Life process Modes of Nutrition & Photosynthesis

✤ NUTRITION INTRODUCTION

Nutrition is a process of intake of nutrients (like carbohydrates, fats, proteins, minerals, vitamins and water) by an organism as well as the utilization of these nutrients by the organism. A nutrient can be defined as a substance which an organism obtains from its surroundings and uses it as a source of energy or for the biosynthesis of its body constituents (like tissues and organs) to provide energy for performing various metabolic activities of the organism.

There are various type of nutrients on the basis of function they perform: -e.g.Energy foods:- Carbohydrates and fats.

Body building foods:- Proteins and mineral salts. Regulating foods:- Vitamins and minerals.

✤ MODES OR NUTRITION:

There are several modes of nutrition on the basis of which organisms are classified as follows:

- **1. Autotrophic:** (Auto = self, trophic = food) It is a mode of nutrition in which organisms prepare their own food. Inorganic molecules like CO2 and H2O are converted into organic molecules like carbohydrates in the presence of sunlight and chlorophyll. e.g., green plants. Autotrophs are further categorized. as:
- (i) Photoautotroph: Those which utilize sunlight for preparing their food
- (ii) Chemoautotroph: Those which utilize chemical energy for preparing their food.
- 2. Heterotrophic :(Hetero = different; trophic = food) It is a mode of nutrition in which organisms derive their food for some other animals or plants. They cannot prepare their own food e.g. human being. Heterotrophs are further categorized depending on the nature of food they consume:
- (i) Herbivores : Animals which eat only plants, e.g. Cow, goat etc.
- (ii) Carnivores : They feed on flesh of other animals, e.g. Lion, vulture etc.
- (iii) Omnivores : They feed on plants and animals both e.g. Dog, human etc.
- (iv) Detritivores : Feed on detritus or dead organic remains, e.g. Earthworm etc.
- (v) Sanguivorous : Feed on blood e.g. Leech, female mosquito etc.
- (vi) Frugivorous : Feed on fruits, e.g. Parrot etc.
- (vii) Insectivores: Feed on insects, e.g. Bats etc.

On the Basis of Mode of Feeding Organisms are Categorised As:

- (i) Holozoic : They ingest mostly solid but sometimes liquid food. e.g., Amoeba, human etc.
- (ii) Saprotrophic: They absorb organic matter from dead and decaying organisms with the help of

their enzymes. e.g., Bacteria, fungi etc.

(iii) **Parasitic:** They derive their nutrition from other living plants or animals e.g. Plasmodium round worms etc.

1. Nutrition in Plants

Plant perform photosynthesis [Photo (light) and synthesis (Build up)]. Photosynthesis is a process that converts carbon dioxide into organic compounds, especially sugars, using sunlight in presence of chlorophyll. Photosynthesis occurs in plants, algae, and many species of bacteria. It is represented by:

 $6CO_2 + 12H_2O \xrightarrow{sunlight,chlorophyll} C_6H_{12}O_6 + 6O_2\uparrow + 6H_2O$



It takes place in every green part of plant mainly in the green leaves. Plants stores food in the form of Starch.

Essential Elements of Photosynthesis:

- (I) Sunlight:
- For plants sun is the basic source of radiant energy.
- Plants utilize the light in the visible region of solar spectra (electromagnetic spectrum) which comes under the range of 400 nm 700 nm.
- Visible region consists of white light which is a mixture of 7 lights of different wavelengths.

Class-X

BIOLOGY



Maximum photosynthesis occurs in red region. There is minimum photosynthesis in green region because green parts of plants reflect whole of the green light

✤ SITE OF PHOTOSYNETHESIS :

The actual site of photosynthesis is chloroplast (cell organelle) Leaf \rightarrow Mesophyll tissue \rightarrow Palisade / Spongy parenchyma \rightarrow Chloroplast \rightarrow Chlorophyll

Green colour of plants appears because out of the seven colour of the white visible light, chlorophyll absorb all excepts green colour. Green is totally reflected back. Hence, leaves look green in colour.



Site of photosynthesis is different in prokaryotes and eukaryotes.

- In prokaryotes: Photosynthesis occurs in lamellar chromatophores.
- In eukaryotes: Photosynthesis occurs in chloroplast.
- Exception: Fungi (It lacks chlorophyll so no photosynthesis occurs here).
- In higher plants chloroplast in the main site of photosynthesis.
- Chloroplast is also called as green plastid.
- Plastid was first observed by Haeckel.
- Plastids are of 3 different types on the basis of pigments present in them.