

## SLENDER MOONWORT

*Botrychium lineare* W. H. Wagner

ADDER'S-TONGUE FAMILY (OPHIOGLOSSACEAE)

**Plants:** Small, **fleshy**, perennial herbs about **10-20 cm tall**; **underground stalk** usually 0.5-3.0 cm long.

**Leaves:** Of 2 types, a single short-stalked, sterile blade below a single fertile blade (see spore clusters); **sterile blades** thick, fleshy, rigid, pale green, oblong to linear oblong in outline, 6-18.5 cm long and 0.5-3 cm wide, **once-divided** into 4-6 pairs of segments (pinnae); segments moderately ascending, usually not overlapping, separated by 2- to 5-times the segment width and all but the uppermost pairs approximately equal in size, **extremely slender, linear**, slightly upcurved, undivided to deeply incised, truncate or shallowly notched and often expanded at the tip; midribs absent.

**Spore Clusters:** Small, spherical, yellow, stalkless spore sacs (sporangia) borne on specialized, fertile leaf blades; fertile blades **single**, 1-2 times as long as the sterile blade, **once-divided**, tapered to stalk 0-1.3 cm long; mature in late June and July.

**Habitat:** Highly variable; mainly at higher elevations (1500-3000 m a.s.l.) in mountains but including grassy meadows, shady woodlands, grassy limestone cliff ledges, and upper river flats; often a colonizer of disturbed habitats.

**Status:** S1; G1

**Notes:** This species is also known as straight-leaf moonwort, skinny moonwort and narrow-leaf grapefern • Slender moonwort is another rare *Botrychium* with sporadically occurring, widely separated, and extremely small populations. To date, only a few hundred plants have been found from less than 20 widely disjunct sites, primarily in the mountains of western North America, plus one site in Minnesota. Also, historical collections (1947 and earlier) are known from Quebec and New Brunswick. Populations are very difficult to assess, because the plants are small and they can exist below ground for most of their life cycle. Current status is Global G1, endemic to North America; United States N2 (Alaska S1, California S1.3, Colorado S1, Idaho SH, Minnesota SNR, Montana S1, Nevada SNR, Oregon S1, South Dakota SNR, Utah S1, Washington S1, Wyoming S1) and Canada N1 (Alberta S1, British Columbia S1, New Brunswick SH, Quebec SH, Yukon Territory S1). • This species can exist with other species of *Botrychium* without intergradation. • Very similar to *Botrychium campestre*, but with more strictly linear pinnae and the sterile segment has a narrow, thin-textured (vs. fleshy and broad) axis. • In Washington, cattle grazing is apparently a threat

