The Flower

Morphology of Herbaceous Plants

A herbaceous plant is a plant that has leaves and stems that die down at the end of the growing season to the soil level.

Types of herbaceous plants

A herbaceous plant can be:

- Annual
- Biennial
- Perennial

Annual herbaceous plants die completely at the end of growing season after they have flowered and fruited.

Perennial and biennial herbaceous plants also die at the end of growing season, but parts of the plants survive under or close to the ground from season to season. In such plants, new growth forms are produced from these remains.

Other Features of Herbaceous Plants

The stems of the herbaceous plants are soft and fleshy. Many herbaceous plants are characterised by bold, bright flowers. The foliage is also bold and colourful.

The stems are aerial or underground and may show modifications such as rhizome, bulb, or corm. The aerial stem may be erect, prostrate, or climbing.

The roots are adventitious and are usually fibrous.

The leaves show parallel venation. They may show different types of phyllotaxy (alternate, opposite, or whorled). They may be scaly, leathery, fleshy, or modified into spines.

Solve this puzzle and check your understanding.

Inflorescence is basically racemose and sometimes solitary also as in *Tulip* and *Biloriosa*. In several cases, the inflorescence possesses a leafless peduncle called scape.

Flowers can be bracteate or ebracteate usually bisexual but can be unisexual rarely as in *Smilax*. Flowers are generally trimerous (rarely bimerous or tetramerous). The accessory floral organs such as petals and sepals are undifferentiated and are collectively called perianth.

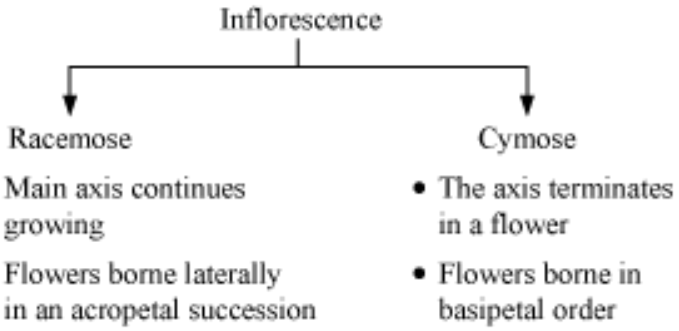
Seed is endospermic and monocotyledonous.

The leaves, roots, flowers, seeds, resins, berries, etc. of herbaceous plants have variety of applications. They are widely used for medicinal purposes, for culinary purposes to provide flavour to the food, as ornamental plants, etc.

Inflorescence

The Inflorescence

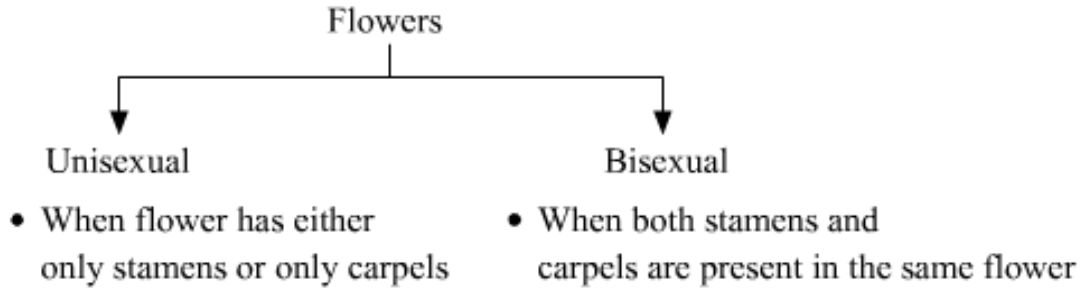
- The arrangement of flowers on floral axis is termed as inflorescence.
- Flower is a modified shoot. Modifications that occur in shoot to give rise to inflorescence are as follows:
- Apical meristem changes into floral meristem.
- Internodes do not elongate and axis gets condensed.
- Different kinds of floral appendages are produced at nodes in place of leaves.
- When shoot tip is modified into flowers, the flower is always solitary.
- Based on arrangement on the floral axis, inflorescence is of two types:



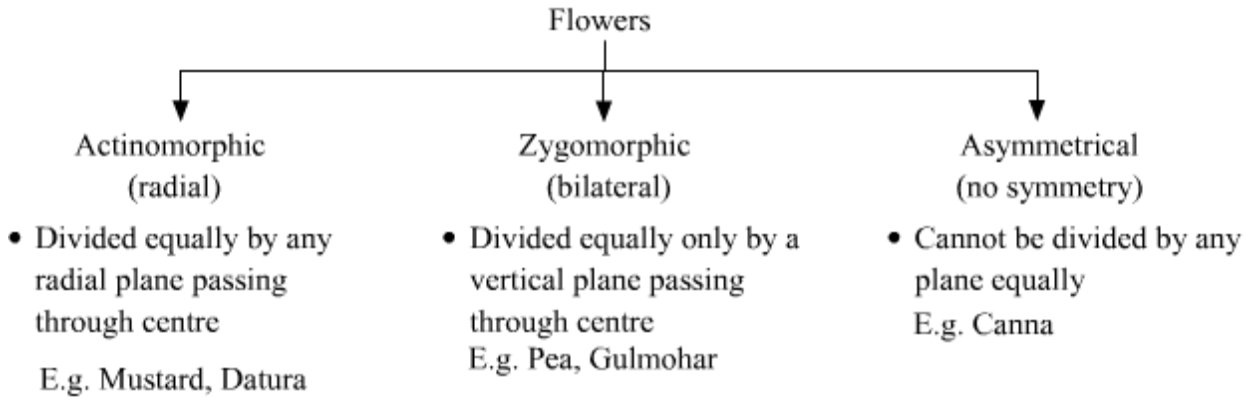
Flower

- Reproductive unit in angiosperms

- Thalamus (receptacle) is the swollen end of stalk (pedicel). On the thalamus, 4 different kinds of whorls are arranged:
- Androecium (reproductive organb)
- Gynoecium (reproductive organ)
- Calyx (accessory organ)
- Corolla (accessory organ)
- Perianth − When calyx and corolla are not distinct, together they are called perianth.
- Based on sexuality, flowers can be divided into:

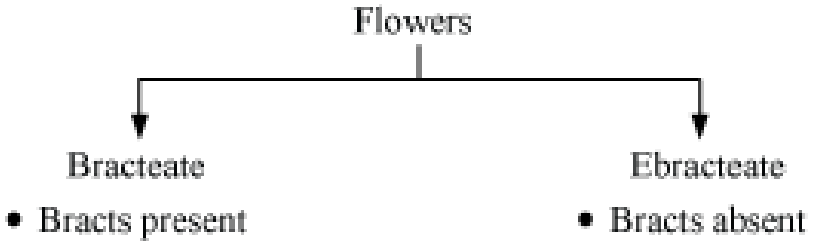


- Based on symmetry:

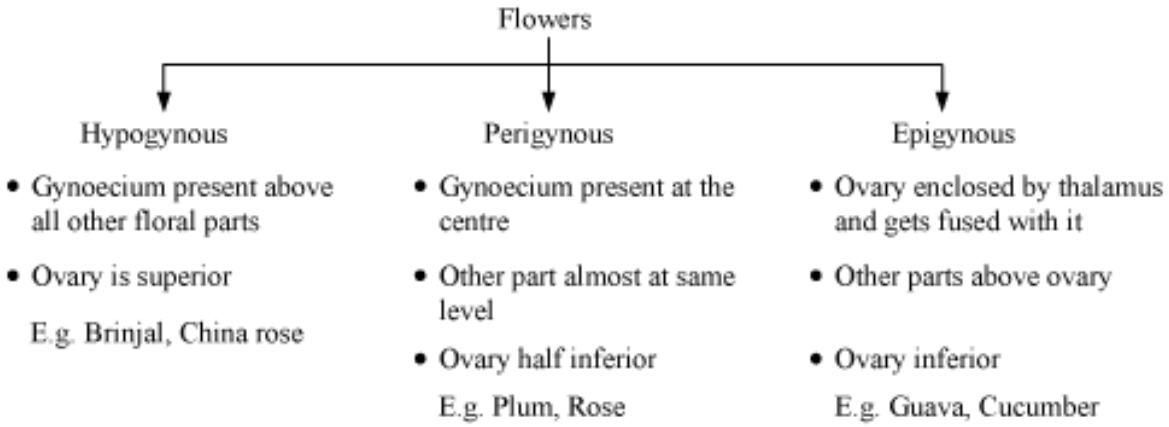


- A flower may be trimerous, tetramerous, or pentamerous based on the number of floral appendages (multiples of 3, 4 or 5 respectively).

