Ch-12-Reproduction in Flowering Plants

Asexual Reproduction

Sexual Reproduction

Seed dispersal

Asexual Reproduction

All living organism reproduce its same kind and this is a typical feature of all, be it plants or animals. The production of new individuals from their parents is known as reproduction.

Modes of Reproduction

The reproduction can be classified into two types

- Asexual Reproduction
- Sexual Reproduction

Asexual reproduction involves the production of offspring without the seeds or spores.

Vegetative Propagation

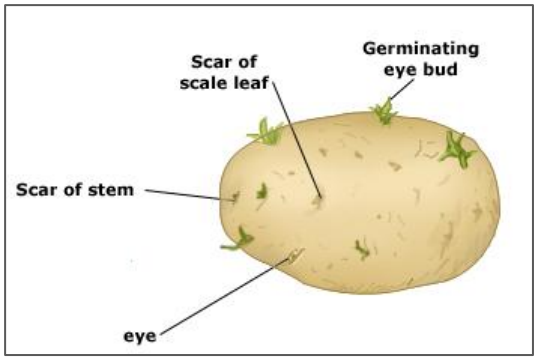
When the plants reproduce from the vegetative parts like stem, roots and leaves it is called **vegetative propagation**. The **stem, roots** and the **leaves** are the **vegetative parts** of the plant while the **flowers** are the **reproductive parts**.

Leaves – In some plants the new plant grows from the leaves and detaches itself from the parent plant like the cacti or the small plants called the plantlets grow on the edge of their leaves as in *Bryophyllum*.

Roots - The roots of some plants can also give rise to new plants. Sweet potato and dahlia are examples.

Buds – The scars or the 'eyes' of potato can also give rise to new plant. Other examples are ginger and turmeric.

Vegetative buds - Apart from flower buds, there are buds in the axil (point of attachment of the leaf at the node) of leaves which develop into shoots. These buds are called vegetative buds.

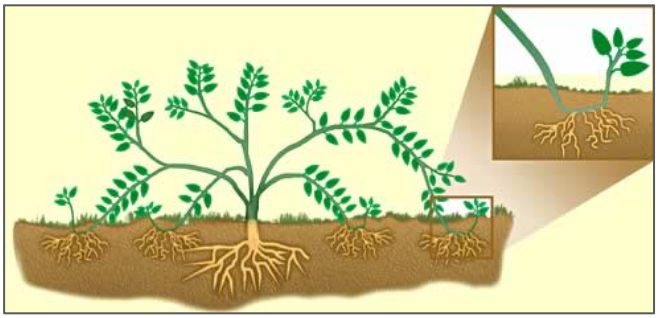


Buds

Horticulturists and farmers use artificial means to produce plants that are identical to the parent plant. Some the methods used are:

Cutting – Cutting is a part of the plant or branch with a node which is cut off of the parent plant. New leaves and roots grow from these cuttings.

Layering – The shoot of a parent plant is bent until it can be covered by the soil. The tip of the shoot remains above the ground. New plant with new roots starts growing which later can be separated.



Layering

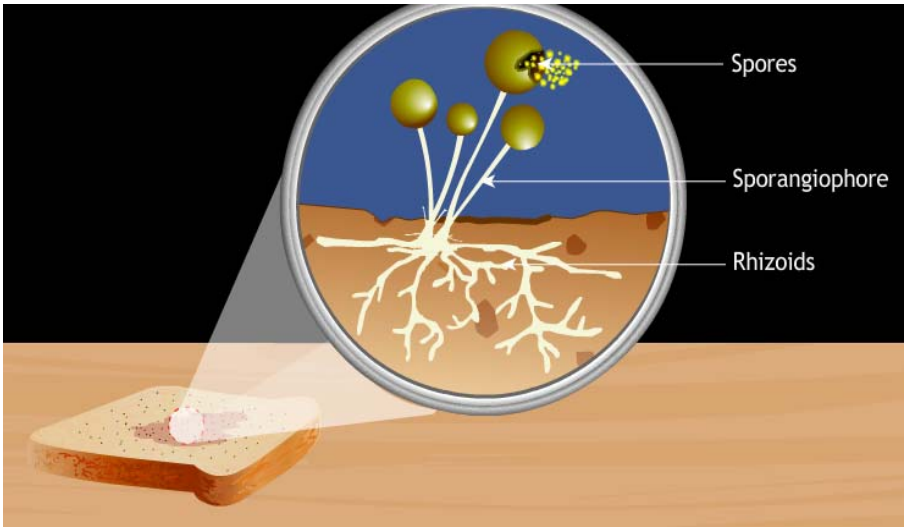
Grafting – In grafting the two plants are used to develop a new plant with combined traits from the two parent parts. The **scion** which is the above ground part is attached to the **stock** that is the rooted part of the second plant.

