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Author(s) :Yelena I. Kosovich-Anderson

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Two Dicranaceae species from the Beartooth Plateau, new to Wyoming

Yelena I. Kosovich-Anderson

Consulting botanist, Wyoming Natural Diversity Database, University of Wyoming,
Laramie, WY 82071

E-mail: yelenaanderson@aol.com

Abstract. Two arctic-alpine species, *Campylopus schimperi* and *Dicranum elongatum* (Dicranaceae), are reported new for Wyoming from the Beartooth Plateau, Central Rocky Mountains.

Keywords. Beartooth Plateau, Dicranaceae, Wyoming.

INTRODUCTION

During the summers of 2008-2010, while conducting bryophyte inventory projects on the Shoshone National Forest (SNF), the author explored its northern territories which lie in the mountains of Wyoming's Beartooth Plateau.

The Beartooth Plateau is a part of the Beartooth-Absaroka mountain complex in the Central Rockies, located in south-central Montana with a small portion in northwest Wyoming, immediately northeast of Yellowstone National Park.

Geologically, it represents an uplifted fault block composed of Precambrian granite and crystalline metamorphic rocks (Poldervaart and Bentley 1958; Lageson and Spearing 1991). An extensive, gentle surface, partially dissected by canyons and glacial cirques and covered by alpine tundra, occupies most of the Plateau, a substantial part of which is above 3000 m. Numerous alpine and subalpine lakes, persistent snowfields, moist north-facing slopes, waterfalls and cascades, riparian corridors and high fen diversity are the features of the area. Of the major alpine vegetation types, Johnson and Billings (1962) describe *Geum rossii* (R. Br.) Ser. turfs on summits, ridges and upper slopes, *Deschampsia* meadows on lower mesic slopes and basins, *Carex scopulorum* Holm fens on wet, mineral bog soils and peat soils and *Salix planifolia* Pursh (+ *S.* spp.) thickets along drainages. Lower elevations have grass and sagebrush-dominated communities, while forested areas are dominated by combinations of species: *Pinus contorta* Dougl. ex Loud., *Pseudotsuga menziesii* (Mirb.) Franco and *Populus tremuloides* Michx. found at elevations up to 2700 m; at higher elevations *Abies lasiocarpa* (Hook.) Nutt., *Picea engelmannii* Parry ex Engelm. (frequently hybridizing with *P. glauca* (Moench) Voss in this region) and *Pinus albicaulis* Engelm. are common, each occurring up to the timberline. Beartooth Scenic Byway (U.S. Highway 212) transverses the Plateau making a variety of sites readily accessible.

Historically, the bryoflora of the Wyoming's Beartooth Plateau has been poorly documented, except for several noteworthy collections of E. Lawton (1953), F. J. Hermann (1965) and W. A. Weber (1973). The present study encompassed the Plateau for a total of 150 mi², ranging in elevation from 2000 to 3340 meters in the montane, subalpine and alpine vegetation zones, within 44°50'-45°01'N and 109°24'-109°51'W.

This note is the first of a series on novelties from Wyoming's Beartooth Plateau and a part of on-going research of the bryoflora of the SNF. Voucher specimens are deposited at the RM.

NEW REPORTS

A preliminary overview of the author's collection of Dicranaceae has resulted in the addition of two species: *Campylopus schimperi* Milde and *Dicranum elongatum* Schleich. ex Schwägr., which were not previously known in Wyoming (Eckel 2007).

***Campylopus schimperi* Milde.** Potential species of conservation concern. Global conservation rank is G3G4.

Campylopus schimperi is a rarely collected arctic-alpine species, occurring in mountain systems of the Northern Hemisphere at elevations of 2700-3400 m. Its world distribution includes Europe (higher parts of the British Isles, the Alps and the Pyrenees, Scandinavia; Iceland, Spitsbergen), Asia (Bhutan, China, Japan, Nepal, Siberia, Mongolia), Greenland, Canada (British Columbia, Newfoundland, Labrador and the Yukon); until recently, it was reported from only two states of the U.S.A.: Alaska and Colorado (Frey et al. 2006; Weber and Wittmann 2007; Frahm 2007). In Colorado, which has a long history of bryological exploration, *C. schimperi* is considered as "...a common but easily overlooked species of the subalpine and alpine snow melt areas, occurring on saturated soil around lakes and solifluction terraces. It is an inconspicuous and nondescript sod-former without any obvious field characters..." (Weber and Wittmann 2007, p. 67).

The discovery of *C. schimperi* in the SNF is the first and only record known yet for Wyoming. The species was collected at subalpine elevations overlying Quaternary glacial deposits, in an aapamire fen (in ecologists' reports referred to as "Little Bear Lake Fen"), featuring a series of elongated mounds and broad intervening shallow swales over much of the area and pH ranging from 6.5-7.4 (Heidel et al. 2008).

Future surveys should determine if *C. schimperi* is simply overlooked in Wyoming as W. A. Weber supposes (pers. comm.). So far, the author's six year collecting efforts at high elevations of the state have resulted in this single occurrence, so this species may be either rare to infrequent but additional field work is required.

The fen that contains Wyoming's *C. schimperi* is the only major fen in the Beartooth Mountains of Wyoming that is crossed by a highway. Current plans for widening of the highway call for replacing a portion of the roadbed with a bridge in order to restore the natural drainage pattern (Heidel et al. 2008). The condition of the *C. schimperi* population may be presently characterized as vulnerable.

