

Algae

algae, (singular **alga**): members of a group of predominantly aquatic photosynthetic organisms of the kingdom Protista. Algae have many types of life cycles, and they range in size from microscopic *Micromonas* species to giant kelps that reach 60 metres (200 feet) in length. Their photosynthetic pigments are more varied than those of plants, and their cells have features not found among plants and animals



Habitat

- The majority of algae live in aquatic habitats named **Phytoplanktons** (Tycoplankton and Euplanktons)

- **Terrestrial algae: included:-**

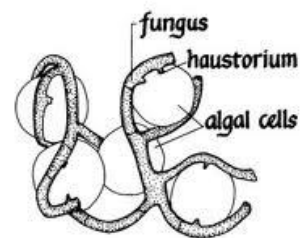
- 1- Aerophytes**

- 2- Cryophytes**

- 3- Thermophytes**



- Halophytic algae
- Epiphytic algae
- Epizoic algae
- Endozoic algae
- Parasitic algae
- Symbiotic algae



Classification of Algae

1- Cyanobacteria (Blue-Green Algae)

2- Chlorophyta

3- Euglenophyta

4- Charophyta

5- Pyrrophyta

6-Phaeophyta

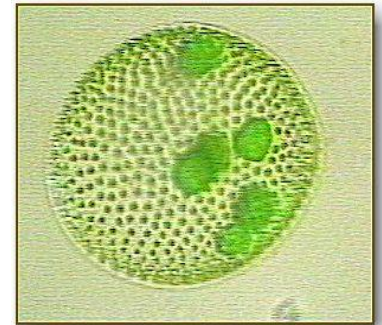
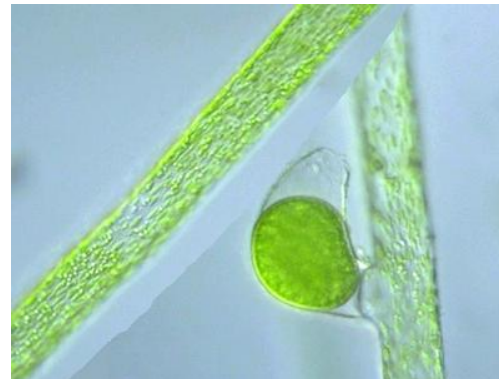
7-Rhodophyta

8-Chrysophyta:-

- Bacillariophyceae
- Chrysophyceae
- Xanthophyceae

Vegetative structure

- **Unicellular**
- **Colonial**
- **Filamentous**
- Siphonaceous
- Parenchymatous



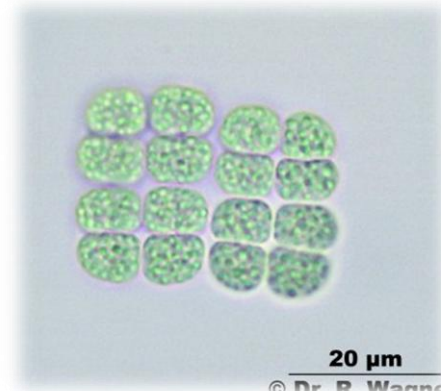
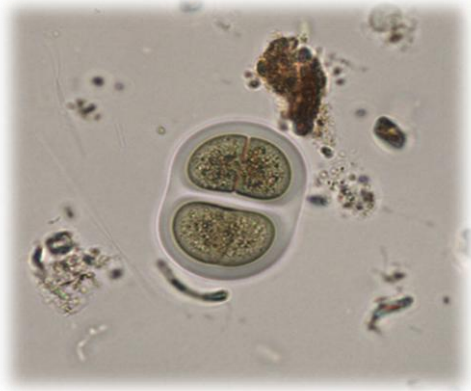
Reproduction

- Vegetative Reproduction
- Asexual Reproduction
- Sexual Reproduction:
 - 1- isogametes
 - 2- Anisogametes
 - 3- Oogametes



cyanophyta

- These are also referred to as blue-green algae. Though they are capable of conducting oxygen-producing photosynthesis and live in many of the same environments as eukaryotic algae, cyanobacteria are [gram-negative bacteria](#), and therefore are prokaryotes. They are also capable of independently conducting nitrogen fixation, the process of converting atmospheric nitrogen to usable forms of the element such as ammonia.
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Water Bloom

refers to the rampant growth of certain microalgae, which in turn leads to the production of toxins, disruption of the natural aquatic ecosystems and increases the costs of water treatments



