

Two *Sphagnum* Sect. *Cuspidata*, New to the Western Conterminous United States

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Two *Sphagnum* Sect. *Cuspidata*, new to the Western conterminous United States

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Abstract. *Sphagnum jensenii* from Wyoming and *S. obtusum* from Washington and Colorado are reported as new to the western conterminous United States. Both are extraordinary disjuncts in the Rocky Mountains and seem clearly to be part of a pattern of relict species left from previously more continuous tundra vegetation.

Keywords. Disjunctions, *Sphagnum* Sect. *Cuspidata*, U.S. Rocky Mountains

INTRODUCTION

In 2007 bryophyte inventory work in the high elevation peatlands of Wyoming resulted in the collection of *Sphagnum jensenii* H. Lindb., a species previously known only from much further north (McQueen and Andrus 2007). Herbarium investigations of previous collections of the very closely related *S. annulatum* Warnst. revealed that a collection from eastern Washington (Andrus and Layser 1976) was misidentified and was actually *S. obtusum* Warnst., thus also adding that species to the Rocky Mountain flora. Further re-examination of the regional collections of Sect. *Cuspidata* revealed *S. obtusum* in iron fens in south-western Colorado. The discovery of *Sphagnum jensenii* in Wyoming and *S. obtusum* in Colorado meaningfully extend the known southern extremity of the range of these species in North America.

NEW RECORDS

Sphagnum jensenii H. Lindb.

***Sphagnum jensenii* in Wyoming:** This species was collected in the Medicine Bow Mountains of southern Wyoming. *S. jensenii*'s previous most southern collection site was from near Edmonton, Alberta, Canada – 12 degrees of latitude or approximately 1340 km further north. This huge disjunct is similar to the 15 degrees of latitude and 1900 km distance previously reported for *Sphagnum balticum* (Russ.) C.E.O. Jens. in Colorado (Cooper et al. 2002).

Sphagnum jensenii occurs in the northern boreal forest region in North America and Eurasia in weakly minerotrophic fens, especially on floating mats. In its main range it occurs in low to middle elevations. By contrast, the Medicine Bow site is a high elevation one at 9,600 ft (2925 m). It occurs in an area known as the North Fork of Rock Creek Fen Complex. Heidel and Jones (2006) describe this as an isolated fen complex that lies in a glacial basin of Medicine Bow

Mountains and formed of Archean metamorphosed igneous rock with a discontinuous mantle of Pleistocene glacial deposits. The *S. jensenii* site is the only known floating peat mat in the Medicine Bows and has much exposed peat, scattered pools and small moss hummocks. *Carex limosa* L., *C. utriculata* Boott, *C. aquatilis* Wahl. and *Salix planifolia* Pursh are abundant. Pools are filled with *Nuphar polysepala* Engelm. and surrounded by a floating mat. *Sphagnum jensenii* forms scattered carpets and low hummocks on gently sloping peaty margins at the southern edges of two pools. Associated bryophytes included *Sphagnum warnstorffii* Russ., *Calliergon giganteum* (Schimp.) Kindb., *Straminergon stramineum* (Brid.) Hedenäs, and *Hypnum lindbergii* Mitt., with pH ranging from 5.3 to 6.7. Based upon the associated species and acidity, the site appears to be a moderately minerotrophic fen similar to those previously reported for the Wind River Range of Wyoming (Cooper and Andrus 1994).

The closely related species *Sphagnum annulatum* has been reported for the Medicine Bows so a review of known specimens was undertaken to see if any of these reports might have been based upon misidentified material of *S. jensenii*. A collection by Welch (# 15926) also was found to be *S. jensenii* but the collection data were insufficient to do more than place it somewhere in the Medicine Bows. The two sites of alleged *S. annulatum* that can be located exactly are about 10 km apart and from 8 to 18 km from the Kosovich-Anderson *S. jensenii* site.

Collection Data. *S. jensenii*. WY. 1. Carbon Co., Medicine Bow Mountains, North Fork of Rock Creek Fen Complex, 41°27' 48-50" N, 106°12' 22-26" W, elev. 9,600 ft. (2925 m), 22/IX/2007, Kosovich-Anderson 1725, 1754 (both – BING, COLO, MO, RM). 2. Medicine Bows, floating in an alpine stream, 11/VIII/1953, Welch 15926 (CU, NY). *S. annulatum*. WY. 1. Albany Co., Medicine Bow National Forest, ca. 1 mile from trailhead of North Gap Lake Trail, growing around several small ponds locate adjacent to the trail, VIII/2001, Booth and Jackson NGT-1D: NGT-1F (BING). 2. Albany Co., Medicine Bow Mountains, near Headquarters Park, elev. 10,500 ft. (3200 m), 29/VI/1934, Porter 1693 (CU). 3. Carbon Co. near Silver Lake, 41° 19' N, 106° 22' W, elev. 10,400 ft. (3170 m), 15/VIII/1962, Shushan (CANM). 4. Carbon Co., W slope of Snowy Range, elev. 10,000 ft. (3050 m), 18/VII/1930, Solheim 388 (CU). 5. Medicine Bow Range, NW of Silver Lake, 10/VII/1960 (DUKE).

