DROSERA LINEARIS

by Donald Schnell

Drosera linearis Goldie, apparently never very common in the past, is a rapidly declining species. Generally, its range is eastern boreal in the United States and Canada, extending into Maine, Michigan and as far west as Saskatchewan (Blue Jay 36: 74-75, 1978). The species was recently rediscovered as a small colony in Crystal Bog, Aroostook County, Maine (Rhodora 81: 145, 1979), and recently additional colonies in the same, large bog have been found (George Newman, personal correspondence). The species was once easily found as far south as Oakland County, Michigan, but has decreased markedly in that area.

Drosera linearis appears less able to compete with other plants than most other carnivorous plants and grows best and often very prolifically in so-called marl bogs or fens (marl fen is probably the preferred wetland term). The latter are wetland areas with a base of sand (usually) covered by a mixture of grass-sedge peat and marl (calcium carbonate). The marl-peat mixture is in small, soft granules and imparts a rather greasy texture to the soil. The fen usually has 1-3 cm of water overlying the marl where *D. linearis* can grow. There are usually widely spaced plants of grasses and sedges leaving many open areas which the linear-leafed sundew is able to colonize. *Sarracenia purpurea* ssp. *purpurea* can also grow in similar habitat where it responds with the so-called "ripicola" growth habit (Castanea 44:47-59, 1979). A typical soil analysis done by me on marl-peat from a good *D. linearis* bog still extant in northern Michigan shows a pH of 8.0, Calcium 9000 ppm, Carbonate positive, Manganese 7.5 ppm and Aluminum 100 ppm. (partial results or more interesting findings listed). There is the usual low N and P, but Potassium was 200 ppm. Other Droseras of the region *(D. rotundifolia* and *D. anglica)* and most Utricularias do not grow well in such soils. *(U. cornuta* is a common exception.)

Frequently, the marl fen is surrounded by and contains island-like hummocks of sphagnum which in many instances has been known to overgrow the bog and eventually impart an acid reaction to it, whereupon it becomes a raised bog of low mineral content. The sphagnum surrounding the fen and in the hummocks supports a rich growth of the other two species of *Drosera,* and additional Utricularias. Many times in a few remaining good locations, one can see an edge gradation around and on the hummocks with *D. linearis* growing in the marl around the hummock, hybrid plants of *D. linearis* x *rotundifolia* (sometimes thought of as "sterile x *anglica*") in the moss of the base of the hummock, and the other two *Drosera* species in the sphagnum at the top.

Even though the reaction of the marl in analysis is basic (see above), the water in the fen is frequently near neutral (pH 7.0) or even slightly acidic (pH 6.8 e.g.), the latter probably reflecting acidification of spring waters percolating through surrounding sphagnum mats before the water spreads out over the open fen. As alluded to previously, *D. linearis* can grow in continuously damp marl soil and in water to a depth of about 1-3 cm; flooding of the fen in very wet weather can produce considerable loss of *D. linearis* plants if the flooding is prolonged. Occasionally, one sees a few individuals growing up on to sphagnum and other moss mats, but these plants appear depauperate.

Flowering occurs in mid-summer (mid-July to mid-August) and the shiny, black 0.5-1.0 mm seeds fill large capsules by September. The species will self if not open pollinated, so there is usually abundant seed in a good flowering year.

CULTIVATION — This is difficult outside the species native climate. The plant is acutely attuned to northern photo-period and temperature cycles and aberrant responses to cultivation are common in

areas further south such as North Carolina. Here, the plants tend to go in and out of winter bud stage several times during the spring and summer, and they grow much smaller. However, if one pays careful attention to providing maximum light vs. preventing excessive heating of the growing container, and providing evenly cool dormancy conditions during winter, the plant can successfully be grown to flowering. The seed germinates abundantly *after stratification* (autumn maturing seed), and stores well under dry refrigeration, so propagation to seedlings is easily accomplished. I have found that native (or artificially mixed) marl soil gives the best long-term results. The plants are in plastic pots with drainage holes (these covered with paper toweling to keep soil in while letting water pass) and the pots placed in saucers which are kept filled. Others grow the plants in Sphagnum or other mosses, but my experience has been that while such a system may maintain the plants for one or two years, they are eventually lost. In a northern Michigan marl fen, I have seen the plants growing profusely in cracks of fallen logs lying in the water of the fen!

