PREVIOUS BOTANICAL EXPLORATIONS
OF THE REGION

Siddharthnagar is one of those regions of the country where there has been no systematic botanical exploration. J.D. Hooker (1872-1897) in collaboration with other contemporary botanist published in seven volumes the “Flora of British India.” Duthie (1903-1929) published the “Flora of upper Gangetic plain and the adjacent Siwalik and Sub-Himalayan tracts.” At places, he has mentioned the occurrence of plants in or about district area.

Raizada (1931, 1935, 1936, 1939, 1950) has published some additions or recently introduced plants to the Duthie’s Flora. Furtherin 1954, he has also published a paper entitled “Grasses of upper Gangetic plains and some aspects of their ecology.” Raizada(1976) has published the “Supplement to Himalayan tracts.” Parker (1914) has published “A Forest Flora of the Punjab with Hazara and Delhi.” Rao, the founder of herbarium of Northern circle of botanical survey of India has prepared a checklist of the flora of upper Gangetic plain and of the adjacent Siwalik& Sub- himalayan tracts in 1969. Raizada et. al. (1957, 1964) have published the “Grasses of upper Gangetic Plains”. Sen (1959, 1960) listed the rainy season weeds of Gorakhpur and made certain ecological studies on aquatic and swampy vegetation of the area.

In recent years the net worthy contributions on the floristic of state were made by Murty & Singh (1961, 1964, 1966); Singh(1971); Raizada & Jain (1966); Bhattacharya (1963); Gupta (1969); Husain (1967) ; Dixit et.al. (1966, 1967); Saxena (1967); Srivastava (1976); Babu (1977) etc.
For Grasses (The grasses of Burma Ceylon India & Pakistan by Bor in 1960 and “Grasses of upper Gangetic plain” by Raizada et. al. in 1957, 1964 are taking into consideration.


As this area is a marshy area and Marshy area is a area where saturation with water is dominant factor determining the nature of soil development and the types of plants and animal communities living in the soil and on its surfaces. They are of the most productive ecosystems of the world and essential life supporting system
DICOTYLEDONES
(POLYPETALAE)

1. RANUNCULACEAE

1. Leaves alternate, stipules imbricate ..............................................................1. Ranunculus

2. Leaves alternate, exstipulate, Sepals 5, posterior odd sepal prolonged to form a long spur ...............................................................2. Delphinium

1. Ranunculus Linn.

1. Semi aquatic herbs; flowers yellow ........................................................... R. scleratus

*Ranunculus scleratus* Linn. Sp. pl. 776; Royle 111.53; HK. f. 8T. Fl. Ind. 35; F.B.I. 1:19 872; BSI.21(1) : 2, 1978; FUGP. 1: 21 Fl. D. Dun 43. 1977.

Annual or Perennial herb, 50 to 60 cm tall, glabrous, hollow branching above, herbaceous, erect. Leaves basal and lowest leaves on long petioles. Petioles 20 cm long, glabrous. Blades 3-lobed, 6 cm broad, 4-8 cm long. Lobes somewhat divided again, with rounded teeth. Upper leaves alternate, becoming sessile near apex of stem, typically 2-lobed. Inflorescence single flowers on short or long peduncles terminating branches, often appearing axillary. Peduncles glabrous or with few sparse hairs. Flowers-petals 5, yellow, shiny above, dull below, free, 3-4 mm long, 2 mm broad broadly oblong to elliptic, glabrous with cup like nectary at base. Stamens upto 20, from base of pistils. Filaments 2 mm long, pale yellow. Anthers yellow, .3 mm long. Pistils in a cylindric head expanding in fruit up to 2 cm long about 1 cm in diameter. Achenes, tuberculate, slightly compressed, with minute beak. Sepals 4, ovate, falling early, free, 2 to 3 mm long, 2 mm broad, pubescent externally, upped, yellow-green. Occurs in muddy shores, ditches, moist ground.
2. Delphinium Linn.

1. Herbaceous; leaves exstipulate; four fused petals, spurred blue flowers...........

.................................................................D. ajacis Linn.

Delphinium ajacis Linn. MCP. 398.

Stem 1 m tall, erect to somewhat reclining with age, glabrous to puberulent or glandular herbaceous, branching above, from taproot. Leaves alternate, petiolate below to sessile above, with 3-5 divided lobes, typically pubescent. Ultimate divisions linear to linear-oblong, entire broad upto 2.5 mm, petioles to 9 cm below. Inflorescence dense terminal racemes to 10 cm in flower. Pedicels 6 to 7 m long, thick, expanded at apex, with pair of subopposite linear bracts to 3 mm long, dense puberulent. Flowers-sepals deep blue-purple, spurred. Spur dense, pubescent. Petals 4, united, covering other floral organs stamens and carpel, spurred. Stomens many, included. Filaments white, sparse pubescent, 5-6 mm long, expanded at base. Anthers yellow, 1.1 mm long ovary dense pubescent, 3-4 mm long, fruit-a follicle 2 cm long, one per flower, variously pubescent. Commonly cultivated

L.N. Larkspur Fl – July-August Collection – Shortgarh, 281

2. MAGNOLIACEAE

1. Flowers axillary; gynoecium stipitate, leaves ovate-lanceolate.............

.................................................................Michelia champaca

Medium to large trees, 9-24m tall, bark dark grey young shoots rusty tomentose. Leaves 10-20 cm long, 4.5-8.5 cm broad, lanceolate to ovate-lanceolate, sparsely rusty hairy on both sides, ultimately glabrous except on veins and midrib, apex acuminate, base acute; stipules densely rusty-pubescent. Flowers solitary, axillary 5-7 cm in diameter, fragrant; bracts coriaceous, with rusty or golden tinged hairs; pedicel 3-4.5 mm long perianth of 12-15 segments each, 2-3.5 cm long, 0-1.3 cm broad, subequal, pale yellow to yellow. Stamens 5-7 mm long, carpels many, free, ovary 4 mm long, unilocular. Fruiting axis 5-10 cm long. Follicles 1-2 cm long, brown, sparsely hairy and covered with warty excrescences, dehiscing from the top downwards on the dorsal side or sometimes along both sides. Seeds 1-2 or several, 5-11 mm long, brown, polished, usually rounded on the back. Planted near the temples commonly cultivated. Oil is extracted from the flowers and used as a perfume. The bark is used in medicine for the treatment of intermittent fevers.

Fl. – April-June Fr- June-July Collection- 249, Parsia

3. ANNONACEAE

1. Carpels sub connate, fruits compact by the fusion of carpels and receptacle

1. Annona Linn.

1. Flowers solitary or clustered, axillary or terminal, 2- sexual........Annona-squamosa

A small evergreen tree, 5-6 m high. Young branches hairy. Leaves elliptic to oblong-ovate, 5-8 cm long, acute to obtuse with cuneate to subrounded base, glabrous on both sides, young leaves sparsely hairy. Petiole 5-10 mm long, glabrous. Peduncle 2-3 mm long, leaf opposed or terminal on short axillary branches, 1-2 flowered. Bract and Bracteole minute, pilose. Pedicel 11-15 cm long, glabrous. Sepals broadly deltoid. Petals 3 outer petals oblong 20-25 mm long, pale yellow with deep purple spot inside at base, obtuse, basally concave within, sparsely pilose to glabrous outside, puberulous inside; inner petals absent. Receptacle conical stamens 1 mm long, narrow cuneate, filament short, locules equal, connote-tip subtruncate. Orpels basally connate, ovary dorsally pilose, 1-ovuled, style short, stigma narrow conical. Fruit globose, 5-10 cm diam. Fleshy, surface tuberculate, yellowish green. Seeds dark brown to black. Commonly cultivated for its fruit.

The root is considered as a drastic purgative. The bark is astringent, used in diarrhea. Ripe fruit is a good tonic, cooling, sedative to the heart. The seeds leaves are used as insecticide, fish poison and to kill lice of head.

L.N. Sarifa        Fl: Mar-May; Fr. Jul-Sept.          Collection- 28, Bansi

2. Polyalthia Blume

1. Large tree tepals in 3 series, carpels free; fruit a cluster of druplets

Polyalthia longifolia (Sonn.) Thw. Enum. 398, 1864; FBI. 1:62, FUGP. 1: 25; FD. 52
A 13 m long, straight, evergreen tree with a conical crown. Young branches pilose becoming glabrous. Leaves lanceolate, with waxy edges 7-20 cm long, margins undulate, glabrous on both sides. Petiole 4-7 mm long, glabrous. Peduncle 3-10 mm long, axillary, pubescent, 6-many flowered, usually pendant. Pedicel 23-29 mm, pubescent. Bract minute, bracteole semi-amplexicaule, densely hairy. Sepals broadly detioid, obtuse to subacute, pubescent on both sides. Petals narrow lanceolate 10-18 mm, 2.5-3.0 mm in width, outer slightly smaller than the inner, tapering into a fine point, slightly undulate, pubescent on both sides, pale green to yellowish green. Receptacle convex. Stamens 1 mm long, anther subsesile, locules unequal, connective-tip subtruncated. Carpels free, a vary glabrous except few hairs in the upper part, stigma subsessile, papillate, Fruit 18 mm long woodf stalk, ovoid, produced in great clusters glabrous stalks, black when ripe. Commonly cultivated as an avenue tree or in gardens.

The bark is used as a tebrifuge in the treatment of fever.

L.N. Sarifa  Fl: Mar-May  Collection- 368, Parsauna Gram

4. MENISPERMACAE

1. Leaves peltate; carpels solitary.......................................................... 2. Cissampelos.

1. Leaves not peltate:

2. Leaves ovate-oblong, villous, dark green, Carpels 3 or more seeds curved
....................................................................................................................... 3. Cocculus

2. Leaves ovate-cordate; carpels 3, stigma for ked; Drupe Oval or round
....................................................................................................................... 1. Tinospora

1. Tinospora Linn.

Tall, climber, Glabrous, succulent shrub with grey dotted bark. Stem 6 cm in diameter, smooth, shining, branches pubescent. Leaves about 7 to 13 cm long, about 9-16 cm broad, ovate or orbicular, deeply cordate at base and shortly acuminate, petiole about 5-10 cm long, thickened and twisted at the base. Flowers greenish yellow in racemes about 7-15 cm long, pedicels slender, usually solitary in female, clustered in male. Male flowers: sepals 6 in 2 series, outer small, ovate-oblong, obtuse concave, the inner large suborbicular, membranous, flat, 2-3 mm broad, petals subequal about 2-3 mm long, 1.2-1.8 mm broad, membranous, smaller than the sepals; stamens 6, filaments free, about 2.5-3 mm long, thick at the apex. Female flowers: sepals and petals as in the male flowers; staminodes 6, carpels 3, seeds, ovoid, 6-9 mm long, 4-5 mm broad, smooth, crimson, endocarp utuberced. It is used as blood purifier, cardiac, diuretic and expectorant. Starch from the roots and stems is used in chronic diarrhoea and dysentery.

L.N. Giloe Fl. & Fr: March-June Collection- 581, Sarota

**Cissampelos Linn.**


A perennial shrub, softy tomentose climbers. Leaves ovate or orbicular, peltate, triangularly broad cordate, suborbicular, 3-6 cm long about 2 to 4 cm, truncate or cordate at base, acuminate, pubescent, palmately 5-7 nerved, petioles about 7 cm long. Flowers pale green, yellow, dioecious, minute. Male flowers in pedunculate
cyme, in axillary. Female flowers clustered in the axis of persistent, in the axils dense racemes. Sepal 1, obovate; petal 1, obovate. Ovary pilose; style glabrous; stigma 3-fid. Drupes subglobose, 2-4 mm long, endocarp curved. Commonly occurs near forest edges, on moist soil, climber on small trees and shrubs.

Root extract used in constipation and gastric troubles, roots also used in cough and urinary troubles.

L.N. Jaljamini  Fl. & Fr- Sept-Oct  Collection- 241, Mathana


A evergreen climber or climbing shrub, covered with grey tomentum leaves ovate or ovate-oblong, 4-7.5×3-4.5 cm, obtuse at apex, rounded at base, pubescent beneath; petioles 1-2 cm long. Male flowers in short axillary panicles. Female flowers in cluster 1-3; small bract. Drupelets red-purple.

Common in the area as hedges and trees.

Paste of leaves applied on swellings and wounds as well as in joint pain.

L.N. – Chiretta  Fl. & Fr – Feb-March  Collection – 318, Sahjanva

6. NELUMBONACEAE

*Nelumbo* Adans.

1. Leaves and Flowers raised above the surface of the water; seeds ........................................

.................................................................................................................................................... *Nelumbo nucifera*

An aquatic herb, with creeping rhizomes. Leaves 10-45 cm in diameter, reniform to orbicular, foliage leaf flat, glaucous with waxy coating on the upper surface, entire, petiol, 50-150 cm long, usually with scattered hooked spines. Flowers rose pink or white, 10-15 cm across, peduncle almost equaling the petiole, usually beset with hooked spines. Outer tepals (Perianth Lobes 4), persistent, 15-20 mm ovate, entire, acute, inner tepalr (10-15 lobes), elliptic, distinctly parallel Veined. Stamens long about 24 mm, anther 12-14 mm long with fleshy appendage. Flowering receptacle 18-24 mm long, broad at the top, carpels 10 mm long, fruiting receptacle 40-49 mm long. Nuts oblong, dark brown to blackish. Commonly occurs near ponds.

The seeds are eaten raw. The flowers and pedicle are used as a cardiac and hepatic Tonic.

L.N. – Kamal Fl. & Fr – July-Oct Collection – 111, Naugarh

**5. NYMPHAECACEAE**

*Nymphaea* Linn. nom. Cons.

1. Leaves sharply toothed, anthers without appendages.....................N. nouchali

**N. nouchali** Burm. f. Fl. Ind. 120, 1768.-N. lotus auct. Pl. (Non Linn. 1753); FB I 1:114; FUGP. 1:33; HFD. 48; FD. 54.

An aquatic herb with creeping rhizomes. Leaves floating about 10-24 cm across on long petioles, elliptic-orbicular or subrotund, cordate, sinuate-toothed, glabrous on upper side or both side, densely pubescent reddish purple beneath, nervied at base. Flowers large, variable in size and colour, white, blue, bluish purple, fragrant.

Common in Fresh water and stagnant water the underground stem used in food and also used medicinally.

L.N. – Kamal Kakri  Fl. & Fr.: July-October  Collection: 288, Ucharia

7. PAPAVERACEAE

1. Plants prickly, sap yellow………………………………………. 1. Argemone

1. Plants glaucous or hispid, but not prickly, sap milky ………………… 2. Papaver.

1. Argemone Linn.

1. Flowers yellow, stigma lobes more or less appressed …………… 1. A. maxicana

2. Flowers pale yellow or white; stigma more or less spreading…2. A. ochroleuca.

Argemone Linn.


Prickly annual herb, 20-90.5 cm tall, with yellow latex. Stems and branches woody, leaves prickly on both sides sinuate-pinnatifid; lower leaves petioled, in rosette, upper leaves sessile, elliptic-ovate, base cordate, 4-20×3-7 cm; spinulose-dentate, white along nerves. Flowers yellow 3-6 cm sessile or shortly stalked, subtended by leaf like bract at the base. Sepals prickly on back, horned at apex. Petals 3+3, bright yellow, obovate. Stigma subsessile, dark red, 3-6 lobed, capsule ellipsoid to oblong, 3-6 valved, prickly with erect spines. Seeds many in no, black.
Common in waste places and along roadsides. The seeds used as medicine, root chewed in leucorrhoea.

L.N. Kateli Fl. & Fr – Oct-April Collection – 101, Sarota


Annual, prickly herb, 20-100 cm tall, with yellow latex. Leaves at base in rosettes, peioled, upper ones sessile, elliptic-ovovate, 3-14×2-6 cm, base semiamplexicaule, acute apex, sinuate to pinnatifid, prickly on nerves. Flowers 2.5-3.5 cm across sessile. Sepals oblong, prickly outside. Petals 3+3 whitish or light yellow. Stigma on short style, red, 5 lobed, lobes narrow, spreading. Capsule ovale-lanceolate or lanceolate; covered with erect spines; seeds black, many in no. Common in waste places, road sides.

L.N. : Satynashi Fl. & Fr. – February-July Collection- 681, Rampur

2. Papaver Linn.

1. Plants glaucous or hispid, but not prickly; sap milky……………… 1. P. somniferum


An erect herbaceous annual, filled with a white latex grows to a height of 1.5 m with a spread of 1m. The stem is bluish grey and generally hairy. The leaves are 12cm long, oval to oblong and deeply lobed, with serrate margins. Flowers are 4 petalled, white, pink, red pusple generally with dark blorthes at the base of the petal 5-7cm long, sepals glabrous, 1.5-2 cm long. Fruit a capsule avoid to globose, glabrous 4-6 cm long, 3.5-4 cm in diameter with 8-12 rayed sessile stigmas; seeds oily, white, dark grey to black. The fruit are hemispherical capsules containing numerous small.
Kidney shaped seeds. Commonly cultivated. Largely used for manufacture of morphine, pavaverne and many other alkaloids.

L.N.- Afim  Fl. & Fr: Jan-April.  Collection-281, Sarota

8. FUMARIACEAE

Fumaria Linn.

1. Sap watery; flowers irregular rose coloured with purple tips, stamen, diadelphous

................................................................. F. indica.


A much-branches, diffuse, pale green, annual herb up to 60 cm in heigh. Leaves are multifid, more or less glaucous; leaflets 2-4 in number, pinnatisect; segment is long, linear or linear-oblong, flat, acute Racemes 10-11 flowers, dense; bracts lanceolate-subulate and slightly acuminate, pedicels 4.5 mm long, erect thickened at the apex. Sepals 1.3 mm long, .5-1.0 mm broad, lancealate or ovate, acuminate, more or less dentate, rosy and persistent in the young fruit. Corolla is 5-6 mm long and rose colored. Fruit 2.5 mm broad, subrotund, quadrate, subtruncate obscurely retuse.

Decoction of F. indica stem and leaves is given as a tonic, also used in syphilis, Leprosy, jaundice.

Fl. & Fr – Nov-Feb  Collection-318, Akhanpur

9. BRASSICACEAE
1. Fruit short, compressed laterally:

   2. Silicle more than 2 seeded ........................................... 2. Capsella

2. Silicle 2- seeded:

1. Fruit long or short, not compressed laterally:

   4. Fruit divided into 1 seeded parts by thick tissue …… 6. Raphanus

   4. Fruit not divided into 1 seeded parts:

      5. Fruit beaked, lateral sepals saccate at base:

         6. Seeds 2- seriate in each cell Beak of the fruit terete.................................................................1. Brassica


      5. Fruit not beaked. Lateral sepals not saccate at base:

         7. Fruit compressed; seeds 1- seriate in each cell.

            8. Leaves pinnate ............................................. 3. Cardamine

            8. Leaves simple or lyrate-pinnatifid……… 5. Sisymbrium

1. Brassica (Tourn.) Linn.

1. Roots tuberous ................................................................. 5. B. rapa

1. Roots not tuberous:

   2. Sepals erect. Flowers upto 2 cm long. Leaves thick, succulent…..3. B. oleracea

   2. Sepals erect or patent. Flowers upto 1.5 cm long. Leaves not fleshy:
3. Open flowers not over topping the flowers. Buds. Leaves glabrous or sparsely pubescent. ......................................................... 1. B. campestris

2. Sepals erect or spreading; flowers small, light to medium yellow:

   4. Leaves mostly in radical rosettes; green, hispid ........ 4. B tournefortii

   4. Leaves not as above, green or thinly glaucous:

   5. Pools long, terete or nearly so; pedicels spreading ....... 2. B. juncea

1. Brassica campestris Linn. var. sarson Prain. FBI. 1:56; FUGP. 1:45, FD. 61.

   Annual herb, root tuberous or fusiform; stem erect, stout, simple on branched, 30-100 cm in height; leaves alternate, petioled, large, more or less pinnatifid; in raceme or in corymb; Flowers yellow, pedicellate, tetramerous, siliquas 3.7-7.5 cm, glabrous; seeds small, pale or dark, smooth. Commonly cultivated seeds used in cancer and tumours. Roots divretic, juice used in chronic cough

   L.N.- Sarson Fl. & Fr. – Jan-April Collection-301, Tetri


   Erect Annual herbs with lyrate leaves, glabrous 30-1m tall, lower leaves pinnately divided, stalked, 10-20 cm long, toothed, upper leaves alternate, stalkless, not clasping, smaller than lower leaves, lanceolate to linear, mostly non-toothed. Flowers in branches clusters, yellow 1-1.5 cm wide, petals four. Stamens six. Fruit a narrow pod, ascending, 1.5-4 cm long, roundish, with a beak. Seeds 2mm long, net-vined. A fairly weed in waste ground and on dums and railway road.

   L.N. Raya Fl. & Fr. – Dec-March Collection 561, Luthchia

Annual, erect herb. Leaves fleshy; lower leaves petioled, lyrate-pinnatifid, sinuate lanceolate to oblong, entire, upper leaves sessile, simple, rounded cordate at base. Flowers yellow, in panicled racemes about 10-29 cm long. Sepals erect, oblong to obtuse. Petals clawed. Stamens erect. Fruits about 5-10 cm long. Commonly cultivated as vegetable.

The following varieties are commonly cultivated in siddharthnagar

(a) **B. oleracea** var. *botrytis* Linn. Sp. Pl. 667, 1753. FD. 60; HFD 55.

Annual herb. Leaves obovate or elliptic-oblong. Rachis of the young inflorescence, pedicels thick. Or dense, fleshy white head.

Commonly cultivated as vegetable.

L.N. Phoolgobhi Fl. Oct-Feb Collection- 602, Naugarh

**B. oleracea** var. *capitata* Linn. Sp. Pl. 667, 1753. FD 60; HFD 55.

A short, stalked annual with densely arranged leaves in a terminal head. Leaves large obovate to circular; nerves prominent, closely packed into a large bud or head. Commonly cultivated as vegetable. Leaves are used as vegetable and salad.


4. **B. tournefortii** Gouan, 111.44, t. 20A, 1773; FBI. 1:156; FUGP. 1:46.

An erect, glabrate annual, about 30-60 cm tall. Radical leaves forming a rosette; petioled, hispid with white hairs, lobes toothed, cauline pinnatifid or linear lanceolate, entire. Flowers small, yellow. Pods about 5-7 an including beak erect, glabrous slender, seeds compressed, dark brown.
Commonly cultivated for leaf vegetable. Seed oil massaged in body ache, skin diseases and cold

L.N. Rai Fl. & Fr. : Jan- Ap Collection: 581, Naugarh


A tall, erect annual with slender branches, upto 0.8m tall stem tingled with reddish-purple, especially at the nodes. Leaves lyrate or pinnatifid; upper leaves smaller, lower leaves larges. Lower leaves alternate stalked, basically pinnately lobed, bristly along the margins, with a waxy coating (glaucous). Upper leaves alternate, stalkless clasping, smaller than lower leaves, lance shaped to oblong, sometimes toothed, with a waxy coating (glaucous). Flowers in branches clusters, stalks widely spaced, yellow, 1 cm wide. Petals 4, stamens six. Fruit a narrow pod, usually ascending, commonly cultivated. Upto 3-5 cm long, roundish in cross section, with an about 8-15 mm long beak. Seeds about 5-2 mm long.

L.N. Shalgam Fl. & Fr. : Dec- Mar Collection- 816, Matahna.

2. **Capsella** Linn.

**C. bursa-pastosis** (Linn.) Medic Pfanzengatt. 85. 1792; FBI. 1:159; FUGP. 1:47; HFD. 56

An erect, branched, hairy or glabrous annual herb, upto 10-50 an tall, Radical leaves pinnatifid in racemes, auricled, smaller, cauline leaves hastate. Flowers white upto 0.1-0.2 cm long, in corymbose internally, elongated in to racemes externally. Pods triangular, glabrous, obcordate about 0.4 to 0.7 cm long.

Commonly found in cultivated fields and along with roadsides

Fl. & Fr. Novem-May Collection- 321, Sanua
3. Cardamine, Linn.


An erect glabrous annual about 14-19 cm tall. Stem 4-angular. Basal leaves with about 6-10, ovate, rounded, 2-5 lobed, about 0.1 to .3 cm long, marginal ciliated leaflets; upper one with 9-11, lanceolate or ovate more or less lobed; shortly stalked, marginal ciliated leaflets; petiole with sagittate auricles. Flowers on about 5-10 cm long, in terminal racemes; pedicel about 0.3 to .5 long during anthesis, upto 1 cm long in fruiting. Sepals 4, lanceolate to oblong petals 4, white, erect, linear about 0.2 cm long, lanceolate to oblong. Pods erect, 1.5 to 2.0 cm seeds brown, small in a single row.

Fl. & Fr. – Jan- April Collection- 316, Lotan


A hispid annual herb upto 20-60 cm high petiolate, lyrate-pinnatifid; fleshy, lower suborsulate shortly stalked, 4-5 jugate, usually 7-15 cm long, 3-5 cm broad; terminal lobe somewhat larger, usually ovate, obtuse, irregularly toothed; lateral lobes ovate-oblong; upper leaves about 1-3 jugate, smaller, subsessile or sessile. Racemes about 15-50 flowered, lax, upto 30 cm long in fruit. Flowers large, about 15-20 mm across, white or dirty white, yellow, pedicel about 3-5 mm long, about 1.8-2 mm broad, oblong, hairy, often pale-violet. Petals about 15-22 mm long, obovate, long clawed, brown or violet veined apex truncate. Stamens 9-13, and about 11-15 mm long, anthers about 2.5 to 3 mm long. Siliquae about 15-30 mm long, broad, ovate-oblong to oblong ellipsoid seeds 6-12 in each locule, ovoid or subglobose, plae brown. Usually cultivated for animals.

Fl. April-June Collection- 238, Bajaha
5. *Sissymbrium* Linn.

1. Leaves simple or lyrate-pinnatifid.

2. Fruiting pedicels. Slender ....................................................... 1. *S. irio*

1. Fruiting pedicels as long as the pod ........................................... 2. *S. orientale*

1. *S. irio* Linn. Sp. Pl. 659, 1753; FBI 1: 150, FUGP. 1:42, FD. 58

   Annual, pubescent herb upto 20-50 cm tall. Radical leaves in rosettes, pinnately-partite; cauline leaves about 8-19 cm long, lobed, hastate or entire, terminal lobe large. The flowers, yellow, about 6 mm wide and have 4 tiny, oblong petals longer than petals the older flower clusters are surrounded by a ring of long, slender seed pods. Upto 2-6 cm long, glabrous; valves 3-nerved. Seeds oblong, granulate.

   It is most common in fields, drainage ditches and vacant lots. Seeds mixed with refreshing drinks,

   Fl. & Fr. Feb-April Collection-1026, chilhiya


   A bristly, annual or biennial herb with a rosette or deeply divided leaves with toothed margins, with large rounded terminal lobe upto 90 cm high. Stem, wiry, with short interodes, the basal leaves about 10 cm long, pinnatified, with 3-5 pairs of toothed lobes large terminal lobe petiolate. Upper stem leaves smaller than basal stem leaves. Flowers small, in racemes, petals 4 about 2-4m long, no bracts, 4 free sepals about 2 mm long, stamens 4-6, inner are longer than the outer pair, fruits, conical shaped, siliqua upto 1-2 cm long, without a beak, dehiscent release with 2 valves,
each with several seeds about 1 to 1.5 cm long-common weed of agricultural areas, wasteland, roadsides.

Fl. & Fr. – Jan-May Collection- 1312 Badhani

6. Raphanus Linn.


Annual or biennial plant consists of a rosette of leaves; the basal leaves are up to 7 cm long and 2 ½ cm across, oblanceolate, coarsely crenate, pinnately loked. Long and round, pungent root. Root varies in size, shape and colour. Higher leaves much smaller, shortly petioled, lanceolate-spellate, more or less dentate. Inflorescence a terminal, erect, oblong, many-flowered racemes flowers bisexual, 4-merous, 1.5 cm in diameter fragment, white to lilac, pedicel up to 2.5 cm long; sepals free, oblong-linear, 6-10 mm long; petals free, spatulate, clawed, 1-2 cm long, stamen 6, 4 long and 2 short, ovary superior, style 3-4 mm long. Fruit cylindrical, up to 10 cm long and 1.5 cm in width, consisting of 2 sperposed joints lower joint very short and seedless, spongy and divided into 2-12 One-seeded compartments

L.N.: Muli F.L. & Fr. Dec-June 2-12 Collection– 1231, Dheberhua

10. CLEOMACEAE

1. Cleome Linn.

1. Gynophore present; stamen 6; Fruit Capsular ……………………………. 1. C. gynandra

1. Gynophore absent; stamens many; capsule short beaked, usually more than 2.5 cm long. …………………………………………………………………………………… 2. C. viscosa

Annual pubescent, herb about 1m tall. Leaves 3-5 foliate with petioles. Leaflets about 3 to 7 cm long, acute, obovate, serrulate. Flowers, white, cream-coloured or pinkish, about 1-2 cm across, in corymbose racemes; pedicels upto 2 cm across, in corymbose racemes; pedicels upto 2 cm in fruiting; bracts leafy, 3-foliate- Sepals 2, acute, lanceolate. Petals 4, obovate with long claws. Stamens 6; anthers versatile, capsule about 4-8 cm long, gland striated pubescent. Seeds brown. Indehiscent, with a long seedless beak. Seeds ovoid globose, yellowish.

Common in waste places and common weed of cultivated fields also

L.N. Hulhul Fl. & Fr – June-Sept Collection- 173, Itwa


An erect, tall, annual herb, up to 1 meter high, with more or less hairy, glandular and eglandular hairs. Leaves digitately compound, with about 3-5 leaflets. Leaflets are obovate, elliptic-oblong, variable in size, about 2-4 cm long, 1 to 2.5 cm broad one large in middle, petioles up to 5 cm long. Racemes elongated, up to 30 cm long with corymbose flowers at the top, bracteate. Flowers about 10-14 mm across, white or yellow; pedicels about 6-20 mm long, foliaceous bracts. Sepals oblong- lanceolate, about 3-4 mm long, 1-2 mm wide glandular-pubescent. Petals about 8-15 mm long, 2-4 mm broad, oblong-ovobvate-stamens 10-12 (more, up to 20), gynophore absent. Fruit about 30-70 mm long, linear oblong, erect, obliquely striated, tapering at both ends, Glandular- pubescent, slender; style upto 2-5 mm long; seeds many,
glabrous with longitudinal and transverse ridges, dark brown. Common weeds of fields and waste places.

Leaves are used as an external application to wounds and ulcers. The juice of the leaves has been used to relieve earache.

Fl. & Fr. – July-Oct Collection: 377, uska bazaar

11. CAPPARIDACEAE

1. Sepals free; fruit globose or ovoid:
   2. Leaves simple; stipular thorns present, large shrubs .......... 1. Capparis.
   2. Leaves trifoliolate; large unarmed tree....................... 2. Crataeva

1. Capparis Linn.

1. A dense shrub or small tree; flowers scarlet or red brown:
   2. Flowers in many flowered corymbs on short lateral shoots, red brown...................................................................... 1. C. deciduas

1. Climbing shrubs; flowers white or purple:
   2. Flowers in simple umbel like corymbs, white ................... 2. C. sepiaria
   2. Flowers supra-axillary in a vertical line, white or purplish...... 3C. zeylanica


A small tree or lower shrub, with spiny branches, up to 5 m high. Leaves present on young twigs, caducous, linear about 4-20 mm long, about 1-3 mm broad, subsessile; stipular spines 1-6 mm long, straight or slightly curved, yellow or brown.
Inflorescence few to many flowered, ebracteate corymbs on short lateral shoots. Flowers 1-2 cm across on long slender pedicel, usually brick red. Sepals petaloid, usually 5-8 mm long, 3-5 mm broad, ovate-oblong, upper one distinctly saccate, often with ciliate margins. Petals about as long as the sepals, puberulous, upper pair slightly larger and hidden in the saccate sepal. Stomens generally 10-15, about 10-20 mm long, often red in colour. Gynophore 10-15 mm long, Fruit globose, about 10-15 mm in diameter, slightly beaked, glabrous smooth, deep red when ripe, seeds reniform about 2-5 mm in diam. Common shrub in waste lands.

L.N. – Kair Fl. & Fr – Jan-Aug Collection- 733, Mahdawal

2. *C. sepiaria* Linn. ed. **10**: 1071; FBI. **1**: 177; FUGP. **1**: 53; Parker, For. Fl. **20**, FD. 66.

Densely armed, evergreen scandent shrub or climber, twigs with grey pubescent, stipular thorn recurved. Leaves ovate, elliptic-lanceolate or oblong-lanceolate, about 2 to 5 cm long, subcordate at base, retuse or emerginate at apex. Flowers about .5 to 1 cm across, white, in sessile or shortly peduncled umbels. Sepals subequal, ovate or suborbicular, ciliate at margins. Petals white obovate or oblong-stamens 25-40, exserted; anther brown. Gynophors slender. Fruit globose, yellow, smooth black at maturity, seeds 1-2, embedded in sticky pulp.

Commonly occurs near forest area. Leaves and twigs are used as fodder for sheep and goats. Fruits elible. Decoction of roots used in paralytic attacks.

L.N.- His Fl. & Fr. – Ap- Aug-Jun-Sept Collection – 928 Biscohar

3. *C. zeylanica* Linn. Sp. Pl. 2: 720; 1762 (non Hook f. & thoms 1872) – *C. horrida*; FBI. **1**: 178; FUGP. **1**: 53

A thorny, climbing or straggling shrubs upto 7 m high, twigs with stellate-greyish tomentum. Leaves ovate, obovate or lanceolate, subcordate at base, acute or
acuminate at tip, entire, glabrescent. Flowers showy pink or purple, fragrant, axillary, solitary, about 3-5 cm across, pedicel pubescent, thickened and elongated in fruits. Sepals unequal, outer large, inner smaller petals purple or pink, oblong, rounded. Stamens 30-45, cremish white, turn to pink or purple. Gynophore glabrous, thickened at base in fruit. Fruits upto 2-3 cm across, subglobose, reddish-brown or orange; seeds many, embedded in scarlet pulp.

Commonly found near forest edges, often climbing on trees. Root bark especially used in diabetes.

L.N. His Fl. Feb – May, Fr.-Aug-Sep Collection- 886 Rudholi

2. Crataeva. Linn.

Crataeva. magna (Lour.) DC Prodr. 1: 243, 1824.

A medium sized tree upto 7 to 8 m. Bark smooth, brown and have patches. Leaves compound, 3-foliate leaves appearing shortly after flowers leaflets ovate, 5-13 cm long, ovate, acuminate, entire, glabrous, petiole about 5-7 cm long. Flowers large, 5-6 cm across greenish white, or greenish yellow poly gamous in dense terminal corymbs, stamens violet longer than petals. Petals ovate, long clawed fruit fleshy, ovoid, Berry, seeds are embedded in pulp, foetia-smelling, many seeded. Commonly cultivated in gardens.

Plant used for asthma and bronchitis. Leaves are also used as fodder.

L.N. – Barun, Barna Fl. & Fr. – March-June Collection- 288, Sarota

A small unarmed, deciduous tree, upto 6-12 cm tall, glabrous leaves-3-foliolate, petiolate; leaflet shortly petiolulate, elliptic, elliptic-lanceolate, ovate-lanceolate, more or less oblique, acuminate, narrow at base, upto 5-11 cm long, herbaceous to subcoriaceous, brown when dry, petiole long, inflorescence axis about 2-4 cm long. Flowers about 3-5 cm across, subirregular, greenish-white turning yellowish after opening, pedicellate, ebracteate; pedicels 2-4 cm long. Sepals about 2-5 mm long, ovate-deltoid, greenish white, distant. Petals ovate or suborbicular, reticulately veined, ventually 20-25 mm long, 2 adaxial ones generally larger. Stamens usually about 20-25, exceeding the petals, inserted at base of the gynophore Gynophore generally 3-5 mm long, slender, thick in fruit, fruit globose, about 3-4 cm in diam, yellowish, seeds reniform, about 3-4 mm in diameter, smooth, brown.

Commonly found near the river banks. Bark yields ceryl alcohol, lupeol are useful in urinary organs disorders, pain and burning micturition.

L.N. – Barna Collection – 431, Karauti

12. FLACOURTIACEAE

Flacourtia Linn. Herit.

1. Tree or shrubs often thorny; drupes globose, purple ………………….. F. indica


A tree or shrub usually 3-5 m tall or upto 10m. Bark, pale, grey, powdery, become brown to dark flaking, revealing pale orange patches. Vegetative parts vary
from glabrous to densely grey. Leaves red or pink when young, variable in size, oval to round, about 2 to 12 cm, edge toothed, becoming leathery; about 4-7 pairs of veins clear on both surfaces. Flowers unisexual or occasionally bisexual. Male flowers in axillary racemes about .5 to 2 cm long, pedicles slender, may be pubescent, up to 1 cm long, basal bracts minute and caduceus. Sepals broadly ovate, apex acute to rounded pubescent on both sides. Female flowers in short racemes or solitary, disk lobulate, clasping at the base of the ovoid ovary; styles 4-8, central, connate at the base, stigma truncate. Fruit globular, red to reddish black or purple when ripe, fleshy upto 2.5 cm across, with persistent styles up to 10 seeded. Common in forest area. Roots and ash have been used as a remedy for Kidney complaint

L.N. – Katai Fl. & Fr- March- May Collection- 816, Gujraulia

13. CARYOPHYLLACEAE

1. Gamosepalous. Petals with long claws:

2. Styles 2. ................................................................. 6. Vaccaria


1. Polypetalous. Petals without long claws:

3. Stipules absent, leaves opposite:

4. Petals lobed:

5. Petals deeply lobed ........................................ 5. Stellaria

4. Petals entire ...................................................... 1. Arenaria

3. Stipules present, leaves in pseudo-whorls:

6. Sepals fleshy, not chafty:
6. Sepals fleshy, not chafty :

7. Stamens 5. styles 3- fid. ......................... 2. Polycarpaea

7. Stamens 10. styles 3, free......................... 4. Spergula

8. Epicalyx present ................................. 7. Dianthus

1. Arenaria Linn.


Annual herb with very short, rough, backward-directed hairs, often becoming glandular above. Stems 1 to several, slender, erect or ascending, simple to freely branched, about 10-30 cm tall. Leaves opposite, ovate to lanceolate, much shorter than the internodes, about 3-7 mm long, 15-4 mm broad, 3 to 5 nerved, needle shaped, sharply pointed, lower ones abruptly short stalked and slightly united at bases, sometimes dotted with minute pimples. Flowers usually several, diffuse, in clusters with leafy bracts. Flower stalks thread like, as long as the flowers. Sepals lanceolate, sharp pointed at the tip, about 3 mm long. Petals about 2/3 as long as sepals. Disc with 3 styles. Fruit capsule avoid to pear-shaped, exceeding the calys, 6 valved. Seeds greyish purple about 0.5 mm long, covered with warty lumps in concentric rows. Common in dry to moist or sandy to grassy areas. The plant is useful to relieve cough, to cleanse the blood, induce urination and fever-reducing. Common weed of fields. Common in moist places.

Fl. & Fr. – Feb-March  Collections- 571, Ucharia

2. Polycarpaea Lam. nom. cons

An erect annual herb, usually unbranched. Leaves opposite or appear in whorls, linear up to 3.5 cm long with a bristle at the tip, glabrous, blade linear, about 1 to 2 cm, glabrous or ciliate, margins revolute. Cymes dense. Pedicels upto 3 mm. Flowers in compact heads at the end of stems. Sepals silvery about 2-3 mm, petals small, pink to orange marcescent, elliptic to ovate, stigmas nearly sessile. Fruit is a minute ellipsoid capsule. Common weed of grassland and of cultivate ground.

L.N. – Bugyale Fl. & Fr. – July-Nov Collection- 490, Khunwa

3. *Silene Linn.*

**S. conoidea Linn.** Sp. Pl. 418. 1753; FBI. 1:218; FUGP. 1:65; HFD. 73.

An annual herb, up to 40 cm tall. Stem erect, branched or simple, densely glandular-velvety. Leaves about 2.5-14 cm long, about 0.2-1.2 cm wide, linear-lance shaped, base stem-clasping at the nodes, stalkless, glandular-velvety. Bracts smaller in size. Flowers borne in panicles, with 3-5 flowers in lax clusters. Flower-stalks densely glandular, velvety, hairy. Sepal tube about 2-2.5 cm long, pointed, with lanceshaped teeth, 30-nerved. Petals pink to red, notched or entire, claw about 1.5 to 1.6. coronal scales oblong. Carpophore is about 1 mm, glabrous. Capsule is about 1 to 1.8 cm, conical with narrow neck, included in the calyx. Seeds long about 1.1 mm long, kidney-shaped. Common weed occurs in winter.

Fl. & Fr : Jan-May Collection- 331, Aghia

4. *Spergula Linn.*

**S. arvensis Linn.** Sp. Pl. 440, 1753; FBI. 1:243; FUGP. 1:67; FD. 69
Annual herb about 0.5m to 1 ft, spread by seed. Forms irregular clumps. Leaves unique, occurs in whorls around the stem, foliage leaves are linearly, awl-shaped, upper surface arched, underside furrowed, about 2-3 cm long, sticky haired, in whorl tufts. Stems erect or ascending in groups or prostrate, jointly articulated, about 40 cm high or long. Flower small, have 5 white petals and calyx with separate sepals, in terminal, umbellate-like in florescence, 10 yellow stamens about 1 cm in diameter. 5 sepals behind the petals which are slightly offset. Seeds small, about 1 to 1.8 mm in diameter, black with narrow brown margins. Seeds per plant from 1000-10,000. Common in moist places

L.N. – Much muchia Fl & Fr – Dec-March Collection – 731, Akbarpur

5. Stellaria Linn.


An annual herb upto 20-35 cm high; stem decumbent rooting at lower nodes, herbaceous, somewhat succulent, mostly glabrous but with a single longitudinal line of pubescence, pubescence hirsute to tomentose. Leaves opposite; ovate, sometime truncate at base, short mucronate, petiolate, blades about 1 to 2 cm wide, 2 cm long, glabrous, green above, lighter green below, entire, petiole winged, pubescent about 2 cm long. Single flower from leaf axils, in terminal cymes, having 3 flowers, peduncles about 1-3 cm long, pubescent. Flower white or cremish, corolla white, rotate, 5-6 mm broad. Petals 5, deeply notched, glabrous, free. Petal lobes oblong. Stamens typically 3-5, attached at base of ovary, alternating with petals. Styles, 3, spreading, sepals 5, free, pubescent with glandular-tipped hairs, ovate-lanceolate,
green. Capsul about 6 mm long, 4 mm wide, glabrous. Seeds tuberculate, rotund about 1 mm in diameter. Commonly occurs in moist and shady places.

L.N.– Buch-bucha   Fl. & fr. – Mar-Nov   Collection- 801, Parsauna

6. Vaccaria Medik


Annual erect herb, glabrous about 1.0 metres high, 0.5 meters wide. Leaves sessile, ovate lance-shaped, stalkless, stem-clasping. Cymes open. Flowers calyx about 9-17 mm with 5 prominent, usually green, winged angles or ridges, each ridge with strong, cord like marginal vein; petals with claw about 8-14 mm, blade about 3 to 7 mm. capsules ovoid included in calyx tube) teeth at apex. Seeds up to 2 to 2.5 mm wide, black, tubercled. Common in grain fields

Fl. & Fr. – Feb-March   Collection- 211, Chilhiya

7. Dianthus barbatus Linn.

Annual herb about .75 m tall, glabrous, herbaceous, typically simple, branching above, 4-angled, rounded. Leaves opposite, lanceolate, elliptic or oblong about 1 to 8 cm long, 2 cm broad, glabrous, sessile to short-petiolate, entire or minutely ciliate. Inflorescence in terminal cyme of 5-30 flowers, dense. Flowers pink or reddish or various coloured petal 5, clawed, fringed. Stamens 10, included to slightly exserted. Styles 2, calyx tubular, striate to 1 cm long. Fruit a capsule, many seeded. Commonly cultivated.

Fl. & Fr. – June – August   Collection- 686, Naugarh
14. PORTULACEAE

1. Portulaca Linn.

1. Flowers terminal, solitary .................................................. 3. P. quadrifida

1. Flowers in terminal clusters:

2. Stems with nodal hairs. Calyx tube Clothed with long hairs:

3. Nodal hairs short. Flowers more than 2 cm across:

3. Nodal hairs long. Flowers less than 2 cm across......2. P. pilosa subsp. pilosa

2. Stem without nodal hairs. Calyx tube Glabrous ................. 1. P. oleracea


A greenish, prostrate with some red tinge, weed, herbaceous, succulent, multiple from base. Leaves alternate, sessile or very short petiolate, glabrous, oblan ceolate to obovate, obtuse to truncate at apex, tapering slightly to base, entire, succulent about 3 mm long, 1.2 cm wide. Inflorescence single or few flowers terminating stems. Flowers yellow, petal 5, glabrous, about 3-4 mm long, 2-3 mm broad, distinct. Stamens 6-10. Filament about 1 mm long, translucent yellow. Anthers yellow about .2-.3 mm wide. Style 5- lobed, glabrous. Calyx tube about 2 mm long, glabrous, green, 2-lobed, with groove. Lobes subequal to unequal about 4 mm long, acute. Capsule cirumsissle. Seeds many. Common in sandy soils and also found in cultivated fields.

L.N.– Kulfa Fl. & Fr – Almost throughout year Collection – 349, Sarota gram

A prostrate herb, fleshy, branched. The leaves alternate, about 3 cm long, 0.5 to 2 cm wide, succulent, more or less rounded, linear to oblanceolate. The small 5-12 mm in diameter. Flowers deep pink, purple, red, yellow. Sepals 2 ovate. Petals 5-6 obovate to oblong. Stamens about 10-15; styles 3-5 lobed. Capsule 2-3 mm across, globose; operculum half the length of capsule; Seeds rugose, blackish, tubercled, reniform. Common in dry sandy soil near rivers and waste places.

Fl & Fr: Jun-Oct

Collection, 908, Parsa


Annual herb, prostrate or ascending, about 8 cm high leaves subsessile, flat succulent, ovate to ovate-lanceolate, acute, entire; appendages with a ring of hairs. Flowers yellow, solitary, terminal. Sepals minute. Petals 4, obovate. Stamens 8. capsule obovate-conical; seeds black, tubercled, minute.

Rare weed on moist soil and moist shady places throughout the district.

L.N. – Chota-luniya

Fl & Fr: July-Nov

Collection: 931, Sarsa

15. TAMARICACEAE

**Tamrix Linn.**

1. Leaf sheaths present; flowers dioecious; indense cylindrical spikes. …. T. dioica

**T. dioica Roxb.** Hort. Beng. 22, Fl. Ind. 2: 101; FBI. 1: 249; FUGP. 1: 71; FD. 72.
A undersized tree or shrub with reddish bark, entirely glabrous, leaves vaginate, abruptly acuminate, about 1.5-3mm long, with white margin. Plant dioecious. Racemes aestival, simple or loosely compound male racemes, 3-8 cm long, 7-8 mm broad, compact, female racemes as long as the male raceme or somewhat longer, about 3-5 mm broad, flowers purple or purplish pink, subsessile. Bracts semi amplexicaul, triangular, acuminate, about 2.5-3mm long, 1 mm broad. Sepals 5, ovate to broadly ovate or somewhat orbicular, about 2 mm long, entire, obtuse. Petals 5, free obovate, about 2-2.5 mm long, entire, obtuse. Stamens 5, free obovate, about 2-2.5 mm long, entire, obtuse. Stamens 5, filaments filiform, 1.75-2mm long, inserted in between the notches of the disc, notches almost entire to slightly emarginated, anthers obtuse, stamen abortive in female flowers. Styles 3 as long as the ovary or slightly shorter, exserted, ovary triquetrous about 1-1.5 mm long, abortive or absent in male flowers. Common in district near all river banks and canals. It is used in liver, fever, kindnery problem

L.N. – Lal Jhau Fl. & Fr. : June-Sept. Collection- 902, Bansi

16. MALVACEAE

1. Herbs or shrubs:

2. Fruits schizocarpic:

3. Bracteoles O :

4. Carpels 5-10, 1- seeded .................................................. 8. Sida


3. Bracteoles 3:
5. Leaves orbicular, palmately veined and lobed; flowers white
........................................................................................................5. Malva

5. Leaves ovate-lanceolate, pinnately veined; flower yellow ............
........................................................................................................6. Malvastrum

3. Bracteoles 5 or more:

6. Leaves glandular at the base of midrib beneath, bracteoles 5
................................................................................................................. 9. Urena

6. Leaves eglandular, bracteoles 5. many ............... 7. Pavonia

2. Fruits capsular:

7. Bracteoles 5 or more oro:

8. Calyx persistent ........................................... 4. Hibiscus

8. Calyx falling off after anthesis.......................... 1. Abelmoschus


1. Abelmoschus medik.

1. Peduncle equal to the petiole in length ...................... 2. A. moschatus.

1. Peduncle shorter than petiole.................................... 1. A. esculentus.

1. Abelmoschus esculentus (Linn.) Moench, Meth, Pl. 617, 1794.- Hibiscus esculentus Linn. Sp. Pl. 696, 1753, FBI 1:373; FUGP. 1: 93; FD. 81; HFD. 81.

Annual herb about 1-2 m tall, with prickly hars on most parts. Stem hollow. Stipule filiform, about 7-10mm, sparsely hirsute, petiole about 6-14cm, long hirsute, often with pubescent adaxial groove; leaf blade palmately 3-7 lobed, lobes broad to narrow, sparsely. Hirsuite on both surfaces, margin sparsely dentate and emerginate.
Flowers solitary, axillary. Pedicel 0-2 cm, strigose. Epicalyx lobes 7-10, filiform, sparsely hirsute. Calyx campanulate, about 2-3 cm, densely stellate puberulent. Corolla yellow or white with dark purple centre, 5-7 cm in diam; petals obovate, Filament tube 2-2.5 cm. Capsule cylindric to tower-shaped, longbeaked, sparsely strigose. Seeds dark brown or gray, globose to reniform, 5-15 per locule, striate, minutely warty.

Commonly cultivated as vegetables crop throughout the district.

L.N. – Bhindi Fl. & Fr.– June-Oct Collection – 121, Itwa


Soft, herbaceous trailing plant about 2m long hirsute with simple or stellate hairs. Leaves variable in shape and size, about 5-10 cm across, angular or 3-7 palmatilobed, upper leaves narrower, lobes linear to lanceolate to oblong-ovate, serrate to dentate; stipules linear to filiform, simple hairy. Flowers solitary, axillary. Epicalyx bracteoles 6-10, free, linear, persistent. Calyx to about 2cm long. Petals yellow, capsules ovoid to globose, about 5-8 cm long, hispid; seed with having cocentric ribs. Commonly cultivated as field crop. Seed yield oil used in perfumery.

L.N.- Musk dana Fl. & Fr. – Sept-March Collection: 258, Bansi.

2. Abutilon Linn.

1. Carpels 15 or more:

   2. Carpels with awns:

       3. Carpels hispid, with short erect awns; leaves hairy and rugose above


3. Carpels glabrescent with short sharp spreading beaks; leaves densely tomentose on both surfaces. ........................................ 2. A. indicum

2. Carpels without awns:

4. Carpels shorter than calyx.

4. Carpels as long as enlarged calyxes.............................. 3. A. hirtum

1. Abutilon. asiaticum G.Don. Gen. Syst. 1, 503; FBI 1: 326 (not of W. & A. Prod.)
FUGP. 1: 82.-Sida asiatica L.

An erect, perennial undershrub upto 0.6-1.4m tall. Stem woody below, densely pubescent. Leaves ovate, cordate, acuminate, serrate, rough pubescent above, valvate beneath; petioles about 4-8 cm long, stipule linear deflexed. Flowers orange yellow, axillary, solitary, about 2 to 4 on across, peduncle 4-8 cm long, jointed near the flower. Calyx lobes oval, acuminate, 3-veined, ultimately deflexed. Ripe carpels about 13-20, hispid, longer than calyx sometimes, awn short, erect. Occasionally occurs in wastelands

Fl. & Fr. – March- June Collection- 371, Dumariaganj


Erect woody shrub about 1 cm to 3m tall, stellate pubescent, covered with small, simple, spreading hairs on the young parts. Branches usually green but sometimes purplish. Leaves 2 to 15 cm long, cordate at base, acute to long acuminate at apex, serrate to crenate, 7-9 nerved, or 3-angular, stellate pubescent, cinereous on both sides, green above, petiole about 2 to 8 cm long, stellate pubescent mixed with sparse, weak, simple, spreading hairs; stipule linear, about 2-5 mm long. Flowers axillary; solitary; calyx 5 lobed, tubular below, lobar ovate-acute; pubescent on both
sides, corolla yellow; petals obovate about 1 to 1.5 cm long and broad, claw hairy on the margins; staminal column about 5-7 mm long. Ripe carpels 15-20, longer than the calyx, truncate or shortly awned. Fruit cylindric truncate about 1.5-2 cm across, stellate pubescent, mericarps about 15-20; 10-18 mm long, acute or acuminate at the back, erect at maturity and not spreading. The roots and leaves are used in the treatment of hyperthermia, headache, dysuria and metrorrhoea. The juice of fresh leaves and seeds internally applied is active in snake-bite. Common throughout the district along roadsides and in waste places.

L.N. Kanghii     Fl. & Fr. July-Oct     Collection: 613, Bairaj


A perennial herb or shrub, about .5 to 2 m tall. Stem, petiole and pedicel clammy pubescent and usually long, dense simple, spreading hairy. Leaves with about 3-15 cm long petiole; stipules about 5-9 mm long, 1.5 to 2 mm broad, falcate, lanceolate, eventually reflexed; blade 4-17 cm long and broad, densely stellate, glutinous hairy on both sides, usually broadly ovate, cordate at base, acute to acuminate at apex, crenulate-dentate or serrate, yellow or yellowish green. Flower yellow, solitary axillary, pedicel about 1 to 3 cm and in fruit about 4 cm long articulate at the middle. Calyx about 6-9 mm long, in fruit about 12 mm, fused to the middle; lobes ovate, acuminate- cuspidate, simple and stellate pubescent. Corolla about 3 to 3.5 across, orange yellow, petals about 1.5 cm long and 1 mm broad, densely simple hairy, sometimes stellate on the covering margins, more towards apex, broadly obovate, claw ciliate. Staminal coloumn about 5-8 mm long, stellate pubescent at the base, truncate, acute at the back, oblong about 10-12 mm long, 6-8
mm broad. Seed 2-3 per mericarp, reniform, about 2 to 2.5 mm across, stellate hairs, brown.

L.N.– Ban Khangi Fl.– Aug-Dect, Fr-Oct-March Collection- 364, Naugarh

**Fioria Mattei**


Herb or shrub about 2-2.5 m tall, densely velvet hairy all over. Leaves about 2 to 6 cm long, succordate-rounded at base, acute at apex, serrate to crenate, not lobed or about 3 to 7-lobed, broadly ovate to orbicular, densely pubescent on both surfaces; stalk 1 to 1.5 cm long. Flowers solitary about 4-6 cm across, pale yellow to yellow with large, purple centre. Petals are about 3-5 cm long, about 2-3 cm broad, outside with simple and 2 rayed hairs towards the top, glabrescent, obovate. Staminal column about 1-2 cm long, glabrous.

Collection- 223, Baanganga

3. **Gossypium Linn.**

1. Bracteoles united, not pectinate:

1. Bracteoles quite free, pectinate; leaves hirsute .................... 1. *G. hirsutum*

1. **G. hirsutum** Linn. Sp. Pl. 2:975, 1763; FBI. 1: 347; FD. 82; Suppl. FUGP. 27.

Erect, Annual or perennial under shrub, much branched bushy, with wholly covered hairs. Stem green or tinged red. Leaves about 3-10 cm long simple to 5 lobed (mostly 3 lobed), thick more or less orbicular, cordate at base, acuminate, petioles about 2-10 cm long, stipules 5-8 mm long, broadly lanceolate. Flowers yellow turning into
pinkish purple, in axillary, solitary. Epicalyx segment broadly ovate, teeth 7-12, pectinate or lacinate free. Calyx copular. Corolla yellow; petals obovate. Capsules ovoid about 3-4 cm. long, 3-5 loculed. Seeds 3-5 cm long, ovoid, white tinted, lint firmly attached. Commonly cultivated as field crop throughout the district

L.N. Bari    Fl. & Fr. : Aug-Oct      Collection- 782, Itwa

4. Hibiscus Linn. nom cons.

1. Plants prickly ......................................................... 1. H. cannabinus

1. Plants not prickly:

2. Bracteoles present, free or connate:

3. Bracteoles connate into a cup at the base; seeds thinly pilose, calyx inflected
   ............................................................................ 5. H. torvum

3. Bracteoles free and distinct:

4. Flowers upto 1.5 cm across; seeds cottony; plants wild.
   .................................................................................. 3. H. ovalifolius.

4. Flowers larger, seeds hairy, plants cultivated.

5. Flowers white, turning red; leaves orbicular palmately lobed.
   .................................................................................. 2. H. mutabilis

6. Petals entire ............................................. 4. H. rosa-sinensis


1. H. cannabinus Linn. Nat. ed. 10.2:1149, 1759; FBI. 1. 339; FUGP. 1:90

    Annual herb with scattered prickles about 1 to 3 mm tall. Leaves 5-10 cm across, palmately 3-4 lobed; lobes linear, elliptic to lanceolate, distantly serrate;
petioles about 3-12 cm; stipule linear to subulate. Epicalyx segments 7-8, spreading, sparsely prickled. Flowers pale yellow with a crimson centre, about 5-9 cm across. Calyx lobes lanceolate or linear, distinctly 3-nerved glabrous outside, tomentose inside. Corolla yellow, spreading, glabrous. Staminal column 1-2 cm capsules globose, beaked, dehiscing into 5-valves seeds reniform, brownish, hairy. Common in waste lands and near agricultural fields. Leaves and flowers are used medicinally, stem yields a strong fibre.

L.N. Patsan Fl. & Fr. Sep-Nov. Collection – 631, Dumariaganj

2. H. mutabilis Linn. Sp. Pl. 694, 1753, FBI. 1: 344; Bailey, Man, Cult. Pl. 666; Bor & Raiz. 234, f. 135, Pl. 86; FD. 81.

Shrub or small tree about 2-4 m tall. With simple, glandular, yellowish or purplish hairs. Leaves with about 3-9 cm long petiole; blade about 5-14 cm long, broader than long, cordate-truncate at base, coarsely serrate obscurely-distinctly 3-7 lobed; lobes acute; stipules small, linear lanceolate. Flowers axillary, solitary, large, single or double; pedicel longer than petiole, articulate near the top; epicalyx segments about 8 to 12 free, linear to linear lanceolate. Calyx free below or to the middle, about 2-3 cm long; lobes ovate, acuminate. Corolla about 5-8 cm across, white to pink, changing in colour; petals about 4-6 cm long and broad, obovate, pubescent outside, claw with ciliate margin. Staminal column about 2 to 2.5 cm long, subglobose, grooved or notched in the centre, lanate seeds numerous, reniform, dark brown, dorsal and latual sides with spreading long hairs. Cultivated as a hedge plant in gardens


Perennial with branched stem. Shrub stem branched, stiff, erect, up to 40-100 cm, bristly hairy. Leaves with stalk about 1-1.2 cm, variable in size and shape, 0.5-2.5×0.5-3.5 cm, triangular or oval, rounded at base, with toothed edges and pointed tips. Flowers white, about 0.5 cm across, on stalks up to 3 cm, axillary, solitary; capsule about 1 cm across. Seeds densely covered with white hairs. Calyx 5 lobed; lobes lanceolate or triangular corolla 1-1.5 cm across, white or pink, petals 5, reflexed, stellate, hairy outside. Staminal tube very short, up to 5 mm long. Capsule globose, about 7-8 mm across. Seeds reniform, cottony.


4. **H. rosa-sinensis** Linn. Sp. Pl. 694, 1753; FBI. 1: 349 Baily, loc lit; Bor & Raizada 237. f. 137, Pl. 88, 89.

A perennial shrub about 3 m tall, with glabrous, woody stem. Leaves ovate or ovate-lanceolate, acuminate at tip, serrate to dentate, glabrous; stipules linear. Flower red or scarlet; long peduncled. Bracteoles 5-8, almost halfp to calyx lobes, lanceolate or linear, calyx campanulate, glandular, hairy outside. Petals obovate, entire. Staminal column about 4-8 cm long, antheriferous towards tip, red, exceeding to corolla.

Commonly cultivated in gardens for its flower. Leaves used as emollient.

L.N. – Gurhal Fl. & Fr – Feb-Oct Collection- 888, Parsauna

Erect or spreading or straggling, hispid about 25-55 cm tall annual herb. Stem herbaceous, erect, branching, sub hollow, stellate and forked pubescent, leaves about 2-6 cm long, central lobe longest, each lobe toothed to pinnately partile, lower leaves sometimes not lobes, glabrous or sparsely stiff hairy, more so beneath; stipules 2-7 mm long, linear, stiff hairy, leaf divisions pinnately lobed, lobes rounded at apex. Flower axillary, solitary, pedicel about 2 to 4 cm long, stiff hairy, articulate near the top. Epicalyx segments 7-11 or 5-14 cm long, linear, margin with long simple spreading, very stiff hairs, tubereled at base. Calyx twice the length of epicalyx, fused above the middle, with green-purple veins, stellate pubescent. Corolla white-pale yellow with purple mouth, about 1 to 3 cm across, petals 1-2 cm long, glabrous. Staminal columns 3-4 mm long, purplish, filaments about 2 mm long, purplish; anthers yellow. Capsule 1 to 1.5 cm long, about 1.2 cm broad, oblong, obtuse, black, very hispid. Commonly occurs in waste ground, fields, roadsides, railroads.

Fl. & Fr. – June-Sept Collection- 734, Birdpur

5. Malva Linn


Biennial upto 1m tall, pubescent to glabrescent herbs. Leaves about 2-4m long, about 2-5 cm broad, 3-lobed, truncate to broadly cordate at; stipule lanceolate, scarious, about 5mm long, 1.5 mm broad; petiole 2-6 cm, pilose Flowers axillary 2-4 in fascicles, purple, appears in clusters, pedicel about 2 cm long. Epicalyx segments ovate, about 2-3 mm long and 1.5mm broad. Calyx free to the middle, about 3-6 mm long, glabrescent, lobes broadly triangular, about 2-3 mm broad. Petals pink-purple, obovate, emarginate, claw ciliate. Staminal tube about 3mm long, stellate pubescent.
Fruit glabrous, about 5-6 mm across, mericarps 10-12, reticulate. Seeds brown about 5-6 mm across, mericarps 10-12, reticulate. Seeds brown about 2.5mm long and broad. Common in waste place.

Lin- Kangani Fl&Fr- Dec-April Collection:- 1203, Khantora

6. Malvastrum Gray nom. Cons


Annual erect herb or under shrubs about 1m high, sparsely appressed with simple or 4 rayed stellate hairs. Leaves ovate –lanceolate to oblong, about 1 to 4cm, coarsely serrate, 3-5 nerved at base, pubescent on both surfaces; petioles about 3cm; stipules filiform. Epicalyx linear to lanceolate, acute. Sepals deltoid to ovate margins hairy. Petals yellow, obovate to rounded, emerginate, ciliate at base. Staminal column 2 to 2.5 mm long, glabrous. Fruits mericarps 10-12, strongly curved, with two dorsal spines and a rigid style; seeds glabrous; brown-black. Leaf decoction given in dysentery and leaf paste applied to wounds common in wastelands, fields and along roadsides.

L.N: Kharenti Fl. & Fr: Major part of the year Collection: 672, Latera

7. Pavonia Cav.nom. cons.


2. Bracteoles 10-12 carpels armed……………………………………2. P. zeylanica

Masters in FBI. 1: 330.1874.

A perennial erect herb, upto 80cm tall; branchlets densely stellate-hairy. Leaves about 3 to 8 long 2.5 to 8.5 cm long, ovate to rounded, base cordate, apex acute, stellate-pubescent on both surfaces, nectaries gland on veins beneath, petiole about 1-6 cm. Flowers pink, axillary, solitary, ultimately in terminal clusters, epicalyx cup shaped, segments 5. Calyx campanulate, shorter than epicalyx, acute to acuminate. Petals pink with dark centre, 2-3 cm long. Seeds about 3 mm long, 2mm broad, brownish-black, glabrous. Common in wastelands and along road sides.

Fl. & Fr. June-Nov. Collection- 873, Latiya


A pubescent, perennial herb or undershrub about 1m tall. Leaves more or less orbicular or roundish, about 1-3 cm long, 0.5-2.5 cm broad, deeply 3-5 lobed, cordate at base, acute or rounded at tip, dentate, sparsely hairy on both surfaces, petioles about 1 cm long; stipules linear, hairy, caducous. Epicalyx campanulate, 8-lobed, linear, hairy, connate at base. Calyx-5-lobed; lobes ovate- lanceolate. Corolla white or pink, rotate; petals 5. Staminal column about 7mm long. Fruit pubescent, mericarps 5, winged at angles, trigonous, awnless, enclosed in persistent calyx, seeds reniform, minutely pubescent. Not common, occurs near the margins of fields.

Fl. & Fr. – June-Nov. Collection : 908, Lewari.

8. **Sida Linn.**

1. A Procumbent, trailing herb

1. A small erect herb:

2. With recurved spines below the petioles……………………………2.S.
alba.

2. Without spines:

3. Awns exceeding the calyx; leaves cordate oblong, downy on both surfaces……………………………………..3. S. cordifolia

3. Awns short:

4. Leaves narrowly lanceolate, staterous or nearly so………………………………………. 1. S. acuta

4. Leaves rhomboid. Lanceolate or obovate, hoary beneath………………………………5.S. rhombifolia

4. Leaves downy on both surfaces…………….4.S ovata


   Perennial, erect. Shrub or undershrub about 1.5m tall, slender or spreading; fibrous to woody, stems with fine stellate hairs. Leaves narrow-lanceolate about 2-9 cm long, 5-40mm wide, ovate-lanceolate or elliptic, base acute, rarely glabrescent, petiole about 2-5mm. Flowers solitary or in crowded heads in the leaf axils, creamish or yellow, axillary or 2-7 in clusters. Calyx about 5-6 mm across, campanulate, slightly accrescent. Corolla light yellow, mericarps about 6-10 and 4mm long. Fruit schizocarp, seeds ovid, dark brown. It is valued as a reliever of stomachache, and is useful remedy in chronic bowel complaints. Common in fields and waste places.

   Fl. & Fr. –Sept-Mar Collection- 373, Lohrooli

An erect undershrub, stellate pubescent. Leaves elliptic to obovate, about 1-2 cm long, 0.5-1 cm broad; stipule filiform, about 5 mm long; petiole 5-10 mm long. Flowers usually solitary, sometimes paired, pedicel 5-6 mm, in fruit 1-2 cm long. Calyx 5 lobed, about 4-6 mm long; lobes 2-3 mm long 1-2 mm broad, triangular, acute– acuminate. Corolla yellow, slightly longer than calyx. Fruit depressed globose, pubescent. Occasionally found in wastelands and along roadsides.

Fl. & Fr-Sept-Oct          Collection – 741, Madeha

3. **S. cordifolia Linn.** Sp. Pl. 684, 1753; FBI. 1: 324, FUGP. 1: 82; Roxb-Fl. Ind. 3: 177.

An erect velvety undershrub upto 1 m tall, branchlets velvutinous to tomentose or densely pubescent with minute stellate hairs mixed with simple hairs. Leaves stipulate, stipul about 2-6 mm long, filiform, stellate hairy; petiole about 0.5-3 cm long, stellate tomentose, usually ovate, some what orbicular, or lanceolate, rounded or slightly cordate at base, acute at apex, crenate to serrate, on both surface stellate pubescent velvety. Flowers axillary, yellow, solitary or 2-5 in clusters. Calyx 5-8 mm across, campanulate, densely stellate-pubescent mixed with hairs. Corolla yellow, petals obliquely ovate, mericarps 8-10, seeds about 2 mm across, dark brown or black, velvety in the upper half, splitting open.

Leaves are cooked and eaten in cases of bleeding piles:

L.N.-Bala          Fl. & Fr-August-Nov.          Collection- 81, Haraiya

4. **S. ovata Forsk.** Fl. Aeg. –Arab 106, 124. 1776; Bhandari. FID. 73. 1978-S. **grewioides** Guill & Perr. Fl. Seneg. Tent. 1: 71, 1831; FBI. 1: 323, FUGP 1: 81; Parker, For Fl. 36; FD. 75.
An erect perennial herb or undershrub, up to 1m tall. Leaves 1.5-4x1-4cm, ovate-oblong, base rounded, margin serrate to crenate, apex obtuse, densely stellate velutinous on both surfaces, stipules about 1 cm long, linear-lanceolate, petiole about 0.5-1 cm. Flowers white or pale yellow axillary, solitary or paired; pedicel 5-8 mm, in fruit up to 9 mm, rarely up to 14 mm long, with or without articulation at the top. Calyx about 5-8 mm across. Corolla pale yellow; petals 1 cm long, obliquely truncate, sparsely covered with bulbous based hairs, glabrous inside. Schizocarps about 5 mm across mericarps 8, seeds 2 mm in diam, black, reniform rounded, glabrous. Common occurs in wastelands and fields.

L.N. – Kharenti Fl. & Fr.: Sep-Oct Collection: 219, Harijot


Erect, perennial herb, branchlets covered with minute stellate hairs up to 1m tall. Leaves about 1.5-3 cm long, ovate to oblong, often more or less rhomboid, apically serrate to crenate, entire towards base. Flowers solitary on slender peduncles about 10-30 mm long, axillary, solitary or 5-7 flowers in clusters. Calyx campanulate, lobes acuminate Corolla yellow to pale orange, petals oblique glabrous mericaps 6-12. Seeds about 2 mm across, brown or black. The stems are rich in mucilage and employed internally as an emollient diuretic with paper common in district along with roadsides and in waste places.

