

Plant parts and structure

A plant is a living organism that produces food for themselves and acts as the primary source of nutrition for all life forms on earth. Plants are also the only source of oxygen in nature.

plants have two organ systems:

- A. the root system.
- B. the shoot system.

A typical diagram of a plant body consists of three parts:

1. roots.
2. stems.
3. leaves.

each having specialized functions.

A flowering plant also contains

4. flowers.
5. fruits.

The root system covers the underground parts of a plant, which include the roots, tubers, and rhizomes.

Shoot system consists of parts found above the ground, such as leaves, stems, flowers, and fruits.

Root: It is the part that lies below the surface of the soil. The top part of a root (root apex) is covered by a covering known as root cap.

Functions

- 1- Absorbing water and minerals from the soil
- 2- Storing food for future use
- 3- Producing plant growth hormones
- 4- Anchoring the plant firmly to the soil and providing support
- 5- Developing new plants from the roots of the old plant (vegetative reproduction).

Roots types

1- Fibrous roots

Some plants have small, thin roots, all of the same length.

- These roots form a tuft, as for instance the roots of onion, rice, millet, maize.
- A plant that has many small roots of the same length, the same thickness, the same shape, has fibrous roots.

Creeping roots

Some plants have roots that are shallow and long.

- Creeping roots do not go deep into the soil.
- These roots go a long way from the base of the plant.

They cover a large area.

They have to find in a small depth of earth the food necessary for the life of the plant. Many trees have creeping roots.

- A plant that has shallow, very long roots has creeping roots.

Tap-roots

Some plants have only one root, very thick, deep, straight, called a tap- root.

- Smaller roots grow on this thick root; they are called rootlets.
- Tap-roots go deep into the soil.

They cannot penetrate soil that is too hard.

Types of tap root

- Cotton, coffee, cocoa, okra, carrots, papayas all have a root that goes deep into the soil, is very thick and straight.

Tuberous roots

Some plants have very thick roots.

- These roots store up food.
- These roots are thick because they have taken up a lot of food from the soil.

The food is stored up in order to feed the whole plant.

The plant is said to have built up reserves.

For example, cassava, potato.

- A plant that stores up reserves in thick roots has tuberous roots.

Adventitious roots

In some plant's roots start from the stem above the soil, that is, above the collar, and afterwards go down into the earth.

- Adventitious roots grow above the collar.

For example, mangrove, bamboo, maize and rice.

Earthing up encourages adventitious roots to develop.

Stems

They are found above the ground and are structurally divided into nodes and internodes. The regions where leaves are found are known as nodes, whereas the areas in-between the nodes are called internodes.

Functions

- 1- Providing strength and support to buds, flowers, leaves, and fruits
- 2- Storing food mainly in the form of starch
- 3- Transporting food, water, and minerals to all parts of the plant body
- 4- Developing new plants from the stem of the old plant (vegetative reproduction).

Stems types

- 1- Underground stem.
- 2- Aerial stem.
- 3- Subaerial stem.

Underground stem:

Stems of some plants remain in the ground and serve the function of perennation and storage of food. They produce aerial shoots annually.

Like Rhizome (ginger), Tuber (potato), Bulb (Onion), and Corm (Colocasia).

Subaerial stems:

Lower buds of the stem in some plants grow out into short, lateral branches.

These are named according to their origin, nature, and mode of reproduction.

Leaves

They are mostly found above the ground and attached to the stem. A leaf consists of three main parts: i) the petiole, ii) leaf base, and iii) lamina or leaf blade.

Functions

- 1- Making food for the plant with the help of sunlight, carbon dioxide, and water through photosynthesis.
- 2- Helping in reproduction such as in Bryophyllum, a group of sprout leaf plants.
- 3- Helping in evaporation from the aerial parts of the plant by transpiration.

Apart from these main functions, leaves of some plants are modified to form tendrils, that help in climbing (e.g., pea plant) or spines, helping in protection (e.g., cactus). Some leaves may turn fleshy to store food (e.g., onion plant).

Leaves types :

Broadly all leaves are classified into two main types, based on the arrangement of the leaf lamina (the broad, thin, flattened surface of the leaf), which is the site of photosynthesis and transpiration in plants.

Simple Leaves

It is a single leaf with undivided leaflets that are directly attached to the stem. It is always attached to a twig by its stem or the petiole.

Compound Leaves

A leaf that is composed of multiple leaflets that are attached to the midvein, and having its stalk.

Flowers

They are the most colorful and attractive parts of a plant. A flower contains four main parts:

Sepals: Green parts of a flower found below the petals that protect flower buds from injury.

Petals: Colorful parts of a flower found above the sepals that help in pollination.

Stamens: Consists of an anther and a filament.

Carpel: Consists of stigma, style, and ovary.

Functions

- 1- Helping in the sexual reproduction of plants.
- 2- Stimulating pollination in plants and fertilization of the ovule.