

## A CONTRIBUTION TO THE FLORA OF LUCKNOW

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## ABSTRACT

This is an account of the flora of Lucknow and its environs and includes 77 angiosperm families and some 330 species. Hindi plant names current locally and local uses of the plants have been given where possible. Climatic, soil and biotic factors have been discussed in relation to the vegetation. The text is illustrated by eight plant sketches and two graphs on climatic data.

## INTRODUCTION

The Gangetic Plains constitute one of the important botanical regions of India. They lie between the ancient crystalline mass of Peninsular India in the south and the comparatively much younger sedimentary rocks of the Himalayas in the north. Both these land-masses appear to have contributed to the geological make-up of the Gangetic Plains.

Physiographically, the Gangetic Plains are formed by the alluvial deposits of the Ganges, Jumna and their tributaries. In a typical profile the Gangetic Plains show deposits of calcareous tufa ("kankar") at different depths with layers of sand or clay with or without silt above and below the tufaceous layer. The tufa is acted upon by various erosion processes as a result of which deep gullies and extensive ravines are formed. Such ravines may effect the production and prosperity of the population.

Since the soil of the Gangetic Plains is complex in origin, it is not surprising that it possesses a very heterogeneous flora. Further the Gangetic Plains are the home of a very ancient civilisation as the recent excavations at Kausambi bear witness. Through the centuries human migration, wars and settlement have profusely affected the plant wealth of this region. Such disturbances have affected the natural vegetation and its orderly successional development. The demand for land by new settlers as well as the old led to the clearing of forests and the creation of open habitats. Such open habitats permit the entry of new plant species from neighbouring areas. Thus the persistence and spread of pioneer elements are a feature of the development of the vegetation in this area.

Botanists and geographers have been interested in the vegetation of the Gangetic Plains for a long time. J. D. Hooker, the great British botanist, botanised in the Gangetic Plains and visited Mirzapur, Benares, Ghazipur and other places in Uttar Pradesh. One of the earliest vegetational studies in the area is by Duthie (1903-1922) who in his *Flora of the Upper Gangetic Plain* has given notes on habitat, locality, flowering and distribution of the different species. Later, Dudgeon (1920) proposed that the vegetation of the Upper Gangetic Plain was in the dry meadow stage and would develop into a

deciduous monsoon forest, if left undisturbed. From his ecological studies Varma (1936) concluded that the vegetation is arrested, most probably deflected, from attaining the climatic climax on account of adverse biotic interference. The vegetation appears to be a pro-climax, the chief determining factor being man.

There is evidence that the Gangetic Plains were covered with forest during historic times. In fact, Bharucha (1955) suggests that the typically arid Western Rajasthan may have been well wooded at the time of Alexander and the Mauryan empire.

Recently, the Planning Commission of India expressed the view that western desert conditions could probably spread to the fertile Gangetic basin on account of the destruction of the vegetation and the formation of "usar" and "reh" soils. We cannot afford the destruction of these fertile alluvial soils and since plants indicate in advance the changes in habitat, their study has a special interest. The present study on the flora of Lucknow and its environs, conducted mostly in 1956-58, is the first of a series of contributions from this Laboratory on the vegetation of the Gangetic Plains. Vegetational studies for Varanasi and its environs have been undertaken by Dr. R. Misra and his students.

The city of Lucknow situated in the Upper Gangetic Plain on River Gomti is 403 ft. above sea level. The natural soil of Lucknow is the stoneless alluvium spread out to form a plain that is almost perfectly level. Oldham (1890) estimated the depth of the alluvium at Lucknow as not more than 2000 ft. Stone and brick masonry, often in ruins, gives diversity of habitat to plant growth. The total annual rainfall has fluctuated greatly during the past five years (Table 1).

TABLE 1

Total annual rainfall. Data supplied by the Meteorological Officer, Civil Aerodrome, Lucknow.

Year	Total annual rainfall
1953	171 cm.
1954	113 cm.
1955	125 cm.
1956	125 cm.
1957	84 cm.

The monthly rainfall and the monthly maximum and minimum temperature for 1956 and 1957 are illustrated in Figs. 1 and 2. Most of the rain falls in July, August and September. A few showers in February serve to interrupt the rigour of the dry season. The temperature rises steadily to a maximum (circa 40°C) in May and then declines to a minimum (circa 10°C) in December and January.

The seasonal variation of climatic factors is so great that a herbaceous species can, only with difficulty, remain dominant throughout the year. Thus species prominent during the monsoon, e.g. *Cassia tora* L., *C. occidentalis* L. and *Anisomeles indica* Kuntze are replaced during the cold season by temperate species, e.g. *Ranunculus sceleratus* L., *Veronica anagallis* L. and *Salvia plebeja* R. Br. especially along the margins of streams and in places of adequate water supply.

The rich aquatic flora found in Chinhat Lake and other "jheels" around Lucknow is dwindling rapidly on account of the ever increasing cultivation of *Trapa bispinosa* Roxb. The cultivation of this plant has led to extensive eradication and clearing out of the natural flora of the ponds. Thus the showy *Nelumbo nucifera* Gaertn., once the dominant plant in Chinhat Lake, is disappearing rapidly with the increasing cultivation of *Trapa*. The water weed *Eichhornia crassipes* Solms, native of Tropical America, has also found its way to some of the ponds where its rapid spread as a compact community has been very destructive to the local aquatic flora.

The indigenous land vegetation of Lucknow and its environs has been replaced from very early times by a flora directly or indirectly fostered by man. The effect of this human factor is obvious from a perusal of the roadside trees and of the parks and gardens. In the environs of the city, cultivated fields and extensive orchards have largely replaced the original flora. Besides this, herbs and shrubs not deliberately introduced by man, have crept into this altered landscape as pioneers. Many of these pioneering species are of foreign origin, e.g. *Hyptis suaveolens* Poit., *Nicotiana plumbaginifolia* Viv., *Croton bonplandianum* Baill., *Evolvulus nummularius* L., *Alternanthera pungens* HBK., *Lantana camara* L. and *Gomphrena celosioides* Mart. Irrigation practices have contributed to the making of a more verdant landscape for the hot season.

The grasses on the meadows in and around Lucknow are usually cut for fodder or heavily grazed. *Imperata cylindrica* Beauv. has been observed to come into bloom as a common lawn weed. The tall *Saccharum spontaneum* L. is particularly abundant on low-lying watery ground between Lucknow and Amausi and comes into bloom in September. Another tall grass, *Saccharum bengalense* Retz. (= *Erianthus munja* Jeswiet) flowers later, i.e. about November. It occurs spontaneously in open waste places but is more com-

monly found on the borders of the cultivated fields. *Desmostachya bipinnata* Stapf, common near Amausi airfield, is in bloom in the hot dry month of May and then gives a characteristic appearance to the otherwise arid open spaces.

The herbaceous flora appearing during and after the rains reaches its greatest luxuriance and diversity in places protected from grazing such as National Botanic Gardens. In the National Botanic Gardens, with the onset of the rains, the following species appear in profusion: *Cassia tora* L., *Euphorbia thymifolia* L., *Phyllanthus niruri* L., *Tribulus terrestris* L., *Crotalaria medicaginea* Lam., *Ageratum conyzoides* L., *Conyza ambigua* DC., *Ipomoea pes-tigridis* L., *Physalis minima* L., *Lindernia ciliata* Pennell, *Lindernia crustacea* F. Muell., *Martynia annua* L., *Justicia simplex* Don, *Commelina benghalensis* L., *Cyperus rotundus* L., *Cyperus triceps* Endl., *Cynodon dactylon* Pers., *Echinochloa colonum* Link., *Eragrostis tenella* Roem. et Schult., *Oplismenus burmannii* Beauv., *Sporobolus diander* Beauv., *Triumfetta bartramia* L. Among the less common of the spontaneous species in the National Botanic Gardens may be mentioned: *Coccinia cordifolia* Cogn., *Alysicarpus vaginalis* DC., *Vernonia cinerea* Less. and *Acalypha ciliata* Forsk. In open areas more or less exposed to grazing and other biotic interference, this diversity of ground flora is not to be found and sometimes one or two species may predominate to form almost pure communities, e.g. *Crotalaria medicaginea* in certain spots at Mahanagar.

The present observations are based on excursions within the less congested areas of the city of Lucknow, i.e. Civil Lines, Cantonment, Old and New Haidarabad, Daliganj, University area, etc. The observations extend into the surrounding countryside along the main roads: as far as Amausi airfield about eight miles away by the Kanpur Road; up to L.I.T. Forest four miles away by the Hardoi Road; to Mithauli village five miles by the Sitapur Road; to Chinhat Lake about eight miles away by the Fyzabad Road; to Mohanlal Ganj fifteen miles away by the Rae Bareilly Road; to Bijnor five miles away by the Jail Road.

An attempt has been made to include almost all the trees (bamboos excepted) whether in gardens and orchards, roadside or elsewhere, within the scope of the present observations. Observations on the herbaceous flora are restricted to the plants propagating spontaneously, e.g. field and lawn weeds, aquatic and semiaquatic plants and plants of waste places. Shrubs that grow wild and those used in hedges have been included. The cereal, leguminous and other agricultural crops are omitted. The observations are restricted to Angiosperms only. The present list of plants is by no means exhaustive within the limits set above, but, on the whole, the common wild herbs and almost all the roadside trees have been included.

A general list of the authors useful in the present study is given in the bibliography at the end. I have frequently referred to certain contributions by Dr. Santapau (1948, 1951, 1953, 1957) for valuable information on botanical nomenclature. Also, mention may be made of the recent book on grasses by Dr. Bor (1960) where the latest changes in the nomenclature of the grasses have been incorporated.

In the text of the Flora, the synonyms where considered necessary are given in brackets after the correct name. The abbreviation "F.B.I." occasionally occurring in the text refers to Hooker's "Flora of British India"

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#### RANUNCULACEAE

Herbs with sheathing petioles. Sepals 3-5, caducous. Petals usually 5. Stamens usually numerous. Carpels many, style short, ovule 1. Fruit of apiculate or beaked achenes. ... *Ranunculus*

##### *Ranunculus sceleratus* L.

On wet ground at the border of a water channel, left bank of the Gomti, near Haidarabad. Not common. In flower and fruit, 21-3-1956. An erect, glabrous, acrid annual with 3-partite leaves, the segments again lobed; flowers yellow; heads of achenes cylindric. *Patil* 224.

#### ANNONACEAE

Shrub or tree. Leaves alternate, simple, entire, exstipulate. Sepals 3. Stamens many, connectives prominent, produced beyond the cells. Carpels numerous.

A Petals 6, in two series, inner series usually reduced to scales or 0. Fruit a syncarp, large and fleshy ... *Annona*

AA Petals 6, in two series. Fruit of free stalked carpels ... *Polyalthia*

##### *Annona squamosa* L.

In an orchard at the outskirts of Lucknow by Sitapur Road. In flower, 18-7-1957. Fruit tubercled, without spiny processes and composed of loosely cohering pistils. *Patil* 419.

*Local use:* Cultivated for edible fruit which is of economic importance.

*Hindi names:* Sharifa; Sitaphal.

##### *Polyalthia longifolia* Hook. f. et Thoms.

Roadside, New Haidarabad. On the grounds of Lucknow University. In flower, 2-5-1956. Leaves narrowly lanceolate, the margins undulate. *Patil* 248.

*Local use:* As avenue tree.

#### MENISPERMACEAE

Slender climbing shrubs with alternate, exstipulate, palminerved leaves that are often peltate. Flowers minute, dioecious. Male flowers: sepals 4; petals connate into a short cup; anthers 4, connate on staminal column. Female flowers in axillary bracteate racemes, tepals 2, carpel 1. Seed horseshoe-shaped ... *Cissampelos*

##### *Cissampelos pareira* L.

Twining around bush on waste ground, near Carlton Hotel, 27-7-1958. Not common. *Patil* 1235.

*Local use:* It is doubtful whether the uses of this important medicinal plant are known locally.

#### NYMPHACEAE

Aquatic herbs. Flowers large, single on peduncles at or above water level. Sepals 4 or 5; petals and stamens many.

A Leaves peltate, mostly above water on stout petioles. Pistils many, immersed in the large nearly flat-topped receptacle ... *Nelumbo*

AA Leaves sometimes peltate near margin, usually floating. Pistils syncarpous, forming a many-celled ovary ... *Nymphaea*

##### *Nelumbo nucifera* Gaertn. (*Nelumbium speciosum* Willd.)

In water, Chinhat Lake. In flower, 20-7-1957. Flowers rose-coloured. *Patil* 1231.

*Local use:* Used by Hindus for religious purposes.

*Hindi name:* Kamal.

##### *Nymphaea pubescens* Willd. (*N. lotus* Hook. f. et Thoms. in F.B.I.)

In water, Chinhat Lake. Common in roadside "jheels" on city outskirts by the Rae Bareilly Road. In flower and fruit, 26-9-1958. Flowers white, anthers without appendages, leaves deeply cordate, toothed. *Patil* 1258, 1229.

#### PAPAVERACEAE

Glaucous herbs with yellow juice. Leaves spiny. Flowers bisexual. Sepals 2-3, petals 4-6, stamens many. Ovary superior, 1-celled, with parietal placentas. Fruit an oblong, usually prickly capsule ... *Argemone*

##### *Argemone mexicana* L.

Roadside, near Paper Mill. In flower, 27-12-1958. Common. Flowers yellow. *Patil* 1297.

*Local use:* It is doubtful whether the medicinal properties of this plant are known locally.

*Hindi name:* Siarkanja.

## CAPPARIDACEAE

Flowers bisexual (rarely polygamous), sepals 4, petals 4, ovary superior, 1-celled with parietal placentas or divided into two or more cells by spurious dissepiments.

- A Herbs with elongate capsules  
 B Stamens 4-many, sessile on disc .... *Cleome*  
 BB Stamens 6, on the gynophore ... *Gynandropsis*  
 AA Trees or shrubs; stamens from base of gynophore; fruit baccate  
 B Unarmed, leaves 3-foliate, sepals open in bud ... *Crataeva*  
 BB Often with stipular spines; leaves simple, sepals closed in bud ... *Capparis*

**Capparis sepiaria** L.

In wasteland, Tiwari Ganj, near Lucknow. On a hillock near Bangla Bazaar. Common. In flower, 27-5-1957; in fruit 21-7-1958. Flowers small, white, in simple umbel-like corymbs; stamens many; berries black when ripe. *Patil* 403, 1207.  
*Local use*: Sometimes used in hedges.

**Cleome viscosa** L.

Near Bijnor (beyond Bangla Bazaar) as a weed in corn fields. Common. In flower and fruit, 15-8-1956. Leaves digitate; flowers yellow, stamens exceeding 10; capsule glandular-pubescent. *Munnalal* 280.

**Crataeva nurvala** Buch.-Ham. (*C. religiosa* Hook. f. et Thoms. in F.B.I.)

Roadside, New Haidarabad. In flower, 12-4-1956. A beautiful tree when in flower; the petals creamy yellow, the stamens purple. *Patil* 236.

*Hindi name*: Barna.

**Gynandropsis gynandra** (L.) Briq. (*G. pentaphylla* DC.)

On waste ground, Daliganj. In flower and fruit, 9-12-1955. Leaves digitate, flowers white or purplish. *Arora* 208.

## VIOLACEAE

Leaves simple, stipulate. Flowers irregular, bisexual, solitary, axillary. Sepals 5, subequal; petals 5, the lower one on a long claw; anthers 2 or 4; ovary 1-celled with three parietal placentas; capsule 3-valved, subglobose, few-seeded ... *Hybanthus*

**Hybanthus enneaspermus** (L.) F. Muehl. (*Ionidium suffruticosum* Ging.)

As lawn weed in Zoological Gardens. With flowers and fruit, 25-9-1958. Rare. A small under-shrub, the leaves alternate, the flowers red, the seeds finely striate. *Patil* 1263.

## PORTULACACEAE

Fleshy herbs. Flowers regular, bisexual. Sepals 2. Petals 4-6, fugacious. Stamens 8 or more. Ovary 1-celled, semi-inferior, placentation free-central  
*Portulaca*

**Portulaca oleracea** L.

East of the Paper Mill, in cultivated field along with *Chenopodium album*. In fruit, 18-3-1958.

Common. Leaves 0.6-3.5 cms., with cuneate base, truncate apex. Flowers yellow. *Patil* 495.

*Local use*: As a pot-herb.

*Hindi name*: Luniya.

**P. quadrifida** L.

On high ground, Chinhat Lake. In flower, 26-9-1958. Not uncommon. Leaves 0.5-0.8 cms., ovate-oblong to ovate-lanceolate. Flowers yellow. *Patil* 1255.

## TAMARICACEAE

Shrubs or small trees. Leaves alternate, minute, scale-like, amplexicaul. Flowers in spikes or racemes. Sepals 4-5; petals 4-5; stamens 4-10, anthers versatile; ovary free, 1-celled; capsule 3-4-valved  
*Tamarix*

**Tamarix dioica** Roxb.

On Gomti riverbank, near Bawa ka Purwa village. In flower, 30-7-1958. The flowers dioecious, in pink-flowered spikes. *Patil* 1238.

*Hindi name*: Jhau.

## MALVACEAE

Flowers bisexual. Sepals connate below. Petals 5, more or less adnate to the base of the staminal tube. Stamens many, united into a long tube, the anthers 1-celled. The ovary free, syncarpous; placentation axile.

- A Ripe carpels separating as cocci; herbs or undershrubs  
 B Styles as many as the carpels  
 C Bracteoles 3; ovule 1 in each carpel ... *Malvastrum*  
 CC Bracteoles 0; ovule 1 in each carpel ... *Sida*  
 CCC Bracteoles 0; ovules 2 or more in each carpel ... *Abutilon*  
 BB Styles twice as many as the carpels ... *Urena*  
 AA Ripe carpels not separating but the fruit capsular; herbs, shrubs or trees  
 B Stigmas distinct ... *Hibiscus*  
 BB Stigmas united in a club-shaped mass *Thespesia*

**Abutilon indicum** Don.

Roadside, Daliganj. In flower and fruit, 8-12-1955. Leaves simple, cordate, irregularly toothed; flowers orange; cocci numerous and shortly awned. *Arora* 207.

**Hibiscus lobatus** (Murr.) Kuntze (*H. solandra* L'Herit.)

On high bank of the pond near the Paper Mill. Not common. In flower, 28-9-1958. A herb; the leaves simple, the upper 3-lobed; flowers white, without bracteoles. *Patil* 1267.

**Malvastrum coromandelianum** (L.) Garcke. (*M. tricuspidatum* Gray)

Weed on the grounds of the Residency. Not common. In flower, 26-7-1958. Leaves simple, oblong-ovate, serrate; flowers yellow. *Patil* 1233.

***Sida acuta* Burm.**

Roadside, Shah Najaf Road, near St. Francis's School. Common. In flower and fruit, 13-8-1959. Leaves glabrous, lanceolate, serrate; flowers pale yellow. *Patil* 278.

*Local use*: Roots used in indigenous medicine.

*Hindi name*: *Bariara*.

***S. cordifolia* L.**

On waste ground near State Bank. Common. With flowers and young fruit, 13-9-1956. Leaves simple, softly tomentose, ovate or ovate-oblong, crenate; flowers straw-coloured. *Patil* 287, 1266.

***S. rhombifolia* L.**

Roadside and on waste ground near State Bank. Common. In flower, 1-9-1956. Leaves rhomboid, always cuneate at base, more or less pubescent beneath; flowers yellow. *Patil* 283.

***Thespesia populnea* Corr.**

Roadside, near Government House. In flower, 6-11-1956. A tree with simple, cordate, acuminate leaves on long stalks; flowers yellow, fading to pink or purplish. *Munnalal* 294.

***Urena lobata* L.**

Waste ground, near Carlton Hotel. Common. In flower and fruit, 7-10-1957. Leaves simple, broad, angled or lobed; flowers pink. *Patil* 473, 1268.

## BOMBACACEAE

Trees. Leaves digitately compound. Flowers large, drooping. Sepals 5; connate below; petals 5; stamens monadelphous, the tube short, dividing above into numerous 1-anthiferous filaments. Ovary free, 5-10-celled, fruit oblong, woody, indehiscent  
*Adansonia*

***Adansonia digitata* L.**

In Zoological Gardens. In flower, 26-8-1957. Tree with swollen trunk, the flowers white. *Patil* 444.

## STERCULIACEAE

Leaves alternate, simple. Calyx 5-parted. Stamens 5-15, the anthers 2-celled. Ovary free.

**A Trees**

**B** Flowers polygamous; petals 0; anthers in a ring on column in male flowers; fruit of large woody follicles ... *Pterygota*

**BB** Flowers bisexual; petals 5; stamens 15 in groups of 3 alternating with staminodes on top of column; fruit a 5-valved capsule ... *Pterospermum*

**AA** Undershrubs or herbs; flowers bisexual; fruit a loculicidal capsule ... *Melochia*

***Melochia corchorifolia* L.**

Mostly at the periphery of the fields towards the water, Chinhath Lake. Not uncommon. In flower and fruit, 26-9-1958. Leaves serrate. Flowers small, pink, subsessile, densely crowded in terminal clusters. Sepals 5, connate below; petals 5; stamens 5,

opposite to the petals and connate below into a tube; ovary sessile, 5-celled. *Patil* 1257.

***Pterospermum acerifolium* Willd.**

In Zoological Gardens, 26-8-1957. Leaves almost round, dark-green above, with grey down beneath, the margins irregularly toothed; the flowers very large. *Patil* 440.

*Local use*: The flowers are used in indigenous medicine.

