Follicle 7 - 10 cm long, broad at the base and narrowed at the tip, thinly coriaceous, slightly divergent. Seeds 5 - 6 × 2.3 mm, oblong, flattened, rounded at the base, truncate at the apex; coma c. 1.8 cm long.

*Fl. & Fr.*: June - September.

Rare, in dry rocky habitats. Reported from Ajmer district only.

*Selected specimen*: Ajmer: Laurie 191 (DD).


subsp. *viminalis*

Much-branched, leafless, straggling shrubs. Flowers sweet-scented, in sessile, many-flowered, terminal umbels. Bracts lanceolate, puberulous. Pedicels 1.0 - 1.5 cm long, pubescent. Corolla rotate, glabrous, pale greenish-white, divided nearly to the base; lobes ovate or oblong, obtuse. Follicles usually solitary, 10 - 13 × 0.7 - 1.0 cm. Seeds 3 - 6 mm long, flattened, ovate; coma c. 1.8 cm long.

*Fl. & Fr.*: June - October.
Fairly common throughout the state, particularly west of Aravalli, in dry rocky habitats.

*Selected specimens*: Ajmer: *Puri* 37585 (BSI); Barmer: Haldeswar Mahadev R.F., *Pundey* 7944 (BSJO); Bhilwara: Amarpura, *Singh* 6234 (BSJO); Jaisalmer: *Bhandari* 1052 (JAC); Jodhpur: Kailana, *Singh* 4490 (BSJO); Pali: Jawai, *Shetty* 1448 (BSJO).


Very similar to *subsp. viminate*, but can be distinguished by its smaller divericate follicles which are cylindric, straight and rod-like. Seeds 6-7 mm long, narrowly oblong, with truncate apex; coma c. 2.5 cm long.

*Fl. & Fr.*: June October.

Rare, in rocky habitats; so far reported from Jodhpur district only.

*Selected specimen*: Jodhpur; Chopasni, *Puri* 23268 (BSI).

### 14. *Telosma* Coville


Twining undersubs; branches pale, more or less pubescent. Leaves 5-9 × 3.5 6.0 cm, membranous, ovate, shortly acuminate, cordate at base. Flowers in many-flowered umbellate cymes, pale creamish to white. Pollen masses clavate or subcylindric. Follicles 10 × 2 cm, woody, lanceolate, shortly acuminate. Seeds ovate oblong, strongly margined, glabrous, comose.

*Fl. & Fr.*: August December.

Occasional, found in open dry wastelands and foot of Aravalli.

*Selected specimenes*: Ajmer: *Tiagi* 19 (DD); Banswara: Kushalgarh, *Singh* 3754 (BSJO); Bhilwara: Bhilon ki Jhopari (along Beawar Road), *Singh* 6213 (BSJO); Jaipur: URF, *Sharma* 2138 (RUBL); Pali: Near Desuri, *Shetty* 1865 (BSJO).
15. Tylophora R. Br.


Twining undershrubs, often clothed with spreading hairs. Leaves 4.5 × 1.5 8.0 cm, ovate to ovate lanceolate, acute to acuminate at apex, rounded to subcordate at base, glabrous or pubescent. Flowers in umbeloid cymes, white to pale green. Calyx segments hirsute. Corolla pubescent within. Follicles 3.5 - 7.5 × 0.5 0.7 cm, usually solitary, tapering upwards, smooth. Seeds c. 6 mm long, compressed, truncate, dark brown, comose.

*Fl. & Fr.*: May November.

Rare, in the interior forests, in shady habitats.

*Selected specimen*: Banswara: Punapathar forest, *Singh* 2927 (BSJO).

16. Wattakaka Hassk.


Large twining shrubs. Leaves 6.0 × 4.0 11.5 cm, broadly ovate or suborbicular. acuminate, glabrous or softly pubescent, with a few small glands just above the petiole, rounded or cordate at base. Flowers in lateral, drooping umbelate cymes, yellowish-green. Follicles 5 10 × 2.0 - 4.5 cm, slightly tapering to a blunt point, rugosely striate. Seeds ovate; coma 4 - 5 cm long.