L.N. Sahadeva Fl. & Fr. Set-Oct Collection -93, Gahraula

9. **Urena** Linn.


An erect, branched annual or perennial undershrub about 1 to 1.7 m tall. Leaves variable in shape and size. Obovate rounded to rhomboid or elliptic lanceolate about 3-8 cm long and 2 to 6 cm broad, acute or obtuse at apex, serrate-crenate, densely hairy on both surfaces; 3-9 nerved at base; petioles 2-8 cm long; stipules linear to lanceolate, as long as calyx. Calyx, tubular to campanulate, lobes 5, ovate, acute. Corolla pink with a purple centre; petals 5, obovate staminal column 1-1.5 cm long. Schizocarps subglobase densely clothed with hooked bristles; seeds brown, reniform. Common in district along with roadsides.

Fl. & Fr- June – Oct   Collection – 1213, Parsauna

17. BOMBACACEAE

**Bombax ceiba**

1. Trunk armed…………………………………………………………………… Bombax ceiba


Deciduous tree with greyish bark about 30-48 m tall, with or without sharp conical prickles; branches in whorls, spreading. Leaves digitate, 5-7 foliate sometimes 9 foliate; petioles about 12-24 cm long; leaflets lanceolate to elliptic, about 12-20 cm long, tapering at base, entire, petiols 2 cm long. Flowers showy bright red to pink, solitary or in clusters on the leafless branches; pedicels about 1-2cm long. Calyx campanulate or cup-shaped, sepals 5, fleshy, thick. Petals fleshy about 7-10 cm long.
Stamens many in no., in 5-6 bundles, in 2 series; staminal tube short, angular. Ovary conical; stigma 5-fid spreading. Capsules oblong ovoid, about 8-14 cm long, woody, 5-valved, silky valves inside; seeds many, dark brown covered in silky hairs. Common near the village area, usually cultivated as avenue tree.

Gum exuded from stem medicinal, aphrodisiac also to relieve digestive disorders.

L.N. Semal   Fl. Jan-Mar, Fr.: Apr-May   Collection-935, Sarota

18. STERCULIACEAE

1. Flowers unisexual or polygamous; petals absent:

   2. Leaves simple, lobed or digitate; follicles usually coriaceous oblong; seeds not winged

3. Fruit of distinct, twisted carpels

4. Stamens 5:

   5. Staminodes O:

      6. Ovary 5-celled

      6. Ovary of 1-carpel

5. Staminodes 5, ligulate

4. Stamens 15 in groove herb or undershrub flowers red staminodes.
7. Herbs or undershrubs flowers red:

7. Large shrub. Flowers white……………………1. Dombeya

1. Dombeya cav. nom.cons.

D. mastersii Hook f. in Bot. Mag. 93, t. 5639, 1867; Parkers, for Fl. 48; FD. 86.

A medium –sized shrub upto 2m tall, with spreading tops. Leaves broadly ovate orbicular 4-12 cm long, serrate, acuminate, velvety. Flowers fragrant, white with light veins of rose, axillary umbellate. Petals about 1.3 to 1.6 cm long, obovate. Staminodes longer than the fertile stamens. Ovary oblong densely villose. Cultivated in gardens.

Fl: April Collection: 1148, Keswar

2. Helicteres Linn.

H. isora Linn sp. Pl. 963, 1753; FBI 1: 365; FUGP 1: 102; Parker in Ind. For. 46: 23, 1920.

A sub deciduous shrub or a small tree with stem 2.5-12.5 cm in diameter, reaching a height of 1.5-4.6m. Bark is grey in colour, young parts covered with stellate hairs. Leaves simple palmately nerved or obliquely cordate with serrated margin, scabrous above and pubescent beneath. Flowers solitary or in sparse clusters about 2-5 cm long, with red petals turning pale blue when mature. Fruits about 5 cm long, greenish brown, beaked, cylindrical, with 5 spirally twisted follicles untwine on ripening, scatter the small seeds contained in them. Seeds many, angular, wrinkled, tomentose. Stem bark used in diarrhoea, dysentery, Billousness. Juice is used for stomach diseases and diabetes. Commonly occurs in forest areas.

L.N. Marorphali Fl. & Fr. May- October Collection: 5714, Bangawa
3. Melhania Forsk.


A small subshrub, m about 40-70 cm tall leaves 5-7 costate, lanceolate, elliptic lanceolate, ovate or ovate lanceolate, unlobed or occasionally obscurely 3- lobe about 2-8 cm long, velvety on both sides, serrate crenate, petiole 1-3 cm long, hairy; stipules filiforms 4-7 mm long, brown. Inflorescence 2-4 flowered cyme, peduncle 1-5 cm long, pubescent. Flowers about 1.5-2cm across, pedicel about 5-10 mm long, pubescent, elongated in fruit, bracts ovate, cuspidate. Sepals linear lanceolate upto 1.8 cm long acuminate or cuspidate, pubescent outside, persistent. Petals oblique, obovate about 1.6 cm long 6-8 mm broad. Stamens 8-10 mm long, staminodes about 1.5 cm long. Ovary subglobose, villous. Capsule oblong subglobose, obtuse or rarely minutely beaked, villous. Seeds angular, muricate, black. Commonly occurs in plains.


4. Melochia Linn

*M. corchorifolia Linn.* Sp. Pl. 675, 1753, FBI. 1: 374; FUGPFD. 86. HFD. 94.

Annual, stellately hairy herbs about 1m high Leaves ovate lanceolate, about 3-7 cm long, cordate or rounded at base, acute lobulate dentate or serrate, hairy on the nerves beneath. Flowers in terminal, subglobose head like inflorescence, bracts ciliate, bracteoles linear. Calyx tubular truncate 5 toothed. Petals obovate, white or pinkish. Capsule 5- valved, smooth, seeds 3-gonous, one in each valve. Commonly occurs near crop fields, along road sides.

L.N. Chitrabee Fl. & Fr. Sept-October Collection- 290, Ajgara

5. Waltheria Linn.

An erect perennial herb upto 1.5m tall, branchlets stellate pubescent, stipules lanceolate, leaves simple, margin serrate, ovate or elliptic, velvety tomentose. Inflorescence terminal or axillary, cymose, often congested. Flowers small yellowish, in axillary clusters. Calyx 5-lobed, Petals 5, spatulate, persistent. Stamens 5, connate at base, opposite to petals, anthers 2-thecate, thecae parallel. Ovary sessile, 1-celled, ovules 2, style clavate or fimbriate at apex. Capsule 2 valved. Seed 1, solitary. It is used as a resinous powder for drying and healing of wounds. The powder is also used against cough.

L.N. Kardudhi Fl. & Fr. July-January Collection-103, Kohal Gaon

6. **Pterospermum Schreb**


A large tree, about 20m tall, with grey bark and rusty pubescent young parts. Leaves oblong, broadly obovate to ovate, orbicular or rectangular, about 15-35 cm long, 8-30cm broad, cordate, often peltate margin wavy to distantly coarse toothed or irregularly lobed, silvery to rusty pubescent beneath, glabrescent and dark green above, petiole 2-15 cm long, tomentoses at base, stipules pinnatifid, caduceus. Flowers solitary, about 10-14 cm across, white, axillary, fragrant, pedicel upto 2 cm long, bracts lacinate sepals linear-lancolate, united at the base into short tube about 8-12 cm long, obtuse, rusty pubescent outside, thick, reflexed, deciduous. Petals linear-oblong to obovate about 5-10cm long, reflexed, obtuse. Fertile stamens about 5-8cm long, staminodes equal to the petal, anthers 1-1.5 cm long. Carpels 5, ovary oblong, pentagonal, 5-located, densely rusty brown glabrescent seeds compressed, oval, wings
brown, membranous. Not common planted as a roadside tree.

Fl.: Mar-Jun    Fr: Sept-Dec    Collection: 377, Barni

7. Sterculia Linn.


A medium sized, monoecious tree Leaves with 20-30 cm long petiole; palmately 5-7 lobed lamina, about 20-30 cm long and broad, glabrous above, tomentose below, cordate at the base, lobes oblong or obovate entire or 3-fid, acuminate-cuspidate. Panicles about 15-25 cm long, rusty pubescent, pendulous. Flowers unisexual, pedicel about 4-8 mm long, bracteole filiform, caduceus. Calyx campanulate, 5-partile, about 5-10 mm long, yellow with pinkish throat, 10-15 mm across, lobes lancolate, about 4-6 mm long, acute staminal column about 4-5 mm long, recurved, glabrous, another 10. Carpels 5; ovary globose, strigose, 5-loculed, many ovules, gynophore about 2-3 mm long, style recurved. Follicles 5, sessile, 4-6 mm long, coriaceous, rusty pubescent, many seeded, red when ripe. Seeds oblong, smooth black.

Commonly cultivate in fields, gardens. The diuretics are particularly useful in the treatment of ascites, congestive cardiac failure, and edema of the lungs, kidneys and liver.

L.N. Udal or Uday Katira    Fl. & Fr. Dec-March    Collection: 727, Basapura

19. TILIACEAE

1. Fruit a drupe........................................................................................................................................2. Grewia
1. Fruit a capsule:

2. Capsules glochidate:

3. Herbs or undershrubs: petals entire……………………………3. Triumfetta

3. Trees; petals lacinate.

2. Capsules not glochidiate ribbed or winged………………………1. Corchorus.

1. **Corchorus Linn.**

1. Capsule ending in a single beak, located at the top:

1. Capsules globose 10-ribbed, glabrous, beak long…………………3. *C. olitorius*

2. Capsule 3 to 4 angled scabrous; beak short:

1. Capsule ending in 3, radiating points;

3. Capsules 6-angled, 3-winged; short stout…………………1. *C. aestuans*.

3. Capsules cylindric, not winged long, slender…………………4. *C. tridens*.

1. Capsule depressed globoase………………………………………2. *C. capsularis*


A erect or suberect annual herb; stem oftenly red tinged about 10-55m tall. Leaves ovate to ovate-lanceolate, rounded at base, acute, serrate, lowest filiform serrations; petiols 2 to 3 cm long; stipules 10-12 mm long, subulate. Flowers yellow, about 1-3, on short, axillary leaf opposed cymes, bracts 4-5 mm long, pedicles short. Sepals linear lanceolate, mucronate petals ob lanceolate spatulate; claws ciliate. Stamens several, up to 20. Carpels 3. Fruit a capsule, about 1.5 to 4 cm long, 6-angled,
3 angled, prominently winged, angled terminating into 3 bifid beaks; seed many, dark brown. Common in waste places, along with road sides. Seeds given in dyspepsia.


   A annual erect herb about 2m tall. Leaves ovate lanceolate to linear lanceolate, about 4-12 cm long and 1-4 cm broad, rounded at base, acute to acuminate apex, serrate, basal serration filiform, petioles 2-4 cm long, stipules 6-8 mm long, linear. Flowers 1-3, in axillary or leaf opposed cymes, subsessile, bracts linear-ovate sepals linear-oblong. Petals obovate, notched at apex. Stamens 20-30. Carpels 5. Capsules about 1 cm across, globose to subglobose, grooved longitudinally wrinkled, 5(10) loculed, seeds glabrous, brown. Common in waste places. Leaves are used in fever and dysentery.


   Annual much-branched herb about 90-120 cm tall, stems glabrous. Leaves 6-10 cm long, 3-5 cm broad, elliptic-lanceolate, apically acute or acuminate, glabrous, serrate, the lower serrature on each side prolonged into a filiform appendages over 6mm long, rounded at base, 3-5 nerved, petioles 2-2.5 cm long, slightly pubescent especially towards the apex; stipules. subulate, about 6-10 mm long. Flowers pale yellow; bracts lanceolate; peduncle shorter than the petiole; pedicles 1-3, very shoot. Sepals upto 3 mm long, oblong, apiculate. Petals 5mm long, oblong spatulate. Style short; stigma papillose. Capsules about 3-6 cm long, linear, cylindric erect, beaked,
glabrous, 10-ribbed, 5-valved, valves with transverse partitions between seeds. Seeds trigonous, black. Common in crop fields waste places or moist places. Leaves are used for ascites, pain, piles and tumors.

L.N. Tussa Jute, Kosta July-Sept, Fr. Sep-Dec Collection 1004, Gahraula


An erect or sub erect annual herb about 30-50 cm tall. Stem and branches glabrous. Leaves 3-4 costate, oblong lanceolate or linear lanceolate or elliptic-ovovate, about 1.5 to 8 cm long, glabrous except the sparsely hairy veins, crenate-serrate, basal serrations filiform spreading appendages or not, acute, petiole about 5-10 mm long, hairy, stipules sclaceous about 2-3 mm long. Flowers yellow about 1 cm across, subsessile, bracts subulate, about 3-4 mm long. Sepals linear oblong, about 4-5 mm long, apiculate. Petals oblong about 3-4 mm long, 2 mm across, obtuse. Stamens 10-15, filaments 4-5 mm long, Carpels 3; ovary cylindric, sulcate, 3 loculed, hairy, style small, stigma sparsely papillate. Capsules, erect, cylindrical, about 1.5-4 cm long, 2 mm in diameter, not ribbed, glabrous, 3 loculed, locule aseptate. Seeds angular, truncate at both ends, black.

L.N – Rawana Torai Fl. – July-Nov. Collection – 450, Bangur

2. **Grewia Linn.**

1. Leaves thick, soft by hairy on both sides; stipules lanceolate……1.Grewia asiatica

1. Leaves hairy or scabrous above.................................2. Grewia hirsuta

**1. G. asiatica**, Linn. Mant 2; 122; Roxb. Fl. Ind. Ii, 586; FBI. 1, 386.

A large shrub or medium sized tree, about 8 m tall. Stem with greyish white to
brown bark, young shoots stellate tomentose. Leaves with 1-1.5 cm long, stellate hairy, clavate petiole; lamina greyish-tomentose beneath, scabrous above, broadly ovate to almost orbicular, 5-10 cm long and broad, obliquely shallow cordate at base, serrate, acute to obtuse; stipules narrowly oblique lanceolate or falcate about 1-1.2 cm long, stellate hairy on both sides, cymes 3 flowered, 2-6 in axillary clusters, densely hairy. Flowers orange yellow about 2 m across, densely hairy, bracts linear-lanceolate, about 3-4 mm long. Sepals oblong about 1.2 cm long and 3-6 mm broad, glabrous inside, hairy outside, acute. Petals oblong, claw 2 mm long, irregularly lobed at the apex, orange-yellow. Stamens many, filaments 1-6 mm long, turn to purple, anthers oblong. Ovary globose, strigose; style about 5 mm long, stigma 4 lobed. Drupe dark purple, more or less globose about 5-10 mm in diameter, entire or obscurely 2 lobed, hairy, acidic. Commonly occurs in tarai region forests. The stem bark is used in refining sugar.

L.N. –Pharsula Fl. Apr.-May; Fr. Jun-Aug. Collection – 118, Andiya

2. Grewia hirsute Vahl, Symb. Bot. 1:34.1790; FBI. i. 391; Brand For. Fl. 42. G. pilosa; Roxb. l.c. 588 (not of Lamk).

A small tree, branchlets coarsely grey-brown stellate hairy. Petiole about 2 mm, tomentose, blade lanceolate about 6-12 cm long, leathery, black-brown, when dried, abaxially yellow-brown, stellate tomentose, adaxially sparsely coarsely stellate, lateral veins 4-5 pairs, base narrow, shallowly cordate, margin serrulate, apex acuminate or rarely obtuse. Cymes 1-5, 3 or 4 flowered; peduncle 3-7 mm, tomentose. Pedicel 3-5 mm, tomentose. Bracts lanceolate about 3-4 mm. sepals narrowly lanceolate, about 6-7 mm, abaxially tomentose, adaxially glabrous. Petals narrowly ovate. Stamens 4-5 mm, ovary villous; style longer than stamens, glabrous; stigma 4-lobed. Drupe globose or 2 lobed, sparsely coarsely, hairy, druplet 2 per lobed.
Commonly occurs in waste places.

It is used for heart disease, cough, wounds, in diarrhoea, and dysentery, heart diseases.

L.N. – Kakarundah Fl. Jun-July Collection: 1006, Caukharra

3. Triumfetta Linn.

1. Stem almost glabrous, except single line of hairs, capsules covered with only hooked spines, otherwise smooth .......................... 2. T. annua

1. Stem hairy all round; capsules covered with hooked spines as well as hairs:

2. Spines glabrous, 1-2 mm long .................................. 4. T. rhomboidea

2. Spines hispid with stellate hairs; 5-6 mm long ......................... 3. T. pilosa

2. Spines pubescent .................................................. 1. T. rotundifolia


A woody shrub or undershrub about 10-35 cm tall, with spreading branches. Stem with greyish-white or brown bark, young shoots densely hairy, scabrous. Leaves thick, 3-5 costate, 1-3 cm long broadly obovate to orbicular, below, cuneate or obtuse at base, irregular and unequal serrate, petiole 0.6-3 cm long, densely hairy, stipules subulate, about 3 mm long, hairy. Cymes many on young shoots, extra axillary, arranged in racemes. Flowers yellow about 5 mm across, subsessile, bracts linear. Buds oblong about 5-6 mm long, 5 tipped at the apex-. Sepals lorate about 5-6 mm long, awned at apex densely stellat hairy outside. Petals spathulate, 4-5 mm long, hairy at base. Stamens about 10-25 as long as petals capsule ovoid subglobose about
6-7 mm long, basally dilated, pubescent, with spines. Commonly occurs in plains.

Fl. July Sep. Collection: 211, Naugarh


Annual herb about 80-100 cm tall. Stems hairless except for a single line of crispy hairs on purple internodes, alternating each node. Leaves membranous, 3-5 nerved, ovate or ovate-lanceolated, about 5 to 7 cm long, about 2-3 broad with scattered simple hairs on both sides, acuminate-acute coarsely serrate, petiole about 1-2 cm long, hairy on upper side, stipules subulate, hirsute. Cymes 3 flowered. Flowers orange about 8mm across; pedicel about 3 mm long, long in fruit. Sepal lorate, cucullate and awned at apex. Petals spathulate, smaller than sepals, obtuse. Stamens twice as petals Carpels 4; ovary globose, 4-loculed hairy, styles equal to the stamens, stigma 4-lobed. Capsule globose, glabrous, about 8-10 mm in diameter, glabrous, conical uncinate spines. Rare, along the waste places, roadsides.

Fl. & Fr. Jul : Sem Collection; 601, acolhiya


Annual or perennial herbs or undershrub about 1.5m tall. Stem tuberculate yellowish brown, stellate or simple patent hairs or glabrescent leaves ovate or ovate-lanceolate about 5-12.5 cm long, 1.3-4.5 broad, stellate hairy on both sides, acuminate at the apex, sub-crodate or obtuse at the base, coarsely serrate; petiols 1-4 cm long, pilose; stipules linear lanceolate about 8-10 mm long, acute, pilose. Flowers yellow, about 10m across, 2-3 mm long, hairy. Sepals lorate, about 9-10mm long, minutely awned at apex, stellate hairy outside. Petals narrowly oblanceolate about 1-8 mm
long, obtuse, hairy at base. Stamens 10, as long as petals. Carpels 4; ovary globose, loculed, hairy, style subulate, about 7-8 mm long, stigma 4-lobed. Capsule subglobose, densely tomentose about 1.1 to 1.3 cm long, 1.2-1.4 cm in diameter including 6-8 mm long, uncinate spines with patent hairs seeds dark brown common in waste places, road sides.

L.N. Kura Fl. June & November Collection-981, Latera


Annual, puberulous undershrub about 80 cm tall. Leaves ovate, rounded to rhomboid, palmately 3-lobed, rounded to cuneate at base, acute or acuminate tip, irregularly serrate, stellate pubescent to glabrescent 3-7 nerved; petioles 2-5 cm long; stipules subulate. Flowers in terminal or leaf opposed cymes 4-7 mm across, shortly pedicellate. Petals yellow, oblong obovate equal to or slightly shorter than the sepals, hairy at the base. Stamens 15, filaments as long as sepals, papillose. Carpels 2-3, syncarpous; ovary subglobose, 2-3 loculed, with uncinate hairs; style subulate, stigma 2-3 lobed. Capsule globose or subglobose, indehiscent, tomentose, globrous, uncinate spines. Common in open waste places, forest edges. Root juice applied on cuts and leaves given to facilitate delivery.

L.N. Jhinjharita, Chjirayari Fl. & Fr.: Aug-Nov Collection: 1007, Fatehpur

20. LINACEAE

1. Linum Linn

1. Flowers blue. Petals linear to lanceolate.......................... L. usitatissimum

L. usitatissimum Linn. Sp. Pl. 1.277. 1753; Hook. f. 1. C.; T. cooke, 1. c; Bamber, 1,
Annual herb about 20 cm to 1 m tall. Stem slender. Leaves alternate, lance shaped, grayish green with 3 veins. Flowers in corymbose racemes, blue; pedicel about 1.5 to 2 cm long. Sepals imbricate, about 5-8 mm long, ovate, acuminate, 3-nerved; margins white. Petals linear to lanceolate. Stamens 5; staminodes absent; filament about 8 mm long; anthers 2 mm long, bilobed. Ovary ovoid, styles free about 3 mm long; stigma linear about 1.5 mm long. Capsule sub-globose, beaked. Seeds ellipsoid, dark brown shiny. Cultivated plant. Linseed oil is extracted from the seeds are used medicinally.

L.N. Alsi Fl. – Feb-May Collection-1825, Domsara

21. ZYGOPHYLLACEAE

Tribulus Linn.

1. Leaves more than 2.5 cm long. Flowers more than 10 mm or more in diameter

....................................................................................... Trubulus terrestris


Annual prostrate, decumbent herbs about 1 m long. Leaves opposite, 4-8 cm long, in unequal pairs, leaflet subsessile, about 4-6 pairs, oblong-acute about 5-12 cm long, acute, rounded base mucronate or obtuse tip, hairy both surfaces, petioles and stipules hairy. Flowers yellow, solitary, axillary or leaf opposed. Sepals ovate lanceolate, about 5-6 mm long, acute. Petals obovate, about 6-8 mm long, 3-4 mm across, obtuse. Stamens 10, anthers versatile. Ovary ovoid, hirsute; style about 1.5 mm long, stigmas decurrent. Fruit about 1 cm in diameter about 4-8 mm long,
mericarps densely crested, tuberculate, hairy, glabrecent, with stout spines.

Common in waste places, roadsides. Seed powder is used in cough and asthma.

L.N. Gokhru Fl. & Fr: Jul.-Nov Collection 1193, Deaipar

22. AVERRRHOACEAE

1. Trees; fruit a berry…………………………………………………1. A. carambola.


A medium sized tree. Leaves alternate, about 8-14 cm long. Leaflets a, terminal leaflets largest, glabrous, acute, acuminate, entire, base oblique. Flowers pinkish or purplish in axillary panicked, in cymes and also show cauliflory. Sepals 5, petals 5, stamens 5-10 connate at base. Ovary 5-lobed style 5 stigma capitate. Fruits yellow ovoid or ellipsoid, 5-angled, acute, about 6-10 cm long, 3-6 cm across. Seeds arilale. Commonly cultivated


23. OXALIDACEAE

1. Oxalis Linn

1. Herbs with branched creeping stem; rooting at joints; flowers yellow ………
…………………………………………………………………………………………1. O. corniculata

1. Stemless herbs, flowers pink-purple.

2. Leaflets obcordate, pedicel hairy; stamen with 4-4.5 mm long filaments…………………………………………………………………………………………2. O. debilis
2. Leaflets triangular glabrous longer filaments 3mm long.................................................................3. O. latifolia


Creeping, pubescent plant, rooting at nodes. Leaflets about 4-14 mm long, 8-25 mm broad, obcordate, pilose tomentose. Flowers solitary or in 2-5 flowered axillary umbels. Pedicel 5-10 mm long, deflexed in fruit. Bracts 3-5, linear. Sepals 5, linear lanceolate, pilose. Petals 5, Yellow. Filaments glabrous. Carpels 5, Pubescent, styles longer than shorter stamens. Capsule about 1 cm long, subcylindric, pubescent. Seeds 1.5 mm long, brown ribbed transversely. Common in crop fields, waste places. Leaf juice dropped in contract and conjunctivitis.

L.N. Khati-Buti Fl. & Fr. Throughout the year Collection: 193, Bhalu Kon


A bulbous plant. Bulbils clustered, sheathed in scales. Roots, fibrous. Leaves trifoliate, as in wood sorrels. Leaflets, large about 1.5-3 cm long, 2-4cm broad, inverted heart-shaped. Leaf stalk, a foot long. Flowering stem up to 27 cm long. Flowers borne in umbels. Flowers stalks, 1 to 2.5 cm long, velvety. Sepals 4-5 mm long, lanceolate, velvety, tip with brownish red part. Petals 1.2-1.5cm long, hinged at base, pink. Short filaments smooth, not exceeding the styles, longer one bristly. Commonly occurs in moist places.

Fl. March –April Collection: 447, Jamuni


A glabrous or sparsely pubescent plant. Bulbils clustered or solitary and
arising from the stolons. Leaflets 15 to 30 mm long, 30-40 mm across, triangular at margins, glabrous. Flowers many, subumbellate. Pedicel about 1-1.5 cm long, glabrous sepals 3 mm long, lanceolate, tip with reddish brown callus. Petals 10 mm long, pink. Both long and short filaments strigose; shorter filaments equal in length to the styles. Common weed in cultivated fields.

Fl. June-August Collection 359, Keswar

24. TROPAEOLACEAE

1. Tropaeolum Linn


Annual herb upto 20-40cm high. Stem climbing. Leaves alternate; long stalked, peltate, blade round, with larged toothed or winding margins, glabrous, juicy. Flower axillary, solitary on 5-20 cm long pedicels, yellow-orange or red, about 2.5-6 cm across; petals 5, lowest two are smaller sepals 5, one with about 2-4 cm long spur. Stamens 8, free dehiscing longitudinally. Ovary sessile, 3-locular, style 1; stigma 3-fid. Fruit ovoid, 3- gonous, ribbed, rugose, indehiscent, 1 seed in each chamber. Commonly cultivated in winter season.

Fl. June-September Collection: 117, Allahpur

25. BALSAMINACEAE

1. Impatiens Linn.
1. Capsule broadly elliptic to fusiform, densely tomentose, pendulous .......

.............................................................................................................. Impatiens balsamina.


Sparsely hairy annual herb about 45-70 cm tall, swollen at nodes. Leaves alternate, sessile or shortly petiolate, lancelolate, 3.5-12.5 cm long, mucronate, sharply serrate. Flowers light pink, about 1.2-2.5 cm long, solitary or 2-3, in leaf axils. Sepal 3, ovate oblong petaloid, producing 1-1.5 cm long curved spur. Petals 5, light pink, upper broad, wings deeply lobed, connate in pairs. Stamens 5 included. Capsule broadly elliptic to fusiform, about 1.2-1.4mm long, densely tomenose, pendulous. Seeds sub-globose, minutely tuber cultae. Commonly cultivated in garden but sometimes wild in nature.

Seeds edible, used as condiment; leaves or substitute of ‘Mehandi’.

L.N. Gulmehndi Fl. & Fr.: Jul-Oct Collection: 639, Ahira Purwa

**26. RUTACEAE**

1. Trees or large shrub, armed with axillary spines:

2. Flowers bisexual:

3. Leaves unifoliate, pericarp leathery.................................................. 2. Citrus


4. Leaves imparipinnate stamens 10-12............................................. 3. Limonia

4. Leaves 3 foliolate. Stamens many..................................................1. Aegle

1. Unarmed shrub or Trees
5. Anthers filaments not dilated below; style longer……………

………………………………………………………………………………4. Murraya

1. Aegle correa


Glabrous tree about 15 m high with sharp straight axillary spines, single or paired. Leaves petiolate, sparsely white pubescent, alternate, trifoliate, petioles about 2.5-5.5 cm long, terete, leaflets ovate or ovate-lanceolate, crenate, about 5-10 cm long, membranous, lateral two sessile, terminal one stalked. Flowers greenish white, fragrant. Pedicels pubescent. Sepal pubescent, deciduous. Petals 4-5, spreading, white. Stamens many, inserted round an inconspicuous disc, filaments short subulate oary 10-22 locular, stigma capitate. Fruit 5-10 cm in diameter, greenish yellow or greenish, globose to pyriform, rind 3 mm thick; pulp pale orange, mucilaginous, aromatic. Seeds flat, oblong, woolly, embedded in transparent sticky gum. Common in dry forest area and also cultivated nearby temples. Fruit pulp eaten raw or made into refreshing drink. Useful in digestive disorder leaves offered to lord Shiva.

L.N. Bel Fl.: Feb-Mar Fr. May-Aug Collection: 366, Parsauna

2. Citrus Linn.

1. Petioles mostly broadly winged; fruit large……………………………1. C. grandis

1. Petioles naked or with small wings fruit small:

2. Young shoots purplish petals more or less pink or purplish outside; rid of fruit thick and soft:

3. Petiole short, not winged, fruits with a blunt apical projection……………. 
3. Petiole with a broad wing, fruits large, variable find very fragrant ........................................................................ 5. C. medica

2. Young shoots green, petals pure white, rind of fruit thin.

4. Peel orange or scarlet orange, fruit rarely longer than broad ........................................................................ 4. C. sinensis

4. Peel green or yellow when ripe; fruts often longer than broad ........................................................................ 1. C. aurantifolia


A spiny bush or tree about 2-5 m tall, spines short and sharp. Leaves ovate 1-3.5 cm long, elliptic oblong, crenate; petiole narrowly winged. Flowers 3-10, perfect staminate, white. Calyx cupular, flesh. Fruit avoid or rounded, shortly mamillate, greenish-yellow when ripe, pulp greenish, very acidic. Commonly cultivated. Fruits is used for lime juice as pickles, raw or made into various products.


2. Citrus grandis (L) Osbick, Dagbok Ostivnd. FBI. 1: 516, FUGP. 1: 142.

Spreading, bushy tree about 5m high, young shoots and leaves beneath pubescent. Leaves large, ovate oblong, often emerginate, rounded or acuminate, petiols broadly winged and pubescent. Flowers large, white crowded in short axillary racemes. Fruit large, turbinate, green to yellow, globose, oval or pyriform about 15-20 cm across, rind very thick, white, spongy, smooth, gland detted, segments large with thick leathery septa juice vesicles larg, tapering, pulp light link, rose white or light
yellow seeds numerous yellowish white, flat oftenly cultivated.

Fl. Feb-March; Fr. Sept-Dec. Collection: 367, Shoratgarh


Trees upto 6m high, with spreading branches, having few thorns. Leaves ovate or round, coarsely serrated, petioles winged or marginate. Flowers small, pinkish white, fruit medium sized, 3-4cm across, ovoid yellow with apical papilla; surface rough and irregular. Pulp yellow, acidic, seeds numerous, some what pyriform. Cultivated throughout the district in moist places.


A compact evergreen tree about 20-30 ft high with a rounded, symmetrical crown spreading 4.6-6.1 m or so. Leaves, shiny, leathery, oblong to elliptic, upto 4 inch (10.2cm) long, narrow wings on the petioles. Flowert white, very fragrant arranged in clusters of 1-6.

Fl. March-April, Fr.: June-July Collection-265, Hwa


Shrub or small tree, spinuous. Leaves about 55-100 mm long, ovate-elliptic, crenate, apex obtuse. Leaf imperfectly jointed to the petiole, petiole inconspicuously winged. Flowers 1-few, in racemes. Petals purple on the outside, fleshy. Stamens 25-40. Fruit oblong mamillate, about 6-10cm in diameter; rind cadmium yellow when
ripe, pulp very acidic. Common cultivated for its fruit.

Fl. & Fr. Maja Part of the year. Collection: 200, Domariaganj

3. **Limonia-Linn.**


Tree about 6-8 m tall. Spines axillary, about 15mm. Leaflets 5-7, obovate, subsessile, entire to obscurely crenulate, retuse, glandular punctate petiole and rachis narrowly winged. Flowers dull red, fragrant. Petals elliptic, spreading. Filaments subulate, hairy at base. Berry 5-9 cm in diameter. Seeds woolly, brown. Commonly cultivated,

Fl.: March-May Fr. Oct-Nov Collection: 182, Chilhiya

4. **Murraya Linn.**

1. Leaves aromatic; leaflet pubescent; berries black. ..................1. M. koenigii

1. Leaves not aromatic leaflets glabrous, berries red..................2. M. paniculata


Large erect shrub or small tree upto 2 to 3 m tall; stem dark purplish –brown, branched, smooth; twigs pubescent. Leaves imparipinnate 6-20cm long, petiole slender, terete, leaflets 9-23 (25), glabrous, elliptic, oblique; apex drawn out, obtuse, sometimes notched margins undulate. Flowers fragrant, white in 3-flowered, cymes. Sepal short, some what triangular, Petals about 8 mm long, oblong, black dotted. Stamens 10. Ovary 2-5 celled, elongarted, stigma lobed, capitate. Berry globose, beaked at the top, ellipsoid, 7-10 mm long, apiculate, deep orange to red when ripe. Common in waste places near villages.
L.N. Krishnapatra  Fl.: March-April, Fr.: June-Oct  Collection:371, Jamoot


   Evergreen large shrub about 5m. high; stem woody rough, pale white, twigs pubescent. Leaves imparipinnate about 4-16 cm long; leaflets 3-7 (9), alternate or subopposite, ovate-lanceolate, shorly stalked, about 2-6 cm long, tip acuminate, oblique at base, entire, shining on both surfaces, gland dotted, hairy along midrib. Flowers white, in terminal, branched cymes. Calyx lobes 5, triangular. Petals obovate-lanceolate, 1-1.5 cm long, gland dotted. Stamens 10 or less. Ovary 2-celled, ovules 2 in each, style filiform. Berry red ovoid or deep orange, about 1-2 cm long, pointed. Commonly occurs in moist places along with road sides. Fruits edible; leaf powder used in cough and cold.


### 27. MELIACEAE

1. Fruit a small, indehiscent drupe:

2. Stamen closed drupe oblong, 1-seeded

   3. Leaves 2-3 pinnate, leaflets usually more or less toothed…………

   ………………………………………………………………………………………………………2. Melia

   3. Leaves once pinnate……………………………………………………………..1. Azadirachta

1. Fruit a capsule

2. Stamens free, Seeds winged:

   3. Leaves paripinnate, ovary 5-celled …………………………………….. 3. Toona
1. **Azadirchta A. Juss**

1. **A. indica A. juss.** In Mem. Mus. Par. 19: 221, 1830; Parker For. Fl. 71; *Melia azadirachta* Linn Sp. Pl. 385, 1753, FBI 1:544, FUGP. 1 : 150

   A tall evergreen tree up to 15-20 m, rarely 35-40 m. branches wide spread, trunk is short, straight up to 1.2 m in diameter. Bark is hard, fissured or scaly, whitish grey to reddish brown. Leaves pinnate, leaflets, serrate, oblique. Leaflets about 3-8 cm long, the shape of mature leaflets more or less asymmetric margins serrate. Flowers bisexual, in axillary panicles. Calyx 5-partite. Petals 5, free. Stamens 10, monadelphous, anther included, sessile on the staminal tube. Disc absent. Ovary triocular, with 2 ovules in each locule, stigma trifid. Fruit a drupe. Commonly occurs near villages.

L.N. – Neem Fl. March-May, Fr. May-July Collection: 263, Naugarh

2. **Melia Linn**

**M. azedarach Linn.** Sp. Pl. 384, 1753; FBI. 1:544; FUGP. 1:151.

Small to medium sized tree or shrub with furrowed grey bark about 6 to 35 meter. Leaves bipinnate, about 12-40 cm long, with 3-5 pairs of pinnae; pinnules mostly 25-65, ovate to elliptic about 2.5 to 6.5 cm long, about 10-30 mm across, apex acuminate, base usually asymmetric margins toothed to entire, glabrous or with scattered stellate hairs; petioles 5-15 cm long, lateral petioles 1-8 mm long. Flowers lilac, sweet scented, in axillary panicles, peedicel 2-3 mm long, spatulate to lanceolate. Calyx acute, pubescent. Petals 7-9 mm long, spatulate to lanceolate, ciliate, imbricate in bud. Anthers sessile. Ovary 5 locular, style 4-5 mm long, stigma capitate. Drupe 1.5-2 cm long, globose, 3-6 seeded yellow when ripe. Commonly planted along with road sides.
3. **Toona Roem**

FB1.1: 568; FUGP. 1: 153.

Medium to large deciduous tree with brown to grey scaly bark. Leaves about 15-45 cm long, usually paripinnate sometimes with a terminal leaflet in juvenile growth; leaflets lanceolate, elliptic ovate, about 2.5-12 cm long, 1-4 cm across, acuminate margin slightly wavy to entire. Panicles drooping, shorter than leaves. Flowers cream, pedicellate, pedicel, mm long, pubrulous. Calyx lobes obovate, about 1mm long, margin ciliate. Petals 6 mm long, oblong to obovate. Stamens 5-6 free, inserted on the disc, filaments 3-4mm long, anthers 1.5 long, anthers 1.5mm long oblong, dorsi fixed disc orange-coloured, 5-6 lobed, pubescent, fused with ovary. Ovary hairy. Capsule about 2cm long, 5-valved, brown when dry. Seeds 1.4 cm long, winged at both ends.

L.N. Tun Fl.: March-April, Fr.: June-July Collection. 777, Bisahna

### 28. RHAMNACEAE

**Zizyphus Juss.**

1. Petals O:

1. Petals 5:
   2. Medium-size tree. Drupe 1.2 cm or more in diameter

   .......................................................... 1.Z. mauritiana

2. Bushy or straggling shrubs. Drupes .1 cm in diameter:

   3. An erect, tomentose shrub

   .......................................................... 2.Z. nummularia
3. Straggling, or climbing shrub, not tomentose……………………
…………………………………………………………………………3. Z. oenoplia


A large shrub or tree about 9-15m long, branches spreading and dropping, young branches softly tomentose, longer stipular spine, sometimes without spines. Leaves ovate, oblong, elliptic –ovate or sub orbicular about 2-9 cm long, slightly oblique at base, obtuse, rounded shortly acuminate at apex, rounded or sub-cordate or entire, serrate, glabrous and dark green above, greyish pale-coloured and densely tomentose beneath; petiole 8-15 mm long, tomentose. Inflorescence axillary cymes, tomentose. Flowers 2-3 mm across, green yellow. Calyx 5, hairy outside, glabrous with in about 1.5mm long, ovate, acute, keeled within. Petals 5; spoon like or clawed, reflexed, stamen 5, smaller than petals. Ovary 2 celled, styles bifid. Disc 10 lobed or grooved; fruit 1.5-3.5 cm long, globose to avoid, bilocular, pyrene tubereled and irregular furrowed. Common in waste places.

L.N. Ber Fl. & Fr. Sept –Nov. Collection 222, Domariaganj


Bushy much branched shrub, branches divaricting flexous, tomentose, young branches puberulous, grey spines in unequal pairs, straight, upto 1 cm long, small recurved, whitish tomentose when young. Leaves about 1-2 cm long and upto 2 cm cross, orbicular or ovate- orbicular to elliptic, dark green and densely pubescent above, densely velvety tomentose beneath, entire or serrate apex obtuse apiculate or mucronate base round to sub cordate, lateral nerves prominent, pedicel 2-3mm long.
Flowers 3-4 mm in diameter. Calyx pubescent, lobes about 1-1.5mm long, obovate lanceolate. Petals cuneate longer than stamens about 1.25 mm long, stamen included about 1mm long. Disc 10-lobed, pitted. Style 2, united to above the middle. Drupe globose, about 5-10 mm long, reddish brown black when ripe., 2-celled. Common along with roadside.

Fl. June-Sept Fr-Cold Season Collection 278, itwa


A thorny, evergreen straggling or climbing shrubs, young branches rusty tomentose, prickles short, recurved or straight, usually solitary. Leaves alternate, ovate or ovate-lanceolate about 2-4 cm long, oblique at base, toothed or entire, pubescent beneath, 3-5 nerved. Flowers in short axillary dichotomous pubescent cymes. Sepals tomentose outside petals 5 obtriangular. Ovary 2-celled; style 2, united above the middle. Drupes 4-10 mm across, globose, black shining; 1-seeded due to abortion. Common in jungles, way sides.

L.N. Makoh Fl.: April-May. Fr. : July-Oct Collection 87, Chilhiya

29. **VITACEAE**

1. Leaves tritoliolate, Petals 4…………………………………………………………1. Cayratia

1. Leaves simple. Petals 5;

2. Petals cohering into calyptra………………………………………………..2. Vitis

1. **Cayratia A.L. Juss. nom. Cons**

Perennial vine, climbing by means of tendrils found opposite the leaves. Leaves are trifoliolate with petioles 2 to 3 centimetres long. Leaflets ovate to oblong ovate, 2 to 8 centimeteres long, about 1.5 to 5 cm wide, pointed at the tip and coarsely toothed at the margins. Flowers small, greenish white, borne on axillary, solitary cymes. Fruit berry, fleshy, juicy, dark purple or black, subglobose about centimeter in diameter.

Root, ground with black pepper applied to boils, also used as astringent medicine. Paste of tubers applied to snake bites.

L.N. Amalbel Fl. & Fr.: July- December Collection: 29, Suhase

2. Vitis Linn


Deciduous climber growing to 15m, Leaves orbicular, cordate, pentagonal or disserted, about 10-20cm long and 7-12 cm across, serrate, or irregular dentate, acuminate, cordate, glabrous or glabrescent above, sparsely grey tomentose beneath, petiole 4-10 cm long. Peduncle 4-5 cm long, often bearing unbranched tendril. Flower bisexual, green about 1mm long, pedicel about 2 mm long, wiry, elongated and thickened in fruit. Calyx minute, copular. Petals 5, lanceolate. Disc with 5 hypogynous glands, adnate to base of ovary. Berry variable in shape size and colours, 6-20 mm long, purple, black-violet, red, pink, green, 2-4 seeded, with juicy, sweet or sour pulp. Seed ovoid about 5-6 mm long, beaked. Commonly cultivated in garden.

L.N. Angoor Fl. Feb-April, Fr. April-June Collection: 563, Basni

31. SAPINDACEAE

1. Herbs climbing by circinate tendrils. Leaves biternate, leaflets pinnatifid………

................................. 1. Cardiospermum
1. Shrubs or trees without tendrils leaves not as above.

2. Flowers petalous.......................................................... 4. Sapindus

2. Flowers apetalous.

3. Evergreen shrub. Leaves simple................................. 2. Dodonaea


4. Calys truncate or shallowly toothed, fruit tubercled..............

.......................................................... 3. Litchi

1. Cardiospermum Linn.


Annual, sometimes perennial herb, upto 3.5m tall, stem and branches slender, grooved, glabrous to sparsely pubescent leaves about 5-6cm long; petiole abut 1-3 cm long; leaflet opposite, about 1-2 cm long, pinnatisect, terminal leaflet 4-6 cm long, acute to a acuminate. Flower white in 3-7 flowered, axillary cymes; peduncle 5-8 cm long, bracts 2, subulate, 1mm long, pedicel 0.5-1.5cm long. Sepals free, concave, persistent, 2 outer ones orbicular about 2mm long, ciliate, 2 inner ones oblong ovate, 3 large leafly scales. Disc reduced to 2 glands inside the lower petals. Stamens free; filaments compresed, 2 mm long hairy, anthers 0.5mm long, pistilloide present in male flower. Ovary obovoid, 2-3mm long, hirsute, style short, pubescent; stigma 3-fid; staminodes 8 in the female flower. Capsule sub globose or broadly pyriform 3-4 cm wide pubescent. Seeds 3, 1 in in each locule about 6mm in diameter, black, aril white, 5mm broad, cordate.

Common climber. Roots, leaves and seeds are used in fever and digestive trouble.

L.N. Kanphuti Fl. & Fr. Aug-Nov. Collection: 554,
2. *Dodonaea Linn.*


Evergreen shrub about 5m tall; branches glandular. Leaves sub-sessile, existipulate, simple, oblanceolate to spathulate, 3-9 cm long or 2.5 to 12cm long, glabrous, entire sub acute to apiculate. Panicles terminal about 3 cm long; flowers green yellow; pedicel 4-8 mm long, sepals 3-5, connate at the base, ovate, about 3mm long, pubrulous; persistent. Stamens usually 8; filaments short. Disc obsolete in the male flower, small in female flowers. Ovary 2-5mm long, 3-4 loculed, 2, Ovules in each loculus; style 3-4 cleft at the top. Capsule 2-4 valved valves membranous, light brown, green or maroon, winged at the back. Seed sub globose about 4mm long, black, without an aril. Common in exposed dry area. Usually hedge plant. Commonly cultivated as hedge

L.N. Vilayati mehndi Fl.: Aug-June, Fr. Feb-April Collection: 341, Sahjanwa

3. *Litchi Sonner*


A evergreen tree uto 8m tall. Leaves alternate, estipulate, paripinnate about 8-20cm long; leaflets 8-12, opposite or alternate, about 4-14 cm long, oblong lanceolate or ovate, glabrous acuminate tip, margins entire, base cuneate; lateral nerves obscure; petiolules to 6 mm long. Flowers minute, greenish white or yellow, in terminal panicles calyx 4-5, dentate. Petals 0.5, stamens 6-10, exserted. Disc glabrous, ovary 2-3 celled, hairy; style 2-3 lobed lobes recurved. Fruit globose or ovoid about 2.5m across; pericarp dry, red pink or yellow-green, brittle with angular tubercles; aril fleshy, whitish, edible, seed 1(2) large, brown. Commonly cultivated for its fruit
L.N. Litchi Fl. & Fr. March-July Collection- 1789, Domariaganj


*S. mukorossi* Gaertner, Fruit Sem. 1: 342. t. 70. f. 3. g.h. 1788. Fl. Indica 2.1: 280-1832.

Deciduous tree upto 16m high. Leaves alternate, estipulate, 20-50cm long, paripinnate, rarely inparipinnate leaflets 5-8 pairs, alternate or upper ones nearly opposite lanceolate or ovate lanceolate about 8-20 long, margin entire, acuminate, base oblique, glabrous on both surfaces. Flowers small, numerous, in terminal panicles calyx lobes 4-5, somewhat unequal, cilite. Petals 5, white or purple, with a wooly scale on each side at the top of claw. Stamens 8, inserted in the centre of the disc, filaments white, woolly anthers versatile. Ovary 3-celled. Fruit fleshy, globose, 1-seeded drupe seeds black, globose. Common near villages.

Fl. Mar-Apr Fr. May-Dec. Collection 1753, Didya

31. **ANACARDIACEAE**

1. Leaves glabrous below, stamens 1-5, only one fertile; style 1, lateral, receptacle not fleshy .......................................................... 1. *Mangifera*

1. Leaves rustly pubescent below, stamens 5-6, styles 3; receptacle of fruits fleshy:

2. Fruits 2-5 celled, 2-5 seeded, 3.5-5cm long, ovoid............... 2. *Spondias*

1. *Mangifera* Linn


Evergreen tree upto 30m tall, with rough thick, dark-grey bark, branchlets
glabrescent. Leaves alternate, simple, crowded at ends of branches oblong or obovate lanceolate, about 12-30 cm long, entire, glabrous, base acute, 3-5 nerved, 20-30 secondary nerves, petioles about 2.5-8 cm long, swollen at base. Flowers yellowish green, scented 3-4mm across, arranged in terminal panicles, panicles erect, conspicuous, longer than leaves, pubescent. Longer than sepals. Ovate, yellow. Staments 4-5, inserted on the disc, only one fertile ovary sessile obliquely ovoid, glabrous with 1 ovule. Style 1 lateral. Drupes 5-15 cm long, avoid, compressed, 1- seeded. Commonly cultivated for its fruit.; resin and seeds used n diarrhoea Harmorrhage.

L.N. Aam Fl. March-April Collection 1753, Naugarh

2. Spondias Linn.


Deciduous tree up to 12m tall, bark, smooth, grey, all younger parts have characteristic smell. Leaves alternate, imparipinnate about 3.5-5.0 cm long. Leaflet about 7-11, opposite elliptic or elliptic oblong, lateral nerves 10-20 pairs, joined by a prominent intra-marginal nerve, acuminate, entire, turning bright yellow before falling. Flowers small, about 3mm across greenish yellow, bisexual or unisexual clustered on the stout, branched panicles, 30-60 cm long, appearing before leaves calyx 5 toothed deciduous. Petals 5, oblong, spreading. Disc crenate stamens 10, filaments subulate, shorter than petals; anthers versatile. Ovary sessile, free, 4-5 carpels in flower. Drups 30-40 mm long, avoid, yellow. Endocarp woody, irregularly furrowed. Seeds 1-3. Common along in the forest Fruit edible, also made into pickle. Gum exuded from the bark used in bowl complaints. Leaf juice poured in ear for otalgia.
32. MORINGACEAE

Moringa Adans


A large tree, younger part pubescent. Leaves alternate, tripinnately, imparipinnate, about 60 cm long, deciduous; rachis pubescent, slender, pulvinate and jointed at base; pinnae 5-11, stalk of the pinnal 1-3 cm long, articulate at base, pinnules 5-11, petioles of pinnule about 4-8 mm long; rachis of the pinnule articulated with small rounded gland; leaflets 3-9, broad sparsely tomentose above, glabrous below, lateral leaflet elliptic, white terminal obovate and slightly larger. Inflorescence 8-30 cm long with ovoid buds. Flowers white, about 2-2.5 cm across 1.3-2.1 cm long pedicel, honey scented. Calyx tube hairy; lobes slightly unequal, petaloid, imbricate, linear to lanceolate, entire, obtuse. Petals white, the anterior erect, others reflexed, ascending imbricate spatulate with prominent veins, actue entire. Stamens 5, alternating with 5 sterile filaments or sometimes with nonfunctional stamen, filaments villous at base, yellow, stamens 1 cm long. Ovary oblong, style cylindric, less villous than the ovary. Fruit 9-ribbed pedulous pod. Seeds valves, 3 angled, winged, blackish, rounded. Commonly occurs forest. Leaves, flowers and fruits taken as vegetables. Roots and other parts used against ascites, cardiac and circulatory disorders.

L.N. Sainjna Fl: Feb-Apr; Fr. May-June Collection: 1311, Sahjanwa

33. FABACEAE
1. Stamens 1 or 2-adelphous.

2. Pod dehiscent along both suture.

3. Leaves simple or digitate or odd pinnate If even pinnate, the rachis not produced.

4. Leaves simple or 3- foliolate. Stamens monadelphos ..................

8. Crotolaria

4. Leaves pinnately or digitately 3- foliolate, Stamens diadelphous:

5. Leaves digitately 3-foliolate.......................... 26. Trifolium

5. Leaves pinnately 3-foliolate:

6. Pods spirally twisted......................... 18 Medicago

6. Pods not spirally twisted.


7. Racemes short. Pods exceeding the calyx.............

.......................... 27 Trigonella.

4. Leaves pinnately 3- foliolate, rarely 5-f foliolate or simple or digitately 3-foliolate. Stamens or 2- adelphous.

8. Leaves gland dotted beneath. Style bead less

9. Ovules 3 or more:

10. Seeds arillate


9. Ovules 1 or 2. .................. 23. Rhynchosia

8. Leaves not gland dotted beneath.
11. Style bearded:

12. Style hairs tufts at apex …… 32. Dolichos

12. Style terminal ………… 15. Lablab

12. Style oblique:

13. Petal keel forming a spiral ……

…………………………………… 21. Phaseolus

13. Petal keel not spirally twisted………

…………………………………… 29. Vigna

11. Style beardless:

14. Rachis of the inflorescence not swollen at the base:

15. Stamens 1 or 2 adelphous. Stipules and bracts persistent. …………

………………………………………………………………………………………… 30. Clitoria


15. Stamens adelphous, anthers uniform………………

………………………………………………………………………………………… 13. Glycine

14. Rachis of the inflorescence swollen at the nodes:

16. Petals very unequal:


17. Anthers uniform Standard exceeding keel and wings………………………… 12. Erythrina

4. Leaves odd pinnate rarely simple. Stamens usually diadelphous:

18. Anthers muticous, hairs basifixed:

19. Flowers in axillary racemes…………………………24. Sesbania

19. Flowers in terminal leaf opposed or paniculate racemes ..........25. Tephrosia

19. Pods 1-seeded. Leaves gland dotted:

18. Anthers apiculate or gland tipped. Hairs centrally fixed.


18. Anthers uniform:

20. Flowers in axillary, Peduncled racemes or heads; stamens diadelphous.

3. Leaves pinnate; rachis ending in a tendril or bristile stamens diadelphous:

21. Stamens 10, adelphous;

22. Leaflets toothed. Wings free from the keel....................7. Cicer

22. Leaflets entire or obscurely toothed wings attached to the keel:

23. Staminal tube with oblique mouth:

24. Style bearded in tuff or ringed at the apex.................................28. Vicia

24. Style bearded longitudinally on one side........................................17. Lens

23. Staminal tube truncate at mouth:
25. Leaflets entire. Style flattened at the apex. 16. Lathyrus

25. Leaflets obscurely dentate style denoted from the base upwards. 22. Pisum

21. Climbers; stamens 9, the odd one absent; seeds scarlet. 1. Abrus

2. Pods indehiscent or opening, along the lower suture:

26. Leaves odd pinnate, stamens 1 or 2 adelphous. Pods continuous (Tribe 7. Dalbergieae)

27. Leaflets alternate. 10. Dalbergia

27. Leaflets 21-71; pods indented on both sides. 2. Aeschynomene

28. Trees Pods not winged:

26. Leaves odd-pinnate or 1 to 3 foliolate Stamens diadelphous. Pods jointed or constricted:

29. Fruit aerial:

30. Leaves simple or pinnate; leaflets more than 1- pair, stamens diadelphous, anotherss equal;

31. Thorny herbs or undershrub. 5. Alhagi

31. Unarmed herb or shrub:

32. Joints of pod turgid. 3. Alysicarpus

32. Joints of pod flattened. 11. Desmodium

29. Fruit geocarpic i.e. maturing under ground. 4. Arachis

1. Abrus Linn.

Deciduous, slender, woody climbers about 5 m high, branches glabrous or appressed hairy. Leaves 5-8 cm long, paripinnate, rachis terminating in minute bristle. Leaflets 12-18 pairs, subessile oblong, about 2-3 cm long, obtuse, mucronate, glabrescent above, appressed hairy beneath. Flowers pale-white, tinged with pink, in leaf bearing, axillary, peduncled about 2.5 -7 cm long racemes, shorter than leaves. Calyx sparsely pubescent, teeth short corolla 3-4 times as long as calyx, wing falicate. Pods thick, hard, oblong about 2.5-4 cm long, 3-6 seeded. Seeds ovoid, red with black spot at hilum. Commonly occurs near forest.

Decoction of roots used in fever, cough, rheumatic arthritis and dysentery

L.N. Rathi Fl. & Fr. Aug-Sep, Oct –Mar Collection- 329, Uska Bazaar

2. Aeschynomene Linn


Annual undershrub, about 30-80 cm tall, with glabrous stem, branches terete with prickle like glandular excreations. Leaf 3.5 to 9.8 cm long, rachis with glandular warts. Leaflets 21-71, alternate, subessile, overlapping about 3-7 mm long 1-3 mm across linear, obtuse, mucronate, glabrous, inflorescence 1-4 flowered, in axillary racemes, peduncle about 2.5 cm long, peduncle and pedicel glandular, viscid, pedicel 5-9 mm long. Bracts about 2 cm long. Calyx 6-7 mm long, bilabiate glabrous, upper lip bifid, lower minutely 3- toothed. Corolla 9-10 mm long, yellow veined with purple. Fruit 3 to 5 mm broad, slightly curved, 6-10 jointed, glabrous or slightly hairy common in waste places.
3. Alysicarpus Desv.

1. Calyx as long or scarcely longer than the first joint of pod:

   2. Pods moniliform......................................................2. A. monilifer

2. Pods not moniliform:

   3. Pods compressed shallowly indented along both surfaces. Stem hirsute with brown patents, hairs all around........................1. A. procumbens

   3. Pods turgid, hardly indented. Stems glabrous or with single line of patent hairs.........................................................4 A. vaginalis

1. Calyx much longer than the first joint of pod:

   4. Flowers in dense racemes, pods included or slightly exserted:

   5. Joints of pods transversely and deeply plicate...3. A. rugosus.


   Annual, prostrate or ascending herb, branches with short pubescence, stem rooting at base. Leaves elliptic ovate, about 1.5 to 2.8 cm long, obtuse mucronate, adpressed hairy; petioles short. Flowers purple or blue, in lax, 3-7 cm long racemes. Calyx 3-5 mm long; segments ciliate, valvate in fruit Pods 3-6 Jointed, submoniliform reticulately veined. Uncommon in grassy places.

   Fl. & Fr- Aug-Nov. Collection 579, Siswa

Annual, prostrate, much branched shrub, branches pilos, hairs long and spreading. Stipule 3-8 long, scarious. Leaf unifoliolate, petiole about 4-8 mm long, petiolules very short, stipules minute filiform. Leaflets 4-25 mm long, 4-15 mm broad, oblong-elliptic rounded at the apex, glabrous above, slightly hairy on the nerve below. Inflorescence 4-10 flowered short axillary racemes. Pedicel about 1 mm long, calyx pilose about 3-4 cm long, teeth, narrow, acute. Pod 1.3-2 cm long, moniliform, joints 4-8, turgid, subglobose, finely downy with minute hooked hairs. Commonly occur in grassy localities.

Fl.-October  Collection: 408, Parsa

3. **A. rugosus** (willd) DC Prodr. 2: 353. 1825, FBI. 2: 159. 1876.

Erect annual or ascending herb about 30-61 cm long, glabrous except to decurrent line of hairs. Leaves stipulate, unifoliolate, stipule almost encircling the stem, scarious, 6-11 mm long, petiole about 3-6 mm long. Leaflet 2.5-8 cm long, 9-2.5 cm broad, usually oblong, rarely orbicular or linear-lanceolate, obtuse, apiculae, glabrous above, appressly hairy below, base often cordate, petiolules about 1 mm long. Inflorescence simple or branced raceme, about 16 cm long. Bracts 5-8 mm long. Pedical 3-4mm long. Calyx 6-9 mm long, deeply divided, teeth lanceolate, imbricate, minutely ciliate, 3-6 joint, included or as long as the calyx, broader than long, glabrous. Common in waste places.

Fl. & Fr.: Sept-Nov.  Collection: 280, Budwa


A prostrate, diffused herb about 30 cm long, with glabrous or a line of hairs on stem. Leaves elliptic to oblong lanceolate about 2-4 cm long, subcordate at base, subacute, glabrous above, hairy beneath petiols 2-3 mm long. Flowers 4-6 cm long,
in lax 3-5 (6) cm long racemes. Calyx 4-5 mm long, deeply divided. Corolla lilac with purple tinge; Keel shortly beaked. Pods subterate, 4-8 jointed, 10-20 mm long, jointly pubescent. Common in open grass fields crop fields.


4. Archis Linn.


A. prostrate diffusse annual herb about 30-50cm tall. Stem and branches with white hairs. Leaves 4- foliate; leaflets ovate or obovate about 3-7 cm long 2-3 cm across, rounded, mucronate at apex, glabrous above minutely pubescent beneath, stipules ciliate about 3 cm long. Flowers 10-12 mm long, yellow, showy, solitary; axillary, bracts biapiculate, bracteoles bifid. Calyx 3-4 mm long filiform, 5- lobed, upper 4- segments united corolla 10-12 mm long, wings free. Pod 1-4 (6) seeded, constricted between the seeds; pediels elongate rapidly soon after fertilization. Cultivated with other crops. Seeds edible and produce oil.


5. Alhagi Deav


Small erect, deep rooted, spinous shrub with terete, glabrous branches; spines 2-3 cm long, axillary. Leaves about .5-1.5m long, obovate-oblong, obtuse, mucronate, cuneate, coriaceous, glabrous or slightly pubescent; stipule minute. Flowers on the spines, shortly stalked calyx glabrous longer than pedicels; teeth short, triangular, acute. Corolla reddish, glabrous. Stamens 10, di adelphous. Ovary, linear, style filiform, stigma capitate. Pods falcate, irregular, torulose.


A medium sized tree growing upto 20 to 40 fee, branches irregular, rough, young branches tomentose. Leaf Pinnate, trifoliate with 8-16 cm petiole, Leaflet 3, each leaflet about 10-20 cm long, broadly ovate, obtuse or retuse, glabrescent, lateral leaflet obliquely ovate, obtuse slightly smaller than the terminal, glabrescent, stipules small deciduous. Inflorescence, in axillary or terminal racemes, 10-18 cm long, Flower fascicled at the nodes Bracts and Bracteoles small, velvety. Pedicel about 1.2-2.5 cm long, velvety. Calyx velvety within or without, teeth dextroid, upper 2 teeth united. Corolla bright red, tinged with orange, silky pubescent outside. Fruit 10-20 cm long, silky, 1 seed at the apex, stalk 1.2-1.8cm long commonly cultivated as an ornamental tree. The gum used medicinally.

L.N. Palash, Dhak, Tesu Fl. March-April Collection, 1315, Tanuwar

7. Cicer Linn.


A glandular hairy, erect or suberect annual herb about 1 m tall, stem 4-gonous. Leaves 1-2 inch long imparipinnate, with terminal leaflet, leaflets 7-17, short petioled, ovate-oblong, about 7-18 mm long, acute or mucronate, dentate in upper part. Stipules 2-5 fid. Flowers pink, blue, 5-10 mm long, solitary. Calyx 6-8 mm long, hairy-glandular. Wings feathery, keel beaked. Pods turgid, pubescent, oblong, 2(-4) seeded, beaked. Commonly cultivated during cold season.
8. Crotalaria Linn.

1. Leaves digitately 3. foliolate:

2. Branches not stiff and ascending

3. Plant diffused, less pubescent..........................1. C. medicaginea

3. Plants erect, much pubescent.

1. Leaves simple:

4. Stem exaltate. Stipule not decurrent:

5. Pods glabrous & hairy not much longer than calyx.


7. Plant prostrate or decumbent.............................2. C. prostrata

7. Plant a xerophytic under shrub ............................3. C. burhia

6. Stipules present:

8. Flowers orange-yellow, pod 3.5 cm long....................4. C. juncea


Prostrate or erect ascending perennial herb, about 30-80 cm tall, stem and branches appressed pubescent. Leaves 3-foliate; leaflets subsessile, variable in shape, ovate-ob lanceolate about 1-4 mm, obtuse to subtruncate, mucronate, glabrous above, pubescent below; petiole upto 1.5 cm; stipules subulate, filiform about 3mm long.
Flowers yellow, in many flowered, erect, 2-6, in close, terminal or leaf opposed racemes; bracts linear, acute. Corolla less than twice as long as calyx, wing weathery; keel incurved, beaked. Pod subglobose, about 2-5mm long, pubescent, 2 seeded. Seed polished. Common in waste places, road sides Leaf juice is applied in scabies and urticaria.

L.N. BanMethi, Thoj Hru Fl. & Fr. July-Nov. Collection: 314, Itwa


A slender, pubescent, suberect herb about 50 cm tall leaves subsessile, lanceolate-oblong or obovate about 2 to 4 cm rounded or obtuse at apex, oblique cordate at base, pubescent on both sides. Flowers 3-6mm long, in leaf opposed, lax, 2-4(5) flowered racemes, bracts, 3-4mm long, lanceolate calyx dense pubescent about 4-5 mm long. Corolla as long as calyx; emarginated vexillum. Pods exserted, glabrous about 1.5-2 cm long, 15-20 seeded. Common in way side and crop fields. Root extract given in diarrhoea.

L.N. Chunchhuni Fl. & Fr. Throughout the year Collection: 216, Bansi


Erect or diffuse, procumbent branched undershrub about 60 cm high, with appressed pubescence. Leaves sub sessile deciduous, oblong lanceolate, about 1.5-2.cm long, obtuse rigid pubescent in both surfaces. Flowers yellow, about 5-10 mm long in 6-12 flowered, short stalked, lax racemes, bracts small, pubescent, bracteoles 2. calyx 5-8 mm long, pubescent, teeth longer than tube. Corolla exserted vexillum ovate, minuted auricled, wing feathery. Keel elliptical, beaked. Pods oblong, pubescent, 3-4
seeded, Rare in moist localities.

L.N. Sissai        Fl. & Fr. Feb-Apr        Collection: 108, Dumariaganj


A stiff erect or branched, shining, hairy undershrubs about 1.2 m tall, stem and branches grooved. Leaves subsessile or short petioled, oblong lanceolate, about 4-15 cm long, obtuse or sub acute, mucronate, short brown silky pubescent on both sides. Flower yellow fragrant, in erect, terminal or lateral many (5-20) flowered racemes; bracts lanceolate calyx pubescent; segments linear-lanceolate. Corolla exserted; wing feathery; Keel slight feathery. Pods. Sessile, velvety about 2.5-3cm long, 10-20 seeded Rare in way side seeds used as blood purifier.


9. Cyamopsis DC.


Annual, erect herb about 50-60cm high; stem gooved; branches pubescent. Leaf rachis about 2 to 4 cm long; leaflets elliptic ovate, obovate about 3 to 7 cm long and 1.2-5cm broad, obtuse or acute, mucronate, dentate, pubescent on both surface, stipules linear. Flowers purple lilac, in 6-25 flowered, about 1-5 cm long racemes. Calyx 5-6 mm long; teeth unequal corolla longer than calyx pods flat, subtetragonal, pubescent, 5-10 seeded. Commonly cultivated for its fruit.

L.N. Gwar        Fl. & Fr. Sept-Nov.        Collection 1106, Uska Bazaar

10. Dalbergia Linn.

A large deciduous tree with glabrous branches about 25m high, with rough, pale grey bark. Leaves 6-10 cm long; leaflets 3-5, alternate, obovate suborbicular, 6-9 cm long, cuspidate-accumulate; firm, glabrescent, base rounded, coriaceous. Flowers pale-yellow, 5-10 mm long, subessile in axillary or terminal panicles, densely pubescent. Calyx 4-5 mm long; teeth unequal, obtuse, shorter than the tube. Corolla yellowish white, twice the calyx stamens 9. Vexillum ovate, emarginated, stalked. Pods oblong about 5-7 cm stalked, yellowish green, 1-4 seeded. Common near river banks. The resin used in skin ailments.

L.N.: Sisham Fl. & Fr. Mar-June Collection: 1021, Kushara

11. **Desmodium Deav. nom. cons.**

1. Leaves 1- foliolate, shrubs or under shrubs:

   2. Leaflets 5-15 cm long ovate elliptic or oblong…………1. D. gangeticum

   2. Leaflets 2.5-6 cm long, roundish cordate:

1. Leaves 3-foliolate, prostrate herb. …………………………………2. D. triflorum


   Erect or ascending-prostrate undershrub about 60-130 cm tall, with angular branches. Stems appressed hairy above, glabrescent below. Leaves simple, variable, ovate-oblong or rounded, about 3-14 cm long, acute to acuminate, glabrous above, pubescent beneath, petioles 1-3 cm long. Flowers purple or white, in 5-12 cm long racemes. Racemes copious, combined to panicles. Calyx 4-5 mm long pubescent.
Vexillum 5-6 mm long, keel incurved. Pods subfalcate, curved, 6-8 jointed, upper suture straight or without indent, lower deeply indented, hooked hairy. Common in the area. Roots astringent and tonic, used in fever and dysentery.

L.N. Salpalnu   Fl. & Fr. Mar-Dec.   Collection: 1147, Naugarh


   Prostrate- creeping perennial herb. Stem rooting from the nodes, with ascending tops, appressed hairy. Leaves 3 foliate, rachis to 1 cm long, leaflets subequal, obcordate obovate, rachis to 1 cm long, leaflets subequal, obcordate obovate, cuneate at base, shallowly retuse, mucronate at apex, glabrous above, appressed hairy beneath stipules ovate, acuminate. Flower purplish blue, about 4-6 mm long, in 1-4 flowered, leaf opposed clusters; bracts ovate, acute. Calyx 2-3 mm long, teeth longer than tube. Pods sessile linear, upper suture straight, lower indented or crescent shaped about 7-15 mm long, 4-5 reticulate joint. Common in grassy localities, road sides, crop fields.

L.N. Kudaliya   Fl. & Fr. July-Sep.   Collection : 1103, Kakra

12. *Erythrina Roxb*


   A medium sized deciduous tree about 13-18m tall, branched armed with conical prickles. Leaf rachis 10-20 m long, leaflets rhomboid ovate, trifoliate the lateral oblique, 9-15 m. long and broad, sub coriaceous, glabrous above, brown pubescent below. Flowers in dense, 5-10 cm long, spike like clusters, bracts caducous, bracteoles minute. Calyx 6-10 mm long, pubescent, becoming bilabiate. Corolla
scarlet. Vexillum 3.7-5 cm long 12-16mm broad. Wings minute. Pods cylindrical, long pointed, constricted between seeds, 2-5 seeded. Common in the district. Bark is used as an insecticides, leaf extract, in gonorrhoeal diseases.


13. **Glycine Linn.**


Erect or suberect annual herb, branches with reddish brown pubescent. Leaf trifoliolate, leaflets, 3-10 cm long, ovate elliptical, alute, base rounded, glaborate above, appressed pubescent beneath; stipules pubescent, ovate lanceolate. Flowers violet-pink or white, in few flowered racemes. Calyx 4-6 mm long, pubescent, upper two teeth united. Vexillum slightly auricled at base, equal to calyx or slightly longer. Pods linear-oblong, 3-9cm long, straight or curved pubescent, 2-4 seeded; seeds with small aril. Commonly cultivated.