PRESERVATION, AND WHERE TO SEE *D. LINEARIS* —

While the chief threat to the species seems to be natural environmental change and local specific environmental damage wrought by development, cumulative massive harvesting of plants is obviously to be discouraged since many colonies are quite small. I have mentioned one particularly fine area with probably the best remaining colonies of *D. linearis* in northern Michigan, but will not disclose or further characterize geographically this unprotected area for obvious reasons. Another excellent area that is protected but open to observation is the Petrel Point Preserve owned by the Federation of Ontario Naturalists. This preserve is located on the western shore of the famous Bruce Peninsula in Ontario, the peninsula extending into Lake Huron. There is a boardwalk from which observations and photographs can be made without disturbing the delicate ecosystem of the fen. Also, the preserve is closely monitored to prevent vandalism which of course is punishable by law. The Petrel Point fens have some of the best *Drosera* stands on the Bruce Peninsula, including some interesting hybrids and backcrosses with particularly large leaves. (Note: Soil analyses were done with the Hellige 697-18 comprehensive soil testing kit, and water pH's were determined in the field with a portable electronic pH meter.)

ADDENDUM

Since completion of the text of this note, a paper has appeared (Michigan Botanist 18: 137-142, 1979) describing in part rediscovered and additional locations of *D. linearis* in the Red Lake Peatland of northern Minnesota.

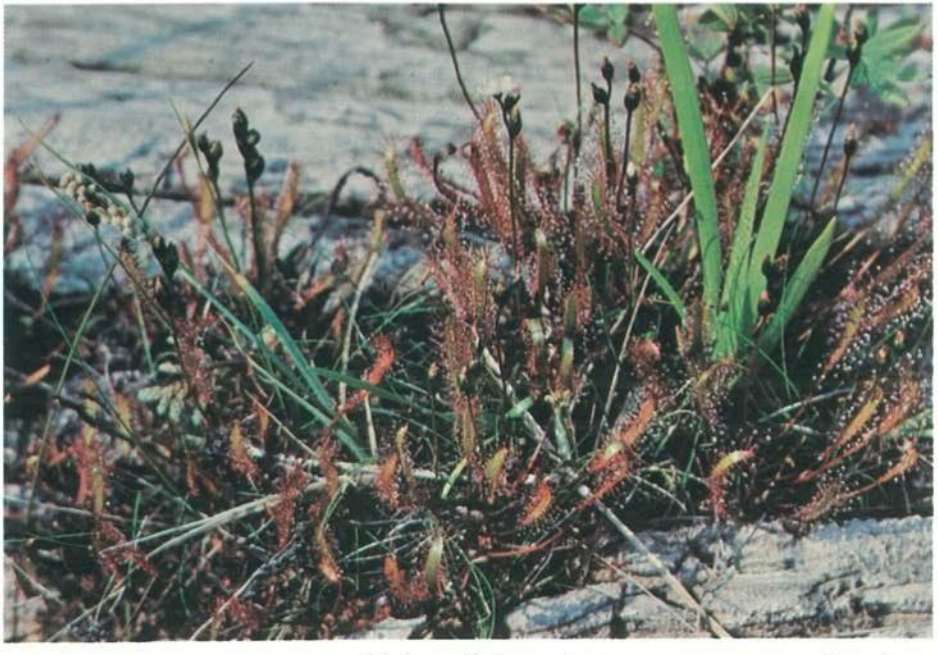


Drosera linearis in flower. Northern Michigan, July, 1979. Photo by author.



Drosera linearis habitat in northern Michigan. This is a portion of a large marly fen.

Photo by
Don Schnell



Closeup of above plants.

Photo by
Don Schnell