

Chapter 20 Protists

Comparing the Movement of Protists

Introduction

Unicellular protists generally live in watery environments, such as ponds, oceans, and within the bodies of larger organisms. Some unicellular protists can move independently through their environment, while others remain in one location. In this investigation, you will compare the ways several different protists move.

Problem

How do unicellular protists move through their environments?

Pre-Lab Discussion

Read the entire investigation. Then, work with a partner to answer the following questions.

1. All bacteria and most protists are unicellular organisms. Which are larger?

2. Why are unicellular protists usually viewed in wet mounts?

3. Why is it helpful to begin viewing the wet mount under low power?

4. What structures do all protists have in common?

5. Would you expect to find more individual protists in a body of water that dries up from time to time, or a body of water that does not? Explain your reason.

Materials

dropper pipette
microscope slide
coverslip

paper towels

compound light microscope


piece of cotton

cultures of various protist species

Safety

Put on a laboratory apron. Be careful to avoid breakage when working with glassware. Use caution when handling microscope slides, as they can break easily and cut you. Observe proper laboratory procedures when using electrical equipment. Follow your teacher's directions and all appropriate safety procedures when handling live microorganisms. Always handle the microscope with extreme care. You are responsible for its proper care and use. Wash your hands thoroughly after carrying out this investigation. Note all safety alert symbols next to the steps in the Procedure and review the meaning of each symbol by referring to Safety Symbols on page 8.

Procedure

-  1. Separate a few strands of cotton and place them on a microscope slide. The cotton strands will help to slow the movement of the protists. Alternately, your teacher may provide a chemical slowing agent. **NOTE:** *This step is not necessary when preparing Amoeba for observation.* **CAUTION:** *Be careful when handling the slide and its coverslips. Microscope slides and coverslips have sharp edges.*
2. With a dropper pipette, place a drop of protist culture on the slide.
3. To make a wet-mount slide, gently lower the coverslip over the drop of protist culture.

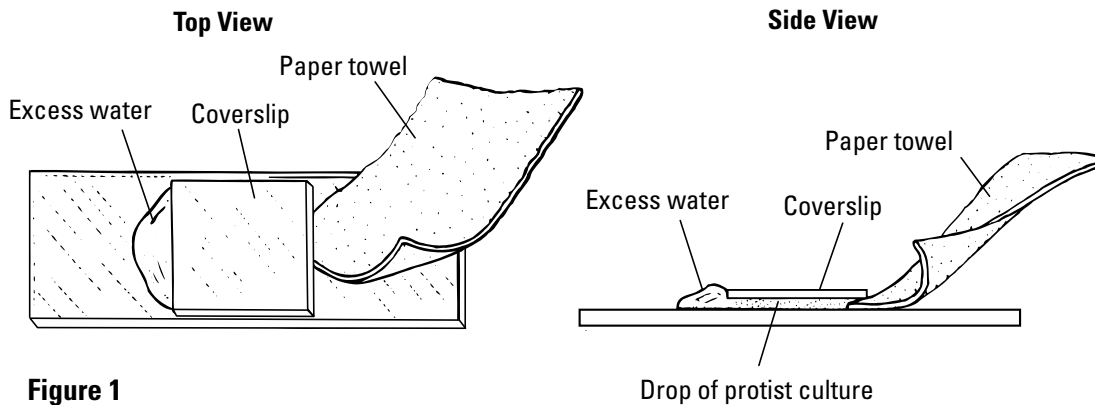


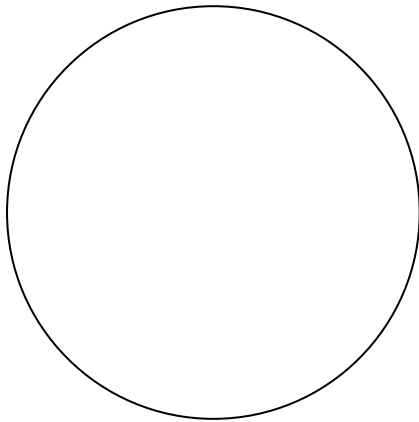


Figure 1

4. To remove any excess liquid, place a piece of paper towel near the edge of the coverslip and allow the paper towel to absorb the excess liquid. See Figure 1.
-  5. Place the slide on the stage of the microscope. Use the low-power objective lens to bring a single organism into focus. Have your teacher check to see that you have an organism in focus.
6. Switch to the high-power objective lens. **CAUTION:** *When turning to the high-power objective lens, you should always look at the objective from the side of your microscope so that the objective lens does not hit or damage the slide.*

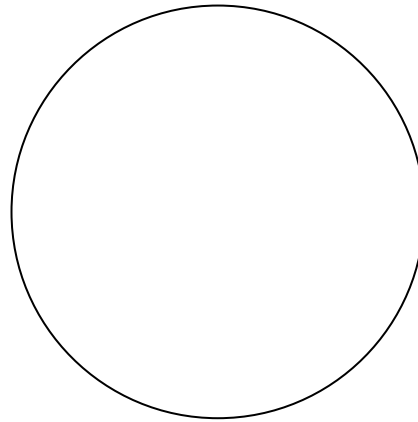
7. Using the fine adjustment knob, bring the organism into a sharper focus.
8. Observe the organism and draw what you see in the space labeled Specimen 1. Label any structures, such as a contractile vacuole or nucleus, that you can distinguish. In the blanks below the space, fill in the magnification you are using, the name of the protist, and a description of the protist's movement.
9. Carefully clean and dry the slide.
-  10. Repeat Steps 1 through 9 for a second, third, and fourth type of protist. Wash your hands well with soap and warm water before leaving the laboratory.

Specimen 1



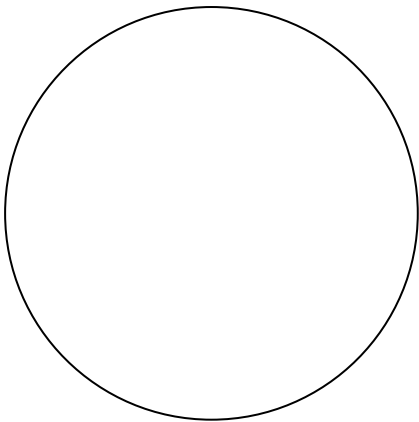
Magnification _____
Name _____
Movement _____

Specimen 2



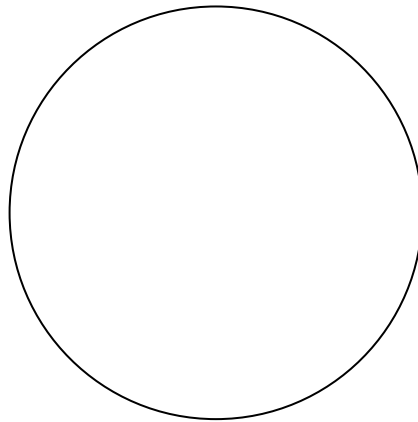
Magnification _____
Name _____
Movement _____

Specimen 3



Magnification _____
Name _____
Movement _____

Specimen 4



Magnification _____
Name _____
Movement _____

Analysis and Conclusions

1. **Analyzing Data** Identify the different structures that the various protists use to move through their environment.

2. **Inferring** Some of the protists you have observed today have been referred to as protozoans—a name that means “first animal.” What aspects of these protists likely gave rise to that name?

3. **Formulating Hypotheses** *Stentor* is a protist that does not move through its environment, yet it has cilia. What function do the cilia likely serve in *Stentor*?

4. **Comparing and Contrasting** In what respect are cilia similar to flagella? In what ways do they differ?

Going Further

Based on the results of this investigation, develop a hypothesis about the relationship between protists’ structures for movement and their feeding behavior. Design an experiment to test your hypothesis. With your teacher’s permission, carry out your planned experiment and record your results.