

## **ECONOMIC IMPORTANCE OF ALGAE TO MAN, ANIMALS AND PLANTS**

Although the use of algae is very old and is mentioned in the Chinese poetic literature about 600 B.C. but they are still considered less important economically than fungi and bacteria. The phycologists are continuously working to get hold of their economic importance and have unearthed many beneficial as well as harmful economic aspects of algae.

**\*\*\*\*\*Beneficial Aspects of Algae:** Some of the beneficial roles exhibited the algae are as followings:

- i. **Role as Primary Producers:** Because of their photosynthetic abilities the algae are the primary producers of the aquatic environments. They provide food and energy to the animal life, produce oxygen and take up carbon dioxide produced during respiration which is injurious for living organisms especially fishes.
- ii. **Source of Food:** More than 100 species belonging to green, brown and red algae are used as food for humans because of presence of proteins, carbohydrates, minerals and vitamins, either in the cell wall or in the cytoplasm. These include Monostroma, Ulva, Codium and Chlorella. The most important of these are the Chlorella which is high in protein and lipid contents. It has all the essential amino acid contents in it, therefore used as substitute food especially in space flights. The algae also afford as food for animals especially in coastal countries. Laminaria, Sargassum, Fucus and Ascophyllum are used as fodder for animals.
- iii. **Industrial Use:** Many algae yield certain chemical products which are used in various industries for various purposes. Some of these products and their uses are:

- a. **Agar-Agar:** It is dried; jelly-like, non-nitrogenous extract obtained from some genera of Rhodophyta like Gelidium, Gracilaria, Ahnfeltia, etc. It is used as base for different culture media in laboratory for culturing microorganisms because of its food value and ability to afford good range of temperature for culturing.
- b. **Alginates:** These are alginic acid and their derivatives, the most common being algin. They are usually extracted from the middle lamella and primary walls of the brown and red algae. The alginates are used in rubber-tyre industry, paints, and ice-creams and in preparation of flame proof fabrics and plastic articles.
- c. **Carrageenin:** It is carbohydrate mucilage extracted from red algae used as clearing agent in beer preparation, in preparation of tooth pastes, cosmetics, and paints and in pharmaceutical industries.
- iv. **Antibiotics and Medicines:** Some algae yield antibiotics, e.g., Chlorellin is obtained from green alga Chlorella; that inhibits the growth of certain bacteria. Similarly some species of Polysiphonia produce antibacterial substances which are effective against gram-negative and gram-positive bacteria. An antibiotic is obtained from a diatom Nitzschia palea which is effective against Escherichia coli. Because of high iodine contents, brown algae are used in manufacture of various goiter medicines.
- v. **Nitrogen Fixation:** The conversion of atmosphere nitrogen compounds is one of the major roles being played by the algal plants especially by the members of Cyanophyta (blue-green algae). A high rice yield has obtained when the rice fields were inoculated by certain nitrogen-fixating blue-green algae.

vi. **Fertilizers:** Due to presence of phosphorous, potassium, calcium and some traces elements, the sea weeds (brown algae) are used as fertilizers in most of the coastal countries of the world. For example Chara is used to overcome calcium deficiency in the fields, and Fucus is used as common manure.

\*\*\*\*\***Harmful Aspects of Algae:** Despite of so many beneficial activities of algae or brings loss of life and economy to the human's beings, animals, etc. some of the harmful aspects of algae are:

- i. **Contamination of Water Reservoirs:** The algae show a luxurious growth in water reservoirs meant for domestic supplies. Such algae included members of Cynophyta like Nostoc, Anabaena, Volvox and some diatoms. Their abundant growth interferes the filtration process and also brings bad taste to water due to decay of dead algal plants.
- ii. **Water Blooms:** Sometimes algal plants show profuse growth and form quite apparent bodies called water blooms. Usually the members of Cynophyta forms water blooms in fresh waters and members of Dinoflagellatae in marine waters. These bodies emit bad smell, secrete certain poisonous substance harmful to aquatic animals and also sometimes check s the speed of ships due to their presence in the form of a thick layer.
- iii. **Disease in Human Beings:** The water contaminated by Microcystis and Anabaena causes stomach troubles in human beings. Similarly respiratory disorders have been observed when the water infected by Gymnodinium bervis is taken by the humans. Lyngby and Chlorella are responsible for skin diseases and some other algae cause allergies.

iv. **Parasitic Activities:** Some algae are parasites on the other plants animals as well. Most of these belong to the Rhodophyta (red algae) and include genera like *Pterocladiphila hemisphaerica* which is parasite in the *Pterocladia lucida*, and *Gelidiocolax mammilata* parasitizing *Pterocladia*, etc.

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