ON THE CULTIVATION OF *DROSERA LINEARIS*

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The best way to begin cultivating any plant is to study its natural habitat, especially if that plant is difficult to grow. The only reason why any plant may be difficult to grow is that the grower is not meeting the conditions for that plant which depends on the grower's budget, knowledge and determination. The enjoyment of growing a desirable plant lies in making an environment economically and requires little attention.

First of all, I would like to relate some observations on two marl fens with *Drosera linearis,* one in southeastern lower Michigan and one in northeastern lower Michigan. In the winter the hibernacula survive the cold January temperatures with a possible freezing depth of 12 inches, based on the ice fishing in the southeast area. The marl flats develop a thin layer of ice, but I find that standing on them is unyielding to my body weight suggesting that the marl is also frozen.

So much for one temperature extreme. I have found temperatures much higher than some sources suggest for growing the species. I have field notes on marl and air temperatures that I have taken throughout the summer of 1988, though not complete. *Drosera linearis* can take the heat, especially in southeastern lower Michigan. The first ten days in July of 1988 high temperatures were at or near 100° F. On one of those days the marl temperature was 93° F and the air temperature one inch above the marl was 105° F. However, this did not bother the plants at all.

In the summer the plants were exposed to direct sunlight most of the day in both locations and grow as clumps and separately in both locations. In the southeastern fen I found some *Drosera linearis* at the base of mossy hummocks along with a few plants of sterile *Drosera anglica,* but these plants did not grow on the hummocks but I also found a few pioneering plants on the open marl. The northeastern location *Drosera linearis* grow on the marl flats and on some of the hummocks as well. *Drosera linearis* grows on the short, isolated hummocks, but does not grow on the thicker hummocks along the edge of the fen. The *Drosera linearis* on the hummocks grow just as vigorously as the ones in the nearby marl. Is this *linearis* able to compete with the faster growing vegetation of the hummocks? Is this a case of "typical" *linearis* and "competitive" *linearis* with intermediates, or are the short hummocks growing slow enough and able to hold seeds better than the marl and thus have the appearance of preference?

I have had limited success growing this species outdoors in my area. During the winter of 1987-88 the hibernacula were brown-green and were frozen during January and February. By mid-April they turned bright green and started growing. I was using marl as a growing medium in undrained plastic pots and my water supply is rainwater which at the time was very clean; it was collected during winter thaws. Then by early summer I compared the culture plants with the wild and concluded they did not grow as vigorously as the wild plants. The plants in culture needed watering daily and this left me with the impression that this periodic raising and lowering of the water table stressed the plants. In their natural habitat the seep water flows at a somewhat steady rate keeping the water table a constant level. *Drosera linearis* does not need precipitation to survive. During the drought of 1988 the plants were doing just fine with their only source of water coming from seeps. On the other hand, if a thunderstorm passes over dumping three inches of rain, that extra water will quickly drain through the fen's natural drainage system.

To keep the water table constant in culture attempts, I came up with an apparatus shown in Figure 1, which I had constructed by August 1988. Even if I am wrong about a changing water table stressing the plants, the apparatus I propose is a practical way of growing the

plants and requires less attention. The two inner tubes support the entire weight of the support frame, pots, soil and plant. I have tested the mechanics of this system without plants and will try growing these plants next year with some results by next autumn (1989).

The reason for two inner tubes is that if one deflates the other will float the system. If you plan on using a fine grade of dolomite or marl, I recommend 1 square inch of siphon cross-section area for every 16 square inches of soil surface area. The response to changes of water table depth is acceptable.

On a fair weather day the water flows from the reservoir to the marl to replace the evaporating water. If it rains and there is an access of water in the culture, the water flows from the culture to the reservoir. You may put a drain hole 1 centimeter above the marl so that the plants aren't submerged to a greater depth for too long.

This self-adjusting system takes about 12 hours to bring the water table back to normal after a heavy rain. The occasional drainage from the pot has the benefit of reducing the soluble mineral content that might have built up. The reason it takes this long is because the marl behaves as a clog. However, the flow is slow but sure. The water level should not be more than 2 centimeters below the surface of the marl as estimated from the natural habitat.

My siphon is made of glass for easy inspection to see if it is working. After a period of time gases may build up in your siphon rendering it inactive. The siphon recharging tube is a practical way of recharging your siphon without disturbing the soil and plants.

To recharge the siphon simply plug the end into the reservoir, remove the stopper and fill with clean water, and then put the stopper back on. Make sure it has a good seal. Do not worry about gases in the recharging tube. It's when the gases get into the siphon proper that you have to recharge.

