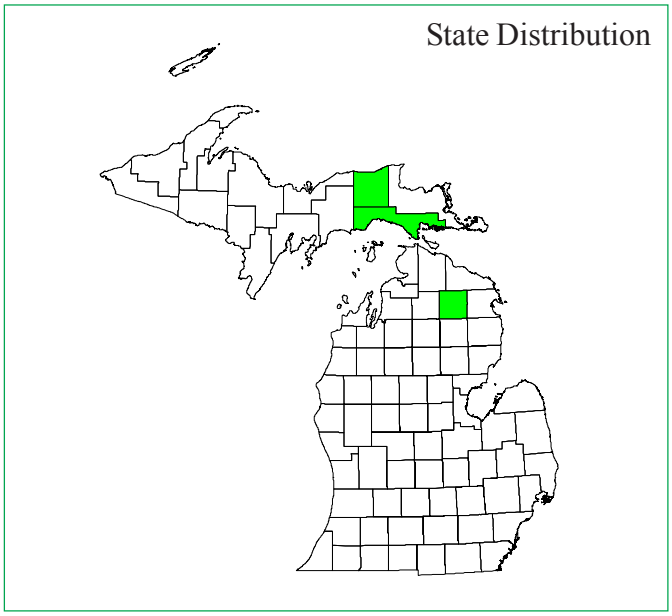
Sarracenia purpurea f. *heterophylla* (Eaton) Fern. yellow pitcher-plant

Photo by Phyllis J. Higman



Best Survey Period

Legal Status: State threatened

Global and State Rank: G5T2/S1

Other common names: side-saddle flower

Taxonomy: This variant of the common pitcher–plant was originally described as a species by Eaton in 1822, then subsequently reduced to a variety and ultimately to a form in 1922 by M. L. Fernald (Schnell 1979). Cytotaxonomic studies by Bell in 1949, as well as contemporary concepts of plant species, support recognizing the status of yellow pitcher-plant as a form (i.e. a sub-specific taxon).

Total range: *Sarracenia purpurea* f. *heterophylla* has been found in few, widely scattered localities principally along the northeastern North American coast including occurrences in Newfoundland, Nova Scotia, Maine, Massachusetts, and New Jersey. Sites are now also known in Ontario, upper Lower Michigan, and Minnesota (Case 1956; Schnell 1979).

State distribution: Yellow pitcher-plant was known only from the northeastern North American coast until Case reported it from Montmorency County, Michigan in 1956. He reported it as frequent to relatively abundant in five acid bogs all within two miles of each other in the southeastern portion of the county. Earlier reports for Michigan by Gillman in 1870 (naming Marquette County as an occurrence) and O. A. Farwell in 1894 are unsubstantiated by specimens (Voss 1985). In 1999, new localities were discovered in the eastern Upper Penninsula, in Mackinac and Luce counties.

Recognition: The yellow form of pitcher-plant is morphologically identical to *Sarracenia purpurea*, **differing only in the complete absence of red pigment in its leaves and flowers** (Case 1956). In the common or typical form of *S. purpurea*, the leaves are at least faintly reddish-veined, the persistent sepals are reddish-purple, and the drooping ephemeral petals are a deep maroon-red. Red pigmentation of leaves of the typical form can be highly variable, particularly in individuals growing in more shaded situations; however, some red pigment is present, usually as faint red veins. Forma *heterophylla* has **flower petals that are pale-lemon yellow to greenish-yellow in color, and the leaves are yellow-green to a rich yellow when growing in the open** (Case 1956). Case notes that **shaded plants** of f. *heterophylla* **have leaves that are very similar to shade leaves of the typical variety** and that confirmation of the identity must be reserved until flowering specimens can be seen.

Best survey time: Since flowers must be observed in order to confirm the identity of yellow pitcher-plant, the optimal survey time is during the peak of the flowering period, which is typically during June and July.

Habitat: Yellow pitcher-plant is found in acid *Sphagnum* bogs, occurring on Greenwood peats with such typical associated species as black spruce (*Picea mariana*), tamarack (*Larix laricina*), Canada blueberry (*Vaccinium myrtilloides*), rose pogonia (*Pogonia*

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ophioglossoides), grass-pink (*Calopogon tuberosus*), leatherleaf (*Chamaedaphne calyculata*), Labrador-tea (*Ledum groenlandicum*), bog laurel (*Kalmia polifolia*), sundews (*Drosera* spp.), *Vaccinum oxycoccos* (cranberry), several *Sphagnum* species, and other typical bog species.

Biology: Pitcher-plants have many complex interactions with insects. As a carnivorous plant, yellow pitcher-plant obtains supplemental nutrients through the entrapment of insects and other small invertebrates in its pitcher-like leaves. One insect, *Wyeomyia smithii* Cog., a non-biting mosquito, has aquatic larvae that are obligate inhabitants of the leaves (Istock 1975). Pollination is carried out primarily by Halictid bees and to a much lesser extent by bumblebees (Apidae) (O'Neil 1983).

Conservation/Management: Management for sustainable populations of yellow pitcher-plant in Michigan will require aggressive protection of the habitat conditions in which this species thrives, as well as pro-active efforts to discourage overzealous plant collectors from gathering specimens. The unique physical parameters of acid bogs, i.e., the acidity, hydrology, and nutrient status are most certainly critical to the persistence of healthy populations of yellow pitcher-plant. Activities that would alter these in any substantial way should be avoided. This would include direct alteration of the habitat as well as disturbances resulting from adjacent land-use activities such as extensive clearing of forested lands or nutrient loading resulting from adjacent agricultural practices. The placement of gas and oil pipelines is also a current threat to the relatively small kettle-hole bogs that support yellow pitcher-plant, and without careful routing, these habitats may be degraded.

Comments: Hybrids between the typical form of pitcher-plant and f. *heterophylla* reportedly occur (Schnell 1979), exhibiting an intermediate orange-red coloration (Case 1956).

Research Needs: Given the recent findings of two new populations of yellow pitcher-plant, surveys for additional occurrences of the yellow pitcher-plant are warranted, especially in the Upper Peninsula. Also of interest is the study of mechanisms that result in the lack of red pigmentation. The observation of pitcher-plants with additional unusual leaf coloration, found only in locations where both the typical and yellow form were growing, led Case (1956) to believe that it is not simply the result of the expression of recessive alleles. Other research needs include virtually any aspect of life history and ecology. Conducting a long-term biological monitoring program of a selected population or two would provide useful demographic information, as well as help determine the status of this species on a yearly basis.

Selected references:

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Abstract citation:

Penskar, M.R. and P.J. Higman. 2000. Special plant abstract for *Sarracenia purpurea* f.*heterophylla* (yellow pitcher-plant). Michigan Natural Features Inventory, Lansing, MI 2 pp.

Updated September 2000.

Funding for abstract provided by Michigan Department of Natural Resources-Forest Management Division and Wildlife Division.