L.N. Soyabean    Fl. & Fr. Aug-Dec    Collection: 366, Panchmari

14. **Indigofera Linn.**

1. Leaves simple:
   2. Pod globose 1- seeded:
      2. Pod oblong 1-2 seeded ........................................... 1. I.cordifolia

1. Leaves imparipinnate:
   3. Flowers in axillary short peduncled heads...............2. I. linnaei

   3. Flowers in axillary racemes.:
      4. Leaves 5-11 foliolate:
5. Pods cylindrical glabrous on maturity........

.............................................................3. I. tinctoria

1. I. cordifolia Heyne ex Roth, Nov Pl. Sp. 357, 1821; FBI 2: 93; FUGP 1. 250; Gillett, loc. cit.

A prostrate or diffuse annual, clothed with long white hairs. Stem 10-20 cm long. Leaves simple sub sessile, hairy, cordate, obtuse, mucronate, entire, about 0.5-0.8 cm long, ovate. Flowers red, in small, sessile heads. Pods terete, oblong, Common in waste places in lawns.

Fl. & Fr. Rainy Season Collection: 512, Pakori


A much branched trailing, prostrate herb with woody base; branches grey-pubescent. Leaves 1.5 to 2 cm long; leaflets 7-9, sub sessile, alternate, oblong-ovate about 7-12 mm long, obtuse, mucronate, pubescent on both sides; stipules lanceolate. Flowers bright red, about 2-4 mm long, 10-15 flowered, 1-2 cm racemes; bracts ovate, acuminate. Calyx 2-3 mm long, segments longer than tube. Pods subovoid, 5-6 mm long, thinly hairy, 2 seeded. Rarely occurs near crop fields dry grassy localities. Plant extract diuretic, decoction given in epilepsy.

L.N. Latahai Fl. & Fr. Aug-Nov. Collection 531, Siswa


A shrub about 60-120 cm tall, branches pubescent hair appressed. Leaves about 1-12.5 cm long; leaflets 7-13, 5-20 mm long, elliptic or oblong, glabrous to
subglabrous above, appressly pubescent below; petiolute about 1 mm long, stipules small. Inflorescence a subsessile racemes about 5-12 cm long calyx upto 1.5 mm long, pubescent, teeth as long as the tube. Corolla pink. Vexillum about 4-5 mm long. Fruit 1.5-3 cm long straight curved, glabrous, 10-12 seeded. Commonly cultivated.

Fl. Nov.-Dec  Collection- 241, Sorata

15. Lablab Adanson.


Annual-perennial climbers, branches patently hairy, leaflets braod ovate-rhomboid, 7.5-15cm long, thin, acute at apex, smooth above and short haired underneath. Petioles long and slender. Inflorescence lax, fascicled, of many flowered racemes on elongated peduncles. Flower white or blue or purple, on short pedicels. Pods 4-5 cm long, broadly scimitar shaped, smooth beaked by persistant style, 2-4 seeds or 6-8. Seeds in pale brown colour, avoid, laterally compressed with conspicuous hilum upto 1-1.7 cm broad. Seeds colour variable. Commonly grown in crop fields.

L.N. Sem  Fl. & Fr. Throughout the year  Collection: 344, Suhase

16. Lathyrus Linn.

1. Stipules foliaceous; leaves without leaflets ........................................4 L. aphaca

1. Stipules not foliaceous; leaves with 1 pair of leaflets.

2. Stem alate; tendrils usually branced:

3. Plants suberect; leaflets linear lanceolate or oblong.........................2. L. sativus
3. Plants climbing or twining, leaflets ovate elliptic


   A trailing or suberect annual herb about 10-30 cm high. Rachis ending into simple, coiled, tendrils. Stem not winged, glabrous, leaflets wanting; stipules foliaceous, 1-3 cm long, ovate, round, mucronate, hastate at base. Inflorescence 1-2 flowered, axillary racemes. Peduncle 1-4 times as long as the stipules. Calyx 3-9 mm long, teeth equal to 3 times as long as tube. Corolla bright to pale yellow. Vexillum 6-13 mm long, erect, broad wings feathery, keel beaked, shorter than wings. Pods compressed, linear-oblong, glabrous, 4-6 seeded. Common weed of wheat fields and also found near road sides.

   L.N. Jangali matar  Fl. & Fr. Feb-May  Collection-1000, Novalpur


   Sub erect or trailing annual, glabrous to subglabrous herb about 70 cm long. Rachis ending into branching tendrils, leaflets 2, narrowly lanceolate to linear, stipules lanceolate, semisagittate 5-6 mm long. Flowers 12-22 mm long, solitary, axillary on 1-1.5 cm long peduncle. Calyx 7-10 mm long, teeth subequal, longer, than tube. Corolla red, blue or white about 12-24 mm long. Corolla red, blue or white about 12-24 mm long. Fruit 2.5-4 cm long, 9-13 mm broad, upper suture broadly winged, 3-5 seeded. Common in crop fields way sides in grassy localities.

   L.N. Latri  Fl. & Fr. Feb-Jan  Collection-1200, Pakori


   Annual, glaucescent hairy climbing herbs about 1 m tall, stem pubescent,
rachis ending into branched tendrils. Leaf is ovate oblong or elliptic, 4-7 cm long, membranous, acute; stipules ovate-lanceolate, falcate, semisagittate at base, about 1-1.5 cm long, flowers purple upto 2.5cm long, 1-6 on 10-15 cm long peduncle. Calyx 1.5 cm long, teeth almost equaling the tube. Corolla white pink, purple, violet or blue in various types. Pods linear oblong 4-6 cm long, 4-6 seeded beaked commonly cultivated in crop fields.

L.N. Matar Fl. & Fr. Dec-March Collection: 100, Sahganwa

17. Lens Miller


A small erect herb about 50 cm tall, pilose, hair spreading, branching at the base. Stipule lateral free, 3-5 mm long, entire, acute. Rachis ending in a short bristle, sometimes in a tendril, leaflets 4-7 pairs, pilose on both sides, linear-oblong, 5-15 mm long, truncate or retuse, mucronate, Inflorescence pedunded 1-4 flowered peduncle 2.5-5cm long. Calyx pilose. 5-6mm, teeth subequal about -4mm long, acute, corolla pale purple. Vexillum 5-6 mm. Pod glabrous, about 8-14 mm long, 5-8 mm broad. Seeds 2 compressed, grey, colylledons orange red. Commonly ultivated for pulse.

L.N. Masur Fl. & Fr. Feb –April Collection : 90, Itwa

18. Medicago Linn.

**Medicago sativa L.,** Sp. Pl. 779. 1753;

An herbaceous sperennial, erect or suberect herb about 20-60 cm tall, branched from the base. Leaf rachis about 1 cm long; leaflets obovate-cuneate,
obtuse, truncate or retuse, slightly toothed. Inflorescence in dense racemes with 10-35 flowers, on peduncles 1-5 cm long, pedical 1.5-2 mm long; calyx 5-lobed about 3-6 mm long, tube and pointed teeth about equal in length; corolla purple or blue rarely white. Pod curled about 3-10 mm in diameter, indehiscent, not spined, containing 2-6 seeds. Seeds yellow to brown kidney shaped to avoid, 1-2.5 mm long and 1-1.5 mm broad. Widely cultivated.

L.N. Alfalfa Fl. & Fr. May-Sep Collection: 150, Sunhaul

19. Melilotus Miller

1. Flower white, to 6 mm long, pods. 2 seeded……………………………………1.M. alba

2. Flowers yellow, 2-3 mm long, pods usually 1-seeded ………..2. M. indica


A deciduous, erect or decumbent much branched annual biennial herbs. Leaf rachis about 2 cm long; leaflets obovate-oblong to sub orbiculare, 10-20 mm long, truncate or rounded at apex rounded or cuneate at base, distantly serrulate, stipules adnate to petiols, linear-lanceolate 4-5 mm long. Flowers white, 3-6 mm long, in 4-8 mm long, axillary racemes. Calyx 2-3 mm long; vexillum retuse, longer than wings. Pods rounded, oblong, 3-5 mm long, reticulately veined, usually 2-seeded. Common in crop fields road sides.

L.N. Safed Senji Fl. Mar-Oct Collection 232, Pariya

A erect much branched annual herb about 50 cm tall. Leaf rachis up to 3.5 cm long; obovate oblong to lanceolate, rounded or emarginated, glabrous or with few hairs on mid rib beneath; stipules with oblique base, linear acuminate. Flower yellow about 2-3 mm long, in 2-6 cm long racemes. Calyx 1-2 mm long, teeth deltoid. Corolla scarsely exserted. Pods ovoid ellipsoid, apiculate, 2-3 mm long, 1-seeded. Common along with roadsides and in crop fields. Roasted seeds given in diarrhoa and dysentery.

L.N.-Ban-Methi Fl. & Fr. Jan-May Collection 771, Pokhara


Annual synderminder climbers branchlets appressed pubescent becoming glabrous. Leaf trifoliate, potiole 2 to 40cm long, leaflet broadly ovate to rhomboid, elliptic, 10-14 cm long, membranous, green and glabrescent above grey silky beneath. Flowers purple 2-3 cm long, single 3-20 flowered dropping, 3-7 cm long racemes; bracts pubescent about 1 cm long, silky pubescent. Corolla 2-3 cm long; wings shorter than slightly incurved keel. Pods 5-8 cm long, turgid not winged or plaited, with longitudinal rib, pubescent, hairy, hairs brown 5-6 seeded. Common at the edges of forest. Pods course blisters and extreme irritation of touched. Seed powder used in diabetes.

L.N. Gaunchhi, Collection, 73, Sunhauli

21. *Phaseolus* Linn
1. Pods oblong-falcate, 3-4 seeded; flowers usually green-white with minute bracteoles .................................................................1. P. lunatus.

2. Pods linear lanceolate, 4-10 seeded, flower pink, white, or purple, with large bracteoles ...........................................................2. P. vulgaris.

3. Pods long hairy, seeds black .................................................3. P. mungo

1. **Phaseolus lunatus** L., Sp. Pl. 724.1753; FBI 2:200.1876; FUGP 1:224.1903

   Annual biennial twinner; stem glabrous or pubescent. Leaf rachis 2-12 cm long; leaflets ovate-lanceolate to rhomboid, 3-15 cm long, acuminate sparsely hairy or glabrous; lateral leaflets oblique; stipules basified, pubescent, about 5mm long. Flowers 5-10 mm long, green-yellow, on axillary about 2-16 cm long, pedunculate racemes, bracts and bracteoles minute about 2 mm long calyx 3-5 mm long pubescent, teeth smaller than tube. Vexillum externally glabrescent, about 10mm long; keel spirally twisted. Pods oblong, falcate, compressed 6-8 cm long 2-4 seeded. Commonly cultivated as crop plant used as pulse and fodder for the animals.

   L.N- Lobia Fl.2Fr: Aug-Nov Collection: 771, Laitya

2. **P. vulgaris** L., Sp.Pl.723; FBI 2:200.1876; FUGP 1:224:

   Annual, twining climbers stem nearly glabrous. Leaf; leaflets ovate to obovate of rhomboid about 4-15 cm long, 3-10 cm across, acuminate, lateral leaflet oblique; stipules pubescent to 5mm long. Flowers white, yellow-purple or pink, about 6-12 mm long, in 1-3 flowered racemes; bracts about 2-3 mm long, bracteoles to 5mm long Calyx pubescent about 3-5 mm long. Vexillum glabrous; keel spirally twisted. Pods linear-lanceolate, about 6-10 long, 5-12 seeded. Commonly cultivated as a crop plant.

   L.N. Rajmah Fl.&Fr- Jul-Nov Collection: 590, Haraiya
3. **P. mungo** Linn. Mant, 101, 1767; FBI 2: 203; FUGP. 1: 226

A trailing annual with hairs. Flowers yellow. Pod hairy nearly erect, terete. Seeds usually black sometimes greenish grown as a mixed crop in fields of Jowar and Bajra.

L.N- Urd      Fl. & Fr- Rainy season      Collection- 1517, Jokha

22. **Pisum Linn**

1. Seeds compressed ................................................................. 1. P. arvense


**P. sativum** L. var. arvens(L.) Poiret in Lam. Encycl 5: 456.1804

A glabrous trailing-ascending or climbing annual herb about 30-40 cm high. Leaflets 2-4 (5), rachis 5-10 cm long, ending in branched tendrils; stipule large, foliaceous about 2-5 cm long, base auricled dentate, apex entire, apiculate. Flowers purple variegated about 1-2 cm long, 1-2 on axillary, 3-5 cm on long peduncles. Calyx tube oblique, glabrous. Vexillum broad, emarginate, wings feathery. Pods 3-5 cm long, glabrous. Commonly cultivated with wheat crop.

L.N- Matar      Fl& Fr: Mar-May      Collection: 925, Barni


Annual glabrous, climbing, trailing or ascending herb, about 60-70 cm long. Leaflets 4-6; rachis ending in branched tendrils; stipules ovate- rounded, subcordate at base about 2-5.5 cm long. Flowers white, about 1.5-3 cm long, 1-3 together on long peduncles. Pods 5 to 9 cm long, green, glabrous, commonly cultivated as crop plant as vegetable.

L.N- Mattar      Fl. & Fr: Feb-May      Collection: 1123, Lotan
23. Rhynchosia Lour nom.cons.

1. Trailing herb Seeds with waxy arillus……………………………………… 1. R. capitata

1. Twining herb, seeds with no arillus :

2. Leaflets small, glabrous :

3. Leaflets up to 1.5 cm long, pod smaller …………………… 2. R. minima

3. Leaflets up to 5.5 cm long. Pods longer ………… 3. R. minima var minima.


A prostrate, densely hairy, trailing annual with spreading pubescence about 1 m long. Leaf rachis about 5 cm long, Leaflets roundish, with a cuneate base; about 3-4 cm, acute or sub acute base oblique, cuneate, glabrescent above, pubescent beneath; stipules ovate about 1.5mm long. Folwers yellow with purple streak, 6-10mm long in 4-8 flowered about 3cm long racemes, racemes many fid, ultimately becoming, twisted and forming round heads of the flowers bracts ovate, pilose calyx segments long, teeth os long as tube. Vexillum glabrous, auriculate, wings feathery; keel incurved. Pods stipitate, sub orbicular sparsely pubescent, about 10-15 cm long, marked with delicate close transverse veins and terminated by the hooked base, of the style seeds 2, waxy-strophiolate. Rarely occurs; at the edges of crop fields and grasses localities.

Fl.&Fr: Sept-Nov Collection- 145, Parsauna

A spreading twining, annual, slender herbs about 1 to 13 m long. Leaf rachis about 2.5 cm long; leaflets rhomboid-ovate, acute, pubescent on both surface, orange to black gland dotted beneth; stipules lanceolate about 3mm long. Flowers yellow about 3-5 mm long, in 6-12 flowered, axillary slender, about 6-9 cm long racemes, Racemes short peduncled; bracts minute or O, calyx 5mm long, tube longer than teeth. Pods sessile, oblong about 1.5 cm long, slightly bent upward, sparsely pubescent, seeds 2, strophilote. Common in grassy localities.

Fl. & Fr: Nov-Mar


Commonly occurs in the forest area

Fl. & Fr: Aug-Sept

24. **Sesbania** Adans Corrs. Scop. nom. cons.

1. Prickly shrubs or undershrubs .................................................. 1. **S. bispinosa**

2. Unarmed shrubs or small trees. ................................................. 2. **S. sesban**


Annual or biennial, erect shrub up to 1-3m tall, stem glabrous or sparsely pubescent when young, sparsely aculeate. Leaf paripinnate, rachis 20-35 cm long, aculeate; leaflets 40-50, glabrous oblong about 1-2 mm wide, obtuse, mucronate, sparsely pillose on margins and midrib below, stipules 6-10 mm long. Inflorescence a raceme, 3-12 flowered, up to 13 cm long. Pedicle 6-10 mm long. Calyx about 4 mm long,
teeth about 1 mm long, margin pubescent. Corolla pale yellow with distinct brown shade, vexillum about 12-13 mm long (including long claw about 3 mm) 30-40 seeded. occurs along the edges of crop field, marshy places.

L.N-Dhaincha Fl.&Fr: Sept-Jan Collection: 805, Uska bazaar

**Sesbani sesban Linn**

**Varieties:**

1. Flower uniformly yellow……………………1. S. sesbanssp. sesban. Var sesban
2. Flower yellow dotted with purple…………………3. S. sesban var. picta
1. Flower dark red or purple inside…………………2. S. sesban var. bicolour

1. **S. sesban Linn.**

   **Glabrous,** unarmed shrubs about 4-8 m high. Stem up to 12 cm in diameter, usually pubes-cent, sometimes becoming glabrous, Leaves rachis 8-15 cm long, leaflets in 6-27 pairs, oblong, glabrous, linear lanceolate, up to 26 mm long and 5 mm across, glabrous above, sometimes pubescent beneath often pilose at the margins; stipules narrowly triangular, up to 7 mm long, pubescent. Racemes 2-20 flowered, up to 20 cm long, pedicels 4-12 mm long, glabrous. Pod subcylindrical, straight or slightly curved, about 20-30 cm long and 2-5 mm across, straw coloured, often with brown or reddish-brown blotch over each septum, 10-15 seeded, glabrous. Seed subcylindrical about 3-5 mm long, olive green or brown, usually mottled commonly planted at the border of the fields. Common as hedge plant.

Collection:- 479 shorutgarh

2. **S. sesban** ssp. sesban var bicolor (wb. and Arn.) F.W. Andr.in Kew Bull. 93. 1953.

A small sized tree with dark maroon or violet coloured flower short lived about 1-7 m tall, young leaf pubescent. Leaf paripinnate, rachis 4-13 cm long; leaflets 18-30, about 7-20 mm, linear-oblong, obtuse apiculate, glabrous; stipules about 5-7 mm long. Inflorescence in axillary racemes, 3-20 flowered. Bract and bracteoles about 3 mm long, caducous. Pedicel about 5 mm long, teeth broadly triangular; corolla maroon. Vexillum about 13-14 mm long. Fruit 15-80 cm long, 20-40 seeded. Grows commonly as a hedge plant along road sides.

Fl- Aug-Feb Collection: 667, Naugarh


A small sized tree with yellow flowers margins with purple. Other characters same as Sesbania sesban var. sesban. Commonly occurs as hedge plant near Waste places.

Fl-& Fr : Oct-Dec Collection: 872, Birdpur


1. Leaves simple............................................................ 1. T. strigosa.

1. Leaves pinnately compound :

2. Pods glabrous or minute hairy;

3. An erect, flabrous herb. Flowers 0.3-0.5 cm across......... 2. T. purpurea.


Annual, pubescent, prostrate with appressed hairs. Leaf simple about 2.5 to 5 cm long, 4-8 mm across, broad, linear, acute, apiculate, sparsely pubescent above, silky below; petiole about 2-3 mm long; stipules about 2-4 mm long. Flowers 1-2 in the axil of the leaf. Pedicel about 6-12 mm long. Calyx about 2.5 mm long, pubescent, teeth lanceolate. Corolla bluish turning yellow. Vexillum about 4-5 mm long. Pods about 1-3 cm long, pubescent, hairs appressed, 6-10 seeded. Common in forest area.

Fl. Sept-Oct. Collection- 647, Bansi


Annual or short lived perennial erect up to 1 m tall, branches glabrous or sparsely pubescent. Leaf imparipinnate, 5-10 cm long, petiole about 6-10 cm long; leaflets 9-21, about 1.8-2.8 cm long and 6-10 mm across, elliptic-oblong, obtuse or trunate, mucronate glabrous above, appressed silky below, stipules narrowly triangular. Inflorescence a leaf opposed raceme; some flowers in the upper leaf axils also. Bract about 4 mm long, Pedicel about 2-3 mm long calyx pubescent cup about 1.5 mm long, teeth about 2-3 mm long corolla reddish purple or bright pink. Vexillum about 6-9 mm long, pubescent externally. Ovary pubescent, style flattened, glabrescent, stigma penicillate to almost glabrous. Fruit about 4-6 cm long, and 4-5 mm across, pubescent, 6-9 seeded, Common in the waste places.

Fl. : Oct-Jan Collection : 869, Barni


Perennial bushy herb; branches appressed pubescent. Leaf imparipinnate, subsessile about 5-8 cm long. Leaflets 11-19, about 12-20 mm long, narrowly
oblanceolate, obtuse, mucronate, subglabrous to sparsely villous above; densely villous below; stipules up to 8 mm long. Inflorescence an elongated raceme, lower flowers in fascicles, the lowest often the axil of the leaf. Bract narrowly triangular. Pedicel about 2-4 mm long. Calyx densely tomentose, tube about 2 mm long, teeth about 7-8 mm long corolla red or purple. Vexillum about 11-15 mm long, externally pubescent. Fruit about 2.5-4 cm long, velvety tomentose, hairs dense, spreading, 6-8 seeded. Rarely occurs in the area at river edges.

Fl: Jan-Sept Collection: 669, Keshwar

26. Trifolium. Linn.

1. Leaflets elliptic to linear ......................................................... 1. T. alexandrianum

2. Leaflets ovate-ovate .............................................................. 2. T. repens.


Erect annual, branches sparsely pubescent. Leaflets about 1.5 to 4 cm long. Broadly elliptic to oblong- lanceolate, mucronate, rarely retuse; stipules oblong, the free portions lanceolate, ciliate. Inflorescence ovoid or oblong- conical head, in fruit about 1-1.5 cm bread, often few bracts forming a minute involucres, peduncle up to 3.0 cm. Calyx pubescent, teeth unequal, spinescent. Corolla cream coloured. Vexillum about 8-13 mm long. Commonly cultivated as a fodder crop.

L.N. Barseem Fl & Fr: Mar-May Collection: 537. Acolhiya

2. T. repens L; Sp.Pl. 767.1753; FBI. 2:86.1876

Glabrous to glabrescent perennial, prostrate, rooting at nodes. Leaflets 1-4 cm long, broadly obovate, rounded or retuse at the apex, petiole long; stipules broad at
the base, sheathing, ending in a subulate apex. Inflorescence a globose raceme, about
15-25 mm broad. Flowers scented. Calyx 2-6 mm, 10- nerved, teeth unequal. Corolla
white or pinkish. Vexillum 8-13 mm long. Fruit linear, 3-4- seeded. Common in waste
places, grassy localities.


27. Trigonella Linn

1. Pods with a long beak; stipules not lacinated……………… 2. T. foenum-graecum

2. Pods linear, falcately curved, 4-8 seeded, pubescent…………….. 1. T. corniculata

1. T. corniculata (Linn) L. Syst. Nat. ed. 10.2:1180.1759; FBI 2:88.1876; FD 167

   Erect to procumbent, glabrous or sparingly pubescent herb, about 20-30 cm
tall. Leaf rachis about 1.2 cm long; leaflets obovate, 0.5 to 1 mm long, trounded.
Truncate, base cuneate, lower half entire, upper half hooted; stipules linear-lanceolate,
about 5 mm long, to theth. Flowers yellow about 6-12 mm long, in pedunculate, about
6-10 cm long racemes; pedicle ending in awn like appendages. Calyx 3-4 mm long,
teeth sub equal, shorter than or as long as the tube. Corolla 6-7 mm long, yellow,
wings shorter than the Keel. Fruit 10-20 mm long, 2-3 mm board, linear, acuminate,
curved, glabrous, with transverse anastomosing veins, 4-8 seeded common in crop
fields, waste places, road sides. Vegetable of young plants relives colic pain.

L.N- Kasruti       Fl.&Fr.- Apr_Jul       Collection :- 203, Harijo


   Erect, annual, aromatic herbs about 10-40 cm tall, sporingly pubescent to
glabrous. Leaflets about 1-3 cm long, about 5-15 mm board obovate to oblanceolate,
denate or incised, stipules lanceolate, acuminate, entire. Flowers 1-2 in leaf axils. Calyx 7-8 long, teeth as long as the tube. Corolla yellowish white, sometimes tinged with lilac, 12-18 mm long. Fruit 5-11 mm long, 3-5 mm across, glabrous or pubescent, tapering into a beak, about 1-4 cm long, length wise reticulately nerved, 10-20-seeded often cultivated near fields. Vegetables considered useful to diabetic patients.

L.N – Methi Fl & Fr : Mar-May Collection :- 426, Hariya

28. Vicia Linn

1. Erect herb.......................................................... 1. V. faba

2. Flowers 2-6 together; pods finely pubescent, 2-seeded ................. 2. V. hirsuta


Erect, annual, flaccial herbs about 30-70 cm tall, stem 4-5 gonoous. Leaf rachis 6-10 cm long ending into tendrils, leaflets 2-6, about 4-10 cm long, oval to elliptic, obtuse, mucronate, glabrous, stipules 10-17 mm long. Flowers 1-6, axillary racemes, Calyx 12-15 mm long, cup oblique, lower teeth longer about 5mm long, Corolla white with dark violet wings. Fruit 8-20 cm long, about 1-2 cm broad, pubescent. Seeds ovoid-oblong about 2-3 cm long, Commonly cultivated as crop plant.

L.N- Bakla Fl : Dec-Apr; Fr.:Apr-May. Collection, 856, jamooti


Trailing or climbing annual herb, stem pubescent to glabrescent, Leaf paripinnately compound, leaflets 6-20, 4-15 mm long, about 1.5-3mm across, linear, obtuse, truncate or marginate, mucronate sparsely pubescent when young; stipules
semi segittate to lanceolate, the lower toothed or lacinate, tendril mostly branched. 
Imflorencence a 2-7 flowered, axillary, pedunclied raceme, peduncle up to 4 cm long then the tube. Corolla rose or pale-blue. Vexillum 3-5 mm long. Fruit 6-11 mm long and 2.5-4 mm across, pubescent to subglabrous 1-2-seeded, Common; weed of crop fields.

L.N- Jhunjhuni  Fl. & Fr : Mar-May  Collection- 99, Bhanwapur

29. Vigna Savi,

1. Pods 15-30 cm long, twining               3-V. unguiculata Sub sp. uniguiculata

2. Seeds black, rim aril around hilum raised          1. V. mungo

2. Seeds greenish, rim aril around hilum not raised                  2. V. radiata


Annual, suberect or twining herbs; branches covered with reddish brown hairs. Leaf rachis 4-10 cm long; leaflets elliptic-ovate or oblong-orbicular, about 5-10 cm long, acute or subobtuse, deltoid, membranous, pubescent stipules peltate, ovate-lanceolate about 6 mm long. Flowers yellow 8-1.4 cm long in 8-12 flowered 10-15 cm long racemes, bracteoles longer than calyx. Calyx lobes shorter than tube. Corolla greenish-yellow, keel curved upward. Pods linear, cylindrical, 4-8 cm long, 0.5-0.6 cm across, 6-12 seeded; rim-aril around the hilum distinctly raised. Commonly cultivated as crop plant.

L.N- Urd  Fl.& Fr: Sept-Nov.  Collection : 1022, Mithual

Sub erect or twinning, brown-pubescent herbs. Leaf rachis 6-15 cm long; leaflets rhomboid or ovate, 6-8 cm, acute, acuminate, entire, lateral once obliques; stipules peltate to 1 cm long. Flowers yellow 10-14 mm long, in 6-12 flowered, axillary racemes. Calyx 2-4 cm long teeth equal or slightly larger to tube. Pods linear, about 6-8 cm long, 0.4 to 0.6 cm across, with dark brown spreading hairs, rim-aril not raised. Commonly cultivated in crop fields. Seeds used as pulse.

L.N. Moong Fl. & Fr : Aug-Nov. Collection : 541, Itwa


Glabrescent, scrambling annual, bushy or twinning herbs, stem angular. Leaf rachis to 10 cm long; leaflets ovate rhomboid, 10-16cm long, acuminate to obtuse, mucronate, glabrous or minutely hairy; stipules ovate-lanceolate, about 1.8 cm long. Flowers yellowish-blue about 1-2 cm long, in long peduncled racemes, bracteoles about 4-5 mm long. Calyx 6-8 mm long, glabrous, Corolla about 1.5-2cm long; vexillum green, turning to yellow, bluish violet outside. Pods 10-30 cm long or more, 5mm broad, glabrous or minutely pilose. Seed 6-9 mm long. Commonly cultivated. Pods and seeds edible.

L.N- Lobia Fl.& Fr. Sept-Dec Collection ; 858. Parsa

30. **Clitoria Linn**

A woody climber Leaves 5-9.5 cm long, unipinnate, leaflets usually 5-7, about 1.4 to 6.5 cm long, 1-4 cm across, oblong slightly emarginated or obtuse, short stalked, petiolules up to 2mm long, stipules linear about 4-10 mm long, apex acute. Inflorescence solitary axillary. Bracts 4-5 mm long, bracteoles about 7mm long orbicular. Pedicel 6-9 mm long. Calyx 12-16 mm long, 2 upper teeth joined hear the base. Corolla rich blue in colour with greenish veins on the vexillum, vexillum 2.5-5.0 cm long, 3.5 cm broad, stamens 10, diadelphous, 9+1, dimorphic the vexillary stamens free, ovary hairy, style simple, hairy along the inner side. Fruit up to 5-12 cm long, beaked 8-10 seeded, glabrous or sparsely pubescent. Widely cultivated as ornamental plant.

L.N- Gokran. Fl- June-Jan Collection : 518, Birdpur


An erect shrub about 1.5 to 4 m tall, stem pubescent Leaf pinnately trifoliate, leaflets 2.5-10 cm long, 1.5-3.5 cm broad, elliptic to lanceolate, acute, velvety pubescent above, pilose beneath, both surfaces glandular; petiole 1.0-5.5 cm broad, 1.0-5.5 cm long, rachis 8-13 mm long; petiolules present. Inflorescence a terminal panicle, paduncle 2-7 cm long, pubescent. Bracts about 8 mm long pedicel 1-1.7 cm long, pubescent Calyx velvety pubescent and glandular tube reddish brown or crimson
lines. Vexillum 1.2-1.7 cm indiameter. Fruit 4.5-10 cm long, 8-14 mm broad, pubescent and glandular. Commonly cultivated for dal.

L.N- Arhar     Fl- July-August     Collection : 1207, Barhni

32. Dolichos Linn.


Annual slender, twining herbs about 1.5 m long, branches densely pubescent when young. Leaf rachis about 8 cm long leaflets ovate, about 3.5 cm long and 2 cm across, acute, entire, pubescent when young; stipules lanceolate, to 4 mm long, caducous, Flower pinkish-red, about 1.3 cm long, in few flowered axillary racemes. Calyx 3-6 mm long, segments smaller than tube. Vexillum emarginated, 3-6 mm long, segments smaller than tube. Vexillum emarginated, ovate; wings feathery Keel beaked. Pods compressed, curved, 3-6 cm long, pubescent, 6-8 seeded. Rare in waysides with grasses.

L.N. Barshur     Fl & Fr- Aug-Oct     Collection- 498, Khuniyaon

34. CAESALPINACEAE

1. Leaves, simple, shallowly or deeply divided into 2. Lobes………………1. Bauhinia

1. Leaves compound; apex not emarginated nor 2- lobed:

2. Leaves 2-pinnate

3. Leaf rachis ending in spines; flat with numerous leaflets……5. Parkinsonia

3. Rachis and rachilla not as above:
4. Scan dent or straggling armed shrubs; stamens exerted.................. 2. Caesalpinia

4. Erect unarmed tress; stamens include.............................. 4. Delonix

2. leaves 1- pinnate:

5. Petal absent; Calyx pataloid; fertile stamen 2-8......................... 6. Saraca.

5. Petals present; calyx not pataloid; fertile stamens3-10:

6. Petals 5; fertile stamens 5-10; pods hard ...................... 3. Cassia

6. Petals 3; fertile stamens 3; pods with pulpy mesocarp ................

.............................................................. 7. Tamarindus.

1. Bauhinia linn.

1. Leaf cleft 3-8 cm long; calyx 2- cleft; petals purple or red ...... 1. B. purpurea

1. Leaf cleft 0.8-2.5 cm long; Calyx entire, spathaceous petals variegated.

.............................................................. 2. B. variegata.


Tree upto 8 m tall, bran lets glabrescent. Leaves petiolate, petiole 2.5-5 cm long, lamina 7-18 cm long, 9-11 nerved. Inflorescence few flowered panicles at the ends of the branches. Flowers few red or purple about 2-4 cm long, on terminal or axillary short peduncled corymbs. Calyx pubescent, 3-4 cm long, splitting into 2-valves, 5 toothed Fertile stamens 3-4, elongate. Ovary glabrescent; Pods linear, flat,15-18 cm long, pointed, green tinged with purple; seeds 12-15, almost brown, smooth. Occurs in exposed dry forest. Bark is used in dyeing and tanning.

L.N.- Koiral  Fl.: Sept-Nov.; Fr: Jan-Mar  Collection: 97, bansi

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A medium sized tree with dark brown bark. Leaves petiolate, petiole 2-4 cm long; lamina 5-15 cm long, lobes obtuse, the base is deeply heart shaped, 9-15 nerved, pubescent beneath when young. Inflorescence few flowered pubescent racemes. Pedicel short or absent, bracteole minute; toothed at the apex. Petals 4-5 cm long, obovate, with broad law with red purple, veins vatriegated. Calyx cylindrical or turbinate, about 2-3 am long, with 5 teeth. stamens 5, fertile, ovary hairy, stipe 10-17 mm long, style long, stigma capitate. Pods 15-30 cm long 10-15 seeded, stipe glabrous.

Common at the road sides at forest edges. Ash of dried leaves taken in cough.

L.N-Kachanar Fl.: Feb-Apr, Fr: May-Aug Collection: 115,Barhni

2. **Caesalpinia Linn.**

1. Pods armed, densely covered with wiry prickles petals narrow……… 1. C. bonduc.

1. Pods unarmed, glabrous, petals broad:

2. Large scrambling shrubs, downy pubescent, flowers yellow

2. Erect shrubs or small trees, glabrous flowers orange-yellow …………

.................................................................2. C. pulcherrima.


Large, straggling prickly shrub or climber about 12 high, prickles straight, yellow about 1.2 cm long; branches grey- downy. Leaves 25-45 cm long; pinnae 6-8
pairs; leaflets opposite, 6-10 pairs, elliptic-oblong, obtuse, mucronate membranous, glabrous above, downy beneath. Flowers yellow, spotted with red or not, simple or paniculate racemes, bracts liner, recurved at apex, caduceus. Calyx rusty tomentose, about 3-4 mm long. Petals yellow, spotted with red, oblanceolate. Stamens 10, free anthers uniform, versatile. Pods oblong, 6-8 cm long, cariaceous, dehiscent, with sharp, wiry prickles, seeds 1-2, oblong, large, shining brown. Common in way sides.

Seeds used in colic; Intermittent fever and in disturbed menstruation.

LN- Kanja. Fl: Jul-Sept, Fr: Jan-Mar Collection : 137, Bhanwapur


Large, erect, glabrous shrub about 2-4 m tall, branches sometimes slightly prickly. Leaves bipinnate, pinnae 3-10 pairs, opposite, leaflets 5-10 pairs, oblique, ovate-oblong about .8-2 cm obtuse or emarginate, entire. Flowers red or orange, long peduncled, in terminal or axillary, about 20-40 cm long, lax racemes. Calyx glabrous. Stamens 10, Filaments long bright red. Pods usually linear, glabrous; 4-7.5 cm long, straight, brown. Commonly occurs along the way sedes and also cultivated in gardens.

Flowers used for intestinal worms, cough and catarrh.


3. **Cassia Linn.**

1. Leaves without glands; stamens unequal; pods cylindric, 25-35cm long; indehiscent

.......................... 1. **C. fistula**

1. Leaves- rechis with glands; stamens nearly equal in length, pods flat, dehiscent.

2. Sepals broadly ovate or obovate, obtuse
3. Leaflets 8-12 pairs, oblong-lanceolate:

3. Leaflets less than 6 pairs, elliptic-ovate………………… 2. C. occidentalis

4. Leaflets ovate or elliptic, acuminate; lower

2. Stamens much longer.

4. Leaflets 5 cm or more long…………………………………….4. C. alata

4. Leaflets obovate obtuse; stamens subequal …………………... 3. C. tora


A large deciduous tree up to 20 m tall. Bark is smooth in young tree and dark brown in old and rough. Stipules detoid, acute, 1-2 mm long, caducous. Rachis 12-25 cm long, terete glabrous. Leaves about 40 cm long with 3-8 pairs of opposite leaflets, smooth above, hairy below. Flowers arranged in drooping raceme, each raeeme about 10-45 cm long; peduncle 2-10 cm long. Pedicel 3-5 cm long, slender slightly hairy or quite smooth, bracts 8-10 mm long, ovate, acute, hairy. Calyx 1 to 1.5 cm long, pubescent, sepal 5, ovate, obtuse, spreading caducous. Petals 5, obovate, blunt, distinctly veined. Stamens 10, 3 longest stamens much curled and bear large oblong anthers, thinly appressed hairy, stigma puncti-form. Pods terete, glabrous, indehiscent, about 40-60 cm long, black glossy brown, 40-100 seeded. Common in the forest area. Fruit and bark used as an antiseptic; antidote of snake and scorpion bite.

L.N-Amaltas Fl.: Feb-April, Fr: May-Jan Collection : 240, Bansi.


Annual– perennial, erect, undershrub about 2m tall. Leaves about 15-20 cm long, a solitary stalked gland present near the base of the petiole; leaflets 4-6 pairs,
sometimes 3-5 pairs, opposite, lamina wide, lanceolate or ovate- lanceolate or narrowly to broadly elliptic, apex acute, rounded at base, glabrous on both sides, pilose when young. Inflorescence pedunculate axillary corymbose racemes forming terminal panicles, peduncle 0.3 to 8 mm long. Flowers yellow, in axillary or terminal pedicel racemes, bract ovate – lanceolate, stamens 6-7, 2 larger. Pods linear, slightly falcate, compressed, suture thick. Seeds 20-30, ovoid compressed 6-12 cm long, brown with yellow margin, pubescent, rounded at the lip, subacute at the base, smooth, hard. Common in waste place, road sides. Leaves used in skin diseases.


An erect annual under shrub up to 1m tall with flexuous stem Leave 6-8 or 5-10 cm long, leaflets 3 pairs, membranous, mostly obviate, nearly equal sided, both surface hairy, glabrescent or glabrous, base oblique, cuneate to rounded, apex delicately acute. Racemes short, peduncled hairy about 3-4 mm long, with a single pair of flower, or axillary, solitary. Bracts linear- acute, about 2-4 mm long. Sepals ovate 5-6 mm long. Petals unequal, ovate top rounded, 8-10 mm long. Stamen 6-7, 3 upper reduced to staminodes. Pods subtetragonal apiculate, 10-15 cm long, suture broad, 30-35 seeded; seeds brown, shining. Common along with roadsides, crop field.

Seeds and leaves used in skin diseases, cuts and wounds and in bone fracture.


A perennial shrub about 1-5 m tall. Stem marked with leaf scars and persistent stipules. Leaves bilateral, symmetrical opposed and told together at night. Petioles
1.5-2.5 cm long, leaflets 8-24 pairs, 3-15 cm long, about 2-7 cm wide, oblong – elliptic or oblong – obovate, top rounded or slightly notched. Racemes 15-70 cm long, bracts 2-3 cm long, enclosing the bud, caducous. Flowers yellow-Sepals 1.5-2 cm long, 4-6 mm wide. Petals 1.5-2 cm long, 1 cm broad. Stamens 9 or 10 variables in size. Pods straight with 2 longitudinal wings, 40-60 seeded. Common in pond ditches. The leaf in decoction is also used to treat bronchitis and asthma.

Fl. Oct-Dec

Collection: 1122, Lotan

4. Delonix Rafin


A large unarmed deciduous tree up to 15m tall with umbrella shaped crown. Leaves bipinnate, feathery, about 15-50 cm long, pinnae 10-16 or 11-18 pairs leaflets 20-30 pairs or 15-25 pairs, on each pinna, oblong. Stipules lateral, pinnately compound. Inflorescence lax terminal or axillary racemes. Flower 10cm across, bright red in colour. Sepals 5, crimson on inside. Petals 5, orange red or red in corymbose racemes. Stamens 10, free, exserted in; anthers oblong, Versatile. Pods 15-25 cm long, flat, many seeded. Seeds 20–40 or many, transverse, mottled.

Commonly planted as ornamental plant.


5. Parkinsonia linn.


A small glabrous or diffused with shrub about 4 m tall, branching from the base, with sharp woody spines. Leaves bipinnate, rachis short and ending into spines,
pinnae 15-35 cm long, main rachis very short, secondary ones flattened, elongated leaflets numerous, minute, oblongate. Calyx deeply cleft, with sub basal disc. Corolla yellow. Flower pedicellate, calyx 7-8 mm long, with a short claw. Stamens 10 free, flattened villous at the base. Ovary silky hairy, ovules numerous. Pods linear contracted between the seeds, about 8-10 cm long, smooth, mottled. Commonly occurs near waste land.


6. Saraca Linn.


A small erect evergreen tree. Leaves up to 15 m high, stipule stipules intrapetiolar. Leaflets 4-6 pairs about 10-20 cm long, oblong, lanceolate glabrous. Flowers in dense corymbs, changing colour from yellow to orange and finally scarlet. Bracts and of Bracteoles coloured Calyx situated at the top of tubular hypanthium sepals 4, oval, petaloid. Petals absent. Stamens 4-8, exserted. Ovary stipitate, style curved into a ring, nearly as long as with 4-8 seeds. Rare plant occasionally met. The brak is used in uterine infections.


7. Tamarindus Linn.


An erect, small evergreen tree about 10-20m tall. Leaves 7-15 cm long, pinnate, leaflets 10-12 pairs, oblong-lanceolate, about 1.5-2 am, obtuse, entire, glabrous. Flowers in dense corymbs, yellowish-orange, in terminal racemes. Calyx
about 1.2 cm long, tube turbinate, teeth lanceolate, the lowest two connate, Petals 3, 1 to 1.5 cm long, pale yellow, with red veins, two lower reduced to scales. Stamens monadelphous, 3 perfect other reduced to bristles. Pods oblong about 10 cm long, slightly compressed, indehiscent. Seeds dark brown or black. Common along with roadsides. Pulp of the fruit and young leaves are used in cooking.


35. MIMOSACEAE

1. Stamen indefinite; usually several:

2. Stamens free; plants usually armed……………………………………1. Acacia

2. Stamens basally connate; plants usually armed:

3. Pods thin, straight; seeds without aril………………………………2. Albizia

3. Pods turgid, coiled; seeds with aril ……………………... 5. Pithecellobium.

1. Stamens definite, usually up to 10:

4. Flowers tetramerous; stamen 4-8; …………………… 4. Mimosa.

5. Unarmed tree; flowers in globular heads; anthers not gland tipped, pod-dehiscent …………………………………………… 3. Leucaena

6. Pinnae 1-2 pais ; spikes with bisexual flowers only…………

…………………………………………………………………… 6. Prosopis

1. Acacia P.Miller

1. Unarmed trees:

1. Leaves reduced to phyllodes; flowers in elongated spikes……1. A. auriculiformis.

2. Leaves 2 pinnate; flowers in globose heads:
1. Armed shrubs or tree:

3. Pinnae about 20 pairs; leaflets numerous, pods dehiscent…… 2. A. catechu

4. Leaflets 40-50 pairs, to 2mm broad; petiole gland oblong:


An every green unarmed tree with smooth and greyish-bark. Phyllode 10-20 cm long about 1.2-5 cm broad, with 4-6 sub parallel nerves, curved. Flowers yellow, in cylindrical, lax spikes. Calyx and corolla small, 3-5mm long. Pods moniliform, brown, twisted at maturity, dehiscent. Common along road side as avenue tree.

Fl.: Sep-Nov ; Fr : Nov-Dec. Collection #: 1239, Bansi

2. **A. catechu** (L.f) willd., Sp.Pl.4: 1079; 1806; FBI 2:295. 1878; FUGP. 1:316.1903:

A small or medium deciduous tree up to 18 m tall, with greyish brown bark. Young branches puberulous. Leaf bipinnate compound; stipules spiny flattened, hooked and pointed up to 8 mm long; rachis about 15 cm long with gland between upper most pair of pinnae; pinnae 10-30 pairs, 4-5 mm long; leaflets about 16-45 pinnae, linear, glabrous, sessile, subacute. Flowers creamy-white, in axillary, solitary or fascicled to 10 cm long spikes. Calyx 1-2-1.5 mm long, camp anulate, pubescent or villous outside, teeth deltoid. Corolla villous or slightly pubescent, lobes ovate, oblong, sub acute. Pods smooth flat, thin brown, shining, narrow at base, stalked, dehiscent, 3-10 seeded. Common in exposed area. Bark used in diarrhoea, dysentery, bron-chitis and menstrual disorders.

F.N – Katha Fl.: Apr-Aug; Fr.: Sept-Feb. Collection: 422 Birdpur

A perennial shrub or tree about 10m tall, branches spreading, forming a dense flat or rounded crown with dark to black coloured stems, branchlets purple-brown, shorty or densely pubescent, with lenticels spike thin, straight, light grey in axillary pairs, usually in 3-12 pairs. Leaves bipinnate 30-40 mm long, often with 1-2 petiolar gland and other glands between all on only the uppermost pinnae; pinnae 2-11 pairs, with 7-25 pairs of leaflets per pinnae. Peduncles clustered-flower prolific, golden yellow, in globulus heads. Pods straight or slightly curved, about 5-15 cm long on a pedicel, fleshy when young, indehiscent, becoming black and hard at maturity. Seeds deep black – brown, smooth, compressed occurs naturally.

L.N- Kikar Fl. March. Collection: 992 Bansi

2. Albizia, auct.pl.


A deciduous tree about 27m tall with dark grey bark. Leaves with 8-13 cm long rachis, gland near the base of the petiole and one between uppermost pair of pinnae; pinnae 2-3 pairs, 8-12cm long, leaflets 5-9 pairs, subessile, 1-2 in, long obliquely elliptic – oblong or obovate – oblong, obtuse or retuse, glabrous or slightly pubescent beneath, pale green. Flowers green white, short pedicelled, fragrant, on 5-10 cm long pedunculate heads, arranged in corymbose racemes. Calyx funnel shaped. Corolla twice as long as calyx Anther filaments 2-3 cm long, rosy coloured ovary
sessile. Pods flat, straw coloured, 12-30 cm long, 2-4 mm broad, 6-10 seeded
Common along with road sides.

L.N- Siris Fl.: Feb-Apr., Fr.: Oct-Dec Collection: 1276, Narhaswa

3. Leucaena Benth. in Hook

Leucaena leucocephala (Lam.) De wit in Taxon 10:54, 1961 et 24:352.1975;

A small deciduous unarmed tree up to 5m tall. Leaves 2 pinnate, pinnae 2-8
pairs, leaflets 15-20 pairs, elliptic about 10-15 cm long acute, glabrous. Flowers white
in axillary, globose, sessile, forming short terminal leafy panicles. Calyx campanulate,
short teeth. Corolla of 5- petals, linear, free. Stamens 10, anther versatile, without
gland. Overy stipitate, stigma short. Pods in umbels, straight, linear, flat about 10-15
cm long, 2 valved seeds 15-20, polished brown, oval, commonly planted along with
roadsides.


4. Mimosa Linn.


A prosstrate or suberect spreading herbs or under shrubs, with hooked prickles
and deflexed bristles. Leaves 2 pinnate; sensitive, pinnae 1 or 2 pairs, sub digitate 4-5
cm long, leaflets 8-24 pairs or 12-20 pairs sessile, obliquely narrow-oblung, acute,
subcoriaceous, glabrous above, appressed bristly beneath. Heads usually in pairs,
peduncles slender. Flower purple or pink, usually I paired, globose, pedunculate.
Calyx absent. Corolla 4 lobed, petals pink. Stamen 4. Pods flat, 2-5 jointed,
membranous with yellowish, hooked bristles along the sutures. Common along with
road sides, waste places. Roots used as antidote to snake bite and as remedy of digestive troubles.


5. *Pithecellobium* nom.cons.


A large thorny tree about 15m tall grey white base. Leaves 2-pinnate, rachis about 2.5 cm long, with gland at tip, pinnae 1 pair, short each with a gland at tip, leaflets 2, from each pinna, obliquely oblong glabrous, stipules spinescent about 1 cm long. Flower white or creamish yellow, in axillary globose heads. Calyx campanulate, 5-toothed corolla 2-3 times as long as calyx, pubescent. Pods spiral, moniliform, reddish brown, 10-5 cm long. 5 cm across, dehiscent, 4-8 seeded. Cultivated in gardens.


A small or moderate sized, drought resistant tree with drooping branches and spreading crown. Rachis 2-3 cm long, pinnae 1-2 (3) pairs, 6-8 cm long, leaflets 16-24 pairs ,oblique oblong, 1-1.5 cm long, obtuse, glabrous, ligulate. Spike1-many, axillary or terminal about 7-10 am long. Calyx 5 toothed. Flowers cream or yellow, in hanging spikes. Petals tomentose inside. Ovary stipulate. Pods pale yellow, glabrous, constricted between the seed, many seeded. Seeds brown. Common in dry localities.

L.N. Kabulikikar Fl.: April-Sep; Fr.: Oct Collection : 168, Parsauna.
36. ROSACEAE

1. Carpels superior or inferior enclosed by the calyx tube (hypanthium)

2. Carpels many, free, achenes included with in calyx tube (hypanthium) ...........
   ........................................................................................................3. Rosa.

3. Styles free; fruit not much; Fruits bright red......................... 4. Pyrus

4. Trees; Flowers white or pinkish, appearing before the leaves; fruits yellow, white or red ..................1. Prunus

5. Fruits dry, in globose heads .................................................2. Potentilla

1. Prunus Linn


A deciduous large shrub or small tree. Bark grey-ashy, rough, young part pubescent Leaves ovate – lanceolate or lanceolate, closely serrate acuminate, glabrous; petioles 1-3 cm long, stipules fimbrite. Flowers pink-white, sessile or short pedicelled, solitary, often born on the previous year shoot, calyx campanulate drupes succulent, downy, variable in shape and size, yellow or red-spotted; stones hards deeply pitted. Commonly cultivated in fruit orchards for its edible fruit. Infusion of leaves and bark used to relieve cough and cold.

L.N-Aaru Fl.: Marc-Apr; Fr.: Apr-Jul. Collection : 150, Bansi

2. Potentilla Linn.

A prostrate sparsely pubescent annual, spreading herb about 10-20 cm long. Leaves imparipinnate, 2-6 cm long, basal leaves larger and with long petiole; leaflet 5-9, oblong, crenate or sharply toothed, sparsely hairy on both surfaces; petioles 1-2 cm long; stipules adnate to base of petiole. Flowers solitary, axillary, about 0.5-0.7 cm broad. Calyx 5-lobed, obtuse, alternating with ovate-oblong, bracteoles. Petals 5 shorter than calyx lobes, obtuse. Achene glabrous ovoid, sooth, covered by calyx lobes on globose receptacle. Receptacle villous. Common along open field terraces, grassy slopes.

FL.: Mar-May Fr.: May-Jun  
Collection: 407, Barhni.

3. Rosa, Linn,

Several types of roses of erect, or climbing shrub are grown in gardens the common colors are white, pink red, rosy, purplish the most common species in siddharthnagar is Rosa involucrata.

Rosa involucrata. Raxb. Hort. Beng. 38; Fl. Indii, 513; Brand. For Fl. 199; FBI. ii 365, Watt ED.

A stout erect or subscandent bush branchlets and inflorescence densely tomentose; prickles straight, compressed, often in pairs below the stipules. Leaves 3-4 in, stipules small lacinate; leaflets 3-4 pairs, elliptic or oblong, acute or acuminate finely serrate shining above, glabrous on both surfaces or tomentose beneath. Flowers 2-3 in across on short pedicels, solitary or in short corymbbs bracts large, lanceolate more or less gland serrate below, peduncles and pedicels sometimes gland – hairy. Calyx tube obovoid unarmed lobes caudate acuminate, entire deciduous. Petals retuse. Fruit globose densely tomentose, styles distinct. Achenes many pale coloured.

Fl. Cold season  
Collection: 381, Shoratgarh
4. Pyrus Linn.


An erect medium or large sized tree, bark grayish-black, fissured. Leaves variable in shape and size, broadly ovate to elliptic or oblong orbicular about 7-10 cm long and 5-6 cm across acuminate, long petioled, petiole about 2.5-4 cm long. Stipules linear about 2-3 cm long. Flower white or tinged with pink, in terminal corymbs, pedicel 2.5-3.5 cm long. Calyx tube urceolate, segments 5, ovate acuminate longer than tube reflexed. Petals 5 white orbicular, long clawed. Stamen numerous. Carpels adnate to calyx pyrifrom or subglobose yellow. Seeds lenticular.


37. CRASSULACEAE

Kalanchoe Adans.

1. Calyx divided less then half way down, flower purple red……………. 2. K. pinnata

2. Calyx divided to the base. Flowers yellow……………………………1. K. integra


A glabrous succulent perennial herb up to 30-90 cm sometimes 1m tall. Leaves opposite fleshy, oblong-spathulate 6-14 cm long, crenate or entire glaucous tinged purple, lower leaves crowded, upper ones distant, sessile, oblong. Flowers large yellow about 1.5-3 cm long, in large terminal corymbs. Calyx lobes 4, nearly to the base, ovate-lanceolate acute. Corlla tubular, tube inflated; lobes 4, spreading.
Stamens 8 adnate to the petals. Disc scales linear. Follicles 4 ovoid-oblong, many seeded enclosed in dry persistent calyx and corolla. Commonly cultivated in the area.


A robust erect or ascending glabrous herb with woody base stem terete or obtusely 4 angular, simple, purple-bloched. Petiole 1-8 cm long. Lower and uppermost leaves simple , middle leave deeply divided or pseudo ternate or pinnately 5- foliolate, ovate-lanceolate to oblong, obtuse crenate bicrenate. Flowers pendent, in lax, panicked cymes. Pedicels 1-1.5 cm long. Calyx purple, terete. Corolla with 8 folds at the base of the tube, greenish in lower base, red in upper, gland hairy, lobes lanceolate, acuminate about 1 cm long. Style 2-4 cm long. Common in shady localities.


### 38. COMBRETACEAE

1. Tree; flower greenish or pale yellow. Petals absent.......................2. *Terminalia*

2. Climbing shrub. Flower pinkish-red, petals 5.........................1. *Quisqualis*

1. *Quisqualis* Linn.


A large climbing or scandent, deciduous shrub; young parts densely tomentose. Leaves opposite, ovate-oblong or elliptic about 6-12 cm long, acuminate
at apex; entire, Petiole 0.4-0.6 cm long. Flowers white, deep pink to red, fragrant, showy, in terminal, drooping spikes, bract elliptic, foliaceous. Calyx 4-6, narrow, petals 5 obovate. Corolla tube 7 cm long. Commonly grown in gardens for ornamental purposes.

Fl. April – Oct. Collection: 222, Bhanwapur

2. Terminalia Linn. nom.cons

1. Fuit tomentose ovoid, without wings………………………………… 1. T. bellirica

1. Fruit glabrous, 6-7 winged:

2. Wings Pf fruit narrow. ………………………………………….. 2. T. arjuna


A large deciduous tree up to 30 m high, bark thick, dark grey. Leaves long about 9 to 28 cm long and 3-14 cm across, alternate, crowded towards the end of branches, elliptic or elliptic-ovate, glabrous when mature, coriaceous, entire, undulate subacute or acuminate, base narrow, petiols long. Flowers pale green-yellow, sessile in solitary or extra axillary, about 7-20 cm long spikes. Calyx teeth triangular, woolly. Inside stamens exserted, Drupes obovoid, grey velvety obscurely angled when dry. Common in the forest area.

L.N. Bahera Fl.: April-June, Fr.: Cold season Collection: 1256. Birdpuhr


A large tree up 30 m tall with smooth pale green to white grey bark. Leaves usually sub opposite, oblong elliptic or sub orbicular about 7-20 cm long acute obtuse,
narrowed towards base, coriaceous, glabrous, lateral nerves 10 -15 or acute, petioles, short with 2 glands near tip. Inflorescence axillary or terminal paniculate spikes 3-6 cm long. Bracteole small, deciduous, linear lanceolate. Flowers yellowish white, sessile. Hypanthium broadly campanulate, about 4-5 mm long, teeth triangular, glabrous. Stamens much exserted. Ovary glabrous disc barbate. Fruit ovoid- oblong, brown with 5 projecting wings, coriaceous narrow wings. Planted as avenues tree. Bark extract useful in diabetes and heart ailments.


39. MYRTACEAE

1. Inflorescence resembling a bottle brush, flowers in spikes......... 1. Callistemon.

1. Inflorescence not as above, flowers solitary; clustered or in umbles heads.

2. Calyx lobes and petals united to form an operculum. Fruits dehiscent capsule .......................... 2. Eucalyptus

2. Calyx lobes and Petals distinct. Fruit a berry:

3. Ovdry 2-3 celled:

4. Flowers greenish white in terminal or lateral panicule.........3. Syzgium

3. Ovary 4-5 celled ................................................................. 4. Psidium


A large, evergreen stiff erect shrub, usually 1-3 m high. Leaves oblong to narrow-elliptic 3-7 cm long, 5-8 mm wide, apex usually short acuminate and pungent, base tapering, venation obvious on both surfaces, glands sometimes conspicuous. Spikes 6-19 cm long, 40-70 mm diam. Filaments bright red, sometimes purplish red or lilac; anthers dark. Capsules 4-7 mm diam.

L.N. Bottle braush   Fl. Nov-Dec   Collection: 24, Mithwal

2. Eucalyptus L. Herit.


Ever green tree up to 30 m tall. Bark grey peeling in thin layers. Juvenile leaves disjunct, broad lanceolate to ovate, glossy green. Adult leaves disjult, narrow-lanceolate or lanceolate, 10-20 cm long, 1-3 cm wide, green dull concolorous. Umbellasters 7 to rarely 11 flowered. Buds cylindrical or fusiform, 10-20 mm long, 4-8 mm in diam, scar present, calyptra conical or elongated acute longer than and as wide as hypanthium. Fruit globose or ovoid, 4 or 5 locular, 4-6 mm long, 4-8 mm in diam; disc raised, valves exserted. Commonly cultivated and also occurs along with road sides.

Fl. & Fr.: Feb-Oct   Collection: 221: Khuniahwa

3. Syzygium (L.) skeels.


Deciduous ever green tree up to 25 m tall, bark grey, smooth, branches terete, pale when dry. Leaves opposite, simple, entire elliptic to broadly oblong smooth, glossy, somewhat leathery, 5-10 cm, 2-5 in, long, short pointed at tips, perioles to 3
cm (1.2 in) long. Leaf midrib prominent, yellowish, blades with many lateral veins, closely parallel. Flowers white to pinkish about 1 cm across (0.5 in) in branched clusters at stem tips; calyx cuplike; petals 4, fused into a cap, stamens many fruit ovoid, berry about 2 cm long, 1-seeded dark purplish red shiny, juicy. Common in forest area also cultivated as avenue tree. Ripe fruit edible seeds used in diabetes.


4. Psidium Linn.

P. guajava L., Sp.Pl.470.1753.FBL2:468.1878 as ‘guyava’

Some deciduous tree up to 8 m tall bark smooth exploiting in thin woody plates young setms 4 angled. Leaves with lamina elliptic to oblong obtuse, entire, 7-12 cm long, 4-6.5 cm wide, apex short acuminate base rounded margins entire glabrescent lateral veins prominent. Oil glands numerous; petiole 5-10 mm long. Inflorescence 1-3 flowered, peduncle 10-20 mm long. Bud spindle-shaped with a constriction below the calyx, 10-15mm long. Petals elliptic to obovate, 10-15mm long, white, stomen as long as the style. Fruit globose, ovoid or pyriform; yellow with pale white or deep pink pulp, crowned by calyx lobes. Commonly occurs near orchids and also cultivated for its fruit edible, decoction of root bark given in diarrhoea. Leaves chewed in throat infections.


40. LYTHRACEAE

1. Shrubs or tree:

2. Flowers 4-merous Stamens 8.............................. 3. Lawsonia

3. Flowers 6- merous Stamens indefinite................. 2. Lagerstroemia
1. Herbs:


1. Ammannia Linn.

1. Flowers peduncled.

2. Flowers and capsules smaller. Petals 4 ………………………..2. A. multiflora

1. Flowers sessile:

2. Leaves narrowed at base …………………………………..1. A. baccifera.

1. A. baccifera Linn. Sp.Pl. 120.1753; Hook f, FBI. 2.569.1875 Nait in Rec. BSI 21(1). 110.1978.

   A erect much branched, glabrous, annual perennial herbs. Leaves opposite, sessile oblong lanceolate to oblanceolate, acute or rounded or attenuate to the base, acute or obtuse at apex; glabrous, 1-6 cm long narrowed at the base. Flowers greenish pink in few, dense flowered; in axillary cymes. Calyx campanulate or obconic subglobose in fruits, teeth 4-5 minute. Petals 0 stamens 4. Style .03 cm long. Capsule depressed- globose, about 1-2 mm acrrose flask shaped irregularly dehiscent. Common in rice fields, river banks; marshy places.

   Paste of the plant rubbed over skin eruptions or rashes.


   A erect simple or much branched annual or perennial herb with quadrangular stem. Leaves opposite narrow oblong to lanceolate 0.5-3 cm long with broad rounded sub cordate base, scabrid on the margin. Peduncles up to 6mm long. Flowers pink to
purple, in axillaries whorls. Pedicels 2-3 mm long. Calyx tube campanulate with 4-8
green lines, lobes triangular, apiculate petals red capsules glulose or subglobose,
exceeding the calyx tube; seeds minute, brown about 1.5-2 mm in diam. Commonly
grows in shallow water.


3. Lagerstroemia

1. Shrubs, leaves up to 5 cm long, calyx not woody in the fruits …………. 1. L. indica

2. Trees; leaves 5-12 cm long, calyx woody in the fruits……………… 2. L. parviflora

1. Lagerstroemia indica L., Syst Nat ed . 10.2:1076.1759; C.B. Clarke in FBI
2:575.1879.

    Deciduous shrub up to 3m high; barks ashy brown, smooth. Leaves alternate
or opposite ovate to obviate or oblong about 3-5cm long, base slightly narrowed,
caudate or obtuse glabrescent; petioles1-3 mm long. Flowers hypanthia pink, purple
or white in panicle. Calyx not woody in fruits teeth small, triangular. Epicalyx lacking
sepals 3.5-6 mm long 2.5-5 mm across in fruit crest. Petals blade 1.6-2.5 cm long,
claw 8-11mm long capsule 10 – 12 mm in diameter. Commonly cultivated in garden.


2. L. parviflora Roxb., Pl. Corom. 1:47. Fl. 66.1795. FBI. 2:575.1879; FUGP.
1:353.1903.

    A deciduous large tree with smooth ash colored barks; young parts pubescent.
Leaves opposite surely alternate towards apex, oblong or ovate lanceolate, 5-12 cm
long entire, acute or acuminate glabrous; lateral nerves 6-10 pairs. Flower white about
5-12 mm across in lax axillaries terminal panicles pedicels slender about 1-3 cm long.
Calyx glabrous or pubescent not ribbed somewhat funnel shaped in fruit; teeth triangular, erect, in fruit, 6-lobed. Petals 6 white, narrow stamens 4-6 longer, other sub equal. Capsules ovoid aciculate 2-3 cm long base partially enclosed by enlarged and woody calyx lobes. Common in the forest area.

L.N. Dhaura Fl. Apr- Jun, Fr. Oct-Jan Collection: 274, Tanuhaar

3. **Lawsonia Linn.**


A fragrant shrub up to 2 or more in highly bark greyish-brown; branchlets angular. Leaves elliptic, ovate or obovate, acute, obtuse or subacuminate, 1.5 to 4 cm long, sessile or subsessile, narrow at the base, coriaceous. Flowers whitish, turn yellow after picking, pungent smelled, in large corymbose branches, terminal panicles. Calyx pink, lobes ovate, persistent. Petals oblong, wrinkled, greenish-white. Stamens usually 8, inserted in pairs between the petals. Capsules coriaceous, globose, 4-8 mm in diameter, wall veined, irregularly dehiscent. Seeds many, angular pyramidal, brown. Commonly cultivated as a hedge plant.

Leaves used as dye for hairs, nail and skin; leaf paste applied on wounds and cuts.


41. **PUNICACEAE**

**Punica Linn.**

1. Ovary inferior; stamens many ............................... *P. granatum*

A small deciduous shrub or small trees, about 4-10m tall, branched and twigs smooth, with sharp thorns; bark pale-grey. Leaves opposite, oblong-elliptic, ob lanceolate, about 2 to 7 cm long, glabrous, shining above, paler beneath, base narrowed to a short petiole, lateral nerve in distinct. Flowers scarlet red or white, conspicuous about 3 cm or more in length. Calyx tube thick, red or dark pink, 5-7 lobed, petals 5-7, obovate, wrinkled, orange or bright red. Stamens numerous, inserted in the calyx-tube. Filaments multisieriate, persistent, ovary subglobose; style thick, reddish, stigma simple; slightly bilobed. Fruit globose, 2-8 cm in diameter or small in wild forms, pale red to scarlet, or brownish, partitioned by thin leathery yellow septa, the rind thick and coriaceous. Seeds red or pink about 10mm long, angular, testa thick, fleshy, juicy. Common in wild state and cultivated also for its fruit.

L.N.- Anar    Fl.: Apr-Jun; Fr. Jul-Dec          Collection: 603, Naugarh

42. ONAGRACEAE

1. Seeds comose ................................................................. 1. Epilobium

2. Seeds not comose:

2. Flowers yellow or white...................................................... 2. Ludwigia

1. Epilobium Linn.


A erect robust perennial herb, about 30-90 cm tall, brances covered throughout with dense spreading long villous hairs, often mixed with short gland-tipped hairs, especially on upper stem, or rarely much less hairy. Leaves oblong lanceolate lanceolate, 2-12 cm long, dense villous-pubescent, coarsely serrulate, acute apex,
subcuneate base, sessile and clasping. Inflorescence erect and branched. Flowers erect, ovaries densely villous and glandular pubescent, 2 to 4 cm long. Sepals apiculate, densely pubescent recurved, exserted beyond the anthers. Capsule 3-10 cm long, on pedicel about .5-2 cm long, villous. Seeds about 1 mm long, coarsely papillate, with in conspicuous short chalazal collar, dull white. Commonly occurs in moist places.

L.N.- Meelu  Fl.: Jun-Sep, Fr.: Jul-Sep  Collection:21, Khasraha

2. Ludwigia Linn.


A erect perennial, branched herbs upto 4 m tall, woody at base sometime. Leaves sessile, alternate, narrow-linear to ovate, about 1.5 to 5.4 cm long, lower ones longer, toothed or lobed; acute apex, narrowed into a short petiole at base. Flowers solitary, showy, in upper leaf axis, bracteoles often bristle-like, pedicels 4-5mm long or more in fruits. Calyx tube 8-10 mm long above the ovary, 4-partile, hairy outside. Petals 4, obovate or rounded, obtuse, 4-10 mm. Stamen 8. stigma 4 cleft. Capsules clavate, sharply angled, about 1 to 1.5 cm long; seeds minute, without hairs. Common in open waste places, roadsides

Fl. : March-Sept; Fr.: Oct-Nov  Collection:-1094, Khuniyaon

43. TRAPACEAE

Trapa Linn.

1. Aguatic herbs; ovary inferior or half-inferior; stamens 4……T. natans var. bispinosa

An aquatic herb. Stem long flexuose, ascending in the water. The more submerged portions giving off at intervals pairs of green, pectinate spreading organs from below the margins of the scars of fallen leaves. Leaves alternate; arranged in rosette, rhomboidal, glabrous above, glabrous to hairy beneath, petioles spongy near the top. Flowers white, pedunculate. Calyx tube adnate to the lower half of the ovary; segments 4 in two pairs, outer pair persistent becoming spinous in fruit. Petals 4, obovate-oblong. Stamens 4, inserted outside the lobes of epigynous disc. Fruit one-seeded drupes. Ripening under water, drups angled, beaked at apex and with sharp spiny horns on either sides. Wild or cultivated in ponds for its fruit. Fruit eaten raw or cooked.

L.N. - Singhara Fl.&Fr.- Sept-Dec Collection: 104, Itwa

44. CARICACEAE

Carica Linn.

1. Small tree or shrubs with milky juice, petals united into a slender tube; ovary superior; fruit a large, pulpy berry………………………………………………………… C. papaya.


A soft tree, with milky juice, stem simple hollow, with leaf scares, succulent, branched terminated by clusters of leaves. Leaves digitate, crowded at apices of stems, lobes pinnatifolobed-partite, swollen at base. Female flowers solitary or in clusters of few flowers; male flowers, several, in long drooping panicles. Calyx 5
toothed small, truncate. Petals 5, fleshy, light yellow, united into a slender tube. Stamens 10, inserted on the petal base; filaments free; anthers opening longhwise. Ovary superior, sessile, 1-locular, with many-ovules in parietal placentae. Fruit pulpy, berry-pepo, ovoid or oblong, 8-30 cm long, fleshy, with large hollow cavity; seeds many small turn black at maturity. Widely cultivated in India for its fruit.