*Fl. & Fr.*: April September.

Common in wastelands, forests and edges of fields and gardens.

*Selected specimens*: Ajmer: Jain 49686 (BSI); Alwar: Sariska, Parmar 10206 (BSJO); Barmer: Haldeshwar Mahadev forest, Pandey 7973 (BSJO); Dungarpur: Sagwara, Kanodia 82175 (BSI); Jaipur: Doasa, Wadhwa 8242 (BSA); Kota: Wadhwa 9226 (BSA); Pali: Ghanerao forest, Pandey 4640 (BSJO); Udaipur: Jaisamand, Kanodia 82258 (BSI).
Asclepias curassavica L. Erect undershrubs. Flowers showy, bright crimson or light orange in extra-axillary umbellate cymes. Commonly cultivated in the gardens for ornamental purposes.

81. PERIPLOCAECEAE

(P.J. Parmar)

1a. Corolla 5 - 6 cm long, dark-violet or purple; tube much longer than the calyx-lobes. ... 2. Cryptostegia

1b. Corolla 0.3 - 1.5 cm long, brownish-yellow, pale yellow, creamy-white or greenish outside and purplish within; tube about as long as or shorter than the calyx-lobes:

2a. Leafy twining shrubs. Corona-lobes 5, free:

3a. Flower-buds produced into a slender beak. Corolla 10-15 mm long, yellowish-white. ... 1. Cryptolepis

3b. Flower-buds ovoid, not beaked. Corolla 5.0 - 6.5 mm long, dull purplish-brown. ... 3. Hemidesmus

2b. Leafless erect shrubs; leaves, when present, small. Corona-lobes 5, connate. ... 4. Periploca


Twining shrubs, with lenticelled stems. Leaves 5 - 15 × 2.5 - 8.0 cm, elliptic to oblong-ovate, acute to shortly acuminate, glabrous, green above, whitish beneath. Flowers in axillary panicked cymes. Corolla-lobes linear to linear-lanceolate, acute. Coronal-scales 5, clavate. Stamens at the base of the corolla-tube; filaments free. Follicles 5 - 12 × 1.2 - 2.5 cm, tapering at the apex, glabrous. Seeds 6 - 7 mm long, ovate-oblong, compressed, black; coma 3 - 4 cm long, white.

Fl. & Fr.: May - August.

Rather common in dry deciduous scrub forests, especially in the eastern parts of the state.
Selected specimens: Ajmer: Todgarh, Duthie 4749 (DD); Banswara: Singh 2874 (BSJO); Jhalawar: Bakani, Wadhwa 9525 (BSA); Kota: Shahabad, Verma 612 (BSA); Sirohi: Mt. Abu, Jain 46592 (BSI); Udaipur: Majumdar 11666 (BSA).

2 Cryptostegia R. Br.


Large, evergreen, glabrous, straggling shrubs with milky sap. Leaves opposite, 5 11 x 3 6 cm, coriaceous, elliptic oblong, obtuse or retuse, acute at base. Flowers in 2 to 3 - chotomous cymes, pale purple or pink. Calyx 5 - lobed. Corolla funnel - shaped. Corona - lobes divided into filiform segments. Stamens short, at the base of the corolla. Follicles woody, 8 - 13 x 2.0 3.8 cm, sharply 3 - angled or winged, ovoid oblong, tapering to the apex. Seeds numerous, 8 9 mm long, ovate oblong, compressed; coma 2.5 cm long, silky - white.

Fl. & Fr.: April - September.

Native of Madagascar; commonly naturalized in wastelands; also cultivated in the gardens for ornamental purposes.