***Sphagnum obtusum* Warnst.**

***Sphagnum obtusum* in Washington.** This species was collected in Pend Oreille County in eastern Washington by Earle Layser in 1972 but not recognized as such. Instead it was determined by the senior author as *S. annulatum* and reported as such in Andrus and Layser (1976). The collection of *S. jensenii* prompted a review of all previous specimens of *S. annulatum* and in that review the Layser collection was recognized as *S. obtusum*. Bunchgrass Meadows is an unusual wetland habitat and has been proposed for Research Natural Area status as of July 2008. It is also the only known location in Washington for another *Sphagnum* species rare to the western U.S. – *S. riparium* Warnst. (Andrus and Layser 1971).

***Sphagnum obtusum* in Colorado.** This species was found in high elevation iron fens in south-western Colorado. Original collections were made by Lemly, Chimner and Cooper in 2006-2007 and, as a result of recent herbarium investigation of the senior author, were identified as *S. obtusum*. Interestingly, in the San Juan Mountains near Silverton *S. obtusum* is rather common in at least six fens quite close to those previously reported for *S. balticum* (Cooper et al. 2002). *S. obtusum*'s present collection sites in Colorado are 1220 km south of the Washington site, which in turn is 600 km south of the next most southerly location in western North America,

a site in central Alberta. The Colorado location is also 1080 km further south than the previous North American southern latitude in northern Minnesota.

Collection Data. *S. obtusum*. CO. 1. Ouray Co., Ironton Park, below Red Mountain Pass, 37°57'00.70" N, 107°40'14.05" W, elev. 9,650 ft (2940 m), 27/VI/2006, Lemly, Chimner and Cooper 1537 (COLO, RM). 2. San Juan Co., Mineral Creek, NW of Silverton, 37°51'22.00" N, 107°43'32.83" W, elev. 10,150 ft (3090 m), 19/VII/2007, Lemly, Chimner and Cooper 2281 (COLO, RM).

DISCUSSION

The new records reported here fit a pattern of scattered disjuncts at high elevation peatlands throughout the Rocky Mountains. The elevations range from 5,000 ft at the northern Washington habitat to over 10,000 ft at most of the southern sites. Weber (2003) has proposed that the Southern Rocky Mountain flora shows a pattern that reflects in part a relictual flora from Tertiary times when much of the area was covered by tundra vegetation while the high latitude arctic was warmer. As the climate changed the more alpine tundra species that had survived in high elevation pockets were able to move into the now cooler northern regions. These relictual southern Rocky Mountain *Sphagnum* sites apparently consist of several fen types, including the iron fens and geothermal fens noted in Lemly et al. (2007) and Cooper et al. (2002). The other cases, including those noted herein, are wetland sites with acidic bedrock and sufficient snowmelt. All of the disjunct *Sphagnum* species noted herein are in Section *Cuspidata*. Species in this Section are typically much more desiccation tolerant than other *Sphagnum* species. Survival as relictual populations would seem to be favored by the ability to recover and regenerate from occasionally drying out.

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LITERATURE CITED

- Andrus R.E. and Layser E. F. 1971. *Sphagnum riparium* Aongstr., a new record for the Western United States. *The Bryologist* 74: 211.
- Andrus R.E. and Layser E. F. 1976. *Sphagnum* in northern Rocky Mountains of United States. *The Bryologist* 79: 508-511.
- Cooper D. J. and Andrus R. E. 1994. Patterns of vegetation and water chemistry in peatlands of the west-central Wind River Range, Wyoming, USA. *Canadian Journal of Botany* 72: 1586-1597.
- Cooper D. J., Andrus R. E. and Arp C. D. 2002. *Sphagnum balticum* in a southern Rocky Mountain iron fen. *Madroño* 49: 186-188.
- Heidel B. and Jones G. 2006. Botanical and ecological characteristics of fens in the Medicine Bow Mountains, Medicine Bow National Forest, Albany and Carbon counties, Wyoming. Prepared for the Medicine Bow-Routt National Forest. Wyoming Natural Diversity Database, University of Wyoming, Laramie, WY. 48 pp. + Appendix A-E.
- Lemly J. M., Andrus R. E. and Cooper D. J. 2007. *Sphagnum lindbergii* Schimp. in Lindb. and other new records of *Sphagnum* in geothermal fens, Yellowstone National Park, Wyoming, USA. *Evansia* 24(2): 31-33.

McQueen C. B. and Andrus R. E. 2007. Sphagnaceae. *In*: Flora of North America Editorial Committee (editors), Flora of North America North of Mexico 27 (Bryophyta, part 1): 45-101. Oxford University Press, New York.

Weber W. A. 2003. The Middle Asian element in the southern Rocky Mountain flora of the western United States: a critical biogeographical review. *Journal of Biogeography* 30: 649-685.



Sphagnum jensenii (top photo as herbarium specimen and bottom photo in natural environment) is new to the Western conterminous United States.

Photos by Y. Kosovich-Anderson.