

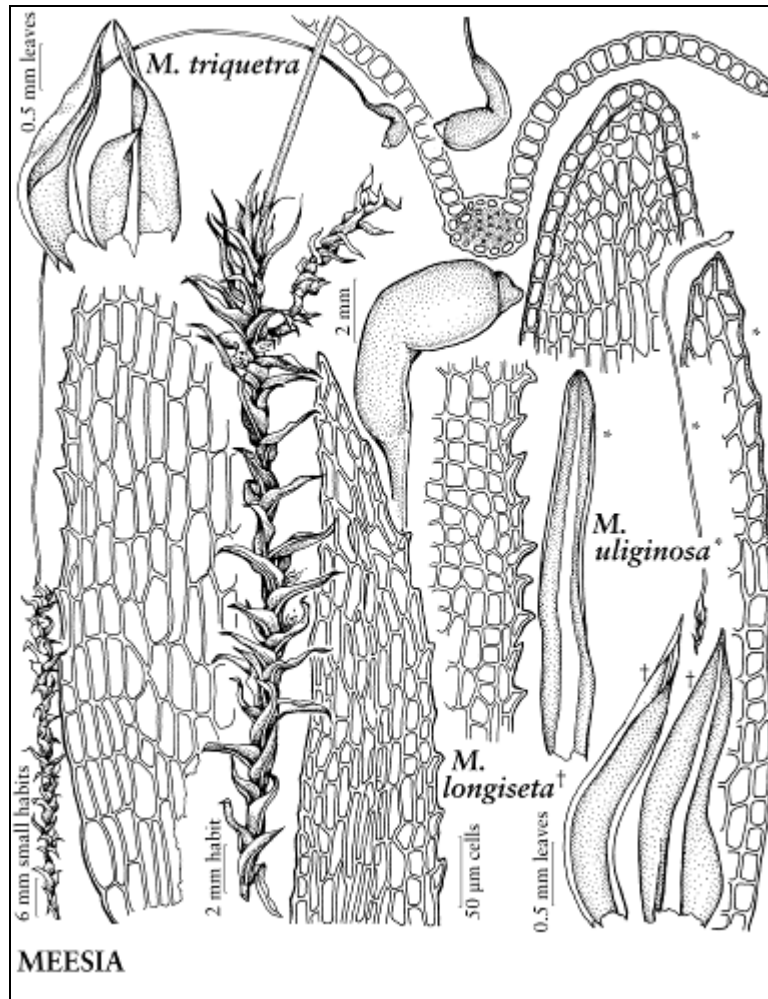
ANNOTATED STATE AND COUNTY CHECKLIST OF THE MOSSES OF WYOMING, PART 2, M–Z

PATRICIA M. ECKEL
Missouri Botanical Garden
P.O. Box 299
St. Louis, Missouri 63166
patricia.eckel@mobot.org

MEESIA Hedw., Sp. Musc. Frond., 173, plate 41, figs. 6–9. 1801, name conserved. (Meesiaceae)

Meesia longiseta Hedw., Sp. Musc. Frond., 173. 1801.

Johnson Co., in association with *Warnstorfia tundrae* (Lenz 2006). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

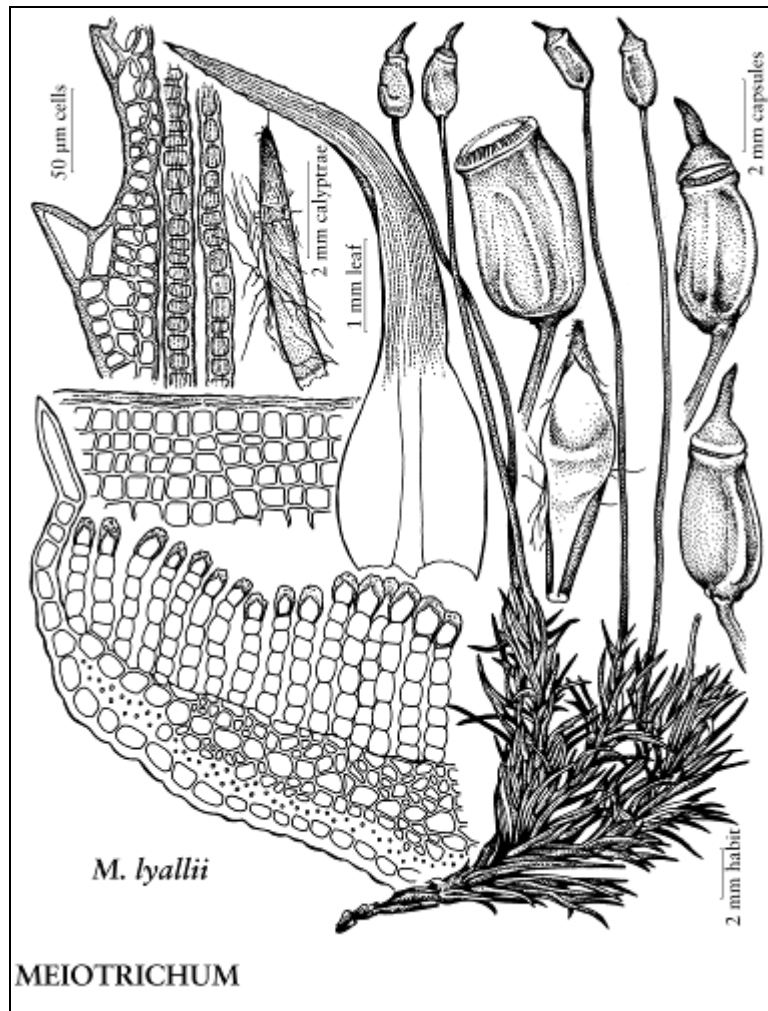
[*Meesia triquetra* (Richt.) Angstr.] was reported for Johnson Co., Wyoming by Lenz (2006).

Meesia uliginosa Hedw., Sp. Musc. Frond., 173. 1801.

Meesia trichodes Spruce

Wyoming (FNA 28, 2014). (As *Meesia trichodes* Spruce) Boggy places near Fox Park, Albany Co. (Nelson 9055), Porter (1935). Johnson Co., in association with *Warnstorfia tundrae* (Lenz 2006). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Boggy places, Fox Park, Medicine Bow Mountains, Nelson 9055 (RM).



Courtesy FNA Association, FNA 27, 2007

MEIOTRICHUM (G.L. Smith) G.L. Smith, Bryologist 95: 271. 1992. (Polytrichaceae)

Polytrichastrum sect. *Meiotrichum* G.L. Smith, Mem. New York Bot. Gard. 21(3): 40. 1971.

Meiotrichum lyallii (Mitt.) G.L. Smith, Bryologist 95: 271. 1992.

Polytrichadelphus lyallii Mitt., J. Linn. Soc., Bot. 8: 49, plate 8. 1864.

Oligotrichum lyallii (Mitt.) Lindb.

Polytrichastrum lyallii (Mitt.) G.L. Smith

Polytrichum angustidens H. Lindb.

Polytrichum lyallii (Mitt.) Kindb.

Wyoming (FNA, Vol. 27, 2007). (As *Polytrichastrum lyallii* Teton Co., Spence 1985). ...throughout the Pacific Northwest; Yukon, California, Nevada, Utah, Colorado, Arizona, New Mexico. Albany, Carbon cos., Yellowstone Natl. Pk., Porter (1937). (As *Polytrichum lyallii*) “Common in front of glaciers,” Teton Range, Grand Teton Natl Park, Wyoming, Spence (1981). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Polytrichum lyallii*: all) Carbon Co.: Medicine Bow Range, *Porter 9699* (RM); Sierra Madre Range, 9600–10,000 ft, wet area by bog, *Kastning-Culp 700* (BUF, RM). Fremont Co.: on US26 & US287, 5 mi E of Togwotee Pass, S slope, Bridger-Teton Natl. Forest, ca. 9000 ft, open Pine-Spruce woods, xeric, in duff on slope, some *Artemisia tridentate*, 6 Jul 1985, *Eckel 94082002*, c.fr. (BUF, RM). Park Co.: 2900 m, *Weber B-44239* (COLO, RM). Sheridan Co.: 7800 ft, limestone area, *Dueholm 8248* (RH).

MNIUM Hedw., Sp. Musc. Frond. 188, plate 45. 1801, name conserved. (Mniaceae)

Mnium affine: see Plagiomnium affine.

Mnium ambiguum H. Müll. = Mnium lycopodioides Schwägr.

Mnium arizonicum J.J. Amann, Rev. Bryol. 52: 23. 1925.

Wyoming (FNA, Vol. 28, 2014). B.C. Wyoming; Ariz, Nev., Utah, Colo. Wyoming, Flowers (1973). Wyoming: Teton Co.: Cascade Canyon 1953, Conard (CANM), Koponen (1972). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 8000 ft, *Hermann 17114* (RM); 10,800 ft, *Rolston 86085* (CSU); 8000 ft, *Eckel 120886* (BUF, RM). Park Co.: thin soil over dry, shaded rock under open canopy of Douglas fir, at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1784* (BUF); 8300 feet, *Elliott 13110* (RM, BUF). Park Co.: T 54 N, R 105 W, Sec. 13 N, 8000 ft, *Nelson 13151* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1/2 mi SW of Barnes Lake, 9760 ft, 42°57'N, 109°36'W, terrace fen, on N facing rock at edge of fen, 15 May 1989, *Andrus 7826* (BING).

“This is the only *Mnium* with pitted cell walls” (McIntosh & Newmaster, FNA Vol. 28, 2014); it has no plagiotropic stems in sterile shoots (unlike *Plagiomnium* spp.); the bright green laminae contrast with the red stems, little tomentum, leaves strongly twisted around the stems. Unlike *Plagiomnium ellipticum*, (with plagiotropic stems) the leaves are obovate and acute (not nearly orbicular) and the marginal cells are short-rhombic near the apex (not long-linear). The laminal cells of *M. arizonicum* are diagonal out from the costa, then tend to become parallel to the margin along the margin in several rows. The cells are porose, rather thick, especially distally, and are not collenchymatous.

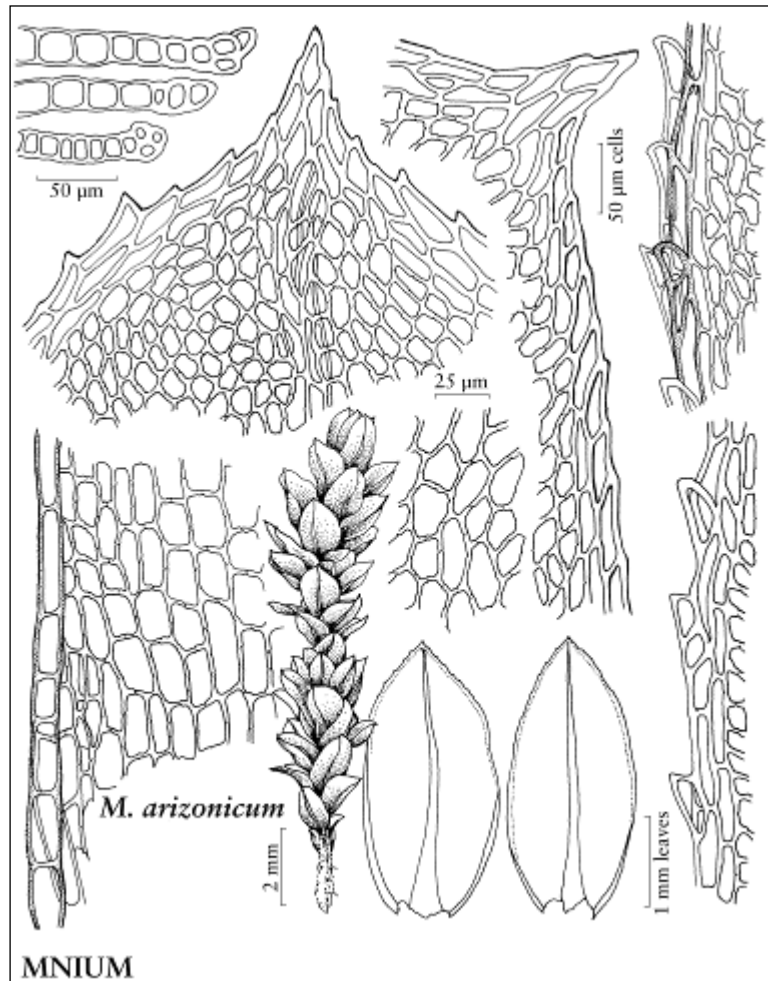
Mnium bimum Schreber = Ptychostomum bimum (Schreber) J.R. Spence

Mnium blyttii P. Bruch & W.P. Schimper, Bryol. Europ. 4: 208, plate 400. 1846.

Astrophyllum blyttii (B.S.G.) Lindb.

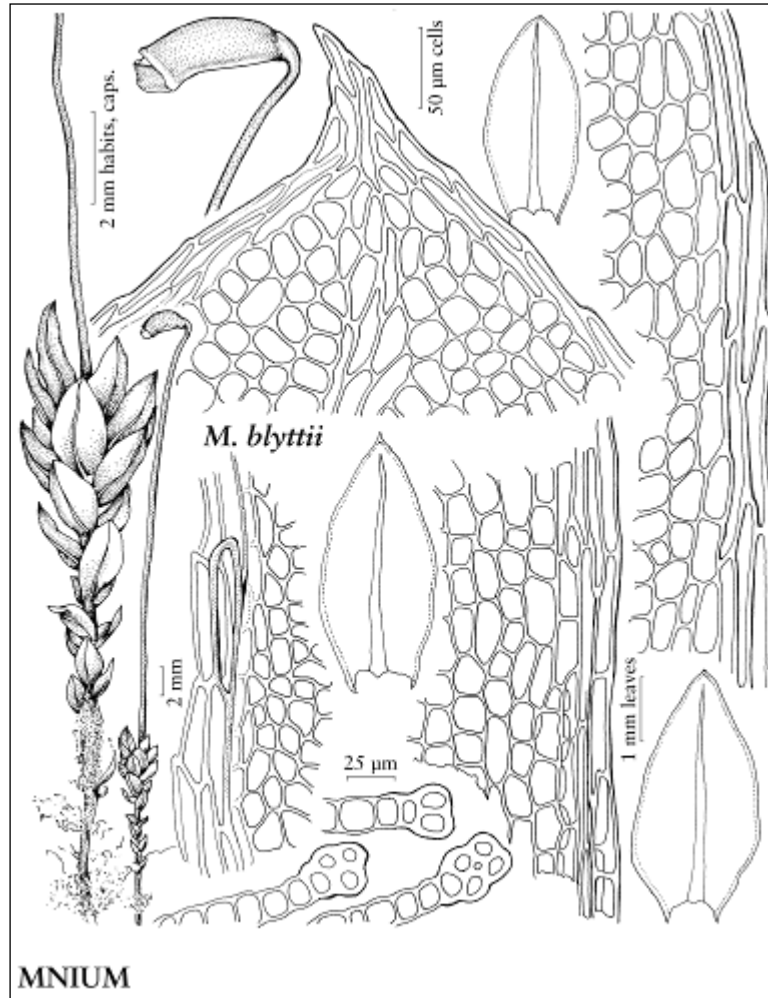
Wyoming (FNA, Vol. 28, 2014). B.C., Northw. Terr., Yukon; Alaska, Wash., Idaho, Mont., Colo., Utah, Wyoming; Greenland. Togwotee Pass, Fremont Co., Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 8500 ft, *Lichvar 1341* (RM); 10,000 ft, *Hermann 17699* (RM). Fremont Co.: 8400 ft, *Hermann 25512* (RM). Sheridan Co.: 6600–8000 ft, *Odasz 1127* (BUF, RM). Sublette Co.: 7950 ft, *Hermann 25329* (RM).



Courtesy FNA Association, FNA 28, 2014

After *Mnium arizonicum* with its porose cell walls, the taxon *M. blyttii* might be most easily confused with is *M. thomsonii*. The last has elongate leaves, vs. the short, broad at the middle leaves of *M. blyttii*. The latter also has consistent sharp, clear double teeth on the margins, whereas *M. blyttii*'s are variable, generally blunter. Variation is conspicuous in *blyttii*, its leaf cells sometimes as small as those of *M. thomsonii*, sometimes as large as in the descriptions, and *M. blyttii* does have rounded corners, slightly, not angular (for *M. thomsonii*, Crum & Anderson 1981 say “more or less thickened at the corners Vol.1, p. 587”). In *M. blyttii* the margins are variously single layered to many: nearly three. My impression of *M. thomsonii* is that it is more stable in its characteristics. The leaf shape seems to be the best character to differentiate them (*M. blyttii* is broadest at the middle, also densely rhizoidal, whereas *M. thomsonii* is scarcely so—Lawton 1971). Also *M. thomsonii* seems to have some teeth at the back of the costa, which was hard to demonstrate in any of the, e.g., McKee specimens. Use the complexity of the leaf margin to separate from *M. marginatum* (q.v.) in sterile specimens. “Doubtful specimens are easily distinguished by the following chemical test: heat a leaf with alcohol to destroy the chlorophyll, then add a drop of KOH. The leaf should turn blue-green” Weber (1973: 24).



Courtesy FNA Association, FNA 28, 2014

Mnium hornum Hedw., Sp. Musc. Frond. 188. 1801.

Not reported for Wyoming by FNA (FNA, Vol. 28, 2014). Brooklyn Lake, Albany Co. (*Nelson 5171*), Porter (1935).

“*Mnium hornum* is one of the most distinctive members of the genus. The long, narrow leaves and strongly toothed abaxial costae are diagnostic for the species, as is the presence of small, narrowly triangular, mostly smooth-margined leaves on the proximal portions of the stem” (McIntosh & Newmaster, FNA 28, 2014). This mostly eastern species does occur in Colorado, though rarely, being a “Pleistocene relict species of the eastern American woodlands” (Weber & Whittmann (2007).

Mnium lycopodioides Schwägr., Sp. Musc. Frond. Suppl. 2(2,1): 24, plate 160 (bottom). 1826.

Mnium ambiguum H. Müller

Mnium lycopodioides var. *inclinatum* (Lindb.) Wijk & Marg.

Mnium pseudolycopodioides Müll. Hall. & Kindb. in Macoun

Mnium umbratile Mitt.

Wyoming (FNA, Vol. 28, 2014). (As *Mnium ambiguum*) B.C., Wash, Oregon, Idaho, Mont., Wyoming; Col; Ontario, New Eng., New York.

(As *Mnium ambiguum*) Albany Co.: 8590 ft, *Hermann* 24878 (RM); 10,000 ft, *Hermann* 17703 (RM).

Mnium marginatum (Dickson ex Withering) P.-Beauvois, Prodr. Aethéogam., 75. 1805.
Bryum marginatum Dickson ex Withering, Syst. Arr. Brit. Pl. ed. 4, 3: 824. 1801.
Mnium serratum Brid.

Wyoming (FNA, Vol. 28, 2014). B.C., Wash., Alberta, Idaho, Mont., Wyoming; Calif., Ariz., Col; South Dak., Iowa, Missouri, Ark., Ontar; Quebec, New Engl., N. Car. (As *Mnium serratum*) Wyoming: Yellowstone Natl Park, c.fr., (1522) (Roell 1893). (As *Mnium serratum* Schrad.) Albany Co., “from several locations,” Porter (1935). (As *Mnium subglobosum* B. & S.) Albany Co. (*Nelson* 1744 & 2702), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: in deep shade on wet, peaty, wooded bank of Nash Fork on Sand Lake Rd., 2 mi NW of Rte 130, alt. 8500 ft, Medicine Bow Mts., ca. 4 mi 2 of Centennial, 5 Aug 1962 *Hermann* 17778, sterile specimen seen, with complex marginal cell bundle (RM); La Plata Mines, 25 Aug 1898, *Nelson* 5176 c.fr., with *Leucobryum pyriforme*, *Bryum turbinatum*, *Distichium capillaceum* (RM). Park Co.: T55N, R104W Sec. 25, 26, 6800–7400 ft, *Hartman* 22062 (RM) . Sublette Co.: wet, peaty knoll under spruce on W shore of Lower Green River Lake, alt. 7950 ft, Wind River Range, 50 mi N of Pinedale, 19 Jun 1973, *Hermann* 25330 (RM). Teton Co.: on US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis* woodland, xeric but for stream bottoms, *Lupinulus*, Asters, wooded stream, soggy debris, 6 Jul 1985, *Eckel* 94082106, c.fr., with *Brachythecium salebrosum*, *Distichium capillaceum*, *Aulacomnium palustre*, *Cratoneuron filicinum* (BUF)

Distinctive for *M. marginatum* are the double teeth (*Mnium*), synoicous inflorescences (good distinction from *M. blyttii*) and thickened cell corners. Especially in sterile specimens, the teeth are sometimes very low and blunt and the doubleness is not demonstrable (as noted by Flowers 1971). Distinguishing *M. marginatum* it from *M. blyttii* is through the complexity of the marginal cell bundle (cf. Lawton's 1971 key: if only two or three cells the plant might be *M. blyttii*. If four or more, it is *M. marginatum*. Otherwise the areolation of both species are the same as described. To differentiate from *M. lycopodioides*, as in Lawton's key, that species has well-defined teeth.

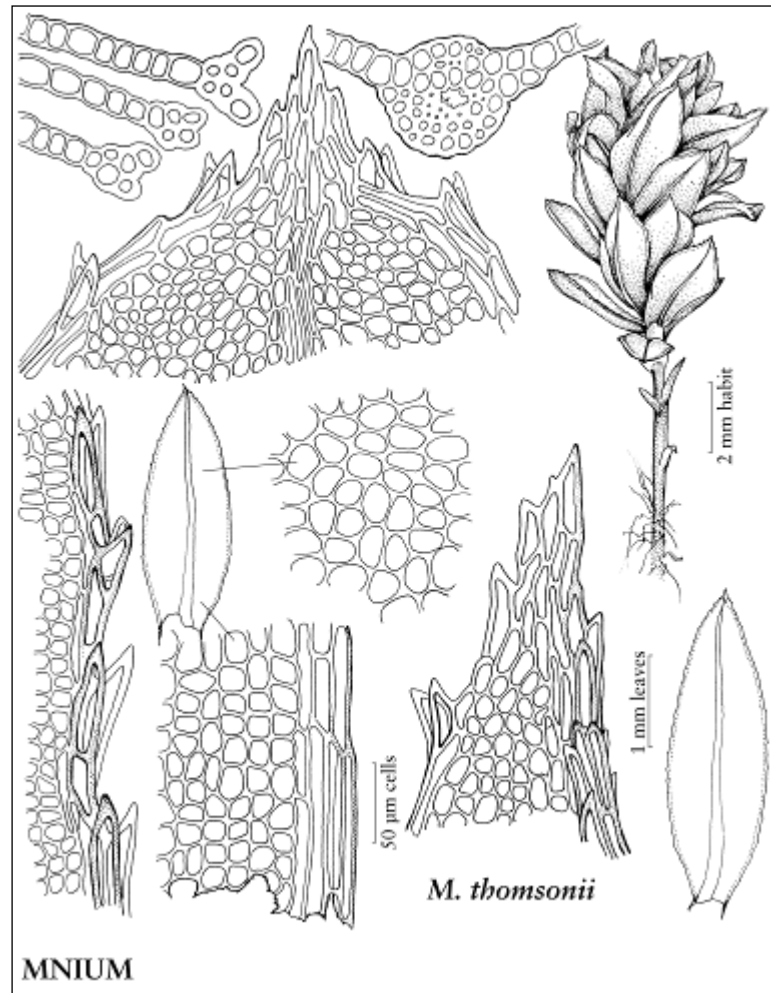
Mnium orthorrhynchium sensu auct. plur. = *M. thomsonii* Schimp. (From the Anderson et al. 1990 checklist, another misuse of *M. orthorrhynchium*. is for *Atrichum tenellum* (Roel.) P. Bruch & Schimp. in B.S.G. which has not been reported for Wyoming, FNA Vol. 27, 2007.)

Mnium spinulosum P. Bruch & W.P. Schimper, Bryol. Europ. 4: 206, plate 394. 1846.

Not noted for Wyoming in FNA (FNA, Vol. 28, 2014). Battle Creek Canyon, Carbon County (*Porter* 1720), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

“*Mnium spinulosum* is distinguished by broad, thick, and pigmented leaf margins, usually obovate leaves, and dark red-brown exostomes” (McIntosh & Newmaster, FNA Vol. 28, 2014).

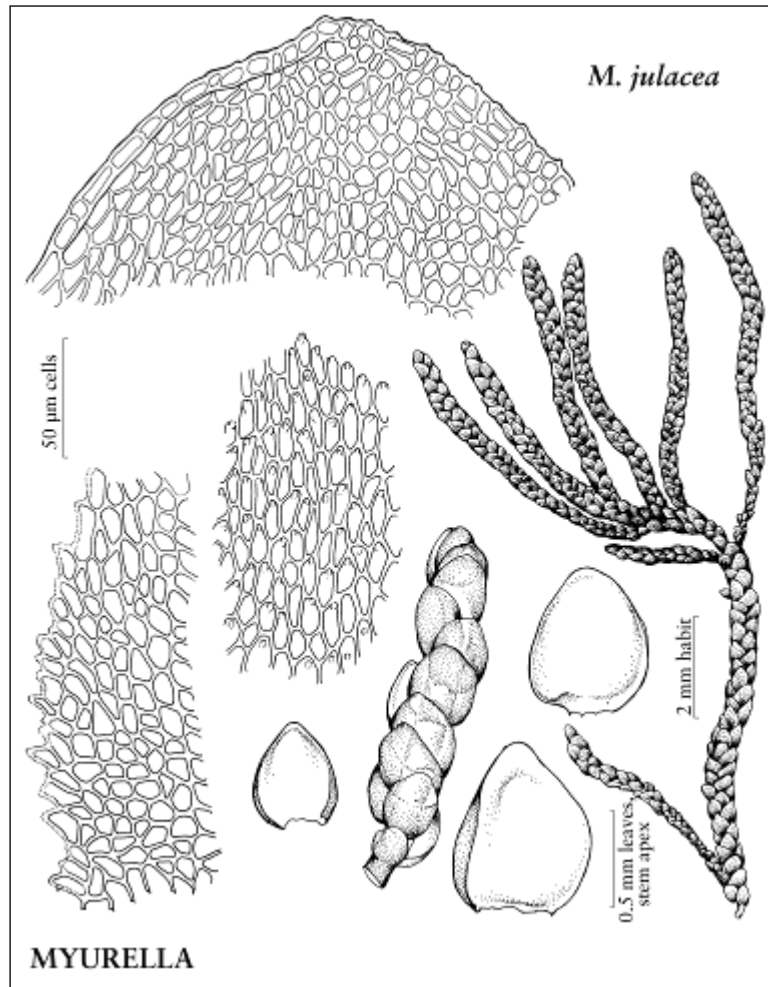
Mnium thomsonii Schimp., Syn. Musc. Eur. ed. 2, 485. 1876 (as thomsoni)
Astrophyllum orthorrhynchum (Brid.) Lindb.
Mnium decurrens Müll. Hall. & Kindb. in Macoun
Mnium inclinatum Lindb.
Mnium lycopodioides ssp. *orthorrhynchum* (Lindb.) Wijk & Marg.
Mnium orthorrhynchum Brid.



Courtesy FNA Association, FNA 28, 2014

Wyoming; “the small laminal cells, the smallest in the genus, are diagnostic” (McIntosh & Newmaster, FNA, Vol. 28, 2014). B.C., Wash., Oregon, Alberta, Mont., Wyoming; Colo., Minnesota, Ont., Iowa, Ark.; Greenland, Quebec, Nova Scot, N.C. (As *Mnium orthorrhynchum*) Albany, Sublette cos., Porter (1937). Teton Co., Spence (1985). “Both of these specimens are sterile. 692 was determined by Dr. Grout as being almost certainly this species,” Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: soil on wet rocky edge of stream in aspens, alt. 8590 ft, NW slope of Pole Mt., Poly creek Campground, Medicine Bow N.F., 9 mi SE of Laramie, Centennial, 7 Jun 1972, *Hermann 24868* (RM); Medicine Bow Mts., Libby Creek, growing along rotten log on moist soil, common (in packet of *Brachythecium erythrorrhizon*), *Lichvar 1347b* (RM). (As *Mnium orthorrhynchum*) Albany Co.: 10,000 ft, *Hermann 17728* (RM). Park Co.: 6500 ft, *Hermann 20036* (RM); 7500 ft, *Hermann 20056* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake, with *Bartramia ithyphylla*, 14 May 1989, *Andrus 7787a* (BING).



Courtesy FNA Association, FNA 28, 2014

The Albany Co. specimen of Hermann (24868) had non-varying double teeth, smaller leaf cells, long thin leaves, thick walls with minor corner thickenings and dioicous. The specimen was determined by T. Koponen as *M. marginatum*, but perhaps in distribution duplicate specimens got mixed.

Mnium orthorhynchum Brid. = *Mnium thomsonii* Schimp.

MYURELLA Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 39, plate 560. 1853.
(Pterigynandraceae)

Myurella julacea (Schwägr.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 41. 1853.
Leskea julacea Schwägr. in J.A. Schultes, *Reise Glockner* 2: 363. 1804.

Wyoming; “Plants of *Myurella julacea* are distinguished by their small, wormlike habit and yellow-green color” (Vitt, FNA Vol. 28, 2014).

Albany Co.: Hermann 17222 1/2 (RM): fragmentary but distinctive material.

NECKERA Hedw., Sp. Musc. Frond., 200, plate 46, figs. 10–15; plates 47, 48. 1801, name conserved. (Neckeraceae) ·

Neckera pennata Hedw., Sp. Musc. Frond., 200. 1801.

Neckera oligocarpa Bruch

Neckera pennata var. *oligocarpa* (Bruch in Ångstr.) Müll. Hall.

Neckera pennata var. *tenera* Müll. Hall.

Not noted for Wyoming by FNA, but within the range of the species (FNA, Vol. 28, 2014). Lawton (1971), indicated a specimen from Wyoming. (As var. *oligocarpa* B. & S.) Hawk's Ranch, Colorado-Wyoming State line, Albany County (Nelson 11,297), Porter (1935). (As var. *oligocarpa* (Bruch) Grout), Albany Co., Porter (1937).

Albany Co.: Porter 1754 (RM).

NIPHOTRICHUM (Bednarek-Ochyra) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 137. 2003. (Grimmiaceae)

Racomitrium subg. *Niphotrichum* Bednarek-Ochyra, Fragm. Florist. Geobot., Ser. Polon. 2: 70. 1995.

Niphotrichum canescens (Hedw.) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 137. 2003.

Trichostomum canescens Hedw., Sp. Musc. Frond., 111. 1801.

Bryum canescens (Hedw.) Wither.

Grimmia canescens (Hedw.) Muller Hal.

Racomitrium canescens (Hedw.) Brid.

Racomitrium canescens fo. *ericoides* (Hedw.) Mönk

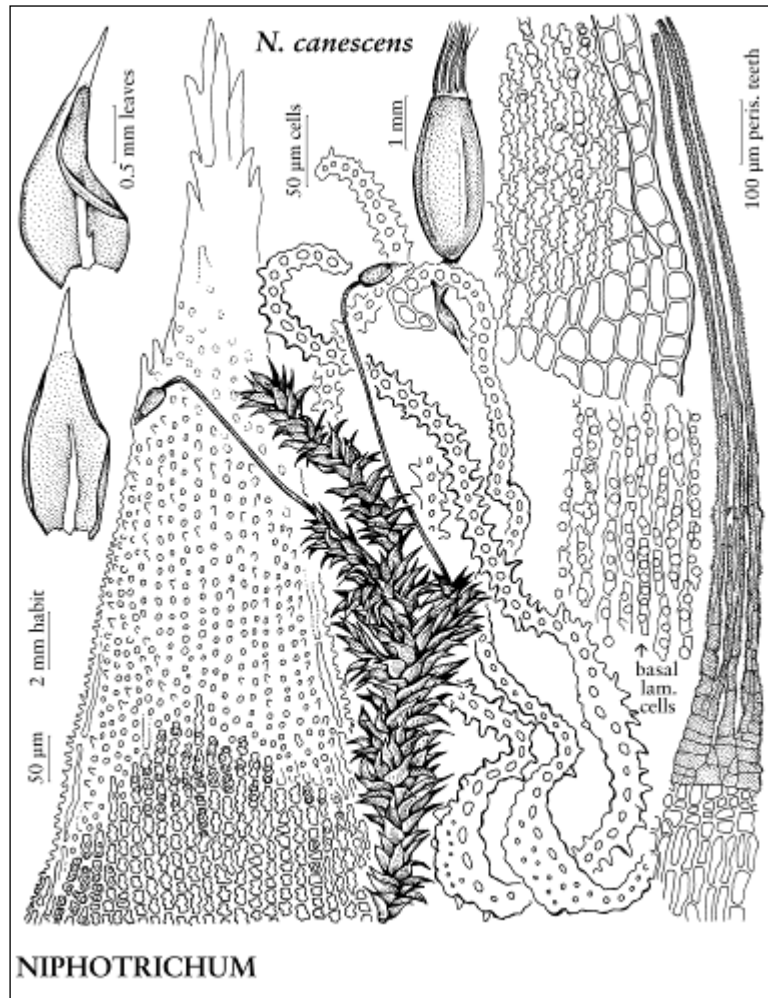
Racomitrium ericoides (Hedw.) Brid.

Trichostomum ericoides Hedw.

Only the subsp. *canescens* is reported for Wyoming in FNA (FNA, Vol. 27, 2007). (As *Racomitrium canescens*) In all states and provinces of the Pacific Northwest; Alaska, Cal., Colo.; Michigan, Ontario; Greenland, New England. (As *Rhacomitrium canescens*) Sundance, Crook County (Nelson 9704); Leigh Lake, Teton County (Porter 1192); around hot springs, Nez Perces Creek, Yellowstone Natl Park (Nelson 6210), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Racomitrium canescens*) Park Co.: 2900 m, Weber, B-44286 (RM, COLO). Sublette Co.: (conforms to Lawton's var. *ericoides*) as ssp. *canescens* (Frisvoll), 11,200 ft, Rolston s.n. (CSU). Teton Co.: gravelly soil, dry stream bed, entrance to Leigh Lake, 7,000 ft, 2 Aug 1932, Porter 1192 (WTU); Teton Natl. Park, Cascade Trail, 14 Aug 1953, Lawton, 1764 (WTU). Yellowstone Natl Park, Nelson & Nelson 6210 (RM); In woods near Old Faithful Geyser, 15 Aug 1925, Frye s.n. (WTU); near Roaring Mountain, 16 Aug 1925, Frye s.n. (WTU); 1 mi N of Thumb, on dry rocky soil, 7 Jul 1934, Frye s.n. (WTU); Norris Geyser Basin, wet soil, 14 Aug 1925, Frye s.n. (WTU); about 5 mi from Canyon Lodge road to Norris, 29 Aug 1951, Lawton 1500 (WTU); on boulder along Firehole River near Old Faithful, 6 Jul 1934, Frye s.n. (WTU); about Terrace Hotspring, 20 Jun 1931, Frye s.n. (WTU); in open dry place, sandy soil at W Thumb, 1 Aug 1932, Smiy 126 (WTU).

(As *Racomitrium canescens*) since I have not made a study of American plants of *Racomitrium canescens* (Timm ex Hedw.) Brid. as to their distinction from *R. ericoides* (Web) ex Brid.) Brid. or *R. elongatum*, as per Frisvoll 1983, I have chosen to follow Lawton (1971) and the conservative concepts of Crum and Anderson (1981), which lump these species under *R. canescens* (Hedw.) Brid. There is a var. *latifolium* C. Jens. in the Anderson et al. (1990) checklist.



Courtesy FNA Association, FNA 27, 2007

Niphotrichum elongatum (Frisvoll) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 138. 2003.

Racomitrium elongatum Frisvoll, Gunneria 41: 74, figs. 1983.

Wyoming (FNA, Vol. 27, 2007).

Niphotrichum ericoides (Brid.) Bednarek-Ochyra & Ochyra in R. Ochyra et al., Cens. Cat. Polish Mosses, 138. 2003.

Trichostomum ericoides Brid., J. Bot. (Schrader) 1800(2): 290. 1801.

Bryum ericoides (Brid.) Dicks.

Grimmia canescens (Hedw.) Müll. Hal. var. *ericoides* (Brid.) Müll. Hal.

Racomitrium brevipes Kindb. var. *ericoides* (Brid.) Kindb.

Racomitrium canescens var. *ericoides* (Brid.) Hampe

Racomitrium ericoides (Brid.) Brid.

Trichostomum canescens Hedw. (unranked) *ericoides* (Brid.) Hartm.

Wyoming (FNA, Vol. 27, 2007).

ONCOPHORUS (Brid.) Brid., Bryol. Univ. 1: 389. 1826. (Dicranaceae)*Dicranum sect. Oncophorus* Brid., Muscol. Recent., suppl. 4: 53. 1819.**Oncophorus virens** (Hedw.) Brid., Bryol. Univ. 1: 399. 1826.*Dicranum virens* Hedw., Sp. Musc. Frond., 142. 1801.*Cynodontium virens* (Hedw.) Schimp.*Dicranum virens* var. *serratum* B.S.G.*Oncophorus virens* var. *serratus* (B.S.G.) Braithw.

Wyoming (FNA, Vol. 27, 2007). Throughout the Pacific Northwest; Alaska, California, Colorado, Utah, Nevada, New Mexico; Minnesota, Michigan; Greenland, Nova Scotia, Quebec. Fairly common along streams from 9,000–10,000 ft, in southeastern Wyoming; Albany (Porter 1372), (Carbon, Johnson cos.) Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: peaty vertical bank of streamlet in mountain meadow, 1 1/4 mi S of Brooklyn Lake, 10,000 ft, Medicine Bow Mts., 9 mi W of Centennial, 2 Aug 1962, *Hermann 17679*, c.fr. (RM). Carbon Co.: moss-covered, peaty bank of Trail Creek, W of Sand Lake Rd., 9000 ft, Medicine Bow Mts., 4.5 mi SW of Morgan, 6 Aug 1962, *Hermann 17798*, c.fr. (RM). Fremont Co.: 12,500 ft, wet places near small waterfall, 6 Aug 1963, *Jozwik 471*, c.fr., (RM). Park Co.: alpine bog, 3250 m, *Weber, B-44223* (RM, COLO); Beartooth Plateau, Cooke City to Red Lodge Highway, alpine bog of E summit, E slope, head of Wyoming Creek, 3250 m, *Weber, B-44264* (COLO, RM).

Oncophorus wahlenbergii Brid., Bryol. Univ. 1: 400. 1826.*Oncophorus wahlenbergii* var. *compactus* (P. Bruch & W.P. Schimper) Braithwaite

Wyoming (FNA, Vol. 27, 2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: 2900 m, c.fr., Aug 19 1973, *Weber B-44288* (RM, COLO). Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake, 14 May 1989, *Andrus 7784a*, with *Campylium stellatum*, *Climacium americanum* & *Distichium capillaceum* (BING).

The Andrus specimen had a single stem with many flagellate branches with minute distant leaves in the apex! The costa has a tendency to come off the stem in a long strip in this species with decurrent leaves—both characters similar to those of *Bryum pseudotriquetrum*.

ORTHOTRICHUM Hedw., Sp. Musc. Frond., 162. 1801. (Orthotrichaceae)**Orthotrichum affine** Schrader ex Brid., Muscol. Recent. 2(2): 22. 1801.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014). Albany County (Porter 1004), (Washakie Co.), Porter (1935).

Orthotrichum alpestre Hornschuch ex P. Bruch & W.P. Schimper, Bryol. Europ. 3: 75, plate 213. 1849.*Orthotrichum alpestre* var. *majus* Lesq. & James*Orthotrichum alpestre* var. *watsonii* (James) Grout*Orthotrichum occidentale* James*Orthotrichum watsonii* James

Wyoming (FNA, Vol. 28, 2014). Albany Co. (*Porter 1288*), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: exposed crevices in granite boulder on grassland, Laramie Mts., Horse Creek drainage, 8000 ft, 10 mi ENE of Laramie, 17 Aug 1961 *Hermann 17112* (RM); Laramie Mountains, Roger Canyon, 8 air mi NE of Laramie city center; 7850–8000 ft, thin soil over limestone boulder, 7 Jun 1993, *Miller 10,240* c.fr. (NYS). Bighorn Co.: UTM 13 316537 E 4900238 N, on rock in forest; on forested, rocky north slope of weathered limestone, with *Picea engelmannii*; near Soldier Creek Cow Camp, ca. 4.5 air mi WSW of W Tensleep Lake, Bighorn Natl Forest, 8285 ft (2526 m), 28 Aug 2005, *Lenz no 2261* (MO). Johnson Co.: UTM 13 342387 E 4902965 N, on rock under overhand, large rock outcrop with *Populus tremuloides* on N side and *Pinus contorta* around S side, ca. 6.6 air mi E of Bighorn Peak; Bighorn Natl Forest, 8180 ft (2494 m), 29 Aug 2005, *Lenz 2367* (RM). Park Co.: 7500 ft, *Hermann 20062* (RM). Fremont Co.: rock outcrop along stream, Fiddler's Lake Rd (Wyo. 131), 8600 ft, 14 mi SSW of Lander, 18 Jun 1973 *Hermann 25310* (RM). Yellowstone Natl Park: 5500 ft, *Hermann 20014* (RM).

A specimen of this species was noted to have a bright blue-green or verdigris-like color of the stems, and bright red-brown tomentum, as mentioned by Crum and Anderson (1981) citing Hinneri (Ann. Univ. Turku A, II, 58:1–37 1976), who reported a “bluish color of the tufts and a rich, red-brown tomentum.” The loose leaves when dry and bright color are suggestive of other mosses, such as *Hymenostylium recurvirostrum*.

The capsule cell walls are thin in the furrows and thicker in the ribs. Basal cells thin-walled and even, as is typical of *Orthotrichum* species with immersed capsules. In section, the cross-walls are thin, the outer surface thick, with tall simple or widely- forked papillae. The emergent capsules are strongly 8-ribbed and strangulate or constricted when dry. Peristome teeth are 8, together with 16 robust endostome teeth that may be erect, wide-spreading or typically strongly deflexed and lying along the capsule mouth. In the latter case, the distinctive endostome segments appear as erect filaments. Axillary perigonia occur in the leaf axils below the perichaetia (not at the ends of separate branches, as in *O. pallens*, which also has 16 endostome segments and a naked calyptra). The rather sparsely hairy calyptra hairs are papillose.

Orthotrichum anomalum Hedw., Sp. Musc. Frond., 162. 1801.

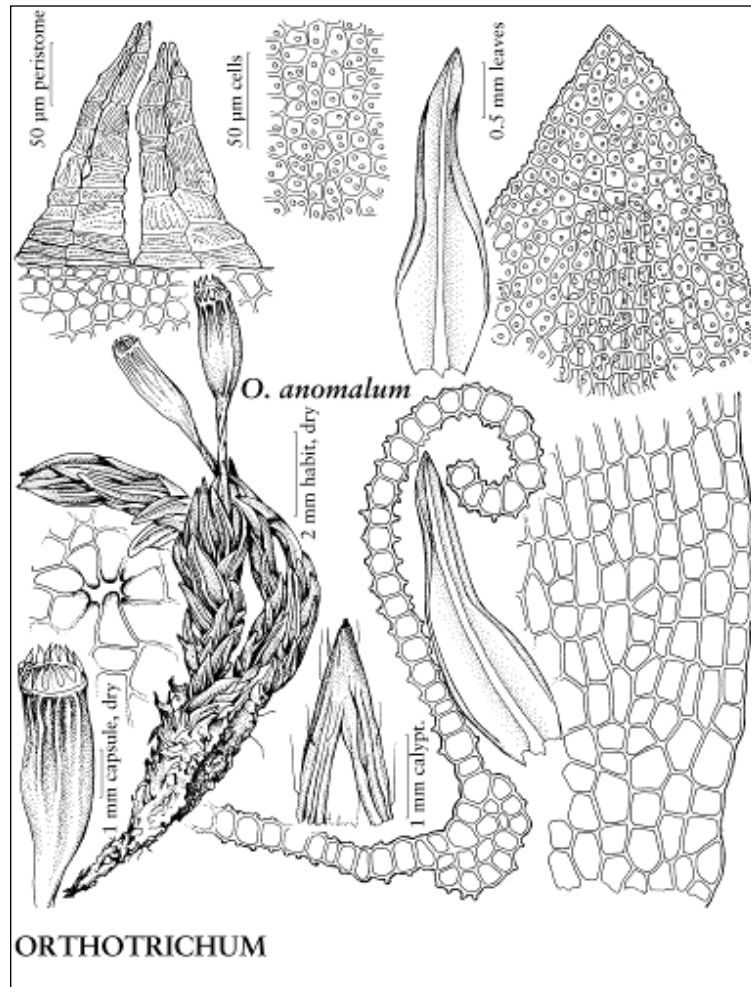
Orthotrichum anomalum var. *americanum* Macoun & Kindb.

Orthotrichum canadense P. Bruch & W.P. Schimper

Orthotrichum consimi subsp. *anomaloides* Kindb.

Wyoming; “The most useful character in distinguishing plants of this species is the exserted capsule with eight long ribs alternating with eight shorter ones” (Vitt, FNA Vol. 28, 2014). Albany Co. (*Porter 756*), Porter (1935).

Albany Co.: On granite rocks, Hawk's Ranch, 26 Apr 1931, *Porter 756*, c.fr., (NY). Weston Co.: Newcastle, on arid rock in dryish canyon, 16 Jul 1942, *Leroy Peiler 17,030* (NY).



Courtesy FNA Association, FNA 28, 2014

Orthotrichum cupulatum Hoffmann ex Brid., Muscol. Recent. 2(2): 25. 1801.

Orthotrichum leiodon Kindb.

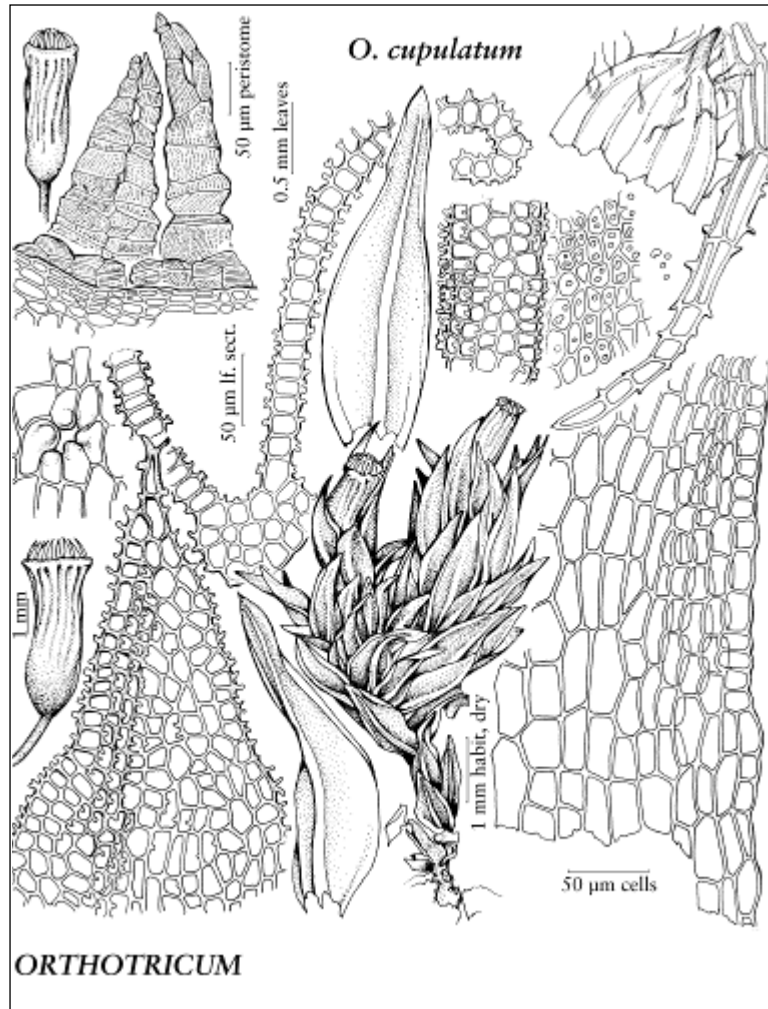
Orthotrichum utahense Lesq.

Wyoming (FNA, Vol. 28, 2014). Apparently the commonest species. Albany, Teton cos., Porter (1937). Teton Co., Spence (1985), citing Porter. Albany Co., Telephone Canyon, *Porter 606, 685, 1270* (TENN), Vitt (1973).

Albany Co.: Laramie Mts., Roger Canyon, ca. 8 air mi NE of Laramie, 2400 m, limestone outcrops with *Cercocarpus montanus*, 7 Jun 1993, *Buck 23151* (NY), capsules with calyptrae. Fremont Co.: 9300 ft, *Hermann 25300* (RM). Sheridan Co.: T 56N, R 87W S14 Big Horn Mts.; ca 4 air mi SSW of Dayton, forested valley through Chugwater redbeds and limestone outcrops and forest margin, 4800 ft, Aug 3 1979, *Hartman 10648* (RM).

The leaf lamina has an occasional bistratose patch or streak especially in the apical part. This feature is not rare, but is not evident in many cross sections even on the same leaf—certainly not as evidently bistratose as *O. pellucidum*, which was once considered to be a variety of this species. The 16 ribs in the dry capsule are conspicuous and the capsules are more immersed than emergent—in *O. pellucidum* the capsules are emergent to shortly exserted—in some collections most of the stems have

shortly exserted capsules (a bit of the seta can be seen below the base of the capsule). The leaf lamina is continuously bistratose throughout in *O. hallii*.



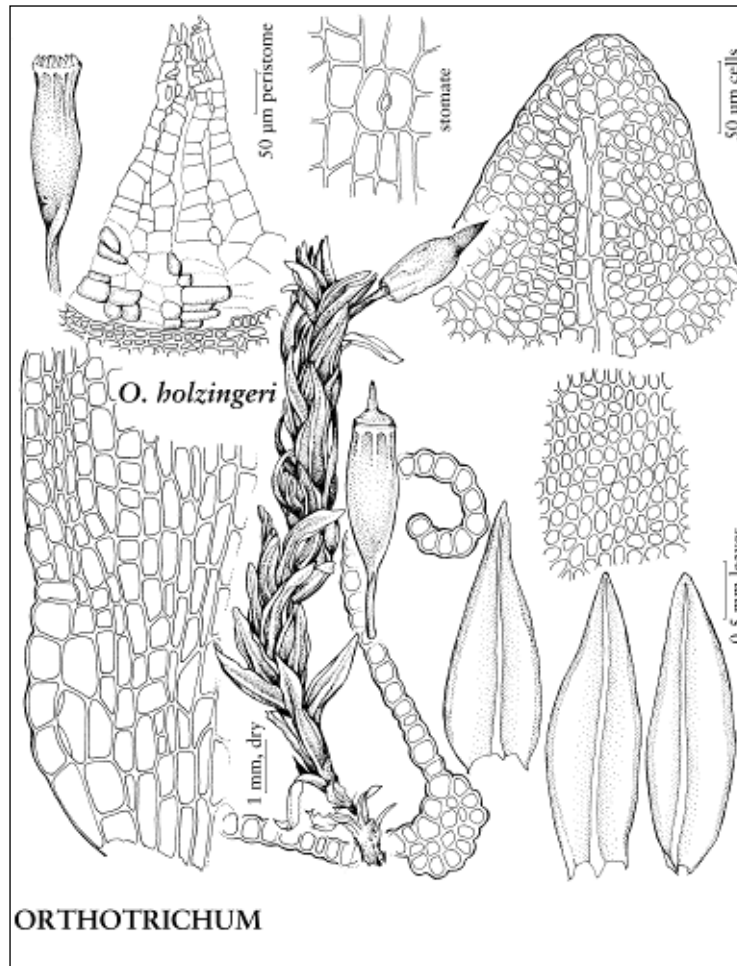
Courtesy FNA Association, FNA 28, 2014

Orthotrichum jamesianum Sull. in James in Watson = *Orthotrichum pellucidum* Lindb.

Orthotrichum hallii Sull. & Lesq. in W.S. Sull., Icon. Musc., suppl., 63, plate 45. 1874.

Wyoming (FNA, Vol. 28, 2014). Albany County (Porter 485 & 638), (Natrona Co.), Porter (1935). Wyoming, Flowers (1973). Campbell Co., Medina (1994).

Albany Co.: Eckel 871104 (RM, BUF); 8600 ft, on granite rocks, 7 Apr 1988 Vukelich s.n. (BUF); along Roger Canyon in the Laramie Mtns, 7 mi due NE of Laramie city center, *Artemisia* scrub vegetation; limestone cliffs and outcrops, 7600 ft, vertical seeping crack in limestone cliff, 7 Jun 1993 Reese 18158, with *Grimmia anodon* (LAF). Fremont Co.: 9300 ft, Hermann 25298 (RM). Park Co.: T55N R104W, sec 5,6,7 5600–6000 ft, Hartman 20603 a & b, with *O. rupestre* and *O. laevigatum* (RM).



Courtesy FNA Association, FNA 28, 2014

The lamina is essentially completely or continuously 2(–3)-stratose, whereas in *O. cupulatum* it is only interruptedly bistratose in streaks, or, in *O. pellucidum*, the streaks are broader but never continuous. The stomata of the capsule are immersed, the basal cells thin and even-walled. The capsules are emersed with only 8 (not 16) ribs. The most distinctive feature of this moss is the essentially completely bistratose laminae in the distal leaf and the papillae that are low and obscure (not high and forked). The peristome teeth may be striate with ridges or with small, conic papillae. They may be proximally coarsely papillose and distally with striae and papillae mixed (after Vitt, FNA Vol. 28, 2014). *Orthotrichum alpestre*, *O. pallens* and *O. pumilum* are all unistratose, the last two with stems less than 0.5 mm long (*O. hallii* is 1–1.5 cm high).

Orthotrichum holzingeri Renault & Card., Contr. U.S. Natl. Herb. 3: 270. 1895.

Wyoming (FNA, Vol. 28, 2014). “Fremont Co.: Shoshone Natl Forest, Wind River Mountains, along Hwy 131, SW of Lander, between Sinks Canyon St. Pk. and Frye Lake, 10.0 km NE of Frye Lake, 2,200 m, Vitt 35377, Vitt (1991).

Fremont Co.: Vitt 35377 as cited above (MO), “On vertical ledges of calcareous rock in seasonally wet stream and on dry outcrops near stream in *Pseudotsuga menziesii*-*Pinus contorta*-*Pinus flexilis* forest,” 5 Jun 1990, Vitt with Hastings s.n. Park Co.: 6500 ft, granite, “new to Wyoming,” Hermann 20029 (RM).

Orthotrichum laevigatum Zett., Öfvers. Kongl. Vetensk.-Akad. Förh. 19: 363. 1862.

Orthotrichum hainesiae Aust.

Orthotrichum kingianum Lesq.

Orthotrichum laevigatum fo. *macounii* (Aust.) Lawt. & Vitt in Lawt.

Orthotrichum laevigatum var. *kingianum* (Lesq.) Grout

Orthotrichum lonchothecium Macoun & Kindb.

Orthotrichum macounii Aust.

Orthotrichum macounii var. *lonchothecium* (Macoun & Kindb.) Grout

Orthotrichum raui Aust.

Orthotrichum roellii Vent.

Orthotrichum roellii subsp. *schlotthaueri* (Vent.) Kindb.

Orthotrichum roellii subsp. *stenocarpum* (Vent.) Kindb.

Orthotrichum schlotthaueri Vent.

Orthotrichum speciosum var. *brevicaule* Lesq.

Orthotrichum speciosum var. *hainesiae* (Austin) Paris

Orthotrichum speciosum subsp. *laevigatum* (Zett.) J.J. Amann

Orthotrichum speciosum var. *polyanthum* Lesq.