Selected specimens: Banswara: Pipalkunt, Singh 2919 (BSJO); Bharatpur: Ghana Bird Sanctuary, Parmur 8708 (BSJO); Ganganagar: Nohar, Roy 6447 (BSJO); Jaipur: Amber, Sharma 465 (RUBL); Jodhpur: Birai dam, Singh 3565 (BSJO); Kota: Wadhwa 9493 (BSA); Udaipur: Nathdawara, Kaul 8582 (LWG).

3. Hemidesmus R. Br.

Plants glabrous. .......................................................... 1. H. indicus var. indicus

Plants pubescent. .......................................................... 2. H. indicus var. pubescens

var. indicus

Scandent undershrubs, with woody root-stock. Leaves opposite, 4 - 15 × 0.8 - 2.5 cm, elliptic-oblong to linear-lanceolate, acute to obtuse and apiculate at apex, acute or rounded-truncate at base. Flowers in axillary, subsessile cymes, dull yellow with purple eye. Follicles 10 - 15 × 0.5 - 1.0 cm, tapering to a point, slightly falcate, glabrous. Seeds 6 - 8 mm long, ovate-oblong, compressed, black; coma up to 4 cm long.

Fl. & Fr.: Almost throughout the year.

Common in the scrub forests in the east of Aravalli.

Selected specimens: Banswara: Ghatol, Kanodia 75473, 75239 (BSI); Dungarpur: Sagwara, Kanodia 82152 (BSI); Jhalawar: Aklera, Wadhwa 1939 (BSA); Tonk: Maheshwari 52980 (LWG).


Very similar to type variety, but can be distinguished by its pubescent branchlets, leaves beneath and inflorescence.

Fl. & Fr.: Throughout the year.

Rare, in wastelands and open forests.

Selected specimen: Jhalawar: Lotia Jhil, Wadhwa 5378 (BSJO).

4. Periploca L.


Erect, branched, generally leafless shrubs, with milky juice. Leaves, when present, 6 - 8 × 3 - 4 mm, ovate-oblong, thick, acute. Flowers in c. 2.5 cm long, axillary and terminal cymes. Calyx-segments with scarious margins. Corolla greenish out side, purplish within. Follicles 4 - 10 × 0.5 - 0.6 cm, rigid, woody, cylindric-conical, beaked. Seeds 5 - 6 mm long, oblong, compressed, reddish-brown, glabrous; coma about 2.5 cm long.

Fl. & Fr.: July - October.

Included on the authority of Sarup (1951 & 1954), Blatter & Hallberg (1918 - 1921) and Bhandari (1978) from Jodhpur and Jaisalmer districts.
82. SPIGELIACEAE

(P.J. Parmar)

MITREOLA L.


Erect, annual herbs, 10 - 50 cm high. Stem 4-angled, narrowly winged. Leaves 2 7 × 0.8 - 3.0 cm, ovate-lanceolate or ovate-elliptic to deltoid, acute, glabrous. Stipules interpetiolar, deltoid or ovate. Flowers terminal or axillary, in dichotomous cymes on cincinniform branches, white. Bracts and bracteoles linear, persistent. Capsules 4 - 5 mm broad, wedge-shaped, deeply emarginate, two horned. Seeds ellipsoid, 3 gonous, with a ventral cavity.

*Fl. & Fr.*: September - December.

Common in wet and shady habitats in the forests. So far reported from Banswara district only.

*Selected specimens*: Banswara: Punapather forest, *Singh 3675* (BSJO); Bhapor, *Kanodia 75222* (BSA); Kaling Wadhadi Khora - nala, *Kanodia 75639* (BSA); on the way to Hudiani Dongri (Ghatol), *Kanodia 75472* (BSA).

83. BUDDLEJACEAE

(P.J. Parmar)

BUDDLEJA L.

Flowers white, in drooping spikes. ... 1. *B. asiatica*

Flowers orange, in terminal panicles. ... 2. *B. madagascariensis*


Evergreen, perennial, straggling shrubs. Leaves lanceolate or oblong, entire or serrulate, obtuse to acuminate, white tomentose beneath. Flowers
in drooping spikes, densely tomentose outside, white. Capsules ovoid, enclosed in the persistent calyx. Seeds not tailed.

