

Family-Malvaceae:

There are about 82 genera and 1,500 species in this family.

Bentham & Hooker (1862)	Engler & Prantl (1931)	Hutchinson (1959)
Phanerogams	Phanerogams	Angiospermae
Dicotyledones	Dicotyledones	Dicotyledones
Polypetales	Archichlamydeae	Lignosae
Thalamiflorae	Malvales	Malvales
Malvales	Malvaceae	Malvaceae

Distribution:

The members of this family are cosmopolitan in their distribution. They are specially found in tropical regions of the world. Several species of this family have been reported from our country, e.g., Hibiscus, Sida, Malvastrum, Malva, Abutilon, Gossypium, etc. Several of them are wild and some are commonly cultivated in gardens, e.g., Althaea rosea. However, the most important member of the family is the genus Gossypium, from which various cottons are obtained.

Habit:

The plants may be herbs, shrubs or trees. A few plants are annual or sometimes perennial herbs, e.g., Abutilon, Malva, Malvastrum, Hibiscus sp., etc., they may be under shrubs, e.g., Sida cordifolia, S. carpinifolia, etc. The species of Hibiscus, may be herbs, shrubs or even small trees. H. rosa-sinensis is a large ornamental shrub with beautiful red flowers. H. mutabilis is a small ornamental tree.

Root:

Tap and branched.

Stem:

The stem is erect, herbaceous or woody, branched, cylindrical, solid usually with stellate hairs. Mucilage sacs occur abundantly in the tissues.

Leaves:

The leaves are simple, alternate, round or palmately divided, stipulate, usually palmately veined. The leaves bear stellate hairs. Mucilage sacs are also found.

Inflorescence:

The inflorescence is of cymose type, very rarely racemose. This may be solitary axillary terminal, or compound cyme.

Flower:

The flowers are usually pedicellate, bracteolate (the bracteoles are arranged in a whorl known as epicalyx), actinomorphic regular, hermaphrodite, complete, hypogynous and pentamerous.

Calyx:

It consists of five sepals, gamosepalous, i.e., the sepals are united to each other, sepaloid, inferior, and the aestivation is valvate.

Corolla::

It consists of five petals, polypetalous but the petals are inferior and the aestivation is twisted. The petals are variously coloured.

Androecium:

It consists of indefinite stamens, the stamens are found arranged on a staminal tube. The stamens are monadelphous. The staminal tube remains united at the base to the petals, and therefore, the condition is known to be epipetalous. The filaments are short and the anthers are monothecous, i.e., one celled and dorsifixed. The anthers dehisce transversely. The stamens are derived from profuse branching of five antipetalous stamens. The outer whorl has been lost, but however, represented in Hibiscus by five staminodes.

Gynoecium:

It consists of 5 to indefinite carpels (polycarpellary), syncarpous. The ovary is superior and multilocular. Each loculus bears one to many ovules. The placentation is axile. The styles are united but the stigmas are free. The style passes through the staminal tube. The number of stigmas is as much as the number of carpels. In Hibiscus the carpels are five, in Althaea rosea the number is ten and in Abutilon the number of carpels is indefinite.

Fruit:

The fruit is loculicidal capsule or schizocarp. It splits into a large number of mericarps. The number of mericarps is equal to the number of carpels. In Hibiscus and Gossypium the fruit is loculicidal capsule.

Seed:

The seeds are usually buried in a hairy covering formed from the testa. The reniform or ovoid in shape. The embryo possesses large much folded cotyledons. The endosperm is scanty.

Pollination: Entomophilous

Description of some important plants in semi-technical language:

1. *Hibiscus rosa-sinensis*

Habit:

Ornamental perennial shrub.

Root:

Tap, branched.

Stem:

Erect, woody, branched, cylindrical, glabrous and solid.

Leaf:

Simple, alternate, petiolate, stipulate, ovate, serrate, glabrous, apex acuminate, multicostate reticulate venation.

Inflorescence:

Cymose, solitary axillary.

Flower:

Pedicellate, hermaphrodite, large, showy, pentamerous, actinomorphic, complete, hypogynous.

Epicalyx:

5-7 bracteoles constitute epicalyx below calyx.

