BOT-HC-5016

REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

UNIT 5: POLLINATION TYPES AND SIGNIFICANCE

Pollination

Pollination is the transfer of pollen grains from the anther of one flower to the stigma of the same or another flower. It is said to be the first process of sexual fertilization in flowering plants. Pollen grains contain the male gamete and are present in the anthers of the flower.

Types of Pollination

Pollination can be of two types:

 Self- Pollination

 Cross-Pollination

Self- Pollination

When the pollen is transferred from the anthers of a flower to the stigma of the same flower, it is called as self- pollination. This form of pollination is common in hermaphrodite or dioecious plants which contain both male and female sexual parts on the same flower.
In self-pollinating plants, there is less dependence on the external factors to cause pollination. These plants depend on wind or other smaller insects that visit the flower regularly. In self-pollinating flowers, the anthers, and stigma are of similar lengths to facilitate the transfer of pollen. Self – pollination can be further divided into two types:

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

Geitonogamy– In this type of self- pollination, the anthers are transferred from the anthers of one flower to the stigma of another flower but on the same plant.

Advantages of self – pollination

 In self- pollination, there is no diversity in the genes and therefore the purity of the race is maintained.
 The plants do not depend on external factors for pollination and even smaller quantities of pollen grains produce have a good success rate in getting pollinated.
 Self- pollination ensures that recessive characters are eliminated.

Disadvantages of self- pollination

 Since there is no mixing up of genes, there are no new characters or features that are introduced into the lineage of the offsprings.
 Self- pollination is said to reduce the vigor and vitality of the race as there are no new features introduced.
 Without new characters introduced, the resultant offsprings' immunity to diseases reduces.

Cross pollination or Allogamy

Transfer of pollen grains from the anther of the flower on the one plant to the stigma of the flower on another plant is called cross pollination or allogamy. Cross-pollination is always dependant on another agent to cause the transfer of pollen. The agents of pollination include birds, animals, water, wind, and insects.

Advantages of cross-pollination

 Cross-pollination is beneficial to the race of the plant as it introduces new genes into the lineage as a result of the fertilization between genetically different gametes
 Cross-pollination improves the resistance of the offsprings to diseases and changes in the environment.

The seeds produced as a result of cross-pollination are good in vigor and vitality.
 If there are any recessive characters in the lineage, they are eliminated as a result of genetic recombination.
 It is the only way unisexual plants can reproduce.

Disadvantages of cross-pollination

 There is a high wastage of pollen grains that need to be produced to ensure fertilization occurs.
 There are high chances that the good qualities may get eliminated and unwanted characteristics may get added due to recombination of the genes.

Significance of Pollination

1. Since the male and female gametes of flowering plants are non-motile, pollination brings them closer together so that syngamy or fertilization can take place. It, therefore, helps in the production of seeds and fruits and thereby help in reproduction as the seeds formed helps in generation of new offsprings.
2. Cross-pollination helps in the evolution of species, as it brings new combinations of genes.