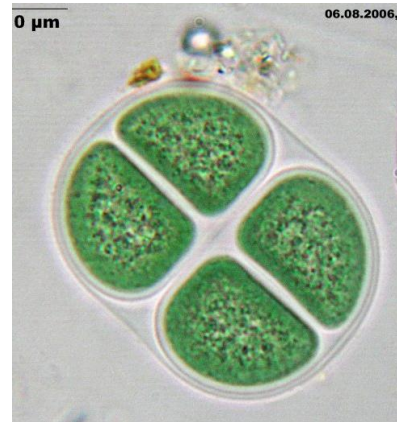
Heterocystis



Akinete

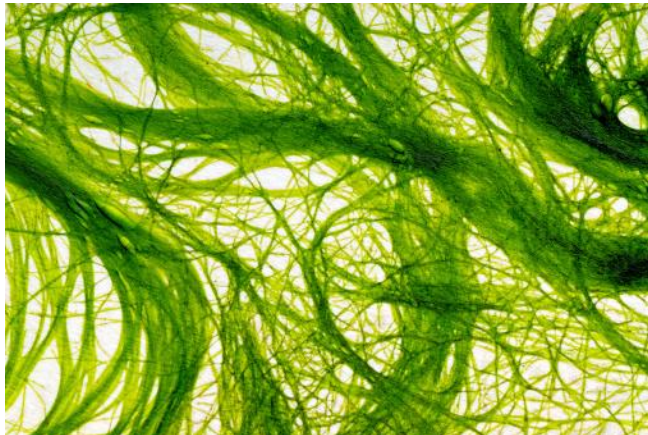


- *Chroococcus*
- *Gleocapsa*
- *Oscillatoria*
- *Spirulina*
- *Rivularia*
- *Scytonema*
- *Nostoc*



Chlorophyta

- members of the division Chlorophyta, comprising between 9,000 and 12,000 species. The photosynthetic pigments (chlorophylls a and b, carotene, and xanthophyll) are in the same proportions as those in higher plants. The typical green algal cell, which can be motile or nonmotile, has a central vacuole, pigments contained in plastids that vary in shape in different species, and a two-layered cellulose and pectin cell wall.
- Food is stored as starch in pyrenoids (proteinaceous cores within the plastids).
- Green algae, variable in size and shape.



Green algae classification

Volvocales

Chlorosarcinales

Chlorococcales

Chlorellales

Tetrasporales

Zygnematales

Oedogoniales

Cladophorales

Ulothricales

Ulvales

Acrosiphonales

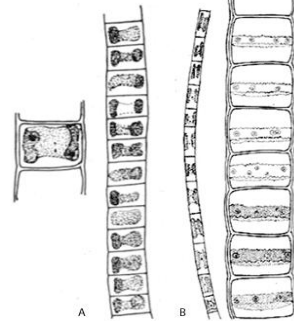
Siphonsaldales

Chaetophorales

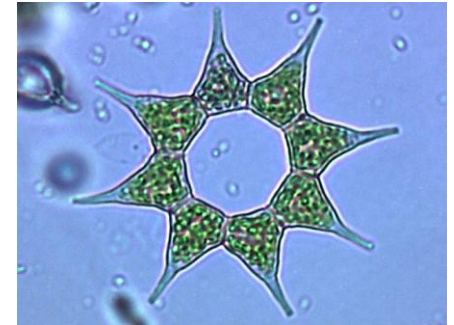
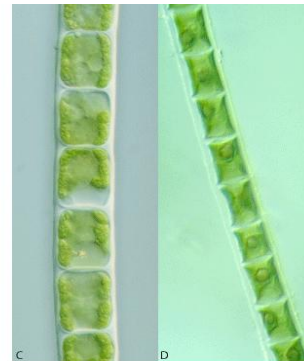
Caulerpdales