*Hindi name*: *Kanakchampa*.

***Pterygota alata* R. Br.**

In National Botanic Gardens, 23-9-1957. Leaves usually cordate, clustered at the ends of branches, on long stalks; seeds winged. *Patil* 470.

## TILIACEAE

Leaves simple, alternate, stipulate. Anthers opening by slits. Ovary free, sessile on torus, syncarpous.

**A** Stamens arising from the apex of a prominent torus. Sepals 5, petals 5 (rarely 0) from base of torus

**B** Fruit without prickles; trees or shrubs *Grewia*

**BB** Fruit with prickles; herbs or undershrubs *Triumfetta*

**AA** Stamens arising from the apex of the very short torus. Sepals 4-5, petals 4-5 from the base of the torus. Fruit capsular. Herbs or undershrubs ... *Corchorus*

***Corchorus capsularis* L.**

At the water fringe, Chinhath Lake. Common. In flower and fruit, 26-9-1956. Leaves serrate, lamina of the leaf with two tail-like appendages at the base; flowers yellow; capsule globose, muricate. *Patil* 290.  
*Local use*: The plant does not appear to be grown for fibre locally.

*Hindi name*: *Patsan*.

***C. aestuans* L. non Forsk. (*C. acutangulus* Lam.)**

As weed in cultivated field, near Amausi airfield. Not common. In flower and fruit, 20-9-1956. Leaves crenate, the lamina often with two tail-like appendages at the base; flowers yellow; capsule elongate, 3-winged, with trifid beak. *Patil* 289.

***C. olitorius* L. L.**

As weed in flooded field, near Amausi airfield. With flowers and young fruit, 12-9-1956. Not uncommon. Leaves serrate, lamina with two tail-like appendages at the base; flowers yellow; capsule elongate, cylindric, 10-ribbed, with entire beak. *Patil* 285.

***Grewia asiatica* L.**

In an orchard at Mithauli on Sitapur Road. In flower, 18-7-1957. A large shrub or small tree; leaves white-tomentose beneath; flowers rather large, the petals yellow, shorter than the sepals; ripe fruit red. *Patil* 417, 433.

*Local use*: Sherbet made from ripe fruit.

*Hindi name*: *Phalsa*.

**Triumfetta bartramia** L. (*T. rhomboidea* Jacq.)

On waste ground, near State Bank. With flowers and young fruit, 14-9-1956. A herb; the lower leaves 3-5-lobed; flowers yellow. Common in the locality cited. *Patil* 288.

## ZYGOPHYLLACEAE

Leaves stipulate, opposite, paripinnately compound; flowers pseudoaxillary, solitary, pedunculate; sepals 5, petals 5, stamens 10, ovary superior, hairy, fruit a schizocarp. Prostrate, hairy herbs

*Tribulus***Tribulus terrestris** L.

Roadside, near National Botanic Gardens and Carlton Hotel. In flower, 23-7-1958. Flowers yellow; fruit of 5 woody cocci, each provided with two long divaricate spines. *Patil* 1222, 1212.

*Local use*: Fruit prescribed in indigenous local medicine.

*Hindi name*: Gokharoo.

## OXALIDACEAE

Herbs. Leaves digitate. Flowers regular. Sepals 5; petals 5, hypogynous, contorted; stamens 10; ovary 5-celled, styles 5, distinct. Fruit a loculicidal capsule ... .. *Oxalis*

**Oxalis corniculata** L.

On waste ground adjoining well, Residency. Fairly common. In flower, 26-7-1958. A diffuse, creeping herb with long-stalked, trifoliate leaves with obcordate leaflets; flowers yellow, umbellate on slender peduncles. *Patil* 1232.

*Local use*: The leaves are used as a pot-herb.

## RUTACEAE

Leaves gland-dotted. Flowers usually bisexual. Calyx and petals present. Stamens inserted around a more or less prominent disk. Ovary superior, 1-many celled. Seeds exalbuminous.

- |    |  |                    |
|----|--|--------------------|
| A  | Fruit a 3-celled capsule; ovules 8 in each cell      | <i>Chloroxylon</i> |
| AA | Fruit indehiscent, baccate                           |                    |
| B  | Ovules 1 or 2 in each cell; unarmed shrub or tree    | ...                |
| BB | Ovules more than 2 in each cell; armed tree or shrub | <i>Murraya</i>     |
| C  | Rind of fruit woody                                  |                    |
| D  | Leaves imparipinnate                                 | ... <i>Feronia</i> |
| DD | Leaves 3-foliate                                     | ... <i>Aegle</i>   |
| CC | Rind of fruit leathery; leaves 1-foliate             | ... <i>Citrus</i>  |

**Aegle marmelos** Correa.

In an orchard at Mithauli, near Lucknow, via Sitapur Road. With young fruit, 2-8-1957. A deciduous tree with straight sharp axillary thorns and trifoliate aromatic leaves; flowers greenish-white, fragrant; fruit globose, grey or yellowish with smooth rind. *Patil* 428.

*Local use*: Ripe fruit is eaten and is used in making sherbet.

*Hindi name*: Bel.

**Chloroxylon swietenia** DC.

In National Botanic Gardens, 23-7-1958. A moderate-sized tree, the leaves pinnate, the leaflets numerous and the flowers small, in panicles.

*Hindi name*: Bhirra.

**Citrus aurantifolia** Swingle (*C. medica* L. var. *acida* Brandis)

In orchards near Lucknow, 23-7-1958. A much branched thorny shrub or small bushy tree; leaves small, with narrowly winged petioles; fruit with thin smooth rind, green or tinged with yellow.

*Local use*: Extensively cultivated for the sour fruit which is used in the making of sherbet and for flavouring food.

*Hindi name*: Nimbu.

**Feronia limonia** (L.) Swingle (*F. elephantum* Correa)

In L.I.T. Forest, via Hardoi Road, at the edge of a clearing. In fruit, 17-7-1957. A spinous deciduous tree; leaves alternate, imparipinnate, leaflets 5-7, the rhachis narrowly winged; fruit globose, grey, rough. *Patil* 414.

*Local use*: Ripe fruit is eaten, especially in chutneys, and sherbet is also made from it.

*Hindi name*: Kaith.

**Murraya paniculata** (L.) Jack. (*M. exotica* L.)

As undergrowth in L. I. T. Forest. Not uncommon. In fruit, 29-1-1957. A large shrub with red or yellow berries; leaflets of the compound leaf 3-7. *Patil* 366.

*Local use*: Often used in ornamental hedges.

*Hindi name*: Madhukamini.

**M. koenigii** Spreng.

In a private garden, New Haidarabad, 23-7-1958. A small tree with black berries; the leaflets of the compound leaf 10-20.

*Local use*: Used for flavouring curries and chutneys, the aromatic leaves being much relished for this purpose by Lucknow's South Indian residents.

*Hindi name*: Mithinim.

## SIMAROUBACEAE

Trees. Leaves alternate, imparipinnate. Flowers small, polygamous. Calyx 5-lobed; petals 5-6; disk present; stamens free, inserted at the base of the disk. Ovary deeply lobed, 2-5-celled, the styles connate above. Ovule 1 in each cell. Fruit of 1-5 samaras ... .. *Ailanthus*

**Ailanthus excelsa** Roxb.

Roadside, New Haidarabad. In flower, 12-3-1957; in fruit, 12-4-1956. Leaves large, the leaflets coarsely toothed; flowers in yellowish panicles; petals usually reflexed. *Patil* 234, 367.

*Hindi name*: Maharukh.

## MELIACEAE

Trees or shrubs. Leaves alternate. Flowers in panicles. Calyx 5-lobed; petals 5, free; ovary superior, syncarpous, style 1, stigma 1.

- A Stamens 10, filaments united into a tube  
 B Leaves bipinnate or tripinnate; ovules 2 in each cell, superposed; fruit a drupe; seeds not winged ... *Melia*  
 BB Leaves imparipinnate; ovules 2 in each cell, collateral; fruit a drupe; seeds not winged ... *Azadirachta*  
 BBB Leaves paripinnate; ovules many in each cell; fruit a woody 5-valved capsule; seeds winged ... *Soyimida*  
 AA Stamens 4-6, free; leaves imparipinnate; ovules many in each cell; fruit a coriaceous 5-valved capsule; seeds winged ... *Toona*

***Azadirachta indica* Juss. (*Melia azadirachta* L.)**

Roadside in Cantonment, New Haidarabad, etc. In flower, 18-4-1956. A tree; leaves simply pinnate, the leaflets toothed; flowers white. *Munnalal* 238.

*Local use*: Almost every part of the plant is used in indigenous medicine.

*Hindi name*: *Neem*.

***Melia azedarach* L.**

In National Botanic Gardens and private gardens, 23-7-1958. A tree; leaves tripinnate; flowers lilac with deep purple staminal tube.

***Soyimida febrifuga* Juss.**

In Zoological Gardens and also roadside in Cantonment. In flower, 27-4-1956; in fruit, 9-7-1956. A tree with large, pendent, woody capsules. *Munnalal* 244, 241; *Patil* 265.

*Local use*: The bark is used in indigenous medicine.

*Hindi name*: *Rohan*.

***Toona ciliata* Roem. (*Cedrela toona* Roxb.).**

Roadside near Chief Court and Land Records Office. In flower, 19-3-1956. A tree; leaves with finely acuminate leaflets. *Patil* 218.

*Local use*: The bark is used in indigenous medicine.

*Hindi name*: *Toon*.

## RHAMNACEAE

Leaves simple, alternate, sub-distichous, 3-5-ribbed; spines stipular, 2 or 1. Flowers small, greenish or yellowish. Calyx-tube broadly obconic, with 5 triangular lobes; petals 5 (rarely 6), inserted on the throat of the calyx-tube; stamens 5, opposite the petals; ovary immersed in the disk. Fruit a drupe  
*Zizyphus*

***Zizyphus mauritiana* Lam. (*Z. jujuba* Lam.)**

In L.I.T. Forest near Lucknow, via HarDOI Road. In fruit, 29-1-1957. An armed tree; leaves dark

green above, whitish or rusty-tomentose below; drupe relatively large, yellow or red. *Patil* 362.

*Local use*: The fruit is eaten.

*Hindi name*: *Ber*.

***Z. oenoplia* Mill.**

In L.I.T. Forest, near Lucknow. Fairly common. In fruit, 29-1-1957. An armed climbing or straggling shrub. Drupe small, black. *Patil* 363.

*Local use*: The fruit is eaten.

*Hindi name*: *Makor*.

## SAPINDACEAE

Trees or shrubs. Leaves alternate, paripinnate. Flowers polygamous, in racemes or panicles. Calyx present; disk annular, extra-staminal; stamens free, 5-10; ovary superior, ovule 1 in each cell.

- A Fruit a large 3-valved capsule ... *Blighia*  
 AA Fruit indehiscent  
 B Petals 0 ... *Schleichera*  
 BB Petals 4-5 ... *Sapindus*

***Blighia sapida* Koenig.**

In National Botanic Gardens. In fruit, 28-9-1958. The *Akee* tree. Leaflets 3-5 pairs; flowers small, greenish-white; ripe seeds with white fleshy aril.

***Sapindus emarginatus* Vahl**

Roadside, La Martiniere Road, near the gate of the Zoological Gardens. In flower, 17-1-1957. A tree. Leaflets 2-3 pairs, emarginate at the apex; fruit of 3 drupes combined halfway up, glabrous. *Patil* 355.

*Local use*: Fruits are used as a substitute for soap.

*Hindi name*: *Ritha*.

***Schleichera oleosa* (Lour.) Oken. (*S. trijuga* Willd.)**

In Zoological Gardens. In fruit, 4-7-1957. A large deciduous tree. Leaflets usually 3 pairs; fruit ovoid, up to 2.5 cms., tipped with the style. The leaves are bright red when young. *Patil* 405.

*Local use*: The aril of the seed is eaten.

*Hindi name*: *Kusum*.

## ANACARDIACEAE

Trees with resinous juice. Leaves alternate, petioled, coriaceous, simple, entire. Flowers polygamous, small, in terminal panicles. Calyx 4-5-partite, deciduous; petals 4-5, free or adnate to the disk; fertile stamen usually 1; ovary 1-celled with lateral style; ovule 1; fruit a large fleshy drupe ... *Mangifera*  
***Mangifera indica* L.**

In orchards near Lucknow. The mango tree.

*Local use*: The edible fruit is of economic importance. Several varieties are grown, the most important being *dashehri*.

*Hindi name*: *Aam*.

## MORINGACEAE

Trees. Leaves alternate. Flowers hermaphrodite, irregular, in axillary panicles. Calyx cup-shaped, 5-cleft, the segments unequal; petals 5, unequal; disk lining the calyx tube. Stamens inserted on the margin of the disk, 5 perfect with 5-7 sterile. Ovary stipitate, 1-celled; placentas 3, parietal. Fruit an elongate 3-valved capsule ... .. *Moringa*

*Moringa oleifera* Lam. (*M. pterygosperma* Gaertn.)

Roadside near Central Drug Research Institute. In flower, 29-1-1957. Leaves mostly tripinnate, flowers white, seeds winged. *Patil* 364.

*Local use:* The unripe capsules are cooked and eaten.

*Hindi name:* *Sahajan*.

PAPILIONACEAE  
(FABACEAE)

Leaves alternate. Flowers hermaphrodite, zygomorphic. Calyx gamosepalous. Corolla papilionaceous: petals 5, the posterior (standard) outside in bud, the two lateral (wings) intermediate, the two anterior inside and usually cohering by their lower margins (keel). Stamens 10, rarely fewer. Ovary free, monocarpellary.

- A Trees or large shrubs  
 B Leaves pinnately trifoliate; flowers large  
 C Standard much exceeding the keel *Erythrina*  
 CC Standard equal to or shorter than the keel ... .. *Butea*  
 BB Leaves imparipinnate, leaflets usually 5 or more  
 C Pod indehiscent; flowers small  
 D Leaflets alternate ... *Dalbergia*  
 DD Leaflets opposite ... *Pongamia*  
 CC Pod dehiscent, with two valves; leaflets opposite ... *Millettia*  
 BBB Leaves paripinnate; leaflets numerous, linear-oblong ... .. *Sesbania*  
 AA Herbs or small shrubs  
 B Anthers dimorphous  
 C Pod flattened; flowers solitary in leaf axils ... .. *Heylandia*  
 CC Pod turgid; flowers in racemes *Crotalaria*  
 BB Anthers uniform  
 C Stamens diadelphous in two bundles of 5 each ... .. *Aeschynomene*  
 CC Stamens 9 united and 1 either free or partly united to the other 9  
 D Flowers large; the standard far exceeding the wings ... *Clitoria*  
 DD Flowers small  
 E Standard subsessile or slightly clawed  
 F Flowers yellow or white ... *Melilotus*  
 FF Flowers reddish or purple ... *Indigofera*  
 EE Standard clawed  
 F Fruit not jointed, dehiscing by both sutures ... *Tephrosia*  
 FF Fruit of 1-seeded joints  
 G Seeds suborbicular ... *Alysicarpus*  
 GG Seeds compressed *Desmodium*

*Aeschynomene aspera* L.

Floating in shallow water, Chintah Lake. With flowers and immature fruit, 19-3-1958. Not common. An aquatic floating herb. Stem swollen; leaves pinnate, the leaflets numerous and small; flowers large, yellow; pod jointed, the joints about 12 mm. long. *Patil* 498.

*Hindi name:* *Sola*.

*A. indica* L.

In flooded cultivated field near Amāusi airfield. In flower and fruit, 12-9-1956. A herb of wet open lands. Stems mostly slender; leaves pinnate, the leaflets numerous and small; flowers small, yellow; pod jointed, the joints about 4 mm. long. *Patil* 286.

*Alysicarpus monilifer* DC.

As weed on stony embankment in Zoological Gardens. Not common. In flower and fruit, 25-9-1958. A small prostrate much branched herb. Leaves 1-foliolate; flowers pink; pods with globose joints. *Patil* 1253.

*A. vaginalis* DC.

On waste ground near Carlton Hotel. Not common. With flowers and young fruit, 24-9-1958. A suberect much branched herb. Leaves 1-foliolate, more variable and longer than in *A. monilifer*; pods cylindrical, the constrictions scarcely evident. *Patil* 1247.

*Butea monosperma* (Lam.) Taub. (*B. frondosa* Roxb.)

Roadside, Rae Bareilly Road, near Mohanlal Ganj. Usually found as coppice. In flower, 20-3-1958. An erect tree. Branches crooked; flowers orange-scarlet. *Patil* 1201.

*Local use:* Leaves are used for making platters and cups and also for fodder. Branches are used for firewood.

*Hindi name:* *Palas*.

*Clitoria ternatea* L.

Sometimes as an escape. A slender climber. Leaves imparipinnate, the leaflets 5-9; flowers solitary, bright blue with lighter markings.

*Crotalaria medicaginea* Lam.

On waste ground near Carlton Hotel and in National Botanic Gardens. Gregarious. In flower and fruit, 23-9-1957. A diffuse or erect herb. Leaves 3-foliolate; flowers in racemes, small, yellow; pods 2-seeded. *Patil* 471.

*Local use:* The plant is used in indigenous medicine.

*Hindi name:* *Gulabi*.

*Dalbergia sissoo* Roxb.

On the grounds of the Central Drug Research Institute. A common roadside tree. In fruit, 9-4-1956. The leaflets 3-5; flowers small, yellowish. *Arora* 231.



**Local use:** Wood extensively used for making furniture at Lucknow.

**Hindi names:** *Shisham*; *Sissoo*.

***Dalbergia lanceolaria* L.f.**

In Zoological Gardens. In fruit, 14-7-1956. A tree. Leaflets 9-12; flowers pink or purplish. *Patil* 271.

***Desmodium gangeticum* DC.**

Roadside, near Paper Mill. In flower and fruit, 28-9-1958. Not common. An erect undershrub. Leaves 1-foliolate; flowers lilac or white, in racemes; pod 6-8-jointed, indented along the sutures. *Patil* 1265.

***Erythrina suberosa* Roxb.**

Roadside, Rai Behari Lal Road, near Parade Ground. In flower, 20-3-1956. A prickly tree. Flowers in dense racemes, scarlet; calyx 2-lipped. *Patil* 220.

**Hindi name:** *Pangra*.

***Heylandia latebrosa* DC.**

On high ground adjoining cultivated fields at Chinhat Lake. Not common. In flower, 26-9-1958. A prostrate herb. Leaves small, simple; flowers yellow. *Patil* 1260.

***Indigofera enneaphylla* L.**

On bare patches in neglected lawn at Zoological Gardens. Fairly common. In flower and fruit, 22-7-1958. An undershrub, prostrate, with thick rootstock. Leaves 7-11-foliolate; the leaflets small; flowers bright red; pods 2-seeded. *Patil* 1211.

***Melilotus alba* Desr.**

Near Haidarabad, as weed in cultivated field on left bank of the Gomti. Not common. In flower, 18-3-1958. An erect herb. Leaves pinnately trifoliolate; flowers white, in slender axillary racemes. *Patil* 492.

***M. indica* All.**

As lawn weed at the Central Drug Research Institute. In flower, 14-3-1957. An erect herb. Leaves pinnately trifoliolate; flowers minute, yellow, in slender axillary racemes. *Patil* 369.

***Millettia ovalifolia* Kurz.**

Roadside, Station Road. A tree. Flowers small, mauve or purple, in racemes; pods 2-3-seeded. *E.K.J.* 7505.

***Pongamia pinnata* (L.) Pierre. (*P. glabra* Vent.)**

Roadside, Cantonment and near Central Drug Research Institute. In flower and fruit, 17-4-1956. A tree. Flowers small, lilac or pale pink, in racemes. *Munnalal* 237, 239.

**Local use:** The oil from the seeds is used in indigenous medicine.

**Hindi name:** *Karanj*.

***Sesbania grandiflora* Pers.**

On the grounds of the General Post Office. In flower, 28-9-1958. A small tree. Flowers large, white; pods long, slender, 4-angled. *Patil* 1264.

***S. sesban* (L.) Merr. (*S. aegyptiaca* Pers.)**

In a field on the left bank of the Gomti, near Haidarabad. In flower and fruit, 21-3-1956. A large unarmed shrub or small tree. Flowers rather small, yellow marked with purple; pods slender. *Patil* 223.

**Local use:** The plant is sometimes used in clipped hedges. The flowers are gathered for religious offerings.

**Hindi names:** *Jait*; *Jainti*.

***Tephrosia purpurea* Pers.**

Roadside and on waste ground near Haidarabad. In flower and fruit, 12-7-1956. Gregarious. An erect undershrub. Leaves imparipinnate, leaflets about 7 pairs + 1; flowers purple. *Patil* 270.

#### CAESALPINIACEAE

Leaves alternate. Flowers hermaphrodite, more or less zygomorphic. Calyx present. Petals not more than 5, the posterior innermost, the others imbricate. Stamens 10 or fewer. Ovary free, monocarpellary.

- A Leaves of two leaflets usually joined together to form a single leaf cleft at the apex ... *Bauhinia*
- AA Leaves compound
  - B Leaves paripinnate
    - C Petals 0; calyx 4-lobed, petaloid ... *Sargca*
    - CC Petals present
      - D Petals 5; calyx 5-lobed ... *Cassia*
      - DD Petals 3; calyx 4-lobed ... *Tamarindus*
  - BB Leaves bipinnate; petals 5
    - C Leaf rhachis long, pinnae several
      - D Pod broadly winged, indehiscent ... *Pithecellobium*
      - DD Pod not winged, woody, dehiscent ... *Delonix*
    - CC Leaf rhachis very short, pinnae 2-6 ... *Parkinsonia*

***Bauhinia variegata* L.**

Off Sitapur Road, near Lucknow. In flower, 27-2-1956. A tree, deciduous when in bloom. Flowers white or pink, the uppermost petal darker and variegated; fertile stamens 3-5. *Patil* 213.

