

Economic Importance of Algae

Economic importance of higher plants are well known among people, and the societies but there is less awareness about the economic importance of lower plants like Cryptogams. Among the groups of cryptogams algae and fungi have very wide importance.

Algae have much importance in respect of food, medicine, industry, space etc. Now a days nutritional products are also prepared. The different examples are as follows: -

(A) As food

- ① Algae are important source of food for fishes, amphibians, mammals as well as humans.
- ② In the pacific islands, red, brown and green algae form a regular portion of diet. Over a hundred species appear on the diet list. The important are *Spirogyra* and *Oedogonium* in India and *Ulva* in Europe. First two are mixed in soup.
- ③ The young slips of *Laminaria* and sporophylls of *Alaria* are also eaten.
- ④ *Ulva lactuca* was formerly used as salad and soup in Scotland.
- ⑤ *Porphyra* is considered a tasteful dish in England and is a common diet in Korea, Japan & China. It is rich in Vitamin B & C.
- ⑥ A red alga, *Rhodomenia palmata* is used as food and confection.
- ⑦ Coastal people of China and Japan uses sea weed like *Porphyra tenera*, *Laminaria*, *Sargassum* while *Caulerpa racemosa* is cultivated in Philippines as source of food.
- ⑧ In Japan many of the weeds are cultivated in bamboo frames in water to meet their demand. About 25% of diet in Japan consists of sea weeds.
- ⑨ Algae are considered rich in protein, fat and Vitamin A, B, C and E. Vitamin B is found in *Ulva*, *Enteromorpha*, *Laminaria*, *Porphyra*, *Nereocystis* & *Chondrus crispus*. *Ulva*, *Enteromorpha* & *Alaria valida* contain vitamin C.

(B) Agar Agar

- ① Agar Agar is a gelatinous, clear, nitrogen free extract from *Gelidium*, *Gracilaria* and *Gigartina*.
- ② The extract is a gel containing galactose and a sulphate, its melting point is between 90-100°F. At lower temperature it becomes solid. It is soluble in hot water.

(3) It is of great value in preparation of foodstuffs, cosmetics and certain medicines. It is generally used as base for culture media.

(C) Alginate Acid

- (1) The insoluble extract of calcium salt is alginate acid and the soluble calcium salt of alginate acid is known as algin.
- (2) Algin is a carbohydrate which occurs in the middle lamellae and primary walls of these sea weeds. It is colloidal material with formula $(C_6H_8O_6)_n$.
- (3) Chief source of alginate acid are *Ascophyllum*, *Laminaria*, *Macrocystis* etc.
- (4) Salts of alginate acid found in cell wall of above sea weeds are known as alginates. Alginates are used as thickeners in food industry, cosmetic and in textile industry as printing pastes. They are also used in rubber industry.
- (5) Alginates are of great value as ~~emulsifiers~~ ^{AS} emulsifiers, ~~gelling~~ ^{AS} gelling agents in confectionary, powder, paints & ice-cream.

(D) Iodine

- (1) Japan produces about 100 tons of Iodine annually from Kelps (Brown sea weeds). The chief genera are *Laminaria*, *Pucus*, *Ecklonia*, *Eisenia* etc.
- (2) The Kelps are also a source of soda and potash.
- (3) Red algae, *Rhodospira* and *Polysiphonia* are the source of bromine.

(E) Carrageenin (Caragheen)

- (1) The chief source of caragheen is red alga *Chondrus crispus* and to a lesser extent *Gigartina*.
- (2) It is a cell wall polysaccharide and is a mucilaginous extract.
- (3) Carrageenin is used in food, textile, pharmaceutical, leather and brewing industries. It is also used to stabilize emulsions.

(F) AS Medicine

- (1) As algae are source of iodine, it is used as ~~goiter~~ goiter medicine. *Laminaria japonica* & *L. religiosa* have high value of iodine. Green alga, *Codium intricatum* has good quantity of iodine.
- (2) Chlorellin from *Chlorella* is used as antibiotic.
- (3) It has been reported that extracts of *Cladophora* and *Lyngbya* possess anti-viral properties and kill strains of certain bacteria (*Pseudomonas* and *Mycobacterium*).
- (4) Now, *Spirulina* is sold as ~~nutrient~~ nutrient under medical ~~and~~ use.

(G) AS Fodder

- (1) Sea weeds are also used as fodder for animals, cattle, poultry etc.
- (2) Norway, France, USA, Denmark and New Zealand have common practice of using fodder from weeds.

- ③ In Great Britain, France, Scandinavia and Pacific coast of USA, kelps are chopped off for sheep and chicken.
- ④ Some countries have developed small industries for processing the weeds like Ascophyllum, Fucus and Laminaria in soluble cattle feed. While Rhodomyria is used as a cattle fodder in France.

(H) In agriculture

- ① Cyanophyceans (blue green algae) are the major source of N_2 fixation in rice fields. Examples are Oscillatoria princeps, O. formosa, species of Anabaena, Spirulina, Nostoc, Cylindrospermum etc.
- ② Larger plants of brown and red algae are used as organic fertilizers. They are richer in potassium but poor in nitrogen and phosphorus than the farm manure.
- ③ In Japan, They are used in rice fields while in China for groundnut and sweet potato. In India, Turbinaria is used as fertilizer around palm trees
- ④ In Rajasthan, Anabaena and Spirulina are enormously produced in Sambhar lake. As such both are used as green manure by local farmers. Sea weeds are also used as compost.

(I) In Space travel

- ① It has been seen that unicellular, microscopic algae such as Chlorella pyrenoidosa and Synechococcus are probable food for space flight.
- ② It multiplies rapidly and could utilize CO_2 and liberates O_2 in sufficient amount. available for spacemen.
- ③ As a source of nitrogen for protein synthesis, it will assist in decomposition of human wastes.

Conclusion

There are many more species of algae and their different uses which can't be dealt with here. We have considered such examples and types which are sufficiently used by wider areas of the ~~world~~ land and people. Foreseeing the future food problem and industrial inputs ~~it~~ it can be said that algae are also a major source of biomass and productivity.