L.N.- Papeeta Fl.&Fr.-Almost through the year Collection: 1088, Uska Bazar

45. CUCURBITACEAE

1. Tendrils simple; flowers white; anthers coherent at base ............... 3. Coccinia

1. Tendrils 2. many fid; flowers yellow; anthers united into a column……5. Cucurbita

2. Anther cells arcuate, connectived produced................................. 6. Mukia

3. Petals entire; calyx subcampanulate; fruits without beak............7. Lagenaria

3. Petals fim briate; calyx tubular; fruits with apical beak..........8. Trichosanthes

4. Fruits fibrous, dry, operculate................................................. 8. Luffa

5. Petal scales present, fruits with fleshy tubercles........... 10. Momordica

6. Stamens inserted near the mouth of calyx-tube .......1. Benincasa

6. Stamens inserted near the mouth or base of calyx-tube:

7. Leaves reniform-sub orbicular.

8. Tendril simple.........................................................4. Cucumis

8. Tendril bifid:

7. Leaves ovate-trifid......................................................2. Citrullus

1. BENINCASA Savi


Patent hairy annual trailing or climbing herb with soft hair, tendril 2-fid. Leaves broadly ovate-reniform, orbicular, more or less deeply 5-lobed, hispid beneath. Bracts opposite the tendril, ovate. Flowers large, yellow solitary. Calyx tube 0.4-0.5 cm long, lobes subulate, about .2 to .3 cm long. Corolla 6-10 cm across, densely villous on the throat. Stamens 3; filaments angular. Female flowers with oblong, densely hairy ovary. Fruits large, fleshy, ellipsoid, dark-green with white bloom. Commonly cultivated, often met with an escape in waste lands and along with roadsides.

Seeds given in gonorrhoea.


2. *Citrullus Schard. nom. cons.*

1. Fruits not depressed at each end, smooth, more than 10 cm in diameter.............................................................. C. lanatus


Annual. Stem with patent hair towards the apex. Tendrils 2-fid. Leaves ovate, 3-fid; segments 1-2 pinnatifid, with lobulate or undulate lobes. Pedicels of male flower up to 2.5 m long. Bract boat shaped, 1-2 cm long. Female flowers: pedicel up to 1.5 cm long. Calyx-lobes lanceolate. Corolla 1-1.5 cm long, pilose. Fruit subglobose or ellipsoid, up to 25 cm across or more, with sweet, red or yellow, watery pulp. Variable in shape and size. Commonly cultivated.
3. Coccinia Wt. and Arn.


A perennial, climbing herb with tuberous roots; tendrils simple, rarely 2-fid. Leaves ovate, dotted at base, shallowly 5-partile, 3 to 8 cm across, segments denticulate, pellucid dothed; petioles 2-3 cm long. Flowers white, 2.5-3.8 cm long; male flowers 1-3, in the axils of leaves. Stamens 3, included; anthers united in S-shape. Female flowers, solitary; calyx tube campanulate lobes patent. Fruit ellipsoid-oblong-cylindrical, with rounded ends, green with white strips, orange-red on ripening, smooth, seeds many compressed, margined, embedded in red pulp. Common in waste places, road sides.

Leaves and root juice given in diabetes; leaves also used as antiseptic; fruit juice given in gonorrhoea.


4. Cucumis Linn.

1. Lobes of leaves obtuse; Fruit not tubercled:

1. Plants much hispid, fruit spherical ........................................... 1. *C. melo*

2. Plant less hispid; fruits cylindrical or oblong

3. Fruits smooth, not ribbed, oblong .................... 2. *C. melo* var* momordica*

3. Fruits ribbed cylindric ........................................3. *C. melo* var* utilissimus*

1. Lobes of leaves acute of acuminate. Fruits tubercled when young.......4. *C. sativus*

Annual, slender, hispid herbs. Leaves broadly ovate, suborbicular, deeply cordate at base, sinuately 3(5) lobed, denticulate, both surfaces, villous-hispid; petioles of variable length. Flowers yellow; male flowers in fasicles. Calyx hispid, lobes subulate. Corolla lobes pubescent. Stamens 3. Female flowers solitary, axillary, rarely in 2. Fruits ovoid-ellipsoid, glabrescent on maturation, varies in size, with irregular blotches of longitudinal lines. Commonly occurs near moist places.


   Fruits oval or cylindrical, smooth, yellow in colour, often spotted with dark green, when ripe bursts spontaneously, varies in size from 30-60 x 7-15 cm. The young fruits resemble the cucumber. The flesh is mealy and insipid. The young fruit is used as a substitute for the cucumber or cooked as vegetable. Although it is inferior to the melon, the fruit is eaten on ripening. Commonly cultivated in fields.


3. **C.melo** Linn. var.utilissimus. Duthie & Fuller, op.cit. 2:55, tt.53,54.1883.


   It differ in the shape of the fruit which varies from oval or cylindrical to elongate, straight or curved, dark green to nearly white, bright orange when ripe.


Annual, trailing or climbing herb. Stem angular, with scabridulous hairs. Leaves ovate, 12-18 cm long., 3-8-lobed, -lobes acute, hispidulous or scabridulous on both surfaces; petiole elongated, 8-20 mm long. Sepals spreading. Corolla c. 2.5 cm long, lobes oblong-lanceolate. Anthers 3-4 mm long. Female flowers solitary or rarely fascicled. Ovary fusiform, muricate. Fruit oblong and obscurely trigonous or cylindric, when young sparsely tuberculated, otherwise smooth and glabrous. Commonly cultivated for its fruit. Fruit edible.


5. *Cucurbita* Linn.

1. Calyx segments linear, lanceolate or subulate. Fruiting peduncle circular, spongy or corky, striated, not expanded at the attachment .................. 1. *Cucurbita maxima*

1. Calyx segments broad, spathulate or foliaceous. Fruiting peduncle stout, hard, 5-6-angled, expanded at the attachment ........................ 2 *Cucurbita moschata*.


Annual. Leaves shallowly 5-lobed or subentire, coarsely hairy on both surfaces with hispidulous soft hairs, margin densely and minutely dentate. Petiole hairy, not pungent. Flowers faintly scented. Calyx lobes linear. Fruiting peduncle circular, striated, corky or spongy, not expanded at the attachment. Fruit generally oval or rounded, bluntly ribbed, large, upto c. 2 m in diameter; flesh yellow or reddish
when ripe. Seeds white, brown or bronze, strongly marginate. Commonly cultivated for its fruit. Seeds considered as antielmintic, edible.

L.N.: Meetha kaddu  Fl.&Fr.: JUL-OCT  Collection:-234, Itwa.


Cogn., l.c. 546; Clarke l.c. 622; Chakravarty, l.c. 123; R.R. Stewart, l.c.; C. Jeffrey, l.c var. **Cucurbita pepo** var. *moschata* Duch. ex Lam.

Petiole without pungent hairs. Leaves 5-7-lobed, lobes acute, with whitish blotches on upper surface, valvety hairy, tendrils branched. Calyx segments spatulate or foliaceous. Flowers large yellow. Fruiting peduncle stout, hard, 5-6-angled, expanded at the attachment to the fruit. Fruits of various size, shape and colour, usually oblong and constricted. Seeds greyish white or tan in colour, margin dark. Commonly cultivated for its fruit.


Annual, procumbent, hispid herbs. Leaves with fistular petioles; reniform-suborbicular, 5(7) lobed, lobes quit prominent, cut more than half way, pubescent on both surfaces; tendrils branched. Flowers yellow with angular pedicels, which expand the top; dioecious. Stamens 3. Fruits large, usually furrowed, green with yellow patches, yellow-light pinkish on maturity. Cultivated as vegetables. The leaf juice applied on burns.


6. **Mukia Arn.**

Perennial, monoecious, climbing or trailing up to 3 m; stem bristly-hairy. Tendrils simple, filiform. Leaves sagittate, hastate, subtriangular to ovate in outline, usually ± cordate, (12-) 15-90 (-100) mm long, and about as broad, ± 5-lobed to almost unlobed, sinuate-dentate to irregularly lobulate-dentate, scabrid; middle lobe longest, triangular; lateral lobes ovate-triangular; petiole 3-80 mm long. Flowers on 1-3 mm long pedicels; calyx tube 1-2 mm long, lobes 1 mm long; petals 1-2 x 1-1.2 mm. Berries 1-7, subsessile, axillary, clustered, subglobose, scarlet, smooth, glabrous, bristly when young, 5-11 mm in diameter. Seeds ovate, c. twice as long as broad. Common in waste places. Fruit - vegetable given in malaria fever and urinary disorders.


7. Lagenaria Ser. in Mem. Soc


Annual, climber or trailer. Tendril 2-fid. Stem densely hairy. Leaves palmate, broadly ovate, reniform or sub-ornicular, cordate, obscurely 3-5-lobed, lobes rounded, 3.0-23 x 4-23 cm; petiole 2.7-13 cm long with a pair of small apical lateral conical glands. Both male and female flowers solitary; male penduncle as long as petiole, female somewhat shorter. Corolla white, petals of male flower obovate, apiculate, 2.7-
4.5 cm long, 1.8-3.7 cm broad. Staminal filaments 3-4 mm long; anthers oblong, coherent, included; thecae triplicate. Petals of female flowers c. 30 x 24 mm. Ovary ovoid, villous, 11-17 mm long, 6-8 mm across. Fruit large, subglobose, ellipsoid, lageniform, sometimes biventricose, green or greenish-yellow, hairy, indehiscent. Seeds white, oblong, compressed, slightly tapered, slightly 2-horned on the shoulders, 7-20 mm long. Commonly cultivated.


8. Luffa Mill.

1. Stamens 5. Flowers deep yellow. Fruit cylindrical, not angled...2. Luffa cylindrica

1. Stamens 3. Flowers pale yellow. Fruit clavate, acutely 10-angled:

2. Petals distinctly emarginate. Fruit (10-) 15-30 (-45) cm long, 5-8 cm...........

.......................................................... 1. Luffa acutangula var. acutangula.


Annual, climber with mostly 3-fid subscabrous tendrils. Stem 5-angled, scabrous along ribs. Leaves pale green, roundish, palmately 5-7-lobed, 15-20 cm across, glabrous; petiole 8-12 cm long. Probracts fleshy with 3-10, glistening glands on upper surface, 3-7 mm long, 2-4 mm broad. Flowers pale yellow, pedicellate, c. 4.5 cm across. Male raceme 10-15 cm long, erect, axillary 10-20-flowered, female flowers solitary in same axil as males. Calyx tube pentagonal, slightly hairy, lobes equal to slightly longer than tube. Petals obcordate, c. 2 cm long, 2-2.5 cm broad, emarginate or not. Stamens 3, filaments c. 4 mm long. Ovary 10-angled. Fruit (10-) 15-30 (-45) cm long, 6-10 cm in diameter, acutely 10-angled. Seeds black, 10-12 mm long, 6-8 mm broad, rugose, emarginate. Commonly cultivated for edible fruit.

Annual, climber or trailer. Tendrils slightly pubescent, 3-6-fid. Stem 5-angled, finely hairy to glabrous. Leaves palmately 5-lobed, dark green, orbicular-cordate, 8-25 cm across, lobes triangular, lanceolate, acute-apiculate, entire or sinuate, scabrous. Petiole 5-15 cm long. Flowers bright yellow, pedicellate, 5-6 cm across; male racemose, racemes axillary, 12-25 cm long, 15-20-flowered, female flowers in the same axil as males. Probrract fleshy, ovate, with 3-7 glistening glands on the upper surface. Calyx tube short, broadly campanulate, slightly pubescent; lobes triangular-lanceolate, longer than tube. Petals obovate-cuneiform, 2.5-3.5 cm long, 1-2.5 cm broad, obtuse. Stamens 3-5, filaments 6-8 mm long. Ovary cylindrical, finely appressed hairy. Fruit cylindrical and fusiform, 20-50 cm long, 6-10 cm across, smooth. Seeds dull black, elliptic-ovoid, c. 10-12 mm long, 6-8 mm broad, with c. 1 mm wide margin. Commonly cultivated.


9. **Trichosanthes Linn.**

**Trichosanthes dioca** Roxb., Fl. Ind 2.3:701. 1832; FBI 2:609. 1879; FUGP 1:364. 1903; HFD 205. 1977.

Scrabous climbers; t endrils 2-4 fid Leaves ovate-cordate, about 7-10 cm long, sinuate-dentate, acute, scabrous on both surface; petioles 1.5-2 cm long. Maleflowers solitary or in two, peduncles hairy; female flowers solitary. Calyx 3.5-4


10. Momordica Linn

1. Flowers monoecious. Fruit tuberculate:


2. Bracts of the male flowers about the middle or below the middle of the pedicel, reniform or orbicular-cordate, mucronate, entire……… 2. Momordica charantia

1. **Momordica dioica** Roxb. ex Willd., Sp. Pl. 4:605. 1805. DC., l.c. 312; Roxb., Fl. Ind. 3:709. 1832; Clarke in Hook. f., Fl. Brit. Ind. 2:617. 1879; Cooke, l.c. 563; Chakravarty, l.c. 91; R.R. Stewart, l.c.; C. Jeffrey, l.c. 790.

   Perennial climbers with unbranched, glabrous tendrils, dioecious. Root tuberous. Leaves broadly ovate, membranous, c. 6.0 x 5.0 cm, glabrous on both sides, deeply 3-5-lobed, lobes triangular ovate or oblong, acute, with undulate or minutely remotely denticulate margin; petiole 1-3 cm long, puberulous. Male flowers 5-6 cm across, yellow, on 4-6 cm long peduncles; bracts large, sessile, entire, glabrous, often ciliated or villous on both surfaces, cucullate, suborbicular or reniform, partly enclosing the flower. Petals 2-3 x 1.5-2.5 cm, obtuse. Female flowers yellow, on c. 2.5 cm long, ebracteate or minutely bracteate peduncles; calyx lobes linear-lanceolate, 5-6 mm long, villous; corolla similar to male flowers. Ovary ovoid, covered with long and soft papillae. Fruit ovoid or ellipsoid, 3-5 cm long, 2-3.5 cm across, yellow when mature, densely covered with soft spines, shortly beaked (rostrate) at apex. Seeds
somewhat compressed, 6-7 x 5-6 mm, irregularly corrugated. Common nearby villages.


2. **Momordica charantia** Linn., Sp. Pl. 1009. 1753. Clarke in Hook. f., l.c. 116; Cogn. in A. & C. DC., Monogr. Phan. 3:436. 1881; Cooke, l.c. 616; Chakravarty, l.c. 88; R.R. Stewart, l.c. 706; C. Jeffrey, l.c. 789.

   Annual, monoecious, climber or trailer with unbranched tendrils. Stem glabrous or hairy. Leaves suborbicular to orbicular, 5-10(-12) cm long and broad, mucronate-dentate, deeply 5-7-lobed, lobes ovate-long or ovate-elliptic, glabrous or pubescent, acute, base constricted. Petiole 1.5-3.5 (-6) cm long, villous. Flowers yellow, c. 3 cm across, solitary, male peduncles c. 7.0 cm long, bearing the bracts about the middle or below the middle. Calyx pubescent. Corolla slightly zygomorphic, with obovate, obtuse lobes. Ovary fusiform, muricate. Fruit oblong-fusiform or oval, 7-25 cm long, dehiscent. Seeds oblong, 1-1.5 cm long, 6-9 mm broad, embedded in red pulp, sculptured. Commonly cultivated and also occurs near waste places. The fruits are considered tonic, stomachic and carminative, they are used in rheumatism, gout and diseases of liver and spleen. The immature fruit is very commonly eaten during epidemics of small-pox as it is supposed to have a preventive effect.

L.N.: Karela  Fl. & Fr.: April-Nov  Collection: 09, Naugarh.

46. **CACTACEAE**

**Opuntia dillenii**
Opuntia dillenii var. Cactus dillenii Ker Gawler, Bot. Reg. 3: t. 255. 1818; Opuntia stricta (Haworth) Haworth var. dillenii (Ker Gawler) L. Benson.

Shrubs sprawling or erect, 1-3 m tall. Trunk absent or short. Larger, terminal joints green to gray-green, obovate or elliptic-obovate to suborbicular, 10-35(-40) × 7.5-20(-25) cm. Areoles 2-9 mm in diam. Spines 1-12(-20) per areole on most areoles, spreading, yellow, ± brown banded or mottled, subulate, straight or curved, 1.2-4(-6) cm, basally flattened; glochids yellow. Leaves subulate, 4.5-6 mm, deciduous. Flowers 5-9 cm in diam. Sepaloids greenish with yellow margin, broadly deltoid-obovate to obovate, 10-25 × 6-12 mm, margin entire or slightly crisped, apex mucronate. Petaloids spreading, bright yellow, obovate or cuneate-obovate, 25-30 × 12-20 mm, margin entire or slightly undulate, apex rounded, truncate, or emarginate. Filaments yellow, ca. 12 mm; anthers yellow, ca. 1.5 mm. Style yellow or yellowish, 12-20 mm; stigmas 5, pale green, ca. 4.5 mm. Fruit purple, turbinate to obovoid, 4-6 × 2.5-3(-4) cm, fleshy at maturity, umbilicus deep. Seeds light tan, irregularly orbicular, 4-5 × 4-4.5 mm.


47. MOLLUGINACEAE


2. Leaves pseudo-verticillate, alternate or basal. ................................. 2. Mollugo.


Annual procumbent herb up to 40 cm long, with stellate woolly parts. Leaves sub-verticillate, 0.6-2.0 cm long, 0.5-1.8 cm broad, orbiculate or more or less cuneate, often mucronate; petiole 2-8 mm long. Flowers in axillary clusters of 5(-6), sub-
sessile; pedicel up to 1.5 mm long. Sepals 4-4.5 mm long, up to 7 mm in fruit, persistent, ovate to ovate-oblong, apiculate, imbricate. Fertile stamens 12; filaments 2-3.5 mm long, unequal, persistent; anthers less than 1 mm long, bilobed. Ovary c. 2 mm long, ovoid. Stigmas 5 (4), linear, c. 1 mm long, persistent. Capsule sub-globose or oblong, c. 6 mm long, membranous, enclosed in the sepals. Seeds many, less than 1 mm long, tuberculate, strophiolate, with a curved linear appendage c. 3/4 the size of the seed. The tender shoots can be eaten as a pot herb. Also used in medicine and as fodder for goats.


2. **Mollugo Linn.**


1. **Mollugo cerviana** (L.) Seringe in DC. Prodr. 1:392. 1824. C.B. Clarke, l.c. 663; Jafri, l.c. 191; J. Cullen, l.c.

Annual up to 15 cm tall. Stem ascending, branched, glabrous, wiry. Leaves up to 11 per node, linear, 0.6-2.0 cm long, c. 1 mm broad; stipules caducous. Pedicel up to 14 mm long, slender, glabrous. Bracts linear, c. 1 mm long. Sepals free, up to 2 mm long in fruit, slightly inflexed, margin white, elliptic-oblong. Stamens 5, alternating with the sepals; filaments dilated at the base, slightly longer than the sepals. Ovary c. 1.1 mm long, ovoid. Stigmas 3, short. Capsule sub-globose, c. 2.5 mm broad, slightly longer than the sepals, dehiscing by 3 valves; valves slightly retuse. Seed less than 1 mm, slightly curved, light brown, reticulate and shiny.


Annual up to 24 cm tall. Stem and branches slender, glabrous. Leaves cauline and ramal, pseudo-verticillate, 1.2-4.0 cm long, 1.5 mm broad, elliptic lanceolate. Sepals 1.5-2 mm long, elliptic ovate. Stamens 5, antisepalous, c. 1.2 mm long; filaments dilated at the base, anthers less than 1 mm long, basifixed, dehiscing longitudinally. Ovary sub-globose, c. 1.5 mm broad, Fruit c. 9 mm broad, membranous. Seed less than 1 mm long, granulate, dark brown. Common in waste places, grassy localities.

Fl: Per.: September-October  
Collection:-567, Lotan

**48. AIZOACEAE**

Flowers solitary; petiole with green basal sheath; leaves scarcely succulent, more than 4 mm wide *Trianthema portulacastrum*


Procumbent or ascending herb; stems 50 c. or more long, glabrous or sparsely hairy. Leaves elliptic to obovate; lamina to 50 mm long, to 40 mm wide, sometimes apiculate; petiole 2–5 mm long, expanded and fused with leaf base to form a cup. Flowers ± hidden in and fused to leaf sheath. Perianth lobes 2–4 mm long, pink to white.. Stamens 10–20 Fruit with 3 or 4 irregular projections; operculum truncate with a toothed rim, 2–3 mm long; seeds 3–12, dull black, 1 or 2 in operculum, others in base. Common in waste places.

L.N.:- Giant Pigweed, Black Pigweed  
Fl. & Fr.: Jun.-Dec.
49. APIACEAE

1. Leaves simple; umbels simple; flowers pink ............................. 4. Centella

1. Leaves compound; umbls compound:

   2. Fruits laterally compressed ............................................. 4. Seseli

   2. Fruits not laterally compressed.

      3. Flowers yellow, ultimate, leaf segments linear

         4. Fruits oblong or ellipsoid, the ribs not winged ............. 1. Foeniculum

         4. Fruits dorsally compressed and narrowly winged. ............ 2. Ancthum

      3. Flowers white; ultimate leaf segments not linear ............ 3. Oenanthe

         5. Fruit bristly .......................................................... 7. Daucus

         6. Fruit subglobose; bracts absent. ......................... 5. Coriandrum


    Plants perennial. Leaves much dissected, 3-4-pinnate; segments filiform to linear. Bracts and bractlets lacking. Peduncles terminal and lateral. Calyx teeth obsolete. Petals yellow. Fruit elliptic to oblong, terete; stylopodium conical; styles very short; fruit ridges distinct; furrows 1-vittate; commissure 2-vittate. Inner seed face plane to slightly concave. Widely cultivated. Fruit is used as spice and flower with wild water given during teething.


Annual herb 40–170 cm high, glaucescent, strongly aromatic. Leaves 3–4-pinnate, oblong to obovate in outline, 13–35 cm long, 10–12 cm wide; lobes narrow-linear, 4–20 mm long, < 0.5 mm wide, often recurved and tangled; sheath broad, loosely clasping and often recurved. Compound umbels 7–12 cm diam.; peduncle 7–16 cm long; rays 10–45, unequal, 2.5–16 cm long; pedicels subequal, 6–20 mm long. Petals c. 0.7 mm long, yellow. Fruit ovoid or broad-oblung, 3.5–6 mm long, 2–2.5 mm wide, the broad back 3-ribbed between winged lateral ribs. Usually grown in waste places.


3. Oenanthe Linn.

Oenanthe javanica (Blume) DC., Prodr. 4:138. 1830. Hiroe, l.c

Erect to decumbent, c. 1 m tall, glabrous herbs. Stem stoloniferous, rooting at the nodes; roots fibrous. Upper leaves ternate; lower pinnate; leaflets oval to ovate; margin serrate. Umbels leaf opposed. Rays 10-20, stout. Calyx teeth distinct, linear, persistent. Pedicels 2-4 times longer than the flowers. Stylopodium conical, surrounded by the calyx teeth; styles 2 mm long. Fruit oblong, c. 2 mm long, 1 mm broad; dorsal and intermediate ridges obtuse, not prominent, lateral corky. The plant grows wild in freshwater marshes and swampy fields, and along ditches, canals, and streams. The tops are eaten raw in salads or as a garnish similar to parsley. The young stems and leaves are also steamed with rice, or boiled and chopped as greens. There are many oriental recipes that include this vegetable.


4. Centella Linn.

Centella asiatica (L.) Urban in Mart. & Eichl., Fl. Bras. 11:287. 1879. Hiroe, 1. c.
A small creeping perennial herb. Stem creeping, rooting at the nodes, glabrous to finely pubescent. Leaves cordate or circular 1–4 cm long and wide, simple, reniform, long petioled; dorsal surface with minute hair clusters; margin repand; leaf bases sheathing; petioles arachnoid. Inflorescence glabrate to finely arachnoid. Involucre of 2 ovate bracts. Umbels 2-4 flowered. Flowers white. Calyx teeth obsolete. Stylopodium depressed, purplish; styles short. Fruit ovate to orbicular, 2-3 mm long; primary ridges prominent, secondary forming a network; vittae not distinct. Common in shady places. Plant juice is used in the treatment of mental disorders and as a blood purifier; leaf paste is applied for skin diseases.


5. Coriandrum Linn.

Coriandrum sativum Linn., Sp. Pl. 256. 1753. Boiss., l.c.; C.B. Clarke, l.c

Erect herb 15–35 cm high, glabrous. Lower leaves 1–2-pinnate, 2–6 cm long; long petiolate, sheathing at base; leaflets oblong to ovate, margins serrate. Leaves subtending inflorescences dissected, sessile to short petiolate; segments narrow-linear, margins entire. Inflorescence a compound umbel with 3–4 rays; rays 8–14 mm long; bracts few or absent, bracteoles simple, reflexed. Umbellules with 6–16 bisexual flowers and up to six smaller male flowers. Peduncles 10–24 mm long. Sepals 0.2–1.9 mm long. Petals white; three outer petals in the peripheral flowers of each outer umbellule elongated with "wings"; 32–42 mm long; inner petals 11–14 mm long. Fruit 3.2–3.5 mm long, mericarps with five primary ribs alternating with 4 secondary ribs. Cultivated and also occurs in waste places. Leaves and fruits used as spice; the fruit is used in digestive disorders.

6. Cuminum Linn.

**Cuminum cyminum** Linn., Sp. Pl. 254. 1753. Boiss., l.c. 1080; C.B. Clarke in Hook. f.

Annual, glabrous, erect herbs upto 15-30 cm tall, branched. Leaves much divided into filiform segments. Involucre of 5-6 linear, entire or ternate bracts with linear segments. Rays 3-6, 5 mm to 1 cm long. Involucel of long linear, white margined bractlets, 5-10 mm long. Calyx teeth prominent, acute, persistent. Petals rose coloured, unequal. Fruit oblong, 5-6 mm long, setulose; stylopodium conical; styles short, erect; vittae solitary under the secondary ridges; commissure 2-vittate. Seed - cooked as a flavouring. Commonly occurs near waste places.


7. Daucus Linn.


Plants biennial, glabrous herb about 15 cm to 1 m tall. Root a thick tap-root. Stem glabrous to pilose; hairs white. Leaves compound, 2-3-pinnate, hispid; segments linear to oval; margin deeply toothed; tips mucronate. Peduncles up to 30 cm long, hispid. Involucre of pinnately divided bracts, up to 5 cm long; segments filiform to linear. Rays numerous, the outer longer, incurved. Involucel of undivided or divided bractlets; margins entire or ciliate. Calyx teeth minute. Petals white to yellowish or light purple, the outer radiate; the petals of the central flower of an umbel sometimes red. Ovary hispid; styles 0.5 to 1 mm long. Fruit ovoid, 2-3 mm long; primary ridges not prominent, slightly bristly; secondary ridges winged, spiny; spines white; one vitta
under each secondary ridge; commissure 2-vittate. Common in waste places. Roots used as vegetable.


**8. Seseli Linn.**


Annual, 15-30 cm tall, pubescent. Leaves bipinnate; segments ovate. Involucr of 5 linear pubescent bracts, c. cm long. Rays 10-16, pubescent. Involucel of 5-8 linear bractlets, 5-6 mm long. Calyx teeth minute. Fruit c. 2 mm long, hispid; ridges prominent. Commonly occurs near river banks.

Collection: 345, Shoratgarh.

**GAMOPETALAE**

**50. RUBIACEAE**

1. Ovules many in each cell:

2. Flowers in dense globose heads:

3. Bracteoles present:

4. Calyx limb entire, stigma mitriform …………………. 6. Mitragyna

5. Short or tall shrubs:

6. One calyx lobe expanded into a coloured leaf…… 3. Mussaenda

1. Ovules solitary in each cell:

7. Flowers in dense corymbs, red; corolla lobes twisted in bud

............................................................... 2. Ixora


7. Capsule 5-valved at the base


1. Ovary5-loculed.Placentationaxile........................................1 Hamelia

1. Hamelia Jacquin,


Evergreen shrub or small tree, up to c. 3 m, young branches angular, pubescent-puberulous or villous. Stipules 3-4 mm long. Leaves in whorls of 4, 3-12 x 2-4 cm, elliptic, oblong or oblong-ovate, glabrous-tomentose beneath, glabrate-glabrous above, rarely sparsely hairy, acute or acuminate, entire. Inflorescence terminal, compound scorpoid cymes. Flowers 2-3 cm long, scarlet, pedicel c. 1 mm long. Hypanthium bell shaped, 4.5 mm long, pubescent, lobes minute, deltoid. Corolla tubular, c. 1.5 cm long, 5-ridged, shortly 5-lobed. Stamens 5, filaments adnate near the middle of the corolla-tube, c. 3 mm long. Ovary surrounded by thick conical disc. Style 1.5 mm long. Fruit ellipsoid-oblong or globose, berry, c. 8 mm long, red in colour. Seeds brown or yellowish brown.Commonly cultivated.

Fl.& Fr.: Almost throughout the year. Collection:-322, Bansi.

2. Ixora *Linn.
2. Style densely pubescent. Calyx-teeth minute, shorter than the tube.

1. Style glabrous. Calyx-teeth equalling the tube:

2. Leaves sessile, obtuse or mucronate with ± 8 pairs of lateral nerves.

1. **Ixora pavetta** Andr., Rep. t. 78. 1799.

   Branched small tree, bark dark coloured, scabrous, younger branches glabrous. Leaves opposite, 7-15 x 3.5–6.5 cm, glabrous, obtuse or shortly acuminate; petiole c. 5 mm long. Inflorescence corymbiform terminal panicle. Flowers sessile, c. 64 mm long, fragrant, white or scarlet. Calyx minute, teeth very small, obtuse. Corolla-tube filiform, c. 6 mm long, glabrous, lobes 4, reflexed. Filaments c. 0.5 mm; anthers ± equalling the corolla-lobes. Style densely pubescent. exserted; stigma biforked. Fruit globose, 2-seeded, somewhat didymous, black when ripe (not seen). Cultivated in gardens as an ornamental plant.


   Branched shrub, up to 1 in tall; branches glabrous. Leaves mostly sessile, opposite deccussate, 4-8-(16) x 1.5-6.5 cm. entire, apiculate, obtuse or mucronate, 8-15 pairs at lateral nerves, glabrous; stipules triangular, cuspidate or awned. Inflorescence terminal dense corymbiform cymes, peduncle very short or absent; bracts c. 8 mm long. Flowers sessile, bright scarlet hypanthium 1-1.5 mm long,
glabrescent, teeth, c. 0.5 mm long, corolla-tube, 2.5-4.0 cm long, 1.5 mm wide, glabrous, lobes 8-10 x 4-5 mm, twisted in bud, throat glabrous. Stamens 4, inserted on the throat of corolla-tube, filaments very short, anthers deciduous, dehiscing just after opening of the flower when the stigma is immature, c. 2 mm long. Style exserted; stigma 1.5 mm long. Fruit globose, red when ripe, crowned with the calyx teeth. Seeds 2, planoconvex, rough and scaly. Commonly cultivated in gardens. roots are also used medicinally.

Fl.& Fr.: Throughout the year. Collection:-441, Birdpur.

3. Mussaenda L.

*Mussaenda flava* (Verdc.) Balch. f. in Blumea.

A planted shrub, branches covered with long appressed hairs. Leaves 4-9 x 1.5-3.5 cm, oblong, lanceolate, acuminate, sparsely pubescent above and pubescent on nerves beneath, petiole 1-2 mm, stipules subulate. Inflorescence a corymb. Calyx hairy, tube c. 2.5 mm long; 5-lobed, lobes c. 3 mm long, subulate, one is generally expanded in a yellow leaf-like structure, 1.5-3.5 x 1-2.5 cm, and stalk 1.5-2 cm long. Corolla pale yellow, tube 2-2.5 cm long, pubescent, mouth villous, 5-lobed, lobes ovate and acuminate, c. 6 x 2.5 cm; style divided into two stigmatic lobes. Fruit an oblong capsule, 7 x 5 mm, loculicidal, 2-valved. Commonly cultivated in gardens.

Collection:-887, Naugarh.

4. Spermadictyon Roxb.

*Spermadictyon suaveolens* Roxb., Corom. Pl. 3: 32. t. 236. 1819.

Erect shrub, 1-3 m tall. Stem much branched, opposite decussate, glabrous or slightly pubescent, more or less herbaceous, bark of woody portion ash-coloured and usually with purple streaks. Leaves opposite, 7-20 x 4-10 cm, elliptic, oblong or
ovate, acute to acuminate, attenuate, glabrous or pubescent, specially on nerves beneath, lateral nerves 10-20 pairs, arcuate; petiole 1-2 cm long; stipules broad triangular, cuspidate, ensiform or abruptly acuminate. Inflorescence trichotomously branched with panicles of head-like clusters. Flowers bluish-purple or white, fragrant, c. 1.5 cm long; bracts c. 2 mm long, leafy; bracteoles many, surrounding each fascicle of flowers, subulate, vinous. Calyx teeth 5, linear-subulate, hispid, persistent; tube narrow. Corolla-tube slender, widened somewhat towards the mouth, pubescent; lobes 5, spreading, oblong or ovate, acute, valvate in bud, c. 2 mm long. Stamens included, filaments very short, anthers erect. Style filiform, as long as corolla-tube; stigma 5-cleft. Capsule 2.5-4 mm long, ovoid, 5-valved at the top, pubescent, black, compressed. Seeds 5 or less by abortion, surrounded by loose reticulate aril. Common in dry exposed areas. Root powder is used in diarrhea and cholera.


5. Oldenlandia L.

Oldenlandia corymbosa L., Sp. Pl. 119. 1753. DC., Prodr. l.c.; Hook. E. l.c. 64; Cooke, l.c. 588; Collett,

Annual herb, 8-10 cm tall, sometimes prostrate, internodes 10-20 mm long. Leaves 8-20 x 2-3 mm, linear or elliptic-lanceolate, margin often recurved, sometimes with minute scabridulous hairs, glabrous or with appressed hairs on the lower surface and minutely papillose on the upper surface; stipules small, membranous, ending in a long and several short teeth. Flowers axillary, 1-4, rarely many. Peduncle 10-15 mm long, glabrous. Pedicel c. 4-5 mm long, enlarged in fruit. Flowers isostylious. Calyx 2-2.5 mm long, teeth c. 1 mm long, margins scabridulous. Corolla white or purplish; tube c. 0.5 mm long; lobes c. 1 mm long. Anthers sessile, inserted in the mouth of
corolla-tube. Style glabrous. Capsule globose or pyriform, didymous, 1.5-2 mm in diameter, with appressed hairs. A common weed occurs near fields.


A large deciduous tree, up to 30 m tall, trunk short. Stipules 7.15-42.5 mm, oblong or elliptic. Leaves 5-12 (-15) x 2.5-8 (-10) cm, elliptic, obovate, ovoid or orbicular, rounded, acute-shortly acuminate at apex, oblique at base, with 6-8 pairs of lateral nerves, glabrous above, glabrous or pubescent on nerves beneath, petiole 6-20 mm long. Heads terminal and solitary or rarely simple thyrs or panicles of 3-5 heads, generally subtended by two narrow bract like leaves. Peduncle 7-10 mm long, glabrous, heads 8-10 mm in diameter, bracteoles spathulate, 2-2.5 mm long, keeled, usually ciliate on margins and keel. Hypanthium 1.5 mm long, glabrous; calyx-lobes minute, truncate or shortly 5-toothed, c. 0.2-3 mm, margin ciliate. Corolla greenish or cream colour; tube funel-shaped, 4-5 mm long, hairy within and glabrous outside, lobes nearly half the length of the tube, ciliate along the midrib inside. Anthers exserted, c. 1.5 mm long, spreading. Style 4-5 mm, exserted; stigma 1.5-2 mm long. Capsule 3-5 mm long, ridged. Commonly occurs near Temples.


51. ASTERACEAE
1. Heads with 1-few florets, aggregated together to form globose compound head.

........................................................................................................................................... Group 1

1. Heads with many-florets, simple, not compound head (tubular or ligulate or both):

2. Heads with all ligulate florets. ................................................................. Group 2

2. Heads with tubular florets; ligulate (ray) florets present or absent:

3. All florets without pappus. .................................................................Group 3

3. Florets with pappus of hairs, bristles or scales:

4. Heads discoid (all florets tubular):

5. Heads discoid, homogamous. ................................................. Group 4

5. Heads discoid, heterogamous, often outer florets unisexual, female fertile or sterile. ................................................................. Group 5

4. Heads radiate (disc florets and outer ligulate ray florets):

5. Heads radiate with usually alternate or basal rosettes of leaves.

........................................................................................................................................... Group 6

5. Heads radiate with usually opposite leaves. ......................... Group 7

Group 1. Heads compound (leaves alternate):

1. Heads sessile, in the axils of leaf sheaths................................. 5. CAESULIA

1. Heads peduncled, usually terminal:

2. Spinescent herbs; heads 1-flowered. .........................................7. ECHINOPS

Group 2. Heads with tubular florets, ray florets may or may not present; pappus absent:

1. Leaves rosulate, long-petioled, florets yellow:
1. Leaves otherwise, subessile; florets blue or pink-purple ...............13. LACTUCA

2. Plants with yellow juice; involucre cylindric; achenes truncate at both ends.
..........................................................................................................................15. LAUNAEA

2. Plants with milky juice: involucre campanulate; achenes narrowed at base.
..........................................................................................................................19. SONCHUS

**Group 3. Heads with tubular florets, ray florets may or may not present; pappus absent:**

1. Leaves simple, usually undivided (rarely lobed):

2. Heads homogamous, unisexual; female heads with 2-florets and fused bristly involucre producing beaks..............................................................23. XANTHIUM

2. Heads heterogamous; at least disc florets bisexual:

3. Heads radiate, outer ray florets and inner tubular disc florets; achenes margined, angled or with bristles:

4. Leaves opposite, glandular-pubescent; involucre 2-seriate:

5. Heads largo, yellow, in terminal compact corymbs.

5. Heads small, greenish, in spreading panicles..............................2. ARTEMISIA

**Group 4. Heads discoid, all florets tubular, homogamous; pappus present:**

1. Anthers with apiculate appendages:

2. Pappus of 5 scales in a ring..........................................................1. AGERATUM

2. Pappus of 10 or more bristles.

3. Shrubs or small trees; involucre coriaceous; anther base ciliate
3. Undershubs or herbs; involucre membranous; anther base non ciliate

.................................................................22. VERNONIA

4. Florets usually unisexual:

4. Florets usually 2-sexual

**Group 5. Heads discoid (not distinctly radiate), hctrogamous, often outer florets unisexual, female fertile or sterile (leaves alternate):**

1. Pappus of hairs; receptacle naked or palaecus:

2. Heads in clusters or fascicled:

3. Heads sessile, involucre bracts paper.; outer florets fertile female; with bifid style:

4. Receptacle naked; achenes with pappus. ............... 10. GNAPHALIUM

4. Stem winged with decurrent leaf base; receptacle pitted; involucre bracts dry, scarious. .................................................................14. LAGGERA

4. Stem not winged; receptacle not pitted; involucre bracts herbaceous:

5. Usually aromatic herbs; florets of various colours; anther cells tailed.

.................................................................4. BLUMEAA

5. Non aromatic herbs; florets yellow; anther cells not tailed:


7. Prostrate-ascending herbs; anther base truncate; pappus of only bisexual florets of 2-3 small bristles
7. Erect undershrubs; anther base tailed; pappus of basally connate
bristles, 1-seriate. ............................................................ 17. PLUCHEA

**Group 6. Heads radiate (outer ligulate or ray florets, inner tubular); leaves
usually alternate or in basal rosettes:**

1. Involucre 2-seriate (5+5); achenes not beaked; pappus of 2-3 awns. ...........
........................................................................................................... 16. PARTHENIUM

2. Ligules less than 1cm long. 2-3 seriate; receptacle not pitted.
........................................................................................................... 6. ERIGERON

3. Heads racemose or thyrasoid: anther cells tailed:

4. Shrubs with stalked leaves; pappus hairs 2-seriate. ......................... 12.-INULA

5. Heads large in scorpioid panicles; ................................................. 18. SOLIDAGO

**Group 7. Heads radiate; leaves usually opposite:**

1. Leaves simple, not pinnatisect.

2. Heads large, more than 10cm across: pappus of caducous scales:............
........................................................................................................... 11. HELIANTHHS

2. Heads not more than 1.5cm across; pappus not caducous:

3. Pappus of scales:

4. Florets white: receptacle concave, embracing the florets; pappus scales
simple. .......................................................... 8. ECLIPTA

5. Disc florets fellow; receptacle flat or convex; pappus of plumose hairs.
........................................................................................................... 21. TRIDAX

1. Leaves 3-tbiae or pinnalipartile:
6. Florets small, ray florets few (heads discoid to radiate): pappus of bristles:

7. Involucre connate, eampamikue; liiulate florets conspicuous; achenes 4-annled, erostrate at apex. ..........................................................3. BIDENS

7. Florets large ray florets few to many; pappus of 3-10 unequal scales........
..................................................................................................................20. TAGETES

1. AGERATUM L.,

1. Involucre bracts almost glabrous, acute or acuminate; corolla to 1.5mm long.
.................................................................................................................................1. A. conyzoides


Annual, erect herbs, to 40cm high; stem hairy on nodes and young parts. Leaves ovate to subrhomboid, 2.5-8.5x1.5-4.5cm, crenate, sparsely pubescent above, glandular-punctate beneath; petioles 0.5-3cm long. Heads white or purple-blue, discoid, several, in terminal corymbs. Involucre bracts glabrous, linear, sharply acute-acuminate, scarious on margins; corolla infundibulifonn, 1-1.5mm long, shortly 5-lobed. Achenes glabrous. Pappus of toothed scales.


2. ARTEMISIA L.,

1. Outer florets fertile female, disc florets sterile:

2. Glabrous annuals; leaves 2-3 pinnatisect, segments filiform; heads subsessile.
.................................................................................................................................1. A. capillaris

1. Outer florets as well as disc florets fertile:
3. Leaves large to 16cm long, ovate-elliptic and lobed or incised. .................

.............................................................................................................2. A. nilagirica.


Annual, glabrous or sparsely, hairy herbs, to 70cm high; stem purplish-brown, grooved, with woody rootstock. Leaves 1-3 pinnatisect, to 7.5cm long; segments filiform, glabrous. Heads sessile or shortly peduncled, discoid, 1.5-2mm across, arranged in panicked racemes. Involucre bracts ovate-elliptic, obtuse, few-seriate. Receptacle slightly convex, glabrous. Outer florets female, fertile; disc florets bisexual, female sterile, 5-fid. Achenes brown, glabrous, minute. Common; along vacant fields.


Perennial, hoary-pubescent, much branched herbs or undershrubs, 1-2.5m high; stem ribbed, pale-green, pubescent. Leaves ovate-elliptic, to 16cm long, and as broad, lobed or incised, prominently nerved beneath, densely tomentose. Heads discoid, 2-3mm across, in leafy, panicked-racemes. Involucre bracts small, few-seriate. Florets tubular, bisexual, brownish-yellow; corolla 3 or 5-toothed. Achenes minute, glabrous. Common; way sides, open places, fields.

3. BIDENS L.,

1. Outer involucre bracts leafy, 10-40mm long; heads discoid to 2.5cm across.

1. Outer involucre bracts linear-ovate, 3-8mm long; heads radiate to 1.5cm across.

2. Leaves 2-3 pinnatipartite; heads 3-6mm across. ................... 1. B. bipinnata

2. Leaves ternate or imparipinnate to bipinnate; heads 5-15mm across:

3. Outer involucre bracts linear-lanceolate; heads 5-8mm across.2. B. biternata

3. Outer involucre bracts spathulate; heads 8-15mm across............ 3. B. pilosa


Annual, much branched, erect herbs, to 125cm high; stem 4-angled. Leaves opposite, 2-3 pinnatipartite or pinnate, 4-20cm long; segments ovate-lanceolate, acute or acuminate, serrate, sparsely hairy. Heads yellow, 6-10mm across, on 1-10cm long peduncle. Outer involucre bracts linear spathulate; inner ovate-lanceolate. Ray florets 2-5; corolla 2-lobed. Disc florets many, tubular, 5-lobed. Achenes 6-20mm long, 4-angled, tapering towards the apex. Common; edges of crop fields, waste places, road sides.


Annual, erect herbs, to 1m high; stem 4-angled, sparsely pubescent or not. Leaves opposite (upper alternate), pinnate or bipinnate, with two subopposite pairs of lateral leaflets and deeply 3-lobed terminal leaflet; leaflets ovate, deeply lobed or
pinnate, acute, glabrous; petioles 3-4cm long. Heads yellow, radiate, borne on dichotomously branched, 2-8cm long peduncle. Outer involucre green, linear, ciliate; inner non ciliate, ovate-lanceolate. Ray florets 3 or 4; corolla white or yellow. Disc florets many, tubular, pubescent. Achenes black, 10-20mm long, outer shorter, tetragonous, glabrous, with 2-5 awns at apex. Common; weed of crop fields, waste places.


Annual, glabrous or sparsely hairy, erect herbs, to 120cm high; stem purplish-green, 4-gonous, striate. Leaves opposite, digitately or pinnately 3-5 lobed, 5-7cm long; segments lanceolate, entire or toothed, acuminate; base cuneate with shortly decurrent petioles. Heads radiate, 5-15mm across, long peduncle. Outer involucre bracts green, linear-lanceolate to spathulate, with dark mid-nerves, inner smaller, ovate. Ray florets white, ligulate, spreading, 2-5, sometimes absent. Disc florets yellow, several. Achenes black, fusiform, 6-10mm long, striate, smooth. Common; nearby crop fields, waste places, *Plant extract with honey used in cough and bronchitis.*


4. **BLUMEAE DC.**

4. Receptacle fimbrillate; pappus pale-red on drying:

5. All involucre bracts linear or linear-lanceolate; petiole not dilated at base.

..........................................................1. **B. aromatica**

9. Heads yellow; leaves lyrately lobes.................................4. **B. lacerv.**
1. **Blumea aromatica** DC., Prodr. 5: 446. 1836; Hook. f. in Fl. Brit. India 3: 270. 1881; Babu, Herb. Fl. D.Dun 244. 1977;

   Aromatic herbs or undershrubs, to 150cm high; stem woody at base, viscid-tomentose. Leaves obovate to elliptic-lanceolate, 10-25x2.5-10cm, acute, dentate-serrate, narrowed towards base, membranous, pilose on upper surface, villous beneath; upper leaves sessile; petioles winged. Heads 5-9mm across, in axillary and terminal panicles; receptacle nearly glabrous, fimbriate. Involucre bracts oblong-lanceolate, acuminate, 2-8mm long, puberulous. Corolla of female florets filiform, 2-3 lobed, glabrous; corolla of bisexual florets tubular, yellow, 5-6mm long; anther cells with long tails. Achenes pale-brown, oblong, 10-ribbed. Pappus pale-brown, 5-6mm long. Common; waste places, edges of crop fields.


   Annual-biennial, aromatic, somewhat viscid herbs, to 90cm high; stem branched from the stout base. Leaves obovate or oblong-elliptic, 2-6x1-2.5cm, lyrately lobed, glandular and densely hairy on both surfaces, narrowed to 1-2cm long petioles. Heads radiate, 4-6mm across, in shortly stalked axillary panicles. Involucre bracts slightly longer than florets, glandular hairy; inner bracts with scarious margins. Corolla of female florets glabrous and of bisexual florets tubular, pubescent. Achenes brown, angular or terete, to 5mm long, sparsely hairy. Pappus white. Common; waste places, crop fields, way sides of *Leaf juice used as vermifuge.*

5. CAESULIA Roxb.,


Annual, prostrate or suberect, somewhat flaccid herbs, 15-60cm high. Leaves narrowly lanceolate, 6-15x0.6-2cm, acute, serrulate, glabrous, base auricled or stem clasping. Heads sessile, 1-2.5cm across, axillary. Florets pale-blue or white, bisexual. Involucre bracts 2(3), outer ovate-orbicular; inner linear-lanceolate. Corolla tubular, 5-lobed. Achenes obovoid, flat, winged and sparsely hairy. Pappus of 2 ovate scales, ribbed. Common; water courses, rice fields, ponds, ditches.


6. CONYZA Less

1. Pappus hairs white or dirty-white or yellow:

2. Pappus hairs yellow; ligulate florets exceeding the pappus.

2. Pappus hairs white or dirty-white; ligulate florets not exceeding the pappus.......................................................................................................................... C. canadensis


Annual, erect, much branched herbs, 20-120cm high; stem ribbed, patent-hairy. Leaves sessile or shortly petiolate, linear-lanceolate, 2-8x0.2-0.6cm, acute, apiculate, entire, glabrous or loosely hairy. Heads 5-6mm across, peduncled, yellowish, in branched panicles. Ray florets pale or rosy-purplish, hardly exceeding
the pappus. Disc florets tubular. Achenes flat, glabrous. Pappus hairs dirty-white.

Common; waste places, road sides, crop fields.

Fl. & Fr.: Feb.-Sept. Collection: 1150; Storatgarh

7. **ECHINOPS L.**

1. Heads usually 2.5-3.5cm across, with projecting spines. .................. 2. E. echinatus.


Annual, tomentose-spinescent herbs, to 60cm high; stem branching from the base. Leaves sessile, oblong, pinnatifid, 7-20cm long, lobes triangular or oblong, sinuate, spinescent; spines to 4cm long. Heads white, globose, 2.5-3.5cm across, with several projecting spines. Involucre surrounded by white bristles; involucre bracts many seriate; outer 6-8, oblanceolate, glabrous; inner smaller. Corolla tubular, 5-lobed. Achenes obconic, silky-villous. Common; exposed slopes, terraces of crop fields.

L.N.: Kantela Fl. & Fr.: Feb.-Aug. Collection: 1075; Itwah

8. **ECLIPTA L.**


Annual, strigose herbs, to 50cm high; stem patent-hairy. Leaves subsessile, elliptic-oblong or oblong-lanceolate, 2.5-8x0.8-1.5cm, mucronate, entire, cuneate at base, pubescent. Heads white, solitary or 2-3 together, axillary, 5-8mm across, on peduncles. Involucre bracts ovate-lanceolate, acute, pubescent. Ray florets in 2-3
series, with 2-dentate corolla. Disc florets many, campanulate, sparingly pubescent, 4-lobed. Stamens sagittate. Achenes dark-brown, oblong-turbinate. Pappus a ring of connate scales, on the top of the achenes. Common; waysides, crop fields, waste places, Deccution of plant given in catarrh and throat pain; plant juice also used in asthma, fever and constipation.


**9. ERIGERON L.**

1. Heads trimorphic (tubular florets female as well as bisexual), to 1cm across. ..........

..........................................................3. *E. sublyratus*


Annual, erect or decumbent, pubescent herbs, 10-50cm high. Basal leaves obovate or spatulate, 1-6x0.5-2.5cm, acute or obtuse, loomed or lobulate, puberulous on both surfaces; cauline leaves smaller, auriculate or semiamplexicaule at base. Heads 5-8mm across, solitary or in subcoryms. Involucre bracts 1-2 seriate, linear-lanceolate, acuminate, hairy. Ray florets pink or purplish; disc florets yellow. Achenes ovoid, puberulous. Pappus hairs dirty-white. Not uncommon; along the banks of rivers or crop fields.

Fl. & Fr.: Apr.-Jul. Collection : 58, Sarsa

**10. GNAPHALIUM L.**

1. Lower surface of leaves loosely villous; pappus hairs free; heads in axillary or terminal clusters. ..................................................1. *G. pensylvanicum.*
1. Lower surface white-appressed hairy; pappus hairs connate at base; heads in spicate clusters. .......................................................... 2. *G. purpureum*


Annual, woolly-tomentose herbs, to 40cm high, often decumbent at base. Leaves spathulate-lanceolate, 2-8x0.5-2cm, tapering at base, apiculate, glabrous or sparsely hairy above, white woolly beneath. Heads 1-2mm across, in woolly axillary and terminal clusters. Involucre bracts 2-3 seriate, brownish, ovate-lanceolate. Ray florets female with filiform corolla; disc florets tubular, bisexual. Achenes brown, oblong 3-4mm long. Pappus hairs dirty-white. Common; grassy slopes, waste places, edges of crop fields.


Annual, erect or diffused-ascending, woolly-tomentose herbs, 15-30cm high. Leaves spathulate, oblong, 1-4x0.4-1cm, rounded and mucronate apex, puberulous on upper surface, patently-white, woolly beneath. Heads discoid, 2-3mm across, arranged in leaf-opposed, spicate-corymbs. Involucre bracts linear-lanceolate, acute, recurved. Florets dull brownish or pale. Ray florets female, filiform, to 1mm long. Disc florets tubular, bisexual. Achenes oblong, minutely papillose. Pappus hairs connate at the base, white. Common; open waste places, crop fields.

Fl. & Fr.: Dec.-Jun. Collection: 1163, SHOHRATHGARH

**11. HELIANTHUS** L.,
1. Involucre bracts ovate-oblong; discoid part of the head 5-30cm across.

.......................................................... 1. *H. annuus*


Annual, simple or sparingly branched towards the upper part, robust herbs, to 2.2m high. Leaves alternate, ovate or ovate-oblong, serrate, hispid, with long petioles. Heads yellow, disciform, 5-30cm across, nodding. Achenes to 1.5cm long; pappus scales 3-5mm long. Commonly cultivated for edible and oil-yielding seeds. *Seeds are fried and eaten; seed oil useful to reduce cholesterol.*


12. **INULA** L.,

2. Leaves petioled; heads more than 5 together. ......................... 2. *I. cuspidata*

**Inula cuspidata** (DC.) C.B. Clarke, Comp. Indicae 125. 1876; Hook.f. in Fl. Brit. India 3; 296. 1881; Babu, Herb. Fl. D.Dun 271. 1977;

Erect shrubs, 50-100cm high; young branches pubescent. Leaves elliptic-lanceolate, 3.5-14x2.5-4.5cm, acute or acuminate, serrulate, upper surface glabrous, rough, lower surface thinly pubescent; petioles to 2cm long. Heads many, radiating, in terminal corymbs, 6-14mm across, pedunculate. Outer bracts linear-oblong with prominent mid-rib. Ligulate florets yellow, 5-10mm long, 5-ribbed, 3-lobed. Disc florets 6-8mm long, 5-lobed. Achenes terete, to 2mm long, silky-hairy. Pappus hairs grey-white, feathery at top. Common; open-rocky forest localities, grassy slopes, *Root decoction given in dyspepsia and colic; roots also used in local beverages.*


13. **LACTUCA** L.,
1. Small, 15-40cm, erect herbs. ............................................................. L. DIRRECTA.


Annual, tufted herbs. Leaves variable, lyrate-pinnatifid, 3.5-10cm long; lobes entire or sparingly toothed; cauline leaves linear, stem clasping. Heads ligulate, 5-15cm long, arranged in corymbose panicles. Outer involucre bracts obovate or ovate; inner linear-oblong. Corolla purple-blue or lilac. Achenes 6-7mm long, including beak. Pappus hairs white. Common; waste places, crop fields, water courses.


14. **LAGGERA**

1. Stem not winged; tubular florets pinkish; achenes subcompressed. .......2. *L. aurita*

**Laggera aurita** L.f, Suppl. PI. 367. 1781; k. f in Fl. Brit. India 3: 271. 1881.

Perennial, aromatic herbs, to 1m high, usually with woody rootstock. Leaves ob lanceolate or obovate, 3-6x0.1-3cm, lobed or pinnatifid, membranous, decurrent and sometimes auricled at base. Heads discoid, 1.2cm across, in diffused panicles. Outer involucre bracts linear, acute, green; inner non-green. Florets pink or yellow, ray florets many seriate, filiform. Disc florets tubular, 5-lobed. Achenes dark-red, subcompressed. Pappus dull-white. Uncommon; waste places.


15. **LAUNAEA**

1. Leaves without white-cartilaginous teeth; segments remotely denticulate. ..........

..................................................................................................................*L. aspleniifolia*
1. Leaves with white cartilaginous teeth; segments closely denticulate..................2. *L. procumbens*.


Annual-biennial, creel herbs, 5-30cm high; much-branched from the base, glabrous. Leaves mainly radical, in rosettes, obovate-lanceolate, 5-15x1-3.2cm, pinnatifid or lobed; segments ovate-oblong, remotely denticulate, non cartilaginous teeth. Heads 1-1.4cm long, on bracteate, pedunculate, terminal panicles. Involucre bracts 2-seriale, outer ovate acute, inner lanceolate-acute. Ligules yellow. Achenes smaller than pappus hairs. Scattered; grassy localities, margins of crop fields.


Perennial herbs, 10-50cm high, with creeping stolons and yellow juice. Leaves mainly radical in rosettes, oblong-oblanceolate or spathulate, 5-20x1-4cm; lobes closely denticulate with cartilaginous teeth. Heads yellow, cylindric, about 1.5cm long, arranged paniculate-spreading branches. Involucre bracts 2-3 seriate; outer ovate, inner lanceolate. Ligules yeliow. Achenes pale-yellow, 2-4mm long, pappus white, soft, longer than achenes. Common; waste places, road sides and crop fields.


16. PARTHENIUM L.,

Annual-perennial herbs, 20-100cm high; stem puberulous. Leaves lanceolate to pinnatisect, 5-15x0.5-4.5cm; segments oblong-lanceolate, deeply lobed. puberulous with decurrent base. Heads white. 4-8mm across, on lax panicles. Involucre bracts campanulate, elliptic-ovate, acute, pubescent. Ray florets 5. 2-lobed. Disc florets 2-seriate, white or pale, 5-lobed. Achenes 2mm long. Common; waste places, road sides.

L.N.: Gajar ghas Fl. & Fr.; Almost throughout the year. Collection : 1145; Bansi.

17. PLUCHEA Cassini,


Stout, softly pubescent undershrubs, to 1m high; stem paniculately branched above. Leaves oblanceolate, or oblong, 4-7x1-1.5cm, obtuse, apiculate, obscurely dentate, narrowed at base, finely silky-pubescent on both sides. Heads pink or purplish, to 6-8mm long or broad, in compound corymbs. Involucre bracts 2-3 seriate; outer bracts tinged with purple, silky-pubescent; inner smaller. Ray florets 2-3 toothed; disc florets tubular, 5-lobed. Achenes minute. Pappus hairs connate at base. Not uncommon; waste places or grassy slopes.


18. SOLIDAGO L.,

1. Inflorescence recurved or spreading; heads about 2-4mm across; ray florets 3-5.

............................................................................................................................................................................................................ 1. S. canadensis

Perennial, glabrous or pubescent herbs, to 150cm high. Leaves sessile, ovate-lanceolate, scabrid or pubescent. Inflorescence spreading or recurved, forming large panicles. Heads yellow, 2-3mm across. Involucre bracts 2-seriate. Achenes 1-2mm long, hairy. Pappus 1-seriate. Usually cultivated in gardens


19. SONCHUS L.,

1. Annual herbs; outer involucre bracts without glands or hairs:

2. Basal lobes of leaves round-auricled, sharply dentate; achenes elliptic............

.................................................................1. S. asper


Annual, glabrous or sparsely-hairy herbs, 15-80(100)cm high. Leaves hard, lanceolate, runcinate or pinnatifid, 5-20x1.5-6cm, spinous-toothed; teeth numerous, unequal, divergent; basal lobes rounded, stem clasping, auricled. Heads yellow, 1-1.8cm, erect, ligulate, in irregular, subumbellate corymbs. Outer bracts shorter, lanceolate; inner larger, oblong-lanceolate. Achenes elliptic, compressed, 3-ribbed. Pappus creamy-white, 8-10mm long, few seriate. Common; waste places, road sides, margins of fields. The plant used as a tonic to purify blood and in hepatitis; leaf paste applied on wounds.


Annual, simple or branched, glabrous herbs, 30-90cm high, with fistular stem. Leaves variable, pinnatifid or without, 8-20x4-7cm, basal leaves with long wing like petiole; cauline leaves often stem clasping, with spreading, acute auricles, sharply dentate or toothed. Heads yellow, campanulate, 1-1.8cm long, glandular-hispid, in subumbellate corymbs. Involucre bracts many seriate, oblong or oblanceolate, glabrous. Achenes obovate, compressed, 3-4mm long, 3-5 ribbed. Pappus hairs white. Common; waste places and crop fields. *Plant used as liver tonic; after thorough wash the leaves cooked as vegetable.*


20. *TAGETES* L.,

1. Heads 5-8cm across; involucre bracts 8-13, 1.5-2.5cm long............ 1. *T. erecta*

1. Heads 2-3.5cm across; involucre bracts 5-7, 1-2cm long. ................2. *T. patula*


Annual, sparingly-branched, aromatic herbs; branches angular, ribbed. Leaves pinnate; leaflets lanceolate-oblong, acute, base decurrent; petioles 2-5cm long. Heads usually solitary, 5-8cm across, on long peduncles, swollen at the base of head. Receptacle convex, pitted. Florets yellow orange, ray ligulate; disc tubular. Commonly cultivated in major parts of district.


Annual, erect, simple or branched, aromatic herbs, 20-60cm high. Leaves: upper ones alternate, pinnate or pinnatifid; leaflets lanceolate-oblong, sharply serrate with several teeth. Heads solitary or few, on 2-10cm long peduncles. Involucre campanulate, 1-2cm long, 5-7 in number, gland-dotted. Ligulate florets yellow to brown-purple or orange, 2-lobed. Disc florets yellow. Achenes compressed, hairy. Common; wild as well as cultivated.


21. TRIDEX LINN


Annual or perennial, decumbent-ascending or erect, straggling, pubescent herbs, 10-70cm high. Leaves ovate or lanceolate. 1.5-6x1 -3.5cm, coarsely serrate-dentate or lobed, cuneate at base, pubescent on both surfaces; petioles 0.5-2.5cm long. Heads solitary, radiate, 0.6-1.5cm across, on long hirsute peduncles. Outer involucre bracts green, ovate-lanceolate, hirsute-hairy; inner ones greenish-white, ovate, apiculate, Ray florets pale-yellow or whitish, 2-3 lobed. Disc florets yellow, tubular, 5-lobed. Achenes obconical, pilose. Pappus white, unequal, plumose-bristled. Common; along road sides, waste places, crop-fields.


22. VERNONIA Schreber

1. Achenes terete, pubescent; involucre companulate. ...............................1. *V. cinerea*

Annual-perennial herbs, to 70cm high, with thick woody base; stem terete, ribbed, with greyish-pubescent. Leaves various, elliptic to ovate or rhomboid, 1-6.5x0.5-3.2cm, obtuse or acute, repand-serrate, undulate or not, glabrous or pubescent beneath; petioles 0-3cm long. Heads 4-5mm across, in terminal corymbose panicles. Involucre bracts 3-4 seriate, lanceolate, 1-nerved, acuminate. Achenes terete, silky-hairy. Pappus hairs 2-seriate, white or brownish. Common; waste places, roadsides, crop fields.


23. XANTHIUM L.,


Annual, branched, sparsely hairy, erect herbs, to 120cm high. Leaves broadly ovate-triangular, 4.5-12.5x2.5-11cm, simple or 3-5 lobed, acute or acuminate, irregularly serrate, hispid on both surfaces; petioles 5-15cm long. Heads solitary or clustered, on short lateral branches, unisexual; male heads globose, 4-5mm across, green. Involucre bracts linear, acute, patent; corolla green, 5-toothed. Female heads ovoid, 10-15mm long. Involucre bracts united, hard, clothed with hooked bristles, terminating into 2-hooked beaks; florets 2, corolla absent. Common; weed of waste places, road sides, crop fields.


52. CAMPANULACEAE

Campanula Linn.
1. Leaves linear-lanceolate; corolla purple up to 5 mm long ……………… C. benthamii


   Annual, erect, multicauline herb, about 15-40 cm tall. Stem simple or sparingly branched, patently hispid-hairy. Basal leaves in a rosette, narrowed into a short petiole, obovate-spatulate; higher ones sessile, linear-lanceolate to oblong, subacute, all leaves subentire-crenulate, hispidly pubescent about 1.5-8 cm long. Flowers dimorphic, either complete flower or smaller or without corolla or stamens; usually clustered in subspicate racemes, forming narrow panicles. Calyx teeth 2-4 mm long, linear lanceolate much smaller in imperfect flowers. Corolla purple, about 5 mm long, hairy outside. Stamens 5, free, filaments dilated at the base. Capsules hemispheric, pubescent; seeds minute. Common in grassey and waste places.

   Fl. : Mar-May; Fr: May-Jun. Collection: 452, Lotan

53. **SPHENOCLEACEAE**

**Sphenoclea Gaertn.**

1. Leaves alternate, simple, estipulate ………………………………… 5. S. zeylanica


A erect, glabrous annual herbs about 20-80 cm tall. Stem fistular, with a peripheral whorl of air-channels, often with a basal coating of aerenchyma. Leaves oblong-lanceolate or oblong, 4 to 10 cm long and 0.5-3 cm across, narrowed at both ends, entire, penninerved; petioles 2-3 cm long. Flowers greenish-yellow, sessile, in dense cylindrical, 2-5 cm long spikes; bracts and bracteoles ovate-spatulate, acuminate.
Calyx divided half way down; tobes triangular or sub orbicular, white margined, enlarged and inflexed in fruits corolla white, divided half way down, caduceus; lobes ovate-trinangular. Capsule depressed globose, with a scarious lower half and a rounded free top. Seeds many, minute, brownish tubered. Rare owns in marshy places.

Fl. & Fr. : Aug-Nov. Collection: 395, Brijmanganj

54. PLUMBAGINACEAE

Plumbago Linn.

1. Flowers white ................................................................. P. zeylanica.


Erect or straggling, perennial undershubs, stems glabrous, often white punctuate. Leaves ovate lanceolate or oblong, with a rounded base, contracted into a petiole, acute, undulate-crispy, glabrous, white punctuate beneath, about 2.5-10 cm long. Petiole about 1 cm long, with 2 basal, caducous, stipuloid auricles. Flowers white, in lax, Often branched, glandular spicate-racemes. Calyx tubular, 5-ribbed, 5-toothed, viscid hairy. Corolla white, tubular, 1.5-2 cm long; lobes 5, spreading, apiculate. Stamens 5, free, filaments linear; anther oblong. Ovary superiory narrowed at the apex, style stands with 5-stigmose branches. Capsules oblong acute, with persistent calyx. Common in waste places. Root extract believed to cause abortion.

L.N. Chitrak Fl. & Fr. : Most part of the year Collection: 348, Lutchuiya

55. PRIMULACEAE

Angallis Linn.
1. Corolla red on blue; lobes fringed with glands. Leaves opposite …… A. arvensis.


Erect or decumbent-ascending, annual herb about 5 to 20 cm high; stem often 4-angular. Leaves sessile, ovate-lanceolate, 0.8-1.5×0.2-1 cm, margins entire, obtuse or subacute, glabrous, often punctuate on the upper surface. Flowers bright blue, solitary, axillary, peduncles 1-3 cm long. Calyx 5-lobed; lobes lanceolate acuminate. Corolla 3-7 mm across, red or blue, 5-fid at the base, lobes gladular, ciliated to the apex. Stamens 5; filaments hairy. Ovary globose, with many ovules; style slender. Capsules globose, opening by circular slit round the middle, seeds many, trigonous. Common as a weed of crop fields.

L.N.- Jainghami Fl: Feb-May; Fr: May-Sept. Collection:335, Barhni

56. SAPOTACEAE

1. Calyx lobes 4-5; staminodes 0. .................................................. 1. Madhuca

1. calyx lobes 6-8; staminodes present:

2. Petals 8-24; berries upto 1.5 cm across, yellow or reddish-yellow when ripe:

3. Flowers trimerous; stamens 6................................. 2. Manilkara

3. Flowers tetramerous; stamens 8. ................................. 3. Mimusops

2. Petals 6; barriers 4.5-5 cm across with thin, rusty-brown scrufy……..4. Achras

1. Mad huca Gmelin.

A large or medium sized deciduous tree about 20 m tall, with grey or blackish, wrinkled bark, young parts pubescent. Leaves clustered at the ends of branches, elliptic or oblong-elliptic, about 11.5 to 20 cm long and 6-12 cm across, short acuminate or obtuse, cariaceous, glabrous above, densely woolly beneath when young; lateral nerves 10-12 pairs; base cuate, petioles 2-4 cm long. Flowers cream, 1-1.2 cm across, in dense fasicles near the ends of branches, on dropping, woolly pedicels. Calyx coriaceous, rusty tomentose; 4- lobed. Corolla fleshy and juicy, caducous, tube ovoid lobes about 6-10 or (-14) erect, ovate-lanceolate. Stamens usually 20-25; anthers in 3 series, sessile, acuminate, hairy on the back. Ovary hirsuite; style hairy at the base. Berries ovoid, 2.5 to 5 cm long, green, fleshy, 1-4 seeded, seeds shining, pale brown. Commonly occurs near temples. Flowers and fruits edible.


2. **Manilkara Adans.**


A evergreen tree, forming a dense crown. Bark grayish black or grey-white. Leaves elliptic-ovovate or oblong, and 5-10 cm long and 2-5 cm across, obtuse or emarginated entire, base narrow, shining above, pale beneath; petioles about 1.3 cm long. Flowers creamish white, axillary or in ascieles solitary. Calyx lobes about (1-8),
ovate, reflexed, 2 seriate corolla lobes 10-18, in two series. Stamens 6 and staminodes 6. ovary 12-cell Berries ellipsoid, about 1.3 cm long, 1-seeded. Oftenly cultivated for epible fruit.

L.N.- Khani Fl.: Oct.-Dec; Fr: Jan-Feb Collection: 574, Barni

3. Mimusops Linn.


A large evergreen tree upto 12m tall; bark dark grey, smooth, not deeply furrowed. Leaves elliptic-ovate to lanceolate, 5-12 cm long and 2-5 cm across, base acute or attenuate, apex acute or acuminate, entire, subcoriaceous; petioles about 3 cm long. Flowers axillary, solitary or fascicled, brownish-white, scented about 1 cm across. Corolla in 2(3) series of 8 each. Stamens 8, or ellipsoid; seed solitary, brownish black. Occurs in moist shady places and cultivated


4. Achras Linn.


A evergreen small or large tree. Leaves oblong-lanceolate or elliptic-oblong about 8 to 12 cm long, crowded at ends of branchlets. Flowers long pedicelled, white. Fruit globose, with thin, rusty brown epicarp, fresh yellowish-brown. Seeds large, shining black. Commonly cultivated in the area

L.N.- Cheeku Fr. – Feb-March Collection- 214, Lotain.