Native of China; usually cultivated in the gardens for ornamental purposes. It flowers from January - April.


Large, scrambling, evergreen shrubs. Leaves ovate-oblong, entire or serrulate, densely white tomentose beneath. Flowers orange, in large terminal panicles. Capsules ovoid, enclosed in the calyx.

Native of Madagascar; occasionally cultivated in the gardens for ornamental purposes. It also flowers during winters.

84. GENTIANACEAE

(P.J. Parmar)

1a. Corolla regular. Stamens all perfect:

2a. Ovary 2-celled. ... 4. Exacum

2b. Ovary 1-celled:

3a. Corolla with one or two glandular nectaries at the base of each lobe. ... 6. Swertia

3b. Corolla-lobes eglandular:

4a. Flowers white, in sessile axillary clusters. ... 3. Enicostema

4b. Flowers pink, in dichotomous cymes. ... 2. Centaurium

1b. Corolla irregular. Only 1 stamen perfect:

5a. Flowers yellow. Stigma sub-entire. ... 5. Hoppea

5b. Flowers pink or white. Stigma distinctly 2-lobed. ... 1. Cancscora

1. CANSCORA Lam.

1a. Calyx-tube winged. Long stamens appended. Stigma hispidulous. ... 2. C. decussata

1b. Calyx-tube striate or keeled, not winged. Long stamens not appended. Stigma glabrous:
2a. Leaves decurrent along the whole length of the internode.  ...  1. C. decurrens

2b. Leaves not decurrent along the stem:

3a. Stem and pedicels winged.  ...  4. C. heteroclita

3b. Stem and pedicels terete or 4 - angled.  ...  3. C. diffusa


Erect, annual herbs, upto 30 cm high. Stem 4 - winged; branches opposite and alternate. Leaves sessile, 3 5 × 1.0 2.5 cm, oblong, attenuated towards the base, acute at apex, membranous; upper leaves much smaller than the lower, ovate or lanceolate, acute. Flowers solitary or in few flowered, sub trichotomous cymes, pale rose or white. Calyx not winged. Stigma 2 lobed. Capsules cylindric, 2 valved. Seeds reticulate, rugose.

Fl. & Fr. : September - December.

Rare, in wet and shady habitats in the east of Aravalli.

Selected specimens: Banswara: Jhola, Kanodia 51148 (BSI); Jhalawar: Shyamgarh, Verma 10087 (BSA); Kharagpura, Verma 6821 (BSA); Kota: Rapi stream, Wadhwa 9331 (BSA); Udaipur: Kalighati, Jain 48538 (BSI).


Erect, annual herbs, upto 60 cm high. Stem and branches 4 - winged. Leaves 1.2 4.0 × 0.4 - 1.5 cm, narrowly ovate to oblong - lanceolate, acute, sub - cordate to rounded at base, 3 - nerved. Flowers solitary or in lax, few flowered cymes, white. One stamen longer than others. Capsules 6 8 × 2 mm, linear oblong, obtuse at apex, tipped by persistent style, shorter than calyx.

Fl. & Fr. : September - December.

Rare, in wet and shady habitats in the forests along Aravalli range.

Selected specimens: Banswara: Wadita Hillage forest, Singh 3690 (BSJO); Bari Ghatia forest, Kanodia 75405 (BSI); Pal: Kanpahar - Rijapur forest, Pandey 19443 (BSJO).

Much branched, erect, c. 30 cm high, annual herbs. Leaves sessile, 1.5 \( \times \) 0.8 - 2.5 cm, ovate lanceolate, acute, truncate or cuneate at the base. Flowers in diffuse paniculate cymes. pink. Pedicels filiform. Anthers dimorphic, oblong sagittate. Capsules narrowly oblong, as long as the calyx, membranous.

*Fl. & Fr.*: October - March.