**Local use:** The leaves and flower buds are eaten as a vegetable.

**Hindi name:** *Kachnar*.

***Cassia fistula* L.**

Roadside, left bank of the Gomti, near Haidarabad. In flower, 23-7-1958. A tree. Flowers bright yellow, in drooping racemes; pods long, cylindrical. *Patil* 1223.

**Local use:** Fruit and root bark are used in indigenous medicine.

**Hindi name:** *Amaltas*.

**Cassia javanica** L.

In Zoological Gardens. In flower, 27-8-1957. A tree. Leaflets 8-14 pairs, the tips of leaflets rounded; flowers rosepink fading to white; pods cylindrical. *Patil* 448, 449.

**C. nodosa** Buch.-Ham. ex Roxb.

In National Botanic Gardens. A tree. Leaflets 6-13 pairs, the tips of leaflets pointed; flowers rosepink fading to white; pods cylindrical.

**C. occidentalis** L. Fig. 3.

Roadside, near Haidarabad. More or less gregarious. In flower and fruit, 11-7-1956. An erect undershrub. Gland 1, just above the base of the petiole; leaflets 3-5 pairs; flowers yellow; pods flat. *Patil* 268.

**C. siamea** Lam.

On the grounds of the Central Drug Research Institute. In flower, 5-12-1955. A tree. Flowers yellow; pods flat. *Arora* 202.

**C. tora** L.

On waste ground near State Bank. Gregarious. In flower and fruit, 4-9-1956. An erect herb. Leaflets 3 pairs; flowers in pairs, yellow; pods very slender, subterete, falcate. *Patil* 284.

*Local use*: The young leaves and the pods are eaten.

*Hindi name*: *Panwar*.

**Delonix regia** (Bojer) Raf. (*Poinciana regia* Bojer)

On the grounds of the Central Drug Research Institute. A rather common roadside tree. In flower, 9-4-1956. An unarmed tree with showy crimson flowers. *Arora* 232.

**Parkinsonia aculeata** L.

On the left bank of the Gomti, near Haidarabad, between the road and the cultivated fields. In flower, 5-12-1955. A small armed tree or bush. Leaflets minute, numerous, on the flattened rhachis of the pinnae; flowers yellow, showy. *Arora* 203.

**Peltophorum pterocarpum** (DC.) K. Heyne. (*P. ferrugineum* Benth.)

In National Botanic Gardens. In flower, 29-9-1957. A large unarmed tree. Flowers bright yellow; pods 1-4-seeded. *Patil* 462.

**Saraca indica** L.

In National Botanic Gardens, 29-9-1957. A small evergreen tree with orange-scarlet clusters of flowers.

*Hindi name*: *Ashok*.

**Tamarindus indica** L.

A very common roadside tree. In flower, 13-6-1956. Flowers with pink and yellow variegations; ripe pods brown, irregularly swollen. The Tamarind tree. *Arora* 260.

*Local use*: The acid pulp of the fruit is used in curries and chutneys.

*Hindi name*: *Imli*.

## MIMOSACEAE

Leaves alternate, bipinnate. Flowers regular, small. Calyx usually 5-lobed. Petals as many as the sepals, valvate, connate or free. Stamens definite or indefinite. Ovary free, monocarpellary.

## A Stamens 10, free

B Trees; flowers in spiciform racemes; pod linear, torulose, curved ... *Adenanthera*

BB Herbs or undershrubs; flowers in globose or oblong peduncled heads; pods flat ... *Neptunia*

## AA Stamens indefinite; trees or shrubs

B Stamens free or almost free ... *Acacia*

BB Stamens monadelphous

C Pod large, straight, flat ... *Albizzia*

CC Pod curved or twisted ... *Pithecolobium*

**Acacia arabica** Willd.

At the edge of a clearing in L.I.T. Forest. In flower, 17-7-1957. A tree or shrub with straight white stipular spines. Flowers yellow, in globose heads; pods moniliform. *Patil* 415.

*Local use*: The wood is used for fuel and the bark as a tanning agent locally. The gum is used in indigenous medicine.

*Hindi name*: *Babul*.

**A. moniliformis** Griseb.

Roadside near Allahabad Bank. In flower, 5-12-1955. An evergreen tree. Leaves represented by phyllodes; the yellow flowers in dense rigid spikes. *Patil* 204.

**Adenanthera pavonina** L.

In National Botanic Gardens. An unarmed tree. Flowers yellow or white in spikelike racemes; seeds red, shining, lens-shaped.

**Albizzia lebeck** Benth.

On the grounds of the Central Drug Research Institute. A rather common roadside tree. In flower, 3-4-1956. An unarmed tree. The pinnae 4-8, the leaflets 10-18 per pinna; flowers whitish, in globose heads; pods straw-coloured, 20-30 cms. long. *Patil* 227.

*Hindi name*: *Kala-Siris*.

**A. richardiana** King et Prain.

In National Botanic Gardens. A lofty unarmed tree. Pinnae 10-14, the leaflets 50-100 per pinna; flowers whitish, in globose heads; pods brownish-grey, almost 10 cms. long.

**Neptunia oleracea** Lour.

Free-floating in Chinbat Lake. Not uncommon. In flower and fruit, 26-9-1956. An aquatic herb with spongy floats on the stem. Flowers hermaphrodite, male and neuter, in yellow heads. *Patil* 291.

**Pithecolobium dulce** Benth.

In a roadside hedge at Haidarabad. In flower, 19-3-1956. Sometimes as a roadside tree. Stipules

spiny; leaf with two pinnae only, each pinna of two leaflets; flower heads white. *Patil* 219.

*Local use:* A common hedge plant at Lucknow. The aril of the seed is eaten.

*Hindi name:* *Vilayati-Imli*.

#### COMBRETACEAE

Trees or shrubs. Leaves simple, alternate or subopposite. Calyx-tube produced more or less beyond the ovary, 5-lobed; petals 0; stamens 10, in two series; ovary inferior, 1-celled; style and stigma 1.

- |    |                              |     |     |                   |
|----|------------------------------|-----|-----|-------------------|
| A  | Flowers in spikes or racemes | ... | ... | <i>Terminalia</i> |
| AA | Flowers in capitate heads    | ... | ... | <i>Anogeissus</i> |

***Anogeissus pendula*** Edgew.

In Zoological Gardens. In flower and fruit, 26-8-1957. A small tree with drooping branches; fruits packed in one dense head, each fruit small with two wings and a short beak at the apex. *Patil* 441.

***Terminalia muelleri*** Benth.

Roadside, near State Bank and site of the stadium. In flower and fruit, 23-4-1956. A small tree from Australia. Leaves broadly obovate, obtuse, usually 8-10 cms. long, narrowed into a short petiole; drupe ovoid, bluish, about 2 cms. long, without angles. *Munnalal* 240.

#### MYRTACEAE

Trees or shrubs. Leaves simple, gland-dotted. Flowers bisexual, regular. Calyx-tube adnate to ovary and sometimes produced beyond it; corolla inserted on the mouth of the calyx-tube; stamens many; ovary inferior, 2-6-celled; style and stigma 1.

- |    |   |     |     |                    |
|----|---|-----|-----|--------------------|
| A  | Leaves alternate; fruit a capsule                                 |     |     |                    |
| B  | Petals 5, free  | ... | ... | <i>Callistemon</i> |
| BB | Petals united into a calyptra                                     |     |     | <i>Eucalyptus</i>  |
| AA | Leaves opposite; fruit a berry                                    |     |     |                    |
| B  | Calyx-limbs united in bud, later splitting; fruit with many seeds | ... | ... | <i>Psidium</i>     |
| BB | Calyx-limbs free in bud; fruit with 1-few seeds                   | ... | ... | <i>Syzygium</i>    |

***Callistemon viminalis*** Cheel.

In Zoological Gardens. In flower, 26-8-1957. Slender tree of pendulous habit. Leaves linear-oblong; flowers in dense spikes, bright red on account of staminal filaments, the axis of the spike later prolonged as a leafy shoot. *Patil* 443.

***Eucalyptus*** sp.

In National Botanic Gardens and in private gardens.

***Psidium guajava*** L.

In an orchard near Lucknow, along Fyzabad Road. In flower and fruit, 17-8-1957. A small tree or shrub; young branches 4-angled; flowers white; fruit globose, ovoid or pyriform, attaining to a width of about 10 cms. in some varieties. *Patil* 431.

*Local use:* Fruit edible. Lucknow is well-known for the cultivation of superior varieties of this fruit.

*Hindi name:* *Amroot*.

***Syzygium cuminii*** Skeels.

On the grounds of the Central Drug Research Institute. In flower, 3-4-1956. A common roadside tree. Flowers white, in branched cymes; berry oval, about 0.75 cms., purplish-red. *Patil* 228.

*Local use:* The ripe fruit is eaten.

*Hindi name:* *Jamun*.

#### LYTHRACEAE

Leaves opposite or subopposite, rarely alternate. Flowers usually regular. Calyx-tube persistent, lobes valvate; petals as many as the calyx-lobes, alternate with them, inserted on the mouth of the calyx-tube or sometimes 0; stamens inserted on the calyx-tube; ovary free, in the bottom of the calyx-tube, the ovules on axile placentas.

- |    |   |     |     |                      |
|----|---|-----|-----|----------------------|
| A  | Low herbs with very small flowers; calyx membranous | ... | ... | <i>Ammannia</i>      |
| AA | Trees or shrubs; calyx moderately thick             |     |     |                      |
| B  | Capsule 3-6-valved; petals 6; stamens many          | ... | ... | <i>Lagerstroemia</i> |
| BB | Capsule irregularly dehiscent; petals 4; stamens 8  | ... | ... | <i>Lawsonia</i>      |

***Ammannia auriculata*** Willd.

On wet ground near Mohanlal Ganj, by the side of a pond. In flower and fruit, 28-11-1958. Common. Erect herb; the flowers in axillary peduncled cymes; the capsules red. *Patil* 1281.

***A. baccifera*** L.

In fallow lakeside field, Chinhat. In flower and fruit, 29-11-1958. Very common. Erect herb; flowers in subsessile clusters at the leaf axils; capsules red, smaller than in *A. auriculata*. *Patil* 1287.

***Lagerstroemia speciosa*** (L.) Pers. (*L. flos-reginae* Retz.)

In the park in front of the General Post Office. In flower, 27-4-1956. A large tree; flowers 5-7.5 cms., lilac. *Munnalal* 242.

***L. thorellii*** Gagnep.

In Zoological Gardens. In flower, 26-8-1957. A tree of moderate size; flowers about 3 cms. wide, purple or lilac, fading to white. *Patil* 447.

***Lawsonia inermis*** L.

In a hedge near the Paper Mill bridge. In flower and fruit, 15-6-1956. A shrub or small tree; flowers greenish-white, 6 mm. wide, fragrant. *Patil* 261.

*Local use:* Women use the crushed leaves for coloring the palms, finger-nails and feet a dull orange.

*Hindi name:* *Mehndi*.

#### ONAGRACEAE

Herbs or undershrubs. Leaves alternate, simple. Flowers bisexual, pedicels with two bracteoles.

Calyx-lobes 4-6; petals 4-6, the stamens twice as many; ovary inferior, 4-5-celled, the ovules many, axile; fruit a capsule ... .. *Jussieua*

***Jussieua repens* L.**

Floating in water, Chinhat Lake. In flower, 18-10-1958. Common. Floating stems supported by spongy vesicles situated below leaf bases; flowers white. *Patil* 1279.

***J. suffruticosa* L.**

Lakeside, Chinhat. In flower and fruit, 8-11-1956. Not common. Suffruticose; flowers yellow. *Patil* 298.

**Local use:** Used in indigenous medicine.

**Hindi name:** *Vanloang*.

#### TRAPACEAE

Floating herbs. Submerged leaves opposite, pinnatisect, root-like; emerged leaves in a rosette, simple, with inflated petioles. Calyx-lobes 4; petals 4; stamens 4; ovary, 2-celled, semi-inferior, the ovules solitary; fruit indehiscent ... .. *Trapa*

***Trapa bispinosa* Roxb.**

In a pond near Bangla Bazaar, 7-6-1956. Gregarious. Flowers white, fruit 2-spined. *Munnalal* 256.

**Local use:** Extensively cultivated in ponds near Lucknow for the edible fruit.

**Hindi name:** *Singhada*.

#### CUCURBITACEAE

Herbs, climbing by tendrils. Leaves alternate. Flowers regular, unisexual. Calyx gamosepalous, 5-lobed. Corolla more or less deeply divided, lobes 5. Stamens 3. Ovary inferior, tricarpeal; fruit a berry.

**A** Filaments of stamens free

**B** Anther cells linear flexuose ... .. *Citrullus*

**BB** Anther cells straight or curved ... .. *Melothria*

**AA** Filaments of stamens connate in a column ... .. *Coccinia*

***Citrullus colocynthis* Schrad.**

Near Amausi aerodrome, 25-5-1957. Leaves pinnatisect; flowers yellow; fruit spherical, smooth, 8-10 cms. in diameter, mottled green when young. *E.K.J.* 7524.

**Local use:** The pulp of the fruit is used in indigenous medicine.

**Hindi name:** *Indrayan*.

***Coccinia cordifolia* (L.) Cogn. (*C. indica* Wight et Arn.)**

As weed in National Botanic Gardens. In flower, 9-9-1957. Rather common. Leaves 5-angled or 5-lobed; flowers large, white; fruit elliptical, 2.5 cms. long, bright scarlet when ripe. *Patil* 463.

**Local use:** The unripe fruit is cooked and eaten.

**Hindi name:** *Kanduri*.

***Melothria maderaspatana* Cogn.**

Roadside, trailing on other herbs, right bank of the Gomti, near National Botanic Gardens. In flower and fruit, 24-9-1958. Leaves usually 3-lobed, cordate, rough; flowers small, yellow; berry globose, 1 cm. in diameter, scarlet when ripe. *Patil* 1248.

#### FICOIDACEAE

Diffuse much branched herbs. Flowers bisexual. Ovary free. Seeds reniform.

**A** Leaves opposite or spuriously whorled; tepals 5, free; ovary with 3-5 styles; fruit a valved capsule ... .. *Glinus*

**AA** Leaves opposite, often in unequal pairs; tepals 5, united; ovary with 1-2 styles; fruit a circumscissile capsule ... .. *Trianthema*

***Glinus lotoides* L. (*Mollugo hirta* Thunb.)**

On damp ground at the water fringe, Chinhat Lake, along with *G. oppositifolius*. Common. In flower and fruit, 24-7-1958. Leaves opposite or spuriously ternate; flowers subsessile, in fascicles of 3-8. *Patil* 1226.

***G. oppositifolius* (L.) DC. (*Mollugo oppositifolia* L.)**

On damp ground at the water fringe, Chinhat Lake. Common. In flower and fruit, 24-7-1958. Leaves in spurious whorls of 3-5; flowers on thin pedicels in fascicles of 2-6. *Patil* 1225.

***Trianthema portulacastrum* L. (*T. monogynum* L.)**

On bare patches of neglected lawn, Zoological Gardens. Fairly common. In flower and fruit, 22-7-1958. Leaves opposite and unequal, the petioles dilated at the base and joined at the nodes by a common sheath; flowers solitary, sessile, white or pinkish; fruit truncate, red or greenish. *Patil* 1210.

#### RUBIACEAE

Leaves opposite or whorled, simple, entire, the stipules various, often interpetiolar. Flowers bisexual. Calyx-tube adnate to the ovary. Corolla regular, gamopetalous. Stamens as many as corolla lobes, epipetalous. Ovary inferior.

**A** Trees or shrubs

**B** Flowers in heads

**C** Flowers small, the calyx-tubes free of each other in the dense globose heads; corolla lobes 5; fruit a cluster of simple fruits

**D** Stigma clavate; calyx limb 5-lobed ... .. *Adina*

**DD** Stigma mitriform; calyx limb truncate ... .. *Mitragyna*

**CC** Flowers medium-sized, the calyx-tubes confluent in the globose or ovoid heads; corolla lobes 4-5; fruit a fleshy syncarpium ... .. *Morinda*

**BB** Flowers not in heads; fruit a berry

**C** One lobe of the calyx often enlarged and petaloid; corolla 5-lobed; ovary 2-celled ... .. *Mussaenda*

**CC** The calyx without an enlarged and petaloid lobe; corolla 5-9-lobed; ovary 1-celled ... .. *Gardenia*

**AA** Generally herbs or undershrubs; flowers small; ovary 2-celled, the ovules numerous ... .. *Oldenlandia*

**Adina cordifolia** Hook. f.

In Zoological Gardens. In flower, 2-7-1956. A large tree; heads about 2-2.5 cm. in diameter, yellow, axillary, pedunculate. *Patil* 262.

*Hindi name: Haldu.*

**Gardenia latifolia** Ait.

In Zoological Gardens. In flower, 26-8-1957. A small tree; flowers large, solitary, white, 7.5-10 cm. in diameter. *Patil* 445.

*Hindi name: Papra.*

**Mitragyna parvifolia** Korth.

In Zoological Gardens. In flower and fruit, 9-7-1956. A large tree; heads about 2.5 cm. in diameter, yellow. *Patil* 264.

*Hindi name: Kaim.*

**Morinda tinctoria** Roxb. var. **tomentosa** Hook.f.

On wasteland, Tiwari Ganj; common. Flowers white, 2-2.5 cm. in diameter. In flower, 27-5-1957. *Patil* 402.

*Hindi name: Aal.*

**Mussaenda luteola** Delile.

At Kaisarbagh, in a hedge, 28-10-1957. The enlarged calyx lobe of the flower yellowish.

**Oldenlandia corymbosa** L.

Border of 'Jowar' field on the outskirts of Lucknow via Rae Bareilly Road. Common. In flower and fruit, 18-10-1958. A small usually prostrate herb with pedicelled white flowers in pairs or threes on the solitary axillary peduncles. *Patil* 1276.

COMPOSITAE  
(ASTERACEAE)

Flowers small, sessile, in heads enclosed by an involucre of bracts but sometimes flower heads reduced to few, rarely a single flower. Calyx 0 or a pappus of scales or hairs. Corolla gamopetalous. Stamens 4-5, epipetalous, anthers usually connate. Ovary inferior, 1-celled, the ovule solitary, anatropous. Fruit indehiscent (cypsela).

- A Herbs with usually milky juice. Heads with all flowers ligulate, yellow
- B Stout fistular erect herbs; cypselas ovoid, obovoid or ellipsoid ... *Sonchus*
- BB Leaves all radical or stems slender; cypselas columnar, truncate both at base and apex ... *Launaea*
- AA Inner flowers of the head not ligulate. Juice not milky
- B Flower heads of two kinds: the hermaphrodite flowers tubular, sterile, in globose heads; female flowers in 2-flowered apetalous heads with bracts united in a closed, 2-cellular, 2-horned utricle ... *Xanthium*
- BB Flower heads of one kind
- C All flowers of the head similar and tubular
- D Leaves and involucre bracts not spiny
- E Heads simple
- F Heads purple or pink; leaves alternate; pappus hairy ... *Vernonia*

FF Heads blue or white; basal leaves opposite; pappus of 5 awned scales *Ageratum*

EE Heads compound, white, axillary; leaves alternate ... *Caesulia*

DD Leaves or involucre bracts spiny; heads simple, purple ... *Volutarella*

CC All flowers of the head tubular but the outer filiform, usually female, the inner stouter, usually hermaphrodite

D Shrubs; heads white, yellow or lilac; anthers tailed ... *Pluchea*

DD Herbs; heads yellow; anthers not tailed ... *Conyza*

CCC Inner flowers of the head tubular, the outer (ray) flowers ligulate

D Receptacle not paleaceous, the pappus of hairs, the ray flowers yellow or orange

E Pappus without scales *Vicoa*

EE Pappus with outer row of scales ... *Pulicaria*

DD Receptacle paleaceous

E Leaves alternate, much dissected; pappus a minute rim *Chrysanthellum*

EE Leaves opposite

F Heads with yellow rays; pappus of aristate feathery bristles *Tridax*

FF Heads with white rays; pappus obsolete or 2-toothed ... *Eclipta*

**Ageratum conyzoides** L.

-As weed in National Botanic Gardens. In flower, 7-10-1957. Almost gregarious. An erect herb with coarsely crenate leaves. *Patil* 474.

**Caesulia axillaris** Roxb.

On damp ground near pond at Mohanlal Ganj. In flower, 28-11-1958. Not common. A glabrous herb; the simple 1-flowered heads, each with two involucre bracts, aggregated to form a compound head with a common involucre; leaves narrow, tapering into a very short petiole with dilated base embracing the compound head. *Patil* 1285.

**Chrysanthellum indicum** DC.

On open elevated pasture, Chinhath Lake. In flower, 26-9-1958. Rather common. Glabrous herb with numerous spreading leafy stems and small yellow heads. *Patil* 1261.

**Conyza ambigua** DC.

A common lawn weed in National Botanic and Zoological Gardens. In flower, 22-7-1958. A grey-villous herb; stems several from the root, erect; leaves linear. *Patil* 274, 1215.

**Eclipta prostrata** L. (*E. alba* Hassk.)

On a bund bordering ricefields, near Bangla Bazaar. In flower and fruit, 21-7-1958. Not com-

mon. A diffuse or erect herb covered with hairs arising from a thickened base. *Patil* 1206.