57. EBENACEAE
**Diospyros Linn.**

1. Leaves glabrescent; fruit glabrous:

   2. Leaves 4-6 cm long; male flowers in threes. ................... 1. D. cordifolia

2. Leaves 6-10 cm long; male flowers in small, few-flowered panicles.

   2. D. montana

1. **D. cordifolia** Roxb. P1. Cor. 38 t 50. 1795; Nair in Rec. BSI 21(1) 152.1978.-

**D. montana** Clarke in Hook. F. FBI. 3:555. 1882 pro parte.

A large shrub or small tree about 2-3 m tall. Leaf blades about 6.5-9 cm long and 2-3.5 cm wide. Usually 4-6 flat glands present on the lower surface or the leaf blade on either side of the midrib. Twigs and petioles clothed in short erect brown hairs at least when young. Male flowers pale white, in triads on axillary cymes. Calyx persistent, enlarged in fruits, lobes reflexed. Fruit globose, yellow at maturity. Common in sandy soil.


Deciduous trees, to 8m high with ashy-grey bark. Leaves alternate, ovate-oblong or elliptic, acute or subacuminate, base rounded, velvety tomentose when young, glabrous on maturity, coriaceous; lateral nerves faint, petioles to 1 cm long male flowers on short axillary cymes, to 1 cm long. Female flowers on short axillary cymes, to 1 cm long. Female flowers solitary, axillary, dark green, calyx lobes broad and rounded, pubescent, on both sides. Corolla pale green in male flowers, dark green
in females, unceolate. Stamens 12-16, in opposite pairs, united at the base; anthers awned, glabrous, staminodes 4 or 8, alternating, smaller and longer. Fruits to 2.4 cm across, globose, red-black when ripe usually 8-seeded. Common in open dry places.

L.N.- Bish-tendu Fl. : Apr-May; Fr. : Dec-Jan Collection: 17, Uska Bazaar

58. OLEACEAE

1. Erect, scandent or climbing shrub, with simple or compound leaves; fruit berry................................................................. 1. Jasminum

1. Shrubs or small tree with simple leaves; fruit a flattened capsule...... 2. Nyctanthes

Jasminium Linn.

1. Flowers yellow ................................................................. 4. J. humile

1. Flowers white:

2. Leaflets 5-7 ................................................................. 3. J. officinale

2. Leaves simple:

3. Plants very hairy; calyx lobes long. ......................... 2. J. multiflorum

3. Plants with hairy branchlets, calyx lobes linear or subclavate .......... 1. J. arbores cens.


A deciduous, suberect, not twining or climbing shrubs; branchlets hairy. Leaves opposite, simple, variable in size, up to 18 cm long and 10 cm broad, ovate, acute or acuminate, soft-tomentose when young, later glabrate, leaf-base broadly rounded, sometimes cordate, nerves distinct beneath, lower
divaricate; petiole 1-2.5 cm. Flowers fragrant, in lax trichotomous cymes; pedicels 5 mm. Bracts linear, up to 5 mm long. Calyx teeth 5-6, sometimes more, linear, 1-2 mm long. Corolla white, tube c. 1 cm long, lobes usually 9, 1-1.5 cm long, lanceolate, acute. Berry mostly simple, 1-1.5 cm long, ellipsoid, slightly bent, black when ripe. Common in open dry places.

L.N.: Chameli

Fl. & Fr.: Mar.-Aug.

Collection: 344, Barni.


Evergreen, scandent shrubs about 2-4 m tall. Branchlets, pedicels and calyx densely fulvous-villous. Leaves opposite, simple, ovate, acuminate, upper surface pubescent, becoming glabrous, ventral tomentose or pubescent, especially on the nerves; petiole stout, tomentose. Flowers sessile or subsessile, in dense capitate cymes, at the tips of dwarf lateral branchlets or axillary, fragrant. Calyx teeth 6-9, linear, c. 1 cm long. Corolla white, tube slender, exceeding the calyx, lobes 6-9, oblong-lanceolate, acute, 1-2 cm long. Berry simple or didymous, ellipsoid, c. 1 cm long, black when ripe, surrounded by the long hairy calyx teeth. Cultivated in gardens.

L.N.: Chameli
Fl. & Fr.: Jan. – Aug.
Collection: 478, Dumariaganj.


Deciduous climbing shrubs, sometimes twining or seeking support. Branches long, weak, sparsely hairy when young. Leaves 5-10 cm long, opposite, imparipinnate, petiole and midrib narrowly margined; leaflets 3-7, upper surface
slightly pubescent, especially on midrib and margins, lateral leaflets acute or apiculate, sessile or subsessile, the upper pair sometimes with broad connate bases, terminal much larger, ovate or lanceolate, acuminate. Flowers fragrant, 1-10 in subumbellate terminal, often leafy cymes; pedicels up to 2 cm. Bracts linear, c. 5 mm long. Calyx teeth linear, 5-10 mm long, puberulous. Corolla white, tube 1-2 cm long, lobes 4-5, oblong, shorter than the tube, more or less involute at the margins. Berry black when ripe, elliptic or globose, 8-10 mm long, full of crimson juice. Commonly cultivated in gardens. Root used in ringwarm; flowers used in perfumes.


A erect or suberect, 1 (-2) m tall, deciduous or evergreen, glabrous shrub. Branches green, angular. Leaves alternate, very variable in size, 2-10 cm long, sometimes revolute; leaflets 3-5(-7), coriaceous, dark green above, paler beneath, variable in shape, elliptic, ovate, or lanceolate, acute or obtuse, terminal sometimes larger than lateral. Flowers in terminal corymbose cymes; pedicels 5-15 mm long. Bracts linear, minute. Calyx tube c. 3 mm long, teeth very short. Corolla yellow, tube 1-2.5 cm long, lobes 5, broadly ovate-obtuse or round, reflexed when the flower is open. Berry simple or didymous, globular-ellipsoid, 4-6 mm long, black when ripe, full of crimson juice. Commonly cultivated and also occurs in moist shady localities.


2. Nyctanthes Linn.

Deciduous shrubs or small, with quadrangular branches. Leaves opposite, simple, ovate, acuminate, entire. Flowers in small, sessile, bracteate heads which are arranged in trichotomous cymes, white with pale orange-mauve heads, fragrant about 1.2 – 2.5 cm across, in pedunculate heads. Calyx ovoid-cylindrical, subtruncate. Corolla salver-shaped; lobes 4-8. Anthers 2, subsessile. Ovary 2-celled; style cylindrical, very shortly bifid. Capsule orbicular, compressed parallel to the partition. Common in dry places also cultivated in gardens. Leaf infusion taken in rheumatic arthritis.

L.N.: Har sringar
Collection: 301, Lotan

59. SALVADORACEAE

Salvadora Linn.

Leaves ovate to ovate-lanceolate; flowers pedicellate ....................... S. persica.

S. persica Linn; Sp. Pl. 122. 1753; FBI. 3:619; FUGP. 2: 28; Parker, For. Fl. 323.

A small medium sized tree, crooked or bent. Bark grey white or dull grey. Trunk deeply grooved. Branchlets hanging. Leaves variable in shape, ovate, elliptic-ovate, elliptic-ovate or ovate-lanceolate about 2.5-7 cm long and 2-4 cm broad, pale green, fleshy, glossy. Flowers greenish yellow, in axillary and terminal panicles. Drupes globose 3 mm long, fleshy, dark red when mature. Occurs near rivers.

L.N.- Pilu
Fl.- Jan-Apr.; Fr.: July
Collection: 31, Itwa

60. APOCYNACEAE
1. Erect herbs or small shrubs:

2. Carpels with many ovules; fruits of 2-follicles. ........3. CATHARANTHUS

2. Carpels with 2 ovules; fruits of 2, 1-seeded drupes. ........6. RAUVOLFIA

1. Erect or straggling shrubs or trees:

3. Plants armed with spines. .................................2. CARISSA

3. Plants without spines:

4. Coralla rotate, another exerted..............................8. VALLARIS

4. Leaves elliptic-lanceolate, corolla salver-shaped; fruits of 2-dehiscent follicles. ........................................................................................................................................5. PLUMERIA

5. Trees, with broader leaves; flowers greenish-yellow; anthers without sterile tails. ..................................................................................................................1. ALSTONIA

5. Large, shrubs with liners-lanceolate leaves; flowers white, pink or red; anthers with sterile tails .........................................................................................4. NERIUM

6. Mouth of corolla with coronary scales .........................9. WRIGHTIA

6. Shrubs; follicles baccate, shout, few seeded. ......................7. TABERNAEMONTANA

1. ALSTONIA R.Br.,


Evergreen trees, to 20m high, with grey bark and verticillate branches. Leaves in whorls of (4-) 7, obovate, elliptic-lanceolate, 9-20 × 2.5-6cm, obtuse, acute or


2. CARISSA L.,

1. Leaves, 3.5-8cm long; calyx laber acute; berries ellipsoid, up to 1.3cm across .................................................................1. C. congesta

1. Leaves 1.5-4cm long; calyx lobes acuminate, berries glucose, up to 0.7cm across .................................................................2. C. opaca


   Evergreen, erect to suberect, diffused shrubs, with pale-brown to grey bark. Leaves opposite, elliptic lanceolate or obovate or obovate or suborbicular, 3.5-8 × 2.5-5.5cm, rarely mucronate or obtuse, cuneate at base, coriaceous, dark green, shining above; spines paired at the base of young branches, 2.5-4cm long. Flowers white or pink, fragrant, arranged in pubescent, corymbose cymes. Calyx pubescent; lobes 5, lanceolate, ciliate. Corolla tube to 1.2cm long; lobes lanceolate acute. Ovary glabrous, 2-celled, each with 4-ovules; style filiform; stigma fusiform, minutely 2-lobed. Berries ellipsoid, to 2.5cm long, smooth, purplish when ripe; seeds not hairy. Often cultivated Fruits edible, made into pickle;

2. **Carissa opaca** Stapf ex Haines in Ind. 47: 378. 1921; *C. spinarum auct. non L.; sensu* Hook. f. in India 3: 631. 1882; Duthie, Fl. U. Gang. Pl. 2: 32. 1922.

Evergreen, erect, bushy-diffused shrubs, w spreading branches; bark greyish-white. S 5cm long, straight or forked, usually at the branches. Leaves opposite, elliptic or ova orbicular, 1.2-3.5 × 0.8-2cm, acute or mu glabrate or pubescent beneath, coriaceo green and shining above. Flowers white, in few-flowered corymbose cymes. Calyx to the base; teeth 5, lanceolate, ciliate. Con cylindrical; lobes elliptic-lanceolate. O celled, each with 2 ovules. Berries subglo elliptic, 0.6-1cm long, purplish-black, juiceripe; seeds 2, not hairy.


Frequent; open exposed places, grassy slo *Leaves browsed by sheep and goats;*

2. **CARISSA** L.,

1. Leaves 3.5-8cm long; calyx lobes acute; berries ellipsoid, up to 1.3cm across. ................................................................. 2. *C. congesta*

1. Leaves 1.5-4cm long; calyx lobes acuminate; berries globose, up to 0.7cm across. ................................................................. 2. *C. opaca*


Evergreen, erect to suberect, diffused shrubs, with pale-brown to grey bark. Leaves opposite, elliptic-lanceolate or obovate or suborbicular, 3.5 -8 × 2.5-5.5cm, rarely cucronate or obtuse, cuneate at base, coriaceous, dark green, shining above; spines paired at the base of young branches, 2.5-4cm long. Flowers white or pink,
fragrant, arranged in pubescent, corymbose cymes. Calyx pubescent; lobes 5, lanceolate, ciliate. Corolla tube to 1.2cm long; lobes lanceolate, acute. Ovary glabrous, 2-celled, each with 4-ovules; style filiform; stigma fusiform, minutely 2-lobed. Berries ellipsoid, to 2.5cm long, smooth, purplish when ripe; seeds not hairy. Often cultivated. Fruits edible, made into pickle.


   Evergreen, erect, bushy-diffused shrubs, with rigid, spreading branches; bark greyish-white. Spines 2-5cm long, straight or forked, usually at the base of branches.

   Leaves opposite, elliptic or ovate to sub orbicular, 1.2-3.5x0.8-2cm, acute or mucronate, globrate or pubescent beneath, coriaceous, dark green and shining above.

   Flowers white, fragrant, in few-flowed corymbose cymes. Calyx divided to the base; teeth 5, lanceolate, ciliate. Corolla tube cylindrical; lobes elliptic-lanceolate. Ovary 2-celled, each with 2 ovules. Berries subglobose or elliptic, 0.6-1cm long, purplish-black, juicy when ripe; seeds 2, not hairy. Frequent; open exposed places, Leaves browsed by sheep and goats.


3. **CATHARANTHUS** G.Don, Gen.

1. Herbs; leaves lanceolate, acuminate, follicles glabrous. .................. 1. **C. pumillus**

1. Undershrubs; leaves oblong obovate, obtuse, apiculate; follicles pubescent..............................................................2. **C. roseus**

Annual, erect, glabrous herbs, to 50cm high; stem somewhat angular. Leaves elliptic-lanceolate, 2-6x1-2.5 cm, entire, acuminate, glabrous, base rounded or tapering; petioles 3-6mm long. Flowers white, solitary or in pairs, axillary. Calyx glabrous; lobes filiform to lanceolate. Corolla white, throat-narrow, hairy; lobes oblong-obovate, obtuse or apiculate. Follicles 3.5mm long, slender, straight, glabrous; seed oval-cylindric. muriculated. Occasional; along the moist places.


Perennial, erect undershrubs or herbs, to 60cm high. Leaves obovate, oblong-elliptic, 2.5-8x1-3.5cm, base cuneate, entire, obtuse, rounded or apiculate, pubescent when young, glabrescent later on; petioles 3-6cm long. Flowers white, pink or purplish, in axillary cymes. Calyx and corolla hairy. Follicles 2-3cm long, pubescent; seeds brownish-black, obovate. Cultivated; ornamental purposes.

L.N.: Sada-bahar Fl. & Fr.: Most part of the year. Collection: 1089, Sunholi

4. **NERIUM L.**

Evergreen shrubs, to 4m high, with silvery grey-bark. Leaves usually in whorls, linear-lanceolate, 10-20x1.2-2.5cm, narrowed at both ends, acuminate, coriaceous, dark-green, shining above, rough beneath; lateral nerves numerous; petioles short. Flowers red, pink or white, 2.5-3.5cm across, in terminal multichasial cymes. Calyx lobes lanceolate, pubescent. Corolla funnel-shaped; lobes obovate, spreading with coronary scales at the base. Fruits paired, narrowly cylindrical, 12-20x0.6-0.8cm, rigid, erect; seeds linear, ribbed, with a tuft of greyish-brown hairs. Common; cultivated in gardens.

L.N.: Kaner       Fl. & Fr.: Major part of the year.  Collection : 1161, Sunholi

5. PLUMERIA L.,


Deciduous trees, with thick fleshy branches and scattered leaves. Leaves alternate, ovate-lanceolate, or elliptic, 25-40x7-10cm, tapering at both ends, acute, entire; lateral nerves numerous, horizontal, parallel; short petioled. Flowers 5-10cm across, white or yellowish, fragrant, in terminal cymose clusters, usually flowering when tree is leafless. Calyx short, with obtuse lobes. Corolla salver- shaped; lobes elliptic, spreading, overlapping to the left. Stamens near the base of tube; anthers obtuse. Carpels 2, district; stigma 2-lobed. Follicles paired, 15cm long; seeds plano-convex, winged. Common; cultivated and naturalised.


6. REUVOLFIA L.,

Perennial, glabrous, imdershubs, branching from the base; stem to 80cm high, pale-coloured, lenticellate. Leaves whoried, elliptic-lanceolate or oblanceolate, 8-16x2.5-6cm, acute or acuminate, membranous, pale-beneath, narrowed into short petiole. Flowers pink-rose or white, about 6mm across, in terminal or axillary, many-flowered, long pedunculate cymes. Calyx lobes small, lanceolate. Corolla tube usually curved, flattened above the middle; lobes small, elliptic-oblong. Stamens included. Disc large, cup-shaped. Drupes 1 or 2, 6-12mm across, shining, purplish-black when ripe. Rare; *Roots well known for commercial drug 'Sarpgandha', used for fever, anxiety, epilepsy, intestinal and nervous disorders.*


7. **TABERNAEMONTANA** L.,


Evergreen, glabrous shrubs, to 2.8m high. Leaves opposite, elliptic to oblong-lanceolate, 7-14x2-5cm, acuminate, subcoriaceous, undulate, shining-green above, pale beneath, narrowed into short petioles; stipules cup-like. Flowers white, fragrant, 2.5-4.5cm across, in 1-8 flowered pedunculate cymes, at the forks of branches. Calyx lobes broadly ovate, acute. Corolla tube 1.5-2cm long, glabrous; lobes larger than tube, oblique-ovate, obtuse, with usually curled margins; mouth with 5-glands.
Follicles usually paired, 2.5-5×1.5 cm, glabrous, divaricate, 1-3 ribbed, with recurved beaks; seeds 3-6 in each follicle, oblong, embedded in fleshy red-aril. Common; cultivated *Roots chewed in tooth ache; latex useful in skin-ailments.*


8. **VALLARIS** Burm.


   Evergreen, glabrous, climbing shrubs, with asy-baric. Leaves opposite, elliptic-oblong, 6-11×2.5-5 cm, acuminate, undulate, gland-dotted, glossy above; petioles 5-10 mm long, with glands at the axils. Flowers white, 1.3-2 cm across, fragrant, in extra-axillary dicotomous. Calyx 5-partite, lobes ovate-oblong, obtuse. Corolla tube short with broad throat; limb rotate, spreading. Stamens woolly; anthers exserted, coherent in a cone a round the stigma; cells spurred. Follicles 10-15×2.5-4 cm, straight, tapering from the round base, connate first, ultimately separate; seeds numerous, ovoid, beaked, with a tuft of hairs. Frequent, in dry exposed slopes, edges of forests, from sub Himalayan tracts *Milky juice externally applied on sores and wounds;*


9. **WRIGHTIA** R. Br.,

Deciduous trees or shrubs, with grey corky bark, to 8m high; apical parts pubescent. Leaves opposite, elliptic, 7-14x3.5-7.5cm, shortly caudate-acuminate, membranous, tomentose on both sides; petioles 4-7mm long. Flowers pale-yellow to white, in erect, terminal, corymbose cymes. Calyx short, with 5-10 scales at the base. Corolla pale-yellow with fleshy orange-coloured coronary scales. Anthers sagittate, spurred at the base. Ovary of 2-connate carpels; style filiform; stigma ovoid. Follicles 2, connate, 10-25x1.3-2cm, grooved at the junction of carpels, straight, rough, with white, specks; seeds numerous, with a tuft of white, silky-hairs. Common; often associated with Sal, *Bark yields a yellow dye, also used as an antidote to snake bite.*


61. ASCLEPIADACEAE

1. Corona scales hood-Shaped without spur; flowers orange-yellow.

1. Corona scales late -ally compressed with a thick, revolute spur; flowers purplish-white

2. Follicles not echinate; coronal scales not notched:.................3. PERGULARIA

3. Leafless erect shrubs; corona of 5- scales.

4. Corolla tube short, limb rotate; corona of 5, hair tipped lobes. ............

..........................................................2. LEPTADENIA

1. CALOTROPIS R. Br.,

1. Corolla lobes erect; coronary scales 2-fid:

2. Leaves sessile. .................................................................................. C. prodera .

1. Corolla lobes spreading; coronary scales not bifid. ..........................

..............................................................................................1. C. gigantea

Erect, subarboreous shrubs, to 3m high; with ashy-coloured bark; young parts and undersurface of leaves white floccose-tomentum. Leaves opposite, sessile or shortly petioled; obovate or oblone or elliptic-oblong, 12-21x4-11 cm, acute or acuminate, base cordate or amplexicaule, cottony beneath, smooth above. Flowers white or purplish-blue, in umbellate or subcorymbose cymes. Calyx-lobes broadly ovate, acute, pubescent. Corolla ovoid in bud, tube short; lobes spreading, glabrous, deltoid, ovate-acute, with recurved margins. Coronary lobes 5, glabrous, ciliolate on the margins, shorter than the staminal column, with a recurved spur at the base and two obtuse auricles, below the rounded apex. Follicles in pairs, 7-10x3-4cm, boat-shaped, cottony-pubescent. Common; along *Regarded as sacred plant by Hindus bark of roots used in dysentery and powder of flowers.*

L.N.: Aak, Safed aak Fl. & Fr.: Most part of year Collection: 1099, Dumarigani


Erect, much branched shrubs, with woody base; bark soft, spongy; stem terete, cottony-pubescent. Leaves opposite, subsessile, elliptic, obovate to oblone, 10-20x5-13 cm, acute or abruptly acuminate, base cordate or auricled or amplexicaule, cottony pubescent on both surfaces. Flower purplish, on 6-12cm long, terete, pubescent peduncles, arranged in subumbellate cymes, arising in between leaf pairs; buds semispherical. Calyx lobes ovate, acute, margins scarious. Corolla lilac-purple, glabrous; lobes erect, ovate, acute or obscurely bifid. Coronary lobes 5, compressed,
slightly larger to staminal column, apex obliquely truncate, obscurely 2-fid, glabrous, without auricles and with a white spur. Follicles 7-10x5-6cm, ellipsoid or ovoid, recurved. Common; waste places, *Stem fibre for making rough nets; the soft floss of the seeds for stuffing pillows and cushions; flowers in cold, cough and asthma.*

L.N.: Aak, Madar  Fl: Dec.-May; Fr.: Apr.-Aug.  Collection: 1147, Itwa

2. **LEPTADENIA** R. Br.,


Deciduous, much branched, twining shrubs, with pale-yellowish to brown bark, young parts minutely pubescent. Leaves opposite, ovate-oblong or elliptic, 5-10x1.5-2.5cm, acute or acuminate, rounded or acute at base, subcoriaceous, glabrous above, minutely pubescent beneath; petioles to 2cm long. Flowers greenish-white or yellow in axillary, peduncled, umbellate cymes. Calyx deeply 5-lobed; lobes ovate, subacute, silky outside. Corolla rotate, fleshy, pubescent outside; tube short; lobes ovate-oblong, or triangular. Corona lobes 5, spreading, fleshy-thick, flattened with a spur from each lobe from insideside. Staminal column short; pollinia erect. Follicles slightly inflated, usually solitary, 10-20cm long, smooth with curved beak; seeds ovate-oblong, about 1-1.5cm long, compressed, margined with 2.5-4cm long coma. *Leaves and roots used in skin ailments.*


3. **PERGULARIA** L.,

Twining shrubs, with spreading hairs on the stem. Leaves opposite, ovate, deeply cordate, 2.5-7.5cm long, as broad as long, membranous, entire, acuminate, pubescent beneath; petioles 5-10cm long. Flowers long stalked, in axillary umbeilate cymes. Sepals small, ovate, pubescent. Corolla creamy-white, tinged with pink; tube short; lobes broadly ovate, spreading. Corona in two series, outer 5-10 crenate or lobed and 5-inner lateral compressed scales adnate to column, spurred. Column large, anther tip inflexed; pollinia pendulous. Follicles reflexed, parallel, lanceolate, 4-6cm long, echinate and beaked. Common in edges of fields and forests,


62. BUDDLEJACEAE

1. Leaves ovate to lanceolate; flowers in spikes. ................................. Buddleja

Buddleja Linn.


A large shrub, with thin grey bark; apical parts densely clothed with soft grey-tomentum. Leaves lanceolate, 3-14 cm long with narrowed base, serrulate, glabrous and dark-green above, densely grey or white tomentose beneath; petioles short or O. Flowers about 5 mm across; fragrant, white, in slender, drooping panicles, terminal or axillary, clusters of spikes. Calyx campanulate, lobes triangular, pubescent. Corolla tube twice as long as calyx, lobes 4, about 6 mm long and wide, white fading purple. Stamens 4; filament short. Ovary 2-celled, with many ovules in each cell. Capsules 5 mm long, ellipsoid, glabrous. Common in open grassy places. Leaf extract used in skin diseases.

L.N. – Neemda FR.: Nov-Apr.; Fr. : Feb-Jul Collection- 916, Shoratgarh
1. Flowers Zygomatic:

2. Herbs, 15-45 cm tall; flowers white or lilac. .................. 1. Canscora.

2. Minute herbs to 15 cm tall; flowers yellowish.................... 2. Hoppea.

1. Canscora Lann.


A much branched erect annual herbs about 10-15 cm long, with 4 angular obtuse stem. Leaves opposite, lower leaves shortly petioled, elliptic-ovate or oblong, about 2-4 cm long and .5-1 cm broad, upper leaves sessile, broadly ovate, base rounded, acute. Flowers rose pink, in lax, diffused at leafy panicles. Calyx tubular, not winged; lobes 4(5), lanceolate, acute. Corolla tube green; lobes unequal oblong, obtuse. Stamens 4; 1-2 fertile. Capsules narrowly oblong as long as calyx, membranous; seeds minute, dark brown, pitted. Common in marshy area.

Fl.: Sept-Feb.; Fr.: Nov-Mar Collection- 1088, Parsauna

2. Hoppea Willd

H. dichotoma Hayne ex Willed; FBI 4:100.1883. FUDP. 2:76. 1922.

A glabrous erect annual herbs about 4-10 cm tall; stem widely branched from the base, tetragonal. Leaves opposite, sessile, ovate, 3 to 5 mm long, acute, glabrous, 1-nerved. Flowers sessile, or shortly pedicellate, in 2-3 chotomous, leafy cymes. Calyx campanulate about 2.5-3 mm long, ribbed; lobes 4, lanceolate, acute. Corolla green-yellow lobes 4, ovate-triangular, quite, smaller than calyx lobes. Capsule
ellipsoid about 2 mm long. Occurs in river banks. Plant used as an antidote to snake bite.

Collection: 311, Dumarianganj

64. MENYANTHACEAE

Nymphoides hydrophylla

1. **Corolla lobes densely long pilose inside, without a longitudinal fold**. ............

.......................................................................................................................... 2. Nymphoides indica

1. Corolla campanulate, lobes shorter than tube; seed coat irregularly short spinescent

.......................................................................................................................... 1. Nymphoides hydrophylla


An aquatic floating herb. Stems 10-30 cm, rooting from nodes. Leaves few per node; petiole 4-10 cm, slender; leaf blade cordate, 1-6 × 1-4(-5) cm, submembranous, veins indistinct. Flowers 2-10 per node, 5merous, homostyous. Pedicel 2-6 cm, slender. Calyx 4-5 mm, lobed to near base; lobes narrowly oblong, apex acute. Corolla white, campanulate, 7-8 mm, lobed to middle, tube 4-5 mm; lobes 3-4 mm, margin laciniate, apex emarginate. Filaments absent; anthers triangular, ca. 1 mm. Style very short. Capsules globose, ca. 3 mm in diam., 6-10- seeded. Seeds brown, globose, ca. 1 mm in diam.; seed coat spinescent.


Rhizomes horizontal. Stems cylindric, unbranched. Petiole cylindric, 1-2 cm; leaf blade broadly ovate to subcordate, 3-18 cm, subcoriaceous, abaxially densely glandular, base cordate, margin entire; veins indistinct, palmate. Flowers many,
clustered at nodes, 5merous, distyloous. Pedicel cylindric, 3-5 cm. Calyx 3-6 mm, lobed to near base; lobes lanceolate to narrowly elliptic, apex obtuse. Corolla white with a yellow center, 7-12 mm; lobes ovate-elliptic, outside densely fimbriate-pilose, apex obtuse. Filaments flattened, linear, 1.5-1.7 mm; anthers sagittate, 2-2.2 mm. Style cylindric; stigma lobes triangular. Capsules elliptic, 3-5 mm, few seeded. Seeds brown, globose, 1.2-1.5 mm; seed coat smooth. Commonly occurs in ponds. Commonly occurs in ponds.


65. HYDROPHYLIACEAE

Hydrolea Linn.


Fl.: Sept-Oct Collection-527, Parsauna

66. POLEMONIACEAE

Phlox Linn.
1. A glandular hairy herb, style 3 fid. .......................... Phlox drummondii.


Annual, up to 40 cm tall, erect branching, more or less villous and viscid. Leaves alternate, lanceolate or oblong-acute, sessile. Flowers conspicuous, in flat-topped leafy cymes; pedicels up to 1 cm. Calyx lobes 5-7 mm long, narrow, acute, spreading or recurving in fruit. Corolla salver-shaped, imbricate, twisted in bud, tube villous outside, c. 1 cm long, exceeding the calyx; colour and shape of the lobes quite variable. Stamens unequal. Capsule globular, 3 mm in diam., usually shed before dehiscing; seeds 3-5. commonly cultivated in garden.


67. BORAGINACEAE

1. Corolla without scales on the throat;

2. Flowers small to 50 mm across........................................ Heliotropium.

2. Flowers large, to 20 mm across................................. Trichodesma

3. Flowers bright yellow, dimorphic.......................... Arnebia

1. Heliotropium

1. Heliotropium Linn.

1. Leaves upto 10 cm long; fruit 4 beaked, separating into 2 nut like 2- seeded pyrenes.

1. Leaves less than 7.5 cm long; fruit not beaked separating into 2-4 nutlets:

2. Sepals broad, enclosing the fruits; prostrate villous annual.......... H. supinum

2. Sepals narrow, not enclosing the fruit:
3. An erect herb, branching from woody bax; leaves broader elliptic to obovate 
................................................................................................................. H. ellipticum

3. A small procumbent herb; leaves narrow linear. ............... H. strigosum

3. A small shrub-like herb with stiff ascending branches…… H. curassavicum.


Prostrate branched annual. Branches brown-tomentose with dense appressed hairs up to 1 mm long. Leaves petiolate, greyish white with dense hairs; petiole up to 15 mm long. Lamina 10-20 x 5-12 mm, ovate to obovate or elliptic, cuneate to ± oblique, entire-undulate, obtuse, nerves impressed on upper surface. Inflorescence lateral and terminal, 2-7 cm long; flowers uniseriate. Calyx deciduous, ± 2.5 mm long, up to 5 mm in fruit, ¼th partite into ± obtuse lobes, densely hairy. Corolla tube 34 mm long, retroresely hairy to the outside, glabrous within lobes oblong, shallow, erect. Anthem c. 1 mm long, narrowed towards the apex, attached c. 1.5 mm from the corolla base. Stigma c. 0.6 mm long, conical; stigmatic ring prominent. Style ± stigma length, with few retrorse hairs. Ovary glabrous. Fruit globose, enclosed in the persistent calyx. Nutlets c. 2.5 mm long, ovoid in outline, glabrous, back rugulose and minutely tubercied.


2. Heliotropium curassavicum L., Sp. Pl. 130. 1753. DC., Prodr. 9:538.1845

A glabrous perennial up to 45 cm tall. Stem and branches decumbent. Leaves 15-40 x 4-8 mm, glabrous, oblanceolate or-linear-lanceolate, obtuse, nerves faint. Inflorescence terminal, simple or bifurcate, 3-6 cm long, with usually uniseriate
flowers. Calyx 1.5 mm long, persistent, 5-partite into ovate-lanceolate lobes. Corolla white, tube short, c. 1.7 mm long, glabrous; lobes c. 1 mm long, obtuse-undulate, ± patent. Anthers 0.7-0.8 mm long, sessile, broader at the base, attached 0.7 mm from corolla base. Stigma conical, c. 0.5 mm long, sessile, stigmatic ring prominent. Ovary and fruit glabrous. Nutlets 2 mm long, brown, back ± rugose.

*Fl. Per.*: March-April.  
Collection: - 432, Birdpur.


Perennial, prostrate to procumbent or ± erect and up to 28 cm tall, usually much branched from the base, appressed hairy. Leaves 6-30 x 2-4 mm, linear-lanceolate, acute, appressed, strigously hairy on both surfaces, with short hairs. Hairs less than 1 mm long. Inflorescence bracteate, 2-10 cm long, simple or paired. Lower bracts lanceolate, 2-3 mm long; lower flowers with pedicels up to 2 mm long. Calyx 2.5-3 mm long, 5-partite, lobes lanceolate, hairy to the outside, glabrous within, somewhat puberulous at the throat; lobes spreading, broad. Anthers 0.7-0.8 mm long, ± adnate when young, attached c. 0.6 mm from base of corolla tube. Stigma conical, 0.6-0.7 mm long, minutely pilose towards tip; stigmatic ring prominent. Style slightly shorter, glabrous. Fruit ± globose, depressed or not, 4-lobed, dense pilose. Nutlets 4, dark brown, c. 1.5 mm long. Occurs in moist shady places.

L.N.: - Jhunkdi  
Fl. & Fr.: - After rain.  
Collection: - 876, Lotan.

**2. Arnebia**

Annual or perennial branched herb; stem prostrate to decumbent or suberect. Root exuding a purplish dye. Stem (-s), branches and leaves hispid, with small (up to 0.6 mm long) weaker hairs. Basal leaves 15-35 x 3-4 mm (cauline shorter), lanceolate, entire, ± revolute, tapering towards the base. Inflorescence a terminal scorpioid cyme up to 11 (-18) cm long in fruit, bracteate; bracts 4-8 mm long, lanceolate. Flowers heterostyled. Calyx 5-partite, 6-9 mm long, hispid, lobes unequal, linear-lanceolate. Corolla vinous to the outside, tubular; tube in long styled flowers 8 mm long, infundibuliform, 4-5 mm broad; lobes broadly ovate, margin entire to undulate, spreading, throat without hairs. Tube pubescent within just below the anthers (in long styled flowers). Anthers 1.5 mm long. Ovary deeply 4-lobed. Style simple, slender. Long styles reaching throat of corolla, short styles 4-5 mm long. Stigmas 2, flabellate. Nutlets ± 1.7 mm long, ovoid, light brown, minutely tuberculate.


An annual herb with spreading and densely hairy branches; hairs dimorphic; shorter ones thin, appressed, up to 0.3 mm long; longer ones stiff, up to 0.6 mm long with smaller bases. Leaves oblanceolate to lanceolate, 3.5-8.5 x 0.6-2.0 cm, amplexicaul or nor; middle cauline ones the largest, hairy on both surfaces, the upper surface with hairs up to 1.8 mm long. Inflorescence terminal, lax, few-flowered.
Bracts leafy. Pedicel 10-25 mm long. Flowers mauve to pinkish blue or lilac. Calyx 5-partite, hairy, 10-12 mm long, base ± auricled; lobes oblong, narrowed towards apex. Corolla exceeding calyx length, infundibuliform, sparsely hairy on outside; lobes suborbicular, subacuminate. Anthers hairy, aristate-the connectives later twisting together. Nutlets 4-5 mm long, ovoid, smooth, white to bluish. Common on the rides and along with road sides during rainy season.

FL.&Fr.-After rain. Collection:- 555, SHOHRTGARH.

68. EHRITACEAE

Cordia Linn.

1. Calyx shortly lobed ................................................................. 1. Cordia
   2. Calyx deeply lobed ............................................................ 2. Ehretia

1. Cordia Linn.

1. Leaves 1-2 times as long as broad. Flowers white. Colyx 2.5-6 mm long. .......... ................................................................. C. dichotoma
   2. Leaves glabrous above not ribbed ........................................ C. myxa
   2. Leaves scabrous above ....................................................... C. vestita.

Cordia myxa

A deciduous tree 3-5 m tall. Young shoots and branches with a rusty pubescence, glabrate at length. Leaves 6-12.5 x 43-8.2 cm, suborbicular. elliptic-ovate to oblong-ovate, 3-nerved, acute or obtuse, subentire to sinuate-crenate or dentate, glabrous to dense tomentose on under surface, base cuneate to rounded. Petiole 2.5-43 cm long. Flowers not seen. Drupe 20 mm long, ovoid, apiculate, brownish-yellow,
base partly surrounded by the enlarged, ± broadly cupular calyx. Occurs in moist shady places of the district.


2. Cordia dichotoma Forster. f., Prodr. 18.1786; FBI. 4:136.1833; FUGP.2: 82.1922.

A polygamo-dioecious tree up to 15 m tall. Branchlets pubescent. Leaves 5-8 x 1.5-3.0 cm, elliptic-ovate to obovate, pubescent, especially on the under-surface, margin sometimes undulate, base cuneate to oblique or rounded. Petiole up to 3.0 cm long. Flowers in dichotomous cymes, ebracteate. Male flowers: Calyx c. 2.5 mm long, shallowly 5-lobed, hairy to the inside. Corolla campanulate, c. 6 mm long, tube about equalling the limb, dense hairy within. Lobes oblanceolate or broadly so, recurved. Filaments c. 4.5 mm, lower half hairy and adnate to tube; anthers 2.5-3 mm long; bisexual flowers: similar but larger than male flowers. Calyx 5-6 mm long, campanulate, accrescent and up to 10 mm in fruit. Filaments c. 2 mm long. Style branched. Drupe up to 15 mm broad, yellowish-red. Occurs in moist shady places of the district.


A deciduous polygamous tree with densely tomentose branchlets. Leaves 7-12 x 4.5-12 cm, broadly ovate to obovate, obtuse or acute, base truncate or cuneate, margin undulate. Upper surface scabrid and darker in colour, lower dense grey-white tomentose. Petiole up to 3.5 cm long. Flowers in dense cymes, yellowish-white. Pedicel 8-15 mm, tomentose. Calyx 8-15 mm long, 5-lobed, ribbed, tomentose on the
outside. Corolla tube equalling calyx, hairy within. Limb 11-12 mm broad; lobes 5, obtuse-crenulate, filaments hairy at base. Drupe 15-17 mm long, ellipsoid. Cultivated species.


2. Ehretia Linn.


A small to medium sized tree up to 9 m tall. Young shoots and branches puberulous to glabrescent. Leaves 8-15 x 4.5-1.5 cm, suborbicular, obtuse to acute, minutely pubescent especially on undersurface, but becoming glabrescent, base rounded to cuneate or oblique. Petiole long. Flowers white, in axillary and terminal cymes, subsessile. Calyx ± 1.5 mm long, 5-partite, minutely rusty-tomentose. Lobes c. 1 mm long, ovate, acute. Corolla c. 5 mm long. Lobes ovate-lanceolate, c. 3 mm long, spreading. Filaments c. length of corolla, glabrous, lower half adnate; anthers 1.5 mm long. Styles 2-3 mm long, Stigma capitate. Ovary 2 mm long, ovoid. Drupe c. 3 mm long, black and wrinkled (When dry). Common on the ridge also occurs in villages.


Deciduous trees to 15 m tall; bark black-gray, laciniate; branches light brown, smooth; branchlets brown, glabrous, with distinct lenticels; axillary buds solitary, compressed. Petiole 1.5-2.5 cm, glabrous; leaf blade elliptic to obovate or obleng-
ovate, 5-13 × 4-6 cm, glabrous or sparsely puberulent, base broadly cuneate, margin regularly serrate with teeth curved upward, apex acute, apiculate. Cymes paniculate, 8-15 × 5-8 cm, short pubescent or subglabrous. Flowers crowded, fragrant. Calyx 1.5-2 mm; lobes ovate, ciliate. Corolla white, campanulate, 3-4 mm; lobes spreading, oblong, longer than tube. Stamens exserted; filaments 2-3 mm, inserted on upper part of base, 0.5-1 mm; anthers ovate, ca. 1 mm. Style 1.4-2.5 mm, branches ca. 0.5 mm. Drupes yellow or orange, 3-4 mm in diam.; endocarp wrinkled, divided at maturity into 2 2-seeded pyrenes Common in exposed areas.


69. CONVOLVULACEAE

1. Flowers numerous in large panicles; capsules 1-seeded, indehiscent....5. PORANA

1. Flowers few in cymes or solitary; capsules with valves or operculum:

2. Prostrate or trailing herbs; leaves small to 3cm; styles 2......... 3. EVOLVULUS

5. Stigma linear, ovary 2-celled; pollen not spinulose. ........2. CONVOLVULUS.

5. Stigma globose, ovary (2)4-celled; pollen spinulose..............4. IPOMOEA


Prostrate, twining or creeping, slender, glabrous or sparsely hairy herbs, with milky latex. Leaves ovate-oblong to lanceolate, 2-18×0.5-4cm, hastate or sagittate at base, obtuse or mucronate at apex, glabrous; petioles 1-3cm long. Flowers white or lilac, axillary, solitary or 2-3 flowered cymes, peduncles angular, variable in size; pedicels 1-2cm or more in length; bracteoles linear. Calyx short; lobes 3.5-5mm long, elliptic-oblong, obtuse or mucronate. Corolla 1.5-2cm, funnel-shaped, white or lilac, with tuft of hairs at apex on dorsal side. Stamens slightly unequal. Capsules ovoid-
globose, 5-8mm long, glabrous; seeds 4, dark-brown to black, slightly verrucose. Common; nearby crop fields,


2. Evolvulus L.

1. Leaves orbicular or suborbicular with cordate base; flowers white; stem rooting at nodes; capsules 1-locular. ........................................1. E. nummularius


Perennial, prostrate, much branched, sparsely pubescent herbs, rooting at nodes. Leaves alternate, shortly petiolate, orbicular or suborbicular, 0.5-1.5cm across, cordate at base, glabrous, except hairy on nerves beneath. Flowers white, 1-2, in sessile cymes. Calyx lobes lanceolate, ciliate on margins. Corolla white, funnel-shaped, about 5-6mm across; lobes oblong, hairy outside. Capsules globose-ovoid; seeds 4(2), smooth. Common; waste places, edges of crop field

Fl.: Aug-Oct; Fr.: Sept-Nov Collection: 1035, Lotan

3. Ipomoea L.

1. Erect or suberect, stout shrubs. ....................................................... 3. I. cornea

3. Leaves pinnatipartite, with linear-filiform segments. ............ 6. I quamoclit

2. Corolla campanulate or funnel-shaped; calyx segments not distinctly awned:

4. Herbs without tubers; flowers purple with pink centre. ..... 1. I. aquatica

5. Flowers in involucre heads (leaves digitately 5-9 lobed)..............

................................................................. 4. I. pes-tigridis
6. Flowers reddish-purple; leaves and calyx glabrous… 2. I. cairica

7. Sepals long, thin, prominently acute. ………… 5. I. purpurea


Procumbent on wet ground or floating on water, rooting at the nodes, the stem hollow. Leaves mostly hastate, the terminal lobe narrowly triangular or lanceolate, the basal lobes smaller and spreading or almost absent, 4-12 cm long, apically acute or obtuse, glabrate. Flowers solitary or in few-flowered cymes. Sepals ovate-oblong, 7 mm long, obtuse or subacute, glabrous. Corolla white or purple, 4-5 cm long. Fruit capsular, ovoid to globose, 8-10 mm long. Seeds densely soft-pilose or glabrous.

*Fl. Per.:* Usually all the year

Collection: 1222, Balrampur


Perennial climbers. Roots tuberous. The stems twining, tuberculate or smooth. Leaves ovate to orbicular in outline, palmately cut to the base into 5 lobes, these lanceolate or ovate-lanceolate to ovate or elliptic, 3-10 cm long, pseudostipules present. Flowers of 1-to few-flowered cymes. Sepals ovate, obtuse to acute, mucronulate, 4-6.5 mm long. Corolla purple or white with a pinkish or purplish base inside the tube, 5-6 cm long. Fruit capsular, subglobose, 10-12 mm long. Seeds densely short-tomentose or with long trichomes on the margins.

*Fl. Per.:* June to December

Collection: 1513, Birdpur

Erect or suberect shrubs, with thick, terete, fistular stem; lenticels in the older parts. Leaves ovate to ovate-oblong, 6-20×4-10 cm, base cordate or hastate, acuminate, glabrous; petioles 3-20 cm long, with a pair of glands at the base of leaf. Flowers purple, 6-10 cm large, in many flowered, axillary or terminal, pedunculate cymes. Sepals subequal, ovate to obovate, obtuse, pubescent outside. Corolla pink to rose-purple, tubular or funnel-shaped, hairy in the mid petaline zones. Capsules ovoid-globose, glabrous, 1.5-2 cm long; seeds 4, large, brown-villous. Common; waste places

Fl. & Fr.: Throughout the year
Collection: 1227, Naugarh


The annual stems twining or prostrate or sprawling, patently pubescent with rigid trichomes. Leaves orbicular to transversely elliptic in outline, palmately divided nearly to the base, (3-) 5-7 (-9)-lobed, the segments oblong to elliptic, attenuate to acuminate on both ends, acute to obtuse apically, pubescent with appressed or patent trichomes, 3-7.5 cm long, often wider than long. Flowers involucrate-cymose. Sepals lanceolate or the inner narrow-lanceolate, 7-12 mm long, pubescent. Corolla funnel-shaped, white, 3-4 cm long. Fruits capsular, ovoid, 8 mm long. Seeds gray tomentose, 4 mm long.

*Fl. Per.*: August to October
Collection: 1412, Itwa

Plants annual, the stems twining, pilose to hirsute with spreading trichomes. Leaves broadly ovate to cordate, 2-10 cm long, entire or trilobate, pubescent on both surfaces. Flowers in 1-5-flowered cymes. Sepals oblong-lanceolate, 8-16 mm long, apically abruptly acute, hirsute on the basal portion. Corolla purple, pink, blue or with stripes of these colours on a white background, throat white, 3-5 cm long. Fruit globose, glabrous; seeds glabrous. Common; along waste places, fields and way sides, Fl.&Fr.: Feb-Oct

Collection: 1237, Bansi


Climbers, the stems glabrous. Leaves 1-9 cm long, ovate to deeply pinnatisect with 9-19 alternate or opposite pairs of linear lobes, glabrous. Flowers solitary or in 2-5-flowered cymes. Sepals elliptic to oblong, 4-7 mm long, obtuse apically, with a 0.25-0.75 mm long mucrone, glabrous. Corolla red, 2-3 cm long, salverform. Fruit capsular, ovoid, 6-8 mm long. Seeds dark brown to black, with dark patches of short trichomes scattered somewhat irregularly.

*Fl. Per.:* August to October

Collection: 737, Birdpur

3. **PORANA** Burm. f.,

1. Flowers in long pendulous racemes; corolla shallowly lobed, 5-6mm long; 3 of the sepals enlarged in fruits. ..........................1. *P. paniculata*

Climbing, pubescent, evergreen shrubs. Leaves ovate-cordate, 6-15x 4.5-10cm, acuminate, entire, membranous, softly grey-pubescent on both surfaces; basal nerves 5-7; petioles 3-12cm long. Flowers white, small, 3.5-5cm across, numerous, in large axillary or terminal, leaf-bearing drooping panicles; bracts foliaceous, not clasping, persistent. Sepals linear-oblong, 1-2mm long, hairy; 3- enlarged in fruits. Corolla white, 5-6mm long, funnel-shaped, shallowly lobed. Stamens included. Style subsessile or short. Capsules to 7mm long, globose-ovoid, hairy, 2-seeded. Common; dry open scrubs jungles.


4. **Rivea**


Perennial, erect or scandent shrubs, with woody base; stem branched from the base, densely white pubescent. Leaves orbicular-reniform, 12-15×14-18cm or more, deeply cordate at base, retuse, white margined, glabrous above, white pubescent beneath; petioles 4-10cm long, with a pair of gland at the base of leaf. Flowers white, in 5-7 flowered, axillary pedunculate cymes; bracts lanceolate, caduceus. Sepals 5, subequal, thick, ovate-lanceolate, persistent. Corolla salver-shaped 6-7 cm long, glabrous outside, hairy along mid-petaline zones. Stamens 5, included. Capsules subglobose, yellowish-brown, 4-seeded, supported by persistent calyx at the base. Along forest clearnings, edges of forests,

Fl.: Aug-Oct; Fr.: Nov-Dec Collection: 1088, Lotan
70. CUSCUTACEAE

Cuscuta Linn.

1. Corolla two to three, as long as calyx……………………………………… C. reflexa.


Annual perennial, parasitic, leafless, twining or climbing herb; stem thick, branched, glabrous or slightly pubescent, mostly not interlaced, succulent, light brown to dark brown. Leaves persistent, cup-shaped, fleshy, margin succulent, obovate obtuse about 1 to 2 mm long. Flowers waxy white, in small, globose, short, axillary racemes. Calyx pale brown, campanulate, 2-4mm long; lobes ovate, obtuse. Corolla waxy white, tubular, 6-8 mm long; lobes reflexed. Ovary 2-celled. Capsule globose, about 3-5 mm across, somewhat fleshy; seeds large, 2-4, black. Common twinner’s on several trees and shrubs such as Vicia, Ziziphus, Abuliton etc.


71. SOLANACEAE

3. Capsules 4-valved; corolla over 10cm large:

4. Flowers smaller than above; fruits dehiscent, spinous. ……………3. DATURA

3. Capsules 2-valved; corolla 3-5cm large. ……………………………... 7. PETUNIA

2. Flowers in panicked cymes or corymbs, usually terminal. …………6. NICOTIANA

6. Anthers opening by apical pores; leaf; entire or lobed. ………………

……………………………………………………………………………………………9. SOLANUM

6. Anthers longitudinally dehiscing throughout; leaves pinnatifid………

……………………………………………………………………………………………4.LYCOPERSICON
8. Flowers solitary or in few flowered panicles; corolla rotate; berries elongate or oblong. ..............................................................1. CAPSICUM

8. Flowers in axillary clusters; corolla Hbular; berries ovoid-globose. ......................................................................................................................2. CESTRUM

9. Flowers solitary; corolla campanulate:

10. Fruiting calyx 5-partite; corolla blue; filaments hairy at base. ..............
..........................................................................................................................5. NICANDRA

10. Fruiting calyx 5-dentate or lobed; corolla yellow; filaments glabrous...
..........................................................................................................................8. PHYSALIS

9. Flowers clustered; corolla rotate. ....................................................... 10. WITHANIA

1. CAPSICUM L.,

1. Fruiting pedicels pendulous at anthesis; corolla milky-white, lobes straight. ........................................................................................................... 1. C. annuum

1. Fruiting pedicels erect at anthesis; corolla greenish-white, lobes slight revolute.
............................................................................................................................................................................. 2. C.frutescens


Annual-perennial, bushy herbs, to 1m high. Leaves elliptic-oblong, entire, acute or obtuse, glabrous. Flowers white or bluish-white, solitary-axillary or paired, on pendent rarely erect pedicels; pedicels variable in size, 2-10cm long. Fruits mostly drooping, elongate, 6-15(-30)cm long; seeds circular, compressed. Commonly cultivated for condiment or vegetable,

Fl. & Fr.: Most parts of the year. Collection: 1154, Itwa.

Annual-perennial shrubs, to 2m high. Leaves elliptic or elliptic ovate, 4-10x2-4.5cm, base acute or round, entire, apex acute, glabrous or minutely hairy. Flowers greenish-white, 2 or more at each node, usually on erect pedicels, rarely pendent. Fruits ovoid, oblong, rarely acuminate, mature fruits red, erect, softly fleshy, calyx embracing the base; seeds creamy-yellow, circular, compressed. Commonly, cultivated for condiment.


2. CESTRUM L.,

1. Flowers orange-yellow; corolla lobes glabrous. ......................... 1. C. aurantiacum

2. Leaves oblong-ovate or elliptic; corolla lobes erect. .................. 2. C. nocturnum

2. Leaves linear or lanceolate; corolla lobes spreading. ....................3. C. parqui.

1. Cestrum aurantiacum Lindley, Bot. Reg. 30: 71. 1844; Bor & Raizada, Beaut. Indian Climb. & Shrubs 119. t. 76. 1954;

Erect or scrambling, glabrous, bushy shrubs, to 3m high. Leaves long petiolate, ovate or ovate-lanceolate, 4-10x2.5-6cm, acute or acuminate, undulate margins, glabrous, foetid when bruised. Flowers orange-yellow, 1.5-1.9cm long, 4-5mm across, sessile, in lateral and terminal panicled cymes. Corolla tubular, glabrous. Cultivated; gardens also naturalised in the moist shady places at


Subscandent, evergreen, glabrous shrubs, to 3m high, with spreading branches, Leaves long petiolate, ovate-oblong to lanceolate, 6-10x2.5-6cm tapering at both ends, acuminate, glossy above, pale-green beneath. Flowers pedicelled, greenish-white or yellowish-green, 2-3cm long, in axillary and terminal panicles, very fragrant at night. Cab/c short, 2-3mm long. Corolla tubular; lobes erect, with pubescent margins, (the flowers usually open at night). Commonly cultivated for ornamental purposes.

L.N.: Rat Ki Rani  Fl: Throughout the year. Corolla: 609, Lotan

3. **Cestrum parqui** L Herit., Stirp. Nov. 73. 1788; Bor & Raizada, Beaut. Indian Climb. & Shrubs 120. t. 77. 1954.

Deciduous, glabrous shrubs, to 1.5m high. Leaves linear to lanceolate, 2.5-10xl-3cm, entire, acuminate, narrowed -into- a short, usually winged petiole; foetid when bruised. Flowers greenish-yellow or white, sessile, in axillary or terminal, umbellate-panicles. Calyx 4-6mm long. Corolla greenish-yellow, tubular, 2cm long; lobes short spreading, with pubescent margins. Flowers fragrant during night. Common; planted in gardens for fragrant blooms.


3. **DATURA** L.,

1. Capsules erect; flowers white. .............................................................. 3. *D. stramonium*

1. Capsules nodding; flowers dull-white or purplish:

2. Capsules with large, slender, 8-14mm long weak spines........... 1. *D. innoxia*

2. Capsules with dwarf, stunted, to 3mm long triangular spines:

3. Flowers with single corolla whorl; stem green or purple tinged; spines not violet; staminodes absent. .................................................................2. *D. metel*

Annual, divaricately branched, stout-bushy herbs; stem cylindric, minutely pubescent with erect viscid hairs. Leaves ovate, 8-18x3-10cm, acute, rounded and oblique at base, glandular pubescent on both surfaces; petioles 5-12cm, hairy. Flowers solitary-axillary, white or dull-white; pedicels 1-1.5cm long, stout, pubescent. Calyx tubular, 7-10cm long, inflated at the base; teeth 1-2cm long, triangular, acute. Corolla 15-18cm long, 8-10cm across at mouth; limb 5, deltoid, acute, with 5-acumens between each sinus. Stamens 5(6), reaching at the mouth of corolla tube; filaments linear; anther oblong, obtuse. Capsules deflexed, minutely pubescent, on curved stalk, ovoid to globose, covered with numerous, straight, 8-11 cm long spines; seeds reniform, flattened, pale-brown to buff coloured, 4.5-x3.5mm, minutely pitted. Common; waste places, road sides, nearby villages Seeds narcotic, used in medicines.


Annual-perennial, dichotomously branched herbs or undershrubs, to 1m high; stern terete, usually tinged purple, or green, glabrous or minutely pubescent, with prominent scars of fallen leaves. Leaves broadly ovate, 15-22(-30)x8-12cm, entire, or toothed or slightly angulate, oblique at the base, acute tip; petioles 4-12cm long,
tinged purple. Flowers solitary-axillary, white or light yellow, 10-15(-20) cm long; pedicels 1-2 cm long, stout, terete. Calyx tubular, 6-10 cm long; lobes triangular, acuminate. Corolla funnel-shaped, 16-20 cm long, white or yellowish-white, or purplish outside; lobes 5, short, acute. Fruits globose, 3-4 cm across, pubescent, with stout, greenish, triangular, 3-4 mm long spines; seeds ear-shaped, light-brown in colour, 4-5 x 3-4 mm, minutely pitted. Common; moist localities, waste places, road sides.


Annual, erect, much branched herbs, to 1 m high; stem and branches green or pale-yellow, glabrous and minutely hairy on apices. Leaves ovate-oblong, rhomboid to somewhat triangular, 10-22 x 6-14 cm, base unequal, margins coarsely double-lobed, sinuses and lobes broad with acute apices, glabrous, thin and membranous; petioles 3-10 cm long, sparsely hairy. Flowers solitary, axillary white, on 4-10 mm long stalk. Calyx angular, 3-4.5 cm long, pubescent, with 5-prominent longitudinal ribs; lobes tomentose inside, 6-7 mm long. Corolla white, 8-10 cm long; lobes 5, rounded, with 8-10 mm long acumen. Capsules erect, oblong or somewhat conical, 4-6 cm long, 2-3 cm across, beset with more than 100 sharp spines; seeds flattened, reniform, 3 x 1 mm, pale-brown to black with pits and reticulations. Common; waste places, road sides,

*Seeds medicinal as toxicant.*


4. **LYCOPERSICON** Miller (LYCOPERSICUM auct. pl.)

Annual, erect or decumbent-ascending herbs; stem somewhat angular or cylindrical, covered with glandular hairs. Leaves 1-2 pinnatifid or partite, varied in shape and size; segments ovate-anceolate, irregularly dentate, glandular-hairy on both sides. Flowers yellow, in 1-several flowered cymes. Fruits red (tomato-red), smooth, sometimes grooved, varies in shape and size, with green persistent Calyx at the base. Cultivated; throughout the area.


Annual, much branched, foetid herbs or undershrubs, to 1.5m high; stem fistular, sulcate, glabrous. Leaves ovate-lanceolate, 8.5-13.5x2.5-8cm, irregularly toothed or lobed, base decurrent, apex obtuse or acute, thin, membranous; petioles winged in the upper parts, to 15cm long. Flowers sky-blue, solitary, axillary, on 1.5-3cm long, drooping stalk. Calyx 1.5-2.5cm long, 5-lobed to the base; lobes ovate-lanceolate, acuminate. Corolla bell-shaped, blue or rarely white, 2.5-4cm across, hairy outside; lobes broad, obovate, spreading. Stamens 5, attached at the base of corolla; filaments linear; anthers oblong. Berries globose, 1.2cm across, glabrous, enclosed by enlarged, 5-angled, papery calyx lobes; seeds minute, somewhat discoid, compressed. Common; waste places, nearby crop fields leaf extract locally used to kill lice.
6. NICOTIANA L.,

1. Leaves radical and cauline; corolla tube linear, pale-pink; stamens subsessile, attached just below the throat of corolla tube. .......................... 1. N. plumbaginitolia.

1. Leaves cauline; corolla tube narrow below, ventricose above, rosy; stamens with about 3cm long filaments, attached just above the base of corolla tubs.

.................................................................2. N. tabacum


Annual-biennial, sticky-glandular, shallow-rooted herbs, to 80cm high. Leaves forming a rosette at base; cauline leaves sessile, elliptic-ovobate or lanceolate, 5-10x3-6cm, semiamplexicaule at base, acute or obtuse, uppermost one smaller, undulate-crispy, glandular. Flowers pale-pink, in distant leafy panicled cymes. Calyx 10-ribbed, glandular-hairy; lobes unequal, lanceolate, acuminate. Corolla glandular-hairy outside, 2.5-3cm long; lobes ovate, obtuse. Capsules ovoid, 10x6mm; seeds rugose. Common; roadsides, waste places.

L.N.: Ban-Tambakhu Fl. & Fr.: Almost throughout the year.

Collection: 1022, Shoratgarh.


Erect, viscid, much-branched, glandular-pubescent, annual-perennial herbs, up to 100 cm tall. Stems terete, glandular-hairy. Leaves sessile, elliptic-oblung, with a narrowed, semi-amplexicaul base, acute or acuminate. Flowers in cymose panicles.
Bracts linear. Pedicels 0.5-1.5 cm long. Calyx 1.5 cm long, glandular-pubescent; lobes ovate-triangular, acuminate. Corolla 4.5-5 cm long, glandular-hairy outside, greenish white; lobes ovate, shortly acuminate. Filaments hairy at base. Fruit ovoid-globose, 2-2.3 cm long, slightly longer than the calyx. Very variable in habit, size and shape of leaves and calyx.

Collection: 1313, Bansi

7. PETUNIA Juss.


8. PHYSALIS L.,

2. Leaves sinuate, dentate; corolla 8-10mm long; fruiting calyx 5-angled. ........
...................................................................................................................................................... 1. *P. divaricata*

3. Filaments not dilated upward; glabrous. ..........................1. *P. peruviana*


Annual, erect or prostrate-ascending, much branched herbs, to 60cm high; stem angular, ribbed, thinly pubescent. Leaves ovate, 3-10x1.5-4.5cm, base obliquely rounded or subcordate, sinuately toothed or lobed, acute or acuminate, more or less pubescent; petioles 1-5cm long. Flowers solitary, on long slender, drooping, 0.5-2cm long pedicels. Calyx hairy outside; lobes acute. Corolla 0.8-1cm long,
yellow; lobes short, obovate, acute. Anthers yellow. Berries globose, 0.5-1cm across, enveloped by distinctly angular calyx lobes. Common; waste places, roadsides, crop.


Annual-perennial, erect or rambling, glandular-viscid herbs; stem fistular, tinged with purple. Leaves ovate-cordate, 6-15x3-9cm, obliquely cordate base, subentire, sinuate to dentate, pubescent, rarely glabrescent, acute or subacute; petioles 0.5-4cm long. Flowers 1-2cm long, solitary, axillary, on 1-2cm long pedicels. Calyx 0.7-1.2cm long, divided to halfway down; lobes ovate, acuminate. Corolla yellow, 1.3-1.6cm long, with distinct dark-brown spot; lobes obovate, obtuse. Filaments slender, uniform in thickness, glabrous. Berries ellipsoid-globose, 1.5-2cm across, enveloped by 5-angled, 4-5cm large calyx. Common; waste places, crop fields.

L.N.: Tipari  Fl: Jul.-Sept; Fr.: Sept.-Nov.  Collection: 1116, Birdpur

9. SOLANUM L.,

1. Unarmed shrubs or herbs:

3. Prostrate creeping plants with tubers; flowers white................ 5. S. tuberosurn

5. Erect or ascending weak herbs; flowers to 5mm across; berries 4-6mm across. .................................................................2. S. nigrum

1. Armed shrubs or undershrubs:

8. Calyx not prickly. .................................................................1. S. Melongena

8. Calyx prickly: .................................................................3. S. surattense

9. Diffused undershrubs, prickles straight.

11. Indumentum grey-white; sparsely aculeate. ....................... 4. S. torvum

   Annual-biennial, aculeate, undershrubs, 0.50-lm high; prickles curved. Leaves ovate, lobed, clothed with hairs. Flowers blue, calyx not prickly in most cases. Fruits are distinct, some varieties with elongated, whereas others with round, globose shape. Commonly cultivated.

   L.N.: Baingan  
   Collection: 1032, Birdpur.


   Annual-perennial, erect or rambling, glabrous herbs; stem much branched, 15-60cm (-1.5m)-high. Leaves ovate, ovate-lanceolate, 2.5-8xl.8-4cm, entire or sometimes repand-dentate or toothed, base cuneate or rounded, acute or obtuse; petioles 1-5cm long. Flowers white or with dark-blue centre, nodding in subumbellate, extra-axillary, peduncled cymes. Calyx 1.5-5mm long, glabrous; lobes ovate-rounded, obtuse, hairy or without. Corolla 6-8mm across, tube short; lobes oblong, subacute. Filaments hairy at the base. Ovary glabrous; style hairy at base. Berries bright red, orange or black when mature, 5-8mm across, globose. Common; waste places, roadsides, crop fields, and gardens, **Fruits edible; the extract of plant used in liver, piles and dysentery.**

   L.N.: Makoi, Kirmoi  
   Fl. & Fr.: Almost throughout the year. Collection: 813, Kanwa.


   Annual or perennial, prostrate, decumbent-ascending, diffused undershrubs; stem aculeate with straight, yellow prickles, glabrous or hairy on young parts. Leaves
oblong in outline, deeply lobed or sinuate, 10-18x2.5-4cm, with straight prickles on margins and midrib; irregularly dentate, subacute. Flowers purple or blue, in 2-6 flowered cymes. Calyx about 6mm long, aculeate and hairy, divided halfway down; lobes ovate-lanceolate, acuminated. Corolla 1.5-2cm across, tube very short; lobes lanceolate, acute, spreading. Ovary hairy and glandular at the upper-part. Berries globose, yellow, about 1.4cm across, occasionally with green streaks. Common; open exposed localities, roadsides, and edges of fields, *Fruits as medicine in fever, cough, asthma, and gonorrhoea.*

L.N.: Berkatali  Fl. & Fr.: Almost throughout the year.


    Perennial, sparsely aculeate, shrubs or undershrubs to 2.5m high; stem stellately pubescent, with short, hooked prickles. Leaves ovate-elliptic, pinnately lobed or fid, base unequal, rounded or cordate, acute or obtuse, sparsely aculeate on mid rib beneath, stellately pubescent on both sides. Flowers white, 1.2-1.4cm long, in many flowered corymbose cymes. Calyx about 6-8mm long, hairy; lobes lanceolate, acuminated. Corolla hairy outside, 7-8mm long; lobes subacute. Ovary hairy. Fruits about 1.2cm across, green or yellowish, globose. Common; forest edges and clearings.


    Erect or prostrate-ascending herbs, with subterranean stolons bearing tubers; stem much branched, ribbed or winged. Leaves sinuate-lobed or pinnate, 6.5-10cm long; leaflets short petioled, ovate or elliptic, with unequal rounded base, more or less
hairy. Flowers white, in lateral or terminal corymbose cymes. Calyx hairy, divided more than half way down. Corolla tube short, hairy outside. Rarely in fruiting, however, berries globose, green, glabrous. Commonly cultivated.

L.N. : Aalu 
Fl. & Fr.: Mai.-Jun. 
Collection: 1097, Birdpur.

10. WITHANIA Pauquy,


Perennial, much branched undershrubs, to 1.5m high; stem stellate-tomentose throughout. Leaves ovate or elliptic-oblong, 4-12x2.5-7cm, acute or decurrent base, entire or rarely crenate, acute or obtuse; petioles 1.5-3cm long. Flowers light yellow, in 1-few flowered axillary fascicles, pedicels short. Calyx about 4.5mm long, hairy; lobes triangular, acute. Corolla greenish-yellow, 5-8mm across; lobes ovate, obtuse. Ovary glabrous. Berries 8-12mm across, yellow-orange, globose, enclosed within the inflated, 5-10 ribbed calyx; seeds discoid, muricate. Common; along waste places, roadsides, Leaf juice given in fever and urinary disorders.

L.N.: Aswagandha, Asgandh. 
Fl. & Fr.: Jan.-Jun. 
Collection: 23, Lotan.

72. SCROPHULARIACEAE

1. Fertile Stamens. 2.

2. Calyx 5 partite; carolla tubular;

3. Leaves basal and cauline; Lindernid

2. Calyx 4-partite corolla with spreading laber .....................7. VERONICA

4. Corolla saccate; flowers white.
5. Erect herbs, leaves not dimorphic .............................6. S. COPARIA

6. Calyx with 2-bracteoles; anther cells sessile. .....................1. BACOPA

6. Calyx spathaceous, inflated; anthers 2-cells stipitate:

7. Capsules septicidal. .........................................................4. LINDERNIA

7. Capsules loculicidal:

8. Leaves glandular-punctate; fruits 4-valved; seeds angular. 2. LIMNOPHILA

9. Calyx without bracteoles; corolla with 2-gibbous throat:

10. Calyx campanulate; anthers 2-celled. .............................5. MAZUS

10. Calyx with bracteoles; corolla without gibbous throat. .................

.................................................................3. LINDEMBERGIA

1. BACOPA

2. Leaves entire; corolla bluish white. ......................................2. B. monnieri

2. Leaves shallowly crenate-serrate; corolla yellowish. ............ 3. B. procumbens.


Glabrous, creeping-ascending, somewhat succulent herbs, 12-25cm high; stem terete, rooting at nodes. Leaves sessile, obovate-oblong, 1-2. 8cm long, narrowed towards base, entire, obtuse or rounded, gland-dotted beneath. Flowers solitary, axillary, on 1-3cm long, slender pedicel; bracteoles linear, shorter than pedicels. Calyx divided to the base, glabrous; lobes unequal, upper segments ovate, acute, longer and broader to others. Corolla bluish-white with purple tinge, 1-1.5cm long; lobes subequal, rounded. Anthers bluish-purple. Capsules ovoid, acute, glabrous. Common; moist and shady places, marshy localities. Plant paste applied externally for rheumatic pains, extract.

Prostrate-ascending, diffused herbs, 10-30cm high; stem 4-angular, rooting at nodes. Leaves sessile or subsessile, ovate or elliptic, 1-3cm long, base narrowed, serrate, subacute, glabrous. Flowers yellowish, solitary, axillary, on 0.5-1.2cm long pedicels; bracteoles oblanceolate. Calyx divided to the base; lobes unequal, upper larger and broader to others. Corolla yellowish, slightly longer than calyx. Fruits oblong, retuse. Common; waste localities, fields and road sides.

Fl. & Fr.: Almost throughout the year. Collection: 1130, Lotan.

2. **LIMNOPHILA** R. Br.

1. Flowers pedicelled; lower leaves in whorls, finely divided to linear segments.

..........................................................2. *L. indica*


Annual-perennial, aquatic or marshy, aromatic herbs, to 30cm high; stem much branched, erect, rooting at nodes. Leaves variable, dimorphic, sessile; lower leaves in whorls, divided into many filiform, linear segments; upper leaves entire, linear-obleng, serrate-dentate, 1-nerved. Flowers pink or white, pedicelled, usually solitary, axillary, rarely racemose. Calyx 3-4mm long; lobes linear. Corolla 4-6mm long, pink or white. Stamens 4, didynamous, included. Capsules subglobose, 3-4mm long.
3. LINDENBERGIA

1. Annuals; calyx-segments obtuse, rounded:

   2. Flowers in terminal lax-flowered spikes, 2-3cm long...............1. *L. grandiflora*


   Softly-pubescent, rambling herbs or undershrubs, 30-60cm high. Leaves opposite, broadly ovate, 2.5-5.3x1-2.5cm, apex acuminate, margins coarsely toothed, lateral veins conspicuous; petioles 2-6cm long. Flowers bright-yellow, 2.5-3cm long, pedicelled, forming lax leafy-spikes; bracts ovate, 8-12mm long. Calyx campanulate; lobes 5, obtuse. Corolla pubescent; tube slender, 3 times as long as calyx; lobes 2-lipped, upper lip with 2-rounded, small lobes; lower lip 3-lobed, much larger, rounded, swelling in the throat. Stamens 4, didynamous. Ovary villous. Capsules ovoid, 2-grooved; seeds minute, numerous. Common; roadsides, grassy slopes.


