Chlorophyceae

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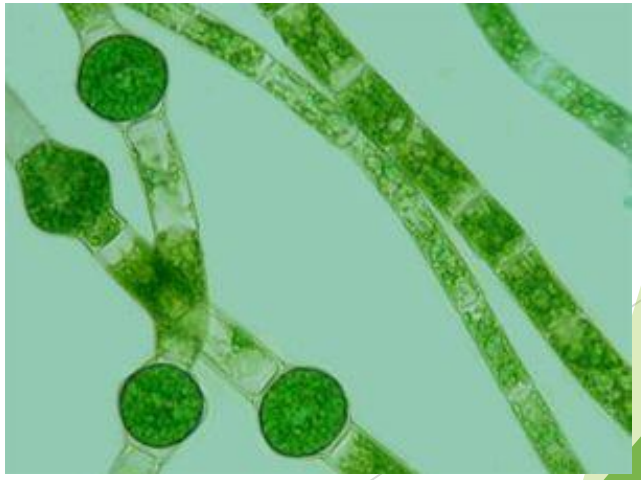
Mrinmoy Midday

Features:

- Known as grass-green algae
- Mainly fresh-water, very few from marine, terrestrial
- Unicellular to colonial to filamentous
- Free living, epiphyte, parasite
- Unicellular non-motile colonial, filamentous, thalloid, heterotrichous, siphonaceous form

Volvox



Oedogonium

Cell Structure:

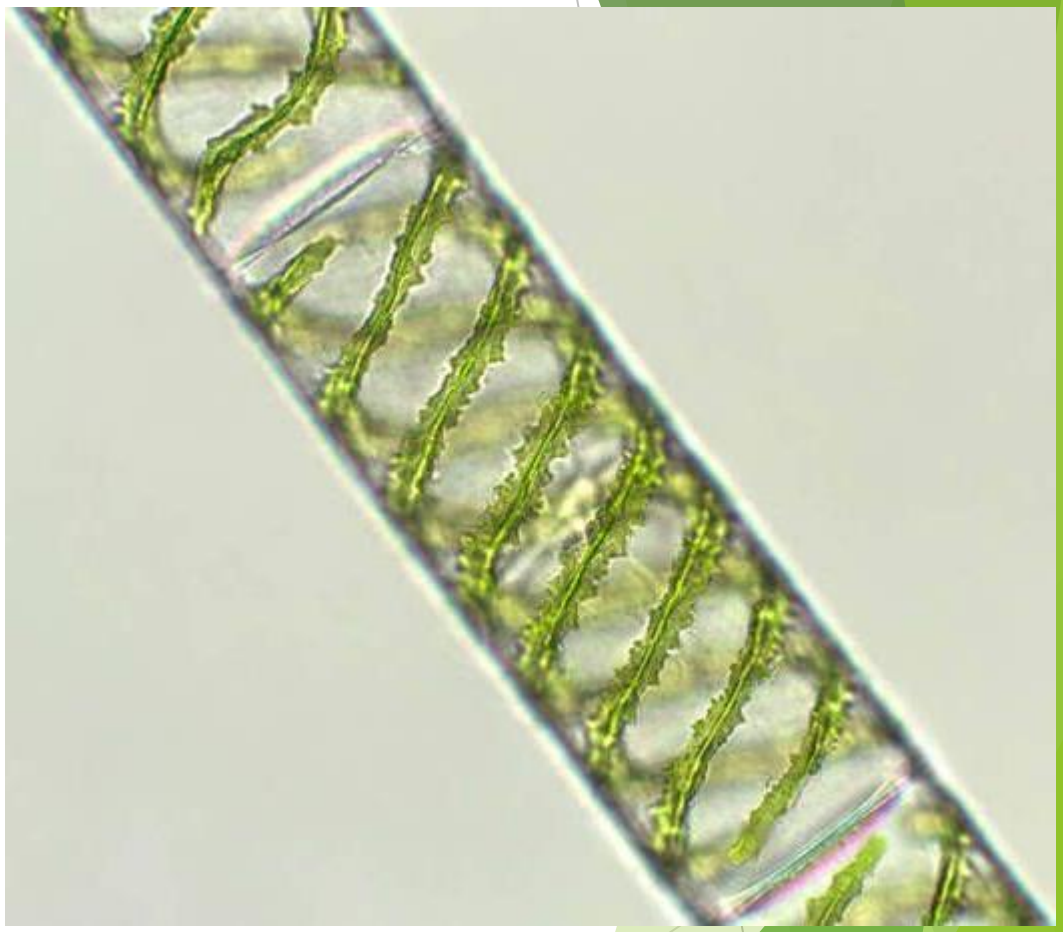
- Eucaryotic cell – organised nucleus and chloroplast
- Cells same as higher plants
- Two layered cell wall, inner and outer layers
- Cuticle may present in some outer surface of cell wall
- Mucilage sheath found in many species