Calyx:

Five sepals, gamosepalous, green, inferior, valvate aestivation:

Corolla:

Five petals, polypetalous, slightly united below, adnate to the staminal tube, inferior twisted aestivation.

Androecium:

Stamens indefinite, monadelphous, stamens form a staminal tube round the style, epipetalous, anthers monothecus, reniform, basifixed.

Gynoecium:

Five carpels (pentacarpellary), syncarpous ovary superior, pentalocular, axile placentation, style long and passes through the staminal tube ending in five distinct rounded stigmas.

Fruit:

In other species of Hibiscus, loculicidal capsule.

Floral Formula :



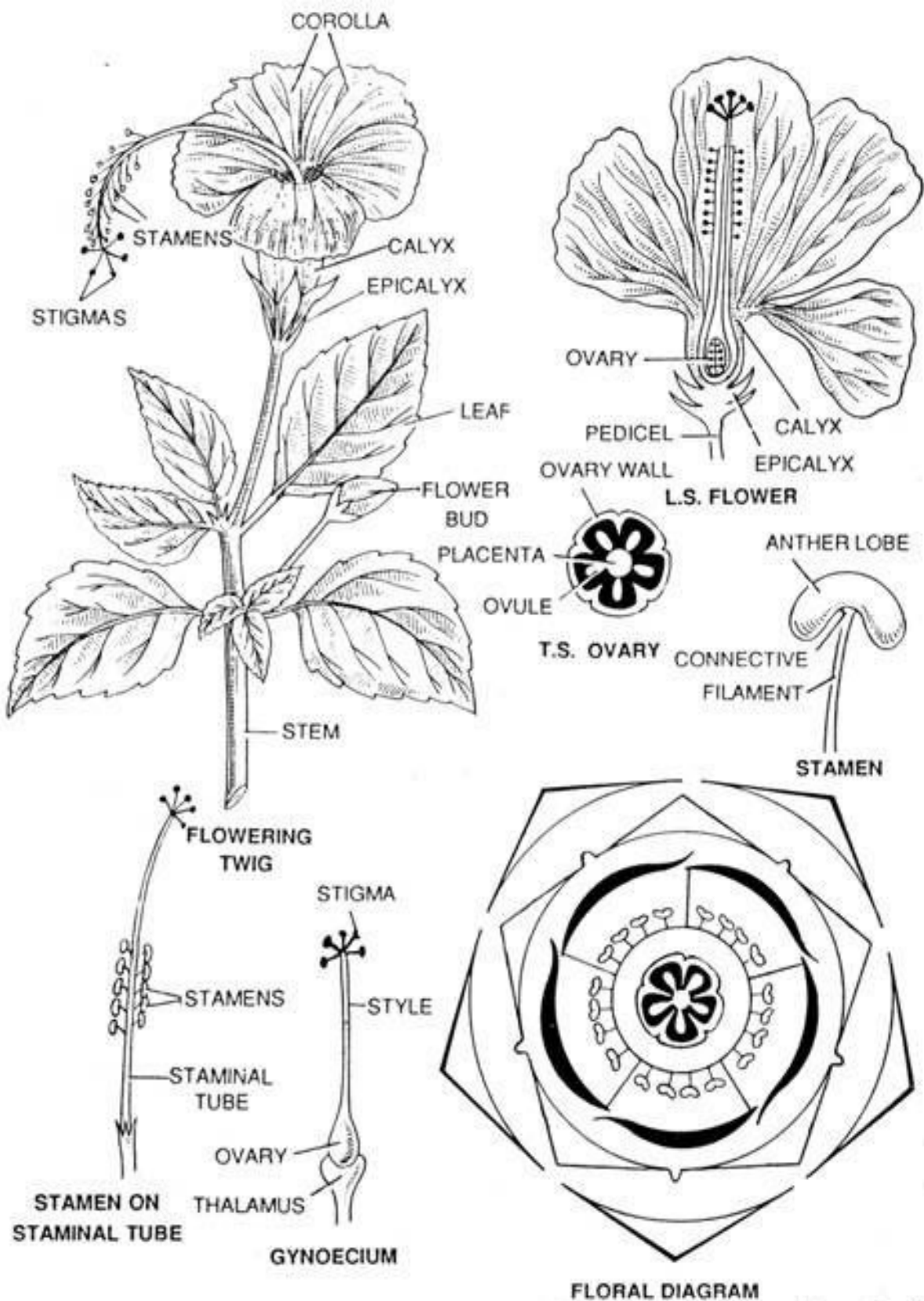


Fig. 16.2. Malvaceae. *Hibiscus rosa sinensis* Linn. Eng., China shooeflower, Verna. Gurhal.

