



# THIRUTHANGAL NADAR COLLEGE

(Belongs to the Chennaivazh Thiruthangal Hindu Nadar Uravinmurai Dharma Fund)

Selavayal, Chennai-51.

A Self-Financing Co-educational College of Arts & Science

Affiliated to the University of Madras

Accredited with 'B' Grade by NAAC

An ISO 9001: 2015 Certified Institution

**NAME OF THE DEPARTMENT: PLANT BIOLOGY & PLANT BIOTECHNOLOGY**

**SUBJECT : ALGAE, FUNGI AND LICHENS**

**TOPIC : GENERAL CHARACTERS OF ALGAE**

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# Habitat

- They occur in variety of habitats, but majority of them are aquatic.
- The plant body does not show differentiation into various tissues systems.
- Aquatic forms of algae are found in fresh water (Eg. *Cladophora*, *Chara*, *Ulothrix*) or in salinewater of the sea (Eg. *Ectocarpus*, *Sargassum*).



# Habitat

- Some algae are found in terrestrial habitats like soils, rocks, logs etc. (Eg. Vaucheria, Fritschiella).
- **Halophytic algae** – algae withstand high concentration of salts and occur in salt lakes Eg. Stephanoptera
- **Ephiphytic algae** – algae grow on large algae or on bryophytes and angiosperms.

- Vaucheria



# Habitat

- **Symbiotic algae** – algae live in association with fungi, bryophytes, gymnosperms and angiosperms Eg. Lichens – algae in association with fungi.
- **Lithophytic algae** – algae growing on moist rocks and stones Eg. Nostoc
- Foliose lichen



# Habitat

- **Parasitic algae** – algae grow as parasites on many plants and animals  
Eg. *Cephaleuros virescens* (chlorophyceae) red rust in tea and coffee plantations in Assam
- **Thermophytes** – algae found in hot water springs, 50-70°C Eg. Blue green algae Eg. *Oscillatoria*

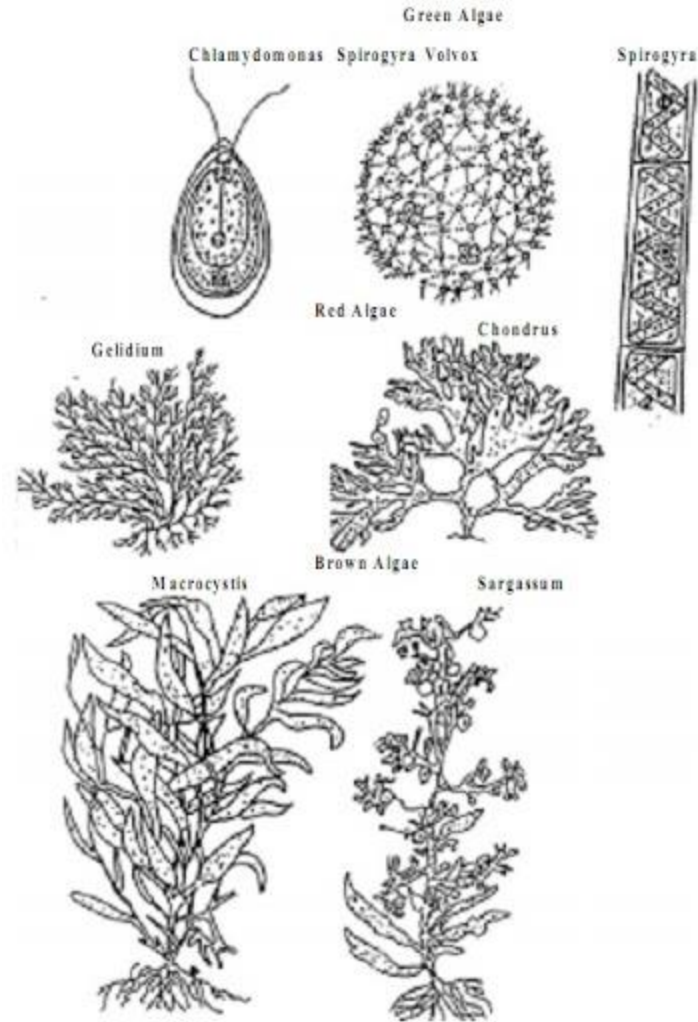


# Thallus organisation

- The vegetative structure of algae shows a wide variety and it ranges in form from unicellular to complex multicellular thalli.
- On the basis of thallus organisation, algae are divided into the following 5 groups:

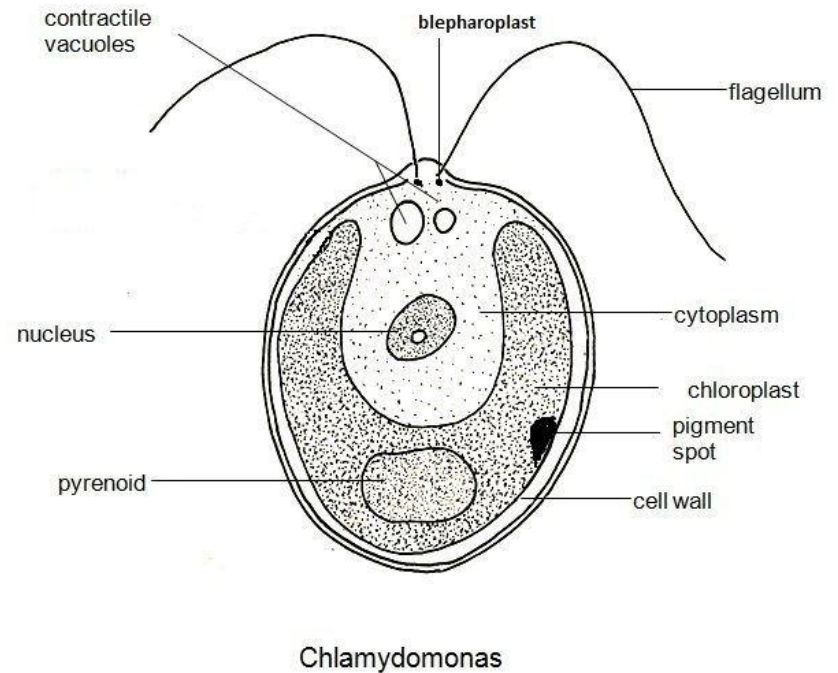
<b>S. No.</b>	<b>Thallus organisation</b>	<b>Examples</b>
1.	Unicellular forms	Chlamydomonas, Euglena
2.	Colonial forms	Volvox, Hydrodictyon
3.	Filamentous forms	Oscillatoria, Nostoc
4.	Siphonaceous forms	Vaucheria
5.	Parenchymatous forms	Ulva, Sargassum

# Thallus organisation



# Thallus organisation

- On the basis of their organisation algal cells may be differentiated into
  - (i) Prokaryotic - Eg. Blue green algae
  - (ii) Eukaryotic – Eg. Chlamydomonas
- Most of the non-motile unicellular and multicellular algae possess a typical cellulosic cellwall.





# Flagellation

- The motility of the motile vegetative or reproductive cells in algae is due to the presence of small thread-like protoplasmic appendages called flagella.
- The 2 types of flagella found in algae are
  - (i) **Whiplash flagella** – flagella with smooth surface
  - (ii) **Tinsel flagella** – surface of flagella is covered with fine filamentous appendages called flimmers.

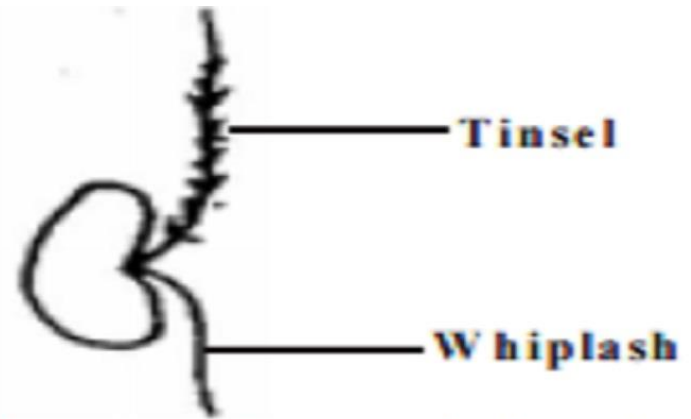
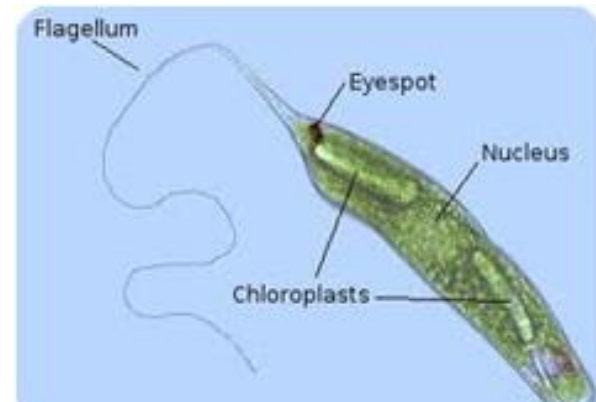


