

Culturing *Hydra*

Live Material Care Guide

Background

The largest phylum of marine organisms is called *Coelenterata* or *Cnidaria*. This phylum, which includes jellyfish and sea anemones, are considered to be the simplest animals with defined tissue layers. A freshwater member of this phylum is a unique organism called *Hydra*. Its single opening, the mouth, in its almost transparent body is surrounded by stinging tentacles used to capture prey and then bring the food through the mouth and into the body cavity. Of course, once digestion is completed, the single opening is also used to expel indigestible, waste material.

Hydra live attached to leaves, rocks, sticks, or other submerged substrates in cool, clean, oxygenated freshwater ponds and streams. They have flexible bodies and tentacles that expand, contract and move or sway with the currents. Although sometimes considered to be stationary creatures, *Hydra* have the ability to move from one place to another by somersaulting on their tentacles.

Hydras are famous for their capacity to regenerate lost body parts and asexual reproduction is common by the formation of “buds” on the parents. (See diagram below.)

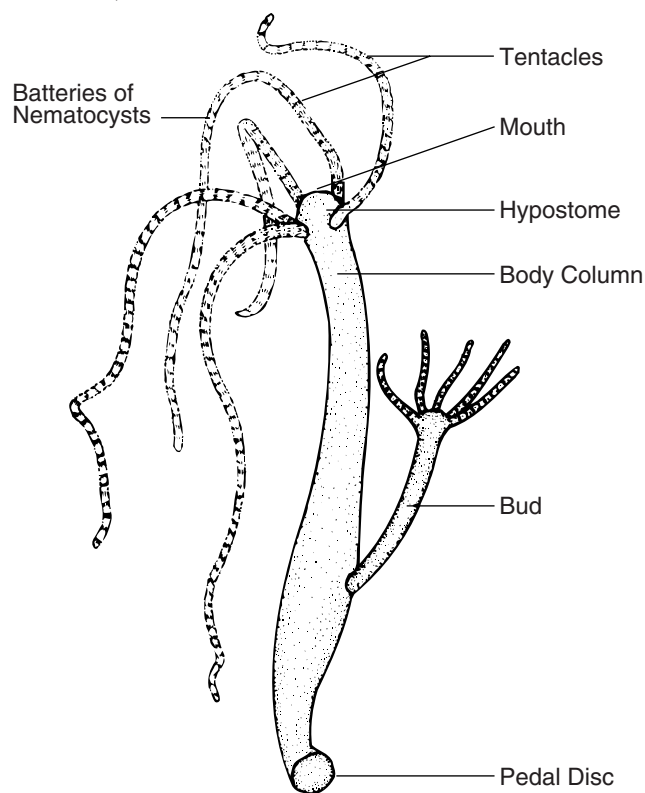


Figure 1. *Hydra* with bud

Culturing/Media

Upon receipt of the stock culture, loosen the cap on the container and aerate the culture with a clean pipet. To maintain your culture of *Hydra* over several days or weeks, fill a small aquarium or large culture dish (up to 5 gallons) almost to the top with spring water, filtered pond or well water, or pure rainwater, i.e., not runoff from the roof or gutter. Do not use tap or distilled/deionized water. Once set up, carefully add *Hydra* to the container using a long, wide-stem, glass or plastic pipet. Culture(s) should be kept in dim light at room temperature (~ 21 °C). Too much light will encourage the growth of algae which is harmful to the hydras. The water in the containers needs to be replaced every day but if this is not practical decant 1/3 to 1/2 of the old culture water and replace it with fresh water, as indicated above. A suggested regime is as follows: Change part of the water each morning; feed the hydras in the afternoon.

Although short term culturing is relatively easy, maintaining a viable culture of *Hydra* for extended periods of time may prove problematic. A primary reason is their insatiable appetite for live food. Keeping *Hydra* alive and healthy requires a

steady and daily diet of living *Daphnia* or brine shrimp. Several animals per hydra per day are necessary and as the population grows, the food supply must be increased. In addition, uneaten food must be removed each day to avoid fouling the water.

Special Problems

Most species of *Hydra* undergo a seasonal cycle of sexual maturation and are more difficult to culture during this time. One species, *H. littoralis*, goes through this cycle in March and April and sometimes in November. This cycle may be noticeable in *Hydra* by a visible contraction of both the body stalk and tentacles and it does not eat. At these times, *Hydra* cultures are vulnerable to attack by a microscopic protist that eats its way down the tentacles and body stalk. Maintaining a “clean” culture environment through frequent water changes is the best way to combat this problem.

If green *Hydra* (*Chlorohydra viridissima*) are cultured, they must be exposed to about 8–10 hours of window or artificial light but not enough to heat up the water in the container. Light is necessary for the symbiotic algae living inside the hydra to photosynthesize. As stated earlier, though, too much light can cause the growth of harmful algae. Adding a few aquarium snails to the culture can help solve this problem without harming the *Hydra* themselves.

Tips

- *Hydra* is also great to use when discussing the two major body plans of *Cnidarians*, namely, medusa and polyp. Most students are familiar with the medusa body plan of jellyfish, as seen in the movie, “Finding Nemo”. However, the polyp body plan of the sea anemone, coral, and *Hydra* may not be as familiar.
- Careful observation of *Hydra* being fed *Daphnia* or brine shrimp may allow students to observe how *Hydra* captures their prey and how *Daphnia* avoid being captured.
- *Hydra* may be collected from among weeds and submerged leaves in cool, clean, natural, fresh water sources. Place the vegetation along with the pond water into an aquarium. In a few days, the *Hydra* will move from the vegetation to the glass surface, where they can be more easily seen and collected using a long-stem pipet.

Disposal

Hydra 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 Hydra* are available from Flinn Scientific, Inc.

Catalog No.	Description
LM1089	Brown Hydra, 30
LM1091	Green Hydra, 30
LM1093	Mixed Hydra, green and brown, 30
LM1107	Daphnia, 30
LM1111	Daphnia Culture Kit
FB0562	Brine Shrimp Hatchery
FB0421	Brine Shrimp Hatching Salts
FB0564	Brine Shrimp Eggs, 6 g
FB0420	Brine Shrimp Eggs, 80 g
AB1265	Culture Dish, 1800-mL
AP2253	Wide-Stem Pipet, Plastic, 153-mm long

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