2. *Abutilon indicum*; Verna-Kangi.

Habit:

Annual or perennial herb or undershrub.

Root:

Tap, branched.

Stem:

Erect, branched, herbaceous, solid, hairy, green.

Leaves:

Simple, alternate, petiolate (petiole usually longer than blade), broadly cordate, acute or acuminate apex, irregularly toothed, pale, minutely pubescent on both surfaces, entire, multicostate reticulate venation.

Inflorescence:

Cymose, solitary axillary.

Flower:

Pedicellate (pedicels longer than the petioles and jointed near the top), one inch – diameter, hermaphrodite, actinomorphic, complete, hypogynous.

Calyx:

Five sepals, gamosepalous, shallow, ovate acute, persistent valvate aestivation: Corolla: Five petals, polypetalous, free above, connate below and adnate to the staminal tube, orange, yellow, petals spreading imbricate aestivation.

Androecium:

Indefinite stamens, staminal tube dividing at the top into numerous anther bearing filaments, monadelphous, anthers one-celled, basifixed, dehisce longitudinally.

Gynoecium:

15-20 carpels (polycarpellary), carpels longer than the calyx, with short spreading awns, hairy, syncarpous, ovary superior, multilocular, axile placentation, many ovules in each locule.



Floral Formula:

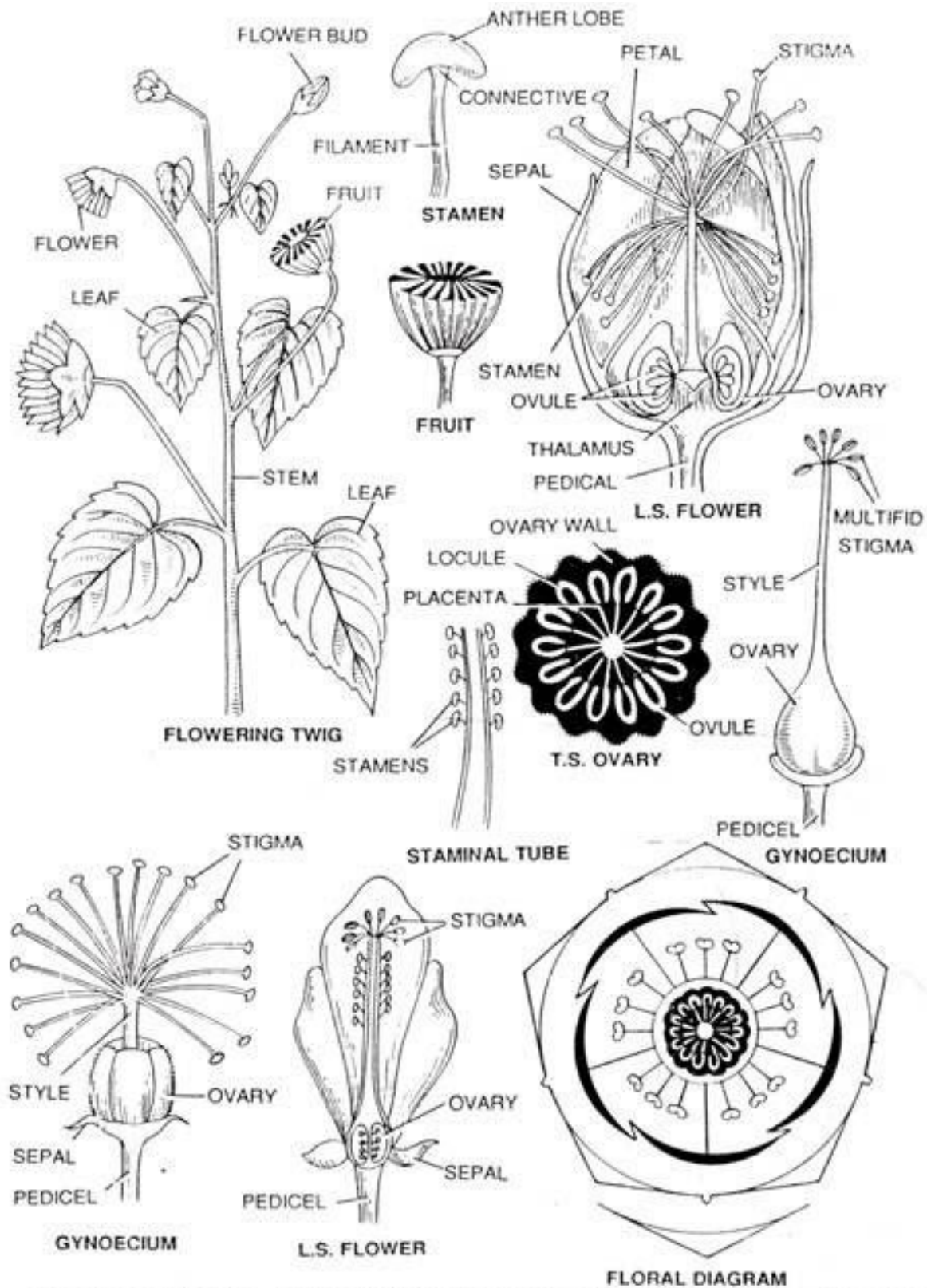


Fig. 16.3. Malvaceae—*Abutilon indicum* (Linn) Sweet. Eng. Country mallow, Verna. Kangi

Economic Importance of Family – Malvaceae:

The family is of great economic value as it contains valuable fibre yielding plants. Some plants are of medicinal value and some are highly ornamental.

The important plants are as follows:

1. *Abutilon asiaticum*; Eng. Don (Verna-Kanghi)- A shrub, cultivated for its stem fibre, which is used for ropes and cordage.