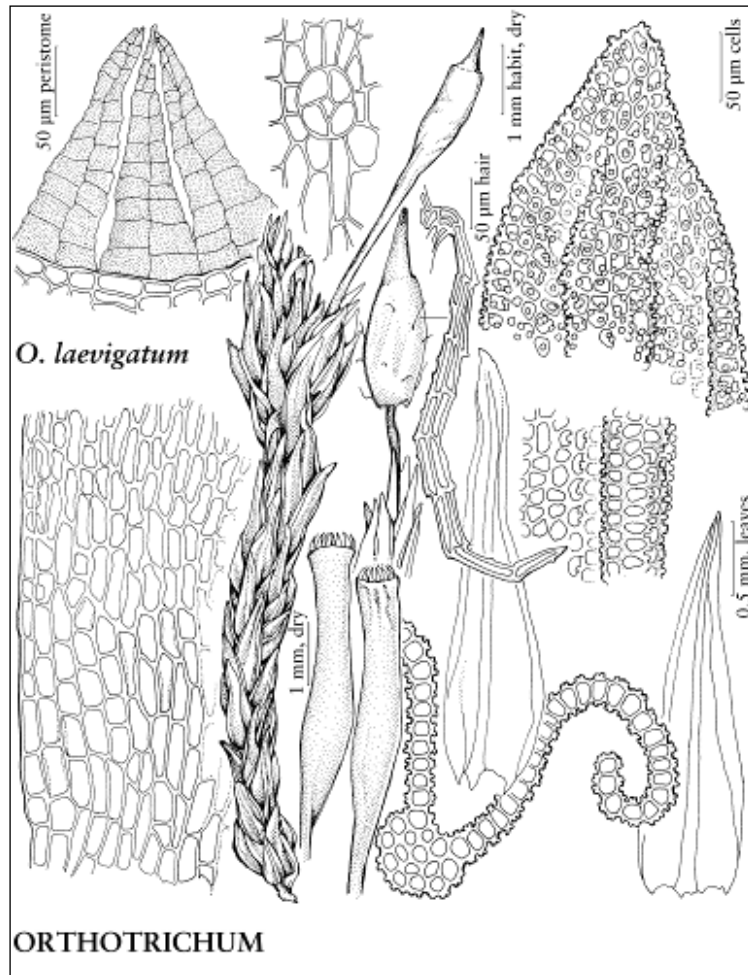
Orthotrichum speciosum var. *polycarpum* Lesq. & James

Orthotrichum speciosum var. *raui* (Austin) Lesq. & James

Wyoming (FNA, Vol. 28, 2014). (As *O. macounii*) Wyoming, Flowers (1973). (As *Orthotrichum macounii* Aust.) Yellowstone Natl Park, Porter (1937). (As var. *lonchothecium* (Müll. Hall. & Kindb.) Grout.) Washakie Co., Porter (1937). Wyoming, Flowers (1973). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Big Horn Co.: Middle Ten Sleep Creek, N side of a great rock, 1 Aug 1901, *Goodding 479* (MO); UTM 13 326560 E 4898333 N, on rock, subalpine lake margin & surrounding forest of *Pinus contorta* & *Abies lasiocarpa*, with *Vaccinium scoparium*, SE shore of East Tensleep Lake, Bighorn Natl. Forest 9734 ft (2968 m), 25 Aug 2005, *Lenz 2148* (MO). Campbell Co.: Richelle Hills, head of Wildcat and S Fork Keyton Creeks, T 41 N, R 69 W, Sec. 11, 12, 1500–1550 m, natural brick and sandstone of Fort Union formation, *Pinus ponderosa-Juniperus*-sagebrush associations, N-facing cliffs, 5–8 Jun 1975, *Weber B-49248*, Powder River Basin Coal Strip Mine Ecological Impact Inventory (MO). Fremont Co.: Bridger-Teton Natl Forest on US26 & US287, between Moran & Dubois ca. 9000 ft, alpine meadow, much herbage, wet with flowing streams, granite outcrops, N slopes of knoll, with *Tortula ruralis*, *Eckel 9308102* (BUF); (as fo. *macounii*) 9300 ft, *Hermann 25299* (RM). Johnson Co.: *Eckel 24586*; T52N, R 84 Sec. 25, 5600–6000 ft, *Odasz 1264* (RM). Lincoln Co.: 6700 ft, *Hermann 25601* (RM). Park Co.: 6500 ft, *Hermann 20032 1/2* (RM); Beartooth Plateau, Cooke City to Red Lodge Hwy, granitic ridges with *Picea* and *Pinus flexilis*, vicinity of Long Lake and lower Shepherder Lakes, 2900 m, on rock outcrops, 20 Aug 1973 *Weber B-44240* (RM, COLO); 7500 ft, *Hermann 20054* (RM); dry, shaded rock under open canopy of Douglas fir, at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1795* (MO); T55N R104W, sec 5,6,7, 5600–6000 feet; *Hartman 20603 a & b*, with *O. hallii* and *O. rupestre* (RM). Sheridan Co.: 5400–6000 ft, *Hartman 9402* (RM, BUF); T 56 N, R 90 W, Sec. 31 & 32, 8800–8700 ft, Big Horn Mountains, *Odasz no .866*; Big Horn Mts., T57N R 87W S29; Freezeout Stock Trail, Sec. 29 & 30, E exposure on limestone and chugwater redbeds, mostly open with a few groves of *Pinus ponderosa*; 5400–6800 ft; 5400 ft, 7 Aug 1979, *Hartman 10814* (RM). Sublette Co.: 10,300 ft, *Rolston 86024*, as fo. *macounii* (CSU); 7950 ft, *Hermann 25322* (RM). Teton Co.: (as fo. *macounii*) 7000 ft, *Hermann 25551* (RM); Teton Natl Park, between Jenny Lake and Lake Solitude, granite, vertical, 7000–7800 ft, 14 Aug 1953, *Welch 16239* (MO). Yellowstone Natl Park: on the vertical face of a great shaded rock, Druid Peak, 12 Jul 1899, *Nelson & Nelson 5791*, capsules

dehisced & old, exsiccat Plants of Yellowstone Natl. Park det. Holz. (RM); on rock at Lower Falls—Yellowstone Falls, 21 Aug 1938, *Bartley & Pontious* 8 (RM) ; W of Bear Tooth Butte, along Clark Fork of Yellowstone River, 6940 ft, 22 Aug 1953, *Lawton* 1997 (MO).



Courtesy FNA Association, FNA 28, 2014

This species is rather a distinctive *Orthotrichum*, with its thick-walled nodose basal cells, recurved margins, long-exserted unribbed capsules. The epithet refers to a capsule that is not ribbed when dry, as is usual in the genus, but essentially smooth. The character most emphasized to separate this species from *O. rupestre* is the length of the seta: for *O. laevigatum*, the capsule is plainly exserted, the seta 2–5 mm long usually longer than the exserted capsule. The stems are relatively shorter (1–4 cm long). The capsules are smooth or slightly plicate distally; exothecial cells homogeneous, rarely slightly ribbed just below the mouth. Exothecial cells not much differentiated among the ribs. The calyptrae can be more copiously pilose than as illustrated here.

In *O. rupestre* the capsule is immersed to emergent, the seta is usually less than 2 mm long (0.8–1.2 mm: less than the length of the capsule), the stems are quite a bit larger (3–8 mm long), the seta usually less than 1 mm long. Note that *O. rupestre* is very variable, sometimes the capsule length is hard to see because the neck and the tip of the seta cannot be distinguished. The capsule is slightly or distinctly 8-ribbed 1/2–2/3 the length and ranges from nearly smooth to distinctly ribbed throughout, or ribbed only in the upper part when dry; the exothecial cells are often differentiated among the ribs. Both these species often grow with *O. hallii*, q.v., a species with 2(–3)-stratose

leaves. *Orthotrichum anomalum* also has exerted sometimes smooth capsules, but its stomata are immersed and the basal leaf cells are rectangular and not nodulose.

Orthotrichum pylaisii is very similar to *O. laevigatum*: see discussion under the former species. The erect peristome teeth of *O. laevigatum* will separate this species from the strongly reflexed teeth of *O. pylaisii*. The long-decurrent, often excavate nature of the alar cells of both these species, and the red to orange coloration at the insertion occurs in both these species.

A specimen of *Orthotrichum laevigatum* from Sheridan Co. (Odasz 1133 Big Horn Mtns.) was strikingly similar to the description of *O. macounii* Aust. as described and figured by Flowers (1973): rather than the bluntly acute or obtuse leaf apex typical of *O. laevigatum*, the apices of all the cauline leaves were long acuminate to a slender, hair-like tip. The capsules were long and very smooth, the plants strongly yellow. *Orthotrichum macounii* intergrades with *O. laevigatum* so extensively that the former is synonymized with the latter.

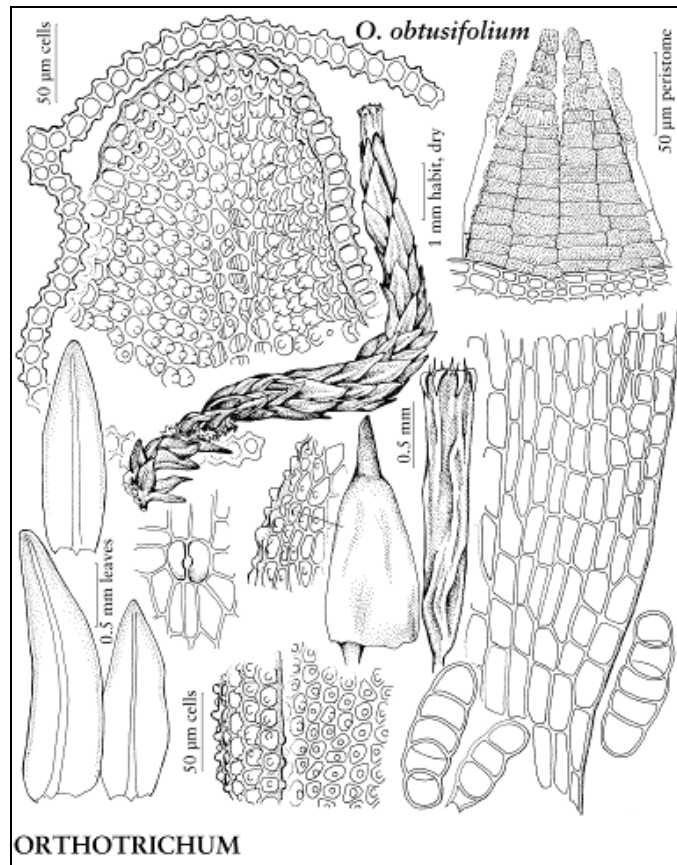
Orthotrichum obtusifolium Brid., Muscol. Recent. 2(2): 23. 1801.

Nyholmiella obtusifolia (Brid.) Holmen & E. Warncke

Orthotrichum inflexum Müll. Hal.

Wyoming; “*Orthotrichum obtusifolium* is a pronounced xerophyte growing only in pioneer situations” (Vitt, FNA Vol. 28, 2014).

Crook Co.: Black Hills: 6.4 km NNE of Warrens Peaks, along Beaver Creek, deciduous woods along creek, moss shaded trunk of *Acer negundo*, 21 May 1977, Churchill 8739 (MO).



Courtesy FNA Association, FNA 28, 2014

Orthotrichum pellucidum Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 23: 549. 1867.

Orthotrichum cupulatum var. *jamesianum* (James) Lawton

Orthotrichum jamesianum James

Wyoming (FNA, Vol. 28, 2014). (As *Orthotrichum cupulatum* var. *jamesianum* (Sull.) comb. Nov (Lawton). Teton Natl Forest, Snake River, Red Canyon, *Ellison 943-3* (UT), Vitt (1973). Teton Natl. For., Snake Riv., Red Canyon, *Ellison 943-3* (UT), Vitt (1973).

Albany Co.: Laramie Mtns., Roger Canyon, ca. 8 air mi NE of Laramie, 2400 m, limestone outcrops with *Cercocarpus montanus*, 7 Jun 1993, *Buck 23165*, capsules old, some with calyptrae (NY). Fremont Co.: 7800 ft, *Hermann 25532* (RM); Shoshone Natl Forest in Wind River Mns., along Hwy 131 SW of Lander, between Sink State Park and Frye Lake 8.4 km NE of Frye Lake, 2260 m, on large, pitted, dry limestone boulders in *Pinus contorta*-*P. flexilis*-*Pseudotsuga menziesii* forest, 5 Jun 1990, *Vitt & Hastings 35381* (MO). Park Co.: T55N, R 104 W Sec., 7, N, 6800-7000 ft, *Hartman 12594*; 6900-7800 ft, *Hartman 21047* (RM). Sheridan Co.: Moist limestone, vertical rock face, calcareous region, Big Horn Natl Forest, T57N, R89W Section 27, 16 Jun 1992, *McKee 92-017*, c.fr., calyptrate, immature capsules (BUF, RM).

Among the Sheridan Co. specimens there were occasionally 16-ribbed capsules (alternate ribs less conspicuous than the main ones and often appearing to be 8-ribbed). These capsules were correspondingly larger. The leafy stems are somewhat glaucous in appearance, the leaves rather broad throughout and oblong-lanceolate to ligulate with broad apices often incurved when dry like a little fist. The stomata are immersed and the cells of the capsule are thick-walled and colored on the ridges, thinner and nearly hyaline in the furrows. Shorter stems are so densely foliose as to appear rosulate. The papillae are large, bi-fid examples mixed with large single ones. The lamina is not supposed to be bistratose in streaks in this species as described for *O. cupulatum*.

Orthotrichum pellucidum grows on rocks (calcareous) and the stems are short (to 1 cm or shorter; however, *O. pallens* and *O. pumilum* are “less than 0.5 cm long” (Lawton 1973) and grow on bark. One handy difference is that the calyptra of *O. pellucidum* is rather conspicuously hairy, whereas that of *O. pallens* is not hairy and that of *O. pumilum* is not or sparsely hairy (Weber & Whittmann 2007).

The glaucous character of *Orthotrichum pellucidum* is not often distinct (the leaves can have a pruinose look, like the surface of a grape) and its thickness appears to be due to the coarseness of the papillae on the laminae.

[*Orthotrichum strangulatum* P. Beauv. has been reported from states W of the central states, but apparently without merit (Vitt, FNA Vol. 28, 2014). It is distinctive in the leaf margins multistratose (2-8 layers).]

Orthotrichum praemorsum Vent., Bot. Centralbl. 44: 418. 1890.

Orthotrichum affine ssp. *praemorsum* (Vent. in Roell) Kindb.

Orthotrichum arcticum var. *praemorsum* (Vent. in Roell) Wijk & Marg.

Orthotrichum idahense Card. & Thér.

Orthotrichum microblephare var. *praemorsum* (Vent. in Roell) Grout

Wyoming; “*Orthotrichum praemorsum* is rare, known only from a few collections” also from California, Nevada and Washington (Vitt, FNA Vol. 28, 2014). Lawton notes Idaho, Wyoming and Nevada (1971). Patria, Rocky Mountains: ad rupes Yellowstone Natl Park (Wyoming 1491) (Roell 1893). “*Orthotrichum praemorsum* Vent. on rocks in Yellowstone Natl. Park, Wyom.” (Roell 1893).

“The type collection of this species was taken from Yellowstone Natl Park by Roell in about 1890. No other collection is known,” Porter (1935). Yellowstone Natl Park, Porter (1937).

Yellowstone Natl Park: Yellowstone Falls, 7500 ft, 14 Aug 1897, *Rydberg & Bessey s.n.*, c.fr., old young middle (NY).

Vitt (1973) mentioned these specimens: Yellowstone Natl Park, near Cascades, Firehole River, *Flowers 3849* (UT, WTU). Vitt indicated this was endemic to the western U.S., “Probably restricted to the higher elevations in Pine forests.” It grows on rock in dry areas, whereas *O. affine*, close to it, grows “on trees in mesophytic areas.”

Orthotrichum pylaisii Brid., Bryol. Univ. 1: 722. 1826 (as *pylaisaei*)

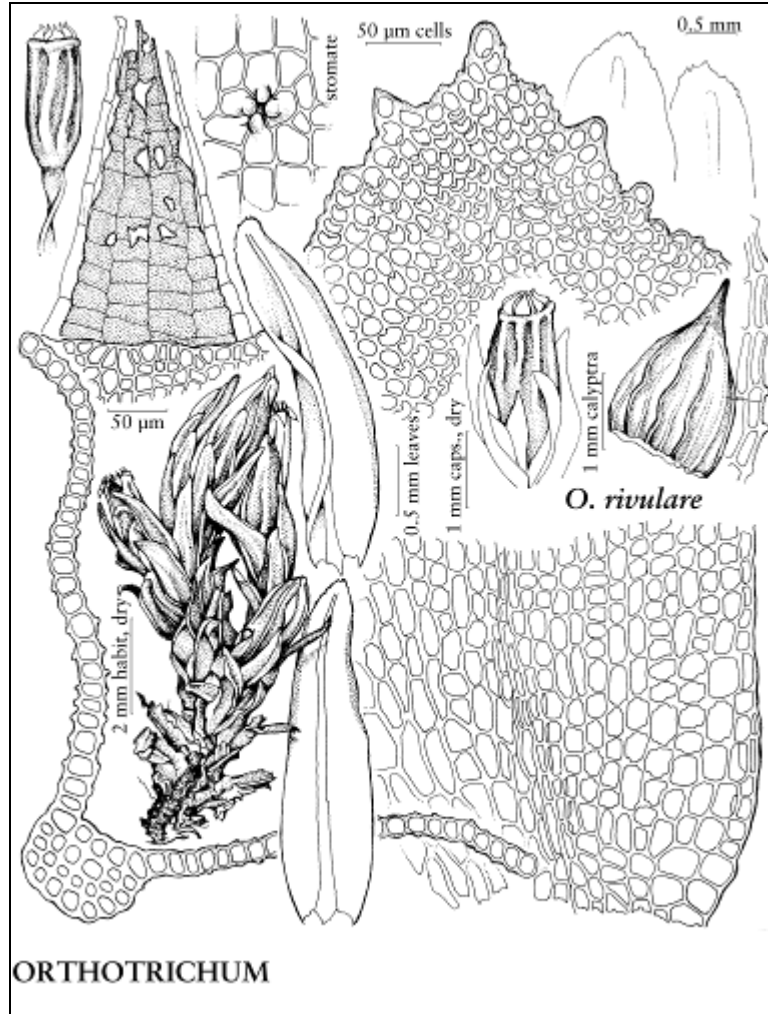
Orthotrichum arcticum Schimper
Orthotrichum arcticum subsp. *blyttii* (Schimp.) Kindb.
Orthotrichum arcticum var. *groenlandicum* (Berggren) Mönk.
Orthotrichum blyttii Schimper
Orthotrichum blyttii subsp. *arcticum* (Schimp.) Macoun
Orthotrichum blyttii var. *arcticum* (Schimp.) I. Hagen
Orthotrichum blyttii var. *groenlandicum* (Berggren) C.E.O. Jensen
Orthotrichum blyttii subsp. *microblephare* (Schimp.) Macoun
Orthotrichum blyttii var. *microblephare* (Schimp.) C.E.O. Jensen
Orthotrichum groenlandicum Berggren
Orthotrichum idahoense Card. & Thériot
Orthotrichum pylaisii subsp. *arcticum* (Schimp.) Kindb.
Orthotrichum pylaisii subsp. *groenlandicum* (Berggren) Kindb.
Orthotrichum pylaisii subsp. *microblephare* (Schimp.) Kindb.
Orthotrichum rhabdophorum Vent.

Wyoming (FNA, Vol. 28, 2014). Yellowstone Natl Park: *Rydberg & Bessey 1897* (NY), Vitt (1973). Vitt (1973): listed for Wyoming. Lawton (1971) does not mention this; see Vitt (1973: 77 ff.).

The capsules are commonly exserted, the top of the seta exposed. Stomata superficial, the basal cells nodose. The leaves of *Orthotrichum pylaisii* may be red at the insertion, with decurrencies, sometimes quite long, and moderately with excavate cells in the alar region. The basal cells are conspicuously nodose—a character most associated with superficial or phaneropore stomata in the capsules. Stomata in this species are located in a broad region mid-capsule. The 8 exostome teeth are so strongly reflexed as to appear glued to the outer mouth of the capsule where they split (hence becoming 16). The cells of the exothecium (capsule) are differentiated in rows to mid capsule (reflecting the ribbed condition). In *O. laevigatum* many of the exostome teeth are erect and the exothecial cells are not or little differentiated as the capsule is generally unribbed (smooth). Note, however, that the capsules of *O. laevigatum* are smooth, but often somewhat ribbed or plicate to strongly furrowed in the same collection.

Orthotrichum rivulare Turner, Muscol. Hibern. Spic., 96, plate 8. 1804.

Wyoming; “Exposed tree roots, base of trees along streams, siliceous boulders at edges of streams and rivers, frequently inundated rock, aquatic habitats; low to moderate elevations (0–1000 m)” (Vitt, FNA Vol. 28, 2014). Lawton (1971).



Courtesy FNA Association, FNA 28, 2014

Orthotrichum rupestre Schleicher ex Schwägr., Sp. Musc. Frond. Suppl. 1(2): 27, plate 53 (top). 1816.

Dorcadion rupestre (Schleicher ex Schwägr.) Lindb.

Orthotrichum bullatum Müll. Hal.

Orthotrichum californicum Vent.

Orthotrichum douglasii Duby

Orthotrichum macfaddenae R.S. Williams

Orthotrichum rupestre var. *globosum* (Lesq.) Grout

Orthotrichum rupestre var. *macfaddenae* (R.S. Williams) Grout

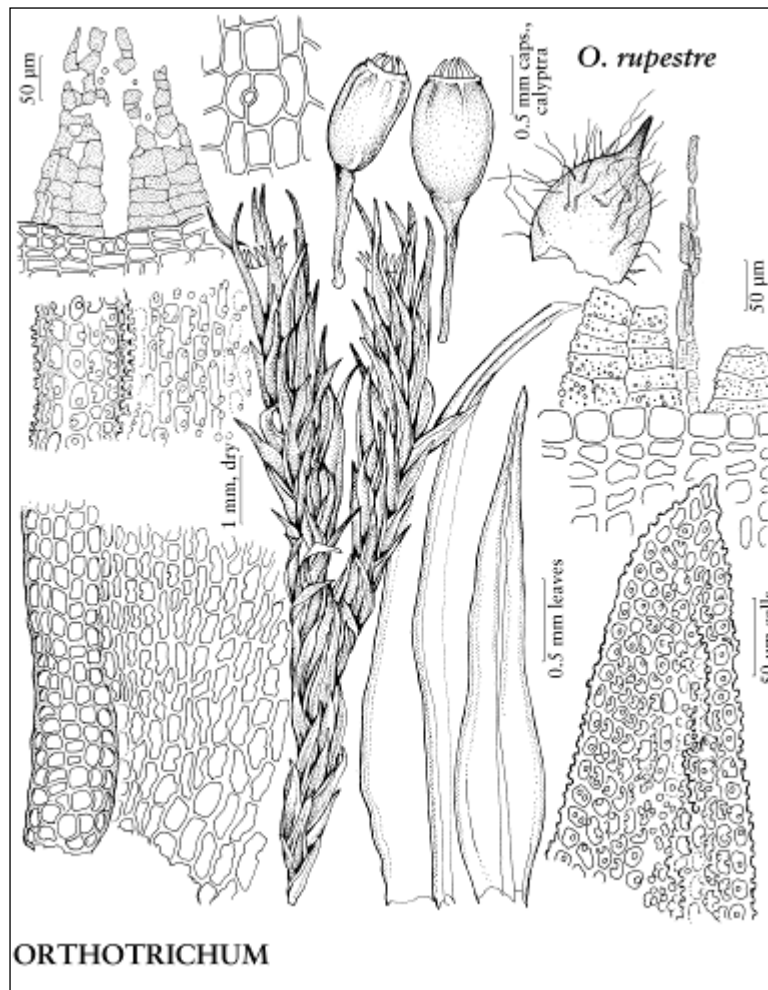
Orthotrichum texanum Sull. & Lesq.

Orthotrichum texanum var. *globosum* Lesq.

Wyoming (FNA, Vol. 28, 2014). Wyoming: Yellowstone Natl Park (1486, 1487, 1489) (Roell 1893). Albany, Carbon Cos., Yellowstone Natl Park. The var. *sturmii* (H. & H.) from Big Horn County, (Gooding 479), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: crevices in vertical face of granite bluff on Sand Lake Rd., 1.3 mi NW of Rte. 130, 8500 ft, 3 mi W of Centennial, 5 Aug 1962, *Hermann 17751* (RM); Medicine Bow Natl Forest,

Laramie Range, Blair Picnic Area, N of Interstate 80, 21 Aug 1987, *Crosby 15348A* (MO). Bighorn Co.: UTM 13 325004 E 4894900 N, on large boulder, lower end of large meadow, along East Tensleep Crk., ca. 1.7 air mi NE of Meadowlark Lake, Bighorn Natl Forest; 9018 ft (2749 m), 25 Aug 2005, *Lenz 2165* (MO). Carbon Co.: 14.8 km E of jct. of Hwys 230 and 130 on Hwy. 130 between Centennial and Saratoga, 41°21'N 106°32'W, 2350 m, on dry acidic rock outcrop in *Artemisia-Juniperus* scrub vegetation mixed with *Amelanchier* shrubs, 5 Jul 1990, *Vitt s.n.* (ALTA). Fremont Co.: Shoshone Natl Forest in Wind River Mts. along Hwy 131, SW of Lander, between Sinks Canyon State Park and Frye Lake; 10.0 km NE of Frye Lake, 2200 m, on vertical ledges of calcareous rock in seasonally wet stream and on dry outcrops near stream in *Pseudotsuga menziesii*—*Pinus contorta*—*Pinus flexilis* forest, 5 Jun 1990, *Vitt 35376* (MO); Shoshone Natl Forest in Wind River Mts. along Hwy 131, SW of Lander, between Sinks Canyon State Park and Frye Lake; just E of Northern Meadows Reservoir (W of Frye Lake), 2650 m, large boulder meadow with stunted *Populus tremuloides*, 5 Jun 1990, *Vitt 35390* (MO). Johnson Co.: Big Horn Natl Forest, Klondike Ranch Quadrant, (54) T49N R83W, Sec., 28, 6600 ft, rocks in *Aspen* grove, 20 Aug 1992, *Andrus s.n.* (BING, BUF). Park Co.: 6500 ft, *Hermann 20031* (RM); T55N R104W, sec 5,6,7 5600–6000 feet; *Hartman no 20603 a & b*, with *O. hallii* and *O. laevigatum* (RM). Sublette Co.: on granite, Bridger Natl Forest ca. 6.5 mi NE of Pinedale, 13 Sep 1977, *Allen 421*. Yellowstone Natl Park: just E of western jct. of Blacktail Deer loop road, Blacktail Deer Plateau, 2280 m,



Courtesy FNA Association, FNA 28, 2014

forming extensive mat on N side of 1.5 m high siliceous rock outcrop in open *Pseudotsuga menziesii* forest, *Tortula ruralis* and *Orthotrichum laevigatum* abundant on other rock surfaces, Vitt 27, Orthotrichaceae Boreali-Americanae Exsiccatae Fasciculus Nos. 21–30 1981 (label data misapplied to 30, *Macrocoma tenue* subsp. *sullivantii*, Christie, in sched.)

The leaf apex is a stumpy, broad acutation; frequently there is a broad leaf decurrency, and the basal angles are often excavate and thinner walled. The capsule is only emergent and still enclosed among the leaves to the middle of the capsule, the seta hidden in the leaves. *Orthotrichum laevigatum* and (*O. anomalum*) have completely exserted capsules with the seta evident.

Orthotrichum speciosum Nees in J. Sturm et al., *Deutschl. Fl.* 2 (17): 5. 1819.

Orthotrichum killiasii Müll. Hal.

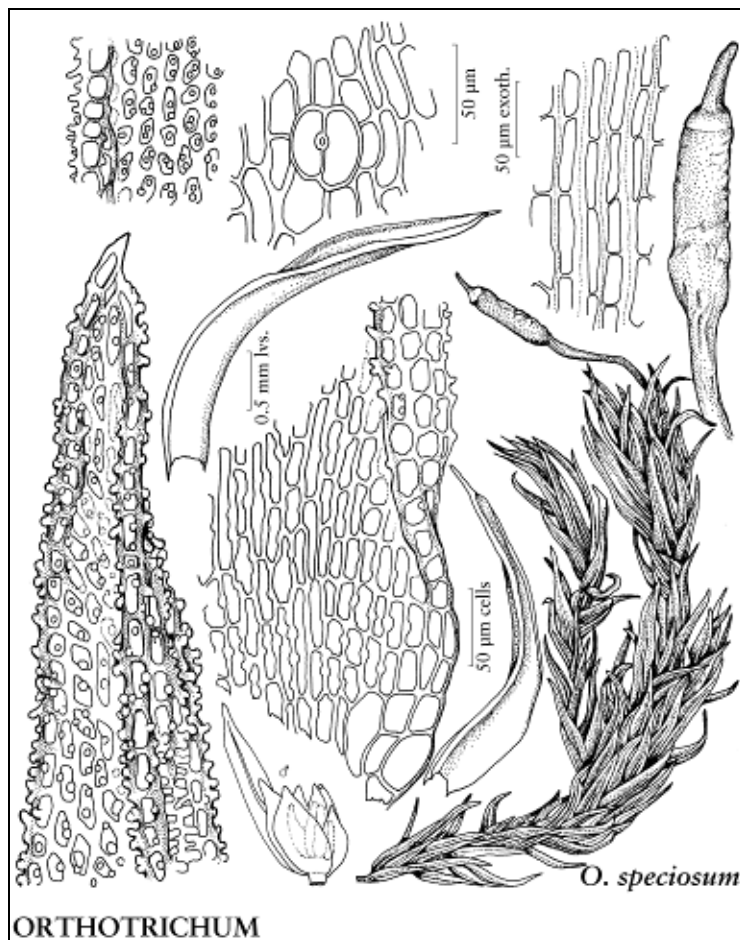
Orthotrichum speciosum subsp. *killiasii* (Müll. Hal.) Kindb.

Orthotrichum speciosum var. *killiasii* (Müll. Hal.) Vent.

Wyoming (FNA, Vol. 28, 2014). Albany Co. (*Porter 865*), (Yellowstone Natl Park), Porter (1935); Yellowstone Natl Park, Firehole River, *Chase 175* (NY), Vitt (1973).

Sublette Co.: 7950 ft, *Hermann 25324* “new to Wyoming” (RM).

The species is separated from *O. laevigatum* “by the presence of thick endostome segments, recurved exostome teeth, and lack of a preperistome,” Vitt (1973). It is “lightly ribbed, exserted capsules with eight recurved exostome teeth and eight stout, thick, endostome segments,” Vitt (1973).



Courtesy FNA Association, FNA 28, 2014

[*Orthotrichum urnigerum* Myr., excluded]

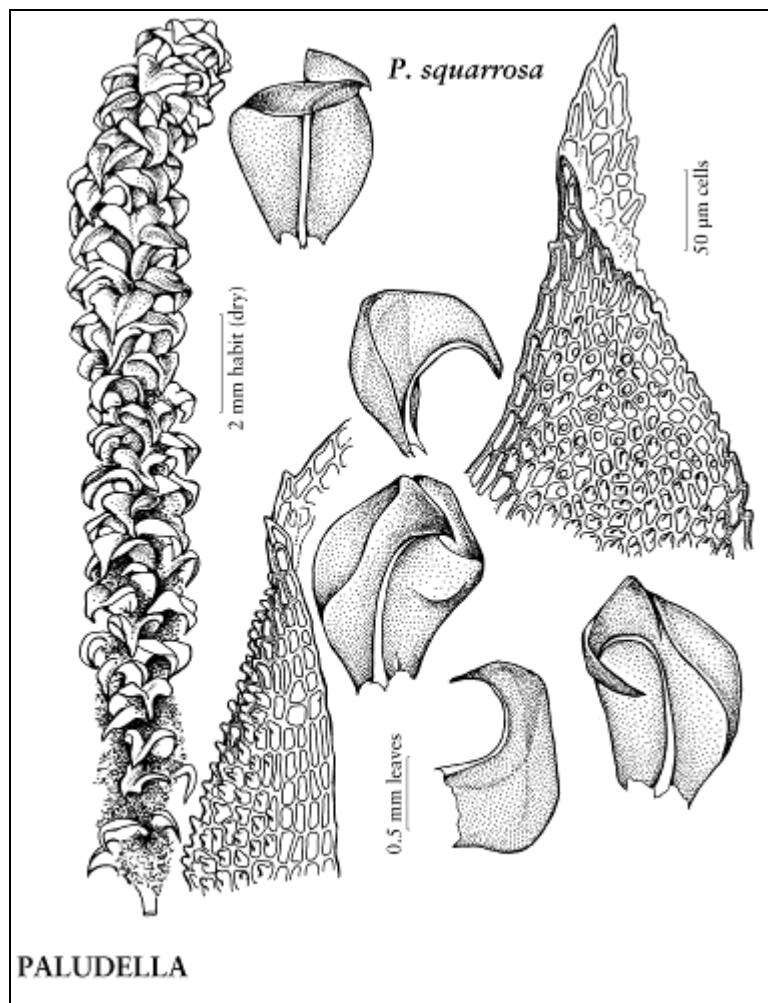
This species has been excluded from North America by Anderson et al. (1990), and it is not cited in FNA Vol. 28, 2014. Wyoming: Yellowstone Natl Park (1884), Roell (1893).

PALUDELLA Ehrhardt ex Brid., Muscol. Recent., suppl. 3: 72. 1817. (Meesiaceae)

Paludella squarrosa (Hedw.) Brid., Muscol. Recent., suppl. 3: 72. 1817.

Bryum squarrosus Hedw., Sp. Musc. Frond. 186, plate 44, figs. 6–11. 1801.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014). Lawton (1971) citation. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010). Johnson Co., in association with *Warnstorfia tundrae*, Lenz (2006).



Courtesy FNA Association, FNA 28, 2014

PALUSTRIELLA Ochyra, J. Hattori Bot. Lab. 67: 223, figs. 5, 6. 1989. (Amblystegiaceae)

Palustriella commutata (Brid.) Ochyra, in North America = *Palustriella falcata* (Brid.) Hedenäs, q.v.

Palustriella decipiens (De Not.) Ochyra, see *Palustriella falcata* (Brid.) Hedenäs

Palustriella falcata (Brid.) Hedenäs, Bryophyt. Biblioth. 44: 136. 1992.

Hypnum falcatum Brid., Muscol. Recent. 2(2): 63, plate 1, fig. 6. 1801.

Cratoneuron commutatum (Hedw.) Roth

Cratoneuron commutatum var. *falcatum* (Brid.) Mönk.

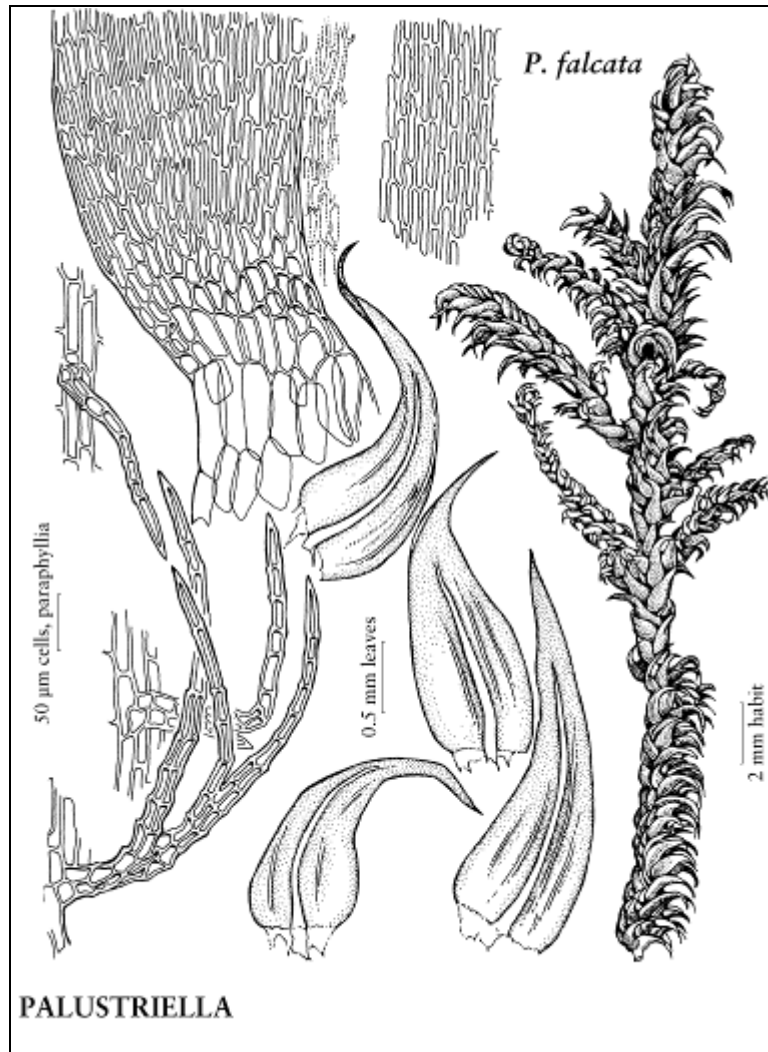
Cratoneuron commutatum var. *sulcatum* (Lindb.) Mönk.

Cratoneuron falcatum (Brid.) G. Roth

Cratoneuron falcatum var. *williamsii* (Grout) Flow.

Cratoneuron papillosum Grout

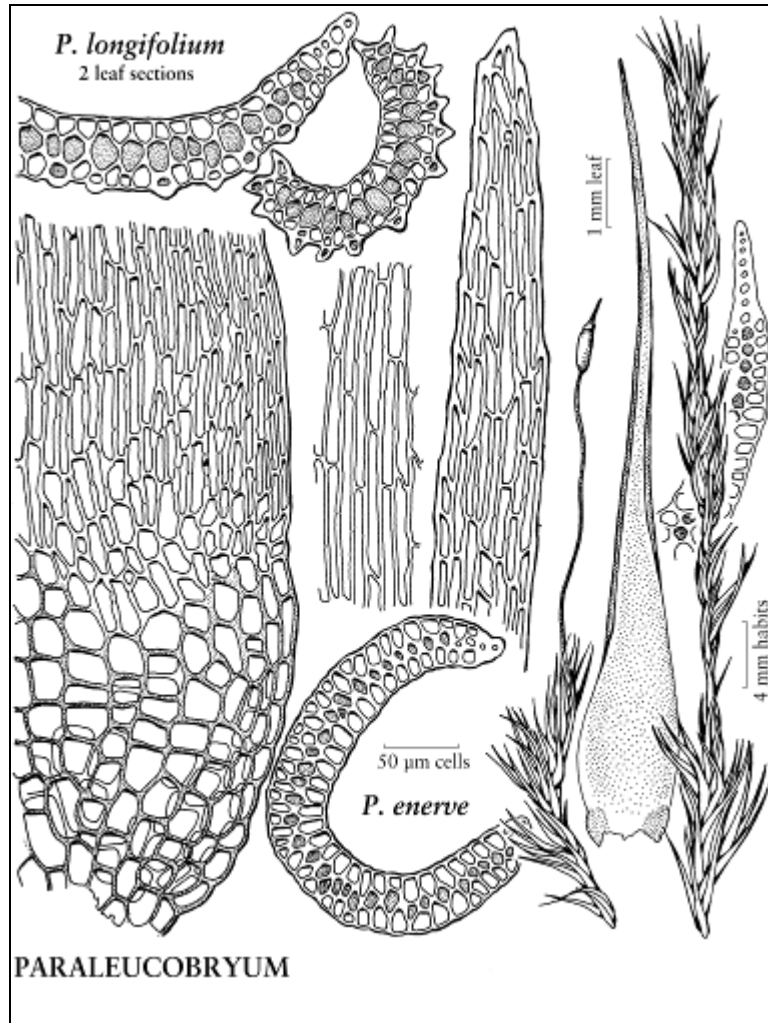
Cratoneuron williamsii Grout



Courtesy FNA Association, FNA 28, 2014

Wyoming; “*Palustriella falcata* is widespread in the northwest, less common in the northeast, and absent in northern-central and high-Arctic areas. The species has been misunderstood in North America; most specimens identified as *P. commutata* (Hedw.) Ochyra (synonym *Cratoneuron commutatum* (Hedw.) G. Roth), and the few *P. decipiens* (Notaris) Ochyra records, belong to this species” (Hedenäs, FNA Vol. 28, 2014). (As *Palustriella commutata*) Brooklyn Lake, Albany County (*Porter 1457*); Union Pass, Fremont County (*Nelson 1078*), Porter (1935). Albany, Fremont

cos., Porter (1937). Teton Co., Spence (1985). (As *Cratoneuron falcatum* (Brid.) Roth.) “Falls of Libby Creek,” Albany County (Porter 1375), Porter (1935). (As *Cratoneuron falcatum* (Brid.) Roth.) Albany Co., Porter (1937). (As *Palustriella falcate* and also *P. decipiens*) Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 27, 2007

(As *Palustriella commutata*) Park Co.: wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1937* (BUF). Park Co.: W end of Bear Tooth Lake, 20 Aug 1953, 1956, *Lawton s.n.* (WTU). Yellowstone Natl Park: (as *Hypnum aduncum* Hedw.) in a bog, Obsidian Creek, *Nelson & Nelson 6106*, exsiccata Plants of Yellowstone Natl. Park det. Holz. (the material was typical, numerous paraphyllia, strongly plicate leaves, falcate, leaves ovate-lanceolate, irregularly branching) (RM). Sublette Co.: 8000 ft, *C.L. & M. Porter 9682* (RM); Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake, 14 May 1989 *Andrus 7801a* (BING).

(As *Palustriella decipiens*) Albany Co.: streamlet in mountain meadow, boulder, 10,000 ft, *Hermann 17725* (RM). Park Co.: S slope of Bear Tooth Butte, 23 Aug 1953, *Lawton 2051*, c.fr. (WTU). Teton Co.: E of Teton Pass, 15 Aug 1953, *Lawton 1778* (WTU).

The basal laminal cells are papillose dorsally from the upper cell ends.

PARALEUCOBRYUM (Lindb. ex Limpr.) Loeske, Allg. Bot. Z. Syst. 13: 162. 1907. (Dicranaceae)
Dicranum subgen. *Paraleucobryum* Lindb. ex Limpr. in G. L. Rabenhorst et al., Krypt.-Fl. ed. 2, 4(1): 373. 1886.

Paraleucobryum enerve (Thed.) Loeske, Hedwigia 47: 171. 1908.
Dicranum enerve Thed. in C. J. Hartman, Handb. Skand. Fl. ed. 5, 393. 1849.
Dicranum albicans B.S.G.

Wyoming (FNA, Vol. 27, 2007). Usually in arctic or alpine regions. British Columbia, Alberta, Montana: Alaska, Colorado. Park Co., with *Pogonatum urnigerum* (Kosovich-Anderson 2011b). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: alpine bog, 3250 m, *Weber B-44256* (COLO, RM).

PHILONOTIS Brid., Bryol. Univ. 2: 15, plate 6, fig. 5. 1827. (Bartramiaceae)
Bartramidula P. Bruch & W.P. Schimper

The species in the genus in Wyoming apparently represent one polymorphic species. The names seem to correspond to stages in the lengthening of the stem: early stages are *Philonotis fontana* var. *pumila*. A subsequent stage may be var. *heterophylla*. *Philonotis americana* var. *torquata* looks like *P. fontana* var. *falcata* or intergrade depending on the degree of ranking of the leaves in the mid-section of the stem. In the end one might want to re-analyze the *Philonotis* specimens from RM with the aid of illustrations.

Philonotis caespitosa Jur. = *Philonotis fontana* (Hedw.) Brid.

Philonotis fontana (Hedw.) Brid., Bryol. Univ. 2: 18. 1827.
Mnium fontanum Hedw., Sp. Musc. Frond. 195. 1801.

Var. fontana

Philonotis caespitosa Jur.
Philonotis fontana var. *caespitosa* (Jur.) Limpr.
Philonotis fontana var. *falcata* (Hook.) Brid.
Philonotis fontana var. *heterophylla* Dismier

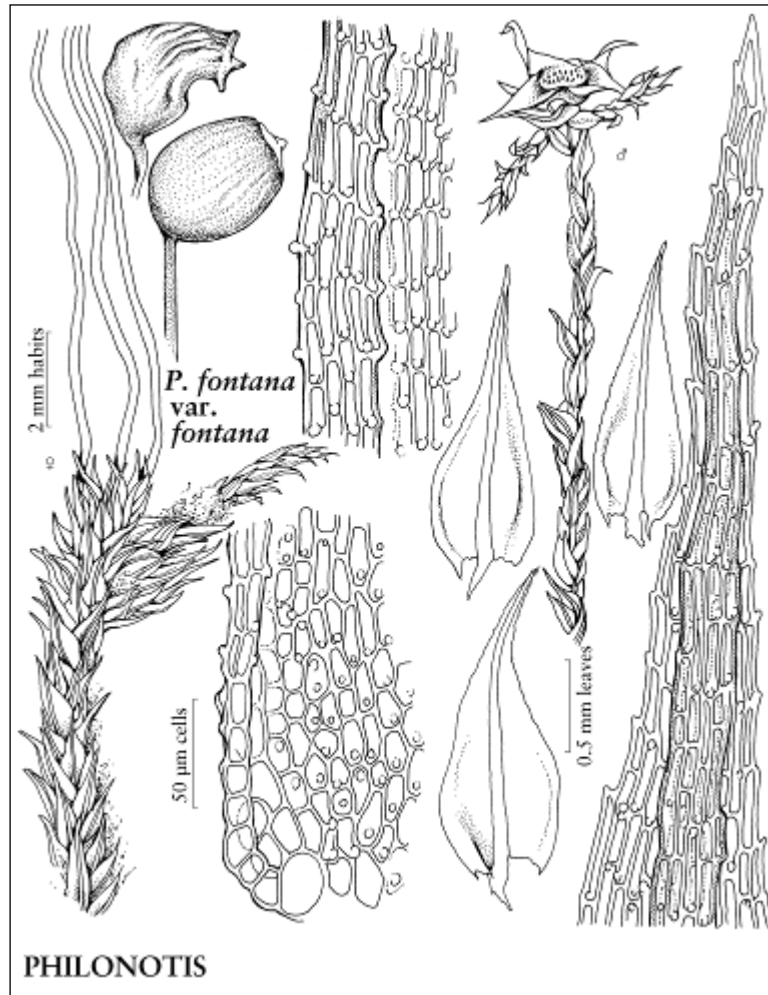
Wyoming (FNA, Vol. 28, 2014). (As *Philonotis fontana*) Wyoming: Yellowstone Natl Park (1495, 1497, 1503) (Roell 1893). Albany, Carbon, Sheridan, Teton cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: La Plata Mines, *Nelson 1800* (RM). Carbon Co.: 9500 ft, *Hermann 17179* (RM). Sheridan Co.: 8400 ft, *B.E. Nelson 4318* (RM, BUF); Dome Lake, 16 Jul 1896, *Nelson 8826*, in packet of *Bryum (Rosulabryum) capillare*, with *Drepanocladus uncinatus* (RM). Sublette Co.: Bridger Wilderness, Wind River Range 2., Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at south end of lake with *Climacium americanum*, *Bryum pseudotriquetrum*, 14 May 1989, *Andrus 7789* (BING).

(As var. *caespitosa* (Jur.) Schimp.) Montana; Minnesota, Ontario; Quebec, New England.

(As var. *caespitosa* (Jur.) Schimp.) Albany Co.: steep, wet, peaty bank of inlet, Towner Lake, 10,000 ft, Medicine Bow Mts., 9 mi W of Centennial, 5 Aug 1962, *Hermann 17768 1/2* (RM). Park Co.: wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1731* (BUF).

(as var. *falcata* (Hook.) Brid.) Albany Co.: Centennial Valley, 18 Aug 1895, *Nelson 1756*, c.fr. (RM). Yellowstone Natl Park: on the steep slopes near the river, Lewis River, *Nelson 6381* (changed from 6391) (RM).



Courtesy FNA Association, FNA 28, 2014

Var. **americana** (Dismier) Flowers ex H.A. Crum, *Bryologist* 72: 244. 1969.

Philonotis americana Dismier, *Mém. Soc. Bot. France* 17: 35. 1910.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014). (As *Philonotis americana* (Dism.) Dism. var. *americana*: Lawton.)

Albany Co.: Sherman & Buford, spring bog, *Macbride 2548* (RM). Carbon Co.: Sierra Madre Mtns, along Haggarty Creek, 9680 ft, in wet meadow by creek, 11 Jul 1991, *Kastning-Culp*

3073, c. young fr., teratological (double capsules) (BUF, RM). Park Co.: pond edge, 7500 ft, *Hermann 20047*, this specimen corresponds nicely with Lawton's illustrations for *P. americana* var. *torquata* (Ren. & Geh.) Flow. in Grout, the leaves are distant on the stem (RM)). Washakie Co.: Big Horn Mtns., ca. 33.5 air mi SE of Tensleep, 14.5 mi SSE Big Trails along Cherry Creek, , 7400 ft, 10 Jul 1979, *B. Nelson 3445*, c.fr., operculate (BUF, RM). Yellowstone Natl Park: *Nelson & Nelson 6062* (det. Holtzinger) (RM).

var. **pumila** (Turner) Brid., Bryol. Univ. 2: 20. 1827

Bartramia fontana var. *pumila* Turner, Muscol. Hibern. Spic., 107, plate 10, fig. 1. 1804.

Wyoming (FNA, Vol. 28, 2014).

Big Horn Co.: Big Horn Natl Forest, Lake Solitude Quadrant. T50N R87W, Sec. 12, 9600 ft, marshy area just W of Lily Lake, 5 Aug 1992. *Zacharkevics s.n.*, plus *Drepanocladus aduncus* var. *kneifiii* (BING, BUF, RM). Fremont Co.: 8400 ft, Absaroka Range, *Hermann 25506* (RM). Lincoln Co.: Salt River Range, 6400 ft, *Hermann 25586* (RM). Park Co.: 3250 m, *Weber B-44262* (COLO, RM). Sheridan Co.: Wolf Creek, 12 Jul 1896, *Nelson 2317*, c.fr. (RM). Yellowstone Natl Park: *Porter 1675* (RM).

This variety is characterized by the long excurrent costa. “Pumilus” implies a dwarfed or shortened aspect. These specimens are very robust in general, at least as large as the typical variety. Note Crum and Anderson (1981: 655) write they saw a specimen from Wyoming.

Var. **heterophylla** Dismier, hom. illeg.

Park Co.: 10,000 ft, tundra, *Hermann 20074* (RM). Yellowstone Natl Park: Exsiccata, in a springy bog, Obsidian Creek, 24 Jul 1899, *Nelson & Nelson 6110* (RM). Holzinger identified this specimen as var. *alpina*, apparently without noticing the dimorphous leaves.

Leaves dimorphic, the lower ones typical, the upper ones shorter with margins plane or revolute only at the base; leaf cells short—Lawton (1971: 212).

Philonotis marchica (Hedw.) Brid., Bryol. Univ. 2: 23. 1827.

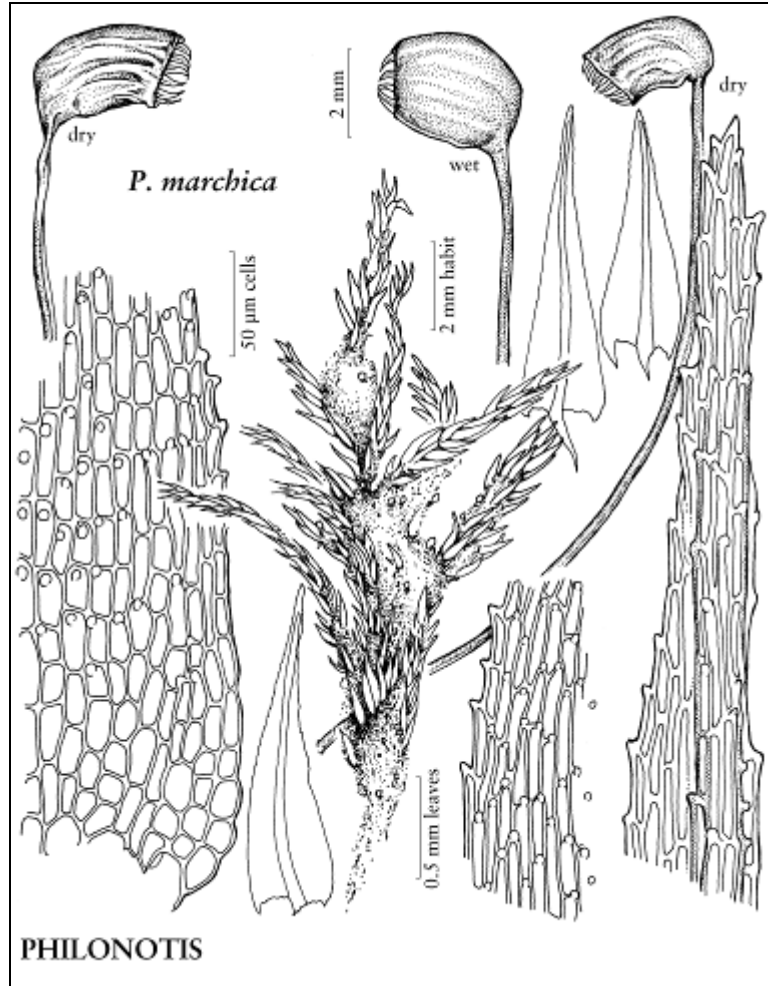
Mnium marchicum Hedw., Sp. Musc. Frond. 196. 1801.

Philonotis muehlenbergii (Schwägr.) Brid.

Wyoming (FNA, Vol. 28, 2014). (As *Philonotis muehlenbergii*) Wyoming: Yellowstone Natl Park (1552) (Roell 1893). (As *Philonotis mohriana* Lesqu. & James) Battle Lake Mountain, Carbon County (*Nelson 4202*, in part.) Not in Anderson et al. (1990) checklist; no reference in FNA Vol. 28, 2014). However, *Philonotis Mohriana* (Müll. Hal.) A. Jaeg. (basonym *Bartramia mohriana* Müll. Hal. = *Breutelia mohriana* (Müll. Hal.) Broth.

Philonotis yezoana Besch. & Card., Bull. Soc. Bot. Genève, sér. 2, 1: 123. 1909.

Not reported for Wyoming in FNA Vol. 28, 2014; “Plants of *Philonotis yezoana* are easily recognized by their dark green color and centrally papillose laminal cells” (Griffin, FNA Vol. 28, 2014.) However, the species has been reported in a paper by Kosovich-Anderson & Weber in 2011. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Park Co.: SNF, Beartooth Plateau, Lake Creek: rapids, overlook “Lake Creek Waterfall,” 50 m N of HWY 212, sheltered granite outcrops lining the waterfall, under the steep bank forested by *Pseudotsuga menziesii*, *Pinus contorta*, and *Picea* sp., on thin wet soil covering an outcrop’s surface, shaded by spruce, in splash zone of the waterfall, 44°55.485–490’N, 109°41.670–675’ W, 2280 m, 26 Aug 2009, *Kosovich-Anderson 5850* (COLO, DUKE); also steep rocky bank forested with *Picea* sp., over rock on a patch of soil, in splash zone of creek, 44°55.350–355’ N, 109°42.430–435’W, 2100 m, 5 Aug 2010, *Kosovich-Anderson 8397* (no herbarium given), “the irregularly subquadrate and rectangular leaf cells with single massive central papillae on both surfaces, along with the dark green color, make the species easy to recognize,” *Kosovich-Anderson & Weber* (2011).

PHYSCOMITRIUM (Brid.) Brid., *Bryol. Univ.* 2: 815. 1827. (Funariaceae)

Gymnostomum subg. *Physcomitrium* Brid., *Bryol. Univ.* 1: 97. 1826.

Physcomitrium hookeri Hampe, *Icon. Musc.*, 30. 1844.

Gymnostomum latifolium Hook. in *Drumm.*, *Musci Amer.*, *Brit. N. Amer.*, 16. 1828 not Brid.

Physcomitrium coloradense Britt.

Physcomitrium hians Lindb.

Physcomitrium latifolium (Hook.) Lindb.

Wyoming (FNA, Vol. 27, 2007). Montana, Wyoming; Utah; Manitoba, N. Dakota, Kansas, Minnesota, Iowa, Nebraska, Wisconsin. (As *Physcomitrium coloradense* E. G. Britton) “A rare plant, collected but once. Stream bank, Millbrook.” Albany County (*Porter 602*), Porter 193. (= *P. hookeri* Hamp. fide Crum & And. Bryologist 58: 10. 1955.) Campbell Co., Medina (1994).

Albany Co.: Millbrook, on soil, along a stream bank, 7600 ft, 20 May 1930, *Porter 602*, c.fr., det. Grout as *P. coloradense* (TENN). Crook Co.: near Hulett, on soil, *Ownbey 556a*, Porter det. as *P. turbinatum*: “a form with some entire leaves, and costa somewhat excurrent!” but note huge revoluble annulus (TENN).

Physcomitrium pyriforme (Hedw.) Hampe, Linnaea 11: 80. 1837 1801.

Gymnostomum pyriforme Hedw., Sp. Musc. Frond., 38. 1801.

Physcomitrium californicum E. Britt.

Physcomitrium drummondii E. Britt.

Physcomitrium kellermanii E. Britt.

Physcomitrium megalocarpum Kindb.

Physcomitrium pygmaeum James

Physcomitrium turbinatum (Michx.) E. Britt.

Wyoming (FNA 28, 2014). (As *Physcomitrium turbinatum* (Michx.) Brid). Crook Co., Porter (1937) (hom. illeg. = *P. pyriforme* (Hedw.) Hamp. fid. Crum and Anderson, Bryologist 58: 5. 1955.)

The Porter citation from Crook County may be Marion Ownbey's specimen which is *P. hookeri*. See discussion above. This species does not occur in the Pacific Northwest. Flowers (1973: 311) includes it in Utah “from Manitoba to Utah and Texas.” Crum and Anderson (1981) also speculated that the species does not occur W of the Great Plains.

PLAGIOBRYOIDES J.R. Spence, Phytologia 87: 24. 2005. (Bryaceae)

Plagiobryoides vinosula (Card.) J.R. Spence, Phytologia 91: 499. 2009.

Brachymenium vinosulum Card., Rev. Bryol. 38: 6. 1911.

Wyoming (FNA 28, 2014). (As *Brachymenium vinosulum*) Hot Springs, Thermopolis, Hot Springs State Park, E bank of the Big Horn River, Rainbow Terraces, on vertical surface of the terrace, washed with geothermal waters, 43°39' N, 108° 11'W, 4330 ft, (1320m), 28 Sep, 2003 Kosovich-Anderson, N 81 (RM,COLO,ASC), not seen. See Kosovich-Anderson and Spence (2008).

PLAGIOBRYUM Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 19: 606. 1863. (Bryaceae)

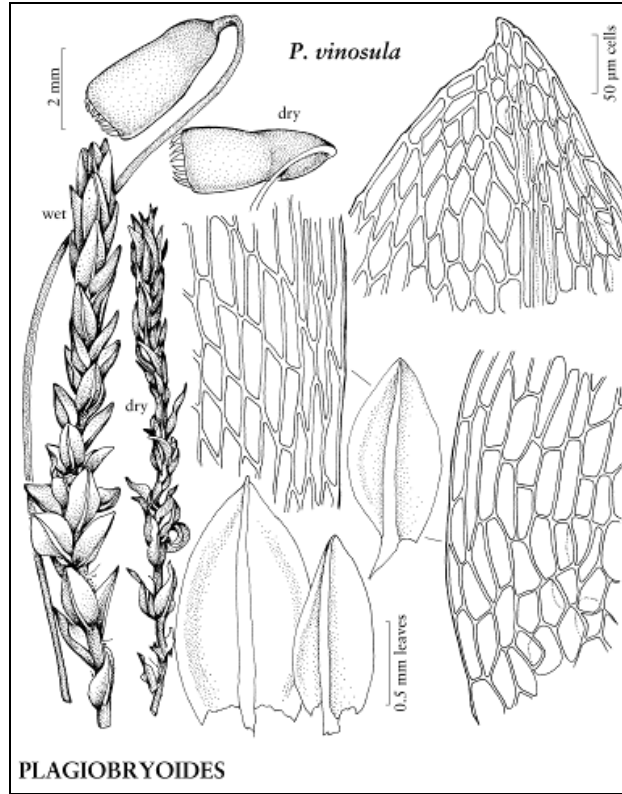
Zieria Schimper, Coroll. Bryol. Eur., 68. 1856, not Smith 1798.

Plagiobryum zieri (Dickson ex Hedw.) Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 19: 606. 1863.

