

CC 1 : BIODIVERSITY (Microbes, Algae, Fungi and Archeogonate)

UNIT – 2

**Algae**  
(Part 1)

**Definition :**

**Fritsch, F.E. in 1935** first defined algae as the holophytic organisms (as well as their numerous colourless derivatives) that fail to reach the higher level of differentiation characteristic of the archegoniate plants.

- The term alga (means - seaweed) was first introduced by **Linnaeus in 1753**.
- The Branch of botany that deals with the study of algae is called **phycology**.

**General Characteristics :**

1. Algae are chlorophyll-bearing autotrophic thalloid plant body.
2. Algae are the primitive and simplest division of plant kingdom, both prokaryotic and eukaryotic.
3. Almost all of the algae are aquatic.
4. The plant body may be unicellular to large robust multicellular structure.
5. The multicellular complex thalli lack vascular tissue and also show little differentiation of tissue.
6. The sex organs are generally unicellular, but when multicellular, all cells are fertile and in most cases the entire structure does not have any protective covering.
7. The zygote undergoes further development either by mitosis or meiosis, but not through embryo formation.
8. Plants have distinct alteration of generations.

**Ecology and distribution :**

The algae are ubiquitous (present everywhere) in distribution, i.e. they are found in fresh water as well as marine water, on soil, on rock, as epiphytes or parasites on plants and animals, in hot springs, in desert etc.

Based on the habitat the algae may be categorized as –

- (i) Aquatic algae,
- (ii) Terrestrial algae, and
- (iii) Algae of remarkable habitats.

❖ **Aquatic algae :**

1. The **fresh water algae** (salinity less than 10 ppm) are *Chlamydomonas*, *Volvox*, *Ulothrix*, *Chara*, *Oedogonium*, *Nostoc*, *Spirogyra* etc., commonly grow in ponds, lakes, tanks etc.

A. When fresh water algae remain suspended on the upper part of the water (e.g., *Volvox*, Diatom) may be termed as planktonic.

B. While the benthic algae are bottom dwellers. The benthic algae may be –

- i. **Epilithic** (that grow on stones),
- ii. **Epipellic** (attached to sand or mud),
- iii. **Epiphytic** (Growing on plants) and
- iv. **Epizoic** (growing on animal body).

2. The **marine algae** (salinity is 30 – 40%) are *Sargassum*, *Laminaria*, *Ectocarpus*, *Polysiphonia* etc. The marine algae may be –

A. **Supralittora or subaerial** : They grow above the water level.

B. **Intertidal** grow in such a depth that they are exposed periodically due to tides.

C. **Sublittoral** : They are constantly submerged . Again they may be epilithic, edaphic, epiphytic, epizoic.

❖ **Terrestrial algae :**

The common terrestrial members are *Oscillatoria sancta*, *Vaucharia geminata*, *Chlorella lichina* etc. Terrestrial algae are of various types –

**Saprophytes** : grow on the surface of the soil.

**Cryptophytes** : grow under the surface of the soil.

❖ **Algae with remarkable habitats :**

1. **Halophytic algae** : They grow in the highly concentrated salt lakes and include *Chlamydomonas ehrenbergii*, *Dunaliella* etc.

2. **Symbiotic algae** : They grow in association with fungi, bryophytes, gymnosperms or angiosperms. Examples include *Nostoc*, *Gloecapsa*, *Rivularia* grow in association with fungi. This association of algae with fungi is call lichen. *Nostoc* may also be associated with *Anthoceros* and *Anabaena* associates with the roots of *cycas* form coralloid roots.

3. **Cryophytic algae** : This type of algae grows on ice or snow and give attractive colours to snow-covered mountains. e.g., the alpine and arctic mountains become red due to the growth of *Haemotococcus nivalis*. Green snow in Europe is due to the growth of *Chlamydomonas yellowstonensis*, *Scotiella nivalis*. *Raphidonema brevirostri* cause black colouration of snow.
4. **Thermophytes or thermal algae** : This group of algae occurs in hot water springs. Examples include many blue green algae such as *Oscillatoria brevis* *Synechococcus elongates*.
5. **Lithophytes** : They grow on the moist surface of stones and rocks. e.g., *Nostoc*, *Gloecapsa*, *Batrachospermum* etc.
6. **Epiphytic algae** : They grow on othe plants including other algal members.  
Algae on algae – Diatoms on *Oedogonium*, *Spirogyra*.  
Algae on bryophytes – *Nostoc*, *Oscillatoria* etc. grow on different bryophytes.  
Algae on angiosperms – *Cocconis*, *Achanthes* etc. grow on an aquatic angiosperm *Lemma*.
7. **Epizoic algae** : The algae growing on animals like fish, snail etc. e.g., *Stigoclonium* grow on the gills of fishes.
8. **Endozoic algae** : They grow in the tissues of animals. E.g., *Zoochlorella* sp is foun in *Hydra viridis*.
9. **Parasitic algae** : They grow parasitically on different plants and animals. e.g., *Cephaleuros* is parasitically grows on the leaves of various angiosperms, such as tea, coffee etc. The most important one is *Cephaleuros virescens* causes **Red rust of tea**.