Contents

INTRODUCTION

During rainy season the slippery green structure we see on the shady and moist places. All these structures which we are study among plants. These organisms are commonly known as 'algae'- a Latin word which literally means sea weeds.

1- Algae are simplest chlorophyllous forms found on the earth.
Photoautotrophs: Make their food with the help of water and carbondioxide in presence of Sunlight.

2- Algae belongs to thallophyta.

Thallophyta: A division of the plant kingdom containing relatively simple plants, i.e. those with no leaves, stems, or roots. It included the algae, bacteria, fungi, and lichens.

- The name algae was first given by Linnaeus.
- Algae may be define as thalloid, autotrophic, non-vascular plants having unicellular or muticellular, non jacketed sex organs with no embryo formation.
- These have been placed under thallophyta.
- The study of algae is called Phycology (a Greek word *Phycos* means 'sea weeds' and *logos* means 'study') and references of

algae are available in ancient literature of Greek, Roman and Chinese.

- ❑ Prof. M.O.P. Iyengar is known as father of Modern Indian Algology.
- ❑ Near about 30,000 species of algae are found in the world.
- ❑ It is generally autotropic but can also exist in the form of symbiont, parasite etc.
- ❑ Algae, commonly known as pond scum, can be seen easily growing on water surface of ponds, ditches, tanks, pools etc.

GENERAL CHARACTERSTICS OF ALGAE

- Algae are chlorophyll bearing thalloid plants with no differentiation into tissue or tissue system; however some algae have advanced complex thalli with slight differentiation of true tissues (*Ulva, Sargassum* etc.).
- All the algae except few are aquatic.
- All the cells of the thallus are morphologically and physiologically similar.
- The cell has cell wall.
- Sex organs are unicellular generally, when multicellular, each cell is capable to reproduce.
- Sex organs are never surrounded by sterile jacket layer.
- No embryo is formed after gametic fusion.
- New plants develops after meiotic division in the zygote.
- Sporophytic and gametophytic generations are independent when represented in life cycle.
- Generally the main plant is a gametophyte.
- Reproduction in algae takes place by vegetative, asexual and sexual modes.

Algae

HISTORY OF PHYCOLOGY

❑ The history of algae is quite old and is available in early literature of Chinese, Roman and Greek. Romans called algae as *Fucus*. Chinese named it *Tsao* while Hawanians called them as *Limu*. In ancient literature it was reported that algae were used as manure on the north coast of France.

❑ **In India**, literature provided the evidence of phycology since 18th century where major interests were on macroscopic forms of algae. F. E. Fritsch (1907) published a marvelous work on sub-aerial and fresh water algae from Ceylon. He published the classification of algae in his book 'Structure and Reproduction of the algae'.

❑ Ghose (1919-32) was the pioneer of phycology in India. He conducted research on blue green algae of Burma and Punjab. Prof. M. O. P. Iyengar is regarded as 'Father of modern phycology of India'. He (1920), together with his students Balakrishna, Desikachary, Kanthamma, Ramanathan and Subramanium studied a number of Indian algae. Iyengar discovered *Fritschiella tuberosa* from India. Biswas (1922-26) wrote on algal flora of East India, Assam and Bengal. Prof. Y. Bhardwaj established a school of algology at Banaras Hindu University.

HABITAT

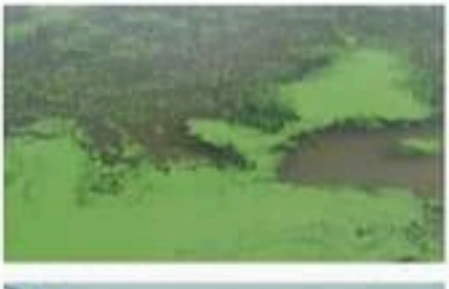
❑ Algae are of universal occurrence because of their presence in nearly all types of habitats.

❑ They are found in fresh water, sea water, on soil, on rocks and stones, on sands, in very hot water, on ice and snow, on tree trunks, in the plants (Endophytic); on the plants (Epiphytic), in the animals (Endozoic) or on the animals (Epizoic) etc.

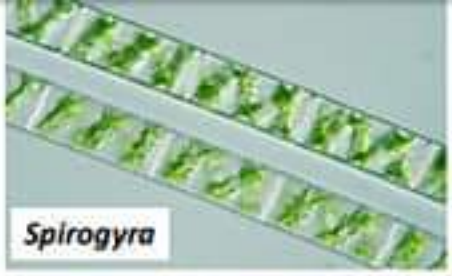
❑ On the basis of its presence they may be:

1- Aquatic
2- Terrestrial
3- Specialized types

1-Aquatic Algae: Most of the algae are found in fresh water or marine water.



a) **Fresh water algae-** free floating algae as *Spirogyra*, or even attached to the substratum e.g.- *Ulothrix*


Spirogyra


Ulothrix

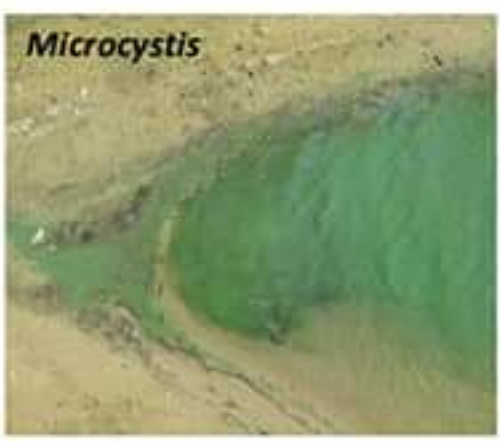
b) **Marine Algae-** are common in salty water of sea and oceans. Generally the members of phaeophyceae, Rhodophyceae and some Chlorophhyceae e.g., *Enteromorpha, Caulerpa. Ulva, Codium, Enteromorpha* etc. are found in marine water.