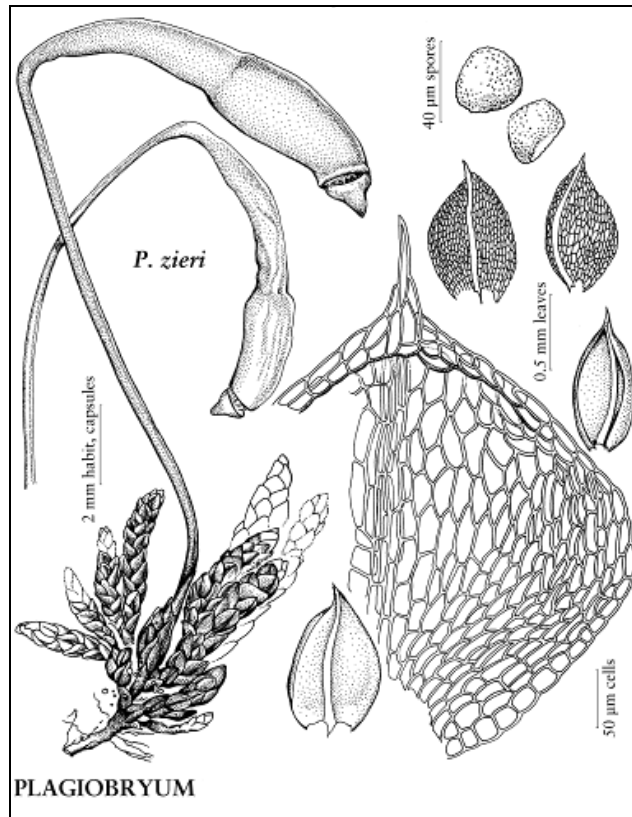
Bryum zieri Hedw., Sp. Musc. Frond. 182, plate 44, figs. 1–5. 1801.

Pohlia zieri (Hedw.) Schwägr.

Wyoming (FNA, Vol. 28, 2014). “... the species is probably relictual in the Rocky Mountains south of the glacial maximum and presumably reached its current distribution during the Pleistocene. Populations south of the glacial ice sheets in the Rockies survived in refugia such as Colorado and expanded north during the Holocene” (Spence in Kosovich-Anderson & Weber 2011).



Courtesy FNA Association, FNA 28, 2014



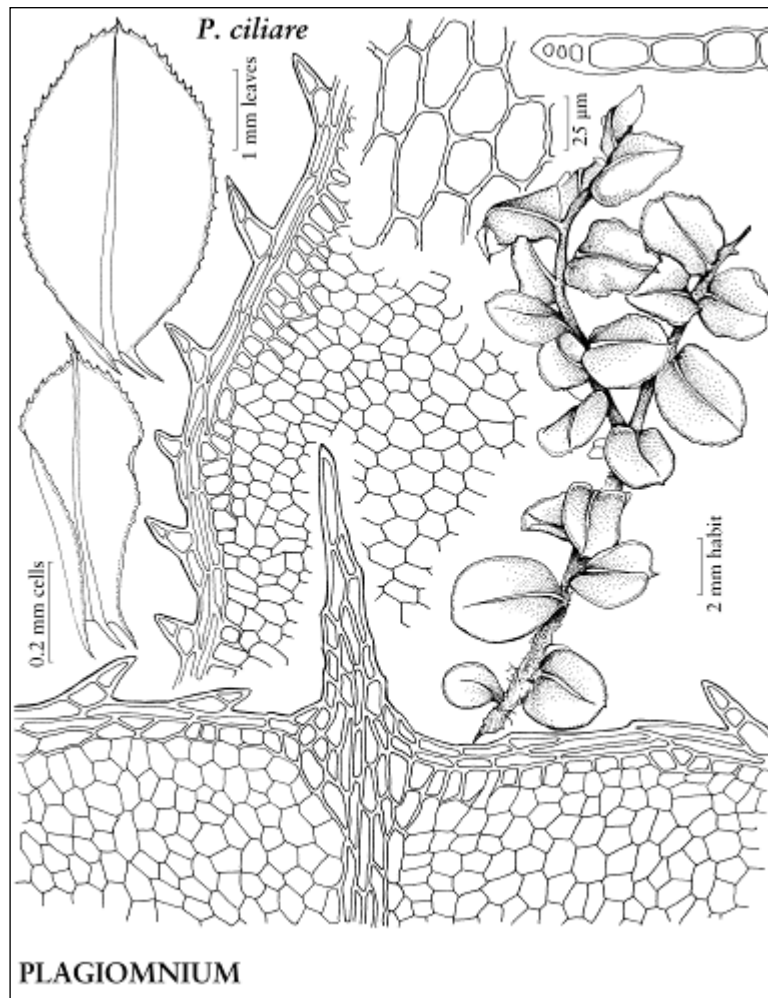
Courtesy FNA Association, FNA 28, 2014

Park Co.: SNF, foothills of the Beartooth Plateau, Clarks Fork of Yellowstone River, immediately SE of junction of Muddy Creek and Clarks Fork of Yellowstone River, gravel shore of Clarks Fork, massive granite boulders along the shore in seasonal splash zone, on wet clayey substrate in a rock crevice, 44°53.965–970'N, 109°40.310–315'W, 2000 m, 26 Aug 2009, *Kosovich-Anderson 5951* (ASC, COLO) “Det. by J. Spence”; also ca. 0.05 mi N-NE of Clarks Fork of Yellowstone River and Crazy Creek confluence, cataracts of Crazy Creek, seeping granite cliff, on a soaked humus soil, in shade, scattered among other bryophytes, 44°56.600–620'N, 109°46.555–565'W, ca. 6900 ft, (2100 m), 3 Aug 2010, *Kosovich-Anderson 7972* (without herbarium designation) (Kosovich-Anderson & Weber 2011).

PLAGIOMNIUM T. Kop., Ann. Bot. Fenn. 5: 145, figs. 14, 15, 20, 31, 32, 35, 36, 41, 43, 47, 60, 69, 78, 81, 98, 100. 1968. (Mniaceae)

[*Plagiomnium affine* (Bland. ex Funck) T. Kop. (*Mnium affine*, Porter 1935) = *Mnium affine* Bland. ex Funck]

Excluded from the North American flora by Anderson et al. (1990). Not reported for the flora of North America in FNA (FNA, Vol. 28, 2014). Wyoming: Yellowstone Natl Park (*1521*) (Roell 1893).



Courtesy FNA Association, FNA 28, 2014

Plagiomnium ciliare (Müll. Hal.) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.

Mnium affine var. *ciliare* Müll. Hal., Syn. Musc. Frond. 1: 159. 1848, based on *Bryum ciliare* Grev., Ann. Lyceum Nat. Hist. New York 1: 273, plate 23 (upper left). 1825, not Dickson 1801.

Mnium ciliare (Müll. Hal.) Schimp.

Plagiomnium ciliare (Müll. Hal.) T. Kop.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014).

Albany Co.: Antelope Basin, on wet banks of the stream, *Nelson 7500*, Plants of Wyoming exs. det. Holz. (female plants) (RM). Carbon Co.: 8500 ft, *Porter & Porter 9714* (female plants) (RM).

The leaf cells are thick walled and porose, the leaves long decurrent on fertile stems, “not or slightly decurrent on sterile stems,” Lawton 1971).

Plagiomnium cuspidatum (Hedw.) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.

Mnium cuspidatum Hedw., Sp. Musc. Frond. 192, plate 45, figs. 5–8. 1801.

Mnium cuspidatum var. *tenellum* Kindb. in Macoun & Kindb.

Wyoming (FNA, Vol. 28, 2014). Rogers Canyon, Albany Co. (*Porter 768a*); Little Goose Creek, Sheridan Co. (*Nelson 2366 & 2376*), Porter (1935). (As *Plagiomnium cuspidatum* (Hedw.) T. Kop.) Teton Co., Spence (1985). (As *Mnium cuspidatum* var. *tenellum* Kindb.) Laramie Mts., Albany County, *Nelson 4308*, Porter (1935).

Albany Co. (Laramie Hills), *Nelson 1898, 4308* (RM); 6 Aug 1934, *Porter s.n.* (RM). Crook Co.: Devil’s Tower Natl Monument; 4050 ft, *1698* (RM). Park Co.: 7500 ft, *Hermann 20046* (RM).

Plagiomnium drummondii (P. Bruch & W.P. Schimper) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.

Mnium drummondii P. Bruch & W.P. Schimper, London J. Bot. 2: 669. 1843 (as *drummondii*)

Plagiomnium drummondii (P. Bruch & W.P. Schimper) Kop.

Not noted for Wyoming in FNA (FNA, Vol. 28, 2014). Northern affinities (B.C. to Nova Scotia and S to Washington, Montana, Minn., Mich., New York, reported from Penn., W. Va., and Maryland (see Crum & Anderson 1981).

Sheridan Co.: Jul 16 1896, *Nelson 2366* (RM).

Plagiomnium ellipticum (Brid.) T. Kop., Ann. Bot. Fenn. 8: 367. 1971.

Mnium ellipticum Brid., Muscol. Recent., suppl. 3: 53. 1817.

Mnium affine Bland. ex Funck, sensu lato, excluded from N. Amer. by Crum et al. (1973).

Mnium affine var. *rugicum* (Laur.) B.S.G.

Mnium affine var. *rugicum* (Laur.) P. Bruch & W.P. Schimper

Mnium rugicum Laur.

Plagiomnium rugicum (Laur.) Kop.

Wyoming (FNA, Vol. 28, 2014). In all states and provinces of the Pacific Northwest; Alaska, Yuk., Cal.; in the midW and in E. N. America from Labrador and Quebec to Penn.) (As *Mnium affine* Bland.) Albany, Big Horn Cos., Yellowstone Natl Park, Porter (1935). (As *Mnium affine* var. *rugicum* (Laur.) B.S.G. Park Co.: *Plagiomnium ellipticum* was reported growing with *Polytrichum juniperinum*, *Sarmentypnum exannulatum*, *S. sarmentosum* and *Sanionia nivalis* (Kosovich-Anderson & Weber 2011). Teton Co.: Camp Davis, Willow Creek 1942 Wehmeyer 3014 (MICH) (Koponen 1971). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *P. ellipticum*) Albany Co.: Medicine Bow Mts., 8000 ft, *Hermann 17723* (RM). Albany Co.: Centennial 1896, *Nelson 2670* (NY); 8000 ft, *Nelson 8819* (US, WTU) *Hermann 17723* (US); Antelope Basin, *Nelson 7500* (K, NY, US, WTU); Pole Creek, *Porter 1027* (WTU); NW base of Sheep Mtn along WY11, seep area (calcareous fen) with *Populus*, *Betula* and *Salix* dominant, *Buck 23225* (NY). (As *P. ellipticum* var. *rugicum*) Fremont Co.: Dubois, Togwotee Pass, 9000 ft, 1931, *Frye s.n.* (WTU); 7800 ft, *Hermann 25539* (RM). (As *Plagiomnium rugicum*). Johnson Co.: 5600–6000 ft, *Odasz 1263* (RM, BUF). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway; alpine bogs of east summit, east slope, head of Wyoming Creek, 3250 m, 19 Aug 1973, *Weber B-44258* (RM, COLO); wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, Aug 12 1990, *Elliott 1780* (BUF). Park Co.: T 54 N, 9600–9900 ft, *Hermann 22341* (RM). (As *Plagiomnium ellipticum* var. *rugicum*): Sublette Co.: Gros Ventre Mts., 8500 ft, *Curtis s.n.* (NY). Sublette Co.: 7950 ft, *Hermann 25336* (RM); Bridger Wilderness, Wind River Range, ca. 1/4 mi SW of Barnes Lake, 9780 ft, 42°59'N, 109°36'W, pothole fen, 15 May 1989, *Andrus 7810*, variable teeth, blunt; thin transversely elongate cell walls (BING). Teton Co.: Grand Tetons Nat. Park, *Sharp & Sharp D3-b* (MICH); on US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis* woodland, xeric but for stream bottoms, wooded stream, soggy debris, 6 Jul 1985, *Eckel 94082107* (BUF); Grand Tetons Nat. Park, *Sharp & Sharp D3-b* (MICH). Yellowstone Natl Park: *Roell 1521* (P); Snake River, *Nelson & Nelson 6426* (K, NY, US); Old Faithful, Firehole River, *Frye, s.n.* (CAN, WTU). (As *M. affine* var. *rugicum*) Yellowstone Natl Park: 6 Jul 1934, *Fry s.n.* (RM).

The erect, fertile stems are shorter than the plagiotropic, sterile elongate stems that can form extensive mats. The laminal and bordering cells are very thin, porose, not thickened at the corners. The leaves may have rather long, thin decurrencies due to the narrow and elongate marginal cells extending down the stem. Mats are a rather sordid yellow-green, with yellowish stems and leaves, as opposed to the rusty-red mats of *Mnium arizonicum* (red stems with green leaves).

Both *Plagiomnium ellipticum* (Brid.) Kop. (= *Mnium rugicum* Laur.) and *P. rostratum* (Schrad.) Kop. overlap in characters. *P. ellipticum* has broader, more (transversely) elongate leaf cells, whereas *P. rostratum* has smaller and more isodiametric laminal cells. Both species may show no teeth on the margins. Ultimately, *P. ellipticum* grows in fens and *P. rostratum* “prefers calcareous rocks”, and soil in woods. *Plagiomnium rostratum* is said to have “no decurrent leaf bases, or only very shortly decurrent leaves” which accounts for its frequent confusion with *P. ellipticum*.

Plagiomnium insigne (Mitt.) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.

Mnium insigne Mitt., Hooker’s J. Bot. Kew Gard. Misc. 8: 230. 1856.

Plagiomnium insigne (Mitt.) T. Kop.

Wyoming (FNA, Vol. 28, 2014). The species is more common along the West Coast.

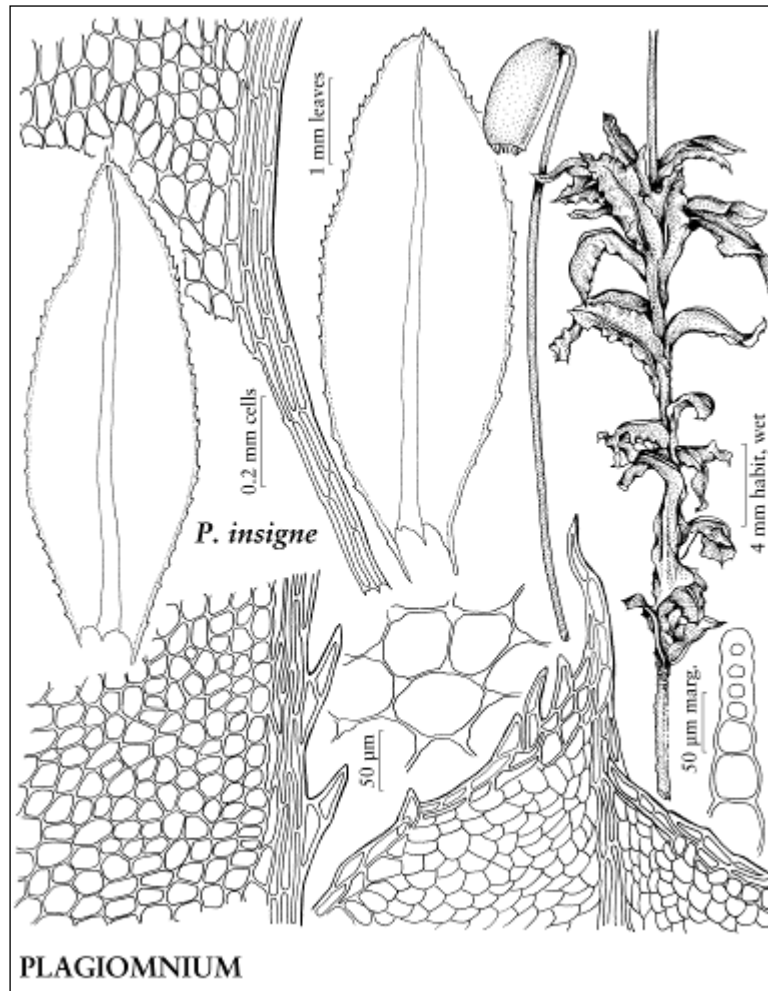
Plagiomnium medium (P. Bruch & W.P. Schimper) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.

Mnium medium P. Bruch & W.P. Schimper, Bryol. Europ. 4: 196, plate 398. 1838.

Plagiomnium medium subsp. *curvatulum* (Lindb.) T. Kop.

Plagiomnium medium var. *curvatulum* (Lindb.) H.A. Crum & L.E. Anderson

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Plagiomnium medium (P. Bruch & W.P. Schimper) T. Kop., Ann. Bot. Fenn. 5: 146. 1968.
Mnium medium P. Bruch & W.P. Schimper, Bryol. Europ. 4: 196, plate 398. 1838.
Plagiomnium medium subsp. *curvatulum* (Lindb.) T. Kop.
Plagiomnium. medium var. *curvatulum* (Lindb.) H.A. Crum & L.E. Anderson

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sheridan Co.: "Floating on water and on logs and branches in slow flowing water," Bighorn Natl Forest, T57N, R89W, Section 28, 25 Jun 1992, *McKee 92-049*, c.fr., dehisced empty (BUF, RM).

Plagiomnium rostratum (Schrad.) T. Kop., Ann. Bot. Fenn. 5: 147. 1968.
Mnium rostratum Schrad., Bot. Zeitung (Regensburg) 1: 79. 1802.
Bryum longirostrum (Brid.) Brid.
Hypnum rostratum (Schrad.) Web. & Mohr
Mnium longirostrum Brid.
Mnium rostratum Schrad.
Plagiomnium rostratum (Schrad.) T. Kop.

Not noted for Wyoming in FNA Vol. 28, 2014. In all states and provinces of the Pacific Northwest; in the mid West, and in eastern North America from New Jersey to South Carolina (Crum & Anderson 1981: 599). (As *Mnium rostratum* Schrad.) Albany, Carbon, Fremont cos., Yellowstone Natl Park, Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: wet shaded bank of stream in spruce grove, 1 1/4 S of Brooklyn Lake, Medicine Bow Mts., 10,000 ft, 9 mi W of Centennial, *Hermann 17700* (WTU). Hermann identified this specimen as *Mnium rugicum* “form with entire leaf-margins”, a determination with which I am inclined to agree. However, T. Koponen determined this specimen as *Mnium rostratum*, and I defer to his experience. The latter, however, is characteristic of more mesic sites, growing on calcareous rocks—see discussion on *Plagiomnium ellipticum* above. Johnson Co.: T52N, R84W, Sec. 25, 5600–6000 ft, *Odasz 1262*, c.fr., rostrate (RM); T52N, R84W Sec. 25, 5600–6000 ft, *Odasz 1260*, c.fr. (RM).

Plagiomnium ellipticum does not have the collenchymatous cell walls of *P. rostratum*, whose cell walls are thicker and not porose.

PLAGIOTHECIUM Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 179, plates 494–506. 1851. (Plagiotheciaceae)
Stereodon sect. Plagiothecium (Schimper) Mitt.

[*Plagiothecium cavifolium* (Brid.) Iwats. Excluded, wrong det.]

Hypnum sullivantiae (Sull.) Sull. & Lesq.

Plagiothecium fallax Card. & Thér.

Plagiothecium roseanum B.S.G.

Plagiothecium sullivantiae Sull. in Gray

Brooklyn Lake, Albany County (*Nelson 5242*), Porter (1935) (as *Plagiothecium roseanum* (Hampe) Bruch & Schimp. (has been reidentified (RM) as *Isopterygiopsis pulchella*, q.v.)

Plagiothecium denticulatum (Hedw.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 190. 1851.

Hypnum denticulatum Hedw., *Sp. Musc. Frond.*, 237. 1801.

Hypnum donnianum Smith

Hypnum obtusifolium (Turner) Brid.

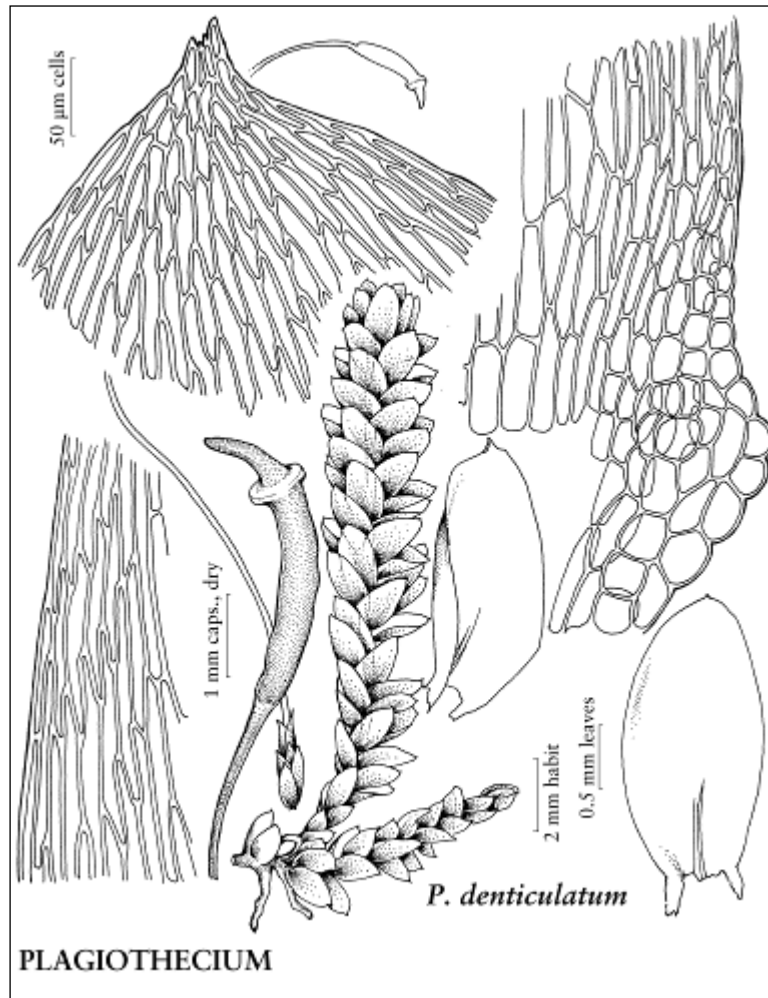
Plagiothecium denticulatum var. *bullulae* Grout

Plagiothecium ruthei Limpr.

Plagiothecium sandbergii Ren. & Card.

Plagiothecium sylvaticum var. *squarrosus* Kindb.

Wyoming (FNA, Vol. 28, 2014). Albany County and Teton County, Porter (1935). Albany, Carbon, Teton Cos., Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Albany Co.: 10,000 ft, Medicine Bow Mts., *Hermann 17763* (RM); Centennial, Lake Marie, alt, 10,000 ft, 25 Jun 1931, *Frye & Ireland s.n* (WTU). Carbon Co.: on rotten wood and soil, lake shore, Stamp Mill Lake, 10,000 ft, 28 Aug 1935, *Porter 2083*, c.fr. (WTU). Sublette Co.: Wind River site, Bridger Wilderness, Wind River Range, Barnes Lake, ca. 9747 ft, 42°59'N, 109°36'W, Pothole fen, 15 May 1989, *Andrus 7809*, in packet of *Brachythecium oedipodium* (BING). Teton Co.: 7000 ft, *Hermann 25565* (RM, WTU). Yellowstone Natl Park: Crescent Hill, 17 Aug 1953, *Lawton 1850*, c.fr., (WTU).

This is a large, flabby, delicate plant with large, broad decurrencies of hyaline, rounded, thin-walled cells. The leaf cells are long-rhomboidal, versus linear-flexuose as in *P. laetum* (cf. Crum & Anderson 1981: 1096). Care must be taken to remove the alar cells with their distinctive circular cells, which may be fragile and remain behind on the stem on dissection, in which case one might tend to the erroneous confusion with *P. laetum*.

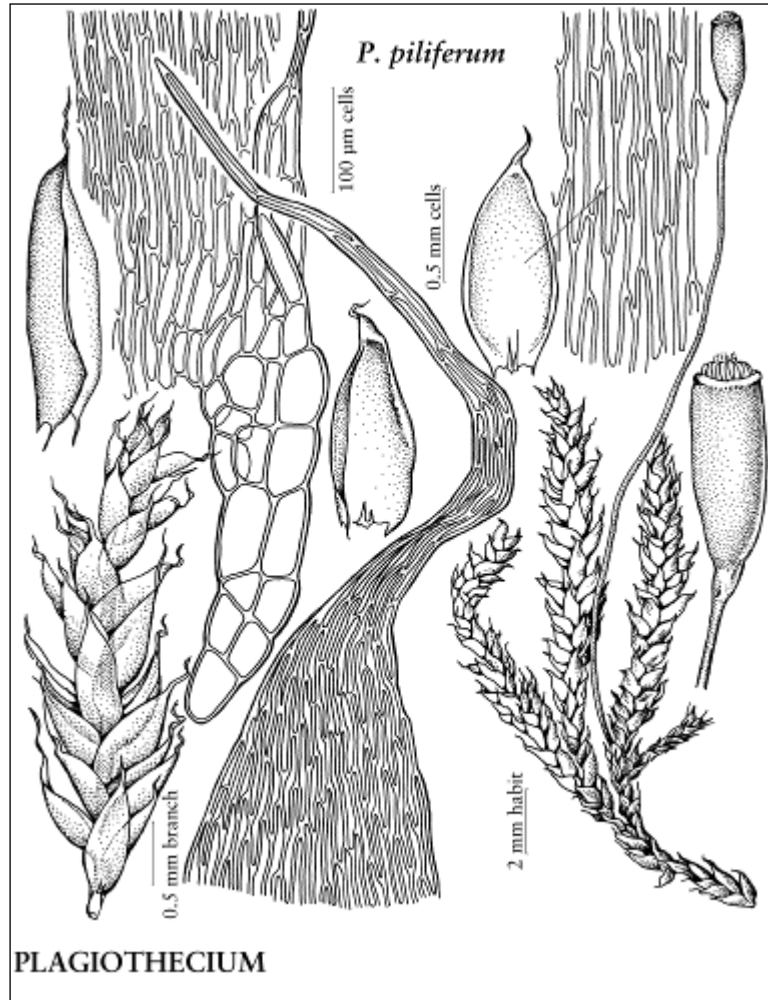
Plagiothecium piliferum (Sw.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 186. 1851.

Leskea pilifera Sw. in c. J. Hartman, *Handb. Skand. Fl.*, 419. 1820.

Dolichotheca pilifera (Sw.) Podp.

Isopterygium piliferum (Sw.) Loeske

Plagiotheciella pilifera (Sw.) Broth.



Courtesy FNA Association, FNA 28, 2014

Not noted for Wyoming in FNA (FNA, Vol. 28, 2014). Teton Co., Spence (1985).

[*Platydictya confervoides* (Brid.) H.A. Crum, Michigan Bot. 3: 60. 1964, excluded]

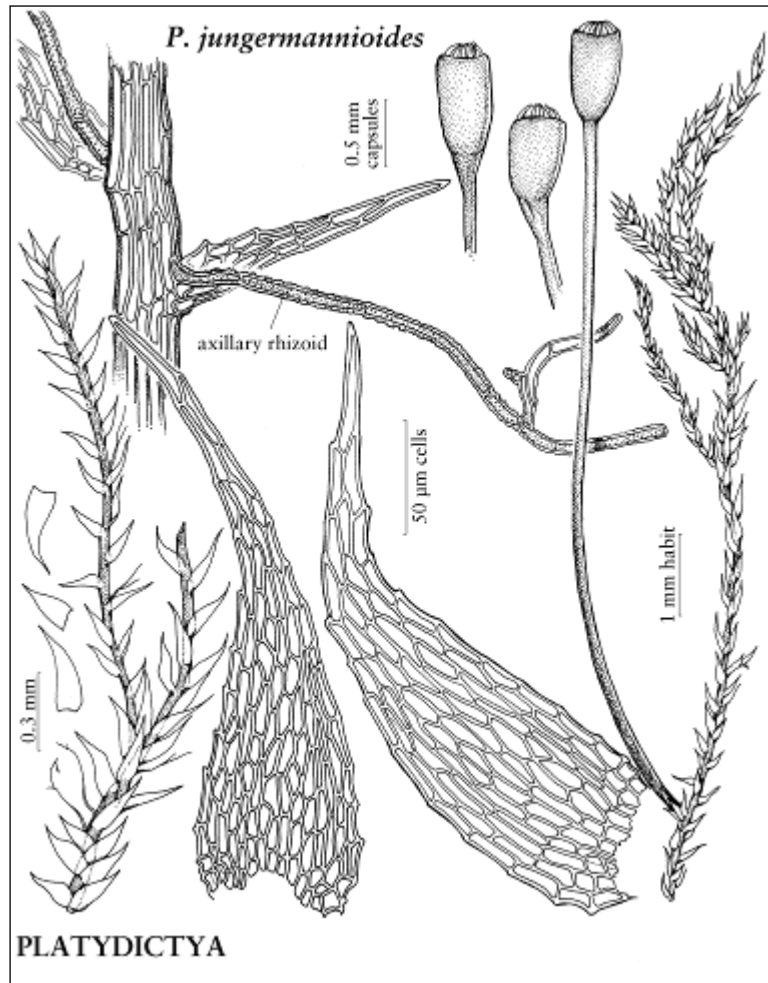
Amblystegiella confervoides (Brid.) Loeske

Amblystegium pseudoconfervoides Kindb.

Hypnum confervoides Brid.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014). (As *Amblystegiella confervoides* (Brid.) Loeske.) “On limestone rocks, Rogers Canyon, Albany County (Porter 950). This is a somewhat doubtful determination” (Porter 1935).

This species appears to be native to eastern North America, with occasional specimens from Alaska and the Yukon (FNA, Vol. 28, 2014))



Courtesy FNA Association, FNA 28, 2014

PLATYDICTYA Berkeley, Handb. Brit. Mosses, 145. 1863. (Amblystegiaceae)
Serpoleskea (Hampe) Loeske

Platydictya jungermannioides (Brid.) H.A. Crum, Michigan Bot. 3: 60. 1964.
Hypnum jungermannioides Brid., Muscol. Recent., suppl. 2: 255. 1812.
Amblystegiella sprucei (Spruce) Loeske
Leskea sprucei Brush ex Spruce

(As *Amblystegiella sprucei* (Bruch) Loeske) Mammoth, Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985).

Albany Co.: Medicine Bow Mountains, Barber Lake Picnic area, 2.5 air mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest, at base of *Populus tremuloides*, 7 Jun 1993, *Miller 10,253* (NYS). Sublette Co.: Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189, wooded spruce bank, sandstone rocks, lush herbage, N slope, Hoback River valley, shaded sandstone rock, 5 Jul 1985, *Eckel 9612510*, with *Drepanocladus uncinatus* (BUF). Teton Co.: 7000 ft, *Hermann 25572* (RM); *Pinus-Pseudotsuga*-forests, primitive rocks about 2260 m, on soil, 7 Aug 1981, *Duell 2245* (NY). Teton Co., on US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis* wood-land, xeric but for stream bottoms, wooded stream, soggy debris, 6 Jul 1985, *Eckel 94082112*, c.fr., with *Brachythecium salebrosum*, *Campyllum*

chrysophyllum, *Cratoneuron filicinum*, *Distichium capillaceum*, *Mnium marginatum*, *Plagiomnium ellipticum*, *Drepanocladus aduncus*, *Aulacomnium palustre* (BUF).

PLATYGYRIUM Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 95, plate 458. 1851, name conserved. (Hypnaceae)

Platygyrium repens (Brid.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 98. 1851.

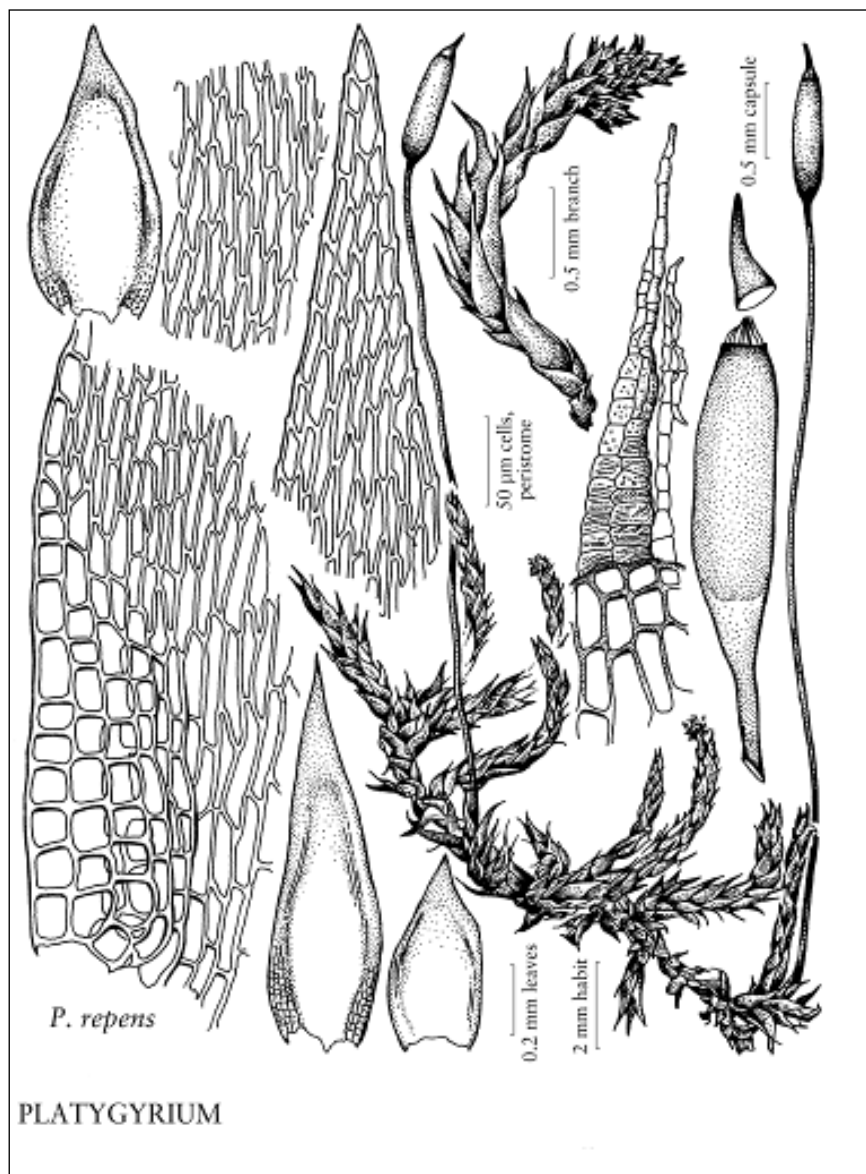
Pterigynandrum repens Brid., *Muscol. Recent.*, suppl. 1: 131. 1806.

Platygyrium orthocladus Kindb.

Platygyrium repens var. *ascendens* (Schwägr.) Grout

Platygyrium repens var. *orthocladus* Kindb.

Wyoming (FNA, Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

PLEUROZIUM (Sullivant) Mitt., J. Linn. Soc., Bot. 12: 537. 1869, name conserved
(Hypnaceae)

Hypnum sect. *Pleurozium* Sull. in A. Gray, Manual ed. 2, 668. 1856.

Pleurozium schreberi (Willd. ex Brid.) Mitt., J. Linn. Soc., Bot. 12: 537. 1869.

Hypnum schreberi Willd. ex Brid., Muscol. Recent. 2(2): 88. 1801.

Calliergon schreberi (Brid.) Mitt.

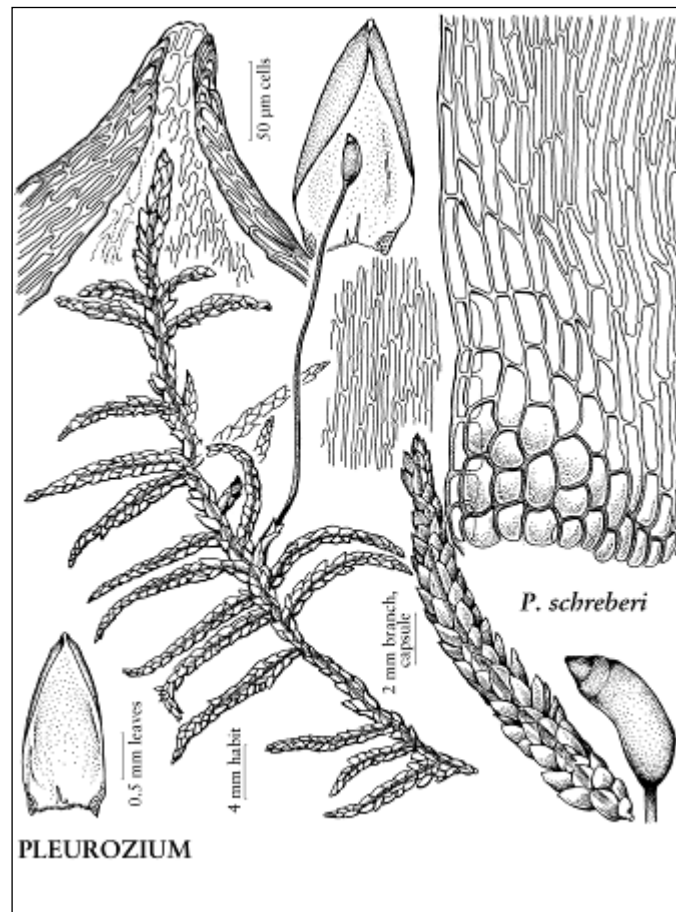
Calliergonella schreberi (Brid.) Grout

Calliergonella schreberi var. *tananae* (Grout) Grout

Pleurozium schreberi var. *tananae* (Grout) Wijk & Margadant

Wyoming (FNA, Vol. 28, 2014). All states and provinces of the Pacific Northwest.
Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Yellowstone Natl Park: wet soil, Norris Geyser Basin, Aug 14 1925, *Frye s.n.* (WTU); near
Giant Paint Pot, 16 Aug 1925 *Frye s.n.* (WTU).



Courtesy FNA Association, FNA 28, 2014

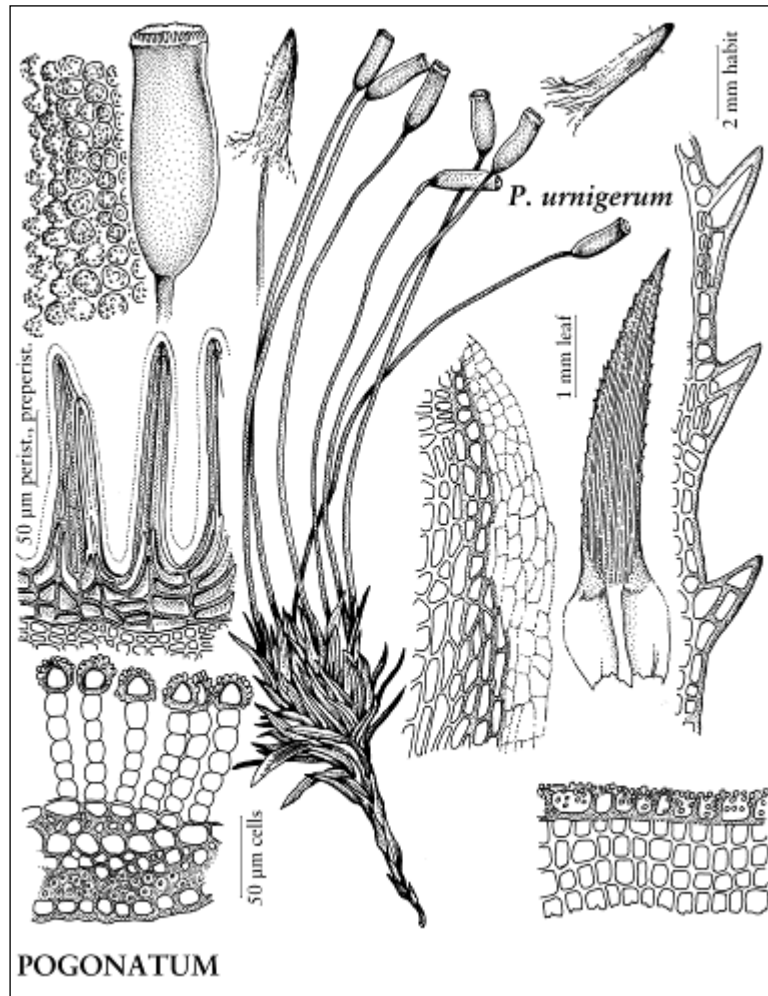
POGONATUM P.-Beauv., Mag. Encycl. 5: 329. 1804. (Polytrichaceae)

Pogonatum urnigerum (Hedw.) P.-Beauv., Prodr. Aethéogam., 84. 1805.

Polytrichum urnigerum Hedw., Sp. Musc. Frond., 100, plate 22, figs. 5–7. 1801.

Not reported for Wyoming in FNA Vol. 27, 2007. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, Shoshone Natl Forest, Little Bear Creek, ca. 100 m W of the Natl Forest Rd #151 dead end, north-facing granite cliff ledge, on sandy substrate, forming an admixture with *Paraleucobryum enerve*, 44°56.480–490' N, 109°30.980–990'W, ca. 9700 ft (2950 m), 14 Aug 2008, Kosovich-Anderson 2712 (MO, RM) (also in Kosovich-Anderson 2011b).



Courtesy FNA Association, FNA 27, 2007

POHLIA Hedw., Sp. Musc. Frond., 171. 1801. (Mielichhoferiaceae)

Pohlia andalusica (Höhnelt) Broth. in H. G. A. Engler and K. Prantl, Nat. Pflanzenfam. 218 (I,3): 551. 1903.

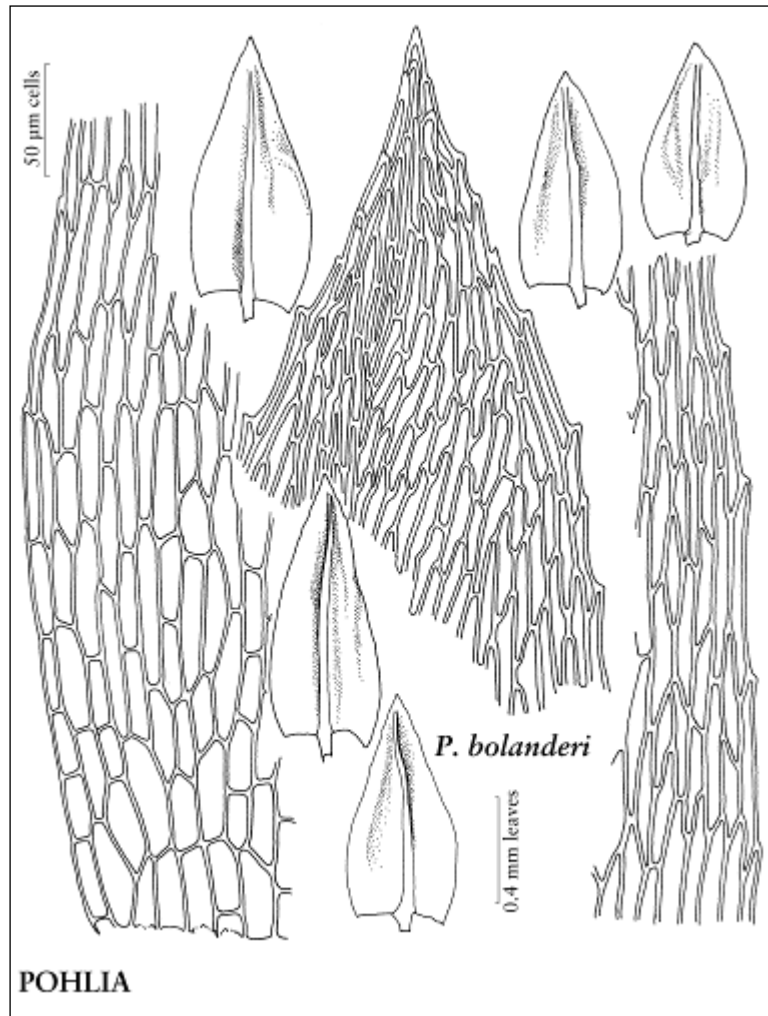
Webera andalusica Höhnelt, Sitzungsber. Kaiserl. Akad. Wiss., Wien, Math.-Naturwiss. Cl., Abt. 1, 104: 326. 1895.

Pohlia annotina var. *glareola* (Ruthe & Grebe in Grebe) Broth.

Pohlia glareola (Ruthe & Grebe in Grebe.) Broth. in Engl. & Prantl.

Pohlia hercynica Warnst. in Bauer.

Pohlia rothii var. *compacta* Ruthe & Loeske in Loeske



Courtesy FNA Association, FNA 28, 2014

Wyoming (FNA, Vol. 28, 2014). Teton Co., Grand Teton Natl Park, 7 km W of Teton Park Rd. on Signal Mtn. Summit Rd., *Shaw 2704* (ALTA) (Shaw 19981a: 43).

[*Pohlia annotina* (Hedw.) Lindb. var. *annotina*: see *Pohlia camptotrachela* (Ren. & Card.) Broth. in H G.A. Engler and K. Prant.]

Pohlia annotina is to be looked for in Wyoming as “*Pohlia annotina* is the most widespread and common gemmiferous species in eastern North America and along the Pacific coast” (Shaw, FNA 28, 2014). Not yet reported for Wyoming.

Pohlia bolanderi (Lesq.) Broth. in H. G. A. Engler and K. Prantl, Nat. Pflanzenfam. 218(I,3): 548. 1903.

Bryum bolanderi Lesq., Mem. Calif. Acad. Sci. 1: 22. 1868.

Pohlia bolanderi var. *seriata* A.J. Shaw

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Pohlia bolanderi* var. *seriata*) Albany Co.: peaty vertical bank of trail along Lewis Lake, alt. 10,800 ft, Medicine Bow Mts., ca. 11 mi W of Centennial, 3 Aug 1962, *Hermann 17716* (RM). Sublette Co.: 11,200 ft, alpine moist area, *Rolston 85122* (CSU); under spruce in moist forest, 10,055 ft, *Rolston 86023* (CSU).

Pohlia camptotrachela (Ren. & Card.) Broth. in H. G. A. Engler and K. Prantl, Nat. Pflanzenfam. 218(1,3): 552. 1903.

Webera camptotrachela Ren. & Card., Bot. Gaz. 13: 199, plate 16. 1888.

Bryum camptotrachelum (Ren. & Card.) Paris

Bryum nutans ssp. *camptotrachelum* (Ren. & Card.) Kindb.

Wyoming (Vol. 28, 2014). Teton Co.: Bradley Lake Trail, 7000 ft, Shaw 2692 (ALTA) (Shaw 1981a: 72).

Pohlia cruda (Hedw.) Lindb., Musc. Scand. 18. 1879.

Mnium crudum Hedw., Sp. Musc. Frond. 189. 1801.

Bryum crudum (Hedw.) Turn.

Webera cruda (Hedw.) Fuernr.

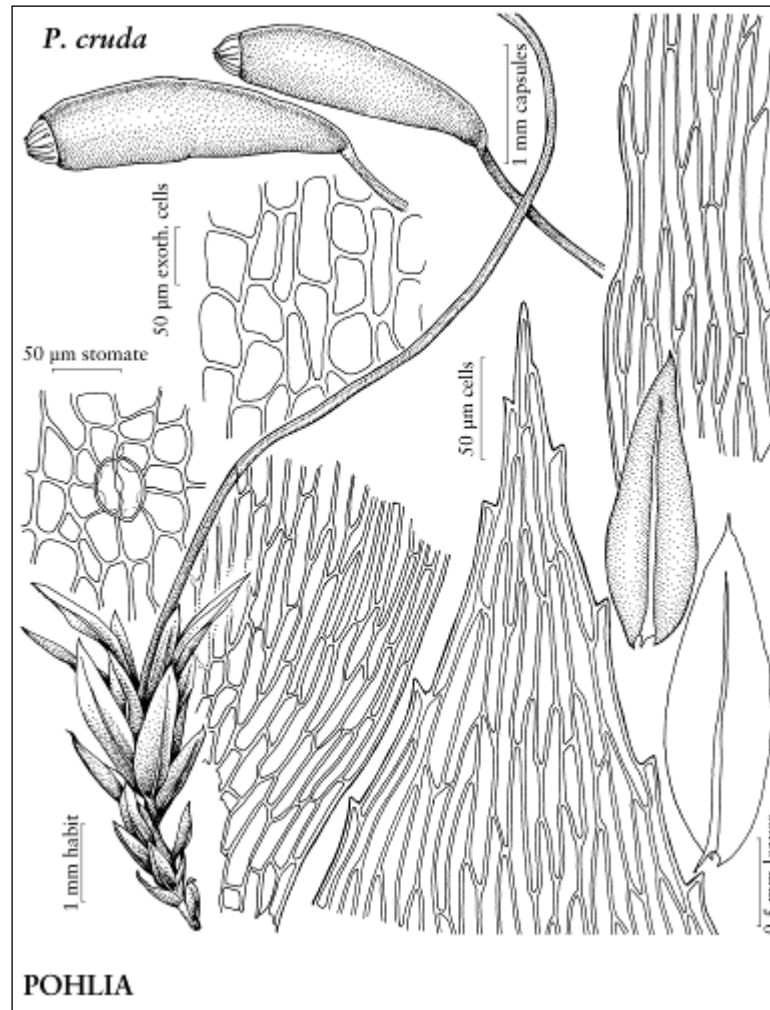
Webera macroapiculata Müll. Hall. & Kindb. in Macoun

Wyoming: Yellowstone Natl Park, c.fr., (1514), Upper Falls (1500) (Roell 1893).

In all states and provinces of the Pacific Northwest; Alaska, Cal., Ariz., Col; Minnes., Iowa, Ont.; Greenland, Quebec, New Brun., New Eng. Pennsyl. Albany, Carbon cos., Porter (1935). "Common in front of glaciers," Teton Range, Grand Teton Natl Park, Wyoming (Spence 1981). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: *Eckel 871108* (BUF); woodland bog, Medicine Bow Mts., published label Plants of Wyoming, 30 Jul 1900, *Nelson s.n.* det. Holz., c.fr., deoperculate (RM); soil on wet, rocky edge of stream in aspens, 8590 ft, Laramie, 7 Jun 1972, *Hermann 24867*, young fruit (RM). Carbon Co.: moss-covered peaty bank of Trail Creek W of Sand Lake, 9000 ft, Medicine Bow Mts., 41/2 SW Morgan, c.fr., 6 Aug 1962, *Hermann 17805* (RM); southeastern county, Medicine Bow Mts., on the Sand Lake road at Trail Creek, 9200 ft, Spruce-Fir zone, soil in forest, common, 11 Aug 1964, *Porter 9700*, c.fr., operculate (RM). Johnson Co.: Big Horn Mtns., in mixed conifer forest, 9400 ft, Aug 17 1980, *Nelson & Fonken 7264*, c.fr., operculate (BUF, RM). Park Co.: *Hermann 25568* (RM). Sheridan Co.: mineral soil on limestone, Big Horn Natl Forest, with *Mnium blyttii*, 16 Jun 1992, *McKee 92-023*, c.fr., indehiscent, ecalyptrate (BUF, RM). Sublette Co.: moist soil on rock under ledge on W shore of Lower Green River Lake, 7950, Wind River Range, 50 mi N of Pinedale, *Hermann 25328* (RM); Bridger Wilderness, Wind River Range Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at south end of lake with *Polytrichastrum alpinum*, *Andrus 7791a* (BING). Teton Co.: peaty soil in wet ditch along Hidden Falls Trail, NW shore of Jenny Lake, 7000 ft, Teton Range, Grand Teton Natl. Centennial Valley, 17 Aug 1896, *Nelson 2657*, c.fr. (RM).

This species has large flat leaves distant on the bright red stem, below leaves are small and often hyaline. The stem is usually a bright or dark red compared to the glaucous green yellow-white to blue-green (glaucous) leaves. Leaves are not decurrent. Leaf margins plane (except in perichaetial leaves), no border, toothed (cf. *Bryum wiegelii*, with strongly decurrent leaf bases, distant on stem, bordered). In fruiting or female plants the perichaetial leaves are conspicuously longer than the subtending leaves, quite thinner and in some contrast with the stem leaves.

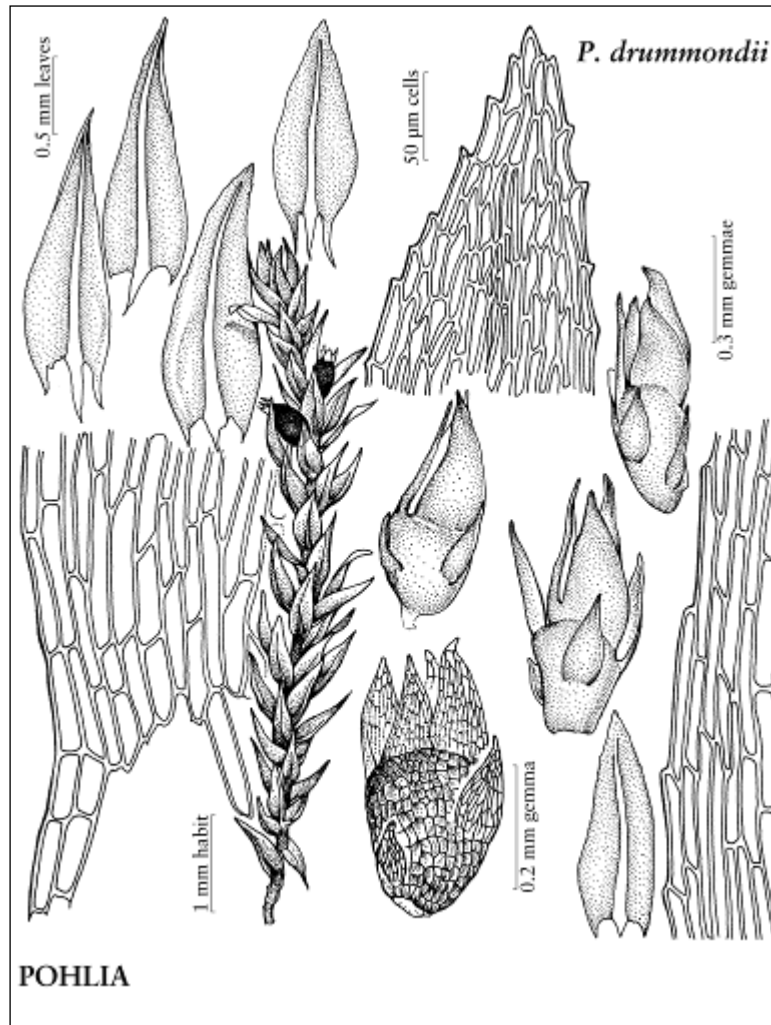


Courtesy FNA Association, FNA 28, 2014

Pohlia drummondii (Müll. Hal.) A. L. Andrews in A. J. Grout, Moss Fl. N. Amer. 2: 196. 1935.
Bryum drummondii Müll. Hal., Bot. Zeitung (Berlin) 20: 328. 1862 (as *drummondii*)
Pohlia commutata Lindb.

Wyoming (FNA, Vol. 28, 2014). Teton Co., banks of Bradley Lake Trail, *Shaw 2695 ALTA*, Shaw (1981). "Common in front of glaciers," Teton Range, Grand Teton Natl Park, Wyoming, Spence (1981). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: (in specimen of *Desmatodon latifolius*) along stream near Bear Tooth Lodge at 9000 ft, 20 Aug 1953, *Lawton 1933*, c.fr., red stem throughout, material fertile and fruiting (WTU).



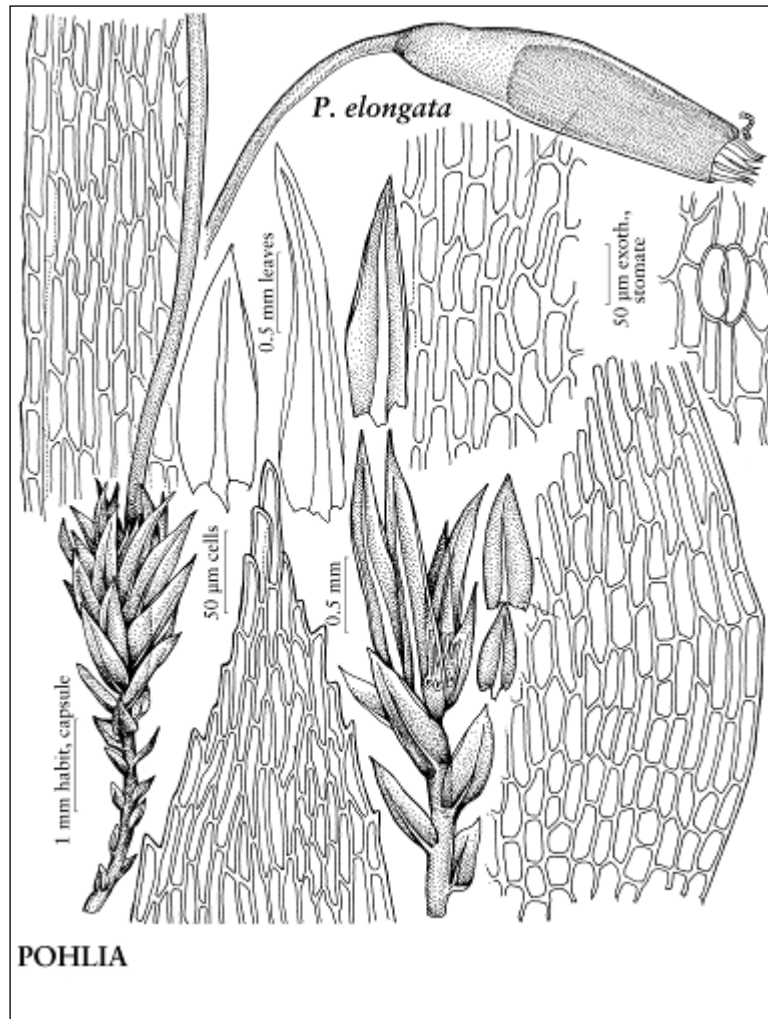
Courtesy FNA Association, FNA 28, 2014

Pohlia elongata Hedw., Sp. Musc. Frond., 171. 1801.
Pohlia acuminata Hoppe & Hornschuch
Pohlia elongata var. *greenii* (Brid.) A. J. Shaw
Pohlia polymorpha Hoppe & Hornschuch

Not reported for Wyoming by FNA (FNA, Vol. 28, 2014). The species is widespread in North America but not common (Shaw in FNA Vol. 28, 2014). Albany Co. (*Nelson 1723*, in part), Porter (1935).

[*Pohlia lescuriana* (Sullivant) Ochi, J. Fac. Educ. Tottori Univ., Nat. Sci. 19: 31. 1968, excluded.]

Not reported for Wyoming; “*Pohlia lescuriana* is an inconspicuous woodland species in eastern North America” (Shaw, FNA Vol. 28, 2014). Yellowstone Lake, Yellowstone Natl Park (*Smy*), Porter (1935) (probably a misidentification.)



Courtesy FNA Association, FNA 28, 2014

Pohlia longicolla (Hedw.) Lindb., *Musc. Scand.* 18. 1879 (as *longicollis*)

Webera longicolla Hedw., *Sp. Musc. Frond.*, 169, plate 41, figs. 1–5. 1801.

Wyoming, a species that is “relatively rare in North America” (Shaw in FNA, Vol. 28, 2014). (As *Pohlia longicollis* (Sw.) Lindb.): Wyoming: Yellowstone Natl Park, Upper Fall, 7000 ft, (1498–99) (Roell 1893).

