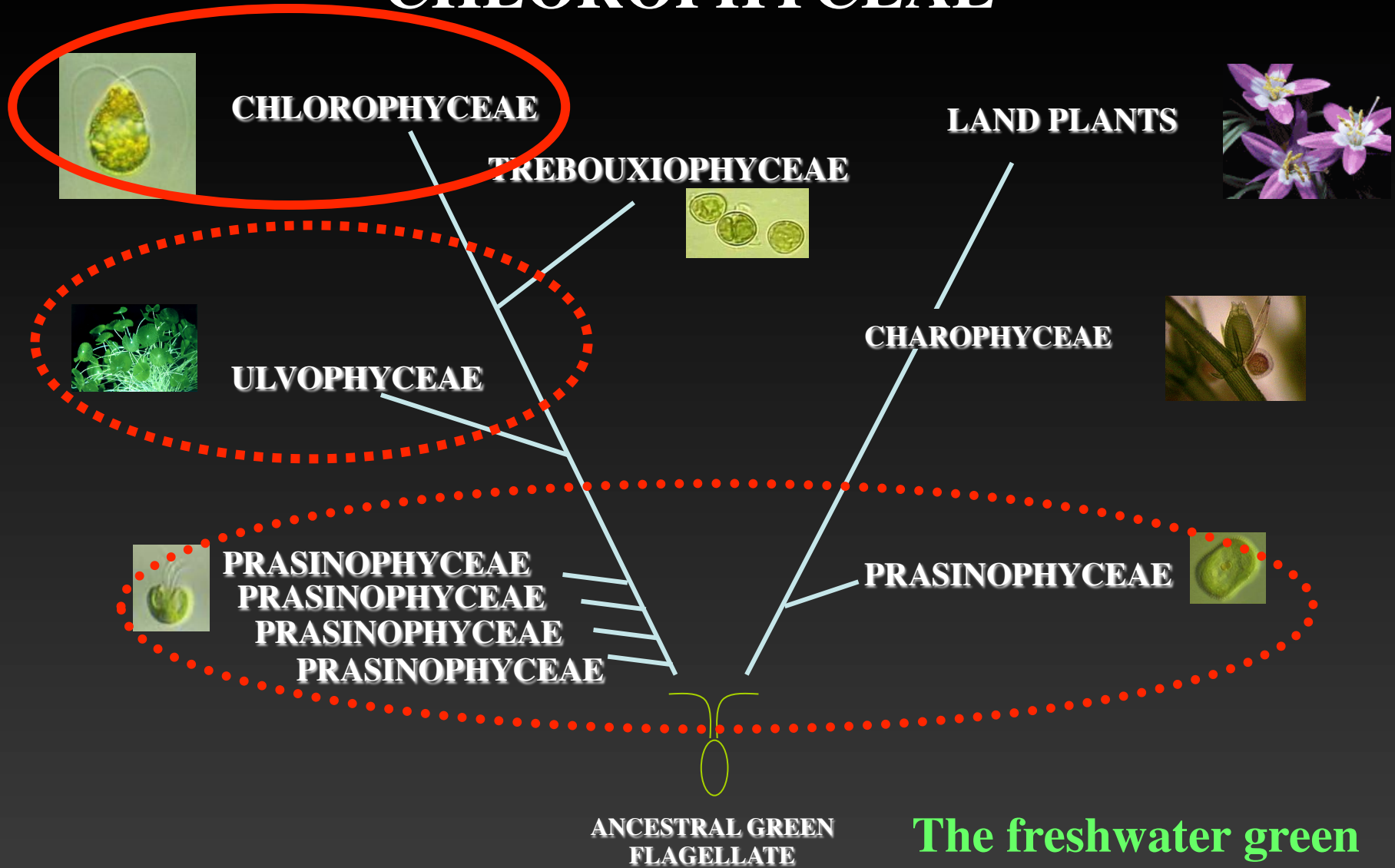
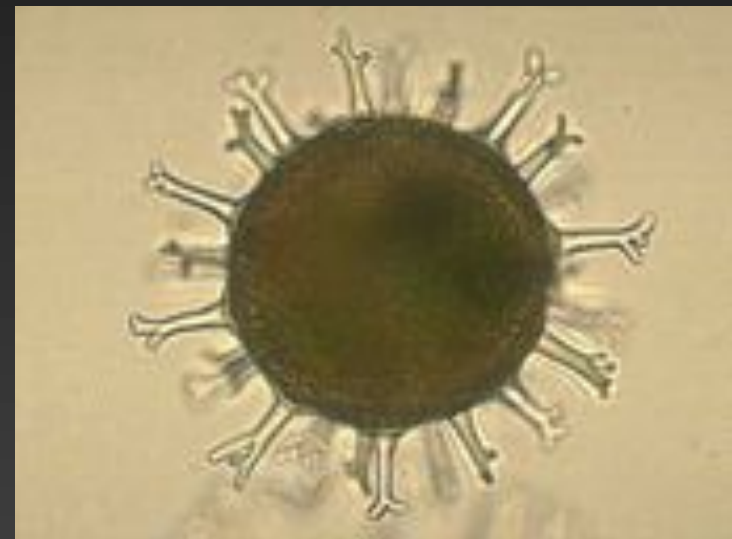


CHLOROPHYCEAE



The freshwater green algal celebrities!

