ANNONACEAE

Key to the genera

1. Plants climbing by means of hooked peduncles ........................................... Artabotrys

1. Plants not climbing:

2. Leaves tomentose; inner petal large, sacculate at base .................................. Miliusa

2. Leaves glabrous; inner petals minute or absent, if present not as above:

3. Leaves narrowly lanceolate with sinuate margins ............................................ Polyalthia

3. Leaves elliptic - oblong or oblong lanceolate, with entire margins ........ Annona

Annona squamosa Linn. Sp. Pl. 537, 1753; FBl 1:78; Cooke 1:14; Wealth of India 1:80, t. 3 PL XV, 1948; Bor, Man. Ind. For. Bot. 44, 1953; Santapau, Fl. Saurashtra 2. (PLATE 2)

A deciduous tree, 3-5 m tall. Leaves 5-14 x 2 - 4.6 cm, glabrous, alternate, elliptic-oblong, oblong-lanceolate or obovate, dark green above, paler beneath, margins entire, acute, subacute or obtuse at apex, subacute or rounded at base; petiole 1-1.5 cm long, thickened at base, grooved on lower side. Flowers creamy yellow, pendulous, solitary or 2-3 fascicled, leaf opposed or cauliflorous. Fruit 3.7-5 cm across, globose, fleshy, areolate, glaucous green when fresh, ash coloured on drying.
Common; wild in the forests at Sagbara behind P.W.D. rest house.

**Flowers**: June - August  
**Fruits**: August - June  
**Local name**: SITAPHAL  
**Herbarium specimens examined**:  
Sagbara: VKS 805, 1309, 1315, 1397, 1459, 1869.

**World distribution**: Native of Central America; widely cultivated or naturalized throughout the tropics.

**Critical notes**: In our Indian floras the generic name is often given as *Anona* Linne, however in both *Species Plantarum* P. 537 (1753) and *Genera Plantarum* P. 241 no. 613 (1754) the name is spelt *Annona* even though in the former book he cites numerous older authors who spelt *Anona*. Therefore, its clear that the spelling adopted by Linne was not an orthographic mistake but an intentional selection of his part. This spelling must be retained in accordance with Art. 73 of 1966 edition of the Code.

**ARTABOTRYS R. Br.**  

A shrub 100-150 cm tall, with hooked branches; young branches dark green, flexuose, smooth. Leaves 7-23 x 5-7.5 cm, oblong-lanceolate, shortly acuminate at apex, acute at base, glabrous. Flowers and fruits not seen.

Planted in the premises of a temple at Dediapada.

Herbarium specimen examined:
Dediapada: VKS 779.

World distribution: According to King in ARBG. 4:44, 1893 "It is wild in the Southern parts of India and Ceylon" also in Java and S. China.

Miliusa Lesch.


Deciduous trees, 8-12 m tall; young branches tomentose, older ones glabrous; bark brown, rough. Leaves 3-8 x 2.5-4.5 cm, entire, ovate-oblong, young leaves tomentose, older ones almost glabrous except densely woolly veins, acute or acuminate at apex, rounded or subacute at base. Flowers 1.8-2.2 cm across, at first creamy-yellow, changing to deep mauve; pedicel 3-3.5 cm, pendent, densely hairy. Berries many, 2-2.5 cm across, subglobose, each on 3-6 mm long stalk.
A rare plant in the area.

Flowers: February.

Fruits: April.

Local name: UMBHA.

Herbarium specimens examined:

Dediapada: VKS 1599, 1928 A

Sagbara: VKS 1661

World distribution: Nepal, India. (Upper Gangetic Plains; Terai, Chhota Nagpur, Bihar & Orissa, Gujarat and Western Ghat from Kakan to Travancore).

Critical notes: For the nomenclature of this plant see Santapau in BBSI 3:20, 1961. The inner large petals, saccate at the base, are typical and the generic name Saccopetalum probably refers to the saccate petals.

POLYALTHIA Blume


An evergreen tree 5-8 m tall; young branches slender, glabrous. Leaves 10-25 x 2-5 cm, narrowly lanceolate, tapering into a fine point, shining at both surfaces, glabrous, margins undulate. Flowers and fruits not seen.
Rare, planted as an avenue tree in Sagbara.

*Herbarium specimen examined:*

**Sagbara**: VKS 2612

*World distribution*: India, Ceylon.
MENISPERMACEAE

Key to the genera

1. Leaves peltate; ovary solitary
   - Cissampeles

1. Leaves not peltate; ovaries 3 or more:
   2. Leaves minutely hairy; seeds oblong or globose
      - Tinospora
   2. Leaves densely silky hairy; seeds reniform
      - Cocculus

CISSAMPELOS Linn.

Cissampeles pareira Linn. Sp. Pl. 1031, 1753; FBl 1:103;

Profusely branched, dioecious climber; stem and branches deeply grooved, younger parts silky pubescent, older ones sparsely hairy or almost glabrous. Leaves 3.5-6 x 3.6-8 cm, peltate, orbicular, reniform or broadly ovate, glabrous or sparingly hairy above, densely silky pubescent beneath, acute, obtuse or emarginate, with a distinct mucro at apex, cordate or subcordate at base; petiole 2.7 - 4.5 cm long, slender, pubescent. Flowers small, greenish-yellow, male fascicled on 6-8 cm long, paniculate cymes, females in 15-25 cm long, pendulous racemes; bracts foliaceous, orbicular or reniform, persistant, shortly villous, mucronate at apex, each bract supporting a cyme of 4-6 flowers. Drupes 0.4-0.5 cm across, globose, silky pubescent, green when young changing to red and finally deep purple to almost black, glabrous.
Common on hedges along roads on the outskirts of the villages and on large shrubs or small trees in thin forests. The foliaceous bracts of female flowers are distinctive.

**Flowers**: August - September.

**Fruits**: October.

**Herbarium specimens examined**:
Dediapada: VKS 210, 684.

**World distribution**: A native of Central America, wide spread throughout the warm regions of Asia, East and tropical Africa and America.

**Cocculus DC.**


Dioecious climbers; stem and branches striate, silky hairy when young glabrescent at length. Leaves 1.5-6.5 x 1.4-5 cm, alternate, 3-5-nerved, deltoid-ovate or ovate-oblong, appressed-hairy, densely so beneath, retuse or subacute and minutely apiculate at apex, rounded or truncate at base; petiole 0.2-1.2 cm long, hairy. **Flowers** greenish yellow, in axillary cymes, culminating into apparent terminal racemes at ends of branches. **Druipes** bright to deep violet-purple, almost glabrous.
Common on hedges, in waste places, trailing in open grasslands and undergrowth of forests and on rocky slopes along river banks.

**Flowers**: January - February

**Fruits**: March - May

**Local name**: JANGLI-BALI

**Herbarium specimens examined**:
- Dediapada: VKS 456, 475, 1151, 1887; Shah 11601.
- Sagbara: VKS 763, 904, 998, 999, 1062, 1063, 1128, 1358.

No: 1887 is a plant with galls on the stem.

**World distribution**: Tropical Africa, Egypt, Arabia, Baluchistan, India, Ceylon, Burma and South China.

**Tinospora Miers**

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Key to the species

1. Leaves 3-8 x 2.5-7 cm long; glabrous .... cordifolia
1. Leaves 6-15 x 7-16 cm, pubescent above
   
   white tomentose beneath ...................... sinensis


A large, deciduous, woody climber; bark loose, corky, greyish-white. Leaves 3.2-8 x 2.5-7 cm, broadly ovate, glabrous, glaucous-green, abruptly acuminate at apex, cordate
at base; petiole 1-4.5 cm long, glabrous. **Flowers** greenish yellow, in 5-6 cm long, drooping racemes, axillary or from leafless branches. **Drupes** deep red, globose.

Occasional in thin forests.

*Flowers and fruits*: February - March.

*Herbarium specimens examined*:

Dediapada: VRS 1653, 1790.

*World distribution*: India, Ceylon, Burma, Andamans, Java and South China.


An extensive *climber*; bark light grey or white, irregularly fissured; stem hairy in younger parts. *Leaves* 6-15 x 7-16 cm, 5-nerved, membranous, broadly ovate, pubescent above, white-tomentose beneath; petiole 3-12 cm long, *Flowers* and *fruits* not seen.

A very rare climber in the area on tall trees in the forest. Thin pendulous roots from the upper branch are distinctive.
Local name: BUDHALE

Local use: Latex of the plant is used for toothache by the tribal people.

Herbarium specimens examined:
Sagbara: VKS 712, 1648.

World distribution: India (Sikkim, Khasia hills, Assam, Bengal, Bihar and Orissa, South India) and Ceylon, Indo-China.
Argemone Linn.


An erect, robust, prickly branched herb, 30-90 cm tall; stem and branches bluish-green. Leaves 6-14 x 1-4.5 cm, sessile, semiamplexicaul, pinnatifid, segments inciso-dentate, spiny on the margins, variegated with whitish nerves, acute at apex, subcordate at base. Flowers 2.5-4 cm across, bright yellow, terminal, solitary. Capsules 1.5-2.5 cm long, spiny. Seeds many, with prominent reticulate ridges, black, spherical.

A common weed, often gregarious and abundant, in dried up river beds, cultivated fields, and ditches along road sides, either by itself or with Solanum surattense Burm. f., Sphaeranthus indicus L. etc. The overall glaucous appearance of the plant is rather typical.

Flowers and fruits: January - April.

Herbarium specimens examined:
Dediapada: VKS 1123
Selamba: VKS 1481

World distribution: Native of tropical America; now widely distributed throughout the tropics.
**BRASSIACEAE (CRUCIFERAE)**

Key to the genera

1. Flowers yellow; roots not tuberous; pods dehiscent ........................................ Brassica

1. Flowers pale to bright rosy purple or violet; roots tuberous, white; pods dehiscent ........................................ Raphanus

**BRASSICA** Linn.


Annual, erect herbs, 40-90 cm tall; stem and branches striate, glabrous or sparsely hairy, sometimes tinged reddish brown. Lower leaves radical 6-8 cm long, lyrate, membranous, terminal lobe the largest, broadly elliptic or obovate, 3-4.5 x 1.5-3.8 cm, upper ones cauline 2-4.5 x 0.7-1.2 cm, linear-lanceolate, entire or shallowly lobed. Flowers yellow in 4-20 cm long, terminal racemes. Pods 1.8-6 cm long (including beak and stalk), beak thin. Seeds 5-8, black or brown, minutely pitted.

Cultivated.

Flowers and fruits November - January.

Local name: KALA-RAYA.

Local use: The plant is cultivated for the seeds that are used in culinary. The oil is extracted from the seeds which is edible. It is also used for massage.
Herbarium specimens examined:

Dediapada: VKS 590, 591, 592, 593.

World distribution: From Central Europe along the Mediterranean region to Arabia and India; in many parts of India cultivated or escaped.

Critical note: Brassica nigra (L.) Koch and B. juncea Linn. are often confused because of their resemblance in general appearance; further the seeds of both are used in culinary; however, following the key given by Blatter (1930), p. 299 the two species differ as follows:

Ovary multiovulate (9-45); pods 1.5-10 cm long; beak distinctly conical, sometimes as thick as the pod, often 1-2 seeded ........................................... juncea

Ovary few ovulate (5-11); pods 0.8-3 cm long; beak very thin, always seedless ... nigra

Another key, based on the position of pods is given by Duthie (Fl. Up. Gang. Fl. 1:42, 1960) to separate these two species.

Pods erect, nearly glabrous, appressed to the axis of raceme .................... nigra

Pods more or less spreading .............. juncea
RAPHANUS Linn.


Annual herbs, 40-85 cm tall; stem terete, fistular, branched in the upper part, glabrous, sometimes tinged purple. Leaves 5-20 x 2.5-9 cm, dark green, at length yellow, lower ones radical, lyrate, pinnatifid with terminal lobe largest, upper ones cauline, pinnatifid gradually becoming entire above, all strigose. Racemes 10-25 cm long, terminal. Flowers rosy-pink to bright violet purple with dark purple veins. Pods 6-6.5 cm long (including stalk and beak). Seeds brown, ovoid.

Rare, cultivated in the area. The whole plant is used as a vegetable.

Flowers and fruits: November - January.

Local name: NULA.

Herbarium specimens examined:
Dediapada: VKS 621, 772.
Mosda: VKS 1278

World distribution: Native of temperate region of the Old World; cultivated in tropical region.
CAPPARACEAE

Key to the genera

1. Trees or shrubs; ovary on a gynophore; fruit a berry:
   Capparis

2. Leaves simple ........................................... Crataeva

2. Leaves 3-foliolate ................................. Cleome

1. Herbs; ovary sessile; fruit a capsule ....
   CAPPARIS Linn.
   =========
   Key to the species

1. Straggling shrubs or climbers; plants
   rusty tomentose or hairy in younger parts
   only; stipular spines present:

2. Plants usually climbers; flowers in supra-
   axillary rows, solitary or in fascicles
   of 2-3; filaments white, at length
   bright purple; berries 2.5-3.5 cm long,
   ellipsoid-oblung ............................... zeylanica

2. Plants straggling; flowers in terminal
   umbels; filaments never purple; berries
   0.8-1.5 cm across, spherical .............. sepiaria

1. Small trees; branches densely tomentose;
   stipular spines absent at least in younger
   parts ........................................... grandis
Capparis grandis Linn. f. Suppl. 263, 1781; FBI 1:176; Cooke 1:50; Santapau, Fl. Saurashtra 18.

Trees, 2-3 m tall, with drooping branches. Leaves 3-4 x 1.2 – 3 cm, elliptic-obovate, densely silky tomentose on both surfaces, obtuse, sometimes mucronate at apex, rounded at base. Flowers 1.5-1.8 cm across, white, in terminal and axillary, 12-20 flowered corymbs. Fruits ± 2 cm across, subglobose, rusty brown. Seeds blackish-brown, smooth.

Rare in the area, sparingly seen in the forest at Dediapada on way to Mosda along road side.

Flowers and fruits: March – June.

Herbarium specimens examined:
Dediapada: VKS 1580, 1798, 1883.

World distribution: India and Ceylon.

Capparis sepiaria Linn. Syst. (ed. 10) 1071, 1759; FBI 1:177; Cooke 1:51; Jacobs in Fl. Males. 6(1):79, 1960, Santapau 9 & Fl. Saurashtra 18.

Shrubs, 1.5-3 m tall; branches spreading, flexuose, dark green, younger parts tomentose, older ones glabrous, faintly striate. Leaves 1.7-3.8 x 1.2-2.5 cm, elliptic-ovate, obtuse, shortly mucronate or not, at times submucronate at apex, rounded at base, silky hairy above, less so beneath, at length glabrous; stipular spines paired, stout, recurved. Flowers 0.8-1 cm long, white, 8-12, in terminal and axillary shortly peduncled umbels. Fruits subglobose, fleshy.
Rare, seen at one place at Dediapada along Mosda river. This is a straggling bushy shrub when growing by itself, but it is a powerful climber in presence of stout support.

Flowers: March - April.

Fruits: April.

Herbarium specimens examined:
Dediapada: VKS 1601, 1799.
Ghatoli: VKS 1570

World distribution: India, Ceylon, Burma, Andamans, Malaya, Java and Philippines.


An extensive, armed woody climber; spines stout, solitary or paired, recurved, polished, rusty-brown; branches in younger parts rufous-tomentose, older ones nearly glabrous. Leaves 3.8-9 x 1.7-4.5 cm, elliptic-oblong, retuse, acute or obtuse and distinctly shortly apiculate at apex, narrowed at base, glabrous and shining above, grey tomentose beneath. Flowers 4-5.5 cm across, white, turning to violet or deep purple, on leafless, rusty pubescent branches, solitary or in fascicles of 2-3. Fruits 2.5-3.5 cm long, ellipsoid, red when ripe.
Common in the forest, along river beds and on hedges near villages. The plant is quite conspicuous when masses of flowers with bright purple filaments are borne along the length of the whole branch.

**Flowers**: November - March.

**Fruits**: March - April

**Local name**: BOR

**Local use**: Fruits are eaten by local people.

**Herbarium specimens examined**:
- *Dediapada*: VKS 1147, 1208, 1440, 1716, 1764.
- *Sagbara*: VKS 416, 864, 977, 1841; Shah 11569, 11600, 13074.

**World distribution**: India, Ceylon, Burma, Siam, Indo-China, Hainan, Andamans, Malaya, Philippines and Java.

**CLEOME** Linn.

Key to the species

1. Plants glabrous; leaves without any smell, 3-5 (-7-9) - foliolate, lower ones forming a rosette; flowers bright rosy-pink or light purple; stamens more than 30; capsules striate with parallel nerves; seeds warty, not ribbed. ....... *chelidonii*

1. Plants glandular-hairy, foetid; leaves 3-5-foliolate, lower ones not forming a rosette; flowers lemon-yellow; stamens less than 30; capsules striates with distinct centripetal nerves; seeds not warty, with strong cross-ribbs and faint concentric ribs ............... *viscosa*
Cleome chelidonii Linne f. Suppl. 300, 1781; FBI 1:170; Cooke 1:42; Santapau 8 & Fl. Saurashtra 15; Jacobs in Fl. Males. 6(1): 102, tt. 31 & 32 a-b. Polanisia cheliodonii DC. Prodr. 1:242. (PLATE 4)

Annual erect, much branched herbs, 30-100 cm tall; stem and branches glabrous, faintly striate, glaucous, lower branches sometimes diffuse. Leaves 3-5 (-7-9) foliolate, forming a rosette at base, gradually leaflets reducing in number upwards and finally ending in simple, linear bracts; leaflets 2.5-4 x 0.8-1.2 cm long, ovate, minutely hairy on margins, acute or subacute at apex, narrowed at base. Flowers 2-3 cm across, bright rosy-pink, solitary, axillary or apparently in terminal, corymbose racemes. Capsules 4-6 cm long, (including beak and stalk) terete, glabrous, tapering at both ends. Seeds yellowish-brown, warty.

Occasional in moist ground and in water logged soil in river beds and ditches. The thickening of the filaments below the anther is a common character of this and the following species; however, it seems to have been overlooked in most of our Indian flora.

Flowers : July - September.
Fruits : September - October.
Herbarium specimens examined:
Dediapada : VKS 154, 178; Shah 13074.
World distribution : India, Burma, Ceylon, Siam and Central and East Java.

Annual erect herbs, 30-100 cm tall; densely, clothed with glandular and simple hairs. Leaves 3-5-foliolate; leaflets 1.5-2.8 x 0.7-1.4 cm long, elliptic-oblong or obovate, hairy, more so beneath, acute at apex, subacute at base. Flowers 2-2.3 cm across, yellow, axillary, solitary, culminating into terminal racemes at ends of branches due to suppression of leaves subtending them. Capsules 4-6.5 cm (including beak and stalk), cylindrical, narrowed at both ends, glandular hairy. Seeds numerous, dark brown, deeply reniform, strongly cross nerved.

A common weed after monsoon, often gregarious, in cultivated fields and waste places along road sides. The plants are variable in habit, the monsoon forms are often 60-75 (-100) cm tall, whereas late post monsoon forms and those growing on exposed or rocky grounds are sometimes only upto 30 cm tall, and often mean looking.

Flowers and fruits: September - June.

Herbarium specimens examined:
Dediapada: VKS 986, 1632A
Sagbara: VKS 997, 1530, 1827
Ghatoli: VKS 2034.
World distribution: Native of the Old World, from tropical Africa and S. Arabia to tropical Australia, commonly adventive in the New World.

Critical notes: There is a considerable diversity of opinion whether this and previous species be assigned to Cleome or Polanisia. Recently Santpau (Bull. bot. Surv. India 3(1):11, 1961) has convincingly shown that they should be retained in the genus Cleome. Jacobs 1960, p. 100 remarks "As to Polanasia - It is pointed out that it is satisfactory to restrict Polanasia to the original concept of Rafinesque, the type species being the N. American P. graveolens Raf. (= P. dodecandra, (L.) DC.) DeCandolle, followed by many later authors, has extended the concept with the Cleomoid Old World species possessing more than 6 stamens, but these possess no large adaxial gland as in the type species. These should be referred to Cleome".

CRATAEVA Linn.


Deciduous trees, 3-5 m tall; bark yellowish-grey, smooth. Leaves 3-foliolate; leaflets 5-12 x 3-6 cm, membranous, lateral ones strongly obliquely falcate, obovate or lanceolate, middle
one equilateral, elliptic-lanceolate, all dark green above, paler beneath, acuminate at apex, narrowed at base. **Flowers** creamy yellow, 2-3.5 cm across, in terminal and lateral, many flowered corymbss. **Ovary** ellipsoid to globose on 2.7-4 cm long, gynophore. **Fruit** 2-2.5 cm long, subglobose or ovoid, papillate at least when young.

Occasional in the forests of Sagbara, Piplad and Mosda. This is one of the elegant trees when in full bloom, conspicuous by the masses of bright creamy-yellow flowers at the ends of leafless branches. Though the tree is generally leafless at flowering time, sometimes it bears flowers along with leaves.

**Flowers and fruits**: March - May.

**Herbarium specimens examined**:
- **Piplad**: VKS 1628
- **Sagbara**: VKS 1441, 1447, 1468, 1659, 1701
- **Ghatoli**: VKS 1568

**World distribution**: India, Burma, Indo-china, S. China, Hainan, Siam, Sumatra, Malay Peninsula, N to E Java and Borneo.
FLACOURTIACEAE

Key to the genera

1. Plants unarmed; leaves with pellucid dots... Casearia
1. Plants armed; leaves without pellucid dots. Flacourtia

CASEARIA Jacq.

In all our Indian floras, the present genus is kept under Samydaceae. But I have followed Hutchinson and Dr. Sleumer (Fl. Males. 5:81, 1954) for its inclusion in Flacourtiaceae, on p. 215 of the International Code of botanical nomenclature, also a note is added under Flacourtiaceae which reads as follows:

"If this family is united with Samydaceae Ventenat, Mem. Cl. Sci. Inst. Nation. France 1807 (2):149, (1808) ('Samydeae') the name Flacuortiaceae must be used. On p. 222 it is also remarked that 'the name Samydaceae is rejected in favour of Flacourtiaceae' if Samydaceae is united with Flacuortiaceae.

Key to the species

1. Stipules 0.8-1.6 cm long, subulate-lanceolate, glabrous ....................... graveolens
1. Stipules 0.3-0.5 cm, minute, densely woolly tomentose ......................... elliptica

Trees 7-9 m tall; bark ash coloured, smooth in younger parts, rough in older; young branches tomentose. Leaves 7-15 x 3.5-5.5 cm, elliptic-oblong, shortly acuminate, entire or faintly serrulate, tomentose, at length glabrescent above, slightly pubescent beneath (densely on nerves) subacute at apex, rounded or subcordate and sometimes oblique at base; Flowers 6-8, greenish-yellow, in axillary clusters. Fruits not seen.

Occasional in the forests.

Flowers: March - April.

Herbarium specimens examined:

Piplad: VKS 1602, 1605.

World distribution: India, Ceylon, Burma, Malaya and North Australia.


3.5-7 m tall trees; bark yellowish-white, smooth, young branches glabrous. Leaves 7-16 x 5-7 cm, broadly elliptic-oblong, glabrous above, silky tomentose beneath at length glabrous. on both surfaces 8-24 pairs of nerves, entire or faintly serrulate, subacute or shortly acuminate, at apex, rounded at base. Flowers not seen. Fruits 1.5-2.5 cm long, ellipsoid, smooth, deep yellow, Seeds with a scarlet aril.

Occasional in Ghatoli forests.

Fruits: May to June.
Herbarium specimens examined:

World distribution: More or less throughout India, Burma and Ceylon.

**Flacourtia** Commers.

*Flacourtia indica* (Burm. f.) Merrill, Interp. Rumph. Herb.

Deciduous, thorny shrubs or small trees; 3-4 m tall; bark smooth, light-brownish black, grey in younger branches; thorns 2-2.5 cm long, straight, axillary. Leaves 6-9 x 3-5.5 cm, Coriaceous, broadly ovate, elliptic or oblong, dark green, glabrous, shining above, paler beneath, hairy on nerves, margins sharply serrate or crenate, rarely entire, subacute at apex, rounded at base. Flowers greenish-yellow, fascicled on leafless branches.

Occasional. The tree is mean looking at least at the time of flowering. However, the new foliage is bright purple, rendering the plant conspicuous. In young twigs the branches and the mid-rib and margins of leaves are often reddish-purple.
Flowers: January - February

Herbarium specimens examined:
Dediapada: VKS 217, 218, 1158A, 1378
Sagbara: VKS 1007, 1816, 2532; Shah 14026

World distribution: Wide spread in tropical and subtropical countries in Africa, India, South-east Asia and Polynesia.
POLYGALACEAE

POLYGALA Linn.


Erect herbs, 10-30 cm tall; stem simple or sparingly branched, faintly striate, glabrous or pubescent. Leaves 0.5-4 x 0.3-0.8 cm, linear-oblong, subsessile, glabrous or glabrescent, margins ciliate, rounded or emarginate at apex, cuneate at base. Flowers yellow in axillary and terminal, condensed racemes. Capsules 2.5-5 x 1-3 mm, suborbicular, ciliate. Seeds 1-2 mm long, ellipsoid.

Occasional among grasses on hilly slopes and in open fields. It is often overlooked among tall grasses.

Flowers and fruits: July - September.

Herbarium specimens examined:

Sagbara: VKS 2113, 2144, 2434.

World distribution: India, Ceylon, Burma, Philippines, Siam, Malaya and Indo-China.
PORTULACACEAE

PORTULACA Linn.


Annual, succulent herbs; branches 15-30 cm long, prostrate, radially spreading, reddish, swollen at nodes, glabrous. Leaves 0.5-2.3 x 0.3-1 cm, subsessile, obovate, dull green, often reddish purple on margins, sometimes entire leaves reddish purple, fleshy, subtruncate or rounded at apex; cuneate at base. Flowers 0.5-0.8 cm across, bright yellow, in axillary and terminal clusters. Capsule ovoid, circumsciss. Seeds black, tuberculate.

Common in moist ground, along margins of ditches in river beds and in open fields. The plant is quite variable in habit. In dense vegetation it is often procumbent tending to be suberect, whereas it is radially spreading in barren soil or in thin vegetation. The plant is nitrophilous, showing luxuriant growth in waste places, the branches upto 30 cm long; at other places they are shorter.

Flowers and fruits Throughout the year.

Local use: The leaves are sometimes used as vegetable.

Herbarium specimens examined:

Dediapada: VKS 733
Sagbara: VKS 2012

World distribution: More or less throughout the tropical and subtropical parts of the world.
ELATINACEAE

BERGIA Linn.

Bergia odorata Edgew. in Journ. Asiat. Soc. Beng. 7:765, 1838; FBI 1:251; Cooke 1:77; Santapau Fl. Saurashtra 29.

A diffuse herb 15-30 cm tall, woody at base; branches decumbent or spreading, glandular pubescent. Leaves 3-7 mm long, subsessile, oblong-lanceolate or elliptic, hispid, crenato-serrate, obtuse at apex, narrowed at base. Flowers solitary or in axillary fascicles of 2-6. Stamens 10. Capsules 5-celled. Seeds brownish-black, minute, slightly curved.

Rare in the area studied, seen only once on 29-3-1968 at Dediapada on way to Kissmore block.

Flowers and fruits: March.

Herbarium specimen examined:

Dediapada: VKS 1629

World distribution: India, Persia, Egypt, Trop. Africa.
Bushy shrubs, 1-2 m tall, with compact branches; bark dark brown, with annulated scars of fallen leaves. Leaves minute, scale-like, ovate-lanceolate, sessile, acuminate at apex, sheathing at base. Racemes 11-20 cm long, simple or variously branched, terminal. Flowers 0.5-0.8 cm across, bright rosy purple when fresh, fading white, brown on withering. Capsules 1-1.2 cm long, with persistent calyx and corolla. Seeds 0.5 - 0.7 cm long, greenish brown, trigonous, plumose with long dirty white hairs.

Locally abundant in stony river beds at Ghatoli, Mosda, Dumkhal, scattered bushes forming loose patches with Homonoia riparia Lour. Syzygium heveneana Gamble and Vitex negundo Linn.

Flowers and fruits: January.

Herbarium specimens examined:
Mosda: VKS 1237A, 1237B, 1237C, 1237D, 1237E.
Shah: Field diary.

World distribution: Throughout India, Ceylon and Burma.
MALVACEAE

Key to the genera

1. Trees ........................................... Kydia

1. Shrubs or undershrubs:

2. Calyx spathaceous ......................... Abelmoschus

2. Calyx not spathaceous:

3. Involucral bracts 0:

4. Plants 1-1.5 m tall; ripe carpels more than one-seeded; fruit a carcerule .... Abutilon

4. Plants less than 90 cm tall; ripe carpels one seeded; fruit not as above. Sida

3. Involucral bracts present:

5. Fresh flowers creamy to sulphur yellow with or without a purple eye; capsule dehiscent, non glochidiate:

6. Involucral bracts 3, large, foliaceous; seeds clothed with long cottony hairs. Gossypium

6. Involucral bracts linear, lanceolate, sometimes minute; seeds glabrous or minutely pubescent but not cottony:

7. Calyx cupular, truncate ............... Azanza

7. Calyx not as above ....................... Hibiscus

5. Fresh flowers bright rosy-pink; fruit indehiscent, glochidiate ............... Urena
**ABELMOSCHUS Medic.**

Key to the species

1. Flowers small, 2-2.5 cm across, pale creamy yellow to almost white; involucral bracts caducous, falling before the flower opens .. *ficulneus*

1. Flowers large, 3.5-6.5 cm across, bright sulphur yellow with a purple or maroon centre; involucral bracts linear or broad and leafy :

2. Involucral bracts 6-15, narrowly linear;

3. Capsule elongated-conical 7-9 angled,
   8-15 cm long; involucral bracts 8-10 equalling the calyx; peduncle shorter than the petiole .................. *esculentus*

3. Capsule ovate to oblong-lanceolate, 5-angled, upto 6* cm long; involucral bracts 6-12, shorter than the calyx;
   peduncle equalling the petiole ........... *moschatus*

2. Involucral bracts 4-5, broad, leafy ...... *manihot*

*Abelmoschus esculentus* (Linn.) Moench. Meth. 617, 1794;

90-130 cm tall, erect undershrubs; stem simple or sparingly branched, strigose, pale to greenish yellow, sometimes purple tinged. Leaves 13-35 cm across, entire or shallowly 3-5-lobed, strigosely hairy when young, glabrate at length, serrate, acute at apex, cordate at base; petiole 10-15 cm long, appressedly hairy, grooved. Flowers axillary, solitary. Capsules 6-15 cm long, 6-9 angled, strigosely pubescent.

Cultivated in the area during monsoon for the fruits used as vegetables; occasionally an escape.

Flowers: August - September
Fruits: August - October
Local name: BHENDI
Herbarium specimens examined:
Dediapada: VKS 3029, 3030, 3078.

World distribution: The plant popularly known as GUMBO, OKRA, Lady’s Finger etc. is cultivated throughout the tropical and subtropical parts of the world for its fruits. According to Wealth of India it is considered to be African or Asian in origin.

Abelmoschus ficulneus (Linn.) Wt & Arn. Prodr. 53: 1834;

Herbs, 1-2.5 m tall; stem and branches hispidly hairy, minutely prickly. Leaves 4-7 x 6-15 cm, orbicular, entire or shallowly to deeply 3-lobed, toothed, minutely hairy, densely
so on veins; petiole 3.5-11 cm long, stellately hairy. **Flowers**
axillary, solitary, culminating into 15-25 cm long racemes at
ends of branches due to subtending leaves. **Capsules** 2-3.5
cm long, ovoid, hispid, shortly beaked. **Seeds** globose, black,
slightly pilose.

Rare, only a few plants seen among grasses along road
sides.

**Flowers and fruits**: September - November

**Herbarium specimens examined**:

Dediapada: VKS 658, 800, 1097, 1192, 1227.

Sagbara: VKS 2224, and one sheet VKS unnumbered.

**World distribution**: Madagascar, India, Malaya, Java,
Australia.

*Abelmoschus manihot* (Linn.) Medic, Malv. Fam. 46, 1787;
Hochreut. in Candollea 2:87, 1924; Hu, (Fam. Malv.) Pl. China
153: 35, PL. IX (1-4); Santapau 18 & Pl. Saurashtra 50; Shah 673.

*Hibiscus manihot* Linn. Sp. Pl. 696, 1753; Wealth of India
tetraphyllus Roxb. Pl. Ind. 3:211, 1832; FBI 1:341; Cooke
Pl. 19, 1861. *Hibiscus manihot* var. *tetraphyllus* Hochr. in

An erect undershrub, 1.5-3.5 m tall; stem simple or
sparsely branched, strigosely hairy, with scattered prickles,
sometimes purple tinged. **Leaves** 4-17 x 3-18 cm, shallow to
deeply 3-5-7-lobed, broadly ovate, strigosely hairy on both
the surfaces, acute at apex, cordate or rounded at base; petiole 2.5-16 cm long, striate, hairy, greenish purple. **Flowers** axillary, solitary, gradually passing into racemes at ends of branches; peduncle in fruit 1.5-5 cm long, stout. **Capsules** 2.5-5 cm long, 5-angled, shortly beaked, hirsute. **Seeds** black, smooth.

Common, scattered or subgregarious in open grass lands and along road side in the latter of half of monsoon. In Wealth of India it is mentioned that the capsule of this species contains "5 seeds". I have examined several fruits and the number of seeds varies from 15-20.

**Flowers and fruits**: August - December

**Local name**: JANGLI-BHENDI

**Herbarium specimens examined**:
Dediapada: VKS 470, 2855, 2982.
Mosda: VKS 343, 349, 355
Sagbar: VKS 2399

**World distribution**: Widely distributed in the tropics. Wealth of India remarks "It is considered to be native of China and Japan and is reported to have been introduced into India from China but its wide distribution as recorded under the synonyms H. tetraphyllus and H. pungens suggest that it occurs wild in this country.

1.5-2 m tall undershrubs; stem simple or sparsely branched, hispid. Leaves 8-13.5 x 9-19.5 cm, polymorphous, broadly ovate, entire or variously palmately 5-7-lobed, serrate or irregularly toothed, hairy, acute or subacute at apex, cordate at base; petioles 4-13 cm long, hairy. Flowers axillary, solitary; Fruits up to 6 cm long, 5 angled.

Common in waste lands along road sides. The plant stands out distinct in dense vegetation by its height.

Flowers and fruits: September - January

Local name: KHAT-BHINDI

Herbarium specimens examined:

Dediapada: VKS 309, 1098, 2963, 2966.

World distribution: It is a pantropic species; native of India (cf. Wealth of India).

* ABUTILON Linn.


An erect, suffruticose undershrub, 1-1.5 m tall; stem and branches terete, covered with soft grey or whitish tomentum. Leaves 4.5-10 x 5-14 cm long, ovate, minutely stellately hairy above, densely stellately tomentose beneath, acute or acuminate at apex, shallowly to deeply cordate at base; petioles 2.5-7
cm long, stiff, silky hairy. **Flowers** 2-2.7 cm across, pale to bright orange yellow, axillary, solitary. **Fruits** 1-2 cm across. **Carpels** 15-20, dark brownish-black. **Seeds** brown, reniform, stellately hairy.

Common in waste lands along road sides and in undergrowth of the forests. Prain (Bengal Pl. 1:173, 1963 reprinted) considers the flowering time as one of the characters to distinguish *Abutilon* from *Sida*, the former as an afternoon or evening flowering plant, the later as a forenoon or noon-flowering plant. This character could not be confirmed at least for my plants by observations during outings and the field notes taken. I have seen the species of both the genera with fully opened flowers from the morning to evening, because the excursions were many times of the whole day.

**Flowers**: August - November  
**Fruits**: October - April  

**Herbarium specimens examined**:

Dediapada: **VKS** 2701  
Sagbara: **VKS** 2130, 2151, 2156, 2167, 2175.

**World distribution**: Tropical Africa, Arabia, India, Ceylon, Burma, Cochin-China, Malaya, Java, Philippines, and China.
AZANZA Alef.


An erect undershrub, 1-1.5 m tall; stem and branches dark purple, stellately tomentose in younger parts, almost glabrous in older. Leaves 9-15 x 9-16 cm, shallowly 3-lobed, broadly ovate, glabrous or sparsely stellately hairy, 3-7-nerved, subcordate at base, lobes acuminate; petioles 0.5-9 cm long, stellately hairy. Flowers 7-10 cm across, bright yellow with crimson centre within, solitary, axillary and in short terminal corymbs. Capsules 1.5-2 x 1-1.3 cm, ovoid, shortly beaked, pubescent, 3-celled.

Common, scattered in the undergrowth of the forests on hilly slopes among tall grasses. The plant is conspicuous by its large sulphur-yellow, drooping flowers above the foliage.

Flowers: August - October.
Fruits: October - January
Local name: RAN BHENDI
Herbarium specimens examined:
Dediapada: VKS 20, 26, 180, 296, 342, 1276; Shah 11516
Sagbarara: VKS 2201, 2293
World distribution: Tropical Africa, India to Malaya, Java, Philippines and China; cultivated in America.

**GOSSYPIUM** Linn.

*Gossypium herbaceum* Linn. var. *acerifolium* (Guill. & Perr.)
Wealth of India 4:176, PL. XII (col.) & t. 84; 1956 (loc. Broach cited).

Annual undershrubs, 1.5-2 m tall; stem and branches densely hairy, reddish-purple with black glands. Leaves 2-10 x 2.5-11 cm, palmately lobed up to middle of the lamina, lobes ovate, stellately hairy on both surfaces, at length glabrous, except on veins beneath, entire, acuminate at apex, cordate at base; petioles 2-5 cm long, hairy; stipules 1-1.4 cm, lanceolate, pubescent, acuminate. Flowers 3.5-4 cm across, when fresh yellow with a deep purple centre, dull pink or purple on withering, axillary, solitary and few in terminal clusters. Fruits 3.5-4.2 cm long, ovoid, sharply pointed. Seeds 10 x 5 mm, ovoid, blackish-brown, clothed with long white hairs.

This is the cotton of Commerce; planted in the second half of monsoon mostly in the black soil.
Flowers: September - October
Fruits: November - February

Herbarium specimens examined:
Dediapada: VKS 481, 622, 699, 1139
Sagbara: VKS 892, 1392, 1673

World distribution: Africa, Middle East countries, Central Asia, and Western India. According to Kirtikar and Basu (Medicinal Plants (ed. 2) 1:344, 1933), it is probably indigenous in N. Arabia and Asia Minor, whereas Wealth of India remarks, "Primitive perennial types are reported to persist in Baluchistan and annual cultivated types are said to have developed here and migrated to neighbouring areas in India, China and Middle East countries.

HIBISCUS Linn.