Big Horn Co.: Big Horn Mtns; east end of Battle Park, ca. 9 air mi SW of Cloud Peak, ca. 20 mi ESE of Basin, sandstone ledges, 9100 ft, 19 Aug 1980, *Nelson & Fonken 7354*, c.fr., deoperculated (RM, Ithaca College, see Eckel 1992.)

Pohlia ludwigii (Sprengel ex Schwägr.) Broth., *Acta Soc. Sci. Fenn.* 19(12): 27. 1892.

Bryum ludwigii Sprengel ex Schwägr., *Sp. Musc. Frond. Suppl.* 1(2): 95, plate 68 (right). 1816.

Bryum bigelovii Sull.

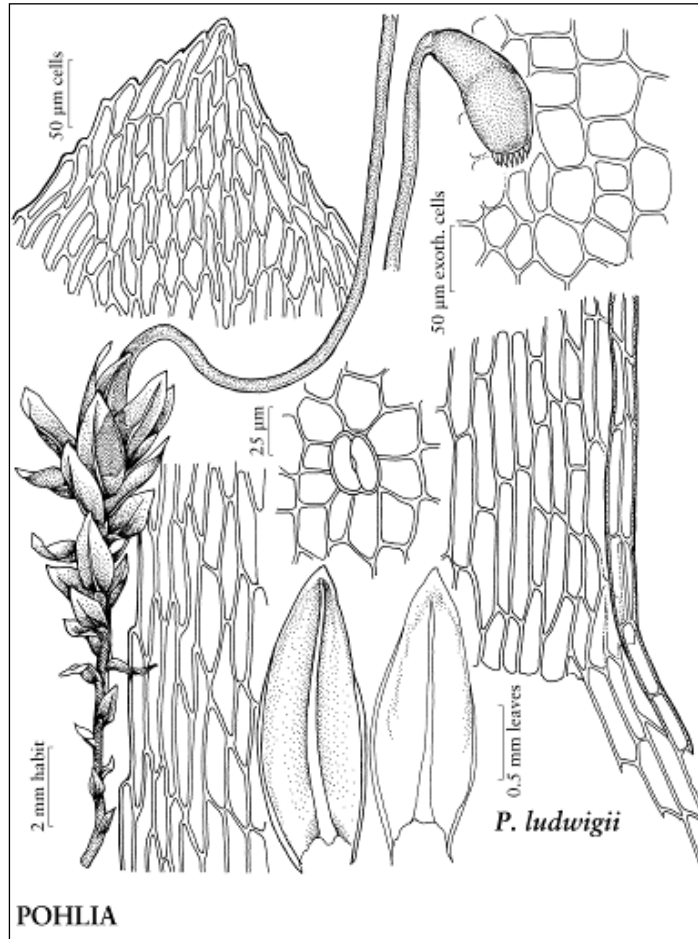
Mniobryum ludwigii (Schwaegr.) Loeske

Webera ludwigii (Schwaegr.) Schimp.

Not reported from Wyoming by FNA (FNA, Vol. 28, 2014). Wyoming; Colo. reported from Calif.; Brooklyn Lake, Albany Co. (*Nelson 7883*), Porter (1937). Halleck Canyon, Albany County (*Nelson 7442*), Porter (1935).

Albany Co.: Telephone Mines, *Nelson 7883* (RM). Fremont Co.: 8600 ft, *Hermann 25303* (RM).

Pohlia ludwigii is the largest species of the genus and is closely related and similar to *P. drummondii*, which has propagula. Both have recurved leaf margins in the upper part of the leaf, whereas *P. wahlenbergii* is plane. (? var. *microphylla* Kindb. Not in Anderson et al. 1990 checklist or in Index Muscorum).



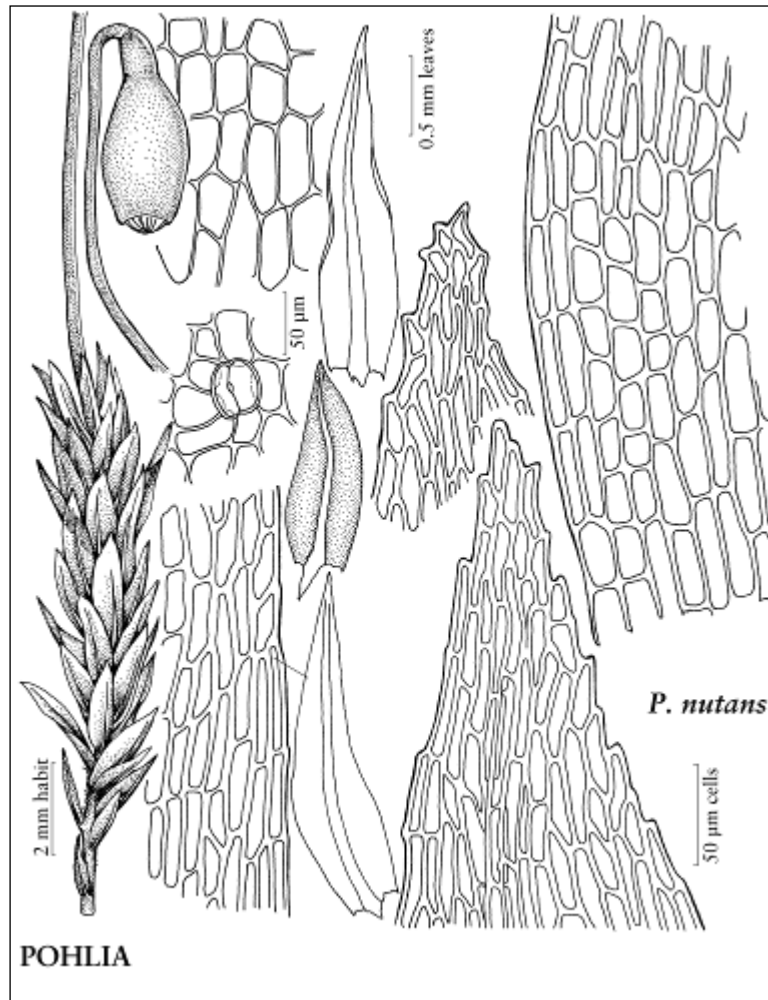
Courtesy FNA Association, FNA 28, 2014

Pohlia nutans (Hedw.) Lindb., *Musc. Scand.* 18. 1879.

Webera nutans Hedw., *Sp. Musc. Frond.*, 168. 1801.

Pohlia sphagnicola (P. Bruch & W.P. Schimper) Lindb. & Arnell

Wyoming (FNA, Vol. 28, 2014). Wyoming: Yellowstone Natl Park, c.fr., (*1502, 1502, 1504*) (Roell 1893). In all states and provinces of the Pacific Northwest; Alaska, Cal., Ariz., Nev., Colo.; in the mid W and eastern N. America from Nova Scotia to N.C. "Common throughout most of the State." Albany, Big Horn, Carbon, Crook cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Campbell Co., Medina (1994). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Albany Co.: 8000 ft, *Schriever 8* (RM). Big Horn Co.: *Hartman & Odasz 8800* (RM); *Nelson 4941*. Fremont Co.: on US 26 & US 287, 5 mi E of Togwotee Pass, S slope, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis*, *Pinus contorta*, xeric, 6 Jul 1985, *Eckel 94081606*, c.fr. (BUF). Johnson Co.: Big Horn Mts., on and around rotten log in mixed conifer forest, 9400 ft, 17 Aug 1980, *Nelson & Fonken 7262*, c.fr., operculate (BUF, RM). Lincoln Co.: 7800 ft, *Goodman 5135* (RM). Park Co.: Absaroka Range, by mine effluent flow in soil wetted by the copper enriched water, *Kastning-Culp 3101* (BUF, RM). Sheridan Co.: Big Horn Mtns., openings in valley and on slopes, 8800 ft, 23 Jun 1979, *Hartman & Odasz 9247* (BUF, RM). Sublette Co.: in montane lake, 10,190 ft, *Rolston 85126* (CSU); Bridger Wilderness, Wind River Range, ca. 1/4 mi SW of Barnes Lake, 9780 ft, 42°59'N, 109°36'W, pothole fen, 15 May 1989, *Andrus 7808* (BING); Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189, wooded spruce bank, rocks, lush herbage, N slope, Hoback River valley, punky log, with *Saonia uncinata*, *Brachythecium salebrosum*, *Eurhynchium*, 5 Jul 1985, *Eckel 9612513* (BUF, RM). Teton Co.: 7000 ft, *Hermann 25573* (RM). Yellowstone Natl Park: *Nelson & Nelson 5846* (RM); Hayden Forest, head of Soldier Creek, 9500 ft, common on sour soils, abundant locally, 11 Sep 1923, *Rose 220 1/2*, c.fr., dehisced (RM); La Plata Mines, 25 Aug 1898, *Nelson 5175*, deoperculate fruit (RM).

When dissecting for sexual structures, the antheridia on the fruiting stem are usually very evident in this species (they are conspicuously large)—they will not appear so in fruiting stems of the other common *Pohlia*, *P. wahlenbergii*, or the rare *P. drummondii*, because these are dioicous.

Pohlia obtusifolia (Villars ex Brid.) L.F. Koch, Leafl. W. Bot. 6: 20. 1950.

Bryum obtusifolium Villars ex Brid., Muscol. Recent. 2(3): 52. 1803.

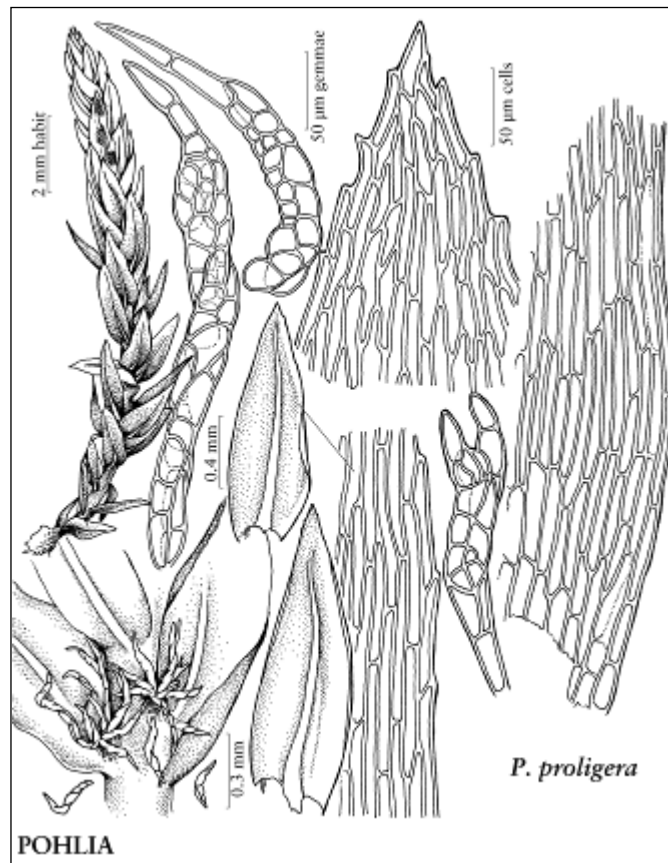
Bryum cucullatum (Schwägr.) Bruch ex Hochstetter

Pohlia cucullata (Schwägr.) Bruch ex Hochstetter

Webera cucullata (Schwaegr.) Schimp.

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Fremont Co.: Gannett Peak area, Wind River Range, base of Gannett Glacier, 12,000 ft, wet places near a creek, 5 Aug 1963 *Jozwik 460*, young fruit (RM). Park Co.: 3200 m, rills and snowbeds, *Weber B-44319* (COLO, RM).



Courtesy FNA Association, FNA 28, 2014

Pohlia proligera (Kindb.) Lindb. ex Arnell, Bot. Not. 1894: 54. 1894.

Webera proligera Kindb., Forh. Vidensk.-Selsk. Kristiania 1888(6): 30. 1888.

Not reported from Wyoming by FNA although it “is a relatively common species in boreal and high-montane habitats” (Shaw, FNA, Vol. 28, 2014). B.C., Wash., Idaho. Wyoming; Alaska, Yuk., Nev.; Minn.; Mich.; Greenland, Quebec. Teton Co., Spence (1985).

Albany Co.: 7800 ft, *Hermann 25929* (RM). Carbon Co.: Sierra Madre Range, on Bridger Peak, 10,400–11,004 ft, sub-alpine, *Kastning-Culp 1063* (BUF).

The linear, twisted, vermicular or worm-like gemmae in the axils of especially the upper leaves of this species have either one or two erect unicellular extensions (leaf primordia) at the apex. Usually one of these apical primordia is longer than the other. These gemmae are distinguished from those of the eastern and western species, *P. annotina*, with similar gemmae but which have 2–5 leaf primordia at their apices. The base of the leaf itself is not decurrent but the majority of leaves are transversely rather straight across. However strips of the stem-cells often may come away on the margins or across the base of the leaf and give some leaves decurrencies.

Pohlia tundrae A. J. Shaw, *Bryologist* 84: 65, figs. 1–10. 1981.

Wyoming (FNA, Vol. 28, 2014). “... all reports of *P. annotina* var. *decipiens* from the mountains of Utah and Colorado are referable to *P. tundrae*” (Shaw 1981). Teton Co., Spence (1985). “Teton Co., 7 km W of Teton Park Rd. on Signal Mtn. Summit Rd., *Shaw 2709* (ALTA)” (in Shaw 1981).

Carbon Co.: (*P. annotina* var. *decipiens* Loeske) Sierra Madre Mtns, Haggarty Creek just below Ferris-Haggarty mine, 9520 ft, wet soil by streamside, *Kastning-Culp 3082* (BUF, RM). Teton Co.: (*P. annotina* var. *decipiens*) Togwotee Pass, 9650 ft, *Hermann 25542* (RM).

Pohlia wahlenbergii (F. Weber & D. Mohr) A. L. Andrews in A. J. Grout, *Moss Fl. N. Amer.* 2: 203. 1935.

Hypnum wahlenbergii F. Weber & D. Mohr, *Bot. Taschenbuch*, 280, 475. 1807.

Bryum wahlenbergii (Web. & Mohr) Schwaegr.

Mniobryum albicans (Wahlenb.) Limpr.

Mniobryum wahlenbergii (Web. & Mohr) Jenn.

Mnium albicans Wahlenb.

Pohlia albicans (Wahlenb.) Lindb.

Webera albicans (Wahlenb.) Schimp.

Wyoming (FNA, Vol. 28, 2014). In all states and prov of the Pacific Northwest. Alaska, Ariz, Colo.; widespread in the mid. W and in eastern N. Amer. “Across the southern part of the State,” Albany, Carbon, Sweetwater, Uinta cos., Porter (1935). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: densely shaded bertyical bank of streamlet under thicket in meadow, 10,000 ft, Medicine Bow Mtns., 9 mi W of Centennial, *Hermann 17727* (RM); Centennial Hills, 9 Jun 1895, *Nelson 1285*, c. young fr. (RM); northwest base of Sheep Mtn. along WY Rte. 11, ca. 4 mi due ESE of Centennial, 7,700–7,800 ft, fen with low forest of *Populus*, *Betula*, *Salix*, in shallow water, a “hanging bog” on steep hillside, open area of bog, 7 Jun 1993, *Reese 18180* (LAF, BUF, RM). Carbon Co.: Sierra Madre Mtns, Haggarty Creek, 8440 ft, moist soil by creek, *Kastning-Culp 3038* (BUF, RM). Carbon Co.: Battle Lake, *Nelson 4180*, leaves long-decurrent (RM). Sublette Co.: wet area in alpine, 10,595 ft, *Rolston 85102* (CSU). Sweetwater Co.: North Vermillion Creek, *Nelson 3576* (RM). Teton Co.: 7000 ft, *Hermann 25564* (RM); Hat (Cat) Six Falls, *Nelson 5035* (RM); La Platte Mines, *Nelson 5248* (RM).

Pohlia wahlenbergii sometimes has cells so large they are readily apparent in the dissecting microscope. The distinction from *P. ludwigii* is minimal, according to descriptions. *P. ludwigii* is recurved in the upper leaves, *P. wahlenbergii* is not. *P. ludwigii* does not form a definite border, *P.*

wahlenbergii apparently does not either! They both have equally large cells: see Andrews for discussion. The plain upper leaf margins distinguish *P. wahlenbergii* from both *P. drummondii* and *P. ludwigii*. The decurrencies on *P. wahlenbergii* are generally not as long, as distinctive: but occasionally they are (Nelson 4180).

Polytrichadelphus lyallii Mitt. = *Polytrichum lyallii* (Mitt.) Kindb.

POLYTRICHASTRUM G. L. Smith, Mem. New York Bot. Gard. 21(3): 35. 1971. (Polytrichaceae)

Polytrichastrum alpinum (Hedw.) G. L. Smith, Mem. New York Bot. Gard. 21(3): 37. 1971.

Polytrichum alpinum Hedw., Sp. Musc. Frond., 92, plate 19, fig. 2b. 1801.

Var. alpinum

Pogonatum alpinum (Hedw.) Roehl.

Pogonatum alpinum var. *arcticum* (Brid.) Brid.

Pogonatum alpinum var. *brevifolium* (R. Br.) Brid.

Pogonatum alpinum var. *campanulatum* (Hornsch.) P. Bruch & Schimp. in B.S.G.

Pogonatum alpinum var. *macounii* (Kindb.) Card. & Thér.

Pogonatum alpinum var. *simplex* Schimp.

Pogonatum alpinum var. *sylvaticum* (Menz.) Lindb.

Pogonatum furcatum (Hornsch.) Brid.

Polytrichum brevifolium R. Br.

Polytrichum ferrugineum Brid.

Polytrichum furcatum Hornsch.

The var. *alpinum* is not reported for Wyoming by FN A (FNA, Vol. 27, 2007); perhaps the following notes all pertain to var. *septentrionale* (Brid.) G. L. Smith, the only variety of *P. alpinum* noted for the state (FNA, Vol. 27, 2007): Throughout the Pacific Northwest; Alaska, California, Colorado: Minnesota, Wisconsin, Michigan; widespread in eastern North America from Labrador to North Carolina. (As var. *septentrionale*) Washington, Alberta, Montana, Wyoming; NorthW Territory, California, Utah, Colorado; Quebec, Nova Scotia.) (As *Pogonatum alpinum*) Brooklyn Lake, Lake Marie, Albany County; Battle Lake, Carbon County; and Tower Falls, Yellowstone Natl Park (Porter 1935). (As *Pogonatum alpinum*) “Common in front of glaciers,” Teton Range, Grand Teton Natl Park, Wyoming, (Spence 1981). (As *Polytrichastrum alpinum* (Hedw.) G.L.Smith) Teton Co., Spence (1985). Sublette Co., Cooper & Andrus (1994). (as var. *septentrionale*) Albany, Carbon cos., Yellowstone Natl. Pk., Porter (1937). Carbon Co. (As *Pogonatum alpinum*) Battle Lake Mt., Aug 17 1897, *Nelson 4225* (Nelson 1900); Albany Co., 25Aug 1898, *Nelson 5170*; *Nelson 5233* (Nelson 1900). Crum & Anderson (1981:1268) consider this variety “...a stunted alpine expression from which the var. *brevifolium* can scarcely be distinguished”). See var. *brevifolium* in Flowers (1973). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Medicine Bow Mts., 9800 ft, *Lichvar 1333* (RM); on the stony shore of an alpine lake, Telephone Mines, 31 Jul 1900, *Nelson 7853*, papillose lamellae, see sub *Polytrichum sexangulare* (RM); Medicine Bow Mts., *Lichvar 1346* (RM). Big Horn Co.: 10,400 feet, *Fonken 994* (RM, BUF). Park Co.: Beartooth Plateau, 3200 m, *Weber, B-44315* (COLO, RM); SNG, Beartooth Plateau, alpine snow melt area, small lake in vast depression, ca. 100 m N of Beartooth Scenic Byway, N 44°58.510–515’, W 109°27.165–170 ft, 3200 m, boggy shore crossed by rills, *Carex* spp.-Bryidae wetlands, wet tussocks, on clay soil, 20 Aug 2008, *Kosovich-Anderson 3508* (MHA, MO, RM). Sublette Co.: 11,200 ft, *Rolston 85098* (CSU); Bridger Wilderness, Wind River Range, Barnes

Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake with *Pohlia cruda*, 14 May 1989, *Andrus 7791b* (BING). Teton Co.: Absaroka Range, 9650 ft, *Hermann 25540* (RM).

This common taxon is distinctive under the hand lens for its long red awn and for the leaf margins broadly and sharply folded inward over the lamellae. With a lens and when dry, the leaf edges present a smooth, shining edge rather like a spruce needle.

Var. **septentrionale** (Brid.) G.L. Smith, Mem. N.Y. Bot. Gard. 21(3): 37. 1971.
Polytrichum septentrionale Brid., J. Bot. (Schrader) 1800(1): 285.1801.
Pogonatum alpinum var. *septentrionale* (Brid.) Brid.
Polytrichum alpinum var. *septentrionale* (Brid.) Lindb.
Polytrichum norwegicum Hedw.

Reported for Wyoming (FNA, Vol. 27, 2007).

[*Polytrichastrum formosum* (Hedw.) G.L. Smith, Mem. New York Bot. Gard. 21(3): 37. 1971, excluded]

[*Polytrichum formosum* Hedw., Sp. Musc. Frond., 92, plate 19, fig. 1a. 1801, excluded]
Polytrichum attenuatum Menzies.

Not reported for Wyoming (FNA 2007). See note under *Polytrichastrum longisetum* (Brid.) G.L. Smith

Polytrichastrum longisetum (Brid.) G. L. Smith, Mem. New York Bot. Gard. 21(3): 35. 1971.
Polytrichum longisetum Brid., J. Bot. (Schrader) 1800(1): 286. 1801.
Catharinea dixonii Braith. in Dix.
Catharinella dixonii (Braith.) Kindb.
Polytrichum attenuatum var. *aurantiacum* (Brid.) Turn.
Polytrichum aurantiacum Hoppe ex Brid.
Polytrichum formosum var. *aurantiacum* (Brid.) C. J. Hartm.
Polytrichum formosum var. *gracile* (Dicks.) Vent. & Bott.
Polytrichum gracile Dicks. in Menz.
Polytrichum gracile var. *anomalum* (Milde) I. Hagen

Reported for Wyoming (FNA, Vol. 27, 2007). Ireland (1982: 684) reported *Polytrichum formosum* Hedw. for Wyoming, with the synonym *Polytrichum gracile* var. *anomalum* (Milde) Hag.. The specimen on which this report is based may be *Polytrichastrum longisetum*. (*As Polytrichum longisetum*) On soil from the lowlands to over 3300 m British Columbia, Montana, Wyoming; Alaska, California, Colorado, Arizona; Manitoba, Ontario, Minnesota, Wisconsin, Michigan, Illinois; Quebec, New England, and North Carolina. (*As Polytrichum gracile* Dicks.) Sylvan Geysers, Yellowstone Natl Park, (*Nelson 6175*), Porter (1935). (*As Polytrichum gracile* Dicks.) Yellowstone Natl Park, Porter (1937). (*As Polytrichum longisetum*) Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: (*As Polytrichum longisetum*) Beartooth Mts., 9700 ft, *Hartman 18542* (RM).
Sublette Co.: (*As Polytrichum longisetum*) Bridger Wilderness, Wind River Range Terrace fen on Baldy Creek, 10,110 ft, 42°58'N, 109°35'W, 16 May 1989, *Andrus 7856* (BING). Yellowstone Natl Park: (*As Polytrichum longisetum*) Sylvan Geysers, *Nelson & Nelson 6175* (RM); *Nelson & Nelson 6175* (RM).

When making sections of this moss, be careful to do it near midleaf, since the lamellae seem to be fewer in the upper and lower parts of the leaf, and one might be misled into *Atrichum* or *Oligotrichum* (lamellae less than 20). Look at the number without sectioning by viewing the ventral surface at midleaf.

Polytrichastrum sexangulare (Brid.) G. L. Smith, Mem. New York Bot. Gard. 21(3): 37. 1971.

Polytrichum sexangulare Brid., J. Bot. (Schrader) 1800(1): 285. 1801.

Var. **sexangulare**

Polytrichum crassisetum Lam. & DC.

Polytrichum norvegicum auct. mult. non Hedw.

Polytrichum sexangulare var. *nivale* Kindb. in Roell

Wyoming (FNA, Vol. 27, 2007). (As *Polytrichum sexangulare*) On soil in the mountains from about 1300 m to over 3300 m British Columbia, Washington, Alberta, Montana, Wyoming; reported from Alaska and Greenland. Brooklyn Lake, Albany Co. (*Nelson 5232*); Telephone Mines, Albany County (*Nelson 7853*); and Ten Sleep Lakes, Big Horn County (*Goodding 427*), Porter (1935). I found *Nelson 7853* to have papillae on the lamellae and so to be *Pogonatum alpinum* var. *septentrionale* (Sw.) Brid. Park Co.: *Polytrichastrum sexangulare* was reported growing with *Polytrichum juniperinum*, *Brachythecium brandegeei* and *Sanionia nivalis* (Kosovich-Anderson & Weber 2011). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Polytrichum sexangulare*) ALBANY CO.: La Plata Mines, 28 Aug 1898, *Nelson 5232* (RM).

The species can be confused with *Pogonatum alpinum* var. *septentrionalis*, but for the papillose lamellae. The urns both appear to be small and round. The 5232 specimen showed little if any ridges in the urns—they were round (young?).

POLYTRICHUM Hedw., Sp. Musc. Frond., 88. 1801. (Polytrichaceae)

Polytrichum commune Hedw., Sp. Musc. Frond., 88. 1801.

Var. **commune**

Polytrichum commune var. *uliginosum* Wallroth

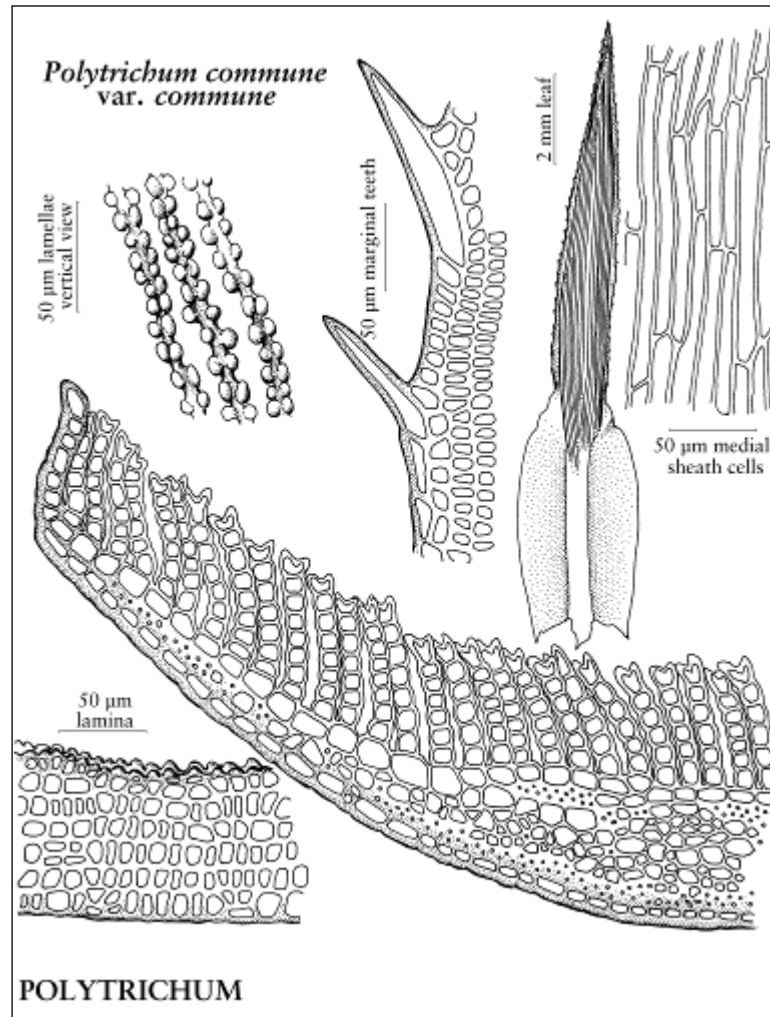
Polytrichum commune var. *maximoviczii* Lindb.

Wyoming (FNA, Vol. 27, 2007). Sylvan Geysers, Norris, in Yellowstone Natl Park (*Nelson 6182* & *6144*). Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Yellowstone Natl Park: *Norris 6144* (RM); 7 Jul 1934, *Frye s.n.*, (RM); 6 Jul 1934, *Frye s.n.* (RM); Sylvan Geysers, 26 Jul 6182 (*Nelson 1900*).

Specimens of *Polytrichum commune* need to be reexamined to consider the variety *perigoniale* (Michx.) Hampe and *P. jensenii* I. Hagen. In Utah the species grows “on damp soil, edges of woods, bogs, and banks of brooks and ponds” (Flowers 1973). Reported as uncommon in Colorado (Weber & Whittmann 2007) and such is probably also the case in Wyoming. In Utah, Flowers (1973) wrote “from the abundant specimens collected by Jones in 1889, it would appear that this moss was plentiful at that time, but repeated explorations of the Brighton and Alta basins have

not revealed the moss in more recent times. The disappearance of certain ferns in the same areas suggests that a decline in average annual precipitation may be the main factor. Since 1924 I have noted a marked decrease in the abundance and vigor of the vegetation as a whole.”



Courtesy FNA Association, FNA 27, 2007

Polytrichum commune var. **perigoniale** (Michaux) Hampe, *Linnaea* 13: 44. 1839.
Polytrichum perigoniale Michaux, *Fl. Bor.-Amer.* 2: 293. 1803.

Wyoming (FNA, Vol. 27, 2007).

Care must be taken with the map accompanying this variety in FNA 2007, as it does not correspond with the extensive distribution listed. The map indicates an Atlantic Coastal Plain distribution, but the variety also occurs in the plains states (Missouri, Oklahoma) and the Pacific Northwest in Washington State, British Columbia, the Yukon and Wyoming.

Polytrichum commune var. *maximoviczii* Lindb. = *Polytrichum commune* Hedw. var. *commune*

Polytrichum formosum Hedw. = *Polytrichastrum formosum* (Hedw.) G. L. Smith

Polytrichum gracile var. *anomalum* (Milde) I. Hagen = *Polytrichastrum longisetum* (Brid.) G. L. Smith

Polytrichum jensenii I. Hagen, Meddel. Grønland 15: 444. 1897.

Polytrichum commune var. *jensenii* (I. Hagen) Mönk.

Polytrichum commune var. *diminutum* (I. Hagen) D. H. Long

Polytrichum commune var. *yukonense* (Card. & Thér.) Frye

Polytrichum yukonense Card. & Thér.

Reported for Wyoming (FNA, Vol. 27, 2007). (As *Polytrichum jensenii* Hagen.) On the shore of Beaver Lake, Yellowstone Natl Park (*Nelson 6131*). “This is the plant which is discussed at length by Holz. (1900). It is apparently the only record for the United States,” Porter (1935).

Specimen at RM: as *P. jensenii* Hagen, *Nelson & Nelson 6131*, Yellowstone Natl Park—in great open beds on the shore of the lake (Beaver Lake) *Jul 24 1899*. An annotation on the label reads: “discussed in Asa Gray Bulletin Vol. 8, p. 95 (1900). This specimen has large cuticular knobs on the terminal cells of the lamellae and teeth were not evident.” The description of the terminal cell does not match those of *P. jensenii*. The species should be considered rare in Wyoming.

Polytrichum juniperinum Hedw., Sp. Musc. Frond., 89, plate 18, figs. 6–10. 1801.

Polytrichum alpestre Hoppe

Polytrichum juniperifolium Funck

Polytrichum juniperinum var. *alpestre* (Hoppe) Röhling

Polytrichum juniperinum var. *alpinum* Schimp.

Polytrichum juniperinum var. *waghornei* Kindb.

Wyoming (FNA, Vol. 27, 2007). On soil or soil over rock, from the lowlands to over 3300m. In all states and provinces of the Pacific Northwest; widespread in the Middle West, and in eastern North America from Greenland and Labrador to North Carolina. Fairly common throughout the State; Albany, Crook, Sheridan, Teton cos., Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). Campbell Co., Medina (1994). Sublette Co. (Cooper & Andrus (1994)). Park Co. *Polytrichum juniperinum* was reported growing with *Plagiomnium ellipticum*, *Sarmentypnum exannulatum*, *S. sarmentosum* and *Sanionia nivalis*; in another site growing with *Polytrichastrum sexangulare*, *Brachythecium brandegeei* and *Sanionia nivalis* (Kosovich-Anderson & Weber 2011). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 9200 ft, spruce fir zone, *Porter 9697* (RM). Carbon Co.: 9400–10,000 ft, *s.n. 4136* (RM, BUF). Big Horn Co.: Big Horn Mtns., ca. 1 air mi SW of Tyrrell Ranger Station, sec 25 & 36, east-facing slope, 8800 ft, 21 Jun 1979, *Hartman & Odasz 9149* (BUF); *Nelson 4868* (RH, BUF). Fremont Co.: near border with Teton Co., between Moran and Dubois twps., on US 26, E of Togwotee pass, ca. 9000 ft, S-facing; spruce and 2 & 5-needle pines, herbaceous, not species abundant slope, *Artemisia tridentata* here and there, on soil, 6 Jul 1985, *Eckel s.n.* (BUF). Park Co.: (Yellowstone Natl. Pk.) *Hermann 12779* (RM, BUF). Sheridan Co.: 8100 ft, *Nelson 4505* (RH, BUF). Sublette Co.: 10,324 ft, *Rolston 85128* (CSU). Teton Co.: 7000 ft, *Hermann 25560* (RM). Yellowstone Natl Park: 8200 ft, *Taylor 67–155* (RM); “La Plata Mines,” *Nelson 5231* (RM).

Polytrichum juniperinum var. *affine* (Funck) Brid. = *Polytrichum strictum* Brid.

Polytrichum longisetum Brid. = *Polytrichastrum longisetum* (Brid.) G. L. Smith

Polytrichum lyallii (Mitt.) Kindb. = *Meiotrichum lyallii* (Mitt.) G. L. Smith

Polytrichum piliferum Hedw., Sp. Musc. Frond., 90. 1801.

Wyoming (FNA, Vol. 27, 2007). Wyoming: Yellowstone Natl Park, sterile (1528) (Roell 1893). Albany, Carbon, Teton cos., Yellowstone Natl. Pk., Porter (1935 & 1937. “Common in front of glaciers”, Teton Range, Grand Teton Natl Park, Wyoming, (Spence 1981). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: (Willow Creek), *Nelson 2919* (RM); 10,000 ft, Medicine Bow Mts., *Hermann 17695* (RM). Bighorn Co.: 10,000–10,400 ft, Big Horn Mts., *Odasz 737* (RM). Carbon Co.: summit Bridger Peak, 11,000 ft, *Porter 1731* (RM). Park Co.: 8600–9400 ft, *20702* (BUF, RM). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1/2 mi SW of Barnes Lake, 9760 ft, 42°57'N, 109°36'W, terrace fen, on N-facing rock at edge of fen with *Pohlia cruda*, 15 May 1989, *Andrus 7817b* (BING). Teton Co.: 7000 ft, *Hermann 25559* (RM). Yellowstone Natl Park: *Nelson & Nelson 6369* (RM); *Gooding 1983* (RM); “La Plata Mines,” *Nelson 1768* (RM).

Polytrichum sexangulare Floerke ex Brid. = *Polytrichastrum sexangulare* (Brid.) G. L. Smith

Polytrichum strictum Brid., J. Bot. (Schrader) 1800(1): 286. 1801.

Polytrichum affine Funck

Polytrichum juniperinum var. *affine* (Funck) Brid.

Polytrichum juniperinum var. *gracile* Wahlenb.

Polytrichum juniperinum var. *strictum* (Brid.) Roehl.

Wyoming (FNA, Vol. 27, 2007). Wyoming: Yellowstone Natl Park, sterile (1527) (Roell 1893). Usually in bogs, often with *Sphagnum*, from the lowlands to about 2400 m British Columbia, Washington, Alberta, Montana, Wyoming; Alaska, Yukon; New England. Woods Creek, Albany County (Nelson 2071); Mirror Lake, Albany County (Porter 1276); Little Goose Creek, Sheridan County (Nelson 2363), Porter (1935). Sublette Co., “occupies the tops of hummocks and other seasonally dry habitats,” Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Wood's Creek, 11 Aug 1896, *Nelson 2071* (RM). Crook Co.: Sundance Mtn., *Nelson 2180* (RM); Sundance Mtn., 3 Jul 1896, *Nelson s.n.*, (RM). Park Co.: Beartooth Mts., *Hartman 18541* (RM); Beartooth Plateau, 3250 m, *Weber B-44259* (COLO, RM). Sheridan Co.: Little Goose Creek, 16 Jul 1896, *Nelson 2363* (RM). Sublette Co.: In a peaty situation above the Lower Green River, 7950 ft, *Herman 25343*, a sterile specimen, but with characteristic white rhizoids (RM).

Pottia heimii (Hedw.) Hampe = *Hennediella heimii* (Hedw.) R.H. Zander

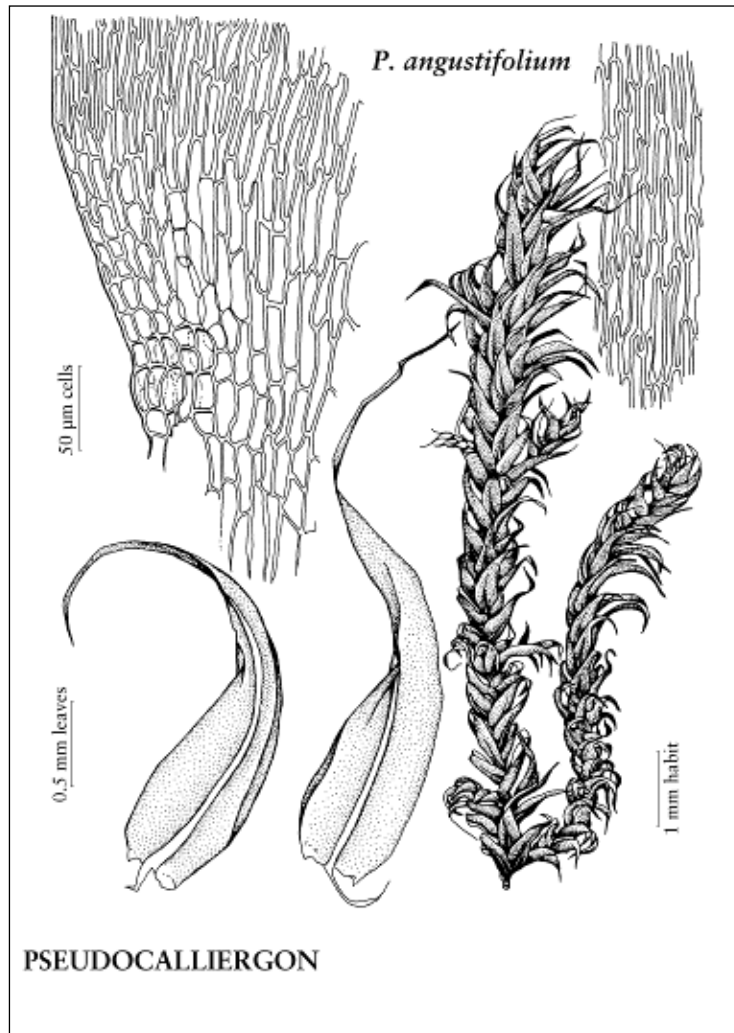
PSEUDOCALLIERGON (Limpr.) Loeske, Hedwigia 46: 311. 1907. (Amblystegiaceae)

Hypnum sect. *Pseudocalliergon* Limpr., Laubm. Deutschl. 3: 547. 1899 (as *Pseudocalliergon*)

Pseudocalliergon angustifolium Hedenäs, Lindbergia 16: 85, fig. 1. 1992 (as *angustifolium*)

Drepanocladus angustifolius (Hedenäs) Hedenäs & c. Rosborg

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Pseudocalliergon trifarium (F. Weber & D. Mohr) Loeske, Hedwigia 46: 311. 1907.

Hypnum trifarium F. Weber & D. Mohr in F. Weber, Naturh. Reise Schweden, 177, plate 2, fig. 2. 1804.

Calliergon trifarium (F. Weber & D. Mohr) Kindb.

Drepanocladus trifarius (F. Weber & D. Mohr) Broth. ex Paris

Scorpidium trifarium (F. Weber & D. Mohr) H. K. G. Paul

Not reported for Wyoming according to FNA (FNA, Vol. 28, 2014). (As *Calliergon trifarium*) Sublette Co., Cooper & Andrus 1994.

Pseudocalliergon turgescens (T. Jensen) Loeske, Hedwigia 46: 311. 1907.

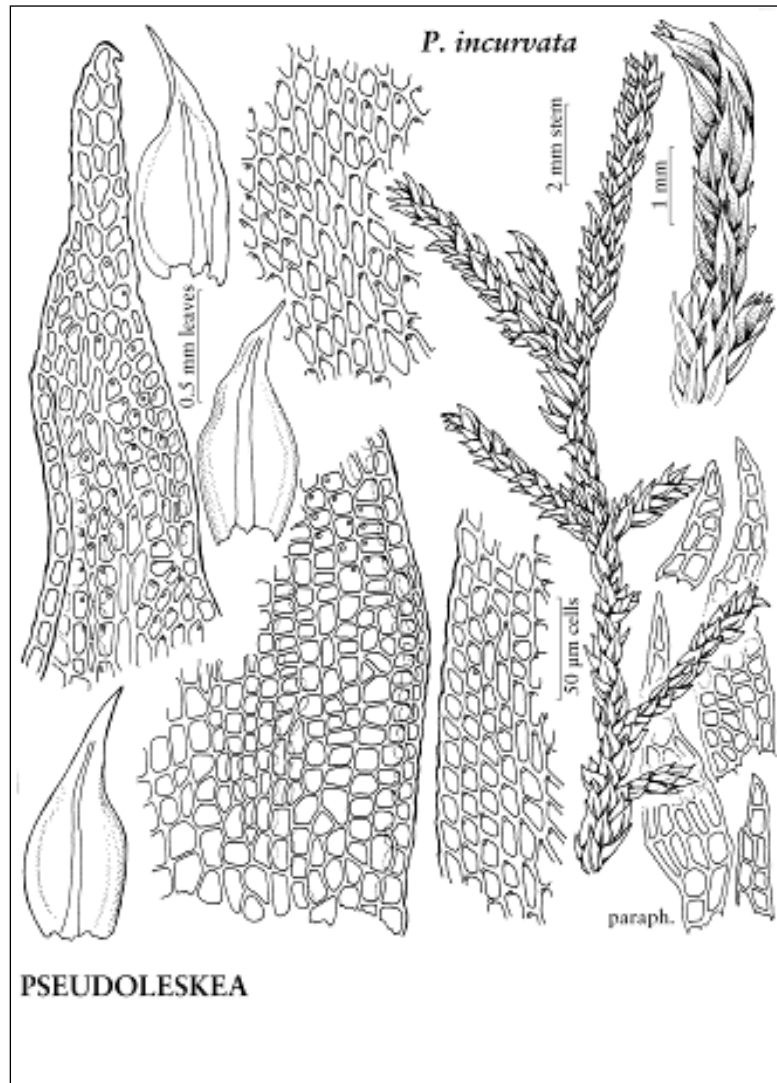
Hypnum turgescens T. Jensen, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1858: 63. 1858.

Calliergon turgescens (T. Jens.) Kindb.

Scorpidium turgescens (T. Jens.) Loeske

Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: (As *Scorpidium turgescens*) alpine bogs, 3250 m, Weber, B-44257 (RM, COLO).



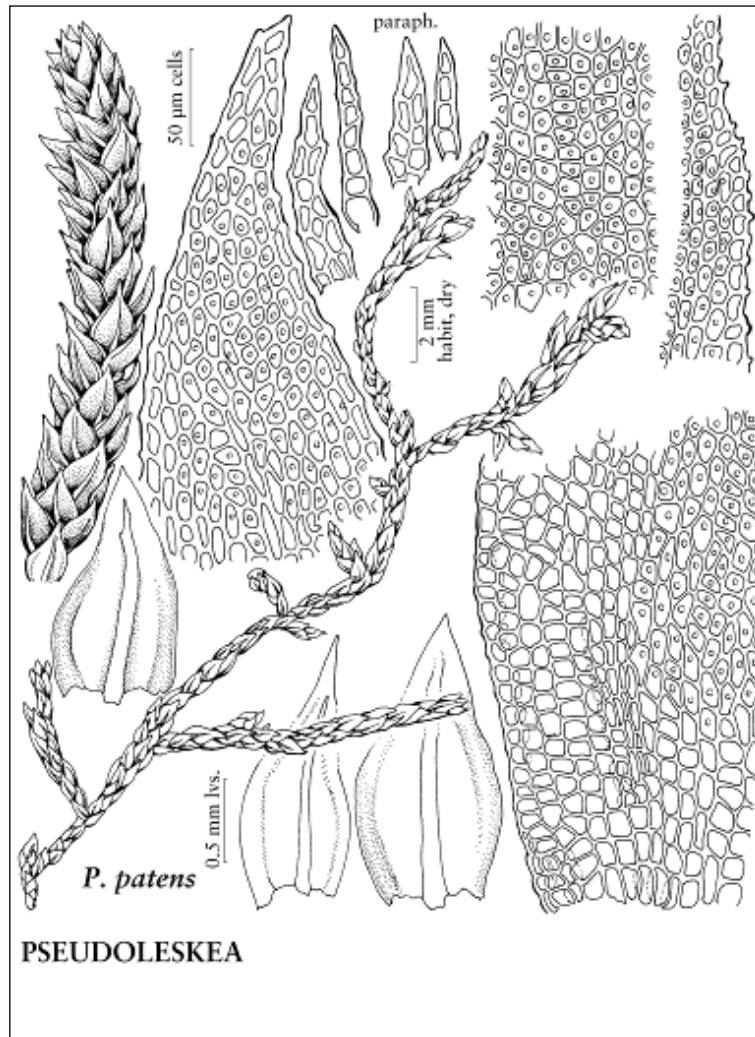
Courtesy FNA Association, FNA 28, 2014

PSEUDOLESKEA Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 147, plates 477, 478. 1852. (Leskeaceae)

Pseudoleskea incurvata (Hedw.) Loeske, *Hedwigia* 50: 313. 1911.

Leskea incurvata Hedw., *Sp. Musc. Frond.*, 216, plate 53, figs. 8–14. 1801.

The species and varieties are not reported for Wyoming in FNA (FNA, Vol. 28, 2014). (As *Pseudoleskea atrovirens*) Yellowstone Natl Park, specimen numbers 1535–36a, and 1539 (Roell 1893); also as var. *brachyclada*, specimen number 1536; also as subspecies *rigescens* (Wils.) Lindb. (1538) (Roell 1893). (As *Pseudoleskea oligoclada* Kindb.) Centennial, Albany County (Nelson 1724); Corral Ranger Station, Carbon Co. (Porter 930), (Sheridan Co.), Porter (1935). (As *Lescuraea incurvata* (Hedw.) Lawt. var. *incurvata*) Wyoming, Flowers (1973). (As *Lescuraea incurvata* (Hedw.) Lawt.) Teton Co., Spence, 1985.



Courtesy FNA Association, FNA 28, 2014

Carbon Co.: W slope of the Sierra Madre, in Battle Creek Canyon, 8500 ft, streamside forest of Engelmann spruce, moist rocks, 18 Aug 1964, *Porter & Porter 9715* (RM). Sublette Co.: , Shannon Pass, above Peak Lake, Wind River Mountains, Jim Bridger Wilderness, 43°08'N., 109°42'20" W, 3414 m, 23 Aug 1985, *Rolston 85110* (BUF, CSU); Bridger Wilderness, Wind River Range, Lake Sequa, 9940 ft, 42°57'30"N, 109°34'W, rock on shore, 17 May 1989, *Andrus 7881* (BING).

Pseudoleskea patens (Lindb.) Kindb., *Canad. Rec. Sci.* 6: 20. 1894.

Lescurea patens Lindb., *Meddeland. Soc. Fauna Fl. Fenn.* 14: 75. 1888.

Wyoming (FNA, Vol. 28, 2014). (As *Lescurea patens*) Lawton. (As *Lescurea patens* (Lindb.) Arn. & Jens.) Wyoming, *Flowers* (1973). (As *Lescurea patens*) Ireland (1982).

Lincoln Co.: on basalt outcrop along Greys River, 1/2 mi N of North Twin Creek, 6700 ft, Salt River Range, 36 mi SSE of Alpine Junction, 30 Aug 1973, *Hermann 25599* (RM) (dupl. det. Lawton).

Pseudoleskea radicata (Mitt.) Macoun & Kindb., Cat. Canad. Pl., Musci 181. 1892.

Hypnum radicosum Mitt., J. Linn. Soc., Bot. 8: 31. 1864.

Lescuraea radicata (Mitt.) Mönk.

Wyoming (as var. *radicata*) (FNA, Vol. 28, 2014). Leigh Lake, Teton Co. (*Porter 1177 & 1175*), Porter (1935). (As *Lescuraea radicata* (Mitt.) Mönk.) Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Var. **radicata**

Albany Co.: vertical face of granite boulder on aspen slope, along N Fork of Little Laramie River, Sand Lake Rd., 8500 ft, Medicine Bow Mts., ca. 3 mi W of Centennial, 4 Aug 1962, *Hermann 17742* (RM). Fremont Co.: thin soil on boulder on spruce-fir slope, Burroughs Creek Road, 8400 ft, Absaroka Range, 14 mi N of Dubois, 28 Aug 1973, *Hermann 25523* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, 42°57'30", 109°36'W, Barnes Lake, 9747 ft, 1/4 mi S of Timico, on soil, 19 May 1989, *Andrus 7897* (BING). Teton Co.: on US 26 & US 287, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl Forest, ca. 9000 ft, *Picea-Pinus flexilis*, *Pinus contorta* var. *latifolia*, xeric, some *Artemisia*, with *Pohlia nutans*, 6 Jul 1985, *Eckel 94081602* (BUF).

Weber (1973) indicated this var. "seems to be intolerant of the drier conditions of the lower forested slopes and so far has been found only in the subalpine zone."

Var. **compacta** Best, Bull. Torrey Bot. Club 27: 231. 1900.

Lescuraea radicata var. *compacta* (Best) Lawton

Pseudoleskea pallida Best

Wyoming (FNA, Vol. 28, 2014). (As *Lescuraea radicata* var. *compacta* (Best) Lawt.) in Lawton (1971).

Var. **denudata** (Kindb.) Wijk & Margadant, Taxon 9: 191. 1960.

Pseudoleskea sciuroides var. *denudata* Kindb. in J. Macoun and N. C. Kindb., Cat. Canad. Pl., Musci 181. 1892.

Wyoming (FNA, Vol. 28, 2014).

Var. **pallida** (Best) Crum, Steere & Anderson

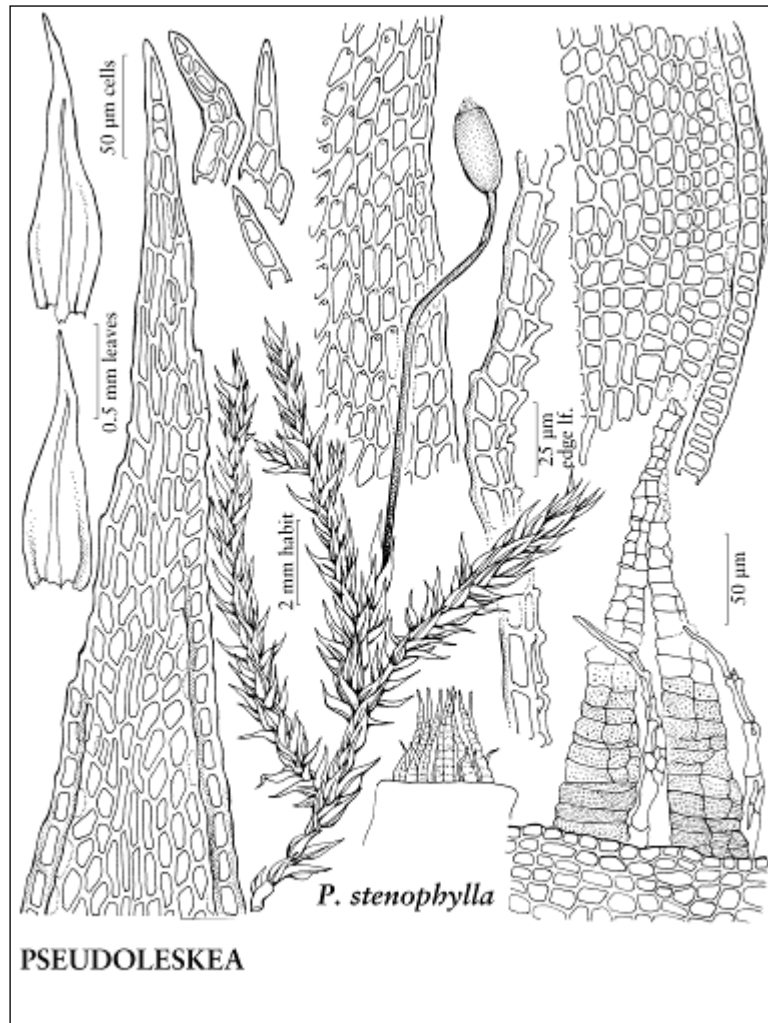
(As *Lescuraea radicata* var. *pallida* (Best.) Lawt.) in Lawton (1971).

This variety is not reported in FNA Vol. 28, 2014, but may be var. *compacta*, q.v.

Pseudoleskea stenophylla Ren. & Card., Bot. Centralbl. 44: 421. 1890.

Lescuraea stenophylla (Ren. & Card.) Kindb.

(As *Pseudoleskea atrovirens* subsp. *P. rigescens* (Wils.) Lindb. Yellowstone Natl Park, 1538 (Roell 1893). (As *Lescuraea stenophylla* (Ren. & Card.) Kindb.) Teton Co., Spence (1985) (citing a Flowers specimen).



Courtesy FNA Association, FNA 28, 2014

PSEUDOLESKEELLA Kindb., Eur. N. Amer. Bryin., 47. 1897. (Leskeaceae)

Pseudoleskeella nervosa var. *sibirica* (H. Arnell) Lawton = *Pseudoleskeella rupestris* (Berggren) Hedenäs & L. Soderström

Pseudoleskeella rupestris (Berggren) Hedenäs & L. Soderström, *Lindbergia* 17: 64. 1992.

Leskea rupestris Berggren, *Acta Univ. Lund.* 3(7): 9, figs. 10–13. 1866.

Leskeella nervosa var. *sibirica* (Arnell) Lawton

Pseudoleskeella sibirica (Arnell) P. S. Wils. & D. H. Norris

Wyoming (FNA, Vol. 28, 2014).

Pseudoleskeella tectorum (Funck ex Brid.) Kindb. ex Broth. in H. G. A. Engler and K. Prantl, *Nat. Pflanzenfam.* 229 (I,3): 997. 1907.

Hypnum tectorum Funck ex Brid., *Bryol. Univ.* 2: 582. 1827.

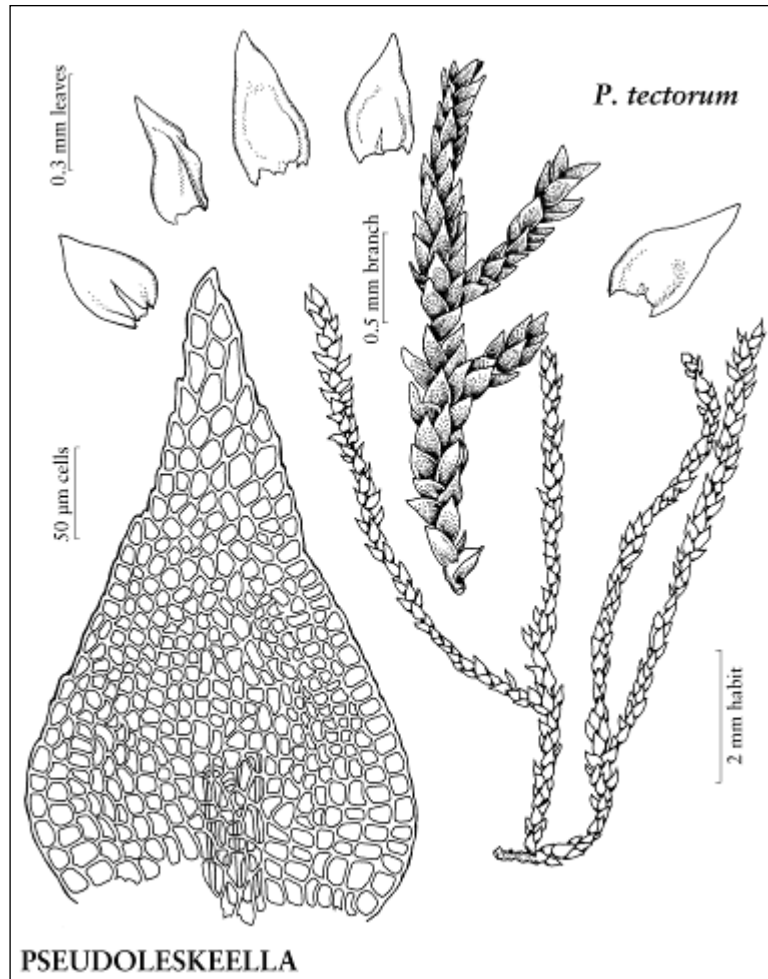
Leskea tectorum var. *flagellifera* Best

Leskea williamsii Best

Leskea williamsii var. *flagellifera* Best

Leskella tectorum (Brid.) Hag.
Pseudoleskea tectorum (Funck ex Brid.) Schimp.

Wyoming (FNA, Vol. 28, 2014). (As *Leskea tectorum* var. *flagellifera*) Rogers Canyon, Albany County (*Porter 1286*); Yellowstone Falls, Yellowstone Natl Park (*Porter 1245*), Porter (1935). (As *Pseudoleskeella williamsii* (Best) Crum, Steere & Anderson. (As *Leskeella williamsii* Best) Near Fox Park, Albany Co. (*Porter 1267*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Albany Co.: NW base of Sheep Mountain along WY11, ca. 4 air mi ESE of Centennial, seep are (calcareous fen) with *Populus*, *Betula* and *Salix*, *Buck 23242* (NY); Laramie Mountains, Roger Canyon, 8 air mi NE of Laramie city center, 7850–8000 ft, on thin soil over limestone boulder, 7 Jun 1993, *Miller 10,247* (NYS). Fremont Co.: limestone outcrop, Douglas fir slope, 1/2 mi E of Horse Creek Campground, 7800 ft, Absaroka Range, 11 mi N Dubois, with *Tortella tortelloides*, *Gymnostomum aeruginosum*, 28 Aug 1973, *Hermann 25530* (WTU). Natrona Co.: Hat Six Falls, SE of Casper, 7 Aug 1897, *Nelson 5036* (RM). Sheridan Co.: on vertical rock face, moist limestone, Big Horn Natl Forest, T57N, R89W, Sect. 27, 16 Jun 1992, *McKee 92-020* (BUF, RM). Weston Co.: *Eckel 923686* (RM).

