



ALGAE

1. What is algae?

Algae is a group of chlorophyll containing thalloid plants which bear unicellular or multicellular sex organs and the sex organs are not protected in the sterile jacket cells. An undifferentiated plant body is known as thallus. In thalloid plants, there is no differentiation of plant body into true roots, stem and leaves. The study of algae is known as phycology and the one who study algae is called phycologist.

2. Write the general characteristics of algae.

- The plant body is thalloid in nature.
- In Eichler's system of classification algae are placed in the division thallophyta along with fungi and lichens.
- Algae are autotrophs (synthesize food using light energy).
- Algae differ from fungi in presence of photosynthetic pigment (chlorophyll) and their mode of nutrition.
- Majority of algae are in aquatic habitat (fresh water or marine), some algae are terrestrial also.
- Algae present in all parts of the world including Arctic and Antarctic regions.
- Sex organs are unicellular or multicellular.
- Sex organs lack jacket cells around them.
- If jacket cells are present, they have different origin.
- There is progressive complexity in the production of different algal groups.
- Embryos are not formed after zygote formation.



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- Show distinct alternation of generation.
- Cellular organization may be prokaryotic (blue green algae) or eukaryotic (all other algae).

3. Briefly describe the ecological distribution of algae.

Algae found in a variety of habitats (Fresh water, marine, on rocks, with in plants or animals).

Aquatic forms are most common.

On the basis of habitat algae are classified in three groups.

I. Aquatic forms

Two types: Fresh water and marine forms.

- a. Fresh water forms: Occurs in ponds, lakes, river etc. (*Spyrogyra sp.*)
- b. Marine water forms: Occurs in saline condition such as seas and oceans
(most of the red and brown algae such as *Polysiphonia* and *Sargassum*)

II. Terrestrial forms

Found in/on soil, rocks, moist wall, tree trunk etc.

Example: *Vaucheria* and *Fritschiella* found on the surface of the soil.

III. Algae of unusual habitats

Halophytic algae: Algae present in highly saline water (e.g. *Dunaliella*)

Epiphytic algae: Algae grown on the surface of other plants/algae (e.g. *Oedogonium*).

Epizoic algae: Algae grown on animals such as snails and fishes (e.g. *Cladophora* grows on the shells of snails).

Endozoic algae: Algae growing inside the animals (e.g. *Zoochlorella* grows inside *Hydra*).

Symbiotic algae: Symbiotic association with fungi in lichen, in bryophytes (*Anthoceros*), in pteridophytes (*Azolla*), gymnosperms (coralloid roots of *Cycas*) and in angiosperms.

Parasitic algae: Algae grows as parasite on plants or animals (*Cephaleuros* is a parasitic green algae grow on the leaves of many plants causing red rust disease)

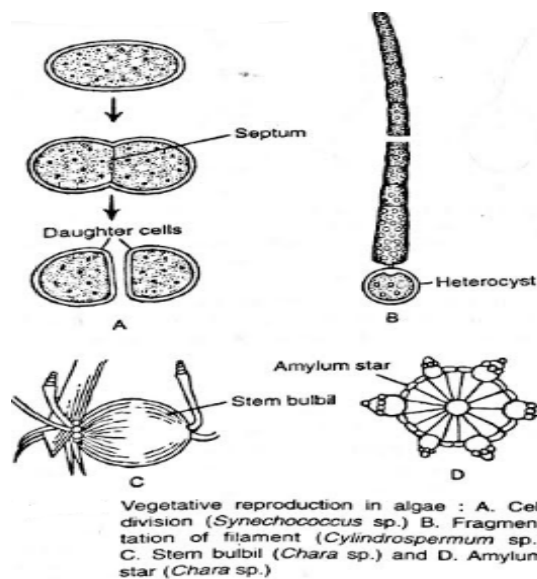
Thermophytic algae: Algae grow in hot springs (*Heterohormogonium*).

Fluviatile algae: Algae found in rapidly running water such as water falls (e.g. *Ulothrix* occurs in mountains waterfalls).

