

## CC 5 : MORPHOLOGY OF ANGIOSPERMS

## UNIT – 2

**Flower**

(Part 4)

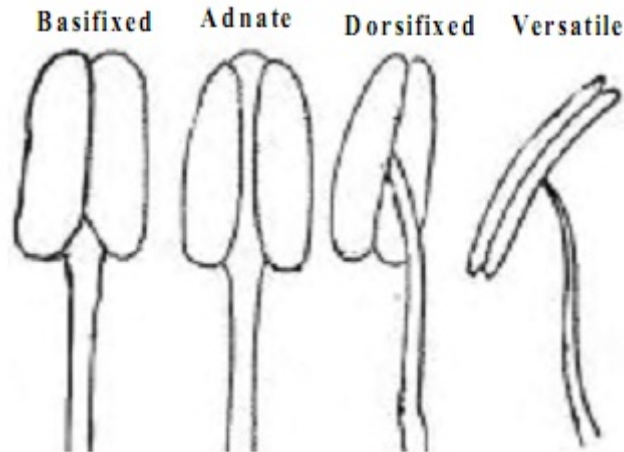
**Androecium :**

It is the first set of essential whorl. The unit members of the androecium are **stamen**. Each **stamen consists of** an elongated stalk, the **filament** and the filament bears at its apex, a sac like structure, the **anther**. Generally, each **anther consists of two anther lobes (i.e. ditheous)**, exception- anther with single anther lobe, called **monotheous**). Two anther lobes are connected by a tissue, called the **connective**. There are longitudinal grooves or **sutures** along the ventral surface of the anther demarcating the **pollen chambers**. Each anther lobe has two pollen chambers, called **pollen sac or microsporangia**. Thereby each anther consists of four pollen sacs or microsporangia. Pollen sac or microsporangium is filled with uncountable number of **pollen grains or microspores**. The sterile stamen is known as **staminode**.

The anthers may be of different shapes. It may be **rounded** (e.g., *Mercurialis annua*), **linear** (e.g., *Acalypha indica*), **reniform** (i.e. unilocular, e.g., *Hibiscus rosa-sinensis*), **sagittate** (i.e. arrow shaped, e.g., *Catharanthus roseus*), **sinuous** (i.e. rolled up like an inverted 'S', e.g., *Cucurbita maxima*), **appendiculate** (i.e. anther with appendix, e.g., *Erica cinerea*).

The anther becomes attached with the filament in different ways –

- i. Adnate :** The filament remains attached to the back of the anther throughout the whole length. e.g., *Magnolia* sp.
- ii. Basifixed :** The apex of the filament becomes firmly attached to the base of the anther. e.g., *Brassica* sp.
- iii. Dorsifixed :** The apex of the filament becomes attached to the back of the anther. e.g., *Sesbania* sp.
- iv. Versatile :** The apex of the filament becomes attached at a point near the middle of the back of the connective, so that the anther can move freely. e.g., *Oryza sativa*.



The number of stamens varies from one to many. Depending on the number of stamens, the flowers are grouped as –

- i. Monandrous (Flowers with one stamen, e.g., *Zingiber officinale*),
- ii. Diandrous (Flowers with two stamens, e.g., *Adhatoda vasica*),
- iii. Triandrous (Flowers with three stamens, e.g., *Triticum aestivum*),
- iv. Tetrandrous (Flowers with four stamens, e.g., *Leonurus sibiricus*),
- v. Pentanandrous (Flowers with five stamens, e.g., *Solanum nigrum*),
- vi. Hexandrous (Flowers with six stamens, e.g., *Oryza sativa*),
- vii. Polyandrous (Flowers with more than six stamens, e.g., *Rosa centifolia*).

The whorl of stamens may be classified with respect to the accessory whorls (i.e. sepals and petals) –

- i. **Antisepalous** – When the stamens lie alternate with the petals or opposite to the sepals, they are called antisepalous.
- ii. **Antipetalous** – When the stamens lie opposite to the petals or alternate with the sepals, they are called antipetalous.

Depending on the number of whorl of the stamen and their arrangement, they are of following types –

### 1. Haplostemonous :

When there is one whorl of stamens, which usually alternate with the petals, it is known as haplostemonous. e.g., *Ipomoea pulchella*.