Common in wet and shady places along Aravalli range.

*Selected specimens*: Banswara: Punapathar forest, Singh 3660 (BSIO); Bhilwara: Bijolia, Singh 7159 (BSIO); Pali: Goramghat, Pandey 4685 (BSIO); Kota: Kunda Khoh, Wadhwa 9244 (BSA); Sirohi: Mt. Abu, Jain 46560 (BSI).


Erect herbs, upto 20 cm high; branches short and broadened towards the base. Leaves few, in rosette; lower ones 0.6 - 1.5 \( \times \) 0.5 - 1.2 cm, broadly ovate, obtuse, truncate and 3 nerved at base; upper ones c. 3 \( \times \) 1 mm. linear - lanceolate, one nerved. Flowers in dichasial cymes. Bracts linear - lanceolate. Corolla pinkish - red; tube c. 8 mm long; lobes of upper lip slightly spreading. Capsules linear - cylindric, brownish. Seeds irregularly rhomboid.

*Fl. & Fr.*: October - March.

Rare, in wet and shady habitats. So far collected only from Jaipur district.

*Selected specimen*: Jaipur: Baragaon, Sharma 2019 (RUBL).

2. **Centaurium Hill**

Small, erect, annual herbs, 5  20 cm high. Radical leaves in rosette, 0 5  2.5 × 0.2  0.6 cm, obovate or oblong, obtuse; cauline ones smaller, linear oblong. Flowers in dichotomous cymes, with a long pedicelled flowers in each fork, pink. Calyx segments linear subulate. Corolla lobes elliptic, acute, glabrous. Capsules linear oblong. Seeds many, faintly reticulate.

_Fl. & Fr._ : December March.

Weed in and around cultivated fields, particularly in the east of Aravalli.

_Selected specimens_ : Ajmer : Gravelly raised ground around lake, _Sharma_ 1579 (LWG); Bharatpur : Katipura village, _Parnar_ 8650 (BSJO); Chittorgarh : _Saran_ 65191 (LWG); Jaipur : Baragaon, _Sharma_ 2019 (RUBL); Sirohi : Mt. Abu, _Kunodia_ 62228 (BSI).

3. **Enicostema** Blume _nom. cons._


Perennial herbs, with many quadrangular branches from the base. Leaves sessile, 1  7 × 0.6  1.3 cm, linear to linear-lanceolate, obtuse, amplexicaule. Flowers subsessile, many, in axillary, capitulate, opposite fascicles, white. Capsules 3  5 mm long, ellipsoid-oblong, glabrous, septicidally 2 valved. Seeds many, minute, sub-globose, foveolate, brown.

_Fl. & Fr._ : June December.

Common in open plains, forests, grasslands and in cultivated fields.

_Selected specimens_ : Banswara : Dagia - Bowji hills, _Singh_ 2864 (BSJO); Barmer : Pachpadra salt basin, _Shetty_ 2244 (BSJO); Bhilwara : Badnor, _Singh_ 6487 (BSJO); Bundi : Manghi river bed, _Verna_ 1869.
4 EXACUM L.

Leaves ovate. Calyx not winged. ... 1. E. lawii
Leaves elliptic - lanceolate. Calyx winged. ... 2. E. pedunculatum


Erect herbs, 10 15 cm high, with quadrangular stem. Leaves sessile, c 6 × 6 mm, ovate. Flowers in few - flowered, lax, terminal or subterminal, pedunculate cymes; pedicels mostly elongate. Calyx lobes 3 - 5 mm long, ovate, strongly nerved, not winged. Corolla - lobes 5 10 mm long, elliptic or round, purple blue. Capsules 3 5 mm long ovvoid.

Fl. & Fr. : September - March.

Rare, in wet and shady localities at high altitude. Closely allied to E. sessile L., but flowers are larger and inflorescence altogether different.

Selected specimens : Sirohi : Mt. Abu, Mehta 398, 1239, 1240 (JAC).