2. *Abutilon indicum*, (Eng.-Indian *Abutilon*; Verna-Kanghi). The stems, on retting, yield a fibre, which is used for making ropes.
3. *Abutilon polyandrum*. The stem fibre is used for manufacturing ropes and cordage. Found in North Western India, the Western Peninsula and the tropical Himalayas.
4. *Abutilon theophrasti*; Syn. *A. avicennae* Gaertn. (Eng.-China jute; Verna-Nahani khapat)- A herb. Its stem fibre called China jute; is used in rug making. Found in North-West India, Kashmir and Bengal.
5. *Althaea rosea*, (Eng.-Hollyhock; Verna-Gulkhera). An ornamental herb. Its flowers yield a red dye.
6. *Abelmoschus esculentus*; Syn. *Hibiscus esculentus*; (Eng.-Lady's finger; Verna-Bhindi)- The fruits are used as vegetable and stalks are sometimes used for making fibres. Native of Tropical Africa, now cultivated throughout India.
7. *Abelmoschus manihot*, (Syn. *Hibiscus manihot*: Verna-Ran bhindi)- The fibre, obtained from the stem, is used for making wrapping cloth. Found in Bengal, the Western Ghats, South Kanara and Travancore.
8. *Abelmoschus moschatus*, Syn. *Hibiscus abelmoschus*', (Verna-Mushkdana)-Source of a fibre, which is used for cloth. The seed-oil is used in perfumery. Found in the hilly regions of Deccan and Karnatak.
9. *Gossypium arboreum*, Syn. *G. indicum*, *G. neglectum*', (Eng.-Tree cotton; Verna-Kapas, Rui)-A shrub cultivated all over India as a fibre plant. The fibre obtained from the surface of the seeds, is utilized in the manufacture of textiles of all types, rubber-tyre fabrics and other woven products. The stalks are used for making paper. The cotton seed and the seed cake are used as fodder and the oil from the seed is edible.