(i) **Benthophytes-** They are generally the attached forms. They cannot float freely in water. Fresh water benthophytes are *Chara, Nitella* etc and the marine water forms are *Lamillaria, Fucus* etc.


Chara


Fucus

(ii) **Euplanktophytes-** The plants are never attached to the substratum. They remain free floating type throughout their life.
e.g.- *Microcystis*


Microcystis

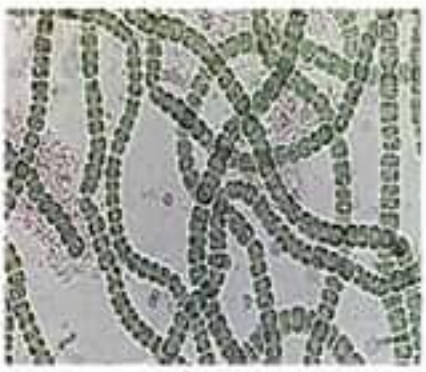
(iii) **Tychoplanktophytes-**
The plants start their life as attached form but later on become free floating type. e.g.- *Oedogonium, Nostoc* etc.


Oedogonium

2-Terrestrial Algae- Those algae which are found in soil are termed as terrestrial algae. The algae makes a green film on the surface of soil. These are of two types-

(a) Saphrophytes – The algae is found in the surface of soil. e.g.- *Botrydium, Vaucheria.*

(b) Cryptophytes- The algae is found in the subterranean region. They are found in the soil.
e.g. *Oscillatoria, Anabaena, Nostoc* etc.



Anabaena

3-Specialized Algae- Such algae are found in places other than water and soil. They are found in specialized habitats. These are:

(i) Thermal algae- The algae are found in hot water springs above 70° C temperature. They can survive well in such a high temperature. e.g. are-

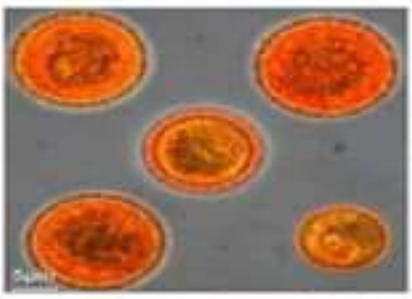
Example: Haplosiphon lignosus

(ii) Cryophytic algae- The algae are found on snow clad (बर्फ से ढका हुआ) mountains. examples are-

(iii) **Halophytic algae-** Found in high salt condition. e.g.-

Halophytic Algae

- They are present in water containing high percentage of salt.



Haplosiphon salina

(iv) **Lithophytic algae-** Common in wet rocks and walls. e.g.- *Vaucheria, Nostoc* etc.

Lithophytes

- Found on moist rocks and rocky surfaces.

Gleocapsa

Rivularia

(v) **Epiphytic algae** (परोपजीवी) – These algae grow on other aquatic plants. On trees, barks, leaves etc. of higher plants. e.g. – *Trentopohlia, Rubus*, etc.

(vi) **Endophytic algae** (अंत:पादपीय)- These algae are found inside the higher plants. Nostoc is found in the thallus of *Anthoceros* and *Anabaena* grows inside the coralloid roots of *Cycas* etc.

(vii) **Epizoic algae** (अधिजातव) - Found on the surface or shell of the animals. e.g.- *Cladophora* sp. found on the shell of snail.

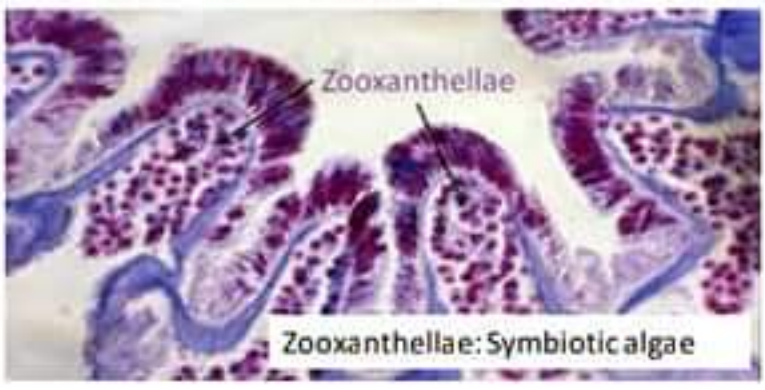
Epizoic Algae

- These algaes are found on shells of molluscans, turtles and fins of fishes.
- Example: *Acrosiphonia*.

(viii) **Endozoic algae** (अंत:जंतुक)- Found inside the body of aquatic animals. e.g.-*Zooxanthella* is found in the fresh water sponges.

(ix) **Parasitic**(परजीवी)**algae**- Some algae are heterotrophic (परपोषी) parasitic type, Red rust of tea(*Thea sinensis*) is caused by *Cephaleuros virescens.*

(x) **Symbiotic**(सहजीवी) **Algae**- Several algal species live in symbiotic(सहजीवी) forms with other plants. e.g.- Lichen where algae (Cynophyceae) and Fungi (*Ascomycetes or Basidiomycetes)* live in symbiotic form. *Nostoc, Anabaena* easily live in symbiotic form in various higher plants.



(xi) **Water blooms**- Some unicellular and filamentous forms of algae grow extensively on the surface of water and make the place lathery (झागदार) called water blooms. e.g.- *Nostoc, Anabaena*