- *Chlorella*
- *Pediastrum*
- *Ulothrix*
- *Spirogyra*
- *Zygnema*
- *Cladophora*

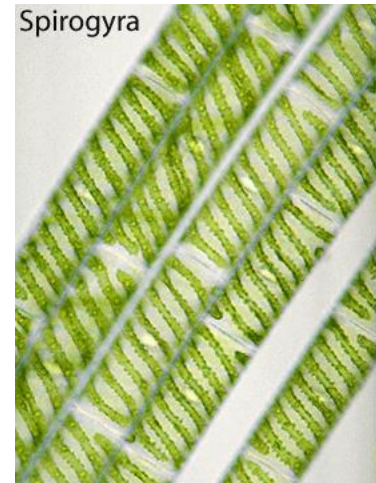
Ulothrix



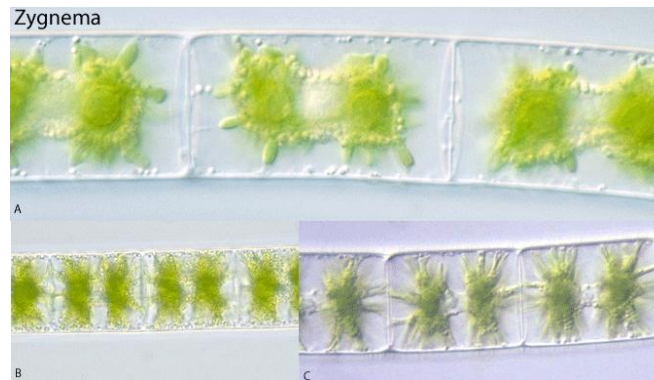
A, B after Prescott (1951)
C, D after Entwisle et al. (1997)



