NYSDEC Environmental Education

Maintaining Live Organisms Indoors

It is very educational and enjoyable to keep live freshwater invertebrates in the home or classroom, where they can be observed consistently over longer periods of time than is possible in the field. The organisms that live in ponds and lakes are very easy to maintain because any aquarium or large glass vessel can simulate their natural habitat. It is best to bring back some of the water from the habitat where you found them because the chemistry of that water is what they are used to. In addition, there are fine particles of detritus and microbes suspended in natural water that will serve as food for some of the invertebrates. Bottled spring water is a good alternative, if you cannot transport water from the place where you collect the invertebrates. Tap water from municipal supplies contains chlorine that is toxic to most invertebrates. If you must use treated water, you should bubble air from an aquarium pump through it for 24 hours to eliminate the chlorine.

Aquarium gravel makes a good substrate for invertebrates. Add a few sticks, stones, dead leaves, or live plants, preferably fro the original habitat, for places the organisms can hide and hold on to. A little bit of the sediment from the original habitat should be added to serve as food for detritus feeders. Also, this material will probably contain some small invertebrates that can serve as food for predators. It is usually not necessary to aerate the water for pond dwellers, but an air stone with a small amount of air coming out will keep the water saturated with dissolved oxygen and will keep anaerobic decay processes, and their accompanying odors, to a minimum. Be gentle with the organisms when you collect and transfer them to the aquarium. Never squeeze them with forceps. Put the tips of the forceps under the organism and lift rather than squeeze. Better yet, use a small aquarium net to lift them or carefully suck them in a turkey baster to transfer them. A screen cover on the aquarium is a good idea to keep anything from escaping, while keeping the water in contact with the air to maintain saturated levels of dissolved oxygen. Do not worry about moderate amounts of algae or scum forming in the aquarium. This is natural, and some of the organisms will probably use it as food. Excessive amounts of this material can be avoided by changing about one-third of the water volume every 2 weeks and by removing any excess food that is not eaten with 24 hours. A few snails will also help keep the algae and scum under control.

Some pond organisms are easy to keep in an aquarium. Examples include:

Dragonflies and damselflies

Skimmer dragonflies, darner dragonflies, narrowwinged damselflies

True bugs

Water boatmen, backswimmers, water striders, water scorpions, giant water bugs

Water beetles

Predaceous diving beetle adults and larvae, water scavenger beetle adults and larvae, whirligig beetle adults

Caddisflies

Longhorned case makers, northern case makers, giant case makers

True flies

Non-biting midges

Crustaceans

Scuds, aquatic sow bugs

Flat worms

Segmented worms

Leeches, aquatic earthworms

Mollusks

Snails

Read about the biology of these organisms so that you can provide the appropriate microhabitats and foods in your aquarium. Notice that many of these pond organisms are predators, so you will need to provide a lot of prey organisms. If you have trouble finding aquatic invertebrates for prey, most pet stores carry other live organisms that can be substituted. True bug and water beetle predators will eat live crickets. Just drop them in the water. Some of the aquatic invertebrate predators will even feed on dead crickets, so you can freeze some fresh ones and drop a few in the water as needed. Carrion scavengers, such as whirligig beetles and water scavenger beetles, will feed on small pieces of raw meat. Dragonfly and damselfly larvae do very well on small earthworms that you can find in the soil or mulch piles. If you cannot find any earthworms, pet stores usually sell several other kinds of small live worms for fish food.

Many predators commonly eat water boatmen and midge larvae, and you can collect these easily in the shallow water of almost any pond. If you use dechlorinated tap water or bottled spring water to start your aquarium, there might not be enough fine detritus to feed any organisms that collect this material for their food. Good sources of this type of food are dry dog food that has been ground up, powdered milk, or fish flakes. Only add a few pinches of this material because it stimulates microbial growth that can accumulate in a thick layer. No matter how much food you provide, it is inevitable that some of the predators will attack and consume their own kind as a result of being kept in a relatively small, artificial environment. Never put any of these invertebrate predators in with tropical fish that you car about, because the fish will probably become prey within 24 hours.

It is enlightening to raise some of the immature aquatic insects to the adult stage and hopefully be able to watch them make the transformation. Dragonflies and damselflies will probably provide the highest rate of success for larvae transforming to adults in an aquarium. Try to collect larvae that are as mature as possible. These have the largest wing pads on the thorax. Collecting mature larvae cuts down on the length of time that you have to provide them with prey organisms for food. When it is time to transform to the adult stage, all dragonflies and damselflies have come out of the water before they shed their skin. Therefore, you must put a stick or rock that extends from the bottom of the aquarium up above the water surface. The substrate must be fairly rough so the emerging organisms can hold on with the claws at the end of their legs. A strip of wire screen hung on the inside of the aquarium also works well for an emergence site. It is best to leave the aquarium uncovered if you are trying to raise dragonflies and damselflies to the adult stage. If the aquarium is covered, they often fall in the water and drown when they first try to fly. Just let them fly away in the room. They will always be found on the inside of a window, because they fly towards the light. You will know that they have emerged because they leave their empty larval skin at their emergence site. After observing the adult for a while, capture it carefully with your fingers or a net and release it outdoors.

A Guide to Common Freshwater Invertebrates of North America. 2002. J. Reese Voshell, Jr. McDonald and Woodward Publishing Company, Blacksburg, VA, 68-70