4. LINDERNIA Allioni

1. Leaves petioled; flowers purplish; calyx divided near to half way down..

   2. Leaves closely serrate with bristly-tip; corolla white. ..............1. *L. ciliata*.

Annual, simple or branched, erect herbs, 3-15cm tall; stem roughly 4-angular, rooting at the base. Leaves sessile, oblong-lanceolate, 1-4x0.5-1.2cm, obtuse or rounded, acutely densely-serrate, with pointed bristles, glabrous. Flowers white, pedicelled, forming terminal racemes; pedicels equalling the calyx; bracts linear-lanceolate, serrate. Calyx about 4-5mm long, divided to base; lobes linear-lanceolate, acuminate, ciliate. Corolla 6-8mm long, white, with pale purple margins and yellowish spot on the lower lip. Fertile stamens 2; staminodes club-shaped. Capsules linear-lanceolate, acute, twice as long as calyx. Common; shady places, crop fields, road sides.


*Capraria crustacea* L., Mant. PI. 1: 87. 1767.

Annual, erect or ascending herbs, branching from the base, to 20cm high. Leaves opposite, ovate, 0.8-2x0.4-1cm, truncate or rounded base, acute or subobtuse, serrate or subentire, glabrous or hairy on mid rib; petioles 2-7mm long. Flowers purplish, solitary, axillary or few-flowered cymes. Calyx shortly 5-lobed, elongated in fruits; lobes triangular, acute. Corolla 5-8mm long, purplish-white. Fertile stamens 4. Capsules obovate, 5-6mm long. Common; moist places, road sides, crop fields.


**5. MAZUS** Lour.,

1. Pedicels and calyx glabrous; calyx lobes ovate-acute.......................... *M.pumilus*

Annual, erect-ascending, glabrous or sparsely hairy herbs; stem 5-10cm long, without stolons. Radical leaves in rosettes or opposite, crowded, oblong or oblong-spathulate, cuneate base, cuneate-dentate, 2.5-5.2cm long; upper leaves alternate, short petiolate or subsessile, glabrous or hairy. Flowers white-lilac, in lax, leafy racemes. Calyx glabrous, 5-7mm long; lobes ovate lanceolate, subacute. Corolla pale or lilac-white, 2-lipped, yellowish, gland-hairy, longer than calyx lobes. Stamens 4, in 2 pairs. Capsules globose, included in the calyx. Common; waste places, lawns, grassy slopes.


6. SCOPARIA L.,


Annual-perennial, simple or branched herbs; stem glabrous, angular-ribbed, often with woody base. Leaves opposite or in whorls of 3, obovate, or lanceolate, 1-4.5x0.5-2.2cm, obtuse or subacute, crenate-serrate, glabrous, gland-dotted beneath; petioles 0.4-1cm long. Flowers white, shortly pedicellate, 1-3 together, in the axils of leaves. Calyx rotate; lobes 4, subequal; stamen filaments filiform; anthers subsagittate. Capsules globose, 3-4mm across. Common; roadsides, old walls, fields, waste places.

Fl. & Fr.: Almost throughout the year. Collection: 1005, Loton.

7. VERONICA LINN.
1. Stem and leaves often glabrous, leaves membranous; capsules turgid, globose, eciliate. ................................................................. 1. \textit{V. anagallis-aquatica}

2. Pedicels shorter than leaves; capsules obcordate, almost as broad as long. ................................................................. 2. \textit{V. arvensis}


Annual, erect or suberect or decumbent, pubescent or glabrous herbs, 10-30 (-50) cm high; stem hollow, creeping, stoloniferous. Leaves sessile, oblong-lanceolate or linear-oblong, 5-10xl2-cm, base semiamplexicaule, subentire-crenate, subobtuse. Flowers pale-purple or white, in lax axillary or terminal, bracteate racemes, forming 15-20 cm long, leafy panicles. Calyx glandular hairy; lobes 4, oblong-lanceolate. Corolla 1.5-2 mm long; lobes 4, rounded. Stamens 2, exserted. Capsules broadly ovate to globose, flattened, with hairs, emarginate. Common marshy-aquatic habitats.


Annual, erect or ascending, pubescent, simple or much branched herbs, 4.5-13 cm high. Leaves sessile, or lower ones short petioled, ovate, 0.8-1.2x0.4-0. 8 cm, crenate or entire, acute; upper alternate, entire, smaller. Flowers solitary, axillary, on 0.5-1 cm long pedicel, arising from the axils of floral leaves (bracts), shorter than leaves. Calyx 4-lobed; segments lanceolate, ovate, obtuse, ciliate. Corolla pale-blue, segments obovate, spreading. Stamens 2. Capsules broadly obcordate, hairy, laterally
flattened to wing-like structures; seeds somewhat biconvex, brownish-black.

Common; as a weed of wheat fields.


73. OROBANCHACEAE

Orobanche L.

1. Flowers with 2. bracteoles; bracts shorter than corolla ............ O. aegyptiaca.


Stout, slender, puberulous or pubescent scapose, parasitic herbs, about 10-20
cm tall, usually branches from the base. Scales distant, few, lanceolate, hairy, flowers
sessile or lowers ones stalked, fosming a lax spikes; bracts half as long as corolla
tube, ovate lanceolate, bracteoles filiform shorter than calyx. Calyx 6-7 mm long,
campanulate, 4-toothed corolla 1.5 to 3 cm long, hairy outside; upper lip 2 lobed,
lower equally 3 lobed, tube slightly curved. Anthers woolly, tube slightly curved.
Anthers woolly. Capsules glabrous, oblong, acuminate. Commonly occurs with crop
fields.

L.N.- tokra, Khumbi. Fl. & Fr.: Feb-Mar Collection: 30, Suhase

74. BIGNONIACEAE

1. Erect trees or shrubs :

2. Fruits indehiscent, large, woody, gourd-like Kigelia Fruits dehiscent, not as
above.

3. Large shrubs; leaflets toothed; capsules linear .................................. Tecoma
4. Leaflets ovate to ovate-lanceolate, larger; staminodes absent; flowers white with long, slender tube. \textit{Millingtonia}

5. Leaflets oblong, smaller; staminodes very long; flowers mauve-blue \textit{Jacaranda}

1. Climbers and lianas:


Small to medium-sized trees, with grey-white or dull-black bark. Leaves paripinnate, opposite, pinnae up to 20 pairs. Flowers mauve or light blue, in lax, pyramidal panicles. Capsules orbicular, hard.

Collection: 1033, Sahanjanua


Collection: 1204, Birdpur.


Collection: 1233, Lotan.
75. PEDALIACEAE

1. Flowers pink or rosy; fruits elongate, capsular .................. 1. Sesamum

SESAMUM L.,


Annual, erect, glandular-pubescent herbs, 30-100cm high; stem bluntly 4-gorgeous, patently viscid-pubescent. Leaves various, lower opposite, 3-foliate or palmatisect; higher ones short petioled, alternate, ovate-lanceolate, acute or rounded base, subacute, subentire or coarsely serrate; petioles 1-10cm long, in the lower leaves. Flowers white or pinkish with yellow-purplish blotch, up to 3.5cm long, solitary axillary, on short pedicel. Calyx 5-6mm long, glandular-hairy; lobes linear, unequal. Corolla 2-3cm long, tubular, 2-lipped. Stamens 4, didynamous, included; anthers sagittate. Capsules erect, hairy, beaked, 1.5-3cm long, 4-chambered; seeds white or black, flattened, obliquely oblong. 2-3mm long. Common; fields, waste places, gardens; Decoction of seeds with jaggery is given in dysmenorrhoea; and leaves as detergent to wash hair.


76. MARTYNIACEAE

Martynia Linn.

A erect, widely branched, glandular-viscid, annual herbs or undershrubs; stem thick, fistular, viscid. Leaves broadly ovate-orbicular, about 15-40 cm long, base cordate, dentate, densely hairy, herbaceous; petioles stout, fistular, 10-30 cm long. Flowers purple pink with yellow spokes, in axillary 5-15 cm long, lax racemes; bracts and bracteoles pale-pink, distinctly veined, pedicles 1 to 3 cm long calyx yellowish-white or greenish, divided near to the base; segments unequal. Corolla 5 to 6 cm long, glandular pubescent; tube 3-4 cm long, pale-pink to purple; lobes broadly rounded, pink with purple blotch anterior segment larger than others. Stamens 2; staminodes 2-3. Drupes 2-3 cm long, ovoid, black pyrenes with serrete dentate ribs, hard curved 2-beaks. Common in waste places and along with roadsides. Fruit powder given in cough and cold.

L.N.- Bichu Fl.- Aug-Oct; Fr.-Oct-Dec Collection: 121, Birdpur

77. ACANTHACEAE

1. Climbing plants; calyx minute, annular or 10-15 toothed; pollen-grains with spiral-apertures. ............................................................................................................... 10. Thunbergia

1. Prostrate or erect plants; calyx usually deeply divided; pollen grains not with spiral-apertures.

2. Corolla without upper lip; lower lip large, 3-lobed; anther 1-celled.
........................................................................................................................................... 3. Blepharis

2. Flowers pink purple in 2-3 chotomously branched panicles.......7. Peristrophe

3. Bracts with scarious margins in 1-sided spikes; pollen grains 2-porate
........................................................................................................................................... 9. Rungia

4. Flowers white with purple line; calyx 5-patite; anther cell apiculate; pollen 2-colporate. ........................................................................................................... 1. Adhatoda
4. Flowers pink-pale-purple; one of the carlx segments small or 4-parted; anther cell not apiculate; polen 3-colporate. .................................................. 6. Justicia

5. Spikes not aggregated; 2 stamens exserted, 2 rudimentary..........

.................................................................2. Barleria

6. Corolla distinctly 2-lipped in flowers cence vermiculate ......

.................................................................5. Hygrophila

6. Roots tuberous; flowers in axillary, pedunculate cymes…. 8. Ruellia

7. Flowers in capitate spikes.................................4. Hemigraphis

1. ADHATODA P. Miller,


Evergreen glabrous shrubs, to 2.5m high; stem clothed with thick, white-woolly tomentum. Leaves opposite, ovate-lanceolate, 4.5-15x2.5-8cm, base decurrent, subentire-crenulate, glabrous, except hairy on nerves beneath; petioles 1-3.5cm long. Flowers white, in short bracteate, 2.5-6cm or more long spikes; bracts foliaceous, ovate, to 2cm long not spiny, glabrous. Calyx 0.5cm long hairy; lobes lanceolate, acute. Corolla white with pink or purple strips, 1.8-2.6cm long, 2-lipped; tube compressed, upper lip 2-fid, curved; lower 3-lobed, deflexed. Stamens 2; anthers minutely tailed. Capsules 2.5x0.8cm or more, clavate, pubescent; seeds 4, suborbicular, rugose. Fairly common; waste places, road sides, edges or forests,

*Young twigs made into vegetable, supposed to be good for cough and cold.*

2. BARLERIA L.,

1. Plant armed; flowers orange-yellow. .....................................................2. B. prionitis

1. Plants unarmed; flowers blue or violet:

2. Outer calyx segments lanceolate, margins spiny. .................................1. B. cristata


   Perennial, deciduous or subdeciduous, stiffly hairy, undershrubs, to 1.5m high, with 4-gonous stem. Leaves opposite, elliptic-oblong or lanceolate, 2.5-12x1-3.2cm, acute or acuminate, entire, adpressed hairy; lateral nerves 4-6 pairs; petioles 0.4-2cm long. Flowers blue or white, subsessile, in axillary or terminal, crowded, short spikes; bracts and bracteoles linear, with spinule tipped apices, bracteoles shorter than outer sepals. Outer sepals 2-2.5cm long, ovate-oblong, spinule-tipped apex; inner ones 1cm long, linear-lanceolate, ciliate, acuminate. Corolla funnel-shaped, 4cm long; lobes to 2.5cm long, rounded, spreading. Fertile stamens 2. Capsules oblong, 1.2-1.8cm long, glabrous, 4-seeded. Fairly common; open grassy slopes, Root decoction used against bronchitis and pneumonia.


   Erect or diffused, armed undershrubs, to 1m high; spines 2 to 4, in the axils of leaves, white. Leaves ovate-elliptic, 6-11x3-5.5cm, base narrowed, acuminate, tipped with spinules, petioles to 2.4cm long, smaller in upper leaves. Flowers orange yellow, in cymes, forming terminal leafy spikes; bracts linear, spinescent; bracteoles of small bristles or 0. Sepals broadly lanceolate, acuminate; 2 outer spine tipped, to 2cm long;
2 inner to 1.2cm long, 2-lipped. Stamens 4, fertile usually 2. Capsules black, 2-2.4cm long, ovoid, beaked, 2-seeded. Uncommon; in waste localities, cultivated for ornamental purpose, Root and bark used in indigenous medicine for cough and cold.


3. BLEPHARIS Juss.,


Perennial, prostrate, spreading or erect, much branched, pubescent herbs, with thick rootstocks. Leaves usually in whorls of 4, unequal ovate-elliptic to obovate, 3-6.8x1.3-2cm, narrowed towards the base, entire, acute, thin in texture; petioles 3-6mm long. Flowers blue or pinkish purple, solitary or 2-3, in leafy spikes; bracteoles 8, in 4-series, bristly, broadly spatulate. Calyx segments 4, unequal, lanceolate, pubescent and ciliate. Corolla 1.2-1.5cm long, blue or pinkish or white, with yellow spot on the throat, 1-lipped. Anthers 1-celled, other reduced or 0. Capsules ellipsoid, 0.8-1.4cm long, 2-seeded. Dry, exposed, rocky slopes.


4. HEMIGRAPHIS Nees in DC.,


Perennial, prostrate-ascending, densely hairy herbs; stem obtusely 4-angled, covered by soft white hairs. Leaves ovate-elliptic, 3-9x1.8-6cm, base attenuate or rounded, acute or acuminate, serrate dentate, lanceolate, pubescent; petioles 1.5-3cm
long. Flowers sessile, blue or purple with yellowish tube, in axillary, capitate heads; bracts foliaceous, ovate-lanceolate, hairy with ciliate margins; bracteoles 0. Calyx 4-5mm long, glandular-pubescent; segments linear, hairy with ciliate margins, subequal. Corolla nearly straight, narrowly funnel-shaped, to 1cm long; tube yellowish, limb blue; lobes obovate, obtuse. Stamens 4, didynamous. Capsules oblong, beaked, 6-8 seeded; seeds hairy. Common; Forest edges, exposed slopes, waste places.

Fl.: Oct.-May; Fr.: Apr.-Jul. Collection: 889, Birdpur

5. HYGROPHILA R.Br.

1. Armed herbs; flowers in axillary whorls; calyx segments 4; fertile stamens 4. ................................................................. 1. H. auriculata

1. Unarmed herbs; flowers in terminal spikes; calyx segments 5; fertile stamens 1. ............................................................................................................................................. 2. H. polysperma


   Perennial, armed herbs, 10-80cm high; stem 4-gonous, strigose-hispid; spines 1.5-4cm long, usually straight. Leaves apparently in whorls of (4)6(8), the outermost largest, lanceolate-oblong to spatulate, 5-9 1-2.4cm, base cuneate, apex acute or subacute, margins minutely dentate. Flowers in axillary clusters; bracts and bracteoles leafy, linear. Calyx 4-partite; segments unequal. Corolla purple-blue to whitish-yellow; tube 1.2cm, broader above lobes 5, subequal. Stamens 4. Capsule glabrous, oblong, 10x3-4mm; seeds orbicular.


Annual-perennial, prostrate-ascending herbs, often rooting near the base. Leaves subsessile, elliptic-lanceolate or narrowly oblong, 1-5x0.4-1.4cm upper ones smaller, lanceolate, glabrous. Flowers pale-blue or white, in dense, terminal, 2.5-8cm long spikes; bracts leaf like, ovate-lanceolate; bracteoles linear, ciliate. Calyx 4-5mm long; teeth linear with ciliate margins. Corolla 6-7mm long, pale blue or white, pubescent, 2-lipped; tube slightly broadened above. Stamens didymous; posterior pair usually rudimentary. Capsules narrowly oblong, 6-7mm long, many seeded. Common; along the banks of rivers and rivulets, near marshy localities.

Fl. & Fr.: Oct.-May. Collection: 1141, Bansi

6. **JUSTICIA L.**

1. Leaves liners to linear-lanceolate, nearly sessile, bracts, bracteoles and sepals obtuse. .................................................................3. *J. quinqueangularis*

1. Leaves elliptic, oblong or ovate, petiolate; bracts, bracteoles and sepals acute:

2. Erect or ascending herbs; leaves 2.5-3cm long, acute; raphides curved; spikes cylindric. .................................................................4. *J. procumbens*

2. Prostrate diffused herbs; leaves 0.6-1.2cm long, obtuse; raphides straight; spikes liners. .................................................................2. *J. prostrata*

Erect, slender, much branched herbs; stem ribbed or 4-gonous, with long internodes, 10-60cm high. Leaves ovate or elliptic, oblong, 1-3.5x0.8-2cm, acute, entire, glabrous or sparsely hairy; petioles 1.5-3cm long. Flowers pale-purple, in axillary and terminal, 1-3cm long, compact, racemose spikes; bracts linear, lanceolate, hairy, ciliate; bracteoles linear, hairy, narrower. Calyx 3-4mm long, deeply 4-partite; segments unequal, linear, subacute or acute. Corolla 4-6mm long, hairy outside, 2-lipped, Stamens 2, attached to the upper part of corolla; anthers unequally placed. Ovary tip and style base hairy. Capsules 3-4mm long, oblong, hairy at the top. Common; moist shady localities, open grounds.

Fl.: Feb.-Apr.; Fr.: Oct.-Nov. Collection: 774, Sunhauli


Prostrate-ascending, diffused, shallow-rooted herbs; stem obscurely 4-angled, to 30cm long. Leaves ovate or elliptic lanceolate, 2.2-5x1.2-1.8cm, acute or acuminate, base narrowed; petioles 0.5-1.2cm long. Flowers pink or pale-purple, in axillary or terminal, 3-12cm long spikes; bracts linear, lanceolate; bracteoles linear, acute. Calyx about 2-3mm long, deeply 4-partite; segments unequal, lanceolate, acute. Corolla 3-4mm long, sparsely hairy outside, 2-lipped. Stamens 2. Ovary glabrous; style hairy below. Capsules 4-5im long, oblong, shortly beaked. Common; waste places, edges of crop fields.


Prostrate-ascending, glabrous herbs, with thick rootstock; stem angular, geniculate with distant internodes, to 50cm high. Leaves linear or linear-lanceolate, 4.5-7.5x0.6-0.7cm, glabrous, raphides obscure. Flowers rose-coloured, in 3-12cm long, terminal spikes; bracts linear, obtuse, glabrous; bracteoles similar to bracts, smaller. Calyx 4 partite, as long as bracts, about 4mm long; segments linear, obtuse. Corolla 6-8mm long; upper lip notched; lower suborbicular, 3-lobed, larger. Filaments glabrous. Capsules oblong, pointed, 5-6mm long, glabrous. Common; along waste places, vacant crop fields.


7. PERISTOPHE Nees in Wallich,

1. Panicles lax-divaricate, bracts acuminate; corolla 1-1.5cm long.1. P.paniculata


Annual-perennial, erect herbs; stem slender, branched, 30-70cm high. Leaves ovate-lanceolate, 2-8.5x1-3cm, rounded at base, acute or acuminate; petioles 0.5-2cm long. Flowers purple, in much branched, lax-panicles; bracts 2, opposite, unequal, linear; bracteoles linear-lanceolate, ciliate. Calyx 4-5mm long; segments 5, linear-lanceolate, ciliated. Corolla pink or purple, 1-1.5cm long, 2-lipped. Capsules oblong, beaked, hairy. Common; along waste places, road sides, terraces of crop fields.
8. **Ruellia** L.,


Erect, simple or branched herbs, with tuberous roots, 20-25cm high. Leaves ovate-elliptic to oblong, 1-4x0.2-1cm, acute at base, obtuse or subacute at apex, glabrous, ciliate; short petioles to 6mm long. Flowers blue-violet, paired in the axil of leaves; bracts linear-spathulate; bracteoles 0. Calyx up to 2cm long; segments linear, ciliate. Corolla 5-5.5cm long, hairy outside; lobes rounded, sinuate-dentate. Capsules ca2.5cm long, cylindrical. Common; waste places, road sides.


9. **Rungia** Nees in Wallich

1. Bracts dimorphic; flowers small, bright blue; tracts not winged...... 1. *R. pectinata*

1. Bracts uniform; flowers large, violet; bracts winged.......................2. *R. repens*


Annual, procumbent, much branched herbs, to 30cm long. Leaves elliptic or oblong-lanceolate, 4-7x1-2.2cm, tapering at both ends, sparsely hairy. Flowers small, bright blue, in one sided, terminal, pubescent, 2.5-3cm long spikes; bracts dimorphic, barren lanceolate, cuspidate, pubescent; fertile orbicular, hairy on margins, bracteoles
smaller, lanceolate, acute, margins scarious, 2-fid. Calyx 2-3mm long, deeply 5-partite; segments linear-lanceolate, pubescent. Corolla 3-4mm long, white with blue lines, 2-lipped; upper lip acuminate. Stamens 2. Capsules 2mm long, ovoid, 4-seeded; seeds orbicular, compressed, echinate. Common; moist-shady places, waste localities.


Annual, procumbent-ascending, spreading herbs, rooting near the base, to 3 cm long. Leaves nearly sessile, lanceolate to elliptic-oblong, 3-5x1-1.5cm, acute, sparsely hairy. Flowers violet or pinkish, in erect, 2.5-6cm long, terminal spikes; bracts broadly elliptic, cuspidate, ciliate; bracteoles smaller. Calyx 3-4mm long, 5-partite; lobes lanceolate, pubescent. Corolla 6-8mm long, violet with purple spot on the lower lip, upper lip notched. Stamens 2. Capsules 3-4mm long, ovoid, pubescent, 4-seeded; seeds rugose. Uncommon; waste localities.


10. **THUNBERGIA** Retz. in Physiogr.


Glabrous or hairy twiners, with swollen nodes. Leaves broadly ovate, 4-12x3-7cm, acute or rounded, entire, base cordate or hastate; petiole 6-10mm long. Flowers white with yellow throat, solitary or paired, in the axils; pedicels 3-5cm long; bracteoles falcate-oblong, lanceolate, acute, hairy outside with 12-15 linear, lanceolate, acute segments. Corolla 3-4cm long, pubescent outside; tube as long as
segments, constricted below the limb; lobes 5, obovate, truncate, spreading. Capsules about 2.5 cm long, glabrous, 4-seeded.

Fl. & Fr.: Almost throughout the year except winters. Collection: 1166 Shoratgarh.

78. VERBENACEAE

1. Prostrate creeping herbs; fruits dry, enveloped by copular calyx. ............ Phyla

1. Shrubs or undershrubs. ......................................................... Lantana

2. Flowers in long cylindric spikes; ......................................... Verbena

2. Flowers white; calyx much accrescent; ...................................... Tectona

3. Leaves digitately compound. ................................................ Vitex

4. Calyx campanulate; drupes succulent. ......................... Clerodendrum

1. Clerodendrum

1. Leaves in whorles; ................................................................. 1. C. indicum

1. Leaves opposite

2. Leaves less than 10 cm long; flowers often in axillary panicles. ............... 

................................................................. 2. C. phlomides


Undershrubs with stolons; stem fistular, sulcate, simple or branched. Leaves in whorls of 3-5(7), subsessile, oblong-lanceolate, 10-18×2.5-3.5, base acute, tip acute or acuminate, subentire, glabrous. Flowers creamish-white, in few-flowered cymes, arranged in terminal, 15-30 cm long panicles; pedicels 1-2.5 cm long. Calyx deeply 5-
lobed, 1-1.5cm long; segments oblong, acute. Corolia tube 10-15cm long, drooping; lobes 1-1.5cm long, oblong-obtuse. Drupes 1-4, connate, dark-blue when ripe, seated on enlarged red calyx.

Fl.: Jul-Sept; Fr.: Sept-Nov

Collection: 1512, Lotan


Hoary-pubescent, woody shrubs, to 5m tall. Leaves opposite, ovate or subrhomboid, 3-5×2-3 cm obtuse or acute, tip chartaceous, serrate, more or less puberulous beneath; petioles to 2cm long. Flowers greenish-white or creamish, in axillary panicles; pedicel slender; bracts leaf like, ovate-lanceolate. Calyx about 8-10mm long, divided to half way down, slightly enlarged in fruits. Corolla tube to 2cm long; lobes less than 7mm long. Drupes globose, black when ripe; seeds oblong. Common; exposed localities

Fl.&Fr.: Almost throughout the year

Collection: 1413, Itwa

2. Lantana

1. Flowers red, orange or yellow in capitate spikes ...................... 1. L. camara

1. flowers white, in ovoid-oblong spikes. ..................................... 2. L. indica


Evergreen, straggling shrubs, with characteristic odour, to 3m high, with or without minute prickles on the branches. Leaves ovate or ovate-lanceolate, 2.5×2-2.5cm, base subcordate or with decurrent petioles, crenate-serrate, scarbrided, with rough hairs on both surfaces. Flowers red, orange or yellow, in short-pedunculate,
capitate spikes, not elongating in fruits; bracts exceeding calyx. Calyx small, membranous, truncate. Corolla tubular, cylindric, pubescent; lobes rounded. Drupes greenish-black or blue, shining, pyrenes 2-4.

Fl.&Fr.: Throughout the year Collection: 1211, Bansi


Erect or ascending, sparsely pubescent, to 2m high; stem angular, purplish or yellowish-brown. Leaves ovate, 2.3-6.8×1.2-3cm, creanate-serrate, scabrid above, pubescent beneath; petioles 7-10mm long. Flowers inodorous, white, in globose heads elongating in fruits. Lower bracts ovate, forming involucre. Calyx small, hairy. Drupes purple or reddish, when mature.

Fl.: Feb-Apr Fr.: May-Jun Collection: 1411, Birdpur

3. Phyla


Perennial, prostrate-ascending herbs; branches usually rooting at nodes, obscurely 4-angular. Leaves subsessile, spathulate, 2-5cm long, cuneate and entire at base, sharply serrate, obtuse at apex, minutely strigose on both surfaces. Flowers sessile, pink or white, arranged in globose, peduncled, axillary heads; elongated in fruits; bracts small, ovate or lanceolate, mucronate, glabrous. Calyx 1-2mm long, unequally divided; lobes keeled, acute. Corolla white, turning lilac, 2-3mm long, caduceus; upper lip 2-fid, lower 3-lobed. Pyrenes 2, dry, 1-seeded.

Fl.: Feb-Sept, Fr.: Apr-Oct Collection: 1415, Kanha
4. Tectona

*Tectona grandis* L.f., Suppl. 151. 1781; C.B. Clarke in Hook. f., Brit. India 4: 570. 1885;

Deciduous trees, to 40m high; branchlets 4-angular, stellately tomentose. Leaves opposite or whorled, obovate or elliptic, acute or acuminate or obtuse, entire, base cuneate, glabrous above, grey-tomentose beneath; petioles 3-6cm long, narrowly margined. Flowers bracteate, fragrant, arranged in 2 or 3-chotomously branched, tomentose cymose-panicles, 30-80 cm long; bracts small, deciduous. Calyx stellate pubescent, 6-lobed, globose in bud, salver-shaped, much accrescent. Corolla rotate, white, glabrous; tube short. Stamens 6(5), exserted. Drupes subglobose.

*Fl.: Jan-May; Fr.: Apr-Sept.*

Collection: 1223, Naugarh

5. Verbena


Perennial, erect or decumbent herbs, to 80cm high; stem shallowly furrowed, glabrous or minutely hairy. Leaves variously lobed, 5-10 scabrous, narrowed to the base; lower ones coarsely toothed or pinnatisect; upper ones usually 3-partite; petioles longer in the lower leaves, upper ones subsessile. Flowers pale-pink, sessile, in dense bracteate spikes, to 15cm long; bracts ovate, acute. Calyx scarious, hairy, minutely 5-toothed. Corolla to 1cm long; tube curved, hairy. Drupes bluish-violet, subcylindric, smooth.

*Fl. &Fr.: Almost throughout the year*  
Collection: 1513, Shorathgarh

6. Vitex

Deciduous shrubs or trees, to 4.5m high, with thin grey bark; branchlets obscurely 4-angled, densely white-tomentose. Leaves opposite, digitately 3-5 foliate; petioles 3-8cm long; leaflets lanceolate, acuminate, entire or distinctly crenate, grey-pubescent beneath; the lowest pair smallest, sessile or subsessile,. Flowers 4-6mm across, lavender to blue, in elongated peduncled cymes, forming terminal compound panicles. Calyx 2-3mm long, white tomentose, shortly 5-toothed. Corolla 6-7mm long, hairy outside, obscurely 2-lipped, with 5-short, unequal lobes. Style exserted. Drupes 3-4mm across, globose, black.

Fl.: Mar-Oct; Fr.: Aug-Oct
Collection: 1246, Itwa

79. LAMIACEAE

Group 1. Ovary 4-lobed; nutlets with large scars; calyx 10-nerved;

Group 2. Ovary 4-partite; fertile stamens 2:

1. Anther cells separated by elongated connectives; nutlets usually trigonous.
................................................................................................................................. SALVIA

Group 3. Ovary 4-partite; fertile stamens 4; corolla regular or nearly so:

1. Large shrubs; leaves broadly ovate in opposite pairs; corolla sub 2-lipped.
................................................................................................................................. POGOSTEMON

  2. Herbs; calyx 5-toothed, (corolla sub 2-lipped); anther 1-celled. .................
................................................................................................................................. MENTHA

Group 4. Ovary 4-partite; stamens 4; corolla distinctly 2-lipped; calyx equally dentate or lobed:
1. Calyx 8-10 toothed; teeth spinescent; lower lip of corolla small. .......... LEONOTIS

2. Calyx tubular; anther cells of lower stamens parallel.................. ANISOMELES

Group 6. Ovary 4-partite; fertile stamens 4; corolla 2-lipped;

1. Lower lip of corolla 3-lobed, spreading; stamens suberect or ascending:

2. Calyx lobes 8-10; flowers white.................................................. LEUCAS

3. Inner pair of stamens longer than outer; nutlets trigonous; pollen hexa-colpate. ............................................................. NFPETA

4. Filaments connate at base in a sheath round the style.................. COLEUS

5. Stigma 2-fid; corolla tube short ................................................. OCIMUM


Annual-perennial, erect, aromatic, pubescent, undershrubs; stem 4-angled, simple or branched, to 2m high. Leaves ovate-lanceolate to oblong, 3.5-10x1.5-5cm, crenate-dentate, acute, rounded, cordate or cuneate base, thinly hairy; petioles 1.5-6cm long. Flowers in axillary whorls, arranged in somewhat interrupted spikes; bracts linear, hairy, 4-10mm long Calyx 4-5mm long, hirsute, enlarging in fruits; teeth 2-3mm long, lanceolate, ciliate. Corolla 8-12mm long, white tinged bluish-purple; upper lip rounded bulged outside; lower lip much longer. Stamens 4, unequal, protruding. Nutlets small, shining-black. Common; waste places, roadsides.


2. COLEUS Lour.,

Annual-perennial, erect, pungent-aromatic herbs; stem much branched from the woody base, patently-hairy, 30-60cm high; rootstock tuberous-fusiform. Leaves ovate or obovate, 3-12x1.5-6cm, obtuse, crenate, glandular-hairy; petioles 5-8cm long. Flowers in distant whorls of 6-8, arranged in slender, 10-25cm long, interrupted spicate-racemes; bracts 2.5cm long, ovate, acute deciduous, overlapping in bud. Calyx 2-lipped, hairy, bell-shaped; upper lip rounded-ovate, acute; lower lip lanceolate, acute to acuminate, deflexed in fruits. Corolla purple or pale-blue, to 2cm long; corolla tube 7-10mm long, longer than calyx, 2-lipped; lower lip boat-shaped, entire; upper lip 3-lobed, reflexed, shorter than lower lip. Stamens in unequal pairs. Common; dry exposed grassy slopes.


3. **LEONOTIS** R. Br.,


Annual, erect, stout herbs, to 1.5m high; stem roughly 4-angled, pubescent. Leaves ovate, 3-12x2-6cm, base truncate or cuneate, apex acute, deeply crenate, hairy on both sides; petioles 2.5-6cm long. Flowers orange-brown to reddish, in dense axillary whors, forming globose verticillasters. Calyx to 1.8cm long, ribbed; tube incurved, mouth oblique; teeth unequal, spine tipped. Corolla tube about 1.2cm long,
glabrous below, upper parts hairy, 2-lipped; upper lip woolly, hooded, lower 3-lobed. Stamens didynamous. Nutlets erect, trigonous. In moist places, roadsides, and hedges.


4. **LEUCAS** R.Br.,

1. Calyx hairy within the throat; flowers in large subglobose terminal heads only...

................................................................. 1. *L., cephalotes*

2. Plant while-grey lanate; leaves linear, sessile......................... 4. *L. lanata*

1. **Leucas cephalotes** (Roth) Sprengel, Syst. Veg. 2: 743. 1825; Hook. f. in Fl. Brit. India 4: 689. 1885; Babu, Herb. Fl. D.Dun 410. 1977; *Bishkhapru*

   Annual, erect, pubescent herbs, 30-80cm high; stem and branches obtusely angular. Leaves ovate or ovate-lanceolate. 5-8.5x 2.3.5cm. crenate serrate, subobtuse, hairy, gland dotted beneath; petioles short. Flowers white, in large dense, globose, terminal whorls, 3-5cm across: bracts foliaceous several, acuminate, ciliate. Calyx about 1cm long, hairy within, mouth oblique, 10-dentate. Corolla 1.5-2cm long; upper lip erect, hood like, lower lip 3-lobed. Nutlets oblong, 3-gonous. Common; waste places, crop fields, Plant used as diphoretic anthelmintic and antisepticals well as an antidote to snake bite.


   Perennial, white-tomentose herbs, with thick rootstock; stem simple or branched from the base. Leaves shortly stalked, ovate, 1.5-3.2x0.6-1.6cm, acute or obtuse, crenate or sub serrate, woolly tomentose. Flowers several, in axillary loose
whorls. Calyx densely hairy; tube 5-8mm long, 10-toothed. Corolla white, 2-lipped, 1.2cm long, hairy outside; upper lip spathaceous; lower spreading, 3-lobed. Nutlets oblong, obovoid, Common; grassy slopes, way sides, crop fields. Plant infusion given with honey in the treatment of whooping cough:

Fl. & Fr.: Almost throughout the year. Collection: 1320, Suhase.

5. MENTHA L.,

1. Leaves long petiolate; bracts large, leaf-like; corolla hairy outside. ....1. M. arvensis

1. Leaves short petiolate; bracts small; corolla glabrous. .......................... 3. M. piperata


   Perennial, erect or prostrate-ascending herbs, to 90cm high. Leaves ovate to lanceolate, 3-8x2-4cm, toothed, passing to smaller above; petioles 1.5-3cm long. Flowers white-lilac, in many, dense and distant whorls, forming slender, leafy inflorescence, often terminated by leaves. Calyx almost equally 5-lobed, not hairy in throat; teeth lanceolate. Corolla about 8mm long, hairy outside, slightly larger than calyx; 4-lobed, equal. Stamens 4, usually exserted. Along the river beds and rivulets.


   Perennial, erect, aromatic, glabrous herbs; stem simple or branched, 4-angled, dark-purple red. Leaves shortly petiolate, lanceolate, 2.5-4.5cm long, sharply serrate, glabrous. Flowers in thick, 1.5-6cm long, terminal spikes, enlarged in fruiting. Calyx 2-3mm long, campanulate, glabrous. Corolla pale-pink, 4-5mm long, glabrous.
Stamens 4, exserted. Common; marshy places, water coarses, The plant is the source of Peppermint', used in various medicines and for flavouring.


6. NEPETA L.,

1. Stem and branches soft; corolla 5-6mm long, slightly longer than calyx. ........
..............................................................N. hindostana.

1. Nepeta hindostana (Roth) Haines, Bot. Bihar Orissa 744. 1922; Babu, Herb. Fl. D.Dun 414. 1977. Glechoma hindostana Roth, Nov. Pl. Sp. 258. 1821. Vern. Billilotan Eng. Indian Catmint. Decumbent-ascending or erect herbs, 20-60cm high; stem branched from the base, terete or 4-angular, densely hairy. Leaves broadly ovate or orbicular, 1-5x1-4cm, rounded or cordate base, crenate-dentate, subobtuse, adpressed hairy; petioles 0.5-2cm long. Flowers blue-purple, in dense, usually peduncled cymes (whorls), forming interrupted slender panicles; bracts linear. Calyx 4mm long, pubescent, oblique at the mouth. Corolla 6-7mm long, hairy outside; upper lip flat, 2-fid; lower lip 3-fid. Nutlets brown, granulate. Common; waste places, terraces of crop fields.


7. OCIMUM L.,

1. Fruiting calyx 5-8mm long; corolla 6-10mm long. ......................2. O. basilicum

1. Fruiting calyx 4-6mm long; corolla 5-7mm long. ...................... 1. O. americanum

2. Pedicels as long as or longer than calyx; bracts shorter than calyx; flowers ..... 3. O. tenuiflorum.

Erect, much branched, bushy, pubescent herbs, with woody base. Leaves elliptic or elliptic-lanceolate, 3.2-5x1.5-2.5cm, entire or shallow notched, gland-dotted; petioles 1-2.4cm long. Flowers pale-violet or purplish-white, in whorls of 4-6, on an erect, 6-15cm long, lax spikes; bracts stalked, elliptic, lanceolate; pedicels recurved. Calyx 4-6mm long in fruiting; upper lip rounded, mucronate, ciliate; lower lip 4-toothed, larger. Corolla 4-7mm long; upper lip broadly oblong, 4-toothed, shorter and broader than lower lip. Nutlets ellipsoid, black-brown. Common; in the sub Himalayan tracts, often cultivated, rarely as an escape, *Leaves as an insecticide*.


Aromatic herbs, 50-100cm long; stem usually branched from the base, hairy. Leaves ovate-lanceolate, 2-7x1-3cm, base cuneate or rounded, acute or subacute, entire or toothed, gland-dotted; petioles 1-3cm long. Flowers purplish or whitish-pink, in whorls of simple or branched racemes; bracts stalked, shorter than calyx, ovate, acute. Calyx 5-8mm in fruits, hairy outside; upper lip rounded; lower lip 4-dentate. Corolla 6-10mm long, glabrous or pubescent. Nutlets ellipsoid, dark-brown. Usually cultivated nearby homeyards.

Fl. & Fr.: Jul.-Dec, Collection: 1378, Suhase.
3. *Ocimum tenuiflorum* L., Sp. Pl 597. 1753; Naithani, FL Chamoli 2: 514. 1985. *O. sanctum* L., Mant. PL 1: 85. 1767; Hook. f. in Fl. Brit. India 609. 1885. Vern. *Tulsi*, Erect, much branched, sparsely hairy, aromatic herbs, 30-90cm high. Leaves ovate-lanceolate, 2.5-6.5x1.8-3cm, entire or shallowly toothed, acute or obtuse, hairy on both surfaces, minutely dotted; petioles 1-2.5cm long. Flowers purplish-pink, whorled, in terminal, 10-15cm long racemes; bracts obovate, acuminate, not exceeding calyx. Calyx 4mm long, enlarged in fruits; upper lip broadly ovate, mucronate, recurved; lower lip larger. Corolla 5-8mm long; upper lip hairy on the back, equally 4-lobed, rounded; lower lip entire, acuminate. Nutlets globose, brownish-black. Common; cultivated nearby houses, *Plant highly medicinal for fever, cold and cough; colitis, urinary troubles and vomiting; believed to be instant remedy of all types of disorders.*


**80. PLANTAGINACEAE**

*Plantago* Linn.


2. Leaves linear, 1-1.5 (-2.5) mm broad. …………………… 1. Plantago ovata


Annual subscaulescent herb, up to 5 (-10) cm tall, sparsely or thickly covered with soft hairs. Leaves in rosettes, narrow linear, 2-10 cm long, 1-1.5 (-2.5) mm broad, obtuse to acute, entire or distantly denticulate, 3-nerved, densely covered with appressed wooly hairs, attenuated at bases, bases slightly dialted. Scapes ascendent, 1-
9 cm long, glabrous, or at the upper part pubescent. Flowers in dense capituliform or short cylindrical, 0.5-2 cm long thick spikes. Bracts ovate to rotundate, 3 mm long, concave, membranous, upper margins ciliate. Sepals usually glabrous, elliptic obovate, up to 3 mm long. Corolla lobes broad ovate to broad rotundate cordate, glabrous. Capsules 8 mm long, ellipsoid, obtuse, membranous, glabrous. Seeds 2, small ovoid-oblong, boat-shaped, smooth, yellowish-brown. Commonly cultivated for its seeds.


Perennial herb, acaulescent, small to 30 (-60) cm tall. Leaves membranous, narrow lanceolate to narrow elliptic, 10-25 (-40) cm long, 1-3 (-5) cm broad, glabrous slightly pilose or attenuated, acute, at the base narrowed into a narrow petiole, nerves 5. Scapes erect, 15-30 (-60) cm long, sulcate, sparsely covered with white hairs. Spikes dense, conic-cylindrical, subglobose to globose, 1-3 (-4) cm long. Bracts broad ovate, narrowly caudate, 4-5 cm long, erose-undulate, carinate. Sepals 3-3.5 mm long, glabrous or at the margin villose, anterior sepals connate, obovate, bilobed. Corolla lobes narrow ovate to ovate. Seeds 2, smooth. Occurs near maeshy places.


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81. **NYCTAGINACEAE**

1. Flowers without calyx-like involucre, minute; perianth articulated……. 2. Boerhavia

1. Flowers with calyx-like involucre, large-showy; perianth not articulated …………

......................................................................................................................... 1. **Mirabilis**
2. Straggling or climbing shrubs. Flowers with 3 conspicuously coloured bracts…

................................................................. 3. Bougainvillea

1. **Mirabilis** Linn.


Erect much branched glabrous herb about up to 1.5 m tall. Roots tuberous. Stem dichotomous, glabrous to minutely pubescent, often swollen at the nodes, reddish, glaucescent and flaccid. Leaves ovate, 5-12 X 2-6 cm, acuminate, puberulous, base slightly oblique. Involucral bracts ovate, united at the base, c. 9 mm long, sepaloid, puberulous and nervose. Flowers subsessile, in clusters of 4-5; pedicel c. 2 mm long. Perianth tube 2.5-3(-3.5) cm long, puberulous outside, limb plicately 5-lobed; lobes emarginate. Stamens 5, exserted; filaments c. 4 cm long, reddish, lower half adnate to the tube, basally connate and surrounding the ovary. Ovary 1.5 mm long, ovoid; ovule solitary, basal, surrounded by a few linear scales. Style reddish; stigma capitate. Anthocarp 9 mm long, ovoid, 5-ribbed, black, tuberculate. Nut subglobose, c. 7 mm long. Common in waste places and along with roadsides.


2. **Boerhavia** Linn.


A perennial diffuse straggling, puberulous herb. Stem woody below, branches often reddish. Leaves opposite and unequal, ovate, oblong to subcordate, 1-5 x 0.3-3.8 cm, sinuate to repand, cuspidate or obtuse, puberulous, often whitish on undersurface. Bract and bracteoles 1.5-2 mm long, ovate, acuminate, puberulous, margin membranous. Flowers c. 3 mm long, in diffuse axillary panicles. Perianth campanulate, pinkish-mauve, as long as or longer than the lower half, deciduous.
Stamens 2-3, exserted. Filaments slender, rosy, arising in the axil of a scale. Ovary less than 1 mm long, ovoid; style c. 1.5 mm long, stigma capitate. Anthocarp turbinate to broadly clavate, 3 mm long, 5 ribbed, glandular and papillose. Common in open waste places.


Annual herb, 5-60 cm tall, erect or decumbent at the very base, puberulous, especially in the upper part at the nodes of shoots. Leaves ovate, cordiform to elliptic, 1-3.5 cm by 0.8-2 cm, base truncate to rounded or cordate, apex acute, lower surface pale-white and occasionally with sunken red glands; petiole 1.5-3 cm long. Inflorescence axillary or/and terminal; flowers 2-7 in cymose panicles; peduncle 2-8 cm long. Flowers tubular-campanulate; pedicel 0.5-3 mm long, with 2-3 lanceolate bracteoles less than 1 mm in length. Perianth 1.5-2.5 mm long, with 5 faint ribs and a distinct constriction halfway, limb 1.5-2 mm long, white to pink. Stamens 2-3. Stigma peltate, entire. Anthocarp obconical, glabrous, 3 mm long, top truncate, with 5 ribs somewhat undulated, star-shaped in cross-section.

Collection: 765, Lotan.


1. Spines slightly curved, up to 1 cm long. Involucral bracts acute, magenta coloured...

......................................................................................................................................................... 1. B. glabra.

1. Spines curved, up to 5 cm long. Involucral bracts obtuse......... 2. B. spectabilis.

An evergreen climber. Spiny hooks up to 1 cm long, slightly curved. Leaves 4-10 x 1.7-5 cm, ovate to cordate, upper ovate acuminate, acute or shortly acuminate, sparsely pubescent; petiole 0.3-1 cm long. Bracts 3, 3.5-4 mm long, ovate, acuminate, nerved, magenta coloured. Flowers 3, c. 2 cm long; sepals 5, acute, c. 2.5 mm long, tip villous, yellow above, lilac beneath, alternating with 5 irregular and adnate yellow lobed appendages. Pedicel subsessile, c. 3.5 mm long, adnate to the bract. Filament 8-13 mm long, unequal, inserted. Ovary 2 mm long, more or less elongated. Style 1 mm long, stigma 2.5 mm long, plumose. Commonly cultivated in gardens

Fl.&Fr.- Summer season. Collection:- 432, Naugarh.


A taller plant with larger and more hairy leaves and curved spines up to 5 cm long. The obtuse bracts are rosy-red, white or brick-red to crimson in colour. Commonly cultivated in gardens.

Fl.&Fr.- Summer season. Collection:- 221, Naugarh.

82. AMARANTHACEAE

1. Leaves alternate: 2. Fruits 1-seeded:

3. Staminodes present alternating the stamens; tepals hyaline and woolly. 2. Aerva

3. Staminodes absent; tepals not woolly:

4. Flowers unisexual; stigma 2-4, sessile; fruit utricles. 4. Amaranthus
4. Flowers bisexual; stigma 1, on distinct style; fruit crustaceous nut……

.......................................................... 6. Digera

2. Fruits 2 to many seeded:

5. Erect herbs; fruits membranous, utricle; style-1, stigma capitate…..

.......................................................... 5. Celosia

6. Stamens with alternating stamens


7. Anthers 2-celled; spikes quite long, elongated ……………………..

.......................................................... 1. Achyranthes

8. Flowers in axillary heads; stinma 1. subsessile, capitate;
stenimal tube very short. ............................... 3. Alternanthera

8. Flowers in terminal heads; stigma 2, on long styles;
staminal tube long. ............................... 7. Gomphorena

1. ACHYRANTHES L.,

1. Leaves thick, scabrid; staminodes fimbriate from the margins; wings of bracteoles
less than 1mm long. .......................................................... 1. A. aspera

1. Leaves thin, membranous; staminodes toothed; wings of bracteoles 1.5-2mm long.

.......................................................... 2. A, bidentata


Annual-perennial, simple or branched, subdeciduous, herbs or undershrubs;
stem woody at base, often tinged purple, occasionally viscid-pubescent, 30-90cm
high. Leaves opposite, ovate-elliptic or obovate, 6-13-6cm, entire, acute, acuminate,
usually thick; petioles 1-2.5cm long. Spikes slender, 30-60cm long, appressed hairy; bracts and bracteoles ovate, spinescent; flowers deflexed. Perianth lobes 5, scarious; segments lanceolate, acute. Stamens 5, alternate with 5 staminodes; staminodes fimbriate. Fruits oblong, utricles 1-seeded. Fairly common; waste places, road sides.

*Root infusion taken in malarial fever: leaf extract supposed to facilitate delivery.*


Annual-perennial, slender, deciduous herbs or undershrubs; stem woody at base, patently hairy. Leaves opposite, narrowly ovate-lanceolate, 6.5-12x1.5-2.5cm, entire, acuminate, thin, dull-green above, sparsely pubescent on both surfaces; petioles 0.5-3.5cm (or more) long. Spikes axillary or terminal, 5-30cm long, rachis pubescent; Flowers deflexed; bracts and bracteoles spinescent. Perianth segments 5, glabrous, green, acute. Stamens 5, alternate with 5 staminodes; staminode truncate or shortly toothed. Urticles oblong, 1-seeded. Common; on shady and moist places.

L.N.: Latjira Fl. & Fr.: Aug.-Dec, Collection: 1103

2. **AERVA** Forsk.,


Perennial, scandent or straggling, tomentose undershrubs, 30-90cm high, with woody base. Leaves usually alternate, rarely opposite, ovate, 2.5-8x1.2-8cm, acute, entire, glabrescent, base narrowed; petioles 0.4-1cm long. Flowers silvery white, polygamous, clustered in short, ovoid 1-3cm long, sessile spikes, forming axillary and


3. ALTERNANTHERA Forsk.,

1. Leaves suborbicular; perianth segments spine-tipped; stamens 5........1. A. pungens

1. Leaves oblanceolate-elliptic; perianth segments not spine-tipped; stamens........

.......................................................... ..........................................................

2. A. Sessilis.


Decumbent-prostrate, much branched, spreading herbs; stem clothed with shaggy hairs. Leaves sub-orbicular or obovate, 1.5-3x2.2cm, obtusely apiculate, entire, tapering at the base, hairy. Flowers greenish-white, in axillary heads; bracts spinescent. Tepals 5, unequal, becoming spinescent in fruits. Stamens 5. Urticles somewhat discoid, 1-seeded.


Annual-perennial, prostrate, creeping herbs, 30-60cm long; stem branched from the base; nodes hairy, with two lines of reflexed hairs on internodes. Leaves opposite, sessile, elliptic or oblanceolate, 1.5-2.5x0.5-0.8cm, acute, rough hairy

L.N.: Gudre-Saag
Fl. & Fr.: Feb.-Oct.
Collection:

4. AMARANTHUS L.,

1. Armed spinous herbs; spikes short, mostly axillary. 

2. Small herbs; tepals 2-3, not awned; terminal spikes prominent.

Amaranthus spinosus

Amaranthus viridis


Annual-perennial, suberect, ascending, glabrous herbs, 15-50cm high; stem branched, spinescent. Leaves ovate or oblong, 2.58x1.5-5cm, obtuse or refuse, mucronate, subentire-repand, glabrous except hair)' nerves beneath; petioles 0.5-6cm long; leaf axils with 2-10nim long spines. Flowers polygamous, in axillary and terminal spicate clusters; female flowers in the lower parts and male flowers in the upper parts; bracts ovate, mucronate, equal or exceeding the tepals. Perianth pale-green, 5-tepals, nearly equal, mucronate. Stamens 5; seeds globose, minute, shining black. Common; in waste places, road sides, fields.

L.N.: Kanteli.
Collection:1079, Mithwal.

Annual, glabrous herbs., 20-60cm high; stem grooved, often tinged red-brown.

Leaves obovate, deltoid to ovate. 1.5-7x1.2-5cm, acuts, subentire-repand, glabrous, base cuneate or decurrent; petioles 1-4cm long. Flowers unisexual, grey-green, in axillary and terminal, 1.5-6cm long, paniculate spikes; bracts ovate, acute, shorter or equal to tepais. Tepais 3, oblong-lanceolate, obtuse or mucronate. Stamens 2 or 3. Utricles ovoid; seeds dark-brown, minute. Common; open waste places, road skies, margin of fields.


5. CELOSIA L.,


Erect, glabrous herbs, to 1.5m high; stem sulcate, ribbed, often tinged puplish. Lower leaves long petioled, upper sessile, elliptic-ovate to linear lanceolate 2-12x0.3-4cm, acute, entire, often tinged with red, base cuneate. Flowers pale-white with pink tinge in terminal, dense, cylindrical, 1-15cm long spikes; bracts and bracteoles subequal, ovate-lanceolate, much shorter than tepais. Tepals 5, scarious, lanceolate, mucronate, white or pinkish. Stamens 5, united below into a cup. Utricles ellipsoid; seeds shining-black. Common; exposed grassy slopes, road sides, fields, Leaves cooked as vegetable.


6. DIGERA Forsk.,

Annual erect-ascending, slender herbs, with spreading branches, to 50cm high. Leaves ovate or elliptic-lanceolate, 3-7.5x2-4cm, obtuse, entire, glabrescent, base truncate; petioles 1-3cm long. Flowers pink or rose, in lax axillary or terminal thyrsiform spikes; bracts ovate, oblong, acute. Sterile flowers reduced to scale like structures; fertile flowers with 5 subequal, pink, tepals. Nutlets indehiscent, compressed, muricate. Common: weed of crop fields.


7. GOMPHRENA L.,

1. Stem decumbent-ascending; flower heads white; bracteoles with narrow inconspicuous, entire dorsal crest. ..................................................1. *G. celosioides*

1. Stem erect; flowers heads coloured; bracteoles with dentate-serrate dorsal crest. ..................................................................................................................2. *G. globosa*


Annual-perennial, decumbent-ascending herbs, to 30cm tall; branches clothed with shaggy-white hairs. Leaves obovate-lanceolate, 1.5-8x0.8-2.5cm, obtusely apiculate or obtuse, entire, glabrous above, long white-shaggy hairs beneath, base cuneate. Flowers white, tinged pale, in axillary and terminal, compressed cylindrical or subglobose, 1-1.5cm long spikes; bracts ovate, acute, small. Perianth lobes 5-6, lanceolate, acute-mucronate; outer-3 white, inner ones green, woolly in the lower


Annual, erect, branched, hairy herbs, to 60cm high; branches roughly 4-angular, stout, thickened at nodes. Leaves ovate-oblong to lanceolate, 2.5-10x1-5cm, obtuse, mucronate, undulate or entire, base narrowed into short petiole, to 2cm long. Flowers in sessile, globose, 1-2.5cm across heads, usually purple-red or variously coloured; bracts ovate, acuminate. Tepals lanceolate, densely woolly. Utricle ovoid, dark-brown. Commonly cultivated as an ornamental, rarely.


8. PUPALIA Juss.


Erect or straggling, undershrubs, to 1m high; stem terete, tomentose, with long internodes. Leaves ovate or elliptic, 4-8x2-5cm, acute or acuminate, base rounded or short cuneate, entire, glabrescent above, sparsely pubescent beneath, membranous; petioles 0.5-2cm long. Flowers greenish-white, in several lax clusters, arranged in terminal, 10-30cm long spikes; rachis slender, tomentose; bracts ovate, acuminate; bracteoles ovate-oblong, concave, apiculate. Tepals of perfect flowers 5, slightly connate below, lanceolate, aristate, 3-nerved, woolly. Sterile flowers reduced to glabrous, hooked awns, yellowish during fruiting. Stamens 5, slightly connate below.
Utricle ovoid, membranous, 1-seeded, surrounded by persistent hooked bristles. Common; waste places, road sides, edges of forests.


83. CHENOPODIACEAE

1. Flowers usually bisexual, all similar:

2. Roots tuberous; flowers with bracts and bracteoles; tepal in fruits thickened.
   .......................................................................................................................... 1. Beta

2. Roots not tuberous; flowers without bracts and bracteoles; tepal in fruits not thickened. ........................................................................................................ 2. Chenopodium

1. Flowers unisexual, dimorphic.................................................................3. SPINACEA

1. BETA L.,


   Glabrous, erect herbs with tuberous roots; stem branched in the upper part. Leaves mostly basal, ovate to oblong-ovate, passing into linear bracts. Flowers greenish, many, axillary or terminal, 2-6 flowered clusters, forming panicles. Tepals 5, oblong, obtuse and with tuberculate base in fruits. Stigma 2-3. Utricle adnate to the disc and base of tepals; seeds smooth, reddish-brown. Cultivated during winters for root vegetable, in the larai-bhabar belt.


2. CHENOPODIUM L.,

1. Plant aromatic, glandular:
2. Branches strict, leaves sinuate toothed; flowers in long slender spikes of clusters........................................2. *C. ambrosioides*

1. Plants non-aromatic or slight foetid:

3. Seeds smooth, shining, not keeled. .............................................1. *C. album*

3. Seeds rugose, dull-black, acutely keeled. ....................................3. *C. murale*


Annual, glabrous, simple or branched herbs, 20-120cm high; stem often red-brown, clothed with white powdery mass. Leaves shortly petiolate, upper ones subsessile, ovate-rhomboid, 8-12.5x3.5-6.8cm, coarsely dentate-serrate to incised or entire, acute or obtuse, base cuneate. Flowers 2-sexual, in paniculate clusters, crowded in axillary or terminal spikes. Tepals 5, equal, ovate-rounded, connate at base, grey-green, rusty. Stamens 5, opposite to tepals; seeds smooth, small. Common; open waste places, crop fields, road sides, *Leaves used as pot-vegetable; breads prepared from the grinded grains.*


Annual, profusely branched or simple aromatic herbs, 20-100cm high; stem angular or ribbed, minutely hairy. Leaves lanceolate to oblong-lanceolate, 4-12x1-5cm or more, coarsely and irregularly toothed, subacute or obtuse, thinly pilose, gland-dotted on the lower surface; petioles 0.5-2cm long. Flowers minute, green, clustered, arranged in axillary or terminal, simple or paniculate leafy spikes. Tepals 5,


Annual, erect, or ascending, glabrous herbs, 15-50cm high; stem ribbed. Leaves rhomboid or ovate-triangular, 3.5-13x3-9cm, sharply and irregularly toothed or entire, obtuse or acute, base entire, cuneate; petioles 2-6cm long. Flowers greenish, clustered in axillary divaricate cymes forming terminal leafless panicles. Tepals 5, oblong, subacute, embracing the utricle; seeds orbicular, sharply margined, dull-black. Common; crop fields, waste places, road sides.


3. SPINACEA L.,


Annual, erect, simple or branched herbs, often tinged with red or purple. Leaves mostly radical, cauline leaves smaller, passing on to bracts in the inflorescence. Flowers unisexual or polygamous; staminate flowers in spikes or panicles; pistillate clustered. Tepals 5, ovate, obtuse in male flowers; stamens 5. Tepals 0, ovary enclosed by tepal like bracts in female flowers. Utricle enclosed in spined, capsule like structures. Commonly cultivated.


84. BASELIACEAE
1. Twiners with somewhat fleshy leaves .............................. Basella rubra.


A glabrous, fleshy much branched perennial twining herbs, often tinged red or purplish. Leaves ovate, fleshy, about 5-8 cm long and 2-5-6cm wide, acute or acuminate, base cordate, green or red tinged. Flower pink or white, sessile, in cymose clusters, forming lax spikes, becomes thickened in the fruits; bracts apiculate; bracteoles oblong. Tepals connate into lower half. Utride globase, 7-8mm across, fleshy black-commonly cultivated.

L.N.- Poi Fl.&Fr.: Jan-May Collection: 482, Naugarh

85. POLYGONACEAE

1. Tepals 6, 2-seriate; inner 3 conspicuously enlarged in fruiting

1. Tepals 4-5(-6),

2. Nut as long as or shorter than the tepals. Cotyledons not convolute……

1. Polygonum

**Polygonum** Linn.

1. Leaves linear-oblong. .................................................. 2. P. plebcium

1. Leaves spatulate-ovate. ............................................. 1. P. recumbens

2. Leaf-base acute, narrowed. ........................................ 3. P. barbatum

1. **Polygonum recumbens** Royle ex Bab Hook. f., Fl. Brit. Ind. 5: 25. 1886;

Prostrate to ascending perennial, with stout, long, much branched ± grooved stem, glabrous or puberulous; internodes short. Leaves 10-15 x 3-5 mm, broadly elliptic, flat, entire, usually acute, sometimes obtuse, nerves ± obscure, or prominent,
petiole 2-5 mm long. Ochreae not covering the internodes, hyaline, ovate - lanceolate, 5-7 mm long, acuminate or sometimes lacerate, nerves 2, stout, excurrent, running from base to the apex but not biaristate. Flowers axillary, usually 2, sometimes 3 or 4 in each axil, pedicel short, jointed just below the tip, perianth lobes 5, outer tepals keeled, styles 2, stigmas capitate. Nut trigonous, black or dark brown, shining, broadest below the middle, 1.5 - 2 mm long. common in moist places.

Fl.:-March Collection :- 889, barni.

2. **Polygonum plebeium** R.Br.Prodr.420.1810; FBl.5:27; FUGP.3:31 (incl.vars.);

Prostrate to decumbent herb, commonly mat-forming, stems to 15 cm long, often rooting at nodes. Leaves linear-oblong to very narrow-elliptic, 3–20 mm long, 1–3.5 mm wide, apex acute, margins strongly recurved, surface minutely warty. Perianth 1.2–2.5 mm long, divided for half to two-thirds of its length. Achene with 3 subequal concave or flat faces, 0.8–1.5 mm long, 0.5–0.8 mm diam., dark brown to black, smooth and shining.


3. **Polygonum barbatum**.

Herbs perennial, rhizomatous. Stems erect, 40-90 cm tall, robust, pubescent, simple or branched above. Petiole 5-8 mm, densely hispidulous; leaf blade lanceolate or elliptic-lanceolate, 7-15 × 1.5-4 cm, both surfaces pubescent, base cuneate, margin ciliate, apex acuminate; ocrea tubular, 1.5-2 cm, membranous, densely hispidulous, apex truncate, cilia 1.5-2 cm. Inflorescence terminal, spicate, erect, 4-8 cm, several spikes aggregated and panicle-like, rarely solitary; bracts funnel-shaped, glabrous, margin ciliate, each 3-5-flowered. Pedicel short. Perianth white or greenish, 5-parted;
tepals elliptic, 1.5-2 mm. Stamens 5-8, included. Styles 3; stigmas capitate. Achenes included in persistent perianth, black, shiny, ovoid, trigonous, 1.5-2 mm. Common near wet areas.


2. RUMEX Linn.


Annual. Stem 20-60 cm high, unbranched or branched from near the base. Basal leaves ovate-oblong from a truncate, rarely subcordate base, flat, sometimes slightly contracted above the base (panduriform), with obtuse or slightly acute apex; petiole shorter or as long as the lamina; stem leaves normally few, smaller and with shorter petioles than the basal one. Inflorescence whorls of many-flowered, all or at least the lower and the middle ones distant, most of them supported by a leaf. Pedicels rather thin, usually slightly longer than the fruiting perigone, articulate near the base. Valves (excluding teeth) 2.5-3.5 mm broad with 3-4 teeth, 2-3 mm long, usually all grain bearing. Nut 2-2.5 mm long.

Collection: 1245, Naugarh

86. PIPERACEAE

1. Leaves opposite or whorled; anther cells confluent; pollen non-aperturate; stigma penicillate. ................................................................. 1. *Peperomia*

A erect or decumbent-ascending annual fleshy herb, up to 10-50 cm high, with glabrous, hollow stem: Leaves alternate, ovate-cordate about 0.5 to 4 cm long, base rounded or cordate, apex obtuse or acuminate, glabrous, fleshy, punctuate, shining above, pale beneath, petioles decurrent, about 0-2 cm long. Flowers minute, in 1-8 cm long spikes, bracts ovate-rounded. Perianth absent, seeds warty. Commonly occurs on roadsides in moist places.

Fl.: Jul-sept.; Fr.: Sept-Nov  
Collection: 42, Barni

**87. PROTEACEAE**

**Grevillea R. Br. nom. cons.** **G. robusta** A. Cunn. in R. Br. Prot. Nov. 24, 1830; Parker, For. Fl. 430, 1918.

A robust, evergreen tree upto 25 m tall; with hoary or rusty tomentose, young branches. Leaves alternate, pinnate, pinnae 10 to 25 cm long, deeply pinnatifid or entire; segments lanceolate acute, margins recurved, dark green above grey-silky beneath. Flowers pale-orange, in short racemes, about 10 cm long, arising on the old leafless branchlets; pedicels to about 1.5 cm long, glabrous. Perianth glabrous; tube 1.2 cm long, rolled back, splitting down 1-side, limb ovoid with 4 revolute-petaloid segments. Stamens 4, opposite to perianth lobes. Follicles oblique, coriaceous, compressed with persistent style; seeds 1 or 2, winged all round. Commonly cultivated as ornamental plant.

L.N.- Oak  
Fl.-March-April, Fr: May-July  
Collection: 653, Shoratgarh

**88. LORANTHACEAE**
**Dendrophthoe Mart.**


A much branched, stout, leafy, partial parasitic, undershrub up to 1 m high. Leaves opposite, leathery, ovate to lanceolate to elliptic or spatulate about 6-14 cm long and 2.5-7 cm broad, base rounded, tip obtuse or rounded; petioles stout, about 0.3-1.9 cm long. Flowers vermilion or deep orange, in second racemes, about 2-10 cm long, often clustered in the axil of fallen leaves; bracts orbicular, cupulus 5-8 mm long with truncate mouth. Perianth bright red, curved, glabrous about 4 cm long; lobes 5, short reflexed. Filaments shorter than the anthers. Fruit ovoid-oblong, about 5-6 mm long, glabrous crowned with persistent calyculus. Occurs during cold season. The most common hosts are Shorea robusta; Dalbergia sissoo Roxb. Bark extract used in bronchial diseases.

L.N.- Vanda Fl.& Fr.: Sept-Feb. Collection: 201 Chilhiya

**89. SANTALACEAE**

**Santalum Linn.**


A medium sized evergreen tree up to 4-5 m tall, with elliptic ovate to lanceolate leaves and purplish-green flowers in panicles. Leaves opposite, ovate or ovate elliptical about 3-8 cm long, glabrous and shining green above, glaucous and slightly paler beneath, tip rounded or pointed, stalk grooved, 5-15 cm long; venation reticulate. Flower purplish green, small, up to 6 in axillary or terminal clusters,
Panicle cymes. Fruit a globose, fleshy drupe; red, purple to black when ripe, about 1 cm in diameter, with hard ribbed endocarp and crowned with a scar, almost stalkless, smooth, single seeded. Commonly cultivated in gardens.

L.N.- Chadan Fl.&Fr.- March-Dec. Collection- 533, Naugarh

90. EUPHORBIACEAE

1. Female & male flowers much-reduced and enclosed within a gland-bearing involucre; stamen 1; milky latex present ................................. 8. Euphorbia

1. Female & male Flowers not as above; stamens 2 or more; latex present or absent:

2. Pistillode present in the male flowers:

2. Pistillode absent from the male flowers ................................. 7. Phyllanthus

3. Styles ± completely fused into a column:

3. Styles connate only at the base ................................. 6. Drypetes

4. Filaments free, incurved in bud ................................. 5. Croton

4. Filaments fused into a column, erect in bud:

5. Inflorescences racemose:

5. Inflorescences cymose ................................. 4. Jatropha

6. Inflorescences paniculate ................................. 3. Ricinus

6. Inflorescences congested:

7. Herbs or shrubs; anthers cylindrical ................................. 2. Acalypha

7. Trees or shrubs; anthers subglobose to oblong:
8. Leaves opposite; fruit usually drupaceous, sometimes dehiscent:

8. Leaves alternate; fruit dehiscent, covered with dark red powdery granules ................................. 1. Mallotus

1. Mallotus Lour.


A shrub or small evergreen tree 3-6 m high. Stems fluted in age. Bark rough, dark grey, thin. Wood white. Young shoots, petioles, leaves and inflorescences fulvous- to ferruginous-pubescent. Leaves alternate or subopposite. Petioles 1-4 (-7) cm long. Leaf-blades ovate to ovate-lanceolate, 5-15 x 2-9 cm, acute or subacutely shortly acuminate, subentire, cuneate, rounded or subtruncate at the base, triplinerved from the base, lateral nerves 3-8 pairs, tertiary nerves ± parallel, glabrous above, with a pair of large glands at the base, sparingly pubescent and minutely reddish-gland-dotted beneath, glaucous. Stipules minute, fugacious. Male inflorescences terminal, spicate or racemose, often clustered and appearing as if paniculate, up to 7 cm long, dense-flowered; bracts triangular, 1 mm long, persistent. Male flowers subsessile, or with pedicels 1 mm long; calyx-lobes ovate-lanceolate to lanceolate, 3 x 1-1.5 mm, acute, pubescent, glandular; stamens c. 30, 3 mm long, anthers 1 mm long, with a few apical glands; disc minute, central. Female inflorescences ± as in the ♂, but shorter and less crowded. Female flowers sessile or subsessile; calyx-lobes 3-5, triangular-ovate, 1.5 mm long, closely adpressed to the ovary, subpersistent, otherwise as in the ♂; ovary subglobose, c. 1 mm diam., pubescent and densely red-glandular; styles 2-3
mm long, plumose, green. Fruit trilobite-subglobose, occasionally quadrilobate, 8-10 x 6-7 mm, ± smooth, densely covered with crimson granular glands, which rub off, loculicidally dehiscent. Seeds subglobose, c. 4 mm diam., ± smooth, black.