This moss is distinct from others in the Leskeaceae by its frequently having no costa in smaller branch leaves. Otherwise, species of the Leskeaceae appear to all have strong costae into the acumen. *Lindbergia brachyptera* has a long acuminate apex, unlike *Pseudoleskeella tectorum*. *Brachythecium collinum* fruits readily around early July, whereas *P. tectorum* seldom does. The former species has a single costa and is regularly and distinctly serrate usually to the base: *P. tectorum* is generally entire except in young leaves where it may be somewhat serrulate in the apex. *Pseudoleskeella tectorum* is characterized by an eagerness to develop reduced leaves, yielding branches flagelliform in appearance. This species reminds one of the flagellate-attenuate branch ends of *Anomodon attenuatus* in the East. *Anomodon* is not an element of the western flora. *Homomallium adnatum*, the other species in that genus, is also an eastern taxon.

PTERYGONEURUM Juratzka, Laubm.-Fl. Oesterr.-Ung., 95. 1882 (as Pterigoneurum), name and orthography conserved. (Pottiaceae)

Pterygoneurum ovatum (Hedw.) Dixon, Rev. Bryol. Lichénol. 6: 96. 1934)

Gymnostomum ovatum Hedw., Sp. Musc. Frond., 31, plate 2, figs. 1–3. 1801.

Pottia cavifolia Ehrh. ex Fuernr.

Pottia pusilla Lindb.

Wyoming (FNA, Vol. 27, 2007). British Columbia, Washington, Oregon, Idaho, Montana, Wyoming; Yukon, California, Nevada, Utah, Arizona, New Mexico, Colorado; Saskatchewan, North Dakota, Ontario, Quebec. (As *Pterygoneurum cavifolium* Jur.) On dry, sandy soil, Telephone Canyon, Albany Co. (*Porter 686*), *Porter (1935)*.

Albany Co.: NW base of Sheep Mtn along WY 11, sandstone outcrops and chugwater redbeds with *Artemisia*, 7 Jun 1993, *Buck 23220*, old fruit (NY). Crooke Co.: *Eckel 519686* (RM, BUF). Hot Springs Co.: *Eckel 123686* (RM, BUF). Lincoln Co.: on US189 just N of border with Uinta Co., S of town of Kemerer, open sage prairie, *Sarcobatus vermiculatus*, on dirt polygons below shrubs, mixed with *P. subsessile*, 4 Jul 1985, *Eckel 94082205* (BUF). Natrona Co.: from soil on south bank of river shaded by slight overhang and tall grass in very dry land, sagebrush, bunchgrass habitat, 22 Mar 1996, *Hoy 315* (BUF). Sweetwater Co.: ca. 6400 ft, on US (187)191, at 14-Mi Reservoir picnic area in *Artemisia* scrubland, moist shaded ravine over brook, with *Hennediella heimii*, *Leptobryum pyriforme*, *Campylium chrysophyllum*, 5 Jul 1985, *Eckel 312086* (BUF).

Pterygoneurum subsessile (Brid.) Juratzka, Laubm.-Fl. Oesterr.-Ung., 96. 1882.

Gymnostomum subsessile Brid., Muscol. Recent., suppl. 1: 35. 1806.

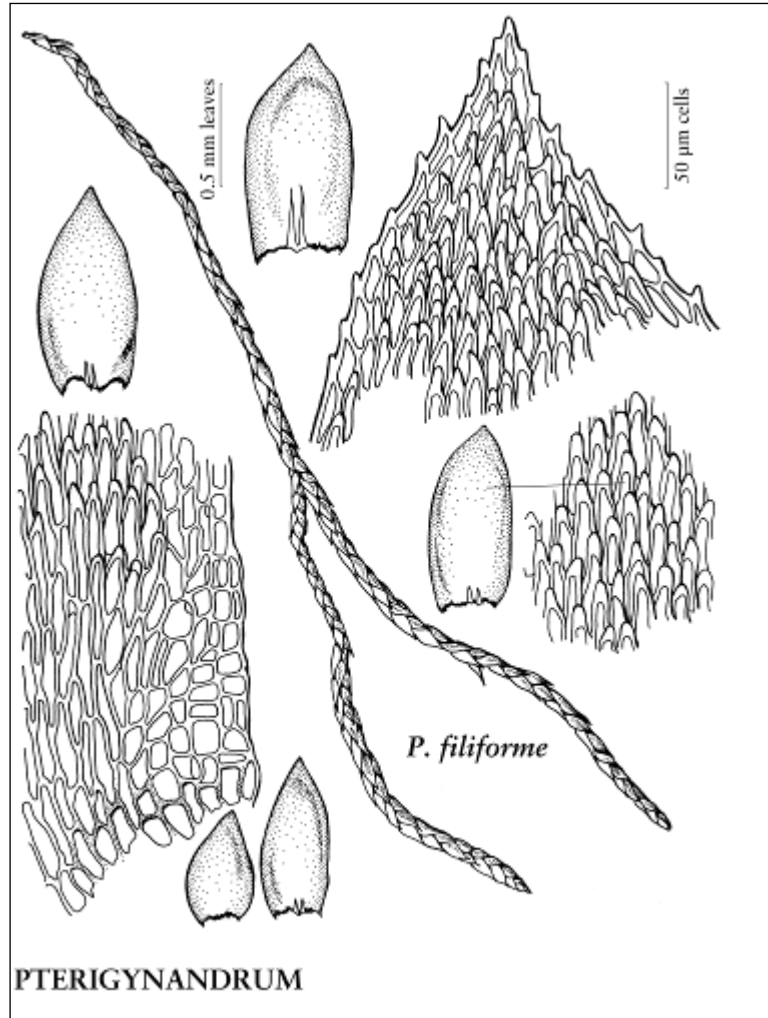
Gymnostomum acaule Floerke in Web. & Mohr

Pottia subsessile (Brid.) B.S.G.

British Columbia, Oregon, Idaho, Wyoming; Yukon, Nevada, Utah, Arizona; Saskatchewan, North Dakota, Oklahoma, Texas, Minnesota.

Albany Co.: Laramie Plains, 2 mi NE of Laramie, chugwater redbeds with *Astragalus*, *Eriogonum*, *Penstemon* and grasses, 7 Jun 1993, *Buck 23188*, c.fr., old but intact, dehiscent (NY); open prairie, low grasses and forbs, ca. 7300 ft, rim of breaks, among grasses, *Reese 18164* (LAF); Laramie Plains, 2 mi NE of Laramie center, chugwater redbeds, rim of breaks, 7250–7300 ft, bare prairie soil between herbs, including *Astragalus*, *Eriogonum*, *Penstemon*, 7 Jun 1993, *Miller 10251* (NYS). Goshen Co.: 4350 ft, *Eckel 871112* (BUF). Hot Springs Co.: *Eckel 323686* (RM). Laramie Co.: *Eckel 871113* (RM, BUF). Lincoln Co.: on US189 just N of border with Uinta Co., S of town of Kemerer, open sage prairie, *Sarcobatus vermiculatus*, on dirt polygons below shrubs, mixed with *P.*

ovatum, 4 Jul 1985, *Eckel 94082206* (BUF). Niobrara Co.: 5000 ft, *Eckel 871102* (RM). Sublette Co.: on US 191, 1.7 mi N of jct. with US 189, *Artemisia tridentata*, *Sarcobatus*, shadscale grassland, on soil, 5 Jul 1985, *Eckel 961254* (BUF, RM). Sweetwater Co.: on US (187)191, at 14 Mile Reservoir, picnic area, US Dept. Interior, dry slopes above pond, *Sarcobatus*, *Artemisia tridentata* scrub, with *Tortula caninervis* & *T. mucronifolia*, 5 Jul 1985, *Eckel 218186* (BUF, RM).



Courtesy FNA Association, FNA 28, 2014

PTERIGYNANDRUM Hedw., Sp. Musc. Frond., 80, plates 16, 17 18, figs. 1–5. 1801.
(Pterigynandraceae)

Pterigynandrum filiforme Hedw., Sp. Musc. Frond., 81. 1801.

Wyoming (FNA, Vol. 28, 2014). Yellowstone Natl Park: a specimen was noted by Roell (1893) for the Park (*1534*, *1537a*, and *1552*).

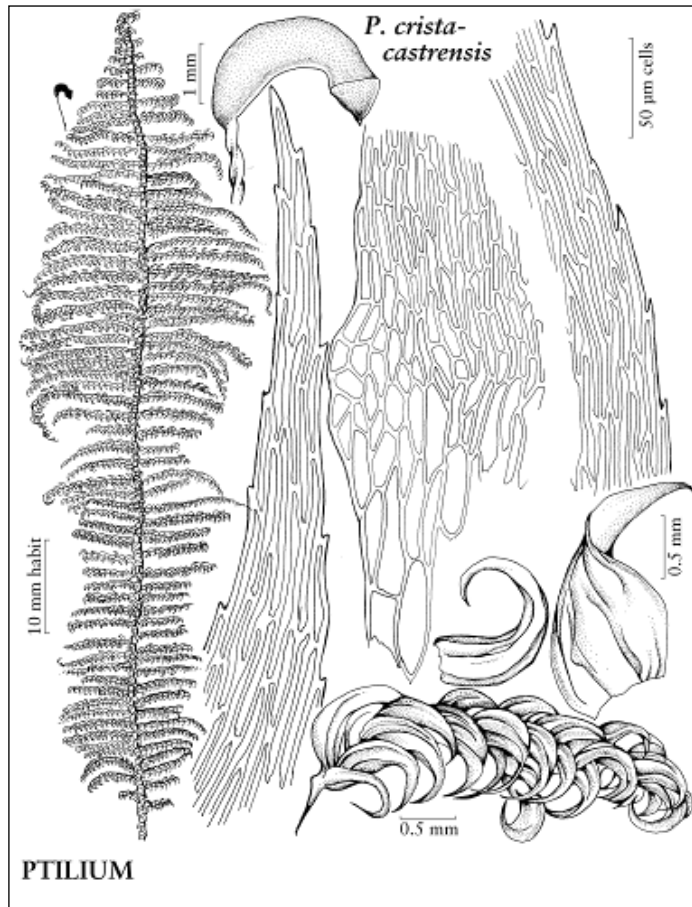
PTILIUM De Not., Comment. Soc. Crittog. Ital. 2: 283. 1867. (Hypnaceae)

Ptilium crista-castrensis (Hedw.) De Not., Comment. Soc. Crittog. Ital. 2: 283. 1867.

Hypnum crista-castrensis Hedw., Sp. Musc. Frond., 287, plate 76, figs. 1–4. 1801.

Wyoming (FNA, Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: W of Bear Tooth Butte Crazy Creek Campground, along Crazy Creek, 22 Aug 1953, *Lawton 2018* (WTU). Yellowstone Natl Park: Madison Junction, 18 Aug 1953, *Lawton 1900* (WTU).



Courtesy FNA Association, FNA 28, 2014

PTYCHOSTOMUM Hornschuch, Syll. Pl. Nov 1: 62. 1822. (Bryaceae)

Ptychostomum arcticum (R. Brown) J.R. Spence, Phytologia 87: 20. 2005.

Pohlia arctica R. Brown, Chlor. Melvill., 38. 1823.

Bryum arcticum (R. Brown) P. Bruch & W.P. Schimper

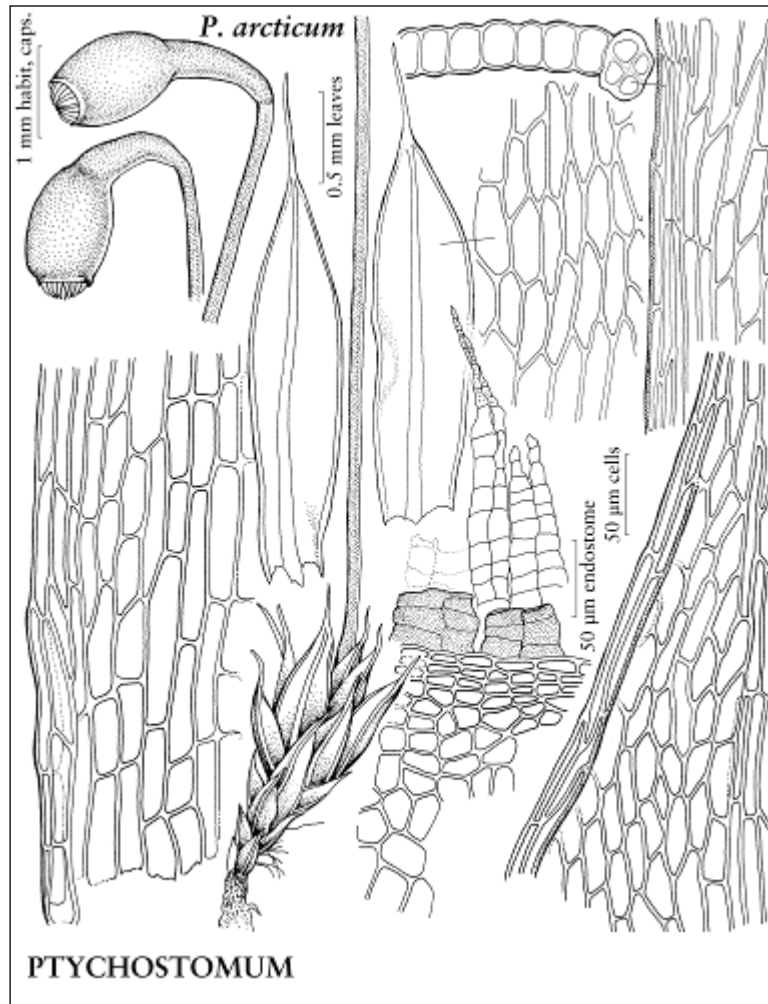
Bryum bryoides (R. Brown) Ångström

Bryum purpurascens (R. Brown) P. Bruch & W.P. Schimper

Ptychostomum bryoides (R. Brown) J.R. Spence

Ptychostomum purpurascens (R. Brown) J.R. Spence

Wyoming (FNA, Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

Ptychostomum bimum (Schreber) J.R. Spence, *Phytologia* 87: 20. 2005.
Mnium bimum Schreber, *Bot. Zeitung (Regensburg)* 1: 79. 1802.
Bryum bimum (Schreber) Turner
Bryum pseudotriquetrum var. *bimum* (Schreb. ex Brid.) Lilj.

Wyoming (FNA 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Ptychostomum cernuum (Hedw.) Hornschuch, *Syll. Pl.* Nov 1: 64. 1822.
Cynontodium cernuum Hedw., *Sp. Musc. Frond.*, 58, plate 9. 1801.
Bryum uliginosum (Brid.) P. Bruch & W.P. Schimper
Bryum cernuum (Sw.) Lindb.
Bryum conditum Williams
Bryum turbinatum var. *pallens* Drumm.
Cladodium uliginosum Brid.

Not reported for Wyoming in FNA (FNA, Vol. 28, 2014). "Reported from Wyoming," Lawton (1971). Teton Co., Spence (1985).

As *Bryum uliginosum*, Flowers (1973: 364) wrote: “The large curved capsule and large lax leaves make this moss easily recognizable.” Note that, like *B. turbinatum*, it has large more or less lax cells and the margins are not recurved (plane) but, unlike *B. turbinatum*, which has no distinct border, *B. uliginosum* has cells “thin walled and lax, rather abruptly narrowly linear on the margins forming a strong border.” Flowers also indicated a 6 mm long capsule!

Ptychostomum creberrimum (Taylor) J.R. Spence & H.P. Ramsay, *Phytologia* 87: 23. 2005.

Bryum creberrimum Taylor, *London J. Bot.* 5: 54. 1846.

Bryum alaskanum Kindb.

Bryum bimum var. *cuspidatum* B.S.G.

Bryum cuspidatum (B.S.G.) Schimp.

Bryum flagellosum Kindb.

Bryum hamicuspis Kindb.

Bryum intermedium (of American authors)

Bryum lisae var. *cuspidatum* (P. Bruch & W.P. Schimper) Margadant

Bryum manitobae Kindb.

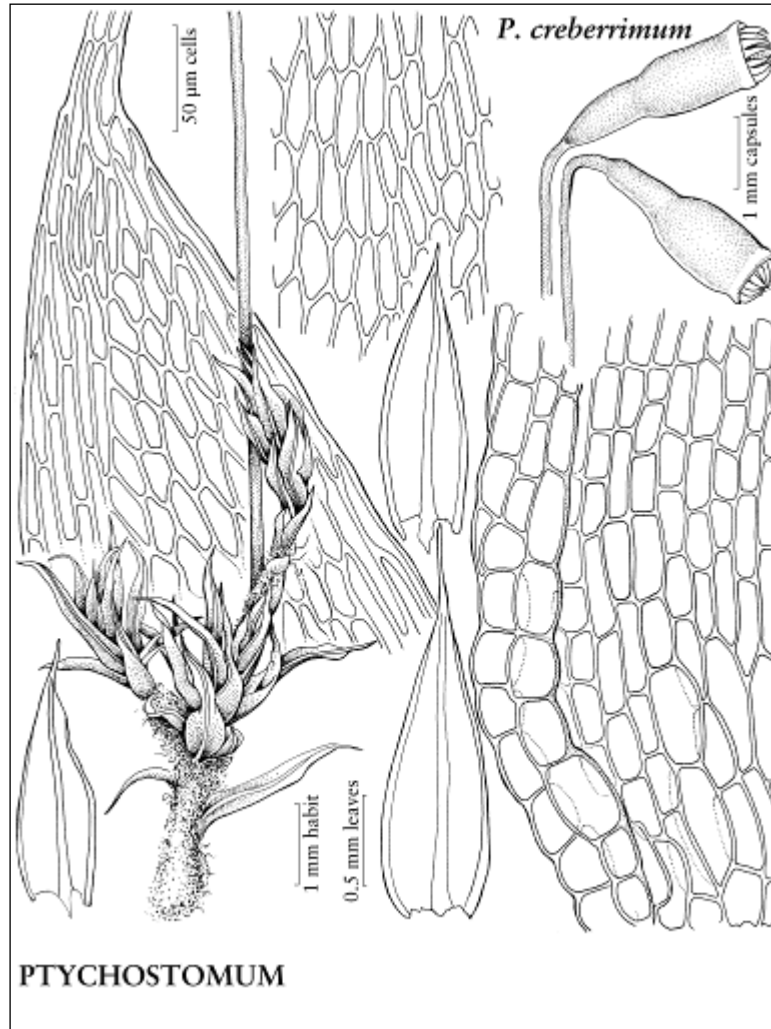
Bryum nano-caespitium Kindb.

Bryum neomexicanum Card.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum lisae* var. *cuspidatum*) In all states and provinces of the Pac. NW; Alask., Cal., Nev., Ariz; widespread in the Midwest and in eastern North America. (As *Bryum intermedium* Brid.) Laramie Mts. Albany Co. (*Nelson 7274*); Centennial Valley, Albany Co. (*Nelson 1263*); Old Faithful, Yellowstone Natl Park, Porter (1935). Teton Co., Spence (1985). (As *Bryum cirrhatum* Hopp. & Hornsch.) Cummins, Homer Ranch, and Brooklyn Lake, all in Albany Co. (*Nelson 1538*, in part, *6955*, and *5235*) Porter (1937).

(All as *Bryum lisae* var. *cuspidatum*) Albany Co.: Centennial Valley, *Nelson 1263* (RM); Laramie Hills, *Nelson 7274* (RM, US); on the wet alkaline ditch banks, Homer's Field, exsiccata Plants of Wyoming, 30 May 1900, *Nelson 6955* (RM). Bighorn Co.: ca. 28.5 mi east of Greyville, ca. 19.5 mi NNE of Hyattville, 9200 ft, 9 Jul 1979, *Nelson 3334*, fruit operculate (BUF, RM); off Devil Canyon Rd. above Little Tepee Creek, on rotten logs, 8300 ft, with *Pohlia nutans*, *Leptobryum pyriforme* and *Distichium capillaceum*, *Nelson 3658a* (BUF); on disturbed soil just off US 16 between Tensleep & Buffalo (near Sitting Bull Campsite), *Pinus contorta* v. *latifolia* being lumbered, just N of Washakie Co. border, ca. 5000 ft, with *Ceratodon purpureus*, 6 Jul 1985, *Eckel 94092200* (BUF, RM). Fremont Co.: 8400 ft, *Hermann 25515* (RM). Park Co.: 7400 ft, *Hermann 20067* (RM). Park Co.: 6000 ft, 1 Apr 1988, *Vukelich s.n.* (BUF). Yellowstone Natl Park: (as *Bryum torquescens*) Druid Peak, Plants of Yellowstone Natl Park, growing amid fruiting *Pohlia nutans*, 12 Jul 1899, *Nelson & Nelson 5801*, synoicous, rosulate specimens, lance-acuminate leaves with long awns, not ovate or obovate (US, RM).

The specimen *Nelson 3658a* is unusual in that the neck of the capsule is, in some plants, as long as the urn. It has low teeth on the lamina margins and hairpoints, as *B. cirrhatum* is described by Crum and Anderson (1981: 556). In Europe this is considered alpine but there is no distinction in the USA in elevation.



Courtesy FNA Association, FNA 28, 2014

Ptychostomum cyclophyllum (Schwägr.) J.R. Spence, *Phytologia* 87: 20. 2005.

Mnium cyclophyllum Schwägr., *Sp. Musc. Frond. Suppl.* 2(2,2): 160, plate 194 (bottom). 1827.

Bryum cyclophyllum (Schwägr.) P. Bruch & W.P. Schimper

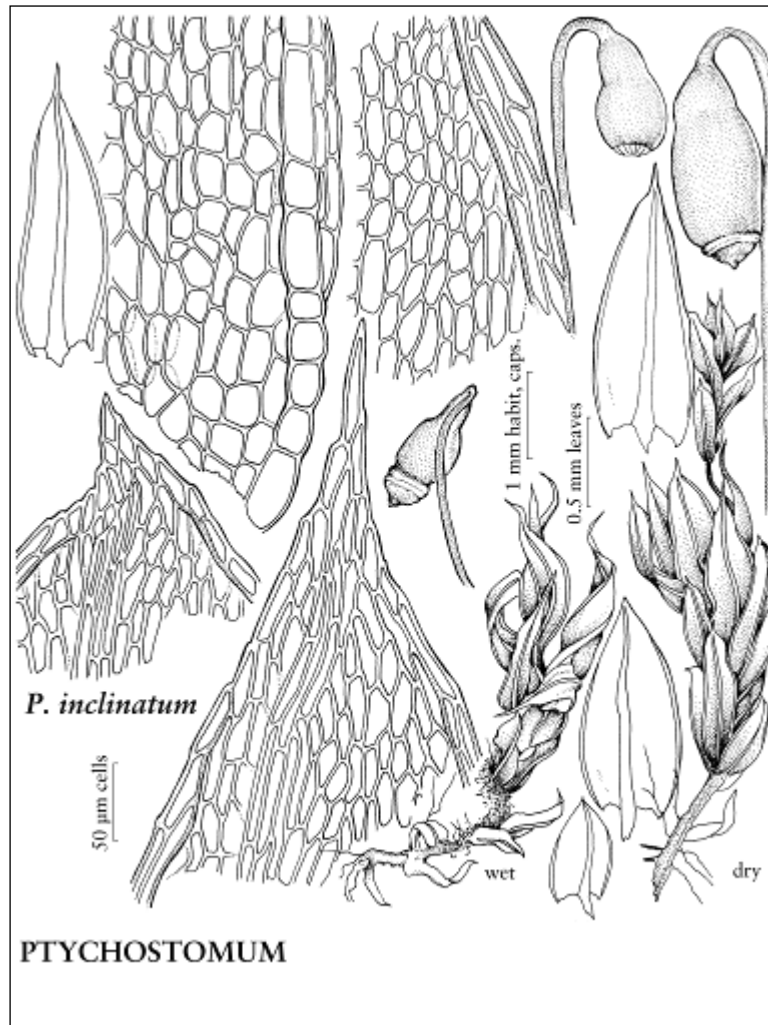
Bryum tortifolium Brid.

Mnium cyclophyllum Schwägr.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum cyclophyllum*) Wash., Alberta, Wyoming; Alask., Yuk., Ariz; Missouri. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Fremont Co.: 9300 ft, *Hermann 25291* (RM). Park Co.: tundra, 10,000 ft, *Hermann 20070* (RM & WTU). Both specimens pink. Tends to a bright red with age.

“The occurrence of *P. cyclophyllum* has probably declined in the United States, as the plants grow in wetlands and along streams in mid elevation regions, areas where human development is often concentrated” (Spence in FNA Vol. 28, 2014). In one instance it was found confused with *B. gemmiparum* which has not yet been found in Wyoming. The latter is without red pigmentation (Crum & Anderson 1981), but most notably is not or scarcely contorted when dry.



Courtesy FNA Association, FNA 28, 2014

Ptychostomum inclinatum (Sw. ex Brid.) J.R. Spence, *Phytologia* 87: 21. 2005.

Pohlia inclinata Sw. ex Brid., *Muscol. Recent.* 2(3): 144. 1803.

Bryum acutiusculum Müll. Hal.

Bryum amblyodon Müll. Hal.

Bryum edwardsianum Müll. Hal. & Kindb. in Macoun

Bryum froudei Kindb.

Bryum inclinatum (Brid.) Bland.

Bryum stenotrichum Müll. Hal.

Bryum stenotrichum var. *biddlecomiae* (Aust.) Lawt.

Cladodium inclinatum (Brid.) Brid.

Cladodium inclinatum (Sw. ex Brid.) Brid.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum inclinatum*) Laramie Hills, Albany Co., Nelson (1928), Porter (1935). (As cf. *stenotrichum*) "Common in front of glaciers," Teton Range, Grand Teton Natl Park, Wyoming, Spence (1981). Teton Co., Spence (1985).

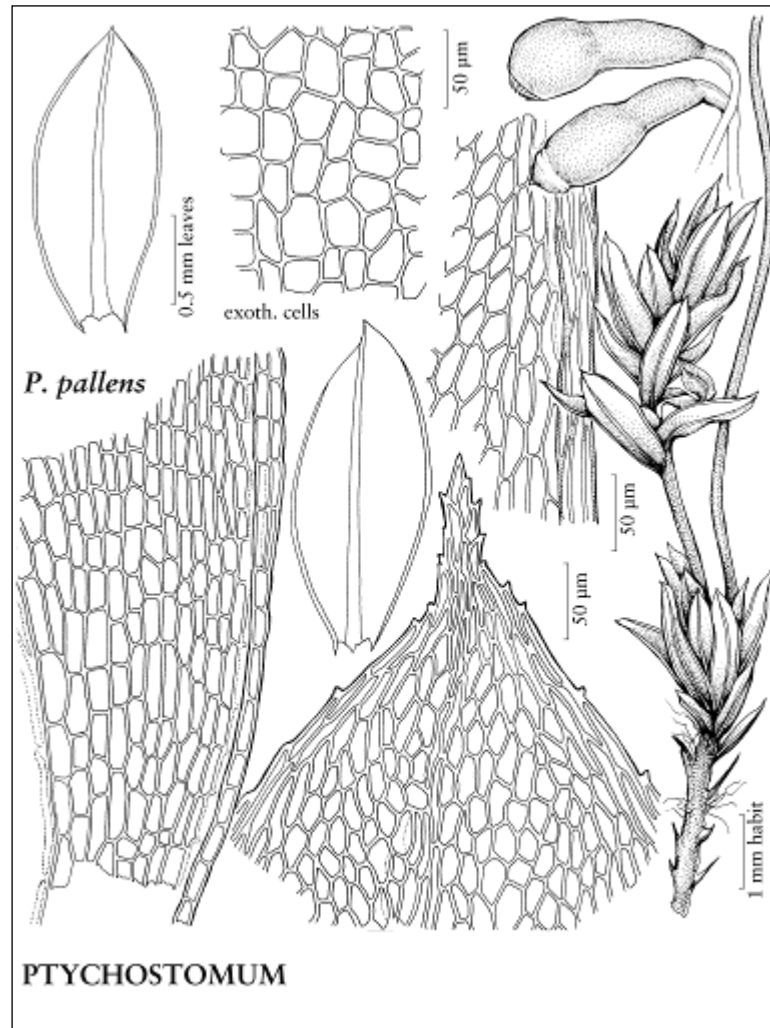
Weber (1973) indicated this species "occurs commonly in the alpine tundra, where it may replace *B. pallescens* on drier sites." Note that *Bryum liseae* var. *cuspidatum*, which Flowers (1973:

370) indicates is in Utah “our commonest species of *Bryum*.” It is not reported as growing in Colorado by Weber (1973).

Ptychostomum knowltonii (Barnes) J.R. Spence, *Phytologia* 87: 21. 2005.

Bryum knowltonii Barnes, *Bot. Gaz.* 14: 44. 1889 (as *knowltoni*)

Wyoming (FNA, Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

Ptychostomum lonchocaulon (Müll. Hal.) J.R. Spence, *Phytologia* 87: 21. 2005.

Bryum lonchocaulon Müll. Hal., *Flora* 58: 93. 1875.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum cirratum* (Hornsch.) Lindb.—although this may be a different taxon than one in synonymy with *P. lonchocaulon*). Wyoming: Yellowstone Natl Park, c.fr., (1506, 1509, 1510) (Roell 1893).

Spence (1988: 83) indicated that (*Bryum lonchocaulon*) is “an ecological variant of *B. lisae* with extremely long hairpoints.” *Bryum cirratum* Hornsch. is in synonymy with *B. lonchocaulon* in the list of Anderson et al. (1990). “*Ptychostomum lonchocaulon* is very similar to *P. creberrimum*,

differing in sexual condition (polyoicous, mixed synoicous and with male-only gametangia vs. synoicous) and its stronger non-yellowish limbidium” (Spence in FNA 28, 2014).

Ptychostomum pallens (Sw.) J.R. Spence, Phytologia 87: 21. 2005.

Bryum pallens Sw., Monthly Rev. 34: 538. 1801.
Bryum anoectangium Müll. Hall. & Kindb. in Macoun
Bryum drepanocarpum Philib. in Card. & Thér.
Bryum heterogynum Philib. in Card. & Thér.
Bryum meesioides Kindb. in Macoun
Bryum subpurpurascens Kindb. in Macoun
Hypnum pallens (Sw.) Web. & Mohr
Pohlia pallens (Sw.) Brid.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum pallens*) Wyoming: Yellowstone Natl Park, c.fr., (1505a) (Roell 1893). (As *Bryum pallens*) B.C. Wash., Oregon, Wyoming; Newfoundland, Quebec, NY.

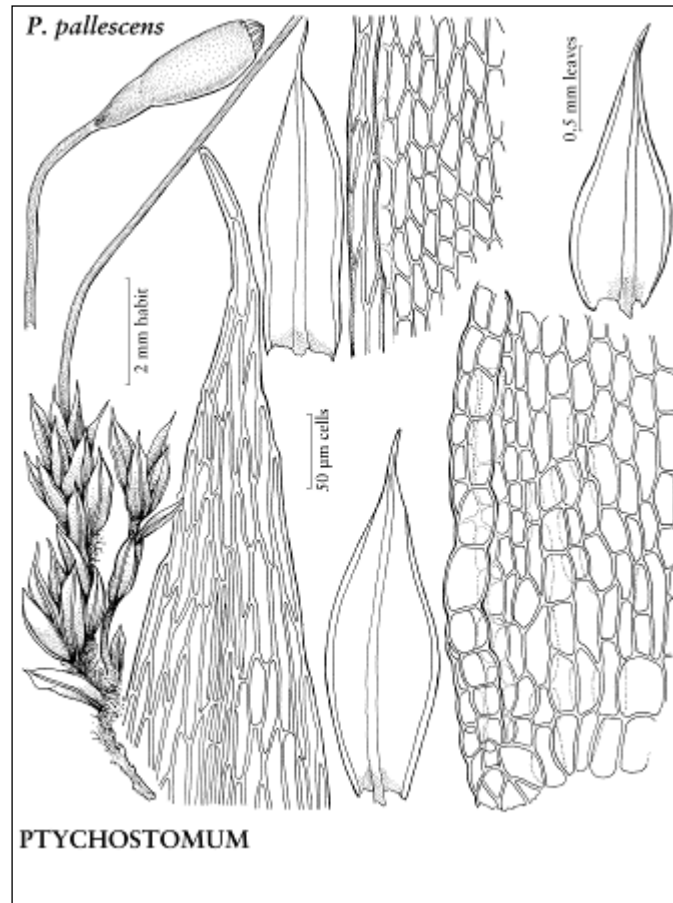
Ptychostomum pallescens (Schleicher ex Schwägr.) J.R. Spence, Phytologia 87: 21. 2005.

Bryum pallescens Schleicher ex Schwägr., Sp. Musc. Frond. Suppl. 1(2): 107, plate 75 (right). 1816.
Bryum microstegioides Kindb.
Bryum subrotundum Brid.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum subrotundum*) Wyoming: Yellowstone Natl Park, parce sed fert. (sparing but fertile) (1511) (Roell 1893). (As *Bryum pallescens*) In all states and provinces of the Pacific Northwest; Cal., Nev., Colo. Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Bryum pallescens*) Albany Co.: Laramie Peak, in the shaded aspen groves, *Nelson 7536* (det. by Holz. as *B. bimum* Schreb., printed label, Plants of Wyoming) (RM); on humus on bank of small stream Medicine Bow Mtns, *Schriever 9* (RM). Big Horn Co.: Big Horn Mtns, off Devil Canyon Road above Little Teepee Creek, moist to wet meadow, 8300 ft, 13 Jul 1979, *Nelson 3652* mature capsules (RM, BUF). Carbon Co.: peaty knoll on shore of Lake Marie, 10,000 ft, Snowy Range, Medicine Bow Mtns., 13 mi E of Ryan Park, 19 Aug 1961, *Hermann 17146* (US); Ferris Mountains, 25 Jul 1898, *Nelson 4980* c.fr., (as *B. cirratum*) cladautoicous plus free endostome (US). Johnson Co.: Big Horn Mtns., along Middle Fork Crazy Woman Creek, 8200 ft, 11 Jul 1979, *Nelson 3584*, c.fr., deoperculate (BUF, RM). Sheridan Co.: Big Horn Mtns., limestone outcrops and adjacent forest, 8000 ft, *Hartman 10253* (RM). Sublette Co.: 10,325 ft, *Rolston 85101* (CSU). Yellowstone Natl Park: Witch Creek Fire Scar W of Flat Mn, 8000 ft, hillside, dry area, *Taylor 67-159* (RM).

“*Ptychostomum creberrimum* is similar, but has smaller spores, synoicous sexual condition, and ovate segment perforations” (Spence in FNA Vol. 28, 2014). This plant has complex sexuality, with male buds on separate branches. The stems are many-branched and felted with rhizoides, unlike *B. lisae*. The fruiting stem may have an archegonium or two, and be apparently synoicous and then easy to mistake as *B. lisae*. The bulb-like habit of *B. caespiticium* with little branches should be looked at in comparison with this species. The Yellowstone specimen also had many branches, up to six, with innovations on the branches. One of the side branches of the fruiting stem bore archegonia and no antheridia could be found on the stem examined. If upon dissection, a plant of this type has copious antheridia, it is probably this species, not *B. lisae*. The cell dimensions are indistinguishable from those of *B. lisae*, frequently being quite long.



Courtesy FNA Association, FNA 28, 2014

Ptychostomum pendulum Hornschuch, Syll. Pl. Nov 1: 64. 1822.

Bryum algovicum Sendtner ex Müll. Hal.

Bryum pendulum (Hornsch.) Schimp.

Bryum roellii Philib.

Ptychostomum compactum Hornsch.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum pendulum*) Wyoming: Yellowstone Natl Park, Upper Fall, 7000 ft, (1500, 1507) (Roell 1893). (As *Bryum algovicum*) British Columbia, Washington, Alberta, Idaho, Montana, Wyoming; NorthW Terr. Cal., Nev., Colo.; Sask., Manit., S. Dakota, Iowa, Nebr., Minn., Mich., Ont., Indiana; Quebec to District of Columbia. (As *Bryum angustirete* Kindb. ex Macoun in Lawton). (As *Bryum angustirete* Kindb.) Cokeville, Lincoln Co. (Nelson 4656), Porter (1935). (As *Bryum pendulum* Schimp.) Albany, Carbon, Johnson, Sheridan, Sweetwater cos., Porter (1935).

(As *Bryum algovicum*) Albany Co.: Centennial Valley, 17 Aug 1896, Nelson 2654, c.fr., small mouth obvious here (RM); also Sherman and Buford, wet granite swales, 27 Jul 1913, Macbride 2547 (RM). Big Horn Co.: Big Horn Mtns., E-facing slope, 8800 ft, 21 Jun 1979, Hartman & Odasz 9152, c.fr., not dehisced (BUF, RM). Carbon Co.: rocky hillside, Rawlins, on flat, wet ground, 13 Jul 1942, Degener 17,049, c.fr. (US). Johnson Co.: Big Horn Mtns., canyon along North Fork Crazy Woman Creek; calcareous boulders in creek and wet cliffs at edge of creek, 6600 ft, 6 Aug 1980, Nelson 6837, c.fr., half deoperculated (BUF, RM), with *Hymenostylium recurvirostrum*. Fremont Co.: in big spring about 4 mi E of Dubois, 23 Jun 1931, Frye s.n. (WTU); Steamboat Mountain, on a boggy flat,

9 Jun 1900, *Nelson 7045* printed label, Plants of Wyoming, det. by E.G. Britton and R.S. Williams, synoicous plus male buds on tips of branches, large spores, small mouths (RM).

The name *Bryum algovicum* is “reserved for the autoicous form and *B. algovicum* var. *rutheanum* (Warnst.) Crund. should be used for the synoicous form. We find that the species is actually polygamous (usually syoicous but sometimes also producing perigonal buds on the same plants)” Crum and Anderson (1981: 544), so they reject the varieties. But see the most recent checklist (Anderson et al. 1990) where both varieties are recognized, cf. discussion in Crum and Anderson 1981. “The name *B. angustirete* Kindb. ex Macoun (Bull. Torrey Bot. Club 16: 94 1889) has been rejected because the type could not be found either in Macoun's or Kindb.'s herbarium, and such specimens as occur in those herbaria under that name are not *B. algovicum*,” (Crum and Anderson 1981: 544). Lawton's (1971) *B. angustirete* is synonymous with *Bryum pendulum*, as is Crum & Anderson's *B. algovicum*. It is through *Bryum pendulum* that I identify Lawton's references to *B. angustirete* with *B. algovicum*.

The Johnson Co. specimen had leaf cells shorter and thicker than those of *Bryum lisa* var. *cuspidatum* but not as short as those of *B. pseudotriquetrum*, which in addition has decurrencies. The peristome is peculiar as described.

As *Bryum algovicum*, Spence (1988) wrote that the species “can be distinguished by its fused peristome, large spores, and small pendulous capsule with a small red mouth.” It occurs at low elevations and in dry regions. The *Degener 17,049* specimen did have a small mouth, as Spence indicated, and with a nice red ring around it. The capsules appear to be as small as those of *B. caespiticium*, with which the Degener specimen had first been identified—but the stem was many branched and not rosulate (resembling *B. pallescens* in this regard) and not bulbous with long leaf apices as in *caespiticium*.

The *Nelson 4656* specimen mentioned by Porter above seen at (US) had capsules that were young, but the tufts were dense and green or yellow-green, as Crum & Anderson (1981: 542) indicated. The plant I examined was synoicous, note “innovations on fruiting plants often terminating in a perigonium”—which reminds me of *Bryum pallescens*. Capsules are definitely needed for identification (Spence in FNA Vol. 28, 2014).

Ptychostomum pseudotriquetrum (Hedw.) J.R. Spence & H.P. Ramsay ex Holyoak & N. Pedersen, J. Bryol. 29: 120. 2007.

Mnium pseudotriquetrum Hedw., Sp. Musc. Frond. 190. 1801.

Bryum crassirameum Ren. & Card.

Bryum crassirameum Ren. & Card.

Bryum dimorphophyllum Card. & Thér.

Bryum euryloma Card. & Thér.

Bryum haematocarpum Müll. Hall. & Kindb. in Macoun

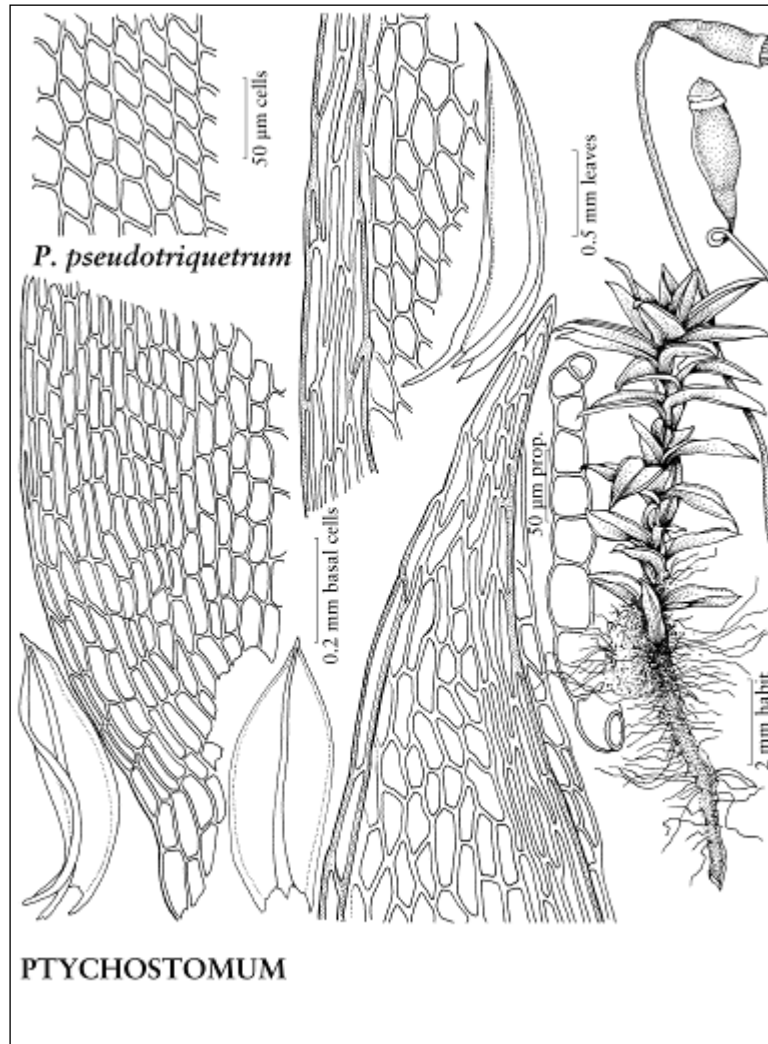
Bryum pseudotriquetrum (Hedw.) P. Gaertner, B. Meyer & Scherbius

Bryum pseudotriquetrum var. *crassirameum* Ren. & Card.

Hypnum pseudotriquetrum (Hedw.) Web. & Mohr

Wyoming (FNA, Vol. 28, 2014) “*Ptychostomum bimum* is smaller, with much weaker decurrencies, and is synoicous” (Spence in FNA, Vol. 28, 2014). (As *Bryum pseudotriquetrum*) Wyoming: Yellowstone Natl Park, (1515) (Roell 1893). A form with short, obtuse leaves with the margins strongly revolute was also found at Yellowstone, as was var. *gracilescens* Schimper, sterile (1508) (Roell 1893). (As *Bryum pseudotriquetrum*) In all states and provinces of the Pacific Northwest: Alaska., Yuk., Cal., Nev., Colo.; widespread in the Middle West and from New England

to N. Carolina. Sand Creek, Albany Co. (*Nelson 7002*); Centennial, Albany Co. (*Nelson 1259*); Medicine Bow Mts., Albany County (*Nelson 7822*—see below), Porter (1935). (As *Bryum bimum* Schreb.) Laramie Peak, Albany County (*Nelson 7536*); Big Sandstone Creek, Carbon Co. (*Porter 914*), Porter (1935). (?)”Ferris Mountains, Carbon Co. (*Nelson 4977*). The determination is by Holz., and he has questioned its accuracy,” Porter (1935). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Albany Co.: wet rocks, Sheep Mountain, 2 Sep 1903, *Goodding 2098*, det. Holz. (Plants of Wyoming, printed label) (RM, US); in spruce woods, Medicine Bow Mts, 30 Jul 1900, *Nelson 7822* in exsiccated Plants of Wyoming (RM). Fremont Co.: swampy border of Fiddler's Lake (Wyo. Rte.131), 9300 ft, 18 Jun 1973, *Hermann 25294* (RM). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Hwy; W side Beartooth Pass, under late snow patch on steep slope N of switchback, rills & snowbeds, 3200 m, 18 Aug 1973, *Weber B-44305* (COLO, RM). Sheridan Co.: wet ground, *Nelson 2416* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at south end of lake, 14 May 1989, *Andrus 7798* (BING). Teton Co.: 7000 ft, *Hermann 25574* (RM). Yellowstone Natl Park: Black Sand Basin, with *Hygrohypnum bestii*, *Lawton 1871* (WTU); Beartooth Plateau, Cook City to Red Lodge Highway,

alpine bogs of east summit, east slope, head of Wyoming Creek, 3250 m (as *B. pallens*), Weber B-44224 (RM, COLO-redet. Spence).

This is supposed to be a West Coast species, with red capsules and leaves imbricate, i.e., barely contorted. (See note under *Bryum pallens*—the specimen of *Nelson 4977* at US was *B. pallens*.) One specimen of *Bryum pseudotriquetrum* s. lat. seen from RM had brown capsules and was synoicous, perhaps indicating that the dioicous-synoicous condition is variable. That specimen was *Nelson 7002* of Plants of Wyoming exsiccata, Holz. Det. Sand Creek, Albany Co., 1 Jun 1900, on the river banks under a cliff. The determination had a query.

Ptychostomum turbinatum (Hedw.) J.R. Spence, *Phytologia* 87: 22. 2005.

Mnium turbinatum Hedw., *Sp. Musc. Frond.* 191. 1801.

Bryum anceps Card. & Thér.

Bryum denticulatum Kindb. in Macoun

Bryum extenuatum Ren. & Card.

Bryum haematophyllum Kindb. in Macoun

Bryum turbinatum (Hedw.) Turner

Hypnum turbinatum (Hedw.) Web. & Mohr.

Wyoming (FNA, Vol. 28, 2014). (As *Bryum turbinatum*) B.C., Mont., Wyoming; Yuk., Nev., Utah, Colo.; Sask; reported from Idaho, Cal., Ariz. (As *Bryum turbinatum*) Tower Falls, Yellowstone Natl Park (collector unknown), Porter (1935). Teton Co., Spence (1985).

(All as *Bryum turbinatum*) Albany Co.: La Plata Mines, with *Leptobryum pyriforme*, *Mnium marginatum* (in packet of) and *Distichium capillaceum*, 25 Aug 1898, *Nelson 5176* (RM). Carbon Co.: Ferris Mts., Flora of Wyoming, 25 Jul 1898, *Nelson 4978* (NY, RM, US); same, *Nelson 4977* (as *Bryum crassirameum* R. & S. “?”) (US, RM). Park Co.: Togwotee Pass, 9658 ft, 13 Aug 1953, *Lawton 1725*, c.fr., indehiscent (NY). Sublette Co.: alpine, moist area, 11,200 ft, *Rolston 85098* (CSU). Yellowstone Natl Park: Slough Creek, 1000 m, 22 Aug 1922, *Hawkins s.n.*, (NY); 2–7 Jul 1922, *Hawkins 538*, c.fr., (NY).

The Carbon Co. material *Nelson 4977* is beautiful—the cilia are poorly developed, the leaves not contorted, the cells lax, and the plants dioicous (male plants in the specimen with buds at the stem tips). It fruited 25 Jul 1898. The margins are recurved, but not consistently so to the apex—mostly appearing not recurved. The dioicous condition is distinctive, as far as descriptions are concerned. The capsules are relatively short, the operculum not particularly small, and not zygomorphic—see discussion in Flowers (1973) who often found the capsules straight.

The distinction from *Bryum uliginosum* is apparently sexual (*Bryum uliginosum* is autoicous, small mouthed with a longer, long necked capsule). Also in *B. pallens*, according to Lawton (1971), the cilia are appendiculate, in *B. uliginosum* they are rudimentary. The *Nelson 4978* specimen has tiny male plants, that is, the antheridia were found with some effort. The plants are dioicous. This specimen is striking by the broad pyriform capsules. The leaves when dry are not contorted but erect and undulate, with leaves a dull yellow-green. The plant is striking by its erect leaf margins (not recurved) and the lax to firm-lax leaf cells. The stem is not rosulate. Note, however, the (to me) distinct leaf border which in older leaves is bistratose in parts in older leaves—this differs from all descriptions of this taxon (indistinct and unistratose) but Spence's. I found the peristome teeth yellow-brown and not very distinctive. *Bryum schleicheri* is said to be of the Pacific coast and coast ranges, with leaves that are shiny and erect. Since this specimen (*Nelson 4978*) is clearly in the interior I have concurred with the designation *B. turbinatum*.

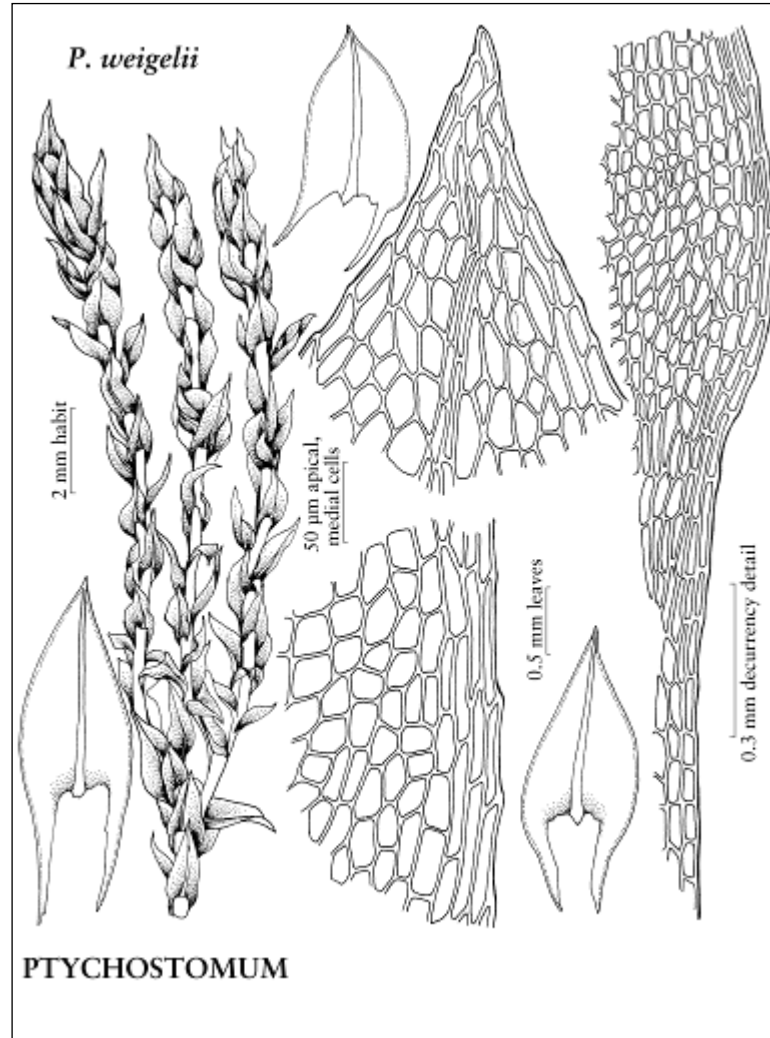
Ptychostomum weigelii (Sprengel) J.R. Spence, *Phytologia* 87: 22. 2005.

Bryum weigelii Sprengel, *Mant. Prim. Fl. Hal.*, 55. 1807.

Bryum duvalii Voit in Sturm

Bryum leucobasis Kindb.

Mnium duvalii (Voit) Schwaegr.



Courtesy FNA Association, FNA 28, 2014

Wyoming (FNA, Vol. 28, 2014). (As *Bryum weigelii*) B.C., Wash., Idaho, Mont., Wyoming; Alaska, Cal., Utah. Colo.; Mich., Ont.; Quebec, New Berun, Nova Scot., New Eng. (As *Bryum duvalii* Voit. in Sturm) Laramie Peak, Albany Co. (*Nelson 7553*), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Bryum weigelii*) Carbon Co.: Medicine Bow Mountains, 8600 ft, *Hermann 26717* (RM); Laramie Peak, shaded stream banks, *Nelson 7553* in *Plants of Wyoming*, sterile (RM).

This species may look strikingly like a *Mnium* in etiolated forms of wet habitats. The stems are long, tangled and reclining to matted in appearance like some *Mnia*. It is separated from species in that genus by the toothless margins and the long decurrencies. As far as I know, there are no

toothless *Mnia* coupled with these long decurrencies. The apiculate apex of *B. weigeli*, in the upper leaves, is also diagnostic.

PYLAISIA Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 87, plate 455. 1851 (as *Pylaisaea*), name and orthography conserved. (Hypnaceae)

Pylaisiella Kindb. ex Grout

Pylaisia polyantha (Hedw.) Schimp. in P. Bruch and W.P. Schimper, *Bryol. Europ.* 5: 88. 1851 (as *Pylaisaea*)

Leskea polyantha Hedw., *Sp. Musc. Frond.*, 229. 1801.

Isothecium polyanthum (Hedw.) Spruce

Pterogonium polyanthos (Hedw.) Muhlenberg

Pylaisia cyrtophylla Kindb.

Pylaisia denticulata Schimper ex Sull.

Pylaisia filari-acuminata Müll. Hal. & Kindb.

Pylaisia jamesii Sull. & Lesq.

Pylaisia ontariensis Müll. Hal. & Kindb.

Pylaisia polyantha var. *jamesii* (Sullivant & Lesq.) Rau & Hervey

Pylaisia polyantha var. *subdenticulata* (Schimper) Rau & Hervey

Pylaisia pseudoplatygyrium Kindb.

Pylaisia subdenticulata Schimper

Pylaisia suttonii Jennings

Pylaisiella polyantha (Hedw.) Grout

Pylaisiella subdenticulata (Schimper) Grout

Stereodon polyanthos (Hedw.) Mitt.

Stereodon subdenticulatus (Schimper) Mitt.

Not listed for Wyoming in FNA (FNA, Vol. 28, 2014). (As *Pylaisiella polyantha* var. *pseudoplatygyria* (Kindb.) Grout. Hawk's Ranch, Colorado- Wyoming State line, Albany County (*Williams 100*), Porter (1935). A sterile and unidentifiable specimen of *Pylaisiella* (as *Pylaisia*) was collected in Yellowstone Natl Park by Roell (1893), specimen number 1533.

Pylaisiella polyantha (Hedw.) Grout = *Pylaisiella polyantha* (Hedw.) Schimp. in P. Bruch and W. P. Schimper

RACOMITRIUM Brid., *Muscol. Recent.*, suppl. 4: 78. 1818. (Grimmiaceae)

Grimmia sect. *Racomitrium* (Brid.) Müll. Hal.

Racomitrium sect. *Lanuginosa* (Kindb.) Noguchi

Rhacomitrium Lorentz, orthographic variant

Trichostomum sect. *Racomitrium* (Brid.) Duby

Racomitrium canescens (Hedw.) Brid. = *Niphotrichum canescens* (Hedw.) Bed.-Ochyra & Ochyra in R. Ochyra et al.

Racomitrium canescens (Hedw.) Brid. var. *ericoides* (Brid.) Hampe = *Niphotrichum ericoides* (Brid.) Bed.-Ochyra & Ochyra in R. Ochyra et al.

Racomitrium fasciculare (Hedw.) Brid. = *Codriophorus fascicularis* (Hedw.) Bed.-Ochyra & Ochyra in R. Ochyra et al.

Racomitrium heterostichum var. *macounii* (Kindb. in Macoun) G. Jones in Grout = *Bucklandiella macounii* (Kindb. in Macoun) Bed.-Ochyra & Ochyra in R. Ochyra et al.

Racomitrium heterostichum var. *sudeticum* (Funck) Bauer = *Racomitrium sudeticum* (Funck) P. Bruch & Schimp. in B.S.G. = *Bucklandiella sudetica* (Funck) Bed.-Ochyra & Ochyra in R. Ochyra et al.

[*Racomitrium lanuginosum* (Hedw.) Brid., Muscol. Recent., suppl. 4: 79. 1818 (Grimmiaceae)]
Trichostomum lanuginosum Hedw., Frond., 107. 1801.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007) where the species is reported from regions north of the Wyoming area.

Wyoming: Yellowstone Natl Park (1473, 1474), Lower Geysers (1475) (Roell 1893; Crum & Anderson 1981).

Racomitrium sudeticum (Funck) P. Bruch & Schimp. in B.S.G. = *Bucklandiella sudetica* (Funck) Bed.-Ochyra & Ochyra in R. Ochyra et al.

RHIZOMNIUM (Mitt. ex Broth.) T. Kop., Ann. Bot. Fenn. 5: 142. 1968. (Mniaceae)

Mnium sect. *Rhizomnium* Mitt. ex Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 219(1,3): 612. 1904.

In Park Co., *Elodium blandowii*, forms a rich bryophyte community combined with *Aulacomnium palustre*, *Climacium dendroides*, *Hylocomium splendens*, *Helodium blandowii*, *Rhizomnium* spp., *Marchantia alpestris*, (*Thuidium recognitum*, q.v.) and others,“ Kosovich-Anderson & Weber (2011).

Rhizomnium andrewsianum (Steere) T. Kop., Ann. Bot. Fenn. 5: 143. 1968.

Mnium andrewsianum Steere, Bryologist 61: 175, figs. 1–12. 1958.

Not reported for Wyoming in FNA, its habitat and distribution given in FNA are “Wet areas (depressions) in tundra; low elevations; Greenland; Alta., Nfld. and Labr., N.W.T., Nunavut, Yukon; Alaska; Europe; Asia” (McIntosh & Newmaster, FNA Vol. 28, 2014). Note that this species is not recorded for Colorado by Weber and Wittmann (2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway; swales around small lakes, 2900 m, subalpine zone between Long Lake and lower Shepherder Lakes, 19 Aug 1973, *Weber B-44267* (RM, COLO).

