

CHAPTER 1: Nutrition in Plants

➤ **Nutrients:**

1. Constituents of food like carbohydrates, proteins, fats, vitamins and minerals which are essential for the body are called nutrients.
2. These nutrients are important as they supply the body with energy, helps living organisms to grow, and also help in healing of injured and wounded body parts.

➤ **Mode of nutrition in plants:**

In general, there are two modes of nutrition:

1. Autotrophic mode of nutrition:
 - (a) Auto = self, trophos = nourishment
 - (b) In this type of mode, the organism utilizes simple molecules like water, carbon dioxide etc. to prepare its own food.
 - (c) Plants are autotrophic organisms who make their food from the nutrients available in the surroundings
2. Heterotrophic mode of nutrition:
 - (a) Heteros = others, Trophos = nourishment
 - (b) In this type of mode of nutrition, the organism can not prepare their own food. They depend on others for their food
 - (c) Animals and other organisms like funguses are heterotrophic in nature.

➤ **Photosynthesis (Photo: Light, synthesis: to combine)**

- 1.) It is the method of making food from simple substances in environment, in the presence of light
- 2.) The site of photosynthesis is green leaves
- 3.) Water and minerals are absorbed from the soil with the help of roots,
- 4.) Plant vessels like xylem transports water from roots to leaves.
- 5.) Carbon dioxide is taken up from air with help of stomata.
 - ✓ **Stomata:** Small openings on the surface of leaves is called stomata. These openings are covered with help of guard cells which swell and shrink to open and close the stomata.
- 6.) **Chlorophyll:** It is a green colored pigment present in leaves which helps the leaves to trap sunlight for preparation of food.
- 7.) Food preparation by plants require chlorophyll, sunlight, carbon dioxide and water.
- 8.) Sun is the source of energy to all leaving organisms on the earth.
- 9.) Photosynthesis can also occur in green stems and green branches.
- 10.) Oxygen is generated as a byproduct of photosynthesis which is necessary for living organism.
- 11.) Desert plants have adaptionlike scales and spines to prevent water loss in water scarce area
- 12.) Algae which are found in ponds, stagnated water bodies can also synthesistheir own food

13.) Photosynthesis is known to generate carbohydrates. These are then known to produce other nutrients like proteins, fats etc.

14.) Nitrogen required for protein synthesis can be absorbed from soil.

15.) Nitrifying bacteria convert atmospheric nitrogen to organic forms, which can be utilized by plants. Apart from these fertilizers added to the soil also serve as a source of nitrogen

➤ **Equation of photosynthesis:**

Carbon dioxide and water combined in the presence of sunlight and chlorophyll generate Carbohydrate (starch), oxygen.

➤ **OTHER MODES OF NUTRITION IN PLANTS**

- 1.) Some plants lack chlorophyll and hence have heterotrophic mode of living.
- 2.) One example of such plant is *Cuscuta*, which absorbs nutrition from host plants which it grows.
- 3.) This is parasitic mode of living as the host plant loses out on nutrients which are essential for its growth and living.
- 4.) Insectivorous plant: Plants which feed on insects are called insectivorous plants.
 - A.) Such plant have a structural adaption which look like a jug or pitcher
 - B.) The pitcher like structure is covered with a lid like structure which modification of leaf apex.
 - C.) There is hair like structures pointing downward which entangled the insect once it lands inside the mouth.
 - D.) Various digestive juices are secreted in the pitcher like structure.

➤ **SAPROPHYTES:**

- Saprophytes: These organisms feed on dead and decaying matter.
- Example of saprophytes include fungi like mushrooms

➤ **SYMBIOSIS:**

- A give and take relationship between plant and fungus is called symbiosis.
- An example is of lichens, it is an association between fungi and algae
- The algae synthesis the food and fungi provide shelter, water and minerals.

➤ **SOIL NUTRIENT REPLENISHMENT:**

- Manure and fertilizers can be added to soil to replenish the nutrient level in soil.
- Nitrogen, Potassium, Phosphorous levels are maintained in the soil by adding these fertilizers in the soil,
- Nitrogen levels decline due to its absorption by plants.
- *Rizobacteria* form a symbiotic relationship with plants.
- *Rhizobium* converts atmospheric nitrogen in organic form.
- *Rhizobium* can not produce its own food and hence reside in roots of leguminous plants like gram, peas and moong.
- *Rhizobium* provides nitrogen to the plants while in return plants provide food and shelter to *Rhizobium*.