*Fl. Per.*: Feb: Nov. *Fr. Per.*: Mar: May  collection 3214, chilliya

2. Acalypha L.


A small or robust annual or woody herb or rarely subshrub up to 2.5 m, but commonly much less. Stems sparingly to evenly crisped-puberulous or tomenlose. Leaves mosaically arranged. Petioles 2-7 (-12) cm long. Leaf-blade ovate, rhombic-ovate or ovate-lanceolate, 2-6 (-9) x 1-5 cm, acute or subacute, cuneate, crenate-serrate, 5-nerved from the base, sparingly puberulous along the midrib and main nerves above and beneath, otherwise glabrous or almost so. Stipules subulate-filiform, 2 mm long. Inflorescences all axillary, pedunculate, androgyinous, spicate, up to 10 cm long but more usually c.5 cm long, the lower ¾ ♂ and lax, the upper ¼ ♂ and dense, often terminated by an allomorphic ♀ flower on a long pedicel. ♀ bracts transversely ovate, dentate or serrate, accrescent to 1 x 1.5 cm, many-ribbed, puberulous along the ribs and usually otherwise ± glabrous, 3-5-flowered. Male flowers subsessile; buds granulate. Female flowers sessile; sepals triangular-ovate, 1 mm long, ciliate; ovary subtrilobate, 0.5 mm diam., tuberculate, pubescent; styles 2 mm long, laciniate, white. Allomorphic ♂ flowers obovoid, furnished with 2 lateral fimbriate tubes, pubescent. Fruits trilobate, 2 mm diam, verrucose at the apex, otherwise smooth, sparingly pubescent. Seeds ovoid, 1.3 mm long, ± smooth, grey, with a whitish hilum.
**Ricinus L.**


An erect, single-stemmed or much-branched shrubby or treelike somewhat glaucous herb upto 5 m, rarely taller. Stems hollow, becoming woody at the base. Young shoots often pruinose. Petioles 5-20 cm long; petiolar glands variously-shaped. Leaf-blades commonly 7-9-lobed, the median lobe usually 10-20 cm long and 2-5 cm wide, sometimes larger, the lateral lobes progressively smaller; lobes lanceolate, acutely acuminate, coarsely glandular-serrate or - biserrate, lateral nerves c. 10-20 pairs, running to the margins, dark green above, paler beneath. Stipular sheath ovate, c. 1-2 cm long, leaving a circular scar when fallen. Inflorescence 10-25 cm long; bracts c. 1 cm long, the bracteoles smaller. Male flowers; pedicels c. 1 cm long; calyx-lobes elliptic-ovate, 6-8 x 3-4 mm, acute, yellowish-green; stamens 7 mm long, anthers 0.5 mm. long, pale yellow. Female flowers: pedicels 3-5 mm. long, extending to 2 cm or more in fruit; sepals lanceolate, 5 mm long, acuminate, purplish; ovary trilobate-subglobose, 2 x 2 mm; styles 3-7 mm long. Fruit trilobate, 1-1.8 x 1-1.5 cm, smooth or sparingly to densely covered with narrowly cylindric bristle-tipped fleshy processes 3-5 mm long. Seeds 7-12 x 5-8 x 4-6 mm, shiny, greyish, silvery or beige generally streaked and flecked with brown; caruncle depressed-conic, 1-2 x 2-3 mm. Widely planted in the district. The oil from the seed has many uses - as an illuminant, in medicine as a purgative, in tanning as a leather-preservation

L.N.: Arand  
Fl. & Fr. Per.: at most seasons.  
Collection: 1514, Lotam

A soft-wooded erect shrub to 3 m tall. Young shoots and petioles sparingly pubescent to subglabrous. Petioles 3-13 cm with branched stipitate glands ad-axially. Leaf-blades 3-5-palmatifid or palmatipartite, the lobes obovate, the median lobe 4-10 x 2-5 cm, the laterals smaller, acute, mucronulate, minutely glandular-denticulate and ciliate, the blades cordate, 3-5-nerved from the base, with 9-12 pairs of lateral nerves per lobe, sparingly pilose on the main nerves above, otherwise glabrous, dark bronze-coloured. Stipules slender, multifid, 4-8 mm long, gland-tipped. Inflorescences leaf-opposed, paniculate, 8-18 cm long, with a clear peduncle 6-8 cm long; bracts linear-lanceolate, 6-12 mm long, margin stipitate-glandular and ciliate. Male flowers: calyx-lobes elliptic-lanceolate, 2 x 1 mm, acute, stipulate-glandular and ciliate; petals broadly obovate, unguiculate, 3.5 x 2 mm, rounded, reddish-purple; disc-glands free, turbinate, truncate; stamens 8, the 5 outer 2 mm long, the 3 inner 3 mm long, anthers 0.6 mm long. Female flowers: calyx-lobes and petals twice as large as in the ♂ flowers, otherwise similar; disc shallowly 5-lobed, the lobes retuse; ovary trilobate-subglobose, 2 x 2 mm, somewhat hirsute; styles 1.5 mm long, bifid. Fruit rounded-trilobate, c. 1 x 1 cm, sparingly hirsute to subglabrous, septicidally and loculicidally dehiscent. Seeds compressed ovoid-ellipsoid, 7 x 4 mm, pale greyish-brown; caruncle multifid, 3 mm wide.


**Croton** Linn.

**Croton bonplandianus** Bat., Adansonia. 4: 339. 1863/4.
A monoecious woody herb or shrub to 1.5 m in height, but more usually c. 30-40 cm, with whorled branches. Young shoots and petioles evenly stellate-lepidote. Leaves alternate, subopposite or whorled. Petioles 0.3-1 cm long. Leaf-blades lanceolate, (2-) 3-5.5 x 0.5-2.5 cm, acute, cuneate, with 2 small sessile discoid basal glands beneath, crenate-serrate, membranous, penninerved, glabrous above, sparingly stellate-lepidote beneath, dark green. Stipules subulate, 0.5 mm long. Racemes terminal, up to 15 cm long, c. the lower third ♀, the upper two-thirds ♂; axis sparingly stellate-lepidote to subglabrous; bracts triangular lanceolate, 1 mm long. Male flowers: pedicels 1-1.5 mm long, glabrous; buds globose, subglabrous; calyx 5-lobed, the lobes elliptic-ovate, 1.5-1 mm, subacute, greenish-yellow; petals 5, oblong, recurved, 2 x 0.5 mm, obtuse, subglabrous, whitish; disc-glands free, subglobose, apiculate; stamens 13-16, filaments 2 mm long, anthers 0.3 mm long; receptacle glabrous. Female flowers subsessile; calyx-lobes 5, triangular-ovate, 1 x 1 mm, subacute, not accrescent, subglabrous; petals 0; disc annular; ovary ellipsoid-subtrilobate, 1.5 x 1 mm, densely stellate-lepidote; styles 3, ± free, 1.5 mm long, spreading, glabrous, bifid, the arms filiform. Fruit ellipsoid-trigoneous, 5-6 x 4 mm, septicidally dehiscent, sparingly stellate-lepidote. Seeds compressed-ellipsoid, 4 x 2 mm, grey, slightly roughened; caruncle bilobate. In sandy clay soil along roadsides.


A dioecious tree up to 15 m with pendent branches. Bark yellowish-grey, ± smooth. Wood whitish, close-grained, hard. Twigs sparingly pubescent. Petioles 5-10 mm long, evenly pubescent. Leaves elliptic-lanceolate, 2–9 x 1–4 cm, obtuse or
subacute, oblique at the base, shallowly crenate-serrate and undulate, lateral nerves 10-20 pairs, tertiary nerve-network reticulate, pubescent when young, soon glabrescent, dark green, glossy above. Stipules narrowly lanceolate, 1 mm long; acute, caducous. Male fascicles dense, 5–8 mm across. Male flowers: calyx-lobes ovate or oblong, 2 x 1–1.5 mm, ciliate, yellowish-green; filaments very short; anthers 2 x 1.5 mm., ciliate, yellow. Female flowers: pedicels 5–40 mm long, extending to 1–2 cm long in fruit; calyx-lobes as in the ; ovary ovoid, tapering into the style, 2 x 1.5 mm, whitish-tomentose, 3-celled; style 3–4 mm long, stigmas cuneate, flabelliform. Fruit ovoid-ellipsoid, pointed at both ends, c. 1.5 x 1 cm, white-tomentose; endocarp rugose, c. 1 nun thick. Seed ovoid, c. 1.3 x 0.8 cm, with a pale exotesta and a darker endotesta. Occurs in moist shady places.


**Phyllanthus** Linn.


A small monoecious glabrous or slightly asperous shrub up to c. 1 m. Intermediate shoots slender, often asperous. Cataphylls. of the long shoots commonly replaced by foliage-leaves. Foliage-leaves: petiole 0.5 mm long; leaf-blades elliptic or elliptic-ovate, 3-9 x 1.5-6 mm, obtuse or rounded and mucronulate, cuneate at the base, margin slightly inrolled beneath, lateral nerves 2-5 pairs, indistinct, green above, glaucous beneath. Stipules triangular. lanceolate, 1.5-2 mm long, acuminate, cordate-auriculate on one side at the base, fimbriate to subentire, chestnut-brown. Proximal nodes usually ♂, distal ♀. Male flowers: pedicels 2 mm long, capillary; sepals 6, obovate-oblong, 1.5-2 x 0.8-1 mm, obtuse, creamy with a reddish-brown midrib; disc-
glands 6, free, flat, circular, entire; stamens 3, the filaments connate at the base, but c.
2/4 free, anthers minute, didymous, horizontal, transversely dehiscent. Female
flowers: pedicels 3 mm long, slender, slightly thickened upwards, extending to 5 mm
in fruit; sepals 6, elliptic, 1.5 x 0.8 mm, obtuse, brownish-purple; disc annular,
shallowly hexalobate, 1 mm diam., flat; ovary subsessile, hexalobate, 1 mm. diam.,
smooth; styles 3, 1 mm. long, free, slender, divaricate, deeply bipartite. Fruit
depressed-subglobose, shallowly trilobate, 3 x 4 mm, smooth; pericarp thin, dull,
black, separating from the crustaceous endocarp after dehiscence. Seeds
asymmetrically or obliquely segmentiform, 2 x 1.3 x 13 mm, dark brown, with several
rows of close-set darker shiny transverse tubercles on the back and each side. On
shady banks near water.

Fl. & Fr. Per.: August-October.            Collection: 1273, Birdpur

1866; Hook. f., Fl. Brit. Ind. 5: 289. 1887.

A monoecious glabrous or pubescent deciduous tree, up to 15-20 in. Bark
grey, smooth. Wood red, hard. Intermediate shoots up to 20 cm long, solitary or
fascicled, resembling pinnate leaves but usually floriferous towards the base, falling
as a unit; short shoots not strongly developed. Cataphylls triangular, lanceolate, 2 mm
long, acuminate, brownish-black. Foliage-leaves up to 80-150 per shoot, closely
distiehous; petioles 0.5 mm long; leaf-blades linear-oblong, 0.5-1.6 x 0.1-0.3 cm.,
usually obtuse, sometimes acute or subacute, somewhat obliquely rounded to
subcordate at the base, margin thickened and inrolled, firmly chartaceous, lateral
nerves 4-9 pairs, sometimes indistinct, light green above, paler and somewhat greyish
beneath. Stipules of the cataphylls triangular-ovate, 1.5 mm long, acuminate,
brownish-black; those of the leaves lanceolate, 0.7 mm long, reddish-brown. Proximal
nodes barren, leafless, then with ♂ & ♀ flowers, distally barren again but leafy. Male flowers: pedicels slender, 1-2 mm long; sepals 6, oblong-oblanceolate, 1.5-2 x 0.5-0.7 mm, obtuse or rounded, entire, yellowish-green with a pale hyaline margin; disc of 6 small clavate glands or 0; stamens 3, the filaments completely connate into a short terete column, anthers sessile, distinct, erect, oblong, apiculate, 0.8 mm long, the sacs parallel, longitudinally dehiscent. Female flowers subsessile; sepals thicker than the ♂ and somewhat denticulate, otherwise similar; disc urceolate, 1.5 mm high, completely enclosing the ovary, 6-ribbed, lacerate at the top; ovary ovoid, 3-celled, c. 1 mm diam., smooth; styles 3, stout, fleshy, c. 4 mm long, united at the base, bipartite, the segments flattened, spreading, sometimes bifid. Fruit. subglobose, c. 2.5 cm diam. when fresh, smooth, succulent, greenish or yellowish-white; endocarp massive, woody, 6-ridged, tardily dehiscent, c. 2 mm thick. Seeds somewhat unequal, trigonous or plano-convex, 4-6 x 2.5-3 x 2-3 mm, 3 smooth, dark chestnut-brown.


Collection: 1274, Sarota


A monoecious slender scaberulous to subglabrous erect annual herb up to 80 cm, although more commonly c. 30-40 cm, with angular branches. Cataphylls linear-lanceolate, 1 mm long, acute, entire, subtending the intermediate shoots. Foliage leaves: petioles 0.5 mm long; leaf-blades elliptic-oblong to elliptic-oblanceolate, 5-13 x 1.5-5 mm, obtuse or rounded at apex and base, or sometimes tapering to the base, membranous, lateral nerves 4-7 pairs, indistinct, dark green above, paler and greyish
Stipules of the cataphylls lanceolate, 1-1.3 mm long, scarious; those of the leaves narrowly lanceolate, 0.7-1 mm long, scarious with a pinkish or olive midrib. Proximal nodes ♂, distal ♀. Male flowers: pedicels 1 mm long; sepals 6, suborbicular-ovate, 0.5 x 0.5 mm, rounded, hyaline, midrib yellowish; disc-glands 6, lobulate, verruculose; stamens 3, filaments united into a short column, anthers subsessile, ± horizontal, transversely dehiscent. Female flowers: pedicels 1.5-2 mm long; sepals 6, oblong-oblancoate, somewhat unequal, 1-1.5 x 0.5 mm, rounded, white, midrib green; disc thin, flat, irregularly deeply-lobed into 6-10 segments, some broad and crenate, others triangular and bifid, yet others linear and entire; ovary sessile, subglobose, c. 1 mm diam., smooth; styles minute, free, adpressed or ascending, bilobate, the lobes recurved. Fruits trilobate-subglobose, 1.7-2 mm diam., smooth, olivaceous or stramineous. Seeds 1 x 0.7 x 0.6 mm, longitudinally 7-8-ridged on the back, concentrically 7-8-ridged on the sides, ochreous-fulvous.

*Fl. Per.*: August-September. *Fr. Per.*: August-October  
Collection: 433, Sarota


A monoecious annual or sometimes perennial decumbent or erect, usually glabrous, sometimes puberulous or hispid herb up to 30 cm, sometimes taller, with angular branches. Cataphylls borne 1-2 mm clear of their stipules on the intermediate shoots, triangular-lanceolate, c. 1 mm long, acute, subentire. Foliage leaves: petioles 0.5 mm long; leaf-blades oblong, oblong-oblancoate or linear-oblong, 5-16 x 2-9 mm, usually rounded at apex and base, ± entire but often with minute tooth-like hairs around the margin, membranous, lateral nerves c. 6 pairs, distinct, glaucous beneath, folding upwards when touched. Stipules of the cataphylls lanceolate, 2 mm long, acuminate, auriculate-sagittate; those of the leaves triangular-lanceolate, 0.5-1 mm beneath.
long, unequal, not auriculate, stramineous. Proximal nodes ♀, distal ♂. Male flowers: pedicels articulate above the middle; sepals 6, obovate, 0.5 mm long, obtuse, glabrous, pale yellow; disc-glands 6, rounded, papillose; stamens 3, filaments united into a short column, anthers sessile but not fused together, erect, vertically dehiscent. Female flowers: pedicels very short and thick or flowers ± sessile; sepals 6, oblong-lanceolate, 1 mm long, obtuse or subacute, subglabrous, yellowish with a reddish-olive midrib; disc flat, irregularly 9-lobed; ovary subglobose, 1 mm diam, verruculose; styles 3, very short, closely oppressed to the top of the ovary, bifid, the segments recurved. Fruit somewhat depressed-subglobose, shallowly hexalobate, 2.5 mm diam., sparingly beset with short transverse rows of flattened triangular tubercles, olivaceous, stramineous or reddish. Seeds 1.3 x 1 x 1 mm, transversely ridged, with c. 15 ridges on the back and fewer on the sides, yellowish-brown.

Fl. & Fr. Per.: August-October. Collection:776, Birdpur.

Euphorbia Linn.

1. Plants erect-ascending. ............................................................. 1. E. hirta

1. Plants prostrate. ................................................................. E. prostrata

2. Petiole 2.5-6 cm long . ...................................................... E. thyminfolia


A more or less erect sparingly-branched softly woody plant usually up to 2 m tall, sometimes taller, with a fleshy storage root in the seedling-stage. Stem-leaves alternate, long-petiolate, the petioles 2.5-5 cm long; blades elliptic-ovate to dentate-panduriform, 7-14 (-20) x 3-7 (-10) cm, obtusely acuminate at the apex, cuneate at the base, entire or irregularly crenate-serrate to repand-dentate, lateral nerves up to 20
pairs, subglabrous and dark green above, sparingly puberulous and paler beneath. Stipules sessile, glandular. Leaves of the pseudopleiochium clustered, petiolate, the petioles 1-3 cm long; blades elliptic-oblancheonate, 5-13 x 1-3 cm, acutely long-acuminate at the apex, attenuate at the base, entire or subentire, lateral nerves c. 12 pairs, sparingly puberulous at first, later becoming subglabrous above, bright red or cream. Cyathia aggregated together in dense terminal basically triradiate pseudopleiochasia, 7-9 x 6-8 mm, borne on stout peduncles 2-6 mm long. Gland solitary, cupular, 4.5 mm across, yellowish. Fruit rounded-trilobate, c. 1.5 x 1.5 - 2 cm, smooth, glabrous. Styles connate at the base, 5 mm long, bipartite. Seeds ovoid, 10 x 8-9 mm, ± smooth, pale grey, ecarunculate.

*Fl. Per:* Jan: April. Collection: 1230, Kanha


A prostrate annual herb with the stems flattened and puberulous or pubescent above, terete and glabrous beneath, extending to 25 cm. Petioles 0.5-1 mm long. Leaf-blades ovate-oblong, 3-8 x 1-5 mm, subacute, obtuse or rounded at the apex, obliquely rounded at the base, minutely serrulate in the upper half, otherwise ± entire, palmilnerved. Stipules linear-lanceolate, 1 mm long, remotely fimbriate, upper and lower both paired. Cyathia solitary in the leaf-mils on microphyllous lateral shoots, pedunculate. Glands suborbicular, purplish, minutely or scarcely appendiculate. Fruits trigonous, 1 x 1 mm, smooth, adpressed-pubescent with multicellular hairs, ochreous, ripening on not or scarcely-extending pedicels thus often causing the cyathia to split down the side. Seeds ovoid-cylindric, quadrangular, shallowly transversely furrowed and ridged, 0.7 x 0.4 mm, pinkish-grey.

*Chamaesyce hirta* (L.) Millspaugh in Field Mus Nat. Hist. Bot. 2.303.1909

Decumbent to almost erect annual to 40 cm high, few-stemmed with sparse to dense, short curled appressed hairs and long, spreading yellowish hairs. Leaves rhombic to ovate or sometimes lanceolate, to 40 mm long and to 20 mm wide, margins toothed, apex obtuse to acute, hairy with short appressed hairs, becoming glabrous above; petiole 1–2 mm long; stipules linear. Cyathia in dense head-like axillary cymes in upper axils; involucre c. 0.7 mm long, glands ovate, reddish with small pink or white appendages or sometimes appendages absent. Capsule 1–1.2 mm long, 1.5 mm diam., with sparse to dense appressed, shortly curled hairs; seeds ovoid-oblong, c. 1 mm long, red-brown, 4-angled.

L.N.- Asthma Plant Fl: mainly spring or summer Collection:- 992, pars.


A prostrate annual herb with the stems flattened and puberulous or pubescent above, terete and glabrous beneath, extending to 30 cm, though usually not exceeding 20 cm in length. Petioles 0.5-1 mm long. Leaf-blades obovate-surborbicular, 3-8 x 1-5 mm, obtuse or rounded at the apex, obliquely rounded at the base, minutely serrulate in the upper half, otherwise ± entire, palminerved, reticulate, green. Stipules triangular, laciniate, the upper paired, narrow, 0.5 mm long, the lower fused, broader, 1 mm long. Cyathia solitary in the leaf-axils on microphyllous lateral shoots, long-pedunculate. Glands transversely ovate, purplish with minute pinkish appendages. Fruits sharply trigonous, keels carinate, 1.2 x 1.5 mm, smooth, glabrous on the sides, pilose with white multicellular hairs on the keels, pale green or stramineous, the keels...
often purplish. Seeds ovoid-quadrangular, sharply transversely furrowed and ridged, 0.8 x 0.5 mm, pale grey

L.N.: - Dudhi  Fl. & Fr.: throughout the year  Collection:- 554, Lotan.

91. ULMACEAE

C. australis Linn. Sp. Pl. 1043.1753; FBI. 5:482; FUGP. 3:121; Parker, For. Fl. 467.

A medium or large sized, deciduous tree with grey bark about 25 m tall, crown spreading, Trunk more or less cylindrical. Leaves 6-8 cm long and 3-4 cm broad; juvenile ones soft. Flowers pale yellow, polygamous, 4-5 merous; male in clusters towards the base, female in the axils of leaves. Perianth segments ovate, fringed with wooly hairs stamens 4-5. Ovary glabrous but style hairy. Drupes ellipsoid, 5-6 mm long, glabrous, purplish-black. Commonly cultivated in gardens. Fruits edible. Bark paste applied on bones, pimples and joint pains.

L.N.- Khairk  Fl.: Mar-Apr., Fr.: Sept-Oct  Collection-516, Suhase

92. CANNABINACEAE

Cannabis Linn.


A erect, annual-pernnial, aromatic herbs or undershrubs about 2.5 cm long; bark fibrous. Leaves palmately 3-9 foliate or partite; hairs white, apprised, segments linear to lanceolate to elliptic about 3 to 10 cm long, narrow at both ends, long acuminate, coarsely serrate, punctuate glands beneath; petioles 2 to 12 cm long; stipules subulate, filiform. Plant dioecious. Male flowers in lax terminal panicked
cyme. Perianth segments 5, oblong, obtuse, ciliate, white margined; stamens 5. Female flowers solitary or clustered, axillary, sessile, forming leafy spikes. Perianth segment-1, leaflike, glandular-viscid, enclosing the ovary. Achenes grayish brown, smooth, ovoid, enclosed with persistent perianth; seeds globose or ovoid, about 2-4 mm length, smooth. Commonly occurs near waste places and cultivated also.


urticaceae

**Boehmeria Jacq.**

1. Leaves ovate or orbicular; petioles quite long……………………………. B. platyphylla

**B. platyphylla** D. Don, Prodr. Fl. Nep. 60.1825; FBI 5:578. 1888; HFD. 466.1977;


A erect perennial undershrubs or shrubs, about 1 to 2.5 cm high; branches pubescent; bark fibrous, red-brown. Leaves broadly ovate, about 12-20 cm, base cordate or rounded, dentate, caudate-acuminate, membranous, subglabrous or thinly stellate-hairy; petioles 3-18 cm long. Flowers small, 1- sexual, pale-white, sessile, in interrupted clusters, on slender, simple or paniculate spikes; bracts lanceolate. Male spikes short, female longer, pendulous. Perianth segments 4, ovate, hairy. Stamens 4. Achense compressed, obovoid, enclosed by dry bristly perianth lobes. Common in crop fields.

L.N.- Bara-Siauru Fl. & Fr.: Aug-Jan Collection: 482, Domariaganj

**93. MORACEAE**
1. Male and female flowers borne inside a closed, urceolate fleshy receptacle (hypanthodium). Fruit a syconium. .................................................. 1. Ficus

1. Male and female flowers borne externally, in a dense to lax catkin, spike or head

2. Plants with axillary spines. Male flowers pedicellate, in a loose raceme.


4. Female flowers in globose heads, with tubular calyx. Winter buds with 2 or 3 scales. ................................................................. 3. Broussonetia

4. Female flowers in ovoid or cylindrical catkins, with free imbricate sepals. Winter buds with 3-6 scales. ........................................... 4. Morus

**Ficus Linn**

1. Young twigs not hollow. Lamina narrowly ovate-lanceolate to ± elliptic-lanceolate glabrous on both sides. (Cultivated) .............................. 2. Ficus racemosa

2. Lamina glabrous on both sides. Lateral nerves more than 20 pairs, almost spreading parallel, intercostals absent. (Cultivated) ................. 1. F. elastica

3. Leaf-lobes spathulate, densely soft hairy, especially on nerves beneath, apically few dentate. Petiole frequently more than 2- cm long. ...........

.............................................................. 4. F. carica

4. Hypanthodia 1.5-2 cm in diameter, pinkish-red on maturity .........

.............................................................. Ficus benghalensis

3. Leaf acumen about ½ as long as lamina; stipules small ....... 3. F. religiosa

2. Lamina nearly as long as broad, dentate-serrate, basally cuneate to rotundate or truncate-subcordate.................................................. 5. F. palmata

A large evergreen, glabrous, up to 30 m tall tree, with a dense crown and spreading branches without prop roots. Trunk massive, 1.5-1.5 m in circumference with copious much buttered and fluted aerial roots spreading on the ground, bark grayish or reddish brown, young twigs finely puberulous. Leaves with 2.5-6 (-8) cm long petiole; lamina thick, glossy above, oblong or elliptic, (10-) 15-25 (-30) cm long, (4-) 5-15 (-22) cm wide, base cuneate, margins entire, apex obtuse with c. 8-10 mm long acumen; lateral nerves almost parallel, 20-30 (-40) pairs, hardly raised beneath, intercostals absent; cystoliths abundant above, few below; stipules very large, 8-25 cm long often rosy to pinkish-brown. Hypanthodia sessile, in extra axillary pairs below the leaves, pale-greenish, subtended by 3 caducous basal bracts, without internal bristles, apical orifice closed by 3-4 apical bracts. Male flowers: pedicellate, dispersed in the interior of receptacle; sepals (3-) 4, ovate, patent. Female flowers: sessile; sepals 4, free, ovary smooth with subterminal style. Figs ovoid-oblong, 10-12 mm long, 6-8 mm across, pale to yellowish brown. Commonly cultivated.


A small to large, 10-20 (-30) m tall, evergreen or occasionally deciduous tree. Trunk up to 3 m in circumference, with spreading brand with or without aerial roots, bark whitish to pinkish-brown, smooth, young twigs with fine white pubescence, soon
glabrous. Leaves with 2.6 (-7.5) cm long, grooved minutely hairy, brownish-scurfy petiole; lamina ovate-lanceolate to ± elliptic-lanceolate, (5-) 6-18 (-20) cm long, (2.5) 3-10 (-1.2) cm broad, 3 from broad to narrowly cuneate, ± oblique base, margin entire to ± used obtuse or subacute to occasionally ± acuminate at apex, glabrous on both sides; lateral nerves 4-7 (-8) pairs, bulging beneath, intercostals present; stipules triangular-ovate, 12-15 mm long, 4-5 mm wide, acute-acuminate, brown, sub-persistent; cystoliths present only on the lower side. Hypanthodia on 8-40 long peduncles, borne in large clusters from tubercles on the main trunk and main leafless branches (cauliflorous), subpyriform-globose, c. 1.5-2.5 cm long and broad, green, subtended by 3, broadly triangular-ovate brownish brads, bracts, apical orifice ± sunken, closed by 5-6, pink-brown bracts without internal bristles. Male flowers: sessile, ostiolar in 23-whorls; 3(-4), united, lobes dentate-lacerate, red; stamens usually 2, pistillode present. Female flowers: sessile or subsessile. sepal as in male; ovary subtipitate, with lateral, 2.3 long, glabrous style, stigma simple. Gall flowers pedicellate, dispersed among female. Figs depressed subglobose or pyriform, 2.54 cm in, diameter red, usually streaked. Seeds lenticular, c. 1 mm long. Commonly occurs near shady places and also along with roadsides.


A large or medium sized, evergreen or deciduous tree, about 6-15 (-20) m tall. Trunk c. 2-3 m in circumference, with spreading branches and usually without aerial roots, bark grey, fissured; young twig pubescent with pink new leaves. Leaves with a pale-green, slender, (4-) 5-10 (-11) cm long, terete petiole; lamina trullate-ovate or suborbicular, about (4.5-) 6-15 (-18) cm long, 4-11 (-14) cm broad, margins entire or ±
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repland, 3-5-costate at the truncate or ± cordate base, apex abruptly long-acuminate, acumen nearly half as long as lamina, lateral nerves 6-9 pairs with several zigzag intercostals; stipules yellowish-brown, deltoid-acuminate, 8-12 mm long; cystoliths present only on the lower side. Hypanthodia sessile, in axillary pairs, c. 5-6 mm in diameter, yellowish-green, subtended by 3 silky-puberulent to glabrescent, broadly ovate-elliptic, obtuse, 3-5 mm long basal bracts, internal bristles absent, apical orifice closed by 3 apical bracts. Male flowers: sessile in a single ostiolar whorl or sometimes absent; sepals 2-3, free, ovate-lanceolate. Female and gall flowers: sessile or pedicellate; sepals 3-4 (-5), lanceolate. Figs depressed globose, c. 10-12.5 mm in diameter, dark-purple on maturity. It is planted as an avenue or roadside tree and is held sacred by the people. Commonly occurs near the temples.


A large shrub to small deciduous tree, 5-9 m tall with several spreading branches from a short, rough trunk. Bark smooth, grey or dull white, young twigs glabrous or softly hairy. Leaves with glabrous to tomentose up to 12 cm long grooved petiole; lamina variable in shape and size, broadly ovate to nearly orbicular, (4-) 5-15 (-20) cm long, (3.5-) 5-15 (-18) cm broad, undivided or obscurely palmatifid to mostly palmatifid partite, lobes spathulate with entire to apically few-dentate margin, 5-costate at the cordate base, margins undulate-dentate or dentate-crenate, acute to ± obtuse, scabrous above, densely soft hairy beneath especially on nerves, lateral nerves 6-8 (-9) pairs, intercostals ascending-parallel; stipules ovate-lanceolate, 10-12 mm long, hairy to glabrescent Hypanthodia axillary solitary or paired, borne on upto 3 cm long peduncles, pyriform to globose, 1.5-2 cm in diameter, subsessile to sessile,
subtended by 3, broadly deltoid basal bracts, apical orifice closed by 4-5, broadly deltoid, ciliate imbricate bracts. Male flowers: sepals usually 4, united, lobes lanceolate; stamens 4, filaments long with oval, exserted anthers. Female flowers: pedicellate, sepals 4, lobes lanceolate-oblong; ovary with lateral style, stigma entire or 2-fid. Figs usually pyriform-obovoid, 2-5 (-8) cm in diameter, glabrous or shortly hispid, yellowish to brownish violet. Commonly cultivated for its fruit.


A large deciduous shrub or small tree, up to 10 m tall. Truck and branches. without aerial roots, bark smooth, brownish-grey, young twigs densely hairy. Leaves with 1.5-6 (-7) cm long, softly tomentose petiole; basins ± membranous, broadly ovate to suborbicular or orbicular, (2-) 2.5-12.5 (-14.3) cm long. and broad, 3-5 (-6)-costate at the cuneate to rotundate or truncate to ± cordate base, mostly undivided or sometimes palmately 3-5 partite, dentate to ± serrate, acute or ± obtuse, upper surface scabrid, soft hairy on lower side to glabrate,. lateral nerves 3-5 (-6) pairs, raised below, intercostals parallel to zigzag; stipules ovate, 6-10 mm long. acute. Hypanthodia solitary or sometimes paired, axillary, on c. 1-2.5 an long, tomentose peduncles, subglobose to pear-shaped, 12-20 mm in diam., tomentose, subtended by 3, deltoid, acute basal bracts, apical orifice umbonate. Male flowers: numerous in the upper half, pedicellate; sepals 4-5, free, lanceolate, hairy; stamens 3-6. Female flowers: basal, numerous; sepals 5, basally united, hairy; ovary ovoid with subterminal, long hairy style. Figs constricted or gradually narrowed at base, 1.5-2.5 cm long, yellow or purple, hairy. Common along with crop fields.

A large, evergreen to deciduous, up to 20 (-25) m tall, with wide leafy crown and branches spreading up to 100 m or more with pillar-like prop roots and accessory trunks. Trunk massive, fluted, bark grey, smooth, young softly white puberulous. Leaves with stout, (1.5-) 2-6 (-8) cm long, do ventrally compressed hairy petiole; lamina coriaceous, ovate or orb ovate to elliptic, (8-) 10-20 (-25) cm long, (6-) 8-15 (20) cm broad, glabrous above, finely pubescent beneath, base subcordate or rounded, margins apically obtuse, lateral nerves 4-7 pairs, intercostals distinct, ± bulging stipules coriaceous, stout, 1.5-2.5 cm long, acute; cystoliths abundant on side, few or absent below. Hypanthodia sessile, in axillary pairs on young depressed-globose, 15-2 cm in diameter, green, hairy, subtended by 3, reniform c. 3-4 mm long, c. 6-7 mm wide, minutely hairy basal bracts, apical orifice by 3, flat or ± umbonate bracts, internal bristles absent. Male flowers: numerous ostiolar, shortly pedicellate; sepals 2-3; stamen solitary, with shortly mucronate anther. Female flowers: sessile, mixed with gall flowers; sepals 34, small; ovary with an elongated style. Gall flowers numerous, pedicellate; sepal as in female ovary with a short style. Figs globose to depressed-globose, 15-2.5 cm in diam pinkish-red, hairy. Common along with roadsides and also near temples.


2. Artocarpus J.R. & G. Forst.,

1. Fruit 20-25 cm in diameter, tuberculate, brown .......... 1 Artocarpus heterophyllus.

1. Fruit up to 10 cm in diameter, smooth, yellow. ................. 2 Artocarpus lakucha.

Evergreen, 10-15 (-20) m tall tree with dense crown. Trunk 3-4 m in circumference, with reddish-brown, smooth bark, young twigs glabrous. Leaves with 2-3 cm long petiole; lamina elliptic to obovate, (5-) 8-15 (-20) cm long, (3.5-) 4-10 (-12) cm broad, leathery, entire or 3-lobed on young shoots, dark green and glossy above, glabrous, base cuneate, obtuse to subacute at tips; stipules large, spathaceous, 5-8 cm long. Male inflorescence terminal or axillary, cylindric to clavate, (2.5-) 3-8 (-10) cm long, 1-2.5 cm across; peduncles up to 6 cm long. Female inflorescence borne on main trunk and old branches, cylindric or oblong, tubercled and larger in size than male. Syncarp oblong-globose, hanging on trunk, massive, 25-100 cm long, 20-25 cm in diameter, fleshy, tuberculate, brown externally, pulp yellow to light orange. Seeds ± reniform, 2-3 cm long, embeded in the pulp. Commonly cultivated for its fruit.


A large deciduous tree, upto 20 m tall, with a dense spreading crown. Trunk with fissured blackish bark, 2-23 m in circumference, young shoots vinous tomentose. Leaves with a 1-2.5 cm long petiole; lamina oblong or elliptic to ± obovate, 15-25 (-30) cm long, 10-15 (-20) cm broad, scabrid, pubescent beneath, entire or denticulate; stipules lanceolate, 10-15 mm long, hairy. Male inflorescence ovoid, c. 20-25 mm long, subsessile, orange yellow. Female inflorescence subglobose, stout peduncled,
slightly longer than male. Syncarp globose, 4-10 cm in diameter, irregularly lobed, almost smooth, yellow on maturity. Common in shady localities.


3. Broussonetia Linn.


A small to medium sized, 3-12 (-16) m tall, dioecious, deciduous tree, upright branches from the base and grey, smooth bark. Young shoots densely villous. Leaves papery, with a densely hairy, (1.5-) 2-12 (-15) cm long petiole; lamina obliquely broad ovate to ovate-elliptic or ± oblong, 4.18 (-20) cm (2-) 3-14 (-16) cm broad, scabrous above, densely soft hairy beneath especially along the veins, entire or serrulate to finely dentate, unlobed or palmately deeply divided with open to close broad obtuse sinuses, 3-costate from truncate to shallowly cordate base, apex short acuminate; stipules ovate, 5-15 mm long, 4-10 mm broad, densely hairy, acuminate. Male catkins axillary or crowded at termini of young shoots, (2-) 5-15 cm long inclusive upto 2 an long hairy peduncles. Male flowers: sepals ovate 1.5-2 mm long, c. 1 mm wide, whitish hairy outside; stain final filaments longer than sepals, with much extorted oval anthers. Female heads globose, solitary on 5-8 (-10) mm long hairy peduncles, 10-20 mm in diameter. Female flowers: sepals oblong connate, c. 2 mm long, with acute long hairy tips; ovary stipitate, included with c. 5-6 mm long, filiform, pink styles. Etáerio of drupes globose, 2-3 cm diameter, orange-red. Commonl in moist shady places.


A deciduous, 8-15 m or rarely up to 20 m tall tree with a dense, compact leafy crown. Trunk c.1.5-2 m in circumference, with dark grey-brown, rough, vertically fissured bark, tender twigs hairy to glabrescent. Leaves. with a crisped hairy, filiform, 1-3 (-3.5) cm long petiole; lamina narrow to broad. ovate, (2.5-) 5-15 cm long, (2.5-) 4-12 cm wide, 3-costate from truncate to shallowly cordate base, upper surface glabrous, midrib and principal wins pubescent, secondary veins and ultimate veinlets glabrous, margin regularly serrate or crenate-serrate or ± irregularly 2-serrate, apex obtuse, acute or shortly acuminate; stipules lanceolate, brownish membranous, hairy. Male catkins 10-20 (-30) mm long including slender, hairy peduncle, c. 5.6 mm broad, with lax flowers. Male flowers: sepals free, broadly ovate, c. 2.5 mm long, cucullate, obtuse, glabrous to ± hairy; staminal filaments ± equal to sepals, with ovate, exserted anthers. Female catkins ovoid, (2) 5-10 (-12) mm long, with out equally long or slightly longer peduncle. Female flowers: sepals suborbicular, c. as long as or slightly larger than of male flowers, glabrous or ± ciliate on margins; ovary with glabrous free styles. Sorosis ovoid, (10-) 15-25 mm long, 5-8 mm across, white to pinkish-purple or black, sweet, edible. Commonly cultivated in the district.


**94. CASUARINACEAE**

**Casuarina Linn.**

1. Nodal leaf-sheaths with 6-(7)-8 teeth …………………………………………C. equisetifolia.

A straight erect tree upto 10-30m tall, monoecious. Bark grayish brown or dark brown. Branchlets 1-1.5 mm in diameter, jointed, internodes 6-8 prominent ridges; nodal leaf sheaths with 6-(7)-8 teeth, pale green, united at base into a short tube, freepart about 0.5 to 1 mm long, glabrous but margins shortly ciliate. Male inflorescence 15-35mm long, 2-4 mm in diameter, bracts arranged in 10-25 whorls and each whorl having 6-7 bracts with one flower in each bract; bracteoles membranous ovate, acute about 0.5-1.0 mm long, tepals 2, membranous. Filaments exserted, anthers 2-celled reddish brown. Female inflorescence in scattered or clustered ovoid-subglobose heads, about 4-8 mm long, stalk about 2-12mm long. ovary unilocular. Samaras 4-8 mm long, yellowish brown. Commonly cultivated as a hedge plant or as an ornamental tree.

L.N.- Jangali saru Fl- Dec-Mar Collection: 408, Birdpur

95. SALICACEAE

1. Leaves long petioled ............................................................ 1. Populus.

1. Leaves short peticeled ............................................................ 2. Salix

1. Populus Linn.


A large deciduous tree; bark on young stems greenish grey, smooth; brown. Bud sticky bud scales brown shining. leaves petiolate, petiole 5-10 cm long, hairy, lamina about 7-15 cm long, broadly ovate, crenate-serrulate, teeth minutely hairy, base cordate or rounded, 3-5 nerved, minutely pubescent on the lower surface, tip acute to
acuminate. Male catkin compact in flower. Male flower: pedicel small, bract ablancoolate, hairy, disk obliquely cup-shaped, crenulate; stamens many, anthers oblong, longer than filaments. female catkins (in fruit) about 15-30 cm long, lax.

Female flower: Disk embracing half the ovary, margin undulate, stigmas 3-4, very large, obcordate. Capsule orbicular, 3-4 valved. Seed covered with long silky hairs.

Commonly cultivated to border the grounds.

L.N.- Popular Fl- March-April Collection-1033-shortgant

2. Salix Linn.

1. Leaves lanceolate, serrulate, female catkins 6-8 cm long ………….. S. tetrasperma.


A deciduous shrub or small tree about 9m tall; bark greyish-brown, rough with vertical tissues; branchlets often pubescent. Leaves lanceolate or ovate lanceolate, about 7-20 cm long, caudate-acuminate, obscurely serrulate, upper surface glabrous, green, lower surface covered with white blooms; petioles about 0.6-2.5 cm long; stipules ovate or orbicular. Flowers appearing after leaves, on leaf bearing peduncles. Male catkins sweet-scented, lax drooping, 4-10 cm long; peduncle, bracts and filaments hairy. Female catkins 6-8 mm long, lax, drooping stigma subsessile, entire. capsules ovoid, about 3-4 mm long, glabrous on slender pedicels. Commonly occurs near wet and swamy places.


96. CERATOPHYLLACEAE

Ceratophyllum Linn.


L.N.- Sivara Fl. & Fr.: Sept-Dec Collection: 1016, Lotan

MONOCOT

97. HYDROCHARITACEAE

1. Stem leafy, branched; perianth 2-seriate; style entire. ........................................ 1. Hydrilla

1. Acaulescent aquatics, leaf ribbon-like; perianth 1-seriate; style 3-lobed.

................................................................. 2. Vallisneria

1. HYDRILLA L.


Slender, submerged, fresh water herbs; stolon tips often developed to nodule like 'turions'. Leaves in whorls, 3-8 together, oblong-linear, apiculate, sharply serrate-dentate, spreading in water; not differentiated into petiole and lamina. Male flowers pedicellate, solitary in spathe; female flowers sessile, 1-3, in tubular spathe. Fruit subulate, smooth or muricate. Common; in ponds, ditches and slow running water.

2. VALLISNERIA L.,


Stoloniferous, aquatic herbs. Leaves radical, ribbon-like, translucent, 20-45x1.2 cm, erect or spreading in water; base sheathing. Male and female flowers on separate plants; male flowers several, short peduncled, in 3-lobed spathe; sepals 3; petals 0. Stamens 1-3; staminodes 2-3. Female spathe tubular, covers half the ovary, solitary flowered, terminating into thread like spiral stalk above the water, which uncoils at the time of fertilization; styles 3; seeds oblong.

Collection: 1040; Naugarh.

98. ORCHIDACEAE

1. Leaves numerous, linear-lanceolate, very much crowded----Zeuxine.


Plants 5-25 cm, very variable in size. Stem creeping below, then erect, densely leafy throughout. Leaves sessile, linear-lanceolate. Inflorescence densely many-flowered, glabrous. Bracts lanceolate, diaphanous, exceeding flowers. Flowers white or pale rose. Sepals up to 5 mm long, the dorsal ovate, concave, laterals ovate-lanceolate; petals subequal in length, falcately-oblung. Labellum fleshy; saccate at base, inside with a tooth on each side and 2 parallel lamellae joining the mid-rib, in front transversely oval and yellow. Ovary fusiform-cylindric, sessile, glabrous. On wet places near rivers and on land temporarily flooded. A lowland plant.

99. MUSACEAE


Tree-like herb, up to 9 m in height. Leaf sheaths tubular, forming a thick trunk. Leaf blade c. 1.5 m, oblong, usually ragged in appearance, splitting between the transverse parallel veins. Spike c. 1 m, drooping. Peduncle thick. Bracts opening in succession, 15-20 cm, ovate, concave, dark red, somewhat fleshy. Outer tepals 22-24 mm, 5-toothed, fleshy, tinged pink. Inner tepals 19-20 mm, ovate, acute, concave. Stamens 5. Fruit oblong, fleshy. (In the wild form 5-7 cm with seed; seedless and longer in the cultivated varieties.) Commonly cultivated for its fruit.

L.N.: Kela Fr. Per.: Summer months. Collection: 543, Itwa.

100. ZINGIBERACEAE

1. Leaves narrow, up to 2.5 cm broad, ligule and sheath glabrous; scapes 20-30 cm long. ................................................................. 1. *Z. officinale*

2. Bracteoles present; inflorescence dense strobiliform .............. 2. Curcuma


Erect or ascending herbs, with creeping, tuberous rhizome; leafy stem 50-150 cm high. Leaves subsessile, linear-lanceolate, 10-30 x 1-3 cm, base narrowed, dark-green; ligule and sheath glabrous. Flowering stem 20-30 cm long, clothed with sheath; spike oblong-cylindric, 8-12 cm; bracts to 2 cm, greenish. Corolla lobes yellowish-green, lanceolate, subequal. Lip small, purplish-black, shorter than corolla segments. Stamen dark-purple, as long as lip. Often cultivated for Ginger.
Collection : 1096, Sarota.

**Curcuma Linn.**

1. Floral spikes in the centre of leafy shoots. ......................... C. longa


   A perennial herb grows up to 60 cm in height with underground stem. Leaves simple, large, with long petiole, oblong â€“ lanceolate and acute. Flowers pale yellow in long spikes. Underground rhizomes cylindrical, ovoid, orange colored when cut and much branched. Plant pacifies vitiated kapha, pitta, skin diseases, ulcers, wounds, inflammations, pruritus, allergy, tumor, cough, asthma malignancy, tumors and hemorrhoids. Cultivated throughout the district.


### 101. CANNACEAE

**Canna L.**


Perennial, erect herbs, with creeping, tuberous rhizome and fibrous roots. Leaves large, sessile or shortly petioled., oblong, 10-30cmlong, acuminate. Flowers in lax, terminal, simple or branched racemes. Flowers sessile, erect, 4-8cm long, variously coloured; bracteoles ovate-oblong. Calyx segments subequal, red, lanceolate, oblong Corolla. 25cm long spikes, floral bracts, large green, flowered.
Calyx membranous, 3 lobed ovate obtuse. Capsule globular, 3-valved wiman orange red living.

Collection: 1121, Lotan.

102. AMARYLLIDACEAE

1. Ovary superior: ................................................................. 1. Allium

1. Ovary inferior:

2. Corona absent:

3. Flowers several together; peduncle solid. ..................................... 2. Crinum

ALLIUM L.,

1. Heads white; bulbils present; stamens exserted:

2. Leaves fistular, terete; bulb simple, large. .................................. 1. A. cepa

2. Leaves linear, flat; bulbs compound, short................................. 2. A. sativum

1. Heads deep purple; bulbils absent; stamens included. ................3. A. wallichii


   Erect, bulbous herbs; stem a short disc. Leaves radical, linear, fistular, glabrous, fleshy, 15-45cm long, shorter than scape. Scape slender, cylindrical, fistular, 30-60cm long, bearing terminal clusters of umbels, surrounded by 2-3 membranous, thin spathes. Flowers greenish-white common; Used in various medicines, for digestive and skin ailments.


Erect, bulbous herbs; bulb short, several together, enclosed in white or pinkish envelope. Leaves radical, flat, fleshy, much pungent, linear-lanceolate, 10-3 Ocm long, glabrous. Scape slender, erect, 20-30cm high. Flowers white or pale-white, in terminal umbels, surrounded by 2-3 papery spathes; spathes long, beaked.

Fl. & Fr.: Apr.-Jun. Collection 1078, Dumariagani


Annual-perennial, erect, glabrous herbs, with short bulbs. Leaves radical, linear-lanceolate, strap-shaped, thin, flat, keeled, 15-30x0.5-1.2cm, glabrous, pungent. Flowering scape 30-90cm high, acutely 3-angled, glabrous. Flowers numerous, dark-purple, long stalked, in globose umbels; spathe papery, narrowly lanceolate. Tepals 6, broadly linear, reflexed on maturity. Stamens shorter than perianth lobes. Common in marshsaria.


2. Leaves broad to 14cm wide; umbel 10-50 flowered. ....................... 1. *C. asiaticum*


Annual-perennial, bulbous herbs. Leaves all radical, several, 80-130x8-14cm, thin, membranous, margins smooth. Scapes 30-60cm long, thick, compressed; spathe 8-10cm. Flowers white, fragrant, in 15-50-flowered compound umbels; pedicels 1.5-2.5cm long. Perianth tube 8-10cm long, greenish; lobes linear, white. Stamens 6,
spreading; anthers linear, dorsifixed, often reddish. Commonly cultivated in gardens.

Fl.&Fr.: Feb.-Jul. 

Collection: 1037, Naugarh.

**103. AGAVACEAE**

1. Leaves less than 1 m long. Marginal spines hooked upwards............. 1. Agave

1. Leaves mostly entire ............................................................... 2. Yucca.

1. Agave Linn.

**Agave wightii** Drumm. & Prain in Beng. Agric. Bull. 8:15. 1906. Parker, For. Fl. 512; F UGP 3:244.

Probably monocarpic. Plant up to 1.5 m. Trunk erect or prostrate, covered with remains of old leaves. Leaves forming a rosette, erect, up to 60 cm, constricted at the neck, greyish-green, sometimes glaucous, hardly channelled. Apical spine 1-1.5 cm, black to dark reddish-brown; marginal spines hooked upwards. Inflorescence large paniculate. Flowers in clusters on the terminal portion of the branches. Perianth lobes slightly longer than the ovary segments. Stamens exserted; filaments c. 2.5-3.5 cm, anthers c. 8-13 mm. Commonly planted as hedge on road sides.

Collection: 144, Naugarh

2. Yucca Linn.


Mound-lily yucca is an erect evergreen shrub with swordlike leaves about 2 in (5.1 cm) wide and 2-3 ft (0.6-0.9 m) long originating from a basal rosette. The leaves are bluish or grayish green with smooth margins and pointed tips. They tend to bend
near the middle and arch downward. In summer mound-lily yucca puts up a showy 6-
8 ft (1.8-2.4 m) spike of fragrant flowers that are white with purplish tinges, pendant
and about 3 in (7.6 cm) across. Mound-lily yucca stays in a stemless rounded clump
2-5 ft (0.6-1.5 m) across and about the same height for several years, but eventually
develops a trunk or stem which elevates that clump of leaves above the ground as
much as 6-8 ft (1.8-2.4 m). In older plants the stem develops branches and each
terminus has its own rosette of leaves

Collection: 1251, Naugarh

104. DIOSCOREACEAE

on Linn).

A climbing herbaceous perennial with large tuberous roots, tubers mostly
large, globose or pyriform. Stems glabrous, twining clockwise bearing numerous
brown warty bulbils c. 2.5 cm in diameter. Leaves alternate, 4-5 cm long, 2.5-13.5
cm broad, ovate, more or less deeply cordate at the base, long acuminate, 9-nerved,
petiole 2.5-12 cm long. Male spikes slender, drooping, 6.5-10 cm long, clustered in
the axils or sometimes panicked; stamens 6, antheriferous. Female spikes simple,
fascicled in the leaf axils, 10-25 cm long. Capsule c. 2 cm long, 1 cm broad, oblong.
Seeds winged at the base.


105. LILIACEAE

1. Leaves reduced to scales; branchlets modified to cladodes.................. 2. Asparagus
2. Leaves broad, succulent, thick, often prickly on margins; tepals more or less connate of form tube. ................................................................. 1. Aloe

3. Flowers in axillary, dropping clusters; perianth segments connate into tube. .................................................................................. 3. Polygonatum

3. Flowers solitary, axillary, large, .............................................. 5. Gloriosa

4. Fruit loculicidal capsule. ...................................................... 4. Asphodelus

1. ALOE L.,


Stoloniferous herbs; leaves all radical, arising from the ground; stem to 60cm high. Leaves erect or spreading, numerous, ensiform, lanceolate, 25-60x2-6cm, long acuminate, succulent with yellowish-brown sap, margins prickly. Flowers vermilion coloured, in terminal racemes, on leafless scapes. Perianth 6-parted, more or less connate to form tube. Stamens equaling the tepals. Capsules oblong-ellipsoid.

Common; waste places, forest edges and clearings. *Fleshy leaves used on wounds and sores: after thorough boiling, occasionally leaves-are edible; plant extract used stomachic, purgative, emmenogogue and anthelmintic; frequently planted as biofence.*


2. ASPARAGUS L.,

1. Cladodes erect, terete, in tuft of 6-20; prickles usually straight to 1.8cm long. ........................................................................................................ 1. A. adscendens

Straggling or suberect, undershrubs or shrubs, with fusiform tuberous roots; stem pale-green, glabrous; spines 1.5-1.8cm long, straight, with woody base. Cladodes in tuft of 6-20, erect, terete, acute, 1-2cm long. Flowers 2-sexual, white, in 3-5cm long racemes, forming terminal panicles. Tepals 6, nearly equal, oblong-lanceolate. Ovary 3-celled. Berries globose or ovoid, 4-5mm across, green or red.

Fl: Aug.-Sept.; Fr.: Sept.-Nov. Collection 1169, Sarota

3. POLYGONATUM Miller in Gard.

1. Tip of leaves straight. ............................................................ 1. P. verticillatum


Annual-perennial, tall, erect herbs, 80-150 cm high; stem angled or grooved. Leaves sessile, in whorls of 4-8, linear or narrowly lanceolate, 8-15x0.5-3cm, acuminate or acute. Flowers white, arranged in terminal, whorls of leafy racemes. Perianth oblong, 4-6mm long, 6-parted; segments spreading. Berries globose, 5mm across, purple-black when ripe. Occasional; moist-shaded.


Erect, annual herbs, with a short rootstock which emits many fleshy root. Leaves in a basal rosette, erect, fistular, ribbed with prominent, minutely scabrid nerves, subcylindric in a transverse section, acute, usually shorter than the scapes, 8-15 cm long. Flowering stems several erect, solid, branches in the upper part, scabrid in the lower part, glabrous upward, up to 60 cm long or more. Bracts membranous
ovate, acuminate, 0.3 cm long. Pedicels erect, jointed below the middle dilated upward 0.3-0.5 cm cm long. Tepals whitish, lanceolate – oblong. obtuse with a brownish keel, 0.4-0.45 cm long. Anthers brown style 0.3-0.35 cm long. capsule globose, faintly 3- gonous , rugose. Common – agricultural fields. especially wheat fields.


Slender, branched, climbing, or scrambling herbs with leafy tendrils and fleshy, cylindric tubers. leaves sessile , opposite or alternate or verticillate, ovate – lanceolate, with a cordate base, narrowed into a coiled tendril at apex, glabrous, 10-15 (-20)* 2-5 cm- flowers axillary, solitary, forming, terminal corymbs. pedicels 10-15 cm long, with a deflexed tip. Teaps lanceolate, acuminate with a crispy undulate margin erect and greenish at first, refexed and purplish or scarlet finally. Anthers 1-1.5 cm long. style 3-fid, 4 cm long capsule oblong. Common – forest edges, forest clearing hedges, scrub jungles grassy localities and sal forest.

Fl. & Fr- Aug-Nov. Collection:- 1389, Shohratgarh.

106. PONTEDERIACEAE

1. Petioles swollen; perianth tubular below; anthers dorsifixed; filaments not horned.

............................................................ 1. Eichhornia

1. Petioles not swollen; perianth free; anther basifixed; filaments of one anther homed.

............................................................ 2. Monochoria

1. EICHHORNIA Kunth,

Perennial, free-floating, aquatic herbs, profusely rooting at nodes. Leaves several in rosettes, spatulate or ovate, 5-15 cm long; petioles swollen into inflated bladders, 3-6 cm long; sheath at the base, oblong, stipule-like, lobed. Flowers blue-violet, in dense, to 15 cm long spikes; bracts leaf-like. Perianth tube 1.3-1.6 cm long, bent at apex; lobes in 2-rows. Stamens 6, attached to perianth tube; anthers versatile. Ovary 3-locular, with numerous ovules. Common; adjacent plains to Hardwar and Bijnor districts, in ponds and pools.


2. MONOCHORIA C.


Perennial hydrophytes, with stout rhizome, clothed by leaf-sheath; stem suberect, leafy. Leaves ovate-triangular, hastate or sagittate, 7-25x4-20 cm; petioles to 60 cm long. Flowers blue-purplish, 1-2 cm long, pedicellate, in racemes or subumbels. Fruiting perianth twisted. Capsule ellipsoid. Fl. & Fr.: Feb.-Nov.

Collection: 1009, Sirsa.

107. COMME LINACEAE

1. Perfect stamens 2-3, with 1-3 staminodes: ……………………………… 1. Commelina

1. Perfect stamens 6, usually all fertile:

3. Petals connate below into tube; cymes scorpoid:
4. Flowers in cymes, enclosed in 2-seriate falcate imbricating bracteoles................................................................. 2. Cyanotis

1. COMMELINA L.,

1. Seeds non appendiculate; spathe cordate. ............................................... 2. C. hasskarlii

2. Spathe funnel-shaped or hooded:

3. Leaves ovate, broader; seeds rugose................................. 1. C. benghalensis

4. Seeds free; capsules 3-valved. ............................................... 3. C. maculata


   Annual, decumbent-ascending herbs, 20-30cm high; stem branched from the base, creeping, rooting at joints, sparsely pubescent or glabrous. Leaves shortly stalked, ovate to ovate-oblong, 2.5-7x1.5-4cm, obtuse, base sheathing, pubescent or ciliate, oblique. Spathe 2-3 together, at the end of branches; cymes peduncled, lower branch 1-flowered, upper ones 2-3 flowered. Sepals 3, unequal, green. Petals 3, sky-blue, 5-7mm long; dorsal one clawed. Fertile stamens 3; staminodes 3. Capsules 3-gonous, 5-seeded. Common; waste places, crop fields, road sides. Plant juice given in dysentery and paste applied on body swelling and ache.


   Annual-perennial, decumbent-ascending herbs; stem branched, rooting at base, 50-100cm high. Leaves subsessile, oblong-lanceolate, 4-10x2-3cm; sheath with an


Annual, decumbent-ascending herbs, 20-60cm high; stem slender, simple or branched from the base, rooting at nodes. Leaves subsessile, narrowly ovate-lanceolate, 5-10x0.5-2.3cm, margins ciliate; sheath glabrous, fringed with hairs. Spathe subsessile, several, in terminal clusters; base cordate, tip acuminate. Sepals 3, unequal; dorsal one smaller. Petals 3, light-blue to whitish, longer than sepals; limb orbicular. Ovary 3-celled; capsules ovoid, 3-seeded. Common; shady and moist places,


2. CYANOTIS D. Don,

1. Leaves ovate-oblong, sheath glabrous; seeds with striations and pitted..1. C. cristata


Annual, erect, glabrous herbs with fibrous roots; stem slender, usually tinged purplish, ascending, rooting at basal nodes. Leaves sessile, ovate-lanceolate or oblong, 3-8x0.4-2.3cm. obtuse, margins ciliate; sheath glabrous. Flowers blue, 2-sexual, in terminal clusters, enclosed in foliaceous bracts and 2-seriate, foliaceous,
ovate, bracteoles. Sepals 3, lanceolate, acuminate. Corolla tube nearly as long as sepals; lobes ovate. Stamens 6, perfect; filaments hairy. Capsule 3-valved, 3-gonous; hairy at top; seeds 2 in each cell, black, with 2-large pits on 2-faces. Common; open waste places, crop fields.


108. JUNCACEAE


Annual, erect, ascending to spreading herb, 25 cm long, fibrous rooted, slender, often gregarious and seemingly tufted or caespitose, usually with several basal leaves and one cauline leaf; stem branched, slender. Leaves usually 1-5 cm x 1-1.15 mm, setaceous or filiform, with a non-auricled broader sheathing base, deeply channeled. Inflorescence a much branched to subsimple panicle, often occupying greater part of the plant with distantly placed (2-) 3-5 (or more) flowers on each branch. Flowers (3-) 5-7.5 mm long, solitary or sometimes 2-3, seemingly together, sessile or subsessile, greenish to straw-coloured; perianth segments unequal, outer usually longer, lanceolate-acuminate, often pale green with hyaline margins, exceeding the oblong, blunt capsules. Stamens 6, up to 2 mm long with subequal anthers and filaments. Capsules (3-) 4-5 mm long, c. 2 mm broad, ovoid to oblong with rounded to obtuse apices, very minutely pointed at the apex, buff, yellowish to brownish; seeds ovoid-rounded to broadly ellipsoid, 0.3-0.5 mm long, c. 1.5 times as long as broad, usually reddish-brown, mucilaginous.

109. ARECACEAE

1. Leaflets narrow, entire, green beneath; spathe solitary.................................1. Phoenix

PHOENIX L.,

1. Stem tall, 5-15m high..................................................1. Phoenix sylvestris.


Evergreen, erect palms, 7-15m high; stem simple, covered with persistent leaf bases and topped by crowns of foliage leaves. Leaves 2-4(5)m long; leaflets rigid, folded, 30-40x1-1.5cm, acicular tip; petioles spiny. Male flowers white, fragrant, in 30-60cm long, spreading panicles; female flowers terminating the branches, in large bunches; spathes 30-40cm long. Fruits 2-2.5cm long, oblong, brownish-red when ripe.


110. PANDANACEAE

Pandanus Linn.


Bushy shrubs. Leaves ensiform, caudate-acuminate, with upcurved, marginal spines, glossy green, dropping. Spathes white, fragrant. Fruit yellow or brown.

Cultivated in gardens; often runs wild in vacant lots and waste places.

Collection: 1225, Nutanwa

111. TYPHACEAE
1. Leaves 25-40 mm broad, trigonous above the sheath, angularly keeled dorsally; stigma lanceolate .................................................. 1. Typha elephantina


Perennial 1.5-4.0 m tall. Leaves linear or broadly linear; trigonous above the sheath, angularly keeled dorsally, 3-angled; lamina 25-40 mm broad. Upper part flat, about as long as inflorescence; male and female parts separate; axis of the male spike covered with hairs; female spike cylindric, blackish brown or brown; pistillodes present; female flowers bracteate; stigma lanceolate, bracts spathulate and longer than the hairs.

*Fl. Per.*: March-August COLLECTION:543, Biripur

### 112. ARACEAE

1. Corm up to 15 cm broad. Basal lobes of leaves obtuse. ..................... Colocasia

1. Ovules anatropous; leaves 3-partite. .......................................... Amorphophallus

1. **Amorphophallus**


*Dracontium paeoniifolium* Dennstaedt *in Schlussel*.

Perennial herbs with bulbiferous tubers. Leaf 1(2), large, 30-65 cm broad, 3-partite with multified segments; leaflets oblong, acute; petioles dark-green with pale blotches. Peduncle elongating in fruits; sheath linear-oblong. Spathe 15-20 cm across, coriaceous of fleshy, variable in colour, purple-yellowish, usually green at the base. Spadix very stout; female at base, 5-20 cm long, cylindric; male 5-8 cm long,
subturbinate; appendages longer than the fertile parts, dark-purple, folded. Fruits sessile, oblong, orange-red, with 2-3 seeds.

Fl. & Fr.: Sept-Nov.  Collection: 1325, Lotan


Perennial herbs, with tuberous rootstock. Leaves ovate-rounded-orbicular, 15-60cm long, with broad triangular basal sinus; petioles stout, 30-80 cm long, green or violet. Peduncle solitary, rarely clustered, much shorter than petiole. Spathe 15-60cm, caudate-acuminate, pale-yellow; spadix shorter than the spathe; female flowers at base, neuter flowers in the middle and male flowers at top, narrowed into variable appendage.

Fl. & Fr.: Aug-Nov.  Collection: 1532, Birdpur

113. LEMNACEAE

1. Fronds with roots; inflorescence spathaceous; stamens 2, anthers 2-locular:

   2. Fronds with 1-root; dorsal or ventral scale absent. ............................ 1. *Lemna*

   2. Fronds with several roots; a dorsal and a ventral scale present........ 2. *Spirodela*

1. Fronds without roots; inflorescence spathaceous; stamen 1, anthers 1-locular.

......................................................................................................................... 3. *Wolffia*

1. LEMNA L.,


Free floating, minute, aquatic herbs. Fronds oblong or obovate-oblong, thin, almost flat on both surfaces, 4-9mm across, opaque, oblique at base, glabrous. Root


2. SPIRODELA


   Free floating, aquatic herbs. Fronds broad, obovate or orbicular, thick, opaque, flat above, slightly convex below, dark-green above, purplish beneath, 7-13 nerved, with more than 5 roots. Spathe with 2- male flowers, represented by 2 stamens and single female flower (carpel). Common in ponds and puddles.

Collection : 1072, Lotani.

3. WOLFFIA Horkel ex Schleiden


   Minute, free floating, glandular herbs. Fronds opaque, ovate or orbicular, about 1mm long, convex on both surfaces, rootless. Common in ponds and ditches.

Collection : 1083, Suhase.

114. ALISMATACEAE

1. Leaf lobes and blade sharply acute. Stamens c. 20. Achenes triangularly obovate with sub-crenate to entire wing. ................................................................. 2. *Sagittaria trifolia*


Aquatic or semi-aquatic herb with floating leaves. Leaves 5-7 cm long, 6-8 cm broad, glabrous; petiole up to 34 cm long, sulcate, minutely hairy. Inflorescence an unbranched scapose raceme, up to 45 cm long, minutely hairy towards apex. Flowers in 2-6 whorls of 2-3 flowers each, lower whorls with bisexual, upper ones with male flowers, c. 1.5 cm across, white; pedicel stout, 1-2 cm long, thickened and elongated up to 3.5 cm in fruit; bracts elliptic, 8-15 mm long, obtuse with membranous margins. Sepals ovate-elliptic, 8-10 mm long, 6-9 mm broad, acute. Petals obovate-suborbicular, yellow-spotted at the base, larger than the sepals. Stamens with c. 2-3 mm long, papillate filaments. Head of achenes c. 1 cm across, achenes flat, elliptic, 3-4 mm long, with distinctly blunt toothed dorsal wing.

*Fl. Per.:* August-November. Collection: 908, Parsia


Aquatic, glabrous herb with thick stolons bearing tubers at tip. Leaves mostly emerged, upright, sagittate or somewhat hastate, blade ovate or linear-lanceolate, (5-
6.5-) 8-17 cm long along midrib, (1.5-2.5-) 5-7 cm broad, acute, basal lobes triangular or linear-lanceolate, often longer than the blade, sharply acute; petiole 60-75 cm long, triangular. Inflorescence an unbranched scapose raceme, 30-50 cm long. Flowers in 2-6 whorls of (2-) 3 (-5) flowers each, unisexual, 1-2 cm across, white; pedicels 8-15 mm long, short in females; bracts triangular-ovate, 8-10 mm long, 3-4 mm broad, acute-acuminate. Sepals elliptic, 6-8 mm long, 5-6 mm broad, somewhat keeled, margins broadly membranous, reflexed in fruit. Petals broadly elliptic-suborbicular, 12-15 mm long 12-15 mm broad, white, without basal purple spot. Stamens c. 20, filaments lanceolate, 1.5-2 mm long; anthers yellow, oblong, as long as the filaments. Head of achenes subglobose, c. 1 cm across; achenes triangularly obovate, with laterally bent beak. c. 2-3 mm long, wings subcrenate to entire.

*Fl.Per.*: April-September  collection :- 555, Lotan

**115. POTAMOGETONACEAE**

**POTAMOGETON** L.,

1. Leaves linear-oblong, crisped-serrulate. 3-nerved. with semiamplexicaule base; fruiting carpels long beaked. .................................................................1. *P. crispus*

1. Leaves narrowly linear or filiform, opaque; fruiting carpels hardly beaked. .................................................................2. *P. pectinatus*

2. Upper leaves 5-10(-12)cm long; drupelets small, smooth. ..........3. *P. nodosus*


Submerged herbs; stem slender, compressed, much branched. Leaves sessile, linear or linear-oblong, 2.5-8x0.3-0.9cm, obtuse, crisped and finely serrulate towards apex and margins; base semiamplexicaule, 5-nerved, translucent; stipules
small, caducous. Peduncles between forks of stem; spikes 6-10nim long, lax, few flowered. Tepals clawed, suborbicular, to 2.5mm long. Drupelets obliquely ovoid, 2.5mm long, compressed, tipped with slightly recurved ovoid beak.

Collection: 1013, SHOHATGARH


Submerged and partly floating herbs; stem terete, branched, smooth, creeping below. Leaves heterophyllous, petiolate; submerged leaves linear of elliptic-lanceolate, acute, often undulate; petioles shorter than the blade; floating leaves usually opposite, coriaceous, elliptic-lanceolate, 5-10x2.5-4cm, oblong or suborbicular, obtuse or subacute, many-nerved; petioles 4-8cm long; stipules scarious, 2.5-3.5cm long. Peduncle axillary or leaf opposed, stout, terete, 4-10cm long; spikes 2.5-3.5cm long, dense flowered. Tepals oblique-suborbicular. Drupelets oblique, sub orbicular with straight, short beak, smooth. Common; ponds and ditches, river banks.

Fl. & Fr.: Mar.-Sept.  
Collection: 1068; Sarota.


Submerged, thread-like, much branched herbs; stem subterete. Leaves alternate, filiform or narrowly linear, 3-15x0.1-0.3cm, acute or acuminate, opaque, 1-3-nerved; stipules adnate to the leaf sheaths. Peduncles slender; spikes 5-8cm long, filiform, interrupted, few flowered, in whorls. Drupelets 3-4, turgid, dimidiate-obovoid, slightly compressed, rounded or obscurely 3-keeled on back, with short beak. Common in marshy area.
116. **ZANNICHILIAEAE**

**ZANNICHELLIA** L.,


Slender, submerged, aquatic herbs; stem corymbosely branched. Leaves filiform or linear, opposite or pseudoverticillate. Flowers minute, 1-sexual, subtended with spathe. Male flowers monoandrous, solitary, naked. Female flowers 2-5 together, with hyaline tubular perianth; carpels 1-8, sessile, with an obliquely peltate large stigma. Fruit stipitate, horned. Slow moving or stagnant water.