Although the specimen was sterile the leaf dimensions correspond with the description in Lawton (1971), the costa was decidedly below the apex of the leaf, more than in *M. pseudopunctatum*, and the leaves were more evidently crisped, whereas in *M. pseudopunctatum* they lie flat and are crisped more around the edges. The specimen from Park Co. was so crisped that the plants looked small in striking contrast to typical broadly expanded *M. pseudopunctatum*. The subalpine zone station also approximates the habitat noted for *M. andrewsianum*.

Rhizomnium magnifolium (Horikawa) T. Kop., Ann. Bot. Fenn. 10: 14. 1973.

Mnium magnifolium Horikawa, J. Jap. Bot. 11: 503, figs. 4, 5. 1935.

Mnium punctatum var. *elatum* Schimp.

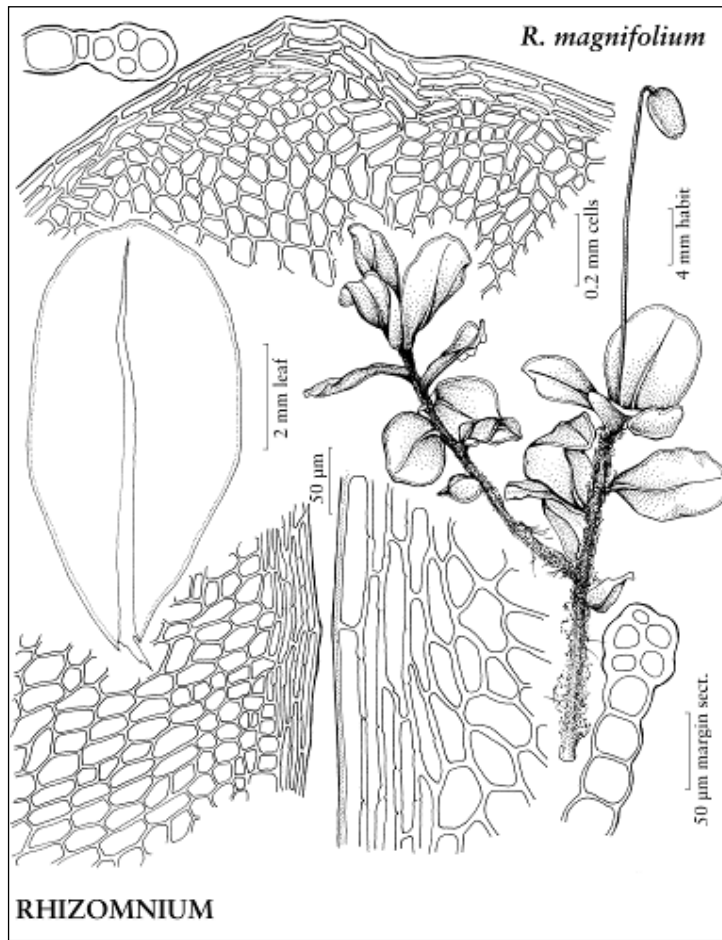
Rhizomnium magnifolium (Horik.) T. Kop.

Rhizomnium perssonii T. Kop.

Wyoming (FNA Vol. 28, 2014). (As *Rhizomnium perssonii* Koponen) Lawton (1971). Albany County, Carbon County, and Teton County, Porter (1935). (As *Rhizomnium magnifolium* (Horik.) T. Kop.) Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: *Sturges 247* (RM); 10,600 ft, *Lichvar 1331* (RM); Medicine Bow Mountains, 10,000 ft, *Hermann 17697* (RM). Bighorn Co.: T50N, R 86 W, Sect. 4, 10,000–10,400 ft, *Odasz 743* (RM). Park Co.: 7500 ft, *Hermann 20058* (RM). Teton Co.: Teton Range, 7000 ft, *Hermann 25580* (RM). Yellowstone Natl Park: 7 Jul 1934, *Frye s.n.* (RM).

In the *Odasz 743* specimen, the costae ended well below the apex, mostly forked, but with several leaves percurrent or subpercurrent. The laminal cells were weakly (not strongly) collenchymatous, and also weakly (not strongly) pitted. The marginal border was 2-stratose (which *R. pseudopunctatum* never is according to McIntosh and Newmaster FNA Vol. 28, 2014). The illustration of *R. punctatum* by Crum and Anderston (1981) shows a strong apical border of several rows of cells, even in small forms. The apex of *Mnium punctatum* var. *elatum* (= *R. magnifolium*) shows a single row of elongate marginal cells at the apex which seems in keeping with the abbreviated costa. The apex is also often notched (emarginate) in leaves with subpercurrent costae. The laminal cells near the leaf margins are very much smaller than those toward the costa, many isodiametric (not elongate-rectangular). The leaf bases are broadly decurrent or sometimes the leaf margins end nearly against or flush with the base of the costa.



Courtesy FNA Association, FNA 28, 2014

Rhizomnium pseudopunctatum (P. Bruch & W.P. Schimper) T. Kop., Ann. Bot. Fenn. 5: 143. 1968.

Mnium pseudopunctatum Bruch & Schimp, London J. Bot. 2: 669. 1843.

Mnium subglobosum B.S.G.

Wyoming (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

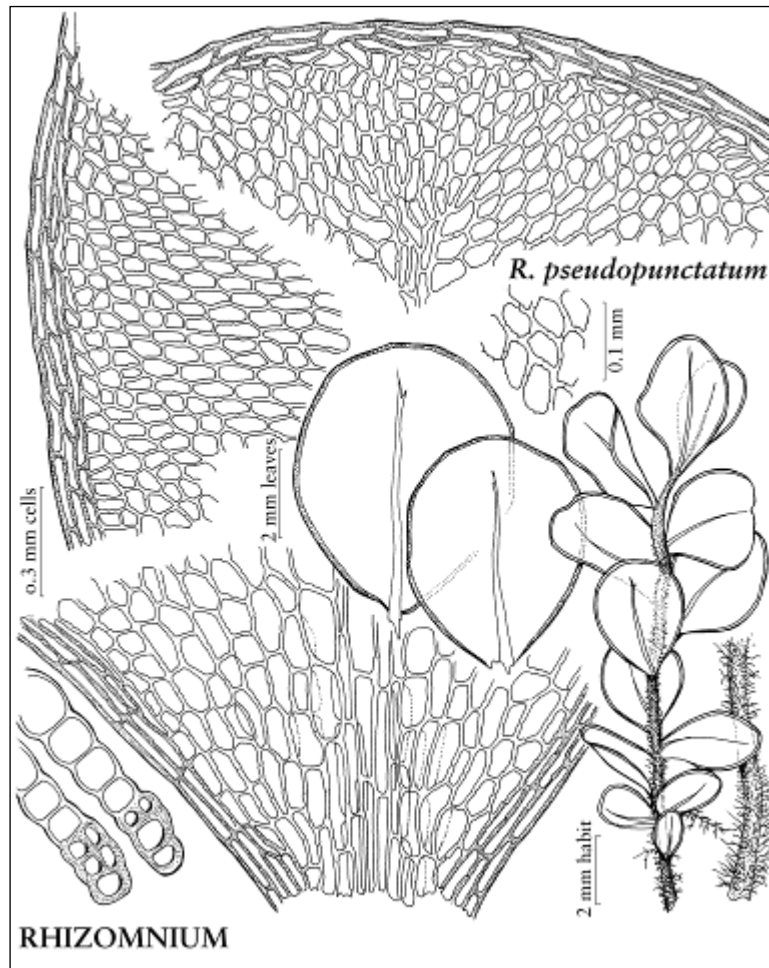
Albany Co.: Centennial Hills, 20 Aug 1896, *Nelson 2702* (RM); Centennial Valley, 19 Aug 1895, *Nelson 1744* (RM). Carbon Co.: Medicine Bow Mts., 9000 ft, moss-covered, peaty bank of Trail Creek, W of Sand Lake Rd., 4 1/2 mi SW of Morgan, *Hermann 17799* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake, 14 May 1989, *Andrus 7797* (BING).

Rhizomnium punctatum (Hedw.) T. Kop., Ann. Bot. Fenn. 5: 143. 1968.

Mnium punctatum Hedw., Musc. Frond. 193. 1801.

Rhizomnium punctatum subsp. *chlorophyllosum* (Kindb.) T. Kop.

Wyoming (FNA 28, 2014). (Carbon, Teton cos.), Yellowstone Natl Park, Porter (1935). (As *Rhizomnium punctatum* (Hedw.) T. Kop.) Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

RHYTIDIADELPHUS (Limpr.) Warnst., Krypt.-Fl. Brandenburg 2: 917. 1906. (Hylocomiaceae)
Hylocomium subg. *Rhytidiadelphus* Limpr., Laubm. Deutschl. 3: 590. 1901.
Hylocomiadelphus Ochyra & Stebel

Rhytidiadelphus triquetrus (Hedw.) Warnst., Krypt.-Fl. Brandenburg 2: 920. 1906.

Hypnum triquetrum Hedw., Sp. Musc. Frond., 256. 1801.

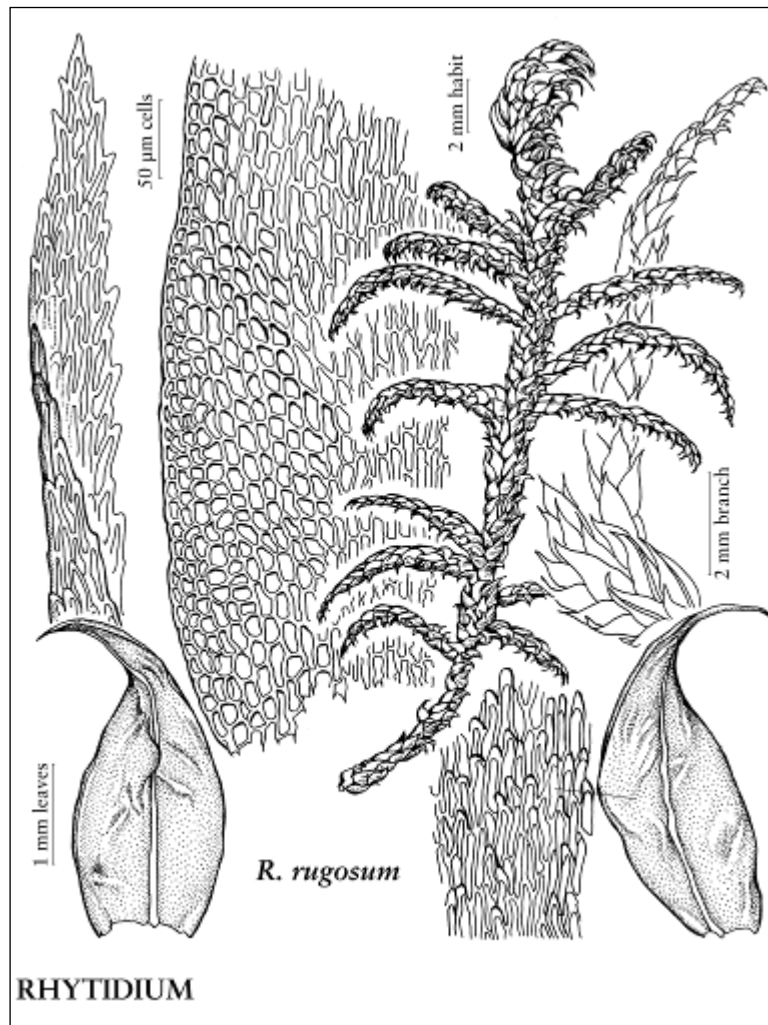
Rhytidiadelphus triquetrus var. *beringianus* (Card. & Thériot) Grout

Wyoming (FNA Vol. 28, 2014). Yellowstone Natl Park (*Smiy, Harris, and Porter*), Porter (1935).

Yellowstone Natl Park: 21 Aug 1938, *Bartley & Pontious s.n.* (RM); *Harris 219* (RM); 6 Jul 1934, *Frye s.n.* (RM).

RHYTIDIUM (Sull.) Kindb., Bih. Kongl. Svensk. Vetensk.-Akad. Handl. 6: 8. 1882. (Rhytidiaceae)

Hypnum sect. *Rhytidium* Sull. in A. Gray, Manual ed. 2, 675. 1856.



Courtesy FNA Association, FNA 28, 2014

Rhytidium rugosum (Hedw.) Kindb., Bih. Kongl. Svenska Vetensk.-Akad. Handl. 7(9): 15. 1883.

Hypnum rugosum Hedw., Sp. Musc. Frond., 293. 1801.

Hylocomium rugosum (Hedw.) De Not.

Wyoming, "Though widespread, *Rhytidium rugosum* is infrequent, presumably because of a preference for exposed calcareous or mafic bedrock in a cool habitat" (Rohrer, FNA Vol. 28, 2014). Hawk's Ranch, Colorado-Wyoming State line, Albany County (*Porter 1445*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: road from Bear Tooth Lodge to Red Lodge, near summit at 10,940 ft, 21 Aug 1953, *Lawton 1981* (WTU).

Roellia roellii (Broth. in Roell) Andrews in Crum = Roellobryon roellii (Broth.) Ochyra

ROELLOBRYON Ochyra, Polish Bot. J. 56: 119. 2011. (Invalid genus name *Roellia* and Greek *bryon*, moss, to coin a valid name for the genus). (Roellobryaceae)
Roellia Kindb., Gen. Eur. N.-Amer. Bryin., 37. 1897, not *Roella* Linnaeus 1753.

Roellobryon roellii (Broth.) Ochyra, Polish Bot. J. 56: 119. 2011.

Mnium roellii Broth., Bot. Centralbl. 44: 420. 1890.

Bryum lucidum Britt.

Bryum sandbergii Holz.

Bryum simplex Kindb. in Macoun

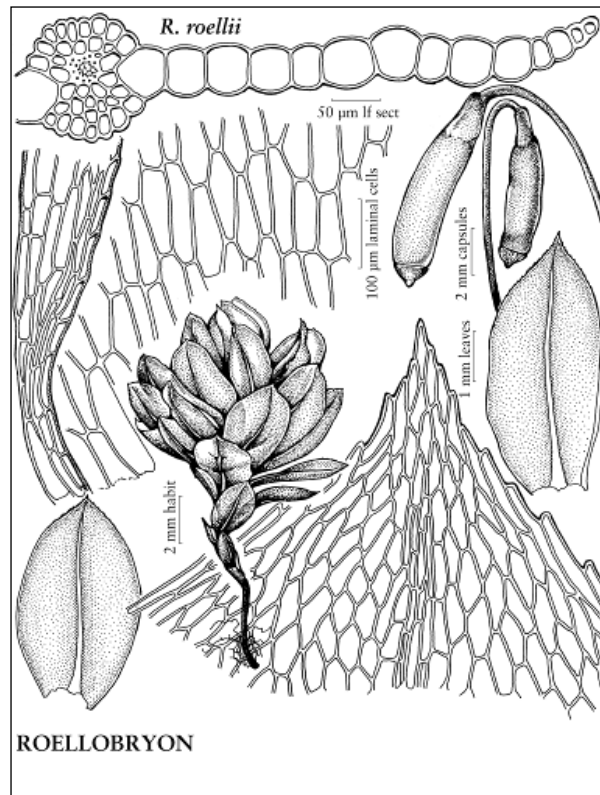
Mnium lucidum (E. Britton) Broth.

Mnium simplex (Kindb.) Kindb.

Roellia lucida Kindb.

Roellia roellii (Broth.) Andrews in Crum

Roellia simplex Kindb.



Courtesy FNA Association, FNA 28, 2014

Wyoming; “*Roellobryon roellii* is rare in Alaska, Nevada, and Utah, and is most common in areas south of the Pleistocene ice-sheets in western North America. Coastal Alaskan-northern British Columbia populations probably survived glaciation in refugia. The species has been found near sea level in coastal Alaska but generally occurs at 500–3200 m” (Spence, FNA Vol. 28, 2014). In all states and provinces of the Pacific North West.; Cal. Colo. (As *Bryum lucidum*) Carbon, Teton cos., Porter (1937). (As *Roellia roellii*) Teton Co., Spence (1985). Vitt (1993, gives the same Wyoming distribution with no citation of specimens.

Teton Co.: Teton Natl Park, Cascade Trail, 14 Aug 1953, *Lawton, 1749*, c.fr. (WTU); Cascade Canyon, 19 Aug 1935, *Ownbey s.n.* (WTU). Yellowstone Natl Park: on ground in woods, Lower Falls of Yellowstone River, *Bartley & Pontious 4* (RM).

ROSULABRYUM J.R. Spence, Bryologist 99: 222. 1996. (Bryaceae)

[*Rosulabryum canariense* (Brid.) Ochyra, Biodivers. Poland 3: 162. 2003, excluded.]

Bryum canariense Brid., Muscol. Recent., suppl. 3: 29. 1817.

Bryum hendersonii Ren. & Card.

Bryum provinciale Philib. in Schimp.

Not reported from Wyoming by FNA; “Moist soil banks, soil over rock; low to high elevations (0–1600 m); B.C.; Calif., Oreg., Wash. (Spence, FNA Vol. 28, 2014). British Columbia, Washington, Oregon; California. (As *Bryum provinciale* Philib.) Medicine Bow Mts., Albany County (*Nelson 7814*), Porter (1935).

Examination of the *Nelson 7814* collection at RM and US shows this is *Bryum caespiticium* Hedw. The geographic anomaly is striking, but more particularly the Nelson specimen had long awns in fertile stems, was not rosulate in stem leaf arrangement, and it had strongly developed cilia that were clearly appendiculate. Sterile stems of this species approximate *B. canariense* in their short, reflexed mucros and the numerous tiny innovative branches that may serve as propagules. No tubers were seen. The propagulaceous tiny stems (not often described for *B. caespiticium*) seem to have confused early workers in the western flora with bulbils (cf. *B. dichotomum*). Leaves “large with short recurved hairpoint, often in 2 or more interrupted comal tufts along stem; leaf border weak or lacking at apex; tubers brown” (Spence, 1988). Spence also says “predominantly coastal Mediterranean climates: British Columbia, Washington, Oregon, California. “*Bryum canariense* is dioicous and lacks tubers, while *B. provinciale* is autoicous or synoicous and produces rhizoidal tubers. Some gatherings from western North America are dioicous and produce tubers, hence I prefer to regard *B. provinciale* as a variety of *B. canariense*.”

Rosulabryum capillare (Hedw.) J.R. Spence, Bryologist 99: 223. 1996.

Bryum capillare Hedw., Sp. Musc. Frond. 182. 1801.

Bryum capillare ssp. *heteroneuron* Müll. Hall. & Kindb. in Macoun

Bryum oreganum Sull.

Mielichhoferia cuspidifera Kindb. in Macoun

Wyoming (FNA Vol. 28, 2014). (As *Bryum capillare*) Wyoming: Yellowstone Natl Park (1517 fo. *sterilis*, ad var. *carinthiacum* vergens (Roell 1893). (All as *Bryum capillare*) B.C., Wash., Ore., Ida., Mont., Wyoming; Cal. Nev., Ariz; widespread in the Middle W and in eastern N. Amer from Quebec to Fla. (As *Bryum oreganum* Sulliv.) Centennial, Albany Co. (*Nelson 2707*, in part & 2708); Dome Lake, Sheridan Co. (*Nelson 8826*), Porter (1935). (As *Bryum capillare*) Antelope Basin, Albany County (*Nelson 7484*); Loomi Creek, Natrona Co. (*Goodding 180*), Porter (1935). (As *Bryum capillare* ssp. *herpetoneuron*) Albany, Natrona Cos., Porter (1937). Teton Co., Spence (1985). Campbell Co., Medina (1994). (As *Bryum torquescens*) Druid Peak (*Nelson 5801*); and

Norris (*Smiy*), both in Yellowstone Natl Park, Porter (1935). See discussion in Crum and Anderson (1981: 574). The 5801 specimen of Nelson at Druid Peak I have redetermined as *Bryum lisae* var. *cuspidatum* (q.v.).

(All as *Bryum capillare*) Albany Co.: Antelope Basin, Damp woods, 9 Jul 1900, *Nelson 7484* (Holz. exsiccata), deoperculate (RM & US). Natrona Co.: Big Horn Mts., First Water Creek, dry creek bed and road crossing, 7700 ft, 1 Aug 1979, *Hartman 10452*, c.fr., operculate, with *Funaria hygrometrica* (BUF, RM). Natrona Co.: Moist places under a ledge, Loomi Creek, 3 Jul 1901, *Gooding 180*, det. Holz., *Plants of Wyoming 180*, c.fr., operculate (US). Sheridan Co.: Dome Lake, 16 Jul 1896, *Nelson 8826*, c.fr., with *Drepanocladus uncinatus* & *Philonotis fontana* var. *fontana* (RM). Teton Co.: Lower Slide Lake, growing along a intermittent stream on dark sandy soil, common, 7000 ft, 25 May 1977, *Lichvar 115*, c. deoperculate fruit (old) (RM). Washakie Co.: Big Horn Mtns., along Red Fork Powder River, 7300 ft, river bank, 11 Jul 1979, *Nelson 3556*, operculated (BUF, RM).

Most descriptions of this species emphasize the sterile plants. Characteristics of the fruiting stems are leaves that are much like *Bryum lisae* var. *cuspidatum*, only very thin (lax) walled. The Washakie Co. specimen was synoicous, the antheridia relatively large (larger than what I have been calling *Bryum lisae* var. *cuspidatum*). The plants can form polsters or cushions: *B. lisae* does not, that I know of. The sterile stems with percurrent but generally not long-excurrent costae are more diagnostic than the fruiting stems. Collections with a lot of fertile stems have long awns (Teton Co.). The Washakie Co. specimen had two setae coming from one archegonium, plus antheridia! The Teton specimen also was synoicous with strikingly large archegonia.

[*Rosulabryum flaccidum* (Brid.) J.R. Spence, *Phytologia* 89: 114. 2007, excluded.]

Bryum flaccidum Brid., *Bryol. Univ.* 1: 667("665"). 1826.

Not reported for Wyoming by FNA although noted in Colorado and Nevada and so to be expected (FNA Vol. 28, 2014)

“In North America there has been significant confusion over the identity of the small species that produce filiform gemmae in the leaf axils. H. Syed (1973) named the common widespread species with short, rosulate innovations *Rosulabryum flaccidum*, and described a new species, *R. laevifilum*, for specimens with smooth gemmae. However, these two species completely intergrade, and the name *R. flaccidum* was incorrectly applied. The correct name is thus *R. laevifilum* for what has passed as *R. flaccidum* in North America. True *R. flaccidum* is a very different species related to *R. pseudocapillare*, with a type from Hispaniola” (Spence in FNA Vol. 28, 2014.)

Rosulabryum laevifilum (Syed) Ochyra, *Biodivers. Poland* 3: 162. 2003.

Bryum laevifilum Syed, *J. Bryol.* 7: 293, figs. 13, 14. 1973.

Wyoming (FNA Vol. 28, 2014).

“*Rosulabryum laevifilum* is the (North American) flora’s most widespread species of the genus with filiform gemmae, and is the most common corticolous species. The sporophytes are rare. Specimens on bark are often very small compared with those on other substrates. See also the discussion under *R. flaccidum*” (Spence in FNA Vol. 28, 2014).

[*Rosulabryum torquescens* (Bruch ex De Not.) J.R. Spence, *Bryologist* 99: 223. 1996, excluded]

Bryum torquescens Bruch ex De Not., *Syllab. Musc.*, 163. 1838

Bryum capillare subsp. *torquescens* (Bruch ex De Not.) Kindb.

Not known for Wyoming in FNA, but to be looked for. Reported for Nevada (FNA Vol. 28, 2014).

SAELANIA Lindb., Utkast Eur. Bladmoss., 35. 1878. (Ditrichaceae)

Saelania glaucescens Hedw.) Broth. in J. O. Bomansson and V. F. Broth., Herb. Mus. Fenn., Musci, 53. 1894.

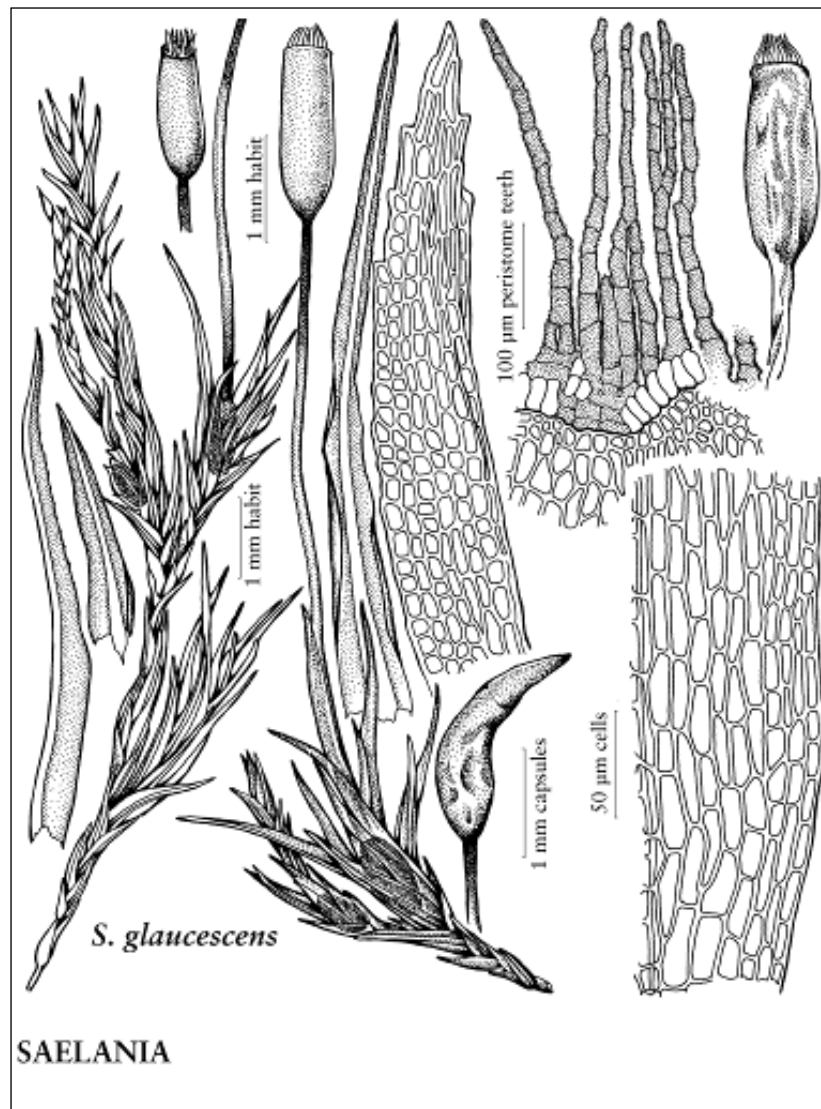
Trichostomum glaucescens Hedw., Sp. Musc. Frond., 112. 1801.

Ditrichum glaucescens (Hedw.) Hampe

Saelania caesia (P.-Beauv.) Lindb.

Wyoming by FNA (FNA Vol. 27, 2007). British Columbia, Alberta, Wyoming; Alaska, Yukon, Colorado, Arizona; Manitoba, Minnesota, Iowa; Ontario, Greenland and Nova Scotia south to New Jersey. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: W of Bear Tooth Butte, Crazy Creek campground, 22 Aug 1953, *Lawton 2020*, old fruit (WTU).



Courtesy FNA Association, FNA 27, 2007

SANIONIA Loeske, Hedwigia 46: 309. 1907. (Amblystegiaceae)

[*Sanionia georgico-uncinata* (C. Muller) R. Ochyra & L. Hedenäs in R. Ochyra, excluded.]

This species has been excluded from North America (Hedenäs 2011); the name to be used for North American species formerly under this name is instead *Sanionia nivalis* Hedenäs.

Sanionia nivalis Hedenäs, Ann. Bot. Fenn. 26: 411, figs. 10–12. 1989.

Wyoming (FNA Vol. 28, 2014).

Park Co.: Shoshone Natl. For., Beartooth Plateau; alpine fen in small depression beside the head of Natl Forest Trail #623, 100–150 m E of Beartooth Scenic Byway, on wet peaty soil, locally abundant, 44°58.770–775'N, 109°25.530–540' W, ca. 10,700 ft (3260 m), 19 Aug 2008, *Kosovich-Anderson 3430* (COLO, MO, S). Park Co.: unnamed tributary of Frozen Lake, seepage slope, on soaked peaty soil and wet clay along streamlets, snow melt area, in pure mats and assoc. with *Polytrichastrum sexangulare*, *Polytrichum juniperinum*, and *Brachythecium brandegeei*, 44°58.050–060'N, 109°28.870–890'W, ca. 10,500 ft (3200 m), 14 Aug 2008, *Kosovich-Anderson 2626A* (MO). Other Park Co. specimens are cited also without herbarium designation; see citations in Kosovich-Anderson & Weber (2011). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Hedenäs (2011) reported that *Sanionia georgico-uncinata* and *S. nivalis* are morphologically indistinguishable and are separated by molecular information, the former belongs to the Southern Hemisphere, the latter to the Northern.

Sanionia uncinata (Hedw.) Loeske, Hedwigia 46: 309. 1907

Hypnum uncinatum Hedw., Sp. Musc. Frond., 289. 1801.

Drepanocladus uncinatus (Hedw.) Warnst.

Drepanocladus uncinatus var. *plumosus* (Schimp.) Warnst.

Drepanocladus uncinatus var. *subjulaceus* (Schimp. in B.S.G.) Warnst.

Hypnum uncinatum subsp. *mosei* (Kindb.) Kindb.

Wyoming (FNA Vol. 28, 2014). (As *Hypnum uncinatum* Hedw.) Wyoming: Yellowstone Natl Park (1570–74) (Roell 1893). (All as *Drepanocladus uncinatus* (Hedw.) Warnst.) Albany County, Big Horn County, Carbon County, Teton County, and Yellowstone Natl Park. “The following varieties have been recorded: var. *auriculatus*, *plumosus* and *symmetricus*,” Porter (1935). Albany, Big Horn, Carbon, Fremont, Johnson, Teton cos., Yellowstone Natl Park, Porter (1937). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Medicine Bow Mtns., Medicine Bow Natl Forest, Barber Lake Picnic Area 2.5 mi NW of Centennial, 2660 m, *Pinus contorta* forest along Libby Creek, *Buck 23195* (NY); on leaf mold in woods 1 1/4 mi S of Brooklyn Lake, 10,000 ft, Medicine Bow Mtns., 9 mi W of Centennial, 3 Aug 1962, *Hermann 17693* (RM). Carbon Co.: on a rotten log, Battle Creek Canyon, 7000 ft, 26 Jun 1934, *Porter 1736* (RM). Fremont Co.: on moderately dry soil and humus, Brooks Lake, To-Gwo-Tee Pass, 15 Aug 1934, *Porter 1614* (RM). Park Co.: 3250 m, *Weber B-44265* (COLO, RM); Beartooth Plateau, Cooke City to Red Lodge Highway, swales around small lakes, subalpine zone between Long Lake and lower Shepherder Lakes, 2900 m, 19 Aug 1973, *Weber B-44276* (COLO, RM); basaltic sand, 6000 ft, 1 Apr 1988, *Vukelich s.n.*, det. Crum (BUF); wet marly substrate, in calcareous fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1725* (BUF). (With *Hygrohypnum styriacum* specimen, q.v.) Beartooth Lake, W and SW shore, *Picea engelmannii* forest along the shore, on wet clay, 44°56.500–520'N, 109°35.980–990'W,

ca. 8,900 ft (2700 m), 24 Jul 2010, *Kosovich-Anderson 6652* (no herb. cited). Sheridan Co.: (as var. *uncinatus*) conifer litter over mineral soil in spruce/fir forest, Big Horn Natl Forest, T57N, R89W, Section 34, 19 Jun 1992, *McKee 92-F2*, with *Tortula ruraliformi* (RM); in packet of *Bryum capillare*, with *Philonotis fontana* var. *fontana*, Dome Lake, 16 Jul 1896 (RM). Sublette Co.: Bridger Wilderness, Wind River Range, South Fork Baldy Creek headwaters, 10,290 ft, 42°59'N, 109°34'W, along small stream, on rocks, 16 May 1989, *Andrus 7840* (BING); Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189; wooded spruce bank, sandstone rocks, lush herbage, N slope, Hoback River valley, shaded sandstone rock, with *Brachythecium salebrosum*, 5 Jul 1985 *Eckel 9612516* (BUF, RM). Teton Co.: On US26 & US237, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis* wood-land, xeric but for stream bottoms, 6 Jul 1985, *Eckel 9408200*. (BUF). Yellowstone Natl Park: in the spray of the falls, Tower Falls, *Nelson & Nelson 5911*, exsiccata Plants of Yellowstone Natl. Park, det. Holz (RM).

There is a var. *symmetrica* (Ren. & Card.) Crum & Anderson in the 1990 checklist, which is accepted as *Sanionia symmetrica* (Ren. & Card.) Wheldon (FNA Vol. 28, 2014). It is a western taxon to be looked for in Wyoming—capsules are needed for identification.

SARMENTYPNUM Tuomikoski & T. Kop., Ann. Bot. Fenn. 16: 223. 1979. (Calliergonaceae)

Sarmentypnum exannulatum (Schimper) Hedenäs, J. Hattori Bot. Lab. 100: 132. 2006.

Hypnum exannulatum Schimper in P. Bruch and W.P. Schimper, Bryol. Europ. 6: 110, plate 603. 1854.

Drepanocladus exannulatus (Schimper) Warnst.

Drepanocladus exannulatus var. *alpinus* (Grav.) Wijk & Marg.

Drepanocladus exannulatus var. *brachydictyon* (Ren.) G. Roth

Drepanocladus exannulatus var. *falcifolius* (Ren.) Grout.

Drepanocladus exannulatus var. *purpurascens* (Schimper) Herzog

Drepanocladus exannulatus var. *rotae* (De Not.) Loeske

Warnstorfia exannulata (Schimper) Loeske

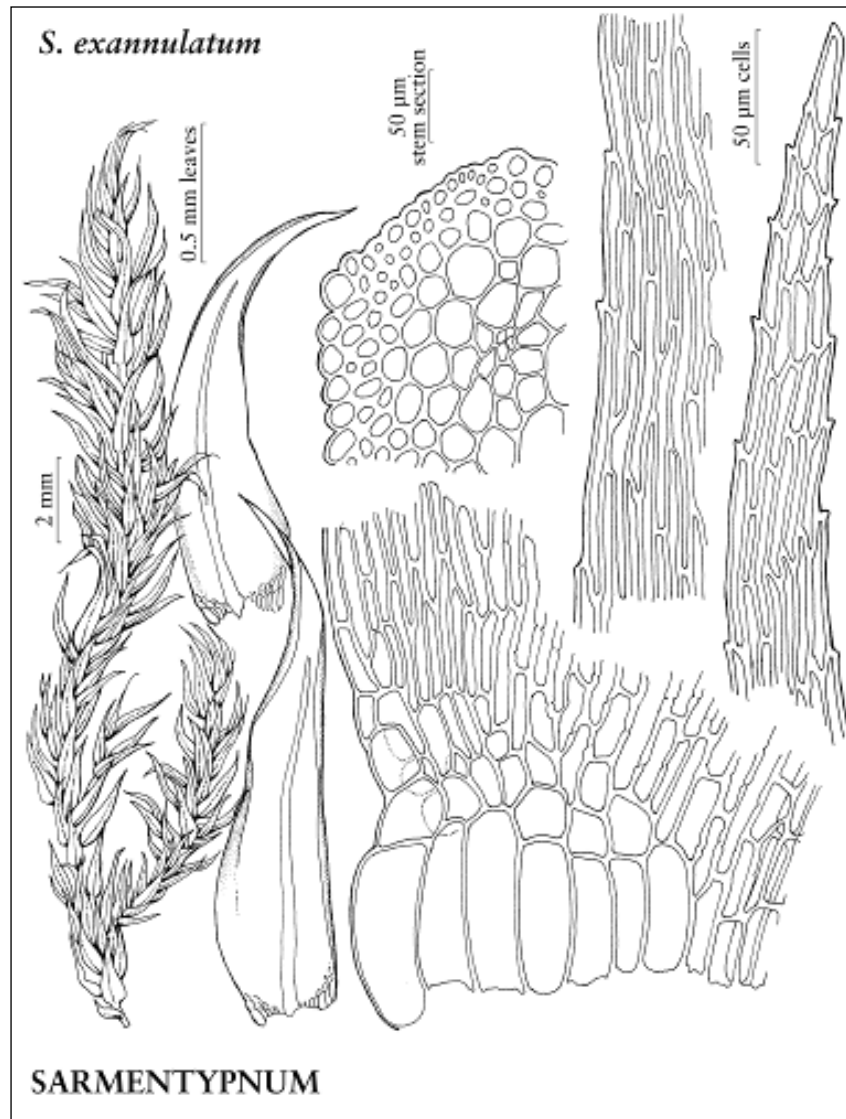
Warnstorfia exannulata var. *purpurascens* (Schimper) Tuomikoski & T. Kop.

Wyoming (FNA Vol. 28, 2014). Johnson Co. (as *Warnstorfia exannulata*), in association with *Warnstorfia tundrae* (Lenz 2006). Park Co.: *Sarmentypnum exannulatum* was reported growing with *Plagiomnium ellipticum*, *Polytrichum juniperinum*, *Sarmentypnum sarmentosum* and *Sanionia nivalis*, Kosovich-Anderson & Weber (2011). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Drepanocladus exannulatus* (B.S.G.) Warnst. var. *exannulatus*): Teton Co., Spence (1985). Sublette Co. “species occupying peatland expanses and spring fens ... tolerant of long periods of saturation and submersion,” Cooper & Andrus (1994). Var. *typicus* Grand Teton Nat. Park 3765 (NY) Wynne, (1944).

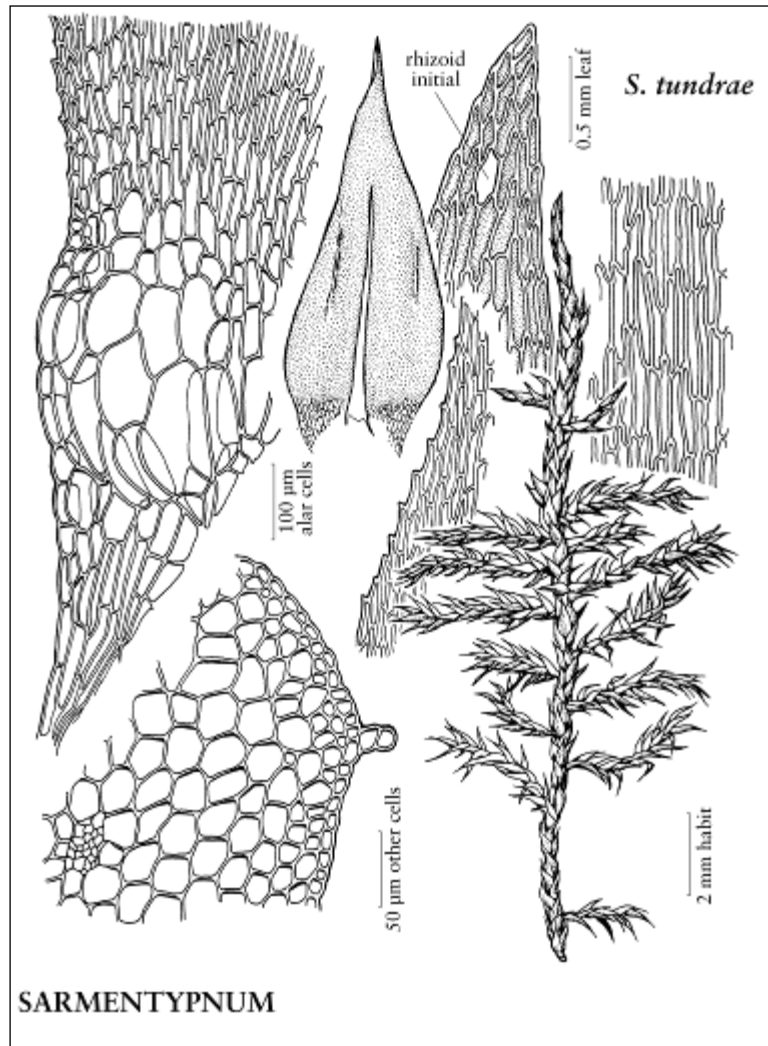
Albany Co.: 10,800 ft, *Rolston 86090* (CSU); La Plata Mines, 30 Aug 1898, *Nelson 5262* (RM); northW base of Sheep Mtn., along WY Rte. 11, ca. 4 mi due ESE of Centennial, ca. 7750 ft, fen with low forest, open area of bog, 4 Jun 1993, *Reese 18174* with *Bryum pseudotriquetrum*, *Cratoneuron filicinum* (LAF). Big Horn Co.: Big Horn Natl Forest, Lake Solitude Quadrant, Cloud Peak Wilderness area, T50N R86W, Sect. 7, 9720 ft streamside below Elk Mountain, 5 Aug 1992, *Zacharkevics s.n.* (BING). Carbon Co.: 9200 ft, *Porter 9698* (RM); Sierra Madre Range, 9600 ft, wet area by stream, *Kastning-Culp 754* (BUF, RM); emergent in pool in marsh near North French Creek at logging road crossing, 8600 ft, Medicine Bow Mountains, 6 mi E of Ryan Park, 27 Aug 1975,

Hermann 26718 (RM). Park Co.: 3200 m, *Weber B- 44310* (COLO, RM); wet soil in white spruce fen at base of Cathedral Cliff, 2 mi E of Crandall Ranger Station, 6600 ft, 19 Apr 1992, *Elliott 1929* (BUF). Sublette Co.: 11,200 ft, *Rolston 85109* (CSU).



Courtesy FNA Association, FNA 28, 2014

(All as var. *rotae* (De Not.) Loesk.) “Leaves more widely spaced and costa shortly to long filiform excurrent” Flowers (1973: 502). Albany Co.: Medicine Bow Mts., Silver Lake, growing 1/2 mi N of lake in a bog, abundant, 10,000 ft, 18 Sep 1977, *Lichvar 1335*, specimen with large, distinct auricles to costa, long, filiform apices, leaves distant on stem (RM). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1/4 mi SW of Barnes Lake, 9780 ft, 42°59'N, 109°36'W, pothole fen, 15 May 1989, *Andrus 7807* (BING). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Hwy, swales around small lakes, subalpine zone between Long Lake and lower Shepherd Lakes, 2900 m, in shallow water of small lakes, 19 Aug 1973, *Weber B-44252* (originally id'd as *D. trichophyllus*) (RM, COLO).



Courtesy FNA Association, FNA 28, 2014

Sarmentygium sarmentosum (Wahlenberg) Tuomikoski & T. Kop., Ann. Bot. Fenn. 16: 223. 1979.

Hypnum sarmentosum Wahlenberg, Fl. Lapp., 380. 1812.

Calliergon sarmentosum (Wahlenb.) Kindb.

Calliergon sarmentosum fo. *heterophyllum* Arnell & C. Jens.

Calliergon sarmentosum fo. *homophyllum* Arnell & C. Jens.

Calliergon sarmentosum var. *beringianum* (Card. & Thér.) Grout

Calliergon sarmentosum var. *crispum* Karcz.

Calliergon sarmentosum var. *fallaciosum* (Milde) G. Roth

Calliergon sarmentosum var. *flagellare* Karcz.

Calliergon sarmentosum var. *fontinaloides* (Berggr.) G. Roth

Calliergon sarmentosum var. *subpinnatum* Warnst.

Warnstorfia sarmentosa (Wahlenberg) Hedenäs

Wyoming (FNA 28, 2014). Park Co.: *Sarmentygium sarmentosum* was reported growing with *Plagiomnium ellipticum*, *Polytrichum juniperinum*, *Sarmentygium exannulatum* and *Sanionia nivalis* (Kosovich-Anderson & Weber 2011). Teton Co., Spence (1985). Sublette Co., “species occupying peatland expanses and spring fens ... tolerant of long periods of saturation and

submersion,” Cooper and Andrus (1994). Cited for Wyoming by Crum and Anderson (1981; 1998). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: 3250 m, *Weber B-44254* (RM, COLO). Sublette Co.: Bridger Wilderness, Wind River Range, South Fork Baldy Creek headwaters, 10,290 ft, 42°59'N, 109°34'W, in small fen, 16 May 1989, *Andrus 7828* (BING).

Sarmentypnum tundrae (Arnell) Hedenäs, J. Hattori Bot. Lab. 100: 133. 2006.

Amblystegium tundrae Arnell, Kongl. Svenska Vetensk. Acad. Handl., n.s. 23(10): 128. 1890.

Drepanocladus exannulatus var. *tundrae* (Arnell) Warnstorff

Drepanocladus tundrae (Arnell) Loeske

Warnstorfia tundrae (Arnell) Loeske

Wyoming (FNA Vol. 28, 2014).

SCHISTIDIUM P. Bruch & W.P. Schimper, Bryol. Europ. 3: 93. 1845, name conserved. (Grimmiaceae)

Schistidium agassizii Sull. & Lesq., Musc. Hepat. U.S., 104. 1856.

Grimmia agassizii (Sull. & Lesq.) Jaeger & Sauerb.

Grimmia alpicola Hedw.

Grimmia alpicola var. *angusta* (I. Hag.) Mönk.

Schistidium agassizii Sull. & Lesq. in Sull.

Schistidium angustum I. Hag.

Schistidium lineare Limpr.

Wyoming (FNA Vol. 27, 2007). B.C., Oregon, Alberta, Idaho, Mont., Wyoming; Alaska, NorthW Territory, Cal., Colo.; Michigan, Ontario; New Brunswick, Quebec Maine, New York. Carbon Co.: inlet to Lake Marie, Medicine Bow Mts. (*Hermann 17147*), Robinson and Herman (1964). Teton Co., Spence (1985).

Carbon Co.: 10,000 ft, *Hermann 17147* (RM).

[*Schistidium apocarpum* (Hedw.) P. Bruch & W.P. Schimper, Bryol. Europ. 3: 99. 1845, excluded.]

Grimmia apocarpa Hedw., Sp. Musc. Frond., 76. 180.1

Schistidium lancifolium H.H. Blom

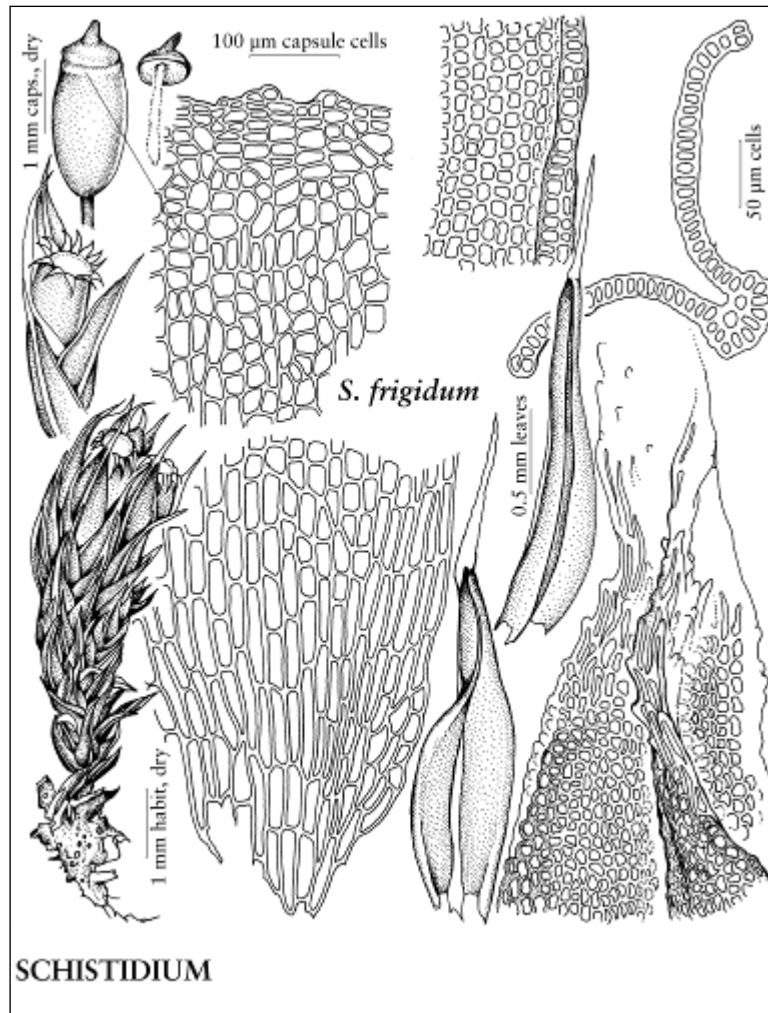
Schistidium umbrosum (J.E. Zett.) H.H. Blom

(For much additional synonymy see Eckel 1996).

Not reported for Wyoming in FNA (Vol. 27, 2007). There is some controversy whether this species occurs only in the eastern United States or has a more widespread distribution. For now it is reported here as excluded from Wyoming (McIntosh in Vol. 27. 2007). The species is not reported for Wyoming and appears to be absent from central Canada and the United States. It appears to occur north of the boundary with Canada, except in the Great Lakes area and Washington State (FNA Vol. 27, 2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Due to the recent extensive revisions of nomenclature, the following information is conjectural:

In all states and prov. of the Pacific Northwest; Alaska, Cal., Nev., Ariz., New Mex; widespread in central and eastern North America. Old Faithful, Yellowstone Natl Park (*Smiy*), Porter (1937). B.C., Wash., Oregon, Idaho, Mont., Wyoming; Michigan, Ont., Quebec, New York, Wyoming, Flowers (1973). Little Goose, Creek, Sheridan County (*Nelson 2416*, in part), Porter (1935). (As *Grimmia atricha* Müll. Hall. & Kindb. in Macoun & Kindb., Cat. Canad. Pl. 6: 65. 1892.) (As *Schistidium apocarpa*) Teton Co., Spence (1985). Telephone Canyon, Albany County (Porter 607); Long Canyon, Albany Co. (*Rollins, 63*), (Sheridan Co.), Porter (1935).. (As *G. dupretii* Thér.) Plumbago Canyon, Albany County (*Porter 482*); Hoback Canyon, Teton Co. (*Porter 1162*), Porter (1935).



Courtesy FNA Association, FNA 27, 2007

The following specimens seem to have been *Shistidium apocarpum*. They need reexamination by a Grimmiaceae expert. Albany Co.: Laramie Mtns., Roger Canyon, ca. 8 air mi NE of Laramie, limestone outcrops with *Cercocarpus montanus*, 2400 m, 7 Jun 1993, *Buck 23174*, old fruit, some with opercula, (NY). Park Co.: 6500 ft, moderately cribose, *Hermann 20032*, small plants with yellowish red peristome teeth (RM). Fremont Co.: thin soil on undersurface of granite ledge on slope, W slope of Fiddler's Lake (Wyo. Rte. 131), 9300 ft, 22 mi SSW of Lander, 18 Jun 1973, *Hermann 25297* (RM). Lincoln Co.: 6700 ft, *Hermann 25597* (RM). Park Co.: granite bluff along Route 212, Shoshone Natl. Forest, 7500 ft, 46 mi NW of Cody, 19 Jul 1965, *Hermann 20063*

(RM). Yellowstone Natl Park: on US14, 16 & 20 just before E entrance to Park, border with Shoshone Natl Forest, 6951 ft, granitic rocks, spruce-pine woods, *Juniperus* woodland, xeric, S slope, 6 Jul 1985, *Eckel 94082303*, c.fr., with *Dicranoweisia crispula* (BUF).

Schistidium confertum (Funck) P. Bruch & W.P. Schimper, Bryol. Europ. 3: 99. 1845.
Grimmia conferta Funck, Deutschl. Moose 18. 1820.

Wyoming (FNA Vol. 27, 2007). (As *Grimmia apocarpa* var. *conferta* Fk.) Wyoming: Yellowstone Natl Park (1470). Upper Falls (1454, 1458, 1461, 1468 and fo. *rivularis* Nees et H. (1485), Roell (1893).

Schistidium dupretii (Thér.) Weber, Phytologia 33: 106. 1976.
Grimmia dupretii Thériot, Bryologist 10: 63, plate 8. 1907.
Schistidium apocarpum var. *dupretii* (Thér.) Wijk & Marg.

Wyoming (FNA Vol. 27, 2007).

Schistidium frigidum H.H. Blom, Bryophyt. Biblioth. 49: 181, fig. 70. 1996.

Wyoming (FNA Vol. 27, 2007).

Schistidium occidentale (Lawton) Churchill, Advances Cladist. 1: 143. 1981.
Grimmia occidentalis Lawton, Bull. Torrey Bot. Club 94: 461, figs. 1–15. 1967.
Grimmia alpicola var. *rivularis* fo. *acutifolia* Grout

Wyoming (FNA Vol. 27, 2007). Montana, Wyoming; California, Nevada, Colorado.

Albany Co.: 9000 ft, *Hermann 17761* (RM). Sublette Co.: Bridger Wilderness, Wind River Range Lake Jacqueline, ca. 9800 ft, 42°57'30"N, 109°37'W, on rocks in stream, 14 May 1989, *Andrus 7779* (BING).

Schistidium rivulare (Brid.) Podpera, Beih. Bot. Centralbl. 28(2): 207. 1911.
Grimmia rivularis Brid., J. Bot. (Schrader) 1800(1): 276. 1801.
Grimmia alpicola of American authors
Grimmia alpicola var. *rivularis* (Brid.) Wahl.
Grimmia platyphylla Mitt.
Schistidium platyphyllum (Mitt.) Persson
Schistidium rivulare subsp. *latifolium* (Zetterst.) Bremer
Schistidium submuticum subsp. *arcticum* H.H. Blom

Wyoming (FNA Vol. 27, 2007). Yellowstone Natl Park: (as *Schistidium rivulare* (Brid.) Podp. ssp. *rivulare*) 1938 Bartley & Pontius (NY) in Bremer 1980. *Schistidium rivulare* (Brid.) Podp. Teton Co., Spence (1985). See Roell citation under *Schistidium confertum* fo. *rivularis*. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: (var. *rivulare*) moist soil in shaded crevice of calcareous sandstone bluff, Roger Canyon, 8000 ft, 10 mi NE of Laramie, 19 Aug 1961, *Hermann 17156* (RM). Carbon Co.: (var. *rivulare*) W slope of Sierra Madre, Battle Creek Canyon, 8500 ft, streamside forest of Engelmann Spruce, on rocks in dry places, 18 Aug 1964, *Porter 9718* (RM). Fremont Co.: (as var. *rivulare*) wet rock in stream on partially shaded slope, along Fiddler's Lake Rd (Wyo. 131), 8600 ft, ca. 14 mi SSW of Lander, 18 Jun 1973, *Hermann 25304* (RM). Sublette Co.: (var. *rivulare*) Bridger Wilderness,

Wind River Range, Lake Sequa, 9940 ft, 42°57'30"N, 109°34'W, 17 May 1989, *Andrus* 7882 (BING); Bridger-Teton Natl Forest, 4.6 mi N of Bondurant on US 191 & 189, wooded spruce bank, lush herbage, N slope, Hoback River valley, shaded sandstone rock, 5 Jul 1985, *Eckel* 961258 (BUF). Teton Co.: (var. *rivulare*) vertical face of boulder on bank of Cascade Creek, near mouth of Cascade Canyon, W shore of Jenny Lake, 7000 ft, Teton Range, Grand Teton Natl. Pk., 19 Aug 1973, *Hermann* 25583 (RM).

The specimen *Porter* 9718 from Carbon Co. is the largest of its kind, with very elongate stems and leaves to 3.5 mm. The leaves are ovate-lanceolate to nearly triangular. Flowers (1973) described the group of *Grimmia* species as including 3.5 mm-long leaves. Others, Crum and Anderson (1981) and Lawton (1971), gave 2.5 and 2.8 mm lengths. Lawton (1971) indicated the stems of var. *rivulare* can be to 10 cm long.

Var. **rivulare**: (As *Grimmia alpicola* Sw. ex Hedw. Including following synonymy.

Grimmia apocarpa var. *alpicola* (Hedw.) Roehl

Grimmia helvetica Schkuhr

Schistidium alpicola (Hedw.) Limpr.

In all states and provinces of the Pacific Northwest; Alaska, Cal., Colo., Manitoba, S. Dakota, Michigan, Ontario; Newfoundland and Labrador to North Carolina. *Grimmia alpicola* Hedw. Big Sandstone Creek, Carbon Co. (*Porter* 927), Porter (1935).

Lincoln Co.: Salt River Range, Greys River Valley, 18 mi SE of Alpine Junction, on boulder in partial clearing in spruce-fir woods along Porcupine Creek, 6600 ft, 30 Aug 1973, *Hermann* 25594 (RM). Park Co.: granite outcrop on bank of Crandall Creek, 6500 ft, Shoshone Natl. Forest, 36 mi NW of Cody, 19 Jul 1965, *Hermann* 20038 1/2, with *Orthotrichum* sp. (RM). Sheridan Co.: crevice in limestone boulder in spruce-fir forest, Big Horn Natl Forest, T57N, R89W, Sect. 34, 19 Jun 1992 *McKee* 92-F5, c.fr., dehisced young, not eroded (RM). Sublette Co.: (var. *alpicola*) on boulder on open slope, W shore of Lower Green River Lake, 7950 ft, Wind River Range, 50 mi N of Pinedale, 19 Jun 1973, *Hermann* 25321 (RM).

Var. **latifolium** (Zett.) Crum & Anderson = *Schistidium rivulare* (Brid.) Podp. (FNA Vol. 27, 2007).

The following synonymy was originally published for var. *latifolium*:

Grimmia alpicola var. *latifolia* (Zett.) Moell.

Grimmia apocarpa fo. *latifolia* Zett.

Grimmia platyphylla Mitt.

Schistidium alpicola var. *latifolia* (Zett.) Limpr.

B.C., Alberta, Idaho, Mont., Wyoming; Alaska, New Brunswick.

Park Co.: 6000 ft, on basaltic sand or rock, 1 Apr 1988, *Vukelich s.n.*, leaves 0.7–1 mm broad (BUF).

Schistidium tenerum (Zett.) Nyholm, Ill. Moss. Fl. Fennoscand., Musci, 775. 1969.

Grimmia tenera Zett., Kongl. Svenska Vetensk. Acad. Handl., n. s. 13(13): 17. 1876.

Grimmia tenuicaulis Williams

Wyoming (FNA Vol. 27, 2007). B.C., Wash., Alberta, Mont., Wyoming; Alaska, Yukon, NorthW Territory, Col; Greenland. (As *Grimmia tenuicaulis* Williams) Dale Creek, Albany Co. (*Porter* 979), Porter (1937).

Albany Co.: 8500 ft, *Hermann* 17751 1/2 (RM).

SCIURO-HYPNUM (Hampe) Hampe, *Linnaea* 38: 220. 1874. (Brachytheciaceae)
Hypnum sect. *Sciuro-hypnum* Hampe, *Flora* 50: 76. 1867.