- Based on presence or absence of bracts − reduced leaf found at the pedicel base

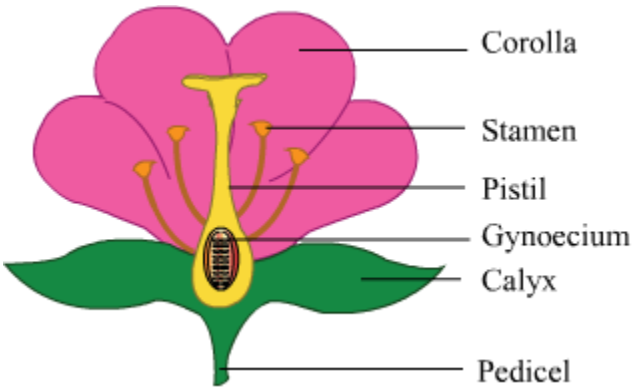


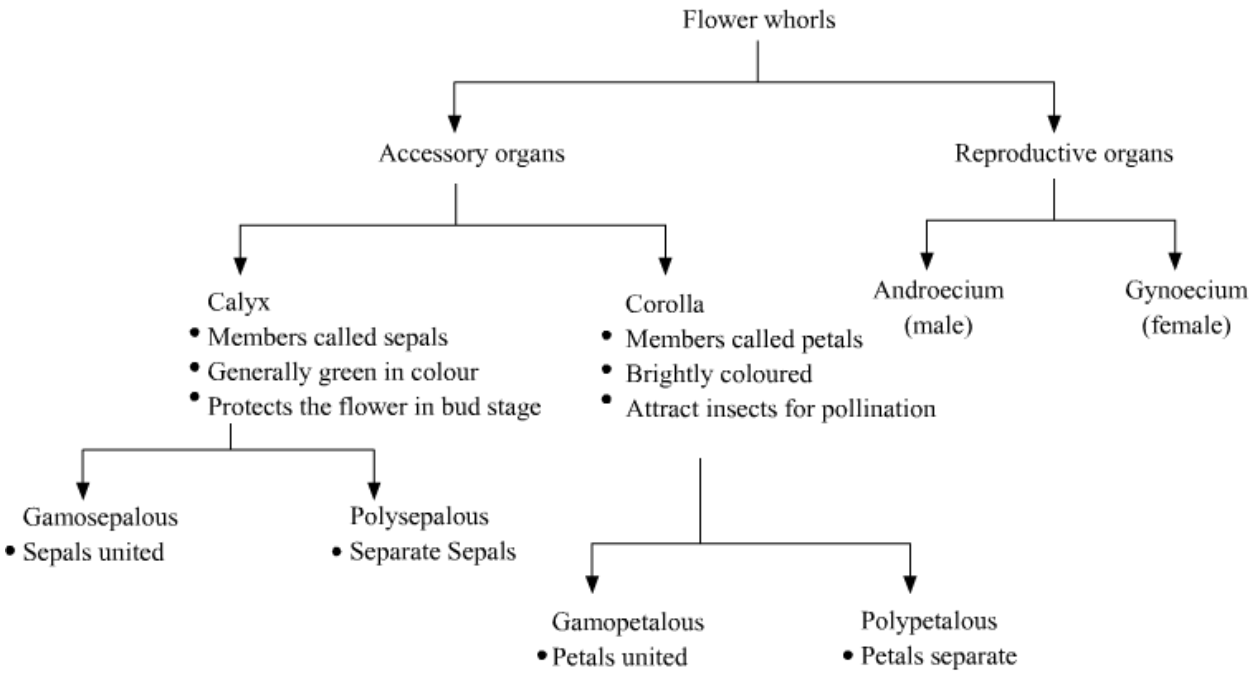
- Based on position of sex organs on the thalamus:



Details of Whorls of a Flower

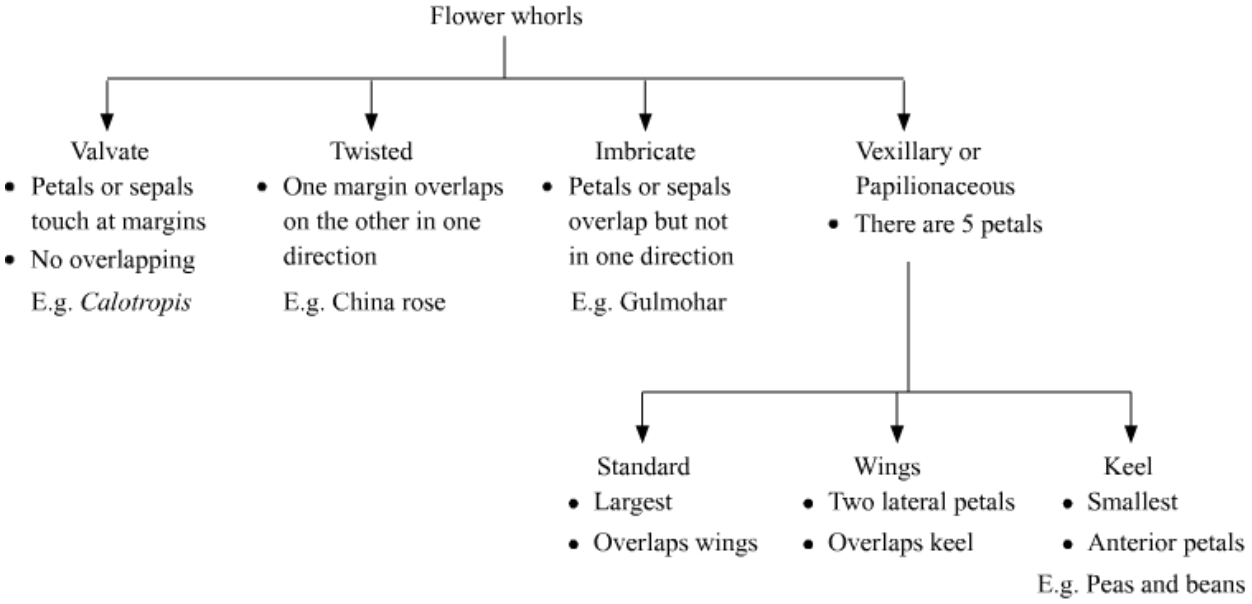
- Whorls are arranged on thalamus or receptacle (swollen ends of pedicel).
- A typical flower has 4 whorls.





Aestivation

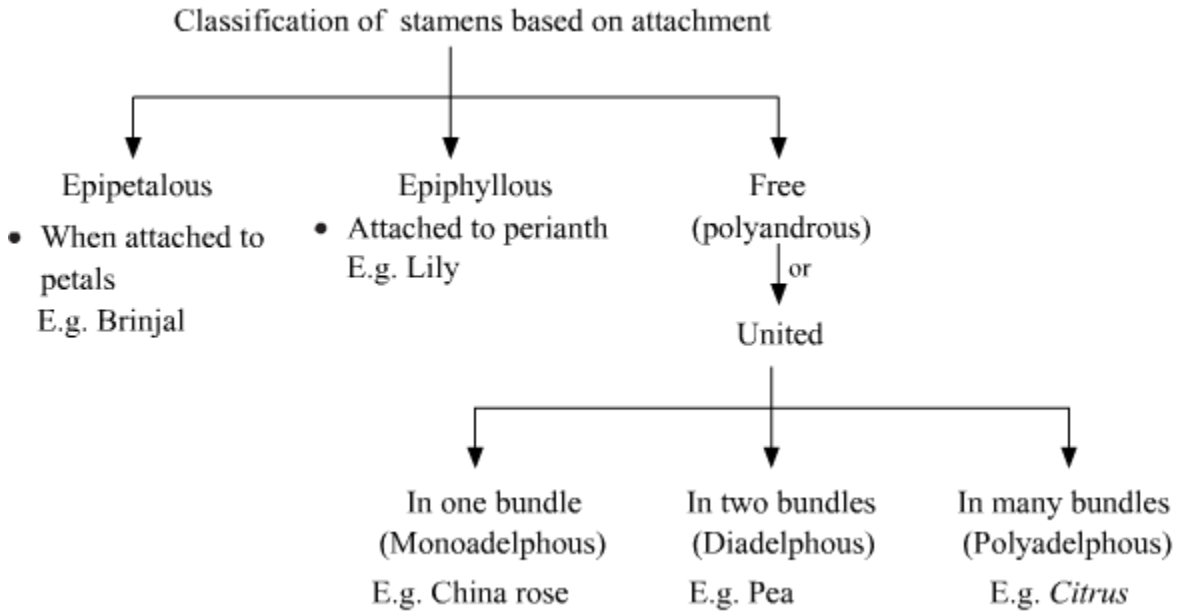
- Mode of arrangement of sepals or petals with respect to other members of the same whorl:



Androecium

- Male reproductive part composed of stamens
- Each stamen consists of a filament and an anther.

- Anther is bilobed; each lobe has 2 chambers called pollen sacs where pollen grains are produced.
- Sterile stamen is called a staminode.



Gynoecium

- Female reproductive part made up of carpels
- Carpel is made up of:
- Style − connects stigma to the ovary
- Stigma − receptacle for pollen grains
- Ovary − enlarged basal part on which style lies
- Each ovary bears one or more ovules attached to cushion-like placenta.
- After fertilization, ovules develop into seeds and ovary into fruit.

Placentation

- Arrangement of ovules within ovary