

Apocynaceae: Characters, Distribution and Types

TOPIC DISCUSSED

1. **Characters of Apocynaceae**
2. **Distribution of Apocynaceae**
3. **Economic Importance**
4. **Affinities**
5. **Important Types.**

Characters of Apocynaceae:

Herbs, shrubs and trees, often twining, usually with white latex; leaves are alternate, simple, exstipulate, usually opposite or whorled, entire margin with latex; flowers' hermaphrodite, actinomorphic, hypogynous; calyx free or united; corolla gamopetalous, 5 lobed, campanulate or funnel-shaped, valvate or twisted; androecium epipetalous, introrse; gynoecium bicarpellary, syncarpous, ovary superior, united by the styles only; fruit-follicle or berry; seeds with crown of hairs.

A. Vegetative characters:

Habit:

Herbs (Catharanthus), shrubs (Carissa, Nerium), twinners (Vallaris), tree (Alstonia) with latex.

Root:

A much branched tap root system.

Stem:

Usually herbaceous (Catharanthus) erect, woody, solid, branched, green or succulent with latex.

Leaves:

Simple, opposite (Catharanthus) or whorled (Nerium), petiolate or sub-sessile, exstipulate, margin entire, unicostate reticulate venation.

B. Floral characters:

Inflorescence:

Usually cymose either terminal or axillary, may be cyme (Carissa) or umbellate cyme (Rauwolfia).

Flower:

Bracteate or ebracteate, pedicellate, complete, hermaphrodite, actinomorphic, tetra or pentamerous, often with corona.

Calyx:

Sepals 5, rarely 4, gamo- or polysepalous, deeply lobed, small, often glandular at the base, imbricate or valvate.

Corolla:

Petals 5, gamopetalous forming a corolla tube which may be long or short, corona present (hairy scales or outgrowth), usually twisted, sometimes imbricate, rarely valvate.

Androecium:

Stamens 4 to 5, epipetalous, alternipetalous, filament short, free, ditheous, connate to stigma, dehiscent longitudinally, introrse.

Gynoecium:

Bicarpellary, syncarpous ovaries are free below but united by style only, superior style short, enclosed in a tube formed by the corolla; stigma thickened distally; when ovaries are free each ovary is unilocular with marginal placentation but when ovaries are fused then axile placentation.

The seeds of *Thevetia* contain Thevetine a poisonous glycoside. The latex of *Acokanthera* is used for poisoning arrows. The bark and wood of *Nerium indicum* provide rat-poison.

5. Ornamental:

Nerium, *Catharanthus* (syn. *Vinca*), *Thevetia*, *Wrightia*, *Allamanda* are cultivated in gardens as ornamentals.

Primitive characters:

1. Plants mostly trees and shrubs (*Nerium*, *Thevetia*).
2. Leaves simple.
3. Flowers hermaphrodite, hypogynous and actinomorphic.
4. Gynoecium superior (*Nerium*, *Catharanthus*).
5. Seeds endospermic.

Advanced characters:

1. Plants rarely herbs (*Catharanthus*).
2. Leaves exstipulate.
3. Inflorescence cyme.
4. Calyx gamosepalous.
5. Corolla gamopetalous.
6. Stamens epipetalous.
7. Gynoecium bicarpellary and syncarpous.
8. Fruit simple.

Affinities of Apocynaceae:

The family Apocynaceae is closely related to Asclepiadaceae and has been placed with it by taxonomists. Hallier included the Asclepiadaceae with the Apocynaceae and derived them from the

Linaceae. Bessey accepted the two families as distinct and treated both in his Gentianales.

Hutchinson placed the family in his order Apocynales and considered it to be derived from stock ancestral to Loganiaceae.

Common plants of the family:

1. Nerium indicum (syn. N. odorum, H. Kaner):

Cultivated in gardens for ornamental purpose, evergreen shrub.

2. Carissa carandus (H. Karaunda):

Spiny shrub, fruits are used as vegetable and pickles.

3. Catharanthus roseus (H. Sada Bahar):

Small evergreen herb.

4. Rauwolfia serpentina (H. Chotachand):

Found in sub-Himalayan tracts. The roots of this plant are hypnotic, sedative and reduces blood pressure.

5. Thevetia peruviana:

Evergreen shrub with highly poisonous milky juice and bitter bark.

6. Plumeria alba:

Indian ornamental tree with pleasant smell.

7. Wrightia tomentosa:

A small deciduous tree; the bark of stem and roots is antidote to snake bite.

8. Baissea multiflora:

A climber with beautiful scented flowers.

9. Apocynum cannabinum:

An ornamental and yields fibres.

Division of the family and chief genera:

Schumann classified the family into two sub-families and five tribes as follows:

I. Sub-family. Plumierioideae:

Stamens free or closely joined to styler head; thecae full of pollen, rarely with spines; seeds usually hairless.

