

# REPRODUCTION

## CONTENTS

- **Reproduction**
- **Asexual reproduction in plant**
- **Sexual reproduction in plant**
- **Pollination**
- **Fertilization**
- **Fruit & seed formation**

## ➤ REPRODUCTION

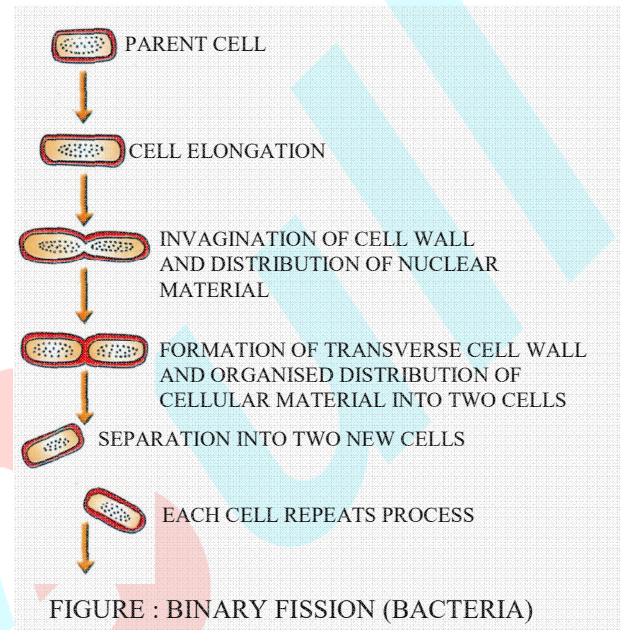
Reproduction is a process by which every living organism produce an organism like their own.

### ◆ Types of reproduction :

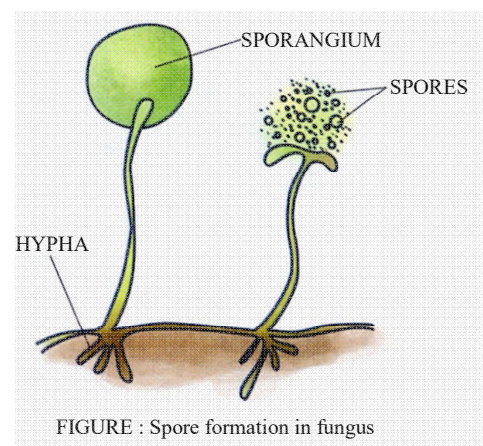
- (a) **Asexual reproduction** : In this type of reproduction only one parent organism either mother or father produces new organism.
- (b) **Sexual reproduction** : In this type of reproduction both parent are involved & produces new organisms.

### ◆ Asexual reproduction in unicellular organism :

1. **Binary fission** : During this process, two daughter organisms of equal sizes are formed from one parent by the division of the parent body. This is the most common method of reproduction in algae, fungi and bacteria (fig.).

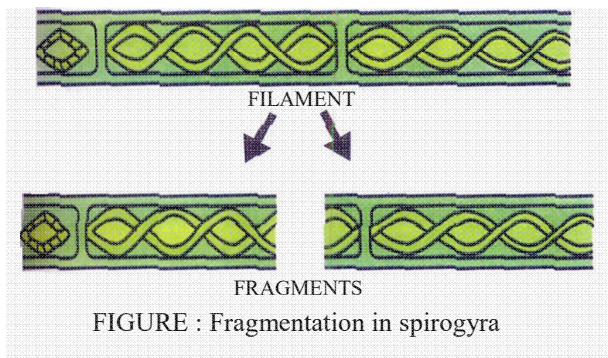


- (2) **Budding** : In this type of reproduction, a small outgrowth appears on the body of the organism. This outgrowth is called a bud. The buds grow and finally detach from the parent body and begin to live as independent organisms.



- (3) **Fragmentation** : This takes place in algae like spirogyra and oscillatoria. The filament of the alga breaks into two or more pieces called fragments, and

the process is known as fragmentation. Each fragment grows into a new plant.



- (4) **Spore formation** : Some lower plants such as ferns, mosses, lichens and fungi reproduce through spore formation under unfavourable conditions. Spores are tiny, microscopic bodies, which are covered by hard protective coats. The protective coats enable them to tide over adverse environmental conditions. When favourable conditions return, each spore gives rise to a new individual.

## ➤ ASEXUAL REPRODUCTION IN PLANTS

When reproduction takes place only from the vegetative parts of plant known as vegetative reproduction.

- Natural vegetative propagation.
- Artificial vegetative propagation.

