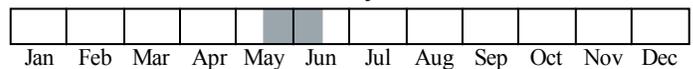


Best Survey Period



Status: State threatened

Global and State rank: G5Q/S1S2

Family: Brassicaceae (mustard)

Taxonomy: Montgomery (1955) concluded that *D. maxima* is part of a sterile, highly variable polyploid complex involving *D. diphylla* (two-leaved toothwort), *D. laciniata* (cut-leaved toothwort), and other species of *Dentaria* in eastern North America. The members of this complex, which can be distinguished cytologically on the basis of chromosome numbers (supporting the separation of the species), are polymorphic and difficult to consistently distinguish morphologically. Gleason and Cronquist (1990) now include *Dentaria* spp. within the genus *Cardamine*.

Total range: The range of large toothwort is centered in New York, occurring formerly from Maine and New Brunswick west to Wisconsin and south to West Virginia. It is considered rare in Quebec and extirpated in Maine and New Hampshire.

State distribution: Five occurrences of *D. maxima* have been documented in Michigan since 1988, including two each from St. Clair and Gogebic Counties, and one from Arenac County. These occurrences were reported to be large and thriving populations with the exception of one Gogebic County occurrence which consisted of only 10 plants. A collection from Ontonogon County was also documented in 1868 and its current status is unknown.

Recognition: This toothwort produces a distinctive

rhizome (underground stem) characterized by **alternately enlarged and slightly constricted regions**. Its 1.5–4 dm stems usually bear three to four alternate leaves, each divided into **three ovate, sharply toothed leaflets** with **stiff, spreading marginal hairs** (0.2 mm). The flowers, which terminate the stem, have **four pinkish to white petals**, and are borne on **stalks that are at least slightly hairy**. Fruits, which rarely develop and mature, are siliques (elongate capsules) 2–4 cm long with beaks from 6–8 mm long, and usually contain aborted ovules.

Of Michigan's two other common toothwort species, *D. diphylla* is the most similar, and can be distinguished by a continuous rhizome that lacks constrictions, the very short (0.1 mm), appressed hairs on leaf margins, glabrous flower stalks, and the presence (usually) of two opposite stem leaves. *D. laciniata* has a whorl of three stem leaves that are deeply divided into 4–7 narrow lobes, rhizomes that are strongly constricted into easily detached segments, and strongly pubescent flowers stalks.

Habitat: Michigan locations for this plant are in rich deciduous woods, which also typify its habitat elsewhere. In Quebec, it is reported from "wet maple stands" (Bouchard et al. 1983). Wisconsin plants have been collected from river bottom forests, and were reported especially abundant from mesic elm bottoms with *Erythronium americanum* (trout lily) and violets (Patman & Iltis 1962).

Biology: In Michigan, this herbaceous perennial flowers in May. Studies indicate that it is unable to reproduce sexually. Montgomery (1955) found that a high percentage of the pollen of *D. maxima*, *D. diphylla*, and *D. laciniata* is



viable, yet in cross- and self-pollination experiments was unable to induce seed production. Reproduction thus apparently occurs entirely through vegetative propagation.

Comments: It has been theorized that *D. maxima* is of hybrid origin, derived from *D. laciniata* and *D. diphylla*, species with which it has been reported to hybridize and putatively backcross (Voss 1985). Montgomery (1955) rejects this theory on the basis of habitat, chromosome number, and sexual sterility of the putative parents. He hypothesizes, instead, that it arose as a segregate before sexual sterility became complete in this complex, perhaps during Wisconsin glaciation.

Research needs: A thorough statewide status survey for this species and studies designed to clarify the taxonomic status, reproductive capability, and microhabitat needs of this species are needed. This would help determine the relative risk the species is under as well as appropriate management strategies.

Related abstracts: mesic northern forest, Assiniboia sedge, fairy bells, ginseng, goblin fern, green spleenwort, Hart's-tongue fern, showy orchis, walking fern, red-shouldered hawk

Selected references

- Montgomery, F.N. 1955. Preliminary studies in the genus *Dentaria* in eastern North America. *Rhodora* 57:161-173.
- Patman, J.P. and H.H. Iltis. 1962. Preliminary reports on the flora of Wisconsin No. 44 Cruciferae—Mustard Family. *Wisc. Acad. Sci., Arts, and Let.* 50:17-73.

Abstract citation

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