Specimen examined. U.S.A., Wyoming, Park County, SNF, Beartooth Plateau, Little Bear Lake vicinity, subalpine aapamire fen crossed by U.S. Hwy 212, *Carex* spp. – *Sphagnum warnstorffii* Russ. + *Aulacomnium palustre* (Hedw.) Schwägr., in pure mats on saturated soil at base of low hummock around swale; T57N, R105W, S11, 44° 56.260-290'N, 109° 30.920-950'W, elev. ca. 9,550 ft (2910 m), 16 August 2008, *Kosovich-Anderson 2896* (BONN, MO, RM).

Comparison of the Wyoming specimen (*Kosovich-Anderson 2896*) with the collection of *C. schimperi* made by the author in 2003 from the Southern Rocky Mountains of Colorado (*Kosovich-Anderson 5.2*, Grand Co, Colorado, elev. 2500 m) (COLO, MO, RM) revealed a meaningful resemblance. W. A. Weber and J.-P. Frahm noted these specimens as typical for *C. schimperi* ecologically and anatomically, although the plants in both collections differ somewhat

from the description of *C. schimperi* in the BFNA (Frahm 2007) in having the costa slightly ridged/ribbed at back (vs. almost smooth), which should be included in the description of the species.

***Dicranum elongatum* Schleich. ex Schwägr.**

Dicranum elongatum is a species widespread in arctic or alpine tundra all across the Northern Hemisphere (Greenland, continental North America, Eurasia); it occurs at elevations ranging from 30 to 3700 m and typically found growing on soil, rock ledges, cliff shelves, sometimes in bogs and fens, rarely decayed wood and stumps (Ireland 2007).

The species was previously known in this portion of the Rocky Mountains. Elliott (1993) reported it from Montana where it was collected in Glacier National Park, as well as in Lake and Lincoln Counties, growing on soil, humus and rotten wood. Weber and Wittmann (2007) also listed it for Colorado, where it is restricted to alpine and subalpine fens or wet moss tundra.

Wyoming populations of *D. elongatum* were discovered in similar localities as the Colorado ones. It occurred on an alpine site of the Beartooth Plateau, on one of the most high elevation fens of the study area, a basin toe slope fen “Littlerock Creek Fen”, where it was growing in hummocks forming typical dense compact tufts in association with *Sphagnum* Sect. *Acutifolia* species and *Aulacomnium palustre*.

Specimens examined. U.S.A., Wyoming, Park County, SNF, Beartooth Plateau, 0.8 km E of Christmas Lake, the head of an unnamed tributary to Littlerock Creek, alpine fen, north-central portion of fen, *Salix planifolia* – *Carex scopulorum* – *Dicranum elongatum*, abundant in hummocks, on peaty soil; T58N, R104W, S34, 44° 57,930-58,015’ N, 109° 24,820-850’ W, elev. ca. 10,650 ft (3245 m), 21 August 2008, *Kosovich-Anderson 3593* (COLO, MO, RM), 3611, 3624, 3640, 3664, 3676.

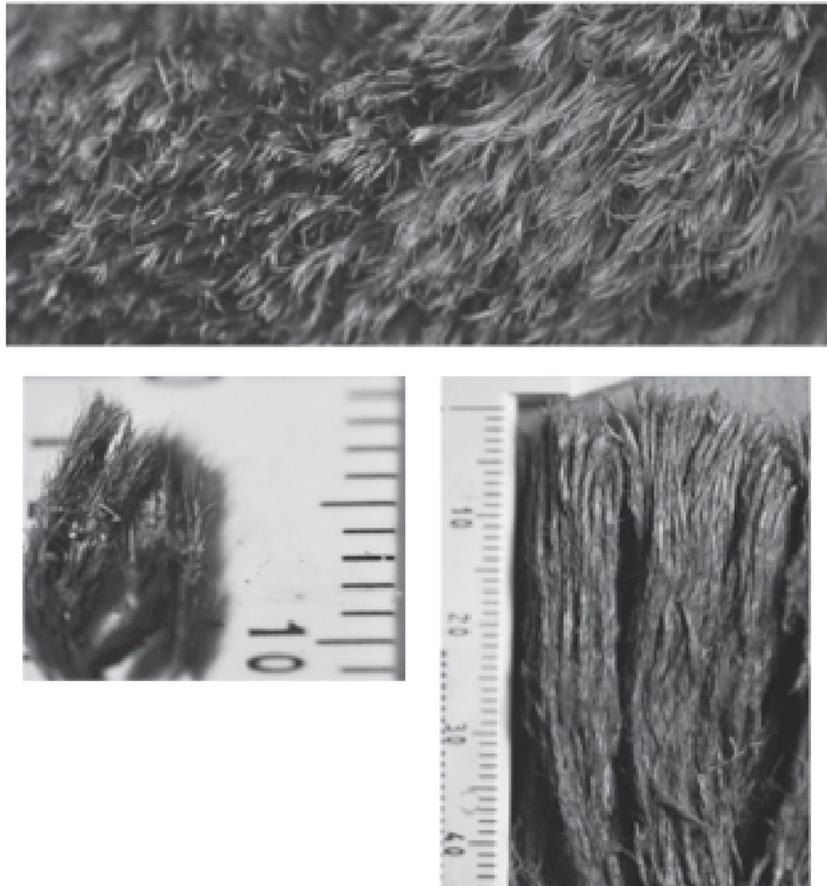
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Campylopus schimperi (top and bottom left) and *Dicranum elongatum* (bottom right) are new to Wyoming. Photos by Y. Kosovich-Anderson.