Vacuole:

- Vacuole may present in different shape and size

Chloroplast:

- Varies shape and number from genus to genus
- Shape changes from genus to genus, a characteristic feature
- Pyrenoids may present in chloroplast, may not present in closely related species
- Pyrenoids disappear more or less in reproductive units



Spirogyra

Pigments:

- Chlorophyll a and Chlorophyll b
- Haematochrome, masking the chlorophyll in terrestrial algae, may present

Storage Food

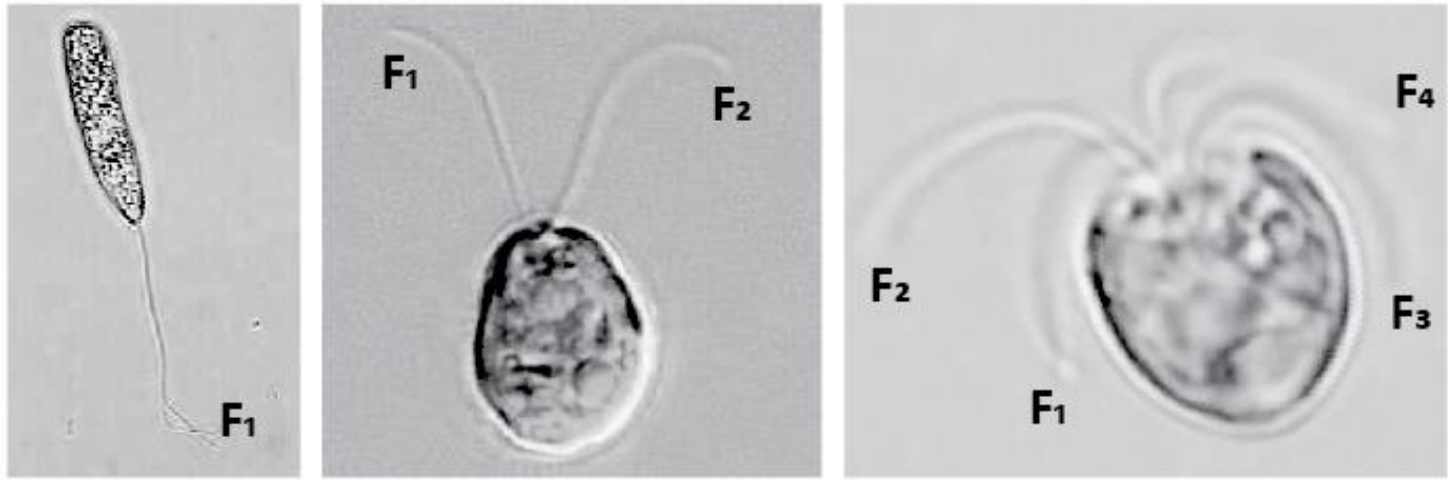
- Starch and oil in some species

Nucleous:

- Mostly uninucleate, multinucleate also found as coenocytic form
- same as higher plants – nuclear membrane, nucleolus, and very poor chromatin network present
- Mitosis and meiosis same as higher plants

Flagella:

- May be present
- Whiplash
- Two to four to many flagella with equal length



Cell Wall

- Same as higher plants

Reproduction:

- Vegetative, asexual, and sexual reproduction
- vegetative reproduction – fragmentation and natural separation
- asexual reproduction – Common zoospore, aplanospore and hypnospore also found in some species
- sexual reproduction – isogamy to anisogamy, antheridium and oogonium as reproductive structure
- Zygote forms, meiosis take places during germination of zygote

Evolution:

- Shows primitive and advance characters
- Motile colonial form from unicellular motile cell
- Non-motile (solitary or colonial) from a motile solitary cell
- Coenocytic thallus from a motile solitary cell without subdivisions into cells
- Multicellular filamentous to thalloid from unicellular motile cell
- Sexual reproduction present, isogamy then developed anisogamy then oogamy

Example:

- *Volvox, Ulva, Oedogonium*, etc.