Budding

It is a mode of reproduction found in yeast, a single cell organism. A small bud or chain of buds bulges out of the yeast cell that grows and eventually separates from the parent yeast cell.

Activity

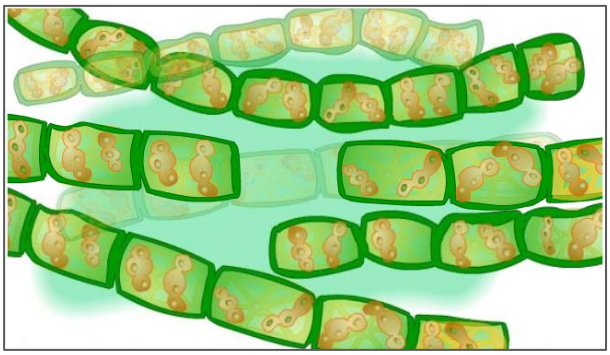
Take a slice of bread in a petridish and keep it in open air for five days. You will observe that the bread gets rotted. Now take a small portion of the rotted bread with the help of a forceps and place it on a slide. Cover the slide with a cover slip and observe it under a microscope.



You can see fungus *Rhizopus* growing on the bread. This fungus is also called as the bread mould.

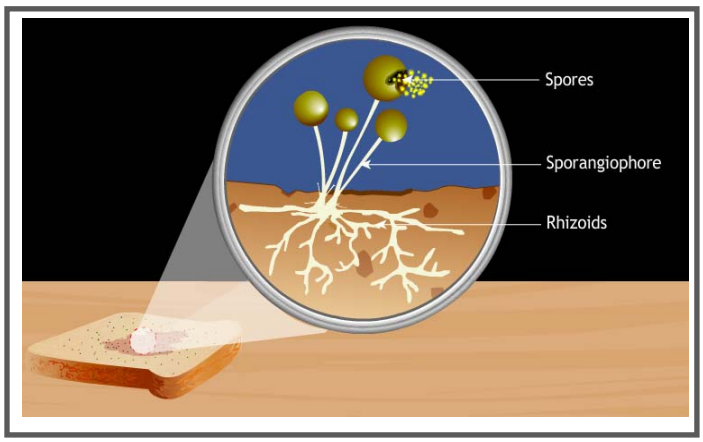
Fragmentation

Spirogyra which is an alga breaks up into two or more fragments. These fragments or pieces grow into new individuals. This process continues and they cover a large area in a short period of time.



Fragmentation

Spore Formation

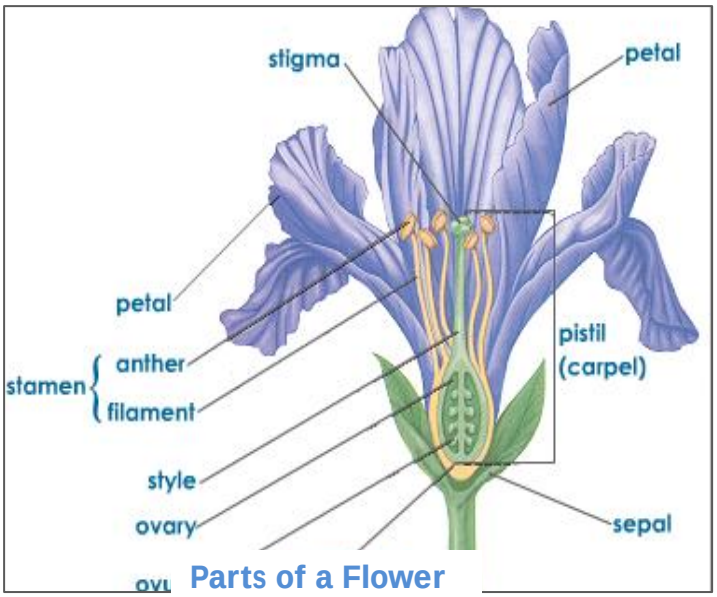


Spore Formation

The spores are asexual reproductive bodies. Each spore is covered by a hard protective coat to withstand unfavourable conditions such as high temperature and low humidity. When favourable conditions arrive, a spore germinates and develops into a new individual. Plants such as moss and ferns also reproduce by means of spores.

Sexual Reproduction

The flowers are the reproductive parts of a plant. It contains the **stamens** which is the male part and the **pistil** which is the female part. Some plants contain either the stamen or the pistil that is they behave like either male or female flowers. Such flowers are called as unisexual flowers for example papaya whereas plants like rose and mustard have both stamen and pistil hence they are called as bisexual flowers. Both the male and female unisexual flowers may be present in the same plant or in different plants.

