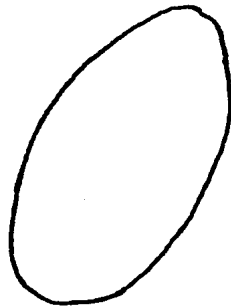


## PHYLUM CHLOROPHYTA

- 1.a. Observe living *Chlamydomonas* from a culture with mixed + and - mating strains. Describe the details of mating and fusing.
  
- 1.b. Describe any cells in a palmella stage.
  
- 1.c. Find and describe zygotes.
  
- 1.d. Observe a vegetative cell and add flagella, chloroplast, eyespot, and pyrenoid to the outline drawing below.

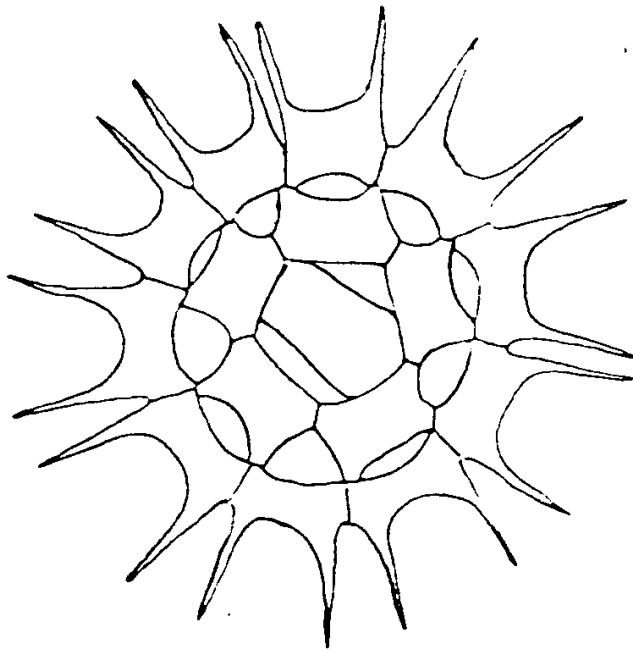


10  $\mu$ m

2.a. *Volvox* resembles *Chlamydomonas* in cellular detail. Observe *Volvox* with daughter colonies and *Volvox* with daughter colonies and *Volvox* with zygotes. How can you differentiate between them?

2.b. Carefully describe the swimming motion of *Volvox*.

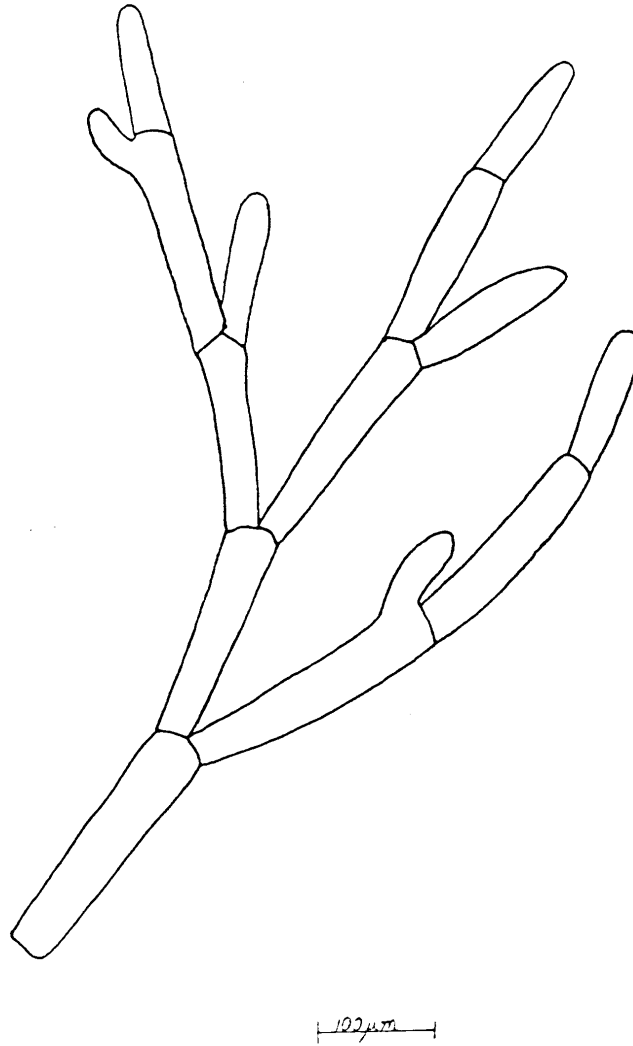
3.a. *Pediastrum* is a plate-like planktonic genus. Observe living cells and sketch chloroplasts and pyrenoids into the drawing below. Also, label the cell wall.



20  $\mu$ m

3.b. What is the significance of the empty cell walls in these colonies?

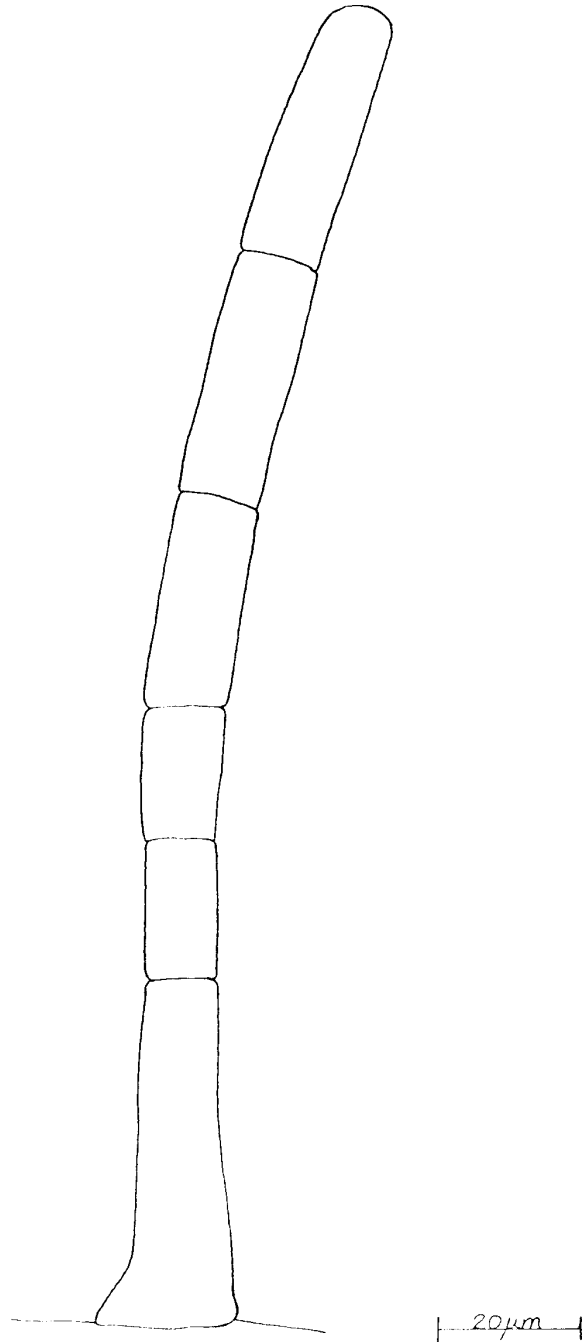
4. *Hydrodictyon* is a large, net-like genus. Observe the arrangement of cells in the colony.
  
5. Examine living and prepared slides of *Chlorella*. How is the chloroplast arranged?
  
- 6.a. *Cladophora* is a highly-branched, multinucleate filament. Observe living and preserved filaments. Sketch chloroplasts, pyrenoids, and nuclei into the drawing below. Use iodine to visualize the nuclei and pyrenoids.



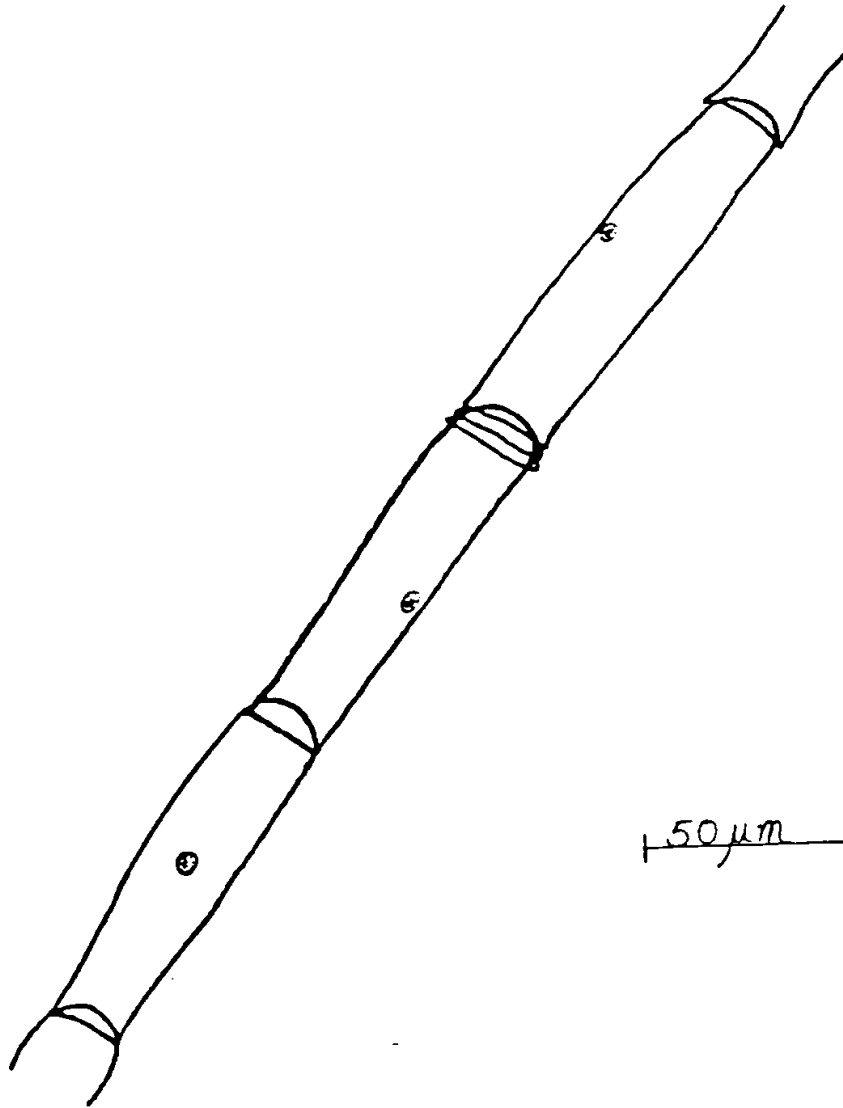
- 6.b. Describe the branching habit.

- 6.c. How is this genus similar to *Hydrodictyon*? Please consider the form of branching, pyrenoids, nuclei, and chloroplasts.
- 7.a. *Bryopsis* is a coenocytic marine alga. Examine the apical portion of a thallus and make note of the chloroplasts, nuclei, and cell wall.
- 7.b. How would you determine whether any of the branches were gametangia?
- 8.a. Find living or preserved *Derbesia* on demonstration. What will the bladder-like structure produce?
- 8.b. Compare the life histories of *Bryopsis* and *Derbesia*.
9. Observe and be able to recognize *Acetabularia*, *Ulva*, *Codium*, *Penicillus*, and *Enteromorpha*. You may find these as preserved, living or pressed as herbarium sheets.

- 10.a. *Ulothrix* is an unbranched, epiphytic genus with a basal cell modified as a holdfast. Sketch chloroplasts and pyrenoids into the drawing below. Also, label the cell walls, vegetative cells, and the basal holdfast.

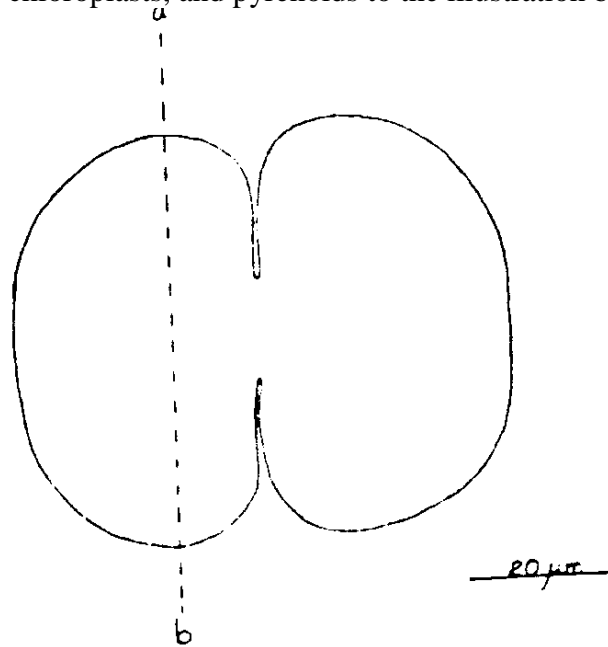


- 11.a. *Oedogonium* is a genus of unbranched, epiphytic filaments with oogamous reproduction. Examine living or preserved materials (as available). Carefully observe the chloroplasts and pyrenoids. Then, sketch them into the drawing below.

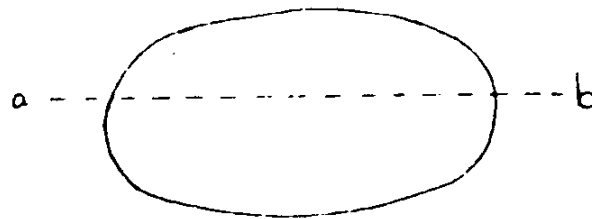


- 11.b. Now find a prepared slide of *Oedogonium* reproduction. Is it macandrous or nannandrous? Explain the difference.

- 12.a. *Cosmarium* is a unicellular planktonic organism. Observe a vegetative cell and add a nucleus, chloroplasts, and pyrenoids to the illustration below.



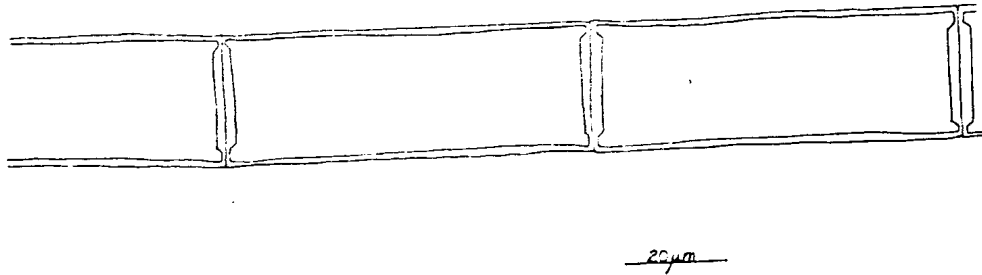
- 12.b. Again, carefully observe the chloroplast. Try to reconstruct the appearance of the cross-sectional aspect of the chloroplast at the dotted line in the previous illustration and add it to the drawing below.



- 12.c. If available, observe demonstrations of desmid cell division and/or desmid sexual reproduction.

13.a. *Spirogyra* is not a desmid but is similar to *Cosmarium* in some ways. What characters do they have in common?

13.b. Observe a vegetative cell and add chloroplasts, pyrenoids, and nuclei to the drawing below.



13.c. Observe sexual reproduction in *Spirogyra*. Add zygospores and label conjugation tubes in the following illustration.