*Local use*: The plant is used in indigenous medicine.

*Hindi name*: *Bhangra*.

***Launaea nudicaulis* Hook. f.**

On the slope of a hill near Bangla Bazaar. In flower and fruit, 21-7-1958. Common. A perennial scapigerous herb. *Patil* 1205.

***Pluchea lanceolata* Clarke**

A weed on open site in Zoological Gardens. In flower and fruit, 22-7-1958. Rare. A hoary-pubescent shrub with deeply penetrating roots. *Patil* 1218.

*Local use*: The leaves are used in indigenous medicine.

*Hindi name*: *Chhoti kalia*.

***Pulicaria crispa* Benth.**

As weed in riverside field, near Haidarabad. In flower and fruit, 18-3-1958. Not common. A suffructose white-cottony plant. *Patil* 488.

***Sonchus oleraceus* L.**

As weed in open site. National Botanic Gardens. In flower, 28-12-1958. Rare. An annual; leaves usually runcinate-pinnatifid, auriculate. *Patil* 1605.

***Tridax procumbens* L.**

As weed in a riverside field near Haidarabad. In flower and fruit, 18-3-1958. Not common. A procumbent herb; flower heads solitary, on long ascending peduncles. *Patil* 494.

***Vernonia cinerea* Less.**

As lawn weed in Zoological Gardens. In flower and fruit, 22-7-1958. Rather common. A slender herb, the flower heads peduncled. *Patil* 1213.

*Local use*: The plant is used in indigenous medicine.

*Hindi name*: *Dandotpala*.

***Vicoa indica* DC.**

In open pasture off Sultanpur Road, near level crossing. In flower, 28-12-1958. Rather common. An erect almost glabrous herb, the leaves sessile from a broad auriculate base. *Patil* 1604.

***V. vestita* Benth.**

Near Bangla Bazaar. In flower, 19-4-1957. An erect very villous herb, the leaves sessile and auriculate but broader than in *V. indica*. *E.K.J.* 7493.

***Volutarella ramosa* (Roxb.) Santapau (*V. divaricata* Benth.)**

As weed in riverside field, near Haidarabad. Not common. In flower and fruit, 18-3-1958. A rigid herb, the leaves pinnatifid, the many-seriate involucre bracts spinescent. *Patil* 489.

***Xanthium strumarium* L.**

Riverside, near Central Drug Research Institute. In fruit, 21-5-1956. Gregarious. An erect herb, the

leaves broad and long-petioled, the female involucre covered with hooked spines. *Patil* 253.

*Local use*: The plant is used in indigenous medicine.

*Hindi name*: *Shankhahuli*.

#### PLUMBAGINACEAE

Leaves simple, alternate. Flowers bisexual. Calyx tubular, covered with stalked glands, 5-fid. Corolla tube long, slender, with 5 spreading lobes. Stamens 5, free from corolla. Ovary superior, 1-celled; ovule 1. Style slender, with 5 branches. Fruit a circumscissile capsule. *Plumbago*.

***Plumbago zeylanica* L.**

In scrub jungle, near military camp beyond Sultanpur Road level-crossing. In flower, 28-12-1958. Not common. A subscandent shrub with white flowers and ovate leaves abruptly narrowing into an amplexicaul petiole. *Patil* 1602.

#### PRIMULACEAE

Herbs. Leaves entire. Flowers solitary, axillary, peduncled. Calyx 5-partite; corolla 5-partite; stamens 5, adnate to the corolla lobes. Ovary superior, globose, 1-celled; ovules many, on a free-central placenta. Style filiform. Fruit a circumscissile capsule ... .. *Anagallis*

***Anagallis arvensis* L. var. *caerulea* Gren. et Godr.**

As weed in cultivated fields, right bank of the Gomti and near Paper Mill. In flower, 18-3-1958 and 27-12-1958. Not common. Small herbs with 4-angled much branched stems, opposite leaves and blue flowers. *Patil* 486, 1296.

#### SAPOTACEAE

Trees or shrubs with milky juice. Leaves simple, alternate, entire, leathery. Flowers actinomorphic. Calyx lobes in two series; corolla gamopetalous; stamens epipetalous; ovary superior, many-locular; ovule solitary in each loculus; style simple; fruit a berry.

A	Calyx lobes 4 rarely 5; corolla lobes 6-12; stamens at least twice as many, staminodia nil	...	...	...	<i>Madhuca</i>
AA	Calyx lobes 6 or 8; corolla lobes 18-24; stamens 6-8 alternating with staminodia	...	...	...	<i>Mimusops</i>
AAA	Calyx lobes 6; corolla lobes 6; stamens 6 alternating with 6 petaloid staminodia	...	...	...	<i>Achras</i>

***Achras zapota* L.**

In National Botanic Gardens, 28-9-1958. An evergreen tree with spreading crown, the fruit a round or oval berry 5-9 cms. long with hard black seeds.

*Local use*: Not cultivated locally for fruit.

***Madhuca indica* Gmel. (*Bassia latifolia* Roxb.)**

Along Rae Bareilly Road, near Mohanlal Ganj. In flower, 20-3-1958. A deciduous tree, the leaves clustered near ends of the branches, the flowers in dense fascicles. *Patil* 1202, 1203.

**Local use:** The juice from the fermented flowers is valued as an intoxicant by the villagers. The juice is also distilled locally.

**Hindi name:** Mahua.

**Mimusops elengi** L.

On the grounds of the Central Drug Research Institute. In flower, 16-7-1957. An evergreen tree with a straight trunk; flowers small, dull white and scented. *Patil* 412.

**Local use:** The flowers are used by the Hindus in religious ceremonies and are used extensively for making garlands.

**Hindi name:** Bakul.

#### EBENACEAE

Trees or shrubs. Leaves alternate, entire. Flowers dioecious, rarely polygamous. Calyx lobes 4-5; corolla gamopetalous, lobes 4-5; stamens 4-many, inserted at the base of the corolla tube, but represented by staminodia in female flowers; ovary superior, 4-16-celled; fruit a juicy berry generally with enlarged calyx ... *Diospyros*.

**Diospyros peregrina** (Gaertn.) Gurke. (*D. embryopteris* Pers.)

In Zoological Gardens. In fruit, 26-8-1957. An evergreen tree with large yellow berries on an enlarged 4-lobed calyx. *Patil* 442.

#### APOCYNACEAE

Juice milky. Leaves entire. Flowers bisexual, regular. Calyx 5-lobed. Corolla gamopetalous, lobes 5. Stamens 5, epipetalous; anthers free or connivent around the stigma; pollen granular. Pistil superior (rarely partly inferior), the style 1, the ovaries 2 or 1.

- |     |  |     |                   |
|-----|--|-----|-------------------|
| A   | Leaves alternate                                       |     |                   |
| B   | Ovules 2 in each cell; fruit a fleshy drupe            | ... | <i>Thevetia</i>   |
| BB  | Ovules many in each cell; fruit of two follicles       | ... | <i>Plumeria</i>   |
| AA  | Leaves opposite  |     |                   |
| B   | Ovary 2-celled; spiny shrubs                           | ... | <i>Carissa</i>    |
| BB  | Ovaries 2, distinct; unarmed trees or shrubs           | ... | <i>Holarrhena</i> |
| AAA | Leaves whorled   |     |                   |
| B   | Fruit of two distinct or connate drupes, each 1-seeded | ... | <i>Rauwolfia</i>  |
| BB  | Fruit of two slender follicles, each many-seeded       | ... | <i>Alstonia</i>   |

**Alstonia macrophylla** Wall.

In National Botanic Gardens. In flower, 23-8-1957. A tree with large narrow leaves in whorls of three and small white flowers. *Patil* 437.

**A. scholaris** R. Br.

Roadside, Mall Road. In flower, 6-11-1956. A tree with rather small leaves in whorls of four to seven and small greenish-white flowers. *Munnalal* 295.

**Carissa carandas** L.

In a roadside hedge, Rai Behari Lal Road, near Police Lines. A large thorny evergreen shrub; leaves rather large, the tips obtuse, sometimes mucronate; berry 1.3-2.5 cm. long. *Patil* 245.

**C. spinarum** L.

As undergrowth in L.I.T. Forest. In fruit, 29-1-1957. A large thorny shrub with zigzag branches; leaves rather small, acute at both ends; berry 7.5 mm. long. *Patil* 365.

**Local use:** The fruit is eaten.

**Hindi name:** Karonda.

**Holarrhena antidysenterica** Wall.

On waste ground, Tiwari Ganj. In flower, 27-5-1957. Tall shrub or low tree with white scented flowers in loose flat clusters at the ends of twigs. *Patil* 401.

**Local use:** The bark is used in indigenous medicine.

**Hindi name:** Kurchi.

**Plumeria rubra** L.

In National Botanic Gardens, 28-9-1958. A small tree; branches thick and fleshy; leaves with conspicuous marginal vein and up to 40 cm. long; flowers large, red.

**Rauwolfia tetraphylla** L. (*R. canescens* L.)

On waste ground near State Bank. In flower and fruit, 25-5-1956. Not common. A shrub with leaves in whorls of three to four, very small white flowers and red berries. *Patil* 254.

**Local use:** The medicinal properties of this plant are generally not known to the local public.

**Thevetia peruviana** Schum.

Roadside in Cantonment, 28-9-1958. Sometimes in gardens. A small tree. Leaves linear, 8-15 cm. long; flowers yellow.

#### ASCLEPIADACEAE

Juice milky. Leaves opposite, simple. Flowers regular. Calyx 5-lobed. Corolla gamopetalous, 5-lobed, valvate. Stamens 5, inserted at the base of the corolla, the filaments monadelphous with 5 fleshy scales (corona). Pollinia attached in pairs to the "corpuscles" on the angles of the stigma. Ovaries 2, superior, the styles united at the apex into a broad 5-angular stigma ... *Calotropis*

**Calotropis procera** R. Br.

Roadside, near Haidarabad, 2-5-1956. A rather common shrubby weed covered with loose soft white wool. Corolla lobes erect, not spreading, purple-spotted. *Patil* 247.

**Local use:** The latex of the plant is used in indigenous medicine.

**Hindi name:** Shwet Ak.

#### BUDDLEIACEAE

Stems generally woody without intraxylary phloem. Leaves simple, opposite, united at the base

by a stipular line. Flowers regular. Calyx 4-lobed. Corolla campanulate or funnelform, 4-lobed. Stamens 4, epipetalous; anthers subsessile. Ovary superior, 2-locular, the ovules numerous. Style 1. Fruit a septicidal capsule ... .. *Buddleia*

***Buddleia asiatica* Lour.**

In a hedge at Kaisarbagh. In flower, 24-2-1956. Shrub with spikes of small fragrant white flowers, the leaves with white tomentum on the underside. *Patil* 211.

STRYCHNACEAE

Stem woody, intraxylary phloem present. Leaves opposite, entire, 3-5-nerved from the base. Flowers regular. Calyx deeply 4-5-parted. Corolla tube cylindric, 4-5-lobed. Stamens 4-5, epipetalous. Ovary superior, 2-celled (or 1-celled above); ovules many. Style 1. Fruit a globose berry with a hard shell *Strychnos*

***Strychnos nux-vomica* L.**

In National Botanic Gardens, 23-8-1957. The Strychnine tree. Flowers greenish-white; berries orange-red when ripe. *Patil* 439.

GENTIANACEAE

Aquatic herbs with cordate floating leaves. Flowers in clusters, regular. Calyx 4-7 parted. Corolla gamopetalous, 4-7-lobed. Stamens 4-7, epipetalous. Ovary superior, 1-celled; placentas 2, parietal; ovules many. Style 1 ... .. *Limnanthemum*

***Limnanthemum cristatum* Griseb.**

In water at Chinhath Lake. In flower, 8-11-1956. Common. Flowers white, the corolla lobes with a longitudinal fold down the middle. *Patil* 297.

***L. indicum* Griseb., emend. Thwaites.**

In water at Sirsakheda, near Lucknow, 26-7-1958. Flowers white with yellow centre, the corolla lobes fimbriate. *Patil* 1230.

BORAGINACEAE

Leaves simple. Flowers more or less regular. Calyx persistent. Corolla gamopetalous. Stamens as many as the corolla lobes, alternate with them, epipetalous. Ovary superior, 2-celled with 2 ovules per cell or 4-celled with 1 ovule per cell. Fruit drupaceous or dividing into 2-4 nutlets.

- A Trees or shrubs
  - B Style twice forked; corolla lobes 4-8 ... *Cordia*
  - BB Style once forked or styles 2; corolla lobes 5 ... .. *Ehretia*
- AA Herbs; leaves alternate
  - B Styles once forked or styles 2; corolla lobes 4-5 ... .. *Coldenia*
  - BB Style simple; corolla lobes 5 ... .. *Heliotropium*

***Cordia dichotoma* Forst. f. (*C. myxa* auct. plur. non L.)**

In Bawa ka Purwa village. In fruit, 12-6-1956. A small tree with drooping ashen twigs, the fruit

yellowish or pinkish, glossy, supported by the accrescent calyx and containing transparent and viscous 1-seeded pulp. *Munnalal* 259.

*Local use:* The fruit is eaten.

*Hindi name:* Lasora.

***Coldenia procumbens* L.**

On the wet border of Chinhath Lake. In flower, 24-7-1958. Common. A much-branched prostrate herb with crisped lobulate leaves and very small white flowers. *Patil* 1224.

***Ehretia acuminata* R. Br. (*E. serrata* Roxb.)**

In the Zoological Gardens. In flower, 4-7-1957. An evergreen tree with acuminate serrate leaves; small white fragrant flowers in terminal panicles and small ellipsoid orange-red drupes. *Patil* 404.

***Heliotropium eichwaldi* Steud.**

In a fallow field along Sitapur Road, near Lucknow. Common. In flower and fruit, 18-7-1957. An erect branching herb with relatively large leaves and clothed with soft bulbous-based hairs; flowers in unilateral, binate or ternate spikes. *Patil* 216, 420; *Munnalal* 255.

***H. indicum* L.**

Roadside, near University. In flower, 30-4-1956. Not common. A coarse annual herb with large leaves, the small flowers in long unilateral, rarely forked, spikes. *Patil* 246.

***H. strigosum* Willd.**

Side of railway track, Mithauli village. In flower and fruit, 18-7-57. Rather common. Small herb with prostrate branches; leaves very small, narrow. *Patil* 421.

CONVOLVULACEAE

Usually twining or trailing. Leaves alternate when present. Flowers regular, bisexual. Calyx free, the sepals 5 (very rarely 4). Corolla gamopetalous. Stamens epipetalous, 5 (very rarely 4). Ovary superior, the loculi 1-4, the ovules 1-4 per loculus.

- A Plants leafless, parasitic; corolla lobed ... *Cuscuta*
- AA Plants with well-developed leaves; corolla not lobed
  - B Style 1; stigma of two rounded lobes; corolla campanulate or funnel-shaped, the stamens included ... .. *Ipomoea*
  - BB Style 1; stigmas 2, filiform to sub-clavate; corolla widely funnel-shaped or campanulate, the stamens included *Convolvulus*
  - BBB Styles 2, each cleft into two linear or sub-clavate stigmas; corolla rotate or funnel-shaped, the stamens exerted or included ... .. *Evolvulus*

***Convolvulus pluricaulis* Choisy.**

On top of stony embankment, Zoological Gardens. In flower, 25-9-1958. Not common. A herb with many suberect and prostrate hairy stems; flowers pale rose, the leaves almost linear. *Patil* 1251.



**Cuscuta reflexa** Roxb.

Near Raj Bhavan on *Cassia siamea*. In flower, 28-11-1956. A leafless twining parasite; stems yellow-green. *Sundara Raghavan* 300.

Hindi name: *Amarbel*.

**Evolvulus nummularius** L.

On the lawns of the Central Drug Research Institute. In flower, 7-10-1957. Very common. A prostrate loosely spreading herb; leaves small, cordate and almost round; flowers small, white. *Sundara Raghavan* 194.

**Ipomoea aquatica** Forsk. (*I. reptans* Poir)

Floating on water, Chinhat Lake. In flower, 7-11-1956. Common. Stems rooting at the nodes; leaves glabrous, variable in shape, truncate, hastate, sagittate or cordate at the base; flowers pink or pale lilac, with a purple centre. *Patil* 296.

**I. nil** (L.) Roth. (*I. hederacea* Clarke in F.B.I.)

Twining on other plants on waste ground near Carlton Hotel. In flower, 23-9-1958. Leaves 3-lobed; flowers pale or bright blue turning to reddish purple. *Patil* 1241.

**I. pes-tigridis** L.

A weed in National Botanic Gardens. Very common. In flower, 21-9-1957. Twining or trailing herb; leaves palmatipartite, the lobes 5-9; flowers pink. *Patil* 468.

## SOLANACEAE

Leaves alternate, often in unequal pairs, never truly opposite. Flowers regular. Calyx gamosepalous. Corolla gamopetalous, the lobes usually 5 (rarely fewer or more) or limb subentire. Stamens 5, epipetalous. Ovary superior, 2-celled or imperfectly 1 or 4-celled; ovules many. Style simple.

- |    |   |                        |
|----|---|------------------------|
| A  | Fruit a berry   |                        |
| B  | Anthers connivent in a cone and longer than the filaments; the calyx when accrescent never completely enclosing the fruit | ... .. <i>Solanum</i>  |
| BB | Anthers not connivent in a cone nor longer than the filaments; the calyx accrescent and inflated, enclosing the fruit     |                        |
| C  | Pedicels solitary; corolla broadly campanulate  | ... .. <i>Physalis</i> |
| CC | Pedicels clustered; corolla narrowly campanulate  | ... .. <i>Withania</i> |
| AA | Fruit a capsule   |                        |
| B  | Calyx nearly or quite covering the fruit  | <i>Nicotiana</i>       |
| BB | Calyx much shorter than the fruit   | ... .. <i>Datura</i>   |

**Datura innoxia** Mill. (*D. metel* auct. plur., non L.)

On the border of a cultivated field at Haidarabad. In fruit, 18-7-1956. Rather common. A coarse bushy densely pubescent annual; corolla 10-toothed, white; capsules with long weak spines. *Patil* 273.

Local use: Though this is a recently naturalized plant, it is probably being used in indigenous medicine on account of its being confounded with *D. metel* L.

**Nicotiana plumbaginifolia** Viv.

Gomti riverbank, near Central Drug Research Institute. Rather common. In flower, 5-4-1956. An erect herb about 60 cms. high with spreading radical leaves and slender leafy stems; flowers very slender, white or greenish-white. *Patil* 229; *Arora* 221.

**Physalis minima** L. var. *indica* Clarke.

A weed in National Botanic Gardens. In flower and fruit, 19-9-1957. Common. A lax herb; corolla about 5 mm. across, yellow. *Patil* 465.

Local use: The fruits are eaten.

**P. peruviana** L.

Above left bank of the Gomti, near Haidarabad. In flower and fruit, 23-7-1958. Common. An erect bushy herb; corolla about 12 mm. across, yellow, with five large purple spots at the base. *Patil* 1219.

**Solanum grandiflorum** Ruiz et Pavon. (*S. macranthum* auct. plur.)

In National Botanic Gardens. In flower and fruit, 9-9-1957. A small tree, the leaves deeply lobed, the flowers large, bluish-violet. *Patil* 460.

**S. nigrum** L.

On waste ground, near Paper Mill. In flower and fruit, 27-12-1958. Common. An erect branched herb with small white flowers and small black berries. *Patil* 1298.

Local use: The fruits and other parts of the plant are used in indigenous medicine.

Hindi name: *Makoi*.

**S. torvum** Swartz.

On waste ground, near Carlton Hotel. In flower, 10-10-1957. Common. A tall tomentose shrub, the prickles very few on the stem and leaf-stalk only. Flowers white; berries yellow. *Patil* 477.

**S. xanthocarpum** Schrad. et Wendl.

Roadside, Sultanpur Road, near Lucknow. In flower and fruit, 18-7-1957. Not common. A spreading very prickly herb with numerous branches; flowers purple-blue; berries yellow. *Patil* 423.

**Withania somnifera** Dunal.

Near Bangla Bazaar. In flower and fruit, 28-8-1958. An erect branching undershrub; leaves broadly ovate; flowers greenish-yellow, fascicled in the leaf axils. *Munnalal* 1238 A.

Local use: The roots and other parts of the plant are used in indigenous medicine.

Hindi name: *Asgand*.

## SCROPHULARIACEAE

Mostly herbaceous. Flowers bisexual. Calyx gamosepalous or polysepalous. Corolla gamopetalous, regular or irregular. Stamens typically 4, didynamous or subequal, epipetalous. Ovary superior, 2-

celled; ovules many on axile placentas. Style simple. Fruit a capsule.

A Leaves all alternate; corolla subrotate, the lobes 5 ... .. *Verbascum*

AA Lower leaves opposite, the upper leaves often alternate

B Corolla 2-lipped

C Stamens 4 or 2 perfect; anterior filaments with an appendage towards the base ... .. *Lindernia*

CC Stamens 4; anterior filaments without appendage ... .. *Striga*

BB Corolla regular

C Stamens 4; corolla 4-fid, densely bearded in the throat; leaves opposite or verticillate ... .. *Scoparia*

CC Stamens 2; corolla 4-fid or 5-fid; upper leaves sometimes alternate ... .. *Veronica*

***Lindernia ciliata*** (Colsm.) Pennell. (*Bonnaya brachiata* Link et Otto). Fig. 4.

A small erect but diffusely branched herb; leaves with sharply serrate margins; flowers small, pink or white, the perfect stamens 2. On waste ground near Carlton Hotel. In flower and fruit, 23-9-1958. Fairly common. *Patil* 1240.