- Mainly freshwater (some terrestrial)
- Unicellular or colonial (monadoid or coccoid), filamentous, some coenocytic
- Closed mitosis with a **Phycoplast**
- **CW** or **DO** orientation of basal bodies
- Zygotic meiosis with **Hypnozygotes** (sleeping zygotes)
- Many of the famous algae!
- Around 7,000 species



Hypnozygote

Major groups of the Chlorophyceae:

A. CW group

B. DO group

C. Oedogoniales group

A) THE CW GROUP: The order VOLVOCALES

Unicellular and Colonial Monadoids!

Chlamydomonas

Freshwater and snow

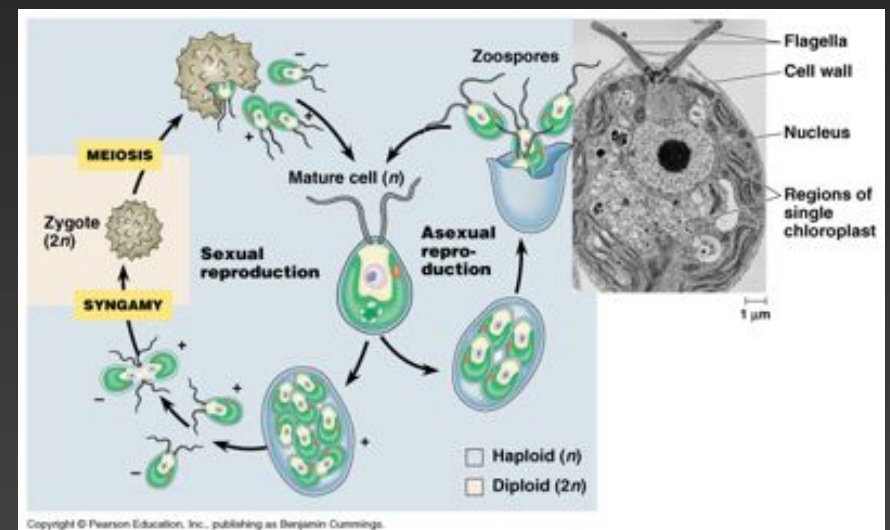
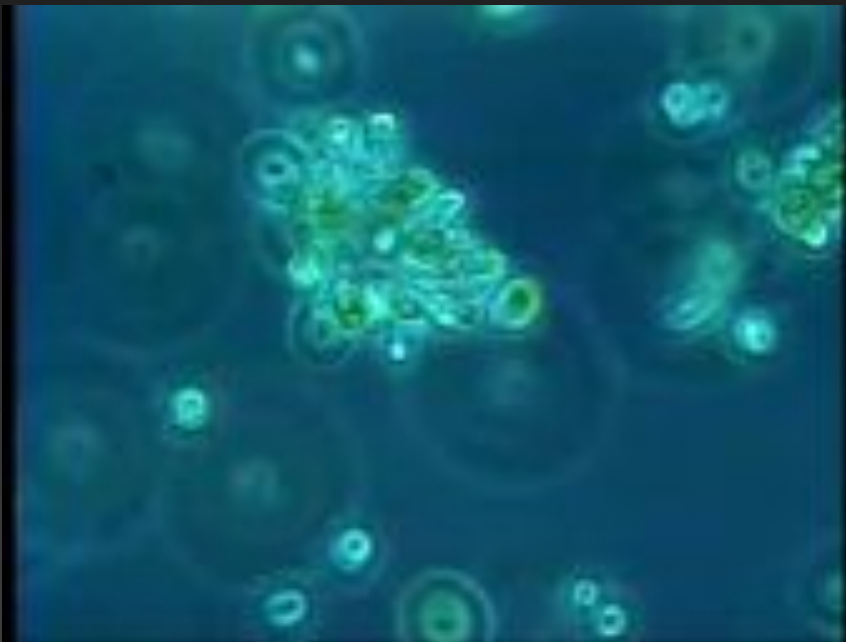
Single biflagellated cells

Cup-like chloroplast

Zygotic meiosis

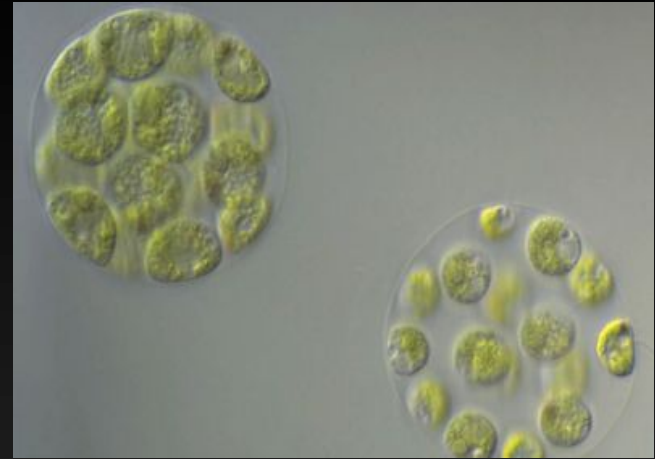
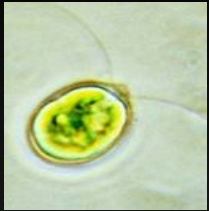
Widely used as model system