The sexual condition of *Sciuro-hypnum* is, as in *Brachytheciastrum*, autoicous (but dioicous in *S. hylotapetum* and *S. latifolium*); the genus *Brachythecium* has both dioicous and autoicous species.

Sciuro-hypnum glaciale (Schimper) Ignatov & Huttunen, *Arctoa* 11: 270. 2003.
Brachythecium glaciale Schimper in P. Bruch and W.P. Schimper, *Bryol. Europ.* 6: 15, plate 542. 1853.

Wyoming; “Soil, rock, near glaciers, open, cold habitats; low to high elevations (0–3200 m); Greenland; Wyo;” “*Sciuro-hypnum glaciale* has a wide distribution globally, but is probably locally common only in Scandinavia. In North America it is confirmed in Greenland and high mountains in Wyoming, but probably occurs also in other regions of the North American Arctic” (Ignatov, *FNA* Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, alpine snow melt area, small lake in vast depression, ca. 100 m N of Beartooth Scenic Byway, boggy shore crossed by rills, *Carex* spp.—Bryidae wetlands, wet tussocks, on clay soil, 10,500 ft (3200 m), 20 Aug 2008, *Kosovich-Anderson 3508* (MHA, MO, RM).

The range of this species is bipolar arctic-alpine. “... the collection from Wyoming is the only one in continental North America. It extends the known range by no less than 4400 km representing an extraordinary arctic-alpine disjunction in the Rocky Mountains” (Kosovich-Anderson & Ignatov 2010).

Sciuro-hypnum latifolium (Kindb.) Ignatov & Huttunen, *Arctoa* 11: 270. 2003.
Brachythecium latifolium Kindb., *Forh. Vidensk.-Selsk. Kristiania* 1888(6): 8. 1888.
Brachythecium nelsonii Grout
Sciuro-hypnum nelsonii (Grout) Ochyra & Żarnowiec

Wyoming (*FNA* Vol. 28, 2014). (As *Brachythecium nelsonii*) Pole Mt., Albany County (*Porter 537*); Brooklyn Lake, Albany County (*Nelson 5172*); Lake and Canyon, Yellowstone Natl Park (*Smiy*). *Nelson's 5172* is the type referred to by Grout (1902), Porter (1935). Albany Co. (*Porter 537;1433*); Yellowstone Natl Park (*Smiy*), Porter (1934). Albany Co., Yellowstone Natl Park, Porter (1937). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Brachythecium nelsonii*) Albany Co.: wet bank of pond in mountain meadow, 1 1/4 mi S of Brooklyn Lake, 10,000 ft, Medicine Bow Mts, 9 mi W of Centennial, *Hermann 17690* (RM); Medicine Bow Mountains, Barber Lake Picnic area, 2.5 mi NW of Centennial, along Libby Creek, 8720–8740 ft, *Pinus contorta* forest, streamside, on rock, 7 Jun 1993, *Miller 10,259* (NYS). Big Horn Co.: Big Horn Mts., Jul 1896, *Nelson 2234* (RM). Park Co.: Shoshone Natl. Forest, Beartooth Plateau, Morrison Jeep Trail, Dollar Lake, SW shore of lake, fen, on soaked boggy soil, 9400 ft, 1 Aug 2010, *Kosovich-Anderson 7754* (RM). Sheridan Co.: on wet soil along streamlet in sloping patterned fen on south side of drainage with a raised spring mound, with *Salix planifolia* and *Pinus contorta*, ca. 0.3 mi up Bruce Creek, ca. 1.5 mi ENE of Granite Pass, Bighorn Natl. Forest, 8870 ft (2704 m), 7 Sep 2010, *Lenz 4323* (RM); also wet decayed log in seep zone near S edge of wet meadow, Upper Preacher Rock Bog, ca. 0.45 mi WNW of Preacher Rock, Bighorn Natl. Forest, 8285 ft (2526 m), 8 Sep 2010 m, *Lenz 4399* (RM). Sublette Co.: 10,324 ft, *Rolston 85103* (CSU); 10,595

ft, *Rolston* 85096 (CSU). Yellowstone National Park: slope along old road, Crescent Hill, 3 Sep 1948, *Conard* 2045 (NY).

This species grows on wet decaying logs and soil in forested areas in basin and patterned fens, hanging or quaking bogs over water, and wet (mountain) meadows, wet banks, ditches and shallow waters of (beaver) ponds, with seeps, springs and creeks, streamsides in areas of lakes and ponds, with herbaceous vegetation of *Carex* and *Juncus* spp., *Alchemilla*, *Salix* spp., in thickets, *Salix planifolia*, *Picea engelmannii*, *Pinus contorta*. Moss associations include *Aulacomnium palustre*, *Plagiomnium ellipticum*, *Brachythecium erythrorrhizon*. Soils are often clay or marl as well as sand.

(As *Brachythecium nelsonii*) Grout (1902 1928) placed this species right beside *B. rivulare*, which it resembles except for its flat leaves (stems appear complanate, flattened, not dendroid), nearly entire leaf margins and extensive area of inflated hyaline cells extending to near the costa. Flowers (1973) wrote that *B. starkei* did not have the linear upper leaf cells of *B. nelsonii*; the *Hermann* 17690 specimen from Albany Co. shows this (the leaves in this specimen have almost no acumination). Flowers (1973) described *B. nelsonii* as “sometimes thin and straggling, mostly bright green, often becoming yellowish or straw colored.” The specimen was first identified as *B. rutabulum*, which has this vivid green, but the plant is apparently dioicous (only males seen) and the alar cells are abruptly inflated and decurrent. (See also Porter 1934, as *B. rutabulum*)

Sciuro-hypnum oedipodium (Mitt.) Ignatov & Huttunen, *Arctoa* 11: 270. 2003.

Hypnum oedipodium Mitt., *J. Linn. Soc., Bot.* 8: 32, plate 5 (lower right). 1864.

Brachythecium collinum var. *holzingeri* Grout

Brachythecium curtum (Lindb.) Limpr.

Brachythecium holzingeri (Grout) Grout

Brachythecium oedipodium (Mitt.) A. Jaeger

Brachythecium starkei subsp. *oedipodium* (Mitt.) Ren. & Card.

Brachythecium starkei var. *curtum* (Lindb.) Warnst.

Brachythecium starkei var. *explanatum* (Brid.) Mönk.

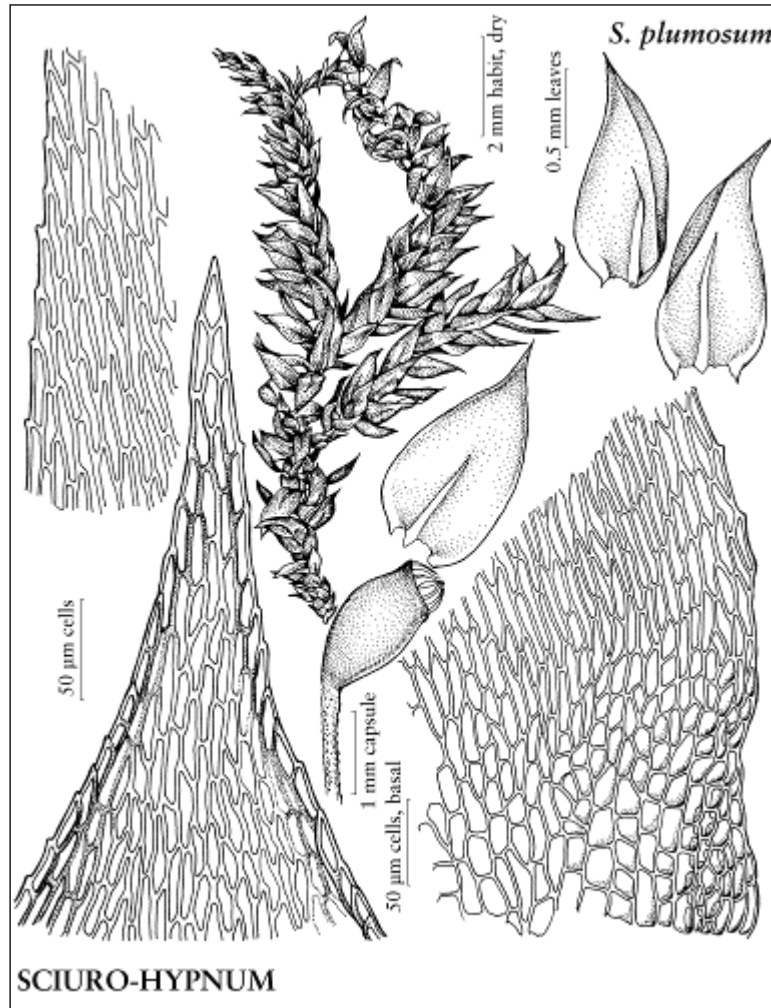
Wyoming (FNA Vol. 28, 2014). (As *Brachythecium starkei*), Wyoming: Yellowstone Natl Park, subspecies *Oedipodium* Mitt. fo. *depauperata* (sic) (1593) (Roell 1893). (As *Brachythecium oedipodium*) Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Brachythecium oedipodium*) Albany Co.: carpeting floor of spruce forest, Little Brooklyn Lake, 10,400 ft, Medicine Bow Mts, 7 mi NW of Centennial, 27 Aug 1975, *Hermann* 26721 (RM). Fremont Co.: thin soil on boulder on spruce-fir slope, Burroughs Creek Rd., 8400 ft, Absaroka Range, 14 mi N of Dubois, *Hermann* 25524 (det. Lawton) (RM). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, under late snow patch on steep slope N of switchback, rills and snowbeds, 3200 m, *Weber*, B-44307 (with *B. salebrosum*). (COLO, RM, US). Lincoln Co.: clay bank of Greys River in meadow, 6600 ft, Salt River Range 18 mi SE of Alpine Junction, 30 Aug 1973, *Hermann* 25596 (RM). Sublette Co.: Bridger Wilderness, Wind River Range 2, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at S end of lake, 14 May 1989, *Andrus* 7792b (BING). Teton Co.: on US 26 & US 287, 1.3 mi W of Togwotee Pass, Bridger-Teton Natl. Forest, ca. 9000 ft, *Picea-Pinus flexilis*, *Pinus contorta* v. *latifolia*, xeric, some *Artemisia*, forest floor, 6 Jul 1985, *Eckel* 9408160, c.fr. (BUF, RM).

(As *Brachythecium oedipodium*) “The following features distinguish *B. starkei* from *B. curtum*: plants smaller, having longer-pointed leaves with a longer costa (in branch leaves at least) and narrower cells. *Brachythecium starkei* differs from *B. reflexum* in having narrower leaf

decurrencies and narrower cells” Crum & Anderson (1981: 1032). Lawton (1971) indicated that in *B. reflexum*, the costa extends to the apex or nearly so: this may help to distinguish *B. starkei*. A specimen from Poland (Ochyra Musci Poloniae Exsiccati 280) seems to suit general descriptions of *B. starkei* var. *explanatum*. However, its medial leaf cells were as elongate as any seen in *B. nelsonii* or *B. rivulare*. They were sharply serrulate and the leaves were more narrowly oblong-lanceolate, rather than the deltoid things of *B. nelsonii* and *B. rivulare*.

Brachythecium starkei is currently *Sciuro-hypnum starkei* (Brid.) Ignatov & Huttunen, not reported from Wyoming, a species of northeastern North America with a western outlier in Wisconsin (Ignatov, FNA Vol. 28, 2014).



Courtesy FNA Association, FNA 28, 2014

Sciuro-hypnum plumosum (Hedw.) Ignatov & Huttunen, Arctoa 11: 270. 2003.

Hypnum plumosum Hedw., Sp. Musc. Frond., 257. 1801.

Brachythecium plumosum (Hedw.) Schimp.

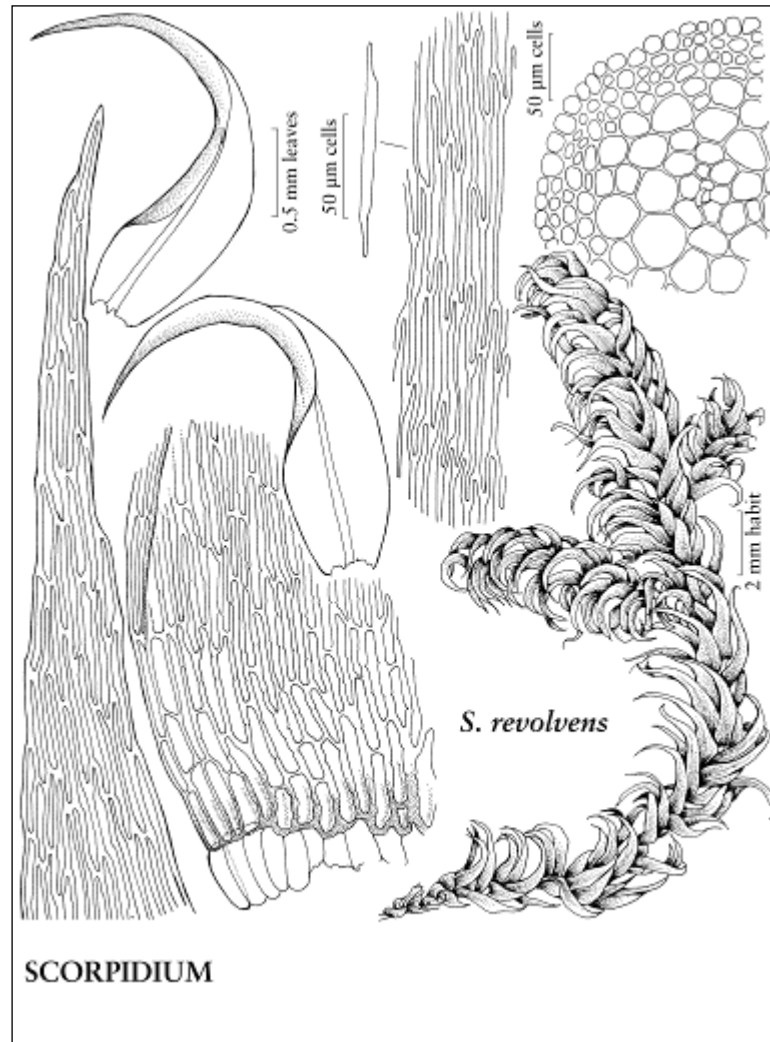
Eurhynchium semiasperum Müll. Hal. & Kindb.

Wyoming (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

SCORPIDIUM (Schimper) Limpr., Laubm. Deutschl. 3: 570. 1899. (Calliergonaceae)
Hypnum subg. *Scorpidium* Schimper, Syn. Musc. Eur., 650. 1860.
Limprichtia Loeske

[*Scorpidium cossonii* (Schimp.) Hedenäs, excluded.]

Shoshone Natl Forest, NW Wyoming (Kosovich-Anderson 2010), incorrect citation.



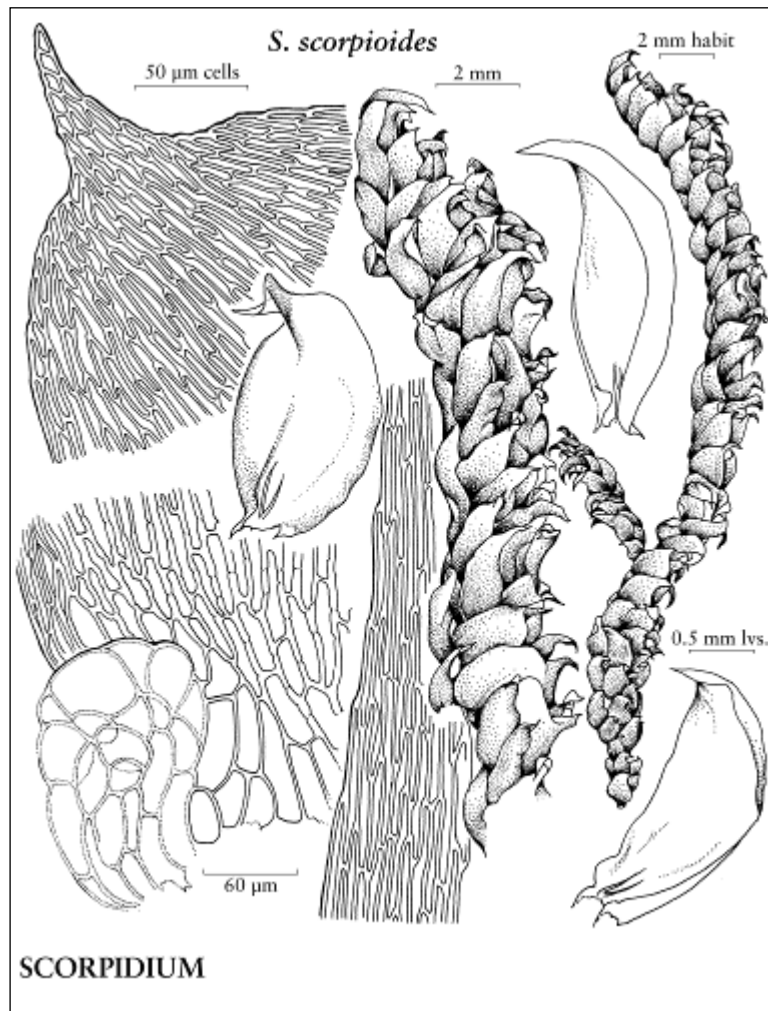
Courtesy FNA Association, FNA 28, 2014

Scorpidium revolvens (Sw.) Rubers in A. Touw and W.V. Rubers, Nederl. Bladmoss., 380. 1989.
Hypnum revolvens Sw. ex Anonymo, Monthly Rev. 34: 538. 1801.
Drepanocladus revolvens (Sw.) Warnst.
Drepanocladus revolvens var. *miquelonensis* (Ren. & Card.) Grout
Limprichtia revolvens (Sw.) Loeske

Wyoming (FNA Vol. 28, 2014). (As *Drepanocladus revolvens* (Sw.) Warnst.): Wynne 1944; who gives a dot map showing a station in the Big Horn Mountains area of Wyoming. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(As *Limprichtia revolvens*) Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1/2 mi SW of Barnes Lake, 9760 ft, 42°57'N, 109°36'W, terrace fen, 15 May 1989, *Andrus 77816c* (BING).

(As *Limprichtia revolvens*) This is a beautiful lustrous golden-coppery to red moss with inflated cortical cells, small central strand and thick-walled alar cells often not coming off with the dissected leaf. They are described variously as few and hyaline with pitted basal cells. Crum and Anderson (1981) make the useful observation that the cells across the insertion are somewhat darker “oblong-linear, with thickened, porose walls” grading to the variety *intermedius* where the cells across the insertion are “not much differentiated.” The few cells at the basal angles are “hyaline and slightly enlarged.” It appears that the costa is somewhat short for the genus, too. The presence of a central strand separates this from *D. vernicosus*.



Courtesy FNA Association, FNA 28, 2014

Scorpidium scorpioides (Hedw.) Limpr., *Laubm. Deutschl.* 3: 571. 1899 (Calliergonaceae)
Hypnum scorpioides Hedw., *Sp. Musc. Frond.*, 295. 1801.

Wyoming (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: wet marl in calcareous fen complex at the base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, Shoshone Natl. Forest, 6600 ft, 12 Aug 1990, *Elliott 1749* (BUF).

SCOULERIA Hook., Bot. Misc. 1: 33. 1829. (Scouleriaceae)

Grimmia sect. *Scouleria* (Hook.) Müll. Hal.

Grimmia subgen. *Scouleria* (Hook.) Lesq. & James

Scouleria aquatica Hook. in T. Drumm., Musc. Amer., 63. 1828.

Guembelia scouleri Müll. Hall.

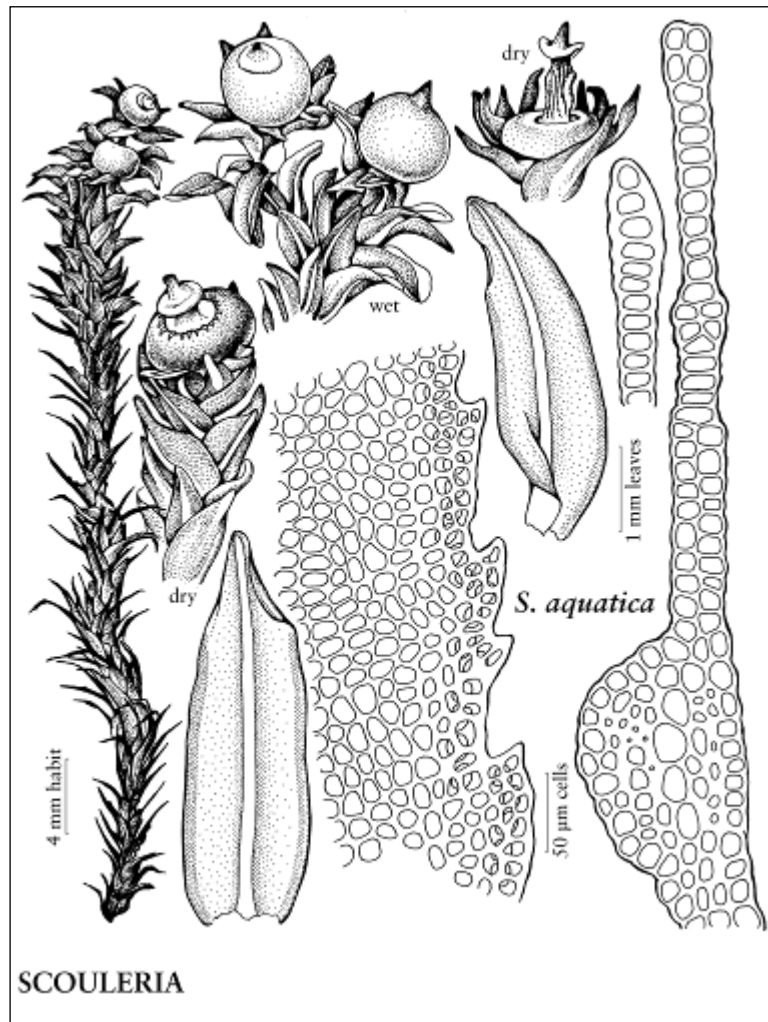
Scouleria aquatica var. *catilliformi* Müll. Hall.

Scouleria aquatica var. *nigrescens* Kindb. in Macoun

Scouleria aquatica var. *virescens* Kindb. in Macoun

Scouleria muelleri Kindb. in Macoun

Scouleria nevii Müll. Hall. in Macoun



Courtesy FNA Association, FNA 27, 2007

Wyoming (FNA Vol. 27, 2007). In all states and prov. in the Pacific Northwest: Alaska, Calif. Laramie Peak, Albany Co. (*Nelson 7559*); Little Goose Creek, Sheridan Co. (*Nelson 2416*, in

part); Teton Co., Amphithestre Lake, (*Williams 1035b*); Teton Co., Leigh Lake (*Porter 1189*), Porter (1935). Teton Co., Spence (1985). Type of var. *catilliformi* Müll. Hall. in Roll, Bot. Centralbl. 44: 389 1890. Yellowstone River, Wyoming (Churchill 1985). “*Scouleria catilliformi* C. Müll. on stones in water in Yellowstone Natl. Park, Wyom.” (Roell 1893); also as the new variety *Scouleria aquatica* var. *catilliformi* (1456) of which Yellowstone Park would be the type locality. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 7800 ft, *Herman 25926* (RM); Laramie Peak, *Nelson 7559* (MO, NY, RM, US). Park Co.: Crandall Creek, 6500 ft, *Hermann 20041* (RM); (associated with *Hygrohypnum styriacum* specimen, q.v.: Shoshone Natnl. Forest, Beartooth Plateau, Beartooth Creek, granite debris along the creek, attached to boulders periodically wet by spray and seasonally covered with fast flowing water, assoc. with *Scouleria aquatica*, 109° 36.010–020’W, ca. 8900 ft (2700 m), 23 Aug 2009, *Kosovich-Anderson 5431* (COLO). Sheridan Co.: Big Goose Creek, *Rollins 360* (RM); Little Goose Creek, 18 Jul 1896, *Nelson s.n.* (RM). Teton Co.: Teton Range, 7000 ft, *Hermann 25582* (RM).

SELIGERIA P. Bruch & W.P. Schimper, Bryol. Europ. 2: 7. 1856. (Seligeriaceae)

Seligeria campylopoda Kindb. in J. Macoun and N.C. Kindb., Cat. Canad. Pl., Musci, 41. 1892.

Seligeria recurvata (Hedw.) P. Bruch & W.P. Schimper var. *arcuata* Lesq. & James

Seligeria subcampylopoda Kindb.

Sweetwater Co.: Teton Natl Forest, 5.3 mi N of Bondurant on US 191 and 189, Hoback River Valley, N-facing slope, rich moist valley woodland, 5 Jul 1985, *Eckel 1121885* (ALTA, BUF, RM).

Although *Seligeria campylopoda* is not reported for Wyoming (FNA Vol. 27, 2007), this was probably an oversight as the author of *Seligeria* (D.H. Vitt) in FNA also verified the species noted (Eckel 1986).

SPHAGNUM L., Sp. Pl. 2: 1106. 1753; Gen. Pl. ed. 5, 487. 1754. (Sphagnaceae)

Wyoming seems to be rather depauperate of plants of this genus (14 species), and Colorado with even less (11 species). This depauperation in Colorado is attributed to the “elevated landscape (which) provides mineral-rich aquatic habitats (cf. soligenous water from run-off, mineral-rich); we have no areas in which the wetlands are dependent upon rain-water alone (ombrotrophic, ‘poor in nutrients’). Our fens are not very acid (acid = oligotrophic, ‘poor in minerals’), hence many of the northern *Sphagnum* species are excluded from this area” (Weber & Wittmann 2007). The moss flora of the Aleutian Islands, in contrast, has 23 species (Schofield & Talbot, in prep.).

[*Sphagnum acutifolium* Ehrh., excluded.]

Shoshone Lakes in Yellowstone Natl Park (Coulter, in 1872) (Nelson 1900), “no material seen,” Porter (1935). Note: “The names *Sphagnum acutifolium* Schrader and *S. nemoreum* Scopoli (doubtful name) have also been used (for *S. capillifolium*, q.v.) (FNA Vol. 27, 2007). Otherwise, *S. acutifolium* is a name not used for the flora of North America.)

Sphagnum angustifolium (Warnst.) C.E.O. Jensen, Bih. Svenska Vetensk.-Akad. Handl. 16(9): 46. 1891.

Sphagnum recurvum var. *angustifolium* Warnst., Nyt. Mag. Naturvidensk. 31: 213. 1888.

Sphagnum amblyphyllum var. *parvifolium* (Sendtner) Warnst.

Sphagnum flexuosum var. *tenue* (H. Klinggraff) Pilous

Sphagnum parvifolium (Warnst.) Warnst.
Sphagnum recurvum var. *parvifolium* Warnst.
Sphagnum recurvum var. *tenue* H. Klinggraff

Wyoming (FNA Vol. 27, 2007), including a boreal distribution extending down into states just north of those bordering the southern United States and absent from the central plains states. Park Co. Top Lake Fen, boggy southwestern shore of lake, on wet peaty soil, abundant in low hummock, assoc. *Polytrichum commune*, *Kosovich-Anderson 5773* (pers. herb.) (Kosovich-Anderson 2010). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, swales around small lakes, subalpine zone between Long Lake and lower Sheepherder Lakes, 2900 m, 19 Aug 1973, *Weber B-44268*, annot. Andrus (COLO, RM).

Sphagnum annulatum Warnst., Bot. Centralbl. 76: 422. 1898.
Sphagnum jensenii var. *annulatum* (Warnst.) Warnst.

Wyoming (FNA Vol. 27, 2007); with generally a boreal distribution just entering the northern United States.

Sphagnum annulatum var. *porosum* (Warnst.) W. S. G. Maas = *Sphagnum jensenii* H. Lindb.

[*Sphagnum capillifolium* (Ehrhart) Hedw., Fund. Hist. Nat. Musc. Frond. 2: 86. 1782, excluded.]
Sphagnum palustre var. *capillifolium* Ehrhart, Hannover Mag. 18: 235. 1780.
Sphagnum capillaceum (Weiss) Schrank
Sphagnum capillifolium var. *viride* Jennings
Sphagnum margaritae H.A. Crum

Cited for Wyoming by FNA (FNA Vol. 27, 2007); with a boreal to northern American states distribution. (As *Sphagnum capillaceum*) Yellowstone Natl Park, Porter (1937).

I have no records for this species. I've determined several Porter specimens (*1198 & 1199*) from 1932 as *S. russowii* so I expect that is what the record of *S. capillifolium* is; Weber and Wittman (2007) also exclude *S. capillifolium* from the Colorado flora.

Sphagnum contortum Schultz, Prodr. Fl. Starg. Suppl., 64. 1819.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007), with a mid-boreal, northern American states distribution in the east and west, with plains states and provinces absent.

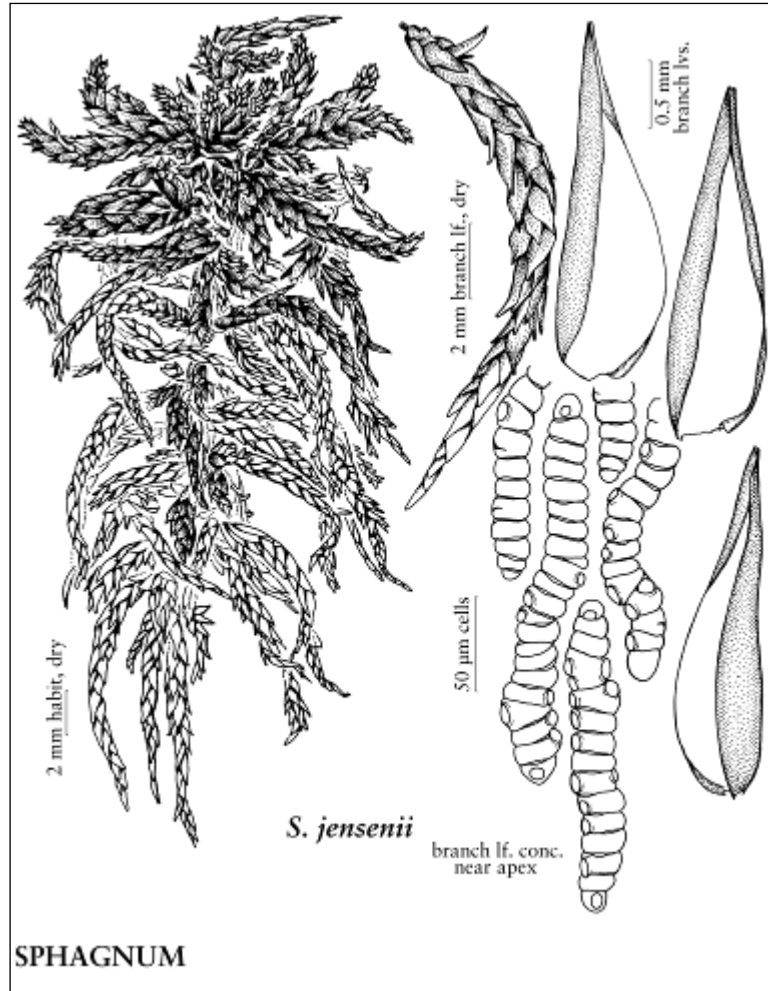
A specimen from Wind River is in BING.

Sphagnum dusenii Russow & Warnst. = *Sphagnum majus* (Russow) C.E.O. Jensen subsp. *majus*.

Sphagnum fimbriatum Wils. & Hook. in J. D. Hook., Fl. Antarct., 398. 1847.
Sphagnum bolanderi Warnst.

Not recorded for Wyoming by FNA; the subsp. *concinnum* (Berggren) Flatberg & Frisvoll grows in Alaska (McQueen & Andrus, FNA Vol. 27, 2007); s.l., the species is boreal and north to middle American states, with a corridor of absence in the central plains states. “*Sphagnum fimbriatum* Wils. var. *densum* and var. *gracilescens* in Yellowstone Nat.-Park, Wyom.” (Roell 1893).

Note that it is Roell himself who identified his own collections (the Torfmoosen). “In Great beds on wet bottoms: Obsidian Creek, Yellowstone Natl Park Jul 24 1899, 6118; Sylvan Geysers, Jul 26, 6181” (*Nelson 1900*), Porter (1935). Beaver Lake and Sylvan Geysers in Yellowstone Natl Park (*Nelson 6118 & 6181*), Porter (1935). Yellowstone Natl Park, Porter (1937). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 27, 2007

Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, swales around small lakes, subalpine zone between Long Lake and lower Shepherder Lakes, 2900 m, 19 Aug 1973, *Weber B-44287* (annot. Andrus) (COLO, RM). Yellowstone Natl Park: in great beds on the shores of the lake, Beaver Lake, 24 Jul 1899, *Nelson & Nelson 6118* (printed label, annot. Andrus) (RM); in the bogs or the open woods, Sylvan Geysers, 26 Jul 1899, *Nelson & Nelson 6181* (annot. Andrus) (RM); geothermal fen complex, with *Sphagnum capillifolium* and *S. platyphyllum*, along Bog Creek at 2500 m (8200 ft), the species occurred “on the tips of strings above pools with pH as low as 2.9 *Lemly & Cooper 848*, COLO, YELL, BING)” see also Lemly, Andrus & Cooper (2007).

Note that Lemly, Andrus, and Cooper (2007) described this species as a first record for Wyoming.

Sphagnum fuscum (Schimper) H. Klinggraff, *Schriften Phys.-Ökon. Ges. Königsberg* 13: 4. 1872.
Sphagnum acutifolium var. *fuscum* Schimper, *Mém. Hist. Nat. Sphaignes*, 64. 1857.
Sphagnum tenuifolium Warnst.
Sphagnum vancouveriense Warnst.

Wyoming (FNA Vol. 27, 2007); the species is boreal and north to middle American states, with a corridor of absence in the southern and central plains states. Fox Park, Albany County (*Nelson 9054*), Porter (1935). Albany Co., Porter (1937).

Albany Co. or Carbon Co.?): Medicine Bow Mts., bogs, in Fox Park, *Nelson 9054* (RM), “Plants of Wyoming from the Rocky Mtn Herbarium” (printed label, annot. R. Andrus)

Sphagnum jensenii H. Lindb., *Acta Soc. Fauna Fl. Fenn.* 18(3): 13. 1899.
Sphagnum annulatum var. *porosum* (Warnst.) W.S.G. Maas

Not reported for Wyoming by FNA (FNA Vol. 27, 2007); there are no records reported for American States (other than Alaska) south of the border with Canada.

Albany Co.: (as *Sphagnum annulatum* var. *porosum*) Medicine bow Mts., bog below lookout W of Snowy Range, 18 Jul 1930, *Solheim 388* (annot. Andrus) (RM). Carbon Co.: (as *Sphagnum annulatum* var. *porosum*): Medicine Bow Range between Silver Lake and Headquarters Park on Highway 130, 10,000 ft, small pond in meadow below the road, forming beds at edge of pond, *Porter 9727* (annot. Andrus) (RM).

The following additional specimens were noted by Andrus and Kosovich-Anderson (2011):

Albany Co.: Medicine Bow Natl Forest, ca. 1 mi from trailhead of North Gap Lake Trail, growing around several small ponds located adjacent to the trail, Aug 2001, *Booth and Jackson s.n.* (BING); Medicine Bow Mountains, near Headquarters of the Park, 10,500 ft (3170 m), 29 Jul 1934, *Porter 1693* (CU). Carbon Co.: near Silver Lake, 10,400 ft (3170 m), 15 Aug 1962, *Shushan s.n.* (CANM); W slope of Snowy Range, 10,000 ft (3050 m), 18 Aug 1930, *Solheim 388* (CU); Medicine Bow Range, NW of Silver Lake, 10 Jul 1960, no collector, *s.n.* (DUKE); Medicine Bow Mountains, North Fork of Rock Creek Fen Complex, 9600 ft (2925 m), 22 Sep 2007, *Kosovich-Anderson 1725, 1754* (both BING, COLO, MO, RM). Medicine Bow Mountains, floating in an alpine stream, 11 Aug 1953, *Welch 15926* (CU, NY).

Sphagnum lindbergii Schimper, *Öfvers. Kongl. Vetensk. Akad. Förh.* 14: 126. 1857.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007); the species is boreal-Canadian with outliers in New York State and New Hampshire in the east, Alaska, Washington and Colorado in the west. The report of this species for Colorado “in the Flora of North America (2007). The specimen of record is actually from Yellowstone Natl Park, Wyoming” Weber & Wittmann (2007).

Yellowstone Natl Park: from a geothermal fen, 8200 ft (2500 m) near headwaters of Sulphur Creek, forming mats near bubbling pools, *Lemly & Cooper 887, 888, 890* (COLO, YELLO, BING).

For the geothermal fen, “Water within the site had a pH of 3.3 to 5.1 and temperature of 17 to 23° C, with the most acid water being the warmest,” growing with liverworts and *Drepanocladus* sp.” (Lemly, Andrus & Cooper 2007). “At the eastern, downslope end of the site, it formed a continuous lawn beneath *Carex aquatilis* and *Eriophorum angustifolium*. At the western, upslope end of the site, it occurred at the base of low hummocks in association with *S(phagnum) riparium* Ångstr.... The

hummocks also supported a few *Pinus contorta* and several species of ericaceous shrubs, including *Kalmia polifolia* and *Vaccinium scoparium*.” Rare and endangered in the conterminous United States (Andrus et al. 1992).

[*Sphagnum majus* (Russow) C.E.O. Jensen in Bot. Forening København, Festskrift, 106. 1890 subsp. *majus*, excluded.]

Sphagnum cuspidatum var. *majus* Russow, Arch. Naturk. Liv- Ehst- Kurlands, Ser. 2, Biol. Naturk. 7: 136. 1865.

Sphagnum contortum var. *platyphyllum* (Lindb.) Åberg.

Sphagnum dusenii Russow & Warnst.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007); a report for Wyoming would be a first for the western and plains states. It seems to be associated with eastern and western boreal Canada and the Great Lakes provinces and states.

(As *Sphagnum dusenii*) Medicine Bow Mts., Carbon County, *Solheim 388*, det. by Andrews (Porter 1935). (As *Sphagnum dusenii*) Carbon Co., Porter (1937).

Excluded (Porter 1935; Crum 1984.) No records from Wyoming. I've looked at everything I could find and it was all *S. annulatum*. *Sphagnum majus* has actually never been collected in the western U.S. as far as I can tell. The nearest sites would be in B.C., central Alberta and Minnesota.

[*Sphagnum palustre* L., excluded.]

I have yet to see any section *Sphagnum* from Wyoming. Those species have only been found along the W Coast by Andrus (in litt.).

Sphagnum platyphyllum (Lindb.) Warnst., Flora 67: 481. 1884.

Sphagnum laricinum var. *platyphyllum* Lindb., Not. Sällsk.Faun. Fl. Fenn. Förh. 13: 403. 1874.

Sphagnum contortum var. *platyphyllum* (Lindb.) Åberg.

Sphagnum grasslii Crum

Sphagnum laricinum var. *platyphyllum* Lindb. ex Braithw.

Sphagnum subsecundum var. *platyphyllum* (Braithw.) Card.

Wyoming (FNA Vol. 27, 2007). The species is boreal, western and clustered around the Great Lakes with a southern states and north-south corridor in the central plains states where it is absent. Ireland 1982. Sublette Co., Cooper & Andrus (1994). Wyoming, Crum (1984). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, swales around small lakes, subalpine zone between Long Lake and lower Shepherder Lakes, 2900 m, 19 Aug 1973, *Weber B-44271* (annot. Andrus) (COLO, RM). Sublette Co.: (as *S. subsecundum* var. *platyphyllum*), Bridger Wilderness, Wind River Range, Lake Jacqueline, ca. 9800 ft, 42°57'30"N, 109°37'W, at lake edge, 14 May 1989, *Andrus 7778* (BING).

[*Sphagnum recurvum* P.-Beauv., excluded.]

All the material from the interior is referable to *S. angustifolium*. *Sphagnum recurvum* s.str. is a coastal plain species from the East.

Sphagnum riparium Ångström, Öfvers. Kongl. Vetensk.-Akad. Förh. 21: 198. 1864.

Not reported for Wyoming by FNA (FNA Vol.27, 2007); again a boreal-Canadian distribution with some states along the Canadian border and Great Lakes states in the east. Yellowstone Natl Park, from a geothermal fen, 8200 ft (2500 m) near headwaters of Sulphur Creek, “water within the site had a pH of 3.3 to 5.1 and temperature of 17 to 23° C, with the most acid water being the warmest,” growing with liverworts and *Drepanocladus* sp.” (Lemly et al. 2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Yellowstone Natl Park: “At the western, upslope end of the site, it occurred at the base of low hummocks, the hummocks also supported a few *Pinus contorta* and several species of ericaceous shrubs, including *Kalmia polifolia* and *Vaccinium scoparium*,” Lemly & Cooper 892 (COLO, WELL, BING) (Lemly et al. 2007).

[*Sphagnum robustum* (Russ.) Roell, excluded.]

This species is not reported for the North American flora area (FNA Vol. 27, 2007). Leigh Lake, Teton County (*Porter 1198 & 1199*), Porter (1935). Teton Co., Porter (1937).

Sphagnum russowii Warnst., Hedwigia 25: 225. 1886.

Sphagnum acutifolium var. *robustum* Russow.

Wyoming (FNA Vol. 27, 2007); a boreal Canadian and temperate American State distribution with a southern states and a north-south central plains corridor where it is absent, Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(Albany Co.: but probably Carbon:) Pond above headquarters Park, Medicine Bow Mts., 17 Jul 1933, *Solheim s.n.* (annot. Andrus) (RM).

Sphagnum squarrosum Crome, Samml. Deut. Laubm., 24. 1803.

Sphagnum squarrosum var. *imbricatum* Schimp.

Wyoming (FNA Vol. 27, 2007); boreal-Canadian, temperate American States, avoiding the southern States and central plains except South Dakota. A robust *Sphagnum* “typically in loose carpets in coniferous forests” (McQueen & Andrus, FNA Vol. 27, 2007). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Teton Co.: Grand Teton Natl Park, Swan Lake, near Coulter Bay, 6500 ft, on a floating island in the lake, with sedges and *Menyanthes*, *Porter 7323* (annot. Andrus) (RM).

Sphagnum subsecundum Nees in J. Sturm et al., Deutschl. Fl. 2(17): species 3. 1819.

Sphagnum crispum R.E. Andrus

Wyoming (FNA Vol. 27, 2007); boreal-Canadian and temperate America with a corridor in the southern and central plains states where it is absent. Park Co.: Wind River Range, (BING). Crum 1984. Sublette Co., Cooper & Andrus (1994). “Seasonally flooded sites, not hummocks or higher terrain,” Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sphagnum subsecundum var. *platyphyllum* = *Sphagnum platyphyllum*, q.v.

Sphagnum teres Ångström in C.J. Hartman, Handb. Skand Fl. ed. 8, 417. 1861.

Sphagnum squarrosum var. *teres* Schimp., Vers. Entw.-Gesch. Torfm., 64. 1858.

Sphagnum teres var. *squarrosulum* (Schimp.) Warnst.

Wyoming (FNA Vol. 27, 2007); boreal Canadian, temperate American states generally with a southern states and plains state's corridor where it is absent. Carbon Co., Porter (1937). Several locations (BING). Sublette Co., Cooper & Andrus (1994). "Seasonally flooded sites, not hummocks or higher terrain," Cooper & Andrus (1994). Wyoming (FNA Vol. 27, 2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Sphagnum warnstorffii Russow, Sitzungs.-Ber. Naturf.-Ges. Univ. Dorpat 8: 315. 1888.

Sphagnum warnstorffianum Du Rietz

Wyoming (FNA Vol. 27, 2007), with a boreal, northern American states distribution. Washakie Co., Porter (1937). Johnson Co., associated with *Warnstorffia tundrae*, Lenz (2006). Park Co. with *Aulacomnium palustre*, *Campylopus schimperi* (Kosovich 2011a). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, swales around small lakes, subalpine zone between Long Lake and lower Shepherder Lakes, 2900 m, 19 Aug 1973, *Weber B-44272* (annot. Andrus) (COLO, RM).

SPLACHNUM Hedw., Sp. Musc. Frond., 51. 1801. (Splachnaceae)

Splachnum sphaericum Hedw., Sp. Musc. Frond., 55. 1801.

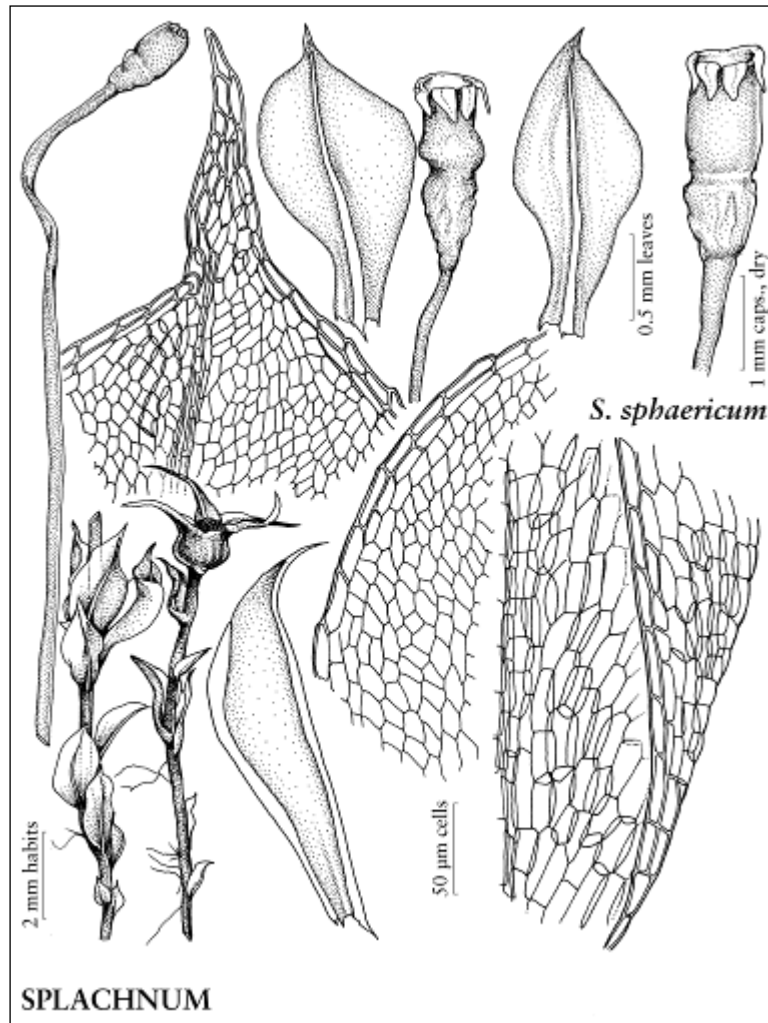
Splachnum ovatum Hedw.

Splachnum ovatum var. *sphaericum* (Hedw.) Dixon

Splachnum pedunculatum Lindb.

Wyoming (FNA Vol. 28, 2014). B.C., Wash., Alberta, Wyoming, Alaska; Labrador, New Brunswick. Cited for WY in Steere, 1978, The Mosses of Arctic Alaska. Strauss And Cramer, Hirschsberg, Germany. For North American citations of distribution v. Cameron, R. G. 1984, *Splachnum sphaericum* from Isle Royale, Michigan. Bryologist 87: 349–350. Occurrence: Isle Royal, MI; Gillam, Manitoba (Crum & Schofield), Washington (Lawton), Wyoming (Steere); Gaspe, Quebec (Crum & Anderson). Widespread circumboreal.

Yellowstone Natl Park: four mi from Old Faithful east, on road to Thumb, Aug 29 1951, *Lawton 1515* (YELLO),.



Courtesy FNA Association, FNA 28, 2014

STEGONIA Vent., Rev. Bryol. 10: 96. 1883. (Pottiaceae)
Pottia sect. *Stegonia* (Vent.) Müll. Hal.

Stegonia latifolia (Schwägr.) Vent. ex Broth., Laubm. Fennosk., 145. 1923.
Weissia latifolia Schwägr. in J. A. Schultes, Reise Glockner 2: 362. 1804.

Var. latifolia.

Anacalypta latifolia (Schwaegr.) Fuernr.
Pottia latifolia (Schwägr.) Müll. Hal. var. *latifolia*.
Stegonia latifolia (Schwaegr.) Vent. ex Broth.

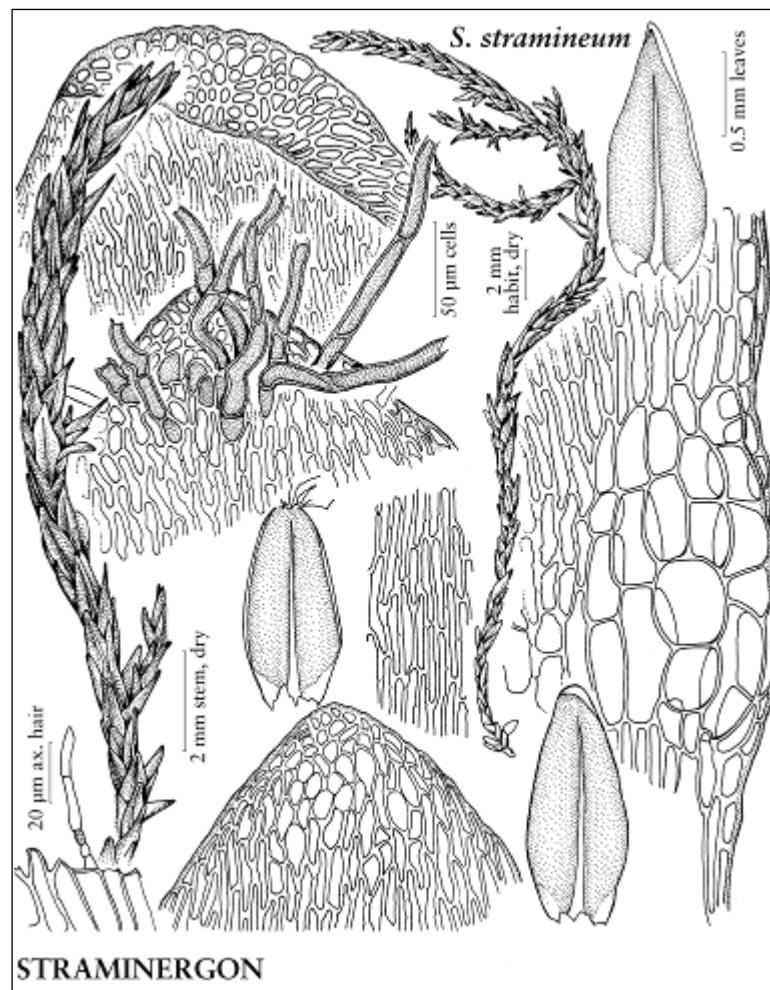
Wyoming (FNA Vol. 27, 2007). Canadian Rocky Mountains, Wyoming; Alaska, Colorado.
 (As *Pottia latifolia* var. *latifolia*) cited by Lawton (1971).

Stokesiella oregana (Sull.) Robinson = *Kindbergia oregana* (Sull.) Ochyra

STRAMINERGON Hedenäs, J. Bryol. 17: 462. 1993. (Calliergonaceae)**Straminergon stramineum** (Dickson ex Brid.) Hedenäs, J. Bryol. 17: 463. 1993.*Hypnum stramineum* Dickson ex Brid., Muscol. Recent. 2(2): 172. 1801.*Calliergon stramineum* (Dickson ex Brid.) Kindb.

Wyoming (FNA Vol. 28, 2014). (As *Calliergon stramineum*) Teton Co., Spence (1985). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

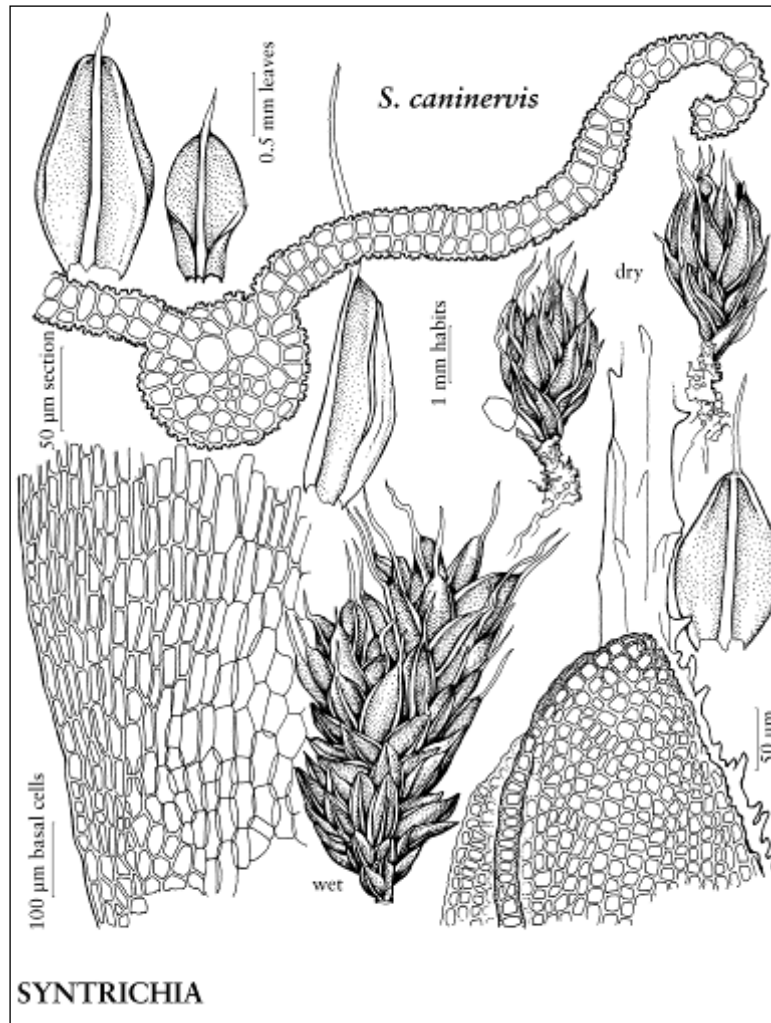
(As *Calliergon stramineum*;) Albany Co.: 10,800 ft, *Rolston 86091* (RM). Park Co.: 9700 ft, *Hartman 18545*, (RM); 2900 m, *Weber B-44280* (RM, COLO). Sublette Co.: Bridger Wilderness, Wind River Range, ca. 1/4 mi SW of Barnes Lake, 9780 ft, 42°59'N, 109°36'W, pothole fen, 15 May 1989, *Andrus 8813* (BING).



Courtesy FNA Association, FNA 28, 2014

SYNTRICHIA Brid., J. Bot. (Schrader) 1801(1): 299. 1801. (Pottiaceae)**Syntrichia caninervis** Mitt., J. Proc. Linn. Soc., Bot., suppl. 1: 39. 1859.*Tortula bistratosa* Flowers*Tortula caninervis* (Mitt.) Broth.

Wyoming (FNA Vol. 27, 2007). (As *Tortula caninervis*) Washington, Oregon, Alberta, Idaho, Montana, Wyoming; California, Arizona, Nevada, Utah, Colorado. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 27, 2007

(All as *Tortula caninervis*) Albany Co.: soil at base of a rabbit brush, 7415 ft, 19 Mar 1988, *Vukelich s.n.* (BUF); Laramie Plains, 2 mi NE of Laramie, chugwater redbeds with *Astragalus*, *Eriogonum*, *Penstemon* and grasses, *Buck 23185* (NY), also a muticous form, same collection (*Buck 23188A*, NY), also *Artemisia* scrub (*Buck 23212*, NY); open prairie of Laramie Plains, ca. 2 mi due NE of Laramie city center, chugwater redbeds, low grasses and forbs, 7300 ft, rim of breaks, 7 Jun 1993, *Reese 18165* (RM, LAF, BUF); Laramie Plains, 2 mi NE of Laramie center, chugwater redbeds, rim of breaks, 7250–7300 ft, bare prairie soil between herbs, including *Astragalus*, *Eriogonum*, *Penstemon*, 7 Jun 1993, *Miller 10252* (NYS). Hot Springs Co.: on WY 120, 1 mi SE of Park Co. line, SE of Meeteetse, thin soil, roadside, *Sarcobatus*, *Artemisia* scrub, cactus, 6 Jul 1985, *Eckel 223686* (BUF, RM); 12 Jun 1990, *Parsons s.n.* (BUF, RM). Niobrara Co.: on US 85, ca. 5000 ft, 17 mi N of jct with WY 270, road to Lance Creek, N slope, open soil, *Melilotus officinalis*, cactus, *Artemisia*, short grasses, *Tortula ruralis*, 10 Jul 1985, *Eckel 871101* (BUF). Platte Co.: *Eckel 1320386* (RM, BUF). Sublette Co.: on US 191 (187), 9 mi N of border with Sweetwater Co., open ca. N-facing slope, bunched grasses, sage, shadscale, saltbush, 5 Jul 1985, *Eckel 961251* (BUF, RM).

Sweetwater Co.: on US (187) 191, 14-Mile Reservoir, US Dept. Interior, picnic area above pond and brook, dry slope, *Sarcobatus* and *Artemisia tridentata* scrub, with *Tortula mucronifolia*, *Pterygoneurum*, 5 Jul 1985, *Eckel 118186* (RM).

Note this species can be tiny, minute and muticous. It differs from *Syntrichia chisosa*, not yet found in Wyoming, by its revolute leaf margins. *Syntrichia chisosa* also has leaflike propagulae in the leaf axils. When *S. caninervis* is miniscule, note its typical *Syntrichia* character of vivid hyaline median basal cells in sharp contrast with the rich red-green brown of the upper lamina—this is in contrast with other tiny mosses such as *Aloina*, *Crossidium*, *Didymodon brachyphyllus*, etc.

Syntrichia norvegica F. Weber, Arch. Syst. Naturgesch. 1(1): 130, plate 5, fig. 1. 1804.

Barbula aciphylla B.S.G.

Barbula rufipila Card. & Thér.

Syntrichia norvegica Web. in Web. & Mohr

Tortula norvegica (Web.) Wahlenb. ex Lindb.

