

## ***Botrychium adnatum***

**Family:** Ophioglossaceae  
**Genus:** *Botrychium*  
**Subgenus:** *Botrychium* (syn. *Eubotrychium*)  
**Species:** *Botrychium adnatum* Gilman et al., ined.  
**Common Name:** Adnate Moonwort  
**Ploidy:** Tetraploid



**Published description:** Underground stem erect. Above ground plant 6 (4—11) cm tall, fleshy, soft, pale whitish-green. Common stalk 3.3 (2—7) cm tall. Sporophore longer than trophophore, erect 4.7 (3.1—7.3) cm, sporophore stalk shorter than or equal to trophophore length, basal branches often elongate 0.7—2 (0.5—3) cm and limbed, acroscopic limb longer than basiscopic limb. Distal branches 0—7 mm long, simple. Branches ascending. Sporangia numerous, massive, surficial, isovalvate, 1 mm in diameter. Spores tetrahedrally subglobose, large, 40—45  $\mu\text{m}$  in diameter, released from sporangia in June. Trophophore oblong-ovate, pinnate, stalked, 2.3 (1.8—3.5) cm long, 1 (0.8—1.3) cm wide, shallowly cupped or spoon-like; tip shallowly notched, overall more or less parabolic in outline. Rachis 2.3 (2—7) mm wide. Pinnae opposite or subopposite, 5 (3—6) pairs. Proximal 1—2 pinna pairs remote; distal 2—5 pinna pairs approximate to overlapping. Pinnae 3—7 mm long, 3—5 mm wide, dolabriform, not or barely stalked, broadly adnate to the rachis, 3 (1—4) mm wide at point of attachment. Distal pinna margins rounded, shallowly crenate, rarely with a shallow distal notch; if so, acroscopic portion of pinna slightly larger than basiscopic portion. Chromosome number apparently tetraploid. (Gilman, Zika, Wagner and Farrar, in preparation 2005)

## Identification

*Botrychium adnatum* is so named for its broadly attached (adnate) pinnae that are also conspicuously decurrent, i.e., the lower sides of the pinnae gradually merge into the rachis. The only other moonwort species with pinna adnation to this degree are *B. simplex*, *B. montanum* and *B. mormo*. *B. simplex* and *B. mormo* lack the conspicuous glaucous, blue-gray color of living plants of *B. adnatum*, and *B. mormo* and *B. montanum* can be differentiated by outer pinna margins that are more or less straight (making the pinnae appear rectangular) with conspicuous teeth.

In *B. simplex* variety *compositum*, the most common western variety of *B. simplex*, the width of the attachment of the middle pinnae is much narrower (1/10 to 1/4 the width of the pinna) than in *B. adnatum* (1/2 to 2/3 the width of the pinna). In both *B. simplex* variety *compositum* and in *B. simplex* variety *simplex*, the most common eastern variety, the common stalk is very short (often barely or not above ground level) and the sporophore stalk is typically longer than the length of the trophophore whereas in *B. adnatum* the common stalk is more conspicuous and the sporophore stalk is typically shorter than the length of the trophophore. Exaggeration of the basal pinnae, common in these varieties of *B. simplex*, seldom occurs in *B. adnatum*.

*B. adnatum* and *B. simplex* variety *tenebrosum* are very similar in their degree of pinna adnation and decurrence and in the proportions of their common, sporophore and trophophore stalks. They are furthermore similar in the common occurrence of sporangia on the pinna margins when growing in sunny habitats. They are distinguished by the blue-gray color of *B. adnatum* (rather than yellow-green), its non-overlapping middle pinnae, and sporophore branches that do overlap. These two taxa are also differentiated by habitat and range with the eastern marsh-preferring *B. simplex* variety *tenebrosum* unlikely to occur in well drained western grasslands.

## Distribution

*Botrychium adnatum* is currently known only from the western portion of Glacier National Park in northwestern Montana.

## Habitat

*Botrychium adnatum* grows in well drained native short-grass prairie.

Additional photographs of *Botrychium adnatum*:

