Culturing Slime Mold

Live Material Care Guide

Background

Plasmodial slime mold (phylum Myxomycota) lives in dark, moist environments such as under the bark of decaying logs, among mulch, or beneath decaying leaves. Slime mold classification is once again changing. They were in Protista due to their amoeboid-like properties. In the past, slime molds were considered a fungus because they produce fruiting bodies and spores used for reproduction. Slime molds are a group notable for its unwillingness to be neatly classified!

Frequently bright in color and large in size (up to 30 cm in diameter), plasmodial slime molds consist of many amoeba-like cells, which form a mass of protoplasm called myxomycota. The organisms are capable of very slow, creeping movement by means of cytoplasmic streaming.

During the reproductive stage, called *pseudoplasmodium*, slime molds tend to migrate to a well-lit area, such as the top of a log, where less moisture is present. They form into a slug-like mass and produce reproductive fruiting bodies, which contain spores. Under adverse conditions (lack of food, water, light, warmth, or pH changes), the organism dries out and forms a hardened mass called a *sclerotium*. These sclerotia may also grow fruiting bodies, but do not release spores into the environment until conditions once again become favorable for growth. Spores are transported by wind, which results in the spreading of slime molds to new areas.

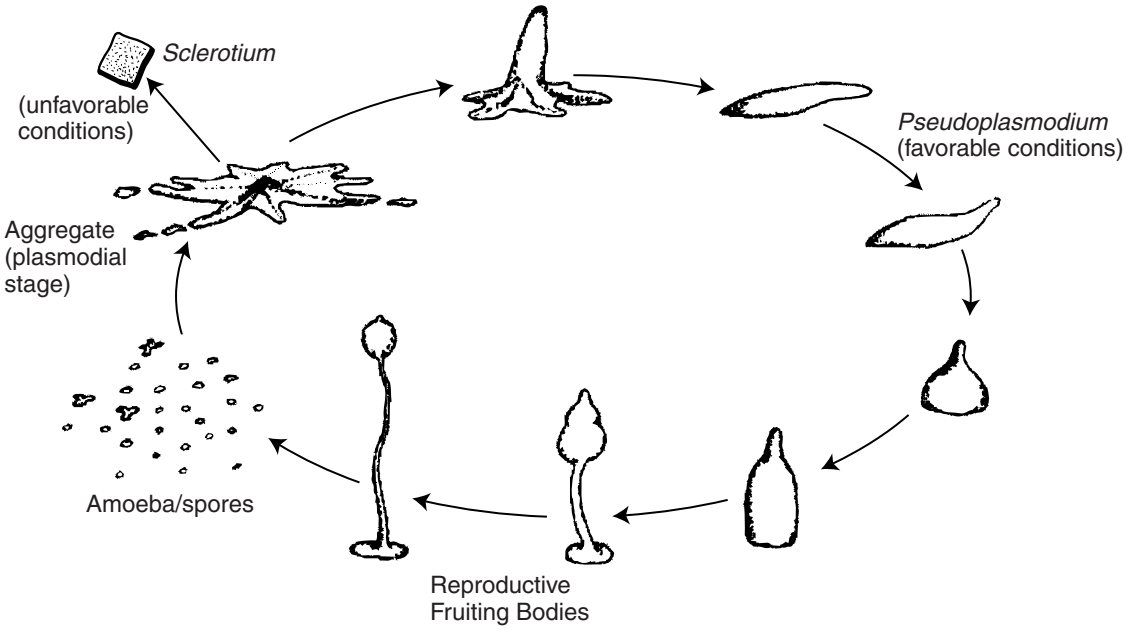

Figure 1. Life Cycle of Slime Mold

Culturing/Media

Slime mold is typically cultured from sclerotia rather than from spores. These dry sclerotia can remain dormant for up to a year if kept dry and in a dark environment. The organism will begin actively growing once it is moved to an environment optimal for development. Ideal growth conditions include warmth (70–80 °F), moisture, a food source, and relative darkness. A suggested method for culturing slime mold from sclerotia is described below.

Publication No. 10586
061616

Filter Paper Sub-Culturing

Wrap a culture dish, or other shallow container, with a large piece of filter paper so that the opening is completely covered and the paper drapes over the sides a few inches. Place this dish into a larger container (jars work well) and pour distilled water down the side of the outside container until it reaches the edge of the filter paper hanging along the side of the culture dish. The purpose is to have the edges of the filter paper act as a wick to keep the entire filter paper moist. See Figure 2.

Place the dried sclerotium on the center of the moist filter paper. (Either the entire sclerotium mass or a sclerotium piece cut from the bulk may be used). Sprinkle 0.1 g of dry, ground oatmeal onto the filter paper around the sclerotium. Oatmeal can be crushed using a mortar and pestle. *Note:* Do NOT use instant oatmeal! Cover the container with a screen, towel, or other breathable lid and place in a warm, dark place for several hours to overnight.

Within 24–48 hours, the plasmodial slime mold will begin to spread across the surface of the filter paper and engulf the oatmeal. Add more oatmeal accordingly as the slime mold consumes the food.

Once the slime mold has grown to completely cover the top of the culture dish, hang paper towels along the insides of the larger container down into the water. The slime mold will eventually travel to the paper towel. At this point the paper towels can be removed and placed in a moist terrarium. If culturing to grow slime mold for future use, remove the paper towel and allow it to dry at room temperature. The dormant sclerotium will become evident. Once completely dried, the paper towel with the sclerotium can be cut into squares, placed in envelopes, or plastic zipperlock bags, and stored in a cool, dry place for future culture initiation.

Individual Observation Cultures

Place a piece of wet filter paper or non-nutrient agar in the bottom of a clean Petri dish. Put a small piece of paper towel with a sclerotium (which can be produced using the previous culture method) in the center of the Petri dish on top of the filter paper or agar. Sprinkle a few pinches of oatmeal a half an inch away from the organism. Cover the Petri dish and store the culture in a warm, dark place. Only expose cultures to light while students are observing them. Add more oat flakes as they are consumed. Petri dish cultures should be monitored using a stereoscope. This will allow students to observe the amazing cytoplasmic streaming that occurs as the slime mold moves.

Tips

- Slime molds are great study organisms during discussions of the characteristics that constitute life, and are living examples of the "gray" area that separates plants and animals.
- Be sure to store dormant sclerotia in a dry place. If they are exposed to moisture, they may return to a plasmodial state and begin to grow.
- For an activity outside the classroom, students can be challenged to find and take pictures of slime mold growing in the wild.

Disposal

Slime mold cultures may be disposed of according to Flinn Suggested Biological Waste Disposal Method Type IV. Please consult your current *Flinn Scientific Catalog/Reference Manual* for proper disposal procedures.

Materials for *Culturing Slime Mold* are available from Flinn Scientific, Inc.

Catalog No.	Description
LM1025	Physarum polycephalum, Plasmodium, active stage
LM1026	Physarum polycephalum, Sclerotia, dormant stage
LM1027	Physarum Study Kit, both Plasmodium and Sclerotia
AB1264	Culture Dish, 300-mL

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.