***L. crustacea*** (L.) F. Muell. (*Vandellia crustacea* Benth.)

On waste ground, near Carlton Hotel. In flower and fruit, 23-9-1958. Fairly common. A small, often diffusely branched herb; flowers blue-violet, the perfect stamens 4; capsule equalling or shorter than the calyx. *Patil* 1239.

***L. parviflora*** (Roxb.) Haines (*Ilysanthes parviflora* Benth.)

On a damp spot in a fallow field at Chinhat Lake. In flower and fruit, 27-12-1958. Fairly common. A small slender herb; flowers white, the perfect stamens 2; capsule longer than the calyx. *Patil* 1601.

***Scoparia dulcis*** L.

Roadside, near National Botanic Gardens. In flower and fruit, 17-5-1956. Rather common. An erect herb. Leaves in whorls of 3; flowers small, white. *Munnalal* 252; *Patil* 424.

***Striga euphrasioides*** Benth.

Border of *Jowhar* field near Lucknow via Rae Bareli Road. In flower and fruit, 18-10-1958. Fairly common. An erect herb; leaves linear; flowers white. *Patil* 1277.

***Verbascum chinense*** (L.) Santapau (*Celsia coromandeliana* Vahl)

By the side of a water channel at New Haidarabad. In flower and fruit, 16-3-1956. Not common. An erect hairy-pubescent herb; leaves lyrate-pinnatifid at the base, gradually smaller up the stem; flowers yellow, the stamens 4. *Patil* 217.

***Veronica anagallis*** L.

On the right bank of the Gomti, near Central Drug Research Institute. In flower and fruit,

31-3-1956. Very common. A glabrous herb with erect or decumbent stems; flowers small, white. *Patil* 226.

#### OROBANCHACEAE

Leafless root-parasites. Flowers bisexual. Calyx 4-fid or 2-partite. Corolla gamopetalous, bilabiate. Stamens 4, didynamous, included; anther cells equal, the bases mucronate. Ovary superior, 1-celled; placentas 4; ovules many. Style simple  
*Orobanche*

***Orobanche cernua*** Loebl. Fig. 5.

In a cultivated field near Haidarabad as root-parasite on tomato. In flower and fruit, 28-12-1958. Not common. An erect herb with pale brown stems; calyx split into two 2-fid segments; corolla with a white tube and pale blue or violet lobes. *Patil* 1603.

#### LENTIBULARIACEAE

Aquatic or hygrophilous herbs usually with bladder-like insect traps. Leaves in floating species multifid, the segments capillary. Calyx 2-partite. Corolla bilabiate, spurred. Stamens 2, epipetalous. Ovary superior, 1-celled, ovules many on free basal placenta ... .. *Utricularia*

***Utricularia stellaris*** L. f.

In shallow water of the pond near Mohanlal Ganj. In flower, 18-10-1958. Very common. An aquatic herb. Leaves all cut up into capillary segments; inflorescence held above water-level by a whorl of spongy floats; flowers yellow. *Patil* 1271.

#### BIGNONIACEAE

Trees or shrubs. Leaves generally opposite, compound. Calyx gamosepalous. Corolla gamopetalous, lobes 5, sometimes two-lipped. Perfect stamens 4, didynamous, sometimes a fifth as staminode. Ovary superior, 2-celled or 1-celled, the ovules many. Style 1.

A Leaves at least bipinnate

B Tube of corolla slender; fruit a slender capsule ... .. *Millingtonia*

BB Tube of corolla broad; fruit an ovate or broad capsule ... .. *Jacaranda*

AA Leaves imparipinnate

B Trees

C Fruit large, cylindrical, indehiscent ... .. *Kigelia*

CC Fruit an elongate capsule ... .. *Haplophragma*

BB Shrub ... .. *Stenolobium*

***Haplophragma adenophyllum*** (Wall.) Dop. (*Heterophragma adenophyllum* Seem. ex Benth. et Hook. f.)

Roadside in Cantonment. In flower and fruit, 16-8-1956. A tall tree; main petiole 7.5 cm. long often with a pair of small leaflets at the base; corolla yellowish-brown, tubular-ventricose; capsule ribbed. *Patil* 281; *Munnalal* 279.

***Jacaranda mimosifolia*** D. Don.

On the grounds of the Central Drug Research Institute. In flower, 31-3-1956. A tree; leaves bipin-

nate, the leaflets numerous, small; flowers blue. This commonly cultivated species has been confused with the Brazilian *J. acutifolia*. *Arora* 225.

***Kigelia pinnata* DC.**

Roadside in Cantonment and in Zoological Gardens. In flower, 28-4-1956. A tree; flowers in long pendulous racemes, the corolla deep chocolate-red, ventricose. *Munnalal* 243.

***Millingtonia hortensis* L. f.**

Roadside in Cantonment near Eastern Command Signal Regiment Building. A tall evergreen tree; flowers white.

***Stenolobium stans* Seem. (*Tecoma stans* HBK)**

At Daliganj. In flower, 9-12-1955. An erect shrub; leaves imparipinnate; flowers bright yellow. *Arora* 209.

**PEDALIACEAE**

Erect herbs. Leaves simple. Flowers bisexual. Sepals 5, more or less united; corolla gamopetalous, limb 5-lobed, obscurely 2-lipped; ovary superior; style 1.

A Flowers with glands at the base of pedicels; perfect stamens 4, didynamous; fruit capsular, not spinous ... *Sesamum*

AA Glands at the base of pedicels absent; perfect stamens 2; fruit drupaceous with two hooks *Martynia*

***Martynia annua* L. (*M. diandra* Glox.)**

A weed in National Botanic Gardens. Very common. In flower and fruit, 19-9-1957. A herb 30-90 cms. high hairy; leaves large, opposite; flowers large, rose-coloured and spotted with purple. *Patil* 466.

***Sesamum indicum* L.**

On waste ground, near Carlton Hotel. Not common. In flower, 23-9-1958. A herb 30-90 cms. high; upper leaves alternate, mostly narrow; flowers pale rose and marked with purple or yellow marks. *Patil* 1242.

*Local use:* The oil from the seeds is used in cooking and is of commercial importance.

*Hindi name:* *Til*.

**ACANTHACEAE**

Herbs or shrubs. Leaves opposite, usually entire. Flowers usually with two bracteoles. Calyx usually 5-partite. Corolla gamopetalous, bilabiate or subequally 5-lobed. Stamens 4 or 2, epipetalous. Ovary superior, 2-celled. Style 1. Fruit a capsule.

A Seeds not supported on hard retinacula; ovules many in each cell ... *Elytraria*

AA Seeds supported on hard upward-curved retinacula

B Corolla lobes twisted to the left in bud; ovules more than 2 in each cell

C Corolla distinctly 2-lipped

D Inflorescence spinous ... *Asteracantha*

DD Inflorescence non-spinous *Hydrophila*

CC Corolla subequally 5-lobed ... *Ruellia*

BB Corolla lobes imbricate in bud

C Ovules 3-6 in each cell; capsule normally 6 or more seeded ... *Andrographis*

CC Ovules 2 or rarely 1 in each cell; anthers 2-celled

D Corolla lobes 5, subequal; calyx 4-partite ... *Barleria*

DD Corolla 2-lipped

E Placentas separating elastically from the valves; spikes unilateral ... *Rungia*

EE Placentas not separating elastically from the valves; anther cells one higher than the other

F Anther cells, at least lower, with a basal spur-like appendage.... *Justicia*

FF Anther cells apiculate at the base, not spurred ... *Adhatoda*

FFF Anther cells muticous at the base, not spurred ... *Peristrophe*

***Adhatoda vasica* Nees**

On waste ground, off Sitapur Road, near Lucknow. In flower, 21-1-1957. Common. A bushy shrub; flowers large and white, in spikes. *Patil* 359.

*Local use:* The roots, leaves and flowers are used in indigenous medicine.

*Hindi name:* *Adusa*.

***Andrographis paniculata* Wall. ex Nees**

In L.I.T. Forest. In flower and fruit, 24-12-1956. Common. An erect herb with square stems; flowers pale-purple, darker on lower lip, pedicelled on the branches of a panicle.

*Arora* 353.

*Local use:* This bitter herb is used in indigenous medicine.

*Hindi name:* *Kirayat*.

***Asteracantha longifolia* Nees**

In a flooded field near Bijnor. In flower, 13-8-1956. Not common. An erect herb with whorled spines; flowers pale blue-purple. *Patil* 277. *Local use:* The leaves and seeds are used in indigenous medicine.

*Hindi name:* *Talimkhana*.

***Barleria prionitis* L.**

In a hedge near Gomti at Haidarabad. In flower, 5-12-1955. A prickly shrub with rather large yellow flowers. *Arora* 201.

***Elytraria acaulis* (L.f.) Lindau. (*Tubiflora acaulis* O. Kuntze)**

Under trees, Residency, 26-7-1958. Almost gregarious. Nearly stemless herbs with alternate crowded radical leaves; flowers white and small, on scapes clothed with imbricate bracts. *Patil* 1234.

**Hygrophila polysperma** T. Anders.

On wet ground bordering the pond near Mohanlal Ganj. In flower and fruit, 26-12-1958. Gregarious. A herb with creeping stems bearing erect shoots, each shoot terminating in a spike; flowers pale blue, small. *Patil* 1292.

**Justicia peploides** T. Anders.

In a fallow riverside field, left bank of the Gomti, opposite Shah Najaf. In flower, 25-9-1958. Not common. Diffusely branched glabrous herb; flowers small and white, in spikes; bracts on spike linear or linear spatulate with rounded tips. *Patil* 1252.

**J. simplex** D. Don.

A lawn weed in National Botanic Gardens. In flower, 25-9-1957. Common. A pale softly hairy branching herb; flowers small and pale pink, in spikes; capsules papery. Readily distinguished from the preceding species by the acute bracts on the spike. *Patil* 472.

**Peristrophe bicalyculata** Nees

On waste ground near Carlton Hotel. In flower, 28-10-1957. Rather common. A branched herb with swollen nodes and sharply 6-angled stems; flowers rather small, bright rose or purple, in copiously branched lax panicles. *Patil* 484.

**Ruellia tuberosa** L. Fig. 6.

In an open space under trees, Zoological Gardens. Common. In flower, 16-7-1956. Roots tuberous; flowers large, deep blue. An erect herb. *Patil* 272.

**Rungia pectinata** Nees

On the dry bank of the Paper Mill tanks. Fairly common. In flower, 27-12-1958. An erect or diffuse herb; flowers blue, very small, in short clustered unilateral spikes. *Patil* 1295.

## VERBENACEAE

Leaves opposite or whorled. Calyx gamosepalous. Corolla gamopetalous, limb bilabiate or subequally lobed, the lobes 4-5, rarely more. Stamens epipetalous. Ovary superior, the loculi 2 or 4, rarely 8; ovules 1 or 2 in each cell. Style 1, terminal.

- |     |   |                     |
|-----|---|---------------------|
| A   | Flowers in dense spikes or heads; stamens 4, didynamous   |                     |
| B   | Calyx truncate or obscurely lobed; fruit succulent ... .. | <i>Lantana</i>      |
| BB  | Calyx 2-4-lobed; fruit dry ... ..                         | <i>Phyla</i>        |
| AA  | Flowers in paniculate cymes                               |                     |
| B   | Leaves simple   |                     |
| C   | Stamens 5-6, equal ... ..                                 | <i>Tectona</i>      |
| CC  | Stamens 4, didynamous ... ..                              | <i>Clerodendrum</i> |
| BB  | Leaves digitate; stamens 4, didynamous                    | <i>Vitex</i>        |
| AAA | Flowers in racemes ... ..                                 | <i>Duranta</i>      |

**Clerodendrum indicum** (L.) Kuntze (*C. siphonanthus* R. Br.)

In a hedge off Sitapur Road, near Lucknow. In flower and fruit, 18-7-1957. An erect shrub; leaves

narrow, in whorls of 3-5; flowers white or cream, the corolla tube over 7.5 cms. long. *Patil* 418.

**C. phlomidis** L. f.

Wild near fields, Bendawa village. In flower, 15-1-1955. A large shrub; leaves medium-sized, usually crenate-dentate; flowers white, the corolla tube about 2.5 cms. long. *Arora* 11.

*Local use:* The plant is used in indigenous medicine.

*Hindi name:* Inni.

**C. viscosum** Vent. (*C. infortunatum* auct. non L.)

Wild on waste ground off Sitapur Road, near Lucknow. In flower, 27-2-1956. Somewhat gregarious. An erect undershrub; leaves opposite, large, cordate; flowers pinkish white, the corolla tube less than 2.5 cms., the calyx enlarged and red in fruit. *Patil* 212.

*Local use:* The plant is used in indigenous medicine.

*Hindi name:* Bhand.

**Duranta repens** L.

On a fence near Carlton Hotel. In flower and fruit, 23-9-1958. Shrub with trailing branches; flowers blue, in loose paniced racemes; berries glossy, orange-coloured and globose. *Patil* 1243.

**Lantana camara** L. var. *aculeata* Moldenke.

Wild near Haidarabad. A straggling aromatic shrub, the stems with many recurved prickles; flowers small, normally orange. *Arora* 132.

**Phyla nodiflora** (L.) Greene. (*Lippia nodiflora* A. Rich.)

On damp ground at the fringes of the pond near Bangla Bazaar. In flower, 21-7-1958. Common. A prostrate herb; leaves cuneate-spathulate, serrate towards the apex; flowers small, white. *Patil* 1204.

**Tectona grandis** L. f.

Roadside in Cantonment. With flowers and young fruit, 16-8-1956. A very large deciduous tree with quadrangular stems and tawny stellate tomentum on stems; inflorescence and under-surface of leaves. Leaves very large, opposite; flowers small and whitish in large panicles. *Munnalal* 282.

*Local use:* The wood probably not much used locally, the common timber being sissoo.

*Hindi name:* Sagon.

**Vitex negundo** L.

In a hedge at Kaisarbagh. In flower, 11-4-1956. A large shrub; leaves digitate, the leaflets narrow and acuminate; flowers bluish-purple. *Munnalal* 233.

## LABIATAE

Herbs, rarely shrubs, usually aromatic. Leaves opposite or whorled, simple. Flowers hermaphrodite, zygomorphic. Calyx gamosepalous. Corolla

gamopetalous, often bilabiate. Stamens 4, didynamous or subequal or only 2 perfect, epipetalous. Ovary superior, deeply 4-lobed, the ovule solitary in each lobe. Style gynobasic.

- A Stamens 4, all perfect and declinate
- B Upper lobe of calyx largest ... *Ocimum*
- BB Calyx teeth subequal ... *Hyptis*
- AA Stamens erect or spreading or ascending
- B Stamens 4 perfect
- C Upper lip of the corolla short, nearly flat ... *Anisomeles*
- CC Upper lip of the corolla hooded ... *Leucas*
- BB Stamens 2 perfect ... *Salvia*

#### **Anisomeles indica** Kuntze

On waste ground near Carlton Hotel and at Mahanagar. Not common. In flower and fruit, 24-9-1958. A very large strongly aromatic under-shrub; leaves ovate, coarsely crenate, acuminate; flowers with a pale upper lip and purple lower lip, in successive whorls merging towards the tip of the axis. *Patil* 1245.

#### **Hyptis suaveolens** Poit.

On waste ground near Carlton Hotel. In flower, 25-10-1957. Almost gregarious. A tall very aromatic herb; leaves ovate, irregularly toothed; flowers small, blue, often capitate on axillary peduncles; fruiting calyx campanulate and ribbed with five aristate teeth. *Patil* 480.

#### **Leucas aspera** Spreng.

On waste ground near Carlton Hotel. In flower, 28-10-1957. Not common. An erect sometimes diffusely branched herb; leaves linear or oblong lanceolate; flowers white, often in a single terminal whorl. *Patil* 483.

#### **Ocimum americanum** L. (*O. canum* Sims)

As weed at the border of a cultivated riverside field, near Haidarabad. In fruit, 18-3-1958. Not common. An erect slender herb; flowers white or pale-purple, about six in a whorl, in terminal elongating racemes. *Patil* 493.

#### **Salvia plebeia** R. Br.

A weed in a cultivated riverside field, near Haidarabad. In flower, 18-3-1958. Not common. An erect regularly branched herb; flowers small, white, in 6-flowered whorls on terminal, often paniced racemes. *Patil* 487.

#### NYCTAGINACEAE

Leaves simple, opposite, often in unequal pairs. Flowers small. Perianth united in a tube below, the limb funnel-shaped or campanulate, 5-lobed. Stamens 5—1, exserted, connate below around the ovary. Ovary oblique, 1-locular, stipitate; ovule 1, erect; stigma peltate. Fruit indehiscent, enclosed in the perianth tube. *Boerhaavia*

#### **Boerhaavia diffusa** L.

Roadside, right bank of the Gomti, near National Botanic Gardens. In flower, 12-7-1956. Common. A diffuse herb with stout rootstock; leaves broadly ovate, whitish beneath; flowers small, red, sub-

sessile in pedunculate heads arranged in umbels. *Patil* 269.

#### AMARANTACEAE

Herbs or shrubs. Inflorescence with hyaline or scarious bracts. Flower with two scarious bracteoles. Perianth of five or fewer hyaline or scarious segments, the latter free or almost free. Stamens 1-5, opposite the perianth lobes, the filaments sometimes connate below in a cup. Ovary superior, 1-celled. Fruit a membranous utricle.

- A Anthers 2-celled
- B Leaves alternate
- C Seeds 2 or more, utricle circumscissile ... *Celosia*
- CC Seed solitary
- D Flowers hermaphrodite, spicate ... *Digera*
- DD Flowers unisexual, inflorescence various ... *Amarantus*
- BB Leaves opposite, seed solitary
- C Flowers clustered, 1-2 perfect surrounded by others imperfect and with hooked bristles ... *Pupalia*
- CC Flowers all perfect ... *Achyranthes*
- AA Anthers 1-celled, leaves opposite
- B Flowers in axillary clusters ... *Alternanthera*
- BB Flowers in terminal heads or short spikes ... *Gomphrena*

#### **Achyranthes aspera** L.

On high ground near the Paper Mill tanks. Common. In flower and fruit, 3-10-1956. An erect herb with simple acuminate leaves; bracteoles spinescent, the flowers deflexed on the axis of long spikes. *Patil* 293.

*Local use:* The leaves are eaten as a potherb.

*Hindi name:* *Apamarg*.

#### **Alternanthera pungens** HBK. (*A. echinata* Sm.)

Roadside, Cantonment, near Eastern Command Signal Regiment Building. Very common. In flower and fruit, 18-10-1958. Regarding the identity of this plant *vide* Raizada (1950). A prostrate spreading herb; stem zig-zag, covered with shaggy hairs; the simple opposite leaves very unequal; flowers in sessile heads. *Patil* 1278.

#### **A. sessilis** R. Br.

In shallow water, Chinhat Lake. Not common. In flower, 19-3-1958. A prostrate herb with ascending almost glabrous stems; the simple opposite leaves approximately equal and narrow unlike those of the preceding species; flowers in white or pinkish axillary heads. *Patil* 497.

#### **Amarantus spinosus** L.

On the border of a water-channel, near New Haidarabad. Rather common. In flower and fruit, 16-3-1956. An erect spinous herb with simple leaves; flowers sessile in dense axillary clusters and also in terminal and axillary dense or interrupted spikes; perianth lobes 5; stamens 5. *Patil* 214.

*Local use:* The leaves are eaten as a potherb.

*Hindi names:* *Cholai*.

**Amarantus viridis L.**

At the border of a cultivated field, near Chinhat Lake. Rather common. Somewhat similar to the preceding species in appearance, but not spiny. Perianth lobes 3; stamens 3. *Patil* 1280.

**Celosia argentea L.**

On the border of a 'Jowar' field at the outskirts of Lucknow via Rae Bareilly Road. Common. An erect glabrous herb; leaves linear or linear-lanceolate, acuminate; flowers in pink or white terminal peduncled tapering spikes. *Patil* 1275.

**Digera muricata Mart.**

On waste ground near Carlton Hotel. In flower, 10-10-1957. Rather common. A herb erect or with ascending branches; leaves simple, the small pink flowers in axillary spikes. *Patil* 479.

**Gomphrena celosioides Mart.**

A lawn weed in Zoological Gardens. Very common. In flower and fruit, 12-8-1957. Regarding the erroneous identification of this species as *Gomphrena decumbens* Jacq. vide Raizada (1950). A much branched procumbent herb with ascending branches; leaves simple; flowers in dense white subglobose heads later lengthening into spikes. *Patil* 429.

**G. globosa L.**

On waste ground near Carlton Hotel. Rare. In flower and fruit, 23-9-1958. A herb quite erect or decumbent at the base; leaves simple; flowers in mostly terminal globose purple heads. *Patil* 1244.

**Pupalia lappacea Juss.**

On broken masonry near the Paper Mill tanks. Rare. In flower and fruit, 3-10-1956. A pubescent or tomentose undershrub with long straggling branches; each flower cluster with yellow stellately spreading hooked bristles, the clusters sessile on the inflorescence axis. *Patil* 292.

## CHENOPODIACEAE

Herbs. Leaves simple, exstipulate and alternate. Flowers minute, without bracts and bracteoles. Perianth usually 5-lobed. Stamens 5 or fewer, anthers 2-celled. Ovary superior, 1-celled; ovule 1. Fruit a membranous utricle enclosed in the perianth. Embryo curved, surrounding the endosperm ... .. *Chenopodium*

**Chenopodium album L.**

A weed in a cultivated field, east of the Paper Mill. In flower and fruit, 8-7-1957. Rather common. A tall scentless herb, the young parts densely clothed with white powdery vesicles. Flowers in paniced clusters; stigmas 2; seeds shining black. *Patil* 410.

