



Status: State special concern

Global and state rank: G3/S3

Family: Orchidaceae (orchid family)

Other common names: ram's head orchid

Taxonomy: Some researchers have proposed segregating *Cypripedium arietinum* in the genus *Criosanthes* based upon the separate lateral sepals, spurred lip, and staminode that resembles a fertile stamen. However, investigation of genetic variation among five species of *Cypripedium* by Case (1994) supports the retention of this taxon within the genus *Cypripedium*.

Total range: *Cypripedium arietinum* is found from Saskatchewan to Quebec, ranging south to Minnesota, Wisconsin, and Michigan, and east to Massachusetts, Connecticut, New York, Maine, New Hampshire, Vermont, and Nova Scotia. It is considered rare throughout its range.

State distribution: In Michigan, 81 occurrences of ram's head orchid have been reported, scattered through northern Lower Michigan and across the Upper Peninsula from Drummond Island to Ontonagan County.

Only thirty-five of these have been reported within the last 20 years, most of which are noted to be small colonies or few individuals. The remaining occurrences date from 1892 to 1982. Although some of the older records do not likely persist today, the elusive nature and difficulty of surveying for this species make it difficult to predict persistence by the collection date alone.

Best survey time/phenology: Unless one has considerable experience with this species, ram's-head lady's-slipper is best sought when in flower, typically in late May or early June. It is notoriously difficult to locate because of its small size and short flowering period, but also due to its sporadic flowering nature and the sparse numbers of individuals in some populations, particularly those from bogs or swamps.

Recognition: Ram's-head lady's-slipper, which is Michigan's **smallest native lady's-slipper orchid**, is highly variable in height, ranging **from 0.7 to 3 dm**, with **3-5 bluish green, lanceolate to elliptic leaves** emerging along the stem in a **spiral arrangement**. It bears a **small, terminal flower**, with a **pouched lower lip** typical of the lady's-slipper orchids. The leaves are often folded longitudinally and are finely ciliate. The purple to brownish sepals are streaked with green; the **lateral sepals are separated all the way to the base**.



The petals are similar but undulate (wavy). The approximately 1.5-2.5 cm long, **conical pouch of the lip is marked with purple, crimson, or even green reticulate (net-like) veination** and the **mouth is densely long hairy**. It's conical shape, due to the downward projection of the bottom of the lip, renders this the most distinctive lady's-slipper orchid in the state. The pouches of other Michigan's *Cypripedium* species exhibit more rounded egg-shaped lips or longitudinally opened lips.

Habitat: According to Case (1987), Michigan occurrences of ram's-head orchid are found either in dense balsam-white cedar-black spruce swamps and bogs or in conifer uplands characterized by pine or cedar needles over sand, especially when associated with limestone beach cobble. In all cases, cool temperatures appear to be important and populations are often confined to northern exposures or cold air channels. Although the species usually attains its largest physical size in swamps or bogs, it reaches its peak abundance, sometimes numbering in the thousands, in conifer uplands of northern Michigan. Many occurrences in the latter habitat are associated with Great Lakes shores, often at the forest edge closest to the open beach.

Biology: The flowers of this lady's-slipper appear early, in mid-May to early June, often developing very rapidly and typically lasting only a week or so. The percentage of individuals that flower in a population is highly variable and was observed to range from 22-44% in several Wisconsin populations during a single year. As is characteristic of many orchid species, individual plants do not predictably mature and produce flowers every year thereafter. Rather, many flowering individuals are reported to become vegetative for one or more years, and flower again in future years. Flowering does not occur, however, if the plant has not reached the minimum height of 11 cm (Bender 1989). The sepals, lateral petals, and particularly the lower lip produce a sweet odor to attract potential pollinators. Known pollinators include small bees of the genera *Dialictus* (Halictidae) and *Megachile* (Megachilidae) which access the pollinia through the lip pouch (Stoutamire 1967). Once fertilized, the upper sepal lowers over the opening of the pouch, excluding additional visitors. Although individual plants can produce copious numbers of minute seeds, they are not thought to disperse great distances (Brower 1977, Stoutamire 1964) and reproduction appears to be

largely asexual via offshoots of parental plants (Brower 1977).

Conservation management: The biggest threats to this orchid are habitat alteration or destruction and possibly over-collection by orchid enthusiasts and poachers. Ram's-head orchid is unable to tolerate high levels of sunlight and is thought to be vulnerable to other habitat disturbances such as those that alter the diversity of soil microbes. Such microbes may include fungi that form a beneficial association with the orchid roots (mycorrhizae). Due to the number of occurrences of this species associated with the Great Lakes shores, ever-increasing shoreline development and recreational pressures could significantly impact this species. Management and conservation strategies should incorporate habitat protection, particularly along the Great Lakes and in areas where management is likely to include significant alteration of habitat, such as clearcutting and activities associated with home construction. Strict enforcement as well as educational strategies that could help minimize illegal collection of this species should also be considered.

Research needs: A dedicated assessment of all reported occurrences including surveys where required would help provide a more accurate depiction of the current status of ram's-head lady's-slipper in Michigan. Further research on the mycorrhizal association(s) of this species as well as the reproductive biology and genetic variation within and between known populations will be important as conservation strategies are developed. The development of greenhouse or laboratory propagation techniques will also be useful for determining critical mycorrhizal associates.

Comments: The genus name *Cypripedium* is derived from the Greek words, Kypris (Venus) and podion (slipper, little foot) and hence lady's-slipper (Case 1987).

Related abstracts: Bog, mesic northern forest, open dune, rich conifer swamp, calypso orchid, Lapland buttercup, limestone oak fern, marsh grass-of-Parnassus, round-leaved orchis, goshawk, merlin, woodland vole.

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