

Nutrition of blue-green algae.

The water is the major essential substance which restrict the growth of algae, therefore it is necessary to provide water mainly so that the algae can be grow, and is followed by the rest of the other nutrients such as nitrogen, potassium, phosphorus, magnesium, sulfur, iron and small amounts of trace elements such as copper, manganese, ...and so on.

According the mode of living, the blue green algae can be classified into three groups:

1. Obligate Photoautotrophic.

The blue-green algae which grow and fed by self-feeding are called obligate photoautotrophic blue-green algae. These organisms get carbon required in the form of CO₂ from the air and derive the energy required from sun. They can build up complex organic substances such as carbohydrates from simple inorganic sources (CO₂ and water). Photoautotrophs contain in their cells chlorophyll known as chlorophyll a by which they can perform photosynthesis.

2. Obligate heterotrophic (Organotrophs).

The algae that live in total darkness and cannot carry out photosynthesis, and therefore classified as heterotrophic organotrophs. The autotrophic species cannot be live under these conditions. **Obligate heterotrophic** depend on readymade organic materials. They can live on such compounds, break it down, enzymatically, into simpler compounds which can be absorbed. The process of breakdown of such complex organic substances releases energy which can be used by such organisms in

building up its complex protoplasmic material from the simple absorbed substances.

3. Facultative photoautotrophic.

There are many species of blue-green algae are considered facultative heterotrophs, where they can to live under both conditions and get the energy necessary in the case of the dark by oxidation of organic matter, so called facultative photoautotrophic such as *Nostoc* and *Anabaena* which can be use molecular nitrogen (N_2) to obtain the energy. These organisms assimilate a group of carbohydrates such as starch and sucrose, glucose and glycerin, citric acid.

The facultative photoautotrophic blue-green algae can be quickly return to the process of photosynthesis, if transferred to the media containing nutrient materials and incubated in the presence of light and that no matter how long the period of custody in the dark. It was found that the rate of growth of these organisms increased in the light conditions than in the case of dark conditions even if these organisms adapted to growth as heterotrophic.

Until now there is no clear geographical map for the distribution of families, genera or species in the world depending on the mode of neutrino. Usually, algal communities tends to concentrated at the surface of the soil or in the layer immediately below, where available sunlight for photosynthesis process.