Key to the species

1. Involucral bracts absent; flowers 2.5-3.5 cm across, pure white or tinged pink but without a purple centre .................. lobatus

1. Involucral bracts present; flowers 4-8 cm across, creamy-white to bright sulphur yellow, usually with a deep purple centre:

2. Leaves not punctate:

3. Leaves deeply lobed, often digitate; mid rib on the lower surface with a gland in the middle or at the base of the lamina; flowers not drooping; capsule not winged:
4. Plants not prickly; stem and branches smooth, deep red; calyx fleshy, deep red; involucral bracts adnate to calyx tube and accrescent ............... sabdariffa

4. Plants not as above; involucral bracts free, shorter than calyx ........ cannabinus

3. Leaves en tire or very shallowly lobed, ovate-triangular; mid-rib without a gland; flowers drooping; capsule winged. vitifolius

2. Leaves pellucid-punctate .................. punctatus


Undershrubs 1.5-2 m tall, simple or sparingly branched. Leaves deeply 3-5-lobed; lobes 2-8 x 0.4-1.6 cm, linear, lanceolate or elliptic-lanceolate, glabrescent, serrate, acute at apex, shallowly cordate at base; petiole 3-10 cm long, glabrous but for a few scattered prickles. Flowers solitary, axillary, culminating into short, terminal racemes. Capsules 1.6-2 x 1.2-1.6 cm, beaked, bristly or pilose. Seeds 3-5 mm long, blackish-brown, glabrous.

Cultivated but occasionally an escape. Locally the dried leaves are stored and used in curries as a substitute for tamarind or lemon juice.
Flowers and fruits: August - December

Herbarium specimens examined:
Dediapada: VKS 113, 203, 674, 1980, 1124, 3024, 3079;
Shah 11519.

World distribution: Wide spread in tropical countries. It is apparently indigenous to India but some consider it to be a native of tropical Africa. (See Wealth of India)

Hibiscus solandra L'Her. Stirp. 1:103, t. 49, 1788; FBI 1:336; Cooke 1:114.

Herbs, erect, 25-45 cm tall; stem simple or sparingly branched, moderately villous. Leaves 2.4-7.5 x 1.6-7 cm, broadly ovate, ovate-lanceolate, shallowly 3-lobed, irregularly crenate, acute or acuminate at apex, cordate, rounded or truncate at base; petiole, 5-7.5 cm long, appressed pubescent. Flowers 1.2-1.5 cm across, white or tinged pink, axillary, solitary, and in terminal, lax racemes. Capsules 6-13 mm long, ovoid, straw coloured. Seeds 1-2 mm long, black, tuberculate.

Occasional in the undergrowth of forests.

Flowers and fruits: November - December

Herbarium specimens examined:
Sagbara: Shah 14122, 14027, 14068
**World distribution**: Tropical Africa, India, Ceylon, Burma, Indo-China and Java.

**Critical notes**: The identification of this species in the genus *Hibiscus* is rather difficult because of the absence of involucral bracts; however the flower colour is rather distinctive.

*Hibiscus punctatus* Dalz. & Gibs, Bombay Fl. 20, 1861; FBl 1:340; Cooke 1:116; Santapau, Fl. Saurashtra 47.

Suffruticose herbs, 30-80 cm tall, scarcely branched. Leaves 2.5-8 x 5-9 cm long, pellucido-punctate, unequally lobed, middle lobe much larger than lateral ones, sinuate-dentate stellately hairy on both surfaces. Flowers yellow, solitary or clustered at the ends of branches. Capsules ovoid, pubescent with short beak. Seeds muricate, black.

A rare plant, seen only once along road sides near Ghatoli.

**Flowers and fruits**: November - December

**Herbarium specimen examined**: Ghatoli: Shah 11602

**World distribution**: Tropical Africa, India, Ceylon, Burma, Indo-China and Java.

Annual, erect undershrubs, 70-180 cm tall; leaves deeply 3-5-lobed; lobes 2-6.5 x 0.3 - 1.4 cm, elliptic-lanceolate or elliptic-oblong, glabrous, serrate, acute. Flowers axillary, solitary. Involucral bracts 10, 0.6-1.4 x 0.2-0.4 cm, glabrous, somewhat fleshy, lanceolate, free, at length becoming deep red. Calyx accrescent in fruit, 2-3 x 0.8-1.2 cm, fleshy, dark red, glabrous. Capsules 1.5 x 0.9 cm, ovoid, beaked, deep red.

Rare, seen only at one place in the area. The overall deep red colour of the plant renders the plant conspicuous in the field.

**Flowers**: September - October

**Fruits**: November - January

**Local name**: LAL-AMBADI

**Herbarium specimens examined**: Dediapada: VKS 479, 1076.

**World distribution**: A native of tropical Africa or Asia, is now found under cultivation throughout the tropics of both hemispheres. (cf. Wealth of India).

**Hibiscus vitifolius** Linn. Sp. Pl. 696, 1753; FBI 1:338; Cooke 1:115; Santapau, Fl. Saurashtra 45; Shah 673.

An erect herb, 75-100 cm tall, sparingly branched, greyish-tomentose. Leaves 6-17 x 4.5 - 16 cm, simple or
shallowly 3-5-lobed, olate-triangular, pubescent, densely so beneath, sharply serrate, acute or acuminate at apex, cordate at base; petioles 3-13 cm long, terete, greyish-tomentose. **Flowers** 6-8 cm across, axillary, solitary, often in condensed racemes at ends of branches; pedicels 1.5-5 cm long, terete, grey tomentose, jointed near base. **Capsules** 1.5-2 x 1.4-1.6 cm, 5-carpeled, winged; wings reticulately veined, hairy.

Occasional in dense vegetation in open ground and on exposed hilly slopes. The olate-triangular, sharply serrate leaves, drooping flowers and the winged capsules are distinctive of the plant.

**Flowers**: September - October

**Fruits**: October - December

**Herbarium specimens examined**:

- Dediapada: VKS 281, 2609, 2792, 2908
- Mosda: VKS 330, 330A
- Sagbara: VKS 1034, 2197, 2290

**World distribution**: Hotter parts of Tropical Africa, India, Ceylon, Siam, Java and Australia, in Central America probably cultivated.

**KYDIA Roxb.**

Deciduous trees, 6-10 m tall, young parts stellately pubescent. Leaves 5-15 x 7-16 cm, 7-nerved, broadly ovate, shallowly 3-7-lobed; lobes often angular, the middle one largest, stellately pilose above, densely so beneath; petiole 2-7 cm long, densely stellately pubescent. Flowers 2-2.8 cm across, white, or tinged pink, in terminal panicles. Capsules 3-4 mm across, globose, grey-tomentose. Seeds 2-3 mm long, dark brown, kidney shaped.

Occasional in dense forests at Ghatoli and between Dediapada and Sagbara. The persistent involucral bracts are typical. The tree is leafless from February to late April or May.

*Flowers*: August - November

*Fruits*: November - January

*Herbarium specimens examined*:

Ghatoli: VKS 1958, 2726, 2848, 2890, 2891; Shah 11476

*World distribution*: According to Stearn, the plant is distributed in the mixed deciduous forests of India and Burma.

*SIDA* Linn.

Key to the species

1. Leaves cordate at base (sometimes subacute or cuneate in spinosa):

2. Pedicels jointed in the middle; petiole 2-4.5 cm long; stem trailing or suberect; leaves not greyish-tomentose beneath, without a spiny tubercle at base ....................... veronicifolia
2. Pedicels jointed under the flower;  
petiole 1-2.5 cm long; erect undershrubs;  
leaves greyish-tomentose beneath, usually  
with a spiny tubercle at base ............. alba

1. Leaves subacute or cuneate at base:

3. Leaves glabrous; peduncle jointed in the  
middle, as long as the petiole; carpels  
long awned ................................ acuta

3. Leaves pubescent to hoary beneath;  
peduncle longer than petiole, jointed  
near the base; carpels with short awns  
or awnless:

4. Leaves obovate-cuneate, coarsely  
toothed in upper half ................... rhombifolia  
var. retusa

4. Leaves rhomboid-lanceolate, serrate .... orientalis

Sida acuta Burm. f. Fl. Ind. 147, 1768; Cooke 1:98; 153:
Wt. Icon. t. 95; Hu, (Fam. Malv.) Fl. China 18, 1955; Santapau  
15 & Fl. Saurashtra 34; Raizada IFR 5(1):42; Shah 673. Sida  
carpinifolia Linn. f. suppl. 307, 1781; FBI 1:23.

Herbs, 40-100 cm tall; branches diffuse or spreading,  
terete, smooth. Leaves 2.4-8 x 0.7-3 cm, lanceolate, bright  
to dark green, glabrous, serrate, acute at ends; petioles  
4-6 mm long, pubescent. Flowers yellow, solitary or in  
fascicles of 2-3 in upper portions of branches. Capsules  
3-4 mm long, globose, glabrous, reticulately veined. Seeds  
brownish black, silky pubescent.
Common along road sides, and in the undergrowth of forests.

**Flowers**: August - October

**Fruits**: October - March

**Herbarium specimens examined**:

Dediapada: **VKS** 485, 725, 747, 796, 2863

Sagbara: **VKS** 451, 844, 1322, 2446, 2556

**World distribution**: According to Santapau in Fl., Khandala, it extends through India, to Ceylon, Malaya, the Philippines Islands, Timor and other Pacific Islands, Formosa and China.

**Critical notes**: Gamble (Flora of Madras Presidency 1:64 ed. 67) categorically states only 5 carpels in *S. acuta*, but in the plants in my area the carpel number ranges from 5-6. My observation, therefore, agrees with those of Masters in FBI, Cooke (l.c.), Duthie (Fl. Up. Gang. Fl. 1:76, 1960) and Santapau Fl. Saurashtra who have also described carpel number 5-10.


An erect **undershrub**, 45 cm-1 m tall, with ascending branches; stem and branches stellately pubescent. **Leaves** 1.3-4.5 x 1-3.2 cm, ovate or ovate-elliptic, glabrate above, densely greyish tomentose beneath, serrate, subacute or obtuse at apex, subcordate or cuneate at base; petiole 1-2.5 cm long, pubescent with spinous tubercle at base. **Flowers** 6-8 mm
across, pale creamy yellow to almost white, axillary, solitary, culminating into short racemes at ends of branches. **Carpels** 3-4 mm long, pubescent, with 2 aristate awns.

Common, scattered, in open ground and along edges of cultivated fields.

**Flowers and fruits** : September - October

**Herbarium specimens examined** :

Dediapada : **VKS** 233, 236, 286

Mosda : **VKS** 337, 346

Sagbara : **VKS** 2675, 2679

**World distribution** : Tropical and subtropical regions of both the hemisphere.

**Critical note** : According to Cooke (loc. cited) the carpels are usually 3, rarely 6; Santapau, (Fl. Saurashtra) states that they vary from 3 to 5 but according to Blatter (in **JBNHS** 34:628, 1930) they are 5. In all my plants the carpels are invariably 5.

**Sida orientalis** Cav. Diss. 1:21, t. 12, f. 1, 1785; Hu, (Fam. Malv.) Fl. China 18, 1955; Santapau Fl. Saurashtra 33.

Undershubs 40-90 cm tall; stellately hairy. Leaves 2.5-6 x 1-3 cm, lower rhomboid, upper ovate-lanceolate, serrate, glabrous, above, stellately hairy beneath more so on nerves, acute at ends. Flowers 7-8 mm across, yellow, axillary, solitary or geminate at ends of branches, pedicel 1-3 cm long, pubescent. Capsules small, globose, 5-carpelled, muticous, awns short or 0.

Common, scattered along road sides and in the undergrowth of forests.

Flowers: September - October
Fruits: September - November

Herbarium specimens examined:
Dediapada: VKS 212, 632
Mosda: VKS 1274
Sagbara: VKS 763

World distribution: Throughout the tropics of both hemispheres.

Sida rhombifolia Linn. var. retusa (Linn.) Masters in FBI 1:324, 1874; Cooke 1:99; Santapau 16 & Pl. Saurashtra 35; Shah 673. Sida retusa Linn. Sp. Pl. (ed. 2.) 961, 1762.
Sida rhombifolia Linn. forma retusa Blatter in JBNHS 34:629, 1930.

An undershrub 45-100 cm tall; stem simple or branched, slender, erect or diffuse, thinly stellately hairy in younger parts, glabrous in older. Leaves 1.5-5 x 1-4 cm, upper lanceolate, lower ones obovate, sharply serrate in the upper
half, entire or nearly so at base, glabrascent above, stellately grey or pale whitish tomentose beneath, obtuse or retuse at apex, cuneate at base. Flowers reddish-yellow, axillary, solitary or fascicled, crowded at tips of branches.

Common and abundant, scattered or subgregarious, in shade along road sides and in the undergrowth on hills.

**Flowers**: September - October

**Fruits**: October - November

**Herbarium specimens examined**:

Dediapada: VKS 292, 350, 737; Shah 11542

Sagbara 4 VKS 450, 2298, 2810

**World distribution**: Arabia, Waziristan, Java, Philippines.

**Critical note**: Merrill (Enum. Phil. Fl. Pl. 2:35) has restored Linne's *S. retusa*.


Diffuse or suberect herbs, 40-80 cm long; stem and branches clothed with stellate and simple, long spreading hairs in younger parts, almost glabrous in older. Leaves 3-11 x 2.3-7 cm long, ovate, appressedly hairy above, stellate pubescent beneath, more so on veins, serrate, acute
at apex, cordate at base; petiole 2-4.5 cm long, hairy.

Flowers 7-8 mm across, yellow, axillary, solitary or 2-3 fascicled. Capsules 2-3 mm long, globose, 5-carpedel.

Occasional, scattered, at times forming dense mats in the undergrowth of the forests and hedges on road sides. The plant is variable in habit, prostrate or trailing on the ground or upto 70 cm tall in hedges and dense vegetation. Seldom the galls are seen on the stem.

Flowers and fruits: August - March

Herbarium specimens examined:
Dediapada: VKS 554, 559, 654, 934, 1195, 1229, 1451, 3074

Sagbara: VKS 924, 1262, 2141, 2255, 2553

World distribution: More or less throughout the tropics of the world.

URENA Linn.


An erect undershrub, 40-150 cm tall; stem and branches stellately pilose. Leaves 3-10 x 1.5-11 cm, shallowly to deeply 3-7-lobed, stellately hairy above, greyish tomentose beneath, acute or subacute at apex, rounded or cordate at base; margins serrate, often minutely spinous tipped; petioles
1-8 cm long, pubescent. **Flowers** 0.5-2 cm across, bright rosy pink, in axillary fascicles. **Fruit** 0.7-1.2 cm across, beset with hooked spines, cocci separating from axis.

Common in waste lands along road sides.

*Flowers and fruits*: September - December, occasionally fruits upto April.

**Herbarium specimens examined**:

Dediapada: VKS 650, 759, 2849, 2853, 2858, 2879, 2961; Shah 11467

Mosda: VKS 1272

Sagbarara: VKS 282, 680, 2392

Kokam: Shah 11551

**World distribution**: India, Ceylon, Burma, North Borneo, Cochin-China, Malaya, Java, Philippines, China and Japan.

**Critical notes**: The two Linnean species *Urena lobata* and *U. sinuata*, have been treated as distinct in many of our Indian Floras. However modern taxonomists like Merrill (Enum. Phil. Fl. Pl. 3:36, 1925) and Santapau (Fl. Khandala) considered the two conspecific. For a detailed discussion see the latter author, whom I have followed.

A large, deciduous, heavily armed tree, 10-15 m tall; bark greyish-white, studded with sharp, black, conical prickles. Leaves 5-7-foliolate; leaflets 11-17 x 4.5-6 cm, ovate-elliptic, glabrous, entire, acuminate at apex, narrowed at base; petioles 10-23 cm long, grooved. Flowers 7-15 cm across, bright red, showy, clustered at the ends of leafless branches. Capsules 8-13 x 4-6 cm, woody, purplish-brown.

Occasional. This is one of the most conspicuous trees of the area by its bright red, showy flowers.

Flowers: February - April
Fruits: March - May

Herbarium specimens examined:
Ghatoli: VKS 1563
Sagbara: VKS 2199

World distribution: Throughout the hotter parts of India, Burma, Ceylon, Yunnan, Cochin-China, Siam, Java, Philippines, Queensland and North Australia. According to Stearn, it is indigenous throughout India and Burma except the most arid tracts.
STERCULIACEAE

Key to the genera

1. Flowers polygamous; petals absent, and then, ovary raised on a gynophore; bark smooth, pale creamy-yellow or reddish, excorticating in thin peels; trees 8-12 m tall .......... Sterculia
2. Flowers bisexual; petals present, regular and ovary sessile or if zygomorphic, ovary raised on a gynophore (Helicteres); shrubs or herbs; rarely trees (Eriolaena):
   2. Flowers zygomorphic; corolla bright red, fading lead coloured; calyx yellowish-brown; capsule valves spirally twisted ..... Helicteres
   2. Flowers actinomorphic; flowers and fruits not as above:
   3. Small trees; flowers yellow, 4-6 cm across, axillary, solitary ............... Eriolaena
   3. Herbs; flowers pale to bright pink 4-6 mm across, in terminal clusters .......... Melochia

ERIOLAENA DC.

Eriolaena stocksii Hook. f. & Thoms. in FBI 1:370, 1872; Cooke 1:139; Brandis, Indian Tr. 87, 1811; Blatter in JBNHS 34:880-882, 1931.

Trees, 3-4 m tall, young parts stellately pubescent; bark rough. Leaves 7-10.5 x 5.5-7.5 cm, broadly ovate or suborbicular, dark green, stellately hairy above, grey-tomentose beneath, prominently 5-7- nerves, crenato-serrate,
acuminate at apex, cordate at base; petioles 2.5-6 cm long, terete, stout, densely stellately hairy. **Flowers** 4-6 cm across, yellow, axillary, solitary. **Capsules** woody, 6-7 valved, 5-6 x 2-3 cm, conical, stellately pubescent. **Seeds** 2-2.5 cm, long winged; wings papery, pale brown.

Occasional.

**Flowers** : June - July

**Fruits** : August

**Herbarium specimens examined** :

Dediapada : VKS 1904, 1907

Ghatoli : VKS 1922, 1985, 2026, 2039, 2093, 2107, 2111

**World distribution** : According to Brandis this plant is distributed in the west side of Peninsula, from Arvalli hills, Panchmahal to Kokan.

**Critical notes** : The occurrence of *E. stocksii* in Bombay Presidency was, so far, doubtful as Cooke (1958) remarked "This species is scarcely distinct from *E. hookeriana* W. & A. and it is impossible to say in absence of fruits, whether the species should be maintained as separate or united with *E. hookeriana* W. & A." In his revision of the flora of Bombay Presidency, Blatter (1931), after consulting all the available literature, expressed an opinion that *E. stocksii* should be altogether dropped from the flora of Bombay. But this view is now not shared by Shah and Suryanarayan (Ind. For 94(12): 894, 1968) who have given full account of *E. stocksii* based on the fruiting specimens collected from Dangs in October and flowering specimens (herbarium sheet, Dalzell N.J. No. 142939,
loc. Bombay Pras. cit.) in the herbarium of the Forest research Institute, Dehradun. It is indeed a very rare plant in Dangs forest found in Malegaon-Saputara hill range and it grows on such spots, which at any rate are accessible only with difficulty (See Shah and Suryanarayana, 1968). The occurrence of this species, both in flowers and fruits is a further evidence of not accepting Blatter's opinion. In Rajpipla forests the plants were seen on edges of cultivated fields on way to Kismore block near Dediapada and in dense but accessible areas.

**HELICTERES Linn.**


1.5-3 m tall shrubs; stem and branches stellately tomentose in younger parts, glabrescent in older. Leaves 7-21 x 5-12 cm, broadly obovate, elliptic-oblong or nearly orbicular, scabridly stellately hairy above, densely so beneath, serrate, acute or acuminate at apex, rounded or subcordate at base; petiole 1.2-2.4 cm long, terete, hairy. **Flowers** 3.5-4 cm long, axillary solitary or in fascicles of 2-5. **Fruits** 4-6 cm long, dark greenish-brown, tomentose, woody on 3-5 cm long stalk.

An occasional plant in the area, found on exposed hilly slopes, rare in the dense undergrowth of the forests. It is conspicuous by the masses of red flowers borne along entire lengths of branches. The fruit is also typical.
Flowers: July - August
Fruits: September - March

Herbarium specimens examined:
Bediapada: VKS 62, 141, 213, 514, 55A, 1125, 1611, 2109
Ghatoli: VKS 2022, 2083, 2090, 2095

World distribution: India, Ceylon, Burma, Malaya, Java, Australia, extending to West Indies.

MELOCHIA Linn.

Melochia corchorifolia Linn., Sp. Pl. 675, 1753; FBI 1:374; Cooke 1:142; Santapau, Fl. Saurashtra 63, Riedleia corchorifolia DC.; Dalzell & Gibson, Bombay Fl. 24, 1861.

An erect herb, 20-75 cm tall, simple or branched in upper part, branches often ascending; stem and branches deeply striate, sparingly hairy in younger parts, glabrous in older, often reddish purple. Leaves 3.5-6 x 2.5-3.7 cm, ovate-oblong, serrate, glabrous, acute at apex, rounded or truncate at base; petiole 1.5-2.5 cm long, hairy, grooved. Capsules 3-4 mm across, smooth, dark brown, 5 valved.

Common in open grass lands and in moist places along road sides, but rarely found in the undergrowth of the forests. The plant is variable in habit, luxuriantly growing in moist ground and dense vegetation but in exposed, dry situation it is often very much stunted. On 11-4-1968 (VKS 1740), one plant, 8-15 cm tall, was seen in flowers and fruits. A noteworthy feature of the species in the present
area is the presence of short branches, each with 3-4 leaves in the axil of the leaves on the main stem or branches.

Flowers: August - September

Fruits: September - April

Herbarium specimens examined:

Dediapada: VKS 196A, 1740, 2922

Mosda: VKS 324

Sagbara: VKS 385, 2136, 2458; Shah 14119

World distribution: Tropical Africa, India (except Punjab and Assam) Ceylon, Sikkim, Burma, Java, Australia.

STERCULIA Linn.

Sterculia urens Roxb. Pl. Cor. 1:25, t. 24, 1795; FBI 1:355; Cooke 1:131; Santapau 21 & Fl. Saurashtra 60; Shah 673.

Deciduous trees, 8-12 m tall, with widely spreading and sometimes drooping branches. Leaves 15-30 cm long, and as much broad, crowded at ends of branches, palmately 5-7-lobed, glabrous or nearly so above, tomentose beneath, acuminate at apex, cordate or rounded at base; petiole 15-18 cm long, appressedly pubescent. Flowers olivaceous green or greenish-yellow in terminal panicles, at ends of leafless branches. Follicles 5, each 3-5.5 x 2-3 cm, deep purple, densely covered with irritant hairs. Seeds black, oblong.

Occasional. The plant can be easily spotted in the forests by its habit and the characteristic bark. From the
bark a colourless gum, called "karaya gum" exudes. The tree is completely leafless from December to April.

**Flowers**: December - February  
**Fruits**: January - April

**Herbarium specimens examined**:  
Sagbara: VKS 1469, 2324; also noted in the forests at Dediapada, Ghantoli, Kokam etc.

**World distribution**: More or less throughout India, Ceylon, and Burma.
TILIACEAE
Key to the genera

1. Trees or shrubs; fruit a drupe:
   2. Inflorescence terminal in paniculate cymes; flowers involucrate ................ Microcos
   2. Inflorescence in axillary or extra axillary fascicled cymes; flowers not involucrate ................ Grewia

1. Herbs or undershrubs; fruit a capsule or indehiscent:
   3. Fruit a capsule, smooth .................. Corchorus
   3. Fruit indehiscent, prickly .................. Triumfetta

CORCHORUS Linn.
Key to the species

1. Capsule 3-angled and 3-winged; beak trifid .......................... aestuans

1. Capsule cylindrical, not winged; beak entire:
   2. Capsule 1-1.5 cm long, softly pubescent; stamens 5-10; prostrate herbs .......... fascicularis
   2. Capsules 4-6 cm long, glabrous; stamens many; erect undershrubs:
      3. Leaves with lower pairs of serratures prolonged into five basal tails;
         capsule smooth .......................... olitorius
      3. Leaves without basal tails; capsule rough, trilocularis

Diffuse or suberect herbs, 30-70 cm tall; glabrous except in younger parts. Leaves 2-7.5 x 1-5 cm, ovate or ovate-oblong, glabrous or very sparsely hairy, serrate, lower most serratures produced into filiform appendages, acute or acuminate at apex, rounded at base; petioles 0.4-2.5 cm long, pubescent. Flowers yellow, leaf-opposed, solitary or in fascicles of 2-3. Capsules 2-3 cm long, reddish brown, sharply 3-angular, 3-winged.

Common, scattered in open waste lands and along the margins of cultivated fields.

Flowers: August - September
Fruits: September - March
Herbarium specimens examined:
Dediapada: VKS 116A, 1162, 1156, 2822, 2877
Sagbara: VKS 2163, 2270
Selamba: VKS 1522

World distribution: More or less throughout many tropical countries.

Corchorus fascicularis Lamk. Encycl. 2:104, 1786; FBI 1:398; Cooke 1:159; Santapau 26 & Fl. Saurashtra 71.

Annual herbs, woody at base, with 15-40 cm long, often radially spreading branches. Leaves 2.5-4.5 x 0.5-1 cm,
elliptic-oblong, ovate-oblong, glabrous, serrate, obtuse at apex, rounded or subacute at base; petioles 2-6 mm long, pubescent. Flowers minute, yellow, in leaf opposed fascicles. Capsules 0.8-1.3 cm long, pubescent, 3 valved.

Rare, in the open waste lands. A distinct species easily recognised by the fruits which are smallest in the genus.

Flowers: September - October

Fruits: November - April

Herbarium specimens examined:

Sagbara: VKS 189, 1818

World distribution: Tropical Africa, Egypt, Anglo-Egyptian Sudan, India, Burma, Ceylon and Australia.

Corchorus olitorius Linn. Sp. Pl. 529, 1753; FBI 1:397; Cooke 1:158; Wealth of India 2:327, t. 152, 1950; Santapau 27 & Fl. Saurashtra 71; Shah 673.

Annual, suffruticose herbs, 60-100 cm tall; stem and branches striate, glabrous. Leaves 3-12 x 2-5 cm, ovate-elliptic or ovate-lanceolate, glabrous, serrate, lower serratures on each side produced into 0.5-1 cm long, filiform appendage, acute or acuminate at apex, rounded or subacute at base; petioles 0.5-3 cm long, thinly hairy or glabrous. Flowers yellow, axillary, solitary or 2-3 in leaf opposed fascicles. Capsules 4-6 x 0.5-0.7 cm, cylindrical, glabrous, distinctly ribbed, 4-5 valved. Seeds dark brown.
Common and abundant, scattered or in loose patches in open fields, along roadsides and in the undergrowth of dense forests during the later half of monsoon.

**Flowers**: August - September

**Fruits**: September - March

**Herbarium specimens examined**:

Dediapada: VKS 304, 313, 367, 1936, 2736, 2950

Sagbara: VKS 2181, 2230, 2667

**World distribution**: Throughout the tropics. According to Wealth of India it is considered to be indigenous to India.

**Corchorus trilocularis** Linn. Mant. 77, 1767; FBI 1:397; Cooke 1:158.

Suffrutescent, much branched herbs, 20-75 cm tall; stem and branches suberect or diffuse, glabrate pubescent. **Leaves** 1.5-2.5 x 0.7-1 cm, elliptic-oblong or oblong-lanceolate, glabrous, serrate, acute or subacute at apex, rounded or subacute at base; petioles 4-7 mm long, terete pilose. **Flowers** 6-8 mm across, yellow, in leaf-opposed, fascicles of 2-3. **Capsules** dark brown, geminate, linear, 3-valved on 3-4 mm long stalk; beak entire.

Rare, seen only once along roadsides at Dediapada.

**Flowers and fruits**: March

**Herbarium specimen examined**:

Dediapada: VKS 1522A.
World distribution: Tropical and South Africa, Anglo-Egyptian Sudan, Palestine & Syria, Arabia, Aden, Afghanistan, Baluchistan, Sind and India.

Grewia Linn.

Key to the species

1. Trees or straggling shrubs; leaves broad, suborbicular or obliquely ovate, often cordate at base:

2. Trees; leaves hoary-tomentose, at least when young; stipules leafy, falcate, auricled at base ....................... tiliaefolia

1* Erect shrubs; leaves lanceolate, ovate-lanceolate or linear-oblong ......... hirsuta

Grewia abutilifolia Vent. ex Juss. in Ann. Mus. Par. 4:92, 1804; FBI 1:390 (pro parte); Cooke 1:152; Santapau 25 & Fl. Saurashtra 69.

Undershrubs, only 15-20 cm tall. Leaves 1.5-2.7 x 0.8-1.4 cm, orbicular-ovate, entire, or shallowly lobed in the upper half, irregularly serrate, scabrous and stellately hairy, obtuse or shortly acuminate at apex, rounded or subcordate at base; petiole 0.3-0.7 cm long, hairy. Flowers yellow, axillary, fascicled.
This is a very rare plant in the area studied, seen only once in stony ground. The plant in other parts of Gujarat is generally a large, sarmentose shrubs, 1.5-2.5 m tall, with 5-12.5 x 4.5-10 cm leaves, however, my plant was only 15-20 cm tall, when in full bloom. The above description is based purely on my specimens.

**Flowers**: June

**Herbarium specimen examined**: Dediapada: VKS 1954

**World distribution**: India (Assam, Upper Gangetic plains, Bihar and Orissa, and Western Peninsula) Burma, Cambodia, Malaya and Java.


Erect undershrubs, 1.5-2 m tall; young parts softly pubescent with fulvous hairs. **Leaves** 4-8 x 1.5-2.8 cm, linear-oblong, serrate, glabrescent or with few stellate hairs above, densely tomentose with fasciculate hairs beneath, acute at apex, somewhat obliquely rounded at base, 3-nerved; petioles 0.2-0.4 cm long, tomentose; stipules subulate, longer than petiole, hairy. **Flowers** creamy yellow when fresh, in axillary umbellate cymes; pedicels 0.2-0.5 cm long, softly pubescent. **Drupes** 0.8-1.2 cm across, fleshy, wrinkled, slightly lobed, glabrescent.

Common in the undergrowth of forests and in open grass lands.
Flowers : July - October

Fruits : November - January

Herbarium specimens examined:
Dediapada : VKS 30, 183, 185, 1172, 2917
Sagbara : VKS 942, 2215, 2240, 2301, 2697

World distribution : Peninsular India, Ceylon and Burma.


Middle-sized trees, 5-8 m tall; bark light brown, rough, excorticating in irregular patches; young parts densely pubescent. Leaves 5-15 x 3.5-8 cm, broadly ovate-oblong, crenate-dentate, minutely hairy above, hoary tomentose beneath, acute to shortly acuminate at apex, obliquely cordate at base; petioles 1-3.5 cm long, tomentose, thickened at base of lamina. Flowers 10-12 mm across, bright yellow, brown on fading, in axillary umbelate cymes; peduncles 0.8-1.5 cm long. Drupes didymous, entire or bilobed, minutely hairy, black when ripe.

Occasional in the forests, though the seedlings upto 1 m tall are often seen in the undergrowth of the forests with those of Butea monosperma Taub., Tectona grandis L.f. and Terminalia crenulata Roth. This may be due to indiscriminate cutting of forests trees by local people for fire wood.

Flowers : March - April

Fruits : April - July
**Local name**: DHAMAN

**Local use**: Locally the fruits are edible. It is also considered as a timber tree by the forest department.

**Herbarium specimens examined**:

Dediapada: VKS 35, 1528, 1574, 1577

Sagbara: VKS 1691, 1801, 1882, 1928

**World distribution**: East tropical Africa, India, Ceylon and Burma.

**MICROCOS Linn.**


This plant is included on the authority of Shah (1967) who collected it from Ghatoli on 27-12-1965. It is also entered in his field diary; but there are no specimens of it in herbarium of the Botany Department of Sardar Patel University.

**Fruits**: December

**Herbarium specimen examined**:

Ghatoli: Shah 11581 (from field diary 27-12-1965)

**World distribution**: India, Ceylon, Burma, Malaya and China.
TRIUMFETTA Linn.

Key to the species

1. Leaves nearly orbicular not lobed, greyish or whitish tomentose beneath; stamens 15-25; spines on the fruit pubescent, dilated at base ........................................ rotunolifolia

1. Leaves broadly ovate-lanceolate, at least the lower 3-5-lobed, not grey or whitish tomentose beneath; stamens 5-15; spines on the fruit not pubescent, or dilated at base:

2. Spines ciliate on one side only .............. pentandra

2. Spines glabrous ............................. rhomboidea

Triumfetta neglecta Wt. & Arn. Prodr. 1:75, 1834; FBI 1:396.

Suffruticose herbs, 30-75 cm tall, stem dichotomously branched from the middle; branches spreading, appressed hairy. Leaves 2.4-6 x 2-7 cm long, upper ones ovate-lanceolate, entire, subsessile, lower broadly ovate or ovate-suborbicular, serrate, stellately hairy on both surfaces, densely so beneath, acuminate at apex, truncate, rounded or tapering at base; petiole 1-4.5 cm long, pubescent, grooved. Flowers bright yellow in extra-axillary clusters, culminating into interrupted 3-45 cm long, terminal racemes. Capsule 4-6 mm across, oblong, brown, spines brownish yellow, polished, slightly hooked at tip.
Common scattered or subgregarious, in open ground along road sides and paths in the forest. The plant is quite conspicuous when in full bloom by its masses of bright yellow flowers.

**Flowers** : September

**Fruits** : September - October

**Herbarium specimens examined** :

Sagbara : VKS 165, 2112, 2153

Dediapada : VKS 2153A

**World distribution** : India, Ceylon, Abyssinia and Senegal.

**Triumfetta rhomboidea** Jacq. Enum. Pl. Carib. 22, 1760;
FBI 1:395; Cooke 1:156; Santapau 26 & Pl. Saurashtra 73


**Triumfetta bartramia** Linn. Syst (ed. 10) 1044, 1759 (nom. illegit.); Blatter in JBNHS 34:890, 1930.

**Undershrubs**, 40-90 cm tall, dichotomously branched; stem and branches appressedly pubescent, densely so in younger parts. **Leaves** 2.5-7 x 1.5-5 cm, upper ones linear-lanceolate, sessile lower broadly ovate or ovate-rhomboid, entire or shallowly to deeply 3-lobed, stellately hairy on both surfaces, densely so beneath, coarsely serrate, acute or acuminate at apex, rounded or subacute at base; petioles 1.5-5 cm long, appressed pubescent. **Flowers** 8-10 mm across, bright yellow, in fasciculate cymes, leaf opposed and in 20-35 cm long,
interrupted racemes at ends of branches. *Fruits* indehiscent, 5-6 mm across, ellipsoid-oblance; spines shining yellowish-brown, hooked at tip.

*Fairly common, scattered or in patches in waste lands along road sides and paths in the forests in later half of monsoon.*

**Flowers**: September

**Fruits**: September - October

**Herbarium specimens examined**:

Dediapada: VKS 260, 2856A, 2867, 3065

Sagbaria: VKS 2120, 2142, 2492

**World distribution**: Throughout the tropics.


**Undershrubs**, 45-90 cm tall; stem and branches reddish-purple, stellately hairy, densely so in younger parts. *Leaves* 2-3.8 x 1-3.5 cm, obovate or orbicular, irregularly toothed, obtuse or rotund at apex, shallowly rounded and somewhat unequal sided at base; petioles 1-2.5 cm long, pilose. *Flowers* 0.7-1 cm across, bright yellow, in dense, fascicled cymes forming interrupted, 20-40 cm long, terminal racemes. *Fruits* 5-7 mm across, globose, studded with hooked, pubescent spines.

*Common throughout the area, scattered in open waste lands along road sides; occasionally also been in the undergrowth of forests.*
Flowers and fruits: July - October

Herbarium specimens examined:
Dediapada: VKS 14, 173, 301

World distribution: India and Burma.
BALSAMINACEAE


dominant


annual herbs, 30-60 cm tall; stem simple or sparingly branched, pubescent, at length glabrous, reddish-purple, striate. Leaves 5.5-12 x 1.5-3 cm long, lanceolate or elliptic-lanceolate, glabrous, deeply serrate, serratures gland tipped, acute or shortly acuminate at apex, decurrent into petiole at base; petioles 0.8-3.2 cm long, with conspicuous black glands often in pairs. Flowers 2-2.5 cm across, pale to deep purple or violet, axillary, solitary or 2-6 together; spur 1.5-2.5 cm long, slender, curved; pedicel 0.8-1.5 cm long. Capsules 0.5-1.2 cm long, ellipsoid or ovoid, apiculate, tomentose.

Occasional in open grasslands and dense undergrowth of the forests on hilly slopes. Clusters of deep purple flowers render the plant conspicuous.

**Flowers**: August - September

**Fruits**: September - October

**Herbarium specimens examined**:

Dediapada: VKS 137, 208, 2158, 2979, 3015, 3071

Sagbara: VKS 2132, 2535

**World distribution**: India, Ceylon, Cochin-China, Malaya, Philippines.

**Critical notes**: Following Hooker f. in Fl. Brit. India 1:454. The plants from the present area fit with var. coccinea Hk.f. which is a common form in Bombay Presidency (cf. Cooke 1:185). Santapau also remarks for this variety "This is about the commonest of the varieties of this species".

Small herbs, erect, 10-20 cm tall. Leaves 3.5-9 cm long; leaflets 7-10 pairs, 7-8 x 3-4 mm long, sessile, glabrous, obtuse and minutely apiculate at apex, obliquely rounded at base; petioles 0.5-2.5 cm long, sparsely hairy or glabrous. Flowers 3-5 mm across, yellow or reddish-yellow in terminal umbels, on 3-10 cm long, hairy peduncles; Capsules ± 2 mm across, pale brown, glabrous, enclosed in persistent calyx. Seeds minute, reddish brown, glabrous, tuberculate.

Common in open waste lands, grasses and cultivated fields.

Flowers and fruits: August - October

Herbarium specimens examined:
Dediapada: VKS 136, 136A, 3007
Sagbara: VKS 381, 900, 2129, 2220, 2683

World distribution: Tropical Africa, Asia and America.
RUTACEAE

Key to the genera

1. Trees; leaves trifoliolate; rachis not winged
   .......................................................... Aegle

1. Shrubs; leaves unifoliolate; rachis winged
   .......................................................... Citrus

AEGLE Corr.


Deciduous trees, 6-8 m tall, armed with 1-3 cm long, stout thorns; branches spreading often drooping; bark greyish white. Leaflets 4-10.5 x 2-5 cm, ovate-elliptic or lanceolate, glabrous, pellucido-punctate, entire or minutely crenate, acute at apex, tapering at base; petiole 1.5-3 cm long, glabrous; petiolule 0.5-2 cm long. Flowers pale to greenish-white, in axillary and terminal panicles. Fruits 6-10.5 cm across, subglobose, bright green turning yellow yellow when ripe, rind rough.

An occasional tree in the forests, almost leafless at the time of flowering.

Flowers: February - April
Fruits: March - June
Local name: BILY
Herbarium specimens examined:
Dediapada: VKS 1787, 1965, 2051
Sagbara: VKS 417, 1290, 1334

World distribution: According to Kirtikar & Basu (Medicinal Pl. 1:499, 1933) it is wild in the sub-Himalayan tract, Central and Southern India and Burma; often planted in India and Burma.

CITRUS Linn.

Citrus limon (Linn.) Burm. f. Fl. Ind. 173, 1768;

An armed shrub, 1-2.5 m tall; bark pale greenish yellow and rough in older parts, smooth and olivaceous to dark green in younger. Leaflets 2-5.5 x 0.5-3.5 cm, elliptic-ovate or ovate-lanceolate, crenate, obtuse or subacute at apex, subacute or subrotund at base; petiole 1.2-2.3 cm long, wings 0.6-2 cm across, glabrous, dark green. Flowers white, axillary, solitary or 2-3 fascicled, fragrant. Berries 3-5 cm across, globose, rind leathery yellow when ripe.

Planted at some places at Sagbara for the fruits which are locally used in curries and pickles.
Flowers and fruits: Throughout the year

Local name: LIMBOO

Herbarium specimen examined:

Sagbara: VKS 2604

World distribution: According to Wealth of India, it is a native of North-West regions of India ascending to 4000'. It is cultivated in home gardens and small sized orchards in U.P; Bombay, Madras and Mysore.
AILANTHUS Desf.


4-6 m tall trees; bark pale greenish-white to light ash coloured, smooth. Leaves 30-80 cm long; leaflets 5-12 pairs, crowded at the top of branches, 9-15 x 4-8 cm, upper leaflets subopposite or opposite, lower ones alternate, all ovate-lanceolate, tomentose when young, glabrous at length, coarsely toothed, acuminate at apex, truncate or rounded and strongly unequal sided at base, petiolules 0.2-2 cm long. Flowers and fruits not seen.

Rare, only few young plants seen along river banks at Sagbara.

Herbarium specimens examined:

Sagbara: VKS 2260, 2634

World distribution: According to Nooteboom, the plant is distributed in South, Central and N.W. India (in the last probably introduced) and Ceylon.
BURSERACEAE

Key to the genera

1. Bark pale white or tinged pink, smooth;
   leaflets not with insect galls; drupes
   trigonous with heart shaped pyrences ....... Boswellia

1. Bark grey to dark blackish-brown, rough,
   irregularly fissured; leaflets often with
   insect galls drupes ovoid or subglobose .. Garuga

**BOSWELLIA** Roxb.

Boswellia serrata Roxb. ex Colebr. in Asiat. Res. 9:379,
t. 5, 1807; FBI 1:528; Cooke 1:210; Wealth of India 1:208,
1948; Santapau, Fl. Saurashtra 85.

Middle sized, deciduous trees 4-6 m tall, often with
pendent branches. Leaves 15-20 cm long; leaflets 2.5-6 x 0.8 -
2.8 cm, opposite, ovate or ovate-lanceolate, pubescent above,
densely so beneath, serrate or crenate, acute or subacute at
apex, rounded and inequilateral at base. Flowers white, in
axillary, racemes at end of leafless branches.

A rare tree in the area studied, seen at Sagbara. A
distinct plant by its bark and crowded leaves at ends of
branches.

*Flowers and fruits*: December

*Local name*: DUBARHA

*Herbarium specimen examined*:

Sagbara: VKS 867
World distribution: India (Base of Himalaya West to the Sutlej, Raputana, Chota Nagpur, Central and South India).

**GARUGA** Roxb.

*Garuga pinnata* Roxb. Pl. Cor. 3:5, t. 208, 1819; Wt. Icon. t. 1594; FBI 1:528; Cooke 1:211; Wealth of India 4:117, Pl. 7, t. 55, 1956; Santapau 45 & Pl. Saurashtra 85; Shah 673.

Deciduous trees, 5-10 m tall; Leaves 15-45 cm long; leaflets 5-10 x 2.5-4.8 cm, subsessile, opposite or nearly so, elliptic-oblong or broadly ovate, glabrous above, pubescent beneath, subcoriaceous, serrate or crenate, acute or acuminate at apex, inequilateral and rounded at base; rachis striate, at times purplish on lower side, hairy in younger parts. Flowers 3-6 mm across, white or creamy white and tomentose outside, deep yellow within, in 6-15 cm long panicles at ends of leafless branches. Drupes 1-1.5 cm across, yellow.

Common. The plant is quite conspicuous by the masses of white or creamy white flowers at the ends of leafless branches. The leaf galls are typical of this plant.

Flowers: February - March

Fruits: March - April

Local name: KAKAR

Herbarium specimens examined:

Dediapada: VKS 97, 107, 703, 1546, 1550, 1612

Sagbara: VKS 930, 932

World distribution: Throughout India, Malaya and Philippines.
MELIACEAE

Key to the genera

1. Leaflets entire; staminal tube cupular; fruit a capsule with woody valves; seeds winged

Soymida

1. Leaflets serrate or crenate; staminal tube cylindric; fruit a drupe; seeds not winged:

2. Leaves pinnate; flowers white; drupe

Azadirachta

1-celled, 1-seeded

2. Leaves bipinnate; flowers lilac; drupes usually 5-celled, each 5-seeded (one in each cell), or fewer by abortion

Melia

AZADIRACHTA A. Juss.


Trees, 5-15 m tall; bark dark brown, rough, longitudinally fissured. Leaves 10-28 cm long, crowded at ends of branches; leaflets 7-15, 3-9 x 1-2.8 cm, subsessile, subopposite or alternate, falcate, ovate-lanceolate, glabrous, acuminate at apex, obliquely acute at base. Flowers 1-1.5 cm across, creamy-white, in 10-12 cm long, lax, terminal and axillary panicles.
Drupes 0.8-2 cm long, ellipsoid, bright yellow, smooth.

Planted as an avenue tree along road sides and a shade tree near houses; also wild in forests, self sown.

Flowers and fruits: February - April

Local name: NIMBARA

Herbarium specimens examined:
Dediapada: VKS 707
Sagbara: VKS 1448, 1662

Economic uses: The plant is economically important for its enormous uses. Apart from its value as an avenue or a shade tree, its bark, leaves and fruits are medicinally useful having astringent properties. The young twigs are used as "tooth brushes", in many drier parts of India as the bark strengthens the gums. The smoke produced by burning leaves is an efficient repelent of mosquitoes. The inhaling of vapour produced by boiling leaves in water is also an efficient treatment for cold.

World distribution: A common tree throughout the drier parts of India, Burma and Ceylon, cultivated as a shade tree or wild in forests.

MELIA Linn.

1. Flowers lilac; anthers equalling the teeth of staminal tube; cultivated................. azedarach
1. Flowers white or creamy-white; anthers exceeding the teeth of staminal tube; wild.. composita

Trees, 6-10 m tall; bark greyish-dark brown, exfoliating in thick rectangular flakes. Leaves 1-3 pinnate, 20-45 cm long; leaflets 3-10, 1.5-3.5 x 0.7-2.3 cm, ovate or lanceolate, obtusely serrate, glabrous, subsessile, acuminate at apex, somewhat inequilateral at base. Flowers 5-7 mm across, fragrant, lilac, in 7-12 cm long, axillary panicles. Drupes 0.7-1.3 cm across, ellipsoid-globose, yellow.

Rare, planted in a private compound at Navagam village.

Flowers: September - November
Fruits: April - May
Local name: BAKAN-NIMB
Herbarium specimens examined:
Dediapada: VKS 118, 194, 1183
Sagbara: VKS 1807, 1807A

World distribution: According to Wealth of India, the plant is a native of West Asia and is now naturalized throughout the warm countries. In India it is often cultivated in the plains as an ornamental tree.

Melia composita Willd. Sp. Pl. 2:559, 1799; Cooke 1:218; Wealth of India 6:325, t. 112, 1962; Melia dubia Hiern. in FBI 1:545, 1875 (non Cav. 1789).

Trees, 10-12 m tall; bark pale to dark brown, rough, exfoliating in thick flakes; young branches densely
stellately hairy, older ones glabrous. Leaves 30-65 cm long, bi-pinnate; pinnae 3-5 pairs; leaflets 5-11, 4-8 x 2-3.5 cm, ovate, oblong-lanceolate or elliptic, sparingly stellate hairy on both surfaces when young, glabrous at length, crenulate, acuminate at apex, acute or rounded and more or less oblique at base. Flowers 0.5-0.8 cm across, creamy white, in compact, terminal panicles; panicles densely hairy; hairs white, stellate. Fruits 2.1-2.8 cm long, ovoid, subglobose or ellipsoid, yellowish, smooth.

Rare, seen only once on 30-4-1968 at Piplad.

Flowers and fruits: March

Local name: MITHA-NIMBARA

Herbarium specimen examined:
Piplad (Dediapada): VKS 1618

World distribution: India (E Himalaya upto 6000\', North Bengal, Upper Assam, Khasia hills, hills of Oriasa, N. Circars, Deccan and Western Ghats), Ceylon, Malay Peninsula extending to China and Australia.

SOYMDA A. Juss.


Swietenia febrifuga Roxb. Cor. Pl. 1:18, t. 17, 1795.
Deciduous trees, 8-15 m tall; bark rough, peeling off in large strips or scales. Leaves crowded at ends of branches, 20-50 cm long; leaflets 5-16 x 2-12 cm long, sessile or subsessile, elliptic or oblong, glabrous, entire, acuminate at apex, obliquely rounded at base. Flowers greenish white, in 15-25 cm long, axillary and terminal panicles. Capsules 5-7.5 x 2.5 - 4 cm, woody, smooth, obovoid, blackish-brown when dry, 5-celled. Seeds winged, light brown.

Rare in the forests of Sagbara.

**Flowers** : March - April  
**Fruits** : March - June

**Herbarium specimens examined** :
Sagbara : VKS 812, 1427  
**Local name** : ROHAN

**World distribution** : India (dry forests of Western Peninsula, extending northwards to Merwar, Mirzapur hills and Chota Nagpur) and Ceylon.

**Critical notes** : The specific epithet "febrifuga" probably refers to the bitter bark used in Ayurvedic medicine.
CELASTRACEAE

Key to the genera

1. Climbing shrubs .............................................. Celastrus
2. Trees; .................................................. Elaeodendron

CELASTRUS Linn.


A large, woody climber; stem and branches pale brown, and warty lenticillate in older parts, pubescent smooth and olivaceous green in younger ones. Leaves 3-14 x 2-7 cm, broadly ovate, elliptic, ovate-oblong, obovate or almost orbicular, glabrous; minutely serrate, acute, abruptly and shortly acuminate or obtuse at apex, rounded or subacute at base.

A rare plant seen on small trees along river banks.

Flowers and/or fruits: Not seen.

Herbarium specimen examined:

Sagbara: Shah 14117

World distribution: India, Ceylon, Burma, Siam, Indo-China, S. China and throughout Malaysia (except Borneo) to Australia and New Caledonia.
ELAEODENDRON Jacq. f.


A small to medium sized tree, 5-8 m tall; bark brown, rough; branches glabrous. Leaves 4-12 x 2.3-8 cm, subcoriaceous, ovate-oblong or elliptic-oblong, glabrous, shining and glaucous above, dull and pale-greenish beneath, serrate, acute or obtuse at apex, rounded at base; petioles 0.4-1 cm long, terete, glabrous. Flowers small, numerous, in axillary or extra-axillary, paniculate cymes. Fruits obovoid, apiculate.

Occasional along roads and on hills at Sagbara, rare at Dediapada.

Flowers and fruits: September
Local name: ALUN or BUJ-JHAR

Herbarium specimens examined:
Dediapada: VKS 1378
Sagbara: VKS 840, 893, 1373, 2078, 2261, 2534

World distribution: Throughout the drier parts of India, Ceylon and Malaya.
RHAMNACEAE

Key to the genera

1. Unarmed lianas; flowers in terminal panicles; fruit a winged nut ............... Ventilago

1. Armed trees or shrubs; flowers in axillary fascicled cymes; fruit a drupe ............. Zizyphus

VENTILAGO Gaertn.


An extensive, woody climber; with drooping, striate, pubescent branches; young branches glaucous to dark green, flexuose. Leaves 6-16 x 3.5-8.5 cm, ovate-elliptic or ovate-oblong, glabrous or minutely pubescent, crenato-serrate, acute or obtuse at apex, rounded or oblique at base; petioles 0.4-1 cm long, stout, pubescent. Flowers not seen. Fruits 0.3-0.6 cm long, globose, pubescent with a girt about the middle, winged; wings 3-5.5 cm long, minutely bifid at tip.

One of the largest climbers in the area, occasionally found on tall trees.
Fruits: December - March

Herbarium specimens examined:
Sagbara: VKS 859, 1586, 1792
Kokam: Shah 11613

World distribution: Throughout the hotter parts of India, Bhutan, Nepal, Burma and Java.

ZIZYPHUS Juss.

Key to the species

1. Small or middle sized trees:
   2. Leaves whitish-tomentose beneath ........ mauritiana
   2. Leaves minutely pubescent beneath ........ xylopyra

1. Shrubs, often bushy:
   3. Leaves whitish-tomentose beneath........... nummularia
   3. Leaves glabrous on both surfaces ........... horrida

1. Scandent shrubs ................................ oenoplia

Zizyphus horrida Roth, Nov. Pl. Sp. 159, 1821; FBI 1:636; Cooke 1:258; Santapau 42.

Small shrubs; 1.5-2 m tall; branches villous, slender, divaricate; spines brown from broad triangular bases, geminate, one hooked, 4-6 mm long, other straight 7-10 mm long. Leaves 2-3.8 x 1.2-2.5 cm, broadly elliptic or suborbicular, often mucronate, glabrescent when young, coarsely toothed, acute or obtuse at apex, rounded at base. Flowers and fruits not seen.
Rare, only two plants seen in waste places along road sides at Dediapada only.

**Herbarium specimens examined:**
Dediapada: **VKS 152, 1953**

**World distribution:** India (Western Peninsula).


An armed tree, 4-6 m tall; bark rough, irregularly fissured; young branches softly pubescent, flexuous. **Leaves** 3-7 x 1.5-2.5 cm, ovate-elliptic, rounded or suborbicular, glabrous above, whitish or buff tomentose beneath, 3-nerved, serrulate, obtuse or subacute at apex, somewhat obliquely rounded at base; petioles 5-12 mm long, pubescent. **Flowers** small, creamy-yellow, in axillary fascicles. **Drupe** 1-2.5 cm long, oblong, globose or ellipsoid.

Fairly common in waste lands along road sides. *Cuscuta chinensis* Lamk. has been found profusely growing on this tree.

**Flowers:** September - October

**Fruits:** November - February

**Local name:** BOR

**Local use:** Fruits are eaten.
Herbarium specimens examined:
Dediapada: VKS 1196
Sagbara: VKS 628, 1432, 2616

World distribution: Throughout India and tropical Africa, Afghanistan, Malaya, China and Australia.


A small, thorny, divaricately branched shrub, 1.5-2 m tall, bark smooth, pale brown, glistening at least in young branches. Leaves 0.5-1.2 x 0.7-1 cm, ovate oblong or suborbicular, rounded at both ends, thinly appressedly hairy above, whitish-tomentose beneath, strongly 3-nerved; stipular spines usually in pairs, one often straight, other hooked. Flowers and fruits not seen.

Occasional in waste lands along cultivated fields and road sides, scattered or in loose patches.

Local name: BORIYA
Local use: Dried up plants are used for fencing the cultivated fields.

Herbarium specimen examined:
Sagbara: VKS 1305

World distribution: Persia, Baluchistan, Pakistan and in dry arid parts of India (Punjab and Rajasthan to Central and South India).

Scandent shrubs 1-5 m tall; young branches rusty-tomentose; spines hooked, solitary. Leaves 2.5-3 x 1.5-2.2 cm, distichous, ovate, ovate-rhomboid or ovate-elliptic, denticulate, minutely pubescent above except on veins, densely appressedly silky brown hairy beneath, acute or acuminate at apex, obliquely rounded at base, 3-nerved. Flowers and fruits not seen.

Rare in waste places. Collected on 22-6-1968.

Herbarium specimens examined:
Dediapada: VKS 1953, 1953B

World distribution: Throughout the hotter parts of India, from Punjab and N.W. Himalaya to Assam and Southwards to Ceylon and Malay Peninsula extending to Australia.

Zizyphus xylopyra (Retz.) Willd. Sp. Pl. 1:1104; 1798; FBI 1:634; Cooke 1:258; Santapau, Fl. Saurashtra 1:94. Rhamnus xylophorus Retz. Obs. 2:11, 1783.

Large shrubs or small trees, 3-5 m tall; bark brown, rough; young branches flexuous, thinly tomentose. Leaves 3-7 x 2.2-5 cm, broadly elliptic, elliptic-oblung, or suborbicular, serrate, prominently 3-nerved, hairy above, densely so beneath, acute or obtuse at apex, rounded or subcordate and inequilateral at base; petiole 0.6-1.2 cm long, pubescent. Flowers 0.3-0.5 cm across, greenish yellow,
in dense, axillary, pedunculate cymes. Drupes 1.4-1.8 cm across, globose.

Common in the forests.

Flowers: April - June

Fruits: June - September

Local name: GHAT-BOR

Herbarium specimens examined:

Dediapada: VKS 1595, 1785, 1940, 1986

Ghatoli: VKS 1926, 2727; Shah 11480, 11493

Sagbara: VKS 1843, 2029, 2068

World distribution: In India from sub Himalayan tract Westward to Jumna, Rajputana, Bihar, Central Provinces and South extending to Ceylon.
VITACEAE

Key to the genera

1. Flowers polygamonoecious; petals 4-5, spreading or recurved; style short, conical... Ampepocissus
1. Flowers hermaphrodite; petals 4; style subulate, slender:

2. Berry 2-4 seeded; seeds hemispheric with deep pits, oblong-angular or pyriform ............... Cayratia
2. Berry usually 1-seeded; seeds ellipsoid or pyriform, smooth or pitted ......... Cissus


An extensive, woody climber; stem reddish-purple, striate, glabrous; internodes 6-20 cm long. Leaves 5-24 x 5.5-25 cm, broadly ovate or almost orbicular, entire or shallowly to deeply 5-6 lobed, sharply and irregularly toothed, tomentose beneath when young, at length glabrous, pale green above, deep vinaceous purple beneath, acuminate at apex, cordate at base; petioles 0.4-1.2 cm long. Flowers small, reddish-purple, in 3.5-6.5 cm long, compact, ovoid, thyrsoid cymes. Berries 0.4-0.8 cm across, deep purple to almost black.
Occasional in the forests on small trees and low shrubs, and on hedges of Euphorbia neriifolia Linn.

Flowers and fruits: July - September

Herbarium specimens examined:
Dediapada: VKS 23, 175, 1901, 1939, 1960, 2062, 2094, 2881.

World distribution: India, Ceylon and Burma.

Critical notes: The genus Vitis in most of our India Floras is a heterogenous group consisting of several genera of which Ampelocissus, Cayratia and Cissus occur in the present area. Planchon (DC. Mon. Phan. 1887) is of the opinion that true Vitis does not occur in India except Vitis vinifera found under cultivation.

CAYRATIA Juss. (Nom. Cons.)


A slender, herbaceous climber; stem soft, much branched, glaucous green, striate, thinly pubescent. Root nodules 2-4.5 cm long. Leaves trifoliolate; leaflets 2.5-7 x 2-6.5 cm, glaucous-green, ovate, elliptic or obovate, thinly pubescent, crenate, acute or obtuse at apex, rounded or
tapering at base. Flowers white with a purplish tinge, in divaricately branched, leaf-opposed pubescent cymes. Ripe berries 0.3-0.7 cm across, globose, deep purple to almost black.

Common on tree trunks in open forests and on hedges along cultivated fields.

**Flowers and fruits**: August - November

**Herbarium specimens examined**:

Dediapada: VKS 176, 190, 192, 1912, 2744, 2800, 2811, 3056, 3076

Sagbara: VKS 2104, 2284, 2462, 2605

**World distribution**: Baluchistan, India, Ceylon, through Malay Peninsula and Java extending to New Caledonia.

**CISSUS** Linn.


A huge climber; young stem and branches vinaceous-purple, covered with appressed rufous-yellow tomentum, older ones woody, with fissured corky bark; tendrils multifid and tipped with flattened discs. Leaves 5-25 x 4-26 cm, broadly ovate or orbicular, pubescent above, silky tomentose beneath, serrate, acute, acuminate or obtuse at apex, deeply cordate at base;
petioles 3-20 cm long, glabrous. Flowers and fruits not seen.

Occasional, trailing in the undergrowth of the forest or climbing on tree trunks.

Herbarium specimens examined:
Ghatoli: VKS 1932A
Sagbara: VKS 382, 383

World distribution: India, Ceylon and Burma
LEEAC EAE

LEEA Linn.

Key to the species

1. Plants suffruticose; leaves 2-3 pinnate, glabrous beneath .................. indica

1. Plants herbaceous; leaves simple, large
   with mealy pubescens beneath ............... macrophylla


An undershrub, 1-1.2 m tall; branches numerous, straight, spreading sometimes tinged purple. Leaves 30-45 cm long; rachis glabrous, striate; leaflets 3-8, 6-21 x 4-11 cm, elliptic-oblong or ovate-oblong, glabrous, coarsely and irregularly serrate with 7-12 pairs of prominent nerves, acute or acuminate at apex, rounded, cuneate or subcordate at base; petiolules 1.5-5 cm long. Flowers small, pink or almost white, in large corymbose cymes. Ripe berries 0.6-0.8 cm across, depressed, globose, 4-6 lobed, deep purple to almost black.

Common in the dense undergrowth of the forests.
Flowers: July - September

Fruits: September

Herbarium specimens examined:
Dediapada: VKS 2005, 2063, 2871
Sagbara: VKS 1844, 1846

World distribution: Tropical Africa, India, Ceylon, Malay Islands, China, Philippines and N. Australia.

Critical notes: In most of our Indian floras the plant is described 4'-10' (1-3.2 m) tall with greenish white or white flowers; in the present area it is only upto 1.5 m tall with pink or white flowers. Even in the same inflorescence several flowers with inter grading colours may be seen between the pink and pure white flowers.

Leea macrophylla Roxb. ex Hornem.Hort. Hafn. 1:231, 1813; = = === == = = = = = = = = = = = = = = = =
Roxb. Fl. Ind. (Carey ed.) 1:654, 1832; FBI 1:664 (excl. syn. L. latifolia Wall); Cooke 1:276.

Stout herbs, 40-100 cm tall; stem greenish-yellow, simple or sparingly branched, pubescent, furrowed, 2-5 cm in diameter, fistular. Leaves 20-70 x 15-48 cm, broadly ovate or suborbicular, glabrous and dark green above, pubescent and galucous-green beneath, coarsely serrate, acute or sub-acute at apex, cordate at base; nerves 8-10 pairs, prominent beneath; petioles 2-8 cm long, stout pubescent, furrowed. Flowers small, white, in leaf opposed, paniculate cymes.
Common among grasses, in shaded spots and in the undergrowth of forests. The leaves of this species are largest in the area.

**Flowers**: August - September

**Fruits**: October

**Herbarium specimens examined**:

Dediapada: VKS 78, 103
Sagbara: VKS 2403, 2425

**World distribution**: Throughout the hotter parts of India, lower Burma, Siam and Laos.
SAPINDACEAE

Key to the genera

1. Climbing herbs with tendrils and ternate leaves; disc unilateral. Capsule inflated 3-celled; aril small, heart shaped ....... Cardiospermum

1. Erect trees; leaves pinnate; stamens inside the disc or unilateral; capsule not as above; aril pulpy ......................... Schleichera

**CARDIOSPERMUM** Linn.


Slender *herbs* with wiry, furrowed hairy stems and branches. *Leaves* alternate, biternate; leaf segments 1.5-6.5 x 0.5-3.7 cm, lanceolate or ovate-lanceolate, coarsely dentate, sparsely pubescent, membranous, pale to bright green, acute at apex, narrowed at base. *Flowers* white, small, in terminal cymes on axillary, forked tendrils. *Capsules* 1-2 cm across, obcordate, glabrous. *Seeds* black.

Occasional, climbing on hedges and low shrubs, and trailing in the undergrowth of the forests.

*Flowers and fruits* : September - December

*Herbarium specimens examined* :

Sagbara : VKS 2121, 2151
World distribution: More or less throughout the tropical and sub-tropical regions of the world.

Critical notes: In the family Sapindaceae where tree habit is predominant, this tiny plant is an exception. The stiff, spirally coiled tendrils and bladdery fruits are typical.

**SCHLEICHERA** Willd.


**Trees,** 10-15 m tall; trunk straight, bark smooth, grey, Leaves abruptly pinnate; rachis terete, pubescent; leaflets 3-4 pairs, 4-25 x 3-10 cm, elliptic, elliptic-lanceolate or elliptic-oblong, glabrous, obtuse at apex, rounded or subacute at base, lower most leaflets smaller than upper ones. Flowers not seen. Fruits reddish brown, 2-3 cm across, oblong, pointed, often echinate with stout, blunt prickles. Seeds 1 or 2 enclosed in pulpy edible aril.

Occasional. The tree is quite conspicuous by the bright reddish-purple young foliage.

**Fruits:** May - June

**Local name:** KUSIM
Local use: The oil extracted from the seeds is said to be used in the treatment of cough, cold and headache by tribal people.

Herbarium specimen examined:

Sagbara: VKS 1838

World distribution: India (Central and Western India) Ceylon, Burma and Cochin-China.
Key to the genera

1. Plants evergreen; leaves simple; bark blackish brown, longitudinally fissured.
2. Drupes obliquely lenticular 0.9-1.5 cm across; carpels 4-6, free, stamens 8-10. *Buchanania*

2. Drupes fleshy, obliquely pyriform or subovoid, 6-15 cm across; carpel one; fertile stamen 1 only. *Mangifera*

1. Plants deciduous; leaves compound at ends of branches; bark grey-white or ash-coloured, longitudinally fissured. *Lannea*

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*Buchanania* Spreng.


8-12 m tall trees, young branches covered with silky brown hairs. Leaves 9-27 x 4.5-14 cm, broadly oblong or oblong-elliptic, thickly coriaceous, glabrous above, sparingly hairy or glabrescent and 17-22 nerved beneath, obtuse or emarginate at apex, rounded, subcordate or subacute at base; petiole 0.5-2 cm long. Flowers not seen. Drupes chestnut-brown, smooth.

A rare tree, only found at Sagbara.
Fruits: March - April

Local name: CHAROLI

Economic use: This is an important plant commercially as its seeds are used as condiment in sweets.

Herbarium specimens examined:

Sagbara: VKS 1463, 1705


LANNEA A. Rich (Nom. Cons.)


A deciduous tree, 6-9 m tall; Leaves 15-35 cm long, imparipinnate, crowded at ends of branches; leaflets 7-10 x 3.5-6 cm, ovate, ovate-oblong or elliptic-oblong, glabrous, sessile, acute at apex, rounded or subacute at base.

Panicles 10-25 cm long, erect or pendulous at ends of leafless branches. Flowers greenish-yellow, with purple tipped petals;
peduncles at first yellow, then reddish yellow and finally reddish-purple. Drupes 0.6-1.5 cm long, oblong or subreniform, ripe ones pale to deep reddish brown, smooth.

Common; the bark is distinctive of this plant.

**Flowers**: December - January
**Fruits**: February - March
**Local name**: MADAL or MADHOL

**Herbarium specimens examined**:
- **Dediapada**: VKS 1421, 1438, 1762
- **Sagbara**: VKS 624, 1327, 1333, 1446

**World distribution**: Baluchistan, India, Ceylon, Burma, Andaman Islands, Malaya, Philippines.

**MANGIFERA** Linn.


An evergreen tree, 6-10 m tall; branches spreading.

**Leaves**: 8-25 x 2-5 cm, crowded at the ends of branches, simple oblong or oblong-lanceolate, glabrous, acute or acuminate at apex, narrowed at base; petioles 2-3.5 cm long. **Flowers** small, greenish-yellow, fragrant, in 10-30 cm long, terminal, erect or drooping panicles.

Planted or selfsown on the outskirts of villages; also wild in dense forests.
Flowers: January - March

Fruits: April - June

Local name: AMBA or KARI

Local use: The ripe fruits are most demanded in hot season; unripe ones are made into pickles.

Herbarium specimens examined:

Dediapada: VKS 589
Sagbara: VKS 912, 1308, 1395

World distribution: Native of India, now cultivated in many tropical parts of the world. Wealth of India (p. 34) remarks that the plant is probably originated in the Assam-Burma - Thailand region where truly wild mango trees are recorded.
Moringa concanensis Nimmo in Grah. Cat. Bombay Pl. 43, 1839; FBI 2:45; Cooke 1:301; Bor, Man. Ind. For. Bot. 151, 1953; Santapau, Fl. Saurashtra 106.

**Trees** 8-10 m tall; trunk straight; bark corky, rough, greyish-brown. **Leaves** 2-pinnate, 30-40 cm long; rachis thickened at base and articulated, with a gland at articulation; leaflets 1.2-4 x 0.5-1 cm, broadly elliptic. dark green above, pale beneath, glabrous, obtuse or retuse at apex, rounded at base. **Flowers** creamy-yellow with red streaks in 20-30 cm long, terminal panicles. **Capsules** 20-40 cm long, pendent, triquetrous, ribbed, many seeded. **Seeds** 3-winged; wings thin, hyaline.

Occasional.

**Flowers** : January - March

**Fruits** : March - April

**Local name** : SARAGVO

**Herbarium specimens examined** :

Dediapada : VKS 500, 1184; Shah 11524, 11525, 14061

Sagbara : VKS 379, 958, 960, 1521, 1806

**World distribution** : Baluchistan, Sind, India (Rajasthan, Gujarat, Kokam).
**PAPILIONACEAE**

Key to the genera

1. Plants erect, suberect or diffuse, but not climbing or twining:

2. Trees:

3. Leaves 3-foliolate:

4. Flowers orange-red or salmon coloured, 4-5 cm long; pods 7.5-17 x 3-4.5 cm, orange brown coloured, at length straw coloured; seed 1 ...................... **Butea p.p.**

4. Flowers white with purple tinge, bright purple or lilac, 0.9-1.2 cm long; pods 4-6 x 0.8-1.2 cm, pale brown at length; seeds 1-3 ...................... **Ougeinia**

3. Leaves 5 or more-foliolate:

5. Flowers white-pink or purple; calyx reddish brown; pods 3.5-5.5 x 1.5-2.3 cm, woody ...................... **Pongamia**

5. Flowers white, creamy white to pale yellow, if pale bluish purple, then Calyx not as above; pods firm, thin, strap shaped, never woody ...................... **Dalbergia p.p.**

2. Shrubs:

6. Leaves 3-foliolate; flowers bright yellow; pods torulose, turgid; cultivated ...................... **Cajanus**

6. Leaves 5-13 or more-foliolate:
7. Leaflets 20-45 pairs; flowers pale yellow, spotted purple on the vexillum outside; stem prickly, sometimes reddish purple ................................... Sesbania

7. Leaves unifoliolate; flowers yellow enclosed within foliaceous bracts ........ Moghania

2. Herbs or undershrubs:

8. Flowers creamy yellow, bright yellow or orange-red:

9. Leaves mostly unifoliolate; if trifoliolate then keel not spiral (cf. C. orixensis; C. medicaginea); pods usually turgid .............................................. Crotalaria

9. Leaves bifoliolate; bracts foliaceous, punctate; joints of pods not turgid, softly echinate ......................... Zornia

9. Leaves trifoliolate; pods linear or orbicular:

10. Plants usually erect, slender; flowers in racemes; keel not spiral .... Melilotus


9. Leaves 4 or more foliolate:

11. Leaflet pairs 2; pods turgid, sub-moniliform, straw coloured, reticulate-ly veined developing in the ground; cultivated .............................................. Arachis
11. Leaflet pairs more than 2; fruits not as above:

12. Leaflet pairs 3; racemes short, condensed; vexillum bright yellow to tinged red, usually with 2 purple lines at base; pods included in calyx; joints of pods one above the other .................................. Smithia

12. Leaflet 10-23 pairs; flowers few in lax racemes; vexillum pale to creamy yellow with a red spot within but without purple streaks; pods jointed, straight or falcate, woody, exserted from calyx; joints of pods not as above ............................ Aeschynomene

8. Flowers bright purple, bluish purple or pale blue:

13. Leaflets unifoliolate:

14. Joints of pods compressed, flat .... Desmodium

14. Joints of pods turgid ............... Alysicarpus

13. Leaflets trifoliolate; pods linear, falcate or irregularly curled, 3-6 jointed, 1.5-2 x 0.8-2 cm, hairy; leaflets entire; racemes lax ............... Desmodium p.p.

13. Leaflets 5-7 or more foliolate:

15. Inflorescence leaf opposed .......... Tephrosia

15. Inflorescence not leaf opposed:
16. Plants suberect or diffuse; leaflets 9-17; pods 1-2 cm long, turgid; cultivated ..................... Cicer
16. Plants usually erect; leaflets 3-7; pods not as above:
17. Flowers axillary solitary or 2-3 together, pale to bright blue; pods not jointed ............... Clitoria p.p.
17. Flowers in terminal racemes; corolla bright purple or lilac, 6-8 mm long; pods 3-6 jointed, ring like, placed one above the other ......................... Uraria

8. Flowers red .......................................................... Indigofera

1. Plant usually climbing or twining:
18. Extensive woody climbers; pods flat, rufous pubescent with one seed at base... Butea p.p.
18. Herbaceous climbers; if woody, pod not as above:
19. Flowers yellow or reddish yellow:
20. Leaflets gland-dotted beneath; keel not spirally twisted;
20. Leaflets not gland dotted beneath; keel spirally twisted ............... Phaseolus
21. Corolla enclosed in persistent, scarious calyx; pod oblique 1-seeded ........................... Cylista
21. Corolla exserted; calyx not as above; pods two or more seeded; if one seeded pod almost orbicular:
22. Corolla pale to creamy yellow; pod obliquely constricted between the seeds; seed with a large strophiole ....................... Atylosia
22. Corolla reddish yellow; pod not constricted between the seeds; seeds estrophiolate .............. Rhynchosia
19. Flowers bright purple, bluish-purple, mauve or pale blue, rarely white:
23. Leaves trifoliolate:
24. Pods flat, constricted between seeds; rufous hairy; hairs not irritant ......................... Pueraria
24. Pods not as above:
25. Flowers in pendulous racemes; pods S-shaped, covered with irritant bristles ................. Mucuna
25. Flowers and fruits not as above:
26. Corolla 1.5-3 cm long:
27. Flowers condensed racemes at ends of long peduncles:
28. Turgid, subfalcate ........ Canavalia
28. Pod subterate, not turgid. Vigna
27. Flowers usually in lax racemes ................ Dolichos
26. Corolla 0.4-0.6 cm long ...... Teramnus

23. Leaves with more than 3 foliolate :
   29. Extensive woody climber :
      30. Branches usually spirally twisted forming hooks; leaflets alternate;
          pods flat, one seeded .......... Dalbergia p.p.
      30. Branches not as above; leaflets opposite ......................... Milletia

29. Herbaceous climber:
   31. Leaflets opposite, 10-16 paired;
       flowers lilac, in compact racemes; pods 2.5-3.5 cm long;
       seeds scarlet with a black hilum ................ Abrus

   31. Leaflets alternate, (3-) 5-7;
       flowers blue, bluish-purple or white axillary solitary;
       pods 10-15 cm long, seeds brownish-black ................. Clitoria

**ABRUS** Linn.


A perennial, deciduous twiner; internodes 5-11 cm long, striate. Leaves 5-12 cm long; leaflets 12-18 pairs, 0.8-2.3 x
0.3-0.5 cm, sessile, elliptic-oblong or obovate, glabrous above, sparingly silky hairy beneath, rounded at ends. **Flowers** bright lilac, in 3.5-5 cm long, compact racemes. **Fruiting peduncles** 2.2-3.5 cm long, axillary or terminal, stout. **Pods** 2.5-3.5 x 1.1-4 cm, thinly pubescent, mucronate, thickened on both sutures. **Seeds** subglobose, shining, bright red with a black hilum.

Occasional on hedges along road sides and cultivated fields. The seed is typical of this plant.

**Flowers**: September - October  
**Fruits**: November - January  
**Local use**: Locally the dried leaves are chewed with betel pan.

**Herbarium specimens examined**:  
**Dediapada**: VKS 1093, 2851, 2884, 2892  
**Piplad**: VKS 1085

**World distribution**: More or less throughout the tropics.

**AESCHYNOMENE** Linn. (Nom. Cons.)

**Aeschynomene indica** Linn. Sp. Pl. 713, 1753; FBI 2:151; Cooke 1:363; Santapau, Fl. Saurashtra 144; Shah 673.

A diffuse herb, 40-70 cm tall; stem and branches glabrous, pale green with red glandular dots; branches terete, pubescent in younger parts. **Leaves** 4-10 cm long; leaflets 20-40 pairs, alternate, 0.2-0.8 x ± 0.1 cm, linear-oblong, glabrous, obtuse, apiculate at apex, rounded at base. **Flowers** small, pale creamy
yellow axillary, solitary or few lax racemes; Pods 3-6 cm long, 4-10 jointed, somewhat woody glabrous with red glands, straight or falcate.

Fairly common, in loose or dense patches, in moist soil along margins of ditches and earth bunds of cultivated fields.

Flowers and fruits: August - October

Herbarium specimens examined:
Dediapada: VKS 131, 373, 2749, 2926; Shah 13072
Sagbara: VKS 336, 1015, 2281

World distribution: Tropics of the Old World extending to Japan.

ALYSICARPUS Desv. (Nom. Cons.)

Key to the species

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

2. Pods distinctly 4-gonous ............... tetragonolobus

2. Pods not as above:

3. Pods exserted, not transversely and deeply plicate:

4. Pods neither veined nor rugose, slightly monilifer ............... bupleurifolius

4. Pods monilifer, reticulately veined...

3. Pods included, transversely and deeply plicate ............... scariosus

1. Calyx as long as or shorter than the first joint of the pod:
5. Calyx as long as the first joint of the pod; pods terete or subterete, glabrous, 1.5-2.5 cm long ......................... vaginalis

5. Calyx much shorter than the first joint of the pod; pods flat, hairy, 1-1.7 cm long ................................. procumbens


Annual, prostrate or suberect herbs, 30-60 cm tall; stem and branches glabrous, but for a line of decurrent hairs along one side. *Leaves* 2.5-5 x 0.3-0.7 cm long, linear-lanceolate, glabrous, obtuse or subacute at both ends; petioles 0.2-0.3 cm long. *Flowers* bright reddish-purple, in 5-12 cm long, lax spikes. *Pods* 0.8-1 cm long, transversely ribbed, apiculate.

Rare, a few plants seen among grasses in the first half of monsoon.

*Flowers and fruits* : August - September

*Herbarium specimens examined* :

Dediapada : VKS 199; VKS without number, two sheets.

*World distribution* : India, Ceylon, Burma, Malaya, China, Philippines, Mauritius and Polynesia.


Erect or suberect herbs, 20-50 cm tall; stem and branches pale straw, terete, glabrous but for a line of decurrent white hairs. Leaves 1.3-3.5 x 0.8-2.4 cm, at times variegated with pale yellow blotches, elliptic-oblong or suborbicular, glabrous above, sparingly hairy beneath, obtuse, emerginate or apiculate at apex, rounded at base. Flowers 0.8-1.2 cm long, in 2-7 cm long, axillary and terminal racemes. Standard yellow or orange outside, scarlet within, wings and keel reddish purple. Pods 0.5-0.7 cm long, straw coloured, moniliform, rugose, apiculate included in the calyx.

Common, often in loose patches, in grass fields and along road sides.

Flowers and fruits: September - October

Herbarium specimens examined:
Dediapada: VKS 115, 258, 1108; Shah 11439, 11462, 11515

World distribution: More or less throughout the tropics of the world.
Alysicarpus longifolius (Rottl. ex Spreng.) Wt. & Arn.

Prodr. 233, 1834; FBI 2:159; Cooke 1:370; Santapau 60 & FI. Saurashtra 148. Hedysarum longifolium Rottl. ex Spreng. Syst. 3:319, 1826.

Annual, erect, slender herbs, 70-160 cm tall, stem simple or branched in upper parts, branches ascending. Leaves 1-2.5 x 0.4-1.4 cm, ovate-lanceolate or ovate-oblong, elliptic, glabrous above, appressedly hairy beneath, obtuse or subacute at apex, rounded or subcordate at base. Flowers geminate, in 10-50 cm long, terminal and axillary racemes. Pods 0.6-1.3 cm long, straw coloured, 4-6 jointed, reticulately veined.

Common along road sides as a weed in cultivated fields. This is the tallest species of the genus in the area explored.

Flowers and fruîes: January - March

Herbarium specimens examined:
Dediapada: VKS 602, 709, 745, 768, 1077
Sagbara: VKS 1014, 1022, 1029, 1508

World distribution: Throughout the plains of India and Ceylon.

Prostrate or suberect herbs, often radially spreading; branches slender, hairy. 15-50 cm long. Leaves 1-3.5 x 0.6-3 cm, broadly ovate or suborbicular, membranous, sparingly hairy on both surfaces, rounded and minutely mucronate at apex, rotund at base; petioles 0.2-0.5 cm long, hairy. Flowers bright purple when fresh, pale blue on fading, in 4-8 cm long, few flowered, lax axillary and terminal racemes. Pods 1-1.7 cm long, compressed hairy, pale straw coloured, black on drying, reticulately veined.

Common among grasses and along road sides, often in loose patches.

Flowers and fruits: September - October

Herbarium specimens examined:

Dediapada: VKS 173, 206, 262, 305, 1530, 1547, 2839; Shah 11513

Sagbara: VKS 393, 1751, 1834, 2118, 2249, 2566; Shah 14121.

World distribution: Arabia, Peninsular India, and Malaya.

Alysicarpus tetragonolobus Edgew. in Journ. Asiat. Soc. Beng. 21:169, 1853; FBI 2:159; Cooke 1:372; Santapau, Fl. Saurashtra 150.

Erect or suberect, caespitose herbs, 45-60 cm tall. Leaves 1.3-5 x 0.4-0.6 cm, linear to elliptic-oblong, glabrous above, thinly pubescent beneath, more so on nerves, obtuse or
subacute at apex, rounded or subcordate at base; petioles 0.2-0.3 cm long. Flowers bright reddish-purple, in 2-5 cm long, terminal and axillary racemes. Pods 0.8-1.2 cm long, 2-6 jointed, glabrous, tetragonous.

Common among grasses in open grounds. It is sometimes mistaken for A. bupleurifolius DC, which it resembles in general appearance and shares similar habit but the tetragonous pods are typical of the present species.

Flowers and fruits: September.

Herbarium specimens examined:
Dediapada: VKS 2748
Sagbara: VKS 2668

World distribution: India (Upper gangetic plains, Central and Western India).

Alysicarpus vaginalis (Linn.) DC. Prodr. 2:353, 1825; FBI 2:158; Cooke 1:369; Santapau 60 & Fl. Saurashtra 148.
Hedysarum vaginale Linn. Sp. Pl. 746, 1753.

Annual herbs, prostrate or suberect, 20-50 cm tall.
Leaves 1-5 x 0.7-3.5 cm, broadly ovate, oblong, ovate-lanceolate or almost orbicular, glabrous or sparsely hairy, obtuse or subacute at apex, rounded at base. Flowers bright purple, violet purple or lilac fading to pale blue, paired, in 6-10 cm long, lax or condensed racemes. Pods 1.5-2.5 cm long, glabrous, 6-8 jointed, reticulately veined, black on drying.
One of the commonest species of the genus along paths in the forest and in open grass lands in loose or dense patches.

**Flowers**: July - September

**Fruits**: September - January

**Herbarium specimens examined**:

Dediapada: VKS 170, 198, 297, 302, 611, 619, 1742, 2732.

Sagbara: VKS 421, 947, 1817, 2146, 2315, 2361, 2445, 2449

**World distribution**: Throughout the tropics of the Old World.

**ARACHIS Linn.**


*Diffuse herbs* with 30-40 cm long branches. *Leaflets* 2 pairs, 1.5-5 x 0.8-2.8 cm, obovate, glabrescent, obtuse or subacute and minutely apiculate at apex, subacute or cuneate at base. *Flowers* bright orange, axillary, solitary or in condensed, few flowered racemes; pedicles 1-1.6 cm, ascending in flower, deflexed in fruit. *Pods* 1.5-5 cm long, oblong, constricted between seeds, apiculate, straw coloured with prominent reticulate venation.

Cultivated at some places in Sagbara and Selamba during monsoon.
Flowers and fruits: August - October

Local name: BHOI-SING

Economic use: The plant is the peanut or ground-nut of commerce. The oil extracted from the seeds, is extensively used for cooking. The oil cakes are used as a food for the cattle. The green leaves are a good fodder.

Herbarium specimens examined:

Sagbara: VKS 2614
Selamba: VKS 2694

World distribution: Native of Brazil, cultivated in tropical and subtropical countries of both hemispheres. The plant is said to be introduced in India in the 10th Century and its cultivation has been extended at a phenomenal rate since 1900.

ATYLOSIA Wt. & Arn.

A herbaceous twinner, somewhat woody at base. Leaflets 3, 1.2-5 x 1-2.5 cm, elliptic or ovate-oblong, grey-pubescent above, more so beneath, strongly 3-nerved, acute or subacute at apex, rounded or subacute at base, lateral leaflets sometimes unequal sided; petiole 0.6-2.3 cm long, hairy. Flowers
pale lemon-yellow, small axillary, solitary of few, in 2-6 cm long racemes. **Pods** 2-2.5 x 0.5-0.9 cm, greyish-brown, deeply obliquely constricted between seeds, clothed with brown spreading hairs. **Seeds** black.

Rare, a few plants seen in stony ground among grasses.

**Flowers**: October  
**Fruits**: November

**Herbarium specimens examined**:
Dediapada: VKS 56, 610, 614

**World distribution**: More or less throughout the tropics of the Old World.

**BUTEA** Roxb. (Nom. Cons.)

### Key to the species

1. Trees ................................................................. **monosperma**
1. Climbers ........................................................... **parviflora**

Deciduous trees, 12-15 m tall; bark rough, greyish brown or dark brown, often crooked, young parts densely silky hairy. Leaflets 3, 5-20 x 3-15 cm, coriaceous, glabrous, terminal leaflet largest, broadly obovate, equal sided, on 4-7 cm long, petiolule; lateral ones broadly ovate to ovate-elliptic, unequal sided at base, on 0.6-1 cm long, petiolule. Flowers 4-6 cm long, orange red, showy, in 6-30 cm long, axillary and terminal, compact racemes at ends of leafless branches. Pods 7.5-17 x 3.5-4.5 cm, oblong, flat, fulvous tomentose, pendent. A very conspicuous tree in the forest rightly called the "flame of the forest" by the masses of bright orange red flowers. It is one of the dominant components of the forest.

Flowers : December - March
Fruits : March - May
Local name : KHAKAR
Local use : The flowers are the source of saffron colour, extracted by boiling them in water.

Herbarium specimens examined :
Dediapada : VKS 1142, 1148, 1385, 1417, 1545
Sagbara : VKS 810, 830, 871

World distribution : Throughout the drier parts of India, Burma and Ceylon.

Butea parviflora Roxb. Hort. Beng. 53, 1814 (nomen) &
Fl. Ind. 3:248, 1832; Wt. Icon. t. 210; Bor, Man. Ind. For.
Bot. 93, 1953; Raizada IFR 5(1):9, 1958; Santapau 65.
Spatholobus parviflorus (Roxb.) O. Kuntze, Rev. Gen. Fl. 1:205,

A large woody climber; branches clothed with soft downy pubescence. Leaflets 3, 2-15 x 6-14 cm, obovate-rhomboid or broadly elliptic, coriaceous, obtuse or shortly acuminate at apex, rounded, truncate or subcordate at base; petioles 3-5 cm long, flowers and fruits not seen.

A rare climber in the forests seen growing on tall trees.

Local name: PAHAL-VEL

Herbarium specimens examined:
Dediapada: VKS 264
Ghatoli: VKS 1619

World distribution: India and Burma

Cajanus indicus Spreng. Syst. 3:248, 1826; FBI 2:217; Cooke 1:435.


An erect shrub, 1-2 m tall; stem much branched, deeply striate, obtusely angular and pubescent in younger parts, terete and glabrescent in older; internodes 7-12 cm long. Leaves 4-6.5 cm long, trifoliolate, alternate; rachis
appressedly hairy, channelled. **Leaflets** 3, 3-6.5 x 1-2.2 cm, elliptic or oblong-lanceolate, appressedly hairy, more so beneath, subcoriaceous, acute at ends. **Flowers** 1.2-1.5 cm long, bright yellow, in condensed racemes at ends of axillary branches. **Pods** 2-5 x 0.4-0.8 cm, torulose, tapering at both ends, silky pubescent, greenish at first reddish brown when ripe, 3-6 seeded. **Seeds** almost spherical, fresh ones glaucous to deep green, when dry dirty white with a touch of pink.

Extensively cultivated throughout the area for the seeds which are one of the important pulses of commerce.

**Flowers and fruits** : October - January

**Local name** : TUVER

**Herbarium specimens examined** :

Dediapada : VKS 585, 1138
Sagbara : VKS 1376, 1379

**World distribution** : According to Wealth of India, the plant is probably a native of Africa and it is now grown in almost all the tropical countries of the World, including Africa, America, India, Australia, Hawaii, East and West Indies.

**CANAVALIA DC.** (Nom. Cons.)

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nec D. ensiformis Linn. 1753; Cooke 1:397.

An extensive twiner; stem and branches terete, twisted, pubescent in younger parts, almost glabrous at length; internodes 9-22 cm long. Leaflets 3.4-13 x 3-1.25 cm, ovate, ovate-rhomboid or ovate-orbicular, subcoriaceous, minutely hairy, subacute or abruptly acuminate at apex, rounded at base, lateral leaflets somewhat oblique at base. Flowers 2.4-3 cm long, bright violet or rosy-purple, in 6-15 cm long, compact racemes, on 10-20 cm long, axillary peduncle. Pods 7-15 x 2-3.5 cm, glabrous, turgid, straight or slightly falcate. Seeds ellipsoid, compressed, red with a creamy yellow hilum.

Occasional on hedges along road sides. It is conspicuous when in full bloom by the masses of bright coloured flowers on long stalks above the foliage.

Flowers and fruits: August - September
Herbarium specimens examined:
Sagbara: VKS 2378, 2421, 2657, 2660

World distribution: Native of Old World tropics, widely distributed throughout the tropics (See Piper and Dunn in Kew Bull 1922; 134, 1922).

Critical notes: For the identification of this species I have followed Chatterjee (1949) and Bailey (1960). C. gladiata DC. and C. ensiformis DC. are distinct and the following key is given by Bailey to distinguish the two plants:
Plant erect; hilum half as long as seed ... *ensiformis*
Plant twining; hilum nearly as long as seed ......................... *gladiata*

**CICER** Linn.


Annual herbs, 20-30 cm tall; stem and branches striate, flexuose, densely glandular-pubescent. Leaves 2-3 cm long; leaflets 9-17, 0.4-0.9 x 0.2-0.4 cm, opposite or alternate, ovate, obovate or oblong, glandular pubescent, sharply serrate, obtuse at apex, acute at base, terminal one sometimes tendrillar or minute blunt spines. Flowers small, violet-purple, axillary, solitary. Pods 1-2 cm long, oblong, turgid, 1-2 seeded, glandular-pubescent.

Cultivated at some places as a winter crop.

**Flowers and fruits**: January - March

**Local name**: CHANNA

**Local use**: The raw or boiled green seeds are eaten as vegetables; dried ones constitute an important pulse of commerce.

**Herbarium specimen examined**: Dediapada : VKS 1213
World distribution: According to some authors like Cooke (p. 435), Kirtikar and Basu etc. (Ind. Med. Pl. 1:768, 1933), the plant is probably a native of S.E. Europe, whereas Bailey considers it to be originally from N. Asia. However, in Wealth of India the distribution is given as follows "It is considered to have originated in the track lying between Caucasus and the Himalayas and from there it has spread to S. Europe, Egypt, India and Malaya, also introduced in South America, Australia and parts of Africa".

CLITORIA Linn.

Key to the species

1. Erect annuals; leaflets 3-5; flowers geminate or solitary by abortion; pods 2.5-5 x 0.5-0.7 cm; seeds 4-6, brownish-black .......... biflora

1. Twining or scandent perennials; leaflets 5-7; flower solitary; pods 6-10 x 1-1.4 cm; seeds 6-10, pale brown ................. ternatea

Clitoria biflora Dalz. in Kew Journ. Bot. 2:35, 1850; FBI 2:208; Cooke 1:406; Santapau 70 & Fl. Saurashtra 172.

An erect herb 30-50 cm tall; stem simple or branched, obtusely angular, striate, hairy. Leaflets 2.5-8 x 1.5-4.2 cm, terminal one the largest, the lateral gradually smaller, elliptic-oblong or ovate-oblong, all sparingly hairy above, densely so beneath, acute or obtuse at apex, rounded at base, petiolules 2-3 mm long, hairy. Flowers 3-4 cm long, axillary,
bluish-purple or deep blue. **Pods 2-5.5 x 0.5-0.7 cm long**, narrowly linear-oblong, flat, appressedly hairy.

Common among grasses and in the undergrowth of thin forests on hilly slopes.

**Flowers and fruits : August - September**

**Herbarium specimens examined :**

Dediapada : VKS 27, 44, 204; Shah 14063
Sagbara : VKS 1055

**World distribution :** India (apparently endemic within the limits of erstwhile Bombay Presidency).


A slender herb; stem and branches terete, faintly ribbed, more or less pubescent. **Leaflets 1.5-5 x 0.7-2.5 cm**, ovate-oblong, or obovate, glabrous above, minutely hairy beneath, obtuse, retuse or emarginate at apex, rounded at base, lateral ones sessile or subsessile, terminal one stalked. **Flowers axillary**, solitary, blue, 3-3.5 cm long. **Pods linear-oblong**, straight or slightly curved, pale straw coloured when dry.

Fairly common on hedges along road sides and on small trees or low shrubs in the outskirts of villages. The flowers in my area are blue but elsewhere in Gujarat a pure white flowered variety is also occasionally met with.

**Flowers and fruits : July - September**
Herbarium specimens examined:
Sagbara: VKS 2643, 2645, 2659, 2663

World distribution: A native of tropical Asia, distributed throughout the tropical regions of the world.

Critical notes: According to Bailey the specific name ternatea refers to Islands of Ternate in Moluccas.

CROTALARIA Linn.

Key to the species

1. Leaves trifoliolate:
2. Pods obliquely subglobose, 2-seeded, sessile, pubescent; plants erect; bracts foliaceous, persistent .......... medicaginea
2. Pods oblong, stalked, many seeded, glabrous; plants trailing; bracts minute, linear ....................... orixensis

1. Leaves simple:
3. Trailing or diffuse herbs (sometimes erect in C. albida):
4. Stem and branches triquetrous; stipules present; pods glabrous ................. triquetra
4. Stem and branches not triquetrous; stipules absent; pods silky hairy ......... albida

3. Erect herbs or undershrubs:
5. Pods glabrous:
6. Stipules persistent; pods exserted:
7. Corolla not exserted; whole plant
densely hairy ..................... mysorensis

7. Corolla exserted; plants not as above:

8. Stipules and bracts foliaceous;
leaf apex emarginate, acute or
subacute, with a mucro ............. spectabilis

8. Stipules and bracts subulate; leaf
apex obtuse or subacute ............. retusa

6. Stipules absent; pods not exserted ..... linifolia

5. Pods hairy:

9. Pods 4-6 seeded; stipules present,
minute, deciduous; stem quadrangular,
angles densely hairy with golden or
fulvous hairs ....................... leptostachya

9. Pods 10 or more seeded; stipules
minute or absent; stem terete, densely
silky brown hairy .................. junccea

Crotalaria albida Heyne ex Roth, Nov. Pl. Sp. 333,
1821; FBI 2:71; Cooke 1:315; Munk in Reinwardtia 6(3):200,
1962; Santapau 53; Shah 673. Crotalaria epunctata Dalz. in
epunctata Baker in FBI 2:71, 1876.

A much branched, prostrate or suberect herb, woody at
base; branches 30-40 cm long, slender, terete, silky pubescent.
Leaves 2-4 x 0.7-0.9 cm, linear-oblong or obovate, appressedly
hairy, pellucido-punctate, acute or subacute at apex, taper-
ing at base. Flowers yellow, few, in 3-14 cm long, lax
racemes. **Pods** 1-2 x 0.3-0.6 cm, oblong-cylindrical, glabrous. **Seeds** 6-12, compressed, brownish-black, shining.

Occasional among grasses along edges of cultivated fields.

**Flowers and fruits:** September - December

**Herbarium specimens examined:**

Dediapada: **VKS 294**
Sagbarra: **VKS 2297, 2467, 2624, 2649**
Ghatoli: **Shah 11484**

**World distribution:** Throughout the hotter parts of India, Burma, Ceylon, Malay Peninsula and Islands, extending to China and Philippines.


1-2 m tall undershrubs with ascending branches; stem and branches terete, deeply striate, silky pubescent, pale green. **Leaves** 2.5-12.5 x 0.4-1.9 cm, elliptic-oblung or linear-oblung, appressedly fulvous silky hairy, obtuse or subacute and minutely apiculate at apex, narrowed at base. **Flowers** 1.5-2 cm long, bright yellow, in 7-20 cm long, terminal and axillary, lax racemes. **Pods** 1.5-2.5 cm long, oblong, densely silky hairy.

Commonly cultivated but also an escape becoming naturalized.
Flowers and fruits: September - October

Local name: JUNGLI-SUNN

Local use: This is the "Sunn-hemp" plant of commerce. The fibres are locally used for cordage and the tender shoots as a fodder for cattle.

Herbarium specimens examined:
Dediapada: VKS 255, 276, 338, 1149, 2826, 3042; Shah 11443, 11616
Sagbara: VKS 377, 652, 1733, 2194, 2282


Undershrubs 1-2 m tall, erect, branching above the middle; branches stiff, ascending quadrangular, finely striate, densely shining silky brown hairy on angles. Leaves 5-16 x 1-4 cm, oblong-lanceolate or linear-oblong, appressedly silky pubescent, acute or subacuminate at apex, rounded at base. Flowers and fruits not seen.

Rare, seen only once in open grass lands and in the undergrowth of forests.

Local name: JUNGLI-SUNN
Herbarium specimens examined:

Dediapada: VKS 50
Sagbara: VKS 2305

World distribution: India (apparently endemic in Bombay; cf. Cooke).

Crotalaria linifolia Linn. f. Suppl. 322, 1781; FBI 2:72; Cooke 1:317; Santapau 53 & Fl. Saurashtra 114; Shah 673.

Erect undershrubs, 45-60 cm tall, much branched in the upper half; branches ascending, terete, clothed with appressed silky hairs. Leaves 1.5-5 x 0.5-1.8 cm, elliptic-oblong or obovate, appressedly silky hairy, densely beneath, obtuse or emarginate at apex, cuneate at base. Flowers pale yellow, in 10-16 cm long, simple or branched, terminal racemes. Pods 0.6-0.8 cm long, globose, deflexed and dark purple to almost black when ripe, 4-10 seeded.

A common plant in the second half of monsoon, scattered or subgregarious, in cultivated fields and open waste lands.

Flowers and fruits: September - December

Herbarium specimens examined:

Dediapada: VKS 11, 114, 247, 253, 270, 517, 2819
Sagbara: VKS 2705, 2716, 2719; Shah 13064
Kokam: Shah 11537

World distribution: Tropical Africa, India, Ceylon, Malaya, China, Philippines and North Australia.
Crotalaria medicaginea Lamk. Encycl. 2:201, 1786; FBI 2:81; Cooke 1:322; Santapau, Fl. Saurashtra 119; Munk in Reinwardtia 6(3):208, 1962; Shah 673.

Suffruticose herbs, 20-45 cm tall; branches diffuse, terete, sparsely clothed with appressed hairs. Leaflets 1-1.7 x 0.2-0.5 cm, obovate, glabrous above, appressedly silky-pubescent beneath, retuse or rounded and minutely mucronate at apex, cuneate at base. Flowers small, yellow, in 3-7 cm long, terminal and leaf-opposed, compact racemes. Pods 0.3-0.4 cm across, obliquely subglobose, pubescent.

Rare; a few plants were seen on hilly slopes at Sagbara on 23-4-1968.

Flowers and fruits: April

Herbarium specimens examined:
Sagbara: VKS 1636

World distribution: Afghanistan, Baluchistan, India, Burma, Ceylon, Siam, Java, South-East New Guinea and Australia.


An erect herb, generally 40-55 cm tall, sometimes up to 100 cm high; branches ascending, densely patently hairy; hairs silky-brown. Leaves 2-7 x 0.3-1.2 cm, linear-oblong, pilose, densely so beneath, subacute and minutely apiculate at apex, rounded at base; petiole 2-3 mm long. Flower 1-1.5 cm long,
yellow, in 10-20 cm long, lax, terminal, compact racemes. 

Pods 2-2.4 cm long, glabrous.

This is one of the commonest species of the genus *Crotalaria* in the area studied, scattered in open grass lands. The overall silky brown hairs are typical.

**Flowers and fruits**: September - October

**Herbarium specimens examined**:

Dediapada: VKS 231, 237, 271, 618
Sagbarra: VKS 718; Shah 14109

**World distribution**: Throughout the hotter parts of India and on Himalayas upto 4000', Ceylon and in Malaysia, N.E. Java and Lesser Sunda. Islands. According to Munk it is a native of S.E. Asia.

*Crotalaria orixensis* Willd. in Ges. Naturf. Fr. Neue Schr. 4:217, 1803; FBI 2:83; Cooke 1:323.

A diffuse herb, 20-25 cm high; stems slender, copiously branched, minutely clothed with spreading brownish hairs. 

Leaflets 3, 2-2.5 x 0.3-0.4 cm, obovate-oblong, glabrous above, clothed with appressed hairs beneath, obtuse at apex, tapering at base, petioles 1.5-2.2 cm long. **Flowers** yellow, in lax, lateral or terminal 6-8 flowered racemes; pedicels 1-1.3 cm long, slender, hairy. **Pods** 1.2-2 cm long, glabrous, shortly stipitate.

Rare; seen only once along margins of a cultivated field on way to Selamba.

**Flowers and fruits**: September
Herbarium specimens examined:
Sagbara: VKS 2630, 2646

World distribution: Tropical Africa and in India throughout the plains of Western Peninsula.


Crotalaria leschenaultii Grah. ex Dalz. & Gibs. Bombay Fl. 54, 1861 (non DC. 1825).

Erect undershrubs, 50-75 cm tall; stem and branches striate, appressedly pubescent. Leaves 3-8.5 x 1.3-3 cm, subsessile, ob lanceolate-oblong or obovate, glabrous above, pubescent beneath, obtuse or emarginate with a minute mucro at apex, cuneate at base. Flowers bright yellow, in 3-18 cm long, terminal, rigid, erect, compact racemes. Pods 2.2-4 x 0.8-1.4 cm, linear-oblong, deep purple to almost black on drying.

Shah reports this species to be occasional in open wastelands, but I have not seen it. This is one of the attractive plants in the area studied, by the bright lemon yellow flowers in racemes above the foliage.

Flowers and fruits: December

Herbarium specimens examined:
Ghatoli: Shah 14054
Dediapada: Shah 14068.
World distribution: Probably a native of South-East Asia, now pantropical in distribution.


An undershrub, 1-1.5 m tall; stem and branches stout, striate, polygonal, subglabrous. Leaves 4-15 x 1-4 cm, oblong, oblong-lanceolate or obovate, glabrous above, appressed hairy beneath, acute or subacute and shortly mucronate at apex, tapering at base; petioles 0.1-0.2 cm long. Flowers 1.5-2 cm across bright, yellow, in racemes, terminal and from upper axils; bracts foliaceous, ovate, acute, rounded or subcordate at base. Pods 4-6 cm long, linear-oblong, glabrous.

Common in moist ground along cultivated fields and river banks. This is one of the showy plants of the area, often mistaken for *C. retusa* L. But the foliaceous stipules and bracts are distinctive of this plant.

Flowers: September - October
Fruits: December - January
Herbarium specimens examined:
Dediapada: VKS 764, 794, 1090, 1101
Sagbara: VKS 866
Ghatoli: Shah 11505, 11593

World distribution: Widely distributed throughout the Old World and Polynesia.

Diffuse herbs, 30-40 cm tall; branches slender, triquetrous, appressedly pubescent. Leaves 1.2-5 x 0.3-2 cm, sessile, elliptic-oblong or ovate-oblong, glabrous above, sparsely appressedly hairy beneath, subacute or obtuse at apex, rounded or subcordate at base; stipules 1-3 mm long, triangular. Flowers yellow, few in 8-15 cm long, axillary and terminal, slender, lax racemes. Pods 1.5-2 x 0.5-0.7 cm, pubescent.

Common in grass fields. The triquetrous stem and branches in younger parts and closely set distichous leaves are typical.

Flowers and fruits: September - October

Herbarium specimens examined:
Dediapada: VKS 134, 491, 1164; Shah 11450, 11456
Mosda: VKS 299, 339, 366
Piplad: VKS 601, 1617
Sagbara: VKS 2472, 2702

World distribution: According to Munk the plant is so far found in South Asia (Deccan, Concan, Bombay and in Malaysia) East Java, Lesser Sunda Islands (Bali) Timor and possibly also Sumbawa.

CYLISTA Ait.

Cylista scariosa Roxb. Pl. Cor. 1:64, t. 22, 1795; FBI 2:219; Cooke 1:412; Santapau 73; Shah 673.
An extensive woody twiner with slender, downy branches. Leaflets 3, 2.5–5.6 x 1.5–3.2 cm, terminal one the largest, ovate, ovate-rhomboid, lateral ones obliquely elliptic-ovate, all glabrous or sparingly hairy above, fulvous-pubescent beneath, subcoriaceous, subacute or obtuse and apiculate at apex, subcordate or rounded at base. Flowers yellow in 3–12 cm long, densely flowered, terminal and axillary racemes. Pods 0.8–1 cm long, pubescent, enclosed in white, persistent, calyx.

Rare, on low bushes and shrubs in dense forests. The plant is often noticeable in the field by the white foliaceous, persistent sepals.

Flowers: September
Fruits: March

Herbarium specimens examined:
Dediapada: VKS 1584, 1719
Ghatoli: Shah 11500, 11607

World distribution: India and Burma.

Critical notes: The generic name Cylista Wt. & Arn. has been proposed for conservation over Cylista Ait. by Ali in Taxon 16:247, 1967.

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DALBERGIA Linn. f. (Nom. Cons.)

Key to the species

1. Stamens 9 + 1:

2. Leaflets 3–5, acuminate; flowers distinctly stalked ................................................. sisso
2. Leaflets 5-7, subacute, obtuse or emarginate; flowers nearly sessile ....................... *latifolia*

1. Stamens 5 + 5 :

3. Trees :

4. Leaflets with prominent apparent parallel nerves; standard 0.75 cm broad with a callosity at the base of the limb. *lanceolaria*

4. Leaflets with reticulate venation; standard 0.4 cm broad without a callosity at the base of the limb ............. *paniculata*

3. A climbing shrub with hooked branches ..... *volubilis*


A deciduous tree, 10-12 m tall; bark grey, smooth. Leaves 15-30 cm long, copious; rachis pubescent; leaflets 7-13, 2-4.2 x 1-2 cm, obovate-oblong or elliptic-oblong, younger ones densely fulvous hairy, older ones more or less glabrous, subcoriaceous, obtuse and often emarginate at apex, rounded at base; Panicles 15-25 cm long, axillary and terminal, rufous-pubescent. Flowers 0.7-0.8 cm long, white. Fruits not seen.

Rare, on hilly slopes at Sagbara.

Flowers : March
Herbarium specimen examined:
Sagbara: VKS 1458

World distribution: India and Ceylon.

Dalbergia latifolia Roxb. Pl. Cor. 2:7, t. 113, 1798; FBI 2:231; Cooke 1:422; Wealth of India 3:4, tt. 3, 4, 6, 7 & PL. II (col.) 1952; Bor, Man. Ind. For. Bot. 89, 1953; Santapau 75 & Fl. Saurashtra 178; Shah 673.

A large tree, 10-16 m tall; trunk straight; bark ash coloured. Leaves 12-22 cm long; rachis glabrous, more or less zig-zag; leaflets 5-7, 2-7 x 2-5.5 cm, broadly ovate or obovate, or suborbicular, glabrous, subacute or emarginate at apex, rounded at base; petiolules 0.8-1.2 cm long. Panicles 6-14 cm long, on axillary or extra-axillary, lax, divaricate branches. Flowers small ~ 0.6 cm long, white. Fruits not seen.

Occasional in the forests.

Flowers: June - September

Local name: SISAM

Local use: The wood is considered to be one of the best quality timbers, used in furniture.

Herbarium specimens examined:
Dediapada: VKS 1947, 2991.
Ghatoli: Shah 11605
Sagbara: VKS 380
World distribution: India, Sikkim, Indo-China, Andamans, Malaya Peninsula.

_Dalbergia paniculata_ Roxb. Cor. Pl. 2:8, t. 114, 1789;
FBI 2:236; Cooke 1:426; Bor, Man. Ind. For. Bot. 89, 1952;
Santapau, Fl. Saurashtra 179.

_Trees_, 10-12 m tall; trunk straight; bark grey, smooth; young branches clothed with greyish-pubescent. _Leaves_ 10-13 cm long; rachis pubescent; leaflets 9-13, 2-4.5 x 1-2 cm, obovate-oblong or elliptic, younger ones densely fulvous hairy, older ones glabrous on both surfaces, subcoriaceous, obtuse, and often emarginate at apex, rounded at base; petiolule 0.3-0.5 cm long. _Panicles_ 13-28 cm long, terminal and from ultimate axils. _Flowers_ small, pale blue, or almost white. _Fruits_ not seen.

Occasional in the forests in vicinity of Dediapada.

_Flowers_: April - June

_Herbarium specimens examined:_

_Dediapada_: VKS 1354, 1789, 1979

World distribution: India, Burma and Indo-China.

& Fl. Ind. 3:223; 1832; FBI 2:231; Cooke 1:421; Bor, Man.
Ind. For. Bot. 88, 1953.

_Medium sized deciduous trees_, 10-18 m tall; bark grey-blackish; young branches pubescent, older ones glabrous. _Leaves_ 13-15 cm long; rachis zig-zag; leaflets 3-5 x 3.5-7 x
3-6 cm, terminal one the largest, alternate, suborbicular, glabrescent, abruptly acuminate at apex, cuneate at base; petiolule 0.6-0.8 cm long. Panicles 5-8 cm long, much shorter than the leaves. **Flowers** yellowish-white. **Pods** 4-8 x 1-1.5 cm, thin, strap shaped, pale brown, glabrous.

Occasional in the forests at Sagbara.

**Flowers**: April - June

**Fruits**: June

**Local name**: SISSO

**Local use**: Wood is used for making agricultural tools and construction of houses by local people. It is considered to be one of the hardest woods. Because it is quick growing, it is sometimes planted as an avenue tree, for example at the University campus. In the present area no information is available if the tree was introduced.

**Herbarium specimens examined**:

Sagbara: VKS 847, 995, 1853

**World distribution**: Plains through India proper, ascending to 5000 ft. in the Central Himalayas, Baluchistan and Afghanistan. Its home is in the Sub-Himalayan tract and it typically prefers alluvial soil, coarse or fine.

*Dalbergia volubilis* Roxb. Pl. Cor. 2: 48, t. 191, 1798; FBI 2: 235; Cooke 1: 426; Santapau 75.

A large woody, deciduous climber; branches glabrous, striate, dark purple. **Leaflets** 9-13, 1.3-4.5 x 1-2.4 cm,
Obovate or oblong, glabrous, truncate, obtuse or emarginate and minutely apiculate at apex, rounded, cuneate or subdeltoid at base; petiolules 0.3-0.5 cm. Flowers and fruits not seen. (PLATE 9)

Rare, seen only once on (23-6-68) along roadside near PANJRI-FALL. The hooked branches render the identification easy even in the vegetative condition.

Herbarium specimen examined:
Dediapada: VKS 1930

World distribution: India, Sikkim, Ceylon, Burma and Andamans.

Desmodium DC. (Norn. Cons.)

Key to the species

1. Leaves trifoliolate:

2. Undershubs; flowers bright-purple sometimes on fading pale blue, in terminal and axillary racemes; pods not woody; with sticky hairs.............. laxiflorum

2. Herbs:

3. Plants diffuse or erect, viscidly pubescent; flowers in axillary and terminal copious racemes:

4. Stipules foliaceous, auricled; pods not curled.................. dichotomum
4. Stipules and pods not as above ...... 

3. Plants radially spreading, glabrous or sparsely hairy; flowers 1-3 in leaf axils:

1. Leaves uni-foliolate:

5. Branches angled, often violet-purple; leaflet ovate-oblung or ovate-lanceolate, glabrous above, appressedly white pubescent beneath; joints of pods longer than broad .................

5. Branches terete; leaflets broadly ovate to suborbicular, fulvous hairy on both surfaces, densely so beneath; joints of pods as broad as long ..............


Diffuse herbs, viscidly pubescent, 40-70 cm tall stem slender, woody, obtusely angled; leaflets 3.5-18 x 2-9 cm, broadly elliptic or ovate-oblong, hairy, obtuse or apiculate at apex, rounded or subacute at base; petioles 2-3.5 cm long pubescent. Flowers minute, deep purple, in terminal and
axillary, 10-20 cm long racemes. Pods 0.8-2.2 cm long, 3-6-jointed, hairy, deeply indented on both sutures.

Common in the undergrowth of forests, often gregarious. The sticky nature of the plant is typical.

Flowers: September - October
Fruits: October - March

Herbarium specimens examined:
Dediapada: VKS 207, 214, 221, 1515, 2758, 2821, 2798, 2846,
Sagbara: VKS 2183, 2615, 2738; Shah 14126.

World distribution: India to China; in Malaysia North-East Java and South-West Celebes.

Desmodium gangeticum (Linn.) DC. Prodr. 2:327, 1827; FBI 2:168; Cooke 1:379; Wealth of India 2:41, t. 21, 1950;

Erect undershrubs, 40-100 cm tall, with spreading branches; stem and branches angled, clothed with appressed hairs. Leaves 6-18 x 2-6.5 cm, ovate-lanceolate or ovate-oblong, appressedly hairy, at length glabrescent, obtuse or emarginate at apex, rounded or tapering at base; petiolule 0.2-0.3 cm long, appressed hairy. Flowers bright purple, distantly fascicled, on 12-40 cm long, axillary and terminal racemes. Pods 1.2-2.5 cm, flat, brown, 4-7 jointed, thinly
clothed with minute hooked hairs.

Common and abundant in the undergrowth on hilly slopes and in shady places.

**Flowers**: September - October  
**Fruits**: October - March

**Herbarium specimens examined**:  
Dediapada: VKS 19, 21, 129, 321, 3024  
Sagbara: VKS 418, 1051, 2192, 2262, 2297, 2304, 2446, 2509.

**World distribution**: Tropical Africa, Arabia, India to Siam, Ceylon, Cochinchina, Indo-China and throughout Malaysia extending to Northern territory of Queensland and Solomon Islands; introduced in the W. Indies.


An erect undershrubs, 25-60 cm tall; stem and branches obtusely angular, hairy. **Leaflets** 5-16 x 3.5-8 cm, ovate-oblong or broadly ovate-elliptic, membranous, sparsely viscidly hairy or glabrous, obtuse, acute or subacute at apex, rounded at base; rachis 2.2-3 cm long, appressed hairy; petiolules 0.3-0.4 cm long. **Flowers** bright purple, on fading pale blue, distantly fascicled, on 10-25 cm long, axillary and terminal racemes. **Pods** 2-3 cm long, slightly falcate, linear with sticky hairs.
Occasional in the undergrowth of forests.

**Flowers and fruits :** August - September

**Herbarium specimens examined :**

Dediapada : **VKS 2791, 2798, 2844**
Sagbara : **VKS 2297A**

**World distribution :** India to Formosa, in Malaysia, Sumatra, Malay Peninsula, Java, Celebes, Philippines, Moluccas, Lesser Sunda Islands and New Guinea.


A diffuse herb, 30-65 cm tall; stem and branches angular, grooved with white recurved hairs. **Leaves** 3-foliolate; rachis 1.5-2 cm long, hairy; leaflets 2.4-4.8 x 1-2 cm, middle one largest, ovate-rhomboid, or ovate-oblong, hairy, acute or acuminate at apex, cuneate at base; petiole 1.5-3.8 cm long, striate, pubescent with recurved hairs; petiolules 4-6 mm long, hairy; stipules 0.5-0.7 cm long, linear. **Flowers** reddish purple, in terminal and axillary, 10-15 cm long racemes. **Pods** 1-2 cm long, appressedly viscid hairy, 2-4 jointed, irregularly curled.

Occasional in the undergrowth of dense forest.

**Flowers and fruits :** September

**Herbarium specimens examined :**

Sagbara : **VKS 2426, 2443, 2487**
World distribution: The plant is a native of Mexico; it seems that the plant *D. spirale* given in FBI is this plant (cf. Chavan, Sabnis & Bedi). It therefore indicates that it might have been introduced in India quite a long ago, but its identity was recently confirmed by Chavan, Bedi, Sabnis. There is also one sheet of this species under the name *D. spirale* (Saxton 1934), in Gujarat College Herbarium, collected from Lunawada in Panchmahal District.


Prostrate herbs with radially spreading, slender, 10-20 cm long, branches. Leaves trifoliolate; rachis 0.4-1.4 cm long, leaflets 0.4-1.3 x 0.3-1 cm, obcordate, glabrous above, appressedly hairy beneath, sessile or subsessile, obtuse or shallowly emarginate at apex, cuneate at base. Flowers bright purple, axillary, solitary or 2-3 fascicled, on the underside of branches. Pods 0.5-1.2 cm long, 3-4 jointed, pubescent, usually produced on lower side of branches.

Common, forming dense mats in moist places along temporary ponds, ditches, riverbeds and on moist rocks.

*Flowers and fruits*: August - January

*Herbarium specimens examined*:

Dediapada: VKS 1526, 2191, 2824, 2833
Sagbara: VKS 395, 1319, 1477, 1745, 2431, 2482
World distribution: Pantropic.


A fulvous-pubescent undershrub, simple or branched, 50-100 cm tall. Leaves 6-13 x 4.5-11 cm, broadly ovate or suborbicular, velutinus, obtuse at apex, truncate at base; petiolules 0.5-0.7 cm long, densely hairy, Flowers bright purple, distantly fascicled, on 10-30 cm long, axillary and terminal racemes; peduncle pubescent. Pods 1.5-2 cm long, 3-6 jointed, densely pubescent, apiculate.

Common in shaded spots in the forests.

Flowers and fruits: September - December

Herbarium specimens examined:
Dediapada: VKS 1526, 2191, 2824
Sagbara: VKS 395, 1319, 2431A, 2482A; Shah 14029

World distribution: Tropical Africa, Madagascar, India, Burma, Ceylon, Malay Isles and Philippines; introduced into W. Indies.

DOLICHOS Linn.

Dolichos lablab Linn. Sp. Pl. 725, 1753; FBI 2:209; Cooke 1:406; Wealth of India 2:104, tt. 61-63, & PL. XII,
Annual or perennial twiners; stem and branches pale green, somewhat woody in older parts, hairy. Leaves trifoliolate; leaflets 2-5 x 1.5-5 cm, terminal one largest, all broadly ovate-rhomboid or elliptic-ovate, pubescent when young, glabrescent with age, acute or abruptly acuminate at apex, truncate, rounded or cuneate at base; petiole 3-7.5 cm long, pubescent, petiolules 0.4-0.8 cm long. Flowers white, in 15-20 cm long, terminal and axillary racemes. Pods 6-8.5 x 0.8-1.3 cm, curved, thickened along sutures, 3-5 seeded. Seeds 0.4-0.8 cm long, ellipsoid oblong, smooth glaucous to dark green when fresh, pale creamy yellow when dry, with a prominent white hilum.

Cultivated at some places, but also an escape on hedges near houses.

Flowers and fruits: August - December
Local name: PAPDI
Local use: The tender pods and fresh seeds are used as vegetables, the dry seeds as pulses.

Herbarium specimens examined:
Dediapada: VKS 575, 678, 693, 1143, 1206

World distribution: The plant is said to be Asian in origin; cultivated throughout tropics.
1. Leaves unifoliolate:

2. Pods globose, 1-seeded; leaves linear .... linifolia

2. Pods oblong, 2-seeded; leaves broadly ovate .................................. cordifolia

1. Leaves 3-foliolate ...................... glandulosa

1. Leaves more than 5-foliolate; leaflets opposite; flowers in racemes:

3. Pods cylindric, glabrous ............... tinctoria

3. Pods tetragonous, pubescent .............. astragalina


Suffruticose, erect herbs, 30-60 cm tall; stem and branches densely fulvous with reddish brown hairs. Leaves 6-15 cm long; leaflets 5-9, 1.5-6 x 0.7-2.5 cm, elliptic-oblong or obovate, appressedly hairy on both surfaces, rounded and apiculate at apex, subacute or rounded at base, larger ones towards the tip of rachis, gradually becoming smaller towards the base. Flowers rosy-purple to scarlet, in 5-20 cm long, axillary and terminal compact racemes. Pods 1.2-2 cm,
deflexed, densely clothed with grey and brown hairs, tetra-
rongous. Seeds black, cubico-rectangular in shape.

Rare, among grasses and in open fields. The overall
scarlet colour of the stem, branches, flowers and pods renders
the plant conspicuous.

Flowers: August - September
Fruits: October - November

Herbarium specimens examined:
Dediapada: VKS 168, 284, 365

World distribution: Tropical Africa, India, Ceylon,
Philippines, Java, tropical Australia, tropical America.

Critical notes: In his monograph on the genus Indigofera
in tropical Africa, Gillett (Kew Bull. 14:294, 1960) has shown
that I. hirsuta in most of our Indian floras is a mixture of
I. astragalina DC. and I. hirsuta Linn. According to him the
two species can be separated by the following key:

Longer peduncles nearly always over 25
mm long; pods usually 6-9 seeded, c.2 mm
wide, some, or all, of the hairs on its
dorsal surface usually brown; largest
number of leaflets on any one leaf
usually 7, less often 9 ................. hirsuta
Longest peduncle under 25 mm long; pods usually 4–6 seeded, c.3 mm wide, the hairs on its dorsal surface usually white; the largest number of leaflets on any one leaf usually 9 or 11, occasionally 7 ......................... astragalina

My plant fits with *I. astragalina* DC. in his key.


A copiously branched, radially spreading herb, branches 7–25 cm long. Leaflet 0.5–1.5 x 0.2–1 cm, sessile, broadly ovate, appressedly hairy, densely beneath, at times woolly, sessile, obtuse, subacute or acute at apex, rounded or subcordate at base. Flowers red, 6–7, in dense, axillary clusters. Pods oblong, pubescent, 2-seeded.

Rare, seen only once among grasses on 26-9-1968.

**Flowers and fruits**: September

**Herbarium specimens examined**:

Sagbara: VKS 2685; VKS without number one sheet; Shah 11934

**World distribution**: Tropical Africa, Afghanistan, Baluchistan, West Pakistan, throughout the plains of India, Indonesia and Timor to N. Australia.
**Indigofera glandulosa Willd. Sp. Pl. 3:1727, 1800; FBI 2:94; Cooke 1:332; Wealth of India 5:179, t. 111, 1959; Santapau 55 & Fl. Saurashtra 125.**

Annual, erect herbs, 20-60 cm tall, woody at base; lower branches sometimes diffuse; stem and branches terete, sometimes red, glabrous or nearly so. Leaves trifoliolate; rachis 1.2-1.5 cm long, leaflets 1-3.8 x 0.4-1.2 cm, ob lanceolate or obovate, appressedly hairy on both surfaces, nigro-punctate; beneath, obtuse or slightly emarginate at apex, cuneate at base; petiolule of terminal leaflet 0.5-0.8 cm long, lateral leaflets almost sessile. Flowers red, in 1-2.5 cm long, axillary clusters. Pods 0.4-0.7 cm long, brown, densely pubescent, obscurely angled, wings on angles, toothed.

Occasional in moist ground along margins of temporary ponds and edges of cultivated fields.

**Flowers and fruits**: August - September

**Herbarium specimens examined**:

Dediapada: VKS 155, 319, 350, 2829, 2875
Sagbara: VKS 2188, 2243, 2391

**World distribution**: Throughout the Peninsular India.

A trailing herb, with radially spreading, 20-50 cm long branches, sometimes suberect in dense vegetation; stem and branches somewhat flattened and appressedly silvery white pubescent in younger parts, terete and almost glabrous in older. Leaves 1-2.5 x 0.2-0.3 cm, linear, sessile appressedly hairy above, silvery silky pubescent underneath, acute and minutely mucronate at apex, subacute at base. Flowers red, 6-12, in lax or compact, 1-1.5 cm long, axillary racemes. Pods globose, apiculate, ± 0.1 cm long, whitish-pubescent, 1-seeded.

Common in patches on rocky soil and among grasses along the margins of cultivated fields.

Flowers: August - September
Fruits: September - April

Herbarium specimens examined:
Dediapada: VKS 711, 2832, 2944
Sedgpur: VKS 2997, 3005
Sagbara: VKS 1730, 2644
Ghatoli: Shah 11578, 13073

World distribution: Abyssinia, Ethiopia, Afghanistan, Baluchistan, throughout India, Ceylon, Burma, Malay Islands, Australia and New Guinea.

An erect undershrub, 50-120 cm tall; branches dark-purple or brown, spreading more or less at right angles to the main stem, terete, with fine appressed hairs. **Leaves** 2-7 cm long; rachis 2.5-6 cm long, pubescent leaflets 9-13, 0.6-2.2 x 0.4-1.3 cm, opposite, obovate or oblong, glabrous, above, appressedly hairy beneath, subacute and minutely apiculate at apex, cuneate or tapering at base. **Flowers** red, in 2.5-6.5 cm long, axillary, compact racemes. **Pods** 2.5-4 cm long, glabrous, straight or slightly curved, stiff, brown when dry.

Common, scattered, among grasses in open ground.

**Flowers and fruits**: August - October

**Herbarium specimens examined**:
- Dediapada: VKS 51, 3050
- Sagbara: VKS 2698, 2699

**World distribution**: Arabia, India, Ceylon, Malaya, Philippines and other tropical regions. It is considered to be Asian in origin.

**MELILOTUS** Juss.

**Melilotus indica** A11. Fl. Pedem. 1:308, 1785; Cooke 1:325; Santapeau 54 & Fl. Saurashtra 121. **Melilotus parviflora** Desf. Fl. Ait. 2:192, 1800; FBI 2:89.

An erect, annual herb 20-40 cm tall; stem and branches ascending, glabrous or nearly so. **Leaves** digitately trifoliolate; petiole 0.8-2 cm long; leaflets 1-3 x 0.3-0.8 cm, obovate or oblanceolate, glabrous, margins toothed, retuse
or emarginate at apex, cuneate at base, terminal one on 0.2-0.4 cm long petiolule, laterals sessile. Flowers small, yellow, in 3-10 cm long, axillary and terminal racemes on 1-½ cm long stalk, flowering stalk 1-¼ cm long, Pods 1-2 mm ellipsoid or globose.

Rare, seen only once on 29-3-1968 at Dediapada.

Flowers and fruits: March

Herbarium specimen examined:
Dediapada: VKS 1587

World distribution: Tropical zones of India, extending to S. Persia and S. Europe; introduced in many other countries e.g. N. America, Africa.

Millettia Wt. & Arn.


An extensive, deciduous, woody climber; bark bluish-black rough. Leaves 20-25 cm long; rachis 25-28 cm long, leaflets 13-15, 5-8.5 x 2-3.5 cm, opposite, oblong or obovate-oblong, membranous or subcoriaceous, glabrous, abruptly acuminate at apex, cuneate at base. Flowers white, in 7-20 cm long, dense racemes. Pods not seen.

Occasional in forests along river banks.
Flowers : May
Local name : VELBELA
Herbarium specimens examined :
Sagbara : VKS 2007, 2080

World distribution : India (Bihar, Orissa and Western Peninsula).

MOGHANIA St. Hill.


Shrubs 1-2 m tall. Leaves unifoliolate; leaflets 5-13 x 2.5-5 cm, ovate-lanceolate, coriaceous, glabrous but sparsely hairy on nerves, acute or acuminate at apex, rounded at base, Racemes 7-16 cm long, axillary and terminal. Flowers yellow, enclosed within bracts; bracts 2.5-3.5 x 2-2.5 cm, foliaceous, orbicular, prominently reticulately veined, persistent, at first pale green at length white or straw coloured. Fruit 0.6-1 cm long, oblong, turgid, mucronate, enclosed within bracts.

Rare, but common along river banks at Ghatoli only. The foliaceous, broadly orbicular bracts are typical of this species.
Flowers and fruits: February - March

Herbarium specimens examined:
Ghatoli: VKS 1555, 1585, 1608; Shah 11575, 11613

World distribution: From Sind, Rajputana and Bengal to S. Inda and Ceylon, Burma, Andamans and Nicobar Islands and Malay Peninsula extending to Java.

Critical notes: The generic name Flemingia Roxb. ex Ait. (1812) is proposed for conservation by Ali (Regnum Veg. 40:25, 1965) over Flemingia Roxb. ex Rottl. 1803 and Lourea (Luorea) Jaume St. Hilaire 1812. The author remarks on p. 26 "A case may also be advanced in favour of Moghania Jaume St. Hilaire which was published as a substitute for Lourea Jaume St. Hilaire as Li (loc. cit.) has already published the requisite new combinations under the genus Moghania Jaume St. Hilaire. However, in that case it will be necessary to conserve Moghania Jaume St. Hilaire against Lourea Jaume St. Hilaire. But as Flemingia Roxb. ex Ait. (1812) is the more universally accepted name as compared to Moghania Jaume St. Hilaire which has only been recently revived by Li (1944), it stands to reason to conserve the generic name Flemingia Roxb. ex Ait to avoid various nomenclatural problems discussed above". In fact Ali has accepted the generic name Flemingia by making a new combination in Biologia 12(2): 1966 as follows:

Flemingia gracilis (Mukerjee) Ail Comb. nov.
MUCUNA Adans.


Large, deciduous twiners, woody in older parts, herbaceous in younger. Leaves 3-foliolate; petioles 3-12 cm long, appressed hairy, terete, leaflets dark green, 5-13 x 2.5-9 cm, appressedly silky hairy above, densely so beneath, terminal one ovate-rhomboid, equal sided at base; lateral ones obliquely broadly ovate-triangular, all acute at apex, rounded or subacute at base; petiolule 1.2-1.7 cm long, appressedly hairy. Flowers 3-3.5 cm long, bright to deep violet-purple, in 4-15 cm long, axillary, pendulous racemes. Pods 4.5-8 cm long, S-shaped, 3-7 seeded, sandy brown, longitudinally ribbed, clothed with irritant bristles.

Common on hedges along road sides and on low shrubs or small trees in the forests.

Flowers and fruits: September - March

Local name: COWICH

Herbarium specimens examined:
Dediapada: VKS 469, 1198, 1768

World distribution: Cosmopolitan in tropics.
OUGEINIA Benth.


Deciduous trees, 9-12 m tall; bark black or dark blackish brown, rough, peeling off in rectangular scales. Leaves 3-foliolate; petioles 3.5-6 cm long, terete; leaflets 6.5-18 x 4.5-15 cm, coriaceous, glabrous, broadly ovate or suborbicular, obtuse, acute or subacuminate at apex, rounded and lateral ones oblique at base. Flowers small, white with purple tinge to bright purple or lilac, numerous, in 4-5 cm long, fascicled racemes on leafless branches. Pods 4-6 x 0.8-1.2 cm, flat, reticulately veined.

Occasional. The tree is rather attractive when in full bloom, eventhough it is leafless from January to May.

Flowers : February - March
Fruits : April
Local name : TANACH
Herbarium specimens examined :
Dediapada : VKS 1604
Sagbara : VKS 1357, 1456
World distribution : More or less throughout India, except the wetter parts.

Twining herbs; stem filiform, striate, glabrous. Leaves 3-foliolate; leaflets 2-4.8 x 1.2-3.8 cm, ovate or ovate-rhomboid entire or lobed, glabrescent on both surfaces, dark green above paler beneath, all acuminate at apex, subacute or tapering at base, terminal one largest, equal sided, the laterals smaller, inequilateral; petiole 1.5-3.8 cm long, petiolules 0.2-0.3 cm long. Flowers not seen. Pods 3.2-5 cm, subcylindric, slightly curved, 6-8 seeded. Seeds truncate, dark brown.

A rare plant seen only once (on 25-12-1967) along river bank at Sagbara.

Fruits: December

Herbarium specimen examined:
Sagbara: VKS 855

World distribution: India (Western Peninsula).


Twining or in absence of support prostrate herbs; stem and branches terete, patently hairy. Leaves 3-foliolate; leaflets 6-10 x 4-6.5 cm, ovate to ovate-rhomboid, entire or sparingly lobed, appressedly hairy, acute or subacute at
apex, truncate or rounded at base, lateral ones unequal sided; petioles 2.5-3.5 cm long, hairy; petiolules 0.3-0.4 cm long. **Flowers** yellow, in short, condensed-racemes at tips of 5-14 cm long, hairy peduncles. **Pods** 3-5 cm long, cylindric, turgid, densely hairy; hairs often brown.

Common, wild in riverbeds.

**Flowers and fruits**: August - September

**Local name**: MAG

**Herbarium specimens examined**:

Dediapada: VKS 58, 370, 682, 1168, 1523
Sagbara: VKS 919, 1645, 2277, 2400, 2542

**World distribution**: Throughout the tropics.

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**PONGAMIA** Vent. (Nom. Cons.)


**Trees** 5-10 m tall with spreading branches; bark grey, smooth. **Leaves** 20-30 cm long; petiole 2.5-5.5 cm long, glabrous, leaflets 5-7, 4.5-13 x 3.8-8.5 cm, coriaceous, broadly ovate, elliptic or suborbicular, glabrous, younger ones membranous, older subcoriaceous, acuminate or rounded at apex, subacute or rounded at base; terminal one largest, laterals basipetally smaller; petiolules 0.5-1.5 cm long,
Flowers white with a pink or light purple tinge, in 8-12 cm long, axillary racemes. Pods 3.5-5.5 x 1.5-2.3 cm long, thick, compressed, woody, obliquely oblong, pale brown when dry.

Common along river banks. The leaflets are sometimes infected with insect, which produce galls or white patches on them.

Flowers: March - April
Fruits: May - September
Local name: KARANJ
Local use: Locally the oil extracted from the seeds is sometimes used as lubricant for the cart wheels.

Herbarium specimens examined:
Sagbara: VKS 463, 858, 885, 1380, 1442, 1626, 1653, 1684, 2045; Shah 14102

World distribution: India, Ceylon, Andaman, and Nicobar Islands, Malay Peninsula and Islands, extending to China and Australia.

PUERARIA DC.

Pueraria tuberosa DC. Prodr. 2:240, 1825; FBI 2:197; Wt. Icon. t. 412; Cooke 1:399; Santapau 67 & Fl. Saurashtra 170. (PLATE 12)

A large deciduous climber with grey silky-pubescent branches. Leaflets 3, 7-15 x 6.5-13 cm, broadly ovate,
appressed silky hairy above, tomentose beneath, acuminate at apex, rounded at base; petiole 5-10 cm long, silky pubescent. Flowers bluish-purple, 1.2-1.5 cm long, in 20-50 long silky-tomentose panicles. Pods 2.5-5 x 0.8-1 cm, dark shining brown, constricted between the seeds, clothed with shining fulvous bristles.

Rare, seen only once in the area.

**Flowers and fruits**: March

**Herbarium specimen examined**: Piplad : VKS 1615

**World distribution**: India.

**Critical notes**: The description of the leaflets is based on the material of this species collected from Dangs by Dr. B. Suryanarayana.

*RHYNCHOSIA* Lour. (Nom. Cons.)


Trailing, herbs; stem and branches slender, finer pubescent, at length glabrous; deeply striate. Leaves 3-foliolate; leaflets 1.5-4.5 x 0.9-3.5 cm, ovate-rhomboid, glabrous above, pubescent on veins and gland-dotted beneath, obtuse or acute at apex, cuneate at base; petiole 1.5-3 cm long, striate. Flowers yellow, in 4-8 cm long, lax racemes. Pods 1.4-1.6 cm long, appressedly pubescent, flat, dotted with red glands.
Rare among grasses and on hedges along cultivated fields.

**Flowers and fruits**: September - October

**Herbarium specimens examined**:
- Dediapada: VKS 193, 3001
- Sedgpur: VKS 2972
- Sagbara: VKS 2291; Shah 14006

**World distribution**: Throughout the tropics.

**SESBANIA Scop. (Nom. Cons.)**


*Undershrubs 1-3 m tall; branches ascending or spreading, violet or reddish-purple, glabrous, sparsely weakly prickly. Leaves 7-24 cm long; rachis sparingly prickly; leaflets in 20-45 pairs, 0.7-2 x 0.1-0.2 cm, subopposite, sessile or subsessile, linear-oblong, glabrous, apiculate at apex, rounded at base. Flowers 0.9-1 cm long, bright yellow, or purple, spotted on standard outside, in 3-6 cm long, racemes. Pods 15-25 cm long, slightly falcate, linear-cylindric, constricted between seeds, with stout, sharp beak.*
Occasional, scattered in waste places and open grasslands. A distinct plant by its height and often with reddish purple stem.

**Flowers**: August - September

**Fruits**: September - November

**Herbarium specimens examined**:

Dediapada: VKS 169, 359, 374, 503, 2619, 2704

Sagbara: VKS 2217, 2245

**World distribution**: Native of India, found throughout the tropics of the Old World.

**SMITHIA** Ait.

*Smithia conferta* Sm. in Rees Cyclop. 33: no 2, 1819; Smithia geminiflora Roth, Nov. PL Sp. 352, 1821. *Smithia geminiflora var. conferta* Baker in FBI 2:149, 1876.

Diffusely spreading herbs; branches 15-35 cm long. Leaves 1-3.8 cm long; leaflets 5-8 paired, 0.6-1.3 x 0.2-0.3 cm, subsessile, linear-oblong, glabrous above, densely bristly on veins beneath and margins. **Flowers** yellow in condensed, axillary racemes. **Fruits** 3-6 jointed, enclosed in persistent calyx.

Rare, in small patches among grasses on the edges of cultivated fields. It is conspicuous when growing in masses by the bright yellow flowers.
Flowers and fruits : September
Herbarium specimens examined :
Dediapada : VKS 2992, 2998
Sedgpur : VKS 2928, 2933

World distribution : India, Ceylon, Burma, Java, Malaya and North Australia.

TEPHROSIA Pers

Key to the species

1. Plants erect with spreading branches; normally more than 3 flowered:

2. Stem and branches zigzag, angled, hairy; flowers more than 8 mm long; pod somewhat constricted between the seeds ....... hamiltonii

2. Stem and branches not as above; flowers up to 8 mm long; pod flat, not constricted between the seeds ................. purpurea

1. Plants procumbent; racemes 1-3 flowered ... pumila


Undershrubs 30-45 cm tall, with spreading branches, stem and branches terete, tinged reddish-purple or completely reddish-purple, with white appressed pubescens, Zigzag in younger parts. Leaves 6-15 cm long; rachis appressed, pubescent; leaflets 7-19, 1.5-2 x 0.6-0.8 cm, ob lanceolate,
glabrous above, appressedly silky hairy beneath, obtuse or retuse at apex, cuneate at base. **Flowers** bright rosy-purple in 8-10 cm long leaf opposed lax racemes. ** Pods** 4-5.5 cm long, slightly curved, mucronate, at first pubescent, glabrous at length.

Rare, in open waste places along road sides.

**Flowers and fruits :** August - October

**Herbarium specimens examined :**

Dediapada : VKS 2898, 2910, 3016

**World distribution :** India (Chota Nagpur, Gujarat, Madras).


Procumbent or prostrate _herbs_, 15-30 cm long, with slender branches, pubescent in younger parts, older ones almost glabrescent. **Leaves** 3-5 cm long; leaflets 7-11, 1.6-2 x 0.4 - 0.7 cm, subsessile, oblanceolate, glabrous or nearly so above, hairy beneath, obtuse or emarginate at apex, cuneate at base. **Flowers** white, 1-2 in leaf opposed racemes. ** Pods** 2.5-4.5 cm long, linear-oblong, flat, finely pubescent. **Seeds** 9-10.

Rare, scattered on hilly slopes in the forests and as a weed in cultivated fields. In _T. purpurea_ and _T. pumila_ the flowers and generally bright purple, at times fading creamy-yellow. However, in my area _T. pumila_ has pure white flowers.

**Flowers and fruits :** September
Herbarium specimens examined:
Sagbara: VKS 408, 956, 2145

World distribution: Throughout the plains of India. Himalaya to Ceylon, Malacea and Siam ascending to 4000' in North-West.


Erect undershrubs 30-70 cm tall, with spreading branches, lower branches sometimes diffuse, spreading on ground, stem and branches grey-tomentose in younger parts, glabrescent in older. Leaves 3-8 cm long; leaflets 7-21, 0.7-2.4 x 0.5-1.6 cm, obovate-oblong or elliptic-lanceolate, glabrescent above, densely hairy beneath, obtuse, retuse or emarginate at apex, tapering at base. Flowers bright pink, purple or velvety purple, in 4-12 cm long, leaf opposed, racemes. Pods 2.5-4 cm long, flat.

Common, scattered or subgregarious, along road sides during monsoon. The plants are hardy and can withstand even hottest months in summer.

Flowers and fruits: August - January (sometimes for the whole year).

Herbarium specimens examined:
Dediapada: VKS 12, 65, 1394, 1543
Sagbara: VKS 408, 961
World distribution: Throughout the tropics of the world.

TERAMNUS SW.

Teramnus labialis (Linn.f.) Spreng. Syst. 3:235, 1826; FBI 2:184; Cooke 1:387; Santapau 64 & Pl. Saurashtra 159.


Trailing or twining annual herbs; stem slender, glabrescent to densely hairy in younger parts, almost glabrous in older parts. Leaflets 3, 1.5-6.2 x 0.7-3.5 cm, ovate-elliptic or elliptic-lanceolate, glabrous or appressedly hairy above, densely so beneath, acute at apex, rounded at base, petiole 3-4.5 cm long, somewhat hairy. Flowers small, bright pink, fading to pale blue or almost white, fascicled on 2.5-11 cm long racemes. Pods 2.5-5 cm long, dark brown, pubescent, ending with a recurved beak.

Occasional among grasses or on low shrubs.

Flowers and fruits: September - March

Herbarium specimens examined:

Sagbara: VKS 465, 922, 2262, 2536

World distribution: Cosmopolitan in tropics.

URARIA Desv.

Uraria picta Desv. in Journ. Bot. 1:123, t. 5. f. 19, 1813; FBI 2:155; Cooke 1:367; Santapau, Pl. Saurashtra 145.
Erect undershrubs, 40-70 cm tall stem and branches finely downy, with hooked hairs. Leaves 8-15 cm long; leaflets 5-7, 4-16 x 1-2.3 cm, sessile, linear-lanceolate to linear-oblong, subcoriaceous, glabrous, often variegated with white blotches, acute or subacute at apex, rounded at base. Flowers bright rosy purple, fascicled, on 10-20 cm long racemes, peduncle and pedical fulvous downy with hooked hairs. Pods glabrous, 3-6 jointed, joints ring like, placed one above the other, shining, ash-coloured, almost black on drying.

Rare, scattered in exposed grounds along road sides and edges of cultivated fields. The variegated leaves are typical of this plant. Cooke, Santapau describe it 3'-4' (1-1.2 m) tall but in the present area it was not seen more than 75 cm in height including the length of inflorescence.

Flowers and fruits September - October

Herbarium specimens examined:
Dediapada: VKS 2752, 2734
Sagbara: VKS 2234, 2610

World distribution Tropical Africa, India, Ceylon, Malay extending upto an elevation of 6000' in Himalayas, Peninsular and Malay Islands, and Philippines.

VIGNA Savi


Twining or trailing herbs; stem and branches glabrous, at times tinged reddish purple. Leaflets 3, 3.5-9 x 2-5 cm, membranous, ovate or ovate-rhomboid, glabrous, acute or acuminate at apex, rounded, deltoid or subacute at base, lateral ones unequal sided; petiole 4-12 cm long, glabrous, striate; stipules 0.8-1 cm long, lanceolate, acuminate. Flowers 2-2.3 cm long, bright rosy purple, fading pale blue to almost white, in condensed racemes at tips of 10-20 cm long peduncles. Pods 8-15 cm long, glabrous, cylindric, shortly beaked, at first olivaceous green, at length pale creamy white, finally pale straw coloured.

Cultivated at some places during the rainy season for the pods used as vegetables.

Flowers and fruits: August - November
Local name: CHOLI
Herbarium specimens examined:
Dediapada: VKS 197, 673, 3006, 3026, 3067

World distribution: Cultivated in all warm countries of the world.

ZORNIA Gmel.

Zornia gibbosa Span in Linnaea 15:192, 1841; Mohlenbrock in Webbia 16(1):112, tt 44 & 76, 1961; Santapau 57. Zornia
**diphylla** auct. plur. (non. Pers. 1807); FBI 2:147; Cooke 1:355; Santapau, Fl. Saurashtra 142.

Annual herbs, 10-30 cm tall, erect or suberect, lower branches often spreading, glabrous, finely pubescent in young parts. Leaflets 2, 1-3.5 x 0.3-1.2 cm sessile, ovate-oblong, or ovate-lanceolate, glabrous, nigro-punctate beneath, acute at apex, rounded and inequilateral at base; petiole 1-1.5 cm, hairy. Flowers yellow with a reddish tinge, enclosed within foliaceous bracts, in 4-15 cm long terminal spikes. Pods 0.7-1.5, 4-6 jointed, echinate.

Common, at times in small patches among grasses, in the later half of the rainy season.

**Flowers and fruits**: August - October.

**Herbarium specimens examined**:

Dediapada: VKS 28, 93, 200, 2830, 2937
Sagbara: VKS 2341, 2362, 2606

**World distribution**: India, Burma, Siam, Malaya, Cochin-China, China, Celebes, Philippines and New Guinea.

**Critical notes**: Mohlenbrock distinguishes. *Z. diphylla* and *Z. gibbosa* by the following key:

Perennial; lower and upper leaflets of the same shape, upper sometimes smaller in size; petiole longer than the leaflets; leaflets, ovate to ovate-lanceolate; auricle of the bract epunctate, lowest with 4 auricles; articles of pods 4.3-4.5 mm long,
3.5 mm broad with nearly glabrous bristles 1.5-3 mm long ............ Z. diphylla

Annuals; lower and upper leaflets different in shape; petioles 2/3 rds to as long as leaflets; leaflets lanceolate to linear; articles of the bracts punctate, lowest with 4-6 articles, articles of pods 2-2.5 mm long, 2-2.5 broad with retrosely hairy bristles. 0.4-1.2 mm long .... Z. gibbosa

My plant agrees with Z. gibbosa in the key.
Key to the genera

1. Plants thorny ........................................... Parkinsonia

1. Plants unarmed:

2. Leaves unifoliolate, bilobed:

3. Plants climbing by tendrils ............... Phanera

3. Plants not as above ......................... Bauhinia

2. Leaves pinnate:

4. Corolla with 5 petals; fertile stamens
   5-10 ...................................................... Cassia

4. Corolla with 3 petals; fertile stamens 3.
   Tamarindus

2. Leaves bipinnate:

5. Flowers orange red or scarlet ............ Delonix

5. Flowers yellow ...................................... Peltophorum

**BAUHINIA** Linn.

Bauhinia racemosa Lamk. Encycl. 1:390, 1783; FBI 2:276;
Cooke 1:459; Wealth of India 1:159, 1948; Bor, Man. Ind. For. Bot. 70, 1953; Santapau 80 & Fl. Saurashtra 197; de Wit in Reinwardtia 3(4):537, 1956; Shah 673. (PLATE 14)

A small tree, 3-5 m tall with straight or crooked trunk; bark blackish-brown, deeply longitudinally furrowed. Leaves 1.5-8.5 x 3-10 cm, broadly ovate to suborbicular, glabrous above, pubescent beneath, deeply cordate at base, lobes rounded at apex; Flowers creamy yellow, in 2.5-10 cm long, erect, pendulous racemes. Pods 5-17 x 1.2-2.5 cm, woody, dark green when young, black on drying.
Occasional in the forests.

Flowers: March - May

Fruits: June - onwards

Local name: ASOTRI; APTA

Local use: The leaves are used as wrappers for local BIDIS.

Herbarium specimens examined:

Dediapada: VKS 325, 1335, 1725, 1948, 2970, 3002

Sagbar a: VKS 1356, 1428, 1823, 2413

World distribution: Native of North-West India; distributed more or less throughout India; Ceylon, Burma and Malaya Islands; also in China.

**PHANERA Lour.**


An extensive climber with opposite, circinnate tendrils; young parts clothed with rusty tomentum; tendrils 7 cm long, rusty pubescent, striate. Leaves 10-22 x 12-24 cm, suborbicular, divided about 1/3 the way down into 2 obtuse lobes, with a broad sinus, glabrous or nearly so above, densely tomentose beneath; petiole 8-10 cm long. Flowers and fruits not seen.
A rare plant in the area, collected by Dr. Shah from the forests of KOKAM. According to him it climbs over large trees spreading over considerable distance. It is a typical plant.

**Herbarium specimens examined:**

Kokam: Shah 11529, 11530.

**World distribution:** Throughout India, (outer Himalaya from the Chenab to Assam, ascending to 4000', Chota Nagpur, and in Central, Western and S. India).

**Critical notes:** The genera Phanera includes climbers or stragglers with or possibly very rarely without tendrils. We have followed the nomenclature adopted by de Wit page (478).

**CASSIA Linn.**

Key to the species

1. Trees; flowers in long, pendulous racemes; pods cylindrical ..................... **fistula**
   
1. Herbs:

2. Plants usually erect; leaflets 2-3 pairs;

3. Leaflets 2 pairs; pods linear-oblong, flat, compressed, obliquely septate between the seeds..................... **absus**

3. Leaflets 3 pairs; pods linear, terete or subtetragonous, not compressed, usually not septate between seed:

4. Gland between each of the 2 lowest pairs of leaflets ..................... **tora**

4. Gland between the lowest pair of leaflets only ..................... **obtusifolia**
2. Plants usually diffuse; leaflets 10-28 pairs ........................................... pumilis

Cassia absus Linn. Sp. Fl. 376, 1753; FBI 2:265; Cooke 1:451; Wealth of India 2:93, 1950; Santapau 79 & Fl.
Saurashtra 192; de Wit in Webbia 10:279, 1955.

Suffructicose herbs, 30-45 cm tall, erect, with ascending branches. Leaflets 4 pairs, 1.4-3.5 x 1-3.5 cm, subsessile, ovate-elliptic or ovate-oblong, appressedly pubescent, obtuse or subacute at apex, obliquely rounded or subacute at base. Flowers small, yellow with reddish tinge in short, lax, terminal or leaf-opposed, 2.5-4 cm long racemes. Pods 2-4 x 0.4-0.7 cm, flat, pale brown, apiculate, straight, appressed to stem.

Common in the undergrowth of forests, open grass lands and waste places along road sides. In the genus Cassia in the area under study, this species can be easily distinguished by 4 leaflets and straight vertical pods.

Flowers and fruits: August - October

Herbarium specimens examined:
Dediapada: VKS 73, 2573, 2951, 3063
Sagbara: VKS 1359, 2384, 2448, 2576

World distribution: Everywhere in tropics.

Cassia fistula Linn. Sp. Fl. 377, 1753; FBI 2:261; Cooke 1:444; Wealth of India 2:97, PL VII (col.), 1952;
Bor, Man. Ind. For. Bot. 72, 1953; Stearn in Blatt. & Mill.
Some Beaut. Ind. Tr. (ed. 2) 19, t. 3, 1954; Santapau 79 & Fl.
A deciduous tree, 6-10 m tall; trunk straight; bark smooth and pale grey when young, rough and dark brown when old. Leaves pinnate, rachis 15-30 cm long, glabrescent. Leaflets 8-10, 8-18 x 3.5-8 cm, ovate-oblong or elliptic-oblong, glabrous, acute or shortly acuminate at apex, rounded or subacute at base, petiolules 0.8-1.2 cm long. Flowers bright yellow in 15-30 cm long, drooping racemes. Pods 33-60 x 2.5-3 cm, pendent straight, cylindric, brownish black.

Occasional in the forests of Sagbara. An elegant tree in full bloom, conspicuous by the masses of yellow flowers on leafless branches. In some parts of Gujarat States, it is planted as an avenue tree.

Flowers: March - June
Fruits: Most of the part of the year
Local name: GARAMALA

Herbarium specimens examined:
Dediapada: VKS 1232, 1700
Sagbara: VKS 841, 911, 1381, 1641, 1820

World distribution: In the deciduous forests throughout the greater part of India, Ceylon, Burma, Malaysia and China. According to Wealth of India the plant is indigenous to India and naturalised in trop. Africa, South American and West Indies.

Erect herbs 50-90 cm tall; stem and branches terete, striate, glabrous. Leaves pinnate; rachis 2.5-5 cm long glabrous; leaflets 3 pairs, 2-5 x 1-3 cm, obovate, glabrous above, pubescent beneath, obtuse and minutely apiculate at apex, cuneate at base. Flowers 1.4-2 cm across, orange-yellow on 1-3 cm long pedicels. Pods 7-15 cm long, obscurely 4-gonous, straight or slightly falcate, beaked.

Common, often mixed with C. tora L. in waste lands along road sides.

Flowers: August - September

Fruits: October - December; rarely upto April

Herbarium specimens examined:
Dediapada: VKS 74, 1539
Sagbara: VKS 499, 1777, 2387, 2426
Ghatoli: Shah 11602

Critical notes: Several authors e.g. Bentham (Trans. Linn. Soc. 27:535-536, 1871), Baker (Fl. Brit. India 2:263, 1878) etc., consider Cassia obtusifolia Linn. and C. tora Linn. conspecific. Prain (Journ. As. Soc. Bengal 66(2):475, 1892 and Bengal Fl. 438, 1903), Cooke, de Wit and Brenan consider them as distinct. According to these authors the two species differ from each other in (1) in the position and number of glands on leaves (2) the size of the pedicels and flowers and (3) the foetid smell in C. tora. Brenan has
further shown that the two species differ (4) in shape of three large anticous anthers and (5) the size of the areole on the seeds.

I have critically examined my specimens and, following the key given by Brenan, agree with the characters of *C. obtusifolia* Linn. in the key. The foetid character is not reliable as both the species give similar smell during monsoon.


*C. tora*, in fact, judging from the rich material at Kew, is strictly confined to the Old World, from India eastwards to Polynesia .... It follows that the native home of *C. tora* Linn. must be looked for in Asia or the Pacific Islands.

*C. obtusifolia* Linn. is, on the other hand, distributed throughout the tropical regions of the world, although I have seen no material from Polynesia or Australia; indeed *C. tora* also seems not to occur in Australia. Thus in Asia both *C. obtusifolia* Linn. and *C. tora* Linn. occur but in America and Africa only *C. obtusifolia*. The native home of *C. obtusifolia* is uncertain, but the possibilities of it being the Old World must be taken into account.
Cassia pumila Lamk. Encycl. 1:651, 1784; FBI 2:266; Cooke 1:452; Santapau 79 & Fl. Saurashtra 193; de Wit in Webbia 1:288, 1955.

A prostrate or suberec, suffruticose herb; branches 15-40 cm long, often radially spreadingly. Leaves 2.5-6.5 cm long; petiole with a stipitate gland between the lower pairs of leaflets; stipules 0.8-1.0 cm long, linear-lanceolate; leaflets 10-28 pairs, linear-oblong, glabrous, apiculate at apex, obliquely rounded at base, minutely hairy on margins. Flowers orange-yellow, axillary, solitary. Pods 2-4.5 cm, flat, apiculate, obliquely partitioned between the seeds, dark brown, glabrous or sparingly hairy. Seed 8-10, dark brown, shining.

Fairly common in grass fields, and on exposed rocky earth bunds.

Flowers and fruits: August - October
Herbarium specimens examined:
Dediapada: VKS 273, 3041
Sagbara: VKS 2128, 2316, 2436, 2577, 2632

World distribution: Tropical Asia (Arabia, Peninsular India to Malaysia, eastwards to Timor and Sumbawa) and Australia.

Annual herbs, 25-100 cm tall; stem and branches terete, striate, glabrous, somewhat woody at base. Leaflets 3 pairs, 1.6-5.5 x 1-3.4 cm, obovate or obovate-oblong, somewhat hairy, obtuse at apex, cuneate at base, upper ones largest, lowermost smallest. Flowers 1.2-1.5 cm across, orange-yellow, geminate on condensed, axillary racemes. Pods 7-20 cm long, linear, somewhat falcate, beaked.

Common and abundant, either in pure or mixed patches, along road sides and paths in the forests. The fresh plants emit a somewhat disagreeable smell.

Flowers: September - October
Fruits: November
Herbarium specimens examined:
Dediapada: VKS 659, 1544, 2367, 2389, 3054
Sagbara: VKS 2177, 2276.

World distribution: See under C. obtusifolia L.

DELONIX Raf.

A deciduous tree, 3-8 m tall, with spreading branches; bark smooth, grey or pale brown. Leaves bipinnate, 14-35 cm long; pinnae 7-18 pairs, 5-15 cm long; leaflets 12-30 pairs, dark green, oblong, appressedly hairy, obtuse or subacute at apex, somewhat obliquely rounded at base. Flowers 6-9 cm across, orange-red or scarlet, in short terminal racemes at tips of leafless branches. Pods 25-35 x 2.5-4 cm long, stout, flat, compressed, pendulous.

Planted in the compound of the rest house at Sagbara as an ornamental tree. It is an attractive tree in vegetative condition by the feather-like foliage. It is also quite conspicuous when in full bloom by the masses of orange-red or scarlet flowers.

Flowers: April - June
Fruits: July - September
Local name: GUI-MOHAR
Herbarium specimens examined:
Sagbara: VKS 1669, 1870

World distribution: A native of Madagascar; cultivated in Angola, Egypt, Arabia, many parts of India, Malaya, Philippines and in many other tropical countries.
An armed, large shrub or a small tree, 4-6 m tall; young branches dark green, terete somewhat flexuose; thorns paired, 0.6-0.8 cm long, straight or curved from stout conical bases. Leaves pinnate; pinnae 1-3 pairs; rachis 15-30 cm long, flattened dark green; leaflets 40-45 pairs, 1-2 mm long, soon falling off, dark green, oblanceolate, glabrous, shortly lobed at apex, rounded or subacute at base. Flowers and fruits not seen.

Rare, planted near a house at Sagbara.

Herbarium specimens examined:

Selamba : VKS 2691
Dediapada : VKS 1870

World distribution: A native of Mexico and Southern United States, but universally cultivated and often naturalised.

PELTOPHORUM Vogel

Peltophorum pterocarpum (DC.) Backer ex K. Heyne, Nutt.


Peltophorum pterocarpum (DC.) Backer ex K. Heyne, Nutt.

Peltophorum pterocarpum (DC.) Backer ex K. Heyne, Nutt.

A small tree 6-8 m tall; young branches clothed with rusty-brown tomentum. **Leaves** 20-25 cm long, with rusty brown pubescent rachis; pinnae opposite, 9-12 pairs; **leaflets** 18-15 pair, 1-1.2 x 0.3-0.4 cm, sessile, dark green above, pale beneath, subcoriaceous, glabrous above, slightly tomentose beneath subsessile, obtuse at apex, unequal sided at base. **Flowers** yellow in terminal ± 15-25 cm long panicles; peduncle and pedicels rusty brown. **Pods** 7-10 x 1.4-2.5 cm, flat, lanceolate, dark copper red, tinged.

Rare, planted along road at Dediapada. This is an attractive plant by bright yellow flowers produced above the foliage and copper-red pods. The specific name *Peltophorum* refers to peltate or shield shaped stigma.

**Flowers** : August - September  
**Fruits** : September  
**Herbarium specimens examined** :  
Dediapada : VKS 104, 1312

**World distribution** : According to Haines (Bot. Bihar & Orissa 2:328, 1961, reprinted) it is a native of Eastern Peninsula and Ceylon; but Stearn states that it is a native of Ceylon, the Andamans, the Malay Peninsula and Malay Archipelago and North Australia. It is grown in many parts of India as an ornamental tree in garden and as an avenue tree along road sides.
TAMARINDUS Linn.

Tamarindus indica Linn. Sp. Pl. 34, 1753; FBI 2:273;


A large, evergreen tree, 10-15 m tall, with spreading branches; trunk straight; bark dark blackish-brown, longitudinally fissured. Leaves 4-7 cm long; leaflets 5-15 pairs, 0.6-2 x 0.3-0.7 cm, fresh ones bright green, linear-oblong, glabrous, obtuse or slightly emarginate at apex, rounded and oblique at base. Flowers yellowish with pink streaks, in lax, 4-8 cm long racemes. Pods 6-10 cm long, more or less falcate, pendulous, greyish brown.

Occasional in vicinity of villages, self sown or planted; also self sown in open forests and cultivated fields.

Flowers : May - June
Fruits : August
Local name : AMBLI
Local use : The juice extracted from pods is used in the preparation of curries.

Herbarium specimens examined :
Dediapada : VKS 1925, 2048
Sedgpur : VKS 2967
Sagbara : VKS 1350
World distribution: Throughout the tropics. In India mostly planted along road sides and near villages, mainly as a shade tree, at times self sown and running wild. According to Bailey this monotypic genus is indigenous to tropical Africa and possibly South Asia.
MIMOSACEAE

Key to the genera

1. Stamens 10; anthers with deciduous apical glands; plants armed; flowers in cylindric spikes:
   2. Pinnae 2 pairs; flowers creamy white to pale yellow; pods turgid, slender, straight, cylindric ............... Prosopis
   2. Pinnae 6-10 pairs; flowers in upper half of spikes hermaphrodite, yellow, lower half sterile, rosy-pink or purple; pods flat, twisted when ripe ................. Dichrostachys

1. Stamens 8-10 or many; anthers without glands; plants armed or not; flowers in globose heads, spikes or panicles:
   3. Stamens indefinite; flowers white, creamy-yellow or bright yellow, (rosy purple in Samanea); pods unarmed:
      5. Stamens free ................................ Acacia
      4. Stamens monadelphous:
         5. Pods flat ................................. Albizia
         5. Pods circinate or twisted:
            6. Pinnae 1 pair, each with 7 pairs of leaflets, pods not septate between the seeds; flowers greenish white...... Pithaecellobium
            6. Pinnae 2 pairs, each 8-10 pairs of leaflets; pods septate; flowers rosy pink .......................... Samanea
3. Stamens 8, free; flowers bright pink 
or rosy purple in globose heads; pods 
strongly falcate with weak prickles ...... Mimosa

**ACACIA** Mill.

Key to the species

1. Climbing shrubs ................................ pennata

1. Trees :

2. Flowers in globose heads; spines 2-2.5 
cm long, straight, white; pods grey, downy, 
deeply constricted between seeds ........... nilotica ssp. 

2. Flowers in spikes or panicles; spines 
much shorter, hooked or straight but never 
white; pods not as above :

3. Flowers in terminal panicles .............. leucophloea

3. Flowers in spikes :

4. Pinnae 10-35 pairs; bark light black; 
stipular spines scattered ..................... chundra

4. Pinnae 4-6 pairs; bark brown stipular 
spines in pairs .............................. ferruginea

Acacia chundra Willd. Sp. Pl. 4:1078, 1806; Bor, Man. 
Ind. For. Bot. 83, 1953; Santapau 84 & Fl. Saurashtra 207.

Mimosa chundra Roxb. ex Willd. Sp. Pl. 1oc. cit. 4:1079, 
1806. Mimosa sundra Roxb. Pl. Cor. 3; t. 225, 1819 & Fl. Ind. 
2:562, 1832. Acacia sundra (Willd.) DC. Prodr. 2:458, 1825; 
FBI 2:295; Wealth of India 1:20, PL. 1(4), 1948. Acacia 
catechu var. sundra Prain in Journ. Asiat. Soc. Beng. 66:508,
10-12 m tall, thorny trees; bark light black coloured, fissured. Leaves 2-pinnate, 10-15 cm long; rachis grooved, glabrous, with a large gland above the middle of the petiole, 3-4 small glands between uppermost 3-4 pairs of pinnae; rachis with scattered prickles; pinnae 15-20 pairs, 2.4-5 cm long; leaflets minute, 35-45 pairs, linear-oblong, glabrous, subacute obtuse at apex, obliquely rounded at base. Flowers pale yellow, in 8-14 cm long, axillary spikes. Pods 6-18 x 2-2.7 cm, flat, thin, brown, with a triangular beak at the apex and narrowed at base.

Occasional along road sides and in the forests.

Flowers: May - June
Fruits: June - December
Local name: KHAIR
Herbarium specimens examined:
Sagbara: VKS 568, 605, 1759, 2073

World distribution: India (upper Gangetic plains, Rajputana, Gujarat, Kokam, Deccan and Carnatic from Kistna to Cape commorin) Burma and Ceylon.

Acacia ferruginea DC. Prodr. 2:458, 1825; FBI 2:295; Cooke 1:477; Wealth of India 1:15, 1948; Santapau, Fl. Saurashtra 209; Shah 673.

10-12 m tall trees; bark brown, excorticating in irregular, rectangular scales. Leaves 2-pinnate, 7-12 cm long; stipular
spines paired, hooked, polished, from triangular bases, pinnae 4-7 cm long; leaflets 10-20 pairs; sessile, linear-oblong, subcoriaceous, glabrous, unequal sided. Flowers pale yellow in 6-7 cm long, axillary spikes. Pods 15-17 x 2-2.5 cm long, copper red to reddish brown, glabrous.

Rare, seen only once at Sagbara on 27-4-1968. Baker (in Fl. Brit. Ind.) and Cooke describe floral rachis and calyx as glabrous, but in my plant, they are grey pubescent.

Flowers : April
Local name : ETCHUN; BABAR-KHAIR
Herbarium specimen examined:
Sagbara : VKS 1778
Ghatoli : Shah 11502

World distribution : Drier parts of India (Western Peninsula) and Ceylon.

Acacia leucophloea Willd. Sp. Pl. 4:1083, 1806; FBI 2:294; Cooke 1:475; Wealth of India 1:9, t. 4, PL. IV. 1948; Bor, Man. Ind. For. Bot. 32, 1953; Santapau, Fl. Saurashtra 207.

Thorny trees, 10-12 m tall; bark brownish-blackish-brown, rough, longitudinally fissured, young branches creamy-white or grey tomentose, branches unarmed. Leaves 8-12 cm long; rachis down with a gland between each pair of pinnae; pinnae 8-10 pairs; leaflets 12-30 pairs; glabrous or nearly so, subsessile, linear-oblong, obtuse at apex, unequal sided and rounded at base. Flowers dull yellow in globose heads forming 8-15 cm long panicles. Pods 8-10 x 0.8-1 cm long, pale yellow, densely silky.
Rare, there is only once tree along road side in Dediapada village. The paniculate heads make this species distinct from other species in the genus *Acacia*.

**Flowers**: September

**Herbarium specimens examined**: Dediapada: VKS 2896, 2976

**World distribution**: India (Drier parts of plains of Punjab, Rajputana, Central and Southern India) Ceylon, Burma and Malaya Islands.


*Acacia arabica* auct. Ind. non (Lamk.) Willd; FBI 2:293; Cooke 1:472.

A straight or crooked, armed tree, 2.5-5 m tall; bark dark brown, rough, longitudinally and irregularly fissured; stipular spines 1-1.5 cm long, grey, shining. **Leaves** 3-8 cm long; rachis prickly downy with a gland below the lower most pair of pinnae and between the three uppermost pairs of pinnae; pinnae 3-8 pairs; leaflets 10-25 pairs; minute, sessile, linear-oblong, oblique. **Flowers** 1-1.2 cm, yellow in globose heads. Peduncles 10-15 cm long, axillary, in fascicles of 2-5. **Pods** moniliform compressed, neck-lace like.

Occasional, mostly near villages, rare in the forests.

**Local name**: BABUL

**Local use**: The twigs are used as tooth brushes.
Herbarium specimens examined:

Dediapada: VKS 833, 2247, 2895
Sagbara: VKS 1307, 1353, 1423; Shah 14067

World distribution: While working on Mimosaceae of Trop. E. Africa, Brenan recognised 4 subspecies of which ssp. indica, which is native of India is also found in Trop. E. Africa along with other subspecies. This ssp. can be easily identified by the pods which are necklace-like, narrowly and regularly constricted between the seeds and are white tomentellous.


A large, scandent, heavily armed, climbing shrub; bark pale to dark brown or yellow, often polished, smooth but for prickles; prickles stout hooked, pale brown polished, from triangular bases. Leaves 2-pinnate, 10-15 cm long; rachis grooved, pubescent, often prickly; gland solitary above the Pinnae, 8-18 pairs, 3-8 cm long, subsessile, leaflets 20-50 pairs, slightly overlapping, linear, glabrous, obtuse and minutely apiculate at apex, oblique and rounded at base. Flowers white when fresh, turning pale yellow later on, in 1-1.5 cm long, globose heads, forming 12-20 cm long, terminal panicles; heads of unopen flowers deep purple; Pods 7-16 x 1.5-2.4 cm, curved or straight, thin, flat, brown, shortly apiculate.

Common; a conspicuous climber by the masses of reddish-purple globose heads in terminal panicles above the dense
foliage. This is the only species of *Acacia* in the area which has a climbing habit. The plant is initially an erect shrub with rambling branches but it becomes a powerful climber in presence of support.

**Flowers** : July - October  
**Fruits** : September - March 

**Herbarium specimens examined** :  
Dediapada : VKS 713, 1176, 1202; Shah 11468  
Sagbarra : VKS 1391, 1429, 1712  
Kakarpara : VKS 570  
Ghatoli : VKS 2756

**World distribution** : Tropical Africa, India, Burma, Ceylon, and Malaya.

**ALBIZIA** Dur.

*Key to the species*

1. Flowers pedicellate; pods pale yellow  
or straw coloured .......................... *lebbeck*  
1. Flowers sessile; pods brown .............. *odoratissima*


An unarmed, deciduous *tree*, 12-18 m tall, with a spreading crown; bark ash coloured to pale brown, irregularly fissured.
Leaves 2-pinnate; rachis 10-15 cm long, grooved with a large, sessile gland near the base and one, smaller one between the uppermost pairs of pinnae; leaflets 2.4-5 x 1-2.2 cm, sub-sessile, elliptic-oblong, the uppermost pair obovate-oblong, sparsely hairy or glabrous above, pubescent beneath, obtuse at apex, obliquely rounded or truncate at base. Flowers greenish-white at first, pale brown on withering, fragrant, in pedunculate heads from the upper leaf axils; heads 2-4.5 cm across; peduncle 1-2.5 cm long. Pods 15-30 x 3-5 cm, flat, linear-oblong, somewhat depressed between the seeds, pale yellow or straw white.

Occasional. The tree is quite conspicuous by the masses of flat, pale yellow or straw coloured polished, pendant pods. It is also raised as an avenue tree in some parts of Gujarat because of its quick growth.

Flowers: October - December
Fruits: December - February
Local name: CHITRAN
Herbarium specimens examined:
Dediapada: VKS 33, 1578, 1916, 1950
Sagbara: VKS 442, 808, 835, 2327

World distribution: Pantropical, originating from tropical Asia.

Albizia odoratissima (Linn. f.) Benth. in Hook. Lond. Journ. Bot. 3:88, 1844; FBI 2:299; Cooke 1:482; Wealth of India 1:44, 1948; Bor, Man. Ind. For. Bot. 78, 1953; Santapau
A large tree, 15-20 m tall; bark smooth, greenish-grey. Leaves abruptly pinnate; pinnae 2-4 pairs; secondary rachises 7-15 cm long, pubescent, or glabrescent; leaflets 5-10 pairs, 1.5-3 x 0.5-1.4 cm, elliptic-oblong, glabrous, sub-coriaceous, rounded at ends, unequal sided. Flowers in globose heads, white, fragrant, in terminal 10-15 cm long panicles. Pods 10-15 x 2-3 cm, brown, flat, straight, smooth.

Rare, a few trees noted in the forests along Dediapada, Ghatoli Road.

Flowers : April
Fruits : September - November
Local name : SIRISH
Herbarium specimen examined :
Dediapada : VKS 1652

World distribution : More or less throughout the deciduous forests in India, Ceylon and Burma.

DICHROSTYACHYS Wt. & Arn. (Nom. Cons.)

Dichrostachys cinerea (Linn.) Wt. & Arn. Prodr. 271, 1834;  
FBI 2:288; Cooke 1:468; Wealth of India 3:56, t. 25, 1952;  
Bor, Man. Ind. For. Bot. 77, 1953; Brenan in Kew Bull. 1957:  
357, 1957; Santapau, Fl. Saurashtra 201. Mimosa cinerea  
Linn. Sp. Pl. 517, 1753.
A much branched, thorny shrub, 1.5-3 m tall, with spreading branches; bark grey or greenish white with longitudinal fissures. Leaves 2-pinnate, 2.5-5 cm long; pinnae 8-10 pairs with stipitate glands at base of each pair; leaflets 12-15 pairs, minute, linear, oblique, sessile, subacute at ends. Flowers numerous, crowded, in dense, axillary or extra-axillary, 3-15 cm long, spikes. Pods flat, twisted when ripe.

Rare, along road sides on the outskirts of Sagbara village. The colour of the inflorescence is rather distinctive of this species.

Flowers : September
Herbarium specimen examined :
Sagbara : VKS 2670

World distribution : Following Brenan in Kew Bull. 1957; 358, 1957 & Fl. Trop. E. Afr., my plant is ssp. Ginerea which is wide spread in tropical and subtropical Africa from the Cape Verde Islands, The Gambia and Sudan southward to Natal and S.W. Africa, also in Arabia, Tropical Asia and Australia; introduced in Florida and Cuba.

MIMOSA Linn.

Mimosa hamata Willd. Sp. Fl. 4:1033, 1805; FBI 2:291;

An armed, straggling, undershrub 70-125 cm tall, with spreading, downy branches; branches reddish purple, heavily studded with 6-8 cm long; recurved prickles; rachis prickly,
pubescent. Leaves 2-pinnate; pinnae 3-6 pairs, 1.5-2.5 cm long, shortly stalked, prickly; leaflets 8-10 pairs, 0.3-0.7 cm long, ovate-oblong, glabrous or nearly so above, thinly hairy beneath, acute and mucronate at apex, obliquely rounded at base. Flowers bright pink or rosy purple in globose heads, on long peduncles, peduncles 1-1.5 cm long, axillary solitary, crowded at ends of branches. Pods 4-9 x 0.8-1.2 cm, flat, strongly falcate with weak prickles on the edges, 4-8 jointed, reddish purple, at length brown.

Rare, seen only once at Dediapada in open waste lands. The falcate pods with weak prickles are typical of the species.

Flowers and fruits: September

Herbarium specimens examined:
Dediapada: VKS 3025, 3051, 3080

World distribution: Throughout the drier parts of Punjab, Central and South India.

Pithecellobium Mart. (Nom. Cons.)


An armed tree, 6-7 m tall, with spreading branches bark greyish-black, rough; trunk straight or crooked. Leaves bipinnate with a pair of pinnae; leaflets 1.5-4.5 x 0.7-2.5
cm, sessile, ovate-oblong, glabrous, coriaceous, obtuse at apex, cuneate and strongly unequal sided at base. **Flowers** white or creamy white when fresh, brick red or brown on withering, in globose heads, forming 8-25 cm long, axillary and terminal panicles. **Pods** 4-14 cm long, 2-6 seeded, much curved or spirally twisted, deeply constricted between seeds, at first glaucous-green, red when ripe. **Seeds** 0.6-0.8 cm long, smooth, black, polished, enclosed in white or red sweet fleshy aril.

Occasional; planted or self sown near houses.

**Flowers**: January - February

**Fruits**: April - May

**Local name**: JANGLI-AMLII

**Herbarium specimens examined**:

Dediapada: VKS 301, 2057, 2899

Sagbara: VKS 1185, 1222

**World distribution**: Native of Mexico, naturalised almost throughout India, Burma, Malaya and Philippines.

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PROSOPIS Linn.

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An armed tree, 10-12 m tall; bark blackish-brown, rough, cracked, irregularly fissured. Leaves 2-pinnate; pinnae 2-paired; leaflets in 8-10 pairs, 0.3-1.3 x 0.2-0.4 cm, obliquely oblong, slightly mucronate at apex, rounded at base. Flowers yellow in 4-8 cm long spikes. Pods 5-12 x 0.4-0.8 cm, straight, torulose, pale brown.

Only one tree seen along road side from Sagbara to Selamba.

Flowers and fruits: April

Herbarium specimen examined:

Sagbara: VKS 1713

World distribution: Afghanistan, Persia, Baluchistan, Sind and dry regions of India.

Samanea


Trees 8-13 m tall; with spreading branches resembling an open umbrella; bark dark brown or grey-brown, irregularly fissured; young branches olivaceous green, studded with white lenticels, subterete. Leaves bipinnate; main rachis 10-20
cm long, striate, pubescent; pinnae 4-6 pairs with a gland between each pair of pinnae; lateral rachises 4-17 cm long, with two small horn like glands on either side of petiolule and one gland between each pair of leaflets; leaflets 3-8 pairs, 2-7 x 1-4 cm, elliptic-rhomboid or obliquely obovate-oblanceolate, dark green, glabrous and shining above, paler and pubescent beneath, subacute or obtuse at apex, obliquely cuneate at base, uppermost pair of leaflets longest, gradually becoming smaller towards base. Heads 2-3 cm across, globose on 8-13.5 cm long, pubescent, axillar peduncle. Flowers bright rosy-pink. Fruit not seen.

Planted as an avenue tree at Dediapada. It is an elegant tree by its umbrella like spreading crown and the heads of bright rosy pink flowers. The tree popularly known as rain tree, from the fact that the leaflets fold together during a rainy storm (See Bor')

Flowers : May - June

Herbarium specimen examined :
Dediapada : VKS 501

World distribution : A native of Central and Tropical America, grown widely distributed through the tropics (See Bailey). In India it is planted along road side's as an avenue tree and in gardens as ornamental.
Key to the genera

1. Woody climbers; petals 4-5 ........................ Combretum

1. Trees; petals absent:

2. Flowers in globose heads ......................... Anogeissus

2. Flowers in spikes ............................... Terminalia

ANOGIEISSUS Wall.

Anogeissus latifolia Wall. ex Bedd. Fl. Sylv. t. 15, 1869; FBI 2:450; Cooke 1:512; Wealth of India 1:81, PL XV (1), 1948; Bor, Man. Ind. For. Bot. 214, 1953; Santapau 91 & Fl. Saurashtra 220; Shah 673. Conocarpus latifolia Roxb. Hort. Beng. 34, 1814 (nomen) & Fl. Ind. 2:442, 1832; Wight Icon. t. 994.

Large, deciduous trees, 8-10 m tall; bark smooth, ash coloured shining, exfoliating in thin rounded scales. Leaves 3.8-5 x 1.7-4.5 cm, ovate-oblong or elliptic-oblong, glabrous, coriaceous, acute and minutely cuspidate at apex, rounded at base; petioles 0.3-1.2 cm long, glabrous. Flowers pale yellowish-brown, in 0.6-0.8 cm across heads; peduncles 1.2-1.5 cm long, glabrous. Fruits 0.7-1 cm long, yellowish-brown, wings with entire margins.

Occasional in the forest. The bark is typical. Sometimes the leaves were seen infected with insect galls. The leaves often turn copper-red before falling.

Flowers and fruits : September - November
**Local name:** DHAWAH or DHAMDA

**Local use:** A timber plant

**Herbarium specimens examined:**
Sagbaras: VKS 459, 896, 1344, 1430, 2294
Ghatoli: Shah 11569

**World distribution:** It is distributed from Punjab as far west as Ravi, ascending to 3000' through Himalaya and Central or South India to Ceylon. It is a characteristic of deciduous forests usually of a dry type but it is also found in moist deciduous forests.

**COMBRETUM Loeffl.** (Nom. Cons.)

Combretum ovalifolium Roxb. Hort. Beng. 28, 1814 (nom. nud.). & Fl. Ind. 2:226, 1832; FBI 2:458; Cooke 1:515; Santapau 91 & Fl. Saurashtra 219; Shah 673.

A large, woody, deciduous climber, with smooth, pale brown bark. **Leaves** 3.5-10 x 2-8 cm, broadly ovate, elliptic or elliptic-oblong, glabrous, obtusely acuminate at apex, rounded at base, minutely crenate on margins; petioles 1-2.5 cm long, grooved, glabrous. **Flowers** greenish-yellow, in 3-7 cm long spikes, forming 8-30 cm long panicles, axillary or from axils of fallen leaves on old wood. **Fruits** 1.5-2.5 cm long, 4 winged, purplish when young turning to golden brown at maturity.

Common on large trees along river banks.

**Flowers:** January - April

**Fruits:** April
Herbarium specimens examined:

Sagbara: VKS 1282, 1313, 1408, 1665

Ghatoli: VKS 1562, 1572, 1678

Dediapada: VKS 1884

World distribution: Throughout the Deccan peninsula and Ceylon.

TERMINALIA Linn.

Key to the species

1. Fruits winged ........................................ crenulata

1. Fruit not winged ....................................

2. Leaves alternate or uppermost subopposite; fruit subglobose ............... bellirica

2. Leaves opposite; fruit ellipsoid, ribbed. chebula


A large, deciduous tree, 8-10 m tall, bark ashy-grey to pale brown, longitudinally cracked. Leaves 7-20 x 4.5 - 10 cm, crowded at ends of branches, broadly elliptic or elliptic-obovate, thinly appressedly pubescent when young, glabrous and coriaceous when old, rounded or rarely subacute at apex, tapering at base, 6-8 pairs of nerves; petiole 6-10 cm long, axillary spikes and terminal panicles. Drupes 2-2.5 x 1.5-2
cm, ellipsoid or subglobose, covered with minute, pale brown tomentum.

Rare in the forest.

**Flowers**: September

**Fruits**: September - January

**Herbarium specimens examined**:

Sagbara: VKS 410, 880, 1926
Ghatoli: Shah 11501

**World distribution**: India, (throughout plains and low hills except western desert tract) Ceylon, Burma, Indo-China, Siam and in Malaysia Java, Sumatra, North Borneo, Central Celebes and Molluccas.

Terminalia chebula Retz. Obs. fasc. 5:31, 1798; FBI 2:446; Cooke 1:509; Bor, Man. Ind. For. Bot. 2:12, 1953; Santapau 90 & Fl. Saurashtra 1:217; Shah 673.

A middle sized tree 9-12 m tall; bark dark brown, longitudinally cracked, exfoliating into woody scales. **Leaves** 7.5-14 x 4.4-9 cm, broadly ovate-oblong or elliptic-oblong, densely silky hairy when young, at length glabrous acute at apex, rounded or subcordate at base; petioles 1-2.6 cm long, with 2 glands near tip. **Flowers** not seen. Drupes 2.4-3 x 1.5-2 cm, ovoid or ellipsoidal, faintly angled, yellowish green when dry.

Occasional in the forests at Ghatoli.

**Fruit**: December.
Herbarium specimen examined:
Ghatoli: Shah 11481

**World distribution**: Throughout the greater part of India ascending to 5000' in outer Himalaya and 6000' in Travancore, Ceylon, Burma, Siam, Malay Islands.


Deciduous trees, 12-15 m tall; bark dark or grey, rough, tesselated, peeling of in rectangular scales. Leaves 4-13 x 3-7 cm, broadly ovate, elliptic-oblong or elliptic-oblanceolate, glabrescent, crenate, acute or emarginate at apex, rounded, acute or subcordate and sometimes unequal sided at base. Flowers fragrant, creamy white when fresh, yellow later on, in 5-13 cm long, axillary spikes, culminating into terminal panicles at ends of branches. Fruits 3-5-6 cm long, 5-6 winged, brown at maturity.

Common, one of the dominant components of the forest vegetation.

**Flowers**: April - June

**Fruits**: Best part of the year

**Local name**: SADADH
Herbarium specimens examined:
Dediapada: VKS 79, 1177, 1377, 1972, 2055, 2077
Sagbara: VKS 1572, 1809, 1840, 2054

World distribution: India (Western peninsula) and upper and lower Burma.

Critical notes: For the identification of this plant I have followed Santapau in JBNHS 50:305-307, 1951. According to him T. tomentosa and T. crenulata Roth can be distinguished by the following key:

1. Lower surface of leaves, twigs and inflorescence villous; panicles dense; glands of leaf near the base ................. tomentosa
2. Lower surface of leaves, twigs and inflorescence glabrous; panicles lax; gland of leaf some way above the base ............... crenulata
MYRTACEAE

Key to the genera

1. Leaves strongly aromatic ............................ Eucalyptus

1. Leaves not as above:

2. Calyx closed in bud; lobes in the flower valvate; ovary many-locular;
   berries 1-2 seeded ............................ Syzygium

2. Calyx open in bud; ovary usually 2-locular; berries many seeded ............ Psidium

EUCALYPTUS L. Herit.

Eucalyptus sp.

Small, evergreen trees, 2-3 m tall; bark greyish-white, smooth. Leaves 3-12 x 0.6-3 cm, opposite or alternate on older shoots, glabrous, entire acute or acuminate at apex, cuneate at base; petiole 2-3 cm long. Flowers and fruits not seen.

Planted along road side from Dediapada rest house to Bus stand.

Herbarium specimens examined:
Dediapada: VKS 1067, 2907

World distribution: The genus Eucalyptus is a native of Australia and various species are cultivated in different tropical regions.
**PSIDIUM** Linn.


An evergreen tree, 4-6 m tall; bark smooth, greenish brown, peeling off in large patches. Leaves 3.5-8 x 1.7-5 cm, opposite, elliptic-oblong, coriaceous, glabrescent above, appressedly hairy beneath, acute or subacute at apex, rounded or cuneate at base; petiole 1-2.5 cm long, glabrous. Flowers white, axillary, solitary or 1-3 fascicled on 0.6-2.5 cm long peduncles.

Occasionally planted near houses for edible fruits.

Herbarium specimen examined:
Dediapada: VKS 778

World distribution: It is a native of tropical America, now cultivated throughout the tropics for its fruits.

**SYZYGIUM** Gaertn.

Key to the species

1. Trees ........................................................cumini
2. Shrubs ........................................................heyneneanum


Trees, 10-12 m tall; bark thick, light to dark grey or brown coloured. Leaves 6-15 x 2-6 cm, elliptic-oblong or elliptic-lanceolate, coriaceous, pale to dark-green, shining above, dull green beneath, acuminate at apex, tapering at base; petiole 1-2 cm long, glabrous. Flowers 0.5-0.7 cm across, greenish white, fragrant, on 4-9 cm long panicles. Berries 1-2.5 cm long, ovoid or oblong, deep purple to almost black.

Occasional; planted near houses and along roads; also self sown in forests.

Flowers: April - May
Fruits: June - August
Local name: JAMUN
Local use: Fruits are edible
Herbarium specimens examined:
Dediapada: VKS 142?, 1903

World distribution: India, Ceylon, Burma, Malaya, Philippines and Australia.

Critical notes: Bor (p. 204) remarks "All Eugenias can be spotted in the forest by their gland-dotted opposite leaves which also have a very definite intramarginal nerve".

Cooke 1:524. *Eugenia salicifolia* Wight. Ill. 2:16, 1850
(non DC., 1828). *Syzygium salicifolium* Grah. Cat. 73, 1839.

Large shrubs or small trees, 2-4.5 m tall; bark greenish white, glabrous. Leaves 7-14 x 1-4.5 cm, opposite, oblong-lanceolate or elliptic, glabrous, dark green and shining above, paler and dull beneath, obtuse or acuminate at apex, tapering at base. Flowers white in shortly pedicellate cymes on old wood from the axils of fallen leaves.

Common in stony river beds, either in pure stands of often mixed with *Homonoia riparia* Lour., *Tamarixericoides* Rottl., *Vitex negundo* L., *Woodfordia fruticosa* Kurz, etc., forming dense thickets near water courses.

*Flowers*: January - April

*Local name*: JAL-JAMUNI

*Herbarium specimens examined*:

Dediapada: VKS 749, 1853

Sagbara: VKS 1793

*World distribution*: More or less throughout the Peninsular India.
LECYTHIDACEAE

CAREYA Roxb.

*Careya* arborea *Roxb.* *Pl. Cor.* 3:14, t. 218, 1819; *FBJ* 2:511; *Wt.* Ill. tt. 99 & 100; *Cooke* 1:528; *Wealth of India* 2:6, t. 35, 1950; *Bor, Man.* *Ind. For. Bot.* 206, 1953; *Santapau* 94; *Shah* 673. (PLATE 16).

Deciduous *trees*, 10-15 m tall, with a straight trunk; bark dark greyish-black or brown, rough, longitudinally fissured. *Leaves* 8-25 x 5-12 cm, sessile or shortly petiolate, crowded at extremities of branches, broadly obovate or oblong-obovate, glabrous, bright to dark green, minutely serrate or crenate, sometimes wavy, subacute or shortly acuminate at apex, tapering at base. *Flowers* creamy-white, 3-4 cm across, sessile, in *fasiclces* of 2-3 on old wood of leafless branches. *Fruits* 4-6.5 cm across, globose, yellow when ripe, fowl smelling.

Occasional in the forests. Fruits are said to be poisonous yet they are eaten by monkeys. The leaves turn brick-red before falling and they render the plants noticeable.

*Flowers*: February - March.

*Fruits*: April - July

*Local name*: GUL-MORA

*Local use*: A timber plant. Bark is said to be medicinally useful.

*Herbarium specimens examined*:

*Dediapada*: VKS 1970; Shah 11492
Sagbara: VKS 974, 1849
Piplod: VKS 1625

World distribution: Throughout India, Burma, Ceylon, Malay Peninsula, Siam.
LYTHRACEAE

Key to the genera

1. Herbs; petals not crinkled; margins entire;
2. Fruit dehiscent, opening by valves;
   valves minutely, horizontally striate..... Rotala
2. Fruit indehiscent, bursting irregularly;
   valves not striate ......................... Ammannia

1. Shrubs:
3. Leaves nigro-punctate beneath; flowers zygomorphic; stamens 12 ................. Woodfordia
3. Leaves not as above; flowers regular,
   stamens 8 .................................... Lawsonia

1. Trees; stamens many; petals crinkled with erispid erose or fimbriate margins ....... Lagerstroemia

AMMANNIA Linn.

Key to the species

1. Flowers sessile, in axillary clusters ..... baccifera
1. Flowers pedicelled, in axillary
   dichasial cymes ........................... multiflora

Ammannia baccifera Linn. Sp.Pl. (ed. 2.) 175, 1762;
FBI 2:569; Koehne in Pfreich 17:53, 1903; Cooke 1:541; Blatter & Hallberg in JBNHS 26:215, 1913; Santapau 97 & Fl. Saurashtra 226; Shah 674. Ammannia salcifolia Hiern. in Oliv. Fl. Trop. Afr. 2:278, 1871 (excl syn), non Monti; FBI 2:569; Cooke 1:541.
Annual or perennial herbs 30-70 cm tall; branches obscurely 4-gonous spreading or ascending, lower ones at times diffuse. Leaves 1.5-4.5 x 0.2-1.2 cm, sessile, pale to dark green, opposite, linear-oblong, linear-lanceolate, glabrous, acute at apex, tapering or subauriculate at base. Flowers minute, red, in axillary clusters. Fruits 0.2-0.4 cm in diameter, red.

Common and abundant, gregarious but at times scattered, in moist places. The spreading branches and dense, axillary clusters of red flowers, render the plant conspicuous.

Flowers and fruits: September - March, or in permanently moist ground throughout the year.

Herbarium specimens examined:
Dediapada: VKS 643, 910, 989, 1109, 1231, 1492, 1723
Sagbara: VKS 894*, 905, 1503
Selamba: VKS 519, 848, 1328

World distribution: More or less throughout the tropics of the Old World.

Critical notes: *A* baccifera Linn. and *A. salicifolia* are treated as distinct in most of our Indian Floras on the basis of the shape of leaf bases, but this character is not a reliable one. I have therefore, followed Santapau (1967) in treating the two conspecific, under *A. baccifera*.

*Ammannia multiflora* Roxb. Fl. Ind. 447, 1820; FBI 2:570; Koehne in Pflreich. 17:48, 1903; Cooke 1:541; Blatter & Hallberg in JBNHS 26:212, 1918 (excl. syn.); Santapau 97 & Fl. Saurashtra 225.
Annual herbs, 10-35 cm tall, stem and branches sharply 4-gonous ascending, pale green to deep red. Leaves 0.7-3 x 0.2-0.5 cm, sessile, linear-oblong or elliptic-oblong, glabrous, acute at apex, auriculate at base. Flowers minute, red, pedicellate in axillary cymes; pedicles 0.2-0.4 cm long, slender, glabrous. Fruits red, with persistent style.

Occasional in moist ground along ditches and in river beds. In cold months the whole plant turns red. The pedicellate flowers and auricled leaves are good field characters.

**Flowers and fruits**: November - January

**Herbarium specimens examined**:

Dediapada: VKS 308, 1770
Mosda: VKS 372
Sagbara: VKS 2373, 2385; Shah 14133

**World distribution**: Old World tropics, indigenous in India.

**LAGERSTROEMIA** Linn.

Lagerstroemia parviflora Roxb. Pl. Cor. 1:47, t. 66, 1795;
Lagerstroemia lanceolata Dalz. & Gibs. Bomb. Pl. 98, 1861 (non Wall.)

A deciduous tree, 5-9 m tall; bark smooth, ash coloured exfoliating in narrow, longitudinal flakes; young parts
glabrous. Leaves 2.5-10 x 2.4.5 cm, shortly petiolate or sub-sessile, ovate-lanceolate or elliptic-oblong, glabrous above whitish tomentose beneath, acute or subacute at apex, rounded or cuneate at base. Flowers white, 0.5-0.8 cm across, fragrant in axillary panicles. Capsules 1.8-2.8 cm long, ovoid to ellipsoid, deep brown, seated on persistent woody calyx. Seeds winged.

Common in the forests.

Flowers: March - May

Fruits: June - December

Local name: BONDARA

Herbarium specimens examined:

Dediapada: VKS 2092

Ghatoli: VKS 1643, 1905

Sagbara: VKS 318, 409, 967, 1008, 1454, 1651, 1761, 1858, 2554.