*Local use:* The plant is eaten as a potherb.

*Hindi name:* Bathua.

**C. ambrosioides L.**

Riverside, left bank of the Gomti, near Haidarabad. Almost gregarious. In flower and fruit, 17-5-1956. A tall strongly aromatic herb, the young parts without white powdery vesicles. Flowers in clusters on a leafy panicle; stigmas 2-5; seeds brownish-black, shining. *Munnalal* 251.

*Local use:* It is doubtful whether the medicinal uses of the oil of *Chenopodium* obtained from this plant are known to the local public.

**C. murale L. Fig. 7.**

Riverside, in a cultivated field, near the Paper Mill. Not common. In flower and fruit, 18-3-1958. A low herb, slightly fetid, the white powdery vesicles not as conspicuous as in *C. album*. Flowers densely clustered in axillary and terminal panicles; stigmas 2; seeds dull black. *Patil* 491.

## POLYGONACEAE

Herbs or shrubs. Leaves alternate, entire or serrulate, the stipules forming a sheath around the stem (ochrea). Perianth often petaloid. Stamens 1-8. Ovary free, 1-celled; ovule solitary, orthotropous.

A Perianth 3-5-cleft; stamens 1-8; fruit biconvex or trigonous ... .. *Polygonum*

AA Perianth 6-cleft; stamens 6; fruit trigonous *Rumex*

**Polygonum glabrum Willd.**

Riverside, in shallow water, near National Botanic Gardens. In flower, 17-5-1956. Gregarious. An erect glabrous herb; leaves linear-lanceolate, up to 22 cms. long, the ochrea closely embracing the stem, truncate at the mouth, non-ciliate; flowers pink, in terminal rather dense paniced spiciform racemes. *Munnalal* 251 A.

**P. hydropiper L.**

Riverside, in shallow water, near National Botanic Gardens. Common. In flower, 17-7-1956. A herb usually with stems decumbent at the base; leaves linear-lanceolate, up to 8 cms. long, the ochrea tubular and sparsely ciliate at the mouth; flowers pink, in rather lax slender racemes. *Patil* 272 A.

**P. limbatum Meissn.**

In shallow water, Chinhat Lake. Gregarious. In flower, 29-11-1958. A herb with stout erect stems; leaves lanceolate, up to 14 cms. in length, the ochrea reflexed and ciliate towards the mouth; flowers white, in paniced racemes. *Patil* 1288.

**P. plebejum R. Br.**

Riverside, on damp ground, near Central Drug Research Institute. Common. In flower and fruit, 22-3-1956. A prostrate herb with a woody rootstock; leaves less than 2.5 cms. long, linear; flowers pink, in axillary clusters. *Patil* 224 AA.

**Rumex dentatus L.**

Riverside, near Central Drug Research Institute. Common. In flower and fruit, 22-3-1956. A stout

erect herb; flowers in dense whorls on the very sparsely branched terminal leafy panicle; fruiting tepals broadly alate and with an oblong tubercle on the midrib. *Patil* 224 A

## LORANTHACEAE

Leafy shrubs parasitic on branches of woody plants. Flowers hermaphrodite. Perianth lobes 5, united below; stamens 5, adnate to the perianth; ovary inferior, 1-celled ... *Dendrophthoe*

***Dendrophthoe falcata*** (L. f.) Ettingshausen. (*Loranthus longiflorus* Desr.)

On a mango tree, near Mohanlal Ganj. In flower, 17-12-1958. A woody parasite; leaves mostly opposite; flowers in unilateral racemes, the perianth scarlet and orange, split down one side. *Patil* 1291. *Hindi name*: Banda.

## SANTALACEAE

Trees or shrubs mostly semiparasitic on the roots of other species. Leaves simple. Flowers hermaphrodite, axillary or in terminal 3-chotomous paniculate cymes. Perianth tube adnate to the base of the ovary, the lobes 4 rarely 5; stamens the same number as the perianth lobes, opposite to them and adnate to their base; disk of scales between the stamens; ovary semi-inferior, 1-locular, the ovules 2-3, pendulous from a free-central placenta

*Santalum*

***Santalum album*** L.

Not wild locally but occurs in the National Botanic Gardens. In flower, 23-8-1957. A small evergreen tree; leaves opposite; flowers small, brownish-purple; fruit a black drupe. The sandalwood tree. *Patil* 438.

*Hindi name*: Chandan.

## EUPHORBIACEAE

Herbs, shrubs or trees, sometimes with milky juice. Leaves simple or compound, mostly stipulate. Flowers unisexual. Perianth present or absent. Ovary superior and with axile placentation; ovules solitary or paired, pendulous.

- |    |  |     |                    |
|----|--|-----|--------------------|
| A  | Inflorescence of many pedicelled bracteolate stamens as male flowers surrounding a single pedicelled female flower, the whole contained in a 4-5-lobed involucre | ... | <i>Euphorbia</i>   |
| AA | Flowers distinct, not contained in a common involucre  |     |                    |
| B  | Ovule solitary in each cell of the ovary, the ovary usually 3-celled   |     |                    |
| C  | The inner perianth whorl (petals) present at least in male flowers   |     |                    |
| D  | Stamens free, inflexed in bud with anthers reversed  | ... | <i>Croton</i>      |
| DD | Stamens connate, at least below, in a column, not inflexed in bud  | ... | <i>Chrozophora</i> |
| CC | The inner perianth whorl (petals) absent   |     |                    |
| D  | Staminal filaments not branched  | ... | <i>Acalypha</i>    |
| DD | Staminal filaments much branched   | ... | <i>Ricinus</i>     |

- |    |  |     |                    |
|----|--|-----|--------------------|
| BB | Ovules 2 in each cell of the ovary, the inner perianth whorl (petals) absent |     |                    |
| C  | Leaves up to 10 cms. long  | ... | <i>Putranjiva</i>  |
| CC | Leaves small   |     |                    |
| D  | Fruit a dry capsule  | ... | <i>Phyllanthus</i> |
| DD | Fruit fleshy   |     |                    |
| E  | Styles usually 3 with twice branched arms                                    |     | <i>Embllica</i>    |
| EE | Styles (or stigmas) 3, not branched  | ... | <i>Melanthesa</i>  |

***Acalypha ciliata*** Forsk.

A weed in National Botanic Gardens. Not uncommon. In flower and fruit, 20-9-1957. An erect herb up to 60 cm. in height. Leaves simple, long-petioled, serrate; flowers in axillary androgynous spikes, the female flowers below with many-nerved campanulate bracts ending in long subulate hispid teeth. *Patil* 467.

***Chrozophora rottleri*** Juss. ex Spreng. Fig. 8.

On waste ground near the site of the sports stadium. Rare. In flower and fruit, 11-5-1956. An erect undershrub with stellate tomentum and large simple leaves. Flowers in short dense androgynous racemes, the males at the top, subsessile, the females below, pedicelled, the stigmas red. *Patil* 249.

***Croton bonplandianum*** Baill. (*C. sparsiflorus* Morong)

In waste places near New and Old Haidarabad. Gregarious. In flower, 4-4-1956. An erect undershrub up to 60 cm. high. Leaves simple, ovate-lanceolate, serrate. Flowers in terminal slender androgynous racemes, the males above, the females below. *Patil* 230.

***Embllica officinalis*** Gaertn. (*Phyllanthus emblica* L.)

In an orchard near Lucknow along Fyzabad Road. In fruit, 17-8-1957. A small or moderate-sized deciduous tree. Leaves simple, narrow, small, distichous, the branchlets resembling a pinnate leaf; stipules minute, scarious. Flowers minute, in dense fascicles situated in the leaf-axils or in the axils of scales below the leaves. Fruit succulent, globose, about 2.5 cm. in diameter. *Patil* 432.

*Local use*: The fruit is esteemed for making pickles and preserves. The fruit is also used in indigenous medicine.

*Hindi name*: Aonla.

***Euphorbia dracunculoides*** Lam.

At Chinhath Lake on dry ground. In fruit, 15-5-1957. An erect herb up to 30 cm. tall, umbellately branched above. Leaves simple, lower leaves alternate, upper opposite. Glands of the involucre 2-horned. *E.K.J.* 7511.

***E. hirta*** L.

A lawn weed at the Central Drug Research Institute. In flower and fruit, 10-7-1956. Common. An ascending hispid herb 30 cm. or more tall. Leaves simple, opposite, longer than 1.3 cm., obliquely elliptic or lanceolate. *Patil* 266.

**Euphorbia microphylla** Lam.

A lawn weed at the Central Drug Research Institute. In flower and fruit, 8-8-1956. Common. A small prostrate glabrous herb. Leaves simple, opposite, up to 6 mm. long. *Patil* 276.

**Melanthesa rhamnoides** (Retz.) Blume (*Breynia rhamnoides* Muell.-Arg.)

In a hedge near the Central Drug Research Institute. In flower and fruit, 31-7-1957. A large shrub up to 3 meters tall. Leaves simple, distichous, generally less than 2 cm. long; flowers minute, monoecious, usually solitary in the leaf axils; berries red, about 5 mm. in diameter on a slightly enlarged calyx. *Patil* 426.

**Phyllanthus niruri** L.

A lawn weed at the Central Drug Research Institute. Common. In flower, 11-7-1956. A slender erect herb reaching a height of 30-45 cm. Leaves simple, rather narrow, small, distichous, the branchlets resembling pinnate leaves. Flowers minute, in axillary clusters of 2-3 males to one female. *Patil* 267.

**Putranjiva roxburghii** Wall.

Roadside, A. P. Sen Road. Male and female trees in flower and female trees in fruit on 12-4-1956. Medium-sized evergreen trees. Leaves simple, bifarious, broadly lanceolate, the margin wavy. Male flowers minute, numerous, in yellow axillary heads or contracted racemes. Female flowers solitary or in few-flowered racemes. Fruit an ellipsoid drupe about 1.5 cm. long. *Munnalal* 235.

*Local use:* The fruits are strung together into amulets which are used by Hindus to ward off the evil eye.

*Hindi name:* *Putranjiv*.

**Ricinus communis** L.

In a plantation off Sitapur Road, near Lucknow. In flower and fruit, 20-1-1957. A small tree. Leaves alternate, large, palmately lobed with 7 or more serrate lobes. The castor-oil plant. *Patil* 357.

*Local use:* The plant is cultivated as a minor crop near Lucknow on account of the oil expressed from the seed and used for burning, as a lubricant and in medicine.

*Hindi name:* *Ayrand*.

## ULMACEAE

Trees or shrubs with hard wood. Leaves alternate, simple, bifarious, the stipules caducous. Flowers small, bisexual or polygamous. Perianth simple, calycine, 4-8-lobed; stamens erect in bud, usually the same number as the perianth lobes, the anthers 2-locular. Ovary superior, of two connate carpels; styles 2, divergent, stigmatose on their inner face; ovule solitary pendulous from near the top.

- A Flowers in clusters appearing before the leaves; ovary stipitate; fruit a samara ... *Holoptelea*  
 AA Flowers appearing on the young leafy shoots, axillary; ovary sessile; fruit a drupe ... *Celtis*

**Celtis australis** L.

In National Botanic Gardens. In fruit, 6-9-1957. A medium-sized deciduous tree. Leaves ovate-lanceolate to lanceolate, 5-12 cm. long, 3-veined and oblique at the base, acuminate at the apex. Fruit a globose drupe 8 mm. wide, usually solitary on a slender stalk in the leaf-axils. *Patil* 458.

**Holoptelea integrifolia** Planch.

Roadside, left bank of the Gomti, near the Paper Mill Bridge. In flower, 12-3-1957; in fruit, 20-3-1956. A deciduous tree usually large. Leaves elliptic or ovate, 5-12 cm. long, somewhat unequal at the base. Fruit a broadly elliptic samara 2.5 cm. wide, notched between the two stigmas. *Patil* 222 A; 368.

*Local use:* The leaves and young fruits are given as feed to livestock.

*Hindi name:* *Chirbil*.

## CANNABINACEAE

Erect herbs. Leaves stipulate. Flowers small, dioecious, the males in axillary panicles, the females in leafy axillary glomerules. Male flower: perianth 5-lobed; stamens 5, drooping, the anthers 2-celled, erect in bud. Female flower in the axil of a small inclosing bract; perianth hyaline, embracing the ovary or suppressed; ovary sessile, 1-locular, the ovule 1, pendulous; style arms 2, filiform

*Cannabis*

**Cannabis sativa** L.

A weed in a private garden, right bank of the Gomti, near the Paper Mill bridge. In flower, 6-7-1956. Common. An aromatic herb. Leaves opposite below and alternate above, palmately compound, the leaflets coarsely serrate. *Patil* 263.

*Local use:* The specially dried leaves and flowering shoots are widely used at Lucknow as an intoxicant especially during the festival of *Holi*.

*Hindi name:* *Bhang*.

## MORACEAE

Trees or shrubs with milky juice. Leaves generally simple, stipulate. Flowers much reduced, crowded together, unisexual, monoecious or dioecious. Perianth lobes 2-6, sometimes reduced or wanting; stamens isomerous and opposite the perianth lobes or reduced in number; ovary with a solitary, pendulous ovule. Fruit composite.

- A Flowers inside a closed receptacle ... *Ficus*  
 AA Flowers external, in a dense spike or head  
 B Inflorescence axis not fleshy when in flower; stamens 4 in the male flower ... *Morus*  
 BB Inflorescence axis fleshy when in flower; stamen 1 in male flower ... *Artocarpus*



**Artocarpus heterophyllus** Lam. (*A. integrifolius* auct. non L. f.)

In orchards and private gardens. Jackfruit. A tall tree, the young parts glabrous. Leaves of mature plant oblong to obovate, 10-20 cm. long. Fruit an elongate tubercled syncarp, 30-60 cm. long.

**Local use:** The edible ripe fruit is of economic importance and the raw fruit is cooked and eaten.

**Hindi name:** Kathal.

**A. lakoocha** Roxb.

In a private garden, Haidarabad, with flowering receptacles, 16-3-1956. A tree, the young parts densely grey-tomentose. Leaves ovate or oblong, 15-25 cm. long. Male receptacle ovoid, orange-yellow, 2-2.5 cm. long, the fruit smooth, irregularly globose, 5-8 cm. in diameter. *Patil* 215.

**Local use:** The fruits and also the male receptacles are eaten.

**Hindi name:** Barhal.

**Ficus bengalensis** L.

Roadside, near the Central Drug Research Institute, with mature receptacles, 4-7-1957. A large tree with aerial roots from the branches to form accessory trunks. Leaves ovate to elliptic with 3-5-nerved base. Receptacles sessile in pairs, subglobose, 12-20 mm. in diameter, scarlet when ripe. *Patil* 407.

**Local use:** Besides being valued for shade on the roadsides, the tree is sacred to Hindus.

**Hindi name:** Bargad.

**F. benjamina** L. var. **comosa** King. (*F. comosa* Roxb.)

In National Botanic Gardens, with mature receptacles, 6-8-1956. A handsome glabrous tree with drooping branches. Leaves ovate or elliptic. Receptacles sessile in pairs, globose, about 2 cm. in diameter, bright yellow when ripe. *Patil* 275.

**F. elastica** Roxb.

In National Botanic Gardens, with immature receptacles, 23-8-1957. The India-rubber tree. Leaves large, elliptic, distinguished from the other *Ficus* species by the numerous and nearly parallel nerves running at right-angles to the prominent midrib. *Patil* 435.

**F. lacor** Buch-Ham. (*F. infectoria* Roxb.)

On Residency grounds, with mature receptacles, 16-7-1957. A tree. Leaves oblong or oblong-ovate, shortly acuminate. Receptacles in pairs, globose, 7-14 mm. in diameter, white or white flushed with red and dotted. *Patil* 411.

**F. lyrata** Warb.

In National Botanic Gardens, 9-9-1957. A tree. Leaves very large, fiddle-shaped. *Patil* 459.

**F. palmata** Forsk.

In L.I.T. Forest as undergrowth, with receptacles, 17-7-1957. A bush. Leaves orbicular-ovate or

3-5-lobed, 3-ribbed. Receptacles axillary, solitary, peduncled, subglobose to pyriform, about 15 mm. long, yellow when ripe. *Patil* 416.

**F. racemosa** L. (*F. glomerata* Roxb.)

On the grounds of the Central Drug Research Institute, with receptacles, 16-5-1956. A tree with pedicelled globose or pyriform reddish receptacles, 2.5-5 cm. in diameter, on special short branchlets. *Patil* 250.

**Local use:** The fruits are eaten.

**Hindi name:** Gular.

**F. religiosa** L.

Roadside, near Central Drug Research Institute, with receptacles, 4-7-1957. A tree. Leaves rotund or ovate, long caudate. Receptacles paired, sessile, depressed globose, 10-15 mm. in diameter, black when ripe. *Patil* 408.

**Local use:** Regarded with reverence by the Hindus.

**Hindi name:** Pipal.

**F. rumphii** Blume

In National Botanic Gardens, with immature receptacles, 23-8-1957. Somewhat resembling *F. religiosa* but the petiole and the acuminate tip of the leaf not so long and the receptacles almost spherical. *Patil* 434.

**Morus laevigata** Wall.

In a private garden, near Central Drug Research Institute. In flower, 16-7-1957. A handsome tree. Leaves ovate with serrulate margins, the male and female flowers in separate slender drooping spikes up to 12 cm. long. *Patil* 413.

#### CASUARINACEAE

Branchlets very slender and equisetum-like, jointed, striate. Leaves of minute scales, in whorls. Flowers unisexual. Male flowers in bracteate spikes, the female flowers in bracteate heads. Male flower: stamen 1, perianth scales 1 or 2, bracteoles 2. Female flower: bracteoles 2, the ovary superior, 1-celled, 2-ovuled, the style with two elongated linear branches. Fruit a cone ... *Casuarina*

**Casuarina equisetifolia** L.

In National Botanic Gardens, with cones, 5-9-1957. A tall tree, the internodes less than 10 mm. long. *Patil* 457.

#### CERATOPHYLLACEAE

Submerged rootless freshwater plants. Leaves verticillate, 2-4 times forked, segments linear dentate. Flowers very small, unisexual, monocious, solitary, axillary. Perianth of 6-12 segments. Male flower: stamens 8-24, the anthers nearly sessile, 2-locular, the connective shortly produced at the apex. Female flower: ovary superior, sessile, 1-celled, 1-ovuled. Fruit indehiscent, warty

*Ceratophyllum*

**Ceratophyllum demersum** L.

Submerged in pond, near Mohanlal Ganj, 26-12-1958. Common. Leaves mostly twice forked, the segments therefore mostly 4. *Patil* 1294.

## HYDROCHARITACEAE

Aquatic herbs pollinated at or above the surface of the water, the leaves simple, usually submerged. Flowers regular, enclosed by a more or less tubular spathe. Outer perianth lobes 3, often green; inner perianth lobes 3 or 0; stamens 3, fewer or more. the pollen sphaeroid; ovary inferior, 1-locular, the placentation parietal with sometimes inwardly intruding placentas; ovules numerous.

- |    |   |     |     |     |                    |
|----|---|-----|-----|-----|--------------------|
| A  | Plants with leaves in whorls on branched stems                                      | ... | ... | ... | <i>Hydrilla</i>    |
| AA | Plants with tufted radical leaves   |     |     |     |                    |
| B  | Flowers dioecious, the males minute, several within the spathe, the female solitary | ... | ... | ... | <i>Vallisneria</i> |
| BB | Flowers bisexual, large and solitary in the spathe                                  | ... | ... | ... | <i>Ottelia</i>     |

**Hydrilla verticillata** Royle

In a roadside pond between Lucknow and Mohanlal Ganj. Gregarious. In flower, 18-10-1958. A slender submerged plant. Leaves about 8 mm. long. Flowers unisexual, the males minute, solitary in a subglobose spathe, the females 1-2 in a tubular 2-toothed spathe. Perianth double; stamens 3 in the male flower; filiform prolongation above the inferior ovary in the female flower. *Patil* 1274.

**Ottelia alismoides** Pers.

In a pond near Mohanlal Ganj. Very abundant. In flower, 18-10-1958. A herb rooting at the bottom. Leaves of two kinds: the submerged tapering towards the petiole, the floating cordate or rounded at the junction with the petiole. Spathe with wings, long-peduncled; perianth double, the outer whorl green, the inner white; stamens 6; ovary beaked. *Patil* 1272.

**Vallisneria spiralis** L.

In Chinhat Lake. In fruit, 19-12-1956. A herb rooting at the bottom. Leaves grass-like; perianth single; stamens 1-3 in male flower, staminodes 3 in female flower. Scape of the female flower long, later spirally coiling. *Patil* 352.

## MUSACEAE

Tall plants. Leaves springing from the ground, spirally arranged, very large, the midrib thick, the nerves pinnately parallel, extending to the margin; leaf-stalks sheathing, together forming a false stem-like structure. Inflorescence spicate; flowers in half-whorled clusters, each cluster with a large spathe-like coloured bract, the lower clusters female, the upper functionally male. The three outer and the two inner perianth lobes united into a tube split down one side, the remaining inner lobe free. Stamens 5 perfect, the sixth usually rudimentary or absent. Ovary inferior, 3-celled, many-ovuled. Fruit baccate ... *Musa*

**Musa** sp.

Cultivated in orchards. Cheesman (1948) states that the cultivated and seedless bananas and plantains of India are closely related to, and probably derived from two distinct species of *Musa*.