Ulva

Charophyceae

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Features:

- Commonly known as Characean algae and stoneworts
- Distributed wild-wide, fresh or saline water, prefer stagnant water
- Elaborate vegetative structure, erect, long, green or grey, successive nodes and internodes, attach mud or sand by rhizoids
- Branched central axis, whorl of lateral branchlets arises from nodes
- Complex reproductive units, can be seen by naked eye
- No asexual reproduction
- Elaborate post-fertilization stage
- Absent of alternation of generation
- Other characters same as Chlorophyceae

Chara

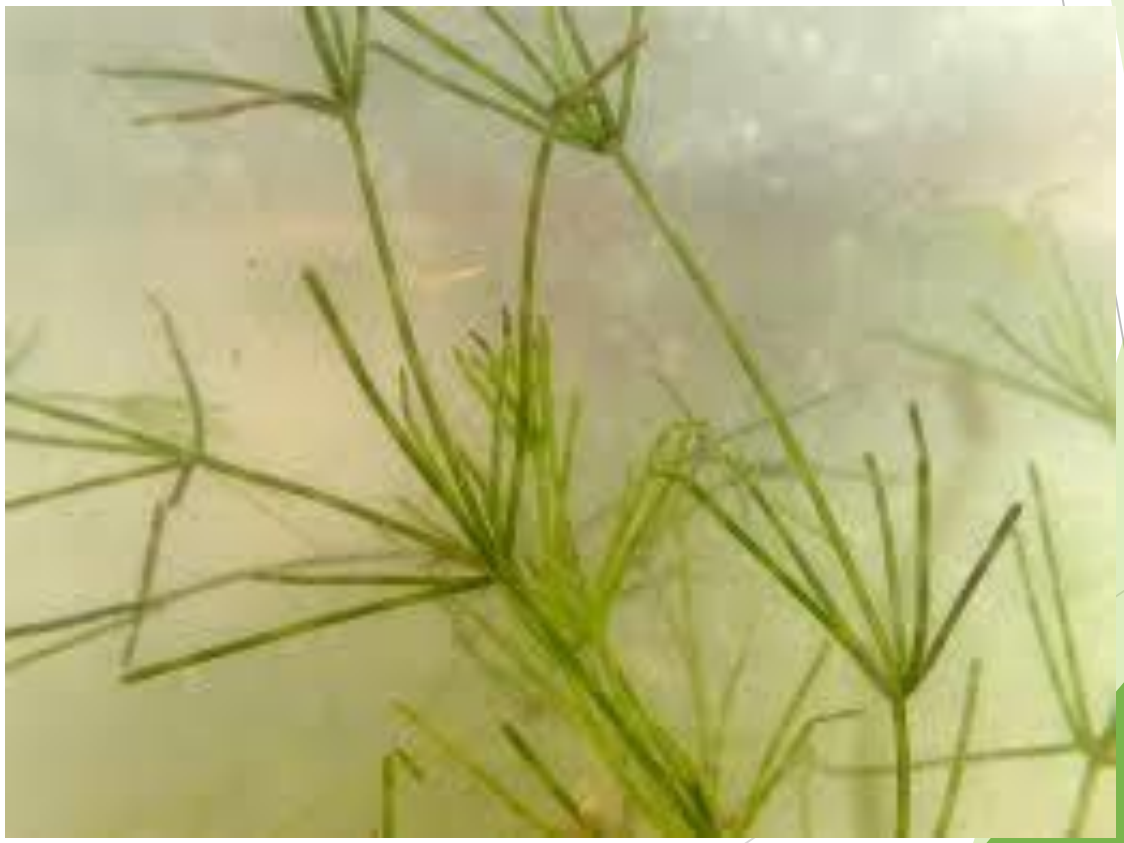
Evolution

- Intermediate form or ancestral from lost
- Intermediate between algae and bryophyta (1) root-like, stem-like, and leaf-like structure (2) Branchlets at nodes in whorls (3) complex sex organ covered by sterile jacket cells (4) spirally coiled biflagellate sperm (5) develop a young plant as a lateral branch from protonema
- Differ from bryophyta (1) alternation of generation absent (2) Unicellular sex organ surrounded by jacket cells

Example:

- *Chara*, *Nitella*, *Nitellopsis*, etc.

Nitella



Nitellopsis