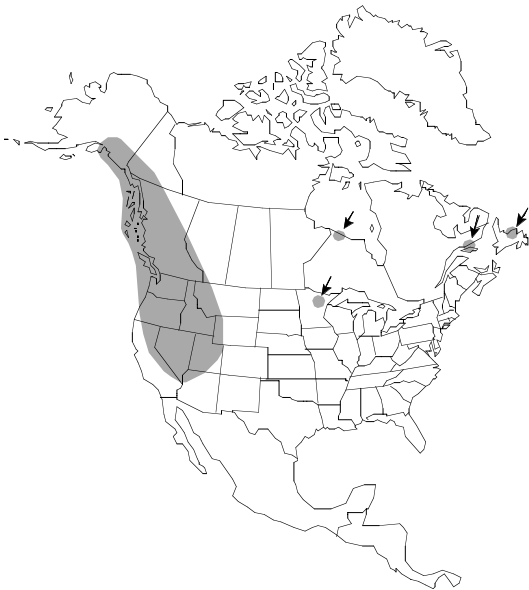


Botrychium ascendens

Family: Ophioglossaceae
Genus: *Botrychium*
Subgenus: *Botrychium* (syn. *Eubotrychium*)
Species: *Botrychium ascendens* W. H. Wagner
Common Names: Upswept Moonwort; Upward Lobed Moonwort
Ploidy: Tetraploid



Published description: Plants exclusive of roots reaching to 20 cm tall, averaging 10-12 cm tall, the common stalk 5 cm [2-12] tall, sporophore one-third to one-half again as long as the trophophore; trophophore bright yellow-green and shiny in life, the veins conspicuous and the lamina surface somewhat crinkled; trophophore stalk 1-30 percent of total trophophore length; blade outline narrowly oblong-triangular, up to 6 cm long and 2 cm wide; segments up to six pairs, strongly ascending, the upper ones extremely ascending; lower pinnae with somewhat curved posterior margins and straight anterior margins, commonly with marginal sporangia; largest pinnae 12 mm long, 10 mm wide; veins dichotomous, 2 or 3 major veins entering the pinna base, 14-17 vein endings along outer margins of larger pinnae; margins deeply and sharply dentate and serrate, often two- to five-lobed; sporophore branches mostly simple except for lower ones with 1-3 branchlets; spores finely verrucose, [40]44-47[54] micrometers in diameter; chromosomes $n = 90$ (Wagner and Wagner, 1986).

Identification

Plants of this species are most similar to *B. lunaria*, *B. crenulatum* and *B. minganense*. *Botrychium ascendens* differs from these species in its strongly ascending (upwardly angled) pinnae, pinna margins that are sharply dentate to cleft (into two to four spreading lobes), a sporophore stalk that is much shorter at maturity than the length of the trophophore, and frequent occurrence of sporangia on the basal pinnae of the trophophore. [This character of 'supernumerary' sporangia must be used with caution because they are not always present in *B. ascendens*, and are occasionally present on the basal pinnae of all moonwort species!] The basal pinnae of *B. ascendens* are cuneate, usually spanning an arc of 90° or less, whereas basal pinnae of *B. lunaria* and *B. crenulatum* typically span an arc of nearly 180°. Forms of *B. ascendens* with unusually narrow pinnae have been confused with *B. campestre* which has pinnae spanning an arc of less than 45°. The range of pinna span in *B. minganense* is similar to that in *B. ascendens*, but the trophophore stalk in *B. minganense* is typically longer and the pinna margins are more entire (sometimes lobed). The sporophore and its branches in *B. ascendens* are stiffly upright as compared to the more lax and spreading sporophores of *B. crenulatum* and *B. minganense*.

Aboveground leaves of *B. ascendens* average 6 -10 cm tall. Smaller plants (which are not necessarily younger) typically have fewer pinnae that tend to be smaller and less dissected than those of larger plants. Plants growing in full sun tend to be more robust and stiffly upright than plants growing in partial shade or among dense herbaceous vegetation. Plants growing at treeline and above tend to be small, resembling the smallest plants at lower elevations.

Distribution

Botrychium ascendens ranges widely across North America, extending from southern Nevada north to Alaska and eastward across Canada to Newfoundland, Quebec and northern Minnesota. Presence of similar genotypes in coastal Alaska and eastern Canada suggests that *B. ascendens* may be more common across central Canada than indicated by the single reported locality in northern Ontario. Historical collections of the Newfoundland (Fogo Islands) and Quebec (Mingan Islands) plants were thought to be *B. campestre* (Wagner 1990).

Habitat

Botrychium ascendens is primarily a plant of open habitats. In southern latitudes it occurs in well-drained natural and artificially maintained habitats including alpine meadows, avalanche meadows, pastured forest meadows and grassy roadsides. In Alaska and Newfoundland it occurs in herbaceous communities on sandy maritime beaches. Minnesota plants are known only from the dry beds of old

iron tailings ponds, growing in sparse to dense cover of grasses, forbs and small shrubs.

Additional photographs of *Botrychium ascendens*:

