Economic importance of Algae

USEFUL ASPECTS OF ALGAE

1) Algae as human food:

Chlorella, a unicellular green alga, possesses a high quality of food value.
 It has about 50 % proteins and 20% lipids and carbohydrates. Besides, it contains vitamins A, B, C, K and essential amino acids.

Porphyra tenera (a red alga) is known as **Amanori** in Japan and the preparation is known as **Asakusa Nori**.

□*Laminaria* (a brown alga) yields a food product known as **kombu or konbu** □Young stipes of *Laminaria* are eaten directly in certain parts of Europe and America.

□*Nostoc* (blue green alga) balls of terrestrial species are collected, boiled and consumed as food by the Chinese.

Alaria (a brown alga) yields a product known as **Sarumen** in Japan.

□*Monostroma* (a green alga) yields food product Aonori in Japan.

□*Ulva lactuca*(*a* green alga) used in salad and soups.

□*Rhodymenia palmate* (a red alga) used as food and also as confectionary named dulse.

2) Algae used as fodder:

Sea weeds, such as *Fucus*, *Laminaria*, *Sargassum*, *Ascophyllum* etc. are used as fodder for the sheep, goat, cattle and poultry in many countries.

- 3) Use of algae in agriculture:
- a) Nitrogen fixers: The common nitrogen fixing blue green algae of Indian rice fields are Anabaena, Aulosira, Nostoc, Cylindrospermum, Tolypothrix, Scytonema, Stigonema etc. Among them the Aulosira fertilisima is most powerful nitrogen fixer.
- b) Reclamation of barren, alkaline soil: sterile alkaline soil is known as usar soil
 BGA such as Nostoc commune, Aulosira, Anabaena etc. if grown under water-logging conditions, convert this soil into agricultural land suitable for cultivation of crop.
 It increase water holding capacity of soil, lower H+ ions.
- c) Soil formation : algae growing symbiotically with lichen acts as pioneers of succession on barren rocks and help in soil formation.
- d) Fertilizer and manure: Turbinaria used as fertilizer around palm tree. Anabaena and Spirulina produced in huge amount in Sambhar Salt lake in Rajasthan is used as green manure by local farmers.
- e) Sewage disposal: Algae such as *Chlorella*, *Chlamydomonas*, *scenedesmus* etc. are allowed to grow in sewage water by certain treatments.

4)Algae in space research: Unicellular alga *chlorella* or *Scenedesmus* could be used to provide oxygen during space flights.

- 5) Commercial products of algae:
- i) Agar-agar: Extracted from red algae, particularly, *Gelidium*, *Gracilaria*, *Gigartina*, *Pterocladia*, *Chondrus*, *Ceramium* etc.
- ii) Alginates :Obtained from *Macrocystis*, *Ascophyllum*, *Laminaria*, *Fucus*, etc. in India it is obtained from *Sargassum*.

used in the preparation of creams, jellys, soups , sauces and ice-creams because of its non-toxic nature.

- iii) lodine : obtained from Laminaria, Fucus, and Macrocystis pyrifera (giant kelp).
- iv) Bromine: obtained from Rhodomella and Polysiphonia.
- v) Carrageenin: it is found in the cell wall of red algae. It is mainly obtained from Chondrus crispus .
- vi)Diatomite (Kieselgurh): Big deposits of fossilized diatoms in the sedimentary rocks make diatomaceous earth or diatomite. These deposits are mined as diatomaceous Earth. Used in industrial filtrations, preparation of high temperature furnaces, as insulators in refrigerators, polishes of metals etc.

6) Role of algae in medicine: An antibiotic chlorellin obtained from chlorella. This is used against gram +ve bacteria and gram -ve bacteria, especially Escherichia coli, Shigella dysenteriae.

Negative aspects of algae

1) Toxicity: Many algae produces toxins which can cause the death of aquatic animals.

Toxins produced by Prymnesium parvum, Gymnodinium, Microcystis, Gonyaulax

can lead to death of fishes and other aquatic animals

Anabaena and Microcystis cause gastric troubles.

2)Parasitism: *Cephaleuros*, a green algae, is parasitic in nature and cause red rust of tea.

Polysiphonia fastigata is parasitic on brown alga Ascophyllum nodosum.

3) Damage: Some seaweeds grow on metalic and wood work of ships and boats causing fouling, corroding and destruction.

Some algae grow on wall of historical buildings and monuments and spoil them. **4)Other effects :** Oscillatoria, Spirogyra and diatoms clog the water filters and change the taste and colour of water, and produce foul odour. Excessive growth of algae cause hypoxic conditions to the aquatic animals.