*Local use*: Several varieties are grown for the ripe fruit which is relished.

*Hindi name*: Kela.

## PONTEDERIACEAE

Aquatic floating herbs, rooting at the nodes. Leaves rosulate or alternate, long-petioled. Inflorescence terminal, spiciform, peduncled. Flowers bisexual. Perianth petaloid, more or less zygomorphous, the lobes 6, partly connate into a tube; stamens 6, unequally inserted on the perianth tube; ovary superior, 3-celled, the ovules numerous

*Eichhornia*

**Eichhornia crassipes** Solms.

In a roadside ditch, Bangla Bazaar, in flower, 21-7-1958. Gregarious. Leaves ovate to orbicular, the petioles inflated to function as floats. Flowers violet, showy. *Patil* 1209.

## COMMELINACEAE

Herbs. Leaves alternate, with a strong midrib and a closed sheath at the base. Flowers usually bisexual, more or less irregular. Tepals 6, the three outer sepaloid, the three inner petaloid. Stamens usually bearded with jointed hairs on the filaments. Ovary superior, syncarpous.

- |    |  |     |     |                  |
|----|--|-----|-----|------------------|
| A  | Fertile stamens 6, staminodes 0; inner tepals often united into a tube below | ... | ... | <i>Cyanotis</i>  |
| AA | Fertile stamens 3 or 2, staminodes 1-4; inner tepals free                    |     |     |                  |
| B  | Cymes 1-2 arising from a spathaceous bract                                   | ... | ... | <i>Commelina</i> |
| BB | Cymes panicled, not arising from a spathaceous bract                         | ... | ... | <i>Murdannia</i> |

**Commelina benghalensis** L.

On waste areas in Zoological and National Botanic Gardens. Common. In flower and fruit, 25-9-1958. Leaves elliptic-ovate, the spathes turbinate, the flowers blue. *Patil* 1249.

**Cyanotis axillaris** Schult. f.

On high ground near fields, Chinhat Lake. Not uncommon. In flower and fruit, 26-9-1958. A creeping herb with blue flowers in the axils of the leaf-sheaths. *Patil* 1256.

**Murdannia nudiflorum** (L.) Santapau (*Aneilema nudiflorum* R. Br.)

In riverside field, left bank of the Gomti facing National Botanic Gardens. In flower and fruit, 25-9-1958. Not uncommon. Slender herb with blue flowers in terminal and leaf-opposed cymes. *Patil* 1250.

## PALMACEAE

Trees with unbranched stem crowned by a cluster of large leaves with sheathing petioles. Flowers usually small, in simple or branched spikes or panicles enclosed in 1-many sheathing spathes. Flowers unisexual or bisexual. Perianth double, the lobes 6, enlarging in fruit; stamens 6-many; ovary superior, sometimes the carpels free.

- A Leaves palmately nerved or divided, the leaf-segments induplicate in bud  
 B Flowers bisexual ... ... *Livistona*  
 BB Flowers dioecious ... ... *Borassus*  
 AA Leaves pinnate, the leaf-segments long and narrow  
 B Leaf-segments induplicate in bud; one or more of the lowest pair of leaflets transformed into spines ... ... *Phoenix*  
 BB Leaf-segments reduplicate in bud; none of the leaflets transformed into spines  
 C Inflorescence borne below the crown of leaves ... ... *Roystonea*  
 CC Inflorescence coming from among the leaves and developing downwards ... ... *Arenga*  
 AAA Leaves bipinnate, the leaflets fan-shaped ... ... *Caryota*

***Arenga pinnata* Merr.**

In National Botanic Gardens, 28-10-1957. A handsome palm, the trunk short and stout, the persistent leaf-stalks covered with long black fibres, the leaflets white below.

***Borassus flabellifer* L.**

In Zoological Gardens, 10-10-1957. Very rare in the environs of the city. The palmyra palm. Trunks very tall, dark-coloured.

***Caryota* sp.**

In National Botanic Gardens, 28-10-1957.

***Livistona chinensis* R. Br.**

In Zoological Gardens, 10-10-1957. A graceful palm, the leaves with long bifid drooping segments.

***Phoenix sylvestris* Roxb.**

In Zoological Gardens, 26-8-1957. Occasionally roadside. Leaves stiff, almost rigid, the pinnae prevailingly more than two-ranked.

**Local use:** The tree is tapped to yield fresh juice (*nira*) and a fermented beverage (*tari*). Both *nira* and *tari* are drunk locally.

**Hindi name:** *Khajur*.

***Roystonea regia* O. F. Cook.**

In an avenue at Zoological Gardens, 10-10-1957. The Cuban royal palm. Trunk smooth, light grey, swollen above the base.

## ARACEAE

Flowers monoecious, the males above, the females below, on a spadix enclosed in a spathe. \* Spadix without barren terminal appendage. Perianth o.

- A Aquatic floating herbs. Spathe small, the spadix attached to the spathe but free above ... *Pistia*  
 AA Terrestrial tuberous herbs. Spathe large, the spadix stipitate and free ... ... *Plesmonium*

***Pistia stratiotes* L.**

Floating in Chinhath Lake, 27-12-1958. Common. An aquatic floating herb propagating by stout off-sets. Leaves cuneate, sessile, in a rosette-like tuft. Male flowers represented by a whorl of connate stamens, the female flower solitary. Ovary unilocular, the ovules several. *Patil* 1299.

***Plesmonium margaritiferum* Schott.**

On damp ground in open forest at Chapruwa kheda, near Mohanlal Ganj. In flower and fruit, 23-7-1958. Leaf solitary, digitately 3-foliolate, the lateral leaflets again 2-partite and then all the lobes pinnatisect, the ultimate segments narrow. Female flowers numerous, separated by a belt of clavate neuters from the males. Ovaries 2-3-celled, the ovules solitary. *Patil* 1217.

## ALISMACEAE

Aquatic or marsh herbs. Leaves basal and with an elongated petiole. Flowers regular, unisexual or bisexual, in bracteate whorls on scapose stems. Tepals 6, the three outer sepeloid, the three inner larger and petaloid; stamens 6-many; carpels many, free.

- A Carpel-bearing receptacle small and flat; stamens 6 ... ... *Limnophyton*  
 AA Carpel-bearing receptacle large, globose to oblong; stamens 6-many ... ... *Sagittaria*

***Limnophyton obtusifolium* Miq.**

In shallow water and wet ground near Mohanlal Ganj. Rather common. In flower and fruit, 28-11-1958. Leaves erect, mostly sagittate, the flowers white, the pedicels slender. *Patil* 1282.

***Sagittaria guayanensis* HBK.**

In a pond near Bangla Bazaar. In flower, 7-6-1956. Leaves ovate-cordate; flowers white, often ternate on the scape. *Patil* 257, 1228.

## APONOGETONACEAE

Aquatic herbs. Leaves radical, the petioles with a sheathing base. Floriferous spike emerging from the water on a long peduncle. Flowers ebracteate, very small, generally bisexual. Tepals 1-3, usually petaloid. Stamens 6, rarely more, the filaments fairly long, the anthers 2-locular. Carpels free, 3 or more. Fruit of follicles ... *Aponogeton*.

***Aponogeton natans* Engl. et Kr. Fig. 9.**

In a pool near Amausi airfield. Not uncommon. In flower, 23-9-1958. Leaves mostly floating, the base of the lamina rounded and usually cordate at the junction with the petiole. Tepals 2, pink, pale-blue or white. *Patil* 1244 A.

***A. crispus* Thunb.**

In a pond near Mohanlal Ganj. Common. In flower, 18-10-1958. Leaves all submerged, the lamina narrowed into the petiole. Tepals 1-3, white; much larger than in the preceding species. *Patil* 1273.

## POTAMOGETONACEAE

Submerged or floating aquatic herbs. Leaves alternate, except the involucrel ones. Flowers bisexual, very small, in erect, emerging, naked spikes. Tepals 4, green. Anthers 4, sessile on the claws of the tepals. Carpels 4, free, the ovules solitary. Fruit indehiscent, of drupelets *Potamogeton*  
**Potamogeton crispus** L.

In water, Chinhat Lake. Common. In flower, 13-2-1958. Leaves all submerged, linear, semi-amplexicaul, 3-nerved, with crisped and finely serrulate margins. *E.K.J.* 485.

## CYPERACEAE

Grass-like herbs. Leaves with closed sheathing bases but sometimes only the basal sheaths present. Flowers typically bisexual, in spikelets with each flower in the axil of a bract (glume); spikelets assembled to form an inflorescence subtended by o-many involucrel leaf-like bracts. Perianth reduced to scales or bristles, sometimes absent; stamens 1-3, the anthers basifixed; ovary superior, 1-locular, the ovule solitary, basal.

A Glumes of the spikelet distichous (2-ranked) *Cyperus*  
 AA Glumes of the spikelet not distichous (more than 2-ranked) ... .. *Scirpus*

**Cyperus compressus** L.

In a riverside field on the left bank of the Gomti, facing the National Botanic Gardens. Not common. With inflorescence, 25-9-1958. Spikelets  $\pm 1.5$  cm. long, flat, in subdigitate spikes at the ends of the rays of the simple umbel, the latter also bearing a sessile head of spikelets at the fork. Keel of the glumes produced into a strong mucro. *Patil* 1254.

**C. cyperoides** (L.) Kuntze (*Mariscus sieberianus* Nees)

At the side of a pool near Amausi aerodrome, with inflorescence, 23-9-1958. Up to 75 cm. in height. Spikelets  $\pm 3$  mm. long, cylindric, in five or more cylindrical spikes, each at the end of a short ray of the simple umbel. *Patil* 1703.

**C. exaltatus** Retz.

In flooded paddy fields on the way to Chinhat village by Fyzabad Road. Gregarious. With inflorescence, 26-9-1958. Stems 0.9-1.8 meters tall. Spikelets  $\pm 4$  mm. long, flat, in elongate spikes on the large compound umbel. *Patil* 1259.

**C. iria** L.

On moist ground near Amausi aerodrome, with inflorescence, 23-9-1958. Common. Up to 50 cm. in height. Spikelets  $\pm 1.2$  cm. long, in spikes on the compound umbel. Glumes orbicular-obovate when opened out. *Patil* 1701.

**C. kyllingia** Endl. (*Kyllingia monocephala* Rottb.)

On moist ground near Amausi aerodrome, with inflorescence, 23-9-1958. Up to 60 cm. in height.

Spikelets small, compressed, densely packed in a terminal ovoid head subtended by the leaf-like bracts. *Patil* 1702.

**C. rotundus** L.

A lawn weed at the Central Drug Research Institute. Common. With inflorescence, 17-9-1957. A glabrous perennial proliferating with thin stolons bearing ovoid black tubers. Stems up to 75 cm. high. Spikelets  $\pm 2$  cm. long, flat, in short spikes of 3-10 spikelets on the simple or compound umbel. *Patil* 464, 1221.

Hindi name: *Motha*.

**C. triceps** (Rottb.) Endl. (*Kyllingia triceps* Rottb.)

On moist ground by the side of a path near Carlton Hotel. Common. With inflorescence, 23-7-1958. Up to 25 cm. in height. Spikelets small, strongly compressed, densely packed in a terminal ovoid ternate head subtended by the leaf-like bracts. *Patil* 1220.

**Scirpus articulatus** L.

On wet ground at the sides of a pool near Mohanlal Ganj. Gregarious. With inflorescence, 28-11-1958. Stems in tufts, stout, terete, fistular, 30-60 cm. high, bearing the spikelets in a single dense lateral head usually close to the base. Basal sheaths present, leaves o. *Patil* 1283.

**S. lacustris** L.

In shallow water at the fringes of a pool near Mohanlal Ganj. Gregarious. With inflorescence, 26-12-1958. Stems 60-180 cm. high, close-packed on a horizontal rhizome. Spikelets discrete or clustered, in usually compound umbels that appear lateral on account of the upward prolongation of the lowest bract. Basal sheaths present, blades hardly any. *Patil* 1293.

**S. quinquefarius** Ham. Fig. 10.

On wet ground by the side of a pool near Mohanlal Ganj. Common. With inflorescence, 28-11-1958. Stems in tufts, slender, terete, up to 30 cm. high, the spikelets in a single dense lateral head, more or less midway. Basal sheaths present, blades hardly any. *Patil* 1284.

## GRAMINEAE

This family includes the grasses. For the key to the genera of the common grasses of Lucknow *vide* Patil (1960). Comprehensive keys leading to identification of the species are given by Bor (1960). Practically all the grasses included below are used locally for pasture or fodder, where available.

**Acrachne racemosa** (Heyne) Ohwi. (*Eleusine verticillata* Roxb.)

In National Botanic Gardens, with inflorescence, 16-7-1956. *E.K.J.* 7217.

**Apluda mutica** L.

On waste ground, east of Carlton Hotel, with inflorescence, 25-10-1957. Not common. The form

observed at Lucknow was awned but Bor (1960) puts both the awned and the unawned forms under *A. mutica* without distinguishing the varieties. *Patil* 481, 482.

*Hindi name*: Phuli.

**Bothriochloa pertusa** (L.) A. Camus. (*Amphilophus pertusa* Stapf)

Roadside, Amausi Airfield, with inflorescence, 30-8-1957. Common. *Patil* 451.

**Brachiaria ramosa** Stapf

At the border of a cultivated field, Bangla Bazaar, with inflorescence, 24-9-1958. Rather common. *Patil* 1711; *E.K.J.* 7204.

**Cenchrus ciliaris** L.

On waste area, Carlton Hotel, with inflorescence, 12-7-1956. Rather common. *E.K.J.* 7211.

**Chrysopogon aciculatus** (Retz.) Trin. (*Andropogon aciculatus* Retz.)

On moist ground near the lake, Chinhat, with inflorescence, 25-9-1958. Common. *Patil* 1713.

**Cynodon dactylon** Pers.

Roadside, Amausi Airfield, with inflorescence, 30-8-1957. Gregarious. *Patil* 452; *E.K.J.* 7209.

*Local use*: Planted in pure stands for lawn.

*Hindi name*: Doob.

**Dactyloctenium aegyptium** P. Beauv.

Roadside, Amausi Airfield, with inflorescence, 30-8-1957. Common. *Patil* 450; *E.K.J.* 7205.

**Desmostachya bipinnata** Stapf

Near Amausi Airfield, with inflorescence, 24-5-1957. Common. *E.K.J.* 7517.

*Local use*: Used in Hindu ritual. Corpses are laid on mats woven from this grass.

*Hindi name*: Kush.

**Dichanthium annulatum** Stapf

On open ground, near Amausi Airfield, with inflorescence, 25-4-1957. Very common. *E.K.J.* 7522.

*Hindi name*: Marwel.

**Digitaria adscendens** (HBK) Henr. (*D. marginata* Link.)

At the border of a cultivated field near Amausi Airfield, with inflorescence, 23-9-1958. Very common. *Patil* 1704; *E.K.J.* 7193.

**D. granularis** (Trin.) Henr. (*D. pedicellaris* Prain)

At the border of a cultivated field, near Amausi Airfield, with inflorescence, 23-9-1958. Rather common. *Patil* 1705.

**Echinochloa colonum** Link.

A weed in National Botanic Gardens, with inflorescence, 21-9-1957. Common. *Patil* 469.

*Hindi name*: Sama.

**E. crusgalli** P. Beauv.

On wet ground, lakeside, Chinhat, with inflorescence, 25-9-1958. Rather common. *Patil* 1712.

**Eleusine indica** Gaertn.

On waste area, Carlton Hotel, with inflorescence, 11-7-1956. Rather common. *E.K.J.* 7196.

**Eragrostis poaeoides** P. Beauv. (*E. minor* Host)

On open ground, near Amausi Airfield, with inflorescence, 25-5-1957. Rather common. *E.K.J.* 7518.

**E. tenella** (L.) P. Beauv. ex Roem. et Schult. (*E. tenella* var. *plumosa* Stapf)

A weed in National Botanic Gardens, 9-10-1957, with inflorescence. Common. The synonymy is discussed by Bor (1960). *Patil* 476.

**Eriochloa procera** (Retz.) C. E. Hubbard. (*E. ramosa* Kuntze)

On wet ground, lakeside, Chinhat, with inflorescence, 25-9-1958. Not common. *Patil* 1715.

**Hemarthria compressa** R. Br.

At the border of a pool, Bangla Bazaar, with inflorescence, 24-9-1958. Rather common. *Patil* 1709, *E.K.J.* 7208.

**Imperata cylindrica** P. Beauv.

On waste area, Carlton Hotel, with inflorescence, 11-7-1956. Rather common. *E.K.J.* 7200.

*Hindi name*: Chhir.

**Iseilema laxum** Hack.

Roadside, Amausi Airfield, with inflorescence, 30-8-1957. Common. *Patil* 454.

**Leptochloa chinensis** Nees

On wet ground, lakeside, Chinhat, with inflorescence, 25-9-1958. Not common. *Patil* 1716.

**L. panicea** (Retz.) Ohwi. (*L. filiformis* in F.B.I.)

On waste area, Carlton Hotel, with inflorescence, 11-7-1956. Not common. *E.K.J.* 7202.

**Oplismenus burmannii** P. Beauv.

In National Botanic Gardens, with inflorescence, 7-10-1957. Gregarious, forming a compact mat under the shade of trees. *Patil* 475.

**Oryza rufipogon** Griff.

In roadside ditches along Sitapur Road during the rains. Very common. This is the wild rice which is closely related to cultivated rice (*O. sativa* L.) but differing from it in having caducous spikelets. *CBL* 73.

*Local use*: The grain is sometimes eaten as a substitute for cultivated rice.

**Panicum antidotale** Retz.

In National Botanic Gardens, with inflorescence, 27-6-1956. *E.K.J.* 7186.

**Paspalidium flavidum** A. Camus.

On high ground near Chinhat Lake, with inflorescence, 25-9-1958. Rather common. *Patil* 1714.

**Paspalum distichum** L.

At the border of a flooded rice-field, Bangla Bazaar, with inflorescence, 24-9-1958. Common. *Patil* 1708; *E.K.J.* 7192.

**Pseudoraphis spinescens** (R. Br.) Vickery. (*P. aspera* Pilger)

In a pool, Bangla Bazaar, with inflorescence, 24-9-1958. Gregarious. *Patil* 1710.

**Saccharum bengalense** Retz. (*Erianthus munja* Jeswiet)

In hedges around the fields near Chinhat Lake, with inflorescence, 29-11-1958. Common. *Patil* 1289.

**Local use:** Often planted around the cultivated fields to form a fairly effective hedge since cattle do not feed on the mature leaves of this tall grass. **Hindi name:** *Munj*.

**Saccharum spontaneum** L.

On low-lying watery ground between Lucknow and Amausi with inflorescence, 5-9-1957. Very common. *Patil* 455, 456.

**Hindi name:** *Kans*.

**Setaria glauca** P. Beauv.

Roadside, Amausi Airfield, with inflorescence, 30-8-1957. Common. *Patil* 453.

**S. tomentosa** (Roxb.) Kunth. (*S. intermedia* Roem. et Schult.)

Roadside, Amausi Airfield, with inflorescence, 23-9-1958. Rather common in the shade of the trees. *Patil* 1706.

**S. verticillata** P. Beauv.

On waste area, Carlton Hotel, with inflorescence, 11-7-1956. Rather common. *E.K.J.* 7206.

**Sorghum halepense** Pers.

In a sugar-cane field near the Sugar-cane Research Institute, with inflorescence, 13-8-1957. Rather common. *Patil* 430; *E.K.J.* 7210.

**Sporobolus diander** P. Beauv.

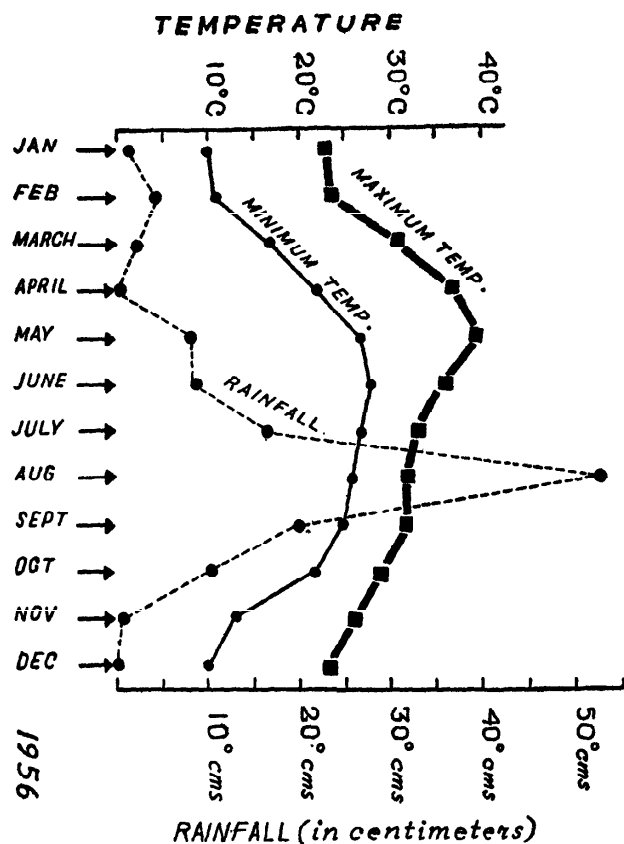
On waste area, Carlton Hotel, with inflorescence, 11-7-1956. Common. *E.K.J.* 7191.