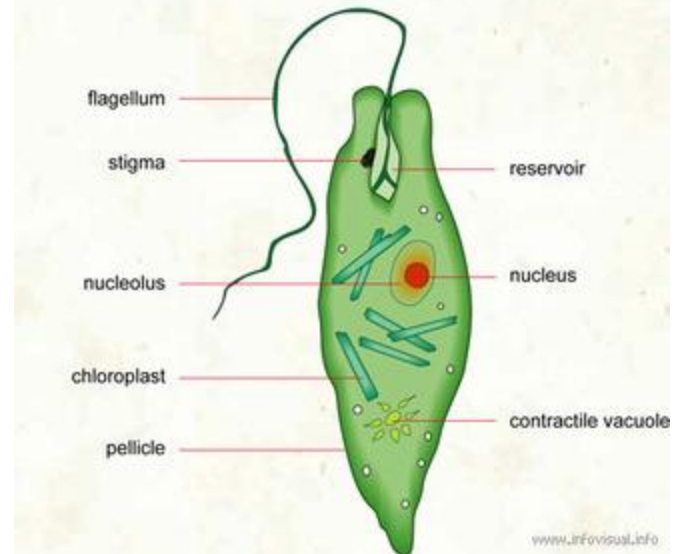
Fig : Types of Flagella

# Eye spot or stigma

- The most vegetative and reproductive cells of algae have a pigmented spot, known as eye-spot or stigma.
- Eye spot is considered to be light sensitive organelle which directs the movement of swimming cells.



STRUCTURE OF A EUGLENA



# Pigmentation

- Algal cells have a characteristic colour due to the presence of combination of pigments, specific to each class.
- The various types of pigments found in algal cell are chlorophyll, xanthophyll, carotenes, phycobilins – red (phycoerythrin) and blue (phycocyanin).

# Reproduction

- Vegetative reproduction in algae takes place by cell division or fission, fragmentation, hormogonia, formation of adventitious branches, tubers and budding.
- Asexual reproduction takes place by a variety of motile or non-motile spores like zoospore, aplanospores, hypnospores (thick walled aplanospores), akinetes etc.

