

3

Normal And Plasmolyzed Cells

11

Diffusion of water molecules across a cell's outer membrane from areas of high water concentration to areas of low water concentration is called osmosis. This movement of water may be harmful to cells. It can result in cell water loss (plasmolysis) when living cells are placed into an environment where the water concentration inside the cell is higher than outside the cell. However, most cells live in an environment where movement of water in and out of the cell is about equal. Therefore, there are no harmful effects to the cell.

In this investigation, you will

- prepare a wet mount of an *Elodea* leaf in tap water and a wet mount of an *Elodea* leaf in salt water for microscopic observation.
- observe and diagram cells of both wet mounts.
- observe the normal appearance of *Elodea* cells in tap water.
- compare normal cells in tap water to plasmolyzed cells in salt water.

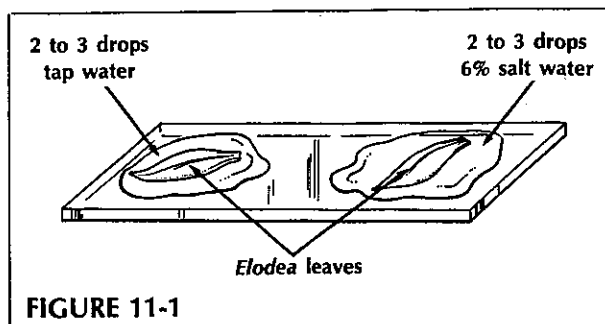
Materials



microscope
microscope slide
coverslips
Elodea (water plant)
dropper
water
6% salt solution
tweezers

Procedure

- Prepare a wet mount of two *Elodea* leaves as follows. Use Figure 11-1 as a guide.
- Step 1.** Put two or three drops of tap water on the left side of the slide.
- Step 2.** Put two or three drops of 6% salt water on the right side of the slide.
- Step 3.** Place one *Elodea* leaf in the water on each side of the slide.
- Add coverslips to both leaves. NOTE: Make sure that the two liquids on the slide do not run together. If they do, discard leaves and start over using fewer drops of liquid.
- Wait two or three minutes. Observe each leaf under both low and high powers. To observe both leaves, simply move the slide back and forth across the microscope stage.
- Carefully observe the location of chloroplasts in relation to the cell wall of both leaves.



steps
Repeat procedure with
distilled water

step 4
Clean slide and place elodea
in distilled water + make
a diagram

LAB: NORMAL + PLASMOLYZED CELLS

Analysis

Name _____

Read the following four statements before answering the questions:

- (a) *Elodea* cells normally contain 1% salt and 99% water on the inside.
- (b) Tap water used in this investigation contains 1% salt and 99% water.
- (c) Salt water used in this investigation contains 6% salt and 94% water.
- (d) Salt water has a higher concentration of salt than fresh water or *Elodea* cells.

1. Describe the location of chloroplasts in a normal *Elodea* cell (in tap water). _____

2. Describe the location of chloroplasts in a plasmolyzed cell (in salt water). _____

3. Answer the following questions about the cell in tap water.

(a) What is the percentage of water outside the cell? _____

(b) What is the percentage of water inside the cell? _____

(c) How do the percentages compare? _____

(d) Did the cell change shape? _____ Explain. _____

4. Answer the following questions about the cell in salt water.

(a) What is the percentage of water outside the cell at the investigation's start? _____

(b) What is the percentage of water inside the cell at the investigation's start? _____

(c) Is the percentage of water (concentration) inside higher or lower than the percentage outside? _____

(d) When will water move across the cell's membrane? _____

(e) Circle the direction water should move: from high to low or low to high concentration.

(f) Did the inside of the cell change shape due to water loss? _____ Explain. _____

5. What is plasmolysis? _____

6. Why do many single-celled organisms that live in water have contractile vacuoles? _____

7. Predict what would happen to freshwater algae if they were placed in the ocean? Why? _____

8. Explain why plants become limp when they are not watered. Describe the sequence of events that occurs after a limp plant is watered. _____

Data

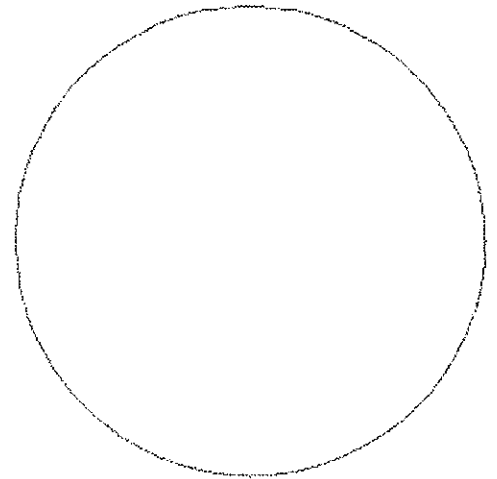
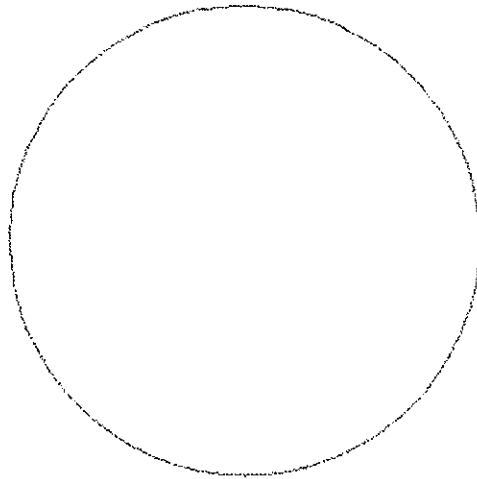
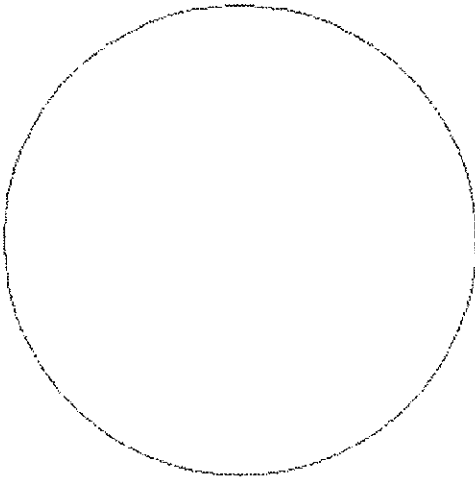
Name _____

Elodea

Distilled Water
Name of solution

Tap Water
Name of solution

Salt Water
Name of solution



Onion

Distilled Water
Name of solution

Tap Water
Name of solution

Salt Water
Name of solution