**Urochloa panicoides** P. Beauv. var. **pubescens** (Kunth) Bor. (*U. helopus* Stapf)

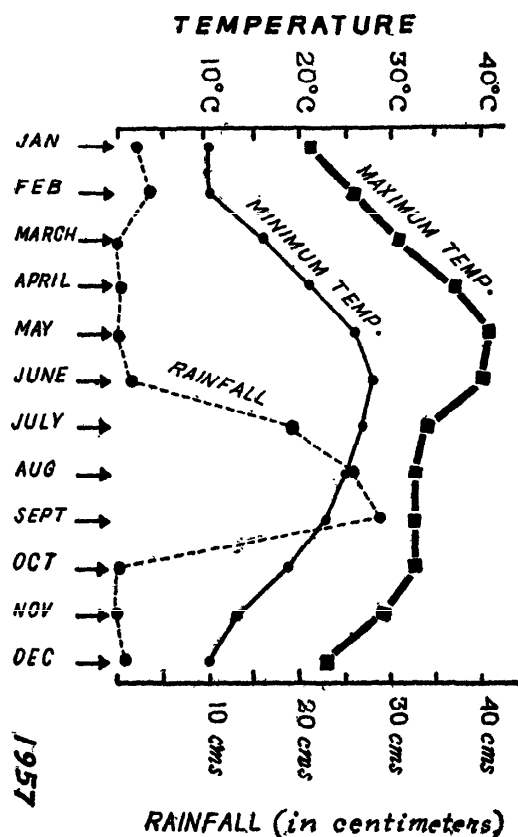
On open ground, near Amausi Airfield, with inflorescence, 25-5-1957. Rather common. *E.K.J.* 7523.

## LITERATURE CITED.

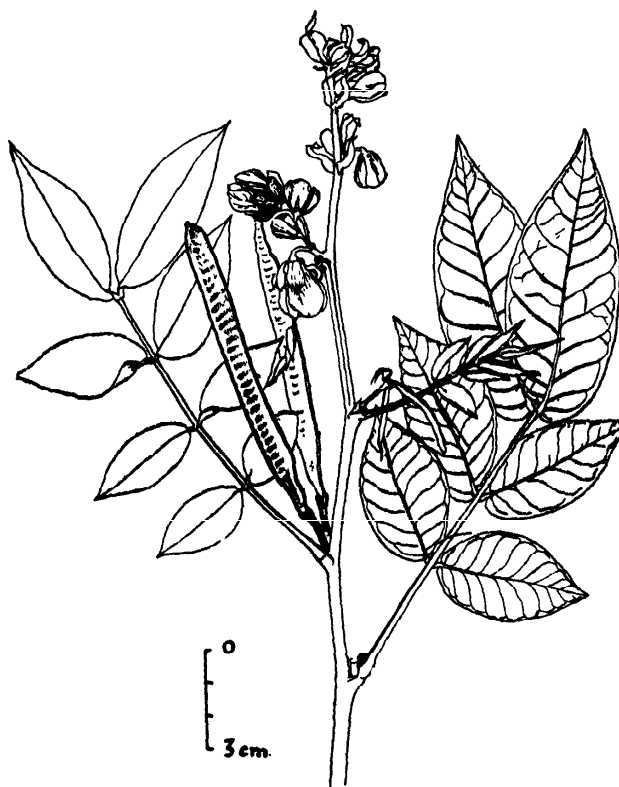
- ANONYMOUS. *The Wealth of India (Raw Materials)*, 5 Vols., 1948-59.
- BAILEY, L. H. *Manual of cultivated plants*. Revised edition, 1954.
- BENTHALL, A. P. *The trees of Calcutta and its neighbourhood*, 1946.
- BENTHAM, G. AND F. MUELLER. *Flora Australiensis*, vol. 2, 1864.
- BHARUCHA, F. R. The structural and physiological features of the Rajasthan Desert. *Proceedings of the Montpellier Symposium on Plant Ecology*, UNESCO, 34-36, 1955.
- BISWAS, K. AND C. C. CALDER. *Hand-book of common water and marsh plants of India and Burma*, 1936.
- BLATTER, E. AND W. S. MILLARD. *Some beautiful Indian trees*. Revised edition, 1954.
- BOR, N. L. Common grasses of the United Provinces. *Indian For. Rec. Bot.* 2(1) : 1-220, 1940.
- *The grasses of Burma, Ceylon, India and Pakistan*, 1960.
- BULLOCK, A. A. *Indicis nominum familiarum angiospermarum prodromus*. *Taxon* 7(1) : 1-35, 1958.
- CHATTERJEE, D. AND R. C. BHARADWAJ. Revision of the *Scrophulariaceae* of the Upper Gangetic Plain and adjoining areas. *Bull. bot. Soc. Beng.* 9(2) : 127-153, 1955.
- CHEESMAN, E. E. Classification of the bananas. III. Critical notes on species. *Kew Bull.*, No. 1, 11-28, 1948.
- DANSER, B. H. The *Loranthaceae* of French Indo-China and Siam. *Bull. Jard. bot. Buitenz.* 16(1) : 1-63, 1938.
- DATTA, S. C. AND B. MUKERJI. *Pharmacognosy of Indian root and rhizome drugs*, 1950.
- DUNGEON, W. A contribution to the ecology of the Upper Gangetic Plain. *J. Indian Bot.* 1 : 296-324, 1920.
- DUTHIE, J. F. *Flora of the Upper Gangetic Plain and of the adjacent Siwalik and Sub-Himalayan Tracts*, 3 vols., 1903-22.
- ENGLER, A. *Die natürlichen Pflanzenfamilien*, vol. 15a, 1930.
- GAMBLE, J. S. *Flora of the Presidency of Madras*, 1915-1936.
- HAINES, H. H. *The Botany of Bihar and Orissa*, 1921-25.
- HOOKE, J. D. et al. *The Flora of British India*, 7 vols., 1872-97.
- HUTCHINSON, J. *The families of flowering plants*, 2 vols., 1959.
- KIRTIKAR, K. R. AND B. D. BASU. *Indian Medicinal Plants*. Revised edition, 4 vols., 1933.
- MISRA, R. The status of the plant communities in the Upper Gangetic Plain. *J. Indian bot. Soc.* 38 : 1-7, 1959.
- MUKERJEE, S. K. A revision of the *Labiatae* of the Indian Empire. *Rec. bot. Surv. India* 14(1) : 1-228, 1940.
- OLDHAM, R. D. The deep boring at Lucknow. *Rec. geol. Surv. India* 23 (Part 4) : 261-66, 1890.
- PATIL, R. P. The flora of Lucknow and its environs. *Proc. 45th Indian Sci. Congr.*, Part III, 324, 1958.
- A key to the genera of the common grasses of Lucknow and its environs. *Proc. Indian Acad. Sci.* 51B : 122-132, 1960.
- RAIZADA, M. B. Recently introduced or otherwise imperfectly known plants from the Upper Gangetic Plain. *Indian For. Rec. Bot.* 1(5) : 223-236, 1939.
- New or noteworthy plants from the Upper Gangetic Plain. *Ibid.* 4(3) : 65-72, 1950.
- New plant records for the Upper Gangetic Plain. *Proc. nat. Inst. Sci. India* 24B(4) : 198-208, 1958.
- SANTAPAU, H. Notes on the *Solanaceae* of Bombay. *J. Bombay nat. Hist. Soc.* 47 : 652-62, 1948.
- The *Acanthaceae* of Bombay. *Univ. Bombay Bot. Mem.* No. 2, 1-104, 1951.
- The Flora of Khandala on the Western Ghats of India. *Rec. bot. Surv. India* 16(1) : xxvii, 1-396, 1953.
- *The Flora of Purandhar*, 1957.
- SHARMA, V. C. Lucknow. *Uttar Pradesh District Gazetteers*, vol. 37, 1959.
- SULOCHANA, C. B. Indian species of *Rauwolfia*. *J. Indian bot. Soc.* 38 : 575-594, 1959.
- VAN STEENIS, C. G. G. J. et al. *Flora Malesiana*, ser. 1, vol. 4, 1948-1954.
- VARMA, S. C. Some ecological aspects of the Upper Gangetic Flora. *J. Indian bot. Soc.* 15 : 247-267, 1936.
- WATT, G. *Dictionary of the economic products of India*, 6 vols., 1889-96.



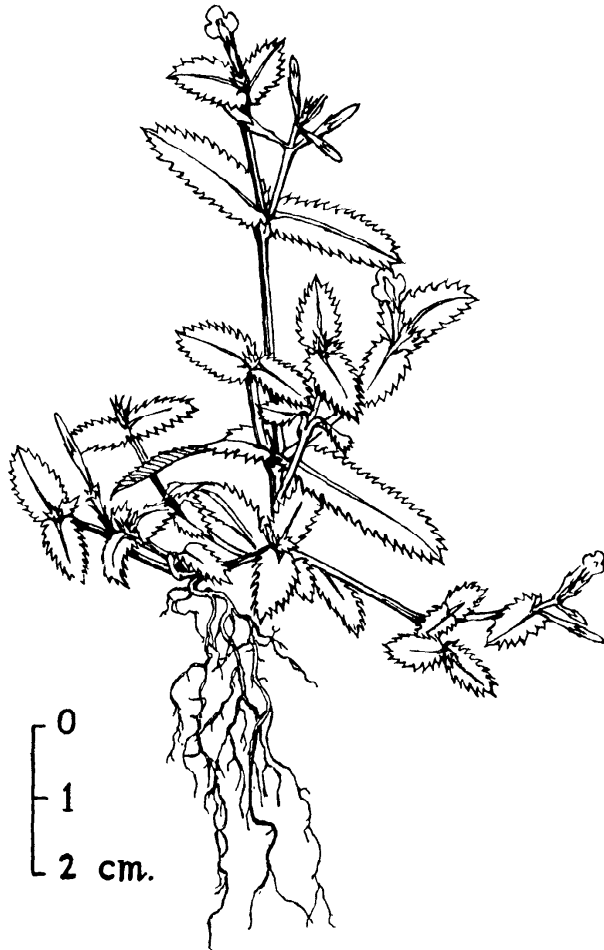
1. Lucknow : monthly rainfall, maximum and minimum monthly temperature in 1956.



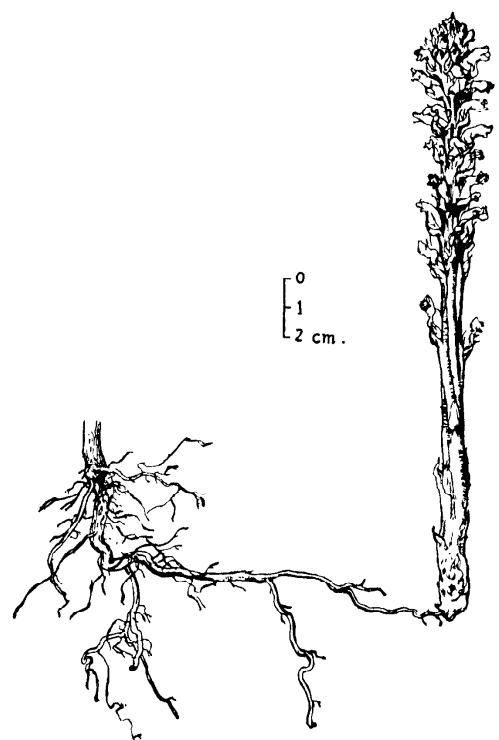
2. Lucknow : monthly rainfall, maximum and minimum monthly temperature in 1957.



3. *Cassia occidentalis* L.

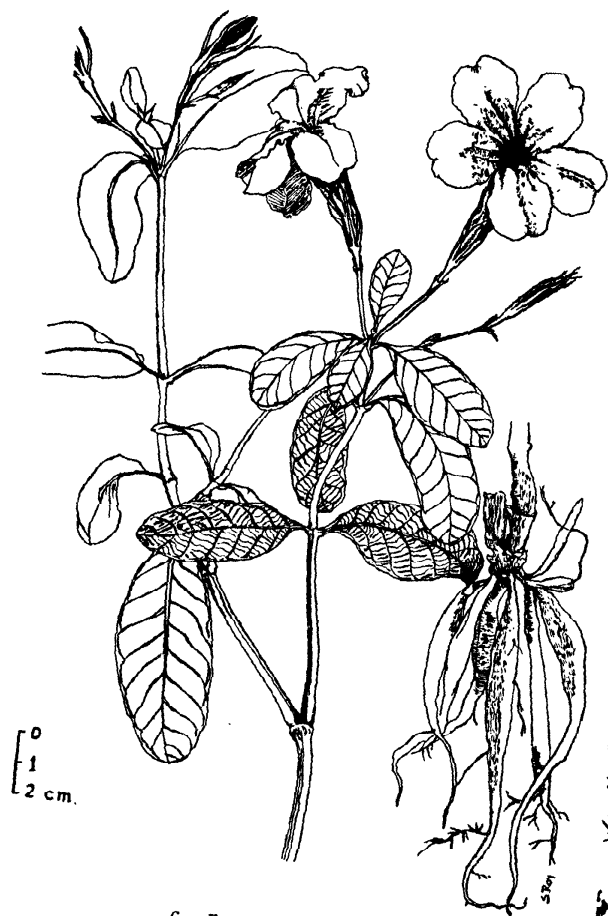


4. *Lindernia ciliata* (Colson.) Pennell.

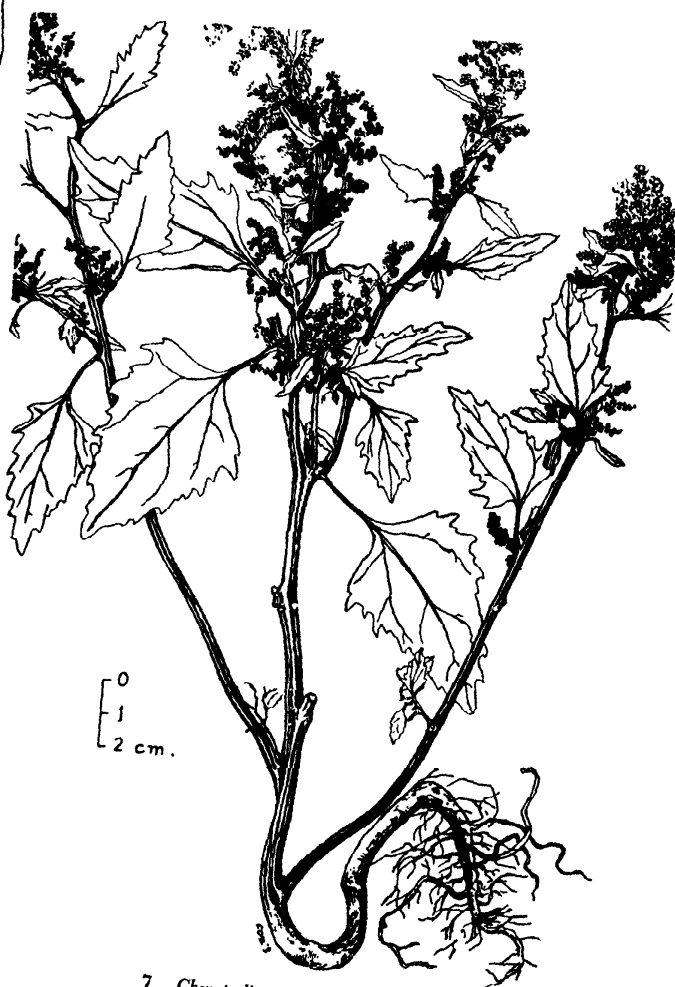


5. *Orobanche cernua* Locfl.

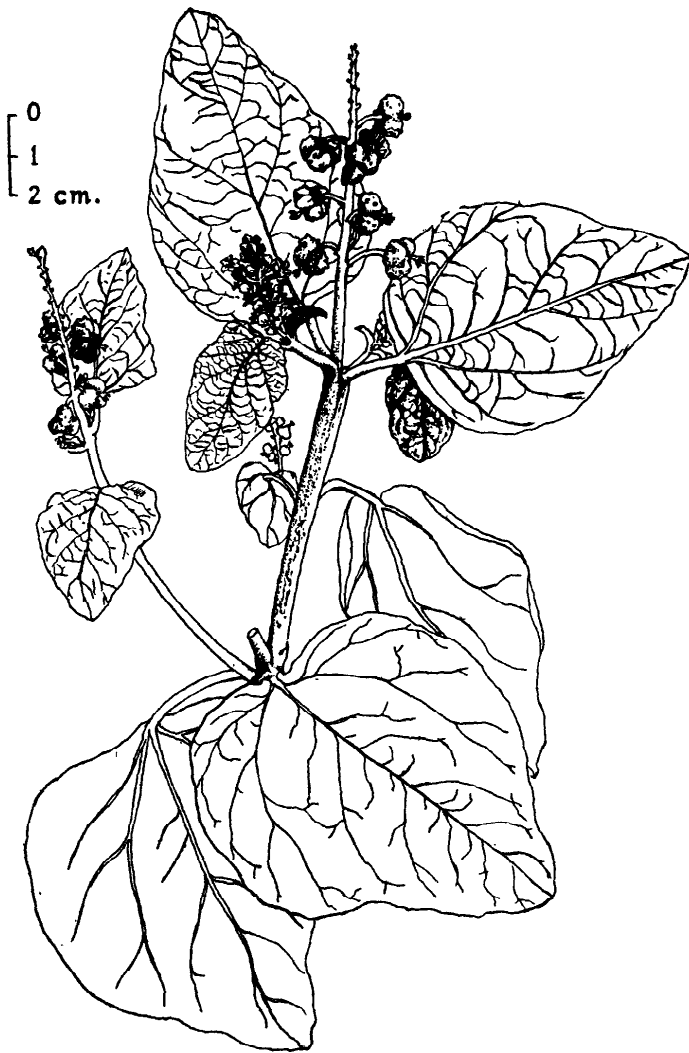




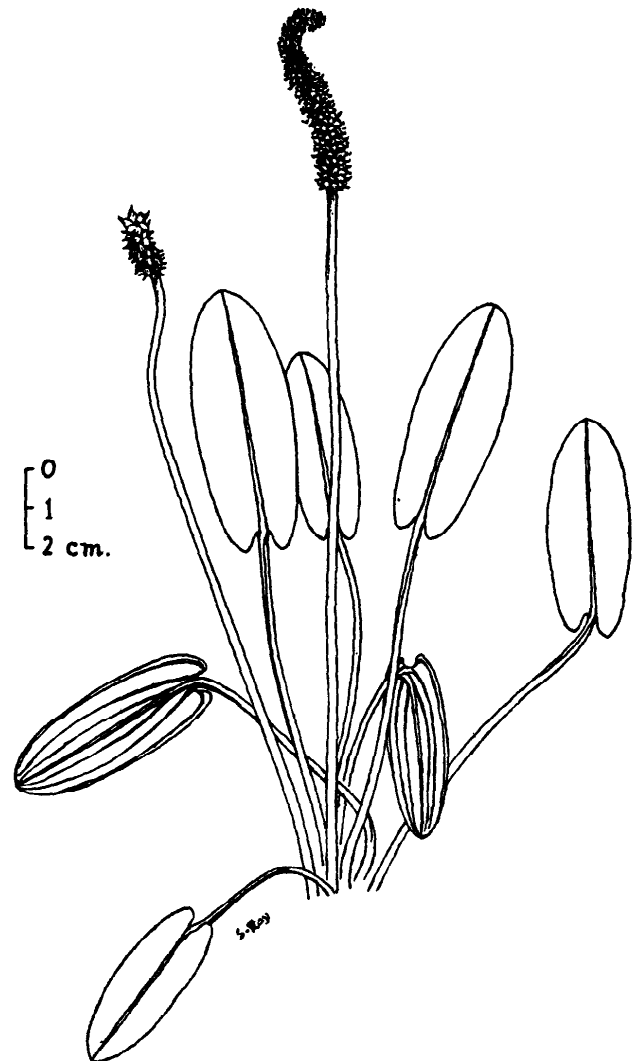
6. *Ruellia tuberosa* L.



7. *Chenopodium murale* L.

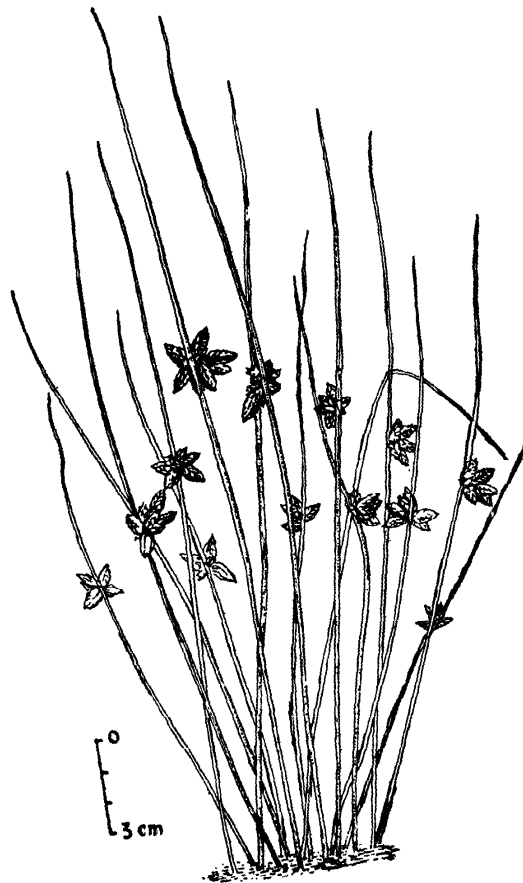


8. *Chrozophora rotleri* Juss. ex Spreng.



9. *Aponogeton natans* Engl. et Kr.

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10. *Scirpus quinquefarius* Ham.