

Protists and Porifera

Kingdom Protista: Microscopic single-celled organisms

Sections of Book:

- Exercise 4-1 Euglenophyta
- Exercise 4-2 page 54 Ciliophora
- Exercise 4-6 pages 66-68 Rhizopoda

Laboratory Exercise (chapter 4):

Questions to keep in mind when observing these organisms:

- Is it motile? How?
- Does it have any specialized internal structures?
- What are the relative sizes of these organisms?

What to see:

Prepared slides:

1. ***Vorticella*** (fig. 4.7) - These slides difficult to make much of. You should try to see the structures that are in fig. 4.7)
2. ***Euglena*** (fig. 4.2) - These slides look just like the live specimens
3. ***Trypanosoma*** (fig. 4.3) - These slides have been specially chosen to clearly show the Trypanosomes. *Trypanosoma* is a genus of flagellates that is parasitic in animals. This slide is a blood smear. You can see the blood cells without nuclei. The Trypanosomes are the squiggly lines among the blood cells. Looking at this blood smear, a parasitologist would quickly note that there is something very wrong with the individual who gave the blood. *Trypanosoma gambiense* causes mid-African sleeping sickness. It is endemic in about 3% of the human population of West Africa. The protozoan is transmitted from person to person by the bite of the Tsetse fly. Sleeping sickness is a major human health problem.
4. ***Volvox*** (fig. 4.14) - These slides are better than the living specimens because the living specimens are very delicate. They don't survive very well.
5. ***Amoeba*** (fig. 4.17) - The slides clearly show the difference between nucleus and cytoplasm. They also show the pseudopodia.
6. ***Paramecium*** (fig. 4.6) - Check out the *Paramecium* conjugation slides. The pellicle slides show the surface of the Paramecia.

Live organisms:

All of these organisms can be seen in wet mounts. You should use the depression slides. Place a couple of drops of protozoan culture in the depression. The drops should be drawn from the bottom of the culture. Most of the organisms are concentrated there. Cover the slide with a coverslip. If you don't see organisms at first, search the depression at the lowest power of the microscope. You will eventually see the organisms. They may move too fast to see very well. To slow them down make another preparation, but add a drop of Protoslo. A few of the cultures have lots of little flagellates in them. These are not the organisms you are looking for.

1. ***Vorticella*** (cilia feeding) Your instructor couldn't find any animals in these samples. Shame on Carolina Biological for selling us pond water without animals.
2. ***Euglena*** (eye spot, contractile vacuole, flagella) - These are very easy to see in wet mounts. You may want to add Protoslo to the mount in order to slow the animals motion. Look at the animals with the iris diaphragm stopped way down. You can see the flagellum whipping away at one end of the cell.
3. ***Volvox*** (colonial) Hopefully, these guys survive until your lab. These organisms are important because they are the very simplest version of a multicellular organism.
4. ***Amoeba*** (pseudopodia, cytoplasmic streaming). These are tough to see, but search the depression slide very thoroughly. They look just like the little bits of dead organic matter in the culture. You can tell that they are alive because you can see the cell organelles being moved about by cytoplasmic streaming. When the slides are first made, the amoebae do not show large pseudopodia. The pseudopodia are produced over time. Place a drop of Janus Green B at the edge of the slide. It will be drawn under the slide by the surface tension. Janus Green B is a redox sensitive vital stain that is clear at low redox potential and blue at high potential. It stains mitochondria in the cytoplasm. You will need to wait about 5 minutes for the stain to enter the organisms. They will turn blue. Vital stains like Janus Green are theoretically non-toxic so they highlight parts of the organism while it is alive. Be careful of the stains because they are very effective. Get Janus Green on you and you will be blue for a week!
5. ***Paramecium*** (micro and macronuclei, oral groove, contractile vacuole, cilia). These cells are very fast. You will need Protoslo to see them at all. As usual, search across the depression slide at lowest power to find some individuals. When you have a good specimen located, switch to higher power. Your highest power will show the beating cilia. You can stain the paramecia with neutral red. Use this vital stain just as you did the Janus Green B above. Place a drop at the edge of the coverslip and let it be drawn into the depression.

Phylum Porifera (sponges)
Exercises 5.1 and 5.2

Cellular level of organization, special cell type- choanocyte, other cell types: amoebocytes, pinacocytes, porocytes. Skeleton: spicules, spongin. Incurrent opening- ostium (ostia), excurrent opening – osculum (ostia).

Make sure you understand the structure of the whole sponge. Be sure to check the pictures in your lab manual and relate them to the slides that you are seeing.

Observations:

Prepared slides: c.s. and l.s. of *Grantia*/sycon/scypha. Sponge at the sycyonoid level of organization. Spicule slide

Preserved sponges, dried sponges, slide show and movies.

Animation: www.biology.ualberta.ca/courses.hp/zool250/LabSched.htm

Click “sponge form and feeding” under animation

Animation of water flow and feeding in the three different types of sponges.