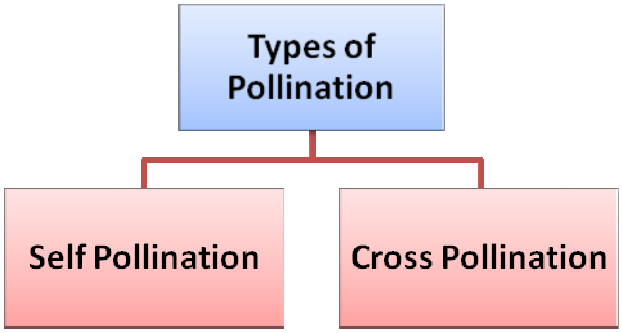


Parts of a Flower

The stamen is the male reproductive part. It has a stalk called **filament** and anther on the top. These **anther** contain the pollen grains that produce male gametes.

The pistil is the female reproductive part that has **stigma** and **style** along with a swollen bottom portion called **ovary** which contains the **ovules**. The formation of female gametes or the egg occurs inside the ovules.

Pollination The transfer of pollen from the anther to the stigma of a flower is called pollination.



If the pollen lands on the stigma of the same flower it is called **self-pollination**. When the pollen of a flower lands on the stigma of another flower of the same plant, or that of a different plant of the same kind, it is called **cross-pollination**.

Self Pollination

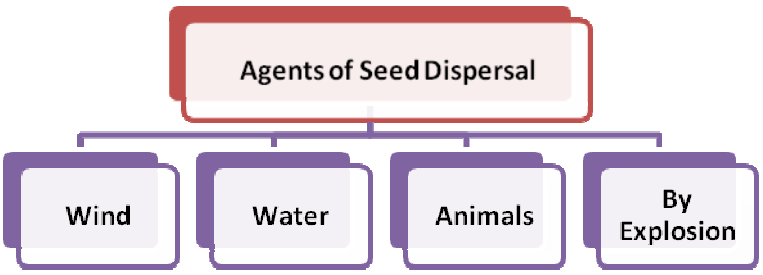
Fertilization

When the pollen grains reach the stigma of the pistil, it develops a pollen tube. The pollen grains enter the pistil through this tube reaches the egg cell in the ovule and fuses with it. This fusion of male and female gamete leads to the formation of zygote and this process is called as fertilization.

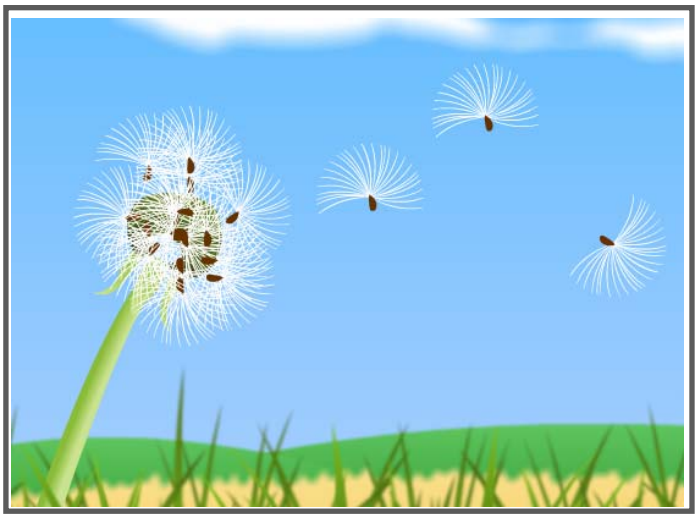
Fruits and Seed Formation

This zygote eventually develops into an embryo. The seeds are the ovules, and the ripened ovary develops into the fruit. The seeds contain embryo enclosed within a seed coat.

Seed dispersal



- The seeds of maple and dandelion are winged. These get dispersed by winds. Other examples are drumstick and sunflower.
- Some get dispersed through water like the coconut. These have spongy and fibrous coating to float in water.
- While some like *Xanthium* and *Urena* get transmitted through the animals. These seed are spiny and get hooked to animal body which then eventually gets brushed away to distant places.
- Some get dispersed by explosion. They burst out and scattered away from the parent plant like castor and balsam.



Seed Dispersal by Wind

If they all germinate close to each other there would be severe competition for sunlight, water, minerals and space. As a result the seeds would not grow into healthy plants.

The advantages of seed dispersal

- It prevents competition between the plant and its own seedlings for sunlight, water and minerals.
- It also enables the plants to invade new habitats for wider distribution.
- Prevents overcrowding