



Pollination

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TOPIC: Pollination

THEME: Bees

DEPARTMENT: Entomology



Lesson Objectives

1. The participants shall define and describe the process of pollination.
2. The participants shall appreciate the importance of pollination to the ecosystem.
3. The participants shall explore agents of pollination and underscore bees as major plant pollinators.

Learning resources

1. Text
2. Video
3. Photo

What is pollination?

Pollination is the transfer of pollen grain from the male part of a flower, anther, to the female part of a flower, stigma, of the same plant or different plants of the same species, to allow fertilisation and the production of seeds.

Pollen is a fine powder produced by some plants when they reproduce.

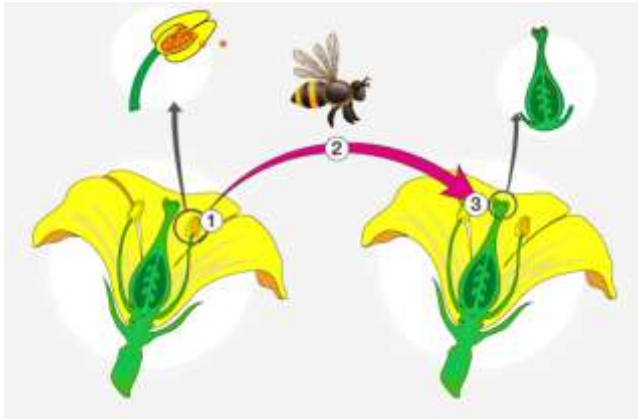


Illustration of pollination
Source: iStock

Types of pollination

There are two types of pollination; self pollination and cross pollination.

1. Self-pollination

Self-pollination occurs when pollen grain is transferred from the anther to the stigma of the same flower.

2. Cross-pollination

Cross-pollination occurs when pollen grain is transferred from the anther of one flower to the stigma of another flower of the same plant species.

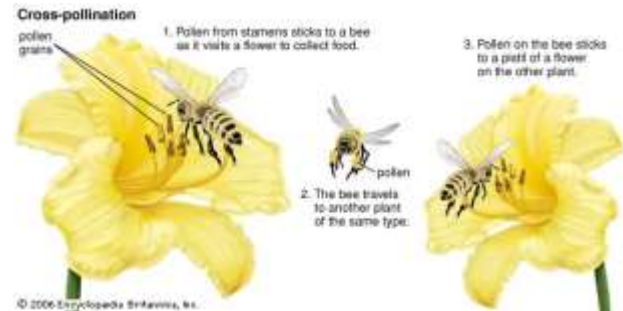


Illustration of types pollination
Source: iStock

How is pollination important to the ecosystem?

Pollination is an essential part of plant reproduction. All plants in the world require pollination:

- Pollination allows plants to fertilise and produce enough seeds for dispersal and growth of new plants.
- Pollination ensures production of quality and quantity yield.
- Pollination helps plants to maintain a wide variety of plant species with different characteristics.
- High plant diversity as a result of pollination helps in maintaining clean air. This process is referred to as carbon cycling or sequestration.
- Pollination ensures abundant plant cover that helps in controlling water or surface run-off, and soil erosion.

Agents of Pollination

The agents or media which can transfer the pollen grains for pollination are called the agents of pollination or pollinators. There are four agents of pollination. These include: animals such as insects, birds, and bats, water, wind and even plants themselves.

1. Pollination by air or wind occurs when light and dry pollen grains are carried by air to the other plants.
2. Pollination by water happens when pollen or the male flower is carried by water current towards the female flower.
3. Pollination by animals takes place when an animal such as an insect or a bird, visits a flower to feed off of pollen and transports pollen grain as they move from one flower to another. For example, the bright colours of corolla and nectar attract the insects and pollen grains stick to the body of the insect which facilitates pollination as it approaches another flower.
4. Pollination by plants occurs when pollen grain is transferred from the anther to the stigma within a closed flower.

Insects and pollination

Did you know that you can identify an insect as either a pollinator or just a flower visitor depending on the insect's behaviour on the flower?

Insects as pollinators visit flowers to collect either nectar or pollen while flower visitors do not collect those resources.

Insects have specific features on their bodies that enable them to carry either pollen or nectar from flowers. Some of these features include:

- Hairy body
- Elongated feeding tube called proboscis
- Long antennae

Did you know that insects have favourite colours?

Different insects get attracted to different flower colours. For example, butterflies prefer pink flowers; bees like yellow, white or blue flowers; moths prefer white flowers and flies like brown or purple flowers.

Bees as major plant pollinators

Bees are the most important and efficient pollinators of most flowering plants.

Bees pollinate over 75% of world flowering plants which accounts for more than two thirds of food crops. Moreover, there are groups of crops that fully depend on bees for their pollination such as watermelon and pumpkins.



Drawer of different types of bees at the NMK Collection
Source: NMK - Entomology

Why are bees excellent pollinators?

1. Most of their life is spent on collecting pollen, as a source of protein that they feed to their developing young ones. When a bee lands on a flower, the hairs all over the bee's body attract pollen grains in large numbers.
2. Bees have special features called scopa where pollen is packed during foraging. The scopa is located either on the underside of the abdomen or hind legs.
3. The social or semi-social nature of some species of bees ensures the worker bee collects more and more pollen.



Leaf cutter bee showing the position of pollen carrying structure below the abdomen
Source: NMK - Entomology

Obstacles to pollination

Major obstacle to pollination is a decline in pollinators. A global decline in pollinators has been caused by invasive pests and disease such as mites and pathogens, use of pesticides, loss of habitat, and climate change.

Pollination and citizen science

Do you know you can contribute towards the conservation of pollinators?

Here are some action points for you:

- Establish a bee hotel or pollinator garden.
- Avoid unnecessary fires.
- Grow indigenous and pollinator friendly plant species.
- Avoid the use of pesticides.