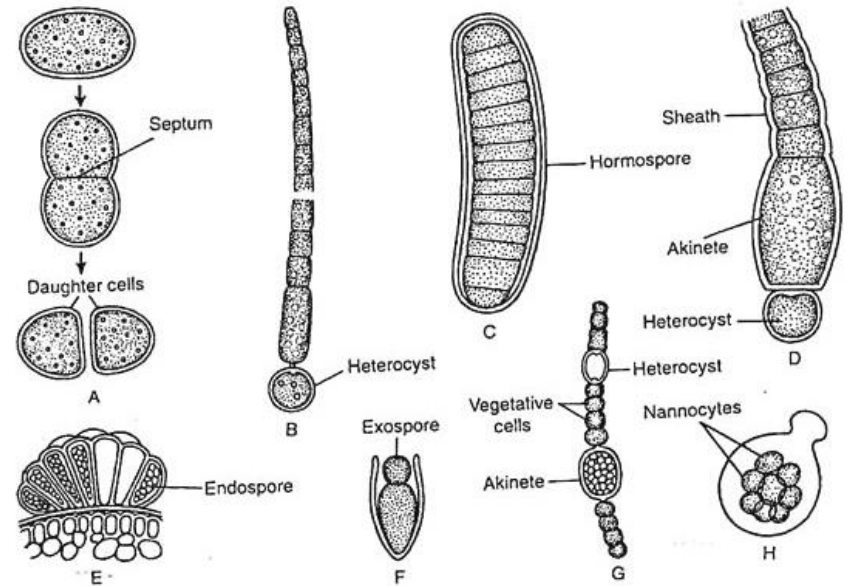


Fig. 3.27 : Vegetative and asexual reproduction in Cyanophyceae : A. Cell division (*Synechococcus* sp.), B. Fragmentation of filament (*Cylindrospermum muscicola*), C. Hormospore (*Vestibella lanosa*), D. Akinete (*Gloeotrichia natans*), E Endospore (*Dermocarpa prasina*), F. Exospore (*Chamaesiphon incrustans*), G. Akinete (*Anabaena* sp.) and H. Nannocytes (*Aphanothece*)

# Reproduction

## Sexual reproduction

**Autogamy** – fusion of two gametes of the same mother cell

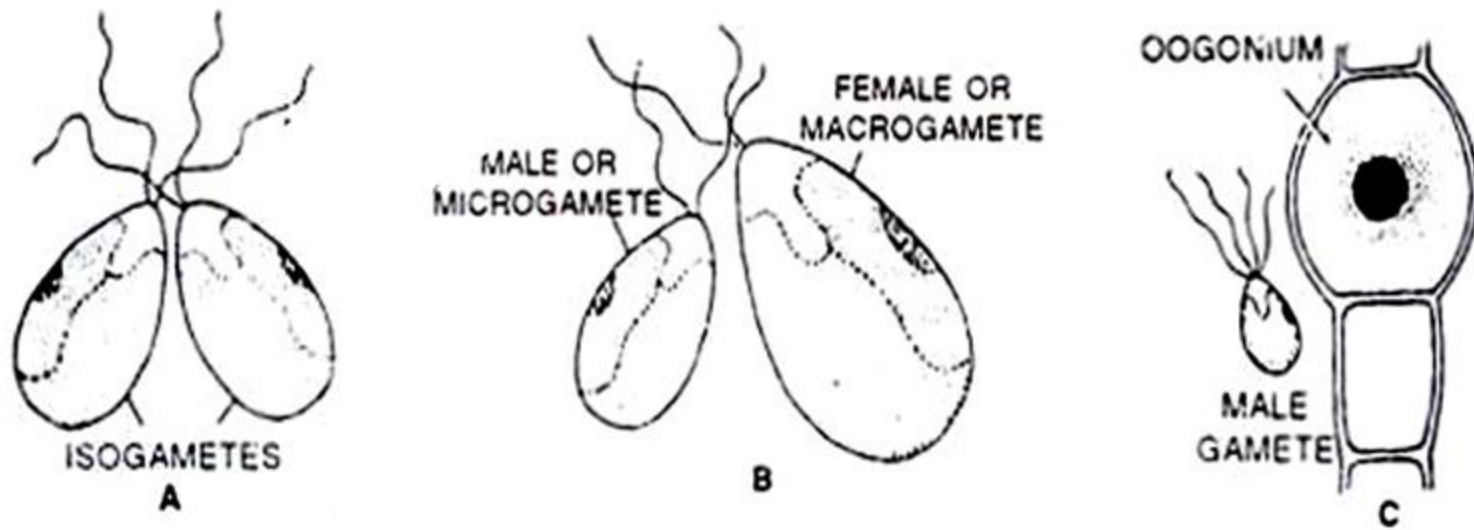
**Hologamy** – in some unicellular forms, the vegetative cells of different strains (+) and (-) behave as gametes and fuse to form zygote are morphologically and physiologically similar.

**Anisogamy** – fusion takes place between morphologically and physiology distinct gametes.

**Oogamy** – large non-motile egg fuses with a small motile spores.

- Usually zygote undergoes a period of rest of a shorter or a longer duration before germination.

# Types of Sexual reproduction in algae



**Figure:** Different types of sexual reproduction A, isogamy, B, Anisogamy and C, Oogamy.

# Life cycle patterns

- The various types of life cycle patterns met among algae can be broadly classified into the following 5 categories:
  - (1) Haplontic type
  - (2) Diplontic type
  - (3) Isomorphic type
  - (4) Hetermorphic type
  - (5) Triphasic type
    - (a) Haplobiontic
    - (b) Diplobiontic

THANK YOU