

Nutrition in Plants

The components of food like carbohydrates, fats, proteins, vitamins and minerals that are necessary for the proper growth and development of living organisms are called **nutrients**. They provide energy which enables them to carry out various body processes.

Mode of Nutrition in Plants

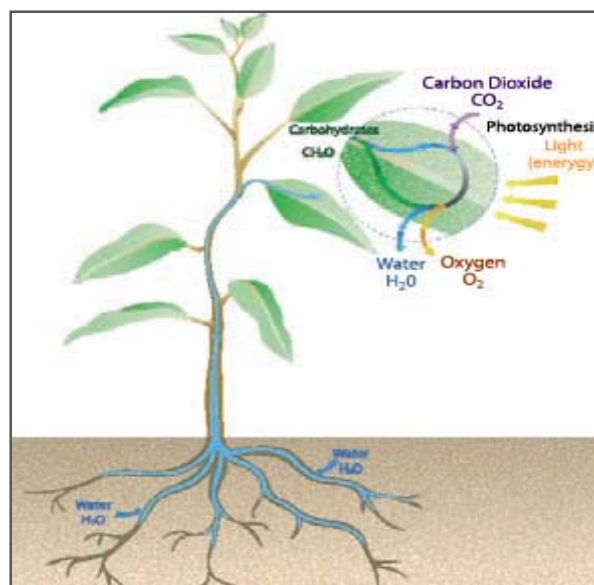
Nutrition is the mode of taking food by an organism and its utilisation by the body. It can be categorized into **autotrophic** and **heterotrophic nutrition**.

The autotrophic implies self nourishment or in other words self dependent like the plants while heterotrophic means dependent on others for nourishment like the animals.

Photosynthesis

The process of synthesizing food by green plants in the presence of **sunlight**, **carbon dioxide** and **water** is called **photosynthesis**. The plants convert light energy from sun and convert it to chemical energy to make **carbohydrates** and gives out **oxygen** in the process. It is prepared in the leaves which are designated as the food factories of the plants. The carbon dioxide is taken in by the tiny pores on the surface of the leaves called **stomata** that are surrounded by the **guard cells**.

The absorption of water is taken care by the **roots** while the transportation is carried out the **stems**. The stem forms a continuous path or passage for the nutrients to reach the leaf.



Photosynthesis



- ❖ All living organisms are made up of **cells**. Some are single cellular while some are multicellular.
- ❖ Each cell is surrounded by the cell membrane and contains a centrally located spherical structure called **nucleus**.

- ❖ All the cellular components or the cell organelles are embedded in the **cytoplasm**.
- ❖ The desert plants have green stem to carry out photosynthesis and even the green **algae** prepare its food by photosynthesis.
- ❖ Plants prepare carbohydrates which is a compound made of Carbon, Oxygen and Hydrogen but the proteins which are nitrogenous compounds are obtained from the atmosphere by **nitrogen fixation** with the help of nitrogen fixing bacteria or by addition of fertilizers.

Activity

- Take two potted plants of the same kind.
- Keep one in the dark for 3 days and the other in the sunlight.
- Perform iodine test with the leaves of both the plants. Record your results.
- You will observe that plant kept in dark does not give test for starch but the other kept in sunlight turns blue black with iodine.
- Now leave the pot which was earlier kept in the dark, in the sunlight for 3 - 4 days and perform the iodine test again on its leaves.
- You will find that the leaf of this plant turns blue black on addition of iodine confirming the presence of starch.



Others Modes of Nutrition in Plants

Plants lacking chlorophyll have heterotrophic nutrition like the animals and humans.

Parasitic Nutrition

Plants like *Cuscuta* lack chlorophyll therefore they depend and derive their nutrition from the host plant. *Cuscuta* is called as parasite and this mode of nutrition is called parasitic nutrition.



Cuscuta Plant

Insectivorous Plants

Plants which are capable of ingesting the insects like the pitcher plant are called insectivorous plants. They have a pitcher like structure with a lid along with hairs on the inner wall of the pitcher which entangles the trapped insects. It is followed by the secretion of digestive juices by the plant to digest the insect.



Picher Plant

Saprotrophs



Fungi

The organisms like fungi which feed on dead and decaying matter have saprotrophic nutrition. These saprotrophs release digestive juices on the dead matter and convert it into solution which they later ingest.

Symbiotic Relationship

Organisms that live in association where both get benefited from each other like the lichens are said to exhibit symbiotic relation. In the lichens the fungal partner provides shelter, water and minerals while the algal partner containing chlorophyll prepares food by photosynthesis.



Lichen

Nutrient Replacement In Soil

Plants utilize the nutrients present in the soil resulting in decrease of these nutrients from the soil. To replenish this loss manures and fertilizers are added to the soil.

The nitrogen gas present in abundance in atmosphere cannot be consumed by the plants, therefore to convert it into soluble form the nitrogen fixing bacteria like *Rhizobium* fix the atmospheric nitrogen into nitrates and nitrates. They live in the root nodules of leguminous plants like the peas and gram.



Rhizobium in root nodules of leguminous plants

It is also an example of symbiotic relation. The plants provide shelter to the bacteria which in return help in fixing atmospheric nitrogen in soluble form.