Spirogyra



Zygnema

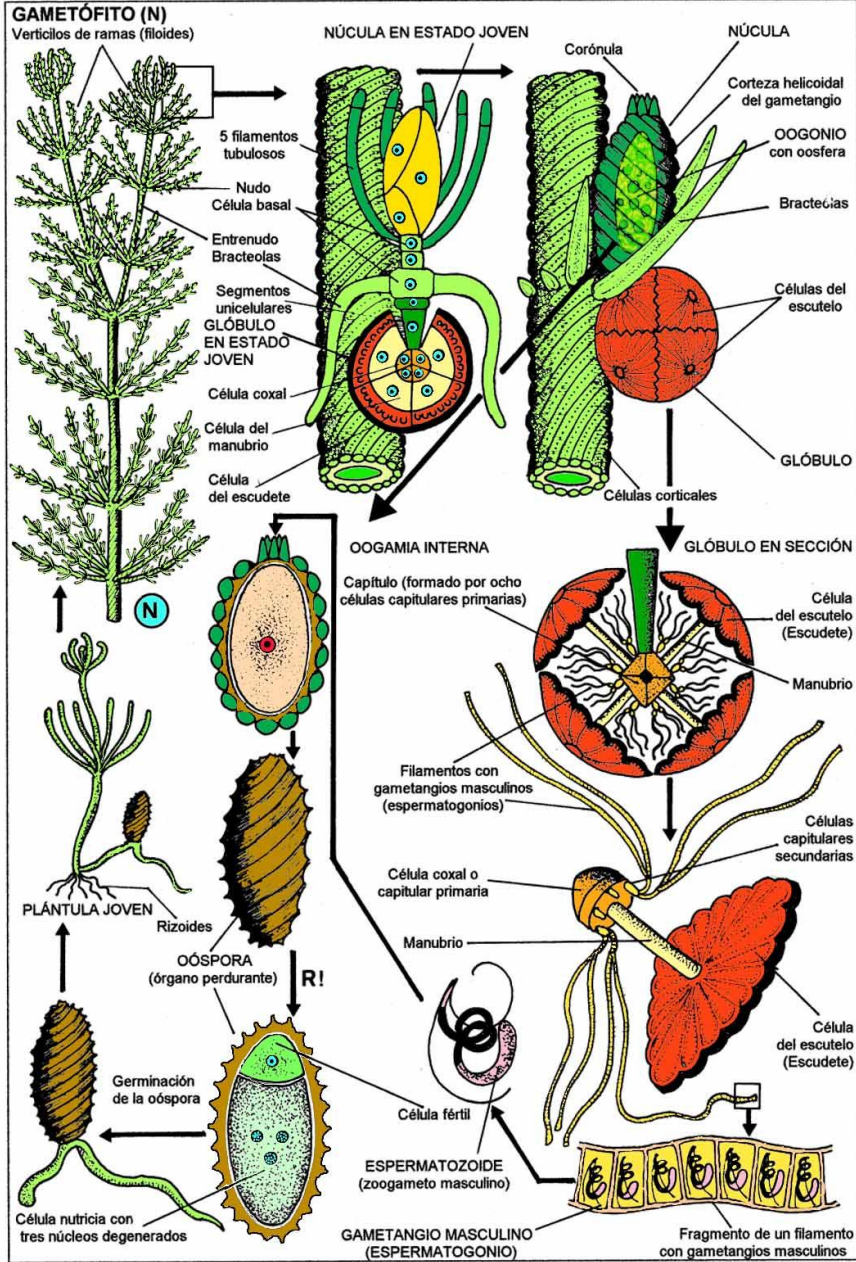


Charophyta

- is a taxonomic group (a phylum) comprised of green algae that live predominantly in freshwater habitats
- the charophytes have chlorophyll a and chlorophyll b. Carotenoids are also present but they are relatively few. Both chlorophytes and charophytes store their carbohydrates as starch. One of the main differences between charophytes and chlorophytes is the use of a phragmoplast that serves as a scaffold for cell plate assembly and later on during the formation of a new cell wall during cell division.



CICLO DE *CHARA SP.* (MONOICA) (Carofíceas, algas verdes)
MONOGENÉTICO HAPLOFÁSICO. ORGANISMO HAPLOBIÓNTICO



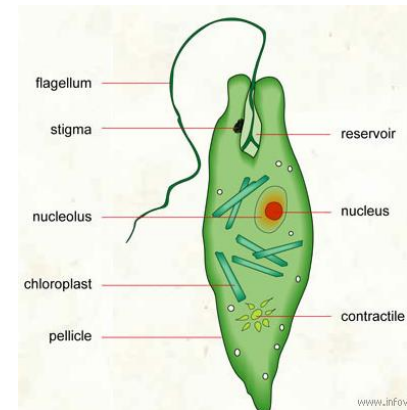
Pyrrophyta (Dinoflagellates)

- Pyrrophyta or fire algae is a division of unicellular algae that has a yellow brown color, and has two different flagella which are ribbon-shaped. It contains some pigments (chlorophyll-a, chlorophyll-b, c1, c2 and fucoxanthin) that can photosynthesize.
- Early botanists classified dinoflagellates as a separate division of algae, which they named Pyrrophyta, after the Greek word 'pyrr(h)os' meaning fire. Later it was found that Pyrrophyta division includes many members which for the convenience of study were divided into dinoflagellates and cryptomonads.



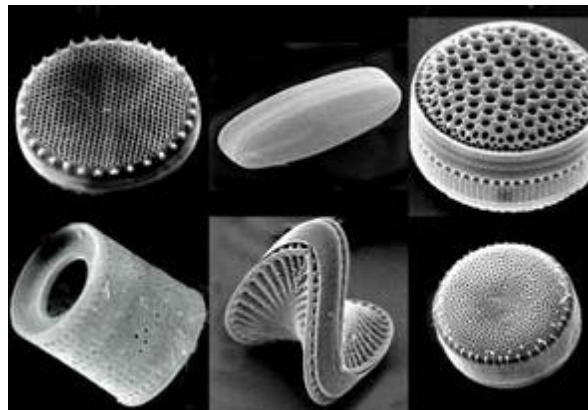
Euglenophyta

- Euglenophyta is a term used in the taxonomic classification of organisms. In the old system of classification such as the five kingdom scheme, Euglenophyta belongs to Kingdom Protista (Protoctista). In this system of classification, Protista is comprised of animal-like (protozoa) and plant-like (algae) eukaryote. Most of them live in aqueous habitats. Protista is divided into several phyla. In particular, animal-like protists are divided into the following phyla: Sacordina (protists that move using pseudopod), Mastigophora (protists that move using flagella), Ciliophora (protists that move using cilia), and Sporozoa (protists that form spores). As for the plant-like protists (Subkingdom Phycobionta), there are also various