@500 spp



THE CW GROUP: The order VOLVOCALES

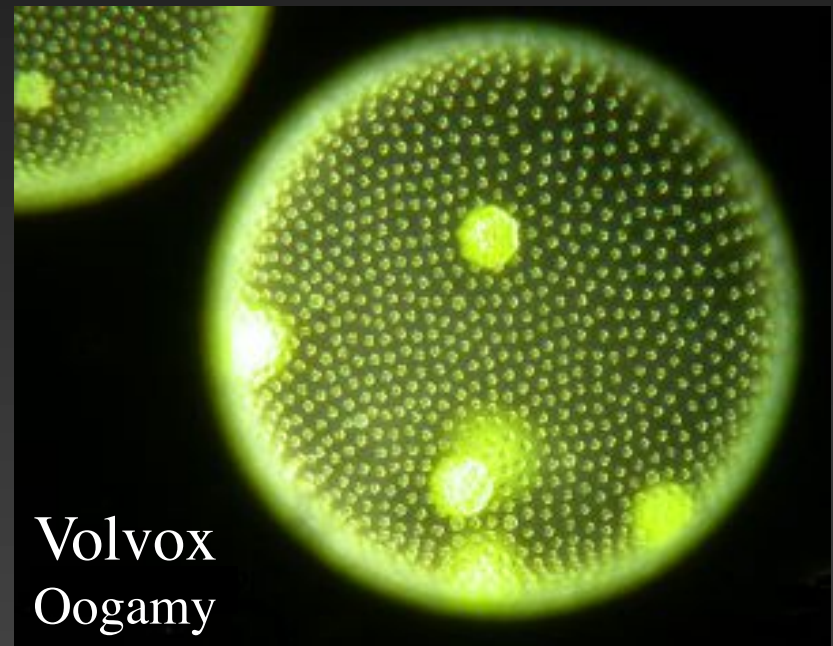
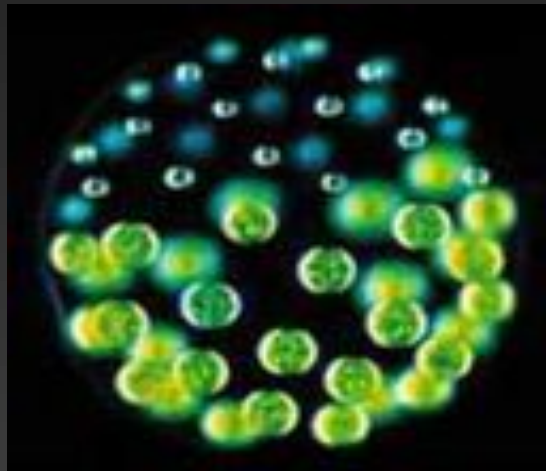
Morphological Trends in Volvocales



