



## CLASS NOTES

Nutrients are chemical compounds in food that help living things:

- to grow
- to remain healthy
- to build body
- to repair damaged body parts
- to provide energy to carry out living functions.

### Nutrition

- The process by which living organisms obtain nutrients or the way of taking food is called nutrition.
- Modes of nutrition are autotrophic mode of nutrition and heterotrophic mode of nutrition.
- Based on the mode of nutrition, living things are grouped as autotrophs or heterotrophs.

### Autotrophs

Auto means 'self' and Trophos- means 'nourishment.'

- Living things that prepare their own food are called autotrophs.
- Example: plants and algae

### Heterotrophs

Hetero means 'others' and Trophos means 'nourishment.'

- Living things which depend on other living things for their food are called heterotrophs.
- They directly or indirectly depend on the food made by plants.

Example: animals and humans



## Autotrophic modes of nutrition:

### Photosynthesis

- It is the process where, in the presence of chlorophyll, plants use the energy from the sun to synthesise food from raw materials like carbon dioxide and water.
- 'Photo' means 'light', and 'synthesis' means 'to combine'.
- Leaves are the food factories of plants.
- All the raw materials must reach the leaf.

### Factors required for photosynthesis:

- i. Availability of water
- ii. Availability of carbon dioxide
- iii. Presence of sunlight
- iv. Presence of chlorophyll

- The roots of the plants absorb water and minerals from the soil, and they are taken to the leaves by the xylem vessels.
- Carbon dioxide is taken in by the tiny pores on the leaves called stomata.
- The light energy from the sun is required for water and carbon dioxide to react.
- Photosynthesis occurs in the cell organelles called chloroplasts, which contain the green pigment called chlorophyll. Chlorophyll helps plants to trap sunlight.



## The Process of Photosynthesis



During the process of photosynthesis,

- Oxygen is released through stomata.
- Carbohydrates are transported to different parts of the plant.
- Excess sugar is stored in different parts of the plant as starch.

## Synthesis of nutrients by the plants

**Carbohydrates** – photosynthesis (autotrophic mode of nutrition)

**Proteins** - nitrogen fixation (symbiosis–heterotrophic mode of nutrition)

## Other Modes of Nutrition in Plants – Heterotrophic modes of nutrition in plants

- Parasitic plant
- Insectivorous plant
- Saprotrophic mode of nutrition
- Symbiosis

### Parasitic plant

- Parasitic plants are non-green plants which lack chlorophyll and cannot prepare their own food.
- It takes readymade food from the plant on which it is climbing.
- The plant on which it is climbing is called a host.
- Parasitic plants deprive the host of valuable nutrients.

Example: Cuscuta, Mistletoe



### Insectivorous plant

- Insect-eating plants are called insectivorous plants.
- Some plants have chlorophyll, and the plant carries out photosynthesis. But as they grow on nitrogen-deficient soil, it lacks proteins which are nitrogenous substances.
- Insectivorous plants modified their structure to trap insects so they can be digested and absorb nutrients.

Example: Pitcher plant and Venus flytrap.

### Saprotrophic nutrition

- Some organisms absorb nutrients from dead and decaying matter.
- The mode of nutrition in which organisms take in nutrients from dead and decaying matter is called the Saprotrophic mode of nutrition.
- Organisms with saprotrophic modes of nutrition are called Saprotrophs. Example: Fungi
- Saprotrophic plants like mushrooms are called saprophytes.

### Symbiosis

- Some organisms live together and share both shelter and nutrients. This symbiotic relationship is called symbiosis.
- Example: In organisms like lichens, a chlorophyll-containing autotrophic partner, which is an algae, and a saprotrophic partner fungus live together.

### Replenishment of nutrients in soil

- 1) Usage of fertilisers and manures
- 2) Rotation of crops