### 2. Diplostemonous :

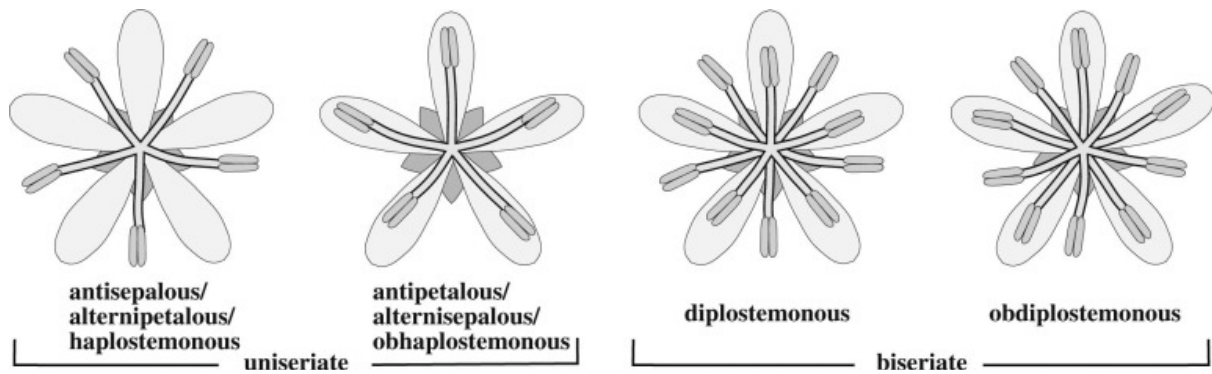
The stamens are arranged in two whorls. Stamens of outer whorl are antisepalous and inner whorl is antipetalous, it is called diplostemonous. e.g., *Cassia fistula*.

### 3. Obdiplostemonous :

The stamens are arranged in two whorls. Stamens of outer whorl are antipetalous and inner whorl is antisepalous, it is called obdiplostemonous. e.g., *Geranium* sp., members of Rutaceae, Caryophyllaceae.

### 4. Polystemonous :

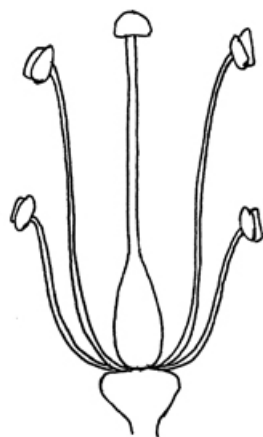
When stamens are arranged in more than two whorls, it is known as polystemonous. e.g., *Delphinium* sp.



Depending on the length of stamen in androecium, it is of following types –

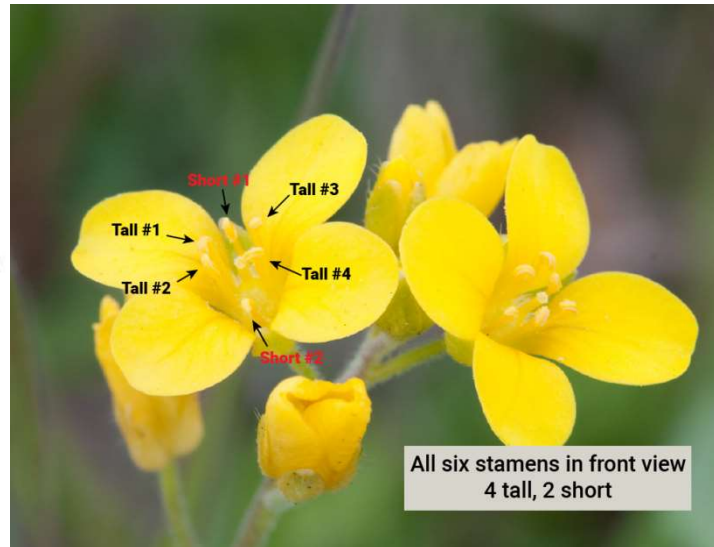
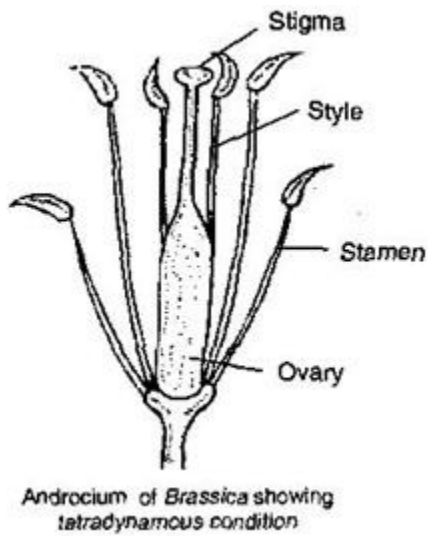
### 1. Didynamous :

There are four stamens in one whorl, of which two are longer than the other two, it is termed as didynamous. e.g., *Leonurus sibiricus*.



## 2. Tetrodynamous :

There are six stamens in two whorls, of which the two stamens of outer whorl are shorter than the four stamens of the inner whorls, it is called tetrodynamous. e.g., *Brassica nigra*.



## 3. Heterodynamous :

When stamens of different lengths are occur in one whorl, it is known as heterodynamous. e.g., *Cassia tora*.