Chlamydomonas
Isogamy

Pandorina
Isogamy

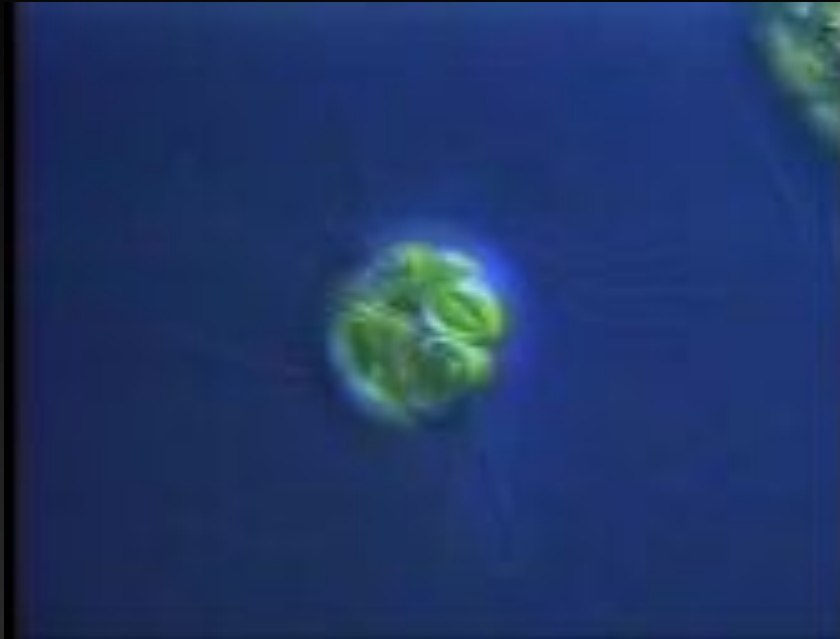
Volvulina
Isogamy



Pleodorina
Anisogamy

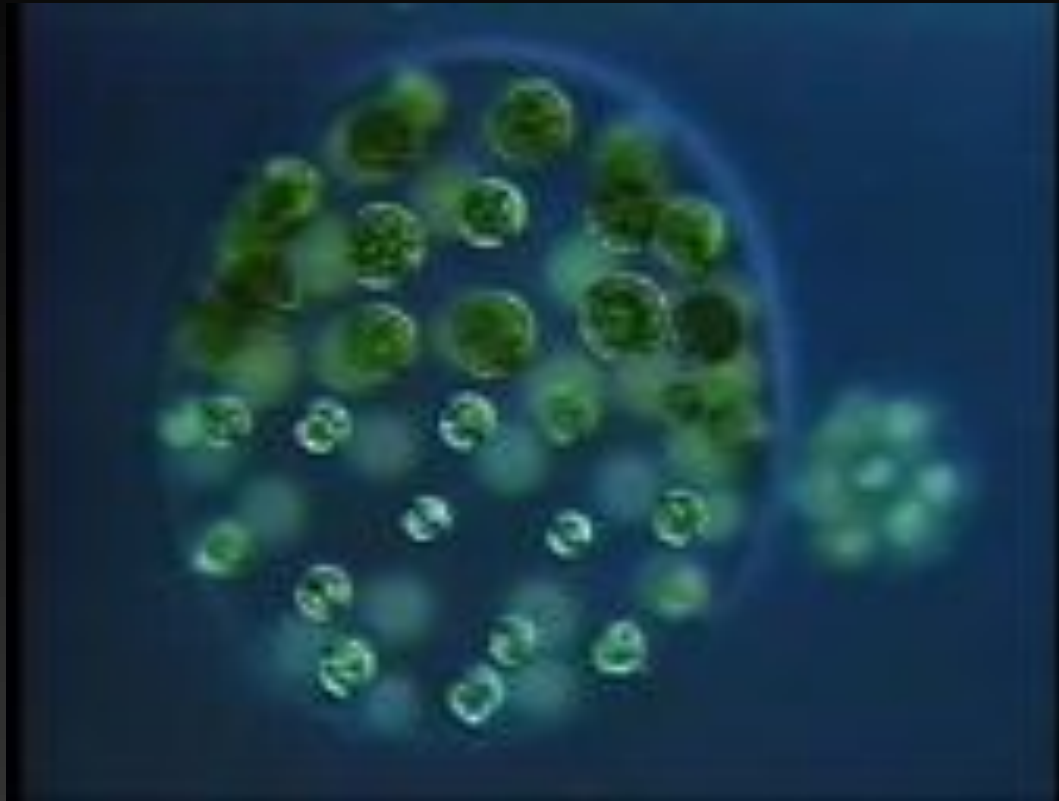
Volvox
Oogamy

Volvocales: *Pandorina* and *Volvox*



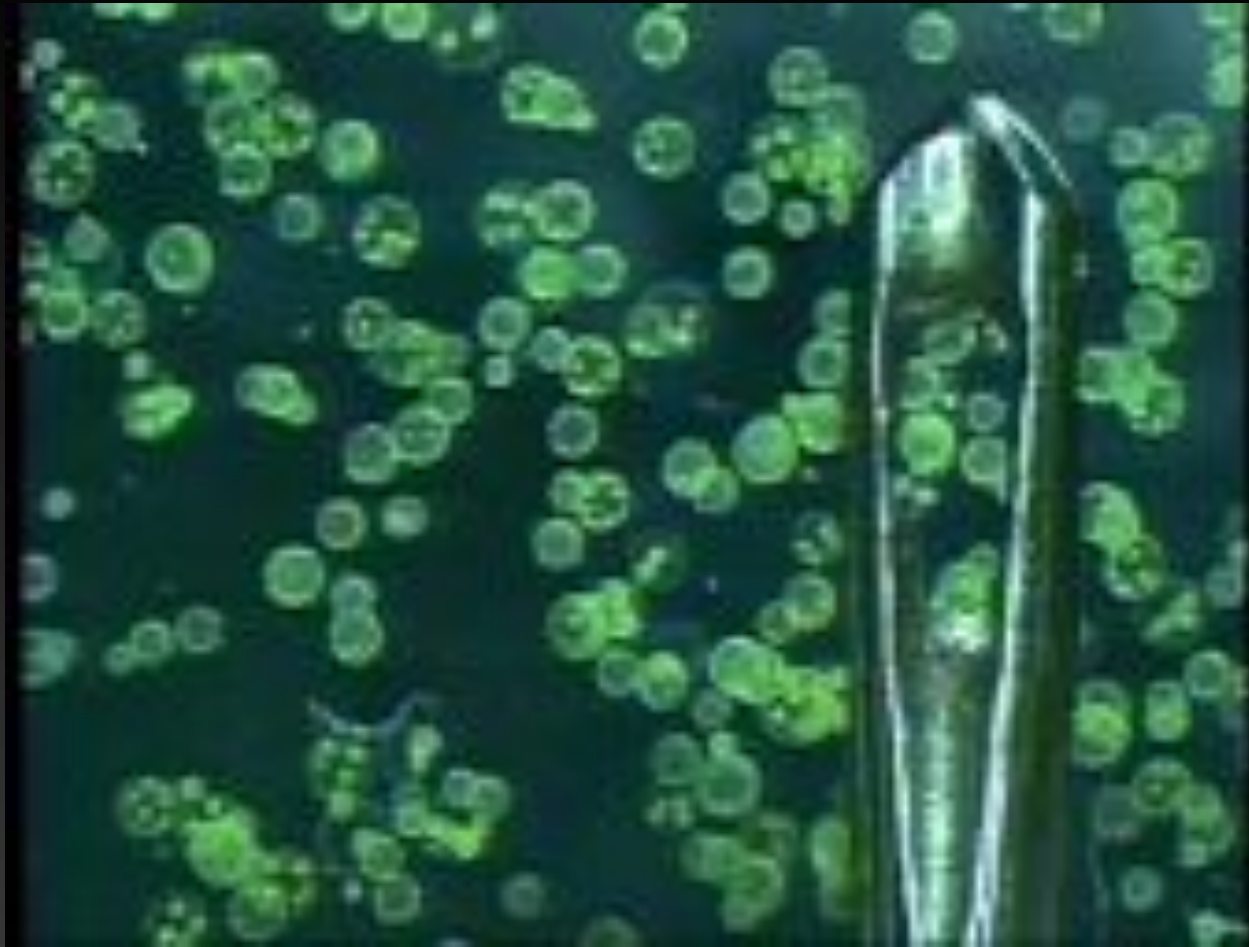
Autocolony: a miniature version of the original colony (coenobium)
Inversion: daughter colonies develop with their flagella facing inward; the colony must turn inside out so flagella are facing outward