**ARECACEAE** (PALMAE, Juss. nom. alt)

1. Leaflets narrow, entire, green beneath; spathe solitary..............................................2. **Phoenix**

**PHOENIX** L.,

1. Stem tall, 5-15m high................................................................. 3. *P. sylvestris*.


Evergreen, erect palms, 7-15m high; stem simple, covered with persistent leaf bases and topped by crowns of foliage leaves. Leaves 2-4(5)m long; leaflets rigid, folded, 30-40x1-1.5cm, acicular tip; petioles spiny. Male flowers white, fragrant, in 30-60cm long, spreading panicles; female flowers terminating the branches, in large bunches; spathes 30-40cm long. Fruits 2-2.5cm long, oblong, brownish-red when ripe.
NAJAS L.,


Bright-green, delicate herbs; stem muricate. Leaves whorled, linear, spreading, recurved, with 30-40 teeth on the margins; sheath elongated with lanceolate auricles and 8-10 teeth on margins. Flowers without spathe. Perianth segments rounded. Fruit solitary or a few together, ellipsoid, tapering at apex; seeds areolate. Common; ditches, lakes.


ERIOCAULACEAE

1. Floral bracts shortly hairy; leaves red-tinged; involucre bracts short..................

...........................................................................................................................................2. E. quinquangulare

2. Leaves filiform, rarely to 2mm broad; floral bracts glabrous; seeds smooth

........................................................................................................................................... 1. E. cinereum


Annual herbs, with fibrous roots; leaves in basal rosette, linear, 1.5-5x0.15-0.25cm-, acute or obtuse, glabrous. Scapes many, 8-15cm long, pale-white, shining; heads to 4mm across, pale-white; involucre bracts obovate-oblong, obtuse, glabrous.
Floral bracts glabrous, oblong, obtuse, apiculate. Male flowers in the centre of head; sepals 3, stamens 1-6. Female flowers: outer tepals 2-3 or 0; inner 2; ovary stalked; style 3-fid; seed ovoid, brownish-black. Common; in rice fields and marshy places.


119. CYPERACEAE

1. Florets 1-sexual,

2. Utricle entire or 3-fid, enclosing 1-female floret and vestigeal rachilla.

.......................................................... 2. CAREX

1. Florets 2-sexual (at least middle ones);

3. Rachilla spikelet not articulated, retained and elongating during ripening; achenes many. .......................................................... 3. CYPERUS


5. Inflorescence terminal, bracts glume like........... 4. ELEOCHARIS

6. Style base adhering on the nut; apex of leaf sheath with long, fine hairs.

..........................................................1. BULBOSTYLIS

1. BULBOSTYLIS Kunth,

1. Spikelets 3-10, arranged in dense globose heads; involucre bracts longer to inflorescence. .......................................................... 1. B. barbata


Annual, glabrous herbs, to 15cm high; stem tufted, numerous, filiform. Leaves radical, filiform, 1.5-5cm long, glabrous except at the mouth of sheath. Spikes globose, dark-brown, 0.5-lcm across; spikelets 3-10, linear-oblong, 3-5mm long,
sessile, clustered in spicate-globose heads; glumes red-brown, 2-3, unequal, longest one to 3cm long, filiform. Nuts ovoid, smooth, pale-white. Common; open grassy places.


2. **CAREX** L.,

8. Leaves longer than stem; female glume with bright midrib; beak of nut notched.

...............1. *C. aristata*


Perennials, with creeping stolons; stem erect, 3-gonous, 15-60cm high. Leaves linear, 2-5mm broad, as long as or longer to stem; margins often enrolled; sheath glabrous. Spikes usually 4-6, erect, oblong-ovoid, to 3.5cm long; the terminal 1-3 male; lower ones female, stalked and distant from the male. Stamens 3; anthers pale-white, linear, versatile. Glumes "of female flowers ovate, margin brown, mid rib bristly, aristate. Utricle ovoid, hispid, notched, strongly 2-edged. Nuts ellipsoid, 3-gonous, dark-brown. Common, in grassy slopes, crop fields.


3. **CYPERUS** L.,

1. Spikes white or straw-coloured; glumes ovate; stamens 3.......... 7. *C. niveus*

4. Secondary rays absent or rare; spikelets in dense globose compact umbels;

..........................................................4. *C. difformis*

4. Secondary rays present; spikelets in lax compound umbels;9. *C. tenuispica*
6. Glumes aristate or cuspidate; spikelets 1-2cm long, in head like clusters.

.........................................................................................................................2. C. compressus

7. Rachilla scabrous, keel 7-nerved, winged with serrulate margins; style and stigma long. .................................................................1. C. alulatus

7. Rachilla glabious, keel 3-5 nerved, not winged nor serrulate; style and stigma short or 0. .................................................................6. C. iria.

10. Rachilla winged, glabrous; glumes overlapping................... 8. C. rotundus

9. Leaves short or obsolete; culms thick, normally more than 50cm tall..

..........................................................................................................................3. C. corymbosus.

12. Spike and spikelets suberec; spikelets 0.7-0.8mm wide, distant, few.

..........................................................................................................................5. C. distans


Annuals, 10-40cm high, with pale-green stem. Leaves flat, acuminate, 3-5mm broad, as long as or longer than stem. Spikes in compound umbel, to 2.5cm long; bracts 6-8, unequal in length, longest to 30cm long; rays 4-8, unequal, 2-7cm long; secondary rays to 2cm long. Spikelets ovoid, greenish-yellow, 2-5x2mm, 8-12 flowered. Glumes ovate, 2mm long, in two opposite rows, slightly imbricate, keel 7-nerved; rachilla scabrid. Stamens 2. Nuts obovoid, reddish-brown, apiculate. Common; moist and shady places of crop fields.


Annual-perennial, glabrous, tufted herbs, with fibrous roots; stem 5-30(40)cm high, erect, striate. Leaves subbasal, 1-4, flat or enrolled margins, as long as stem, 1-2mm broad, 1-nerved, acuminate; sheath purplish-brown. Inflorescence simple or compound umbel, 2-4(6) rays; bracts 4-6, unequal, to 10cm long. Spikelets 3-10, subdigitate at the end of rays, grey-green or straw-coloured, compressed, 10-20x2-3mm, linear, 20-40 flowered; rachilla straight, flat, persistent, winged. Glumes ovate, 2.5-3.5mm long, mucronate, 9-13 nerved; keel pale-yellow; lowest 2-glumes empty. Stamens 3; anthers yellow with prolonged connectives. Nuts obovoid, dark-brown, 3-gonous, 1.5-1.6mm long. Common; as weed of crop fields.


Glabrous, tall, rush-like plants, with horizontal, creeping, woody rhizome. Leaves reduced to sheath, rarely solitary, with small acute blade and serrate margins. Inflorescence somewhat a compound umbel; primary rays slender; secondary rays terminated by spikes or corymbs of 4-16 spikelets. Glumes ovate-oblong, deep straw coloured, pale-reddish-brown or red-brown. Nuts narrowly obovoid, ellipsoid, trigonous. Common; marshy places and near ponds in the.


Annuals, with fibrous roots; stem dark-green, 10-50(70)cm high.-Leaves basal, usually shorter than stem, linear-acuminate, 1-2mm broad, flaccid, obscurely nerved. Inflorescence a simple umbel, 6-12 rays; rays 5-15mm long; bracts 2(-4),
unequal, leaf-like, filiform, sharply keeled, longest to 15cm long. Spikelets 3-5x1mm, oblong, obtuse, dusky or brown, 10-30 flowered. Glumes obovate-obtuse, 0.8-1mm long, closely imbricate, scarious at tip, 3-nerved. Stamen 1, rarely 2. Nuts obovoid, 3-4-gonous, apiculate, pale-brown, 5-7mm long. Common; rice-fields, wet and marshy places.


   Perennial, glabrous herbs; rhizome stoloniferous, covered by dark-brown, elliptic, acute scales; stem 30-80cm high, 3-quetrous. Leaves basal, as long as stem, 0.6:1cm broad. Inflorescence compound umbel; primary bracts to 60cm long; primary rays 10-16, to 30cm high; rachis of spike glabrous, 1-4cm long. Spikelets linear, chestnut-brown, 8-12 flowered. Scarnens 3; anthers oblong, muticous. Glumes ovate-oblong, mucronate. Nuts dusky-black, obovoid, or ellipsoid. Common; grassy localities, waste places.

Fl. & Fr.: Jul.-Nov. Collection: 1078, Mithwal


   Annual, glabrous herbs, with fibrous roots; stem tufted, striate, 20-60cm high. Leaves basal, as long as stem, linear, 3-5mm broad. Umbel simple or compound, spreading to 25cm across; bracts 4-8, unequal, longest to 20cm long. Spike of 5-20 spikelets, loosely spicate on rachis; spikelets 6-15x2-3mm, linear-oblong, pale-brown, 6-20 flowered; rachilla broad, flattened, not winged. Glumes obovate, 5-20, arranged in 2-opposite rows, 3-5(7)-nerved, 1-1.5mm long, truncate. Stamens 1-3.
Nuts equal to the glumes, pale-brown, oblong-ovoid, minutely punctate. Common; weed of rice Fields, waste places.

Fl. & Fr.: Sept.-Dec. Collection: 1144, Bansi


Perennial, tufted, glabrous herbs; rhizome woody, creeping with fibrous roots; stem 10-30cm high, 3-gonous. Leaves basal, narrowly linear, 2-4mm broad, shorter or half as long as the stem. Inflorescence a solitary head of 3-8(12) spikelets; bracts 2-3, unequal, linear. Spikelets white, much compressed, ovate-lanceolate, 10-15x4-5mm. Glumes ovate, distichous, 3-5.5x2mm; keel 6-nerved. Nuts obovoid, 2-mm long, dark-brown, 3-gonous. Fairly common; open grassy slopes.


Perennials, rhizome woody, stoloniferous, covered with brown leaf-sheath; stem 15-30cm high, 3-gonous upwards. Leaves basal, shorter than stem, linear, margins curved, 4-6mm wide. Umbels simple or compound, 2.5-8cm across; bracts 3, unequal, to 12cm long, usually exceeding the umbel; rays 3-8, 6-8mm long. Spikes with 2-12 spikelets; spikelets red-brown, 8-20mm long, 12-30 flowered; rachis and rachilla winged, smooth. Glumes ovate, obtuse, 3-3.5mm long, imbricate, redbrown, margins scarious, 5-7-nerved. Stamens 3; anthers linear, connectives produced. Nuts ellipsoid to ovoid, trigonous, 1.5mm Ions; pale-brown to dull-white. Common; grassy localities, lawns, crop fields.


Annuals, with fibrous roots; stem tufted, 10-30cm high, 3-gonous. Leaves basal, shorter or longer than stem, linear, 2-3mm broad. Umbel simple or compound, with 3-8 rays; bracts unequal, the longest to 30cm long; spikelets greenish-yellow, 2-5x1 mm. 6-12 together, in subglobose spikes. 5-many flowered. Glumes ovate-oblong, obtuse, keel 3-veined. Stamens 2; anthers obtuse. Nuts laterally compressed to 2-convex, white to brownish, finely reticulate. Common, in open marshy localities, crop fields.


4. ELEOCHARIS R. Br.,

1. Style 2-fid; nuts flattened or biconvex:

2. Small annuals, rhizome 0; spikelets 3-5mm long, with minute bristles. 

................................................................................................................................................. 1 E. atropurpurea

2. Stout perennials, with creeping rhizome; spikelets 10-20mm long, with long bristles. ................................................................................................................................. 3. E. palustris.


Annual, densely tufted herbs; stem filiform, simple, glabrous to 10(-15)cm high; sheath short, membranous. Spikelets solitary, terminal, ovoid-cylindric, obtuse, purple-brown, broader than stem, 3-5mm long. Glumes ovate-obovate, obtuse or rounded, loosely imbricate, membranous, red or purple-brown with a greenish keel,
1.2-1.3mm long. Bristle white, scabrid, very small. Stamens 1-2. Nuts ovate or obovoid, black, biconvex, tipped by the style base. Common; marshy places, rice fields.


Perennial, tufted herbs, with creeping rhizomes; stem erect, 15-60cm high, terete, finely grooved, base sheathed by scales; sheath truncate. Spikelets solitary, terminal, ovoid or ellipsoid, yellow or brown, broader than stem, 4-15mm long. Glumes closely imbricate, ovate-lanceolate or elliptic, obtuse, upper ones fertile. Bristles usually 6, brown, as long as the nuts, retrorsely barbed. Stamens 3. Style 2(3) fid. Nuts broadly obovoid, biconvex, pale-brown, smooth, shining, tipped by bread style base. Common; marshy places, ponds and ditches.


5. FIMBRISTYLIS Vahl,

1. Spikelets solitary, terminal, rarely 2-3:
   3. Nuts orbicular, sessile, wrinkled and wavy; bracts present ..... 1. F. acicularis

2. Spikelets few to many in umbels:
   4. Spikelets compressed, pale-brown; stamen 1 ..................2. F. bisumbellat
         6. Spikelets and glumes obtuse; pale-brown; stamen 2; stylo glabrous. ..............................2. F. miliacea
7. Stamen 1; stem 4-5 angled at the top; spikelets somewhat terete...

..........................................................7. F. quinquangularis

8. Lower glumes distichous; spikelets few. ...................... F. tenera

7. Spikelets subsessile in umbellate clusters; glumes not spirally arranged................................................................. F. facata.


Annuals, with fibrous roots; stem 3-10(-12) cm high, filiform, glabrous. Leaves basal, filiform, acute, nearly as long as stem or shorter; sheath hairy at the mouth. Spikelets 1, ovoid-lanceolate, 2-3 mm long; bracts 1 or 2, unequal. Glumes thin, ovate-obtuse, pale. Stamens 1-2. Style 2-fid, villous at top. Nuts stipitate, orbicular, whitish with transverse wavy wrinkles, less than 1 mm across. Common; moist places, cropfields.


Annuals; stem tufted, flat or striate, 5-20 cm high, hairy above. Leaves basal, falcate-linear, acute, shorter than stem, margins hairy. Umbels compound; bracts hairy, unequal, leafy, 1-2 cm long. Spikelets stalked, compressed, ovoid-ellipsoid, 3-5 mm long. Glumes red-brown, ovate-mucronate, keeled. Stamens 1. Style shortly 2-
fid, base swollen. Nuts shortly stipitate, obovoid, tuberculate. pale-white. Common; along crop fields, waste and moist places.


    Annuals or perennials, with woody rhizome; stem terete, grooved, 18-40cm high. Leaves basal, nearly half to the length of stem, 2-3mm wide. Umbels compound; bracts 3-5, small, unequal. Spikelets dark-brown, ovoid, 4-6mm long; gynophore not conspicuous. Glumes imbricate, ovate-acute with scarious margins, 2-2.5mm long. Stamen l(-3). Style 2-fid. hairy. Nuts 3-gonus, obovoid, striate with 5-6 longitudinal lines. Common; marshy places, crop fields.


    Perennials, with stout, woody rhizome; roots fibrous, wiry; stem tufted, 15-30cm high, rigid, 4-5 angular or compressed, grooved. Leaves crowded round the base of stem, shorter than stem, 5-10cm long, spreading, recurved, linear-acute, 2-3mm broad. Umbel compound, rays few, 2-5cm long; bracts 2-4, shorter than umbel, erect, leafy. Spikelets 2-5 together, ovoid-oblong, red-brown. Glumes ovate-acute, membranous, keel slender, margins pale-hyaline, 2.5-3mm long. Stamens 3; anthers long acuminate. Style hairy along the margins. Nuts subsessile, obovoid, 3-gonous, 3-ribbed, verrucose, pale-white. Common; grassy and sandy localities, waste places.


Annuals, with fibrous roots; stem slender, obtusely angled, grooved, or striate, 20-60cm high. Leaves basal, longer or shorter than stem, linear, acuminate, 1.5-2mm wide; sheath long, subdistichous, green, coriaceous. Umbels compound, rays many, suberect, filiform, bearing small pedicelled spikelets. Bracts filiform, unequal, shorter than rays. Spikelets ellipsoid or ovoid, terete, pale-brown; rachilla winged. Glumes-laxy imbricated, orbicular-ovate, mucronate, 2mm long; keel 3-veined, margins hyaline. Stamens 3; anther obtuse. Nuts ovoid, obtusely 3-gonous, tuberculate, pale or brownish. Style slender, more or less pubescent. Common; crop fields, waste places.


Annuals, with fibrous roots; stem 15-30cm high, cylindric below, somewhat terete below the umbel. Leaves basal, half as long as the stem, linear, flat, 1.3-1.8mm broad; sheath short. Umbel with 7-9 rays; spikelets ovoid, subcylindric, 5-6mm long, 8-10 flowered. Bracts 2-3 bristle like. Glumes boat-shaped, red-brown, pubescent on margins, 1-1.5mm long. Stamens 2. Style deciduous, leaving pyramidal base. Nuts roundish, 3-gonous, 5-8mm long, dotted. Common; on wet grounds, crop fields.

Fl. & Fr.: Sept.-Nov. Collection: 1109, Itwa.

120. POACEAE
Group 1. Shrubs or trees with woody culms; leaves usually with a petiole like base and articulated with sheath:

1. Shrubby bamboos; ovary appendage lacking or inconspicuous; stamens 3:
   1. Large tree like bamboos; ovary, with conspicuous appendage; stamens 6:
   3. Florets separated by a rachilla internode, if 1-floret then extension present. ....

Group 2. Spikelets with 2 or more fertile florets; if one then with the sterile floret above:

1. Lemma hairy on the back; rachilla glabrous. ......................................... 4. Arundo

1. Lemma glabrous; rachilla long hairy................................................... 29. Phragmites

2. Spikelets more than-1, at each node of the spike axis. ..........20. HORDEUM-

2. Spikelets solitary at each node of the spike axis. .................35. TRITICUM

3. Ovary hairy above or all over; spikelets over 8mm long; awns twisted at base:

4. Annuals; spikelets nodding; glumes 7-11 nerved....................... 5. AVENA

5. Spikelets usually with 2-3 florets; lemma acute, usually hairy near the base.

6. Inflorescence solitary second spike glumes absent............. 23. LOLIUM

6. Inflorescence panicle. ..............................................................18. ERAGROSTIS

7. Axis of spike terminating in sharp point. 12. DACTYLOCTENIUM

8. Spikelets falling entire at maturity from the axis of spikes

8. Spikelets in digitate spikes, with 3-5 florets. ......17. ELEUSINE

8. Spikelets in pseudowhorls, with 8-12 florets......1. ACRACHNE
Group 3. Spikelets with 1-fertile floret, 1 or 2 imperfect florets may be present or absent:

1. Inflorescence digitate; spikes umbelled or racemose:

2. Spikelets with 1 or more imperfect florets, awned.
   
   2. Spikelets without imperfect florets, awnless........................11. CYNODON

1. Inflorescence panicle, spicate or racemose:

3. Glumes minute, usually represented by 2 circular lips or absent; stames 6; fertile lemma and palea similar. .......................................................25. ORYZA

3. Glumes well developed; stames (2) 3; fertile lemma and palea not similar.

4. Spikelets with 3-florets, lower 2-florets reduced. ......................28. PHALARIS

3. Glumes equal obtuse or mucronate. ......................................... ISACHNE

3. Spikelets with 1-fertile floret, usually imperfect floret none:

5. Spikelets without awns;

6. Spikelets in spicate racemes or contracted panicles:

7. Spikelets in pairs, glumes not awned, L-glumes with hooked bristle....... .......................................................... TRAGUS.

7. Spikelets solitary, glumes awned, L-glumes without hooked bristles.

..........................................................27. PEROTIS

6. Spikelets in loose panicles.............................................. 34 SPOROBOLUS.

5. Spikelets with awns:

8. Glumes longer than lemma; style very short..........................2. AGROSTIS


9. Panicle spreading not spiciform, lobulate. .......................... POLYPOGON

Group 4. Spikelets solitary or paired, more or less similar; glumes usually membranous, the lower smaller; upper lemma usually awnless.
1. Spikelets subtended with involucre of bristles or 1-bristle:

2. Spikelets with bristle which remains even after the fall of spikelets; U-lemma transversely rugose................................................................. 32. SETARIA

2. Spikelets with caducous bristles; U-lemma smooth:

3. Bristles united at base forming a cup, hardened.

3. Bristles free, not hardened. .................................................

1. Spikelets not subtended with involucre of bristles or 1 bristle:

4. Spikelets in panicles:

5. Spikelets gibbous :

5. Spikelets not gibbous. ..........................................................26. PANICUM

4. Spikelets in 1-sided spikes or spike

6. Spikelets abaxial; U-glume away from the rachis:

7. L-glumes usually absent; spikelets plano-convex. ............... PASPALUM

7. L-glumes usually developed.

8. Leaves linear; culms erect; leaf base not oblique; racemes dense. ...... 

.................................................................16 ECHINOCHLOA

8. Leaves ovate-lanceolate; culms creeping below; leaf base oblique; racemes loose. ................................................................. 24. OPLISMENUS


9. U-lemma obtuse, mucronate or shortly awned. ..............36. UROCHLOA

6. Spikelets adaxial, U-glumes bent towards the rachis: ......7. BRACHIARIA

10. Spikelets awned; palea 2-partite.

10. Spikelets not awned; palea entire .................................15. DIGITARIA

**Group 5. Spikelets often paired, with one sessile and other pedicelled, those of each pair similar or more often dissimilar; glumes as long as the spikelets**
enclosing the floret, more or less rigid or firmer than lemmas: U-lemma usually awned:

1. Spikelets in simple panicle or compound racemes, arranged on the central axis.
   
   2. Lemma unawned; spikelets in pair, one sessile .......................... 21. Imperata
   
   2. Rachis of racemes fraglic, breaking up. ............................. 31. SACCHARUM

1. Spikelets in each pair dissimilar, sessile 2-sexual;
   
   2. Raceme 1-noded, reduced to 3-heteromorphous spikelets, enclosed in boat shaped spathe. ............................... 3. APLUDA
   
   2. Raceme many noded, espathulate. ........................................ 22. ISCHAEMUM
   
   3. Spikelets dorsally compressed (L-glume flat) ...................... 33. SORGHUM
   
   3. Spikelets 3-note at the end of branches (L-glumesmooth).............

................................................................................................ 88. CHRYSOPOGON

4. Lowest 1-3 pairs of spikelets homogamous,............... 14. DICHANTHIUM

5. Non-aromatic grasses; racemes in simple pairs........ 2. ANDROPOGON

5. Aromatic grasses, racemes in spathaceous pair ..... 10. CYMBOPOGON

6. Receme without an involucre of homogamous spikelets. ........

................................................................................................ 19. HETEROPOGON

**Group 6. Florets all one sexed and dissimilar, the male differing from female.**

1. Male and female florets in the same spikelets; female spikelets completely enclosed in modified leaf sheath. ................................................................. 9.CO1X

1. Male spikelets terminal, female spikelets axillary on lower leaves and not enclosed by leaf-sheath................................................................. 37. ZEA

**1.ACRACHNE**

Erect, stout or slender annuals, 40-75cm high; nodes glabrous. Leaves flat, flaccid, 20-30x0.3-0.5cm, acuminate, glabrous; sheath compressed; ligules of a ciliate rim. Spikes few to several, up to 12cm long, scattered or in pseudowhorls; rachis slender; spikelets 8-20-flowered. L-glume ovate, 3.6mm long, 1-nerved; U-glume broadly ovate, aristulate, 4.5mm long, 6-nerved. Lemma broadly ovate, 3-nerved, glabrous. Palea ovate-truncate. Grains coarsely rugose, brown, grooved or hollowed on one face, with an early deciduous pericarp. Uncommon; along the crop fields and road sides.


2. ANDROPOGON L.,


Perennial, erect or decumbent grass with strong rootstock; culms 60-75cm high, branched upward, glabrous; nodes shining chocolate-coloured. Leaves flexuous, linear, 20-50x0.15-0.3cm, glabrous, margins scabrid; sheath terete, keeled; ligules 2mm long, glabrous. Panicle of 4-8 racemes on short branches, 4-6cm long; joints and pedicel shortly silky-hairy; spikelets in pairs; sessile spikelets up to 5mm long. L-glume acuminata, 5mm long, nerveless; U-glume equal to lower one, 3-nerved, keel ciliate above the middle. Lower floret barren. L-lemma ovate-oblong, 4mm long, 2-
nerved; U-lemma narrower, 3mm long, lobes subulate; with 5-6mm long awn, paleate. Pedicelled spikelets 6mm long; L-glume 7-9 nerved, U-glume 3-nerved; stamens 3. Grains ovoid with persistent glumes. Open exposed slopes of montane.


3. APLUDA L.,

1. Joints bulb-like. 2.5mm long, densely hairy; sessile spikelets 5mm long. U-lemma awned; raceme solitary. .......................................................... 1. A. aristata

1. Joints very much reduced, not hairy; sessile spikelets 3mm long; U-lemma awnless; racemes fascicled. .......................................................... 2. A. mutica


Perennials with woody base; culms erect, 35-90cm high; nodes glabrous. Leaves linear-lanceolate, 6-12x0.2-0.3cm, acuminate, base narrowed, usually petioled, scabrid above, glabrous beneath; sheath rarely hairy; ligules a short membrane, about 1mm long. Panicles dense, 15-38x1-5cm; racemes enclosed by peduncle-spathe, combined into a leafy panicles; spathe shorter than spikes; spikelets 3-nate, 1-sessile and 1-pedicelled imperfect which is reduced to a small glume, terminal sessile male. Sessile spikelets 5mm long, bulbous base. L-glume chartaceous, 3.5mm long, keel ciliate above; U-glume mucronate. L-lemma ovate-lanceolate, 3mm long, 2-3 nerved; U-lemma 2-toothed, hyaline with 5mm long awn. Stamens 3. Ovary with distinct style and stigma. Common; along road slides.


Perennials; culms erect, more solid, 30-105cm high; nodes glabrous, shining-white. Leaves flat, linear-acuminate, 8-15x0.3-0.6cm, light green, smooth with strong mid rib; sheath glabrous; ligules a short glabrous membrane, about 1mm long. Panicles lax, 15-18x2cm; racemes in fascicles of 8-10, combined into a leafy panicle; spikelets 3-nate, a sessile and two pedicelled, of which 1-reduced to a small glume. Sessile spikelets 3mm long.

L.N.: Ponai  
Collection: 1093, Itwa.

4. **ARUNDO LINN**


Perennial, tall grass with creeping rhizomes; culms erect, 1.8-3m high, fistular, glabrous; nodes glabrous. Leaves flat, lanceolate, 3 0-60x1 cm, glabrous; sheath glabrous; ligules a row of stiff hairs. Panicles large, decompound, laterally compressed, 35-60x6cm; branches scabrid, erect or drooping; spikelets 3-4-flowered, green or yellowish, 9mm long. L-glume oblong-lanceolate, hyaline, acuminate, 7.5mm long, 3-nerved, persistent; U-glume similar, slightly larger up to 8mm long. Lowest lemma lanceolate, acuminate, 7mm long, 2-fid at tip, with 1.5mm long awn; palea 3.5mm long, 2-keeled. Rachilla jointed between the florets, glabrous. Common; along road sides and shady-moist places, *Leaves eaten by cattle; brooms are prepared from the panicles.*

L.N.: Narsal.  
Collection: 1088, Barhni

372
5. AVENA.

1. Spikelets up to 2.5cm long; all lemmas with thickened callus at the base. .................................................................................................................................................................................. 1. A. fatua

1. Spikelets more than 3cm long; lowest lemma with thickened callus, others without callus. ................................................................................................................................................................................................................ A. sativa x sterilis


Stout annuals; culms erect or ascending, 30-90cm high, leafy; nodes hairy. Leaves flat, linear, 12-25x0.3-0.5cm, scabrid; sheath glabrous or hairy; ligules short, 2mm long, torn. Panicles 6-12cm long; branches scabrid; spikelets 18-25mm long; pedicel scabrid; rachilla hairy, articulating in between florets. L-glume 16mm long, 9-nerved; U-glume 18mm long, 9-nerved. Lowest lemma 2-lobed at tip, 12mm long, 7-nerved, hairy all over except at the tip, with stout long awn; callus densely bearded at the base; palea narrow, as long as lemma, with ciliate keels. Grains with hairy top, 7x2mm. Common; in waste places, crop fields, road sides.


Annuals; culms erect, 20-60cm high; nodes glabrous. Leaves linear-lanceolate, 10-15x1-1.5cm, acuminate, base cordate; sheath glabrous; ligule 2-2.5mm long. Panicles open, up to 6cm long; spikelets drooping, 3-3.3cm; pedicels 1cm long, scabrid. Glumes 9-nerved. Lowest lemma 7-nerved, with 3cm long awn; callus bearded with a thick or lip like scar at the base of lowest lemma only; palea with ciliate keels. Stamens 3; anthers 3mm long. Cultivated in the outer Used as fodder.

6. **BAMBUSA** Schreber,


Large thorny, arborescent or shrubby bamboo; culms erect or dropping, to 20m high and 10-15cm in diam., branches thorny, pruinose when young; culm sheath 10-30x2.7-10cm, rounded at apex, with dark brown hairs on the back; ligules truncate, long ciliate; imperfect blade rudimentary. Leaves linear, 8-20x2cm, with a short pseudo-petiole, glabrous or hairy beneath; sheath with collar like callus, ciliate, appressed hairy on back; ligules short, glabrous. Panicles enormous; spikelets lanceolate, 1.5-2.5cm long, acute, with 2-many florets. Glumes 1-3. Lemmas ovate-lanceolate, usually mucronate; palea keeled, ciliate or not. Common, along the forest edges and waste places.


7. **BRACHIARIA** Grisebach

1. Spikelets 1.5-2.5mm long:

2. Plants glabrous or minutely hairy; spikelets paired, 1.2-2mm long, glabrous; pedicel with white bristles.................................................................3. *B. reptans*

2. Plants pubescent; spikelets solitary, 2-2.5mm long, more or less hair, pedicel without bristles. .................................................................4. *B. villosa*

1. Spikelets 2.5-3mm long:

3. Spikes 2-4, spreading; spikelets 2.5mm long; upper lemma ellipsoid, rounded at top. .................................................................1. *B. distachya*

3. Spikes many, crowded; spikelets 3mm long; upper lemma subovoid, apiculate. .................................................................2. *B. ramosa*

Annual grass; culm slender, erect, 20-30cm high, straggling or creeping below; nodes glabrous. Leaves linear-lanceolate, 1.5-2.5x0.4-0.5cm, glabrous, base rounded; sheath ciliate on the margins, hairy on apex; ligule obscure. Panicle spreading, 22.xl-2cm, minutely hairy; spikes 2-4, spreading; rachis slender, glabrous; spikelets crowded, 2.5mm long. L-glume ovate-acute, 5-nerved; U-glume broadly ovate, 7-nerved. Lower floret empty. L-lemma broadly ovate, 5-uerved, with 2-nerved palea; upper floret 2-sexual. U-lemma ellipsoid, rounded at top, rugose, paleate. Common; along crop fields and terraces.


Annuals; culms decumbent-ascending, 30-80cm high: nodes pubescent. Leaves linear-lanceolate, 6-16x0.5-1 cm, glabrous or pubescent; sheath glabrous, mouth ciliate; ligule short, ciliate. Panicles oblong 7.5-15x2.5cm; spikes many, crowded; rachis angular; spikelets 3mm long, glabrous; pedicel with colourless hairs. L-glume ovate-rounded, 5-nerved; U-glume broadly ovate, 7-nerved. L-lemma ovate, 3mm long, 5-nerved, with 2-nerved palea. U-lemma subovoid, apiculate, rugulose, paleate. Common; along road sides, waste places.


Annuals or perennials; culms ascending, creeping below, glabrous; nodes glabrous. Leaves lanceolate, 2.5-5x1-1.5cm, with amplexicaule base, glabrous or hairy; sheath ciliate; ligule long, ciliate. Panicles shortly peduncled; spikelets 2mm long; pedicel with long, white bristles. L-glume truncate, 3-nerved; U-glume as long as spikelets, 5-nerved. L-lemma 5-nerved, paleate. U-lemma obovate, apiculate.轮»ulose or glabrous. Found to occur in waste places, road sides.

Fl. & Fr.: Juf.-Sept Collection:


Annual, hairy grass; culms erect or ascending, 20-40cm high, branched, rooting below; nodes pubsecent. Leaves ovate-oblong, 2.5-4x0.4-0.8cm, acute, densely pubescent on both surfaces; sheath with soft white hairs; ligule a short membrane. Panicles oblong-lanceolate. 3-7x0.5-1cm, tomentose; spikes erect, secund, tomentose; spikelets elliptic, 2.5mm long, solitary, hairy. L- glume 1.5mm long, 3-nerved, hairy; U-glume ovate, 2.2mm long, 5-nerved, hairy. L-lemma 2.5mm long, ovate-oblong, 5-nerved, with narrow 2-nerved palea. U-lemma ovate, apiculate, 2mm long, minutely rugulose, paleate. Common; in waste places, crop fields.


8. CHRYSOPOGON
1. Base-of plant creeping; sessile spikelets 3-4.5mm long, with long callus decurrent
to peduncle.......................................................... 1. C. *aciculatus*.

1. **Chrysopogon aciculatus** (Retz.) Trinius, Fund, Agrost. 188. 1820; Bor, GBCIP

Perennials, with woody or creeping rhizome; culms ascending-erect, 15-60cm
high, creeping at base; nodes shining, glabrous. Leaves flat, 1-3x0.3-0.5cm, densely
tufted, glabrous, margins spinulose; sheath terete; ligules very narrow, ciliate
membrane. Panicles narrow, 2.5-7.5cm long, pale or purplish; branches capillary,
scabrous; sessile spikelets 3.5mm long, with a long callus. L-glume linear-acute or 2-
toothed, 3.2mm long, 0-3 nerved, keel scabrid above; U-glume lanceolate, aristulate,
4mm long, 1-nerved. Lower floret empty 2 nerved, ciliate, epaleate. Upper floret 2-
sexual, U-lemma, linear, acuminate awned up to 8mm long, L-lemma ciliate with
polcar. Common in grassy localities.


9. **COIX L.**

**Coix laevis-jobi** L., Sp. PI. 927. 1753; Hook. f. in Fl. Brit. India 7: 100. 1896;

Perennials; culms stout, 90-180cm high, leafy, rooting at base; nodes glabrous.
Leaves lanceolate, 20-70x1.2-2.5cm, acuminate, base semiamplexicaule; sheath
glabrous, striate; ligule a short membrane. Raceme solitary or fascicled, axillary or
terminal, androgynous, 5-7.5cm long; male spikelets 3-nate, pedicelled one in the
middle, 12-15mm long. L-glume lanceolate, 10-15mm long, keeled, margins winged,
inflexed, ciliate along wings and keels; U-glume lanceolate, acuminate, 13-15


10. CYMBOPOGON

1. Leaf base cordate-amplexicaule; lower empty glume of sessile spikelets with a deep slit like depression. ................................................................. C. martini


Perennials with woody base; culms cylindrical, erect, 50-100cm high, usually unbranched, smooth; nodes shining-glabrous. Leaves linear-lanceolate, 8-15x0.5-1.4cm, acuminate, cordate and amplexicaule at base, glaucous or pruinose, smooth; sheath glabrous; ligule oblong, ca 2mm long, scarious. Panicles compound or decompound, dense or lax, 9-13cm long; spathe pale; sessile spikelets 3.5mm long, reddish. L-glume flat, obtuse, 3.5mm long, with deep, narrow-slit in the lower half; U-glume lanceolate, ciliate at margins. Lower floret barren, upper one 2-sexual. L-lemma oblong, 3mm long, ciliate, epaleate; U-lemma 2-fid, 1mm long, with a slender, up to 17mm long awn. Pedicelled spikelets 4mm long, glabrous; pedicel 2mm long; L-glume oblong-lanceolate, acute, 4mm long; U-glume ovate-acute, 3-nerved. L-lemma oblong, 3mm long, 2-nerved, ciliate. Upper floret absent, lower one male. Common; along road sides, grassy slopes.
11. **CYNODON** Richard,

1. Plants rhizomatous; ligule a ring of white hairs; spikes 2-6, up to 6cm long.

........................................................................................................................................................................2. *C. dactylon*


Perennial, rhizomatous grass; culms prostrate, or ascending, from the creeping base, branched, 10-30cm long; nodes glabrous. Leaves linear-subulate, 2.5-4x0.1-0.2cm, glaucous, glabrous; sheath glabrous; ligule a rim of white hairs. Spikes digitate, 2-6, to 6cm long, green or purplish; spikelets 2mm long. L-glume ovate-acute, 1.2mm long, keel scabrid; U-glume similar, to 1.3mm long. Lemmas 2mm long, 3-nerved, keel and margins scabrid; palea as long as lemma, 2-nerved. Stamens 3; anthers 1.2mm long. Common; waste places, gardens, crop fields. *Roots taken in fever and in internal injury. Plant is believed pious and used in several religious ceremonies.*


12. **DACTYLOCTENIUM** Willld.,


Stoloniferous grass; culms erect or prostrate-ascending, 10-4cm high, branched at nodes, leafy; nodes glabrous. Leaves linear, 12-20x0.2-0.6cm, acute or acuminate, scabrid on upper surface and margins; sheath compressed, glabrous;
ligules a ciliate rim. Spikes digitate, 2-5, 1.5-4x0.4-0.6cm; rachis mucronate at tip; spikelets densely crowded, 3-4 flowered, sessile, 3-3.5mm long; rachilla glabrous. L-glume ovate-acute, 2.3mm long, with winged, ciliate keel; U-glume broadly ovate, 2mm long, cuspidately l-2mm long awn. Lemmas mucronate, 3mm long, 3-nerved, glabrous, keeled; paleas 2-fid, 2.2mm long, with winged and ciliate keels. Stamens 3; anthers short. Grains subglobose, 1mm across, rugose. Common; along road sides, waste places.


13. DESMOSTACHYA Stapf in

Desmostachya bipinnata (L.,) Stapf in Dyer, Fl. Cap. 7: 632. 1900; Bor, GBCIP 491. 1960; Babu, Herb. Fl. D.Dun 600. 1977. Hook. f. in Fl. Brit. India 7: 324. 1896. Perennials, with thick rootstock; culms 30-80cm high, creeping-ascending, much branched from the base, glabrous; nodes glabrous. Leaves 40-50x1 cm, basal ones in fascicles, rigid, acuminate, tip filiform, margins hispid; sheath glabrous; ligule hair) rim. Panicles 20-40x1.5-4cm, erect, narrowly pyramidal, often interrupted; rachis hairy; spikes many, to 2cm long, crowded; spikelets purple-brown, 2-seriate, 3-10(-16) flowered, 1.3mm long. L-glume keeled, mucronate, 1-nerved, 0.5-0.6mm long; U-glume to 1mm long. Lemma subacute, with scabrid keel, 3-nerved; palea shorter than lemma. Grains obscurely 3-gonous, ovoid, 0.5-0.6mm across. Common; along the outer.


14. DICHANTHIUM

Perennials, densely tufted; culms decumbent-ascending, erect, 30-60cm high, slender, terete, smooth; nodes purple-brown, hairy. Leaves basal, linear, 10-30x0.3-0.6cm, finely acuminate, glabrous or sparsely hairy above, margins scabrid; sheath terete, tight, striate, bearded at tip; ligules up to 3mm long, membranous, glabrous. Racemes 2.5-6cm long, of 3-9 subdigitately erect, pinkish or white spikes; common rachis filiform, 4-10mm long, hairy. Sessile spikelets oblong-obtuse, 3mm long; callus bearded; L-glume 2-keeled, 5-nerved, ciliolate, hairy on back; U-glume narrower, lanceolate, acute, 3-nerved. U-lemma with 2-sexual flowers, often reduced to the base of 2cm long, scabrid, brown awn; L-lemma linear-obtuse, nerveless, glabrous. Pedicellate spikelets 3-4mm long, oblanceolate, hairy, reduced to empty glumes or male; U-lemma small or obsolete. Common; in open grassy slopes, crop fields.


15. **DIGITARIA** Heister ex

1. Tip of pedicels cupuliform with hairs on the rim or below it. ...............3. *D. stricta*

2. U-glume less than one third of the spikelets length, often very-short; L-glume absent. .........................................................................................................................2. *D. setigera*

3. Spikelets lanceolate-elliptic, not turgid; fruits not apicular nor exserted; L-glume ovate-scale. .........................................................................................................................1. *D. ciliaris*

   Annuals; culms prostrate or decumbent-ascending, 10-60cm high, rooting below; nodes glabrous. Leaves amplexicaule with contracted base, 5-14x0.5cm, scabrid above, glabrous beneath; sheath long ciliate; ligule 2mm long, truncate membrane. Racemes 2-6, digitate, on short axis; spikelets elliptic-lanceolate, 3mm long; pedicels 2.5mm long. U-glume ovate-acute, 2.5mm long, 3-nerve'd, hairy; L-glume short, an ovate scale. L-lemma elliptic-lanceolate, 3mm long, 5-7 nerved, hairy, epaleate; U-lemma ovate-acute, 2.8mm long, glabrous; palea as long as U-lemma, glabrous. Stamens 3; anthers 1mm long. Common; along fields, road sides and waste places.


   Annuals; culms slender, 40-80cm high, glabrous, stout at base; nodes glabrous. Leaves linear-lanceolate, 20-25x0.6-0.9cm, acuminate, glabrous, with strong mid rib, margins serrate; sheath keeled, glabrous or hairy; ligule 2mm long, truncate membrane. Racemes many, corymbose, to 16cm long, densely pubescent in the lower axils; rachis thick, nearly glabrous; spikelets narrowly lanceolate, 2.5mm long, somewhat hairy. L-glume absent; U-glume a triangular scale. 0.75mm long, 3-nerved, hairy on sides and top. L-lemma 2.5mm long, 5-nerved, shortly hairy; U-lemma lanceolate, 2.2mm long, glabrous; palea as long as lemma. Common; along crop fields, waste places.


Annuals; culms erect, 30-50cm high, branched from base leafy, glabrous; nodes glabrous. Leaves linear, 10-15x0.3-0.4cm, acuminate, ciliate at base, with strong mid rib, green or violet; sheath glabrous; ligule short, 1mm long, lacerate-membrane. Racemes 5-8, subdigitate, 8-10cm long, on long slender peduncle; rachis 3-gonous; spikelets oblong, 1.25mm long, with short, thick clavate hairs on the rim and below. L-glume absent; U-glume very short, 0.5mm long, white-tomentose. L-lemma oblong, subulate, 1.25mm long, 5-nerved, hairy; U-lemma oblong, 1.2mm long, dark-brown. Common; along paddy fields and nearby water courses, waste places.


1. Spikelets 3-4mm long, conspicuously hispid; panicles stiff, erect......2. E. crusgalli


Annuals; culms erect or ascending at base, 30-60(80) cm high, glabrous, leafy; nodes glabrous. Leaves-flat- linear, 10-40x0.4-0.6cm, glabrous or scabrid, margins serrate with strong mid rib; sheath loose, glabrous; ligule 0. Panicles contracted or pyramidal, 10-12x1-1.2cm; spike sessile to subsessile, many, 1.5-3cm long, subcompound; rachis axils with cellulose hairs; spikelets cuspitate, 4mm long (excl.
cusp), hispid; pedicels 1mm long. L-glume ovate, rounded, 2mm long, 5-nerved; U-glume acuminate, 4mm long, 7-nerved, hairy. L-lemma awned, 4mm long, with 10mm long awn; palea 4mm long, empty; U-lemma ovoid, cuspidate, 3.5mm long, 3-nerved, glabrous; palea as long as lemma; bisexual. Common; along paddy fields and edges of water courses.


17. ELEUSINE Gaertner,

1. Spikes slender, narrow, subdigitate or digitate, 7-10x0.2cm; seeds oblong, minute.

.......................................................... 1. *E. indica*


Annuals; culms erect or ascending, 30-60cm high, branched, glabrous, leafy; nodes glabrous. Leaves linear, 15-30x0.3cm, scabrid above; sheath flattened, ciliate on the margins; ligule short, truncate membrane, scarious or ciliate. Spikes subdigitate, rarely digitate, compressed, slender, narrow, 4-5, 7-10x0.5cm; spikelets 3-5-flowered, pale-green, compressed, glabrous or hairy, 5mm long, 2-seriate. L-glume lanceolate-subulate, 3.5mm long, 1-nerved, with winged keel; U-glume 4mm long, many keeled. Lowest lemma ovate-subacute, 4mm long, 3-nerved; palea oblong, 2.5mm long, 2-keeled. Grains oblong-globose, rugose, brown, about 1mm across. Common; along fields, waste places and road sides.


18. ERAGROSTIS N.M. Wolf,

1. Palea keels not ciliate (scabrid or glabrous).................................1. *E. japonica*
2. Plants glandular:

3. Lower branches not whorled; lemma 1.75mm long. .................. 2. E. minor

3. Lower branches of panicles subwhorled; lemma 1.2mm long. ......3. E. Pilosa

4. Plants eglandular:

5. Spikelets ovate or ovate-oblong, 2mm or more in width. ......... 5. E. unioloides

5. Spikelets linear, narrowed, 0.7-2mm in width, often curved. ....... 4. E. tremula


Tufted, annuals; culms slender, erect, 30-50cm high, branched from the base, leafy, glabrous; nodes glabrous, shining. Leaves linear-lanceolate 15-25x0.3-0.5cm, long acuminate, glabrous; sheath compressed, glabrous; ligule a short rim. Panicles linear-oblong, 15-20cm long; branches erect, pseudowhorled, spreading; spikelets loose, few flowered, pale-green, 1mm long. L-glume acute, 0.2mm long, 1-nerved; U-glume 0.5mm long, 1-nerved. Lemmas ovate, acute, 0.6mm long, 3-nerved. Common; along road sides and crop fields.


Tufted annuals; culms slender, erect, 15-30cm high, branched, leafy, glabrous; nodes glabrous, shining. Leaves flat, 6-12x0.2-0.3cm, more often with raised glands on the margins; sheath glabrous, mouth bearded; ligule a ciliate rim. Panicles oblong or ovate, 5-15cm high; rachis glabrous; branches spreading when mature; spikelets pale-green, 4x2mm. Glumes acute, 1-nerved; L-glume 1.2mm long; U-glume 1.7mm
long. Lemmas broadly ovateobtuse, 1.75mm long, 3-nerved; palea obovate-oblong, 1.5mm long, with scabrid keels. Grains globose or ellipsoid, 0.5mm long. Common; along road sides, crop fields, waste places.


Annuals; culms very slender, erect, 25-65cm high, simple or branched, glabrous; nodes glandular, tinged purple. Leaves linear, flexuous or strict, convolute, 6-15x0.08-0.15cm, glabrous; sheath glabrous, margins glandular; ligule a short rim of hairs. Panicles oblong to pyramidal, 15-25x2-6cm; branches fascicled or subwhorled, at the lower node, long white hairs on the axils; rachis glabrous; spikelets linear, grey, purple at tip, 3-4x0.7-1mm. L-glume short, 0.2mm long, nerveless, hyaline; U-glume acute, 0.6mm long, 1-nerved, hyaline. Lemmas ovate-acute, 1.2mm long, 3-nerved; palea keels scabrid. Stamens 3; anthers very short, 0.01mm long. Common; along road sides, waste places.


Annuals; culms slender, suberect, 15-50cm high, glabrous; nodes glabrous. Leaves few, narrow, 9-12x0.3cm, tapering at the tip, base rounded, glabrous; sheath tight, hairy at mouth; ligule a short rim. Panicles large, ovate, 10-20x10cm; rachis glabrous; branches loose, solitary, bearded with long white-hairs at the base; spikelets pale-green or purplish, 6x1.5mm. L-glume acute, 1.2mm long, 1-nerved; U-glume
acute, 1.5mm long, 1-nerved. Lemmas broadly ovate-acute, 1.5mm long, 3-nerved; palea obovate-oblong with scabrid keels. Grains globose. Along river banks and crop fields.

Fl. & Fr.: Jul.-Sept. Collection: 1095, Birdpur


Annuals; culms erect, 3-30cm high, many from base, leafy, glabrous; nodes glabrous, shining dark-brown. Leaves flat, linear-lanceolate, 2.5-10x0.2-0.3cm, glabrous; sheath glabrous; ligule short, scarious, hairy at top. Panicles ovoid or oblong, straight, 2-10x1.5-4cm; rachis glabrous; branches solitary; spikelets ovate or ovate-oblong, compressed, green to reddish-purple, 10-20(-50) flowered, 5x3mm. L-glume acuminate, 1.9mm long, 1-nerved; U-glume 2.2mm long, 1-nerved. Lemmas ovate or ovate-elliptic, 2mm long, 3-nerved; palea diciduous, broad, keelscabicrid, Grain ovoid, compressed. Common in oper areas.


19. **HETEROPOGON** Persoon,

1. Annual-perennial grass; L-glume of pedicelled spikelets devoid of glands......

.............................................................................................................................. 1. H. contortus


Perennials densely tufted grass; culms erect or geniculately ascending, 30-120cm high, simple or branched, glabrous; nodes glabrous. Leaves linear, 10-25x0.2-
0.3cm, shortly acuminate, scabrid above, shortly hairy below; sheath ciliate above, compressed; ligule short, truncate, ciliate. Racemes straight or slightly curved, 5-10cm long; spikelets closely imbricating, lower 2-6 sessile, awnless, male or neuter; upper ones female, 6.5mm long, awned; callus bearded. L-glume terete, 6mm long, hispid, margins incurved; U-glume linear, 5mm long, 3-nerved, glabrous, L-lemma oblong, 3mm long, hyaline, embracing long slender ovary; U-lemma reduced to a hyaline base of brownish, hirsute, 6-8cm long awn. Pedicelled spikelets 9mm long; pedicels short, 1.5mm long; L-glume lanceolate, many-nerved, 8mm long, U-glume 9mm long, 3-nerved, ciliate. Common road sides, borders of forests.

Collection: 1119, Sarota.

20. HORDEUM L.,


Annuals; culms erect, 6-90cm high, simple, leafy; nodes glabrous. Leaves flat, 30-40x0.6-1.2cm, glabrous, sheath glabrous; ligule a short membrane. Panicles spike like, spikelets 1-flowered, 3 at each rachis, 11mm long. Glumes reduced to awl-shape, 7mm long, coriaceous, with long awns. Lemmas dorsally rounded, 11mm long, 5-nerved with recurved up to 10cm long awn; palea 2-keeled. Lodicules ciliate. Stamens 3. Grains grooved, usually adhering to the lemma or rarely free. Common; cultivated.

Fl. & Fr. : Apr.-Jun.  
Collection: 78, Bansi.

21. IMPERATA

Perennials with creeping rootstock; culms erect, 30-90cm high, unbranched, glabrous; nodes glabrous. Leaves erect, linear, 5-20x0.2-0.6cm, glabrous, mainly at basal parts; sheath glabrous or hairy; ligule a scarious, erose rim. Panicles narrow, cylindric, silvery-woolly tomentose, 5-15cm long; branches short; spikelets 2-nate, both pedicelled, 3mm long; callus bearded with soft-white, 1.5mm long hairs. L-glume lanceolate, 2mm long, 5 nervd; U-glume similar, 7-nerved, hairy. L-lemma oblong, toothed, 2mm long, nerveless, epaneate; U-lemma ovate, toothed, 1.5mm long, nerveless; palea retruse or toothed., nerveless. Stamens 2; anthers 2.2mm long. Grains small, oblong. Common; along forest edges, grassy slopes.


22. ISCHAEMUM L.,


Annuals; culms erect, 30-60cm high, branched, leafy; nodes glabrous or puberulous. Leaves linear-lanceolate, 15-25x0.8-1.4cm, acuminate, narrowed at base, hairy; sheath glabrous or hairy; ligule 3-5mm long, truncate membrane. Racemes 2, erect, 4-10cm long, yellowish; joints and pedicels stout, 3.5mm long, ciliate; sessile spikelets 5.5mm long; callus bearded at base. L-glume crustaceous below, membranous above, 4mm long, glabrous; U-glume acute, 4.5mm long, keeled, scabrid. L-lemma with male floret, lanceolate, 4mm long,- hyaline, with long, 1-nerved. Lowest lemma ovate, 1mm long, 3-nerved, hairy; palea as long as lemma, keels ciliate. Common; margins of crop fields, waste places.


23. LOLIUM L.,

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Annuals; culms erect, 30-60cm high, unbranched, leafy; nodes glabrous. Leaves flat, 10-25x0.5cm, glabrous; sheath glabrous; ligule a short membrane. Spikes solitary, 15-25cm long; rachis stout; spikelets variable in shape and size, 3-8-flowered, solitary, sessile, 10-15mm long, awned. L-glume absent; U-glume oblong-lanceolate, obtuse or slightly truncate, 12mm long, 7-nerved, rigid and glabrous. Lowest lemmas elliptic-oblong, 6mm long, 5-nerved, rounded on back, with up to 2cm long awn at the tip; palea as long as lemma with winged, serrulate keels. Stamens 3; anthers 1.8mm long. Common; with crop fields and terraces.


**24. OPLISMENU** S Linn

1. Plants tall, not diffusely branched; panicles longer, 4-20cm long; awn glabrous, filiform, reddish. .................................................. O. compositus


Annuals; culms slender, erect or ascending, 30-90cm high, branched, leafy; nodes glabrous or hairy. Leaves flat, ovate-lanceolate, 3-9x0.7-1.5cm, glabrous or hairy, with strong mid rib; sheath keeled; ligule a rim of long white-hairs. Panicles to 15cm long; racemes 5-7, 2-5cm long; rachis glabrous; spikelets green or purple-violet, 3mm long, with few bristles, often longer than spikelets; pedicels short. L-glume short, lanceolate, 1.5mm long, 3-nerved, ciliate with up to 6mm long awn; U-glume longer, ovate, 2mm long, 5-nerved, shortly ciliate above on the margins, with very short 0.2mm long awn. L-lemma ovate-obtuse, 2.8mm long, 9-nerved, hispid at tip,
awnless, with narrow hyaline palea; U-lemma lanceolate, 2.5mm long, glabrous; palea shining-yellow. Common; along road sides, fields.


25. ORYZA L.,


Erect annuals, 30-90cm high; culms fistular; nodes glabrous. Leaves flat, acuminate, 15-30x0.5-lcm; sheath glabrous, striate; ligule transparent, truncate, membranous, 5-8mm long. Panicles spike-like, compact, ovoid-cylindric, 20-45cm long; spikelets yellow, laterally compressed, 3-florets, 1-perfect, ellipsoid, acute. Glumes 2, reduced to minute lip like structures, 3-nerved, scarious, transparent, to 5mm long. Lowest 2-lemmas empty, scale-like, lanceolate, eapaleate, 1-nerved. Uppermost lemma fertile, scarious, 5-nerved, hairy on upper half, with up to 4cm long awn; palea abruptly acute, 3-nerved. Stamens 6. Commonly cultivated.

L.N.: Saatti Fl. & Fr.: Jul.-Oct. Collection:

26. PANICUM L.,

1. Perennial grass; leaves 2-5cm broad..............................................................I. P. antidotale


Perennials with hairy-villous creeping rootstock; culms slender, erect, 60-120cm high, much branched, leafy to the panicles; nodes glabrous. Leaves linear-lanceolate, long acuminate, 15-30x2-5cm, glabrous with shining midrib; sheath glabrous; ligule a narrow row of bright-white hairs. Panicle thyrsiform or contracted,
5-20xl-12cm; branches longer on the lower side, erect, alternate; spikelets crowded, green or purplish, acute, 3mm long. L-glume ovate-acute, 2mm long, 3-nerved, white; U-glume ovate-lanceolate, 3mm long, 7-nerved. L-lemma paleate, male, 3mm long; U-lemma ovate-acute, 2mm long, shining white or creamish, paleate. Along the borders of crop fields.

L.N.: Gunara       Fl. & Fr.: Dec.-Jan.   Collection:

27. PEROTIS W. Aiton, Hort


Annuals; culms erect or ascending from the base, up to 45cm long, unbranched, leafy; nodes glabrous, shining. Leaves flat, ovate-lanceolate, 1.5-3x0.5-0.6cm, cordate at base, margins serrate; sheath glabrous; ligule a short ciliate rim. Racemes solitary, terminal, 6-20cm long; spikelets 1-flowered, crowded, 2mm long. L-glume narrowly linear, acuminate, 1.8mm long, 1-nerved with about 7.5mm long capillary awn; U-glume 2mm long, 1-nerved, margin scabrid, with about 10mm long awn. Lemmas minute, hyaline, awnless; palea minute, hyaline. Stamens 3; anther short. Along terraces of fields, road sides.


28. PHALARIS L.,


Annuals; culms erect, 30-90cm high, branched, leafy, glabrous; nodes glabrous, shining-brown. Leaves flat, lanceolate, acuminate, 20-25x1cm, glabrous; sheath glabrous; ligules truncate, 10mm long. Panicles cylindrical, 5-7x1-1.5cm,
green; spikelets 5mm long, shining; pedicels 1.5mm long, scabrid. Glumes equal, 5mm long, acuminate, with winged-serrulate keels. Lowest lemma absent, lower sterile lemma reduced to a subulate, 1.2mm long hairy glume; upper fertile lemma ovate, acute, 3mm long, 5-nerved, awnless, silky-hairy; palea 2.5mm long, 2-nerved, with 2-ciliate keels. Stamens 3; anthers 1.8mm long. Common; along road sides.


29. PHRAGMITES Adanson,


Perennials; culms erect, arising from creeping rootstock, fistular, up to 2m high; nodes glabrous. Leaves linear-lanceolate, long acuminate, 10-50x0.4-0.9cm, base subcordate or rounded, margins shortly ciliate; sheath long keeled, hairy at throat; ligule obtuse, 1.5mm long, membranous. Panicles effuse, plumose, oblong-lanceolate, 15-30x1-3cm; branches erect, 2-3, 4-6cm long, scabrid; spikelets purplish-white, 9mm long; pedicels hairy. L-glume oblong lanceolate, 7mm long, 3-nerved, glabrous; U-glume 8mm long. Lemma acute, 9mm long, 3-nerved with very long silky-white hairs; palea shortly truncate, 3.8mm long, keels ciliate. Stamens 3. Common; along river banks of outer.


30. POA L.,

1. Annuals; palea keels ciliate throughout; callus without wool. .......... 1. P. annua

2. Ligule longer l-2.3mm long; L-glume 1-nerved. ....................... 3. P. pratensis

Annuals; culms erect or geniculate at base, 4-20cm high, glabrous; nodes glabrous. Leaves linear, subulate, 2-10x0.15-0.3cm, margins scabrid; sheath glabrous; ligule 1.5-3mm long. Panicles ovate or pyramidal, 1.5-10x1-3.5cm; branches spreading; spikelets ovate or elliptic-oblong, 5mm long, 3-5 flowered. L-glume lanceolate, acute or acuminate, 2.2mm long, 1-nerved, margins hyaline; U-glume elliptic, acute, 2.5mm long, 3-nerved; rachilla glabrous; callus glabrous. Lowest lemma ovate-oblong, obtuse, 3.2mm long, keel ciliate up to greater parts; palea elliptic, 2.5mm long with ciliate keels. Anthers 0.7-0.9mm long. Common; in crop fields, gardens, waste places.


Perennials; culms erect, 30-60cm high, base decumbent, with pale white sheath; nodes glabrous. Leaves mostly basal, linear, enrolled, 10-15x0.2-0.35cm, glabrous; sheath glabrous, cylindric; ligule 1-2mm long. Panicles pyramidal, compact, pale-green, 8-10x1-1.5cm, lower branches in whorls of 3-5; spikelets ovate-lanceolate, 3-5-flowered. L-glume ovate, 1-nerved; U-glume 3-nerved. Lemmas oblong-lanceolate, acute, 5-nerved; palea up to 3mm long, keels scabrid.


31. **SACCHARUM** L.,

1. Hairs of callus much shorter than spikelets; L-glume of sessile spikelets dorsally villous...................................................................................................................... **I. S. bengalensis**
2. Hairs of callus twice as long as the spikelets; L-glume of sessile spikelets glabrous.................................................................5. *S. officinarum*


   Perennials, with stout, rootstock; culms erect, large, 1.5-2.5m high. Leaves linear, usually to 1m long, 1-2cm broad, margins scabrid; sheath tight, silky at base, hairy on the margin above; ligule a ciliate, truncate rim. Panicles dense, erect, 25-80cm long, white-villous; branches whorled, joints and pedicels ciliate; callus hair silky, much shorter than the spikelets. Spikelets in pairs, lanceolate, acute, 5-5.5mm long; L-glume acuminate, dorsally villous, nerveless; U-glume lanceolate, acuminate, ciliate on the keel at the top, glabrous. L-lemma oblong-lanceolate, nerveless, epaleate, empty; U-lemma lanceolate, ciliate, epaleate, bisexual. Pedicelled spikelets similar to sessile ones, except both glumes villous. Common; along river banks scrub jungles.


   Perennials; culms erect, solid, glabrous below the panicles; nodes glabrous. Leaves long, to 1m, flat, scabrid on the margins; sheath hairy at mouth; ligule membranous. Panicles dense, 30-60cm long, branches long, spreading; joints of spikes and pedicels glabrous; callus hairs twice as long as spikelets; spikelets 4mm long, awnless. L-glume subchartaceous, glabrous; U-glume glabrous. L-lemma oblong-lanceolate, to 4mm long, epaleate; U-lemma 0, bisexual. Stamens 3. Occassionally cultivated.


Perennials, with tufted rootstock; culms erect, to 3m high, silky below the panicles; nodes pubescent. Leaves linear, filiform, 15-70x0.15-0.2cm, margins convolute; sheaths glabrous or pubescent; ligule a scarious rim. Panicles silvery-white, 15-30cm long; branches whorled, branchlets fragile; joints and pedicels ciliate, 2.5mm long; callus hairs to 15mm long, silvery; spikelets lanceolate, 3mm long, awnless. L-glume lanceolate, acute, 2.8mm long, 2-nerved; U-glume acuminate, 2.5mm long, subkeeled. L-lemma ovate-lanceolate, subacute, 2mm long, ciliate, epaleate; U-lemma usually absent, bisexual, epaleate. Common; along river banks Leaves used in asthma and cholera.


32. *Setaria* P. Beauv.,

1. Spikelets deciduous in false spike but not lobed; L-lemma paleate..................

......................................................................................................................... 2. *S. viridis*

2. Spikelets 3mm long; U-lemma coarsely rugose, boat-shaped and keeled at top.

......................................................................................................................... 1. *S. glauca*


Annuals; culms erect or ascending, 45-60cm high, simple or branched; glabrous; nodes glabrous. Leaves flat, 15-35x0.4-0.6cm, glabrous or minutely hairy, margins scabrid; sheath compressed, keeled; ligules oblong-obtuse, to 0.6mm long. Panicle a cylindric false spike, 6-12x0.5cm, densely flowered, usually golden-yellow,
rarely interrupted; rachis scabrid; involucre bristles 6-12, variable in length; spikelets solitary, ovoid, 3mm long. L-glume ovate-rounded, acute, 1.5mm long, 3-nerved, glabrous; U-glume subulate, 2.5mm long, 7-nerved. Lower florets male; upper ones 2-sexual. L-lemma ovate-subacute, 3mm long, 5-nerved, with an obtuse palea; U-lemma ovoid, 3mm long, keeled at top, transversely rugose; palea 1.5mm long, 2-nerved. Common; crop fields, waste places, road sides.


Annuals; culms erect, 10-30cm high, glabrous; nodes glabrous. Leaves elliptic-lanceolate, flat, 10-20x0.2-0.4cm, glabrous; sheath glabrous; ligule a short membrane. Panicles short, cylindric, solitary, often interrupted, 1-2x0.4cm; involucre bristle 3-6, short with spreading barbs, tinged red-brown; spikelets ovoid, deciduous, 2-3 mm long. L-glume ovate-acute, 1.5mm long, 3-nerved; U-glume 2mm long, 5-nerved. L-floret barren; upper 2-sexual. L-lemma broadly ovate, 2.2mm long, 5-nerved with 2-nerved palea; U-lemma oblong, 2.5mm long, subrugose, with 2-nerved palea. Grains ovoid.


33. **SORGHUM** Moench,

1. Perennials with stoloniferous creeping base, leaves 0.6-0.8cm broad, villous towards base. .......................................................... *S. halepens*

Perennials, with stoloniferous, creeping base; culm erect, 0.9-3m high, simple, leafy, glabrous; nodes glabrous. Leaves large, 0.6-0.8cm broad, glabrous except villous at base; sheath glabrous; ligule a rounded ciliate membrane. Panicles effuse, pyramidal, 10-25x2-6cm; branches spreading, erect or drooping, whorled, axils bearded; sessile spikelets elliptic-lanceolate, 4mm long. L-glume 3-toothed at tip, 4mm long, 5-11 nerved, silky-hairy; U-glume chartaceous, subcoriaceous, keeled, margins ciliate. L-lemma elliptic-oblong, 3.5mm long, 2-nerved, hyaline with ciliate margins, epaleate; U-lemma smallor, ovati, 3mm long, ciliate, epaleate. Pedicelled spikelets linear-lanceolate, 4mm long; lemma with male florets. Common; along crop fields, edges of forests.


34. **SPOROBOLUS** R. Br.,

1. Panicles effuse; spikelets 1.2mm long; stamens 2............................ 1. *S. diander*.


Perennials; culms erect, 20-90cm high, leafy; nodes glabrous. Leaves flat or convolute, 6-25x0.1-0.16cm, acuminate, glabrous; sheath cylindric, glabrous; ligule a line of few hairs. Panicles effuse, 10-25x1-3cm; branches capillary, in scattered fascicles; spikelets numerous, slaty-grey, 1.2mm long, racemosely arranged on branchlets, 2-flowered. L-glume truncate, 0.2mm long, nerveless; U-glume elliptic-ovate, acute, 0.6mm long, 1-nerved. Lemmas longer, subulate, 1.2mm long, 1-nerved; palea as long as lemma. Stamens 2; anthers very short, 0.2mm long. Common; along road sides, crop fields.
35. TRITICUM L.,


Annuals; culms erect, fistular, to 1m high; nodes glabrous. Leaves linear, flat, 20-80x1mm; sheath glabrous; ligules short, to 2mm long. Spikes 6-10x0.8-1mm; rachis compressed, flexuous, ciliate; spikelets 3-5(7)-flowered, hairy, 8-12mm long. Glumes ovate, coriaceous, 5-7-nerved, 7-10mm long, with long scabrid awns, keeled at top. Lemma 10-12mm long, 5-nerved, hairy, with 7-10cm long awn; palea 2-keeled, entire, obtuse or truncate. Stamens 3; anthers 3.5mm long. Commonly cultivated in the region.


36. UROCHLOA P.


Annuals; culms decumbent-ascending, to 60cm tall, branched, leafy; nodes pubescent. Leaves ovate-lanceolate to oblong, 4-10x0.6-1cm, acuminate, cordate at base, sparsely hairy on lower side; sheath, compressed, hairy above; ligule a line of hairs. Spikes 3-5(8), spreading, secund, 2-4.5cm long; rachis 3-gonous; spikelets 2-seriate, elliptic-ovate, 3.8x1.8mm, glabrous with very short pedicels. L-glume ovate, acute or obtuse, 1.2mm long, 3-nerved, glabrous; U-glume ovate, acute, 3.5mm long, 7-nerved, glabrous. L-lemma as long as U-glume, with inflexed margins, 5-nerved,
glabrous, paleate; U-lemma oblong, rounded at tip, apiculate, 3.2mm long, rugose; palea 2.2mm long. Stamens 3. Along road sides, crop fields.

Fl. & Fr.: Jul.-Sept.       Collection: 1501, Dumariagani

37. VETIVERIA


Reshira, Sugandhimula Eng. Khus-Khus, Vetiver. Perennial, tufted grass, with spongy, aromatic rootstock; culms erect, 70-200cm, leafy, glabrous; nodes glabrous. Leaves linear-lanceolate. 30-60x0.2-0.3cm, acute, glabrous, with scabrid margins; sheath to 20cm long, glabrous, ligule a short, scarious rim. Panicles terminal, lax, 15-40cm long; rachis stout; branches glabrous or scarbid; spikelets 2-seriate, sessile and pedicelled, yellow or purplish, elliptic-oval, 3.5mm long; callus pilose. L-glume muricate, acute, 3.5mm long, 4-nerved; U-glume concave, with muricate keel. L-lemma lanceolate, 3mm long, retrorsely ciliate, epaleate, empty; U-lemma as long as L-lemma, mucronate, bisexual; palea short, obtuse, 1.5mm long, glabrous. Stamens 3; anthers to 1.5mm long. Pedicelled spikelets shorter, to 3mm long; L-glume scarcely muricate. Rare; along borders of fields.


38. ZEA L.,


Tall annuals; culms robust, solid, thick, 0.5-2.5m high, glabrous; nodes glabrous or hairy, lower nodes beset roots. Leaves flat, broad, 50-100x0.3-0.6 (-0.8)
cm, glabrous or hairy, with tubercled-based hairs; sheath glabrous, hairy at mouth; ligules 2-6.5mm long. Male spikelets- in terminal, lax panicles, 2-12x0.3cm long branches; spikelets pale-brown, 0.5-1cm long. L-glume truncate or 2-toothed, ciliate; U-glume subacute. L-lemma lanceolate-obtuse, hyaline, ciliate, paleate.; U-lemma paleate. Female spikelets seated on the strong axis of the cylindric spike; style extremely long, 2-fid, silky. Grains subglobose.

Fl. & Fr.: Jul.-Sept. Collection: 1210, Dumariagani