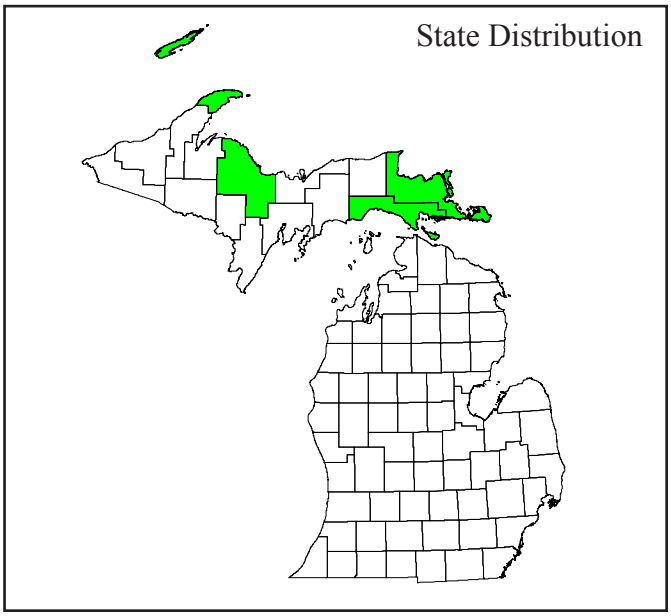
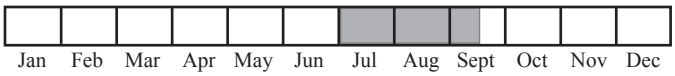
Draba arabisans Michaux — rock whitlow-grass



Best Survey Period



Status: State special concern

Global and state rank: G4/S3

Other common names: Rock-cress whitlow-grass

Taxonomy: In his overview of the genus, Fernald (1934) noted *Draba arabisans* as "one of the clearest-cut perennial species of temperate eastern America", and also commented that confusion about this species arose in part because of a reliance on outlines of the fruits (siliques) rather than depending on the more significant characters that clearly distinguish it.

Range: This species occurs along the eastern seaboard from Newfoundland to New York, extending west to Ontario and northern Minnesota. It is considered rare in Maine, Minnesota, New York, Vermont, Wisconsin, New Brunswick, Newfoundland, Nova Scotia, and Quebec (NatureServe 2006). *Draba arabisans* is at the southern edge of its range in Michigan, becoming more common and abundant northward.

State distribution: The vast majority of the 33 known Michigan localities for this plant lie on Isle Royale and the Keweenaw Peninsula. This species has been documented from several stations near the shore of Lake Huron in Mackinac and Chippewa Counties and from three sites in Marquette County. A significant number of occurrences (11), however, are ranked as historical (observed no more recently than 40 years ago), comprised of seven localities in Keweenaw County, three in Mackinac County, and one in Chippewa County.

Recognition: The stems of this **perennial** species arise from a basal rosette of small, crowded leaves. The coarsely-toothed basal leaves are ca. 0.7-7 cm long, oblanceolate (broader toward the leaf tip), and bear a uniform pubescence of stellate hairs. The flowering stems range to about 0.5 to 4.5 dm high and branch upward, bearing 3-12 well-spaced smaller leaves, terminating in a raceme of 7-25 small white flowers, each with four petals 4-6 mm long. Both leaves and stem have branched hairs on very short stalks, the **pubescence absent or much reduced** on the main stem of the inflorescence. The **hairless** fruits (silicles), which **taper more toward their apex than at their base,** are flattened, elongate (7-12 mm by 2-3 mm), and typically **strongly twisted when mature**.

As noted by Voss (1985), *D. arabisans* is the most likely species in the genus to be encountered by botanists in Michigan. *D. cana*, a much rarer species, has leaves or bracts subtending (just below) the lowest flower stalks (a character lacking in *D. arabisans*) and hairy fruits. *D. incana*, a species known in Michigan only from the vicinity of Isle Royale, has fruits that

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are not twisted and very leafy stems bearing at least 20 stems leaves between the lowest flower stalk and the basal rosette (*D. arabisans* bears few stem leaves).

Best survey time/phenology: Records for this species indicate a relatively long flowering and fruiting period. Since reliable identification is best achieved with fruiting plants, the recommended survey period is from July through mid-September. Occasionally, young fruiting plants have been observed in late June.

Habitat: In Mackinac and Delta Counties, *D. arabisans* occurs on limestone cliffs, boulders, and cobble substrates near the Great Lakes shores. In the western Upper Peninsula, it inhabits cliffs, exposed ridgetops, and outcrop areas along the Lake Superior shore, growing on a variety of rocky substrates and often on calcareous bedrock. Large colonies occur at several localities in Isle Royale National Park, such as on Passage Island, where meadow-like openings may support thousands of plants growing with *Linnaea borealis* (twinflower), *Castilleja septentrionalis* (pale Indian-paintbrush), *Anaphalis margaritacea* (pearly everlasting), and *Lycopodium obscurum* (princess-pine). At mainland and coastal sites elsewhere in Michigan, associates typically include such species as *Juniperus horizontalis* (creeping juniper), *Arabis divaricarpa* (rock-cress), *Artemesia campestris* (wormwood), *Campanula rotundifolia* (harebell), *Deschampsia flexuosa* (hair-grass), *Diervilla lonicera* (northern honeysuckle), *Potentilla tridentata* (three-toothed cinquefoil), *Arctostaphylos uva-ursi* (bearberry), *Trisetum spicatum* (downy oat-grass), and *Danthonia spicata* (poverty oat-grass).

Biology: This mustard is a perennial or a sturdy biennial species (Voss 1985), flowering largely from late May through June to early July and bearing fruits primarily from July and August to early September. The flowers of *D. arabisans* are self-compatible, and fruiting usually occurs without cross-fertilization (Mulligan and Findlay 1970). Insect pollination can occur, however, after the flowers open, before self-fertilization takes place. Smith (1938) reported the chromosome number as 2n = 48, identifying *D. arabisans* the only species in the genus in which as many as 48 chromosomes were observed, and also noting that eight is probably the base number (x = 8) for the genus.

Nichols (1934), in studying the influence of winter temperature on seed germination in selected native species, used a Michigan seed source for *Draba arabisans*. For *Draba*, he found that subjecting seeds to cold treatment resulted in a more than fourfold increase in germination versus seeds not subjected to such a temperature regime, although there was strong overlap in the number of days to germination when comparing the germinated seeds of the two treatments.

Conservation/management: Preservation of this species' rocky habitat in natural condition should ensure its survival. Numerous Isle Royale stations are protected within the National Park and another locality lies on State Forest land. Several old records exist from what is now Mackinac Island State Park, and thus status survey is warranted there as well as in several other sites with historical records where habitat persists. Although this species often occurs in relatively inaccessible situations, such as on cliff faces and other bedrock exposures, excessive human recreational activities, including rock climbing, could comprise a future threat and thus should be monitored.

Research needs: Despite the fact many mustard species are well studied, there is a surprising lack of research on this species. It is thus likely that any type of population, genetics, or life history study would provide information useful to the management and conservation of this northern rarity.

Related abstracts: Alvar, limestone pavement lakeshore, volcanic bedrock lakeshore, alpine bistort, alpine bluegrass, dwarf bilberry, encrusted saxifrage, downy oat-grass, Crested vertigo, Mystery vertigo, northern blue butterfly,

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