10. *Gossypium arboreum* var. *nadam*, Syn. *G. barbadense*', (Eng.-Egyptian cotton; Verna-Kapas, Rui).-It is native of tropical America, grown mainly in Malabar and South Kanara. The fibre obtained from the surface of the seeds, is utilized in the manufacture of textiles and the seed oil is edible.

11. *Gossypium herbaceum*; (Eng-Asiatic cotton; Verna-Kapas)-Cultivated mainly in Maharashtra, Tamil Nadu, Andhra Pradesh and Karnataka. The fibre obtained from the seeds is used in making cloth and other woven products. The oil-cake is used as fertilizer and fodder.

12. *Gossypium hirsutum*', Syn. *G. mexicanum* (Eng.-Upland cotton; Verna-Kapas)- Grown chiefly in the Punjab, Uttar Pradesh, Rajasthan, Madhya Pradesh, Tamil Nadu and Maharashtra. The fibre obtained from the seeds, is utilized in the manufacture of textiles, rubber-tyre fabrics and other woven products. The cotton seed and cake are used as fodder and the seed oil is edible.

13. *Hibiscus cannabinus*; (Eng.-Kenaf, Verna-Patsan)-A herb grown in West Bengal, Andhra Pradesh, Assam, Bihar and the Punjab. The fibre obtained from the stem, is used for making ropes cordage and paper pulp and the seed oil is edible.

14. *Hibiscus collinus*; A small tree grown as an ornamental.

15. *Hibiscus ficulneus*; Syn. *Abelmoschus ficulneus*; Verna-Ran Bhindi-A herb, found in the Punjab, Bengal and South India. The mucilaginous extract of the green stem is used for clarifying sugar juice and the seeds are used for flavouring purposes.

16. *Hibiscus urcatus* Roxb.-Found in Assam, Madhya Pradesh, Orissa, Andhra Pradesh, Bengal and Karnataka. The leaves are edible and the stem fibre is used for flavouring purposes.

17. *Hibiscus macrophyllus*; Roxb. (Verna-Baiza)-A small shrub, found in Bengal and the Eastern Peninsula. The stem fibre is used for ropes and cordage.

18. *Hibiscus mutabilis*', (Eng.-cotton rose; Verna-Guliajaib)-A bushy shrub; native of China. The bark yields a fibre, which is used for ropes and cordage.

19. *Hibiscus rosa-sinensis*', (Eng.-Rose of China; Verna-Gurhal)-A common ornamental shrub, the flowers yield a dark purplish dye, which is used for making shoe-polishes.

20. *Hibiscus sabdariffa*; (Verna-Patwa)- A shrub native of the West Indies, now grown in Andhra Pradesh, Bihar, the Punjab, Assam and Tamil Nadu. The stem fibre is utilized for making ropes and cordage and the red fleshy epicalyx is edible.
21. *Hibiscus schizopetalous*; (Eng-coral Hibiscus)-A shrub, native of East Africa, grown as an ornamental for its orange-red flowers.
22. *Hibiscus surattensis*; (Verna-Ranbhindi)-A herb cultivated mainly in Bengal. The leaves are edible and the stem fibre is used for rough cloth and cordage.
23. *Hibiscus syriacus*; (Verna-Swet jaha)-A shrub native of China and Japan, now cultivated all over India for its edible flowers.
24. *Hibiscus tiliaceus*; Syn. *Paritium tiliaceum*; (Eng.-Cuban bast; Verna-Chelwa)- Commonly found along the coasts of both the Peninsulas and in the Sunderbans. The leaves are edible and the bark fibre is used for ropes and mats.
25. *Hibiscus vitifolius*; (Verna-Ban kapas)-Found in Northern India and Madhya Pradesh. The bark is the source of strong fibre.
26. *Malachra capitata*, (Eng.-cork wood: Verna-Ranbhindi)-A herb, found throughout the hotter parts of the country. The stem fibre is used for cloth, twines and ropes.
27. *Urena lobata*; Syn. *U. sinuate*; (Verna-Vilayati san)-A small shrub, commonly found in Bengal. The stem fibre is a substitute for jute, and is used for cordage ropes and coarse fabrics. The mucilaginous seeds are used for making soap.