Water quality is also a very important factor in growing this species. By mid-July I found that rainwater collected after a long drought is too dirty or nutrient-rich for *linearis*. Use only the cleanest rainwater - toward the end of a long rain, or if it also rains the very next day that water should be cleaner than the previous collection. Let the water stand for a week, then look for color in the water and any film on the surface. The water should be clear with no film

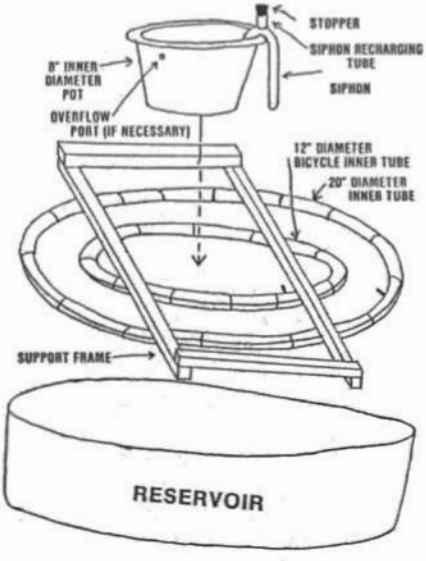
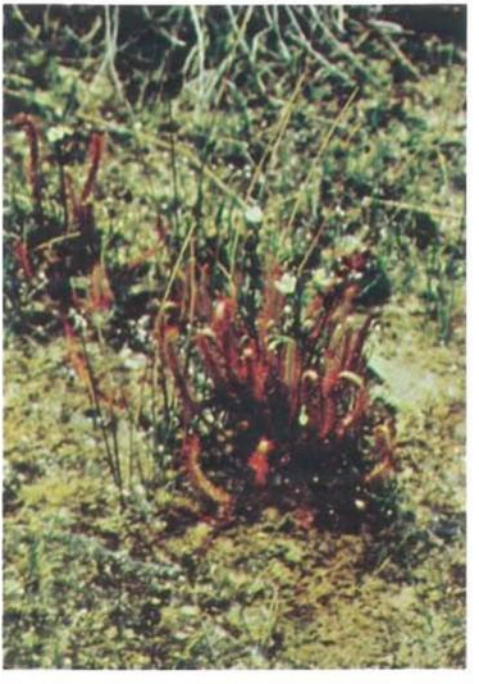


FIGURE 1

CP IN A SOUTHEASTERN MICHIGAN FEN



S. purpurea* in a *southeastern Michigan fen.



***Drosera linearis* in a southeastern Michigan fen. All photos by author.**

on the surface. There will always be some sediment from rainfall, so after using nearly all the collected water shake up the collection vessel and dump the remainder, and prepare for the next collection of water. If you don't want to gamble at all and pay a little more for it, use distilled water. You could build a solar still to be economical.

Use chickenwire around your reservoir so that the birds don't use it as a bird bath and contaminate your water. You also need a sieve to keep bugs off the surface of the water. If you want to grow the plants in peat moss using this method that's an experiment left to the reader. The parts of this apparatus are inexpensive and should be inspected annually for cracks in the inner tubes.

Finally, I found a marl fen in southeastern lower Michigan that has a large population of *Sarracenia purpurea* but does not contain *Drosera linearis*. This fen is now public land and there is evidence that it was once exploited for its limestone. It has two marl flats that look like they could support *Drosera linearis*. I am considering transplanting some plants and seeds to this location. If the plants grow and reproduce, they may possibly have grown there once before. If they do not grow there, then either they never did, or possibly the aquifer is contaminated because of human development. If they do grow there they have a better chance than threatened habitats on private land that I have seen. I would hate to see *Drosera linearis* eliminated from southeastern lower Michigan. It would mean a longer trip for me to go see them, and possibly the loss of a genetically different plant than those of upper Michigan and the northern tip of lower Michigan.

Fortunately, this fen is secluded and not accessible to the casual wanderer such as the average person on a Sunday picnic. Deerflies and mosquitos will be enough to turn most away. If that is not enough, peat muck, poison sumac and massasauga rattlesnakes might be the final discouragement.

The other thing—a constant water table might be a difference between good growth and luxurious growth of acid bog CP. I have seen some of the local kettle hole bogs that have *Sarracenia purpurea* and *Drosera rotundifolia* that are larger than my culture plants which are in undrained pots. The floating sphagnum mats in these bogs assure that the water table of these plants is constant no matter if it is a dry year or a wet one.

Acknowledgements:

I would like to thank Frederick W. Case for these locations and hints of what to look for in finding fens.

References:

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FOR THE RECORD

In Barry Rice's article "A Varying Lighting Scheme and Its Effects on Some Easily Grown CPs" which appeared in the September, 1988 issue of CPN, the plant referred to as *D.* 'Lake Badgebup White Flower', was incorrectly identified. According to Barry, it is actually *D. pygmaea.*