### ◆ Natural vegetative propagation :

- **Natural propagation by leaf** : Vegetative propagation by leaves can be seen in very few plants like Bryophyllum and Begonia. In these plants buds are produced on leaf margins. These buds after falling on the ground grow into new plants.

- **Natural propagation by stem** : Underground stems are modified for storage of food. These underground stems produce several new plants from their buds. Modified stems like tuber, bulb, rhizome and corm help the plants to multiply.

- **Natural propagation by root** : Roots also help in vegetative propagation. For example,

sweet potato and dahlia give rise to new plants from their fleshy roots. (figure)

### ◆ Artificial vegetative propagation :

- **Grafting** : In this commonly practiced method a new variety is obtained from the mother plant (figure). In this process a detached part of one plant is inserted into the stem or the root system of another plant.

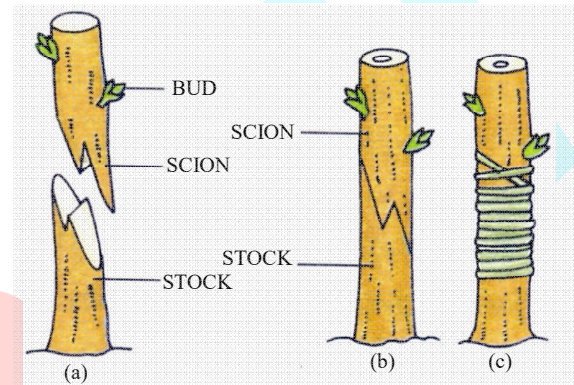


FIGURE : Grafting

The short piece of detached shoot containing several buds is called scion. The lower portion of the plant that is fixed to the soil by its roots system is called the stock. They establish vascular connection with each other after a few days.

- **Layering** : In this method a young branch is bent towards the ground and covered with moist soil. After some days, new roots develop from the covered part, which is in contact with the soil. This is called a layer and the process is called layering. The branch is then separated from the parent plant and allowed to grow into a new independent plant.

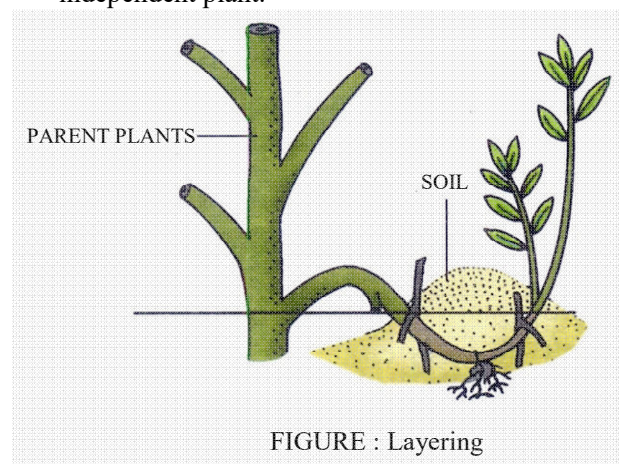


FIGURE : Layering

- **Cutting :** In this method a healthy young branch of a plant having leaf buds is cut out and planted in moist soil (figure). The branch develops root and grows into a new plant. Bougainvillea, sugarcane, rose and grapes are grown from cuttings.

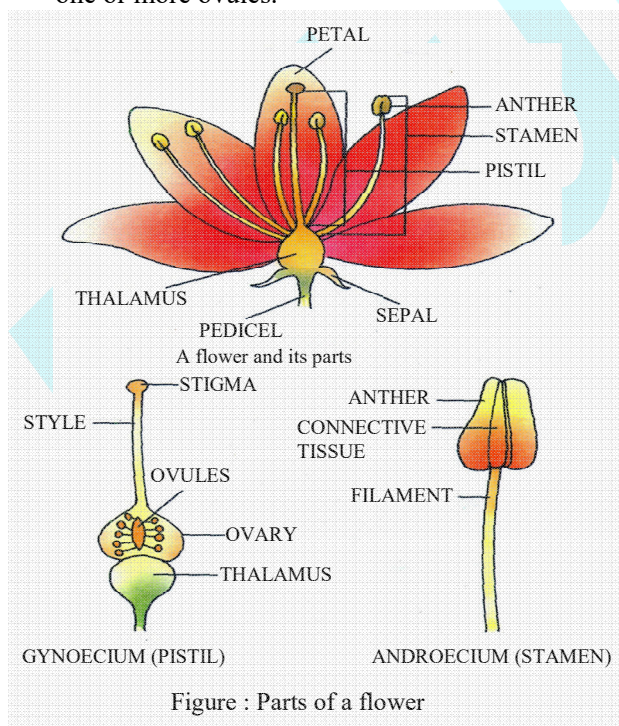
## ➤ SEXUAL REPRODUCTION IN PLANTS

Flower is a reproductive part of plant. Which contain male & female sex organ & produce ovum & pollen grain.