Erect, annual, glabrous herbs, 15 30 cm high. Leaves sessile to sub sessile, 3 5 × 0.3 1.0 cm, elliptic or lanceolate, obtuse, tapering at the base. 3 nerved. Flowers in terminal, much branched panicled cymes, bluish purple. Calyx tube cup - shaped; lobes 4, ovate, acute, with a wedge - shaped wing extending from apex to the base on the outer surface. Anthers sagittate at base, not spirally twisted after anthesis. Capsules globose, membranous, surrounded by persistent, winged calyx. Seeds minute, glabrous, pale brown.

Fl. & Fr. : September - March.

Common in wet places in the forests, particularly east of Aravalli.

Selected specimens : Banswara : Jhola, Kanodia 42 (BSI); Bhilwara : Meja dam, Singh 6044 (BSJO); Jhalawar : Shyam ghat, Majumdar & Mishra 10086 (BSA); Looda, Majumdar 10265 (BSA).
5. HOPPEA Willd.


Small, annual, glabrous herbs; stem and branches quadrangular, more or less winged. Leaves sessile, 0.2-0.6 cm long, ovate, acute, glabrous. Flowers in terminal, dense, dichotomous cymes, pale yellow. Capsules c. 0.25 cm long, ellipsoid, enclosed in persistent calyx. Seeds numerous, oblong or subglobose, pale to dark-green, muricate.

*Fl. & Fr.*: September January.

Common in moist places, particularly in the east of Aravalli.

*Selected specimens*: Ajmer: Clayey river bed, *Sharma* 1247 (LWG); Banswara: Khora forest, *Singh* 3725 (BSJO); Bhilwara: Bijolia, *Singh* 5704 (BSJO); Jalore: Sunda hills, *Vyasa* 6857 (BSJO); Jhalawar: Kyasara, *Verma* 6807 (BSA).

6. SWERTIA L.


Small, erect, annual herbs, up to 15 cm high. Stem 4-winged. Leaves sessile, 1 2×0.5-1.2 cm, ovate, acute, 3 nerved, membranous. Flowers 4-merous, in leafy paniculate cymes, bluish-purple. Calyx enlarged in fruit; segments ovate. Each corolla-lobe with 2 triangular pocket-shaped nectaries at the base. Capsules 4-6 mm long, ovoid. Seeds suborbicular, compressed.

*Fl. & Fr.*: November March.

Rare, on hills in wet, springly grounds; so far reported only from Mt. Abu.

*Selected specimen*: Sirohi: Mt. Abu, *Jain* 46607 (BSI).
NYMPHOIDES Seguir

1a. Leaves floating only, 3.5 - 22 cm broad. Flowers nearly 15 - 24 in a fascicle. Corolla - lobes 5 - 7, more than 1.5 cm across. Seeds smooth or tuberculate:

2a. Corolla - lobes densely fimbriate on inner surface. Style heterostylos. Capsules 15 or more - seeded. Seeds smooth. ... 2. N. indica

2b. Corolla - lobes with a median longitudinal crest on inner surface, not fimbriated. Style homostylos. Capsules 5 to 10 - seeded. Seeds tuberculate. ... 1. N. hydrophylla

1b. Leaves both floating and radical; floating leaves 1 - 3 cm broad. Flowers 4 - 9 in a fascicle. Corolla - lobes 4, not more than 1.2 cm across. Seeds muricate. ... 3. N. purviflora


Attached or floating perennial herbs; rhizome short, erect or oblique, bearing scaly leaves from the axils of which petiole like branches develop and come above the water surface. Floating leaves 4 13 × 3 11 cm, elliptic orbicular, deeply cordate hastate at base, with rounded lobes, faintly crenate, greenish above, purplish beneath. Flowers white with yellow centre. Sepals obtuse. Capsules 7 10 × 3 - 5 mm, broadly ovoid - oblong. Seeds 2 3 mm in diam., yellowish white.