World distribution: Throughout the dry mixed forests of India, Burma and Java.

LAWSONIA Linn.

A copiously branched, thorny or unarmed bushy shrub, 2-3 m. tall, with spreading, ascending or drooping branches, bark in younger branches, smooth, polished, creamy white tinged pink or pale straw. Leaves 1.3-2 x 0.5-1 cm, elliptic, obovate, or lanceolate, subsessile acute or subacute at apex, cuneate at base. Flowers white or creamy-white, fragrant, numerous, in terminal panicles. Fruits globose, greenish at first, finally brown.

A common hedge plant near houses and around cultivated fields. This is the "HENNA" plant, from the leaves of which a red dye is extracted which is used for colouring palms, nails and feet of ladies, particularly on auspicious occasions like marriages.

**Flowers and fruits**: For the best part of year.

**Local name**: MENDI

**Herbarium specimens examined**:

Dediapada: VKS 1068, 1472, 3009
Sagbara: VKS 886

**World distribution**: Native of Egypt; now cultivated in many tropical and warm temperate region. It is found often running wild in many parts of India.

**ROTALA** Linn.


Slender herbs, 7-20 cm tall; stem simple or branched near tip, glabrous, terete, at first green, then greenish-brown and finally deep red. Leaves 0.2-0.4 mm long, opposite, subsessile, minute, broadly ovate or elliptic, glabrous, obtuse or acute at apex, rounded at base. Flowers minute, bright pink to red, in 0.5-1 cm long, compact, simple or branched racemes. Capsules ellipsoid, red.

Common and abundant, often in pure patches on rocks and in rocky ground in river beds. The plant is at first green, at length it turns completely reddish-purple.

Flowers and fruits: October - March

Herbarium specimens examined:

Dediapada: VKS 182, 483, 1082, 1145, 1755
Sagbara: VKS 857, 990, 1018, 1321
Ghatoli: VKS 1595
Dumkal: Shah 11523, 11525

World distribution: India (Bengal, Upper Gangetic Plain, Central India and Western Peninsula).
WOODFORDIA Salisb.

Woodfordia fruticosa (Linn.) Kurz in Journ. As. Soc. Beng.

Deciduous shrubs, 2-4 m tall; bark brown, faintly striate; branches patent, glabrous in older parts, pubescent in younger. Leaves 2-7 x 0.5-1.8 cm, opposite or subopposite sessile, broadly lanceolate, glabrescent above, hoary tomentose beneath, acute or shortly acuminate at apex, cordate at base. Flowers 1.5-1.8 cm long, deep red, in axillary or extra-axillary fascicled cymes, or on old leafless branches. Capsules 0.8-1 cm long, ellipsoid, pale brown, enclosed in persistent calyx.

Common and abundant on hilly slopes along river banks and in stony river bed in association with Homonoia riparia Lour., Syzigium heyneanum Gamble, Tamarix ericoides Roxb. and Vitex negundo etc. in Ghatoli area only. The plant is quite conspicuous and attractive by the masses of red flowers borne in axils along the branches.

Flowers and fruits * March - April

Herbarium specimens examined:

Dediapada: YKS 634
Ghatoli: VKS 1556, 1607; Shah 11565, 11598

**World distribution**: Tropical Africa, Madagascar, Arabia, Baluchistan, throughout the greater part of India, ascending to 8000' in the Himalayas, Ceylon, Burma, Java, Timor, Philippines and South China.
ONAGRACEAE

LUDWIGIA Linn.

Key to the species

1. Capsule up to 1.5 cm long, not ribbed, pubescent, pale straw coloured ............ perennis

1. Capsule more than 1.5 cm long, ribbed, glabrous, brown .................. octovalvis var. sessiliflora


Suffruticose herbs, 30-100 cm tall; branched from base, lower branches diffuse; stem and branches glabrous, pale green, obtusely 4-gonous. Leaves 5-8 x 0.5-2 cm, elliptic-lanceolate, glabrous, membranous, acute or acuminate at apex, narrowed at base, dark green, at times purplish brown on margins or entirely so; petiole 0.8-2.5 cm long, glabrous. Flowers yellow, axillary, solitary. Capsule 1.2-2.4 cm long, crowned, with persistent sepals, brownish in colour. Seeds numerous, reddish to brown, finally grooved.

Common in moist along river banks and margins of ponds and ditches.

Flowers and fruits: September - November or for the best part of the year in favourable conditions.
**Herbarium specimens examined:**

Dediapada: VKS 494, 638, 1114, 1886

Sagbara: VKS 1119, 1775, 1788

**World distribution:** Wide spread in tropics and subtropics of the Old and New Worlds. Throughout the greater part of India in plains in wet places.

**Critical notes:** For the nomenclature of this plant and the following one I have followed Raven in Reinwardtia 6(4): 367, 1963, who has discussed it at length.


An erect, glabrous herb, 15-45 cm tall; stem and branches glabrous, often tinged purple. **Leaves** 2-8 x 0.5-1.3 cm, linear-lanceolate or elliptic-lanceolate, glabrous, prominently nerved, acute at apex, tapering at base; petiole 0.6-1 cm long. **Flowers** bright yellow, axillary, solitary. **Capsule** 1-1.5 cm long, cylindric, pale straw coloured.

Rare in moist places. This species at the first sight, may be confused with the former one which it resembles in general appearance and shares similar habitat; but the
Capsule is a distinctive character to separate the two (See the key).

Flowers and fruits: August - November; in permanently moist ground for the best part of the year.

Herbarium specimens examined:
Sagbara: VKS 420, 2415; Shah 14124

World distribution: Wide spread in tropics of the Old World. In India, throughout the plains.
MOLLUGINACEAE

Key to the genera

1. Flowers in axillary fascicles; seeds
   strophiolate ........................................... Glinus

1. Flowers in terminal paniculate cymes;
   seeds estrophiolate ............................... Mollugo

GLINUS Linn.


Prostrate, often radially spreading, at times procumbent herbs; stem and branches greyish-tomentose, at times whole plant reddish-purple; branches 10–35 cm long. Leaves 0.5–2 x 0.4–1.7 cm, alternate, subopposite or fascicled, ovate, obovate or suborbicular, densely stellately hairy on both surfaces, subacute, acute or obtuse at apex, cuneate at base; petiole 0.3–0.5 cm long, tomentose. Flowers greenish to dirty white, sessile or subsessile, in axillary fascicles. Capsules 0.3–0.6 cm long, ovoid, enclosed in persistent sepals. Seeds numerous, subreniform tuberculate, black.

Common, in drying moist places along the ditches and river beds, often in large pure patches, or mixed with Heliotropium supinum L., Sphaeranthus indicus L. Gnaphalium indicum Linn. etc.
Flowers and fruits: January - May

Herbarium specimens examined:
Dediapada: VKS 1251, 1525, 1631, 1973
Sagbara: VKS 1405, 1794, 1830, 2676

World distribution: South Europe, North and Tropical Africa, Ceylon, more or less throughout India, South to South East Asia, extending to Australia and America.

MOLLUGO Linn.

*Mollugo pentaphylla* Linn. Sp. Pl. 89, 1753; Cooke 1594,
FBI 2663.

Erect, slender, apparently dichotomously branched herbs, 10-20 cm long, lower branches at times spreading; stem and branches pale green, striate, more or less quadrangular; Leaves both radical and cauline, radical ones in rosette, cauline ones in whorls of 2-6, all 1-3-6 x 0.2-0.5 cm, linear-lanceolate, obovate-oblong or spatulate, glabrous, pale green, subacute or acute at apex, tapering at base. Flowers minute, white in terminal paniculate cymes. Capsules minute many, spherical, brown, tuberculate.

A common weed in cultivated fields and on moist rocks.

Flowers and fruits: July - December

Herbarium specimens examined:
Dediapada: VKS 52, 232, 2886, 2913, 3033
Sagbara: VKS 2207, 2238, 2269
**World distribution** : Tropics and subtropics of the world, apparently very rare in Australia. In India everywhere ascending 5000' on the Himalaya.
CUCURBITACEAE
Key to the genera

1. Petals fimbriate or laciniate ............  Trichosanthes
1. Petals not as above : 
   2. Flowers white :
      3. Plants dioecious; tendrils simple ....... Coccinia
      3. Plants monoecious; tendrils 2-3-fid .... Lagenaria
   2. Flowers pale to bright yellow or reddish-yellow :
      4. Petals free or slightly connate :
         5. Tendrils simple; male flowers usually
            ebracteate and fruits softly echinate
            or papillate, but without operculum ... Momordica
         5. Tendrils 2-3-fid; male flowers usually
            ebracteate and in racemes; fruits
            ribbed or smooth but with operculate
            dehiscence .......................... Luffa

4. Petals united, campanulate or
   infundibuliform :
6. Tendrils simple :
   7. Connective produced beyond the
      anther cells .......................... Cucumis
   7. Connective not produced beyond the
      anther cells:
8. Plants glabrous, dioecious; leaves
    clasping the stem ...................... Solena
8. Plants hispid, monoecious; leaves
    not as above .......................... Mukia
6. Tendrils 2-3 fidi:

9. Plants monoecious:

10. Plants glabrous; leaves variously deeply lobed, fruit spherical 1-2 cm across, brick red with greenish or deep purple veins

\[ \text{Diplocyclos} \]

10. Plants hispid; leaves entire or very shallowly lobed; fruits ellipsoid-oblong, grooved, orange coloured.

\[ 40-60 \times 25-40 \text{ cm or more} \]

\[ \text{Cucurbita} \]

9. Plants dioecious

\[ \text{Citrullus} \]

\[ \text{CITRULLUS} \text{ Schrad (Nom. Cons.)} \]

\[ \text{Citrullus colocynthis (Linn.) Schrad. in Linnaea 12;414,} \]
\[ \text{1838; Wt. Icon. t. 498; FBI 2;620; DC. Monog. Phan. 3;510,} \]
\[ \text{1881; Wealth of India*2;185, t. 76, 1950; Cooke 1;571.} \]

\[ \text{Cucumis colocynthis Linn. Sp. Pl. 1011, 1753. Cucurbita}\]
\[ \text{citrullus Linn. Sp. Pl. 1010, 1753. Colocynthis vulgaris}\]
\[ \text{Schrd. Ind. Sem Hort. Getting 2, 1833; Chakravarty in RBSI 17(1) 113, 1959; Santapau, Fl. Saurashtra 250.} \]

Scabridly hairy, prostrate herbs, often radially spreading. Leaves 2-7.5 x 1.8-6 cm, deltoid-ovate to almost suborbicular, entire or deeply 3-7-lobed, scabridly hairy on both surfaces, dark green above, paler beneath, lobes pinnatifid or bipinnatifid, subacute or acute at apex; petiole 2-5 cm long, scabridly hairy. Flowers lemon yellow, solitary
axillary. Fruits 2-7 cm across, globose, yellow with green stripes.

A common weed in waste places along road sides and occasionally in cultivated fields, forming large patches on the ground.

**Herbarium specimens examined:**
Dediapada: VKS 1536, 1631, 1744, 2755.

**World distribution:** Ceylon, throughout the drier parts of India, Sind, Arabia, Syria, Egypt, Tropical Africa, and the regions of the Mediterranean; also found in Atlantic. It is a native of warmer parts of Asia and Africa (cf. Wealth of India). It is cultivated to some extent in Spain, Sicily and Morocco.

**Coccinia Wt. & Arn.**

Trailing or twining, glabrous, dioecious, perennial herbs, with long tuberous roots. Leaves 2.5-8 x 2.6-7.5 cm, broadly ovate or ovate-triangular, shallowly to deeply 3-5-lobed, acute or subacute at apex, deeply cordate at base; petioles 1.5-4 cm long, glabrous, striate. Flowers white, axillary, solitary. Fruits 2-5 x 1-2 cm, ovoid, oblong or obscurely fusiform, mucilagenous, light to dark green, fleshy, bright red with lighter stripes when ripe.

Cultivated at few places for the new berries used as vegetables.

**Flowers and fruits** Throughout the year.

**Local name** : GHILODA

**Herbarium specimens examined** :
Dediapada : VKS 780, 783

**World distribution** : India, Ceylon, Burma, Malaya, China, tropical Africa and Central America.

**CUCUMIS** Linn.

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Key to the species

1. Plants wild; fruit obovoid, or almost spherical, smooth .............. callosus

1. Plants cultivated; fruits cylindric, sparsely mucilate ..................... sativus

Cucumis callosus (Rottl.) Cogn. in Pfreich. 88:129, 1924; Chakravarty 100; Santapau 103 & Fl. Saurashtra 249; Raizada IF 92(5):307; Shah 674. Bryonia callosa Rottl. in Neue
*Cucumis trigonus* Roxb. Hort. Beng. 70, 1814 (nomen.) & Fl. Ind. 2:619, 1824; FBI 2:619 (excl. syn.); Wt. Icon. t. 497;
Cogn. in DC, Hon. Phan. 3:485, 1881; Cooke 1:569; Wealth of India 2:392, t. 144, 1950.

Perennial, monoecious herbs, trailing or twining, rooting at nodes; stem simple or branched, scabrid or hispid, more or less angular, fistular, deeply striate or furrowed, pale yellow, Leaves 4-13 cm long and as much broad, broadly ovate-triangular, entire or shallowly 3-5 lobed, scabridly hairy, acute at apex, cordate at base; petioles 3-8.5 cm long, pale greenish-yellow, angular, scabrid. Flowers pale to bright yellow, 1.5-2 cm across, axillary, male in fascicles of 2-3, female solitary. Fruits 1.4-3 x 1-3 cm, obovoid or almost spherical, variegated with green strips, with a few weak-spines, mature ones yellow, smooth.

Common and abundant during monsoon, climbing on hedges and trailing in waste open lands.

*Flowers and fruits:* August - October

*Herbarium specimens examined:*

Dediapada: VKS 6, 261, 564, 797, 1137, 1506, 1727; Shah 11520

Sagbara: VKS 1302, 2214, 2520, 2546

*World distribution:* North Africa, Orient, Palestine and Syria, Afghanistan, Baluchistan, more or less throughout India in drier parts, Ceylon, Malaya, China and North Australia.
**Cucumis sativus** Linn. Sp. Pl. 1:1012, 1753 Cogn.

Annual, trailing or twining herbs, rooting at lower nodes, stem scabridly or hispidly hairy, angulare, furrowed. Leaves 8-18 cm long, and as much broad, broadly-ovate, 3-5 angled or very shallowly lobed, hispid on both surfaces, acuminate or acute at apex, often prolonged into a short mucro, rounded at base; petioles 5-8 cm long, hispidly hairy. Flowers monoecious, yellow, males fasciculate; females solitary or fasciculate. Fruits 8-20 x 2.5-6 cm, cylindric, pale to dark green, obscurely sparsely muricate.

Cultivated.

**Local name**: KAKRI

**Local use**: Fruits are eaten

**Flowers and fruits**: September - October

**Herbarium specimens examined**:
Dediapada: VKS 2817
Sagbara: VKS 2237

**World distribution**: Cultivated throughout tropical and subtropical parts of the world as a popular vegetable crop. Probably it is indigenous to North India (cf. Wealth of India).

**CUCURBITA** Linn.

*Cucurbita maxima* Duch. in Encycl. 2:151, 1786; FBI 2:622; Cooke 1:582; Santapau 105 & Fl. Saurashtra 252; Wealth of India
Trailing annual, herbs; stem stout, pale green, obtusely or acutely angled, Fistulose, simple or sparingly branched, densely hispidly hairy, almost dense villous in young parts; tendrils slender, often long thread-like, pale greenish-yellow, trifid. Leaves 8-18 cm long and almost as much broad, broadly ovate to suborbicular 5 angled or very shallowly 5-lobed, coarsely hairy on both surfaces; petiole 10-20 cm long, stout, hispid hairy. Flowers 4-6 cm long and as much broad, orange or reddish yellow, axillary, solitary, on 10-17 cm long, hispid peduncle.

This is the red pumpkin of commerce, cultivated at a few places for the fruits which are consumed as vegetables.

Flowers : August.

Fruits : Sold in the local market for the best part of the year.

Local name : KOHLU

Herbarium specimens examined :
Dediapada : VKS 117, 2911, 2996

World distribution : Cultivated throughout India and distributed through cultivation in all tropical and temperate regions of the globe. No where recorded wild. (cf. Chakravarty). Duthie (Pl. Up. Gang. Pl. 1:346, 1960 reprinted) remarks "It is said to have been found wild on the banks of the Niger in Guinea but the evidence obtained from historical research favours the opinion that it originated in Asia and
subsequently became the source of the European pumpkins, cultivated during the Middle ages”.

**DIPLOCYCLOS**


A large, glabrous, monoecious, herbaceous climber. **Leaves** 4-8.5 x 3-8 cm, broadly ovate to almost orbicular, deeply palmately 3-7-lobed, dark green above, paler beneath, membranous, glabrous, punctate, acute or acuminate at apex, deeply cordate at base; petiole glabrous, slender, almost as long as lamina. **Flowers** creamy white, male and female sessile or subpedicellate. **Berries** 1-2 cm across, smooth, spherical, brick red with greenish or deep purple veins.

Common on hedges along road sides at Dediapada only.

**Herbarium specimens examined**:

Dediapada: VKS 60, 244, 280, 351

**World distribution**: Central Africa, India, Ceylon, Java, Philippines, and Australia.
Critical notes: C. Jeffrey (1962) remarks "Linnean epithet, *Bryonia laciniosa* has long been erroneously applied to a wide spread plant of the old world tropics in the combination of *Bryonopsis laciniosa* (L.) Naud. for which species the correct name appears to be *Diplocyclos palmatus* Jeffrey ... ".

**LAGENARIA Ser.**


*Cucurbita leucantha* Duch. in Lamk. Encycl. 2:150, 1786.


Climbing herbs; stem simple or branched, stout, furrowed, densely ashy pubescent. Leaves 5-13 x 4.5-16 cm or even much larger, broadly ovate, entire or shallowly 3-5-lobed, densely pubescent, denticulate on margins, acute at apex, cordate at base; petiole stout, pubescent, striate, as long as or shorter than lamina. Flowers 3.5-4.5 cm long, white, axillary, solitary. Fruits variable in length, pale to dark green, pubescent when young, glabrous at length.
Cultivated for the fruits used as vegetables.

Flowers: August - September

Fruits: October - December; but they are sold throughout the year in local market.

Local name: DUDHI

Herbarium specimens examined:
Dediapada: VKS 756, 732, 1175

World distribution: Cultivated throughout the warmer regions of the world. According to Wealth of India "it is considered to be of Asian or African origin. It is found also in America and is supposed to have been introduced in the New World even before Columbus".

**LUFFA Cav.**

Key to the species

1. Stamens 5; fruit smooth ..................... **cylindrica**

1. Stamens 3; fruit angled ..................... **acutangula**

**Luffa acutangula** (Linn.) Roxb. var. **amara** Lamk. Clarke in FBI 2:615, 1879; Cogn. in DC. Mon. Phan. 3:461, 1881; Cooke 1:567; Wealth of India 6:179, 1962; Santapau 103 & Fl. Saurashtra 1:246; Chakravarty 81; **Shah** 674. **Cucumis acutangulus** Linn. var. **amara** Lamk. Encycl. 2:74, 1786. **Luffa amara** Roxb. Hort. Beng. 70, 1814 & Fl. Ind. 3:715, 1832; Dalz. & Gibbs. Bomb. Fl. 102, 1861.
Annual herbaceous climbers; stem slender, hispid, obscurely angled, furrowed. Leaves 4-16 x 5-17 cm, shallowly 3-lobed, broadly ovate, membranous, glabrous above, appressed-ly pubescent beneath, acute at apex, cordate at base, elder leaves often scabrid with peltate dots; petiole 2.5-10 cm long, thinly hispid, pale yellow. Flowers 2-3.5 cm across, bright yellow, males in short racemes at ends of 10-15 cm long peduncles, females solitary, axillary on 4-7 cm long peduncles; peduncles 15-17 cm long, pale green, thinly hairy. Fruits 7-10 x 2-2.6 cm, fusiform, sharply angled, brown on drying.

This is one of the commonest climbers of the area during monsoon, often conspicuous by the masses of bright yellow flowers produced on long peduncles above the dense foliage. The fruits are very bitter.

Flowers: September - October, at times up to March.
Fruits: Dry fruits for the best part of the year.

Herbarium specimens examined:
Dediapada: VKS 574, 743, 1281
Sagbara: VKS 2210, 2273

World distribution: Throughout the greater part of India (especially Western Peninsula) and Ceylon.

Luffa cylindrica (Linn.) M.V. Roem, Syn. Mon. 2:63, 1846; Cogn. & Harms in Pfreich. 88:62, ff. 8 & 24 E;
Raizada IFR 5(1):28; Chakravarty 75; Bailey, Man. Cult. Pl.
Momordica cylindrica Linn.

Monoecious, climbing herbs; stem stout angled, glabrous or pubescent, often scabrous at angles. Leaves 7-15 x 6-17 cm, often broader than long, orbicular to reniform, palmately 5-lobed, base deeply cordate, lobes acute or acuminate, glabrous except pubescent on nerves beneath; petiole 2.5-6 cm long, angular. Flowers bright yellow, male flowers, few in axillary racemes, crowded near tip of 9-13 cm long peduncles; pedicels 1.2-1.5 cm long. Fruit 12-28 cm long, cylindric, blunt at the end, marked with longitudinal lines.

Cultivated at some places for fruits which are used as vegetable.

**Flowers and fruits**: August - September

**Local name**: GALKA

**Local use**: Fruits are used for vegetable.
Herbarium specimens examined:
Dediapada: VKS 787

World distribution: Throughout the tropical regions of the Old World. Duthie (Fl. Up. Gang. Pl. 1:336, 1960 reprinted) remarks that this plant is believed to be indigenous in India in the Indian Archipelago and North Australia, but in Wealth of India, it is given "India".

**Momordica** Linn.


Slender climbers or trailing in absence of support; stem and branches grooved, villous in young parts, older ones hairy. Leaves 3-10 x 2.4-9 cm, deeply 5-9 lobed, dark green, membranous, dentate on margins, hairy on both surfaces but densely so on nerves beneath, acute at apex, cordate at base; petioles 2.3-7 cm long, faintly grooved, hairy. Flowers bright yellow, 2-2.5 cm across, axillary, solitary; pedicels 2.5-5 cm long, slender, almost wiry; bract reniform, at base or middle of pedicel. Fruits 4-7 cm long, pendent, fusiform, densely papillate, pale to dark green at first, finally yellow or orange.

Cultivated, at times as an escape, in waste places near houses. The fruits are bitter but are used as vegetables after pretreatment with salt.
Flowers and fruits: September - October

Local name: KARELA

Herbarium specimens examined:
Dediapada: VKS 3061, 3062

World distribution: Throughout tropical and subtropical regions of the Old World; introduced in America.

MUKIA Arn.


Monoecious, scabridly hairy annuals, generally climbing, in absence of support trailing. Leaves 3-7 x 3-6.5 cm, entire or shallowly 3-5-lobed, ovate-triangular or subdeltoid, minutely denticulate on margins, scabrid, acute at apex, shallowly to deeply cordate at base; petioles 2.5-4 cm long, patently scabrid. Flowers 4-6 mm across, pale to bright yellow, male and female in some axil, males fascicled, female solitary. Berries 0.6-0.8 cm across, spherical, at first green, then yellow and finally deep red.

Common on hedges and low bushes or trailing along road sides. The flowers of this species are smallest in the family in the area explored.
Flowers: September - October
Fruits: October - January
Herbarium specimens examined:
Dediapada: VKS 61, 72, 83, 263, 2823
Sagbara: VKS 354, 2091, 2257

World distribution: Tropics of the Old World. It is found throughout India, ascending up to 1800 m in the hills.

Critical notes: In Indian floras the name Melothria maderaspatana has been commonly used; but Jeffrey (in Kew Bull. 15:343, 1961) is of the opinion that Melothria is entirely a new world genus not represented in India by any wild species.

SOLENA Lour.

Solena heterophylla Lour. FI. Cochinch. 1:514, 1790;

Slender or scandent, dioecious, perennial climbers; stem and branches glabrous, furrowed. Leaves 5-15 x 3-10 cm, ovate-oblong or suborbicular, entire, dark green above, paler beneath, crenato-dentate on margins, acute at apex, cordate at base, often clasping the stem. Flowers and fruits not seen.
Rare, seen only once (25-9-1968) in a cultivated field at Sagbara. The leaf shape and leaf bases clasping the slender stem are distinctive of the species even in absence of flowers and fruits.

Herbarium specimen examined:
Sagbara : VKS 2424

World distribution: Throughout the greater part of India ascending to 2100 m in the hills, Nepal, Burma, Ceylon, Cochin-China, Malaya, Java and China.

**TRICHOSANTHES Linn.**

**TRICHOSANTHES bracteata** (Lamk.) Voigt, Hort. Sub. Cale. 58, 1845; Cogn. in DC. Mon. Phan. 3;175; 1881; Santapau 102 & Fl. Saurashtra 1:241; Chakravarty 44. **Medecca bracteata** Lamk. Encycl. Meth. Bot. 4:210, 1797. **Trichosanthes palmata** Roxb. Fl. Ind. 3;704; 1832; FBI 2;606; Wt. Ill. tt. 104-105; Cooke 1:360.

An extensive climber, woody below. **Leaves** 6-14 x 5-13 cm, deeply 3-5-lobed, glabrous dark green above, pale nigro-punctate beneath, dentate, acute at apex, deeply cordate at base; petiole 7-8 cm long. **Flowers** not seen. **Fruits** 4-6 cm across, globose, when ripe red with orange streaks.

Rare on trees in the forests and on hedges along cultivated fields. The nigro-punctate undersurfaces of leaves are a good field character.

**Fruits**: September

Herbarium specimens examined:
Dediapada : VKS 1797, 2006
World distribution throughout India, ascending to 5000' in Himalaya, Ceylon, Burma, Malaya, China, Japan and Australia.
UMBELLIFERAE

Key to the genera

1. Flowers white or pink:
2. Flowers white; fruits compressed;
   lower leaves trifoliolate .................. Trachyspermum
2. Flowers white or pink; fruits subglobose;
   all leaves decompound .................... Coriandrum
1. Flowers greenish yellow .................. Foeniculum

CORIANDRUM Linn.

Coriandrum sativum Linn. Sp. Pl. 256, 1753; FBI 2:717;
Cooke 1:609; Buwalda in Fl. Males. 4(2):128, 1949; Wealth of

Annual herbs, 20-40 cm tall; stem simple or branched
   glabrous, striate, greenish-yellow, fistular. Leaves
decomound, lower leaves palmate-lobate to palmatifoliate,
   upper ones pinnately to bipinnately pinnatisect, segments
   1-2 x 0.1-0.2 cm, glabrous, acute to subacute at apex;
Flowers small, white or bright rosy pink, in terminal, compound
   umbels; peduncles 2-5.5 cm long, glabrous; pedicels 0.3-0.5
   cm long, glabrous. Fruits 0.2-0.4 cm long subglobose, ribbed
   glabrous.

Cultivated for its fruits and leaves which are used
   as spices and condiments.

Flowers and fruits : February - March
Local name : DHANA

Herbarium specimen examined :
Dediapada : VKS 1087

World distribution : Indigenous from the Mediterranean region to Central Asia; cultivated in nearly all the parts of world. According to Wealth of India, it is cultivated in all the states and is an important subsidiary crop in the black cotton soils of Deccan and South India and the rich silt loams of North India.

**FOeniculum** Adans.


40-150 cm tall, simple or branched herbs; stem and branches glaucous green, striate, furrowed, hollow. Leaves pinnatisect, segments narrowly linear or filiform, 1-3 cm long, sheathing at base. Flowers yellow, in compound, terminal umbels; peduncle 8-15 cm long, umbellate ray numerous, 3.5 cm long, glaucous green; glabrous; pedicels 0.5-1 cm long. Fruits 0.4-0.6 cm long, oblong, on drying pale green, ribbed.

Seen only under cultivation. Fruits are used as flavouring agent in caulinary.

*Flowers and fruits* : January

Herbarium specimen examined :
Dediapada : VKS 1173
World distribution: Indigenous in Mediterranean region; cultivated all over world.

TRACHYSPERMUM Linn.


Herbs 40-75 cm tall; stem and branches striate, slender, glabrous hollow. Leaves 3-9 cm long, cauline, lowest 3-foliolate; leaflets 2.5-6 x 0.7-2 cm, ovate-lanceolate, coarsely serrate, acuminate at apex, rounded or subcordate at base, upper ones deeply pinnatifid, segments narrowly-linear, petioles 1.5-2 cm long, glabrous, sheathing with scarious margins. Flowers white, in compound umbels; primary ray 5-10, 0.7-1.5 cm long, fruits ovoid, brown, glabrous or puberulous.

Rare, in the undergrowth of forests on hilly slopes.

Flowers and fruits: December

Herbarium specimen examined:
Sagbara: VKS 822

World distribution: India (W. Peninsula) and Ceylon.
**ALANGIACEAE**

**ALANGIUM** Lamk. (Nom. Cons.)

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*Alangium salvifolium* (Linn.f.) ssp. *salvifolium*;


3-5 m tall, thorny shrubs or small trees, with grey bark; branches lenticellate drooping, young ones spinous tipped. Leaves 4-13 x 1.5-4 cm, elliptic-lanceolate or elliptic-oblanceolate, glabrous above, pubescent on nerves beneath, abruptly acuminate at apex, rounded at base; petioles 0.6-1.5 cm long, pubescent. Flowers 1.2-1.5 cm across, white, in axillary fascicles on leafless branches. Berries 1.5-1.8 cm, globular, crowned with persistent calyx.

Occasional along paths in the forests and river banks in the area explored. However it is a very common tree at Dumkhal (From Dr. Shah field diary). The plant is often cut down by local people for its wood, which is used for fuel. It, therefore, remains a bushy shrub in many places in the present area. If it is allowed to grow by itself it reaches 8-12 m in height.

**Flowers**: March - April

**Fruits**: April
Herbarium specimens examined:

Dediapada: VKS 786, 1596
Sagbara: VKS 448, 879, 1390, 1465, 1686
Kokam: Shah 11600

World distribution: Throughout the plains of India from the foot of the Himalayas to extreme south Ceylon and Burma.

Critical note: Mukerjee in Bull. bot. Surv. India 10 (3 & 4): 330, 1968 recognises two subspecies of this species on the basis of the following character:

Fruit < 1 cm long; leaves lanceolate or elliptic-lanceolate, acute ........... ssp. salvifolium

Fruit > 2 cm long; leaves oblanceolate, acuminate .................................... ssp. hexapetalum
RUBIACEAE

Key to the genera

1. Trees or shrubs:

2. Flowers in globose heads:

3. Flowers pure white; fruit a syncarpium... Morinda

3. Flowers yellow; fruit not as above:

4. Leaves usually cordate at base;
   stigma clavate; calyx lobed ............ Adina

4. Leaves rounded; truncate or acute at base; stigma mitriform; calyx tube truncate ........................................ Mitragyna

2. Flowers not in globose heads:

5. Ovary two celled ........................ Xeromphis

5. Ovary 3-5-celled.......................... Meyna

1. Herbs; erect or diffuse:

6. Seeds angular ............................. Oldenlandia

6. Seeds ellipsoid or oblong; ventrally grooved ................................. Borreria
ADINA Salisb.


Deciduous trees 15-20 m tall; bark grey or greyish-black, excorticating in patches forming indentations. Leaves 9-28 x 8-27 cm, broadly ovate to suborbicular, glabrous or slightly pubescent above, more or less densely so beneath, shortly acuminate or obtuse at apex, rounded or cordate at base; petioles 3.5-10.5 cm long, reddish-brown, channelled; stipules 1.2-4 x 0.9-3.5 cm, reddish brown or cream coloured, obovate, subacute or obtuse at apex, truncate or rounded at base. Heads 2-2.5 cm across, globose, axillary on 1.5-5 cm long, peduncles, flowers at first bright yellow, afterwards reddish-brown. Capsules 4-5 mm long, straw coloured, obconical, densely pubescent.

An occasional tree in the forests and along road sides. The cordate leaves, large, foliaceous, connate stipules protecting the terminal buds are distinctive of this plant.

\textbf{Flowers} : February - April

\textbf{Fruits} : The dried fruits throughout the year on the tree.

\textbf{Local name} : HALDU
Local use: The wood is one of the best timbers.

Herbarium specimens examined:
Dediapada: VKS 1453
Sagbara: VKS 398, 403, 1293, 2511, 2574; Shah 13015

World distribution: More or less throughout the deciduous forests of India, ascending up to 3000' in Himalaya, Ceylon and Burma.

BORRERIA G.F.W. Meyer (Nom. Cons.)

Key to the species

1. Plants procumbent; flowers purple-lilac, several, in axillary fascicles ............... articulard
1. Plants erect; flowers white in terminal clusters .............. stricta


Diffuse or procumbent, hispid herbs; branches quadrangular, reddish-purple, 10-30 cm long. Leaves 1-4 x 1-2 cm, subsessile, obovate-oblong or elliptic, scabridly hairy with ciliate margins, obtuse or acute at apex, tapering at base. Capsules 0.4-0.2 cm long, oblong, hairy. Seeds oval, dark brown.
Common among grasses, on moist soil along margins of ponds.

Flowers and fruits: August - October

Herbarium specimens examined:

Dediapada: VKS 66, 91, 142, 2937
Mosda: VKS 362
Sagbara: VKS 982, 2115, 2203, 2261
Kokam: Shah 11554

World distribution: India, Ceylon, Malay Peninsula and Islands, China and Philippines.

Borreria stricta (Linn. f.) Schum. in Pfam. 4(4):143, 1891; Santapau 121 & Fl. Saurashtra 262. Spermacoce stricta Linn. f. Suppl. 120, 1781; FBI 3:200; Cooke 2:52.

Annual herbs, 6-30 cm tall; stem rigid, 4-gonous, scabrid with recurved white hairs. Leaves 1.5-4.5 x 0.3-1 cm, linear, linear-lanceolate or elliptic-lanceolate, sessile or subsessile, glabrous, margins with stiff hairs, acute and shortly mucronate at apex, tapering at base. Capsules ± 2.5 mm long. Seeds ± 1.5 mm long, elliptic or oblong, black.

Common on rocks and in rocky soil.

Flowers and fruits: August - October

Herbarium specimens examined:

Dediapada: VKS 55, 166, 189, 2741; Shah 13060
World distribution: Tropical Asia and Africa. It is distributed throughout India ascending to 5500 ft in tropical Himalayas.

MEYNA Link.


An armed tree, 5-9 m tall; bark black, smooth. Leaves 5-10 x 4.5 - 8.5 cm, broadly elliptic-oblong or suborbicular, glabrous, acute or abruptly acuminate at apex, rounded and shortly cuneate at base; spines 1.5-3 cm long, straight, opposite, sharp, dark brown. Flowers greenish-yellow, in axillary cymes on old leafless wood. Fruits not seen.

Occasional in the forests.

Flowers: March - April

Local name: ALI

Herbarium specimens examined:

Piplad: VKS 1606, 1802
Sagbara: VKS 1695

World distribution: India (W. Peninsula, North Bengal), Burma, Pegu and Java.

Critical notes: Santapau in RBSI. 16(1):134, 1953, has discussed the nomenclature of this plant at some length. I
have followed him in changing *Vangueria spinosa* auct. to *Meyna laxiflora* Robyns.

**MITRAGYNA** Korth.

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A 8-15 m tall; trees bark smooth, light coloured, greyish, exfoliating in scales which leaves shallow depressions. Leaves 4.5-11 x 3-8 cm, obovate, elliptic or nearly orbicular, glabrous, subacute or obtuse at apex, truncate, rounded or acute at base; stipules 1-2.5 x 0.8-2 cm, obovate-oblong or acute at base; stipules 1-2.5 x 0.8-2 cm, obovate-oblong or nearly orbicular; petioles 0.7-3.5 cm long. Flowers yellow, in globose heads; Heads 1-2 cm across, spherical, subsessile, solitary, axillary and termina, on 0.8-1.2 cm long peduncle. Capsule conical, glabrous, ribbed, black on drying.

Common in the forests of Sagbara, occasional at Dediapada.

Flowers: April

Fruits: (Dried) for the best part of the year

Local name: KADAMBA
Herbarium specimens examined:
Dediapada: VKS 482, 516, 710, 1962, 2044, 2410
Sagbara: VKS 873, 1021, 1698, 1702, 1857

World distribution: Throughout the deciduous forests of India, Ceylon and Burma.

MORINDA Linn.

*MORINDA Linn.*

Morinda tomentosa Heyne ex Roth, Nov. Fl. Sp. 147, 1821; Santapau, Fl. Saurashtra 258; Shah 674. Morinda tinctoria Roxb. var. tomentosa (Heyne ex Roth) Hook. f. in FBI 3:156, 1880; Cooke 2:43. (PLATE 20)

4-7 m tall trees; bark light black, longitudinally fissured, young, branches 4-angled, tomentose. Leaves 7-25 x 4-13 cm, elliptic-oblong or obovate-oblong, tomentose, acute at apex, decurrent at base; stipules 0.4-0.7 cm long, broadly triangular, tomentose; petiole 1-2 cm long, tomentose. Flowers pure white, in 1-2 cm across, globose heads, Corolla 1.2-1.5 cm long, which. Fruits 1-3 cm long, glaucous-green with polygonal marks.

Common in the forests.

*Flowers*: April - June

*Fruits*: July - December

*Local name*: AAL

Herbarium specimens examined:
Dediapada: VKS 427, 1203, 1598; Shah 11479
Ghatoli: VKS 1913, 1893; Shah 11497
Sagbara: VKS 895, 1638, 1646, 1760, 1822, 2306; Shah 13049

**World distribution**: More or less throughout India, Ceylon and Burma.

**OLDENLANDIA Linn.**

*Oldenlandia corymbosa* Linn. *Sp. Pl.* 119, 1753; FBI 3:64; Cooke 2:15; Blatter & McCann 784; Santapau 115 & Fl. Saurashtra 263; Shah 674.

Annual, herb, diffuse or suberect, 30-45 cm tall; branches 20-30 cm long, sometimes reddish-purple, obtusely 4-gonous, glabrous. Leaves 1-3 cm long, narrowly linear, glabrous, subacute at apex, narrowed at base. Flowers white in axillary, cymes; peduncle 1-2 cm long; pedicel 0.5 - 0.8 cm long; Capsules 1-2 mm long, globose, brown. Seeds minute, angular.

A rare weed in the cultivated fields.