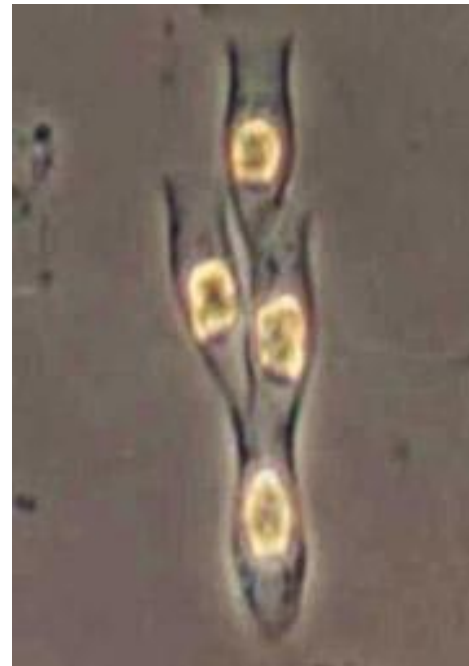
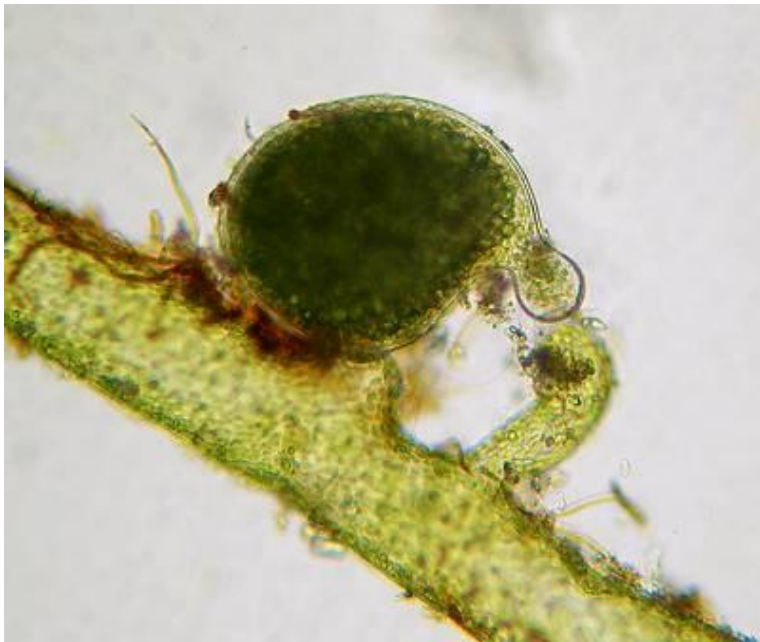


Chrysophyta

- Chrysophyta is a phylum of unicellular marine or freshwater protists. Members of this phylum include the diatoms (class Bacillariophyta), golden/golden-brown algae (class Chrysophyceae), and yellow-green algae (class Xanthophyceae). Species' characteristics are varied: some are free-swimming unicells, while others are filamentous or colonial.
- Because Chrysophyta encompasses so many species, there is no common cell structure. Some cell walls are comprised mainly of cellulose, with large amounts of silica, while some are amoeboid with no cell walls. If flagella are present, there may be one or two



- Members of Chrysophyta are found in marine and freshwater environments. The diatoms and the golden-brown algae are the most ecologically significant; they make up part of the plankton and nanoplankton that are the foundation of the aquatic food chain. Distribution of these organisms depend on the class to which they belong



Rhodophyta

- **Red algae**, (division Rhodophyta), any of about 6,000 species of predominantly marine algae, often found attached to other shore plants. Their morphological range includes filamentous, branched, feathered, and sheetlike thalli. The taxonomy of the group is contentious, and organization of the division Rhodophyta may not accurately reflect the phylogeny(evolutionary relationships) of its members