Tortula ruralis var. *alpina* Wahlenb.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007) but the state is within the range of the species. (As *Tortula norvegica*) In all states and provinces of the Pacific Northwest; Yukon, California, Nevada, Utah, Colorado; Manitoba, Ontario. (As *Tortula aciphylla* Bruch & Schimp.) Mammoth, Yellowstone Natl Park (*Smy*), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Tortula norvegica*) Albany Co.: 8000 ft, *Hermann 17720* (RM); crevices in vertical face of granite bluff on Sand Lake Rd., 1.3 mi NW of Route 130, 8500 ft, 3 mi W of Centennial, *Hermann 17749* (RM); Laramie Mountains, Roger Canyon, 8 air mi NE of Laramie city center, 7850–8000 ft, on thin soil over limestone boulder, 7 Jun 1993, *Miller 10241* (NYS). Johnson Co.: *Eckel 34586* (MO). Park Co.: 3200 m, *Weber B-44311* (COLO, RM); 6400–6600 ft, *Nelson 12563* (BUF, RM); 6458 ft, *Nelson 12382* (BUF, RM). Sheridan Co.: 4800 ft, *Hartman 10645* (RM, BUF); 5400 ft, *Hartman & Odasz 9403* (RM); dry soil, base granite rocks, Big Goose Creek, 2 Mar 1934, *Rollins 384*, c.fr. (RM). Sublette Co.: moist exposed spruce root on W shore of Lower Green River Lake, 7950 ft, Wind River Range, 50 mi N of Pinedale, *Hermann 25326* (RM); Bridger Wilderness, Wind River Range, South Fork Baldy Creek headwaters, 10,290 ft, 42°59'N, 109°34'W, on damp rock at edge of fen, 16 May 1989, *Andrus 7835* (BING). Teton Co.: 7000 ft, *Hermann 25549* (RM).

Syntrichia papillosissima (Coppey) Loeske, Hedwigia 49: 44. 1910.

Barbula papillosissima Coppey, Bull. Séances Soc. Sci. Nancy, sér. 3, 8: 314, plate 2, figs. f, g. 1908.

Barbula ruralis var. *hirsuta* Vent.

Tortula papillosissima (Copp.) Broth.

Tortula ruralis var. *hirsuta* (Vent.) Paris

Not reported for Wyoming by FNA (FNA Vol. 27, 2007) although the state occurs within the range of the species. (As *Tortula papillosissima*) PARK CO.: 6458 ft, *12381* (BUF, RM); *13071* 6,000 ft (BUF, RM).

[*Syntrichia princeps* (De Not.) Mitt., J. Proc. Linn. Soc., Bot., suppl. 1: 39. 1859, excluded.]

Tortula princeps De Not., Mem. Reale Accad. Sci. Torino 40: 288. 1838.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007). (As *Tortula princeps*) Hat Six Falls, Carbon County (*Nelson 5034*); Sundance, Crook Cos. (*Nelson 2181*), Porter (1935).

R.H. Zander (pers. comm.) determined a specimen at RM labeled *Tortula princeps* as *Syntrichia ruralis* instead (Nelson 2181, Jul 3 1896), this specimen is not synoicous, it has no central strand in the stem; in all other respects it is *S. ruralis*. A specimen at RM (Hermann 17844) det. as *T. princeps* was also det. as *S. ruralis*, also Nelson 5034 (RM), Aug 7 1898 (RM) (as *T. princeps*). Since I have only Porter's report, presumably based on the Carbon and Crook specimens redetermined as *S. ruralis*, I exclude this species from the moss flora of Wyoming.

Syntrichia ruralis (Hedw.) F. Weber & D. Mohr, Index Mus. Pl. Crypt., (2). 1803.

Barbula ruralis Hedw., Sp. Musc. Frond., 121. 1801.

Barbula laeviuscula Kindb. in Macoun

Syntrichia ruraliformi (Besch.) Dixon

Tortula ruraliformi (Besch.) W. Ingham

Tortula ruralis (Hedw.) Gaertn., Meyer & Scherb

(As *Tortula ruralis*) Wyoming: Yellowstone Natl Park, Grand Canon, "6000 ped. alt. ster. (1449–52) (Roell 1893). (As *Tortula ruralis*) In all states and provinces of the Pacific Northwest; Alaska, Yukon, California, Nevada, Utah, Arizona, New Mexico, Colorado; widespread in the Middle W and in eastern North America. Common in dry situations, Albany, Carbon, (Johnson), Sublette, Sweetwater, Teton Cos., (Yellowstone Natl Park), Porter (1935). "Common in front of glaciers," Teton Range, Grand Teton Natl Park, Wyoming (Spence 1981). Teton Co., Spence (1985). Campbell Co., Medina (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Tortula ruralis*) Albany Co.: Eckel 871105 (BUF); ca. 4 mi SE of Centennial, NW base of Sheep Mountain along WY 11, ca. 7800 ft, sandstone outcrops and Chugwater Red Beds, with *Cerocarpus*, *Artemisia*, and *Amelanchier*, on soil beneath shrubs, 7 Jun 1993, Miller 10262 (NYS). Big Horn Co.: Big Horn Mts., 28.5 air mi E Greybull 19.5 mi NNE Hyattville, fruit old, dehisced, with *Bryum lisae* var. *cuspidatum*, 9200 ft, 9 July 1979, Nelson 3344 (RM). Carbon Co.: 7 Aug 1898, Nelson s.n., (as *Tortula princeps*) (RM). Crook Co.: 3 Jul 1896 Nelson s.n., (as *Tortula princeps*) (RM). Crooke Co.: Eckel 319686 (RM, BUF). Fremont Co.: 10,300 ft, Rolston 86027 (CSU); rotten wood and dry soil, Brooks Lake, To-Gwo-Tee Pass, Porter 1613 (RM); Bridger-Teton Natl Forest on US26 & US287, between Moran & Dubois, ca. 9000 ft, alpine meadow, wet with flowing streams, granite outcrops, with *Encalypta vulgaris* var. *rhabdocarpa*, *Bryum caespitium*, 6 Jul 1985, Eckel 93081103 (BUF, RM). Goshen Co.: Fort Laramie Natl Historical Site, on WY 160 off US 160, 4230 ft, open kept lawn, in soil around low shrubs, some seepage, gentle slope, 4 Aug 1984, Eckel 412386 (BUF, RM). Laramie Co.: Eckel 1123686 (RM, BUF). Lincoln Co.: on US 189 S at jct. with US 30, Diamonville town limits, ca. 6927 ft, rocky dry gully in hillside, *Sarcobatus vermiculatus*, shadscale, *Artemisia tridentata*, Sego lily, *Opuntia*, calcareous fine soil, with *Desmatodon systylius*, Eckel 94082201 (BUF). Niobrara Co.: 5000 ft, Eckel 871103 (BUF). Park Co.: 5000 ft, xeric, with lichens, 4 Apr 1988, Vukelich s.n. (BUF); granite outcrop on bank of Crandall Creek, 6500 ft, 19 Jul 1965, Hermann 20037, c.fr., calyptra falling away, c. opercula (RM). Platte Co.: Eckel 1220386 (RH). Sheridan Co.: Hartman 10735 (RH, BUF); 6600–8000 ft, Odasz 1126 (BUF, RM); Odasz 1144 (BUF, RM). Sublette Co.: on US 191, 21 mi N of border with Sweetwater Co., soil, with bunched grasses, sage, shadscale, saltbush, soil under *Artemisia*, 5 Jul 1985, Eckel 961252, with *Tortula caninervis* (BUF, RM). Weston Co.: outskirts N of Newcastle on US85, near base of low hill above grassy scrub, arid woodland of *Pinus contorta*, *P. ponderosa*, *Juniperus*, shaded, with *Grimmia plagiopodia*, 10 Jul 1985, Eckel 723686 (BUF). Yellowstone Natl Park: low meadow along pond, 7700 ft, N shore of Yellowstone Lake, Hermann 20018 (RM); Lost Lake outlet, 1 Sept 1948, Conard s.n. (BUF); Main Hot Spring, calcareous soil, 22 Jul 1980, Zander & Eckel s.n. (BUF).

(As *Tortula ruraliformis*) Park Co.: 6400–6600 ft, *Hartman 12563* (BUF, RM). Sheridan Co.: 6500 ft, *Hartman 10732* (RM, BUF).

TAYLORIA Hook., J. Sci. Arts (London) 2(3): 144. 1816. (Splachnaceae)

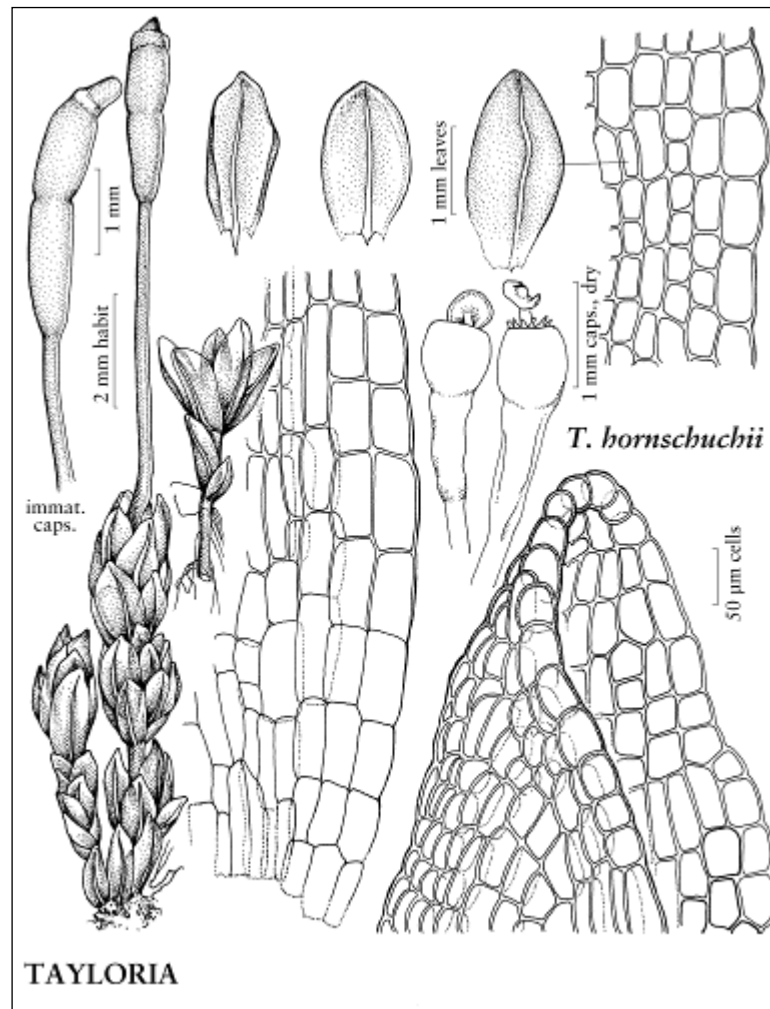
Tayloria acuminata Hornschuch, Flora 8: 78. 1825.

Tayloria serrata subsp. *acuminata* (Hornschuch) J.J. Amann

Tayloria splachnoides subsp. *acuminata* (Hornschuch) Kindb.

Tayloria splachnoides var. *acuminata* (Hornschuch) Huebener

Wyoming (FNA 28, 2014). Crum & Anderson (1981).

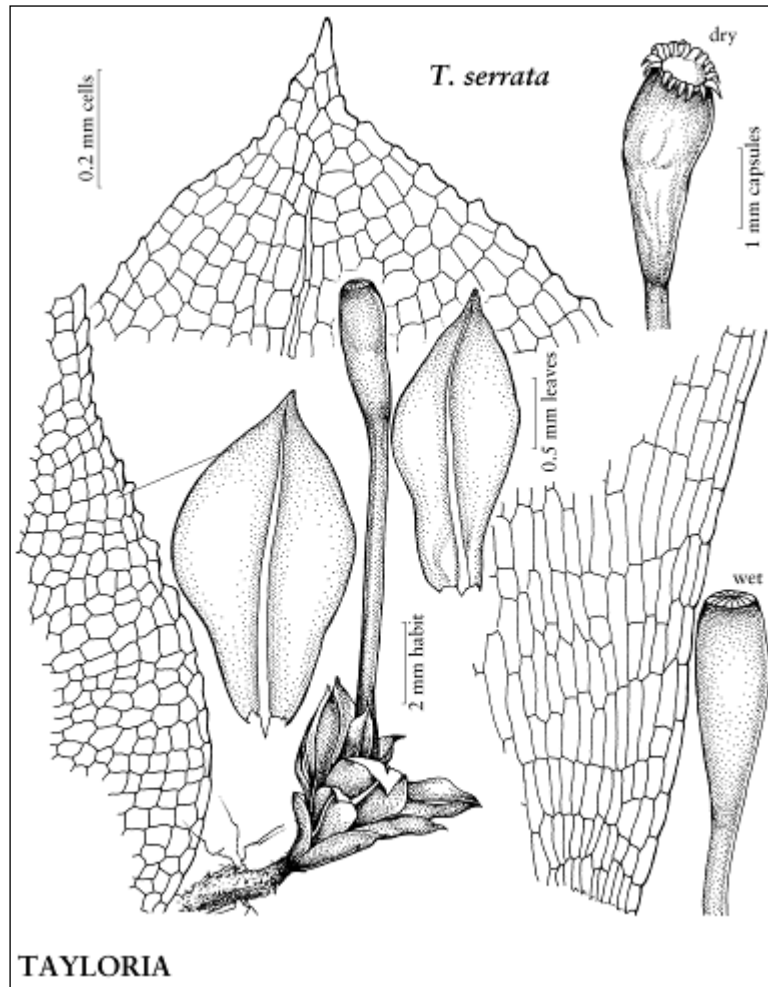


Courtesy FNA Association, FNA 27, 2007

Tayloria hornsuschii (Greville & Arnott) Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 216(1,3): 502. 1903.

Dissodon hornsuschii Grev. & Arnott, Mem. Wern. Nat. Hist. Soc. 5: 468, plate 13, figs. 34–38. 1826.

Wyoming (FNA 28., 2014).



Courtesy FNA Association, FNA 28, 2014

Tayloria ligulata (Dickson) Lindb., *Musc. Scand.* 19: 1879.

Splachnum lingulatum Dickson, *Fasc. Pl. Crypt. Brit.* 4: 4, plate 10, fig. 6. 1801.

Weissia turbinata Drumm.

Not reported for Wyoming in FNA (FNA 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: subalpine, 2900 m, *Weber B-44275* (COLO, RM) (NY, Buck, in litt.)

Tayloria serrata (Hedw.) P. Bruch & W.P. Schimper, *Bryol. Europ.* 3: 204. 1844.

Splachnum serratum Hedw., *Sp. Musc. Frond.*, 53, plate 8, figs. 1–3. 1801.

Not reported for Wyoming in FNA (FNA Vol. 28, 2014).

Yellowstone Natl Park: 4 mi SE of Old Faithful and W of Divide, on damp soil, 29 Aug 1951, *Welch 14864*, c.fr. (NY); on wet clay, same locale, etc., *Welch 14863* (NY).

The leaves of this species resemble those of *Physcomitrium*, large and lax with blunt teeth along the margins, in this specimen strongly obovate with a sharp, reflexed cusp at the apex. The fruit is critical in determining this species.

TETRAPHIS Hedw., Sp. Musc. Frond., 43. 1801. (Tetraphidaceae)
Georgia Müll. Hal.

Tetraphis pellucida Hedw., Sp. Musc. Frond., 45, plate 7, fig. 1a–f. 1801.
Georgia pellucida (Hedw.) Rabenh.
Tetraphis cuspidata (Kindb.) Paris

Wyoming (FNA Vol. 28, 2014). “In all states ... of the Pacific Northwest ... widespread in the Middle West ...” Jenny Lake Teton Co. (*Porter 1225*), Porter (1935). Teton Co., Spence (1985).

Teton Co.: 7000 ft, Aug 29 1973, *Hermann 25571*, c.fr. (RM).

Var. **pellucida**

Wyoming (FNA Vol. 28, 2014)

Var. **trachypoda** (Kindb.) J. Harpel, Sida 22: 551. 2006.
Georgia trachypoda Kindb., Rev. Bryol. 20: 93. 1893.

Wyoming (FNA Vol. 28, 2014).

THUIDIUM Schimper in P. Bruch and W.P. Schimper, Bryol. Europ. 5: 157, plates 481–486. 1852.
(Thuidiaceae)

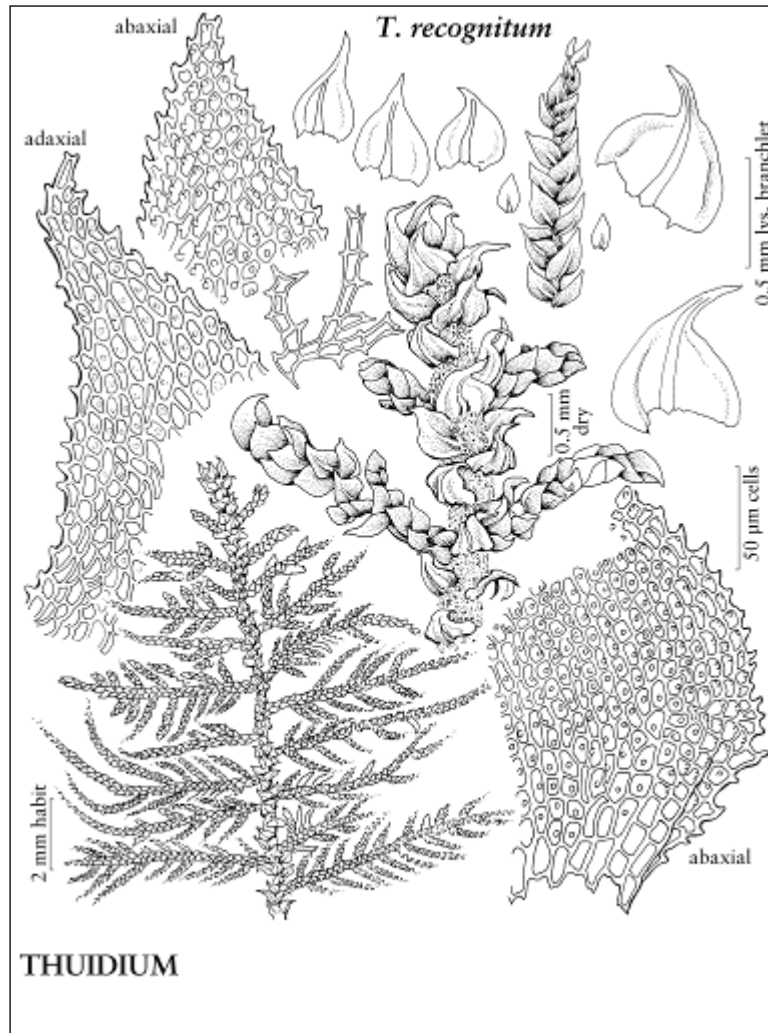
Thuidium abietinum (Hedw.) Schimp. in B.S.G. = *Abietinella abietina* (Hedw.) Fleisch.

Thuidium recognitum (Hedw.) Lindb., Not. Sällsk. Fauna Fl. Fenn. Förh. 13: 416. 1874 (as *Thuidium*).
Hypnum recognitum Hedw., Sp. Musc. Frond., 261. 1801.
Hypnum protensum Michaux

Not reported for Wyoming by FNA (FNA Vol. 28, 2014). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: SNF, Beartooth Plateau, Lily Lake shore, wet spruce forest, on wet litter and humus, 44°56.880–890’N, 109°42.930–940’W, ca. 7700 ft (2350 m), 17 Aug 2008, *Kosovich-Anderson 3047* (COLO, MO).

The absence of this species “from western North America is nearly complete except for an arc of distribution that extends from eastern North America into the high Arctic thence southward in the mountains from Alaska and British Columbia barely reaching Washington State” (Norris & Shevock 2004). From an ecological community that “is generally characterized by high bryophyte diversity and abundance, creating for Wyoming an unusual picture of a northern boreal forest with bryophyte coverage up to 100%, dominated by typical luxuriant forms of *Hylocomium splendens* combined with *Aulacomnium palustre*, *Climacium dendroides*, *Helodium blandowii*, *Rhizomnium* spp., *Thuidium recognitum*, *Marchantia alpestris*, and others,” Kosovich-Anderson & Weber (2011).



Courtesy FNA Association, FNA 28, 2014

TIMMIA Hedw., Sp. Musc. Frond., 176. 1801. (Timmiaceae)

Timmia austriaca Hedw., Sp. Musc. Frond., 176, plate 42, figs. 1–7. 1801.

Timmia arctica Kindb.

Timmia austriaca var. *arctica* (Kindb.) Arnell

Timmia austriaca var. *brevifolia* Ren. & Card.

Timmia austriaca var. *papillosa* Hesselbo.

Timmia polytrichoides var. *lutescens* Brid.

Wyoming (FNA Vol. 27, 2007). Wyoming: Yellowstone Natl Park, sterile (1526) (Roell 1893). Laramie Peak, Albany County (*Nelson 1645*); Brooklyn Lake, Albany County (*Nelson 5174*); Wolf Creek, Sheridan County (*Nelson 2324*). Carbon, Crook: (as var. *brevifolia*) R. & C., Tower Falls, Yellowstone Natl Park (*Nelson 5913*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: Aug 1897, *Nelson 22* (RM); 8500 ft, *Hermann 17779* (RM). Big Horn Co.: *Nelson 4543* (RH, BUF); 7200 ft, Big Horn Mtns., ca. 33.5 mi ESE of Greybull, ca. 11.5 mi NE of

Hyattville, S of Paint Rock Lakes, under Engelmann spruce-subalpine fir, 8600 ft, 9 Aug 1979, *Nelson 4942* (RH, BUF). Carbon Co.: 9000 ft, *Hermann 17801* (RM). Fremont Co.: 8400 ft, *Hermann 25514* (RM). Johnson Co.: (var. *brevifolia*) 5600–6000 ft, *Odasz 1261* (BUF, RM). Park Co.: 6000 ft, 1 Apr 1988, *Vukelich s.n.* (BUF); (var. *brevifolia*) 6800–7400 ft, *Herman 22063*, c.fr. (BUF, RM). Sheridan Co.: 12 Jul 1896, *Nelson s.n.* (RM); 5200–7200 ft, *Odasz 1029*, (BUF, RM); (var. *brevifolia*) 5200–7200 ft, *Odasz 1030* (BUF, RM). Sublette Co.: *Hermann 25332* (RM). Washakie Co.: (var. *brevifolia*) Big Horn Mts; along Canyon Creek ca. 6.7 mi W of Hazelton Pyramid, mixed conifer forest, 8000 ft, 17 Aug 1980 *Nelson & Fonken 7315* (BUF, RM). Yellowstone Natl Park: *Nelson & Nelson 5913* (RM).

Var. *brevifolia* is not recognized in the Anderson et al. (1990) checklist. One probably should not recognize var. *brevifolia*: all specimens seen appear to be between 4 and 6 mm in leaf length: perhaps this is the typical size. *Timmia megapolitana* in the field resembles more a *Polytrichum* with rather erect, non-contorted leaves, which are inrolled. *Polytrichum* has multicellular filaments on the costa and a tympanum across the mouth of the capsule. *Timmia* has peristome teeth with an inner peristome of 64 cilia; the capsules are inclined.

Timmia megapolitana Hedw., Sp. Musc. Frond., 176. 1801.

Wyoming (FNA Vol. 27, 2007); note the subsp. *megapolitana* is not reported for Wyoming by FNA Vol. 27, 2007. Wood's Creek, Albany Co. (*Porter 670*); Beaver Creek, Weston County (*Nelson 9459*), Porter (1935). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: *Eckel 871111* (RM, BUF); Laramie Mtns, Roger Canyon, ca. 8 mi NE of Laramie, limestone outcrops with *Cercocarpus montanus*, 7 Jun 1993, *Buck 23153*, c.fr., young, lid fast shut (NY); along Roger Canyon in the Laramie Mtns, 7 mi due NE of Laramie city center, *Artemisia* scrub vegetation, limestone cliffs and outcrops, ca. 7600 ft, on limestone cliff, 7 Jun 1993, *Reese 18148* (LAF). Sheridan Co.: 6600–8000 feet, *Odasz 1132* (BUF, RM); Big Horn Mts., forested valley through Chugwater redbeds, limestone outcrops, and forest margin, 4800 ft, 3 Aug 1979 *Hartman 10649*, c.fr. (BUF, RM).

subsp. **megapolitana.**

Timmia cucullata Michaux

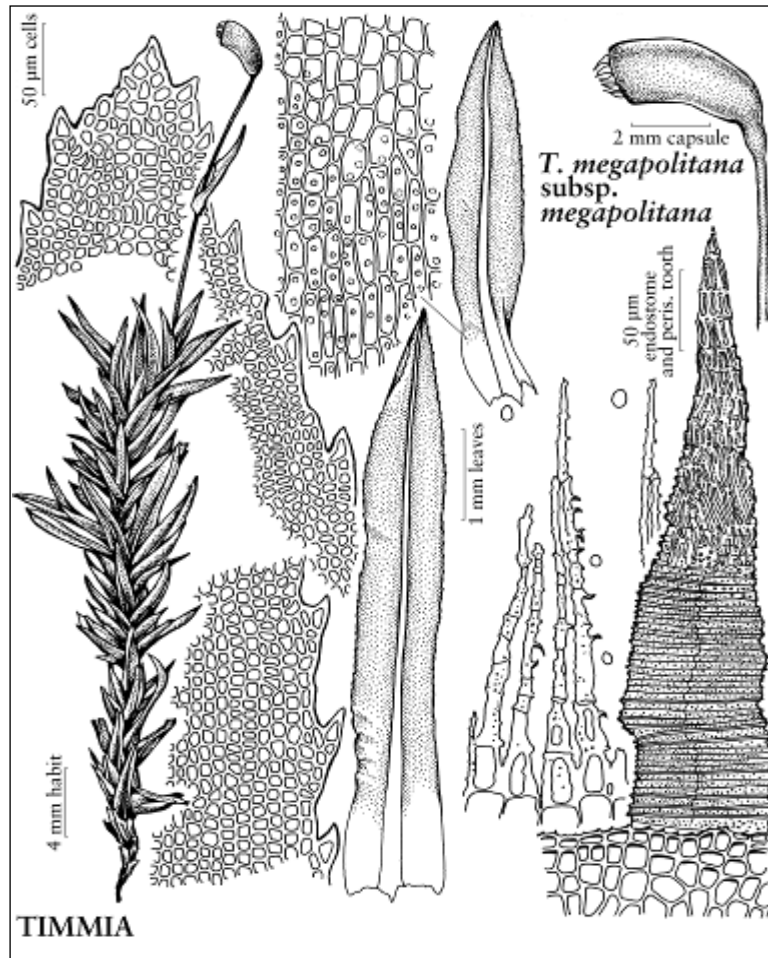
subsp. **bavarica** (Hessler) Brassard, *Lindbergia* 10: 34. 1984.

Timmia bavarica Hessler, *De Timmia* 19, fig. 3. 1822.

Timmia megapolitana var. *bavarica* (Hessler) Brid.

Wyoming (FNA Vol. 27, 2007). (As *Timmia bavarica* Hesel.) The common species in the southern part of the State. Telephone Canyon, Albany Co. (*Porter 1456*); Pole Mountain, Albany County (*Porter 666*); Rogers Canyon, Albany County (*Porter 670*), Porter (1935).

Albany Co.: 8500 ft, *Hermann 17757 1/2* (RM); Laramie Mountains, Roger Canyon, 7 mi NE of Laramie city center, limestone outcrops with *Cercocarpus montanus*, *Artemisia cava*, *A. tripartita*, *A. nova*, *A. tridentata*, aspen grove below bluff, on soil, 7 Jun 1993, *Miller 10237* (NYS). Big Horn Co.: Big Horn Mts., 8600–8800 ft, on limestone, *Odasz 731*, c.fr. (BUF, RM). Park Co.: 6900–7800 ft, *Hartman 21049*, c.fr. (BUF, RM); 6900–7800 ft, *Hartman 21026*, c.fr. (BUF, RM). Sheridan Co.: 8400 ft, *Nelson & K. Dueholm 3757* (RM, BUF).



Courtesy FNA Association, FNA 27, 2007

TOMENTYPNUM Loeske, Deutsche Bot. Monatsschr. 22: 82. 1911. (Amblystegiaceae) (note: not Tomenthypnum)

Camptothecium sect. *Tomentella* Kindb.

Homalothecium subg. *Tomentypnum* (Loeske) H. Robinson

Tomentypnum nitens (Hedw.) Loeske, Deutsche Bot. Monatsschr. 22: 82. 1911,

Hypnum nitens Hedw., Sp. Musc. Frond., 255. 1801,

Camptothecium nitens (Hedw.) Schimp.

Homalothecium nitens (Hedw.) H. Robinson

Tomentypnum nitens var. *involutum* (Limpr.) C.E.O. Jensen,

Wyoming (FNA Vol. 28, 2014). Wyoming (Lawton). (As *Camptothecium nitens* (Schreb.) Schimp. sec. Crum et al. (1973). (As *Camptothecium nitens* (Schreb.) Schimp.) Albany County (Porter 937, 942 & 1421), Porter (1935). Johnson Co., in association with *Warnstorfia tundrae*, Lenz (2006). Sublette Co., Cooper & Andrus (1994). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Park Co.: calcareous bog, 6700 ft, *Hartman 18547* (RM); Beartooth Plateau, 2900 m, *Weber B-44285* (COLO, RM); Beartooth Lake, S slope, alt. 9000 ft, boggy area, *Whitehouse 27444* (US);

wet soil, in calcareous white spruce fen at base of Cathedral Cliffs, 2 mi E of Crandall Ranger Station, 6600 ft, 12 Aug 1990, *Elliott 1730* (BUF). Sheridan Co.: on vertical rock face, moist limestone, Big Horn Natl Forest, 16 Jun 1992, *McKee 92-019*, with *Encalypta vulgaris* var. *vulgaris* (RM). Sublette Co.: Bridger Wilderness, Wind River Range, Barnes Lake, 9747 ft, 42°57'30"N, 109°36'W, mineralized seeps at south end of lake, 14 May 1989, *Andrus 7794* (BING).



Courtesy FNA Association, FNA 28, 2014

TORTELLA (Lindb.) Limpr., Laubm. Deutschl. 1: 599. 1888, name conserved. (Pottiaceae)
Mollia subgen. *Tortella* Lindb., Musc. Scand., 21. 1879.

Tortella alpicola Dixon, Ann. Bryol. 3: 54. 1929.

Tortella fragilis var. *tortelloides* (S. W. Greene) R.H. Zander & Hoe

Tortella tortelloides (S. W. Greene) H. Robinson

Wyoming (Eckel 1997). (All as *Tortella tortelloides*.) Fremont Co.: limestone outcrop, Douglas fir slope, 1/2 mi E of Horse Creek Campground, 7800 ft, Absaroka Range, 11 mi N Dubois, 28 Aug 1973, *Hermann 25530* (with *Pseudoleskella tectorum*, *Gymnostomum aeruginosum* (WTU)). A duplicate specimen of *Hermann 25530* in RM did not contain a specimen of *T. alpicola*. Sheridan

Co.: moist limestone, on vertical rock face with *Trentepolia* (agla), Bighorn Natl Forest, 16 Jun 1992, *McKee* 92-018 (BUF, RM); same area, in crevices of rock ridge faces, limestone, 24 Jun 1992, *McKee* 92-046, with *Encalypta vulgaris*, *Mnium blyttii*, *Orthotrichum jamesianum*, *Pseudoleskeella tectorum*, *Tortula norvegica*, *Tortula mucronifolia* (BUF, RM).

Tortella fragilis (Hook. & Wils.) Limpr., Laubm. Deutschl. 1: 606. 1888.

Didymodon fragilis Hook. & Wils. in T. Drumm., Musc. Amer., 127. 1828 (as fragile).

Barbula fragilis (Hook. & Wils.) B.S.G.

Mollia fragilis (Hook. & Wils.) Lindb.

Wyoming (FNA Vol. 27, 2007). British Columbia, Washington, Alberta, Montana, Wyoming; Alaska, Nevada; Iowa, Minnesota, Michigan, Ontario; Greenland, Quebec, New England, New Jersey. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Albany Co.: 10,000 ft, Medicine Bow Mts., *Hermann* 17222 (NY, RM); along Roger Canyon, Laramie Mtns., 7 mi due NE of Laramie, Artemesia scrub, limestone cliffs, 7600 ft, crack in limestone cliff, *Reese* 18163A (LAF, BUF); thin soil on low basalt boulder, shore of rocky pond 1 mi S of Brooklyn Lake, 10,000 ft, Snowy Range, Medicine Bow Mts, 9 mi W of Centennial, 22 Aug 1961, *Hermann* 17222 (MICH); Medicine Bow Natl Forest, Snowy Range, Libby and Lewis Lakes vicinities (near Sugarloaf Campground area), slope facing the north, alpine tundra, on open dry gravelly soil, associated with *Encalypta* sp., 10,800 ft, 16 Sep 2007, *Kosovich-Anderson* 1604 (MO). Park Co.: 3250 m, *Weber* B-44263 (COLO, RM) Beartooth Plateau, Cooke City to Red Lodge Highway, alpine bogs of E summit, E slope, head of Wyoming Creek, 3250 m (COLO); W of Bear Tooth Butte, Crazy Creek campground, 22 Aug 1963, *Lawton* 2027 (NY, WTU); Beartooth Plateau, Cooke City to Red Lodge Hwy alpine bogs of E summit, E slope, head of Wyoming Creek, 3250 m, 19 Aug 1973, *Weber* B- 44263 (COLO). Teton Co.: Hidden Falls along the E shore of Jenny Lake, on soil near falls, 6600-7100 ft, 12 Aug 1962, *Redfearn* 11713 (MO).

Tortella humilis (Hedw.) Jennings, Man. Mosses W. Pennsylvania, 96. 1913.

Barbula humilis Hedw., Sp. Musc. Frond., 116, plate 25, figs. 1-4. 1801.

Barbula caespitosa Schwägr.

Tortella caespitosa (Schwägr.) Limpr.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007). Teton Co., Spence (1985).

This appears to be an eastern species, but is provisionally accepted based on the report of Spence (1985).

Tortella tortelloides (S. W. Greene) H. Robinson = *Tortella alpicola* Dixon

Tortella tortuosa (Hedw.) Limpr., Laubm. Deutschl. 1: 604. 1888.

Tortula tortuosa Hedw., Sp. Musc. Frond., 124. 1801.

Var. **tortuosa**

Barbula tortuosa (Hedw.) Web. & Mohr

Mollia tortuosa (Hedw.) Lindb.

Trichostomum tortuosum (Hedw.) Dix.

Wyoming (FNA Vol. 27, 2007). In all states and provinces of the Pacific Northwest; Alaska, Nevada, Utah, Colorado; South Dakota, Minnesota, Michigan, Ontario; Nova Scotia and Quebec to

North Carolina. Hoback Canyon, Teton Co. (*Porter 1166 & 1169*), Porter (1935). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

Crook Co.: Black Hills: 6.4 km N-NE of Warrens Peaks, along Beaver Creek, *Betula-Pinus* woods, rather exposed on soil covered rock, 21 May 1977, *Churchill 8734b* (MO). Sheridan Co.: 6600–8000 ft, *Odasz 1172* (BUF, RM); 6600–8000 ft, T58N, R90W Sec. 30, *Odasz 1084* (MO, RM). Park Co.: Beartooth Plateau, Cooke City to Red Lodge Highway, alpine bogs of E summit, E slope, head of Wyoming Creek, 3250 m, 19 Aug 1973, *Weber B- 44263*, as *T. arctica* (MO).

TORTULA Hedw., Sp. Musc. Frond., 122. 1801, name conserved. (Pottiaceae)

Desmatodon Brid.

Phascum Hedw.

Pottia (Reichenbach) Fürnrohr

Protobryum J. Guerra & M. J. Cano

Tortula caninervis (Mitt.) Broth. = *Syntrichia caninervis* Mitt.

Tortula cernua (Huebener) Lindb., Musc. Scand., 20. 1879.

Dermatodon (sic) *cernuus* Huebener, Muscol. Germ., 117. 1833 .

Cynodontium latifolium Schwaegr.

Desmatodon camptothecius Kindb. in Macoun

Desmatodon cernuus (Hüb.) P. Bruch & Schimp. in B.S.G.

Tortula cernua (Hüb.) Lindb.

Wyoming (FNA Vol. 27, 2007). (As *Desmatodon cernuus*) British Columbia, Alberta, Montana, Wyoming; Yukon, Nevada, Utah, Colorado; Manitoba, Wisconsin, Ontario; Greenland, Newfoundland, Quebec, Ohio. Wyoming, Flowers (1973). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(All as *Desmatodon cernuus*) Albany Co.: 8500 ft, 17 Aug 1961, *Hermann 17105*, c.fr. (RM); northwest base of Sheep Mtn. along Wy Rte. 11, ca. 4 mi due ESE of Centennial, ca. 7750 ft, fen with low forest of *Populus*, *Betula*, *Salix* in shallow water, a “hanging bog” on steep hillside, hummock under trees, 7 Jun 1993, *Reese 18175*, with *Desmatodon cernuus* (LAF). Yellowstone Natl Park: Lower Falls, Yellowstone River, 21 Aug 1938, *Bartley & Pontious s.n.* (RM); Soda Butte, 19 Aug 1953, *Lawton 1905*, c.fr. (WTU).

This species looks much like a *Bryum* because of the large, thick walled, square to short rectangular, smooth upper cells, the apiculus or cusped leaf tip, and especially the leaf border. The capsule is zygomorphic, however, and the teeth were coarsely papillose and pronged—unlike the delicate teeth with their sprinkles of minute papillae of *Bryum*.

Tortula guepinii (P. Bruch & W.P. Schimper) Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 214(I,3): 430. 1902.

Desmatodon guepinii P. Bruch & W.P. Schimper, Bryol. Europ. 2: 58, plate 133. 1843.

Wyoming (FNA Vol. 27, 2007).

(As *Desmatodon guepinii*) Park Co.: 6400–6600 ft, *12567* (BUF, RM).

Tortula guepinii is smaller than *T. hoppeana*, with leaves less than 2 mm, “and cells of the leaf margin are distinctly less papillose at the apex” (Zander & Eckel, FNA Vol. 27, 2007).

Tortula hoppeana (Schultz) Ochyra, Bryologist 107: 499. 2005.

Trichostomum hoppeanum Schultz in C. F. Hornschuch, Syll. Pl. Nov 2: 140. 1828.

Bryum piliferum Dicks.

Desmatodon glacialis Funck ex Brid.

Desmatodon latifolius (Hedw.) Brid.

Desmatodon latifolius var. *muticus* (Brid.) Brid.

Desmatodon latifolius var. *muticus* (Brid.) Brid.

Desmatodon latifolius var. *pilifer* (Dicks.) Rabenh.

Dicranum latifolium var. *muticum* Brid.

Tortula eucalyptrata Lindb.

Trichostomum euryphylla R.H. Zander

Wyoming (FNA Vol. 27, 2007). (As *Desmatodon latifolius*) Washington, Oregon, Alberta, Idaho, Wyoming; California, Nevada, Colorado; Quebec. In all states and provinces of the Pacific Northwest; Alaska, California, Arizona, Nevada, Utah, Colorado; Quebec. (As *Desmatodon latifolius* var. *glacialis* Schimp.) Nash's Fork, Albany County (*Nelson 7810*); Brooklyn Lake, Albany County (*Nelson 1835*) and *Nelson 5234*); Bridger Peak, Carbon Co. (*Goodding 1965*). *Nelson 5234* was determined by Holz. as *Barbula amplexa* Lesq., and was so reported by Dr. Nelson (1900). “Mr. E.B. Bartram is to be thanked for the correction,” Porter (1935). “Common in front of glaciers”, Teton Range, Grand Teton Natl Park, Wyoming, (Spence 1981). Teton Co., Spence (1985). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

No county, *Nelson 2865b* (RM). Carbon/Albany Co.: *Nelson 7810* (RM). Albany Co.: Nash's Fork, under spruce trees, 9000 ft, 29 Jul 1900, *Nelson 7810*, c.fr., & calyptrae (TENN); La Plata Mines, 10,000 ft, on soil, in wet places, *Nelson 5234* (muticous form) (TENN). Carbon Co.: Medicine Bow Mts., 9600–10,000 ft, *Hermann 20730* (RM, BUF); rotted wood in soil in lodgepole pine woods along Trail Creek, Sand Lake Rd., 9000 ft, Medicine Bow Mts., 4.5 mi SW Morgan, 6 Aug 1962, *Hermann 17813*, c.fr., (WTU), Medicine Bow Mts., 2.3 mi above French Creek, 11 Aug 1953, *Lawton 1705*, c.fr., (WTU); *Hermann 17187* (RM); Nash's Fork, Medicine Bow Mts., *Nelson 7810* (RM). Park Co.: road from Bear Tooth Lodge to Red Lodge, E of summit near small glacial lake at 10,500 ft, 21 Aug 1953, *Lawton 1967*, c.fr. (WTU). Sublette Co.: Bridger Wilderness, Wind River Range, near Bell Lakes, 10,100 ft, 42°58'N, 109°35'W, with *Polytrichum juniperinum*, *Bryum pseudotriquetrum*, *Pohlia nutans*, 16 May 1989, *Andrus 7861* (BING).

Tortula inermi (Brid.) Mont., Arch. Bot. (Leipzig) 1: 136. 1832.

Syntrichia subulata var. *inermi* Brid., Bryol. Univ. 1: 581. 1826.

Syntrichia inermi (Brid.) Bruch

Wyoming (FNA Vol. 27, 2007). Wyoming; California, Arizona, Utah. Wyoming, Flowers (1973). Dry limestone rock crevices, Telephone Canyon, Albany Co. (*Porter 1272*), Porter (1935).

Tortula leucostoma (R. Brown) Hook. & Grev., Edinburgh J. Sci. 1: 294. 1824.

Barbula leucostoma R. Brown, Chlor. Melvill., 40. 1823.

Desmatodon leucostoma (R. Brown) Berggr.

Desmatodon obliquus B.S.G.

Desmatodon suberectus (Hook.) Limpr.

Tortula suberecta Hook. in Drumm.

Not reported for Wyoming in FNA (FNA Vol. 27, 2007). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).

(No county): Big Horn Natl Forest, Prune Creek, 30 Aug 1951, *Whitehouse s.n.* (WTU). Sublette Co.: on steep, gravelly, peaty open slope above W shore of Lower Green River Lake, 7950 ft, Wind River Range, 50 mi N of Pinedale, 19 Jun 1973, *Hermann 25339*, c.fr. (WTU).

Tortula mucronifolia Schwägr., Sp. Musc. Frond. Suppl. 1(1): 136, plate 34. 1811.

Wyoming (FNA Vol. 27, 2007). British Columbia, Alberta, Idaho, Montana, Wyoming; Alaska, Yukon, Arizona, New Mexico, Utah, Colorado; Minnesota, Iowa, Ontario; Greenland, New England, New York. Albany, Carbon cos., Yellowstone Natl Park, Porter (1935). Campbell Co., Medina (1994).

Albany Co.: dry sandy soil, *Porter 1751* (RM); *Porter 1697* (NY, RM); NW base of Sheep Mtn., sandstone outcrops and chugwater redbeds with *Artemisia* dominant, 7 Jun 1993, *Buck 23221*, fruit old, peristomes eroding (NY). Crook Co.: Devil's Tower Natl. Mon., open *Pinus ponderosa-Quercus* woods, 22 May 1977, *Churchill 8814*, c.fr. (NY). Park Co.: 6500 ft, *Hermann 20040 1/2* (RM). Sweetwater Co.: on US (187) 191, at 14 Mile Reservoir, picnic area, US Dept. of Interior, dry slopes above pond, *Sarcobatus*, *Artemisia tridentata* scrub, with *Pterygoneurum subsessile*, *T. caninervis*, 5 Jul, 1985, *Eckel 318186* (BUF). Sheridan Co.: 6500 ft, *Hartman 10735* (BUF, RM); 4,800 ft, *Hartman 10591* (BUF, RM).

Tortula norvegica (Web.) Wahlenb. ex Lindb. = *Syntrichia norvegica* F. Weber

Tortula obtusifolia (Schwägr.) Mathieu, Fl. Gén. Belgique 2: 48. 1853.

Barbula obtusifolia Schwägr., Sp. Musc. Frond. Suppl. 1(1): 129, plate 31. 1811.

Desmatodon arenaceus Sull.

Desmatodon coloradensis Grout

Desmatodon obtusifolius (Schwaegr.) Schimp.

Wyoming (FNA Vol. 27, 2007). (As *Desmatodon obtusifolius*) British Columbia, Washington, Alberta, Montana, Wyoming; Alaska, Utah, Colorado, Arizona, New Mexico; South Dakota, Nebraska, Kansas, Texas, Manitoba, Minnesota, Iowa, Missouri, Wisconsin, Michigan, Indiana, Ontario; Quebec, New Jersey, Ohio, Tennessee. Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010). (As *Desmatodon obtusifolius*) Weston Co., Wynne (1943).

Weston Co.: *Eckel 1023686* (RM, BUF). ? Co., Kofa Mts., *Gooding s.n.*, Mar 22, 1939 (RM).

Tortula papillosissima (Copp.) Broth. = *Syntrichia papillosissima* (Coppey) Loeske

Tortula princeps De Not. = *Syntrichia princeps* (DeNotaris) Mitt.

Tortula plinthobia (Sull. & Lesq.) Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 214(I,3): 430. 1902.

Desmatodon plinthobius Sull. & Lesq. in A. Gray, Manual ed. 2, 628. 1856.

Not reported for Wyoming by FNA, although the state is within the range of the species and should be expected (FNA Vol. 27, 2007). (As *Desmatodon plinthobius*) Rochelle Hills, Campbell Co., Medina (1994).

[*Tortula porteri* (James) Broth. in H.G.A. Engler and K. Prantl, Nat. Pflanzenfam. 214(I,3): 430. 1902, excluded.]

Desmatodon porteri James in C.F. Aust., Musci Appalach., 123. 1870.

Desmatodon fisherae H.A. Crum

Not reported for Wyoming in FNA; the species occurs in eastern North America (FNA Vol. 27, 2007). (As *Desmatodon porteri*) Cummins, Albany Co. (*Nelson 1538*, in part), Porter (1937).

This distinctively Eastern species is very doubtfully a member of the Wyoming moss flora.

Tortula ruraliformi (Besch.) Ingh. = *Syntrichia ruralis* (Hedw.) F. Weber & D. Morr.

Tortula ruralis (Hedw.) Gaertn., Meyer & Scherb. = *Syntrichia ruralis* (Hedw.) F. Weber & D. Morr.

Tortula systylia (Schimper) Lindb., Musc. Scand., 20. 1879.

Desmatodon systylius Schimper, Flora 28: 145. 1845.

Wyoming (FNA Vol. 27, 2007). (As *Desmatodon systylius*) Canadian Rocky Mountains, Wyoming; California; Newfoundland.

Lincoln Co.: on US 189 S at jct. with US 30, Diamonville town limits, ca. 6927 ft, rocky dry gully in hillside, *Sarcobatus vermiculatus*, shadscale, *Artemisia tridentata*, Sego lily, *Opuntia*, on calcareous fine soil, 4 Jul 1985, *Eckel 94082200*, c. fr., with *Tortula ruralis* (BUF, RM).

In the Lincoln Co. specimen, the capsule variation is strongly reminiscent of that of *Henediella heimii*, the setae are some long, some short, the capsules are some broad and dark, others seem thin and light—perhaps this is just the last season and the present. The gametophytes when not bleached yellow-orange are a fresh green, bright because they are not papillose like *Pterygoneurum* species, which are more dull, sordid brownish orange and green. The latter genus often has rough awns: *D. systylius* has smooth awns. This species also has the distinctive areolation of the group, lax, thin-walled, with a gradual transition from basal cells to those of the limb—a more delicate overall appearance. “*Tortula systylia* may be confused with *Stegonia* but the latter has a distinct triangle of echlorophyllose cells at the apex of the much broader leaves. It is similar also to *T. hoppeana*, but the laminal cells (of *T. systylius*) are smooth” (Zander & Eckel, FNA Vol. 27, 2007).

TRICHOSTOMUM Bruch, Flora 12: 396. 1829, name conserved. (Pottiaceae)

Oxystegus (Limpr.) Hilpert.

Paraleptodontium D. G. Long

Trichostomum subg. *Crispuliformes* (Kindb.) R.H. Zander

Trichostomum subg. *Oxystegus* Limpr.

Trichostomum tenuirostre (Hook. & Taylor) Lindb., Öfvers. Kongl. Vetensk.-Akad. Förh. 21: 225. 1864.

Weissia tenuirostris Hook. & Taylor, Muscol. Brit. ed. 2, 83.

Didymodon trachyneuron Kindb.

Oxystegus cylindricus (Brid.) Hilp.

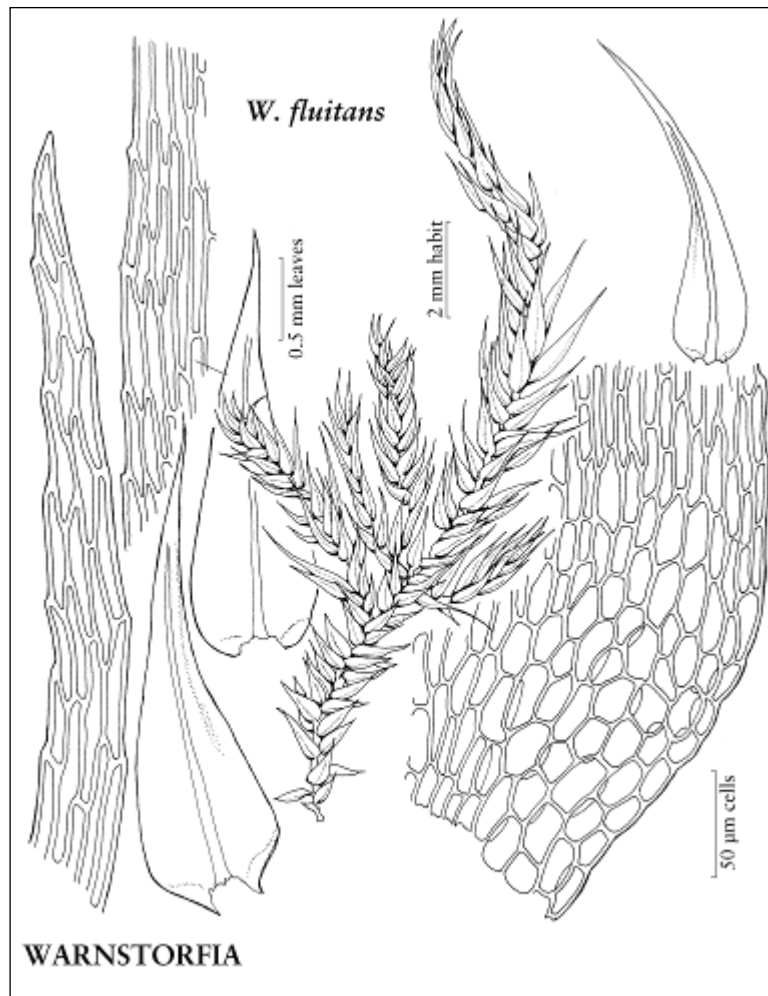
Oxystegus tenuirostris (Hook. & Tayl.) A. J. E. Smith

Trichostomum cylindricum (Brush ex Brid.) Müll. Hal.

Weissia cylindrica Bruch ex Brid.

Not reported for Wyoming by FNA (FNA Vol. 27, 2007). Crum and Anderson (1981: 303).

While thumbing through the first volume of the mosses of Eastern North America it was noticed that the chromosome number ($n = 13$) of this species was determined from a specimen from Wyoming (Crum & Anderson 1981: 303). The species has a disjunctive distribution between the east and western coasts of North America. It is reported from Colorado in "alpine tundra, and at compensating environments on north faces of lower canyon walls" (Weber & Wittmann 2007).



Courtesy FNA Association, FNA 28, 2014

WARNSTORFIA Loeske, Hedwigia 46: 310. 1907. (Calliergonaceae)

Warnstorfia exannulata (Schimp. in B.S.G.) Loeske = *Sarmentypnum exannulatum* (Schimper)
Hedenäs

Warnstorfia fluitans (Hedw.) Loeske (Hedw.) Loeske, Hedwigia 46: 310. 1907.

Hypnum fluitans Hedw., Sp. Musc. Frond., 296. 1801.

Drepanocladu fluitans var. *setiformi* (Ren.) Mönk.

Drepanocladus berggrenii (C. Jens.) G. Roth

Drepanocladus fluitans (Hedw.) Warnst.

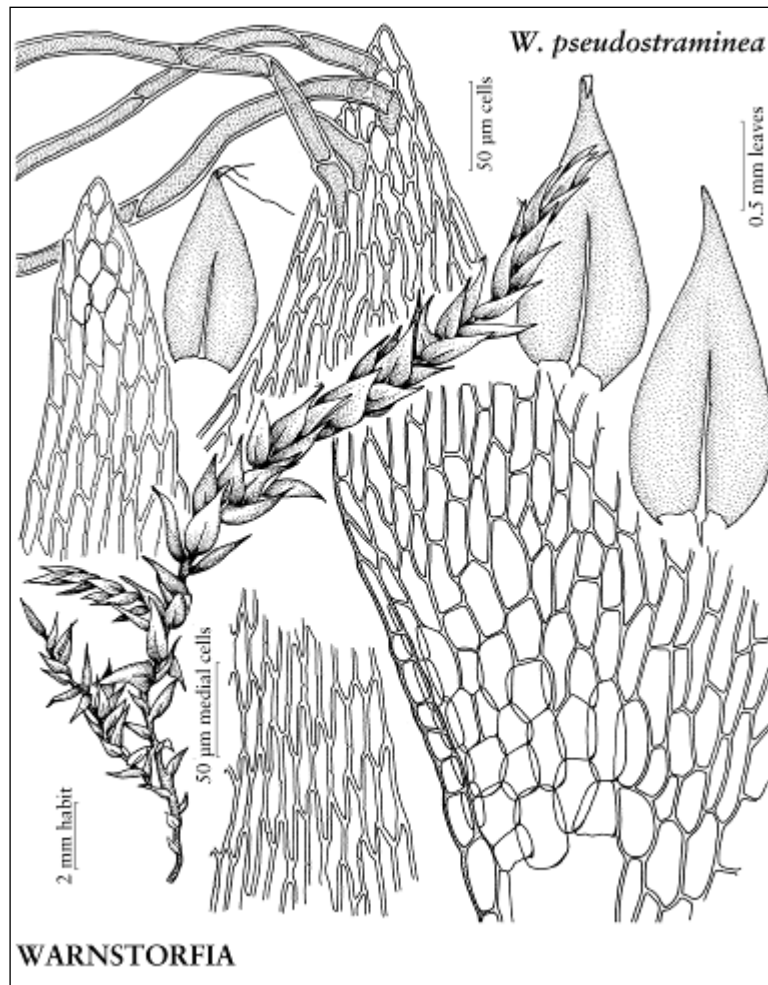
Drepanocladus fluitans var. *uncatus* H.A. Crum, Steere & L.E. Anderson

Drepanocladus fluitans var. *falcatus* (C.E.O. Jensen) G. Roth

Warnstorfia fluitans var. *falcata* (C.E.O. Jensen) H.A. Crum & L.E. Anderson

Var. **fluitans**

Not reported for Wyoming by FNA (FNA Vol. 28, 2014). (As *Hypnum fluitans* L.) Wyoming: Yellowstone Natl Park (1574–75, 1581) (Roell 1893); as fo. *depauperata* (sic): Yellowstone Natl Park (1552) (Roell 1893). (All as *Drepanocladus fluitans* (Hedw.) Warnst.) Snake River, Yellowstone Natl Park (Nelson 6485), Porter (1935). Yellowstone Natl Park, Porter (1937). Both of these are probably Nelson 6485, redetermined by me as *D. exannulatus*, q.v. Wynne (1944). Shoshone Natl Forest, NW Wyoming, Kosovich-Anderson (2010).



Courtesy FNA Association, FNA 28, 2014

Sheridan Co.: dominant species in sunnier areas, moist limestone, Big Horn Natl Forest, T57N, R89W, Section 34, *McKee 92-011*, with *Distichium capillaceum*, *Hylocomium splendens* (BUF, RM). Sublette Co.: Bridger Wilderness, Wind River Range, South Fork Baldy Creek headwaters, 10,290 ft, 42°59'N, 109°34'W, in small fen, with *Amblystegium riparium*, 16 May 1989,

Andrus 7827 (BING). Yellowstone Natl Park: in a woodland pool, Snake River, *Nelson & Nelson* 6485, exsicc. Plants of Yellowstone. Nat. Park, det. Holz. (RM).

There is a var. *falcata* (Sanio ex C. Jens.) Crum & Anderson in the Anderson et al. (1990) checklist but “Variety *falcata* (*Drepanocladus fluitans* var. *uncatus*) has been recognized, but because no type material seems to be extant, the status of this taxon cannot be evaluated” (Hedenas, FNA Vol. 28, 2014).

Warnstorfia pseudostraminea (Müll. Hal.) Tuomikoski & T. Kop., Ann. Bot. Fenn. 16: 223. 1979.
Hypnum pseudostramineum Müll. Hal., Bot. Zeitung (Berlin) 13: 502. 1855 (as pseudostramineum).
Calliergidium pseudostramineum (Müll. Hal.) Grout
Calliergidium pseudostramineum var. *hoveyi* Grout
Calliergidium pseudostramineum var. *plesistramineum* (Ren.) Grout
Drepanocladus pseudostramineus (Müll. Hal.) G. Roth

Wyoming (FNA Vol. 28, 2014).

WEISSIA Hedw., Sp. Musc. Frond., 64. 1801. (Pottiaceae)
Astomum Hampe
Hymenostomum R. Brown
Weissia sect. *Astomum* (Hampe) Müll. Hal.
Weissia subg. *Astomum* (Hampe) Kindb.
Weissia subg. *Hymenostomum* (R. Brown) Andrews

Weissia controversa Hedw., Sp. Musc. Frond., 67. 1801.
Gymnostomum rauanum Aust.
Mollia viridula (Withering) Lindb.
Weissia andrewsii E.B. Bartram
Weissia brandegeei Aust.
Weissia controversa var. *australis* (Austin) Schornherst
Weissia controversa var. *longiseta* (Lesq. & James) H.A. Crum, Steere & L.E. Anderson
Weissia controversa var. *wolffii* (Lesq. & James) H.A. Crum, Steere & L.E. Anderson
Weissia curvicaulis Brid.
Weissia longiseta Lesq. & James
Weissia microodonta Hedw.
Weissia viridula var. *nitida* Ren. & Card.
Weissia wolffii Lesq. & James

Not noted for Wyoming in FNA Vol. 27, 2007, but reported from stations in all encircling states.

(As *Weisia wolffii* L. & J.) Mammoth and Old Faithful, Yellowstone Natl Park (*Smiy*), Porter (1935). (As *Weisia convoluta*) Yellowstone Canyon, Yellowstone Natl Park (*Smiy*), Porter, *Smiy* 46 (YELLO) has been determined to be *Dicranoweisia crispula* (q.v.), as is 93, and 150 (YELLO).

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