

## Maintaining Hydra

Hydra is a freshwater member of the largely marine phylum Coelenterata (or Cnidaria). These are the simplest animals with definite tissues. The tube-like body has two cell layers with a layer of jelly and wandering cells in between. A single opening, the mouth, leads into a gastro vascular cavity. Tentacles armed with stinging cells surround the mouth. When a prey organism, such as a small crustacean, brushes against the hydra's tentacles, the hydra first harpoons it with stinging nematocyst threads; it then uses its tentacles to guide the meal into its mouth.

Hydras living on the undersides of lily pads and other leaves in cool ponds and streams look like tiny pieces of frayed string. They can contract and extend their flexible bodies and tentacles. Extended, they may reach 25mm or more in length. Hydras can move from place to place by "walking" or somersaulting on their tentacles or by sliding along in measuring-worm style.

Sometimes called the "eternal animal," *Hydra* has an amazing ability to regenerate lost body parts. A hydra cut in half will form two complete animals within a few days.

### **Materials for Culturing Hydra** (Items 1-2 are available from Region 20, Living Science Materials Center)

1. Hydra Culture
2. Brine Shrimp Eggs
3. Spring Water
4. Glass Culture Dishes or Baby Food Jars
5. Pipettes for transferring Hydra
6. Sieve for straining Hydra for cleaning and for separating from brine shrimp after feeding

### **Culturing Hydra**

Despite its regenerative powers, the hydra can be quite difficult to maintain over long periods, although short term culturing is relatively easy. Hydras are voracious eaters, feeding on small, motile forms, particularly crustaceans. To keep your hydras alive and healthy will require a continuous food supply. Hydras thrive on *Daphnia* and brine shrimp. Provide several animals for each hydra and increase the number of food animals daily as the hydra population grows.

Use glass culture dishes or baby food jars to culture your hydra. Fill the jars  $\frac{3}{4}$  to the top with spring water, filtered pond or well water or rainwater. Do not use distilled water or tap water. Keep the containers at about 70° F. in dim light. Too much light favors the development of algae, which can be detrimental to the cultures. Use a pipette to transfer a dozen or more hydras to each container. *Be careful: the hydra is extremely delicate.*

### **Maintaining Hydra**

Change the spring water in the cultures every day, or, if this is not practical, siphon off at least one-third of the old culture water and replace it with fresh spring water. Feed every other day or so with brine shrimp. (Hatching instructions **LMP-157**). Squirt rinsed brine shrimp, in plastic pipette, over the hydra, attempting to hit the tentacles of most of the animals. Put the pipette under the surface of the water and squirt the water in and out to move the brine shrimp to encounter all the hydra tentacles. After 30 minutes to an hour, pour off the water, unattached hydra and uneaten brine shrimp onto the sieve. Squirt spring water over the hydra and brine shrimp to rinse the shrimp on through. Turn the sieve over, atop the hydra culture dish and squirt spring water through to get the hydra back into the culture dish. Add fresh spring water to about an inch.

### Maintaining Hydra (cont)

The next day, clean the hydra culture dish thoroughly. Run your finger over the bottom and sides of the dish to remove the accumulated bacteria and “scum.” Pour the solution and hydra over the sieve. Rinse the hydra using the pipette and spring water. Invert the sieve over a clean culture dish and squirt spring water through to get the hydra into the clean dish. Add fresh spring water to about an inch. If the hydras are fed every day, they will begin to bud and the population will increase the speed of budding.

### **Special Problems**

Hydra is difficult to culture during the seasonal period in which spermaries and ovaries are formed. Hydra normally undergoes sexual cycles in March and April, and occasionally in November. At these times, the animals appear “sick,” and the tentacles and body column contract. During this period, the animals are most susceptible. The flatworm *Microstomum* may also attack and completely eliminate a culture. The best way to combat these problems is to maintain a “clean” culture by frequently changing the spring water. Green hydra must be exposed to light-about 8 to 10 hours per day of window or artificial light, but not so much that the culture water is heated. Keep the containers clean and avoid algal buildup. A few snails added to the container can help solve this problem