Tribe 1. Arduineae:

Syncarpous, style not split at the base e.g. *Ardunia*, *Allamanda*, *Carpodinus*.

Tribe 2. Pleiocarpeae:

Apocarpous, style split at the base, e.g. *Pleiocarpa*.

Tribe 3. Plumiereae:

Apocarpous, -bicarpellary, style split at the base, e.g. *Rauwolfia*, *Catharanthus*, *Alstonia*.

II. Sub-family. Apocynoideae:

Stamens firmly joined to styler head, thecae empty at base, seeds hairy.

Tribe 4. Apocynae:

Anthers included, e.g. *Apocynum*, *Nerium*.

Tribe 5. Parsonsieae:

Anthers exerted, e.g. *Wrightia*.

Important Types of Apocynaceae:

1. *Catharanthus roseus* (syn. *Vinca rosea*) (Fig. 74.1):

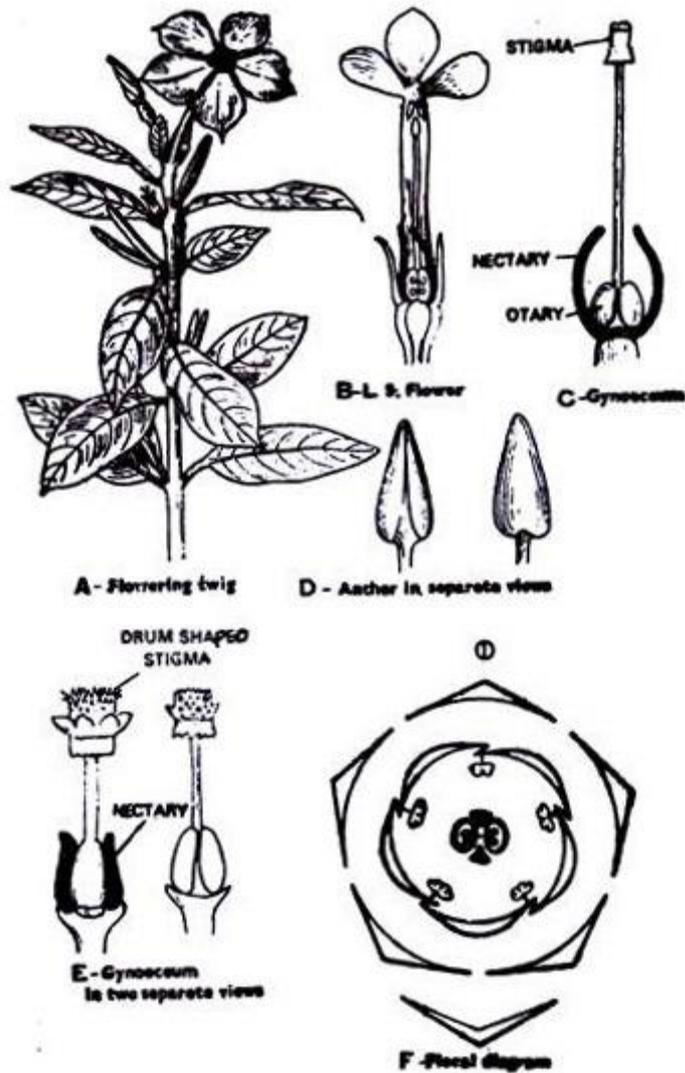


Fig. 74.1. *Catharanthus roseus*.

Habit:

Perennial herb.

Root:

Branched tap root system.

Stem:

Herbaceous erect, cylindrical, solid, branched, glabrous, and green.

Leaves:

Cauline, ramal, opposite decussate, simple, exstipulate, petiolate, ovate, entire acute, unicostate reticulate venation.

Inflorescence:

Solitary axillary or in pairs.

Flower:

Bracteate, pedicellate, complete, hermaphrodite, actinomorphic, pentamerous, hypogynous, red, pink or white.

Calyx:

Sepals 5, gamosepalous, quincuncial or imbricate aestivation, glandular, inferior.

Corolla:

Petals 5, gamopetalous, tubular and rotate, corona at the throat of corolla tube, twisted aestivation, pink or white.

Androecium:

Stamens 5, epipetalous, alternating with the petals, inserted near the mouth of the tube, sagittate, filaments short, anthers adhering to stigma, stamens with long hairy appendages upwards and rigid spoon like appendages downward, anthers basifixed, introrse.

Gynoecium:

Bicarpellary, syncarpous, superior, bilocular, axile placentation, style long, stigma drum shaped.

Floral formula:

$Br \oplus \text{♀} K_{(5)} \overset{\frown}{C}_{(5)} A_5 \underline{G}_{(2)}$