A normal flower consists of four whorls namely sepals, petals, androecium and gynoecium (figure).

The androecium is the male reproductive part of the flower. Androecium may consist of one or more tube-like stamens. Each stamen consists of thin stalk called filament and a two-lobed head called the anther. Anther contains pollen grains which produce male gametes.

The pistil or gynoecium is the female reproductive part of the flower. Each pistil consist of stigma, style, and ovary. The ovary contains one or more ovules.



## ➤ POLLINATION

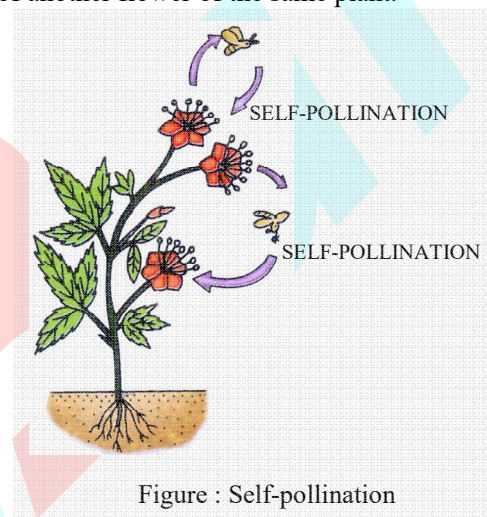
Pollination is the process by which pollen grains from the anther of a flower are transferred to the stigma of the same flower or another flower.

### ◆ Types of pollination :

There are two types of pollination which are described below :

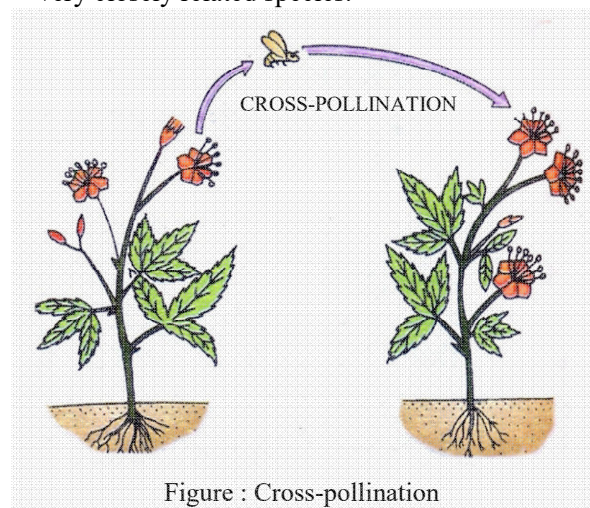
#### ● Self-Pollination or Autogamy :

It is the process of transfer of pollen from anther to the stigma of the same flower or to the stigma of another flower of the same plant.



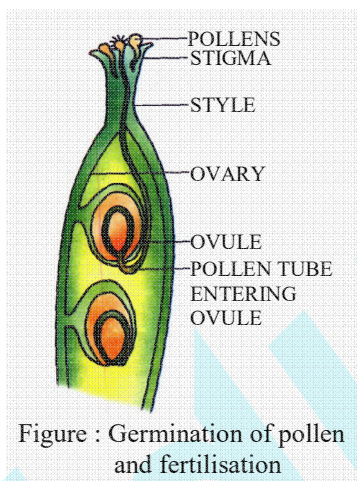
#### ● Cross-pollination or Allogamy :

It is the process of transfer of pollen from the anther of a flower to the stigma of a flower of another plant of the same species or sometimes of very closely related species.



## ➤ FERTILISATION

After successful pollination the stigma secretes nutrients for the lodged pollen grains. The pollen grains absorb these nutrients and grow to form a thin tube called **pollen tube**. This grows into the stigma in down the style (figure). It grows until it reaches the ovule and enters inside it. The pollen tube contains two male gametes. After reaching the ovule, it releases the male gametes, one of which fused with the egg to form the zygote. This process of fusion of a male gamete with a female gamete is called **fertilization**. The zygote develops into an embryo.



## ➤ FRUIT & SEED FORMATION

After fertilization the ovary grows into a fruit and the ovules inside it become seeds. The other parts of the flower such as sepals, petals, and stamens fall off. A fruit is actually a biologically ripened ovary.