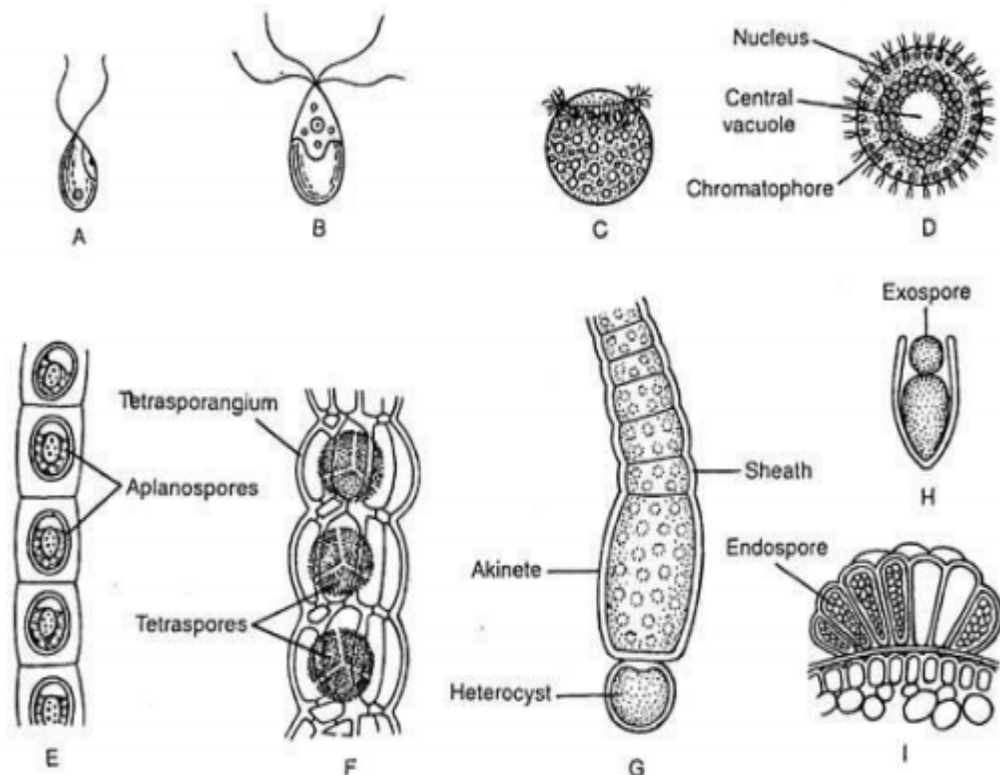
4. Reproduction in algae

Algae reproduce by three methods.

- a. **Vegetative reproduction:** Cell divisions, fission, hormogonia, formation of adventitious branches, tubers, buddings, bulbils, amyllum stars are the important vegetative reproduction methods in algae.

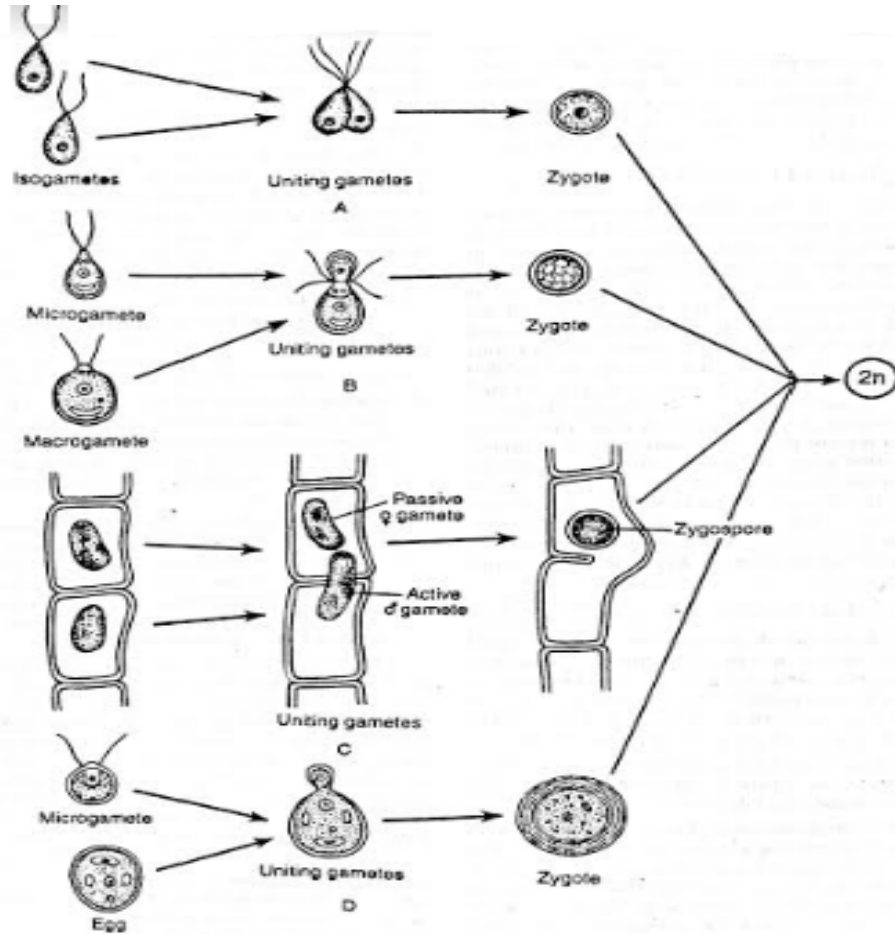


- b. **Asexual reproduction:** By a variety of motile or non-motile spores, zoospore, aplanospore, hypnospore, tetraspore, autospore, akinetes, exospores, endospores etc are the important spore types in algae.



Asexual spores in algae : A. Biflagellate microzoospore, and B. Quadri-flagellate microzoospore of *Ulothrix* sp., C. Multiflagellate zoospore of *Oedogonium* sp., D. Synzoospore of *Vaucheria* sp., E. Aplanospores of *Ulothrix* sp., F. Tetraspores of *Polysiphonia* sp., G. Akinete of *Gloeotrichia* sp., H. Exospore of *Chamaesiphon incrustans*, and I. Endospores of *Dermocarpa prasina*

- c. **Sexual reproduction:** Here the union of gametes are involved in Autogamy, hologamy, isogamy, anisogamy and oogamy are the different types of sexual reproduction in algae.



Types of sexual reproduction in algae : A. Isogamy in *Chlamydomonas* sp., B. Anisogamy in *Ectocarpus* sp. C. Physiological anisogamy in *Spirogyra* sp., and D. Oogamy in *Chlamydomonas* sp.

References:

1. <https://www.easybiologyclass.com/algae-general-characters-ppt-power-point-presentation/>
2. Hait G, Bhattacharya K, Ghosh A k. A Textbook of Botany (vol.1). New Central Book Agency (P) Ltd. 2017; ISBN:81-7381-547-x

(All the information is collected from above references and will be used only for teaching and learning purposes)