**Flowers and fruits**: September

**Herbarium specimens examined**:

Ghatoli: Shah 11526
Sagbara: VKS 464

**World distribution**: More or less throughout the tropics.
Key to the species

1. Flowers white; corolla glabrous outside ........................................... uliginiosa

2. Flowers creamy-white or yellow; corolla hairy outside ......................... spinosa


A deciduous, armed shrub, 1-3 m tall; bark rough dark brown. Leaves 3-9 x 1-5 cm, fascicled, at ends of branches, elliptic or obovate, subcoriaceous, glabrous except pubescent nerves, dark green and shining above, pale dull beneath, obtuse or subacute at apex, tapering or narrowed at base; petiole 0.8-1.5 cm long, thinly pubescent. Flowers 2-2.4 cm across, at first white, turning yellow to orange with age, axillary, solitary or in fascicles of 2-3, at the ends of branches. Fruits 2-3 cm across, ovoid, pale yellow when ripe.

Occasional at Dediapada, and in Ghatoli forests.

Flowers: April - July
Fruits: For the best part of the year.

Herbarium specimens examined:
Dediapada: VKS 1795, 1949, 2036
Ghatoli: Shah 11479
Piplad: VKS 1277
Sagbara: VKS 2071, 2296, 2881

World distribution: East tropical Africa, India, Ceylon, Burma, Java, Sumatra and South China.

Santapau, F1. Saurashtra 266.

An armed small tree, 2-4.5 m tall; spines 1.5-2.3 cm long, stout sharp. Leaves 4-13 x 2.5-4.5 cm, crowded towards ends of branches, obovate or obovate-oblong, glabrous above, minutely hairy beneath, obtuse at apex, tapering at base; petioles 0.6-1.2 cm long. Flowers 3-5 cm across, white when fresh, at length creamy yellow, solitary at ends of suppressed branches. Fruits 5-7 cm across, ovoid, yellow when ripe.

Occasional along road sides from Dediapada to Ghatoli and in the Ghatoli forests. This is an attractive tree by the white or creamy-white flowers produced on leafless branches.
COMPOSITAE

Key to the genera

1. Flowers in a head, white, pale bluish or greyish:
   2. Leaves opposite; anthers not tailed:
      3. Heads heterogamous; solitary or in fascicles of 2-3; pappus 0 .............. Eclipta
      3. Heads homogamous in terminal paniculate cymes:
         4. Plants not viscid; anthers appendaged at apex; achenes with 5 pappus scales, connate below ....................... Ageratum
         4. Plants viscid; anthers with a truncate apex; pappus 3-5, short, rigid, often clavate, inserted in a short ring ...... Adenostemma

2. Leaves alternate; anthers tailed:
   5. Heads terminal, pedunculate:
      6. Plants erect, rigid; heads globose, woolly white, spinescent; pappus short, cylindric, brush like .................. Echinops
      6. Plants procumbent; heads ovoid, reddish brown, but open flowers white; not spinescent; pappus 0 ............... Sphaeranthus
   5. Heads axillary, sessile, pappus of 2 scales ...................... Caesulia

1. Flowers in a head purple, violet or reddish brown:
7. Heads homogamous:
8. Heads spinescent; anthers tailed ....... **Amberboa**
8. Heads not spinescent; anthers not tailed:
9. Leaves alternate, cauline, heads cymose or panicked ................. **Vernonia**
9. Leaves radical and cauline; heads in lax corymbs ....................... **Emilia**

7. Heads heterogamous:
10. Leaves pinnatifid; pappus 0 ............ **Cyathocline**
10. Leaves entire; pappus copious ........ **Blumea p.p.**

1. Flowers in a head pale to bright yellow, or orange:
11. Leaves all radical or a few cauline ones also present, plants with milky juice. **Launaea**
11. Leaves all cauline or a few radical ones present as in Blumea; plants without milky juice:
12. Achenes, enclosed in a hard spinescent fruit ...................... **Xanthium**
12. Achenes not as above:
13. Achenes stellately arranged, studded with stout spines ............ **Acanthospermum**
13. Achenes not spinescent:
14. Leaves lobed ....................... **Bidens**
14. Leaves not lobed:
15. Leaves simple, opposite:
16. Achenes longitudinally ribbed; pappus 0 ................. **Guizotia**
16. Achenes oblong, silky-hairy; 
pappus of feathery bristles. **Tridax**

16. Achenes compressed and 
ciliate ...................... **Spilanthes**

15. Leaves lower opposite, upper
alternate ..................... **Blainvillea**

15. Leaves all alternate :

17. Plants strongly aromatic,
smelling camphor ............. **Blumea**

17. Plants not as above :

18. Plants woolly tomentose ..... **Gnaphlium**

18. Plants not woolly tomentose :

19. Pappus 0 .................. **Sclerocarpus**

19. Pappus present ............ **Vicoa**
ACANTHOSPERMUM Schrank.

Acanthospermum hispidum DC. Prodr. 5:522, 1836; Gamble
Pl. Madr. Pres. 2:495, 1957 (reprinted); Santapau 139 &
Santapau in JBNHS 4:445, 1945; Shah 674.

Annual herbs, 30-75 cm tall; stem erect, dichotomously
branched, hispid. Leaves 2-7 x 1-4 cm, sessile, spathulate,
obovate or broadly elliptic, densely appressedly hairy on
both surfaces, serrate, acute or subacute at apex, tapering
at base. Heads solitary, axillary or in forks of branches.
Flowers yellow, minute. Achenes 6-8 each 3-6 mm long,
obconical, glabrous, stellately arranged, covered with stout
hooked spines.

Common in pure patches in waste lands and in forest
clearings.

Flowers and fruits: August - October

Herbarium specimens examined:
Dediapda: VKS 616, 1146
Sagbara: VKS 939, 1369, 2138

World distribution: More or less throughout the tropics;
native of Central America.

ADENOSTEMMA Forst.

Adenostemma lavenia (Linn.) O. Kuntze, Rev. Gen. Pl.
3:304, 1891; Santapau 124; Raizada IFR 5(1):3; Shah 674.
Verbescina lavenia Linn. Sp. Pl. 902, 1753. Adenostemma
viscosum Forst. Charact. 90, 1776; FBI 3:242; Cooke 2:69.
Adenostemma latifolium Don; Wt. Icon. t. 1087.
Erect herbs, 30-90 cm tall; stem and branches purplish glabrous in lower parts, viscidly pubescent in upper, striate. Leaves 2.5-7 x 1.5-2.8 cm, opposite, sessile or subsessile, broadly ovate, ovate-lanceolate or oblong-lanceolate, glabrous, serrate-dentate, subacute or acute at apex, cuneate or tapering at base. Heads white, 7-10 mm across, in terminal, lax panicles. Achenes + 3 mm long, brown, triangular, obconical, glandular, 3-horned.

Rare, in small patches near water course.

Flowers and fruits; October - November

Herbarium specimens examined:
Dediapada: VKS 702
Ghatoli: Shah 11524, 11563

World distribution: Native of America, now widely occurring in wet or damp places throughout India, Ceylon, and other tropical countries.

AGERATUM Linn.


Erect herbs, 30-60 cm tall, glandular pubescent; stem and branches terete, faintly striate, dull green. Leaves 2.5-7 x 1-4 cm, ovate, opposite or alternate, appressedly hairy, serrate, subacute or acute at apex, truncate or very shallowly cordate or attenuated at base, generally lower ones.
opposite, upper alternate or opposite and alternate mixed. Heads 0.5-0.7 cm across, generally white, rarely bluish-purple, in terminal, paniculate cymes; pappus scales 5, scarious, broad at base, sharply serrate on edges. Achenes + 1.5 mm long, wedge shaped, sharply angular, black, glabrascent on angles.

Common, often in patches in moist places. The leaves when bruised between fingers give out an offensive smell and, therefore, the plant at some places in Gujarat is known as 'Makadmari'.

Flowers and fruits Throughout the year.

Herbarium specimens examined:
Dediapada: VKS 13, 545, 663
Sagbara: VKS 811, 2408, 2527, 2548
Ghatoli: Shah 11577

World distribution: Native of Mexico, now widely distributed in the tropics. It is widely distributed in moist places throughout India.

AMBERBOA Less. (Nom. Cons.)

A suffrutiaceous procumbent *herb*, with suberect or diffuse branches, 30-55 cm long; stem and branches glaucous green, striate, obscurely angled, puberulous. *Leaves* 2-10 x 0.5-2 cm, oblong-obovate, or ob lanceolate, pinnatifid, almost sessile, glabrous, margins spinous tipped, acute or subacute, minutely mucronate at apex, narrowed or tapering at base.

*Heads* 1.2-2 cm long, ovoid, pale to bright purple, solitary, axillary or terminal at ends of branches. Involucral bracts, glaucous, each with a spreading or recurved spinescent awn. Pappus of many, white, unequal hairs. *Achenes* ± 5 mm long, angled, dull brown to almost black, ribbed and punctate between ribs.

Common along edges of cultivated fields and in the forest clearings.

*Flowers*: November - December

*Fruits*: February - March

*Herbarium specimens examined*:

Dediapada: **VKS** 1116, 1211, 1504, 1707, 1983,

**Shah** 11508.

Sagbara: **VKS** 938, 1372

*World distribution*: Through the drier parts of India, Baluchistan and Afghanistan.

Annual herbs, erect, 30-80 cm tall; stem simple or branched, sometimes brownish tinged, glabrous, obtusely tetragonal, deeply striate. Leaves 4-12 cm long, bipinnatisect; lobes 2-4 x 0.6-1.5 cm, dark green, elliptic or ovate, glabrous, acute at apex, cuneate at base. Heads yellow, solitary, terminal, on 4-14 cm long, stiff, erect peduncles. Achenes 0.5-1.2 cm long, ribbed, glabrous or slightly hairy, with two brown, scabrid awns, spindle shaped, 4-gonous; pappus scales 4, retrorsely hispid.

Common, gregarious in the undergrowth of hills and in shade along road sides. The leaves and the awned achenes are rather typical of this plant.

Flowers and fruits: August - October

Herbarium specimens examined:
Dediapada: VKS 2, 48, 265, 347
Sagbara: VKS 2165, 2172

World distribution: According to Sherff, Bidens biternata is widely distributed in Eastern hemisphere, from Japan and China to the Malay Peninsula, Westwards to Arabia and Africa except North Africa, eastwards to Polynesia. In India it is found everywhere, ascending to an altitude of
6000' on the Himalaya.

Critical notes: Sherff, in his monograph has shown that the Indian plant is *B. biternata* and not *B. pilosa*, as given in most of the Indian floras. *B. biternata* can be separated from *B. pilosa* on leaf character; in the former the lower leaflets are generally tripartite, whereas they are simple in *pilosa*. External involucral bracts and achenes are also distinctive in *B. biternata*.

**BLAINVILLEA** Cass.


Annual herbs, 25-70 cm tall, branched from the middle; stem and branches striate, appressed hairy in older parts, villous in the younger. Leaves 2.5-8 x 1.3-5 cm, ovate, ovate-rhomboideal or ovate-lanceolate, softly appressed hairy, densely so beneath, acute at apex, cuneate at base; petiole 0.5-2.5 cm long, appressed hairy. Heads 0.5-0.8 cm across, white or yellowish, axillary, solitary and in terminal panicles; peduncles 1-4.5 cm long, appressed hairy, pale greenish-yellow. Achenes of two types; those of ray florets 0.2-0.3 cm long, triquetrous, truncate, more or less cuneate, pubescent; those of disc florets 0.3-0.4 cm long,
compressed, nearly flat, glabrascent. Pappus scales unequal, acute, hairy, occasionally, reduced to bristles.

Common, scattered or subgregarious, in grass fields, along edges of cultivated fields and in waste places along road sides. It is a rather variable plant generally 60-75 cm tall in favourable ground, but in exposed dry soil, plants upto 25 cm tall have also been noted.

**Flowers**: August - October

**Fruits**: August - December

**Herbarium specimens examined**:
- Dediapada: VKS 68, 329, 361, 2812, 2883, 2903
- Sagbara: VKS 2156, 2173, 2295; Shah 13059

**World distribution**: Tropical Africa, Arabia, India, Ceylon, Upper Burma, Java, Philippines and Australia; introduced in America. In India it is found throughout the plains and hilly regions ascending to an elevation of about 5000' in Kokam.

**Critical notes**: Duthie (Fl. Up. Gang. Pl. 2:428; 1960 reprinted) reports that the plant flowers during cold season. In our experiences it is a typical monsoon plant, sprouting up soon after the rains and bears flowers and fruits from August onwards. Our observations are in agreement with those of Cooke who also gives flowering season August - September.
BLUMEA DC. (Nom. Cons.)

Key to the species

1. Heads few, in axillary and terminal corymbs:
   2. Heads peduncled; achenes not ribbed, plants pubescent or villous:
      3. Erect herbs ........................................ eriantha
      3. Prostrate herbs, branches radiating from base .................. oxyodonta
   2. Heads sessile; achenes ribbed ........ belangeriana

1. Heads many in spiciform cymes or panicles:
   4. Heads yellow ........................................ lacera
   4. Heads purple ........................................ mollis

1. Heads many in open panicles .................. membranacea

Blumea belangeriana DC. Prodr. 5:444, 1836; FBI 3:266;

Erect herbs, 30-50 cm tall; stem and branches striate, villous. Leaves 1.5-15 x 1-5 cm, radical and cauline, basal shortly petiolate, upper ones sessile, all elliptic-oblong or obovate-oblong, membranous, thinly villous above, densely sericeo-woolly pubescent beneath, coarsely inciso-dentate, acute at apex, tapering at base. Heads 5-9 mm across, yellow tinged purple, solitary or in clusters of 2-3, axillary and terminal. Achenes + 1 mm long, terete, ribbed, slightly villous.
This is a rare plant in the area seen only once in the undergrowth on hilly slopes. The aromatic nature is typical of the genus *Blumea*.

**Flowers and fruits**: December

**Herbarium specimen examined**: Sagbara: VKS 928

**World distribution**: Endemic to the west coast of Peninsular India.


Strongly aromatic, annual herbs, erect, 30-75 cm tall; stem and branches terete, sometimes reddish to dark brown striate pubescent to villous, at length glabrescent, at times glabrous and polished in older parts. **Leaves** 4-8 x 2.5-4.2 cm, radical and cauline, former petiolate latter ones 2.3-3 x 1.1-1.3 cm, sessile, all elliptic-oblong, obovate or suborbicular, silky pubescent on both surfaces, densely so beneath, irregularly toothed, serratures spinous-tipped, acute or subacute at apex, rounded or tapering at base. **Heads** 0.5-1 cm across, yellow in axillary and terminal paniculate cymes; peduncles 0.6-1.5 cm long, slender, glandular hairy, **Achenes** minute, angled, sparsely hairy on angles.

Common and abundant in grasslands, cultivated fields in shaded spots and in the undergrowth of forests.
Flowers and fruits: November - March

Herbarium specimens examined:
Dediapada: VKS 1188, 1969; Shah 11564
Sagbara: VKS 1332, 1335, 1371, 1401, 1406, 1436

World distribution: In India, it is found in Western Peninsula and Upper Gangetic Plain (Bundelkhand).


Annual herbs, erect strongly aromatic, 30-50 cm tall; stem and branches densely glandular-villous, striate. Leaves 1.6-4.5 x 0.8-2.5 cm, elliptic-ovate or obovate, villous above, densely so beneath, sharply serrato-dentate, sessile or subsessile, acute at apex, rounded or tapering at base. Heads 0.5-1 cm across, yellow, in axillary and terminal, spiciform panicles. Achenes minute, glabrate, subtetragonal.

Rare. A few plants seen, cultivated fields and along road sides.

Flowers and fruits: November - January

Herbarium specimen examined:
Dediapada: VKS 1204

World distribution: Africa, South East-Asia to the Rynkus and New Guinea to Northern Australia. It is spread throughout the plains of India.
Critical notes: This species is often mistaken for Blumea mollis Merrill, but the yellow colour of florets makes it distinct from the later plant which has purple coloured florets.


Annual, erect herbs, 50-90 cm tall; stem and branches bright green, patently glandular hairy, striate. Leaves radical and cauline, 2-13 x 2.4-5 cm, radical ones sometimes much longer, all obovate-oblong, elliptic-oblong, lyrately or runcinately pinnatifid, glabrous, coarsely to sharply serrate, membranous, acute at apex, decurrent at base. Heads 5-8 mm across, numerous, in much branched, 10-30 cm long, open, terminal panicles. Florets yellow. Achenes ribbed, oblong, hairy on ribs.

Common in stony shaded ground along road sides, and in the undergrowth on hilly slopes.

Flowers and fruits: November - March

Herbarium specimens examined:
Dediapada: VKS 647, 1634
Sagbara: VKS 854, 1045, 1005, 1300, 1406, 2505
Kokam & Shah 11538

World distribution: Throughout India, Pakistan, Ceylon Burma, Indo-china, Indonesia, Malaya and China.

Erect, glandular-pubescent herbs, 30-60 cm tall; stem simple or branched, pale green, terete, deeply striate. Leaves 2-7 x 1-4 cm, obovate-oblong, membranous, thinly villous on both surfaces, irregularly serrate or toothed, sometimes lower lyrate, petiolate, upper ones sessile, acute or subacute at apex, rounded or tapering at base; petiole 0.8-2 cm long, appressed hairy. Heads numerous, 5-7 mm across, in axillary and terminal, spiciform, compact, 6-15 cm long panicles. Flowers purple. Achenes 4-5 angled not ribbed, brown, glabrescent.

Common in moist, waste places, in the undergrowth on hilly slopes and on exposed rocky soil.

Flowers and fruits: November - April

Herbarium specimens examined:
Dediapada: VKS 1271, 1435
Sagbara: VKS 967, 1375, 1406

World distribution: India to tropical Africa and China, southwards through Malaya to Australia, introduced in Philippines and New Caledonia. In India it is found everywhere from Outer Himalaya to South India.
**Blumea oxyodonta** DC. in Wt. Contrib. 15, 1834; FBI 3:266; Cooke 2:77; Randeria in Blumea 19(1):280, 1960; Shah 674.

Prostrate or procumbent herbs, branched from base, branches radially spreading. 8-25 cm long pubescent, at length glabrous, striate, at times reddish-brown. Leaves elliptic-oblong or obovate-oblong, sometimes suborbicular, densely woolly-pubescent, radical leaves 2.2-5.6 x 1.2-3.4 cm, cauline one 1-4 x 0.4-1.8 cm, shortly petiolate to almost sessile. Heads few in terminal and axillary, lax, pedunculate cymes; peduncles 0.8-2 cm long, slender hairy. Florets yellow. Achenes slightly hairy.

Rare a few plants seen in the rocky ground along Ghatoli road.

Flowers and fruits: December

Herbarium specimens examined:

Ghatoli: Shah 11472, 11473

World distribution: More or less throughout India, Pakistan, Nepal, Burma, Indo-China, Philippines and Southern China.

**CAESULIA** Roxb.

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*Caesulia axillaris* Roxb. Pl. Cor. 1:64, t. 93, 1795; FBI 3:291; Cooke 2:92; Santapau 132; Shah 674.
Prostrate or suberect, diffuse herbs, 20-45 cm tall; sometimes rooting at the lower nodes; stem simple or sparingly branched, glabrous, pale green. Leaves 3-9 x 0.5-2.5 cm, lanceolate bright green, distantly serrate, sessile, acute at apex, subrotund at base clasping stem at nodes. Heads 0.7-1.5 cm across, homogamous, axillary, solitary. Florets ash coloured or dirty white. Anthers purple when fresh, black on drying. Achenes 0.2-0.5 cm broad (including the broad wings) puberulus, obovoid, notched at apex, a few teeth on either side.

Common, in moist places along margins of temporary ponds and ditches, in river beds, in cultivated fields, etc., often forming large, pure patches with Sphaeranthus indicus L, Heliotropium ovalifolium Forsk. etc.

**Flowers and fruits**: August - November; at times up to March.

**Herbarium specimens examined**:
Dediapada: **VKS 103, 252, 498, 670, 715, 1169, 1558, 1758, 2754, 2831**
Mosda: **VKS 344**
Sagbar: **VKS 1033; Shah 11458**

**World distribution**: Throughout the greater part of India in moist places, ascending to 3000' on the Himalaya.

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**CYATHOCLINE Cass.**

**Cyathocline purpurea** (Don) O. Kuntze, Rev. Gen. Pl. 338, 1891; Santapau 124; Raizada IFR 5(1):13; Shah 674. **Tenacetum**

Prostrate or suberect herbs, 10-30 cm tall; stem and branches slender striate, pale green or sometimes purplish. Leaves radical and cauline, radical much longer than cauline varying 4-15 cm long, all deeply pinnatifid, lobes 0.5-2.5 x 0.3-1 cm, toothed or subentire, glabrate above, pubescent below, subacute or obtuse at apex. Heads 3-5 mm across, bright rosy-purple, in terminal panicles; peduncles 0.3-0.6 cm long, hairy. Achenes minute, oblong, smooth.

Common and abundant, often gregariously growing in moist places along streamlets and in riverbeds. The plant is rather attractive when in full bloom by the masses of rosy-purple heads.

**Flowers and fruits:** September - March

**Herbarium specimens examined:**

Dediapada: VKS 520, 1166, 1488, 2795; Shah 11437

Sagbara: VKS 836, 1295, 1692, 2664, 2684

**World distribution:** More or less throughout India in moist places, ascending to 5000' on the Himalayas, Burma, China.

**ECHINOPS** Linn.

Erect, rigid herbs, 30-75 cm tall, stem 1-2.5 cm across, terete, stout, grey-tomentose, simple or sparsely branched, spiny. Leaves sessile 5-13 x 2-5 cm, oblong, pinnatifid, glaucous-green above, white-woolly beneath, lobes triangular-oblong, sinuate and spinescent; spines 0.8-1.5 cm long. Heads 3.5-5 cm long, rigid, spinescent. Corolla white or pale blue, 0.6 cm long; pappus short, yellowish. Achenes 0.4-0.8 cm long, obconical, densely villous.

Occasional, scattered or in loose patches in open waste lands. The overall white cottony tomentum and large, globose, spinous heads are distinctive of this plant.

**Flowers and fruits**: October - November

**Herbarium specimens examined**: Dediapada: VKSH 720, 735, 738

**World distribution**: Afghanistan, Sind, more or less throughout the drier parts of India ascending to an altitude of 5000' on Himalayas and on the Shan hills in upper Burma.

**ECLIPTA** Linn. (Nom. Cons.)


Prostrate or suberect, much branched slender herbs; stem simple or branched, strigously hairy, densely so in younger parts. Leaves 1.5-8.4 x 0.7-2.5 cm, elliptic-lanceolate, sessile or shortly petiolate, appressedly hairy, irregularly and very shallowly dentate or almost entire, acute or subacute at apex, tapering at base. Heads 0.5-0.9 cm across, white, solitary or in fascicles of 1-3, axillary and terminal; peduncles 1.2-4 cm long, densely strigously hairy. Pappus 0. Achenes + 2 mm long, obconical, compressed, with a narrow wing, ridged on one side, deep brown to almost black when ripe.

Common and abundant in moist ground along margins of ponds, ditches and among grasses. A variable plant almost erect and subfleshy in moist ground, but stunted, almost wiry and closely appressed to the ground in dry soil.

Flowers and fruits: Throughout the year.

Herbarium specimens examined:
Dediapada: VKS 102, 1159, 1692, 2060, 2930
Sagbara: VKS 426, 993, 1027, 2232, 2537
Selamba: VKS 1661, 1743, 1812

World distribution: Most tropical and subtropical regions of the world. In India it is found in moist ground in plains and ascending up to an elevation of 6000' in Himalaya.
Critical notes: For the nomenclature of this plant see Santapau in JBNHS 54:475, 1957.

EMILIA Cass.


Annual herbs, diffuse or erect, 15-40 cm tall, usually branched, lower branches at times prostrate, rooting at nodes, stem slender, terete, glaucous to dark green, glabrous, striate. Leaves 4-8 x 1-3 cm, sessile, sharply serrate, pinnatifid, nigro-punctate, radical ones lyrate, runcinate, obovate or spathulate, cauline ones ovate, ovate-lanceolate, obovate or spathulate, acute at apex, auricled at base. Heads 0.6-1.2 x 0.4-0.6 cm, bright purple, in terminal lax, pedunculate corymbs., peduncles 1.2-4 cm long, glabrous, slender. Pappus copious, silky, fugacious. Achenes ± 2 mm long, brown, narrowly oblong, ribbed, scabridly hairy on ribs.

Common in shaded places, on earth bunds, occasionally among grasses on hilly slopes.

Flowers and fruits: September - January

Herbarium specimens examined:
Dediapada: VKS 389, 432, 815, 1826, 2441, 2934
Sagbara: VKS 842, 1533

World distribution: Tropical Africa, throughout India, ascending to 5000' on the Himalaya, and Ceylon to Japan and
to the South through Malay to Australia, apparently introduced in tropical America.

**GNAPHALIUM Linn.**

*Gnaphalium indicum* Linn. Sp. PI. 853, 1753; FBI 3:289; Cooke 2:87; Santapau 131.

Erect, suberect or prostrate herbs, 6-20 cm high, greyish-white woolly tomentose; stem simple or branched, often rooting at lower nodes. Leaves 1-4 x 0.2-0.4 cm, upper leaves sessile, lower ones shortly petiolate, all white-woolly, narrowly linear-obovate or spatulate, obtuse or apiculate at apex, tapering at base; petiole 0.8-2 cm long. Heads 0.3-0.4 cm across, woolly, in terminal and sub-terminal dense, spiciform clusters. Corolla minute, creamy white or light yellow. Pappus copious. Achenes minute, oblong, minutely papillose, slightly pilose.

A rare plant in the area, seen in abundance in moist river bed at Mosda only.

**Flowers and fruits** : January

**Herbarium specimen examined** :

Mosda : VKS 1264

**World distribution** : Tropical Africa, throughout the plains in India, Burma, China, Japan and Australia.

**GUIZOTIA Cass.** (Nom. Cons.)

*Guizotia abyssinica* Cass. in Diet. Sci. Nat. F:59;248, 1829; FBI 3:308; Cooke 2:125; Santapau 138; Wealth of India
A stout, erect herb, 20-120 cm tall; stem branched from middle, glabrous, striate, greenish-brown in lower parts. Leaves 5-12 x 1-4 cm, lanceolate, membranous, glabrous, serrate, sessile acute at apex, subauricled at base; slightly clasping stem at nodes. Heads 2-3 cm across, orange-yellow, heterogamous, solitary, axillary and terminal, on 1-8 cm long, glabrous peduncles. Achenes 0.4-0.5 cm long, longitudinally ribbed, black, glabrous.

Rare, seen only once in the river bed at Piplad, probably an escape.

Flowers and fruits: January

Herbarium specimen examined:
Piplad: VKS 1269

World distribution: This is the 'Niger' plant, reported to be a native of Abyssinia, extensively cultivated as an oil seed crop in India, Abyssinia and parts of East Africa. In India it is grown extensively in Madhya Pradesh, Hyderabad, Orissa, Bombay and Mysore and to some extent in Bihar, Andhra, Madras, Central India, Vindhyachal and Bhopal.

LAUNAEA Cass.

Trailing or suberect, perennial herbs, 20-50 cm long; stem slender, glabrous, striate, glaucous green. Leaves sessile, glaucous-green, glabrous, dentate, radical ones 6.5-15 x 1-3.5 cm, lyrate or runcinate, cauline ones few, 2.5-5 x 1-2.5 cm, linear-lanceolate pinnatifid. Heads 1-1.5 cm across, creamy-white or pale to bright, yellow, homogamous, distantly fascicled or subracemose on flowering branches. Achenes ± 3 mm long, smooth, brown, inner ones apparently 4-gonous due to thick ribs, outer slightly curved and compressed.

A rare weed in cultivated fields.

Flowers and fruits: March - June

Herbarium specimens examined:
Dediapada: VKS 1521, 1835

World distribution: India, Baluchistan, Waziristan, Arabia, Afghanistan, Persia, extending westwards to Atlantic. In India, it is found as a weed in plains of Bengal to Punjab and southwards through Sind to the Deccan; also in West Himalaya upto 8000' in Kumaon.

SCLEROCARPUS Jacq.


Annual, erect herbs, 30-50 (75) cm tall; stem and branches striate, hispidly hairy, pale brown. Leaves 6-10 x
3-5.4 cm, alternate, ovate, ovate-oblong, appressedly pubescent, serrate, acute at apex, shortly cuneate at base; petioles 0.4-1.5 cm long, hairy. **Heads** 0.6-0.7 cm (in fruits ± 1.3 cm) across, orange-yellow, terminal, sessile or shortly peduncled. **Achenes** 0.7-0.9 cm long, obovoid, ribbed, pale brown or straw coloured, pubescent at apex.

Rare in shaded places and in dense undergrowth of the forests.

**Flowers and fruits:** September

**Herbarium specimens examined:**

Dediapada: VKS 38, 42, 2963

Sagbara: Shah 13067

**World distribution:** Tropical Africa and India from Simla to Kumaon up to 5000 ft in (W. Himalaya, Punjab and W. Peninsula). The specific epithet "africanus" suggests that the plant may be a native of tropical Africa.

**Sphaeranthus Linn.**

*Sphaeranthus indicus* Linn. *Sp. Pl.* 927, 1753; *FBI 3:275; Cooke 2:84; Robyns in Kew Bull.* 1924:197, 1924;

Santapau, 130; Shah 674.

Annual herbs, prostrate or procumbent, occasionally suberect, 30-40 cm long; stem and branches, glaucous-green, terete, striate, winged, glandular-pubescent in younger parts, wings deeply and irregularly serrate. **Leaves** 1.8-6 x 0.5-2.5 cm, elliptic-oblong or obovate-oblong, glandular-
pubescent, sessile, sharply serrate, serratures spinous tipped, acute, subacute or obtuse at apex, always ending in a small spine, usually decurrent at base forming dentate wings on stem. Head 0.7-1.7 cm across, compound, green at first, at length deep purple, globose, or ovoid, solitary, terminal, on a fairly stout, 1.5-3.5 cm long, winged peduncles. Flowers white. Achenes minute, cuneate, pale brown, obscurely angled, glabrous or sparsely hairy.

Common in drying moist ground along margins of ponds, ditches and cultivated fields forming pure patches or mixed with Glinus lotoides L. and Heliotropium ovalifolium Forsk. etc. The overall glaucous-green, colour of the plant with purple heads above the foliage are typical and render the plant conspicuous when gregarious.

**Flowers and fruits** : November - March

**Herbarium specimens examined** :
- Dediapada : VKS 490, 665, 1141, 1187, 1480
- Sagbara : VKS 1361, 1411, 1739
- Selamba : VKS 955, 1367, 1404

**World distribution** : Africa, throughout India in moist ground and ascending to 5000' on Himalaya, Ceylon, Burma, Malay Islands and Australia.

Erect or ascending herbs, 20-35 cm tall; stem and branches puberulous or glabrous, sometimes purplish, faintly striate. Leaves 2-5 x 0.8-2.3 cm, ovate, glabrous, irregularly crenato-serrate, acute or obtuse at apex, narrowed at base. Heads 0.6-1.2 cm across, brownish-yellow ovoid, solitary, on 2-12 cm long, terminal and axillary peduncles. Pappus 2, bristles awn-like. Achenes ± 2 mm long, oblong, compressed, densely ciliate on margins.

Common in cultivated fields and in the undergrowth of hilly slopes.

Flowers and fruits: September - December

Herbarium specimens examined:
Dediapada: VKS 1519
Sagbara: VKS 404, 2344, 2648, 2677; Shah 14086

World distribution: Throughout India, ascending to 5000' on the Himalayas, Ceylon and all other warm countries.

TRIDAX Linn.

Tridax procumbens Linn. Sp. Pl. 900, 1753; FBI 3:311;
Cooke 2:102; Santapau 134; Shah 674.

Annual, erect or procumbent herbs, 30-60 cm tall; stem and branches slender, pale green, striate scabridly hairy; hairs white, jointed. Leaves 2.5-6 x 1-2.5 cm, ovate-lanceolate, hairy on both surfaces, hairs from bulbous bases, inciso-dentate on margins, acute at both ends; petioles 0.5-1 cm long, Heads 0.7-1.4 cm across, solitary at ends.
of 10-35 cm long, slender, straggling peduncles. Ray florets few, bright yellow to creamy white; disk florets tubular, deep yellow. Achenes 0.3-0.4 cm long, densely clothed with silky-white hairs. Pappus of many unequal aristate feathery fristles.

One of the commonest weeds in the area thriving in all types of soil.

Flowers and fruits: Throughout the year.

Herbarium specimens examined:

Beadiapada: VKS 473, 1210, 1294, 1693, 2015
Sagbara: VKS 843, 1303, 1380, 1400.

World distribution: Native of Central America, now common over most parts of India, Ceylon, Burma and Singapore.

VERNONIA Schreb. (Nom. Cons.)

Key to the species

1. Slender herbs; achenes ≤ 1.5 mm long ...... cinera
1. Robust herbs; achenes ≥ 5 mm long .......... anthelmintica


Robust herbs 0.5-1.5 m tall; stem and branches softly hairy, striate. Leaves 4-7.5 x 2.3-3.7 cm, elliptic lanceolate or broadly elliptic, appressedly pubescent and dark green above, glandular villous and whitish green beneath, coarsely toothed, acute or acuminate at apex, tapering at
base; petiole 0.8-1.5 cm long. Heads 1-2.5 cm across, in terminal corymbs. Flowers bright purple. Achenes black, ribbed, obconical hairy.

Rare, a few plants seen at Sejpur on hilly slopes on 29-9-1968.

Flowers and fruits: September

Herbarium specimen examined:
Sejpur: VKS 2903

World distribution: India and Ceylon


Erect herbs, 30-55 cm tall; stem simple or branched, striate densely appressedly greyish pubescent. Leaves 1.5-7 x 1-3.5 cm, ovate, elliptic or lanceolate, glabrous above, densely hairy beneath, irregularly toothed or shallowly crenato-serrate, acute at apex, attenuated at base; petiole 1.5-2.5 cm long, appressed hairy. Heads 4-5 mm across, numerous in terminal open paniculate cymes. Florets light to deep purple. Achenes ± 1.5 mm long, densely hairy.

Common in open grass lands and in waste places along road sides and in the undergrowth of forests.

Flowers and fruits: Throughout the year.
Herbarium specimens examined:
Sagbara: VKS 2231, 2335, 2342, 2380

World distribution: Africa, Madagascar, India, Ceylon, Burma, Cochin-China, Siam, Malay Islands, China, Philippines Australia. In India it is a common weed, found in plains and hilly regions, ascending to 8000' on the Himalaya.

Critical note: According to Koster, the Indian plant is var. Cinerea.

VICOA Cass.

Key to the species

1. Leaves not auriculate at base; involucral bracts squarrose ....................... cernua

1. Leaves auriculate at base; involucral bracts erect ......................... indica

Vicoa cernua Dalz. in Dalz. & Gibs. Bomb. Fl. 126 & 314, 1861; FBI 3:297; Cooke 2:89; Santapau 132.

Slender, erect herbs 20-45 cm tall; stem and branches sparsely hairy, striate. Leaves 2.5-8 x 0.8-3 cm, elliptic, elliptic-lanceolate or oblanceolate, sparsely hairy, serrate apex, tapering at base. Heads 0.7-0.9 cm across, yellow, in axillary and terminal pseudocorymbs. Achenes minute, hairy.

Rare, in waste places.

Flowers and fruits: November
Herbarium specimen examined:
Dediapada: VKS 704

World distribution: Apparently endemic in Bombay Presidency.


A much branched, erect herb or an undershrub, 50-75 cm tall, branched above the middle, branches spreading; stem faintly striate, glabrous, at times dark-brown and polished in lower parts. Leaves 1-6 × 0.2-1.5 cm, linear or linear-lanceolate, sessile, deflexed, dark-green and hairy above, densely pubescent and paler beneath, acute and minutely apiculate at apex, auricled at base clasping the stem. Heads 1.4-2 cm across, heterogamous, solitary, drooping, terminal and leaf opposed, forming pseudo-panicles. Florets bright yellow. Achenes minute, hairy.

Occasional in open grass fields and on hilly slopes. It is quite conspicuous by the masses of bright florets in drooping heads produced above the dense foliage.

Flowers and fruits: October - March

Herbarium specimens examined:
Dediapada: VKS 606, 696, 1191, 1796, 2959, 2984
Sagbara: VKS 944, 948, 1377
World distribution: Tropical Africa, throughout the drier parts of India, Ceylon and Burma.

XANTHIUM Linn.

Xanthium strumarium Linn. Sp. Pl. 987, 1753; FBI 3:303; Cooke 2:94; Santapau 132; Shah 674. Xanthium indicum Koen. ex Roxb. Wt. Icon. t. 1104.

Annual herbs, 60-150 cm tall; stout, terete, simple or sparingly branched, pale yellow, at times reddish purple. Leaves 3-13 x 4-12 cm, broadly ovate-triangular, shallowly 3-lobed, hispidly hairy, irregularly serrate, acute or shortly acuminate at apex, truncate, subcordate or tapering at base. Heads tinged purple in axillary and terminal, 4-15 cm long spikes. Fruits 1-2 cm long, 2-celled, 2-beaked, indehiscent, ellipsoid or oblong, pale brown, covered with hooked spines. Achenes 0.8-1 cm long, oblong-ovoid, smooth, compressed glabrous, black.

Common and abundant, usually gregarious in pure strands, forming dense and at times impenetrable thickets along road sides, margins of ponds and ditches and along river banks.

Flowers and fruits: September - November

Dediapada: VKS 2866
Sagbara: VKS 1489

World distribution: Native of tropical America, now widely spread throughout tropical and temperate regions of the world. It is found throughout the hotter parts of India and up to 6000' on Himalaya.
PLUMBAGINACEAE

PLUMBAGO LINN

Plumbago zeylanica Linn. Sp. Pl. 151, 1753; FBI 3:480; Cooke 2:136; Pax in Pfam. 4(1):120, t. 66 E, 1890; Steenis in Fl. Males. 4(2):109, 1949; Bor & Raizada, Some Beaut. Indian Climb. & Shrubs 162, t. 102, 1954; Santapau 140; Shah 674.

An undershrub, 1-1.5 m tall; stem slender, simple or branched from the middle, terete, striate, olivaceous green often with reddish-purple tinge at nodes, young branches distinctly flexuous. Leaves 2-8 x 1-5 cm, ovate, glabrous dark green, membranous, acute at apex, shortly and abruptly attenuated at base; petioles 0.8-1.5 cm long, sheathing and often auriculate at base. Flowers 0.8-2 cm long white, in 8-20 cm long, axillary and terminal spikes. Calyx 0.8-1.3 cm long, dark green, tubular, mouth minutely toothed, clothed with yellowish or olive-green, viscid, stipitate glands. Capsules 0.8-1 cm long, obovoid-oblong, 5-valved, acuminate at apex, enclosed in persistent calyx tube.

Occasional, in the undergrowth of the forests on hilly slopes. The stipitate, glandular calyx is quite typical of this plant.

Flowers and fruits: September - March

Herbarium specimens examined:

Bediapada: VKS 224, 227, 241, 1194; Shah 13096
World distribution: More or less throughout the tropics of the old world, to Hawaii, possibly only indigenous in South East Asia. Wild and extensively cultivated throughout the hotter parts of India.