

**BOT-HC-5016**

**REPRODUCTIVE BIOLOGY OF ANGIOSPERMS**

**UNIT 5: ADAPTATION FOR POLLINATION**

## Adaptations for Self-Pollination

- **Bisexual or Hermaphrodite flower:** Male and female floral organs are present in the same flower.
- **Homogamy:** Anthers and stigma of a flower mature at the same time. Example- *Mirabilis jalapa*, *Argemone Mexicana*, *Grewia asiatica*, *Catharanthus*. In *Mirabilis*, when the stamens mature the filaments recoil and bring the anthers near to the stigma so that when they burst self-pollination is achieved.
- **Cleistogamy:** In these cases, the flower never opens as opposed to most flowers which show chasmogamy (Flower open normally during anthesis)

## Adaptations for Cross Pollination

### Dicliny

- Cross-pollination is the rule among diclinous plants, i.e., those bearing unisexual flowers. In monoecious plants the only alternative is geitonogamy.

### Self-sterility or Self-incompatibility

- Pollen of a flower do not grow or grow very slowly if they fall on the stigma of the same flower to prevent self-fertilization.
- Many species of *Solanum* (Potato, Tobacco) and the tea plant are self-sterile because of genetic reasons.

### Dichogamy

- Stigma become receptive before or after the pollens of the same flower are mature.
- Dichogamy may be of two types:

**Protandry:** Anther mature before the stigma receptive. Example- *Saxifraga*, *Impatiens*, *Epilobium*, *Salvia* and members of Umbelliferae and Malvaceae.

**Protogyny:** Stigma mature first and losses its receptivity by the time the anthers shed their pollens. Examples- Members of Anonaceae (e.g., *Anona*, *Polyalthia*) and Magnoliaceae (*Magnolia*, *Machelia*).

- In nature protandry flowers are much more common than protgynous flowers

### Herkogamy

- In bisexual flowers, the structure of anthers and styles is such that autogamy is mechanically impossible.
- In Caryophyllaceae and Cruciferae, the style is much longer than the stamens due to this the pollens of the flower fail to reach the stigma.
- In orchidaceae and Asclepiadaceae, the pollens of an anther sac are united into single compact pollinium. These large and heavy pollinia can only be transported from one place to another by ants, beetles etc.

## **Heteromorphism**

- Flower having two (Dimorphic) or three (Trimorphic) different forms with anther and stigma.
- This dimorphism or trimorphism usually involves heterostyly (Style of different lengths) and heteroanthy (different types of anthers)
- Long styled flowers: Possess a long style (2 to 3 time long). Small stamen with smaller and oblong pollen grains
- Short styled flowers: Which bears stigma of about half the height of corolla tube thus standing well below the anther