**Fl. & Fr.:** October March, sometimes almost throughout the year.

Common in the east of Aravalli in ponds, pools, tanks, lakes and other stagnant water sources.

**Selected specimens:** Alwar : Baran Viar. Parmar 9748 (BSJO); Banswara : Lamarao talao, Singh 3632 (BSJO); Bhilwara : Banera Singh 6021 (BSJO); Jhalawar : Anawar - Aklera, Wadhwa 7534 (BSA); Sirohi : Mt. Abu, Mehta 342 (JAC), Blatter 21491 (BLAT).

Attached or floating perennial herbs; rhizome oblique, thick; scale-like leaves numerous, ovate. Petioloid branches long, simple, flexible. Floating leaves 4.5 - 22.0 × 3.5 - 22.0 cm, nearly orbicular, deeply cordate at base, coarsely crenate. Flowers white, throat yellow. Sepals acute. Capsules obovoid or oblong-ovoid. Seeds globose, shining, yellow.

*Fl. & Fr.*: Most part of the year.

Common in the east of Aravalli in stagnant water in tanks, ponds, lakes, rivers etc.

*Selected specimens*: Banswara: Verma 218 (BSA); Bhilwara: Bijolia. Singh 6100 (BSJO); Kota: Lachhamipuria tank, Wadhwa 9483 (BSA); Sirohi: Mt. Abu, Mehta 337 (JAC); Tonk: Bislepura, Shetty 544 (BSJO).


Perennial, aquatic or terrestrial, rhizomatous herbs. Leaves radical & floating; radical leaves 0.7 - 1.1 × 0.6 - 1.1 cm, spatulate or deltoid, cuneate at base, obtuse; floating leaves 1.0 - 4.2 × 1.0 - 3.0 cm, broadly ovate or cordate, orbicular or obovate, with deep triangular sinus. Flowers in axillary clusters. Calyx lobes oblong lancolate, faintly 3-nerved. Corolla white; lobes 4, subacute. Capsules 4 × 2 mm, oblong, 15 or more - seeded. Seeds lenticulate, muricate, white.

*Fl. & Fr.*: May - December.

This species is included on the authority of Blatt. & Hallb. (1918 21), who collected it from Badaka, W. Rajasthan.

**CULTIVATED SPECIES**

*Nymphoides peltatum* Kuntze (*Limnanthemum nymphoides* Link)

Perennial, aquatic herbs with creeping rhizomes. Stem long, floating, rooting at nodes. Leaves 2.5 - 5.0 cm in diam., deeply cordate. Flowers in
axillary umbels, yellow. Reported to be grown in Jodhpur district (Puri et al., 1964).

86. HYDROPHYLLACEAE

(P. J Parmar)

**Hydrolea** L. nom. cons.


Erect or procumbent, annual, glandular hairy herbs at least younger parts, rooting at the lower nodes. Leaves 2 - 5 × 0.5 - 1.5 cm, oblong to narrowly lanceolate. Flowers solitary or in condensed, glandular hairy racemes, lilac blue. Bracts and sepals lanceolate, acute, glandular. Capsules 4 - 6 mm long, ovoid oblong or ellipsoid, enclosed in persistent calyx. Seeds many, minute, oblong, glabrous.

*Fl. & Fr.*: September - February.

Common in moist low lying areas, rice fields, ponds etc., particularly in south & south eastern parts of the state.

*Selected specimens*: Banswara: Kushalgarh, Singh 3751 (BSJO); Bhilwara: Bijolia, Singh 6052 (BSJO); Jhalawar: Singh 83721 (LWG).

87. BORAGINACEAE

(P. J. Parmar)

1a. Style arising from between the carpels:

2a. Anthers connivent into a cone; connectives much produced, twisted together at the apex. ... 8. *Trichodesma*

2b. Anthers not connivent into a cone; connectives obtuse or apiculate, not twisted together:

3a. Floral appendages (scales) present:

4a. Corolla 2 - 5 mm long, limb divided nearly to the base, pale - purple to blue: