4. Study of flowers adapted to pollination by different pollinating agencies (Wind and Insects)

Date : / /

Aim : To tudy different adaptation shown in flower for pollination.

Requirement : : Flowers of grass, maize, *Salvia*, *Ocimum*, *Brassica*, etc, forceps, hand lens, slide, etc.

Observe the given flower with the help of hand lens and note down different adaptations for pollination.

a. Maize flower (v ind pollination) :

- The flowers are unisexual and plant is monoecious. Male inflorescence is terminal tassel (panicle of spikeletes) while female inflorescence is compound spadix, borne axillary.
- Flowers are small inconspicuous, non-attractive without colour, odour and nectar. Perianth is reduced to two lodicules.
- Stamens are extrorse and exserted. Anthers are versatile which produce large number of tiny, light-weight, dry, dust like pollen grains with smooth exine.
- Gynoecium shows feathery or brush like stigma supported on a long style, coming out of the Perianth. The stigma is bifurcated. Styles and stigmas are bushy. Hence, in a single breeze, many flowers get pollinated if wind flows in a desired direction.
- In maize, flowers are unisexual and protandrous (stamens mature early), therefore, it is cross pollinated by the agency of wind (i.e. anemophilous).

Figure:-

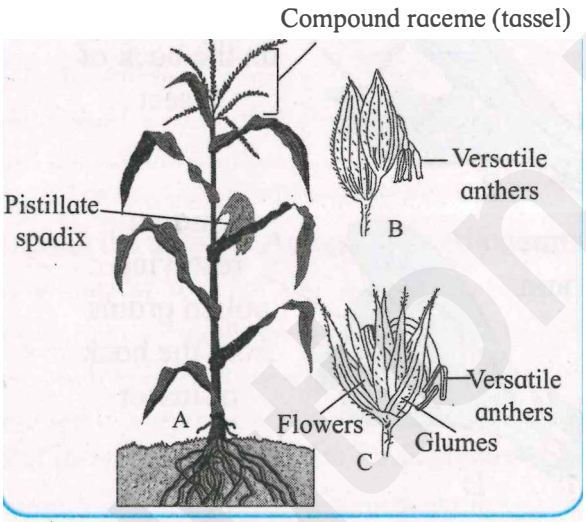
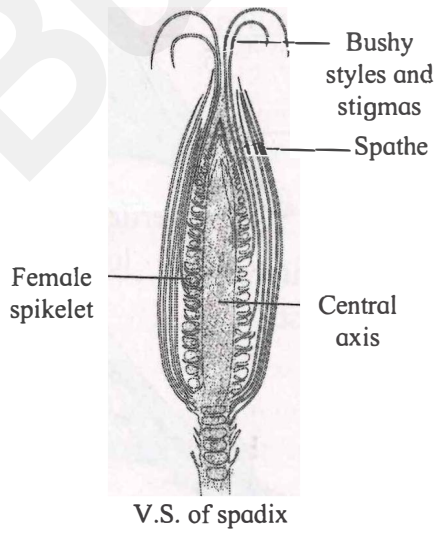


Fig. Anemophily in maize

A: Maize plant, **B:** paired spikelet, **C:** open spikelet



V.S. of spadix

Fig. Bushy styles and feathery stigmas in spadix of maize

b. *Salvia* (Insect Pollination) :

- Flowers are bisexual attractive and have bright coloured petals.
- The nectar and the nectar glands are present in flower and they are situated in such a way that when insect tries to reach the nectar glands, its wings and body parts will definitely touch the anther and stigma.

- *Salvia* shows bilipped corolla. The larger lip encloses style and stigma. There are two stamens located at the mouth of corolla tube.
- Stamens of *Salvia* show short filaments and elongated divaricate connective. The fertile anther lobe is at the tip of longer arm. The sterile anther lobe is situated at the tip of shorter arm of connective. When insect enters the flower it lodges on the lower sterile lobe, pushes it and as a result upper fertile lobe bends down. Nectar glands are located at the base of corolla tube.
- The gynoecium is made up of two carpels fused together, showing long style with bifid, hairy stigma. The stamens mature earlier than the carpels i.e. protandrous.
- Visitor insect lands on the lower lip of corolla and then pierces its proboscis right up to the nectar gland. In doing so, sterile anther lobes are pushed and fertile anther lobes bend down, dusting the body of insect with pollen grains are ornamented.
- When gynecium matures, style elongates and stigma bend down and thus gets positioned across the path of visitor insect.
- When pollen-laiden insect visits flower, the drooping stigma brushes the body of the insect and thus effects the pollination.
- The pollination in *Salvia* is cross pollination and effected by insects (i.e. entomophilous).
- The pollination mechanism in *Salvia* is called lever mechanism because the divaricate connective swings like a lever helping in pollination.

Figure:-

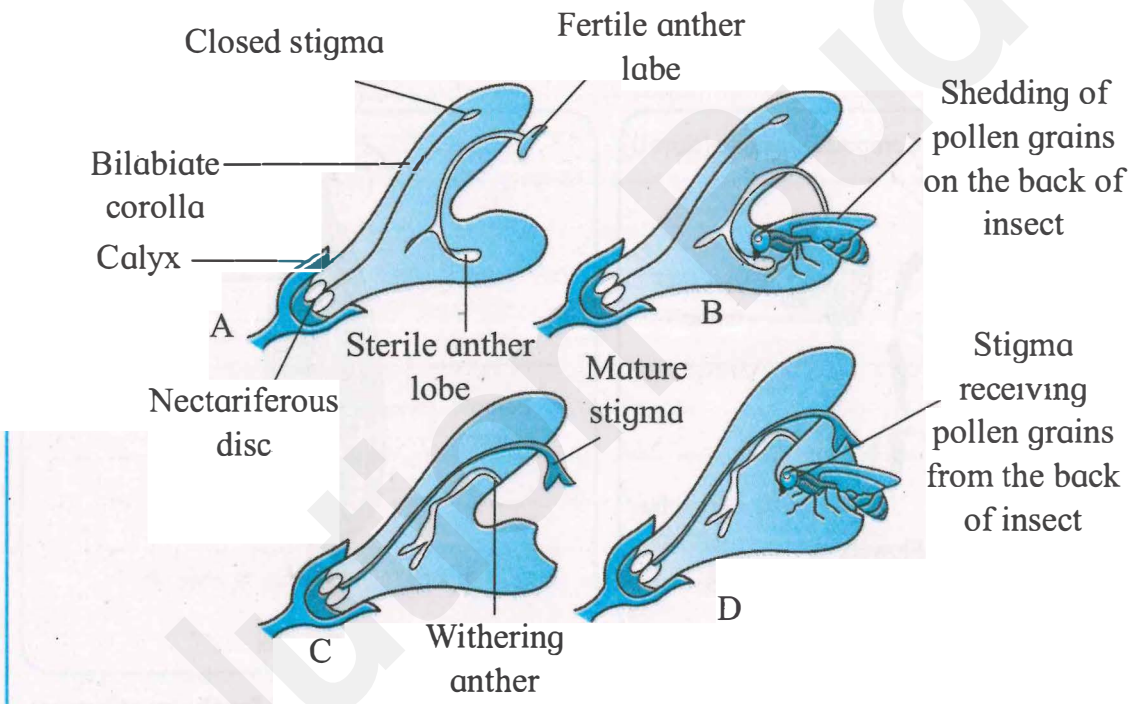
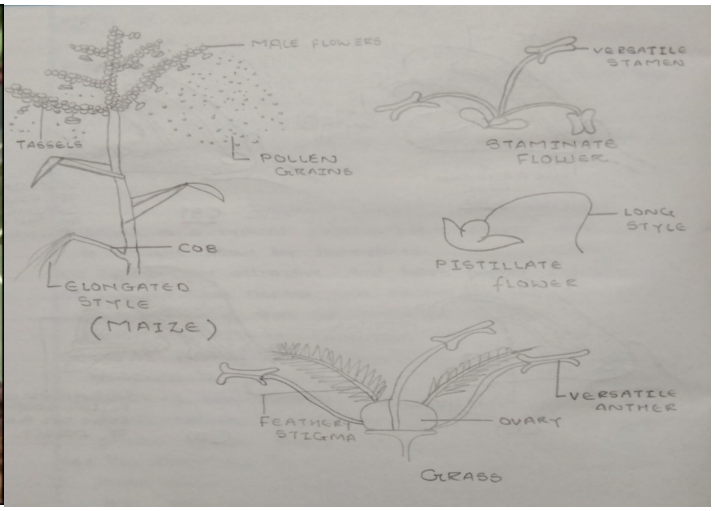


Fig. Pollination by lever mechanism in *Salvia* flower

- **Figure and photograph**



Questions

1. What is pollination?

Pollinatin is the transfer of pollen from the anther to the receptive stigma.

2. Differentiate between self and cross pollination.

Self-Pollination	Cross-Pollination
Transfer pollen grains from the anther to the stigma of the same flower.	Transfer pollen grains from the anther to the stigma of a different flower.
This process can take place in the same flower or a different flower of the same plant.	This process can take place between two flowers present on different plants.
It occurs in the flowers which are genetically identical.	It occurs between flowers which are genetically different.

3. Give reason as to why do maize as well as *Saliva* plants show cross pollination ?

Maize which is also known as Corn plant is pollinated by wind. The anthers are born in long tassels that move with the wind and shake off their pollen. The stigma is feathery and hairy so as to catch the wind-borne pollen. Thus, in maize, pollens are transferred from the anthers of one plant to the stigma of another plant by means of wind i.e. cross-pollination occurs by the wind.

4. Explain the term : a. Autogamy b. Allogamy c. Geitonogamy

a. Autogamy- In this type of self-pollination, the pollen is transferred from the anthers of one flower to the stigma of the same flower.

b. Allogamy- allogamy is the deposition of pollen grains from the anther of the one flower on the stigma of another flower, either in the same plant or a in a different plant of the same species

c. Geitonogamy- type of self- pollination, the pollen grainsare transferred from the anthers of one flower to the stigma of anotherbut on the same plant.

5. 'Pollination is pre-requisite for fertilization in flowering plants'- Explain/comment.

As a prerequisite for fertilization, pollination is essential to the production of fruit and seed crops and plays animportant part in programs designed to improve plants by breeding. In flowering plants, these are (roughly in order of diminishing importance) insects, wind, birds, mammals, and water.

Remark and Signatur of Teacher .....