Beginner's Corner

ALDROVANDA

by Joe Mazrimas

Active trapping mechanisms in the flowering carnivores are present in two genera, *Dionaea* and *Aldrovanda.* Although the former plant is mainly a terrestrial form, the latter plant floats on the surface of tropical and temperate zone waters, especially acidic water. A comparison of some properties in these two plants reveals that *Dionaea* has 6-8 sensory hairs on the trap lobes while *Aldrovanda* has 30-40 sensitive hairs on the upper surface of the trap lobes. At moderate temperatures, it takes 2 stimuli, either mechanical or electrical, at an interval less than 20 seconds for complete closure of the *Dionaea* trap to take place. In *Aldrovanda,* if the hair is bent twice, the trap will close; it's not known what the minimum interval is. The traps of both genera can be stimulated to shut even when the lobes are scratched or pricked with a needle. The cells of *Aldrovanda* in the motor zone in the central part of the trap are very sensitive to mechanical stimuli. One can even stimulate the traps to close by immersing electrodes in water and giving the floating plant an electrical shock.

At very high temperatures about 95-105°F (40°C), *Dionaea* needs only one stimulus on the trigger hair to cause the trap lobes to close. A sudden rise or fall in water temperature results in the traps of *Aldrovanda* to close but it takes much longer for the effect to take place — 2-50 secs vs. 0.1 sec in *Dionaea.*

One gets the impression when looking at a mass of *Aldrovanda* from a short distance, that they resemble tiny green bottlebrushes floating just under the smooth surface of the orange-brown clear water. A closer look reveals that the leaves are arranged in whorls separated by short segments of stem. There are usually 6-8 leaves arranged like spokes of a bicycle wheel around the stem with the flytrap-like traps found on the tips of the leaves. However, the largest trap I've seen was no bigger than 3/16ths of an inch (5 mm.) but its sensitivity and trapping ability is astonishing. I noticed that some of the bristles connected to the trap actually break the surface of the water and stick straight up into the air about 1/16th of an inch (2 mm.) but I don't know what purpose these bristles serve. For the five years that I was growing this genus of plants, I experimented and found a simple system to grow this plant requiring a few essentials.

The container is a plastic dishpan about 8 in. (20 cm.) deep and 20 inches (50 cm.) in diameter. First, I bring to a boil a large kettle of water (I use tap water) and slowly pour into it sufficient Canadian peat moss so that it will fill the bottom of the dishpan to a depth of two inches (5 cm.). Bring the mixture to a boil again and let simmer for 30 minutes. After it cools, pour the entire kettle into the dishpan and after 4-6 days the peat finally settles so that the water is clear and yellowish in color. This water is acid and is sufficient for growing *Aldrovanda.*

Aldrovanda grows best in partial sunlight since you don't want any competition with algae growing in the same container. Algae prefers strong light and so it's best to grow in bright shade for most

of the day. The temperature of the water should be 70-75°F (23°C). If the temperature is lower the growth is slower and at temperatures below 60°F (16°C) growth practically ceases. At lower temperatures the plant will attempt to go dormant. I don't give my plants any dormancy period since that is rather tricky and you may lose the plants trying to do so.

Also, I don't make any attempt to feed the plants since the water contains tiny organisms and tiny animals for the plants to feed on. You can feed the plants brine shrimp, daphnia or vinegar eels. Don't overfeed the plants since this fouls the water.

Healthy *Aldrovanda* plants have an onion-shaped growing tip and should produce at least one to two whorls per day. If your plants look sick and are not growing well, then change ⅔rds of the water with fresh water by carefully pouring off the old water and replacing it with fresh water. The surface of your artificial pond should be crystal clear and to make it so, swipe the surface with newspaper by dragging sheets of newspaper over the surface which removes both surface algae and grease and oils that contaminate the surface. Remember that the water should always be acid. Although in nature the plants grow in water at a pH of 6.5 or so, in cultivation they seem to like to grow in pHs of 4.5 to 5.5 since these pH values are easy to maintain with the above system that I described.

To propagate *Aldrovanda* is simple—just cut the stems at intervals containing 3 whorls or more. In a few weeks time, a new growing shoot will start from the whorl axil and grow into a new plant.

Although my plants have never flowered in cultivation, its interesting that the white petaled flower is related to *Dionaea* which is not too surprising because of the similarities mentioned in function described in the beginning of this essay.

Sibakoa, Takao in Annual Review of Plant Physiology. 20:165-184, 1967.

Review of Recent Literature

Adams, Richard II. 1978. Plant parenthood and the single cell. Horticulture 56(10):16-22.

While not dealing solely with CP, this excellent review article on the process of "meristemming" or "shoot tip culture" certainly has potential application for us. There is an inspiring full page color plate of some young *Cephalotus* "budlings" in an agar culture tube, and many other line drawings to illustrate the principles of this process.

Dexheimer, J. Study of mucilage secretion by the cells of the digestive glands of *Drosera capensis* L. using staining of the plasmalemma and mucilage by phosphotungstic acid. Cytologica (Tokyo) 43(1):45-52. 1978.

Phosphotungstic acid makes it possible to contrast the membranes and mucilage secreted by the digestive glands of the *Drosera* species under study.

Fish, D., Hall, D. W. Succession and stratification of aquatic insects inhabiting the leaves of the insectivorous pitcher plant, *Sarracenia purpurea.* Am. Midl. Nat. 99(1):172-183. 1978.

Three types of insects that inhabit the pitcher fluid of the above plant do so at different times and at different strata as they feed upon the dead insect remains. The buoyant larvae of *Blaesoxipha fletcheri,* of the fly family, feed up-