Volvocales: *Pleodorina*



Cell specialization: Somatic cells and Asexual reproductive cells (**Gonidia**)

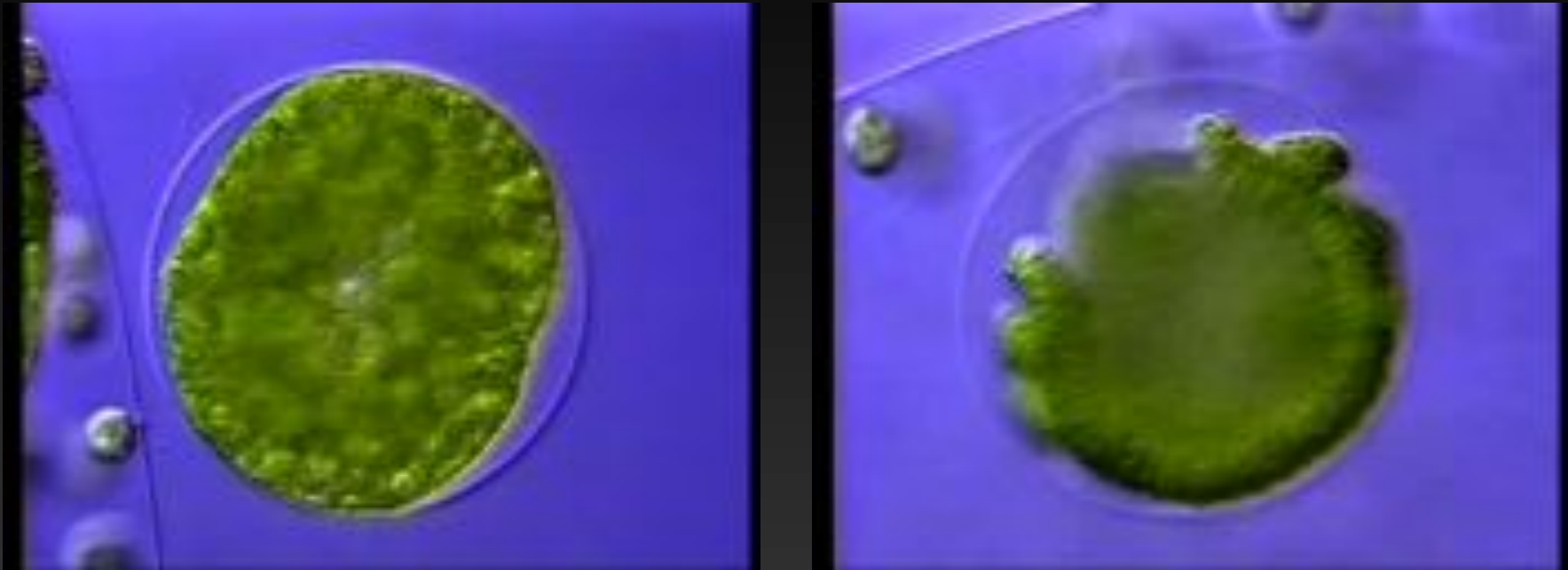
Volvocales: *Volvox*



Colonies with hundreds or thousands of cells!

Volvox: Asexual reproduction

Gonidium, Inversion, and Autocolony release



Phialopore: a hole in the colony surface through which the colony undergoes inversion

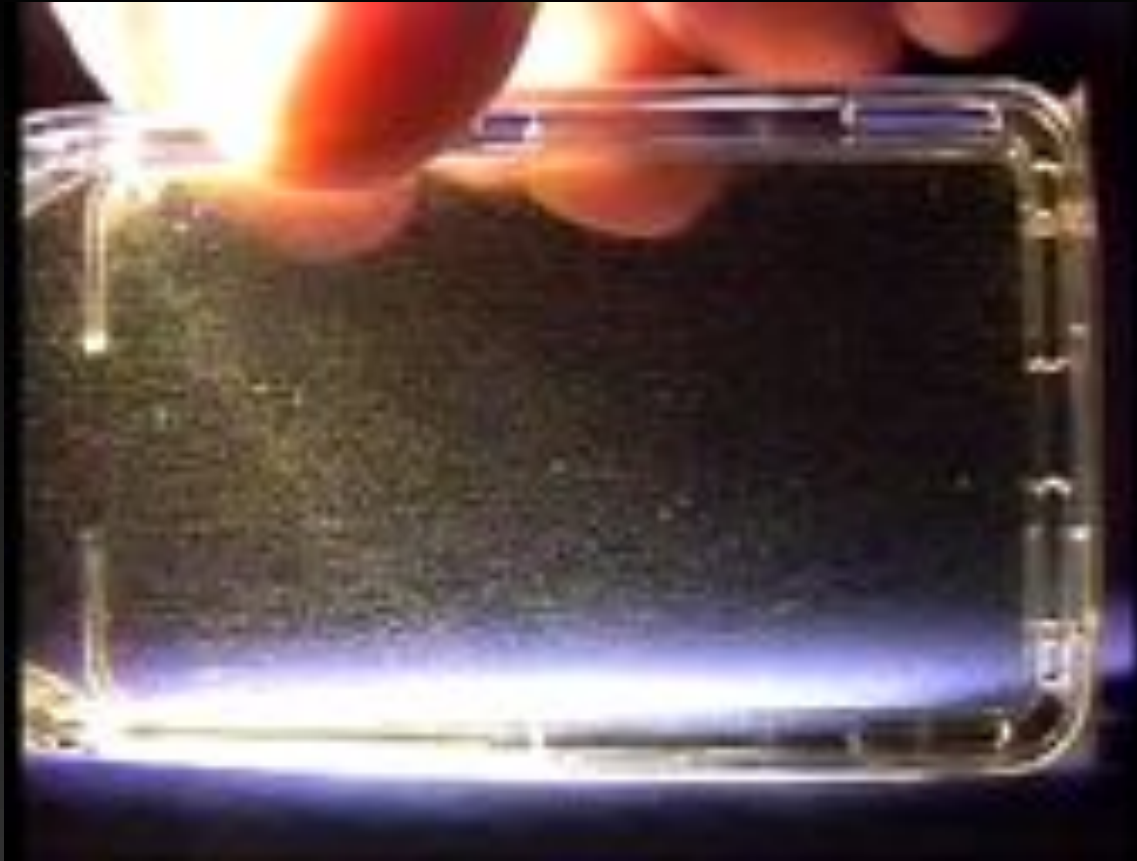
Volvox: Sexual reproduction



Gonidia { Male Colonies with ♂ Gonidia (Androgonidia) form Sperm packets, the ♂ gametes
Female Colonies with ♀ Gonidia: they will become Oogonia, the ♀ gametes

Zygotes will become hypnozygotes or sleeping zygotes

Volvocales: Eyespot and Phototaxis



Eyespot (stigma): a red colored spot, made of lipids and carotenoids, involved in the perception of light

Phototaxis: Movement toward (+) or away (-) from light

B) THE DO GROUP: The cenobial coccoid colonies

Scenedesmus-Pediastrum-Hydrodictyon



Scenedesmus

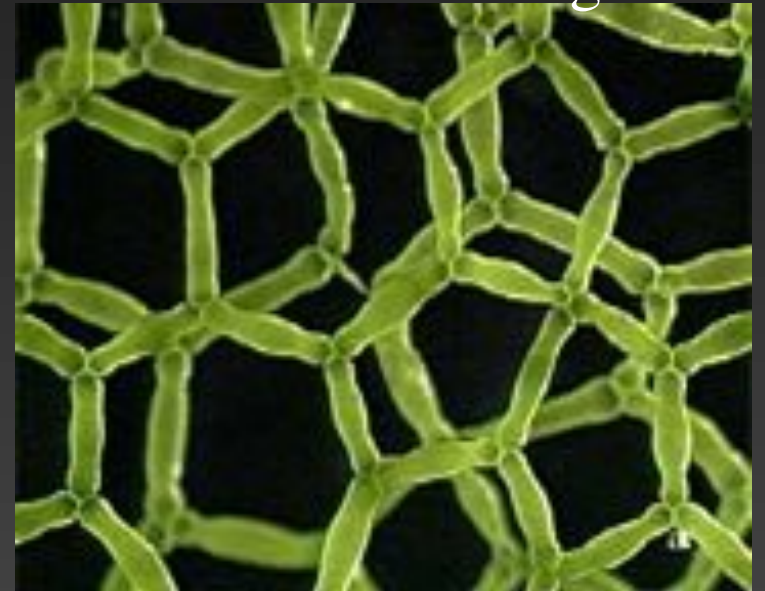


Pediastrum



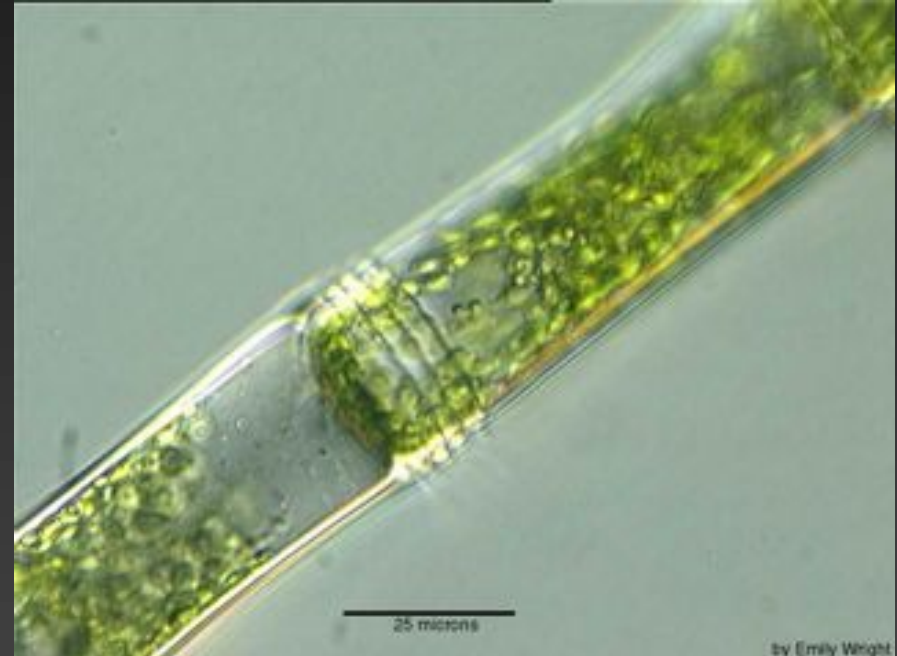
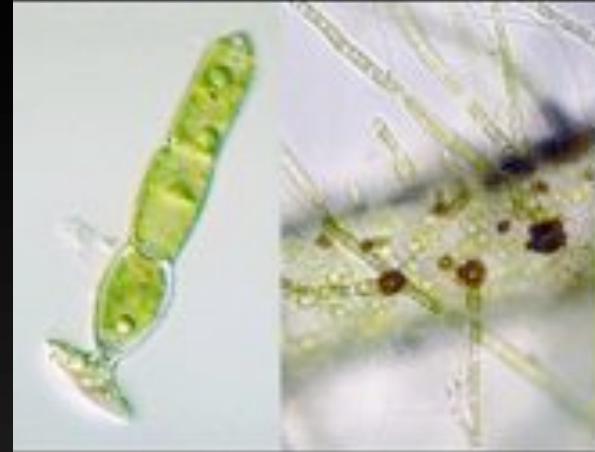
Hydrodictyon

“Water-net alga”

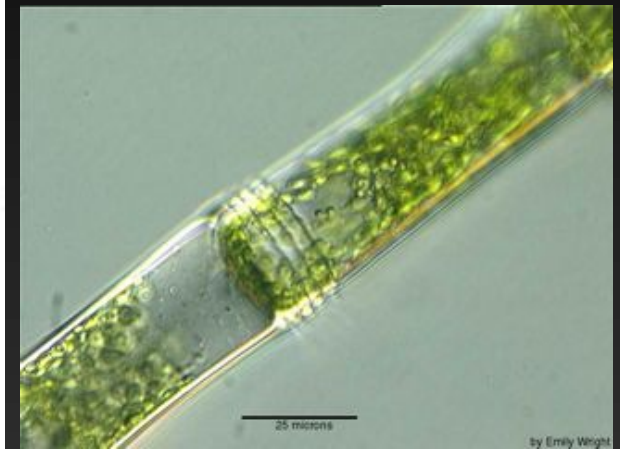
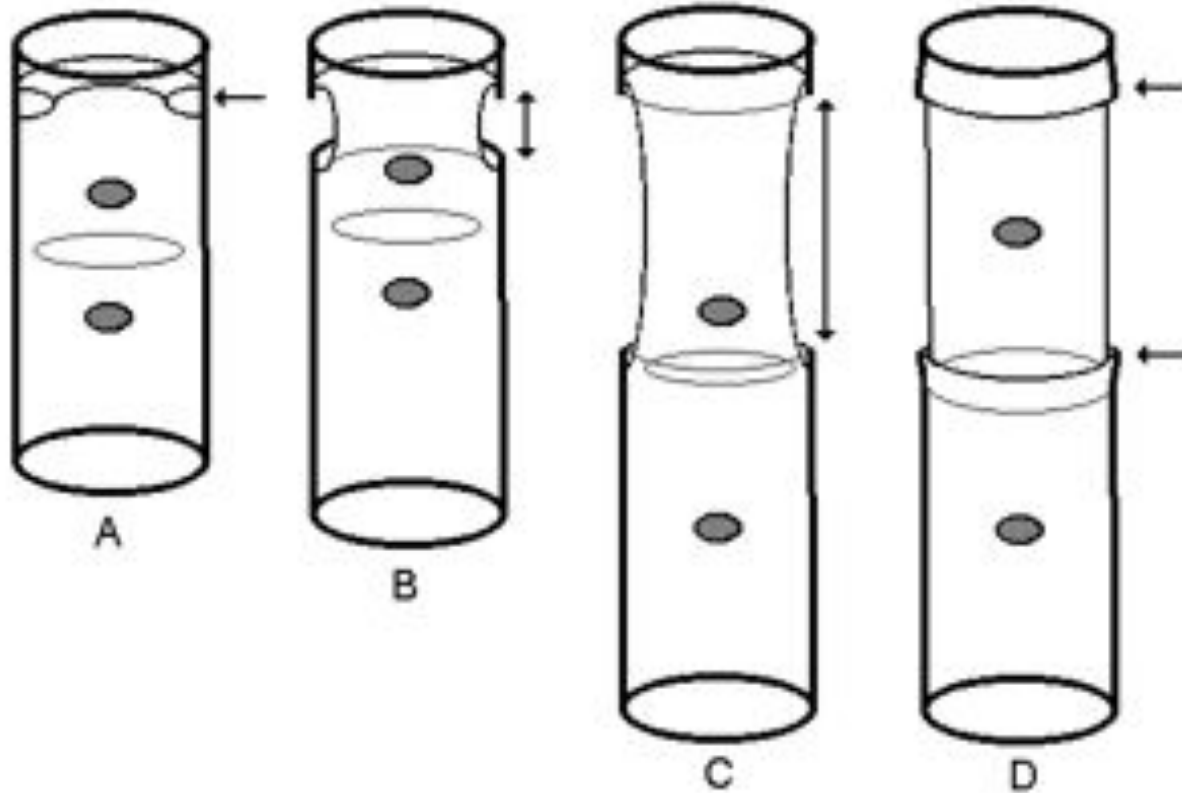


C) The Oedogoniales group

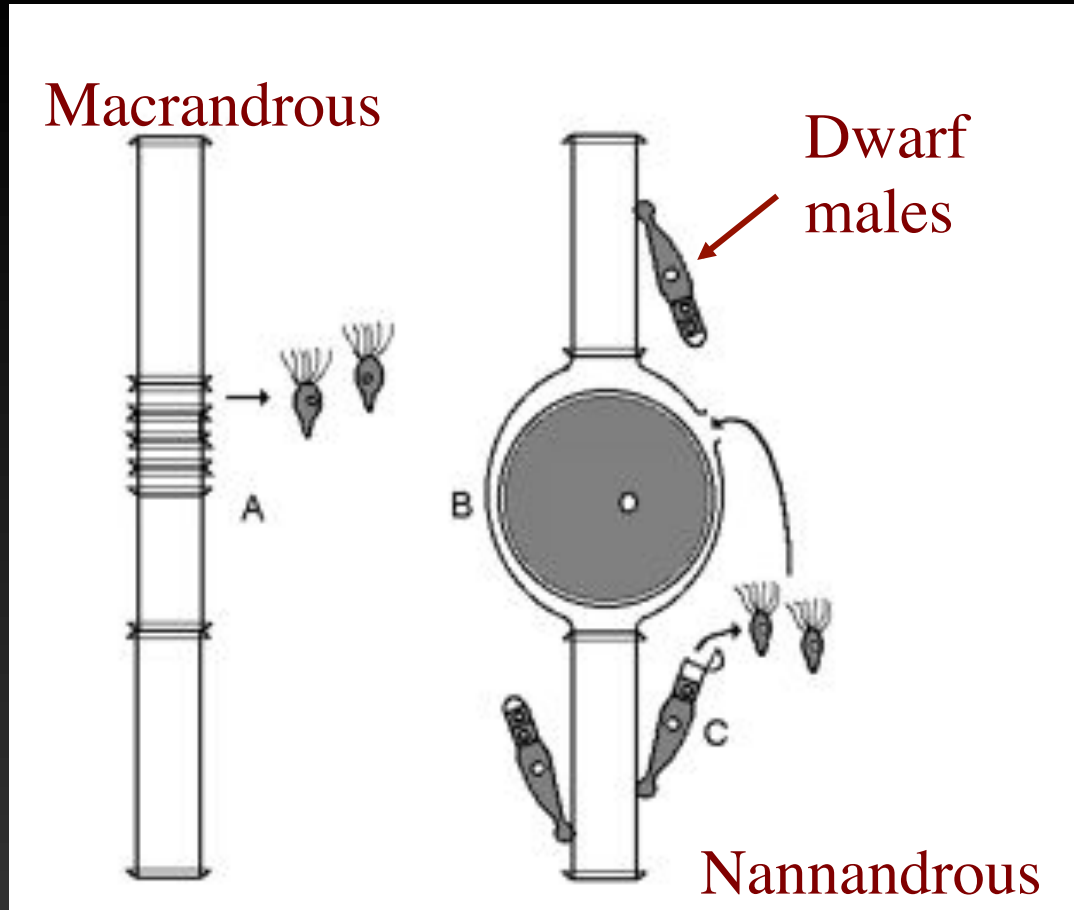
- Filamentous thalli
- Unusual cytokinesis with an “apical cap or ring”
- Stephanokont zooids
- Dwarf males



Oedogoniales: Unusual cytokinesis with an “apical cap or ring”



Life cycle: Zygotic meiosis with a hypnozygote



Female with Egg

Species are either:

- **Macrandrous:** Male and female filaments similar
- **Nannandrous:** Female normal size but Dwarf males

